

TOSHIBA

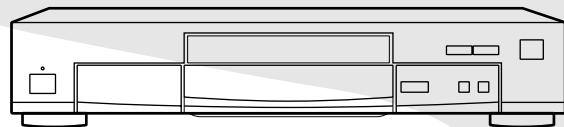
FILE NO. 810-200019

SERVICE MANUAL



DVD VIDEO PLAYER

SD-2300



LASER BEAM CAUTION LABEL



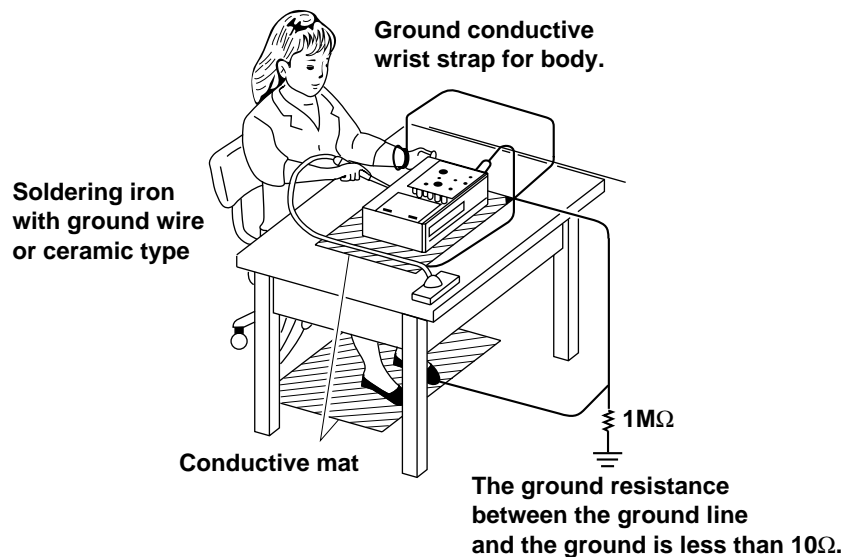
When the power supply is being turned on, you may not remove this laser cautions label. If it removes, radiation of a laser may be received.

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.



SAFETY NOTICE

SAFETY PRECAUTIONS

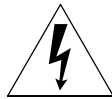
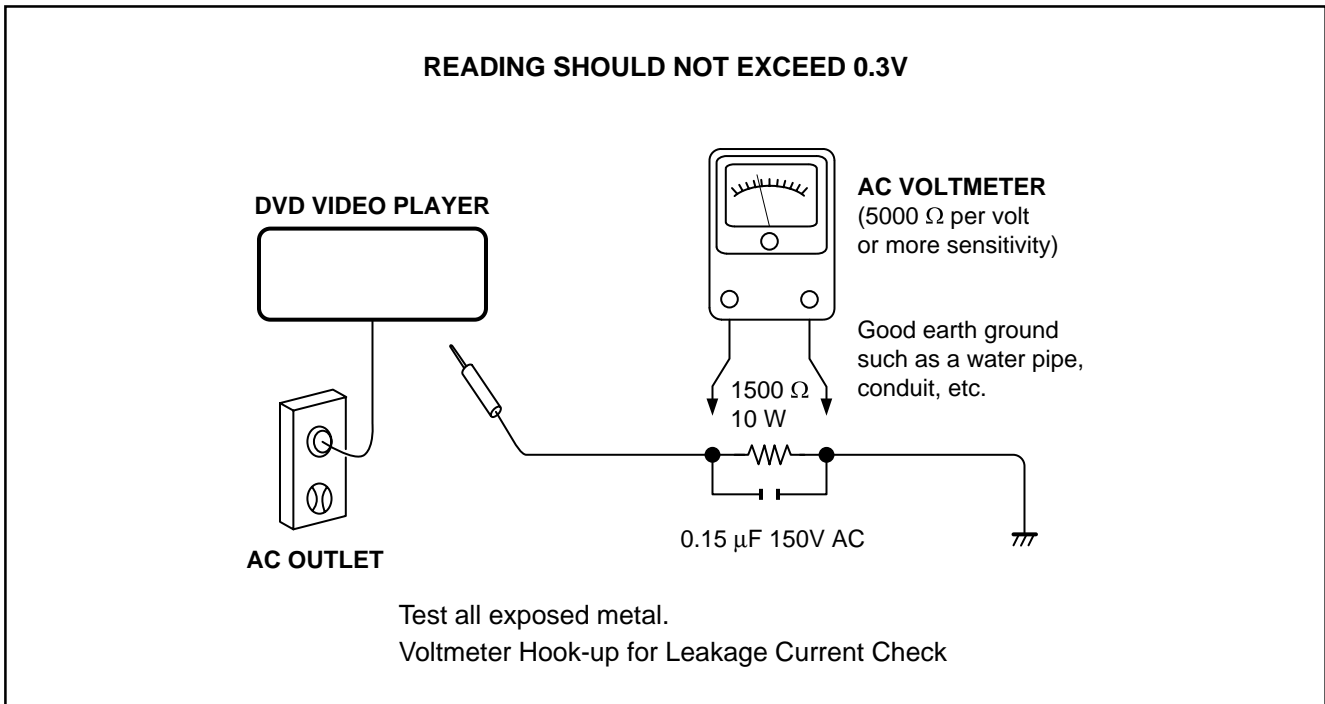
LEAKAGE CURRENT CHECK

Plug the AC line cord directly into a 120V AC outlet (do not use an isolation transformer for this check). Use an AC voltmeter, having 5000 Ω per volt or more sensitivity. Connect a 1500 Ω 10 W resistor, paralleled by a 0.15 μ F 150V AC capacitor between a known good earth ground (water pipe, conduit, etc.) and all exposed metal parts of cabinet (antennas, handle bracket, metal cabinet screwheads, metal overlays, control shafts, etc.).

Measure the AC voltage across the 1500 Ω resistor. The test must be conducted with the AC switch on and then repeated with the AC switch off. The AC voltage indicated by the meter may not exceed 0.3 V. A reading exceeding 0.3 V indicates that a dangerous potential exists, the fault must be located and corrected.

Repeat the above test with the DVD VIDEO PLAYER power plug reversed.

NEVER RETURN A DVD VIDEO PLAYER TO THE CUSTOMER WITHOUT TAKING NECESSARY CORRECTIVE ACTION.



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated “dangerous voltage” within the product’s enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

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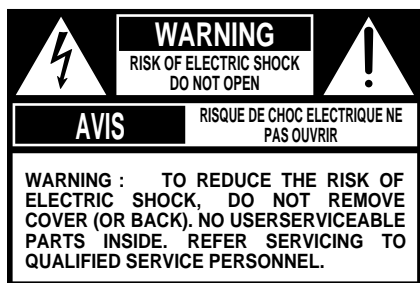
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ABBREVIATIONS
1. Integrated Circuit (IC)
 2. Capacitor (Cap)
 3. Resistor (Res)
4. EXPLODED VIEWS
 - 4-1. Packing Assembly
 - 4-2. Chassis Assembly
 - 4-3. Mechanism Assembly
 5. PARTS LIST

SECTION 1 GENERAL DESCRIPTIONS

1. OPERATING INSTRUCTIONS

SAFETY PRECAUTIONS



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

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: TO PREVENT ELECTRIC SHOCK, MATCH WIDE BLADE OF PLUG TO WIDE SLOT, FULLY INSERT.

ATTENTION: POUR EVITER LES CHOCS ELECTRIQUES, INTRODUIRE LA LAME LA PLUS LARGE DE LA FICHE DANS LA BORNE CORRESPONDANTE DE LA PRISE ET POUSSER JUSQU'AU FOND.

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.

FCC NOTICE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rule. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

WARNING: Changes or modifications made to this equipment, not expressly approved by Toshiba, or parties authorized by Toshiba, could void the user's authority to operate the equipment.

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.

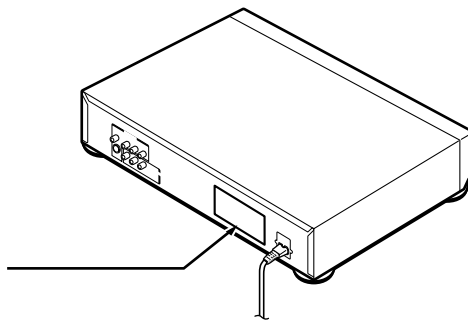
Location of the required label

PRODUCT IS CERTIFIED BY THE MANUFACTURER TO
COMPLY WITH DHHS RULE 21 CFR SUBCHAPTER J
APPLICABLE AT THE DATE OF MANUFACTURE.

MANUFACTURED

TOSHIBA CORPORATION

1-1, SHIBAURA 1-CHOME, MINATO-KU.
TOKYO 105-8001, JAPAN



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.

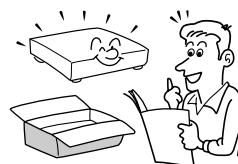
PLEASE READ THE OWNER'S MANUAL AND EXPLAIN THE CONTENTS TO ANY CHILDREN WHO MAY USE THIS PRODUCT.

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 owner's manual

After unpacking this product, read the owner's manual carefully, and follow all the operating and other instructions.



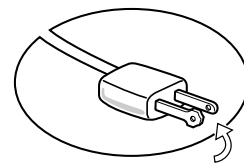
2. Power Sources

This product should be operated only from the type of power source indicated on the label. If you are not sure of the type of power supply to your home, consult your product dealer or local power company. For products intended to operate from battery power, or other sources, refer to the operating instructions.



3. Grounding or Polarization

This product may be equipped with a polarized alternating current line plug (a plug having one blade wider than the other). This plug will fit into the power outlet only one way. This is a safety feature. If you are unable to insert the plug fully into the outlet, try reversing the plug. If the plug should still fail to fit, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the polarized plug.



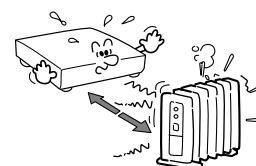
4. Ventilation

Slots and openings in the cabinet are provided for ventilation and to ensure reliable operation of the product and to protect it from overheating, and these openings must not be blocked or covered. The openings should never be blocked by placing the product on a bed, sofa, rug or other similar surface. This product should not be placed in a built-in installation such as a bookcase or rack unless proper ventilation is provided or the manufacturer's instructions have been adhered to.



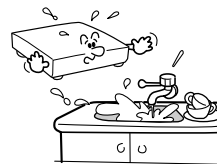
5. Heat

The product should be situated away from heat sources such as radiators, heat registers, stoves, or other products (including amplifiers) that produce heat.



6. Water and Moisture

Do not use this product near water - for example, near a bath tub, wash bowl, kitchen sink, or laundry tub; in a wet basement; or near a swimming pool and the like.



7. Cleaning

Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.



8. Power-Cord Protection

Power-supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the product.



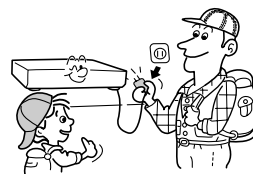
9. Overloading

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



10. Lightning

For added protection for this product during storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet. This will prevent damage to the product due to lightning and power-line surges.



11. Object and Liquid Entry

Never insert objects of any kind into this product 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 product.



12. Attachments

Do not use attachments not recommended by the product manufacturer as they may cause hazards.

IMPORTANT SAFETY INSTRUCTIONS

13. Accessories

Do not place this product on an unstable cart, stand, tripod, bracket, or table. The product may fall, causing serious injury to a child or adult, and serious damage to the product. Use only with a cart, stand, tripod, bracket, or table recommended by the manufacturer, or sold with the product. Any mounting of the product should follow the manufacturer's instructions, and should use a mounting accessory recommended by the manufacturer.

A product and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the product and cart combination to overturn.



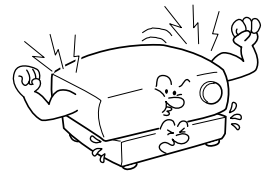
14. Disc Tray

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



15. Burden

Do not place a heavy object on or step on the product. The object may fall, causing serious personal injury and serious damage to the product.



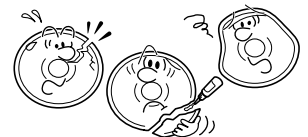
16. Headphones

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.



17. Disc

Do not use a cracked, deformed, or repaired disc. These discs are easily broken and may cause serious personal injury and product malfunction.



18. Damage Requiring Service

Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:

- When the power-supply cord or plug is damaged.
- If liquid has been spilled, or objects have fallen into the product.
- If the product has been exposed to rain or water.
- If the product does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions as an improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to its normal operation.
- If the product has been dropped or damaged in any way.
- When the product exhibits a distinct change in performance - this indicates a need for service.

19. Servicing

Do not attempt to service this product yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.

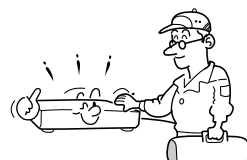


20. Replacement Parts

When replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer or have the same characteristics as the original part. Unauthorized substitutions may result in fire, electric shock, or other hazards.

21. Safety Check

Upon completion of any service or repairs to this product, ask the service technician to perform safety checks to determine that the product is in proper operating condition.



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 VCR, 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 VCR.

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.

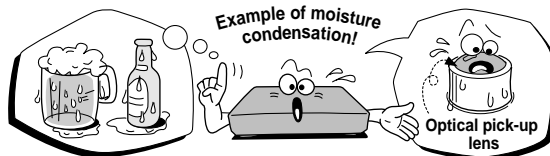
To obtain a clear picture

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

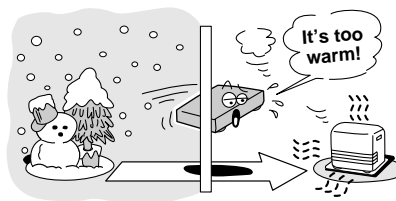
Moisture condensation damages the DVD video player. Please read the following carefully.

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.



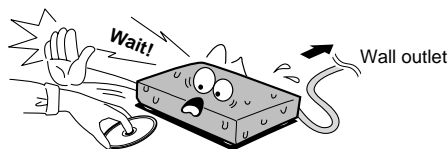
■ **Moisture condensation occurs during the following cases.**

- 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.



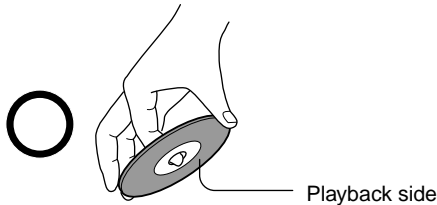
■ **Do not use the DVD video player when moisture condensation may occur.**

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.



On handling discs

- Do not touch the playback side of the disc.

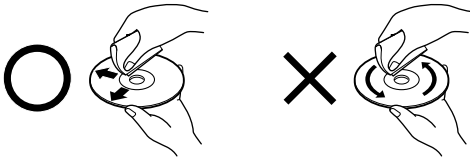


- Do not attach paper or tape to discs.



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, benzene, commercially available cleaners or antistatic spray for vinyl LPs. It may damage the disc.

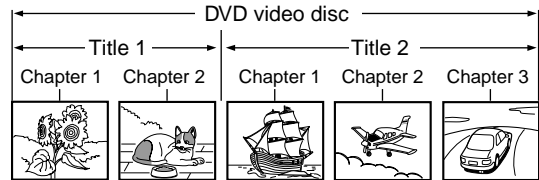
On storing discs

- 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.

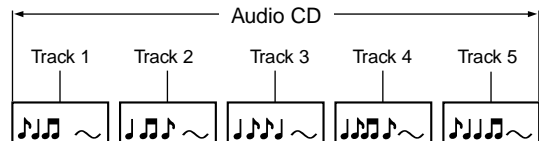
Structure of disc contents

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



Audio CD



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.



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 1. 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		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		Audio	12 cm	Approx. 74 minutes
			8 cm (CD single)	Approx. 20 minutes
Discs with a mark  are also playable.				

- 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 NTSC color system, and cannot play DVD video discs recorded in any other color system (PAL, SECAM, etc.).

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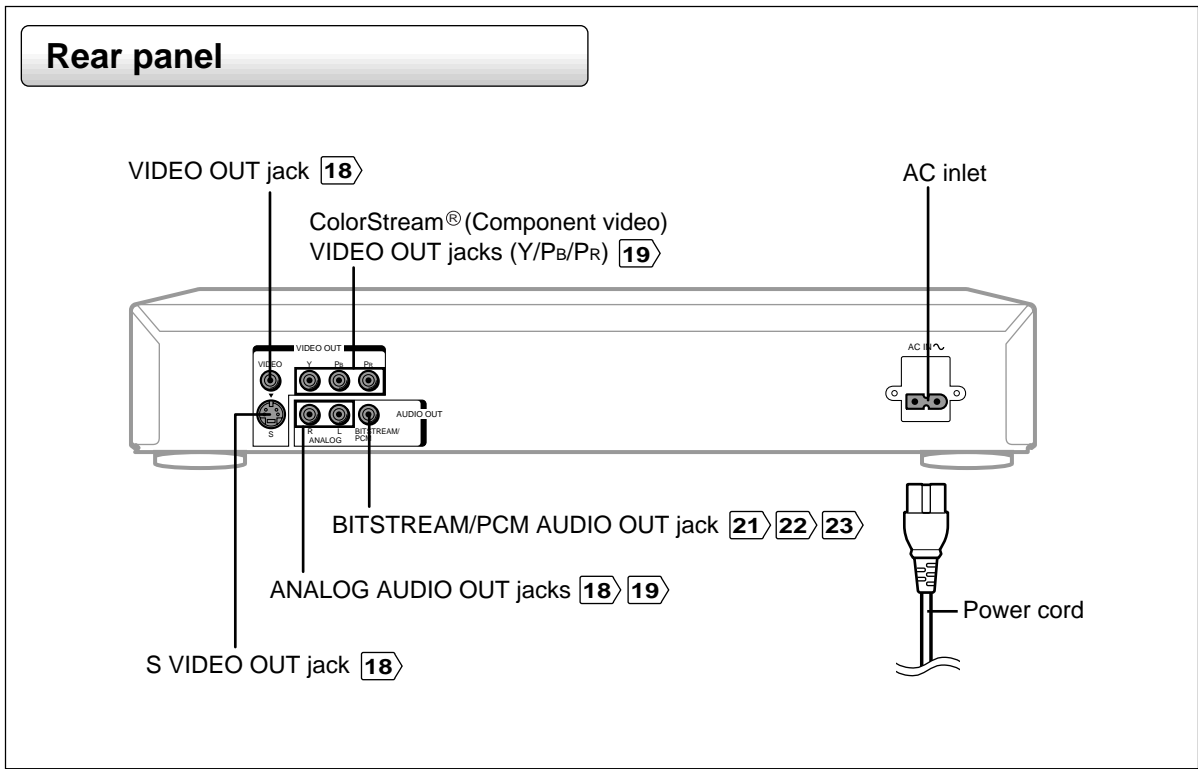
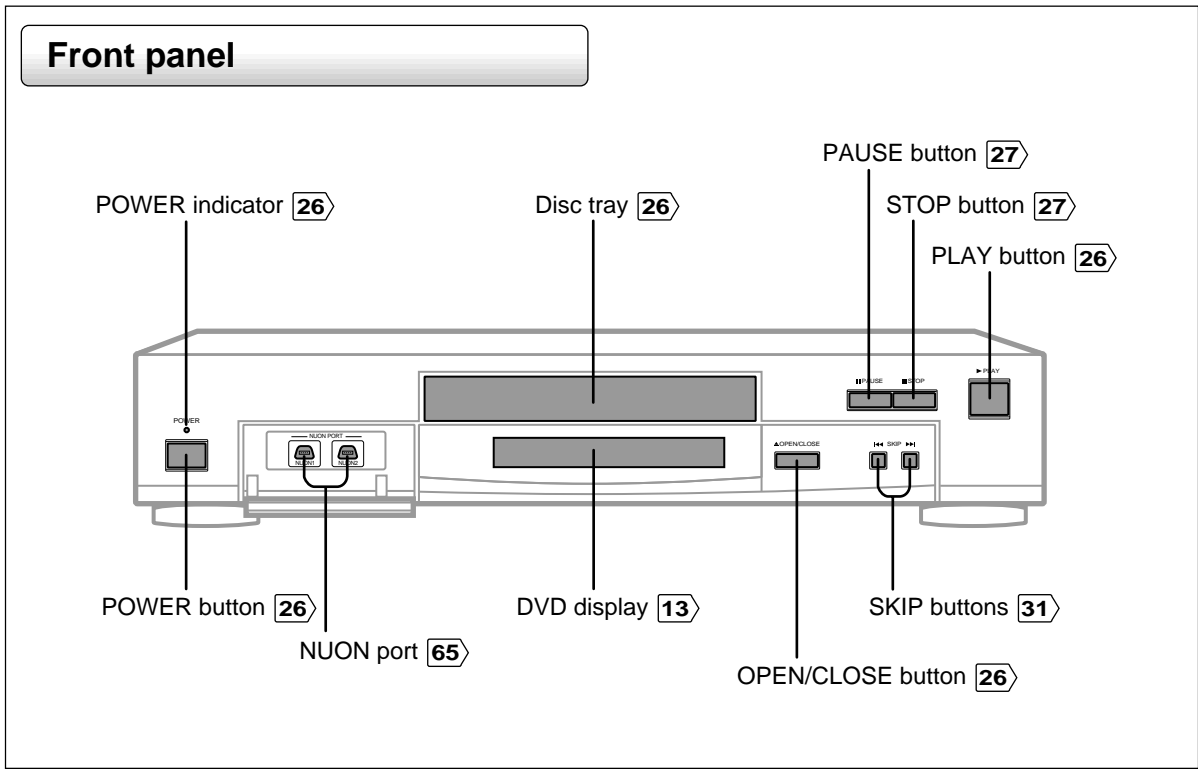
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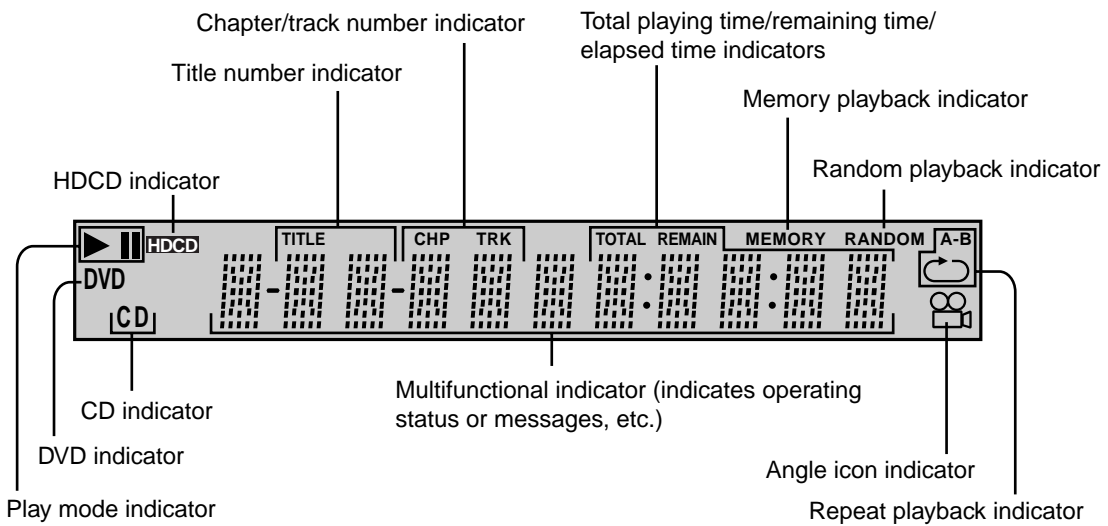
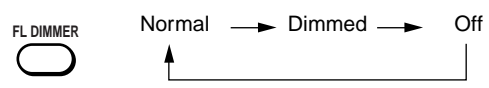
Identification of Controls

See the page in for details.



DVD display

■ Repeated pressing of the FL DIMMER button on the remote control changes the brightness of the display.



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

DVD video disc

• During playback:

Example



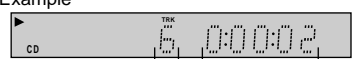
Playing chapter 3 **Elapsed time of the current title**

- Some discs may not display chapter numbers.
- A time indication not accompanied with a chapter number shows elapsed time of a segment within the current title.

Audio CD

• During playback:

Example

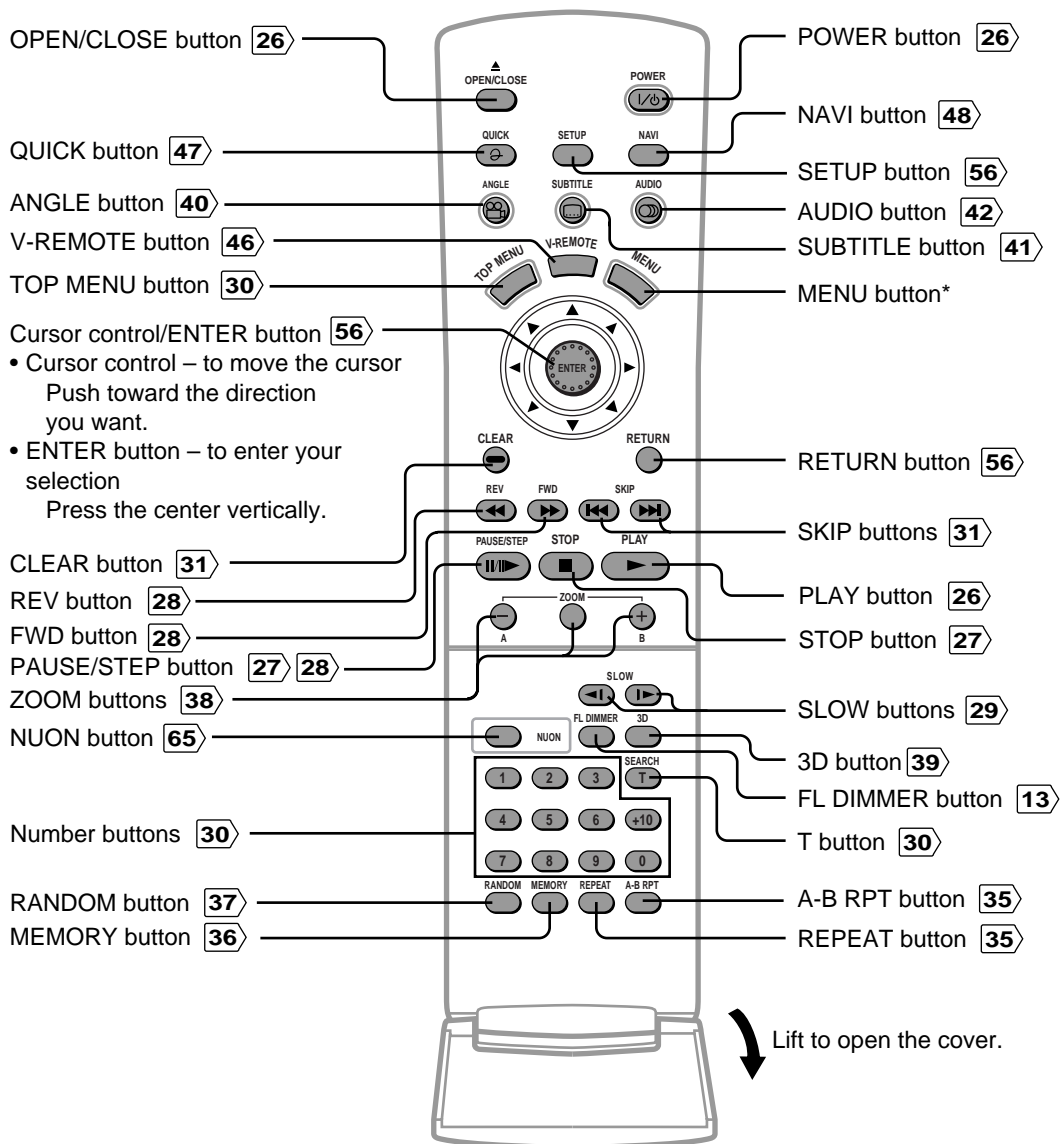


Playing track 6 **Elapsed time of the current track**

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 **26**

POWER button **26**

QUICK button **47**

NAVI button **48**

ANGLE button **40**

SETUP button **56**

V-REMOTE button **46**

AUDIO button **42**

TOP MENU button **30**

SUBTITLE button **41**

Cursor control/ENTER button **56**

MENU button*

- Cursor control – to move the cursor
Push toward the direction you want.
- ENTER button – to enter your selection
Press the center vertically.

RETURN button **56**

CLEAR button **31**

SKIP buttons **31**

REV button **28**

PLAY button **26**

FWD button **28**

STOP button **27**

PAUSE/STEP button **27 28**

ZOOM buttons **38**

SLOW buttons **29**

NUON button **65**

3D button **39**

Number buttons **30**

FL DIMMER button **13**

RANDOM button **37**

T button **30**

MEMORY button **36**

A-B RPT button **35**

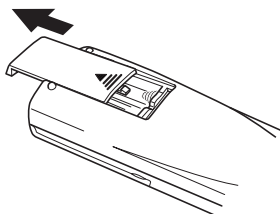
REPEAT button **35**

↙ Lift to open the cover.

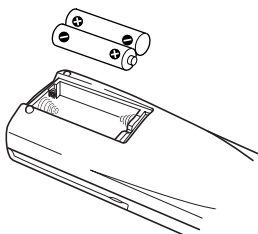
*** MENU button**
Use the MENU button to display the menu included on many DVD video discs. To operate a menu, follow the instructions in "Locating a title using the top menu." **30**

Loading batteries

1 Open the cover.

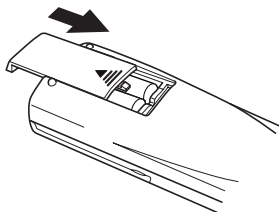


2 Insert batteries (AAA size).



Make sure to match the + and – on the batteries to the marks inside the battery compartment.

3 Close the cover.



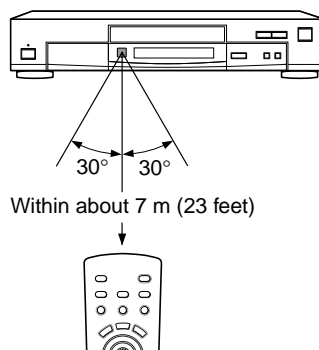
Notes on batteries

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.

Operating with the remote control

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



Distance: About 7 m (23 feet) 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.

Connections

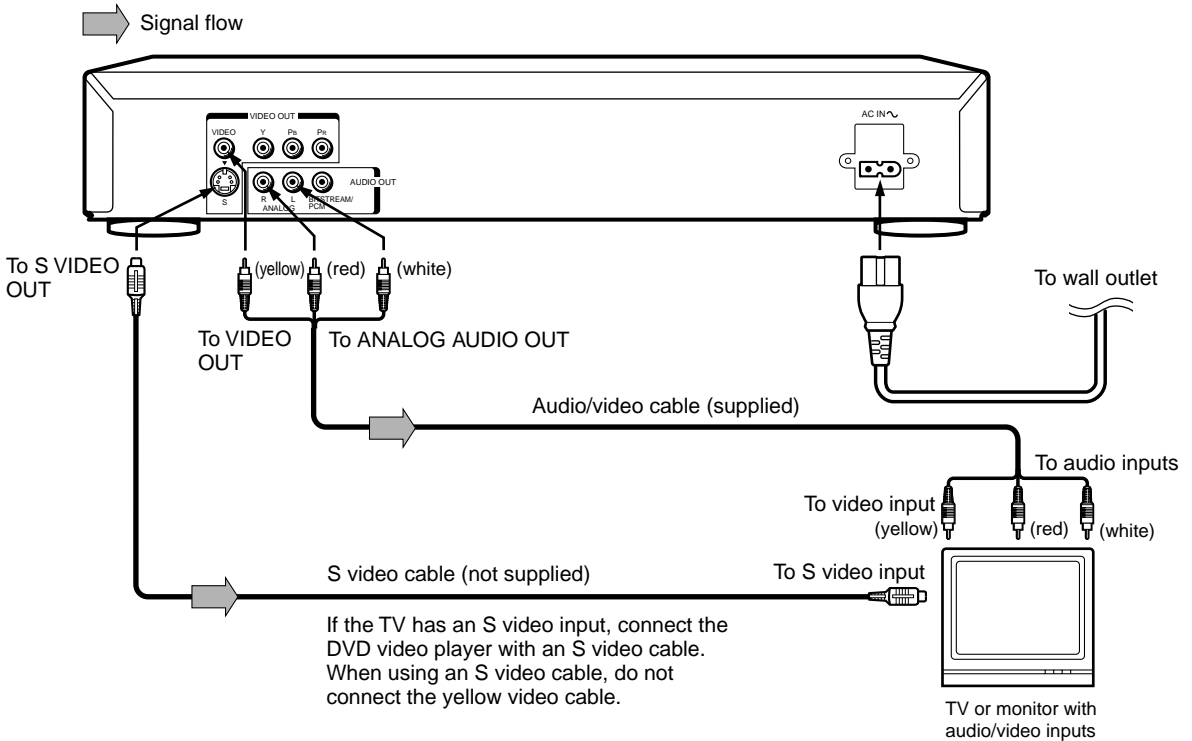
Read this chapter first to make all necessary preparations.

- **Connecting to a TV**
- **Connecting to an audio system and TV equipped with component video inputs**
- **Connecting to an amplifier equipped with a Dolby Digital decoder**
- **Connecting to an amplifier equipped with Dolby Pro Logic Surround**
- **Connecting to an amplifier equipped with a DTS decoder**
- **Connecting to an amplifier equipped with a digital audio input**

Connecting to a TV

Connect the DVD video player to your TV.
 For details of output sound, see [43](#).

Connecting to a TV



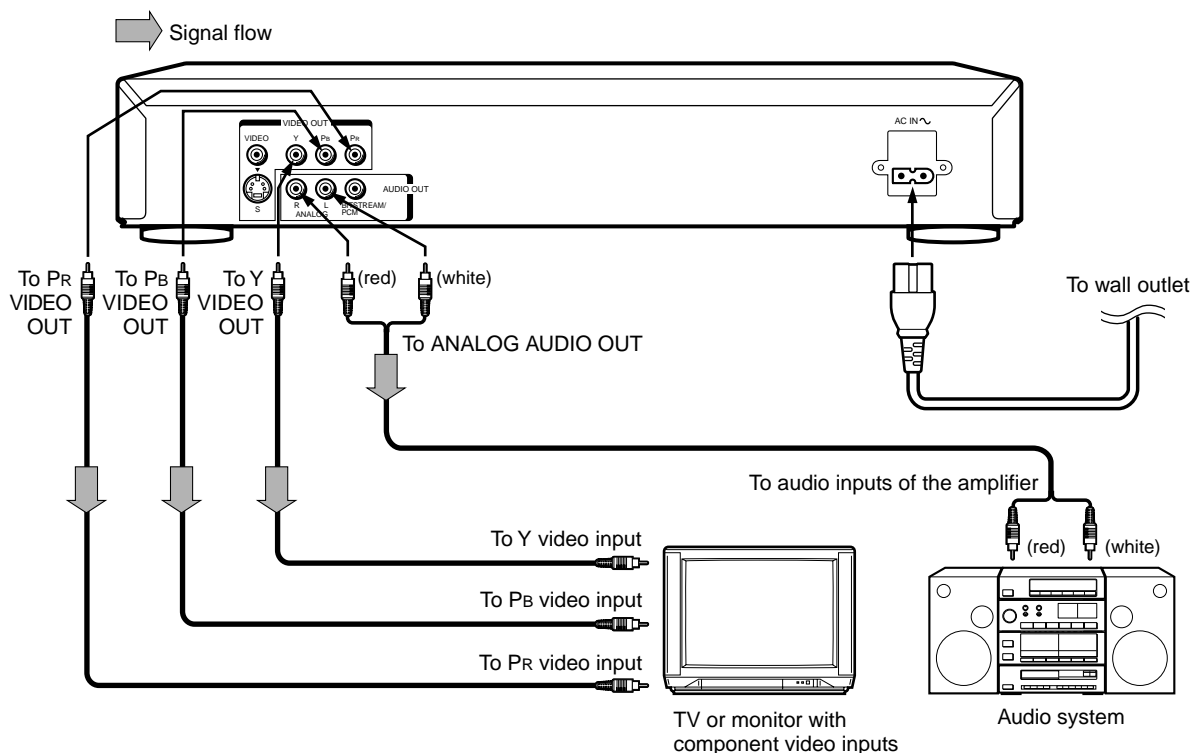
• Make the following setting.

On-screen display	Select:	Page
"Audio Out Select"	"Analog 2ch"	56
		58

Notes

- Refer to the owner's manual of the connected TV as well.
- When you connect the DVD video player to your TV, be sure to turn off the power and unplug both units from the wall outlet before making any connections.
- 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.
- Connect the DVD video player directly to your TV. If you connect the DVD video player to a VCR, TV/VCR combination or video selector, the playback picture may be distorted as DVD video discs are copy protected.

Connecting to an audio system and TV equipped with component video inputs



Component video outputs/inputs (ColorStream®)

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 color 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.

- Make the following setting.

On-screen display	Select:	Page
"Audio Out Select"	"Analog 2ch"	56
		58

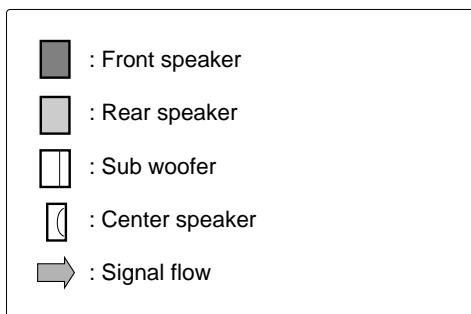
Notes

- 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.

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” [18](#) [19](#).
- For details of output sound, see [43](#).
- This section uses the following reference marks.



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.

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) decoding function, be sure to set “Audio Out Select” to “PCM” from the on-screen displays [56](#) [58](#). 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 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 a Dolby Digital decoder

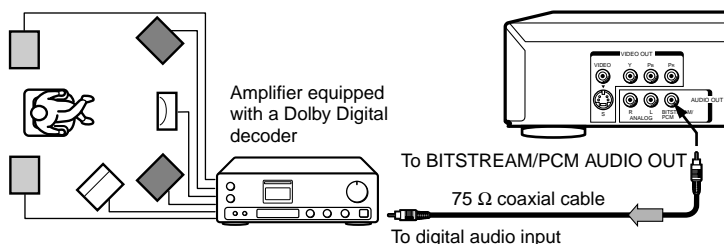
Dolby Digital

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" and the double-D symbol are trademarks of Dolby Laboratories. Confidential unpublished works. ©1992-1997 Dolby Laboratories. All rights reserved.

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

On-screen display	Select:	Page
"Audio Out Select"	"Bitstream"	56
		58
Recording system	 D	42



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

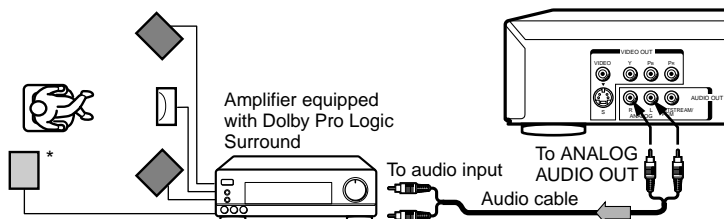
Connect the equipment as follows.

- Make the following setting.

On-screen display	Select:	Page
"Audio Out Select"	"Analog 2ch"	56
		58

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.



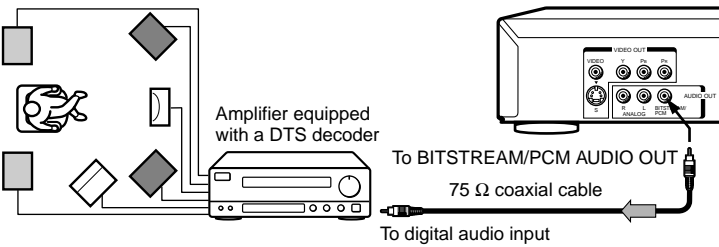
Connecting to Optional Equipment (Continued)

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 Out" are trademarks of Digital Theater Systems, Inc.

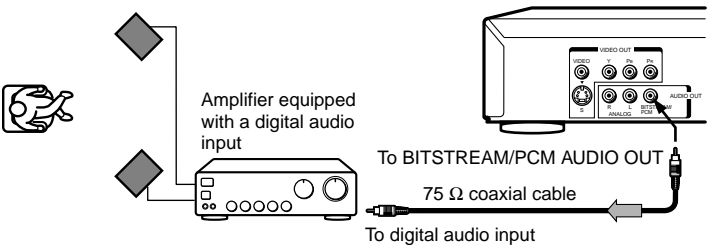
- Use DVD video discs or audio CDs encoded via the DTS recording system.
- Make the following setting.

On-screen display	Select:	Page
"Audio Out Select"	"Bitstream"	56
		58
Recording system	DTS	42

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"	56
		58

Basic playback

Begin your operation.

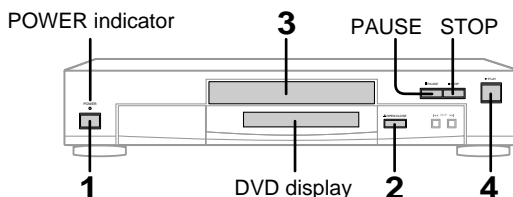
- **Playing a Disc**
- **Locating a Specific Title, Chapter, or Track**

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.



DVD CD 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 POWER.



The DVD video player turns on and the POWER indicator on the player illuminates.

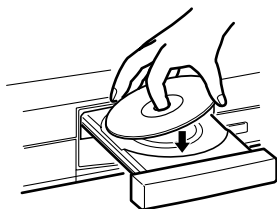
When the DVD video player is turned on for the first time, a message appears. Press **ENTER**, and make the proper settings before proceeding to step 2. [63](#)

2 Press OPEN/CLOSE.



The disc tray opens.

3 Place a 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.



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." [30](#)
You may need to press the **TOP MENU** or **MENU** button to display disc menu (depending on the actual DVD video disc.)

- If the disc tray contains a disc you have already played, playback will begin from the location where you last stopped playback. [29](#)

■ To start playback in the stop mode

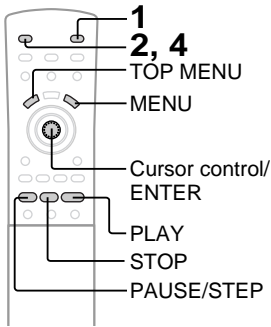
Press **PLAY**.



■ POWER button on the DVD video player

The POWER button on the DVD video player is equipped with a special function, besides turning the power on and off. By holding it down longer than usual while the power is on, you can operate the DVD video player as follows: (Not applicable to the POWER button on the remote control.)



- Holding down for about 1 to 3 seconds to reset NUON game play, etc.
- Holding down for more than about 3 seconds to turn off the DVD video player which will not respond to your command during NUON game play, etc.




■ 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

The   icons on the heading bar show the playable discs for the function described under that heading.

 : You can use this function with DVD video discs.

 : You can use this function with audio CDs.

■ To pause playback (still mode)

Press **PAUSE/STEP** during playback.



To resume normal playback, press the **PLAY** button.

- Sound is muted during still mode.

■ To stop playback

Press **STOP**.

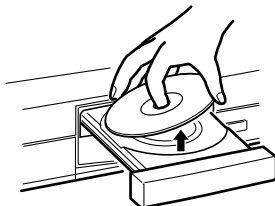


■ To remove the disc

Press **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" ). To turn off the screen saver, press the **PLAY** button.




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.

■ Background pictures in audio CD playback

If you move the cursor control ( / ) while playing an audio CD, you can display programmed background pictures such as "Virtual Light Machine". Select a favorite one by moving the cursor control ( / ) further. To obtain a picture's name, press **MENU**.

Notes

- Sound output may be interrupted when you move the cursor control ( / ) to select the pictures.
- While displaying pictures, the **BITSTREAM/PCM** jack cannot output sound properly.
- While displaying "Virtual Light Machine", the following functions are disabled:
 - 3-D (N-2-2) sound enhancement 
 - HDCD decoding (see below)

Caution

- Please do not play the "Virtual Light Machine" in a darkened room and maintain a sufficient distance from the TV display.
- Please refrain from watching when you do not feel well.
- Please see a doctor before playing "Virtual Light Machine" if you have any health problems.


■ 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.

■ HDCD (High Definition Compatible Digital®)

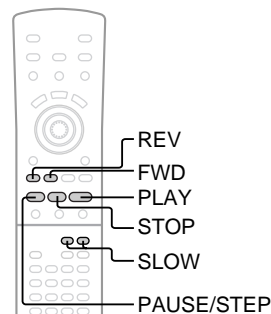
HDCD® (High Definition Compatible Digital®) is a recording system that has improved audio CD sound in dynamic range, sound field reproducibility and vocal acoustics.

This DVD video player is equipped with an HDCD decoder. The HDCD indicator illuminates when playing an HDCD-encoded audio CD.

, HDCD®, High Definition Compatible Digital® and Pacific Microsonics™ are either registered trademarks or trademarks of Pacific Microsonics, Inc. in the United States and/or other countries. HDCD system manufactured under license from Pacific Microsonics, Inc. This product is covered by one or more of the following patents: United States: 5,479,168, 5,638,074, 5,640,161, 5,808,574, 5,838,274, 5,854,600, 5,872,531 and 5,864,311. Australia 669114. Other patents pending.

Playing a Disc (continued)

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



Playing in fast reverse or fast forward directions

Press REV or FWD during playback.



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**.



Notes

- The DVD video player mutes sound and omits subtitles during reverse and forward scan of DVD video discs. However, it plays sound in the following cases:
 - forward scan (▶▶ displayed) of DVD video discs.
 - fast forward or fast reverse play of audio CDs.
- The playback speed may differ depending on the disc.

Playing frame by frame

Press **PAUSE/STEP** during still playback.



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

■ To resume normal playback

Press **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.

SLOW If you press the SLOW  button during playback, you can view the picture in reverse slow-motion. (Only when using a DVD video disc.)

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

■ To resume normal playback

Press **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.



2 Press 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 **[61]** or select a disc menu language **[59]**.
 - 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.

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

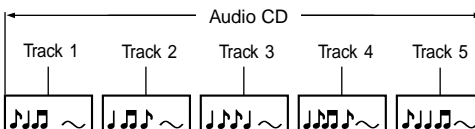
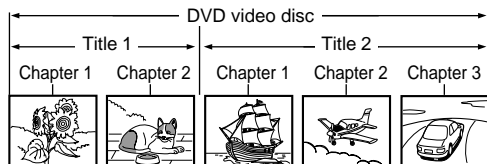
1 Press STOP twice.

STOP The DVD video player's memory is cleared.



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.



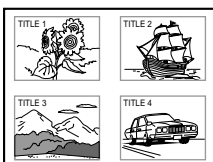
DVD Locating a title using the top menu

1 Press TOP MENU.

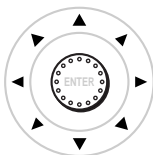


The top menu appears on the TV screen.

e.g.



2 Select the title you want moving the cursor control.



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.



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.



Make sure that the space next to "Title" is highlighted. (You can shift the highlight moving the cursor control (▲ / ▼).)

Title: **1**
Chapter: 1

2 Press the corresponding number buttons for the title you want.

e.g. To select title 2 **2**

To select title 12 **1** → **2**

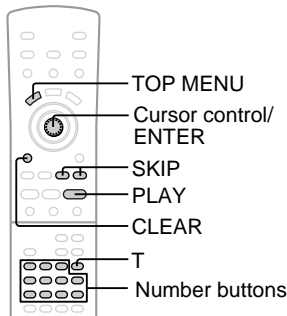
3 Press PLAY.



Playback starts from chapter 1 of the selected title.

Notes

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



DVD CD Locating a specific chapter or track directly

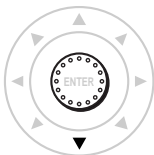
1 Press T.

Skip steps 1 and 2 if you are using an audio CD.



Title: **1**
Chapter: 1

2 Move the cursor control (▼) to highlight the space next to "Chapter."

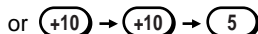


Title: 1
Chapter: **1**

3 Press the corresponding number buttons for the chapter or track you want.

You can use the +10 button to select numbers from 10 through 99.

e.g. To select chapter or track 25



4 Press 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 next to "Title" using the number buttons, then perform steps 2 to 4.

Note

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

DVD CD Locating a specific chapter or track

Press SKIP ◀◀ or ▶▶ repeatedly to display the chapter or track number you want.

Playback starts from the selected chapter or track.



To locate succeeding chapters or tracks



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.
- When you set "Title Stop" to "Off" [63], you can access chapters in another title. If you go back to the preceding title by pressing the SKIP ◀◀ 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.
- If you press and hold the SKIP ◀◀ or ▶▶ 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 further.
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 ◀◀ or ▶▶ button.

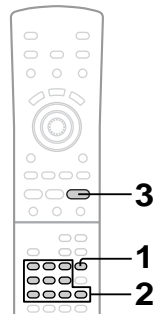
Advanced playback

Customizing the performance of your DVD video player.

- **Accessing a Specific Location Directly**
- **Playing Repeatedly**
- **Playing in a Favorite Order**
- **Playing in Random Order**
- **Zooming a Picture**
- **Selecting DNR Picture Enhancement**
- **Selecting the Camera Angle**
- **Selecting Subtitles**
- **Selecting a Language**

Accessing a Specific Location Directly

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



Entering the time of the desired location

1 Press T twice.



You may have to press further depending on the disc. Press the button repeatedly until the following display appears.



2 Press the number buttons to enter the time.

e.g.



Time 1:25:30

3 Press PLAY.



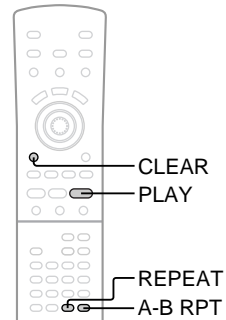
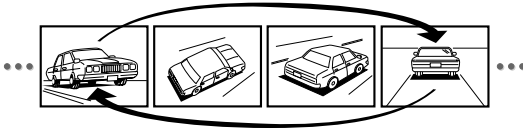
Playback starts from the desired location.

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.

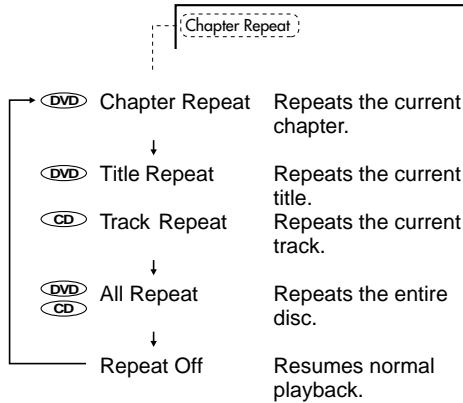


DVD CD Repeating a title, chapter, or track

1 Press REPEAT.



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



2 Press 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.

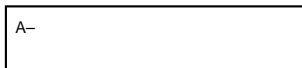


Note

Some discs may not permit repeat operation.

DVD CD Repeating a specific segment

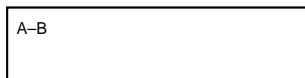
1 Press A-B RPT at the beginning of the segment (point A) you want to play repeatedly.



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



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



■ To resume normal playback

Press CLEAR.

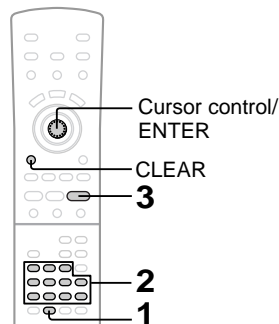


Notes

- 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 (40).
- 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)

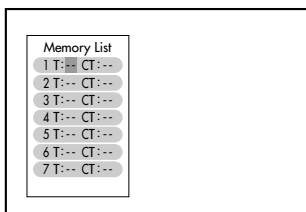


DVD CD Setting titles, chapters, or tracks in a favorite order

1 Insert a disc and press MEMORY during stop.



The following display appears.



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 move the cursor control (◀/▶), the spaces of "T" and "CT" are highlighted in turn. Highlight where you want to enter, then press the corresponding number buttons.

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" may be showing a number. Neglect this number when using an audio CD.

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

3 Press PLAY while the "Memory List" display appears on the TV screen.



The DVD video player starts memory playback.

■ To change the programmed selections

- 1 While the "Memory List" display appears on the TV screen, move the cursor control (▲/▼) to highlight the item you want to change.
- 2 Change the selection following the instructions in step 2.

■ To cancel the programmed selections

- 1 While the "Memory List" display appears on the TV screen, move the cursor control (▲/▼) to highlight the item you want to cancel.
- 2 Press **CLEAR**.

■ To resume normal playback from memory playback

Press **CLEAR**.



The memory playback indicator disappears.

■ To program during playback

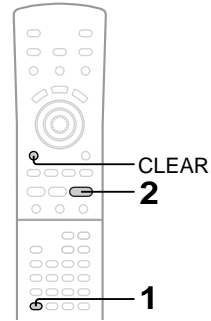
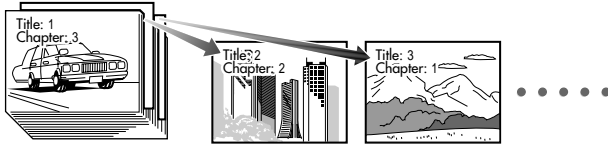
If you press the **MEMORY** button during playback, a programming display appears. Follow steps 2 and 3.

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 "Memory List" display appears on the TV screen, the "Memory List" display disappears.
- The programmed selections will be cleared when you turn off the DVD video player.

Playing in Random Order

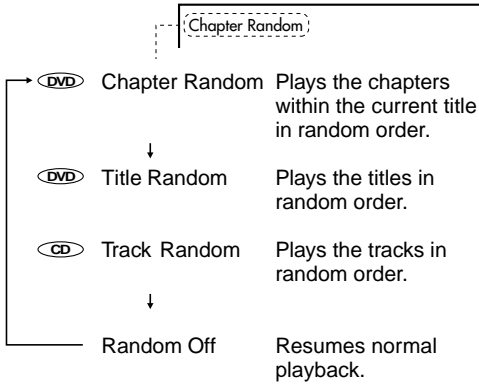
You can play titles, chapters within a title, or tracks in random order. (Random playback)



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.



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**.

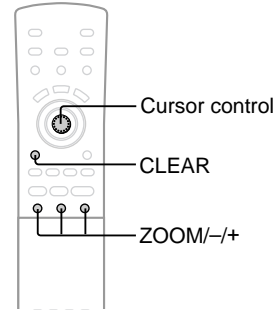
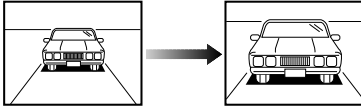


Notes

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


Zooming a Picture

You can magnify areas within a picture.





DVD Zooming a picture

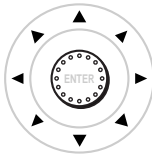
1 Press ZOOM during normal, slow or still playback.


 Zoom playback starts.

2 Select the zoom point and magnification level.

 To increase the magnification level.

 To reduce the magnification level.

 As you move the cursor control, the zoom point shifts.

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

■ To resume normal playback

Press ZOOM repeatedly so that "Zoom Off" appears.

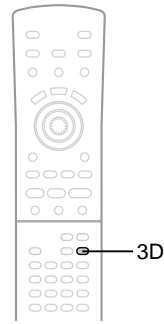


Notes

- 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.
- During zoom playback, the cursor control cannot work on menus included on DVD video discs. If you want to view the menus, cancel the zoom playback.
- The magnification level varies depending on the picture size you select. **58**
- When magnified, pictures may not move smoothly responding to the ZOOM+/- buttons or the cursor control.

Selecting 3-D (N-2-2) Sound Enhancement

You can enjoy expansive virtual surround sound effects from just two speakers.



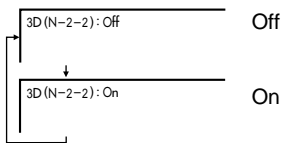
Selecting 3-D (N-2-2) sound enhancement

Press 3D during playback.




The current setting is displayed.

Each time you press the 3D button, the setting changes as follows.



Notes

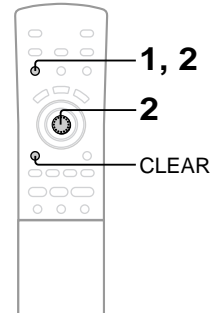
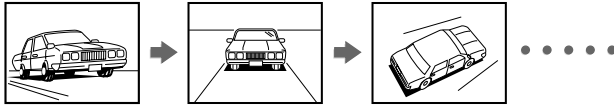
- You may sense a difference in volume between normal and 3-D (N-2-2) enhanced sound.
- 3-D (N-2-2) sound enhancement may not function (or may not be realized) depending on the sound output setting or disc recording system .
- If 3-D (N-2-2) sound enhancement is on, Dolby Pro Logic Surround may not function on output sounds at all, or may function differently than usual.

Spatializer® 3-Dimensional Sound Processing provided by Desper Products, Inc.
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Advanced playback

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.



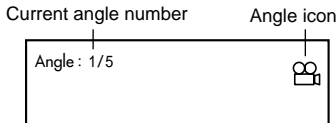
DVD Changing the camera angle

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



While playing a scene recorded with multiple angles, the angle icon (📷) appears in the DVD display and on the TV screen. Press the ANGLE button while the angle icon is displayed.

e.g.



■ To turn off the angle number display

Press CLEAR.



■ To disable the angle icon display on the TV

From the on-screen displays, set "On-Screen Displays" to "Off." [61] Monitor the DVD display when you want to change the camera angle.

Notes

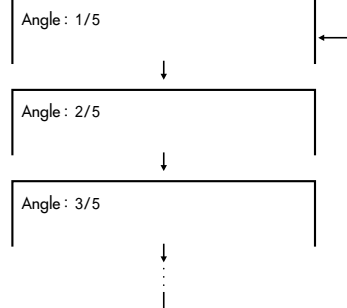
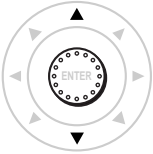
- You can change the camera angle during still playback. The camera angle changes to the new setting when you resume normal playback.
- If you pause a picture immediately after changing a camera angle, the resumed playback picture may not display the new camera angle.

2 Press ANGLE or move the cursor control (▲) while the angle number is displayed on the TV screen.



Each time you press the ANGLE button or move the cursor control (▲), the camera angle changes.

e.g.

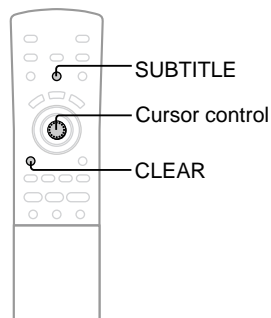
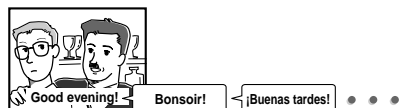


▼ : Cycles backwards

You can change the camera angle directly by pressing the number buttons corresponding to its angle number instead of moving the cursor control (▲ / ▼).

Selecting Subtitles

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



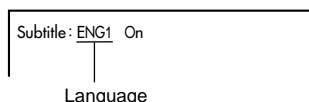
DVD Selecting a subtitle language

1 Press SUBTITLE during playback.

SUBTITLE



The current subtitle setting is displayed.



The abbreviation of the language appears instead of the language name. Refer to the list of languages and their abbreviations. **64**

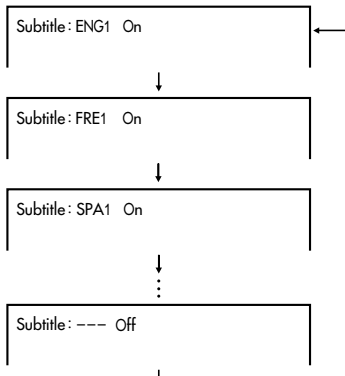
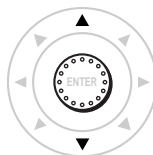
2 Press SUBTITLE or move the cursor control (▲) while the subtitle setting is displayed on the TV screen.

SUBTITLE



Each time you press the SUBTITLE button or move the cursor control (▲), the subtitle languages included on the DVD video disc change.

e.g.



▼ : Cycles backwards

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

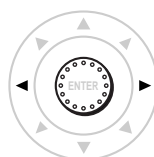
■ To turn subtitles on or off

1 Press SUBTITLE during playback.

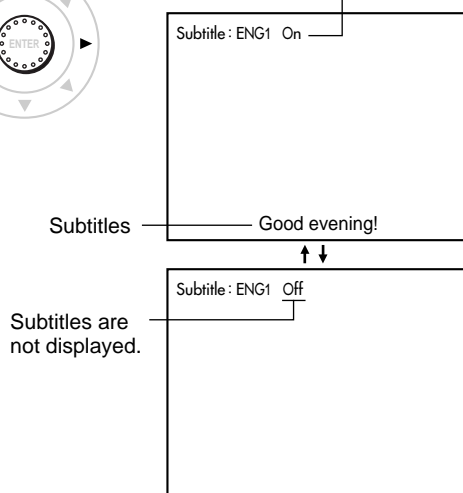
SUBTITLE



2 Move the cursor control (◀/▶) while the subtitle setting is displayed on the TV screen, to select "On" or "Off."



Displayed for about 3 seconds.



Notes

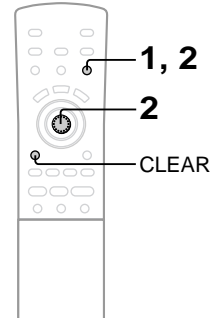
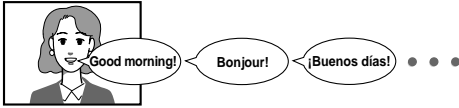
- Some DVD video discs are set to display subtitles automatically, and you cannot turn them off even if you set the subtitle function to off.
- During some scenes, the subtitles may not appear immediately after you select "On."
- Some DVD video discs will allow you to make subtitle selections and turn 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 **60**. 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 by moving the cursor control (▲/▼).

Selecting a Language

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

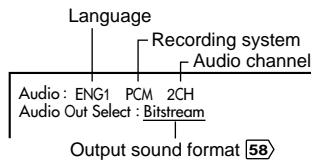


DVD Selecting a playback audio setting

1 Press AUDIO during playback.



The current audio setting is displayed.

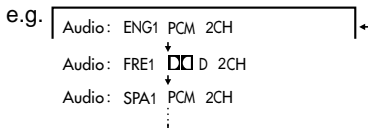
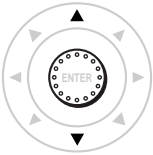


The abbreviation of the language appears instead of the language name. Refer to the list of languages and their abbreviations. [64]

2 Press AUDIO or move the cursor control (▲) while the audio setting is displayed on the TV screen.



Each time you press the AUDIO button or move the cursor control (▲), the audio settings included on the DVD video disc change.



▼ : Cycles backwards

If you move the cursor control (◀/▶), you can select output sound format. [58]


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 [60]. 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	Sound recording system	Audio selection from the menu [56]/[58] 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/20 bit	48 kHz/16 bit	48 kHz/20 bit	48 kHz/16 bit	48 kHz/20 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	48 kHz/16 bit
		96 kHz/16 bit	48 kHz/16 bit	48 kHz/16 bit	–	96 kHz/16 bit	48 kHz/16 bit
		96 kHz/20 bit	48 kHz/16 bit	48 kHz/20 bit	–	96 kHz/16 bit	48 kHz/16 bit
	96 kHz/24 bit	48 kHz/16 bit	48 kHz/24 bit	–	96 kHz/24 bit	48 kHz/16 bit	
	DTS	Bitstream	–	Bitstream	–	–	–
MPEG2	48 kHz/16 bit	48 kHz/16 bit	48 kHz/16 bit	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
	HDCD	44.1 kHz/16 bit	44.1 kHz/20 bit	44.1 kHz/16 bit	44.1 kHz/20 bit	44.1 kHz/16 bit	44.1 kHz/20 bit
	DTS	Bitstream	(Noise)	Bitstream	(Noise)	Bitstream	(Noise)

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

- HDCD sound via the ANALOG AUDIO OUT jacks is output in a normal audio CD format when 3-D (N-2-2) sound enhancement is on.
- Sound is not output via the BITSTREAM/PCM jack in fast reverse play of DTS recorded audio CDs.
- Programmed background pictures are disabled in play of DTS recorded audio CDs.

Quick control

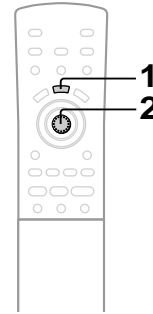
Simple use of a single button and the cursor control enables you to direct your playback, without manipulating many actual buttons.

- **Using the Graphic Remote Control - V-REMOTE -**
- **Selecting the Playback Function - QUICK -**
- **Accessing Features - NAVI -**

Using the Graphic Remote Control

- V-REMOTE -

Pressing one button can display a graphics based on-screen remote control that allows you to control playback as if you were doing it from the actual remote control.

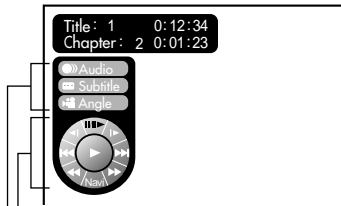


DVD CD Using the graphic remote control

1 During playback, press V-REMOTE.



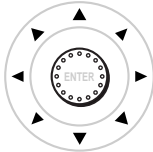
The graphic remote control (Virtual Remote) appears.



- Speed control
Proceed to 2-A.
- Stream selection
Proceed to 2-B.

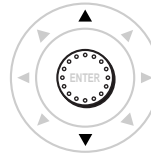
2 Proceed to A or B.

A: Move the cursor control to select the speed control, and press ENTER.



- ||/▶ : Pause [27] / Frame by frame [28]
- ▶ : Normal playback [26]
- ▼ : Slow [29]
- ▶▶ : Forward skip [31]
- ▶▶▶ : Fast forward [28]
- ◀◀ : Reverse slow [29]
- ◀◀◀ : Reverse skip [31]
- ◀◀ : Fast reverse [28]
- Navi : Accesses the Navi menu [48]

B: Move the cursor control (▲ / ▼) to select "Audio," "Subtitle," or "Angle," and press ENTER.



Audio: Move the cursor control (▲ / ▼) to select a desired audio language, and press ENTER.

For details, see page [42].

Selecting the output sound format is not possible here.

Subtitle: Move the cursor control (▲ / ▼) to select a desired subtitle language, and press ENTER.

For details, see page [41].

Angle: Move the cursor control (▲ / ▼) to select a desired camera angle, and press ENTER.

For details, see page [40].

■ To turn off the Virtual Remote

Press V-REMOTE.

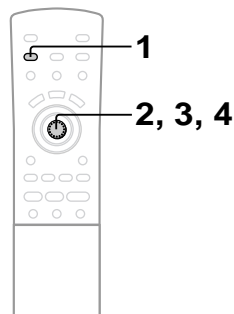


Note

Some discs may not permit this operation.

Selecting the Playback Function - QUICK -

Pressing one button can display a list of playback functions which are relevant to your current playback mode. You can check and modify them from the list.



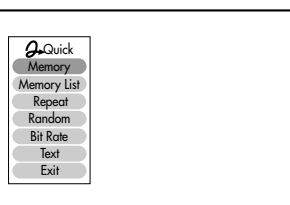
DVD CD Selecting the playback function

1 During playback, press QUICK.



The following on-screen display appears. (The actual display will vary depending on the playback status.)

e.g.



4 Press ENTER.



The on-screen display disappears and playback will resume according to your selection.

Quick menu

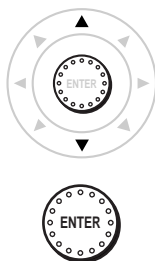
For details, see the respective pages.

- Memory : To program memory playback. [36](#)
- Memory List : To list memory settings. [36](#)
- Repeat : To select the repeat playback mode. [35](#)
- Random : To select the random playback mode. [37](#)
- Bitrate : To activate/disable the bitrate display. [48](#)
- Text : To activate/disable the Text display.
- Text display: Displays DVD-Text data or CD-Text data if included on the disc. (Some content on the disc may not be displayed properly depending on the disc.)
- Exit : To quit the on-screen display.

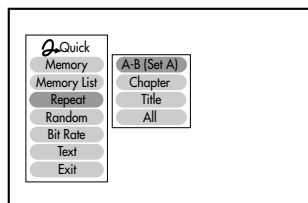
Note

Pressing the QUICK button again also exits the on-screen display.

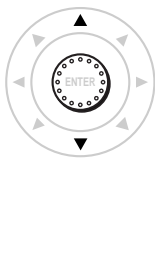
2 Move the cursor control (▲ / ▼) to select a desired item, and press ENTER.



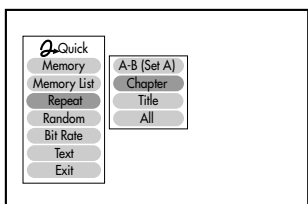
e.g. To change the repeat mode:



3 Move the cursor control (▲ / ▼) to change the setting.

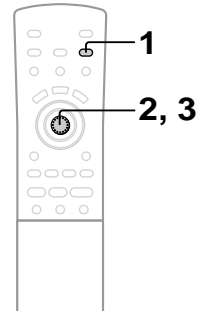


e.g. To select the chapter repeat mode:



Accessing Features - NAVI -

The NAVI menu provides an icon based display from which you can easily access key playback function.

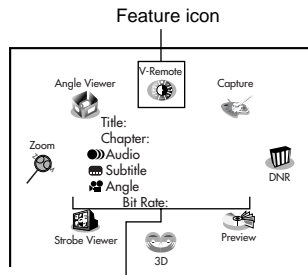


DVD CD NAVI menu items

1 Press NAVI.



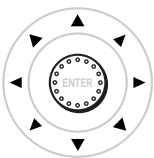
The NAVI menu appears.



Each time you press the NAVI button, the display changes.

- Title/Chapter: Elapsed time and remaining time of the current title/chapter.
- Audio: Current audio setting
- Subtitle: Current subtitle setting
- Angle: Current angle setting
- Bit Rate: Data transfer rate (Mbit/s)
Amount of picture, sound and subtitle data in the DVD video disc transferred per second.
The larger the value, the more data processed, but this does not necessarily insure better picture quality.
- Status display (playback mode, current DNR setting, current zoom status, etc.)

2 Move the cursor control to select a desired feature icon.



For details on each feature, refer to the list on the next page.

3 Press ENTER.



Selection details appears.

4 Refer to the list on the next page and follow the instructions detailed on subsequent pages.

Notes

- The NAVI menu will disappear by pressing the NAVI button several times.
- The number of feature icons on the display will vary depending on the disc.
- Feature icons are displayed only when you play a DVD video disc.

Navi menu selections

V-Remote



You can control key playback functions using the graphics based on-screen remote control.

46

Angle Viewer



You can display all camera angles simultaneously and select your preferred one from them.

50

Zoom



You can magnify areas within a picture.

38



Strobe Viewer

You can divide a desired scene into stop action frames for careful analysis.

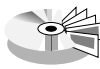
50



3D

You can enjoy expansive virtual surround sound effects from just two speakers.

51



Preview

You can display thumbnail views of the first scenes of titles or chapters and select a preferred one.

51



DNR

You can view a picture with less video noise.

52

Capture



You can sample a scene from a playback picture and transform it into a background picture.

52

Accessing Features - NAVI - (continued)

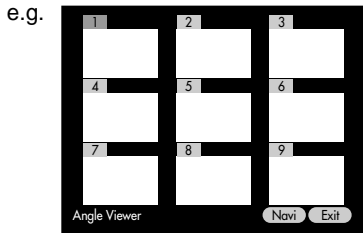
NAVI menu items

Angle Viewer



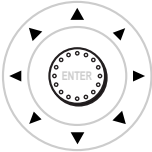
You can display all camera angles simultaneously and select your preferred one from them.

After selecting this icon and pressing ENTER, the following on-screen display appears:



When the scene contains 9 camera angles:

- 1 Move the cursor control to select.



1-9 : To select the camera angle.
 Navi: To return to the NAVI menu.
 Exit : To quit the on-screen display.

- 2 Press ENTER.



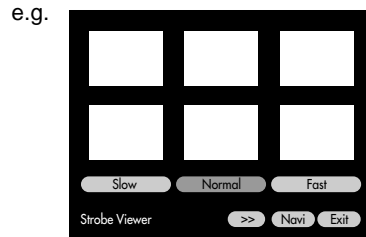
Note
 Some discs or scenes may not permit this operation.



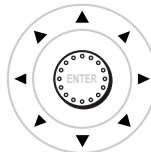
You can divide a desired scene into stop action frames for careful analysis.

Strobe Viewer

After selecting this icon and pressing ENTER, the following on-screen display appears:



- 1 Move the cursor control to select.



Slow: Still pictures at shorter intervals.
 Normal: Still pictures at normal intervals.
 Fast: Still pictures at longer intervals.
 >>: To view the next series of 6 pictures.
 Navi: To return to the NAVI menu.
 Exit : To quit the on-screen display.

- 2 Press ENTER.



Note
 Some discs or scenes may not permit this operation.

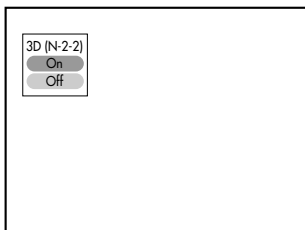


3D

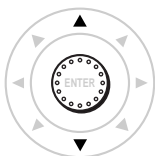
You can enjoy expansive virtual surround effects from just two speakers.

After selecting this icon and pressing ENTER, the following on-screen display appears:

e.g.



1 Move the cursor control to select.

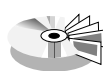


On: This function works.
Off: This function does not work.

2 Press ENTER.



Note
For details and notes on 3-D (N-2-2), see page 39.

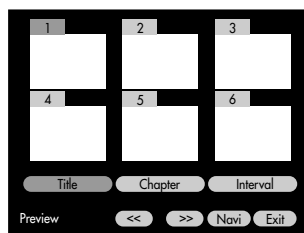


Preview

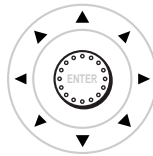
You can display thumbnail views of the first scenes of titles or chapters and select a preferred one.

After selecting this icon and pressing ENTER, the following on-screen display appears:

e.g.



1 Move the cursor control to select.



1 - 6: To locate the scene.
Title: To display the first scenes of titles (1 to 6).
Chapter: To display the first scenes of chapters (1 to 6).
Interval: To display scenes at intervals of about 10 minutes apart.
<< : To go to the previous page.
>> : To go to the next page.
Navi: To return to the NAVI menu.
Exit : To quit the on-screen display.

2 Press ENTER.



Note

- Some discs or scenes may not permit this operation.
- Some items may not be selected depending on the disc or scene.
- Some of the first scenes may not be picked up depending on the disc.

Accessing Features - NAVI - (continued)

NAVI menu items

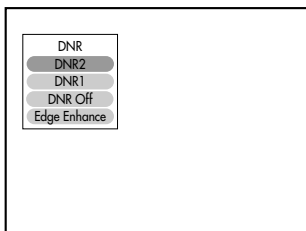


DNR

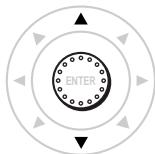
You can view a picture with less video noise.

After selecting this icon and pressing ENTER, the following on-screen display appears:

e.g.



- 1 Move the cursor control to select.



DNR2: To increase the DNR1 effect.
 DNR1: To reduce minute video noise.
 DNR Off: Off.
 Edge Enhance : To sharpen picture edges.

- 2 Press **ENTER**.



Notes

- Actual picture enhancement may vary depending on the quality of the disc.
- While the DNR2 level can provide additional improvement in the reduction of noise in the video signal, it may produce undesirable picture artifacts on some discs. Should this occur, select a more appropriate DNR level (DNR1 or off).
- Depending on the disc, some kinds of picture details may be lost by the picture enhancement.

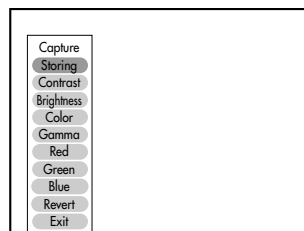
Capture



You can sample a scene from a playback picture and transform it into a background picture.

After selecting this icon and pressing ENTER, the following on-screen display appears:

e.g.



- 1 Pause playback at a scene you want to capture.
- 2 Adjust the picture quality if necessary as follows.
 - 1) Move the cursor control (▲ / ▼) to select a desired item, and press **ENTER**.
 - 2) Move the cursor control (◀ / ▶) to adjust the value, and press **ENTER**.

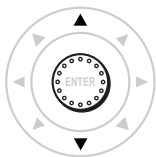
(-7) Lower	Contrast	Higher (+7)
(-7) Darker	Brightness	Brighter (+7)
(-7) Duller	Color	Brighter (+7)
(-7)	Gamma*1	(+7)
(-7) Reducing red	Red	Enhancing red (+7)
(-7) Reducing green	Green	Enhancing green (+7)
(-7) Reducing blue	Blue	Enhancing blue (+7)

*1: Adjust when a picture is too dark or too whitish.

Note

You cannot move the picture to sample another scene after you have started the adjustment. To change the scene, select "Revert" then press **ENTER**, and return to step 1.

3 Move the cursor control to select.



Storing: To sample and store the current picture in the player memory.

Revert: To restore the picture to its original condition. All the adjustment values return to 0 (center position).

Exit : To quit the on-screen display.

4 Press **ENTER**.



The stored picture will be displayed as a background picture when the player is in the stop mode. It is necessary to confirm this process via the setup menu **[61]**.

Notes

- You can store only one picture. Storing a new picture will erase the old one.
- No operations are permitted in process of sampling and storage of background picture.

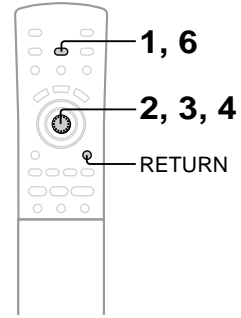
Function Setup

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

- **Customizing the Function Settings**
- **Table of Languages**
- **NUON games and peripherals**

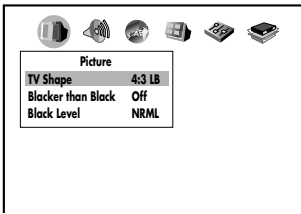
Customizing the Function Settings

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

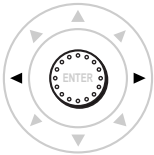


DVD CD Setting procedure

1 Press **SETUP** during stop.
 The following on-screen display appears.



2 Move the cursor control (◀/▶) to select a symbol for the setting you want to change.
 (See the next page.)



Picture performance settings



Output sound settings



Language settings



Display settings

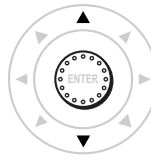


Operational settings

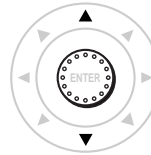


Initial settings

3 Move the cursor control (▲/▼) to select the setting you want to change, then press **ENTER**.



4 Change the selection by the cursor control (▲/▼) or other buttons, by referring to the corresponding pages (58), then press **ENTER**.



5 Repeat steps 3 and 4 to change other settings.
 To select another operation, go back to step 2.

6 Press **SETUP**.
 The on-screen display disappears.



































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



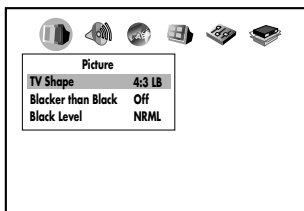
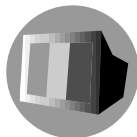
Notes

- 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	 To select a picture size according to the aspect ratio of your TV.	58
	Blacker than Black	 To make an adjustment of the black level on your TV using a commercially available test disc that contains adjustment signals.	58
	Black Level	 To select the black level of playback pictures.	58
	Audio Out Select	  To select an output sound format corresponding to your system connection.	58
	Dynamic Range Control	 To turn on or off a function that makes faint sounds easier to hear even if you lower the volume during late hours playback.	59
	Karaoke Vocal	 To turn on or off the vocal output during DVD KARAOKE disc playback.	59
	CD Attenuation	 To attenuate sound distortion incurred during playback of an audio CD (HDCD).	59
	On-Screen Language	  To select a preferred language for on-screen displays.	59
	Disc Menu Language	 To select a preferred language for disc menus.	59
	Audio Language	 To select a preferred language for the sound track.	60
	Subtitle Language	 To select a preferred language for subtitles.	60
	On-Screen Displays	  To turn on or de-activate the operational status display on the TV screen.	61
	Background	  To select the background color or background picture.	61
	Screen Saver	 To turn the screen saver on or off.	61
	Pause/Still	 To select the resolution of still pictures. (Field/Frame)	61
	Parental Lock	 To turn the parental lock function on or off.	61
	Remote Confirmation	  To turn on or off the confirmation beeper announcing when each remote command received.	63
	Title Stop	 To turn on or off a feature that automatically stops playback after a title has been viewed.	63
	Priority Contents	 To select the playback priority between DVD video signals and NUON game signals.	63
	On-screen Language TV Shape Audio Out Select	  To install the initial system setting.	63

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.

Blacker than Black (DVD)

Off: For normal use.

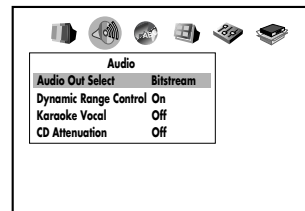
On: Select when you adjust the black level of your TV using a commercially available test disc that contains adjustment signals.

Black Level (DVD)

Set to your preference and monitor's ability.

Enhanced: Expanded black level. (0 IRE)

Normal: Standard black level. (7.5 IRE)



Audio Out Select (DVD CD)

Select the output sound format corresponding to your system connection.

For details of sound recording systems, see [43](#).

Bitstream: Select when connected to an amplifier equipped with a Dolby Digital or DTS decoder. [21](#) [22](#)
The DVD video player outputs digital audio information in the bitstream format when you play a DVD video disc recorded on the Dolby Digital or DTS recording system.

Analog 2ch: Select when connected to a TV, or Dolby Pro Logic or stereo system via the analog audio jacks. [18](#) [19](#) [21](#)

PCM: Select when connected to a 2 channel digital stereo amplifier. [23](#)
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

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.

Karaoke Vocal

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

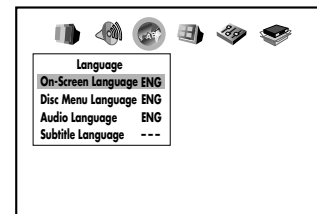
Notes

- 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.

CD Attenuation

HDCD enhances the output sound level of audio CD by approximately 6 dB. As such, distortion may occur in some connected products that are unable to compensate for a wide range of input signal levels. (e.g. TV, stereo receivers)

Off: For normal use.
 On: Select when an HDCD sound is distorted. Sound volume of an HDCD is lessened.



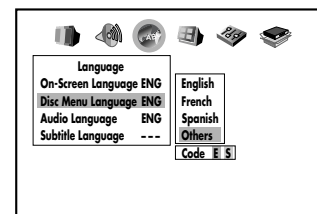
On-Screen Language

English: To view on-screen displays in English.
 Français: To view on-screen displays in French.
 Español: To view on-screen displays in Spanish.

Disc Menu Language

English: To display disc menus in English.
 French: To display disc menus in French.
 Spanish: To display disc menus in Spanish.
 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 **[64]**.
- 2) Select the first character by moving the cursor control (▲ / ▼).
- 3) Move the cursor control (◀ / ▶) to shift and select the second character by moving the cursor control (▲ / ▼).



- 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.

Customizing the Function Settings (continued)

Setting details

Audio Language (DVD)

English: To play sound tracks in English.

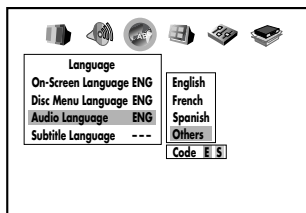
French: To play sound tracks in French.

Spanish: To play sound tracks in Spanish.

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 **64**.
- 2) Select the first character by moving the cursor control (**▲ / ▼**).
- 3) Move the cursor control (**◀ / ▶**) to shift and select the second character by moving the cursor control (**▲ / ▼**).



- 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.

Spanish: To display subtitles in Spanish.

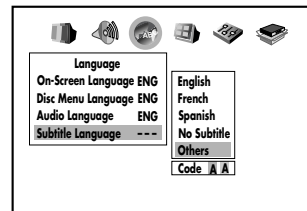
No Subtitle: To disable subtitles.

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 **64**.
- 2) Select the first character by moving the cursor control (**▲ / ▼**).

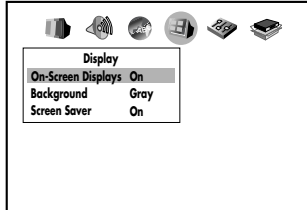
- 3) Move the cursor control (**◀ / ▶**) to shift and select the second character by moving the cursor control (**▲ / ▼**).



- 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.



On-Screen Displays (DVD) (CD)

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

Background (DVD) (CD)

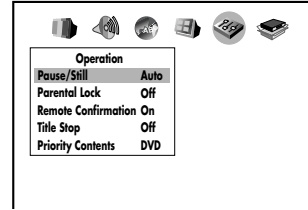
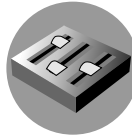
- Blue: Blue background.
- Gray: Gray background.
- Capture: To use a picture you sampled and stored in the memory using the Capture feature **[52]** as a background.
- Jacket: To use the jacket picture included on some discs as a background. If it is not included, a gray background will be substituted.
- Original: To erase a picture you stored in the memory and use an original picture in the DVD video player.

Notes

- Selecting "Original" erases a picture you stored in the memory. No operations are permitted in process of storage of an original picture.
- "Original" is automatically changed to "Capture" when you store an original picture in the memory.
- While playing an audio CD, you cannot view a picture you stored, even though "Capture" is selected.

Screen Saver (DVD)

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



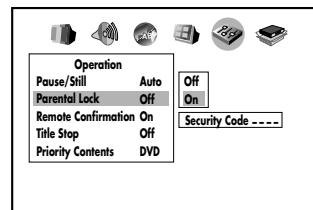
Pause/Still (DVD)

- 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.



(Continued)

Customizing the Function Settings (continued)

Setting details

(Continued)

- 1) Press the number buttons to create a personal 4-digit security code, then press the ENTER button.

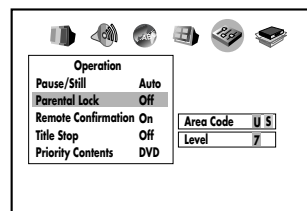
If you make a mistake before pressing the ENTER button, press the CLEAR button and enter your 4-digit security code again.

- 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 moving the cursor control (▲ / ▼).
- b) Move the cursor control (◀ / ▶) to shift and select the second character by moving the cursor control (▲ / ▼).
- c) Press the ENTER button.

- 3) Move the cursor control (▲ / ▼) to select the parental lock level, then press the ENTER button.



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

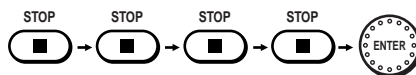
The parental lock levels for other countries/areas than U.S. are included for future use. Check the appropriate parental lock level when you buy a DVD video disc equipped with the parental lock feature in the future.

■ 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.



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.

Remote Confirmation DVD CD

Off: The beeper does not sound.
 On: The beeper sounds with each remote operation.

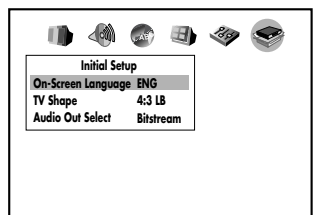
Title Stop DVD

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.

Priority Contents DVD

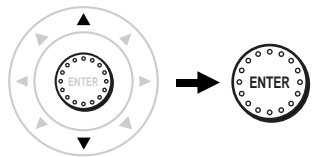
Select the playback priority between DVD video signals and NUON game signals when playing a disc that contains both DVD video signals and NUON game signals.

- DVD: DVD video signals take priority over NUON game signals.
- NUON: NUON game signals take priority over DVD video signals.



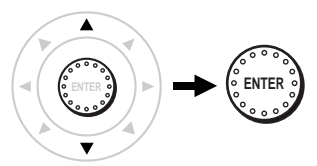
Initial Setup DVD CD

- 1) Move the cursor control (▲ / ▼) to select "On-Screen Language," and press the **ENTER** button.



- 2) Select a language moving the cursor control (▲ / ▼), and press the **ENTER** button.

See page 59, "On-screen Language."



- 3) Make your selection in the same manner as step 1) then step 2).

See page 58, "TV Shape."
 See page 58, "Audio Out Select."

Table of Languages

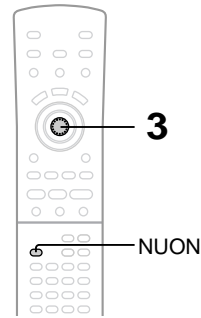
Table of languages and their abbreviations

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

NUON games and peripherals

You can play a NUON game or operate NUON peripherals on this DVD video player.

NUON™ and the NUON logo are trademarks of VM Labs, Inc.



DVD Playing a NUON game disc or NUON peripheral

Caution

- Please do not play games in a darkened room and maintain a distance of 10 feet from the TV.
- For your health, please take 10 – 20 minutes break every hour.
- Please refrain from viewing when you do not feel well.
- Bright flashes can cause some people to experience temporary convulsions and can even cause unconsciousness. If you should experience such phenomena, please see a doctor.
- Please see a doctor before playing the game if you have any health problems.

1 Insert a NUON disc into the DVD video player.

If you insert a NUON disc that contains NUON game signals only, the game starts. No need to follow the steps below.

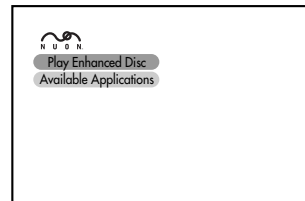
Play the game using a connected NUON game pad or the remote control.

Some buttons on the remote control can be used. See "Buttons on the remote control to play a NUON game" [66].

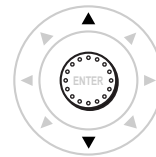
2 Press NUON on the remote control during stop.

The following menu appears.

e.g.



3 Move the cursor control (▲ / ▼) to select an item.



Play Enhanced Disc:

To play a NUON game using a disc that contains both DVD video signal and NUON game signal.

Select this, then press **ENTER**.

The NUON game starts.

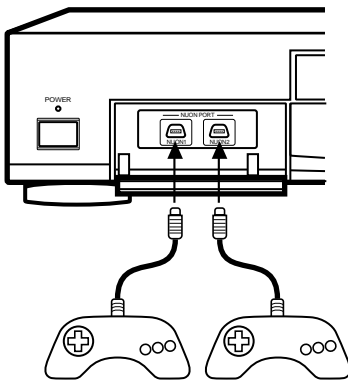
Available Applications:

To play a connected NUON peripheral.

Select your NUON peripheral moving the cursor control (◀ / ▶) then press **ENTER**.

Refer to the instructions of the connected NUON peripheral to operate.

■ Preparation



- 1 Press **POWER** on the DVD video player to turn the power off.
- 2 Push the cover of the NUON port on the DVD video player to open.
- 3 Connect a NUON game pad or a NUON peripheral to the NUON port. Make a firm connection matching the shapes of the port and the connector.
- 4 Turn on the NUON peripheral if connected.
- 5 Press **POWER** on the DVD video player to turn the power on.

(Continued)

NUON games and peripherals (continued)

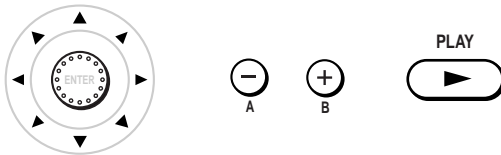
Playing a NUON game disc or NUON peripheral (continued)

Notes

- Pressing NUON button during a NUON game play displays a menu if it is contained in the playing NUON disc or in the connected NUON peripheral.
- If you have set "Priority Contents" to "NUON" **[63]**, you can start a NUON game without displaying the menu in step 2.
- While playing a NUON game or operating connected NUON peripherals:
 - the DVD video player will not receive most commands by the buttons on the front panel or the remote control (except those described below and the POWER button and OPEN/CLOSE button).
 - follow the operating instructions of the game or the peripherals, even for the purpose of viewing DVD video signals contained in a disc together with NUON game signals.
 - the DVD video player may not work according to your setting.
 - brightness control by the FL DIMMER button is reset to normal.

■ Buttons on the remote control to play a NUON game

For details on the functions, refer to the instructions of the NUON game disc.



The ENTER button functions as an A button.
The PLAY button functions as a start key.

Note

Depending on the NUON game or peripheral, these buttons may not operate properly. In such a case, use other control devices applicable to NUON games.

Others

- **Before Calling Service Personnel**
- **Specifications**
- **LIMITED WARRANTY DVD VIDEO PLAYER**

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.	<ul style="list-style-type: none"> The power plug is disconnected. 	<ul style="list-style-type: none"> Connect the power plug securely into the wall outlet. 	18
The DVD video player turned off by itself.	<ul style="list-style-type: none"> The automatic power off function turned the unit off. 	<ul style="list-style-type: none"> Press the PLAY button. 	27
No picture.	<ul style="list-style-type: none"> The TV is not set to receive DVD signal output. 	<ul style="list-style-type: none"> Select the appropriate video input mode on the TV so the picture from the DVD video player appears on the TV screen. 	26
	<ul style="list-style-type: none"> The video cable is not connected securely. 	<ul style="list-style-type: none"> Connect the video cable securely into the appropriate jacks. 	18, 19
No sound.	<ul style="list-style-type: none"> The equipment connected with the audio cable is not set to receive DVD signal output. 	<ul style="list-style-type: none"> Select the correct input mode of the audio receiver so you can listen to the sound from the DVD video player. 	26
	<ul style="list-style-type: none"> The audio cable is not connected securely. 	<ul style="list-style-type: none"> Connect the audio cable securely into the appropriate jacks. 	18-23
	<ul style="list-style-type: none"> The audio receiver or TV is turned off. 	<ul style="list-style-type: none"> Turn on the equipment connected with the audio cable. 	26
	<ul style="list-style-type: none"> The setting of output sound format is incorrect. 	<ul style="list-style-type: none"> Select the proper audio setting. 	42, 56 58
The playback picture has occasional distortion.	<ul style="list-style-type: none"> The disc is dirty. 	<ul style="list-style-type: none"> Eject the disc and clean it. 	9
	<ul style="list-style-type: none"> It is in fast forward or fast reverse playback. 	<ul style="list-style-type: none"> 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.	<ul style="list-style-type: none"> The effect of copy protection. 	<ul style="list-style-type: none"> Connect the DVD video player directly to the TV. Avoid connecting the DVD video player to a VCR or TV/VCR combination. 	18
The DVD video player does not start playback.	<ul style="list-style-type: none"> No disc is inserted. 	<ul style="list-style-type: none"> Insert a disc. 	26
	<ul style="list-style-type: none"> An unplayable disc is inserted. 	<ul style="list-style-type: none"> Insert a playable disc. (Check the disc type and color system.) 	10
	<ul style="list-style-type: none"> The disc is placed upside down. 	<ul style="list-style-type: none"> Place the disc with the playback side down. 	26
	<ul style="list-style-type: none"> The disc is not placed within the guide. 	<ul style="list-style-type: none"> Place the disc correctly inside the guide on the disc tray. 	26
	<ul style="list-style-type: none"> The disc is dirty. 	<ul style="list-style-type: none"> Clean the disc. 	9
	<ul style="list-style-type: none"> The parental lock function is set. 	<ul style="list-style-type: none"> Cancel the parental lock function or change the parental lock level. 	56, 61
Playback does not follow the course of the disc's program.	<ul style="list-style-type: none"> It is in the mode of repeat playback, memory playback, etc. 	<ul style="list-style-type: none"> These operations may prevent a proper progress of the contents. 	—
Buttons do not work.	<ul style="list-style-type: none"> Power supply fluctuations or other abnormalities such as static electricity may interrupt correct operations. 	<ul style="list-style-type: none"> Turn the power on or off with the POWER button. Or disconnect the power plug and insert it into the wall outlet again. 	—
The remote control does not work properly.	<ul style="list-style-type: none"> The remote control is not pointed at the remote sensor of the DVD video player. 	<ul style="list-style-type: none"> Point the remote control at the remote sensor of the DVD video player. 	15
	<ul style="list-style-type: none"> The remote control is too far from the DVD video player. 	<ul style="list-style-type: none"> Operate the remote control within about 7 m. 	15
	<ul style="list-style-type: none"> The batteries in the remote control are exhausted. 	<ul style="list-style-type: none"> Replace the batteries with new ones. 	15

DVD video player / outputs / supplied accessories

DVD Video Player

Power supply	120 V AC, 60 Hz
Power consumption	17 W
Mass	3.0 kg
External dimensions	430 × 81 × 305 mm (W/H/D)
Signal system	Standard 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 105 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	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) 0.286 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 (BITSTREAM/PCM)	0.5 V (p-p), 75 Ω, pin jack × 1
Audio output (ANALOG)	2.0 V (rms), 220 Ω, pin jacks (L, R) × 1

Supplied Accessories

Audio/video cable	1
Remote control (SE-R0029)	1
Batteries (AAA)	2
Power cord	1

- Designs and specifications are subject to change without notice.

LIMITED WARRANTY DVD VIDEO PLAYER

Toshiba America Consumer Products, Inc. ("TACP"), Toshiba Hawaii ("THI") and Toshiba Canada Limited ("TCL") make the following limited warranties. These limited warranties extend to original purchaser or any person receiving this set as a gift from the original purchaser and to no other purchaser or transferee.

Limited Ninety (90) Day Warranty

TACP/THI warrant this product against defects in materials or workmanship for a period of ninety (90) days after the date of original retail purchase. During this period, TACP/THI will repair or replace a defective product or part, at their option, with a new or refurbished product or part without charge to you. You must deliver the entire product to a TACP/THI Authorized Service Station. You are responsible for all transportation and insurance charges for the unit to and from the Authorized Service Station. If you live in the U.S.A. you may, at your option, return your DVD Unit to:

Toshiba America Consumer Products Inc.
Returns Center
1420C Toshiba Dr.
Lebanon, TN 37087

Upon receipt we will, at our option, exchange the DVD Unit with a new or refurbished unit. **Canadian consumers are requested to contact TCL. In Hawaii consumers are requested to contact THI.**

Limited One (1) Year Warranty

TACP/THI further warrant the parts in this product against defects in materials or workmanship for a period of one (1) year after the date of original retail purchase. During this period, TACP/THI will repair or replace a defective product or part, at their option, with a new or refurbished product or part without charge to you, except that if a defective part is replaced after ninety (90) days from the date of the original retail purchase you pay labor charges involved in the replacement. You must also deliver the entire product to a TACP/THI Authorized Service Station. You are responsible for all transportation and insurance charges for the unit to and from the Authorized Service Station. If you live in the U.S.A. you may, at your option, return your DVD Unit to:

Toshiba America Consumer Products Inc.
Returns Center
1420C Toshiba Dr.
Lebanon, TN 37087

Upon receipt we will, at our option, exchange the DVD Unit with a new or refurbished unit. **Canadian Consumers are requested to contact TCL. In Hawaii consumers are requested to contact THI.**

Rental Units

The warranty for rental units begin with the first rental or thirty (30) days from the date of shipment to the rental firm, whichever comes first.

Commercial Units

Products sold and used for commercial use have a limited ninety (90) day warranty for all parts and labor.

Owner's Manual

You should read the owner's manual thoroughly before operating this product. You should complete and mail the enclosed Demographic card within ten (10) days after you, or the person who has given you this product as a gift, purchased this product. This is one way to enable TACP to provide you with better customer service and improved products. Failure to return the card will not affect your rights under this warranty.

Your Responsibility

The above warranties are subject to the following conditions:

- (1) You must retain your bill of sale or provide other proof of purchase.
- (2) You must notify a TACP/THI/TCL /Authorized Service Station within thirty (30) days after you discover a defective product or part.
- (3) All warranty servicing of this product must be made by a TACP/THI/TCL Authorized Service Station.
- (4) U.S.A. warranties are effective only if the product is purchased and operated in the Continental U.S.A. or Puerto Rico.
- (5) Labor service charges for set installation. Set up, adjustment of customer controls and installation or repair of antenna systems are not covered by this warranty. Reception problems caused by inadequate antenna systems are your responsibility.
- (6) Warranties extend only to defects in materials or workmanship as limited above and do not extend to any product or parts which have been lost or discarded by you or to damage to products or parts caused by misuse, accident, damage caused by Acts of God, such as lighting or fluctuations in electric power, improper installation, improper maintenance or use in violation of instructions furnished by us; or to units which have been altered or modified without authorization of TACP/THI/TCL or to damage to products or part thereof which have had the serial number removed, altered, defaced or rendered illegible.
- (7) Should you elect to return your DVD Unit to TACP after the ninety (90) days and within one (1) year, or after the warranty period has expired: Call (800)-631-3811 to receive information concerning an exchange price. Payment must be enclosed with product in the form of a certified check or money order including reason for return.
- (8) Physically damaged DVD Units are not acceptable for repair or exchange whether in or out of warranty and will be returned as received.

How to Obtain Warranty Service

- (1) Refer to the troubleshooting guide in your owner's manual. This check list may solve your problem.
- (2) In the U.S.A., only call the TACP toll free number 800-631-3811, or if in Hawaii or Canada see listing below within (30) days after you find a defective product or part.
- (3) Arrange for the delivery of the product to the TACP/THI/TCL Authorized Service Station or TACP Return Center. Products shipped to the Service Station must be insured and safely and securely packed, preferably in the original shipping carton, and a letter explaining the defect and also a copy of the bill of sale or other proof of purchase must be enclosed.

In the Continental United States contact:



In Hawaii contact:
Toshiba Hawaii Inc.
327 Kamakee Street
Honolulu, HA 96814
(808)-521-5377

In Canada contact:
Consumer Electronics Group
191 McNabb Street
Markham, Ontario L3R 8H2
(905)-470-5400

Consumer Electronics Group
22171 Fraserwood Way
Richmond, B.C. V6W 1J5
(604)-303-2500

Consumer Electronics Group
1643 North Service Road
Droval, QC H9P 1J1
(514)-856-4100

All warranties implied by state law, including the implied warranties of merchantability and fitness for a particular purpose, are expressly limited to the duration of the limited warranties set forth above. With the exception of any warranties implied by state law as hereby limited, the foregoing warranty is exclusive and in lieu of all other warranties, guarantees, agreements and similar obligations of manufacturer or seller with respect to the repair or replacement of any parts. In no event shall TACP/THI be liable for consequential or incidental damages.

No person, agent, distributor, dealer or company is authorized to change, modify or extend the terms of these warranties in any manner whatsoever. The time within which an action must be commenced to enforce any obligation of TACP/THI arising under the warranty or under any statute, or law of the United States or any state thereof, is hereby limited to ninety (90) days from the date you discover or should have discovered, the defect. This limitation does not apply to implied warranties arising under state law.

This warranty gives you specific legal rights and you may also have other rights which may vary from state to state. Some states do not allow limitation on how long an implied warranty lasts, when an action may be brought, or the exclusion or limitation of incidental or consequential damages, so the above provisions may not apply to you.

ATTENTION CANADIAN CONSUMERS:

Canadian consumers are requested to complete the special Canadian "Warranty Registration Form" enclosed, and forward this completed form with a copy of bill of sale to TOSHIBA OF CANADA to "Register and Validate" their warranty. Product must be purchased from an Authorized Canadian Dealer. Products purchased in the U.S.A. and used in Canada are not covered by these warranties.

IMPORTANT: PACKING AND SHIPPING INSTRUCTION

When you send the product to a Service Station, you must use the original carton box and packing material, then insert the original carton box containing the unit into another carton using more packing material.

2. LOCATION OF MAIN PARTS AND MECHANISM PARTS

2-1. Location of Main Parts

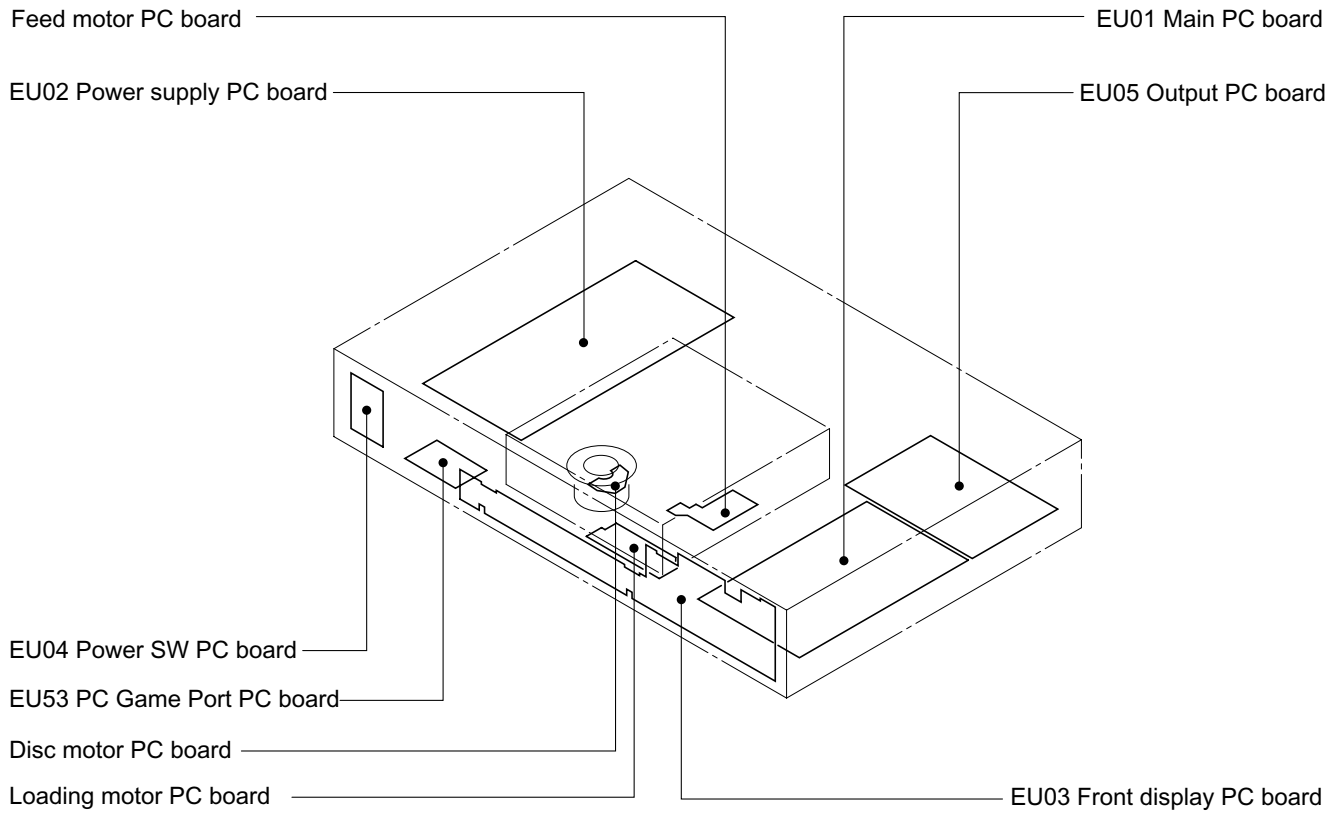


Fig. 1-2-1

2-2. Location of Mechanism Parts

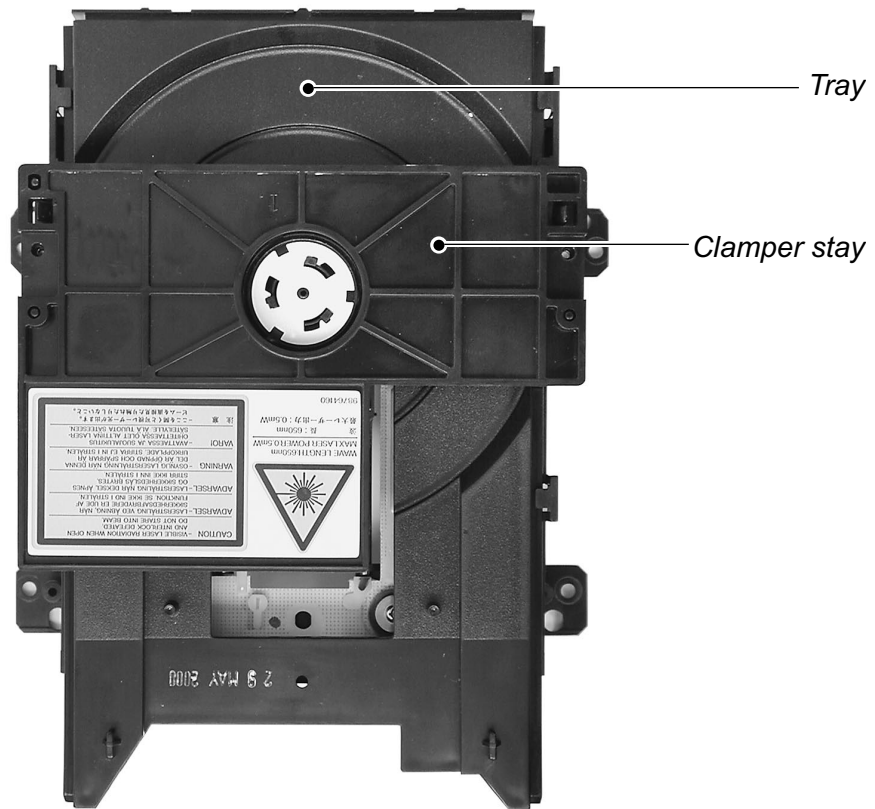


Fig. 1-2-2 Mechanism chassis assembly (Top side)

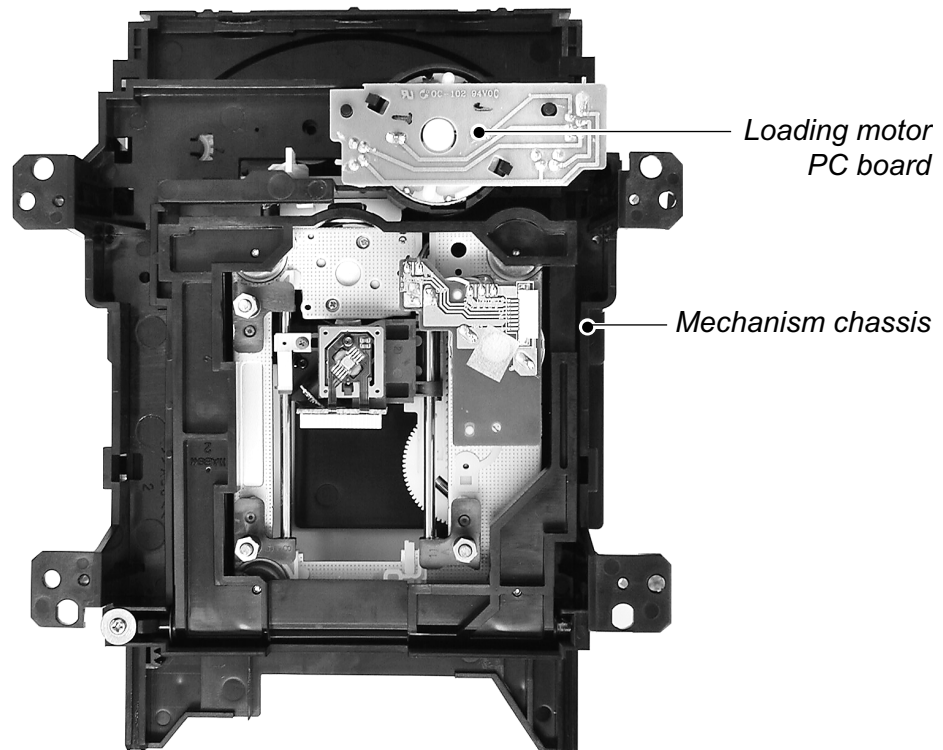


Fig. 1-2-3 Mechanism chassis assembly (Bottom side)

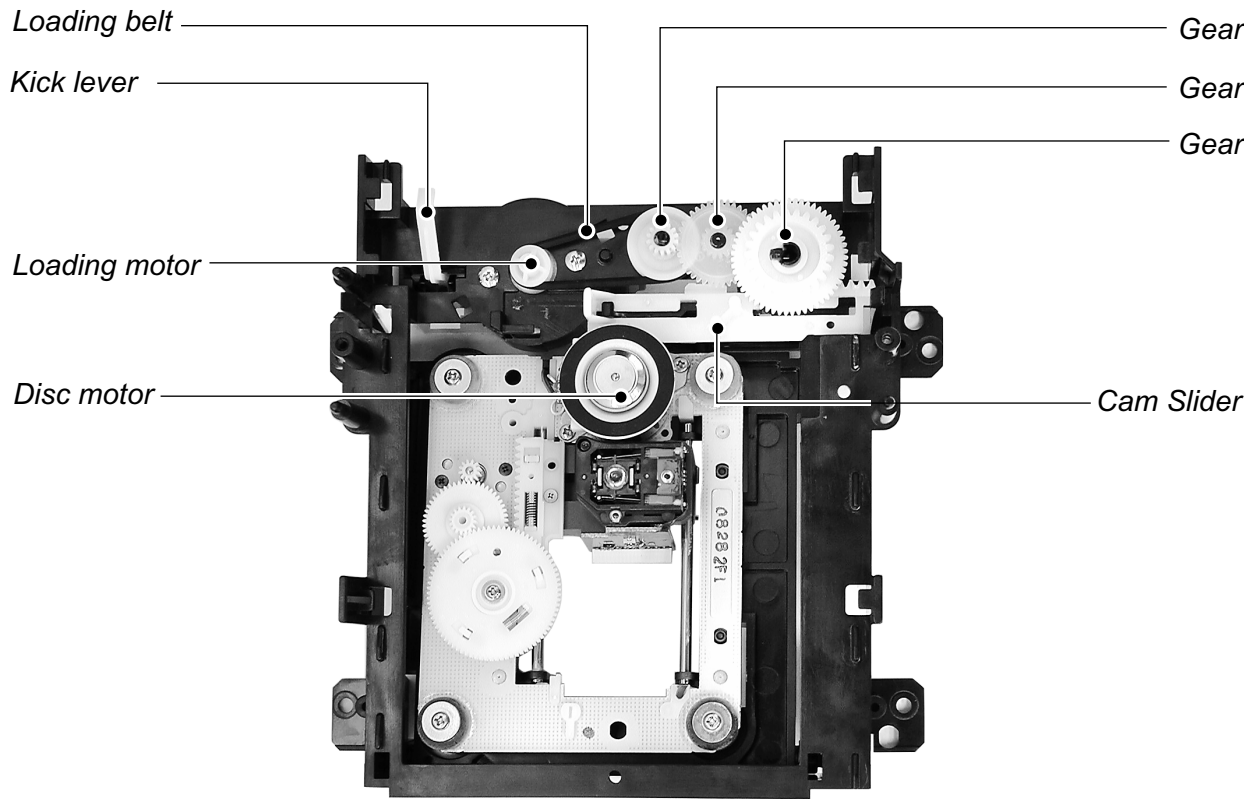


Fig. 1-2-4 Mechanism chassis assembly (Internal side)

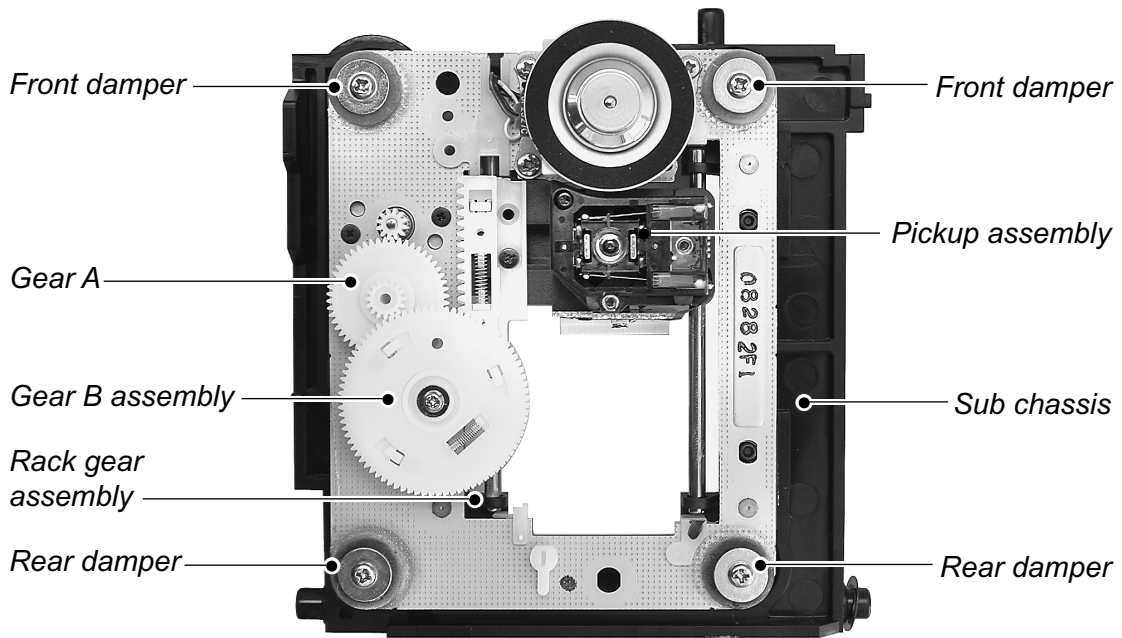


Fig. 1-2-5 Pickup mechanism chassis assembly (Top side)

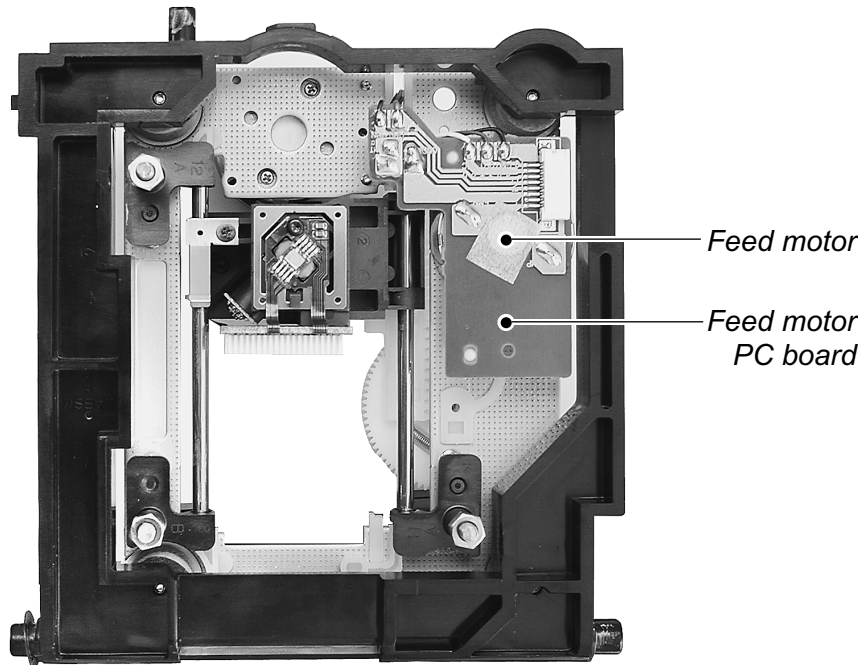


Fig. 1-2-6 Pickup mechanism chassis assembly (Bottom side)

3. TROUBLESHOOTING

3-1. Main Circuit

3-1-1. Servo System

(1) Initial Operation after Power ON

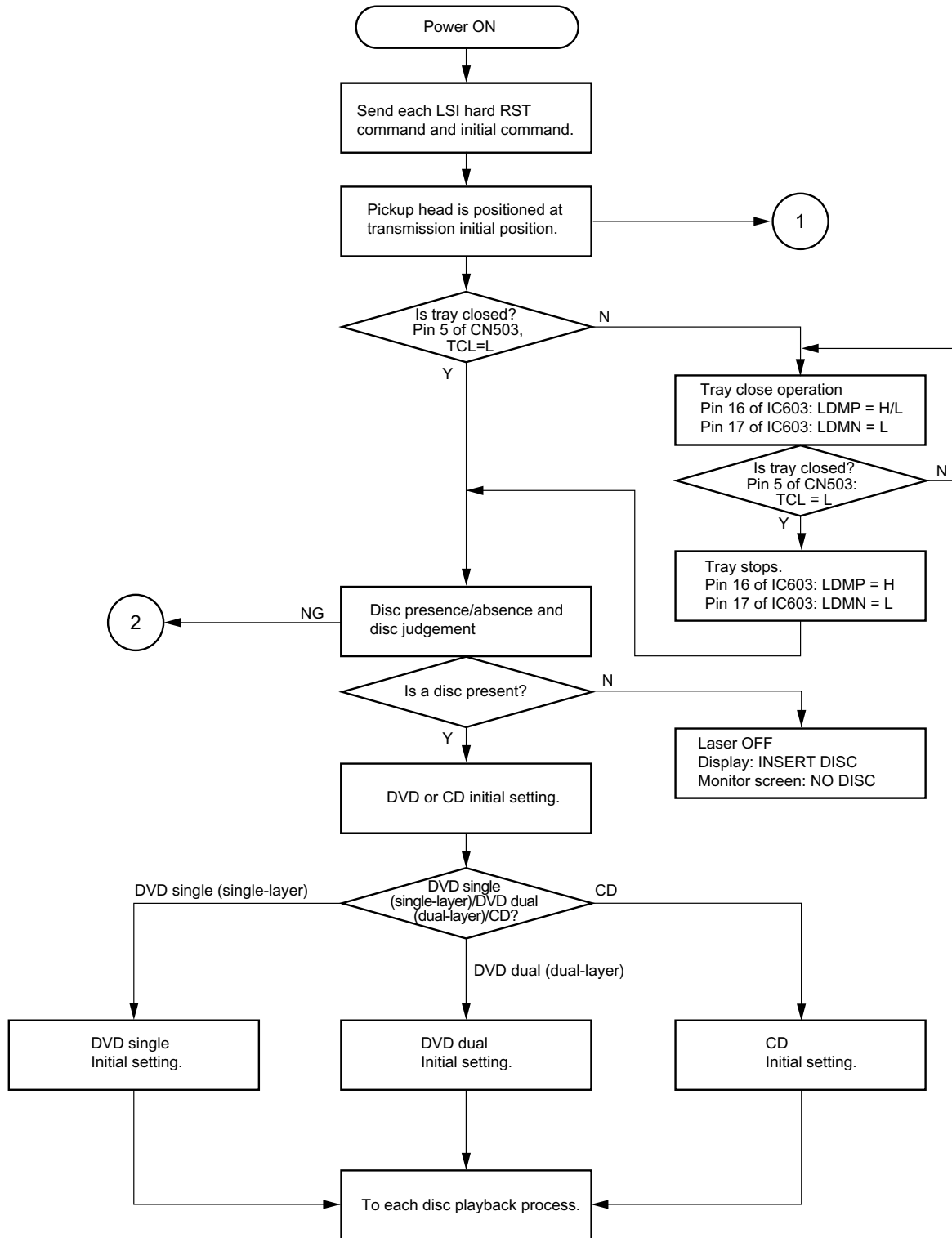


Fig. 1-3-1

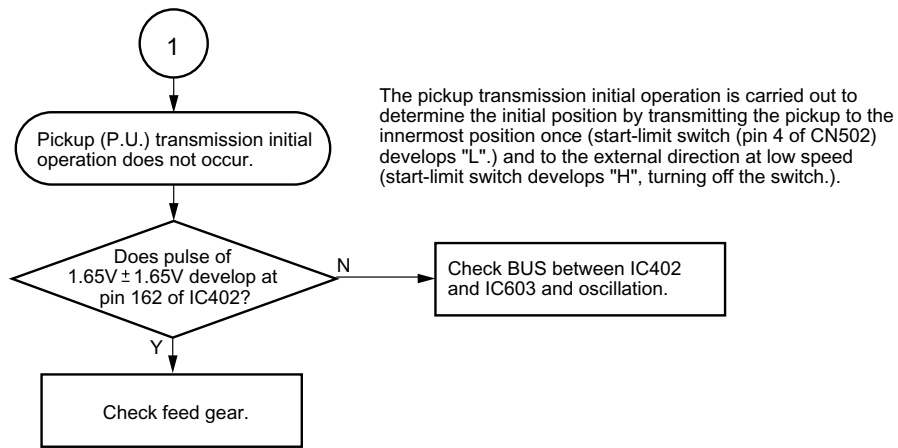


Fig. 1-3-2

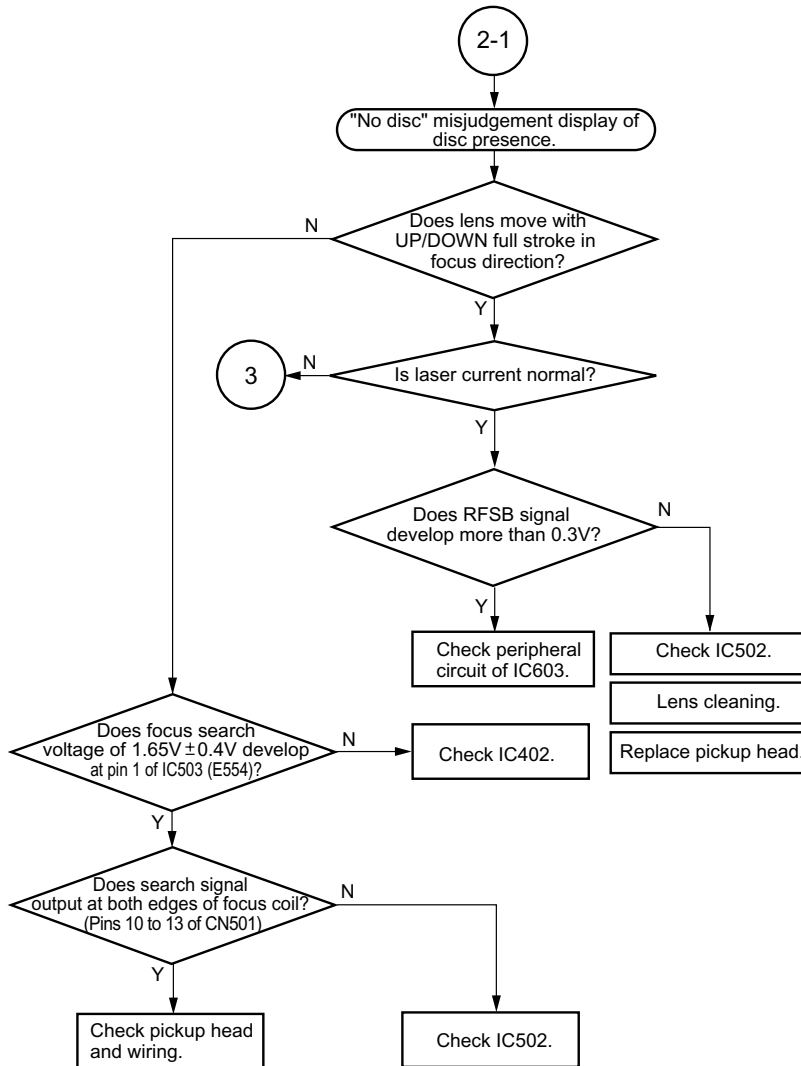


Fig. 1-3-3

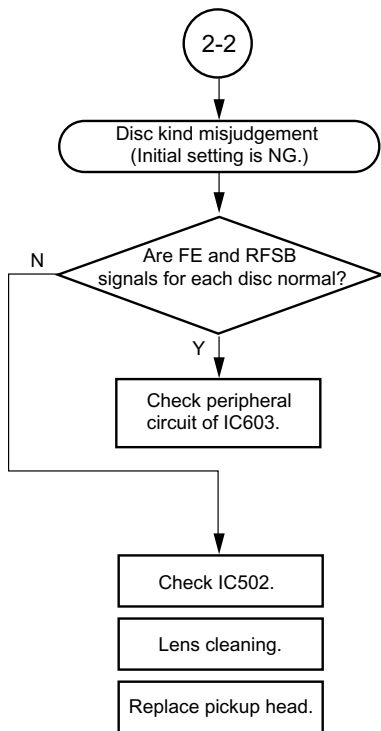


Fig. 1-3-4

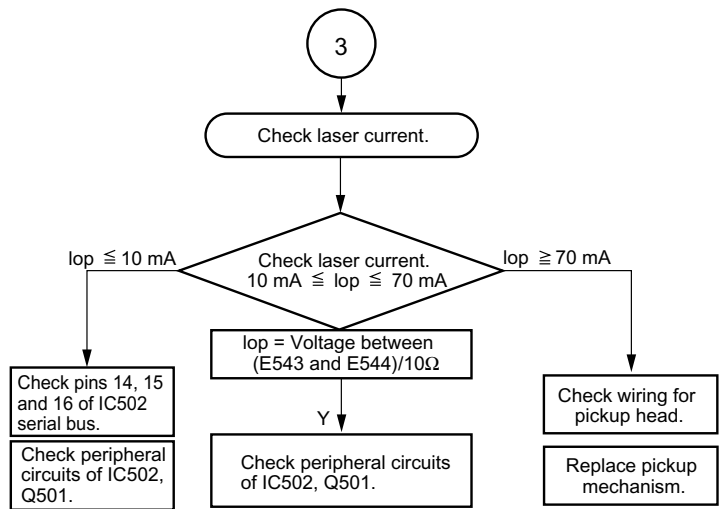


Fig. 1-3-5

DVD single (single-layer) disc
detection waveform

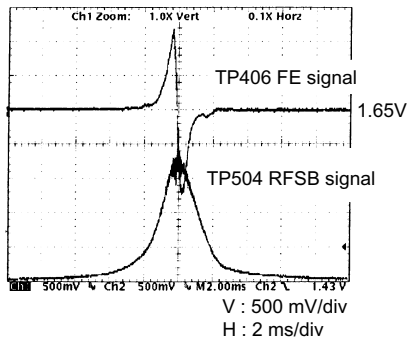


Fig. 1-3-6

DVD dual (dual-layer) disc
detection waveform

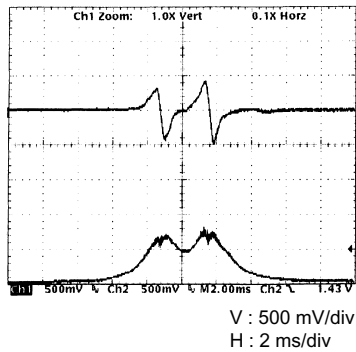


Fig. 1-3-7

CD disc
detection waveform

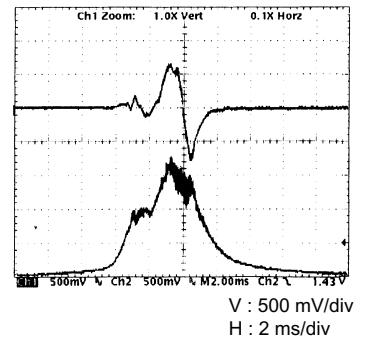


Fig. 1-3-8

(2) Picture appears (PLAY)

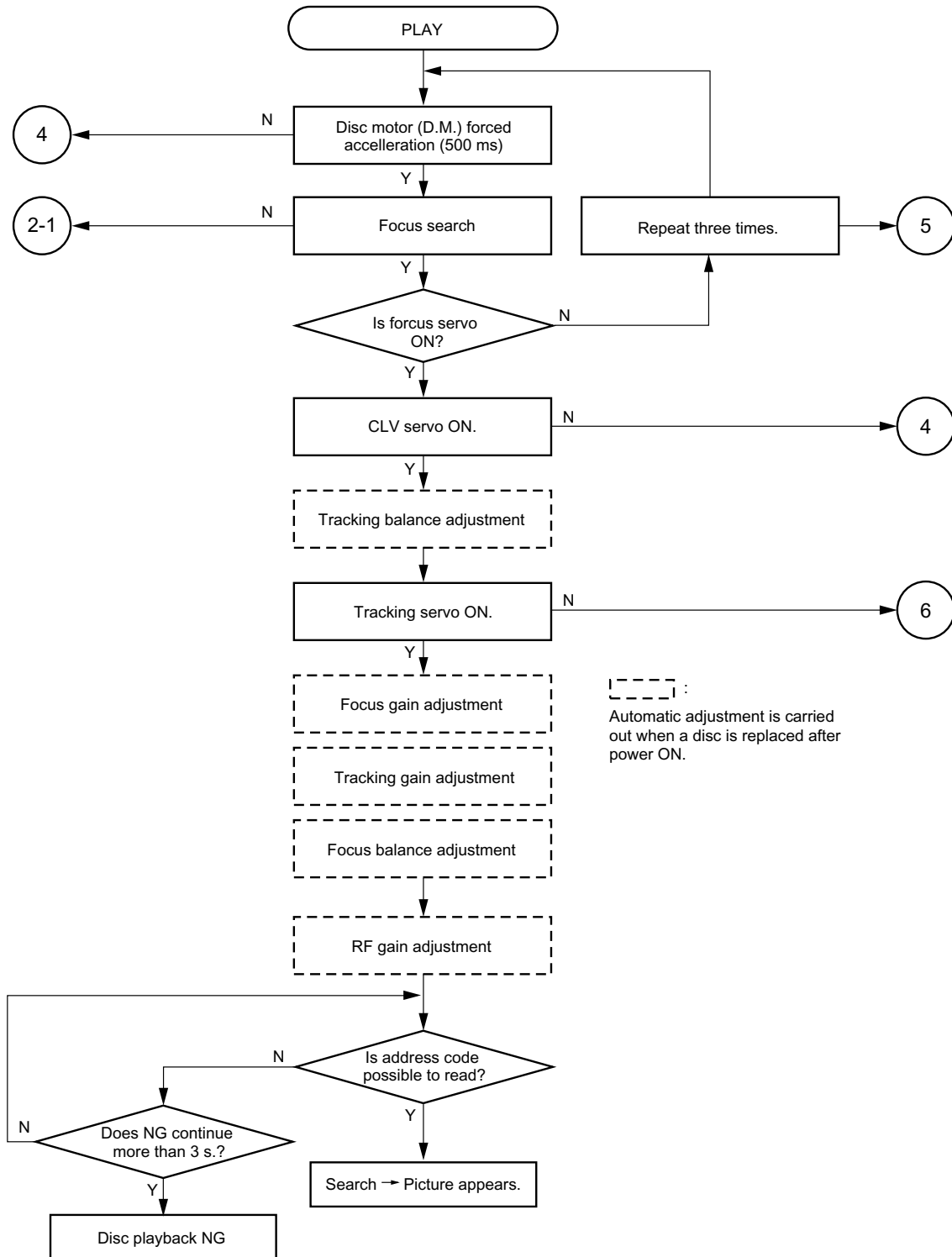


Fig. 1-3-9

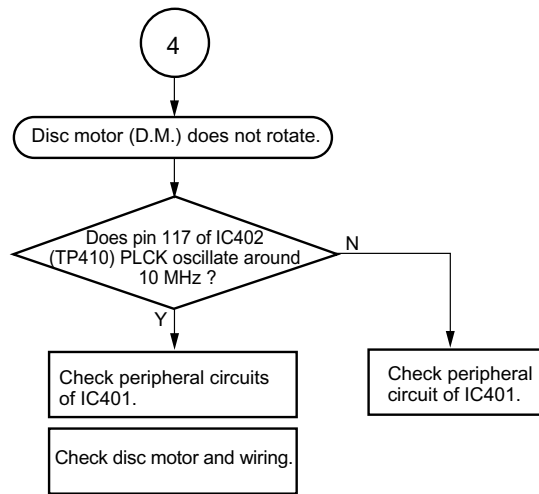


Fig. 1-3-10

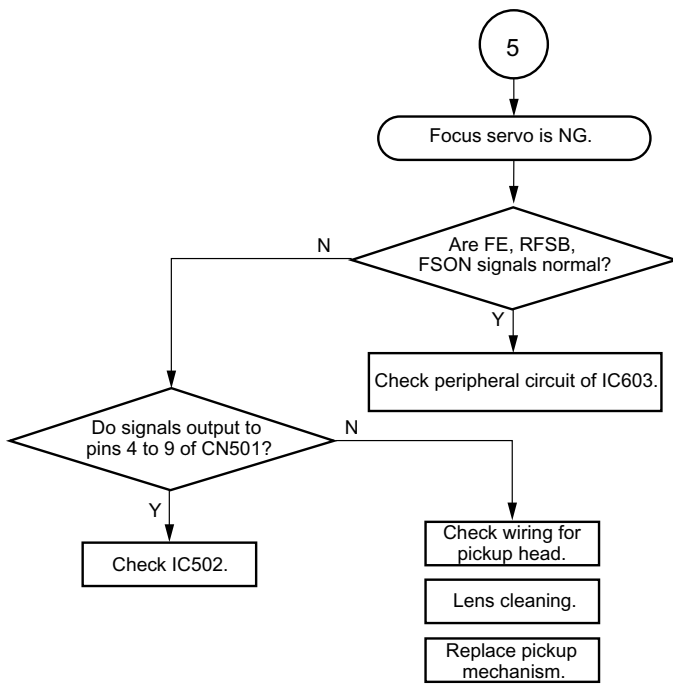


Fig. 1-3-11

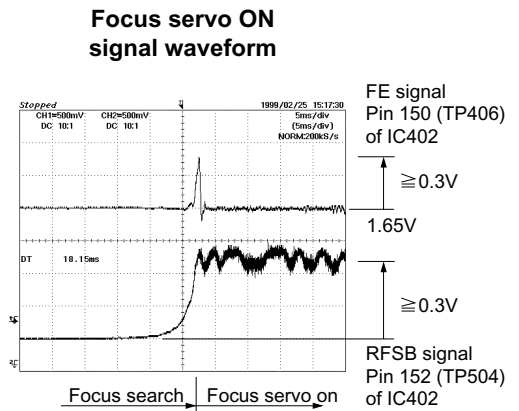


Fig. 1-3-12

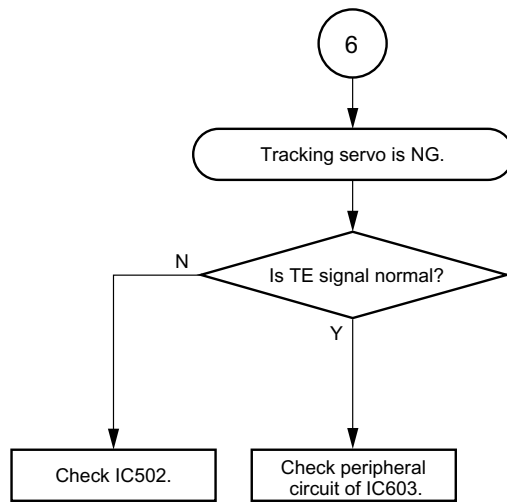


Fig. 1-3-13

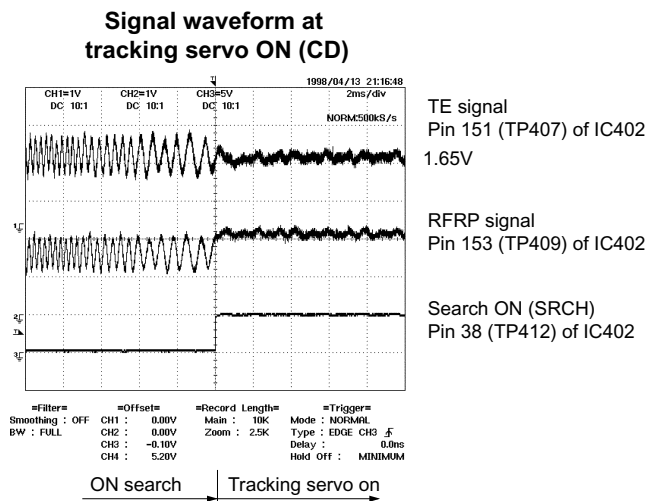


Fig. 1-3-14

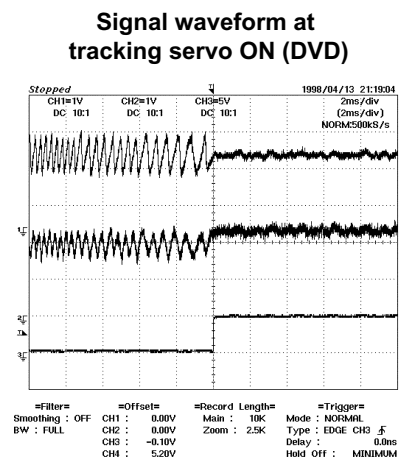


Fig. 1-3-15

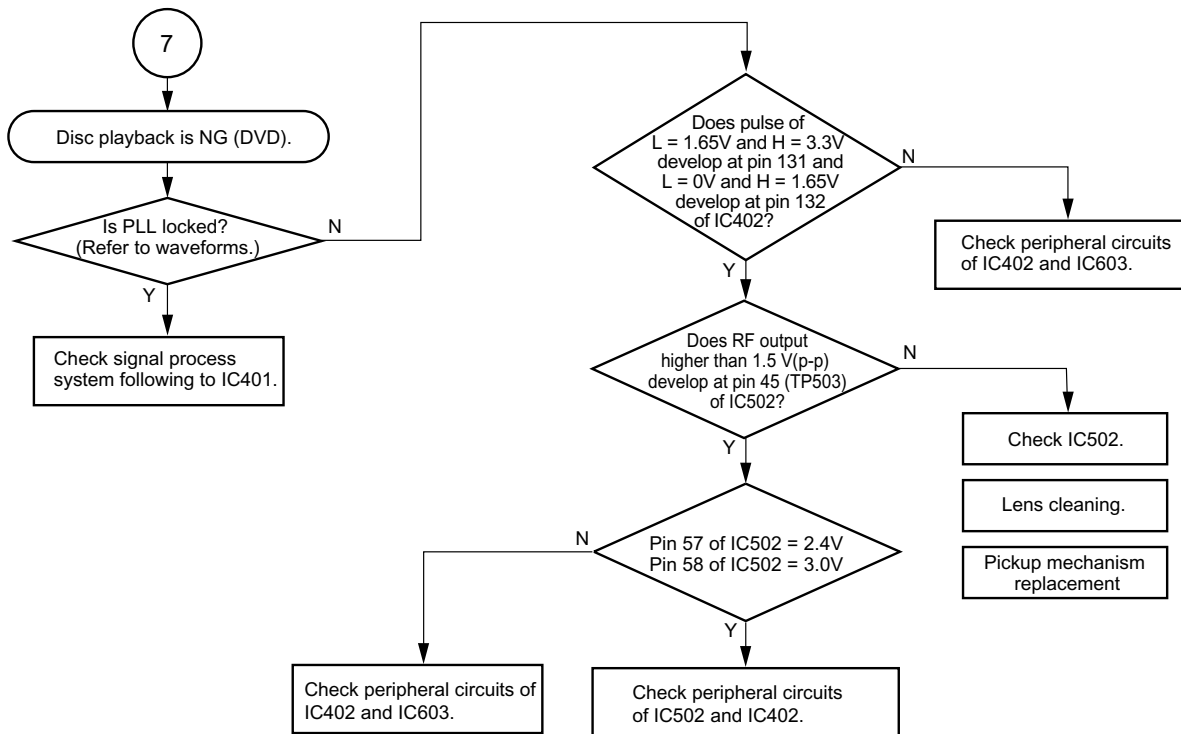


Fig. 1-3-16

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.

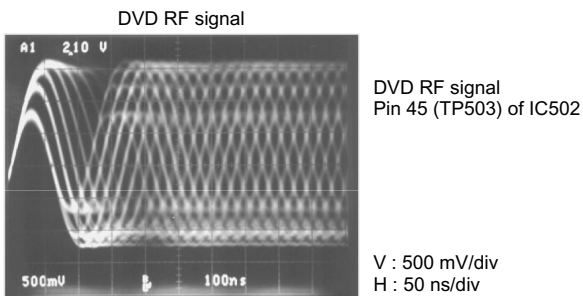


Fig. 1-3-17

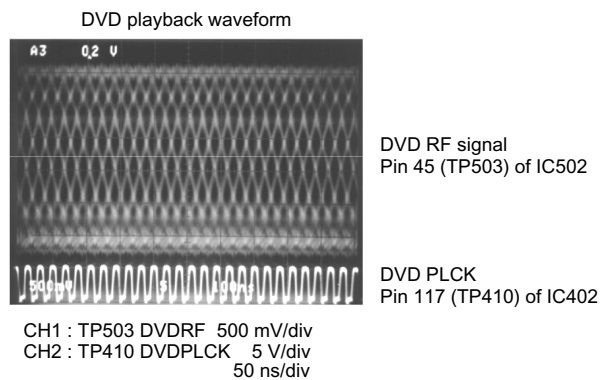


Fig. 1-3-19

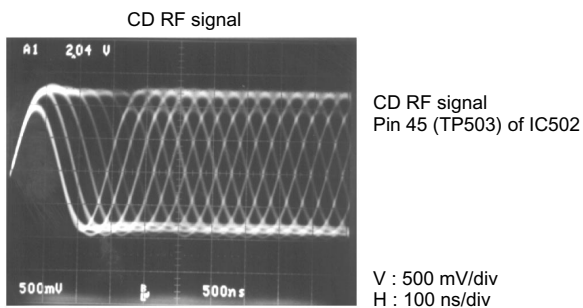


Fig. 1-3-18

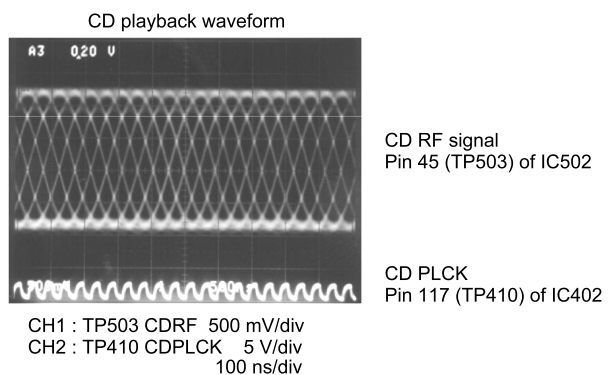


Fig. 1-3-20

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

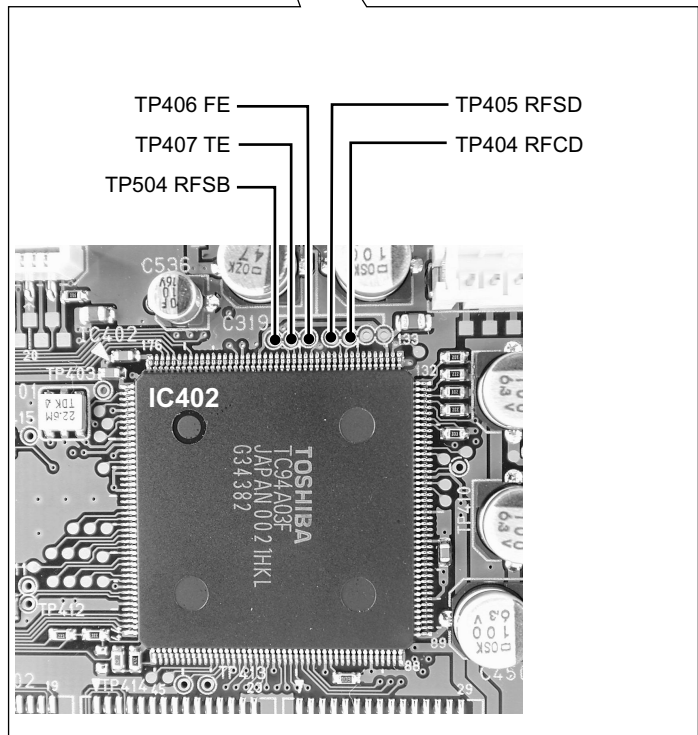
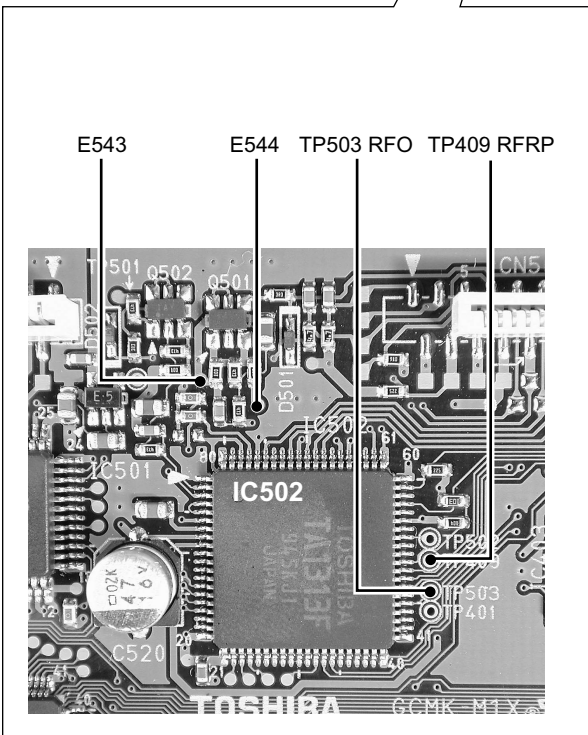
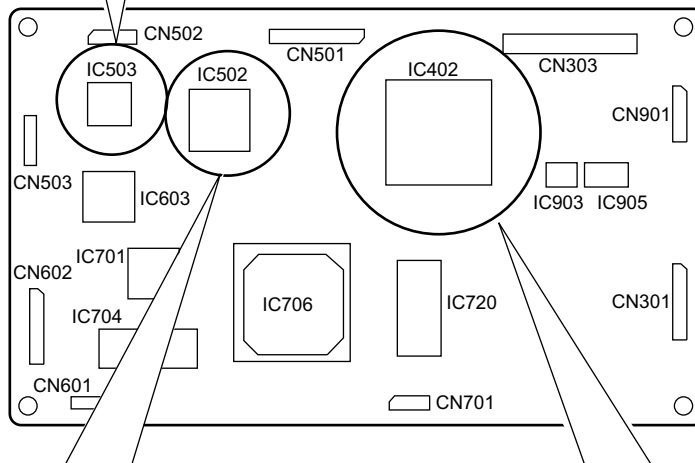
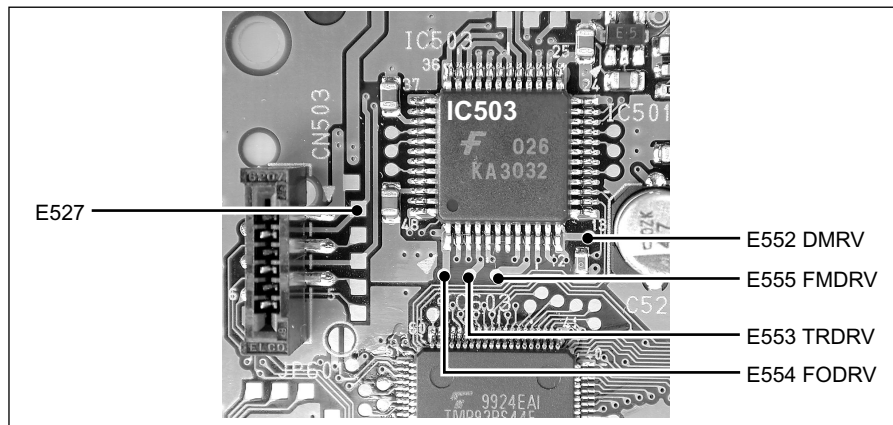


Fig. 1-3-21

SECTION 2

PART REPLACEMENT AND ADJUSTMENT PROCEDURES

CAUTIONS BEFORE STARTING SERVICING

Electronic parts are susceptible to static electricity and may easily be 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).

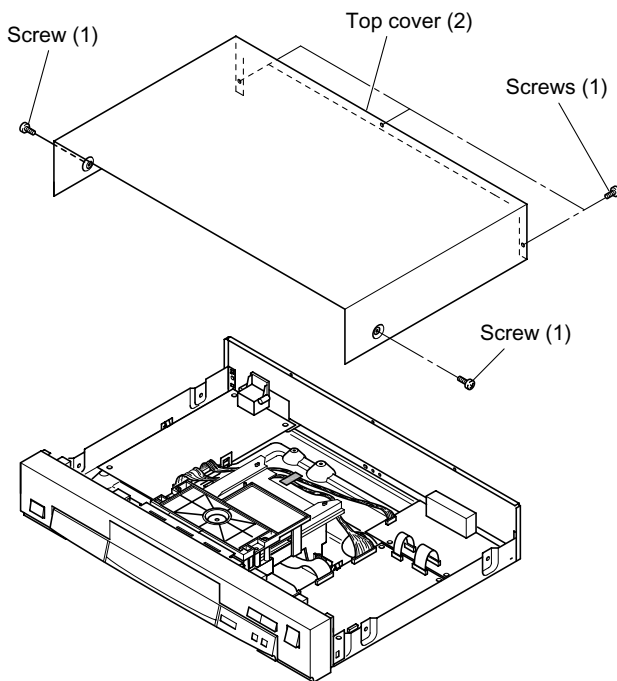


Fig. 2-1-1

1-1-2. Clamper Stay

<Removal>

1. Remove two screws (1).
2. Release two claws and remove the clamper stay (2).

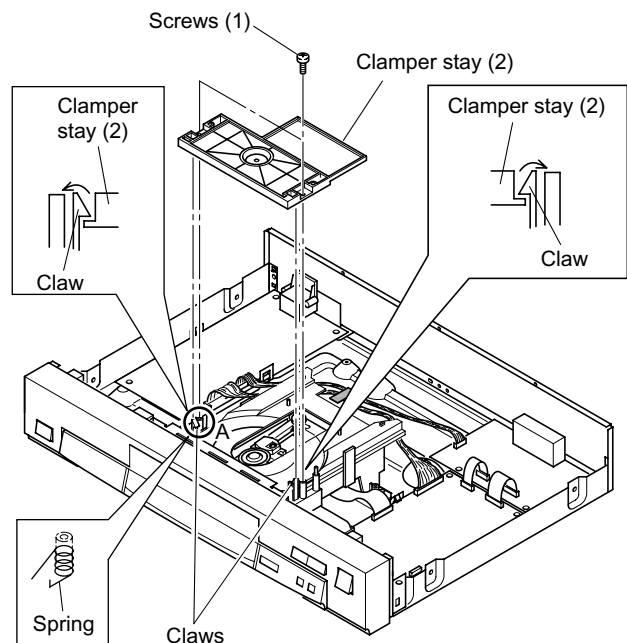


Fig. 2-1-2

<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 clamber stay.

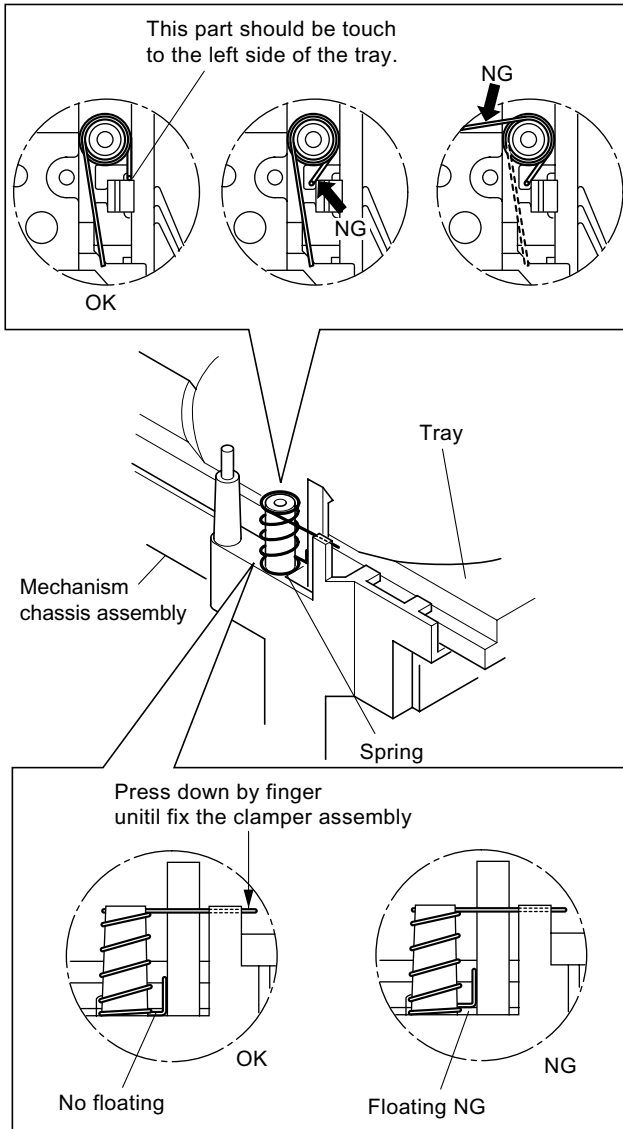


Fig. 2-1-3

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.

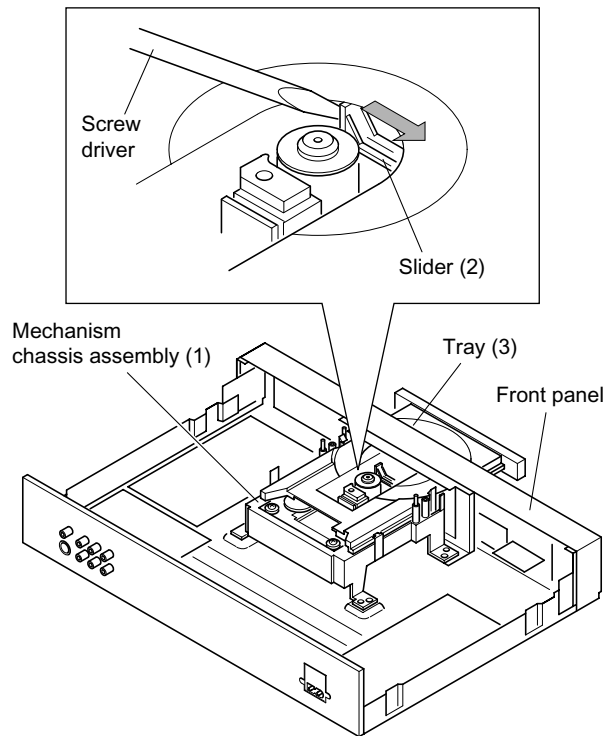


Fig. 2-1-4

<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.

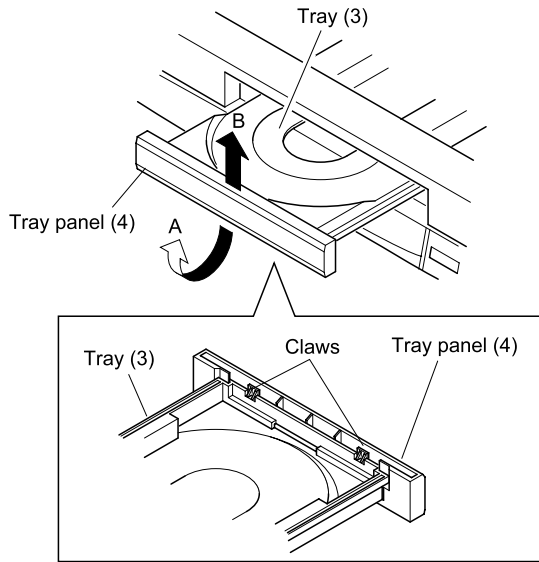


Fig. 2-1-5

1-1-4. Front Panel and Tray

1. Disconnect the flexible cables (2).

Note:

- The flexible cables (2) can be connected between main and front PC boards or between main and game port PC boards.
2. Disconnect the flexible cable (3).
 3. Remove two screws (4) and remove two GND leads (5).
 4. Release four claws and remove the front panel (6).
 5. Pull out the tray (7).

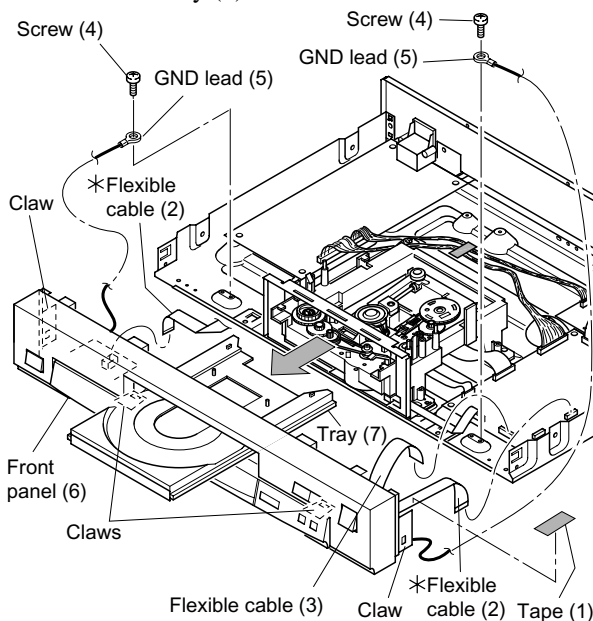


Fig. 2-1-6

Note:

- Insert the tray (3) 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 as shown in the Fig. A, insert the tray (3). When inserting a tray (3), push the rack gear side shown by the arrow. (Refer to Fig. 2-1-7.)
- Confirm that the marking of the gear (4) 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.)

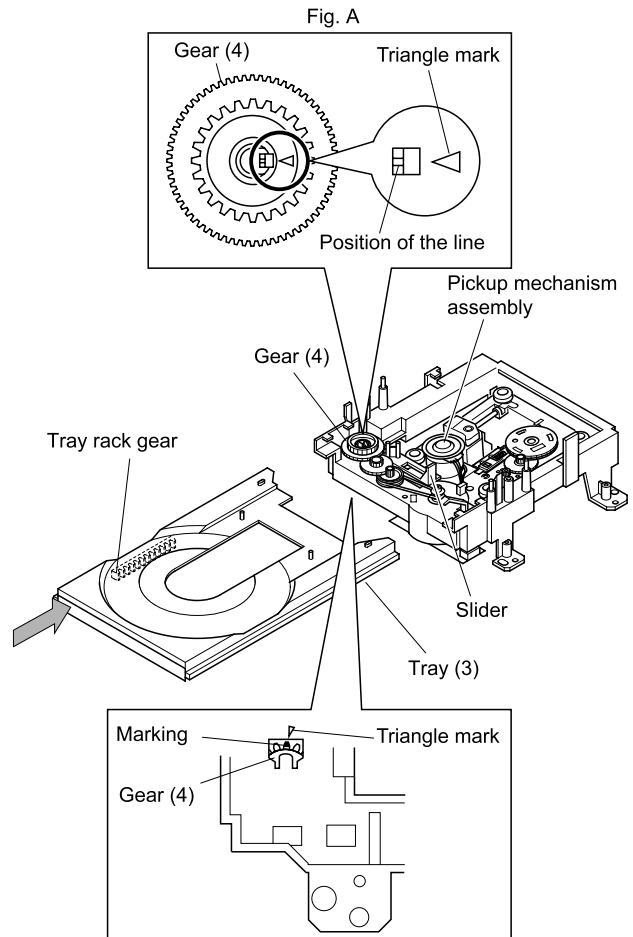


Fig. B
Fig. 2-1-7

1-1-5. Rear Panel

1. Remove three screws (1) and remove the rear panel (2).

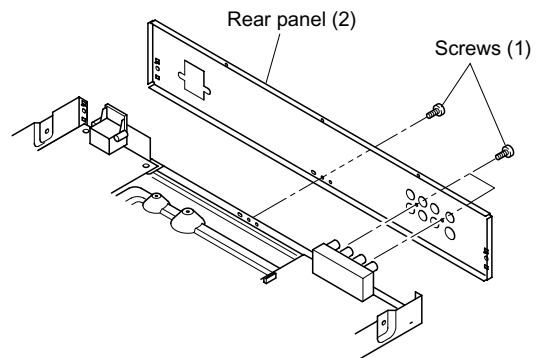


Fig. 2-1-8

1-2. PC Board Replacement

Note:

- The flexible cable of the game port PC board may be connected to the front PC board or to the main PC board.

When connecting to the main PC board, refer to the followings for wiring.

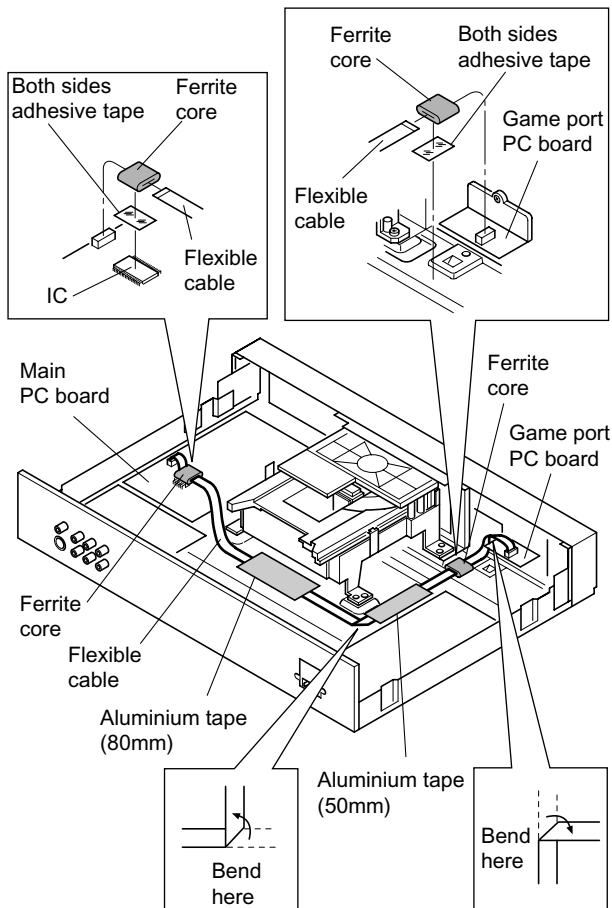


Fig. 2-1-9

1-2-1. Main PC Board

Note:

- Before removing the main PC board (4), be sure to short-circuit the laser diode output land. After replacing, open the land as it was after inserting the flexible cables (1).
- The game port PC board and the main PC board may be connected. (Refer to Fig. 2-1-9.)

- Remove the top cover. (Refer to item 1-1-1.)
- Remove seven flexible cables (1) and remove one connector (2).
- Remove four screws (3).
- Release two claws and remove the main PC board (4).

Note:

- When mounting, be sure to twist the wire for the connector (2) several times.

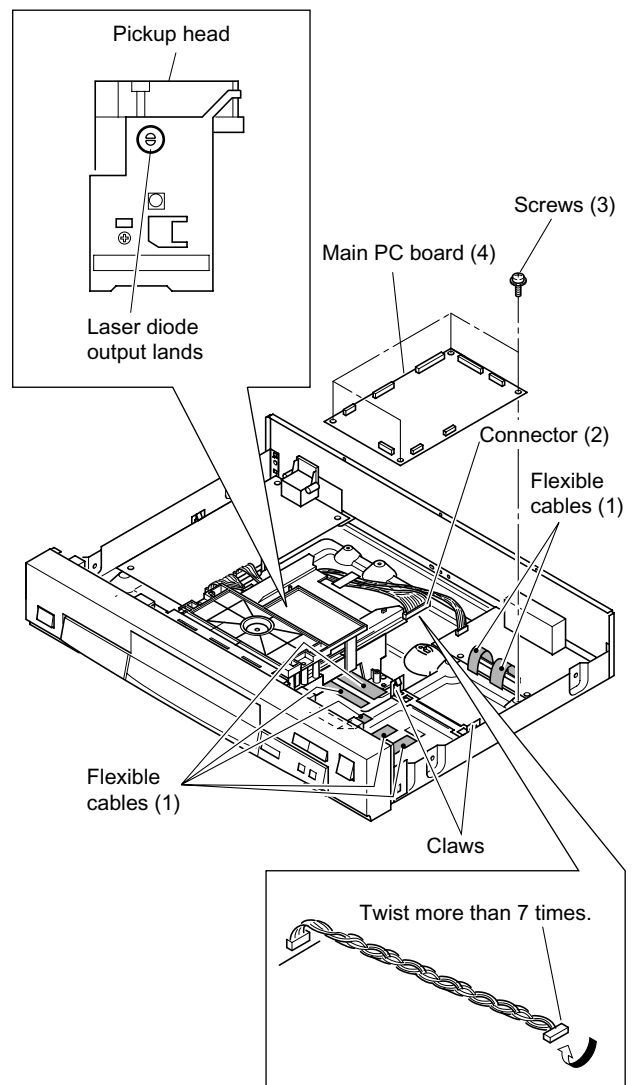


Fig. 2-1-10

1-2-2. Output PC Board

1. Peel off the tape (1).
2. Remove the connector (2).
3. Disconnect two flexible cables (3).
4. Remove two screws (4).
5. Remove two screws (5) and remove the output PC board (6).

Note:

- When mounting, be sure to twist the wire for the connector (2) several times.

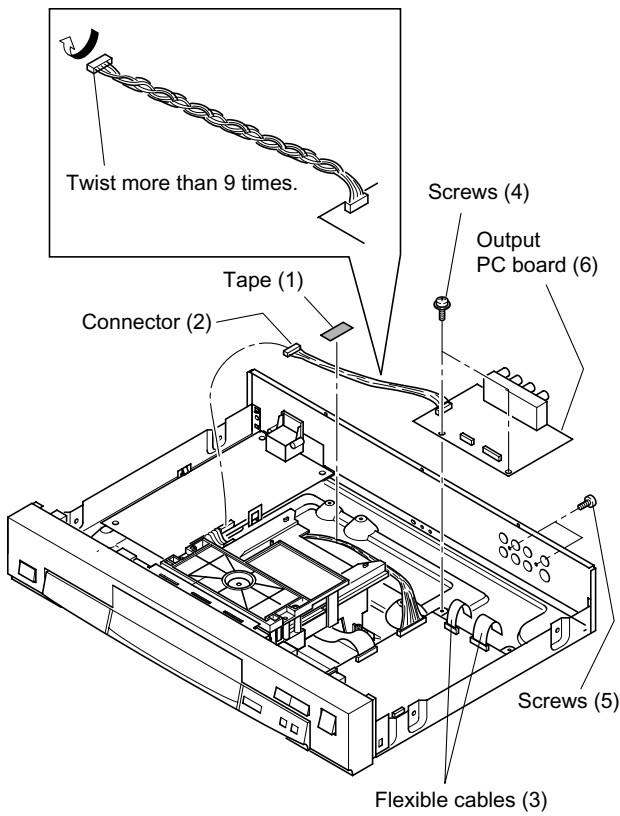


Fig. 2-1-11

1-2-3. Power PC board

1. Peel off the tape (1).
2. Remove the connectors (2) and (3).
3. Remove three screws (4).
4. Remove two screws (5).
5. Release two claws and remove the power supply PC board (6).

Note:

- When mounting, be sure to twist the wire for the connectors (2) and (3) several times.

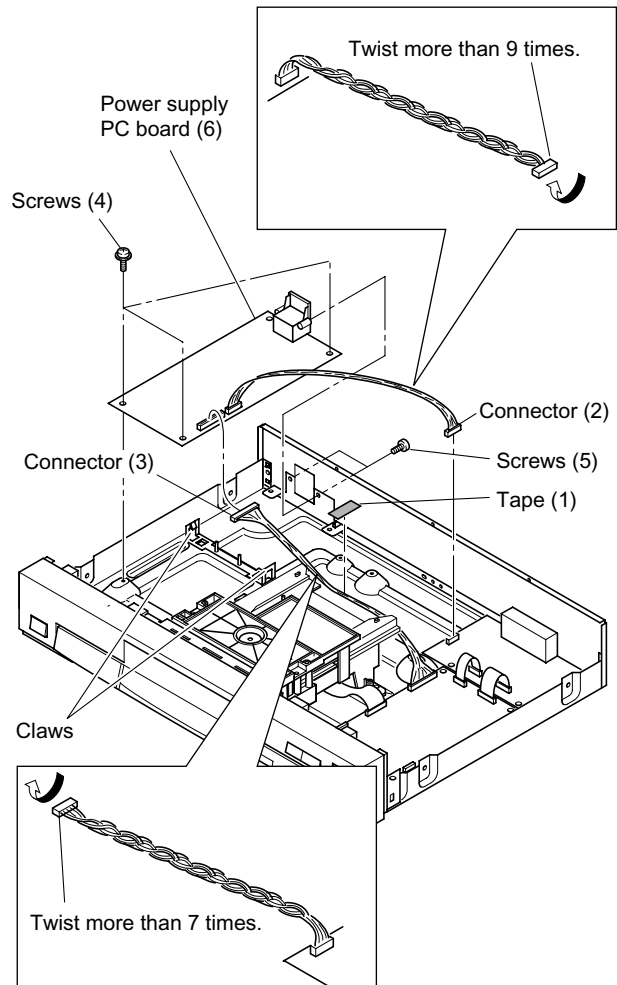


Fig. 2-1-12

1-2-4. Front PC Board

Note:

- The flexible cable of the game port PC board may be connected to the main PC board. (Refer to Fig. 2-1-9.)
1. Remove the front panel. (Refer to item 1-1-4.)
 2. Remove two flexible cables (1).
 3. Remove four screws (2) and remove the front display PC board (3)
 4. Remove three screws (4) and remove the PC Game port PC board (5).
 5. Remove two screws (6) and remove the power switch PC board (7).

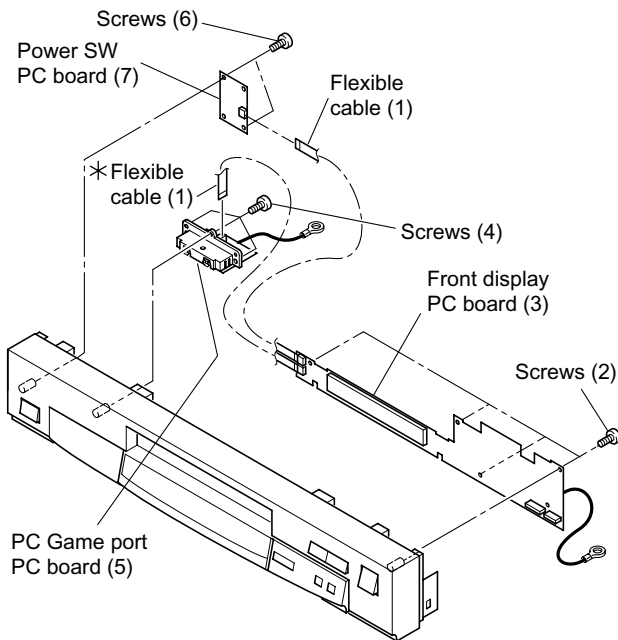


Fig. 2-1-13

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).

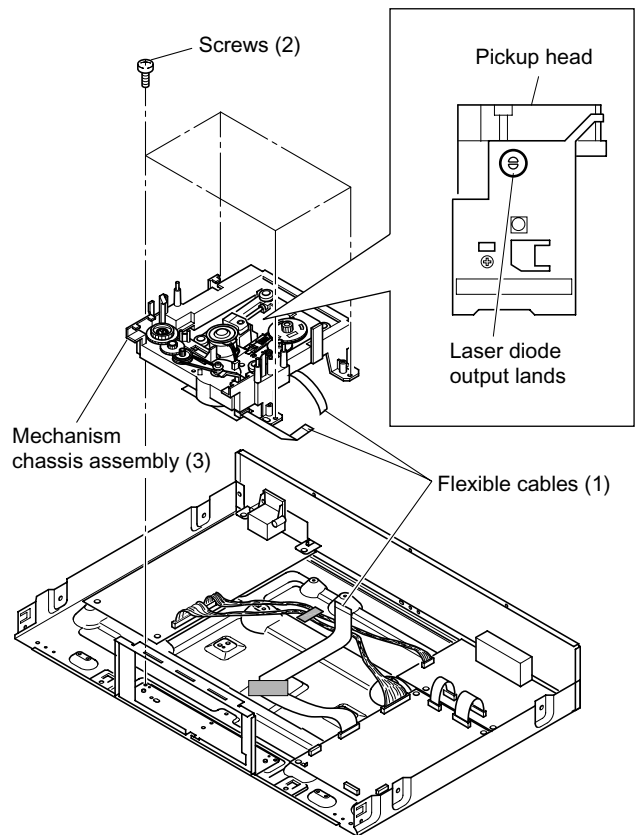


Fig. 2-1-14

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.

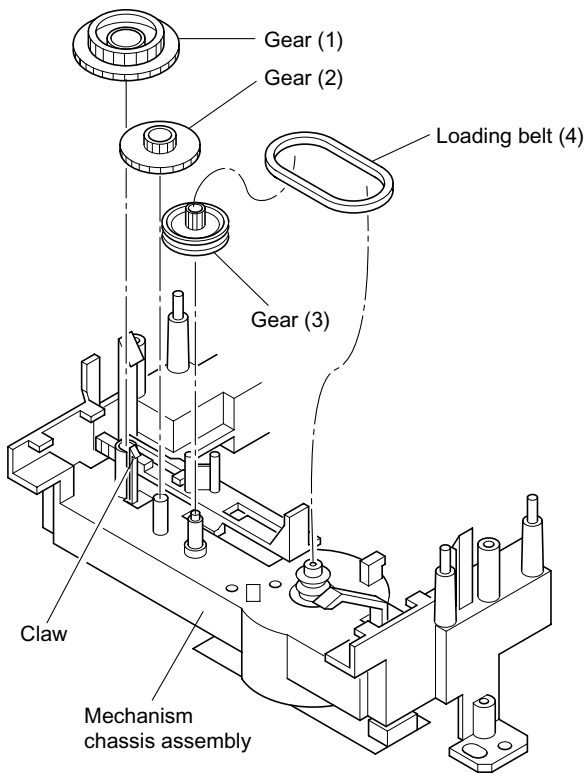


Fig. 2-1-15

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. 2-1-16.)

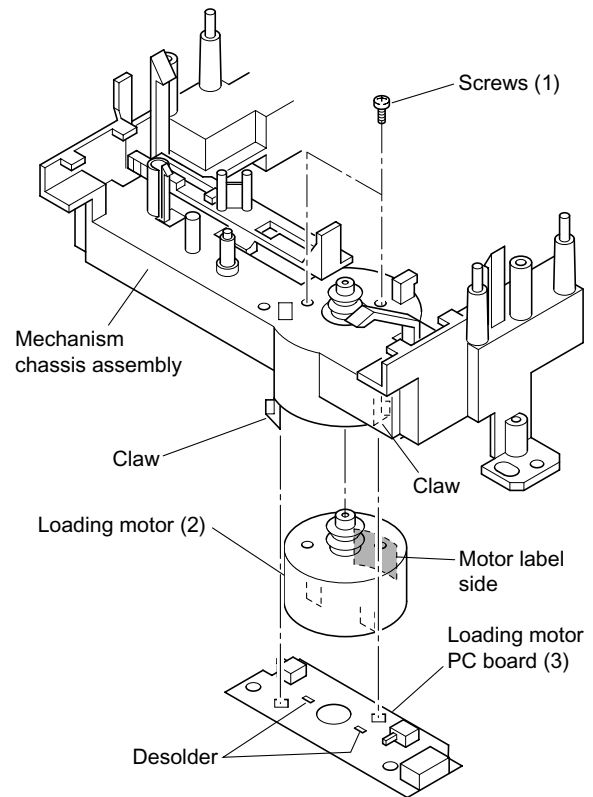


Fig. 2-1-16

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

1. Turn the mechanism chassis assembly (1) upside down.
2. Remove one screw (2) and release the boss "A" from the claw. Then remove the sub chassis (3) (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 (3) (with the pickup mechanism), first, insert the boss "C" along the groove of the cam slider up/down cam (4) and next, the boss "B" and "A".
- The boss "A" and "B" 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.

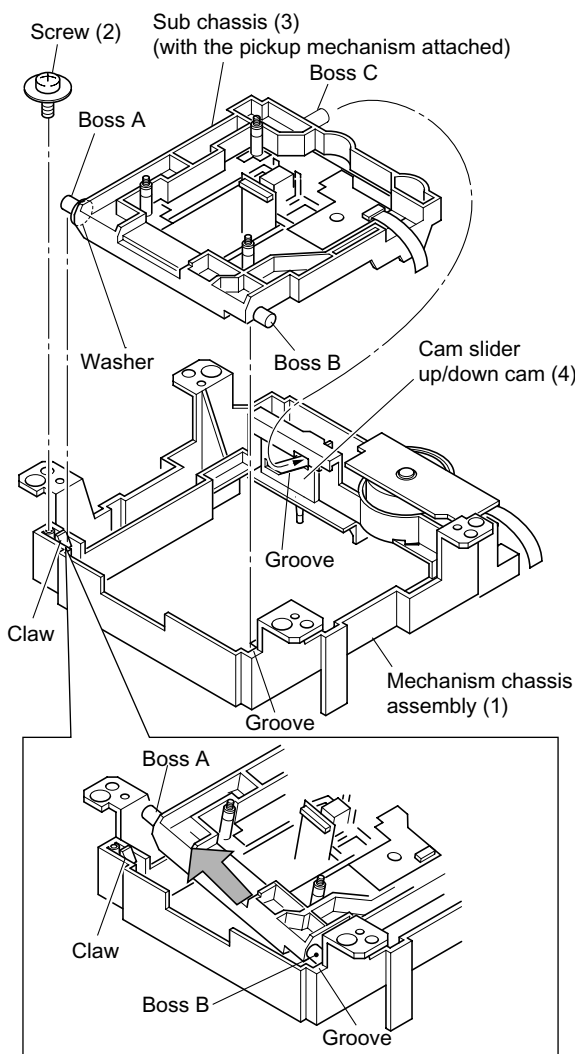


Fig. 2-1-17

1-3-5. Pickup Mechanism Assembly

<Removal>

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

<Mounting>

1. Replace the pickup mechanism assembly (2) with a new one.
2. When mounting, perform the reverse order of the removal.

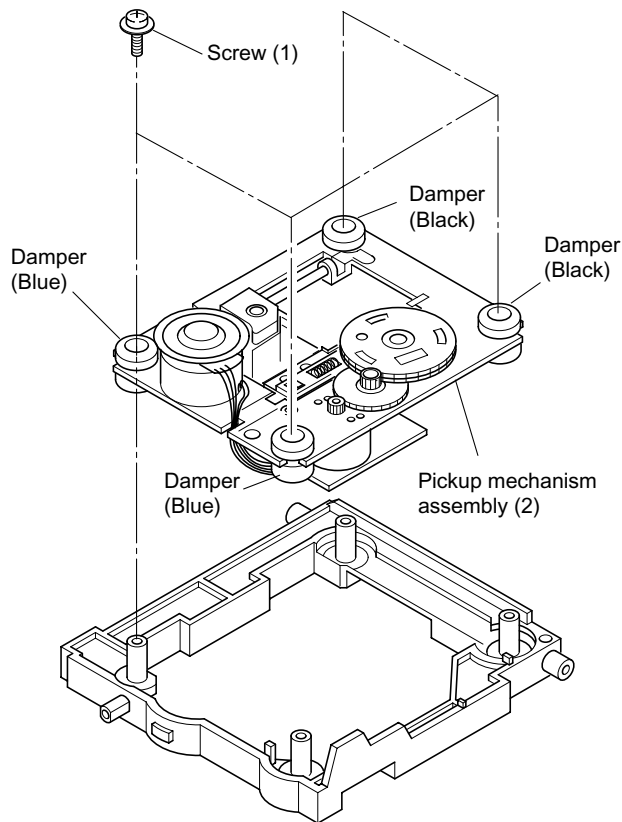


Fig. 2-1-18

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.

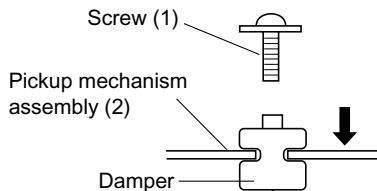


Fig. 2-1-19

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

<Removal>

1. Remove one screw (1) and remove the gear B assembly (2).
2. Remove the gear A (3).
3. Remove one screw (4) and remove the rack gear assembly (5).

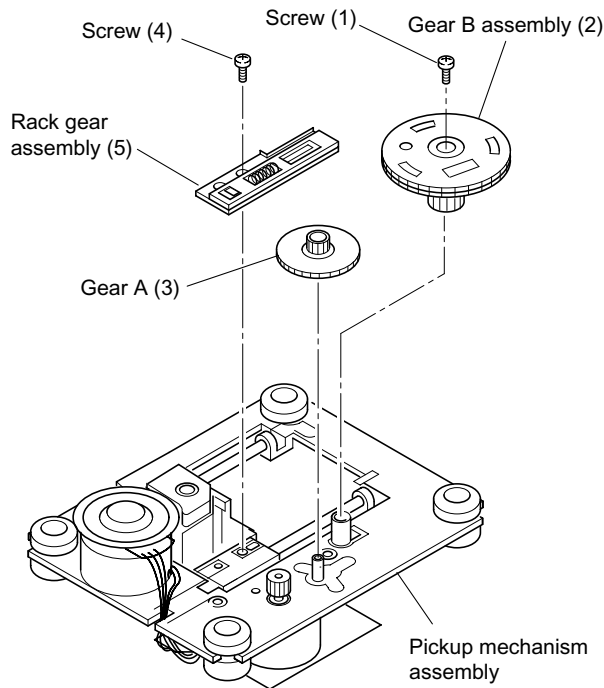


Fig. 2-1-20

<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. 2-1-21.)
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. 2-1-22.

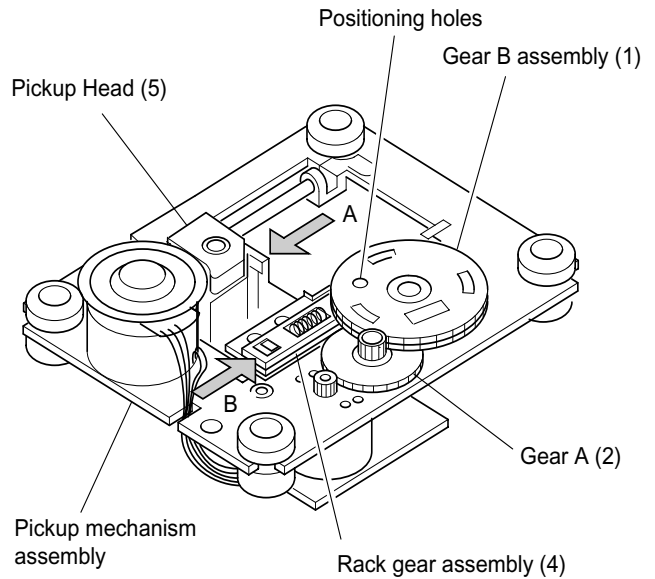


Fig. 2-1-21

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.

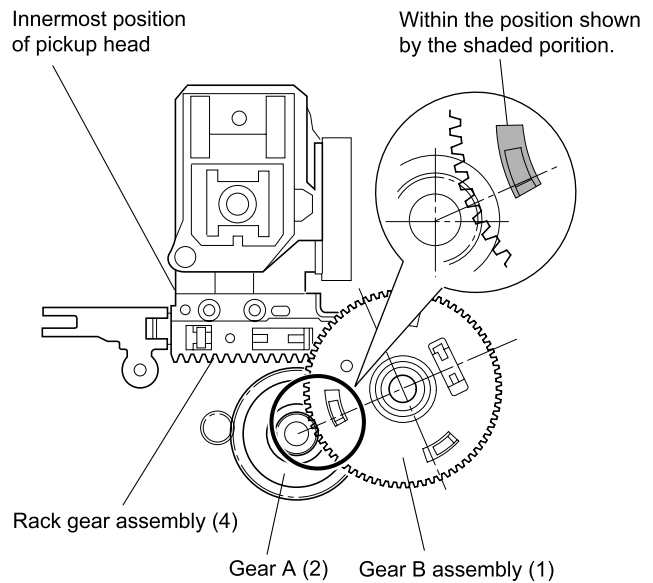


Fig. 2-1-22

1-3-7. Feed Motor

<Removal>

1. Remove the gear B assembly (1) and the gear A (2).
(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. 2-1-23.)
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 position-
ing pin on the chassis matched and solder the termi-
nals.
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. 2-1-23.)

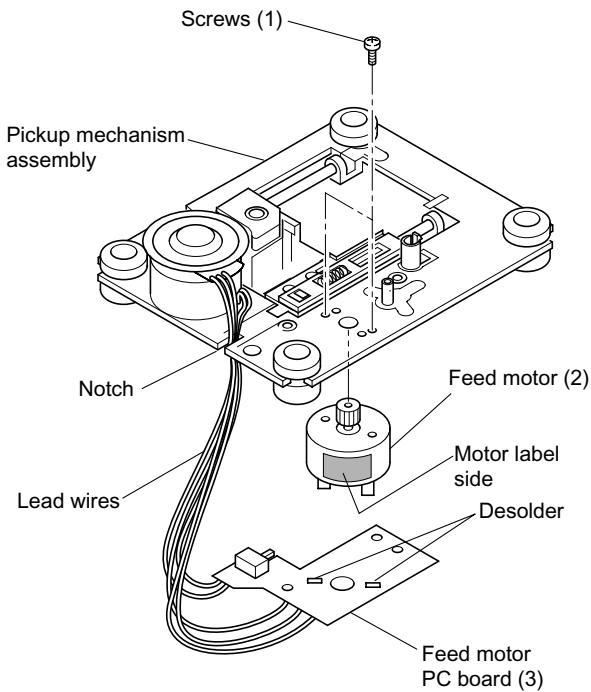


Fig. 2-1-23

SECTION 3

SERVICING DIAGRAMS

1. STANDING PC BOARDS FOR SERVICING

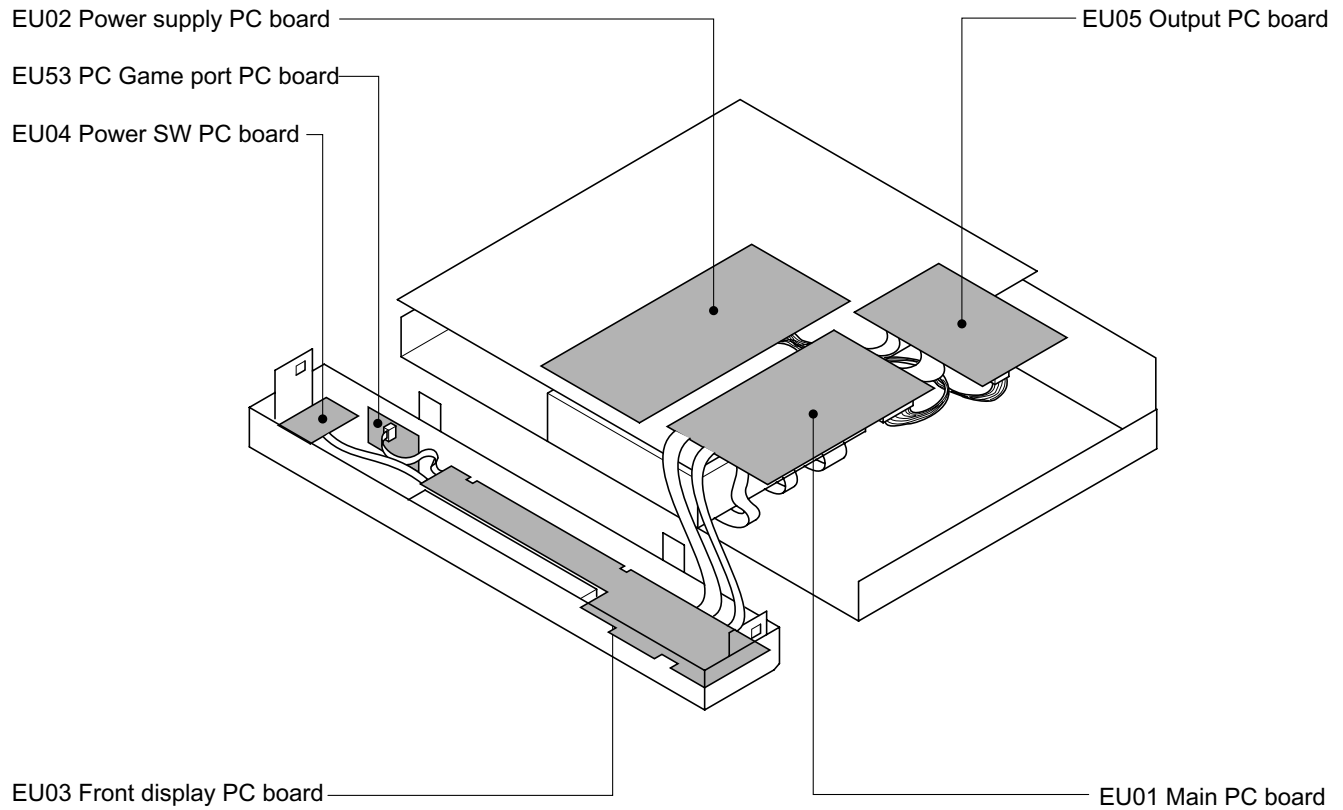


Fig. 3-1-1

2. CIRCUIT SYMBOLS AND SUPPLEMENTARY EXPLANATION

2-1. Precautions for Part Replacement

- In the schematic diagram, parts marked \triangle (ex. \triangle 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 $k\Omega$ M $M\Omega$
Tolerance	None $\pm 5\%$ B $\pm 0.1\%$ C $\pm 0.25\%$ D $\pm 0.5\%$ F $\pm 1\%$ G $\pm 2\%$ K $\pm 10\%$ M $\pm 20\%$
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

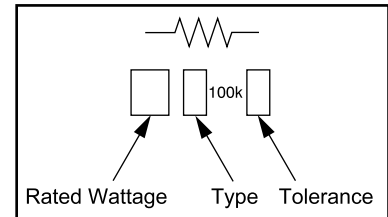


Fig. 3-2-1

2-3. Capacitance Indication

Symbol	$\begin{array}{l} \text{---} \text{ } \text{---} \text{+} \\ \text{---} \text{ } \text{---} \text{NF} \\ \text{---} \text{ } \text{---} \\ \text{---} \text{ } \text{---} \text{M} \\ \text{---} \text{ } \text{---} \end{array}$ 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 $\pm 5\%$ or more B $\pm 0.1\%$ C $\pm 0.25\%$ D $\pm 0.5\%$ F $\pm 1\%$ G $\pm 2\%$ (2) Ceramic, plastic, and film capacitors of which capacitance are 10 pF or less. None more than $\pm 5\%$ 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

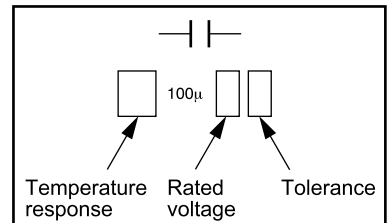


Fig. 3-2-2

Eg. 3

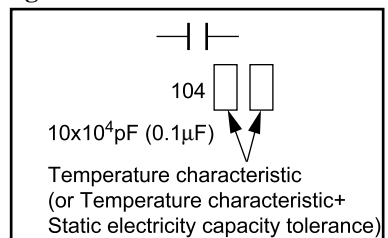


Fig. 3-2-3

2-4. Inductor Indication

Unit	None H μ μ H m mH
Tolerance	None $\pm 5\%$ B $\pm 0.1\%$ C $\pm 0.25\%$ D $\pm 0.5\%$ F $\pm 1\%$ G $\pm 2\%$ K $\pm 10\%$ M $\pm 20\%$

Eg. 4

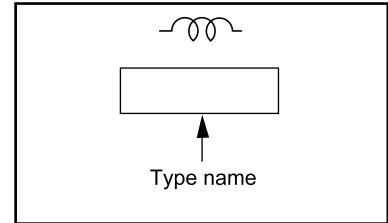


Fig. 3-2-4

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.

Eg. 5

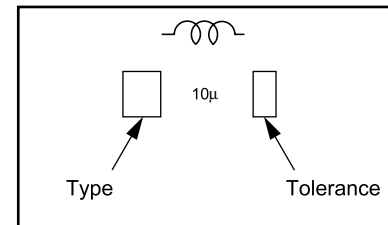
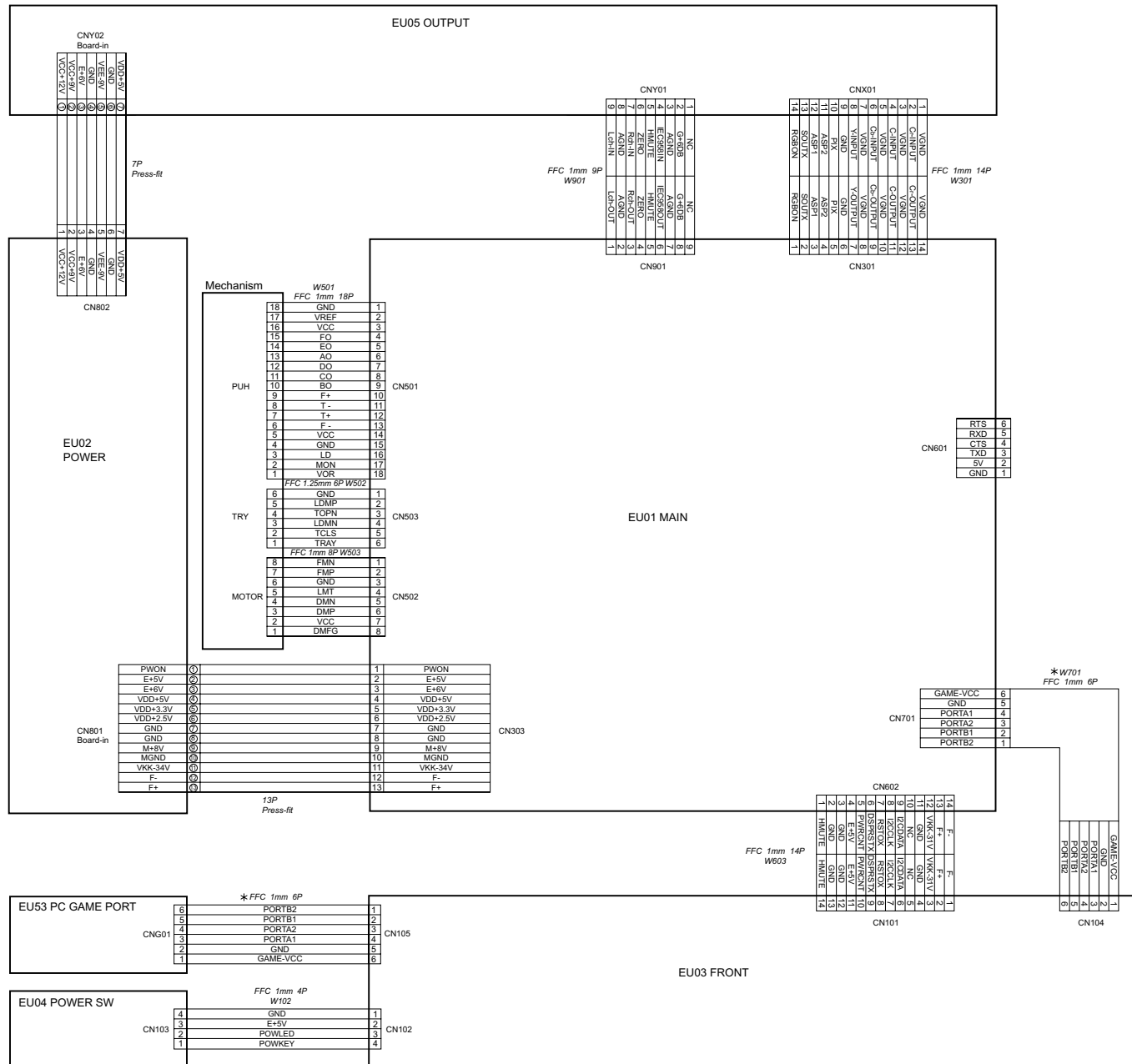


Fig. 3-2-5

3. PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM



* When Game Port PC Board (EU53) and Front PC Board (EU03) are not connected by using a FFC, connect Game Port PC Board (EU53) and Main PC Board (EU01) directly by using the FFC (W701).

FFC (W701) is a service part. Connect the Game Port PC Board (EU53) to the Main PC Board (EU01) when servicing.

Fig. 3-3-1

4. BLOCK DIAGRAMS

4-1. Overall Block Diagram

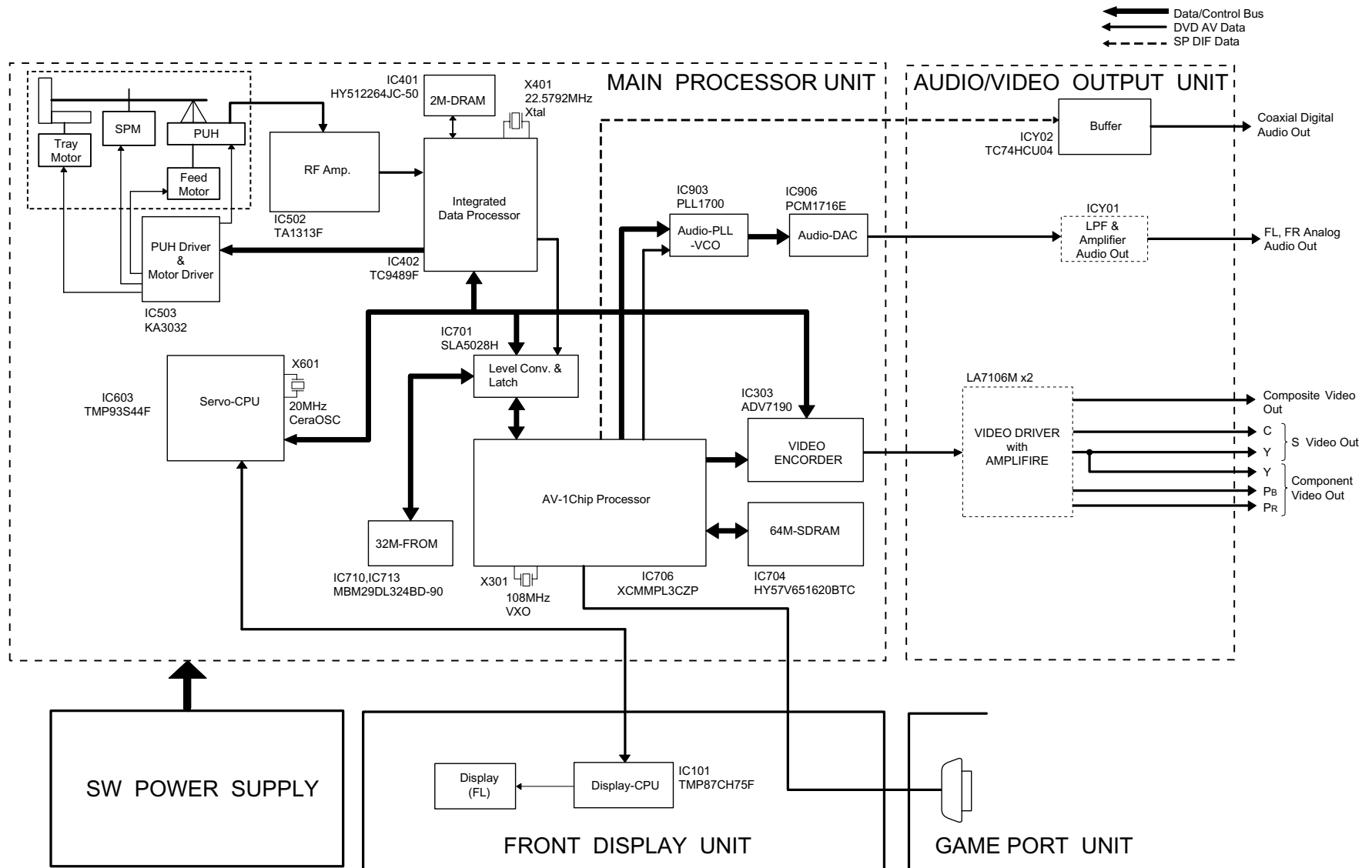


Fig.3-4-1

4-2. Power Supply Block Diagram

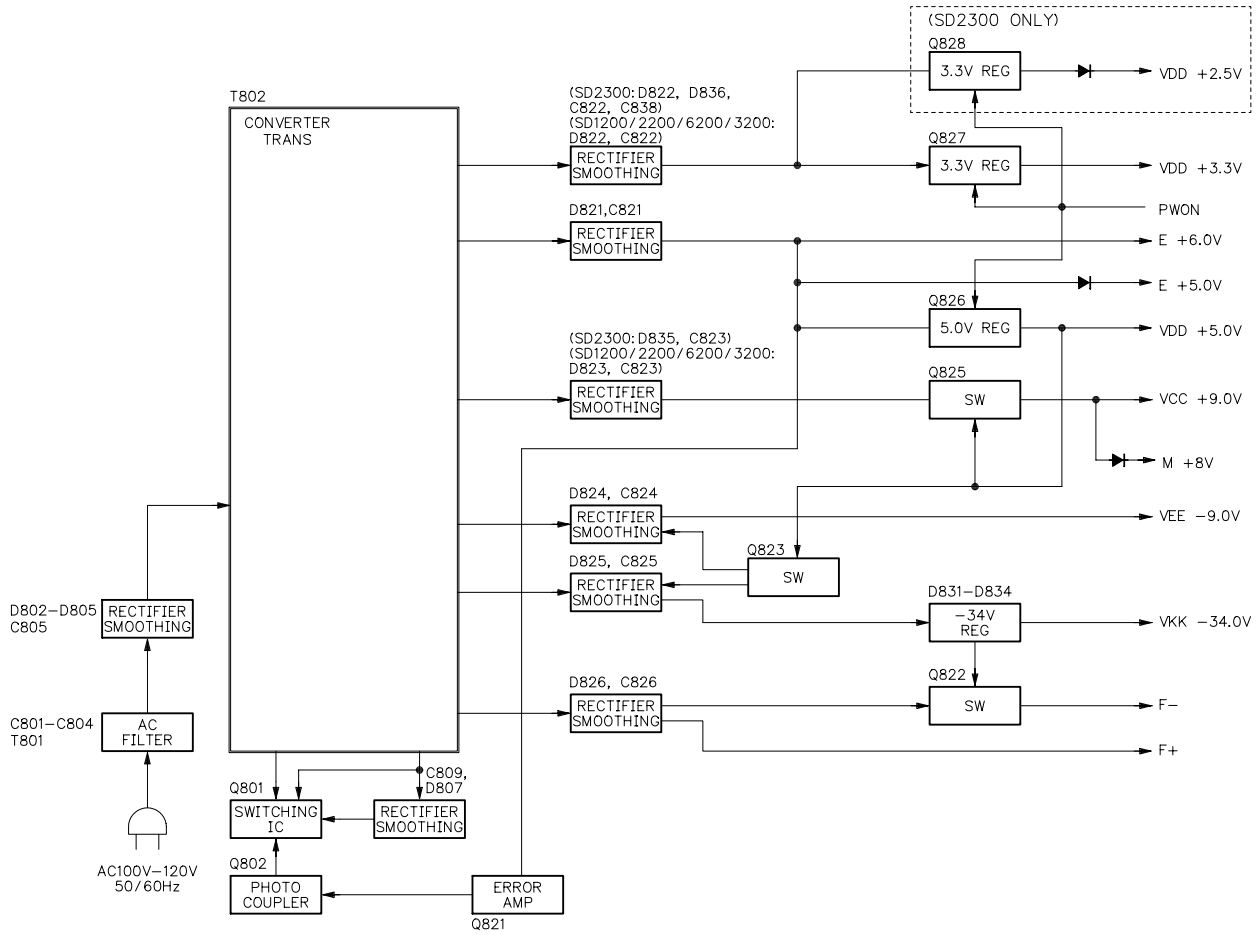


Fig. 3-4-2

4-3. Front Display, Power Switch Block Diagram

4-3-1. Front Display

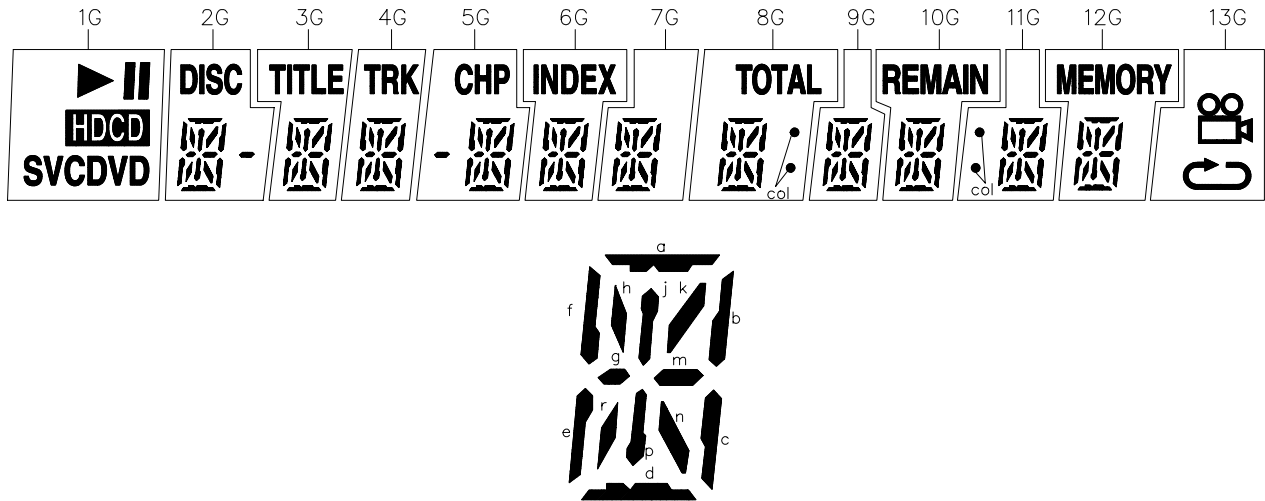


Fig. 3-4-3

4-3-2. Front Display Pattern

	1G	2G	3G	4G	5G	6G	7G	8G	9G	10G	11G	12G	13G
P1	▶	a	a	a	a	a	a	a	a	a	a	a	—
P2		b	b	b	b	b	b	b	b	b	b	b	—
P3	V	c	c	c	c	c	c	c	c	c	c	c	—
P4	C	d	d	d	d	d	d	d	d	d	d	d	—
P5	D	e	e	e	e	e	e	e	e	e	e	e	—
P6	VD	f	f	f	f	f	f	f	f	f	f	f	—
P7	S	g	g	g	g	g	g	g	g	g	g	g	—
P8	HDCD	h	h	h	h	h	h	h	h	h	h	h	—
P9	—	j	j	j	j	j	j	j	j	j	j	j	⏻
P10	—	k	k	k	k	k	k	k	k	k	k	k	↻
P11	—	m	m	m	m	m	m	m	m	m	m	m	—
P12	—	n	n	n	n	n	n	n	n	n	n	n	—
P13	—	p	p	p	p	p	p	p	p	p	p	p	—
P14	—	r	r	r	r	r	r	r	r	r	r	r	—
P15	—	-	—	—	-	—	—	col	—	—	col	—	—
P16	—	DISC	TITLE	TRK	CHP	INDEX	—	TOTAL	—	REMAIN	—	MEMORY	—

Fig. 3-4-4

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

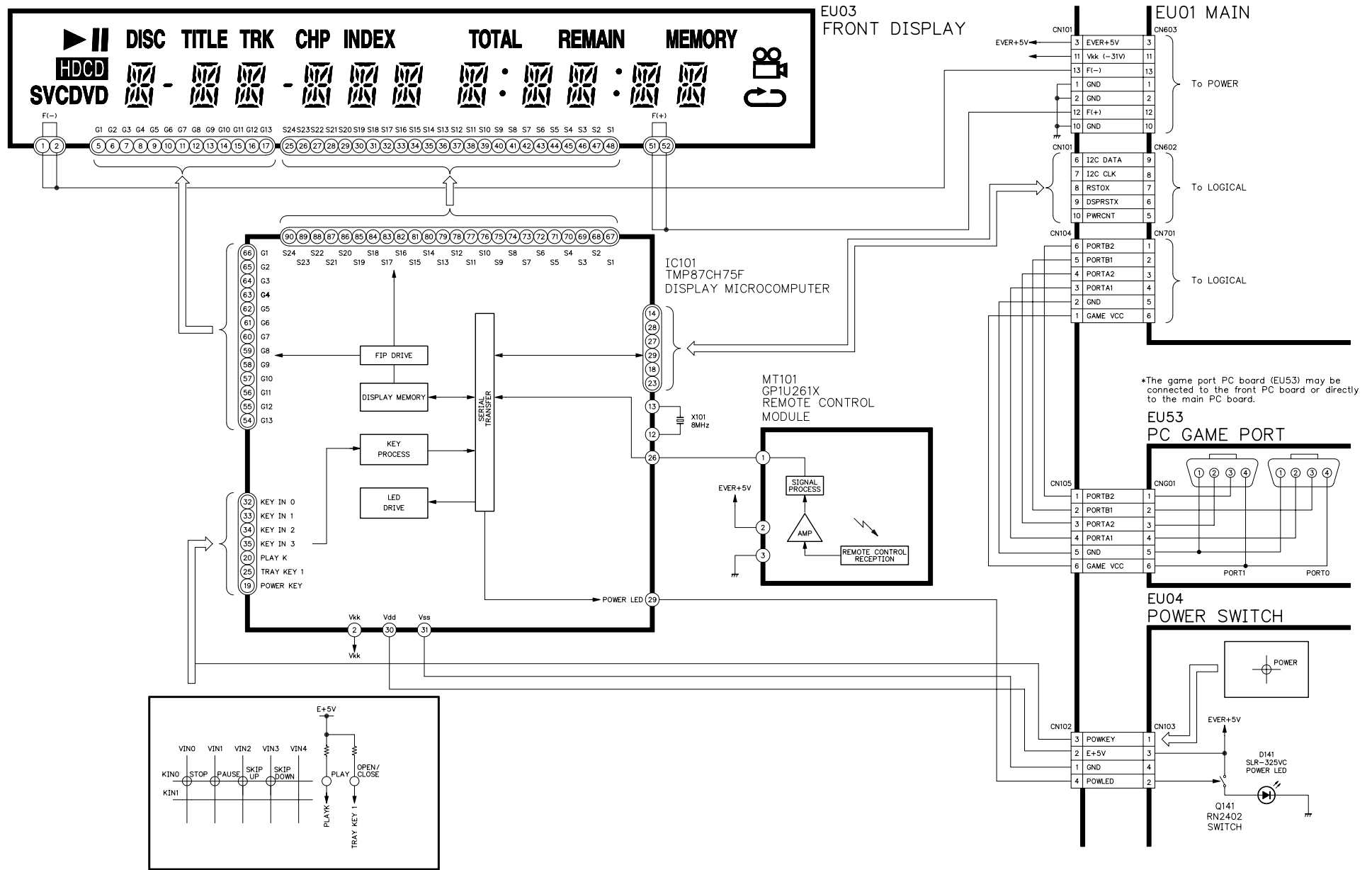


Fig. 3-4-5

4-4. Main Block Diagrams

4-4-1. Servo System Block Diagram

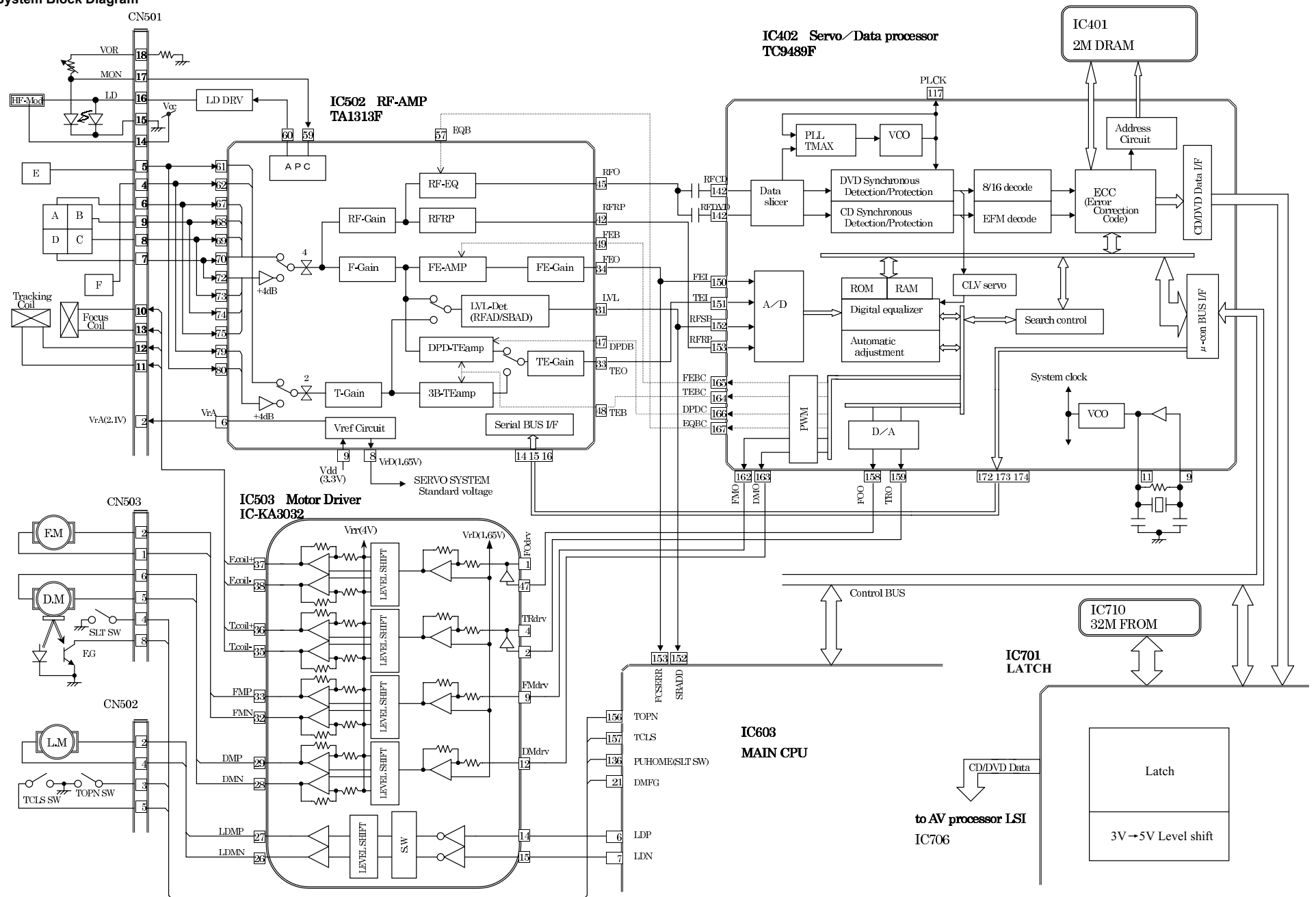


Fig.3-4-6

4-4-2. Logical System Block Diagram

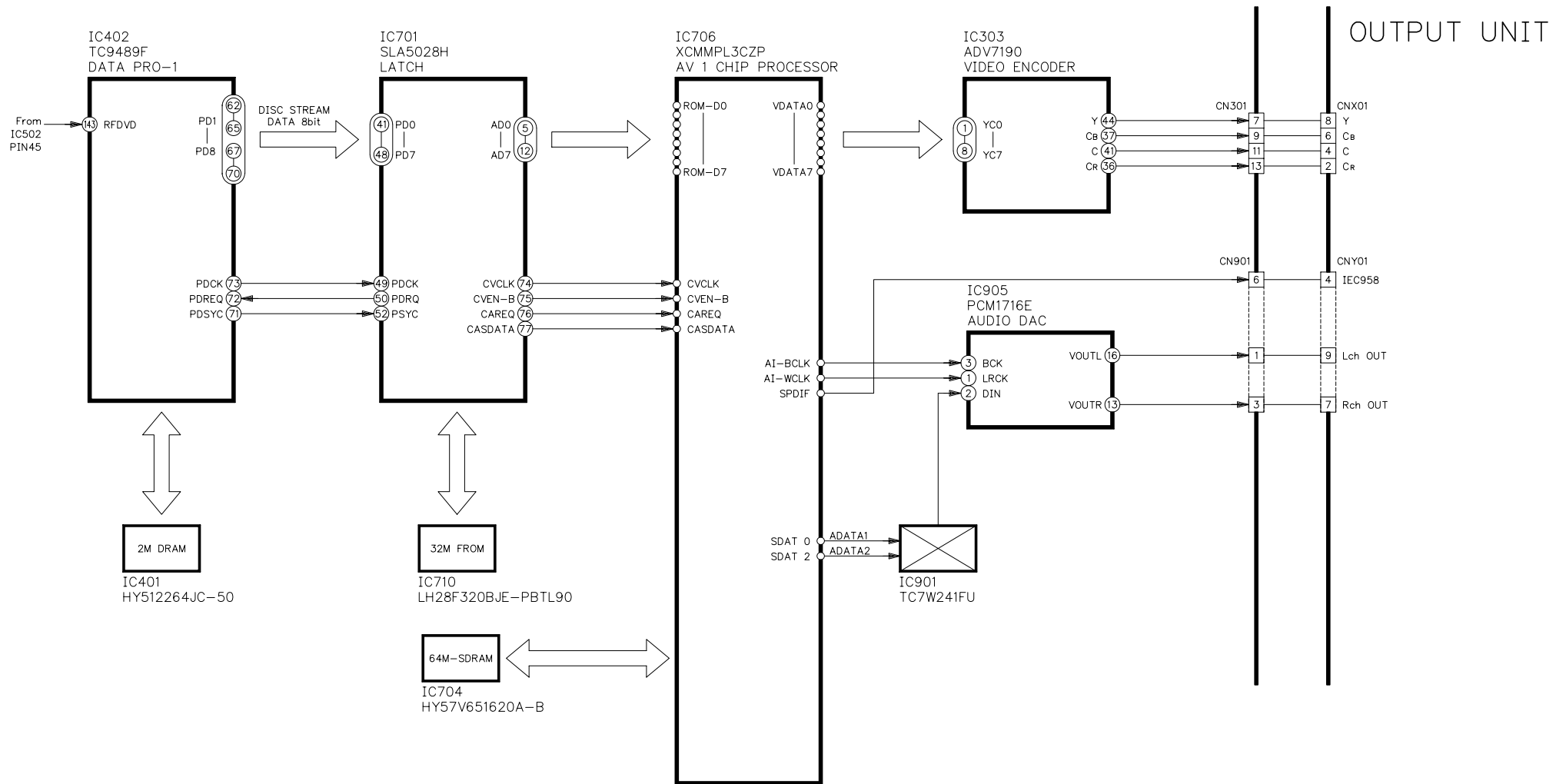


Fig. 3-4-7

4-5. Output Block Diagram

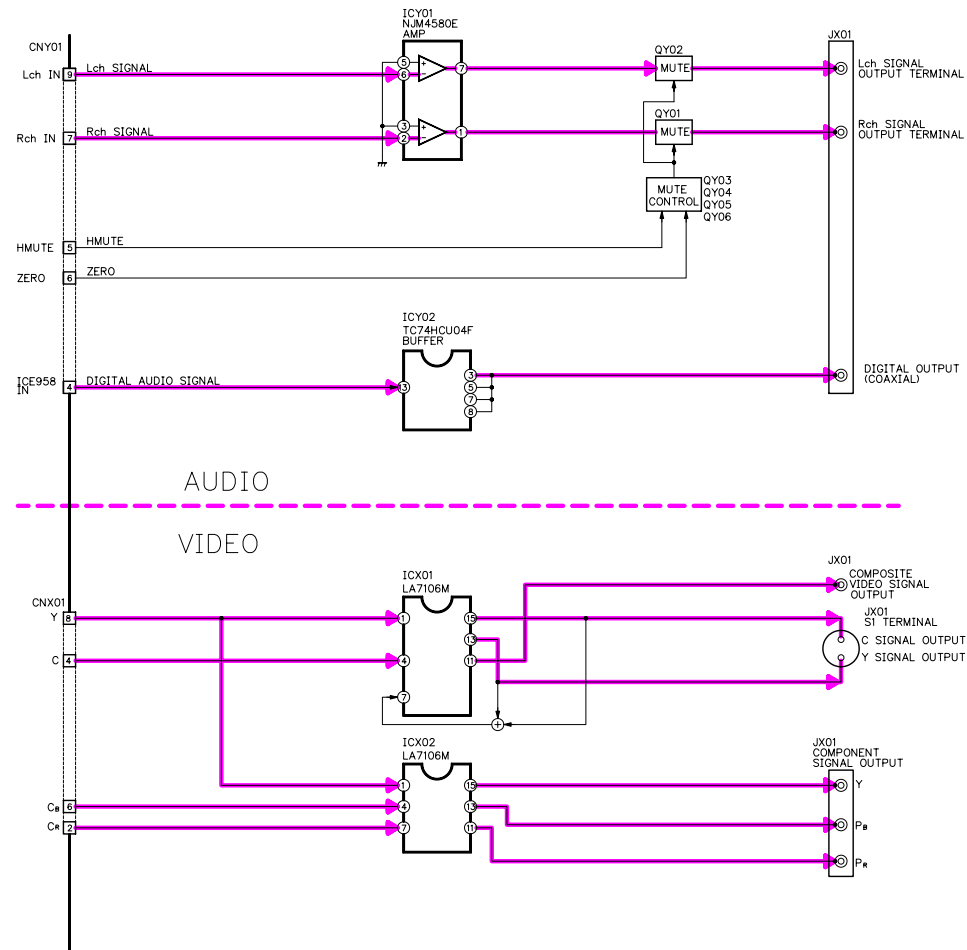
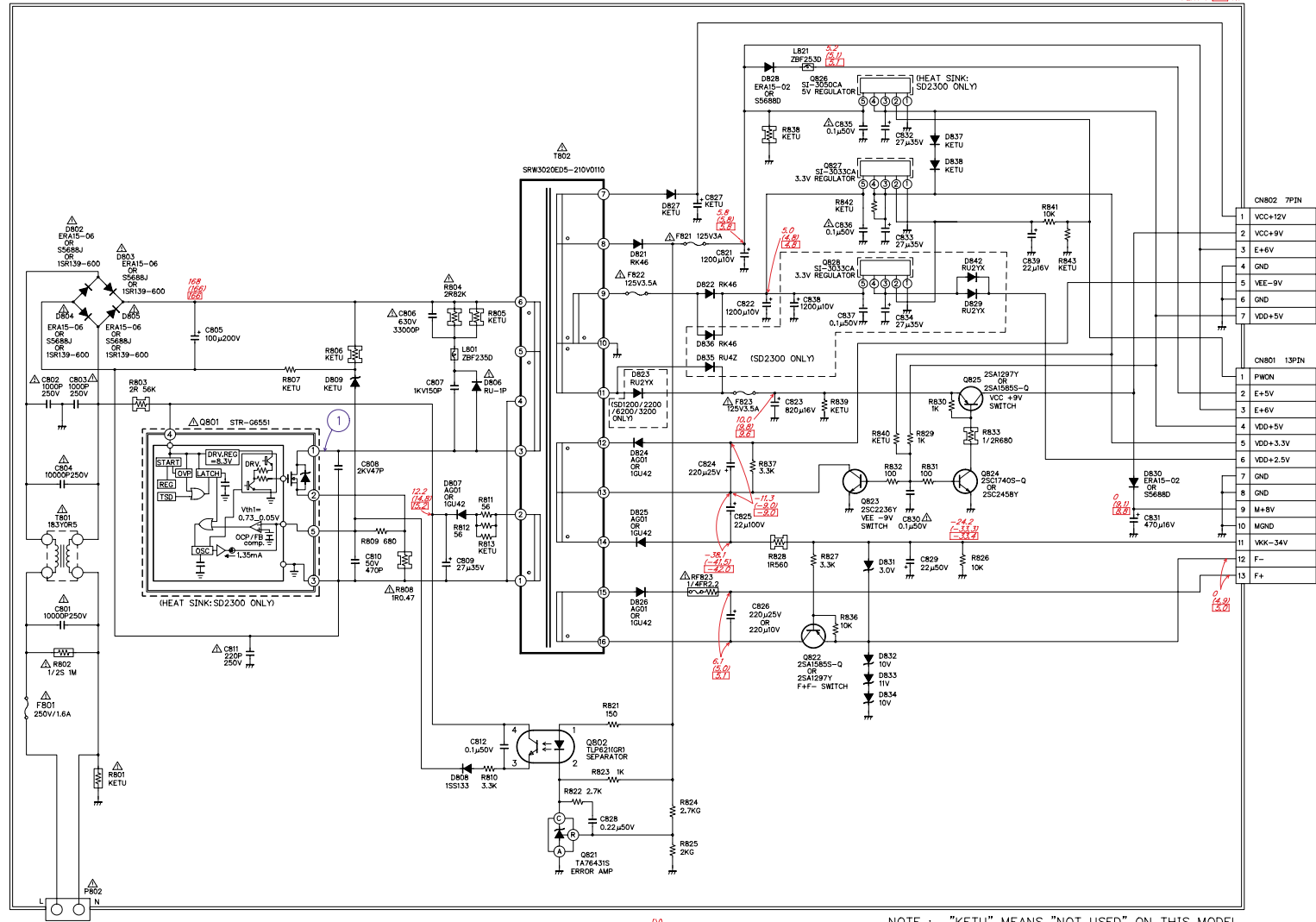


Fig. 3-4-8

5. CIRCUIT DIAGRAMS

5-1. Power Supply Circuit Diagram

EU02 POWER



OFF : 1 00
ON : 1 00
PLAY : 1 00

	Q821				Q822				Q823				Q824				Q825				
	A	C	R	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B
OFF	0	4.7	2.5	-23.0	-29.0	-23.0	0	12.0	0	0	10.0	0	10.0	0	10.0	0	10.2				
ON	0	4.8	2.5	-30.0	-30.0	-31.0	0	0	0.7	0	0	0	0.7	9.8	9.8	9.1					
PLAY	0	4.8	2.5	-30.0	-30.0	-31.0	0	0	0.7	0	0	0	0.7	9.6	9.6	8.9					

	Q826					Q827				
	1	2	3	4	5	1	2	3	4	5
OFF	0	0	0	0	5.8	0	0	0	0	5.0
ON	0	5.0	5.0	5.0	5.8	0	5.0	3.3	3.3	4.8
PLAY	0	5.0	5.0	5.0	5.8	0	5.0	3.3	3.3	4.8

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

Fig. 3-5-1

Power Supply Circuit Diagram

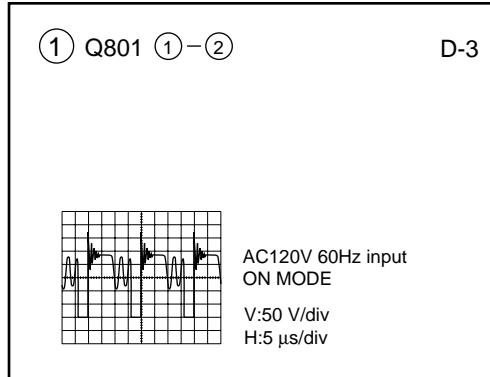
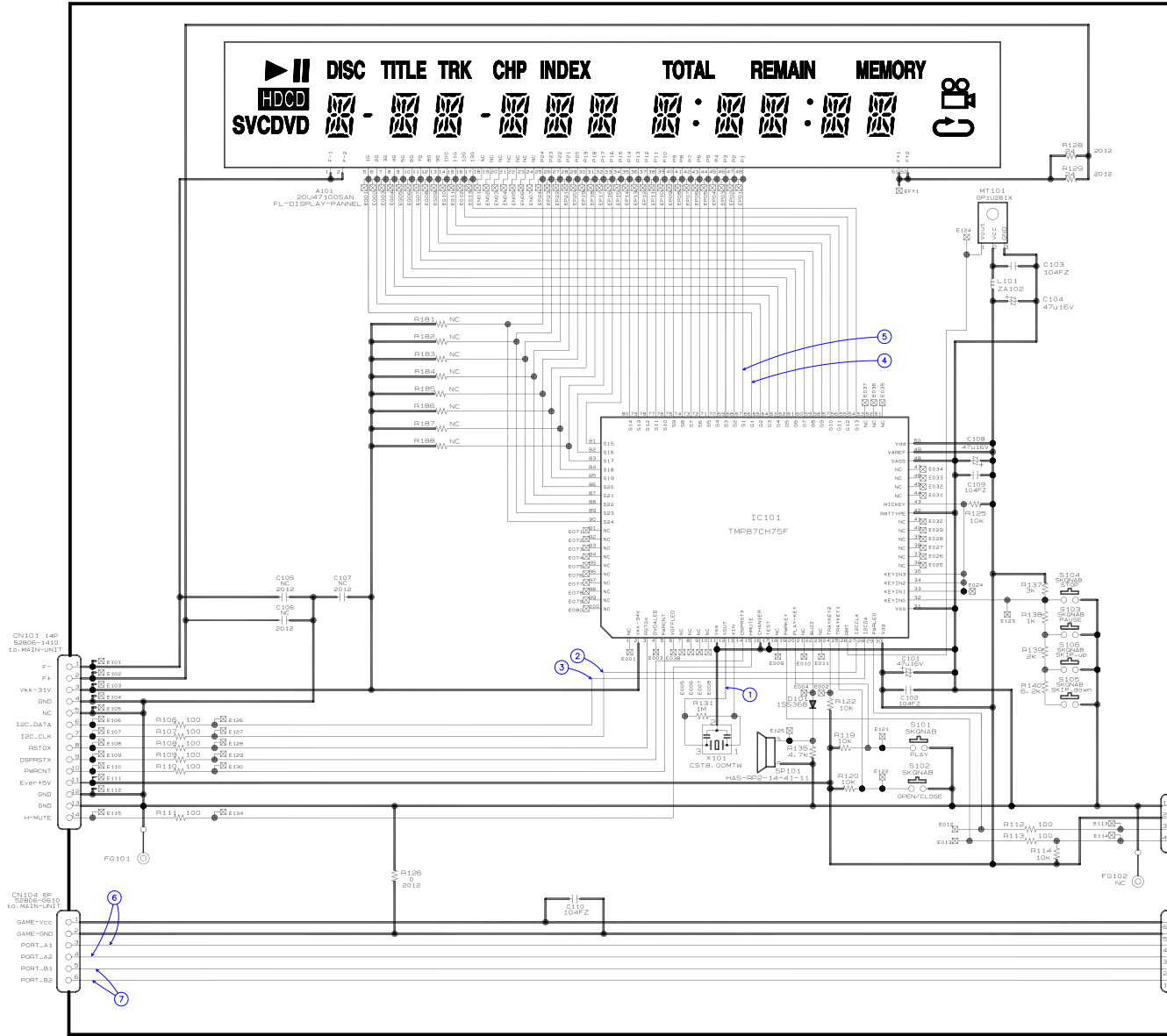


Fig. 3-5-2

Part No.	Location	Part No.	Location	Part No.	Location
C801	E2	D807	D4	Q828	C6
C802	C2	D808	F4	R801	F2
C803	C2	D809	C3	R802	E2
C804	D2	D821	C5	R803	C2
C805	C3	D822	C6	R804	C4
C806	C4	D823	C5	R805	C4
C807	C4	D824	D5	R806	C3
C808	D4	D825	D5	R807	C3
C809	D4	D826	E5	R808	E4
C810	D4	D827	B5	R809	D4
C811	E3	D828	B6	R810	F4
C812	E4	D829	C7	R811	D4
C821	C6	D830	D8	R812	D4
C822	C6	D831	D7	R813	D4
C823	C6	D832	E7	R821	E5
C824	D6	D833	E7	R822	F5
C825	D6	D834	E7	R823	F5
C826	E6	D835	C6	R824	F5
C827	B6	D836	C6	R825	F5
C828	F5	D837	B7	R826	D7
C829	D7	D838	B7	R827	D6
C830	D7	D842	C7	R828	D6
C831	D8	F801	E2	R829	D7
C832	B7	F821	B5	R830	C7
C833	B7	F822	C5	R831	D7
C834	C7	F823	C6	R832	D7
C835	B6	L801	C4	R833	D7
C836	B6	L821	A6	R836	E6
C837	C6	P802	F2	R837	D6
C838	C6	Q801	D3	R838	B6
C839	C7	Q802	E5	R839	C6
CN801	C9	Q821	F5	R840	D7
CN802	B9	Q822	E6	R841	B7
D802	B2	Q823	D6	R842	B6
D803	C2	Q824	D7	R843	C8
D804	C2	Q825	C7	RF823	D6
D805	C2	Q826	B6	T801	D2
D806	C4	Q827	B6	T802	B5

5-2. Front Display, Power Switch Circuit Diagram

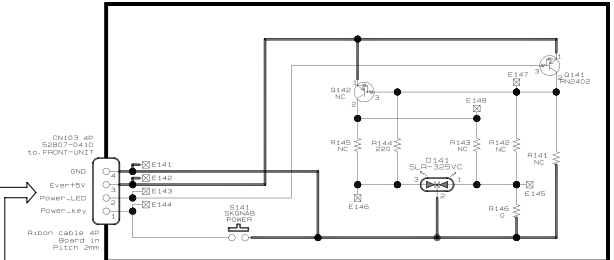
EU03 FRONT



*The game port PC board (EU53) may be connected directly to the main PC board. Depending on the connection, one part of the circuit is different.

FRONT CIRCUIT	GAME PORT CIRCUIT
1) CN104 DELETE	1) FG103 DELETE
2) CN105 DELETE	2) FG104 ADD
3) C110 DELETE	3) CNG01 to MAIN DIRECT
4) L101 CHANGE ZA102→0	

EU04 POWER SWITCH



*EU53 PC GAME PORT

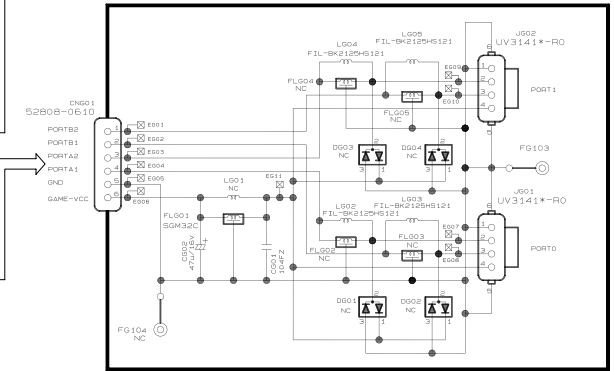


Fig. 3-5-3

Front Display, Power Switch Circuit Diagram

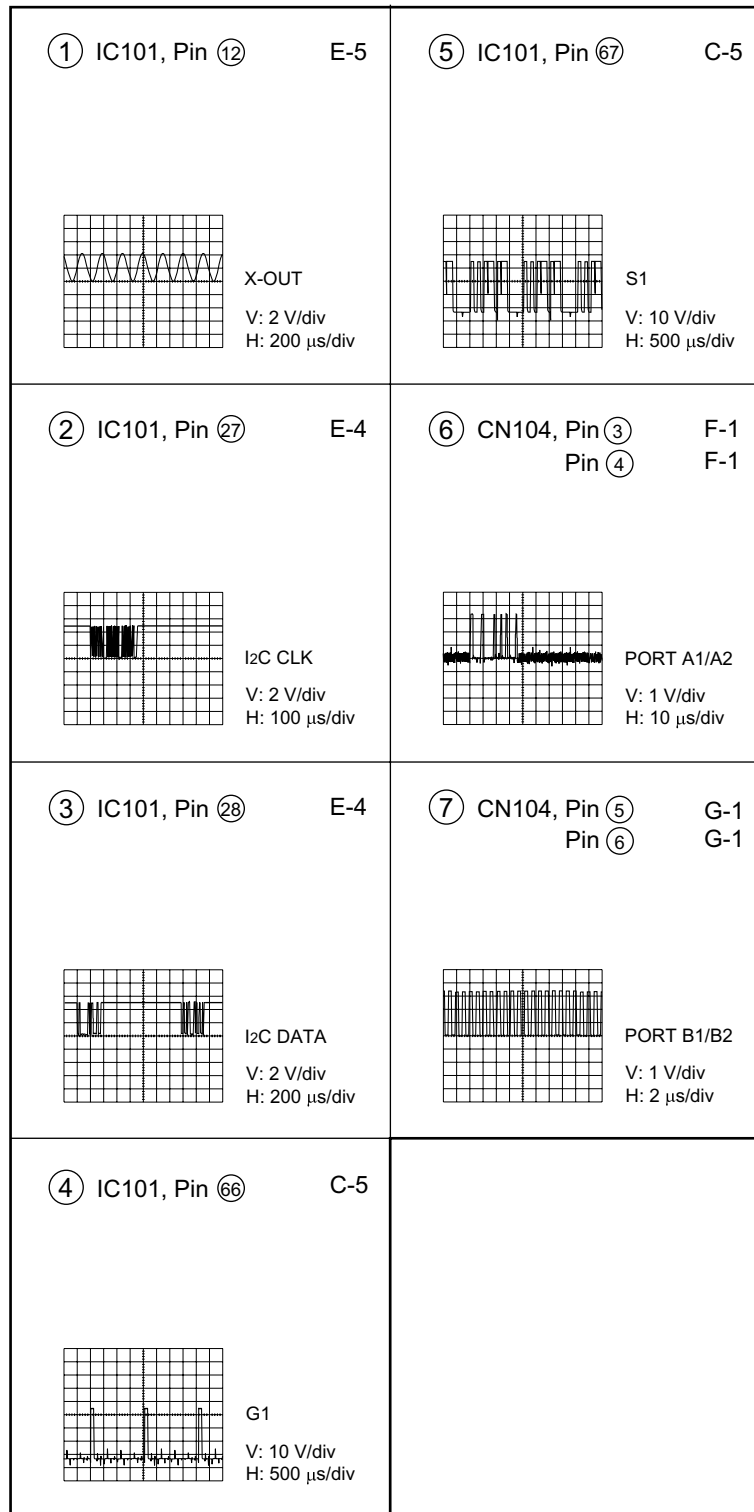


Fig. 3-5-4

Front Display Power Switch Circuit

Part No.	Location	Part No.	Location	Part No.	Location
A101	B2	E073	D4	EG05	B3
C101	E6	E074	D4	EG06	B3
C102	E6	E075	D4	EG07	B3
C103	C6	E076	D4	EG08	B3
C104	C6	E077	E4	EG09	B3
C105	E2	E078	E4	EG10	B3
C107	E3	E079	E4	EG11	B3
C108	D6	E080	E4	EG12	B3
C109	D6	E101	E1	EG13	B3
C110	F4	E102	E1	EN01	B3
CN101	E1	E103	E1	EN02	B3
CN102	F7	E104	E1	EN03	B3
CN103	D8	E105	E1	EN04	B3
CN104	F1	E106	E1	EN05	B3
CN105	F7	E107	E1	EN6	B4
CN106	E2	E108	E1	EN7	B4
D101	E5	E109	F1	EP01	B5
D141	E10	E110	F1	EP02	B5
E001	E4	E111	F1	EP03	B5
E002	E5	E112	F1	EP04	B5
E003	E4	E113	F7	EP05	B5
E004	E5	E114	F7	EP06	B4
E005	E4	E115	F1	EP07	B4
E006	E4	E121	E5	EP08	B4
E007	E4	E122	F5	EP09	B4
E008	E5	E123	E6	EP10	B4
E009	E5	E124	B6	EP11	B4
E010	E5	E125	E5	EP12	B4
E011	E5	E126	E2	EP13	B4
E012	F6	E127	E2	EP14	B4
E013	F6	E128	E2	EP15	B4
E024	E6	E129	F2	EP16	B4
E025	D6	E130	F2	EP17	B4
E026	D6	E134	F2	EP18	B4
E027	D6	E135	E6	EP19	B4
E028	D6	E141	E8	EP20	B4
E029	D6	E142	E8	EP21	B4
E030	D6	E143	E8	EP22	B4
E031	D6	E144	E8	EP23	B4
E032	D6	E145	E10	EP24	B4
E033	D6	E146	E9	FG101	F1
E034	D6	E147	D10	FG102	F7
E035	C5	E148	D10	IC101	D5
E036	C5	EF+1	B6	L101	C6
E037	C5	EG01	B3	MT101	B6
E038	E4	EG02	B3	Q141	D10
E071	D4	EG03	B3	Q142	D9
E072	D4	EG04	B3	R106	E2

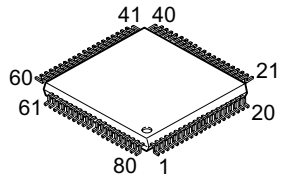
PC Game Port Circuit

Part No.	Location
CG01	G9
CG02	G9
CNG01	F8
DG01	G9
DG02	G10
DG03	F9
DG04	F10
EG01	F8
EG02	F8
EG03	F8
EG04	F8
EG05	F8
EG06	F8
EG07	F10
EG08	G10
EG09	F10
EG10	F10
EG11	F9
FG103	F10
FG104	G8
FLG01	F9
FLG02	G9
FLG03	G10
FLG04	F9
FLG05	F10
JG01	F10
JG02	E10
JG03	F10
LG01	F9
LG02	F9
LG04	F9
LG05	E10

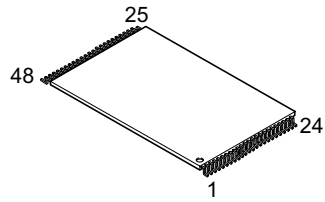
5-3. Main Circuit Diagrams

5-3-1. New Main ICs Information

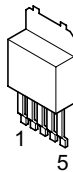
TMP93CS44F
SLA5028



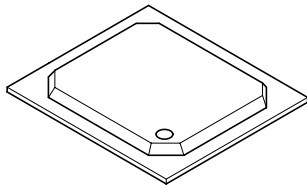
MBM29D



PQ20WZ51



XCMMPL3CZP



Main ICs Function

Table 3-5-1

Ref. No.	IC Name	Function	Detail
IC721	S24C04BFJ-TB	EE-PROM	Setup default, memorization of specification setting.
IC303	ADV7190	Video Encoder	Built-in D/A converter. Encodes digital video signal to analog video signal of NTSC/PAL system.
IC706	XCMMPL3CZP	AV Decoder	Decryption, MPEG-2 Decode, Audio Decode, Sub Picture Decode, OSD.
IC402	TC9489F	SERVO & Data Processor	Performs servo control of DVD or CD, and performs demodulation and correction of RF signal.
IC502	TA1313F	RF Signal processing IC	Equalizes of playback RF signal and generates error detection signal required for each servo operation.
IC503	KA3032	5-CH Motor Driver	5ch driver for motor driving.
IC905	PCM1716E	DA Converter	Stereo audio DA converter with a dual PPL built-in.
IC603	TMP93CS44F	Main Micro Processor	Performs system control for all circuits.
IC710 IC713	LH28F320BJE-PBTL90	Flash ROM	Memorization for firmware.

Table 3-5-2 MBM29DL324BD

Pin No.	Name	Function
1 10, 16 25, 48	A ₁ , A ₀ -A ₂₀	Address Input
29 36, 38 45	DQ ₀ - DQ ₁₅	Data I/O
26	\overline{CE}	Chip enable
28	\overline{OE}	Output enable
11	\overline{WE}	Write enable
12	\overline{RESET}	Hardware reset
15	$\overline{RY/BY}$	Ready/Busy output
47	\overline{BYTE}	8 bit, 16bit mode switch
14	$\overline{WP/ACC}$	Write protect/acceleration
27 46	V _{SS}	Ground
37	V _{CC}	Power supply
13	N.C.	No connection

Table 3-5-3 PQ20WZ51

Pin No.	Name	Function
1	V _{IN}	DC input
2	V _C	ON/OFF control terminal
3	V _O	DC output
4	V _{ADJ}	Output voltage adjustment terminal
5	GND	GND

Table 3-5-4 TMP93CS44 (1/3)

Pin No.	Name	Function
33 40	P00-P07	Port 0: I/O port, that can set I/O on a bit-by-bit basis.
	/AD0-AD7	Address data (lower): address/data bus 0-7
41 48	P10-P17	Port 1: I/O port, that can set I/O on a bit-by-bit basis.
	/AD8-AD15	Address data (upper): address/data bus 8-15
	/A8-A15	Address: Address bus 8-15
49 56	P20-P27	Port 2: (lower): I/O port, that can set I/O on a bit-by-bit basis. (Pull-up resistance is built in.)
	/A0-A7	Address: address bus 0-7.
	/A16-A23	Address: address bus 16-23.
58	P30	Port 30: Exclusive port for output.
	/RD	Read: Develops strobe signal to read the external memory.
59	P31	Port 31: Exclusive port for output.
	/WR	Write: Develops strobe signal to write the data transmitted to terminals of AD0-7.
60	P32	Port 32: I/O port. (Pull-up resistor is built-in.)
	/HWR	Upper write: Develops strobe signal to write the data transmitted to terminals of AD8-15.
	/SCK	Clock I/O terminal at SIO mode of the serial bus interface.
61	P33	Port 33: I/O port.
	/SO	Data transmission channel at SIO mode of the serial bus interface.
	/SDA	Data I/O terminal at I2C bus mode of the serial bus interface.
62	P34	Port 34: I/O port.
	/SI	Data receiving channel at SIO mode of the serial bus interface.
	/SCL	Clock I/O terminal at I2C bus mode of the serial bus interface.
63	P35	Port 35: I/O port.
	/INT0	Interrupt request terminal 0: Interrupt request terminal with the signal at level/rising edge programmable.
64	P40	Port 40: I/O port.
	/TI0	Timer input 0: Input terminal, Timer 0.
	/INT1	Interrupt request terminal 1: Interrupt request terminal at rising edge.
65	P41	Port 41: I/O port.
	/TO3	Timer output 3: Output terminal, Timer 3.
66	P42	Port 42: I/O port.
	/TI4	Timer input 4: Input terminal, Timer 4.
	/INT4	Interrupt request terminal 4: Interrupt request terminal with the signal at rising/falling edge programmable.
67	P43	Port43: I/O port
	/TI5	Timer input 5: Input terminal, Timer 4.
	/NT5	Interrupt request terminal 5: Interrupt request terminal at rising edge.
68	P44	Port 44: I/O port.
	/TO4	Timer input 4: Output terminal, Timer 4.

Table 3-5-4 TMP93CS44 (2/3)

Pin No.	Name	Function
69	P45	Port 45: I/O port.
	/TI6	Timer input 6: Input terminal, Timer 5.
	/INT6	Interrupt request terminal 6: Interrupt request terminal with the signal at rising/falling edge programmable.
70	P46	Port 46: I/O port
	/TI7	Timer input 7: Input terminal, Timer 5.
	/INT7	Interrupt request terminal 7: Interrupt request terminal at rising edge.
71	P47	Port 47: I/O port.
	/TO6	Timer input 6: Output terminal, Timer 5.
76 78	P50-P52, P54-P57	Port 50-52, 54-57: exclusive port for input.
	80, 1 3	AN0-AN2, AN4-AN7
79	P53	Port 53: Input port.
	/AN3	Analog input 3: Input terminal of A/D converter.
	/ADTRG	A/D converter external start trigger.
5	P60	Port 60: I/O port. (Pull-up resistor is built-in.)
	/TxD0	Serial transmission data 0.
6	P61	Port 61: I/O port. (Pull-up resistor is built-in.)
	/RxD0	Serial reception data 0.
7	P62	Port 62: I/O port. (Pull-up resistor is built-in.)
	SCLK0 /CTS0	Serial clock I/O 0. Serial data transmission available 0 (Clear to Send).
8	P63	Port 63: I/O port. (Pull-up resistor is built-in.)
	/TxD1	Serial transmission data 1.
9	P64	Port 64: I/O port. (Pull-up resistor is built-in.)
	/RxD1	Serial reception data 1.
10	P65	Port 65: I/O port. (Pull-up resistor is built-in.)
	SCLK1 /CTS1	Serial clock I/O 1. Serial data transmission available 0 (Clear to Send).
	26	P66
27	/XT1	Low frequency oscillation connection terminal.
	P67	Port 67: I/O port (Open drain output)
11	/XT2	Low frequency oscillation connection terminal.
	P70	Port 70: I/O port (Large current drive is possible).
12, 14 19	WAIT	Wait: Bus wait request terminal to CPU (effective at the 1Wait + N mode: set by bus width/wait control resistor).
	P71-P77	Port 71-77: I/O port, that can set I/O by bit. (Large current driving is available).
75	AVCC	A/D converter power supply terminal.

Table 3-5-4 TMP93CS44 (3/3)

Pin No.	Name	Function
74	AVSS	A/D converter GND terminal (0V).
72	VREFH	Reference voltage input terminal (H) for A/D converter
73	VREFL	Reference voltage input terminal (L) for A/D converter
4	$\overline{\text{NIMI}}$	Nonmaskable interrupt request terminal: Interrupt request terminal with the signal at rising/falling edge programmable.
22	X1	High frequency oscillation connection terminal.
23	X2	High frequency oscillation connection terminal.
25	$\overline{\text{RESET}}$	Reset: Initializes TMP93CS44/S45 (Pull-up resistance is built in.)
32	ALE	Address latch enable (Available to set output enable to reduce noise).
20	CLK	Clock output: develops clock signal divided in fsys two. It is pulled up during the reset. (Available to set output enable to reduce noise)
24	$\overline{\text{EA}}$	External access. Connect to VCC in TMP93CS44.
21	AM8/16	Address mode: Selection terminal of the external data bus width. (TMP93CS44) Connect the terminal to VCC. Data bus width at accessing to external can be set by the wait control resistor, port 1 control resistor.
30 57	VCC	Power supply terminal (connect all VCC terminals to the power supply).
13 31	VSS	GND terminal (connect all VSS terminals to GND (0V)).
28 29	TEST1, TEST2	Terminal for test. (Connect the both terminals on the PC board.

Note: The terminals with pull-up resistors other than RESET terminal can be separated the resistors from the terminals electrically by using the software.

Table 3-5-5 XCMMPL3CZP (1/2)

Group	Name	Function
SDRAM port	SD_DQ (15:0)	DRAM data bus
	SD_A (11:0)	DRAM MUX address
	SD_A (13)/ SD_DQMB2 [1]	Main memory address bus bit 13/ Data byte mask for bank 2
	SD_A (12)/ SD_DQMB2 [0]	Main memory address bus bit 12/ Data byte mask for bank 2
	SD_CAS_B	Column strobe
	SD_RAS_dB	Row Strobe
	SD_CS_B (1:0)	Chip selects
	SD_DQM (1:0)	Byte selects
	SD_WE_B	Read/Write enable
	SD_CLK_IN	SDRAM clock input
SD_CLK	SDRAM clock output	
ROM port	ROM_D (7:0)	Multiplexed address/data
	ROM_LAT (2:0)	ROM address latch enables
	ROM_CS_B	ROM chip select
	ROM_WE_B	White enable (for SRAM/FLASH)
	ROM_OE_B	Output Enable
System Bus (Internal Mode)	SYSD (31:0)	System bus data
	SYSA (22:2)	System bus address
	SYSA [24:23]/ SYSA [1:0]	System bus address
	SYSCS	Chip select
	SYSBR	Bus Request
	SYSBG	Bus Grant
	SYSBB	Bus Busy
	SYSBCLK	Bus Clock output - CLKIN/2
	SYSRDY_B	Data ready signal
	System Bus (External Mode)	SYSD (31:0)
SYSA (22:2)		System bus address
SYSA [24:23]		System bus address
SYSA [1]		System bus address bit 1
SYSA [0]		System bus address bit 0
SYSAMUX		System Memory Address Mux Control
SYSCS		Chip select
SYSBR		Bus Request
SYSBG		Bus Grant
SYSBB		Bus Busy
SYSTA		Transfer acknowledge
SYSBURST		Burst Transfer
SYSBCLK		Bus Clock output - CLKIN/2
SYS_RDY_B		Data ready signal
SYSTS [1:0]		Transfer start

Table 3-5-5 XCMMPL3CZP (2/2)

Group	Name	Function
Global	PLL_CLKI	System clock input - 108 MHz
	PLL_REF	PLL reference clock output
General IO	GPIO (15:0)	General purpose IO signals
Video out	VDATA (7:0)	Video data/Mode select
	VCLK	CCIR 656 clock
	FIELD	Odd/Even field
	HSYNC	Horizontal Sync
Video in	VID (7:0)	Video In Data
	VICLK	Video In clock
Audio out	SDAT (2:0)	Serial Data
	SBCLK	Bit clock
	SWCLK	Left/right clock
	ACLK	Audio master clock
IEC-958	SPDIF	Coded Audio data
Audio in	AI_DATA	Serial Data
	AI_BCLK	Serial Clock
	AI_WCLK	Serial Word clock
Coded Data	CVDATA [7..0]/CAPDATA [7..0]	Program Elementary Steam Video/ Audio, Program Stream or Transport Stream data
	CVENAB/CVSTROBE	Coded Video/Transport Stream/ Program Stream data enable or data strobe
	CVCLK	Coded Video/Transport Stream/ Program Stream data clock
	CVREQ	Coded Video/Program Stream Request
	CAENAB/CASTROBE	Coded Audio data enable or data strobe
	CASDATA/CVERRFLG	Coded Serial Audio data or Coded Transport Stream/Program Stream error flag
	CACLK	Coded Audio data clock
	CAREQ/CVTOP	Coded Audio request or Transport Stream/Program Stream top of packet/pack signal
Controllers	CP_CLK	Controller clock output
	CP_DOUT (2:1)	Controller data outputs
	CP_DIN (2:1)	Controller data inputs
	CP_ENA_B	Controller data tri-state enable
Test mode	TEST_CLK_ (4:0)	Diagnostic test mode clocks, should be tied low.
	TEST_CLK_5	Diagnostic test mode clocks, should be tied low.

5-3-2. Main Circuit 1 Diagram

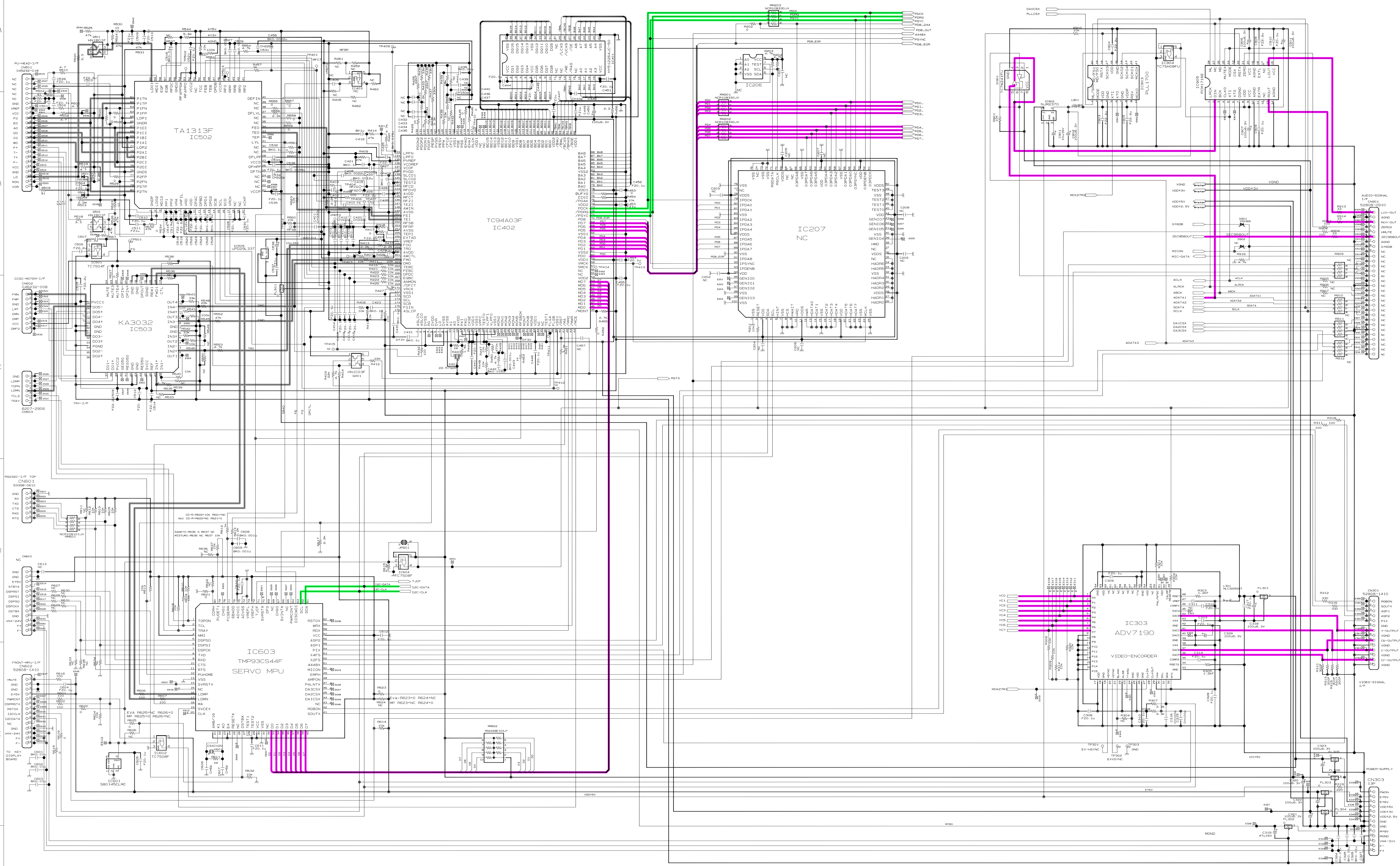


Fig. 3-5-5

5-3-3. Main Circuit 2 Diagram

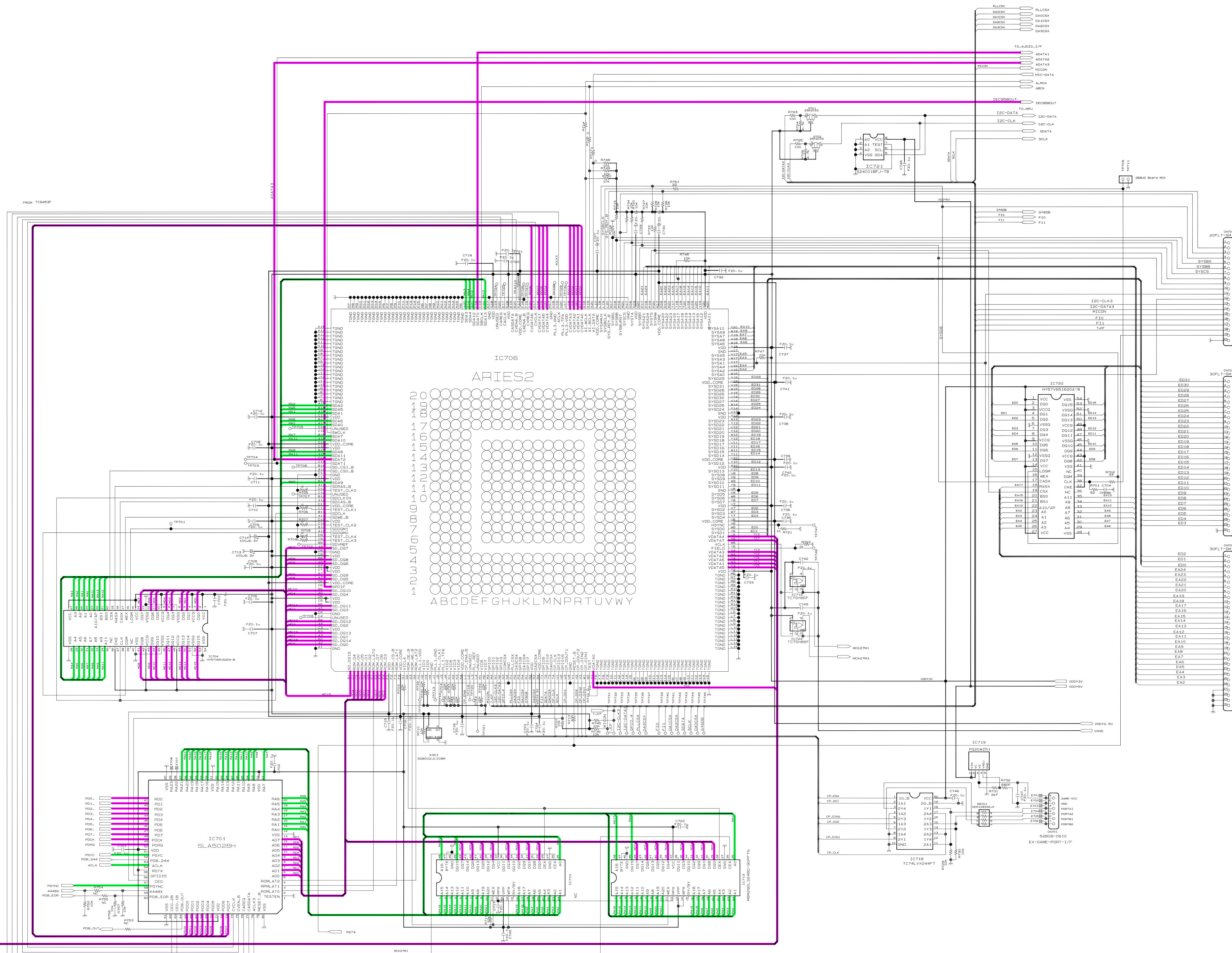
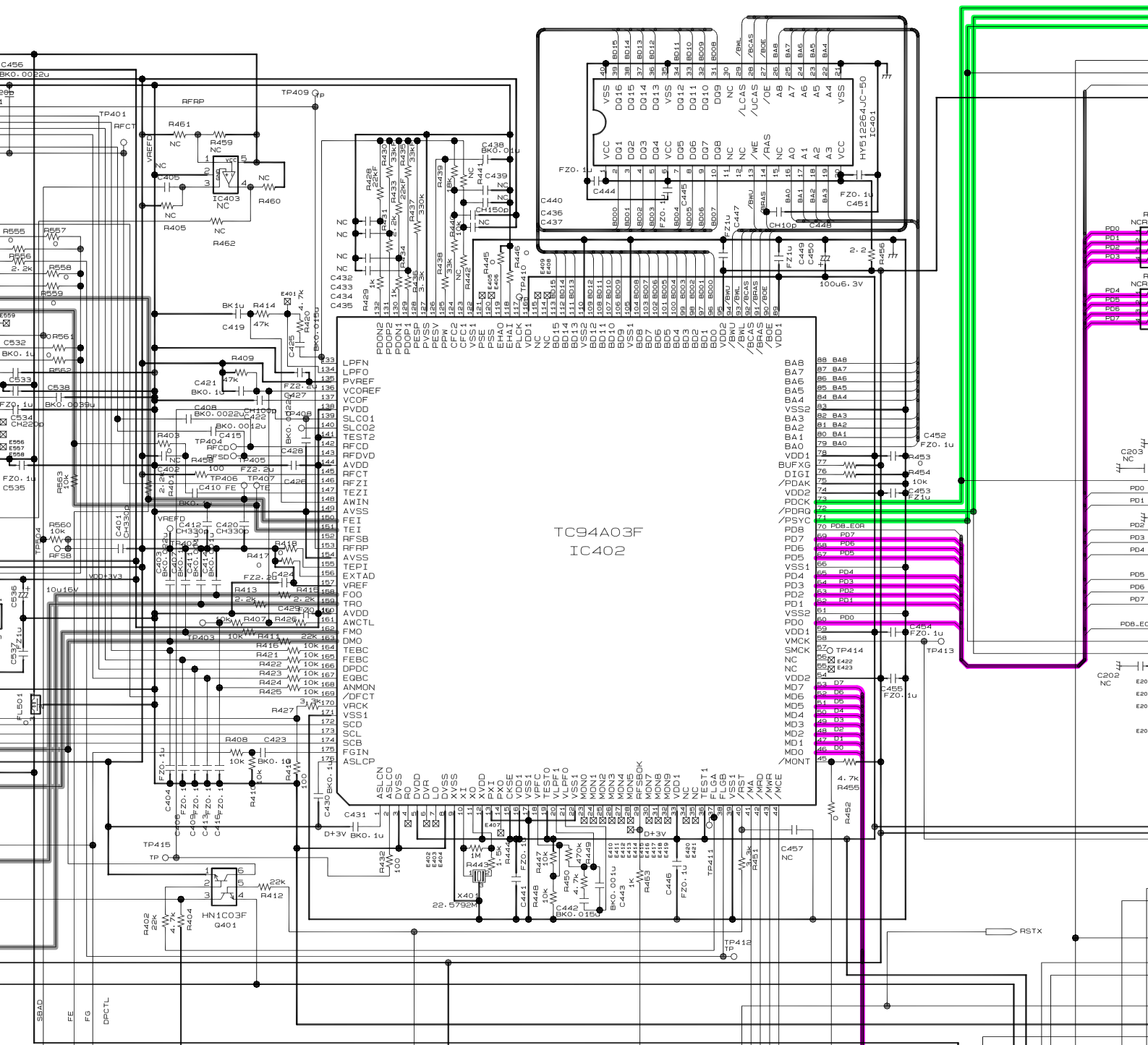
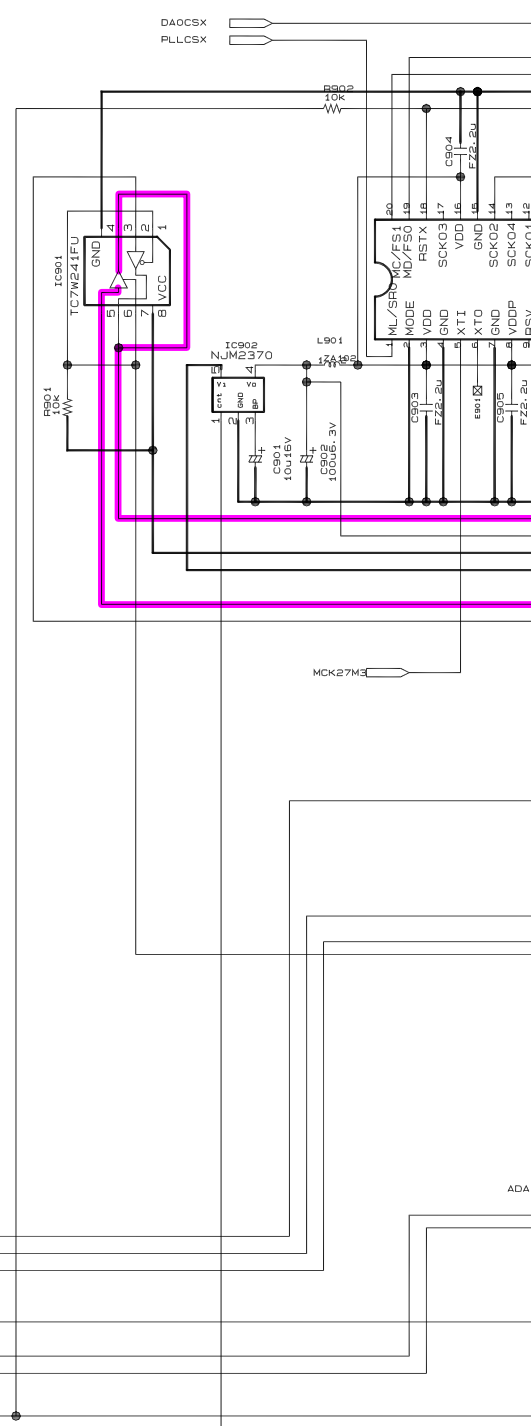
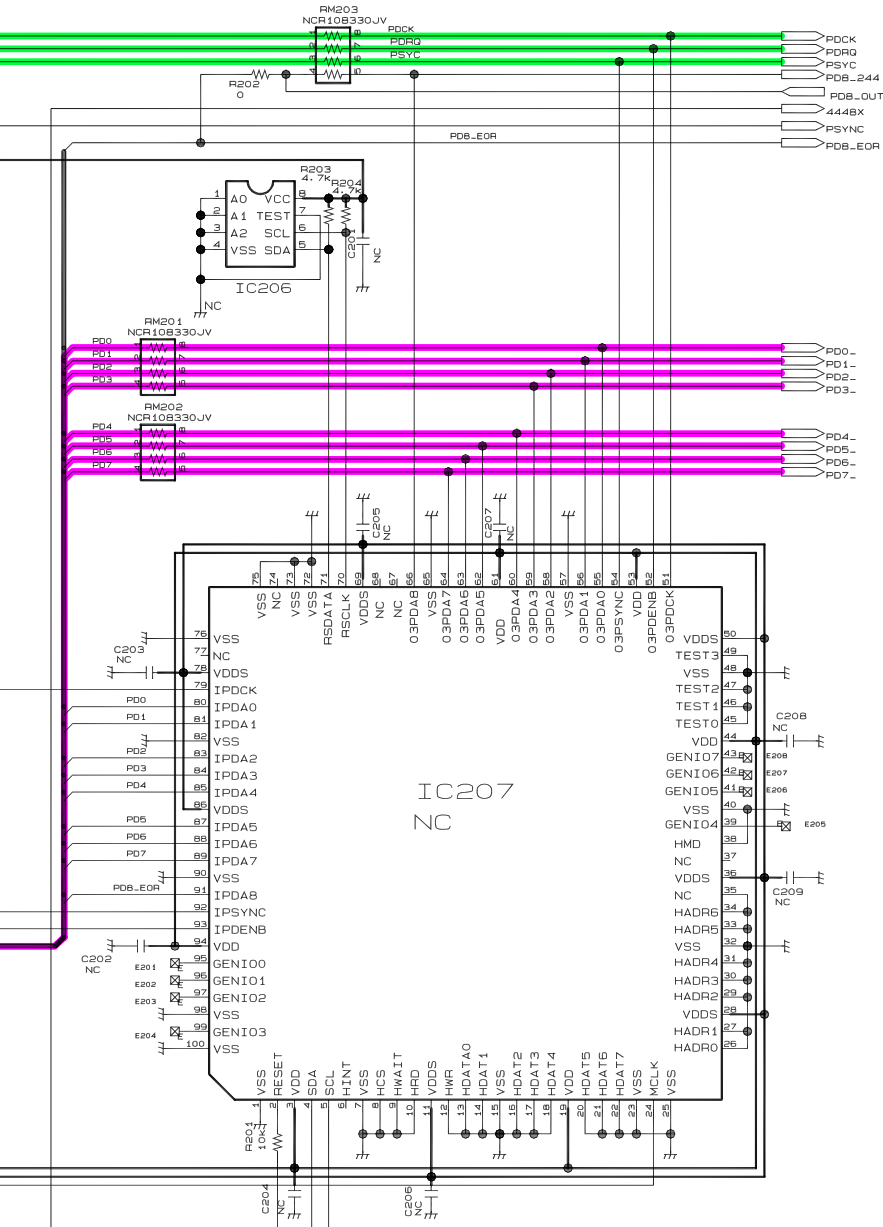
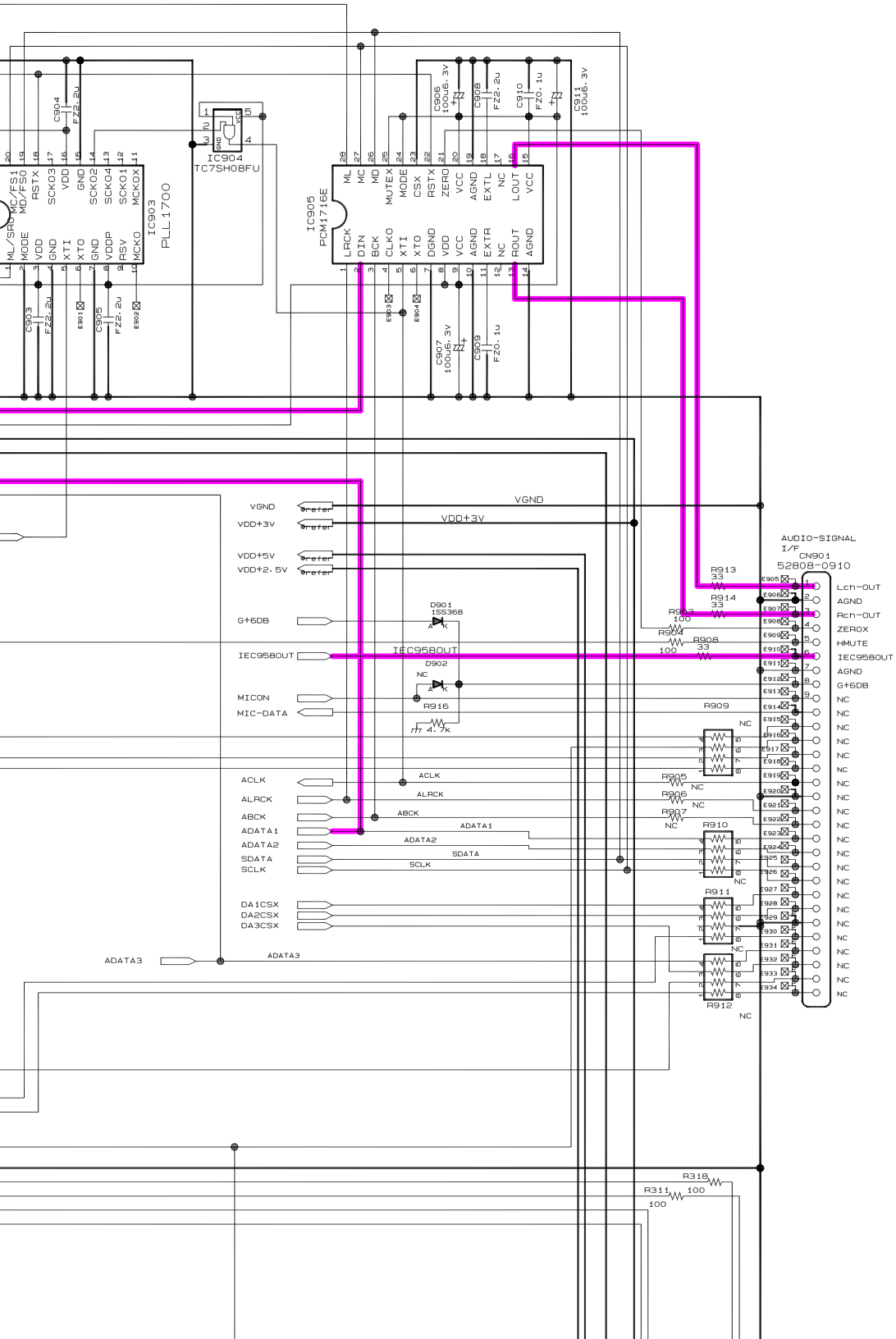


Fig. 3-5-6



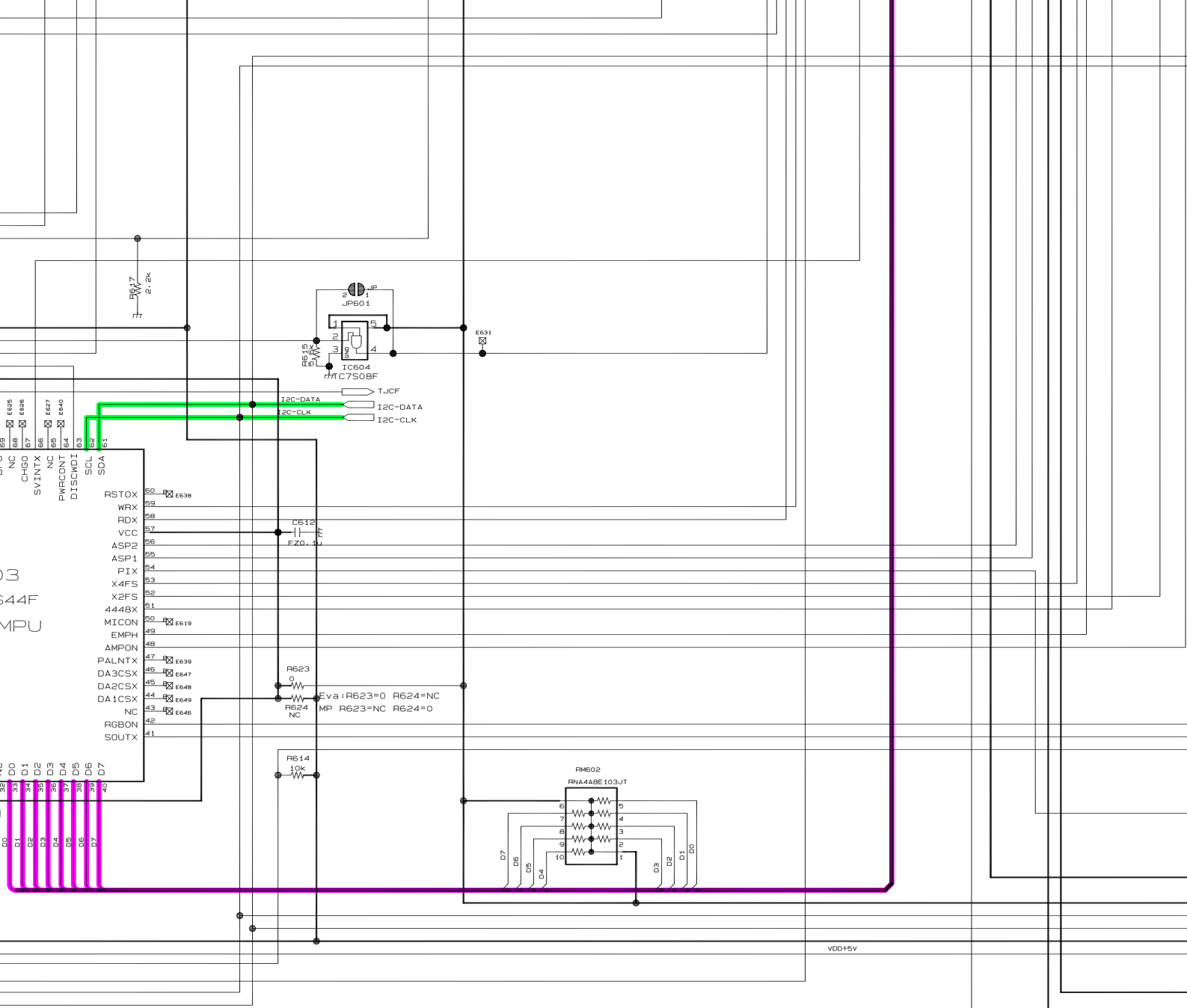


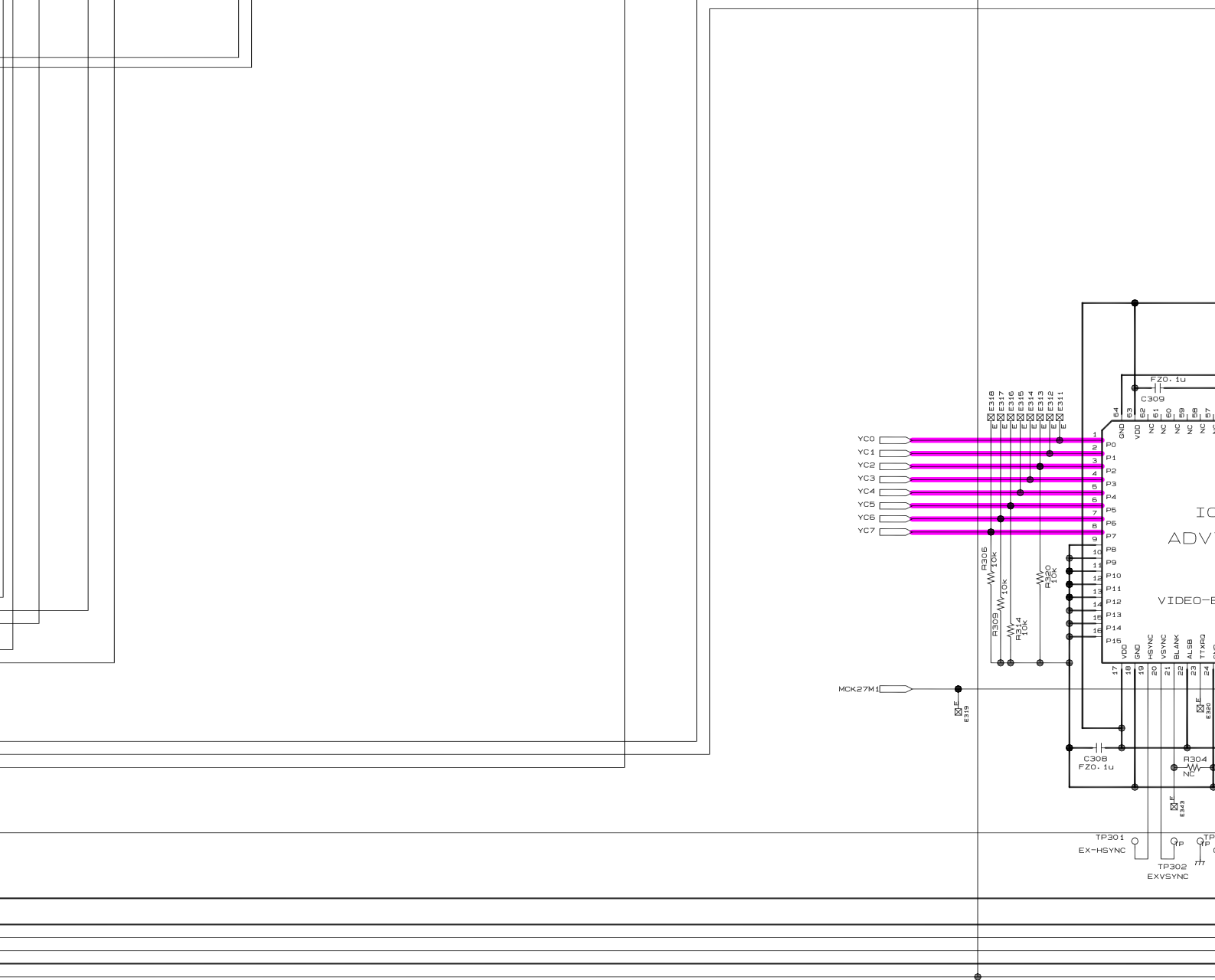


A

B

C





M+Bv

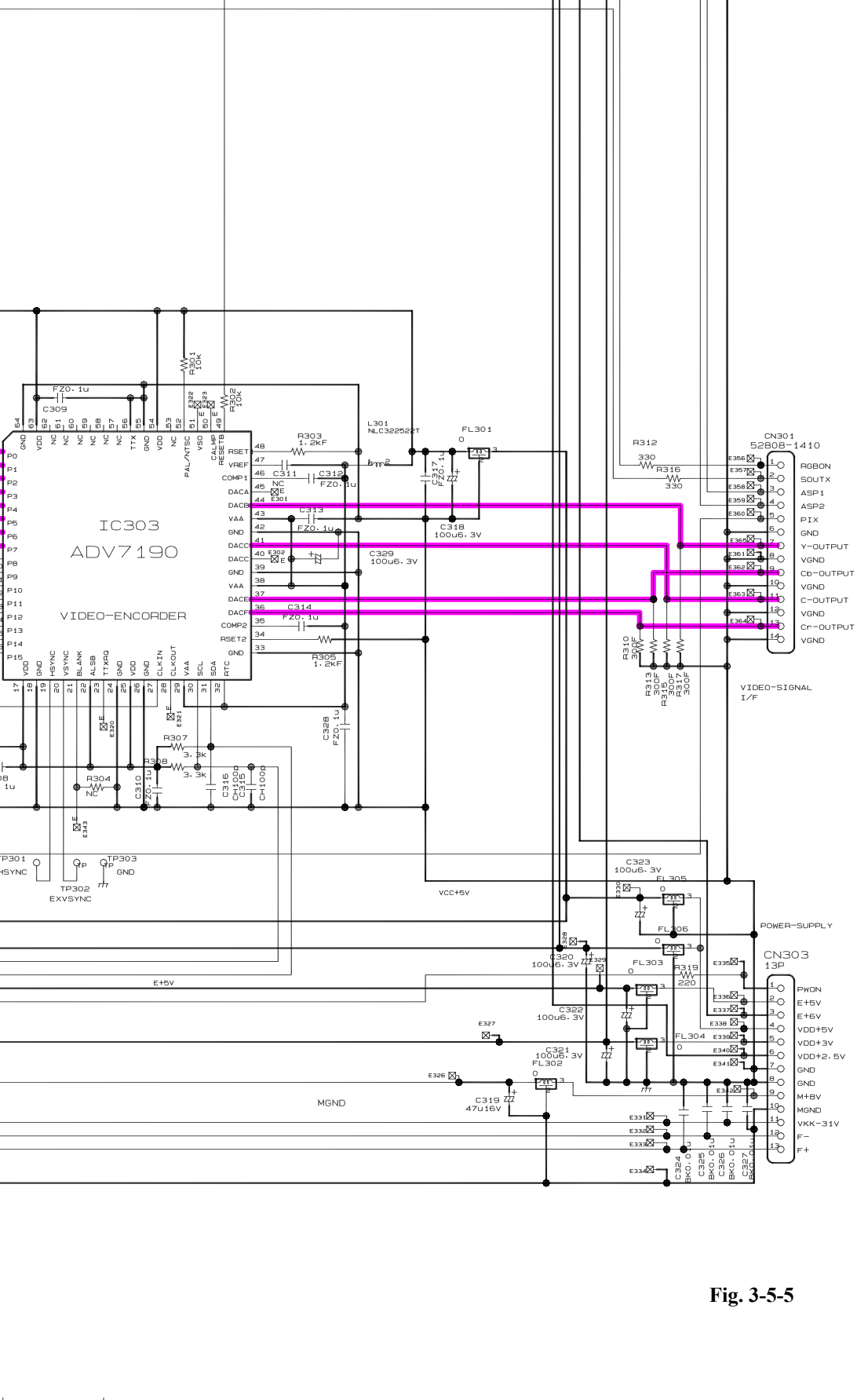


Fig. 3-5-5

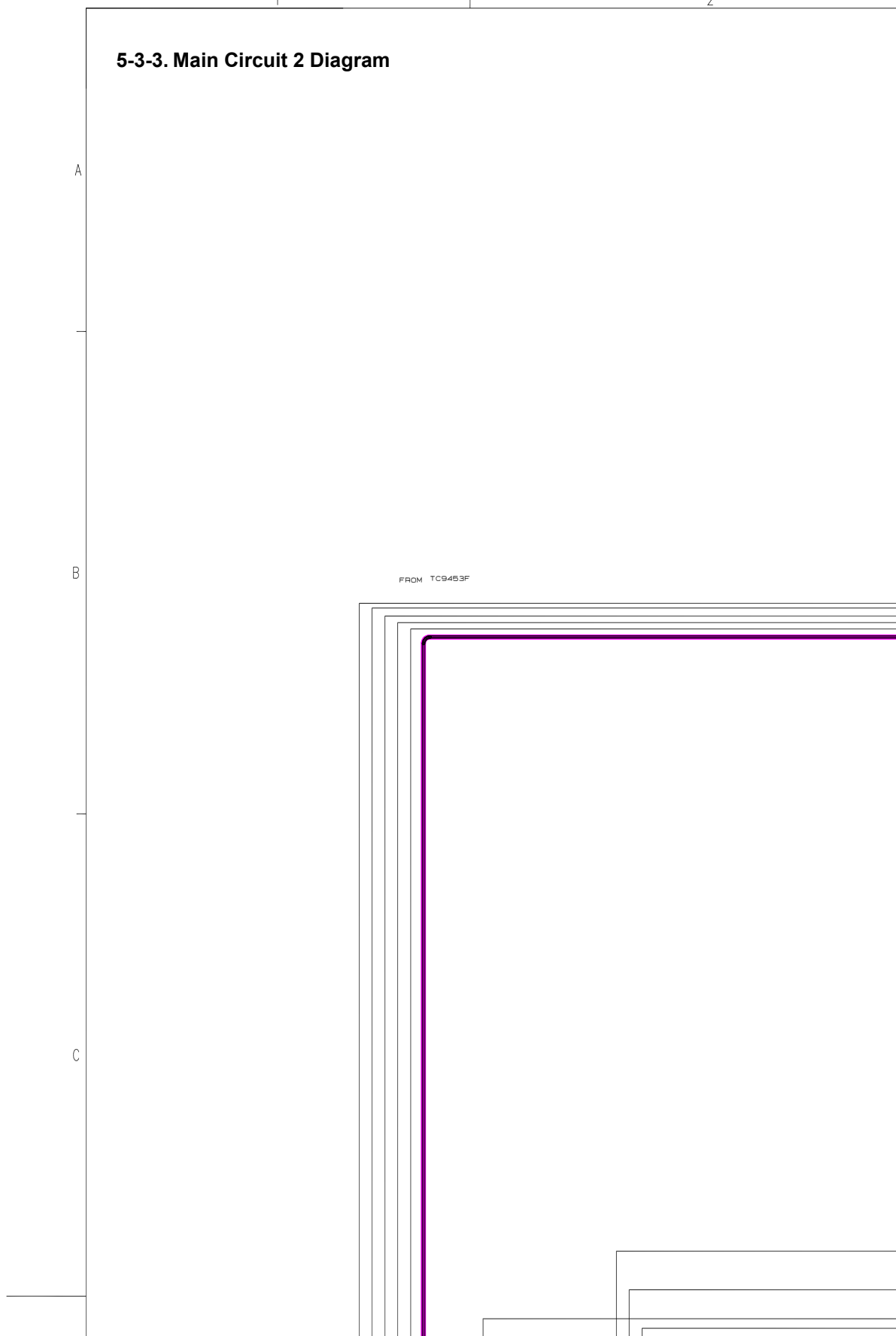
5-3-3. Main Circuit 2 Diagram

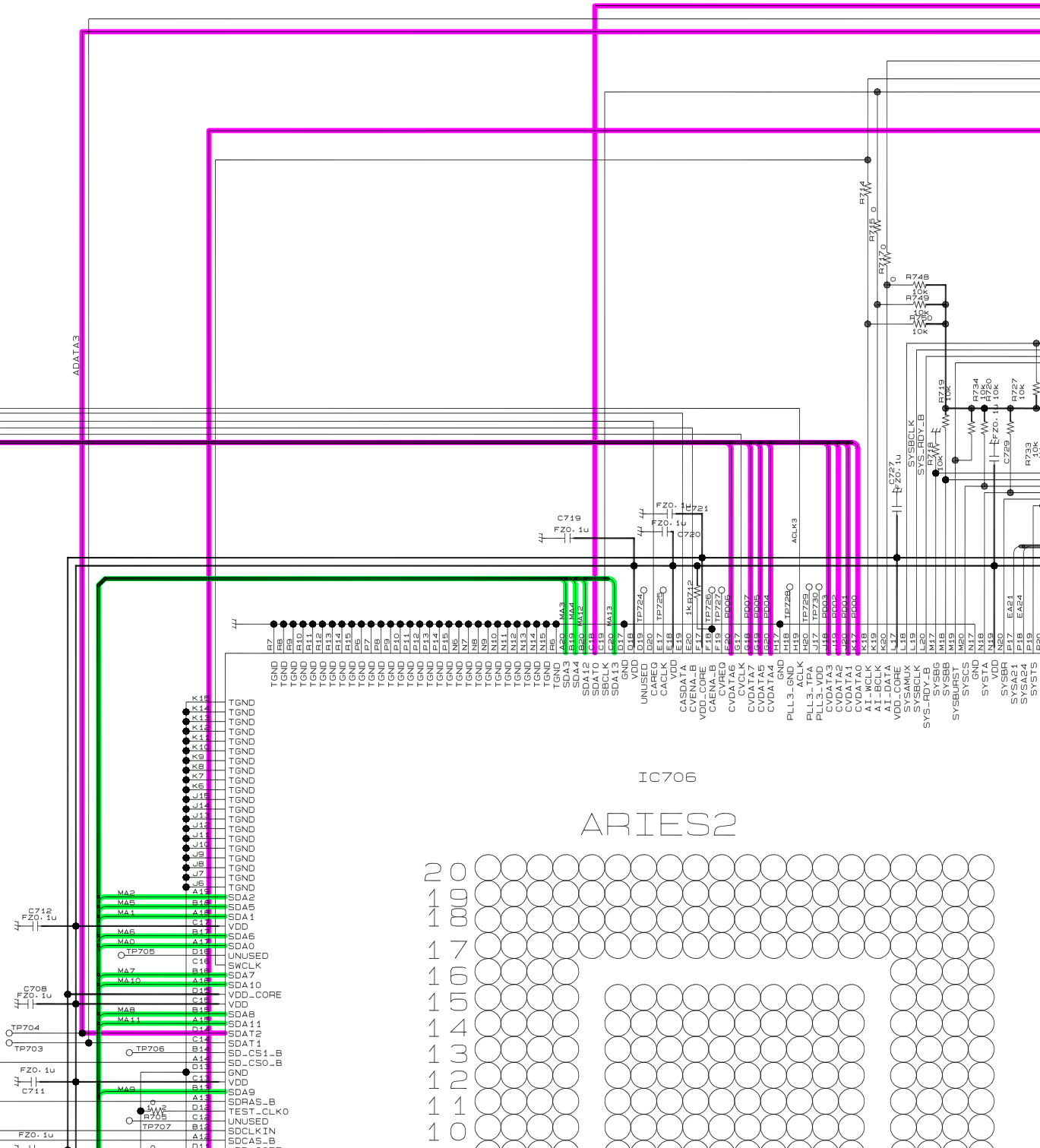
A

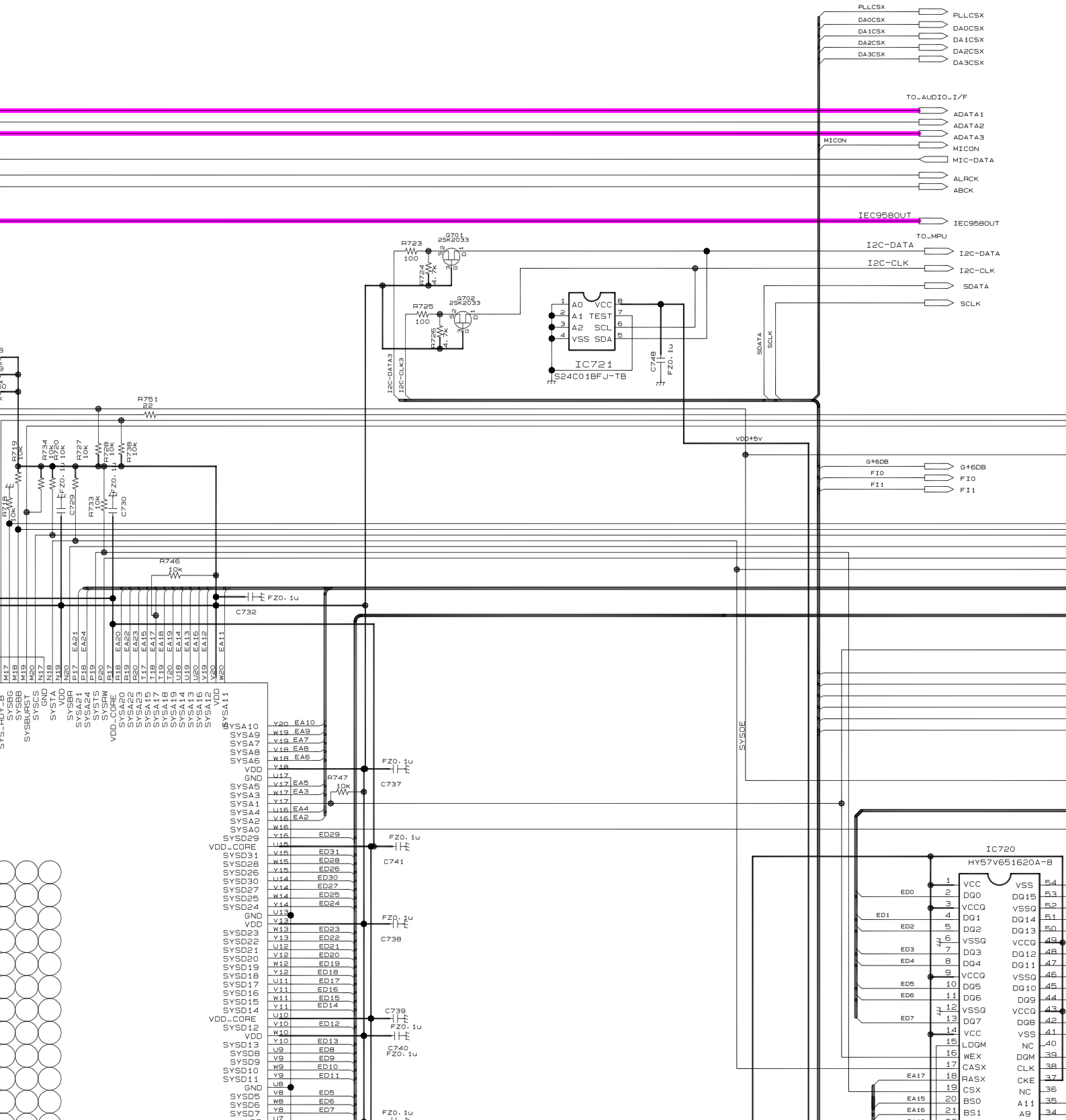
B

C

FROM TC9453F







LCSX
 OCSX
 ICSX
 ECSX
 ACSX

 -
 ATA1
 ATA2
 ATA3
 CON
 C-DATA
 RCK
 CK

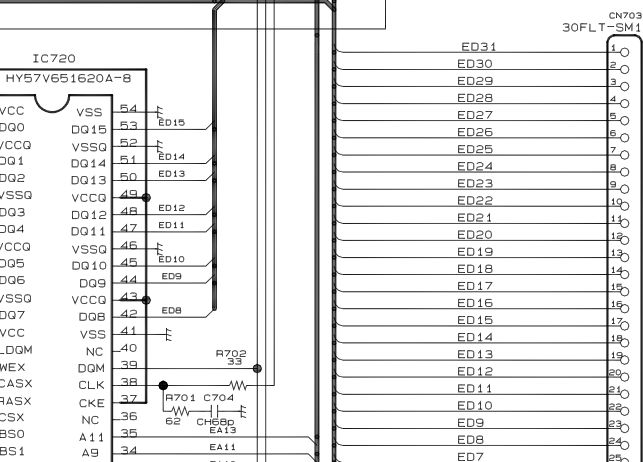
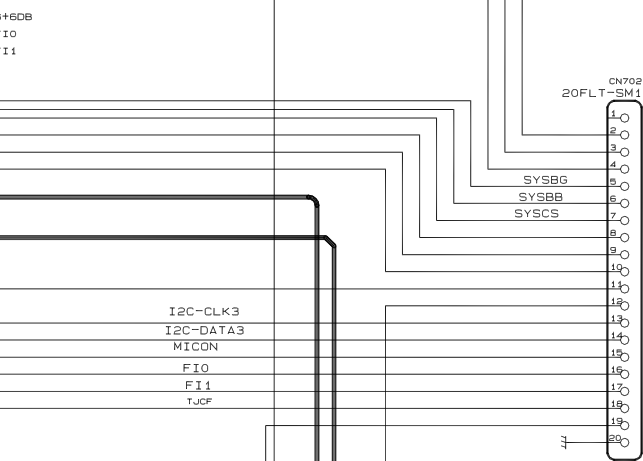
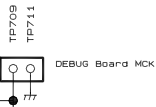
 C95BOUT

 2C-DATA
 2C-CLK
 SDATA
 CLK

A

B

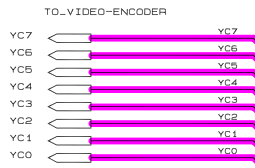
C

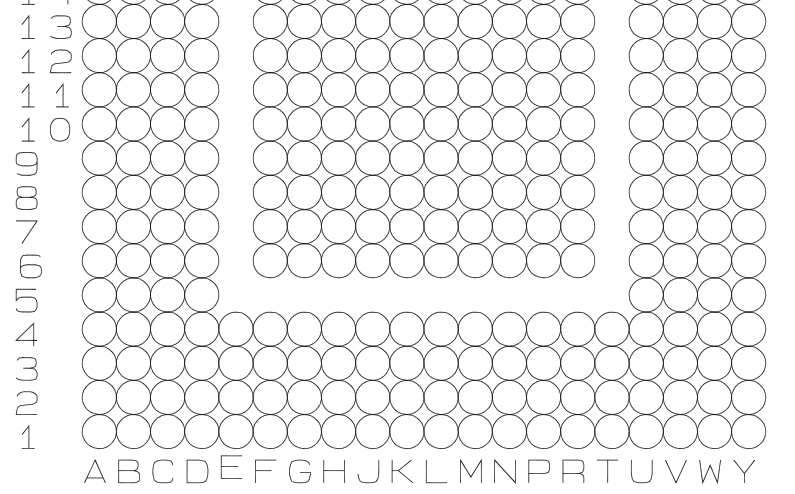
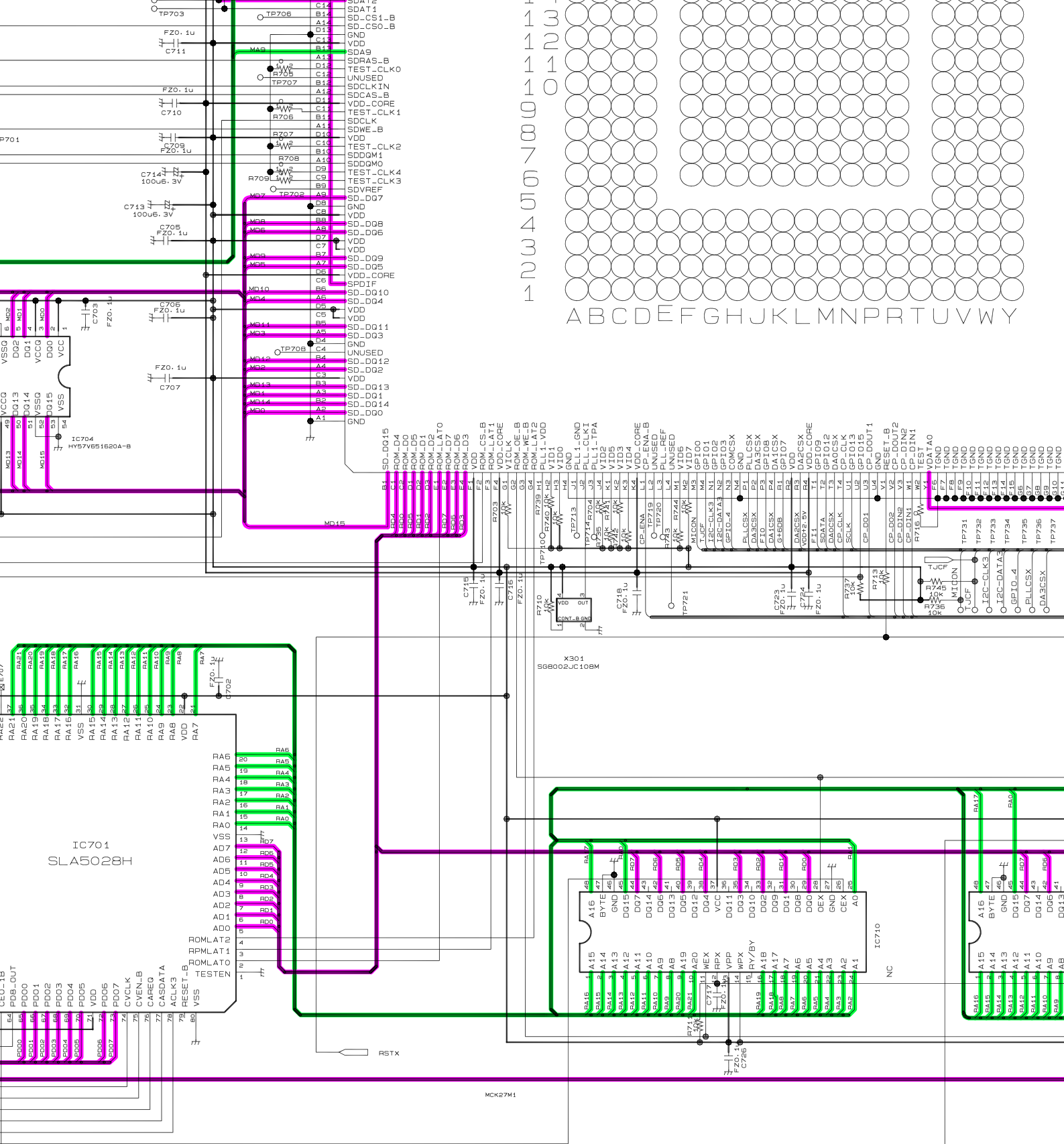


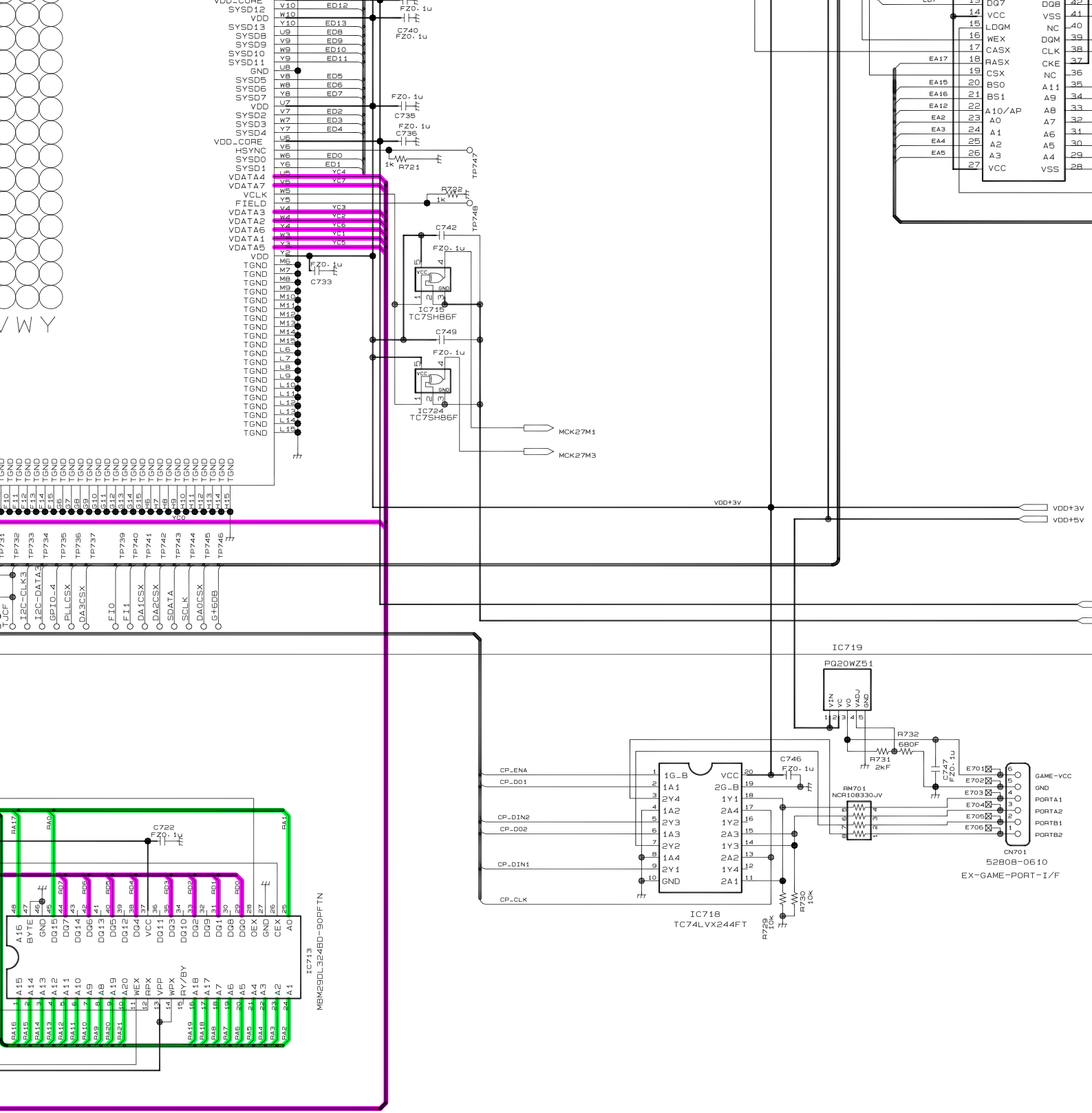
D

E

F







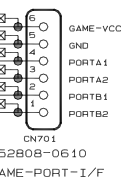
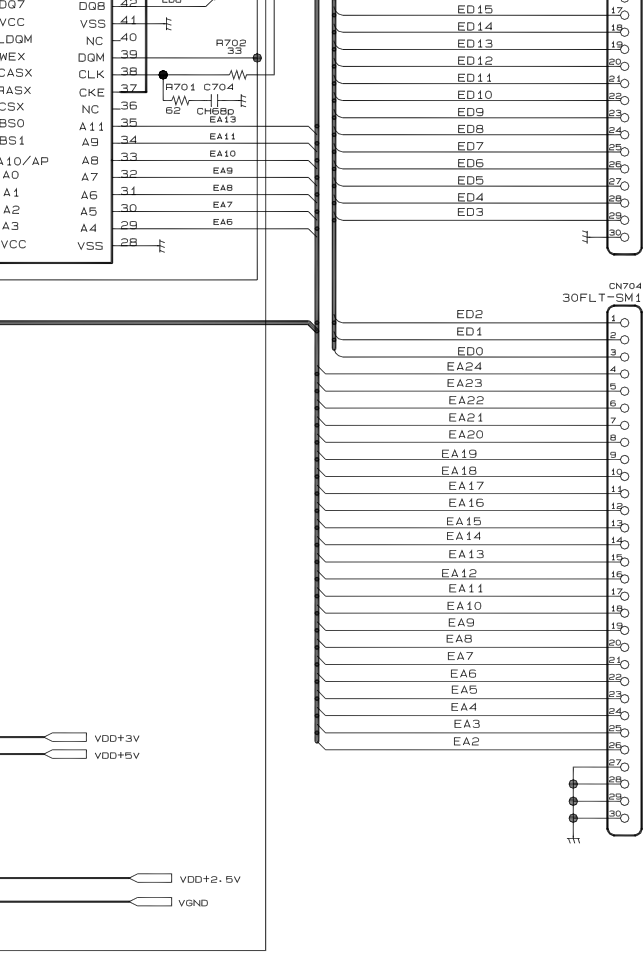


Fig. 3-5-6

Main Circuit 1 Diagram

Part No.	Location	Part No.	Location	Part No.	Location	Part No.	Location	Part No.	Location	Part No.	Location	Part No.	Location	Part No.	Location
C201	A5	C455	C4	E205	B6	E514	B1	E645	E1	R307	E7	R512	D1	R634	E1
C202	C5	C456	A2	E206	B6	E515	A1	E646	E3	R308	E7	R513	D1	R635	E1
C203	B5	C457	C4	E207	B6	E516	C1	E647	E3	R309	E6	R518	B1	R636	D2
C204	C5	C501	B1	E208	B6	E517	C1	E648	E3	R310	E8	R519	B1	R637	D2
C205	B5	C502	B1	E301	D7	E518	B1	E649	E3	R311	C8	R520	A1	R901	B6
C206	C5	C503	A1	E302	D7	E519	B1	E650	D1	R312	D8	R521	B1	R902	A7
C207	B5	C504	B1	E311	D7	E520	B1	E651	D1	R313	E8	R522	B1	R903	B8
C208	B6	C505	C1	E312	D7	E521	C1	E901	B7	R314	E6	R523	B1	R904	B8
C209	B6	C506	B1	E313	D7	E522	C1	E902	B7	R315	E8	R524	A1	R905	C8
C308	E7	C507	B1	E314	D6	E523	C1	E903	B7	R316	D8	R525	A1	R906	C8
C309	D7	C508	C1	E315	D6	E524	C1	E904	B7	R317	E8	R526	B1	R907	C8
C310	E7	C509	A1	E316	D6	E525	C1	E905	B8	R318	C8	R526	B1	R908	B8
C311	D7	C510	B1	E317	D6	E526	C1	E906	B8	R319	E8	R527	B1	R909	B8
C312	D7	C511	B1	E318	D6	E527	C1	E907	B8	R320	E7	R529	B1	R910	C8
C313	D7	C512	C1	E319	E6	E528	C1	E908	B8	R401	B3	R530	A1	R911	C8
C314	E7	C513	A2	E320	E7	E529	C1	E909	B8	R402	C2	R531	A1	R912	C8
C315	E7	C514	C2	E321	E7	E530	C1	E910	B8	R403	B3	R532	B1	R913	B8
C316	E7	C515	B2	E322	D7	E531	C1	E911	B8	R404	C3	R533	C2	R914	B8
C317	D7	C516	A2	E323	D7	E532	C1	E912	B8	R405	B3	R534	B2	R916	B7
C318	D8	C517	B2	E326	E7	E533	A1	E913	B8	R407	B3	R535	C2	RM201	B5
C319	F8	C518	B2	E327	E8	E534	B1	E914	B8	R408	C3	R536	B2	RM202	B5
C320	E8	C519	B2	E328	E8	E535	A1	E915	B8	R409	B3	R537	A2	RM203	A5
C321	E8	C520	B2	E329	E8	E536	B1	E916	B8	R410	C3	R538	B2	RM601	D1
C322	E8	C521	A2	E330	E8	E536	B1	E917	B8	R411	B3	R539	C2	RM602	E3
C323	E8	C522	B2	E331	F8	E537	A1	E918	B8	R412	C3	R540	C2	TP301	E7
C324	F8	C523	B2	E332	F8	E538	B1	E919	C8	R413	B3	R541	C2	TP302	E7
C325	F8	C524	B2	E333	F8	E539	B1	E920	C8	R414	B3	R542	C2	TP303	E7
C326	F8	C525	B2	E334	F8	E542	B1	E921	C8	R415	B3	R543	C2	TP401	A2
C327	F8	C526	B2	E335	E8	E543	A1	E922	C8	R416	B3	R544	A2	TP402	B3
C328	E7	C528	B2	E336	E8	E544	A1	E923	C8	R417	B3	R545	C2	TP403	B3
C329	D7	C529	A2	E337	E8	E546	B1	E924	C8	R418	B3	R546	C2	TP404	B3
C401	B2	C530	B2	E338	E8	E547	C1	E925	C8	R419	C3	R547	A2	TP405	B3
C402	B3	C531	A2	E339	E8	E548	B1	E926	C8	R420	B3	R548	C2	TP406	B3
C403	B2	C532	B2	E340	E8	E549	C1	E927	C8	R421	B3	R549	C2	TP407	B3
C404	C3	C533	B2	E341	E8	E550	B1	E928	C8	R422	B3	R550	C2	TP408	B3
C405	A3	C534	B2	E342	F8	E551	C1	E929	C8	R423	C3	R551	A2	TP409	A3
C406	C3	C535	B2	E343	E7	E552	C2	E930	C8	R424	C3	R552	C2	TP410	B3
C407	B3	C536	B2	E356	D8	E553	C2	E931	C8	R425	C3	R553	C2	TP411	C4
C408	B3	C537	B2	E357	D8	E554	C2	E932	C8	R426	B3	R554	A2	TP412	C4
C409	C3	C538	B2	E358	D8	E555	C2	E933	C8	R427	C3	R555	B2	TP413	B4
C410	B3	C539	A1	E359	D8	E556	B2	E934	C8	R428	A3	R556	B2	TP414	B4
C411	B3	C601	E1	E360	D8	E557	B2	FL301	D8	R429	B3	R557	B2	TP415	C2
C412	B3	C602	E1	E361	D8	E558	B2	FL302	E8	R430	A3	R558	B2	TP501	B1
C413	C3	C603	E1	E362	D8	E559	B2	FL303	E8	R431	B3	R559	B2	TP502	A2
C414	B3	C604	E1	E363	E8	E601	D1	FL304	E8	R432	C3	R560	B2	TP503	A2
C415	B3	C605	E1	E364	E8	E602	D1	FL305	E8	R433	A3	R561	B2	TP504	B2
C416	C3	C606	E2	E365	D8	E603	D1	FL306	E8	R434	B3	R562	B2	X401	C3
C419	B3	C607	E2	E401	B3	E604	D1	FL501	C2	R435	A3	R563	B2	X601	E2
C420	B3	C608	D2	E402	C3	E605	D1	IC206	A5	R436	B3	R567	B1		
C421	B3	C609	D2	E403	C3	E606	D1	IC207	B5	R437	B3	R601	E1		
C423	C3	C610	D2	E404	C3	E607	E1	IC303	D7	R438	B3	R602	E1		
C424	B3	C611	E2	E405	B3	E608	E1	IC401	A4	R439	A3	R603	D1		
C425	B3	C612	D3	E406	B3	E609	E1	IC402	B3	R440	B3	R604	E1		
C426	B3	C613	D1	E407	C3	E610	E1	IC403	A3	R441	A3	R605	D1		
C427	B3	C627	A2	E408	B3	E611	E1	IC501	B1	R442	B3	R606	E1		
C428	B3	C901	B6	E409	B3	E612	D2	IC502	B2	R443	C3	R607	E2		
C429	B3	C902	B7	E410	C3	E613	E2	IC503	C1	R444	C3	R608	D2		
C430	C3	C903	B7	E411	C3	E614	D1	IC505	B2	R445	B3	R609	D2		
C431	C3	C904	A7	E412	C3	E615	D1	IC601	E1	R446	B3	R610	D2		
C432	B3	C905	B7	E413	C3	E616	D1	IC602	E2	R447	C3	R611	E2		
C433	B3	C906	A7	E414	C4	E617	D1	IC603	E2	R448	C3	R612	D2		
C434	B3	C907	B7	E415	C4	E618	E2	IC604	D3	R449	C3	R612	E1		
C435	B3	C908	A8	E416	C4	E619	E3	IC901	A6	R450	C3	R613	D2		
C436	B3	C909	B8	E417	C4	E620	D2	IC902	B6	R451	C4	R614	E3		
C437	B3	C910	A8	E418	C4	E622	D1	IC903	A7	R452	C4	R615	D3		
C438	A3	C911	A8	E419	C4	E623	E2	IC904	A7	R453	B4	R616	E1		
C439	A3	CN301	D8	E420	C4	E624	E2	IC905	A7	R454	B4	R617	D2		
C440	A3	CN303	E8	E421	C4	E625	D2	JP601	D3	R455	C4	R618	E1		
C441	C3	CN501	A1	E422	B4	E626	D2	L301	D7	R456	B4	R619	E1		
C442	B3	CN502	C1	E423	B4	E627	D2	L901	B7	R457	A2	R620	E1		
C442	C3	CN503	C1	E501	B1	E628	D1	Q401	C3	R458	B3	R621	D2		
C443	C3	CN601	D1	E502	B1	E629	E2	Q501	A1	R459	A3	R622	D2		
C444	A3	CN602	E1	E503	B1	E630	D1	Q502	B1	R460	A3	R623	E3		
C445	A4	CN603	D1	E504	B1	E631	D3	R201	C5	R461	A3	R624	E3		
C446	C4	CN901	B8	E505	B1	E632	E1	R202	A5	R462	B3	R625	E1		
C447	B4	D501	B1	E506	B1	E633	E1	R203	A5	R463	C4	R626	E1		
C448	B4	D502	B1	E507	B1	E634	E1	R204	A5	R501	B1	R627	D1		
C449	B4	D901	B7	E508	B1	E635	E1	R301	D7	R502	B1	R628	D1		
C450	B4	D902	B7	E509	B1	E636	E1	R302	D7	R503	B1	R629	D1		
C451	A4	E201	C5	E510	B1	E637	E1	R303	D7	R504	A1	R630	D1		
C452	B4	E202	C5	E511	B1	E638	D3	R304	E7	R509	B1	R631	D1		
C453	B4	E203	C5	E512	B1	E639	E3	R305	E7	R510	A1	R632	E2		
C454	B4	E204	C5	E513	B1	E640	D2	R306	D6	R511	D1	R633	E1		

Main Circuit 2 Diagram

Part No.	Location	Part No.	Location	Part No.	Location	Part No.	Location
C701	E2	CN701	E7	R718	B4	TP702	D3
C702	E3	CN702	B8	R719	B4	TP703	C3
C703	D2	CN703	C8	R720	B5	TP704	C3
C704	C7	CN704	D8	R721	D5	TP705	C3
C705	D3	E701	E7	R722	D5	TP706	C3
C706	D3	E702	E7	R723	B5	TP707	D3
C707	D3	E703	E7	R724	B5	TP708	D3
C708	C3	E704	E7	R725	B5	TP709	B7
C709	D3	E705	E7	R726	B5	TP710	E3
C710	D3	E706	E7	R727	B5	TP711	B7
C711	C3	E707	E2	R728	B5	TP713	E3
C712	C3	E708	E2	R729	E6	TP714	E4
C713	D2	IC701	E2	R730	E6	TP719	E4
C714	D2	IC704	D2	R731	E6	TP720	E4
C715	E3	IC706	C4	R732	E6	TP721	E4
C716	E3	IC710	F4	R733	B5	TP724	B4
C717	F4	IC713	F5	R734	B4	TP725	B4
C718	E4	IC715	D5	R735	E4	TP726	B4
C719	B4	IC718	E6	R736	E4	TP727	B4
C720	B4	IC719	E6	R737	E4	TP728	B4
C721	B4	IC720	C7	R738	B5	TP729	B4
C722	E5	IC721	B6	R739	E3	TP730	B4
C723	E4	IC724	D5	R740	E3	TP731	E4
C724	E4	Q701	B5	R741	E4	TP732	E4
C726	F4	Q702	B5	R742	E4	TP733	E4
C727	B4	R701	C7	R743	E4	TP734	E4
C729	B5	R702	C7	R744	E4	TP735	E5
C730	B5	R703	E3	R745	E4	TP736	E5
C732	B5	R704	E4	R746	B5	TP737	E5
C733	D5	R705	D3	R747	C5	TP739	E5
C735	D5	R706	D3	R748	B4	TP740	E5
C736	D5	R707	D3	R749	B4	TP741	E5
C737	C5	R708	D3	R750	B4	TP742	E5
C738	C5	R709	D3	R751	B5	TP743	E5
C739	C5	R710	E3	R752	F2	TP744	E5
C740	C5	R711	F4	R753	F2	TP745	E5
C741	C5	R712	B4	R754	F2	TP746	E5
C742	D5	R713	E4	R755	F2	TP747	D5
C746	E6	R714	B4	R756	F2	TP748	D5
C747	E7	R715	B4	R757	F2	X301	E3
C748	B6	R716	E4	RM701	E6		
C749	D5	R717	B4	TP701	D2		

5-4. Output Circuit Diagram

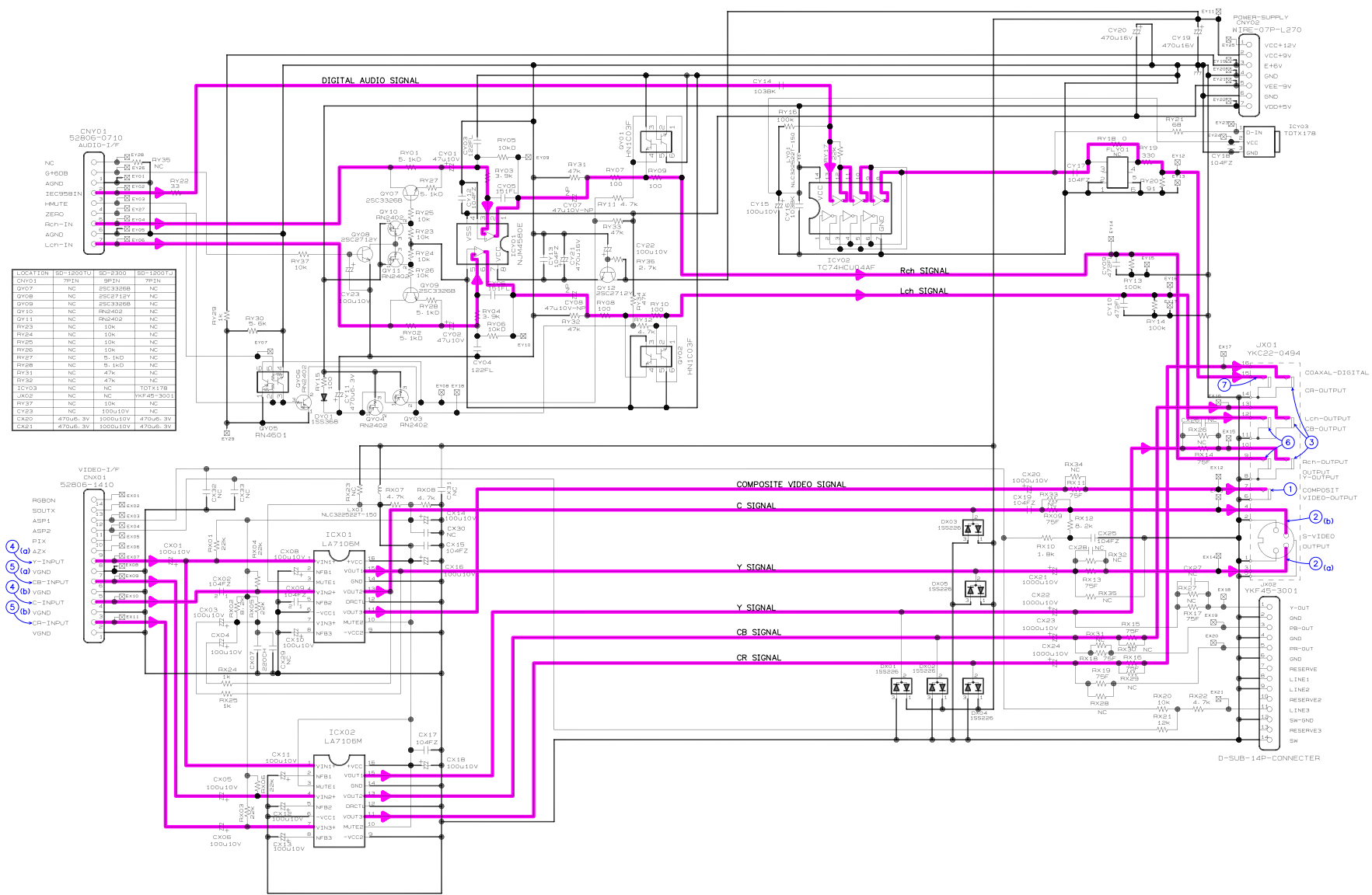
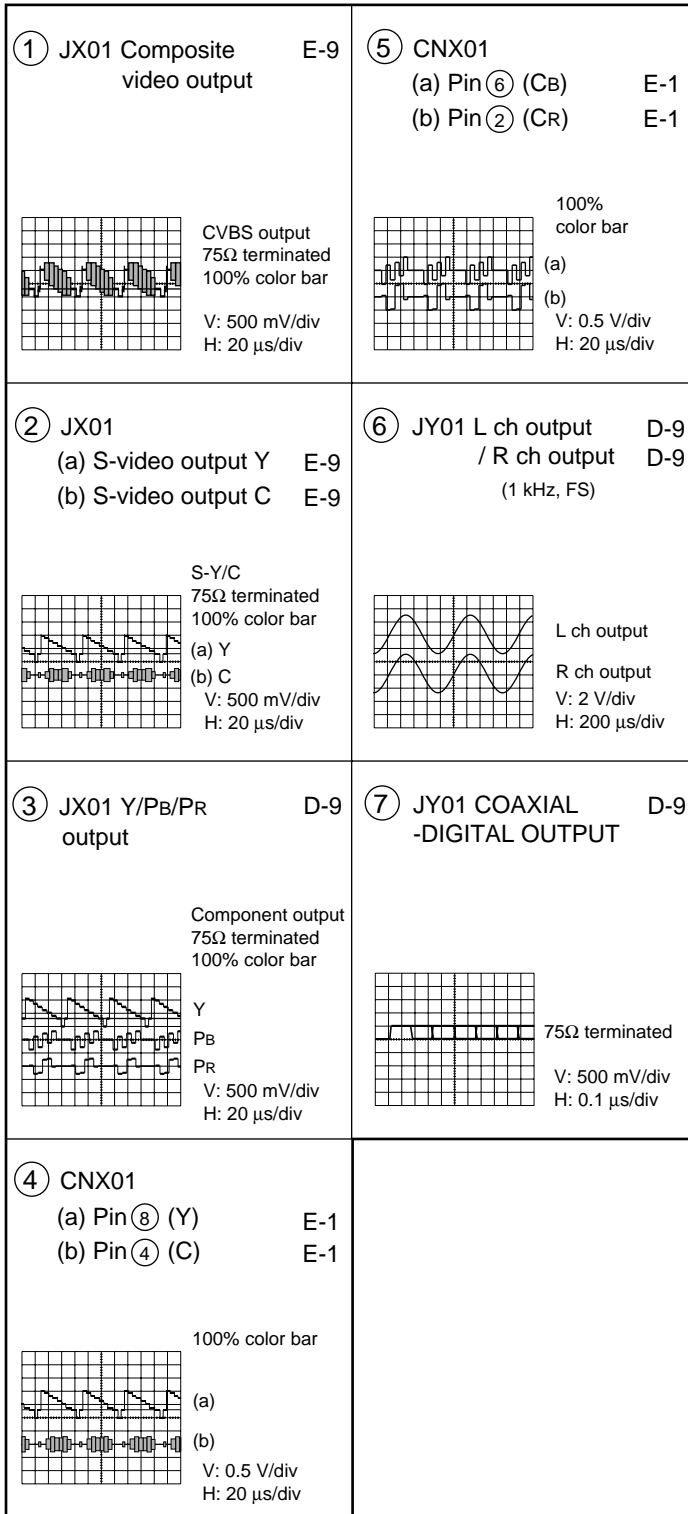


Fig. 3-5-7

Output Circuit Diagram



IC

ICY01
LPF & AMP

1	0
2	0
3	0
4	-10.0
5	0
6	0
7	0
8	9.5

ICY02
BUFFER

1	2.5
2	2.4
3	2.5
4	2.4
5	2.5
6	2.4
7	0
8	2.4
9	2.5
10	2.5
11	2.0
12	2.0
13	3.9
14	4.9

Transistor

QY05
SWITCH

1	5.8
2	5.5
3	5.5
4	0
5	0
6	0

QY06
SWITCH

E	5.8
C	0
B	5.5

QY01
SWITCH

1	0
2	0
3	0
4	0
5	0
6	0

QY04
SWITCH

E	5.8
C	0
B	5.8

QY02
SWITCH

1	0
2	0
3	0
4	0
5	0
6	0

QY03
SWITCH

E	5.8
C	0
B	5.8

Fig. 3-5-8

Output Circuit Diagram

<u>Part No.</u>	<u>Loca- tion</u>	<u>Part No.</u>	<u>Loca- tion</u>	<u>Part No.</u>	<u>Loca- tion</u>	<u>Part No.</u>	<u>Loca- tion</u>
CNX01	D2	CY18	B9	EY21	B9	RX23	D3
CNY01	B2	CY19	A9	EY22	B9	RX24	E3
CNY02	A9	CY20	A8	EY23	B9	RX25	F3
CX01	E2	CY21	C5	EY24	B9	RX26	D9
CX02	E3	CY22	C5	EY25	A9	RX27	E9
CX03	E2	CY23	C3	EY26	B2	RX28	F8
CX04	E3	DX01	E7	EY27	B2	RX29	E8
CX05	F3	DX02	E7	EY28	B2	RX30	E8
CX06	G3	DX03	E7	EY29	D3	RX31	E8
CX07	E3	DX04	F7	FLY01	B8	RX32	E8
CX08	E3	DX05	E7	ICX01	E3	RX33	D8
CX09	E3	DY01	D3	ICX02	F3	RX34	D8
CX10	E3	EX01	D2	ICY01	C4	RX35	E8
CX11	F3	EX02	D2	ICY02	C6	RY01	B4
CX12	F3	EX03	D2	ICY03	B9	RY02	C4
CX13	G3	EX04	E2	JX01	C9	RY03	B4
CX14	D4	EX05	E2	JX02	E9	RY04	C4
CX15	E4	EX06	E2	LX01	D3	RY05	B4
CX16	E4	EX07	E2	LY01	B6	RY06	C4
CX17	F4	EX08	E2	QY01	B5	RY07	B5
CX18	F4	EX09	E2	QY02	C5	RY08	C5
CX19	D8	EX10	E2	QY03	D4	RY09	B5
CX20	D8	EX11	E2	QY04	D4	RY10	C5
CX21	E8	EX12	D9	QY05	D3	RY11	B5
CX22	E8	EX13	D9	QY06	D3	RY12	C5
CX23	E8	EX14	E9	QY07	B4	RY13	C8
CX24	E8	EX15	D9	QY08	C3	RY14	C8
CX25	E8	EX16	D9	QY09	C4	RY15	D3
CX26	D9	EX17	C9	QY10	C4	RY16	B6
CX27	E9	EX18	E9	QY11	C4	RY17	B6
CX28	E8	EX19	E9	QY12	C5	RY18	B8
CX29	E3	EX20	E9	RX01	E3	RY19	B8
CX30	E4	EX21	F9	RX02	E3	RY20	B8
CX31	D4	EY01	B2	RX03	F3	RY21	B8
CX32	D3	EY02	B2	RX04	E3	RY22	B2
CX33	D3	EY03	B2	RX05	E3	RY23	C4
CY01	B4	EY04	C2	RX06	E3	RY24	C4
CY02	C4	EY05	C2	RX07	D4	RY25	C4
CY03	B4	EY06	C2	RX08	D4	RY26	C4
CY04	C4	EY07	C3	RX09	D8	RY27	B4
CY05	B4	EY08	D4	RX10	E8	RY28	C4
CY06	C4	EY09	B5	RX11	D8	RY29	C3
CY07	B5	EY10	C4	RX12	E8	RY30	C3
CY08	C5	EY11	A9	RX13	E8	RY31	B5
CY09	C8	EY12	B8	RX14	D9	RY32	C5
CY10	C8	EY13	B8	RX15	E8	RY33	C5
CY11	D3	EY14	C8	RX16	E8	RY34	C5
CY12	B4	EY15	C8	RX17	E9	RY35	B2
CY13	C5	EY16	C8	RX18	E8	RY36	C5
CY14	B6	EY17	C8	RX19	E8	RY37	C3
CY15	B6	EY18	D4	RX20	F8		
CY16	B6	EY19	B9	RX21	F8		
CY17	B8	EY20	B9	RX22	F9		

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5-5. Motor System Circuit Diagram

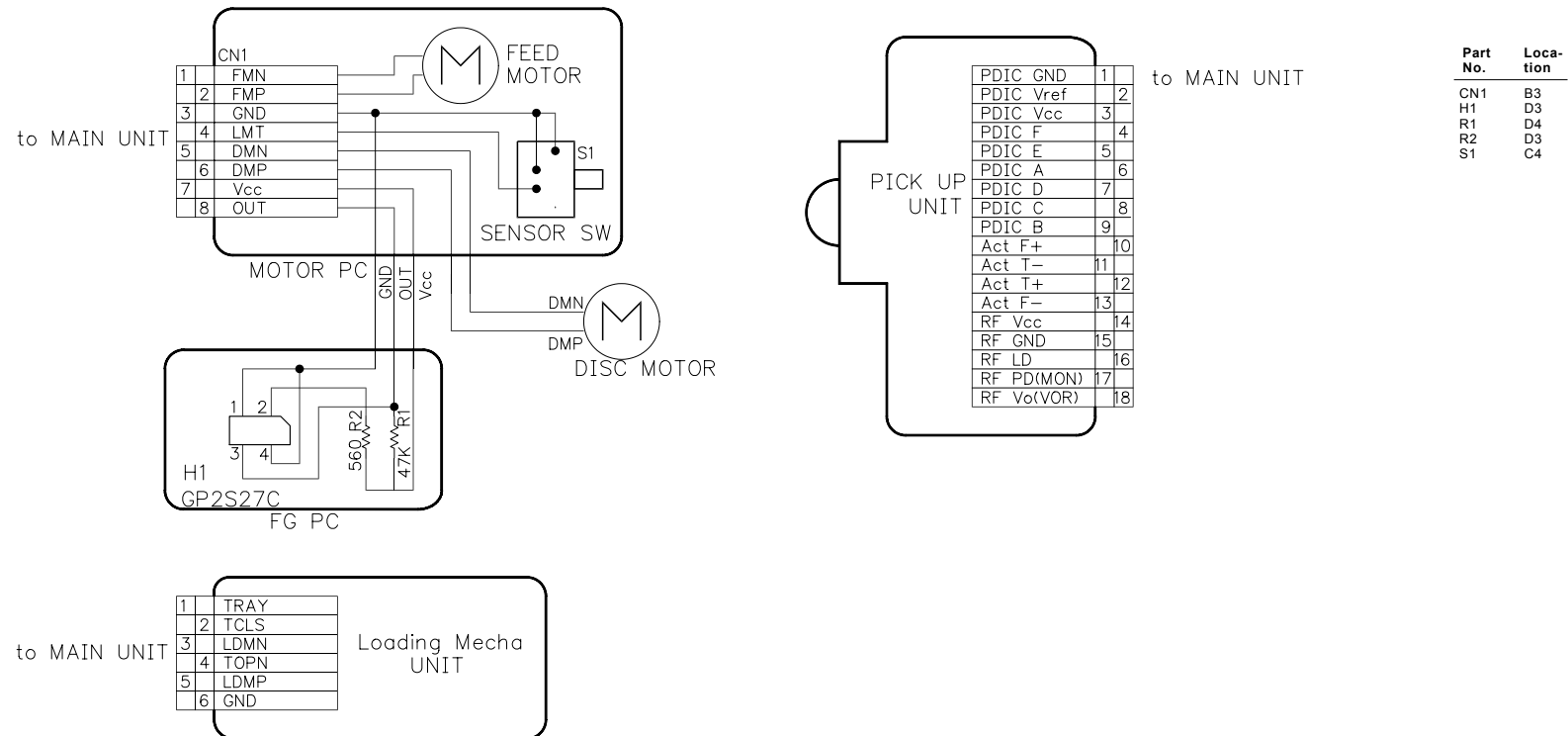
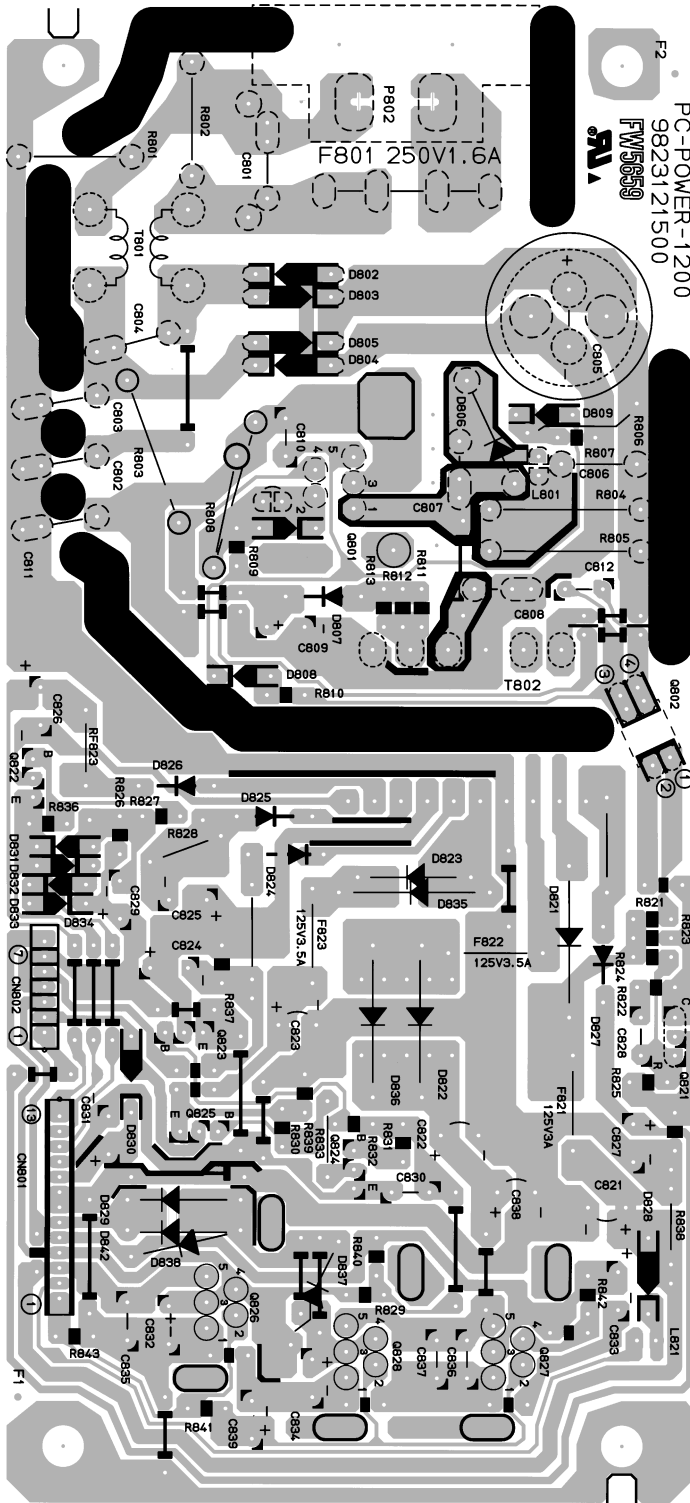


Fig. 3-5-9

6. PC BOARDS

6-1. Power Supply PC Board



Part No.	Location	Part No.	Location
C801	B2	F821	F3
C802	C1	F822	E2
C803	C1	F823	E3
C804	C2	L801	C3
C805	C3	L821	F3
C806	C3	P802	B2
C807	C3	Q801	D2
C808	D3	Q802	D3
C809	D2	Q821	E3
C810	C2	Q822	D1
C811	D1	Q824	F2
C812	D3	Q825	F2
C821	F3	Q826	F2
C822	F3	Q827	F3
C823	E3	Q828	F2
C824	E2	Q829	E2
C825	E2	R801	B2
C826	D1	R802	B2
C827	F3	R803	C2
C828	E3	R804	C3
C829	E2	R805	C3
C830	F2	R806	C3
C831	F1	R807	C3
C832	F2	R808	C2
C833	F3	R809	D2
C834	G2	R810	D2
C835	G1	R811	D3
C836	F3	R812	D2
C837	F3	R813	D2
C838	F3	R821	E3
C839	G2	R822	E3
CN801	F1	R823	E3
CN802	E1	R824	E3
D802	C2	R825	E3
D803	C2	R826	D1
D804	C2	R827	D2
D805	C2	R828	E2
D806	C3	R829	F2
D807	D2	R830	F2
D808	D2	R831	F2
D809	C3	R832	F2
D821	E3	R833	F2
D822	E3	R836	D1
D823	E3	R837	E2
D824	E2	R838	F3
D825	D2	R839	F2
D826	D2	R840	F2
D827	E3	R841	G2
D828	F3	R842	F3
D829	F1	R843	F1
D830	F2	RF823	D2
D831	F1	T801	B2
D832	F1	T802	D3
D833	F1		
D834	F1		
D835	E3		
D836	E2		
D837	F2		
D838	F2		
D842	F1		

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

1

2

3

4

5

A

6-2. Power Switch PC Board

B

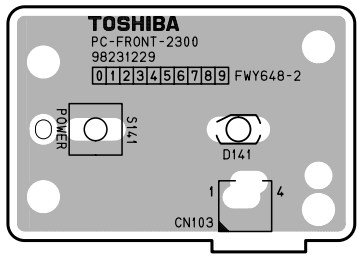


Fig. 3-6-2 EU04 Power Switch PC Board (Top side)

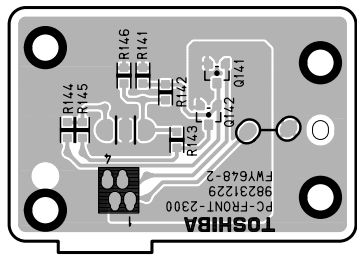


Fig. 3-6-3 EU04 Power Switch PC Board (Bottom side)

C

D

E

F

G

6-3. Main PC Board

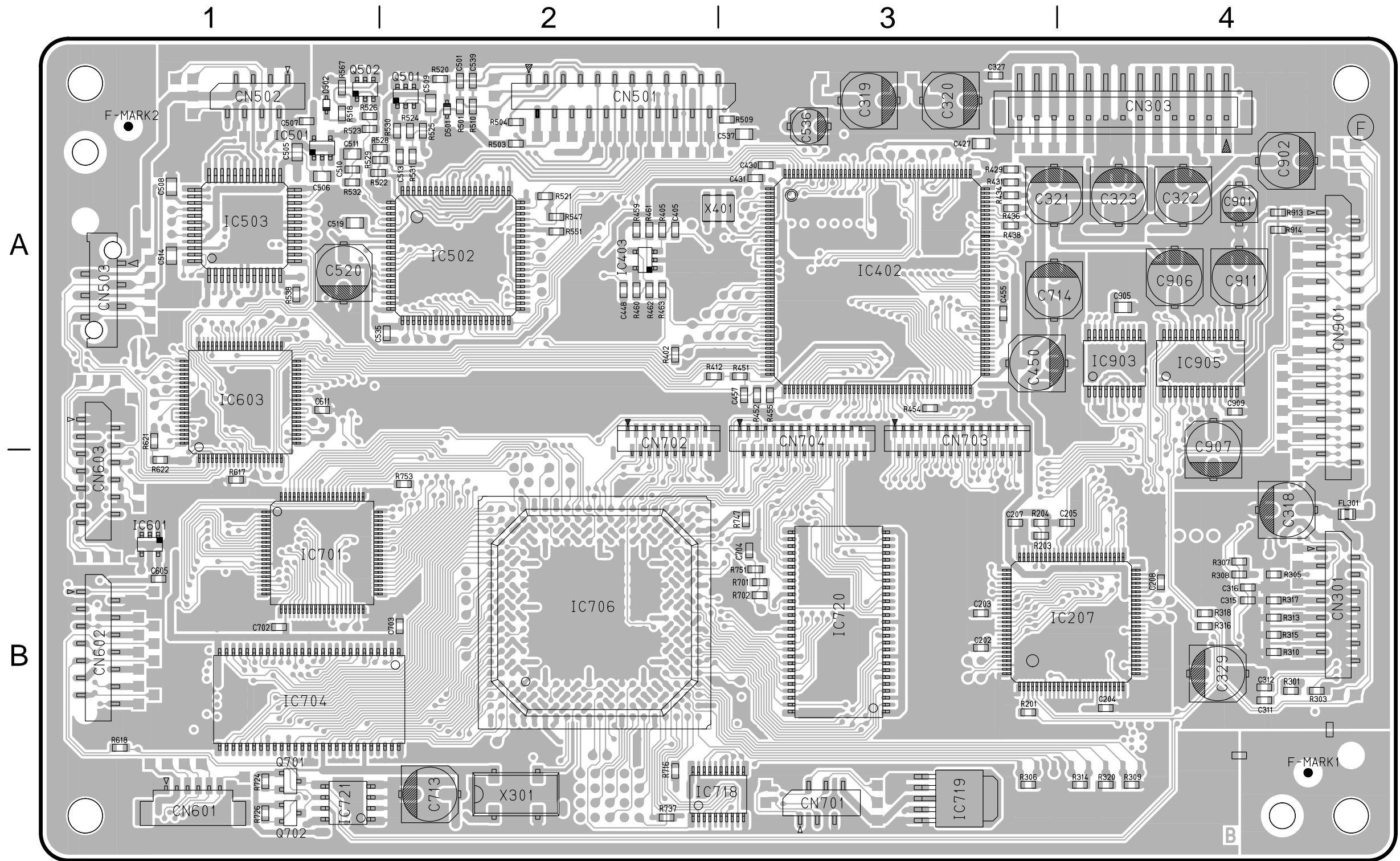


Fig. 3-6-4 EU01 Main PC Board (Top pattern and Top parts location diagram)

Top Side

Part No.	Loca- tion	Part No.	Loca- tion	Part No.	Loca- tion
C202	B3	CN301	B4	R402	A2
C203	B3	CN303	A4	R405	A2
C204	B4	CN501	A2	R412	A2
C205	B4	CN502	A1	R429	A3
C207	B3	CN503	A1	R431	A3
C208	B4	CN601	B1	R434	A3
C311	B4	CN602	B1	R436	A3
C312	B4	CN603	B1	R438	A3
C315	B4	CN701	B3	R451	A3
C316	B4	CN702	A2	R452	A3
C318	B4	CN703	A3	R454	A3
C319	A3	CN704	A3	R455	A3
C320	A3	CN901	A4	R459	A2
C321	A3	D501	A2	R460	A2
C322	A4	D502	A1	R461	A2
C323	A4	FL301	B4	R462	A2
C327	A3	IC207	B4	R463	A2
C329	B4	IC402	A3	R501	A2
C405	A2	IC403	A2	R503	A2
C427	A3	IC501	A1	R504	A2
C430	A3	IC502	A2	R509	A3
C431	A3	IC503	A1	R510	A2
C448	A2	IC601	B1	R518	A1
C450	A3	IC603	A1	R520	A2
C455	A3	IC701	B1	R521	A2
C457	A3	IC704	B1	R522	A1
C501	A2	IC706	B2	R523	A1
C505	A1	IC718	B2	R524	A2
C506	A1	IC719	B3	R525	A2
C507	A1	IC720	B3	R526	A1
C508	A1	IC721	B1	R528	A2
C509	A2	IC903	A4	R529	A2
C510	A1	IC905	A4	R530	A2
C511	A1	JP601	A1	R531	A2
C513	A2	Q501	A2	R532	A1
C514	A1	Q502	A1	R538	A1
C519	A1	Q701	B1	R547	A2
C520	A1	Q702	B1	R551	A2
C535	A2	R201	B3	R567	A1
C536	A3	R203	B3	R617	B1
C537	A3	R204	B3	R618	B1
C539	A2	R301	B4	R621	A1
C605	B1	R303	B4	R622	B1
C611	A1	R305	B4	R701	B3
C702	B1	R306	B3	R702	B3
C703	B2	R307	B4	R716	B2
C704	B3	R308	B4	R724	B1
C713	B2	R309	B4	R726	B1
C714	A3	R310	B4	R737	B2
C901	A4	R313	B4	R747	B3
C902	A4	R314	B4	R751	B3
C905	A4	R315	B4	R753	B2
C906	A4	R316	B4	R913	A4
C907	A4	R317	B4	R914	A4
C909	A4	R318	B4	X301	B2
C911	A4	R320	B4	X401	A2

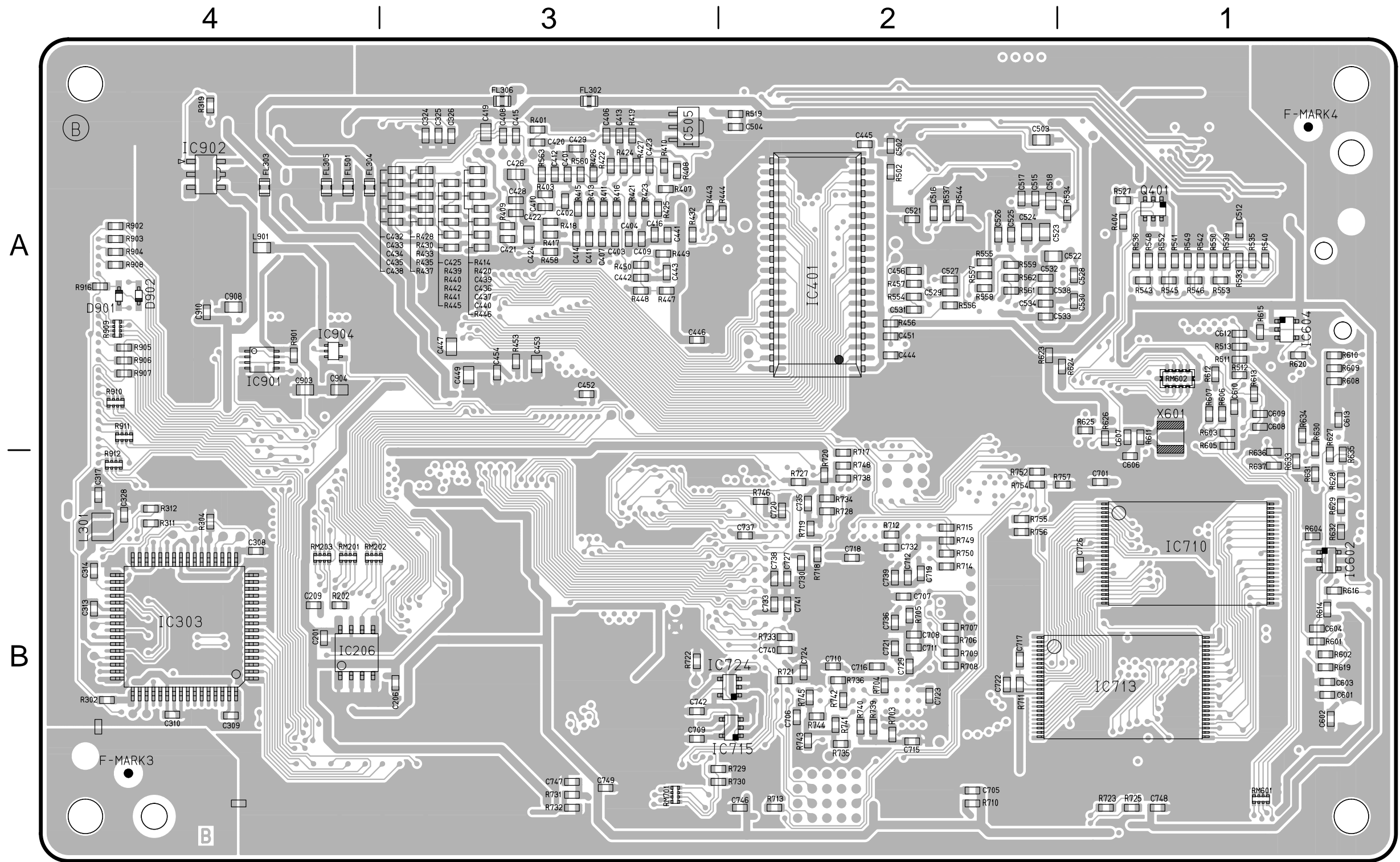


Fig. 3-6-5 EU01 Main PC Board (Bottom pattern and bottom parts location diagram)

Bottom Side

Part No.	Location	Part No.	Location	Part No.	Location	Part No.	Location	Part No.	Location
C201	B4	C522	A2	FL303	A4	R456	A2	R637	B1
C206	B3	C523	A2	FL304	A4	R457	A2	R703	B2
C209	B4	C524	A2	FL305	A4	R458	A3	R704	B2
C308	B4	C525	A2	FL306	A3	R502	A2	R705	B2
C309	B4	C526	A2	FL501	A4	R511	A1	R706	B2
C310	B4	C527	A2	IC206	B4	R512	A1	R707	B2
C313	B4	C528	A1	IC303	B4	R513	A1	R708	B2
C314	B4	C529	A2	IC401	A2	R519	A2	R709	B2
C317	B4	C530	A1	IC505	A3	R527	A1	R710	B2
C324	A3	C531	A2	IC602	B1	R533	A1	R711	B2
C325	A3	C532	A2	IC604	A1	R534	A1	R712	B2
C326	A3	C533	A2	IC710	B1	R535	A1	R713	B2
C328	B4	C534	A2	IC713	B1	R536	A1	R714	B2
C401	A3	C538	A2	IC715	B2	R537	A2	R715	B2
C402	A3	C601	B1	IC724	B2	R539	A1	R717	B2
C403	A3	C602	B1	IC901	A4	R540	A1	R718	B2
C404	A3	C603	B1	IC902	A4	R541	A1	R719	B2
C406	A3	C604	B1	IC904	A4	R542	A1	R720	B2
C407	A3	C606	B1	L301	B4	R543	A1	R721	B2
C408	A3	C607	A1	L901	A4	R544	A2	R722	B3
C409	A3	C608	A1	Q401	A1	R545	A1	R723	B1
C410	A3	C609	A1	R202	B4	R546	A1	R725	B1
C411	A3	C610	A1	R302	B4	R548	A1	R727	B2
C412	A3	C612	A1	R304	B4	R549	A1	R728	B2
C413	A3	C613	A1	R311	B4	R550	A1	R729	B3
C414	A3	C701	B1	R312	B4	R552	A1	R730	B3
C415	A3	C705	B2	R319	A4	R553	A1	R731	B3
C416	A3	C706	B2	R401	A3	R554	A2	R732	B3
C419	A3	C707	B2	R403	A3	R555	A2	R733	B2
C420	A3	C708	B2	R404	A1	R556	A2	R734	B2
C421	A3	C709	B3	R407	A3	R557	A2	R735	B2
C422	A3	C710	B2	R408	A3	R558	A2	R736	B2
C423	A3	C711	B2	R409	A3	R559	A2	R738	B2
C424	A3	C712	B2	R410	A3	R560	A3	R739	B2
C425	A3	C715	B2	R411	A3	R561	A2	R740	B2
C426	A3	C716	B2	R413	A3	R562	A2	R741	B2
C428	A3	C717	B2	R414	A3	R563	A3	R742	B2
C429	A3	C718	B2	R415	A3	R601	B1	R743	B2
C432	A3	C719	B2	R416	A3	R602	B1	R744	B2
C433	A3	C720	B2	R417	A3	R603	A1	R745	B2
C434	A3	C721	B2	R418	A3	R604	B1	R746	B2
C435	A3	C722	B2	R419	A3	R605	A1	R748	B2
C436	A3	C723	B2	R420	A3	R606	A1	R749	B2
C437	A3	C724	B2	R421	A3	R607	A1	R750	B2
C438	A3	C726	B1	R422	A3	R608	A1	R752	B2
C439	A3	C727	B2	R423	A3	R609	A1	R754	B2
C440	A3	C729	B2	R424	A3	R610	A1	R755	B2
C441	A3	C730	B2	R425	A3	R611	A1	R756	B2
C442	A3	C732	B2	R426	A3	R612	A1	R757	B1
C443	A3	C733	B2	R427	A3	R613	A1	R901	A4
C444	A2	C735	B2	R428	A3	R614	B1	R902	A4
C445	A2	C736	B2	R430	A3	R615	A1	R903	A4
C446	A3	C737	B2	R432	A3	R616	B1	R904	A4
C447	A3	C738	B2	R433	A3	R619	B1	R905	A4
C449	A3	C739	B2	R435	A3	R620	A1	R906	A4
C451	A2	C740	B2	R437	A3	R623	A2	R907	A4
C452	A3	C741	B2	R439	A3	R624	A1	R908	A4
C453	A3	C742	B3	R440	A3	R625	A1	R909	A4
C454	A3	C746	B2	R441	A3	R626	A1	R910	A4
C456	A2	C747	B3	R442	A3	R627	B1	R911	A4
C502	A2	C748	B1	R443	A3	R628	B1	R912	B4
C503	A2	C749	B3	R444	A2	R629	B1	R916	A4
C504	A2	C903	A4	R445	A3	R630	A1	RM201	B4
C512	A1	C904	A4	R446	A3	R631	B1	RM202	B4
C515	A2	C908	A4	R447	A3	R632	B1	RM203	B4
C516	A2	C910	A4	R448	A3	R633	B1	RM601	B1
C517	A2	D901	A4	R449	A3	R634	A1	RM602	A1
C518	A2	D902	A4	R450	A3	R635	B1	RM701	B3
C521	A2	FL302	A3	R453	A3	R636	B1	X601	A1

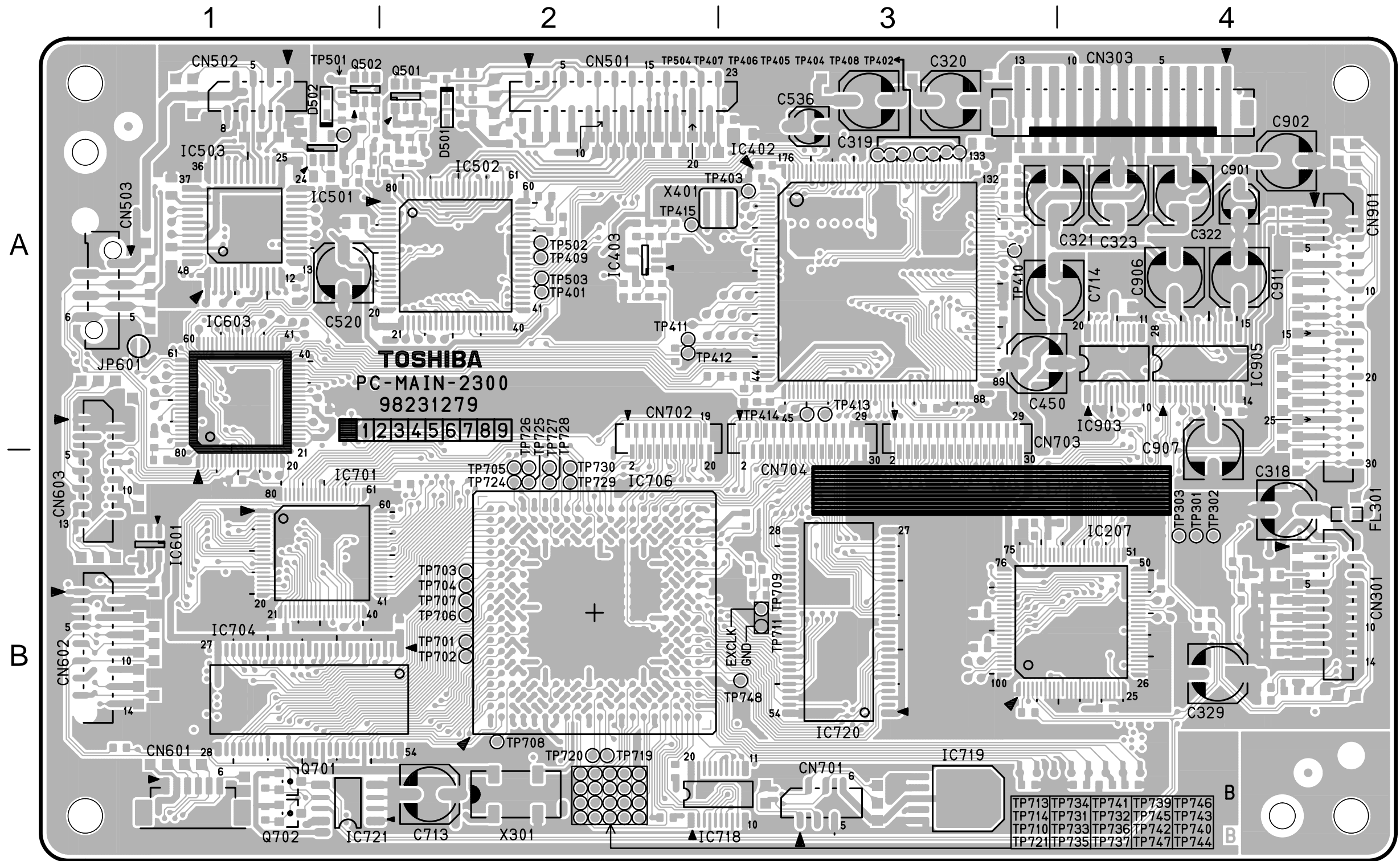


Fig. 3-6-6 EU01 Main PC Board (Top pattern, character/symbol)

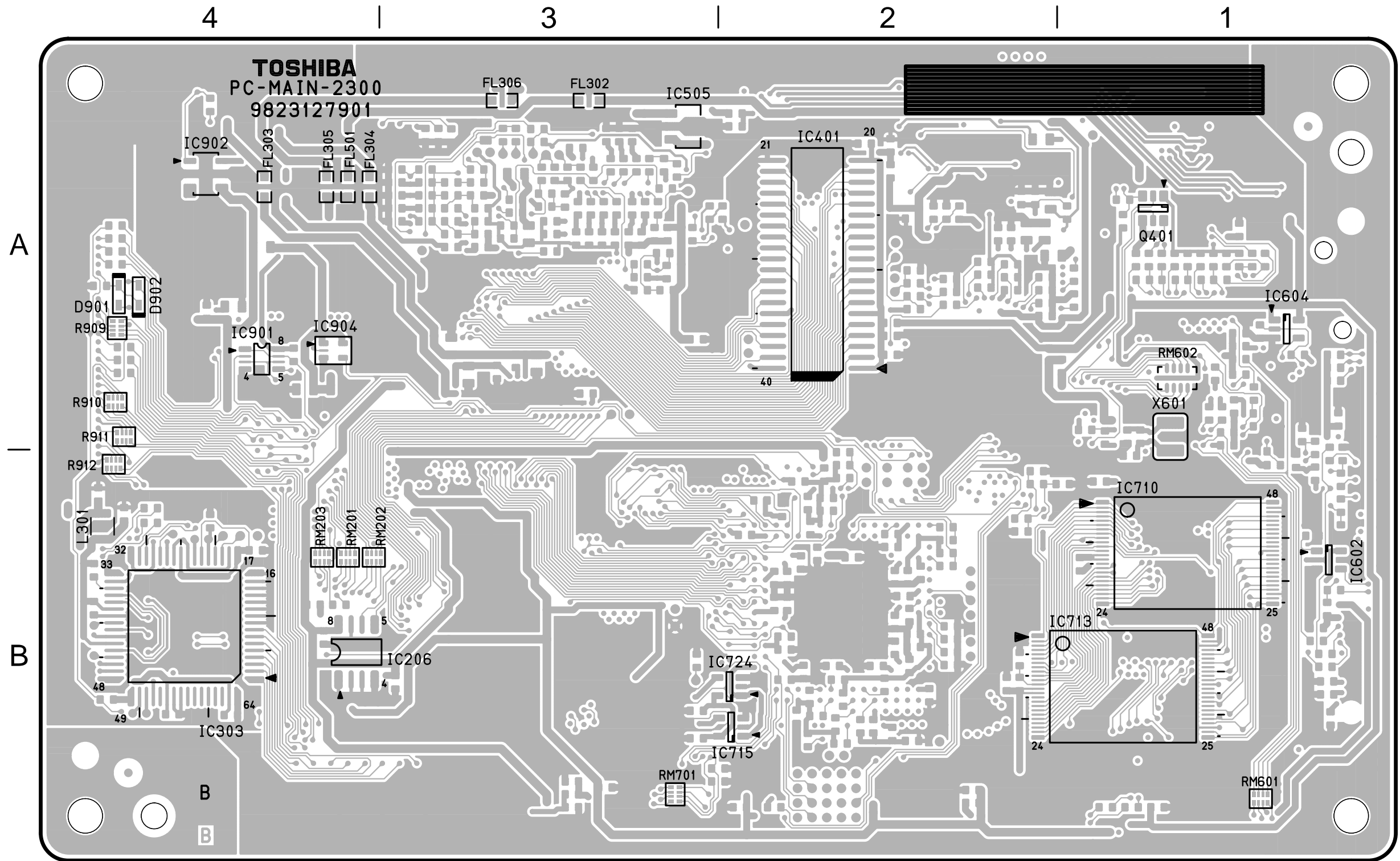
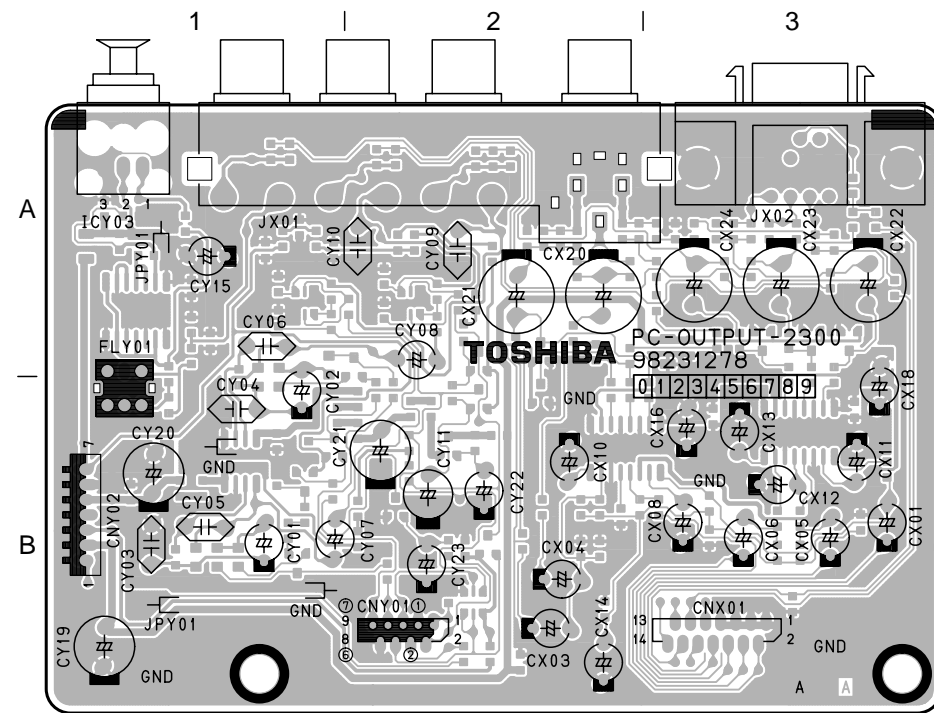


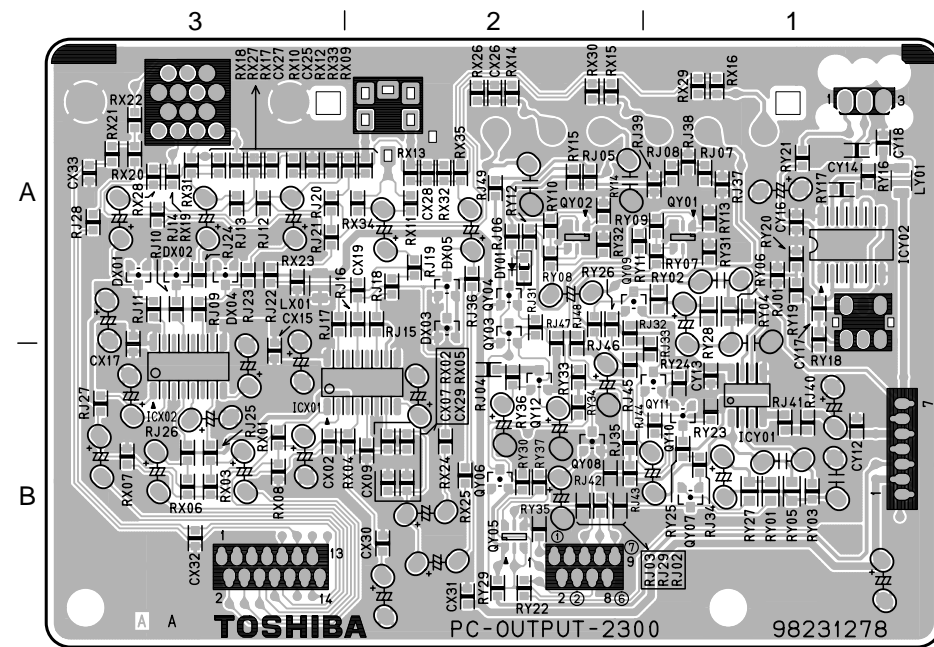
Fig. 3-6-7 EU01 Main PC Board (Bottom pattern, character/symbol)

6-4. Output PC Board



Part No.	Location	Part No.	Location
CNX01	B3	CY01	B1
CNY01	B2	CY02	B1
CNY02	B1	CY03	B1
CX01	B3	CY04	B1
CX03	B2	CY05	B1
CX04	B2	CY06	A1
CX05	B3	CY07	B1
CX06	B3	CY08	A2
CX08	B3	CY09	A2
CX10	B2	CY10	A2
CX11	B3	CY11	B2
CX12	B3	CY15	A1
CX13	B3	CY19	B1
CX14	B2	CY20	B1
CX16	B3	CY21	B2
CX18	B3	CY22	B2
CX20	A2	CY23	B2
CX21	A2	FLY01	B1
CX22	A3	ICY03	A1
CX23	A3	JX01	A1
CX24	A3	JX02	A3

Fig. 3-6-8 EU5 Output PC Board (Top side)



Part No.	Location	Part No.	Location	Part No.	Location	Part No.	Location	Part No.	Location
CX02	B3	QY03	A2	RJ26	B3	RX13	A2	RY13	A1
CX07	B2	QY04	A2	RJ27	B3	RX14	A2	RY14	A2
CX09	B2	QY05	B2	RJ28	A3	RX15	A2	RY15	A2
CX15	B3	QY06	B2	RJ29	B2	RX16	A1	RY16	A1
CX17	B3	QY07	B1	RJ31	A2	RX17	A3	RY17	A1
CX19	A2	QY08	B2	RJ32	A2	RX18	A3	RY18	A1
CX25	A3	QY09	A2	RJ33	B1	RX19	A3	RY19	A1
CX26	A2	QY10	B1	RJ34	B1	RX20	A3	RY20	A1
CX27	A3	QY11	B1	RJ35	B2	RX21	A3	RY21	A1
CX28	A2	QY12	B2	RJ36	A2	RX22	A3	RY22	B2
CX29	B2	RJ01	A1	RJ37	A1	RX23	A3	RY23	B1
CX30	B2	RJ02	B2	RJ38	A1	RX24	B2	RY24	B1
CX31	B2	RJ03	B2	RJ39	A1	RX25	B2	RY25	B1
CX32	B3	RJ04	B2	RJ40	B1	RX26	A2	RY26	A2
CX33	A3	RJ05	A2	RJ41	B1	RX27	A3	RY27	B1
CY12	B1	RJ06	A2	RJ42	B2	RX28	A3	RY28	A1
CY13	B1	RJ07	A1	RJ43	B2	RX29	A1	RY29	B2
CY14	A1	RJ08	A1	RJ44	B1	RX30	A2	RY30	B2
CY16	A1	RJ09	A3	RJ45	B2	RX31	A3	RY31	A1
CY17	A1	RJ10	A3	RJ46	A2	RX32	A2	RY32	A2
CY18	A1	RJ11	A3	RJ47	B2	RX33	A2	RY33	B2
DX01	A3	RJ12	A3	RJ48	B2	RX34	A2	RY34	B2
DX02	A3	RJ13	A3	RJ49	A2	RX35	A2	RY35	B2
DX03	A2	RJ14	A3	RX01	B3	RY01	B1	RY36	B2
DX04	A3	RJ15	A2	RX02	B2	RY02	A1	RY37	B2
DX05	A2	RJ16	A2	RX03	B3	RY03	B1		
DY01	A2	RJ17	A3	RX04	B2	RY04	A1		
ICX01	B2	RJ18	A2	RX05	B2	RY05	B1		
ICX02	B3	RJ19	A2	RX06	B3	RY06	A1		
ICY01	B1	RJ20	A3	RX07	B3	RY07	A1		
ICY02	A1	RJ21	A3	RX08	B3	RY08	A2		
LX01	A3	RJ22	A3	RX09	A2	RY09	A1		
LY01	A1	RJ23	A3	RX10	A3	RY10	A2		
QY01	A1	RJ24	A3	RX11	A2	RY11	A2		
QY02	A2	RJ25	B3	RX12	A3	RY12	A2		

Fig. 3-6-9 EU5 Output PC Board (Bottom side)

6-5. Front Display PC Board

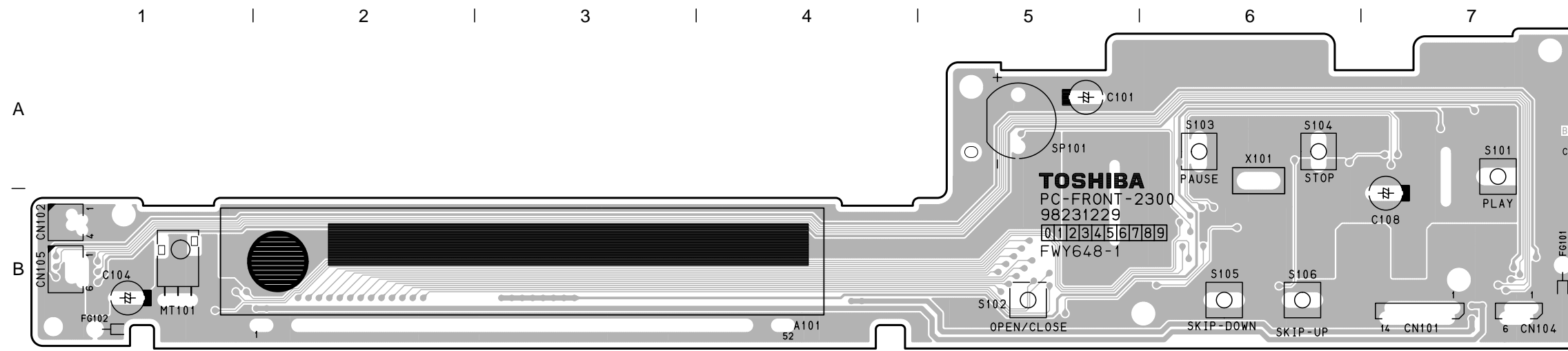


Fig. 3-6-10 EU03 Front Display PC Board (Top Side)

Part No.	Location
A101	B3
C101	A5
C104	B1
C108	B7
CN101	B7
CN102	B1
CN104	B7
CN105	B1
FG101	B7
FG102	B1
MT101	B1
S101	A7
S102	B5
S103	A6
S104	A6
S105	B6
S106	B6
SP101	A5
X101	A6

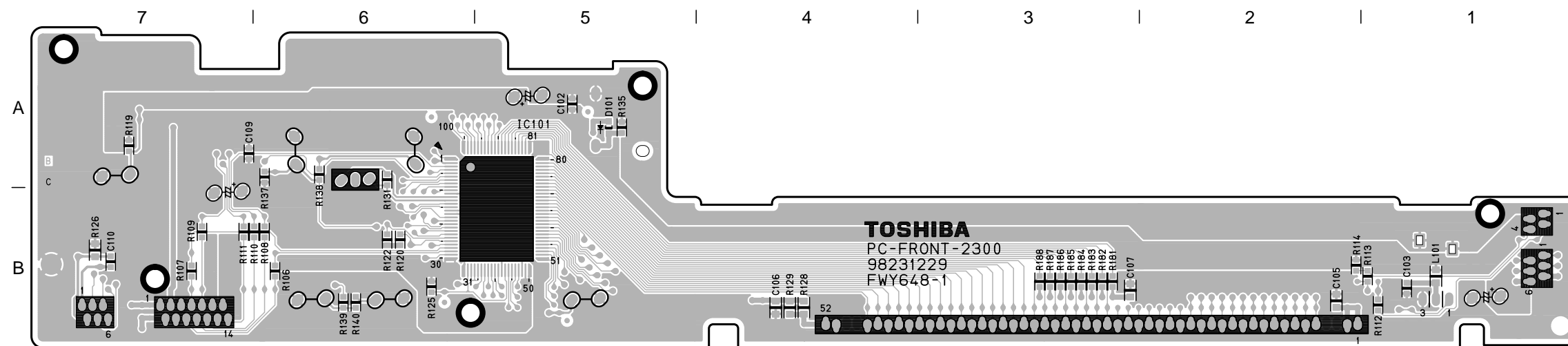


Fig. 3-6-11 EU03 Front Display PC Board (Bottom Side)

Part No.	Location	Part No.	Location
C102	A5	R114	B2
C103	B1	R119	A7
C105	B2	R120	B6
C106	B4	R122	B6
C107	B3	R125	B6
C109	A7	R126	B7
C110	B7	R128	B4
D101	A5	R129	B4
FM101	A6	R131	A6
FM102	B6	R135	A5
FM103	B5	R137	A6
FM104	A5	R138	A6
IC101	B5	R139	B6
L101	B1	R140	B6
R106	B6	R181	B3
R107	B7	R182	B3
R108	B6	R183	B3
R109	B7	R184	B3
R110	B6	R185	B3
R111	B7	R186	B3
R112	B1	R187	B3
R113	B1	R188	B3

1

2

3

4

5

A

6-6. PC Game Port PC Board

B

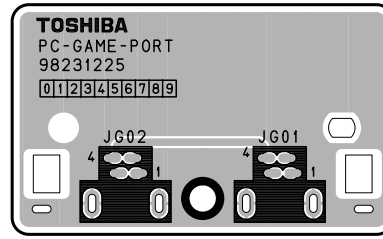
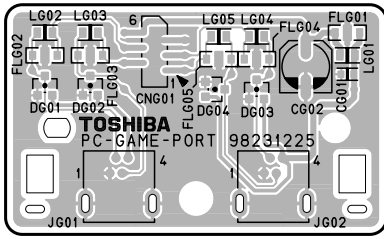


Fig. 3-6-12 EU53 PC Game Port PC Board (Top side)

Fig. 3-6-13 EU53 PC Game Port PC Board (Bottom side)

C

D

E

F

G

SECTION 4 PARTS LIST

SAFETY PRECAUTION

The parts identified by ! (\triangle) 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 = 10 μ F $\pm 5\%$

- 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 ± 2 pF

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. 470ohmJ = 470ohm $\pm 5\%$

4. EXPLODED VIEWS

4-1. Packing Assembly

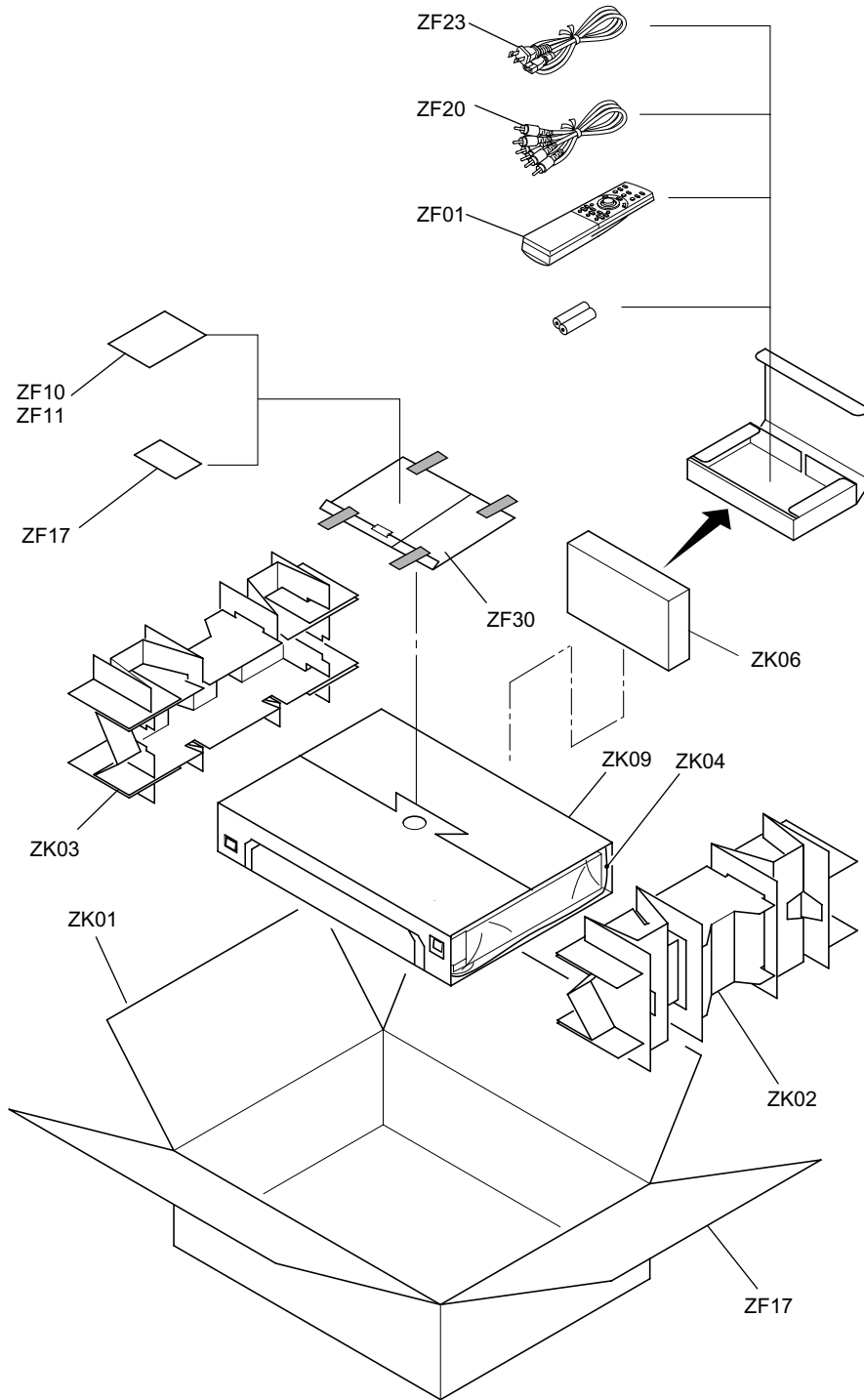
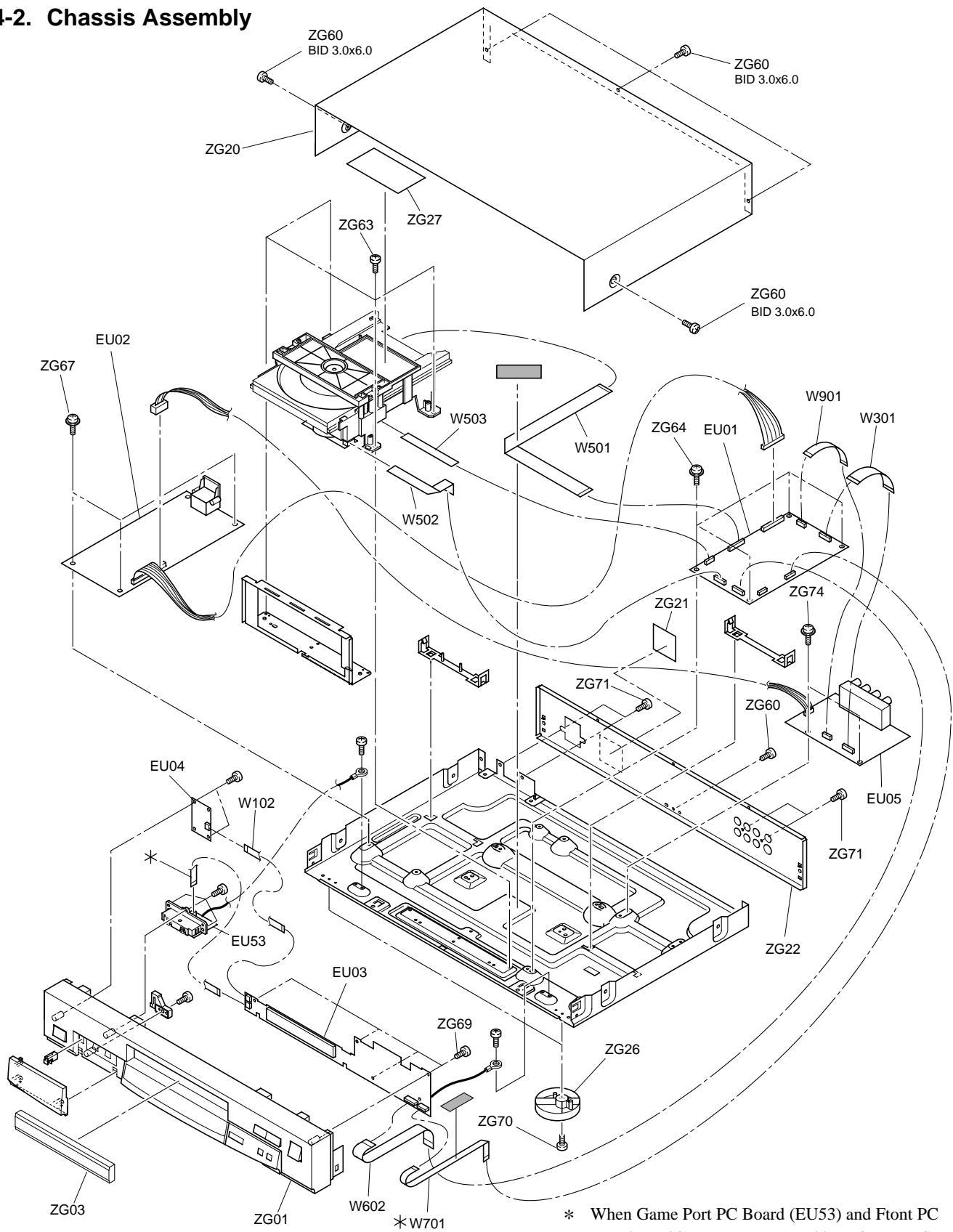


Fig. 4-4-1

4-2. Chassis Assembly



* When Game Port PC Board (EU53) and Front PC Board (EU03) are not connected by using a FFC, connect Game Port PC Board (EU53) and Main PC Board (EU01) directly by using the FFC (W701). FFC (W701) is a service part. Connect the Game Port PC Board (EU53) to the Main PC Board (EU01) when servicing.

Fig. 4-4-2

4-3. Mechanism Assembly

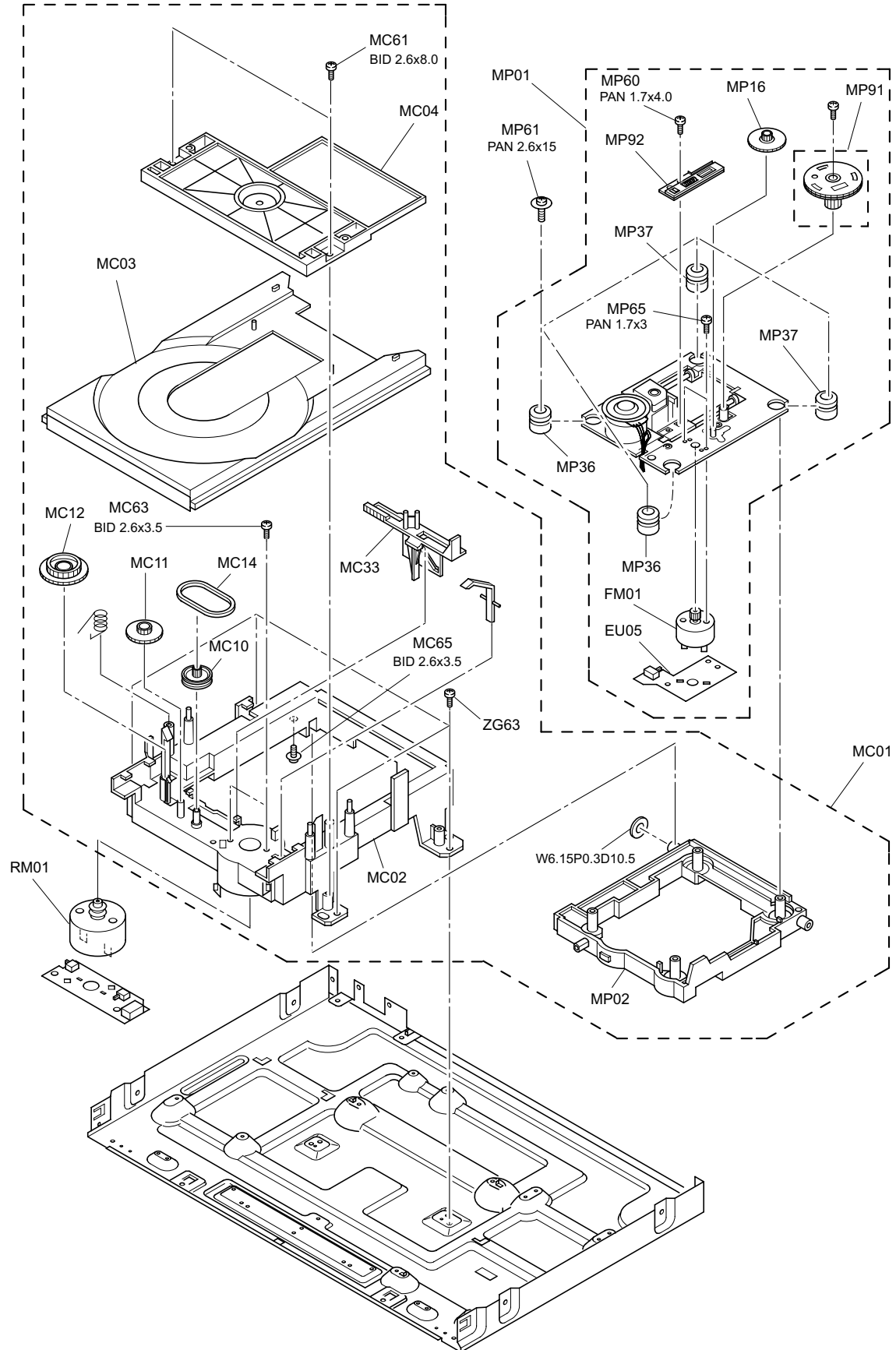


Fig. 4-4-3

LOCATION PART

NUMBER NUMBER DESCRIPTION

- MECHANICAL PARTS -

FM01	79070421	Motor Assy,Feed	
MC01	79070416	Chassis Assy,Mechanism	
MC14	79070428	Belt,Loading	
MP01	79070467	Mechanism Assy,Pickup	
MP16	79070422	Gear	
MP36	79070458	Rubber,Dumper Kit	
MP37	79070458	Rubber,Dumper Kit	
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	
W102	79080268	Cable,Flexible	FFC,4P,L130
W301	79080226	Cable,Flexible	FFC,14P,L70
W501	79080191	Cable,Flexible	FFC,18P,L297
W502	79080193	Cable,Flexible	FFC,8P,L85
W503	79080192	Cable,Flexible	FFC,6P,L110
W602	79080271	Cable,Flexible	FFC,14P,L120
W701	79080272	Cable,Flexible	FFC,6P,L500
W901	79080270	Cable,Flexible	FFC,9P,L70
ZF01	79078065	Remote Control Unit	
! ZF10	79077114	Owners Manual	English
! ZF11	79077115	Owners Manual	Spanish
ZF16	79075104	Label,Shipping	
ZF17	79070272	Warranty Card	USA
ZF20	79070037	Cable,AV	
! ZF23	79088007	Power Cord	
ZF30	79070042	Bag,Polyethylene	
ZG01	79071173	Front Panel	
ZG03	79071174	Panel,Tray	
ZG20	79073055	Cover,Top	
! ZG21	79073057	Label,Rating	
ZG26	79073036	Foot Assy,Front	
! ZG27	79070468	Label,Caution	
ZK01	79075137	Case	
ZK02	79075094	Packing,L	
ZK03	79075094	Packing,L	
ZK04	79070033	Bag,Polyethylene	
ZK06	79075142	Box,Accessory	
ZK09	79075095	Sleeve,Protect	
ZZ03	79080074	Kit,Data Update	

LOCATION	PART		LOCATION	PART			
NUMBER	NUMBER	DESCRIPTION	NUMBER	NUMBER	DESCRIPTION		
		- ELECTRICAL PARTS -					
EU01	79083070	PC Board Assy Main					
		- INTEGRATED CIRCUITS -					
IC303	79040246	IC ADV7190KST	R802	79030055	Res,Oxide Metal	1Mohm	J 1/2W
IC401	79040148	IC V53C16128HK-30					
IC402	79040224	IC TC9489F	! F801	79087002	Fuse	1.6A,250V	
IC501	79040006	IC TC7S04F	! F821	79070061	Fuse	125V,3.0A	
IC502	79040225	IC TC1313F	! F822	79070054	Fuse	125V,3.5A	
IC503	79040150	IC KA3032	! F823	79070054	Fuse	125V,3.5A	
IC505	79040066	IC UPC29L33T	! P802	79089023	Jack	AC Inlet	
IC601	79040248	IC S-80145CLMC-J16	RF823	79030015	Res,Fusible	2.2ohm	J 1/4W
IC602	79040007	IC TC7S08F	T801	79010025	Line Filter	183Y0R5	
IC603	79040293	IC TMP93CS44F-1B74	T802	79010026	Power Transformer	SRW3020ED5-210	
IC604	79040007	IC TC7S08F					
IC701	79040286	IC SLA5028	EU03	-----	PC board Assy	Front	
IC704	79040245	IC HY57V651620B			- INTEGRATED CIRCUITS -		
IC713	79040284	IC MBM29DL324BD	IC101	79040291	IC	TMP87CH75F-1V79	
IC715	79040119	IC TC7SH86F			- DIODES -		
IC718	79040287	IC TC74LVX244FT	D101	79060022	Diode,Chip	1SS368	
IC719	79040285	IC PQ20WZ518			- MISCELLANEOUS -		
IC720	79040245	IC HY57V651620B	A101	79089107	Display,FL	20U47100SAN	
IC721	79040264	IC S-24C02BFJ-TB	MT101	79080140	Module,RMT	GPU261X	
IC724	79040119	IC TC7SH86F	S101	79089020	Switch	Push	
IC901	79040087	IC TC7W241FU	S102	79089020	Switch	Push	
IC902	79040102	IC NJM2370U05	S103	79089020	Switch	Push	
IC903	79040227	IC PLL1700E-T	S104	79089020	Switch	Push	
IC904	79040249	IC TC7SH08FU	S105	79089020	Switch	Push	
IC905	79040228	IC PLL1716E-T	S106	79089020	Switch	Push	
		- TRANSISTORS -	SP101	79089086	Buzzer	HAS-RP2-14-41-11	
Q401	79050014	Transistor,Chip	X101	79089095	Oscillator,Ceramic	8MHZ	
Q501	79050015	Transistor,Chip					
Q502	79050015	Transistor,Chip					
Q701	79050084	Transistor,Chip	EU04	-----	PC board Ass	Power Switch	
Q702	79050084	Transistor,Chip			- TRANSISTORS -		
		- DIODES -	Q141	79050001	Transistor,Chip	RN2402	
D501	79060022	Diode,Chip			- DIODES -		
D502	79060022	Diode,Chip	D141	79060035	Diode,LED		
D901	79060022	Diode,Chip			- MISCELLANEOUS -		
		- MISCELLANEOUS -	S141	79089020	Switch	Push	
X301	79089120	Oscillator,Crystal	EU05	-----	PC board Ass	Output	
X401	79089021	Oscillator,Ceramic			- INTEGRATED CIRCUITS -		
X601	79080015	Oscillator	ICX01	79040229	IC	LA7106M-TLM	
			ICX02	79040229	IC	LA7106M-TLM	
EU02	79085068	PC Board Assy Power	ICY01	79040044	IC	NJM4580E	
		- TRANSISTORS -	ICY02	79040074	IC	TC74HCU04AF	
! Q801	79040221	IC STR-G6551LF1105			- TRANSISTORS -		
! Q802	79050041	Photo Coupler	QY01	79050014	Transistor,Chip	HN1C03F	
Q821	79040146	IC TA76431S	QY02	79050014	Transistor,Chip	HN1C03F	
Q822	79050076	Transistor	QY03	79050001	Transistor,Chip	RN2402	
Q823	79050005	Transistor	QY04	79050001	Transistor,Chip	RN2402	
Q824	79050077	Transistor	QY05	79050012	Transistor,Chip	RN4601	
Q825	79050076	Transistor	QY06	79050001	Transistor,Chip	RN2402	
Q826	79040222	IC SI-3050CALF1101	QY07	79050085	Transistor,Chip	2SC3326-B	
Q827	79040223	IC SI-3033CALF1101	QY08	79050016	Transistor,Chip	2SC2712	
Q828	79040223	IC SI-3033CALF1101	QY09	79050085	Transistor,Chip	2SC3326-B	
		- DIODES -	QY10	79050001	Transistor,Chip	RN2402	
! D802	79060016	Diode	QY11	79050001	Transistor,Chip	RN2402	
! D803	79060016	Diode	QY12	79050016	Transistor,Chip	2SC2712	
! D804	79060016	Diode			- DIODES -		
! D805	79060016	Diode	DX01	79060028	Diode,Chip	1SS226	
D806	79060009	Diode	DX02	79060028	Diode,Chip	1SS226	
D807	79060013	Diode	DX03	79060028	Diode,Chip	1SS226	
D808	79060015	Diode	DX04	79060028	Diode,Chip	1SS226	
D821	79060010	Diode	DX05	79060028	Diode,Chip	1SS226	
D822	79060010	Diode	DY01	79060022	Diode,Chip	1SS368	
D824	79060013	Diode			- MISCELLANEOUS -		
D825	79060013	Diode	JX01	79089094	Plate,Jack		
D826	79060013	Diode					
D828	79060012	Diode	EU53	79081070	PC Board Assy	Game Port	
D829	79060008	Diode					
D830	79060012	Diode					
D831	79060007	Diode,Zener					
D832	79060034	Diode,Zener					
D833	79060005	Diode,Zener					
D834	79060034	Diode,Zener					
D835	79060017	Diode					
D836	79060010	Diode					
D842	79060008	Diode					
		- CAPACITORS -					

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