

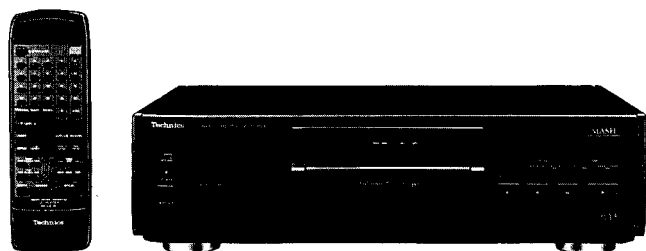
Service Manual

COMPACT
disc
DIGITAL AUDIO

DIGITAL

MASH*
multi-stage noise shaping

Compact Disc Player
SL-P2000



Color

(K) ... Black Type

Area

Country Code	Area	Color
(EG)	Europe.	(K)
(EB)	Great Britain.	
(GC)	Asia, Latin America, Middle Near East and Africa.	

- ※
- Technics (or Panasonic) developed the world's first MASH type DAC and ADC. MASH technology was invented by NTT (LSI Labs).
 - MASH is a trademark of NTT.

NEW MECHANISM SERIES (RAE0201-1)

SPECIFICATIONS

■ Audio

No. of channels	2 (left and right, stereo)
Frequency response	2–20,000 Hz, ± 0.2 dB
Output voltage	2.3 V (at 0 dB)
Dynamic range	100 dB
S/N	120 dB
Harmonic distortion	0.0008% (1 kHz, 0 dB)
Total harmonic distortion	0.0014% (1 kHz, 0 dB)
Channel separation	115 dB
Wow and flutter	Below measurable limit
DA converter	S-Advanced MASH, 1 bit
Output impedance	600 Ω
Load impedance	More than 10 k Ω

■ Pickup

Wavelength	780 nm
Laser Power	No hazardous radiation is emitted (with safety protection)

■ General

Power consumption	18 W
Power supply	
For Europe:	AC 50/60 Hz, 230–240 V
For others:	AC 50/60 Hz, 110 V / 127 V / 220 V / 240 V
Dimensions (W×H×D)	448×125×332 mm
Weight	7.7 kg

Note:

Design and specifications are subject to change without notice. Weight and dimensions are approximate.

This apparatus was produced to BS 800.

Technics

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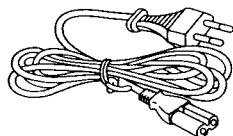
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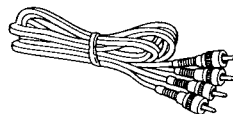
ACCESSORIES

Note:

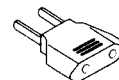
The configuration of the AC power supply cord differs according to area.



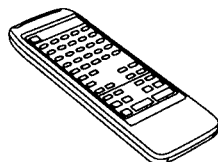
AC power supply cord 1 pc.
[VJA0733 (EB)
[RJA0019-2K (EG, GC)]



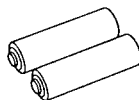
Stereo connection cable 1 pc.
[SJPD18]



Power plug adaptor 1 pc.
[SJP5213-2 (GC)]



Remote control transmitter
[RAK-SL512W] 1 pc.



Batteries "AAA" (UM4/R03) 2 pcs.
for remote control transmitter

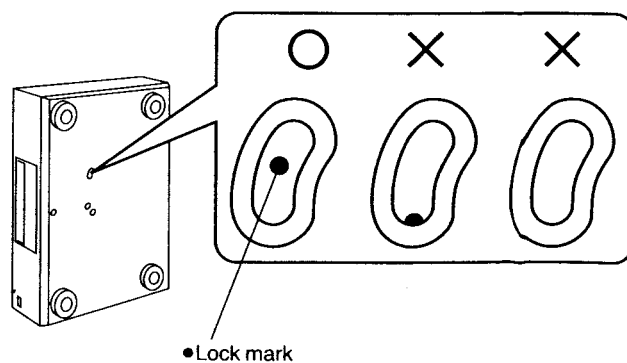
Note:

These are available on sale route.

BEFORE TRANSPORTING THE UNIT

To safeguard against damage in transit, be sure to secure the optical pickup by following the procedure below.

- 1 Remove the compact disc inside, and set the power switch to OFF with the disc tray still open.
- 2 Slowly push in the disc tray by hand.
 - Do not tilt the unit while doing this.
 - If the disc tray is not pushed in slowly, the optical pick-up may not be secured properly.
- 3 Check that the lock mark can be seen in its entirety as shown in the figure on the right.



■ PRECAUTION OF LASER DIODE

CAUTION: This product utilizes a laser diode with the unit turned "on", invisible laser radiation is emitted from the pickup lens.
Wave length: 780nm
Maximum output radiation power from pickup: 100μW/VDE

Laser radiation from the pickup lens is safety level, but be sure the followings:

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

ACHTUNG: Dieses Produkt enthält eine Lasereinheit. Im eingeschalteten Zustand wird unsichtbare Laserstrahlung von der Lasereinheit abgestrahlt.

Wellenlänge: 780nm

Maximale Strahlungsleistung der Lasereinheit: 100μW/VDE

Die Strahlung an der Lasereinheit ist ungefährlich, wenn folgende Punkte beachtet werden:

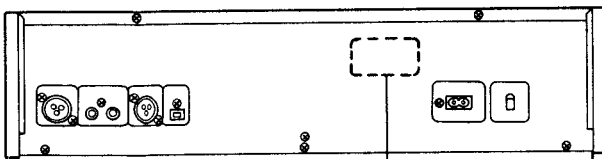
1. Die Lasereinheit nicht zerlegen, da die Strahlung an der freigelegten Laserdiode gefährlich ist.
2. Den werkseitig justierten Einstellregler der Lasereinheit nicht verstellen.
3. Nicht mit optischen Instrumenten in die Fokussierlines blicken.
4. Nicht über längere Zeit in die Fokussierlinse blicken.

ADVARSEL: I dette a apparat anvendes laser.

• Use of caution labels

Note: ○ Mark is used, × Mark is not used.

Areas	SQWD7	RQLS0021	RQLS0078
(EG)	○	○	○
(EB)	○	○	×
(GC)	○	○	×

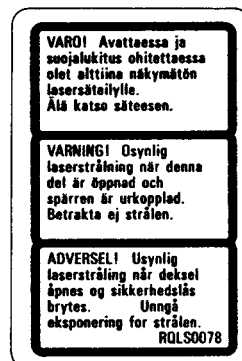


SQWD7

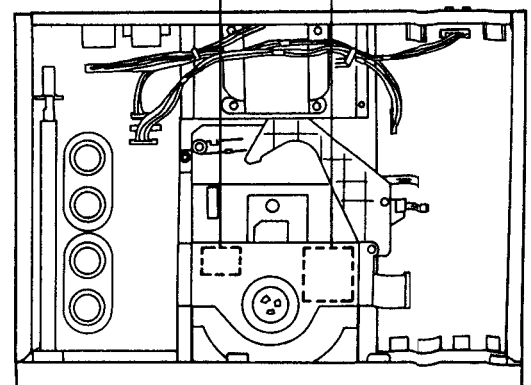
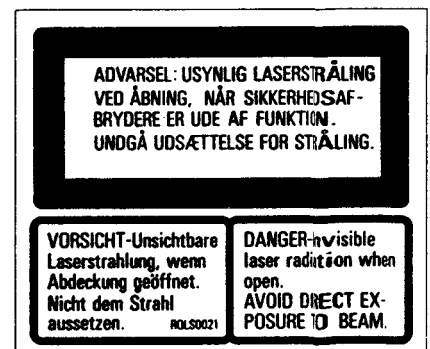


LUOKAN 1 LASERLAITE
KLASS 1 LASER APPARAT

RQLS0078



RQLS0021

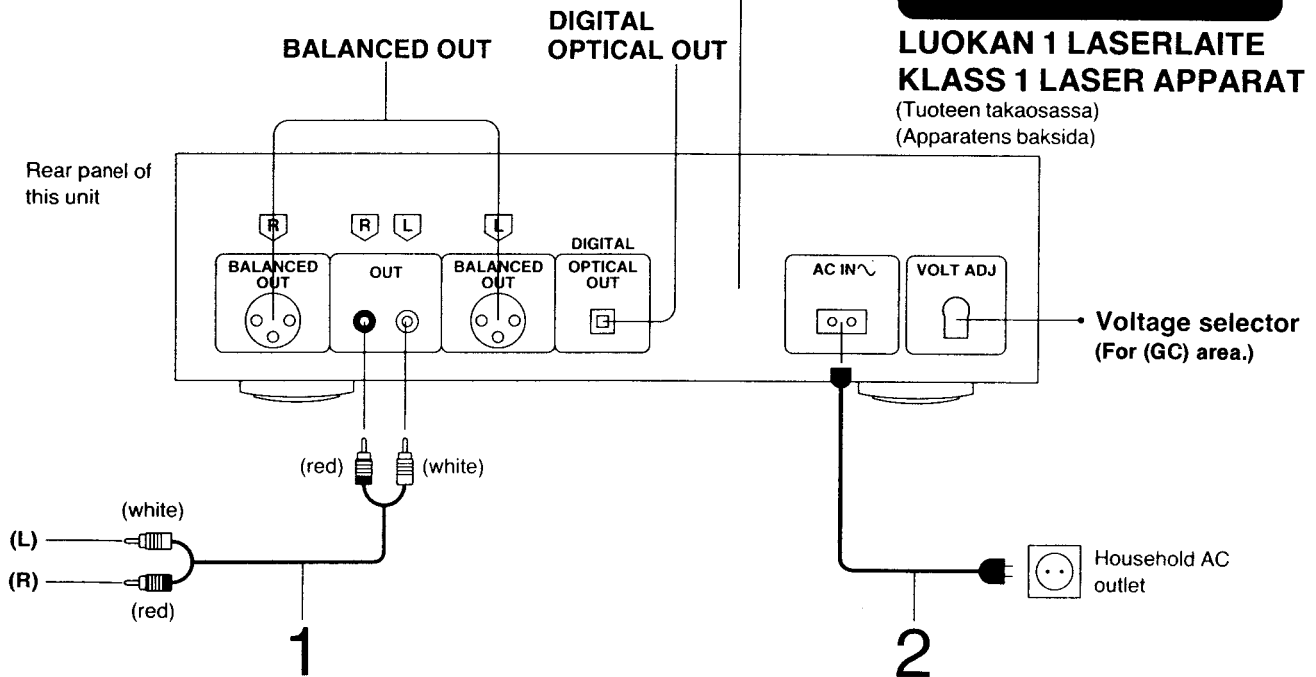


CONNECTIONS

Before connecting this unit to your audio system, be sure that the power of this unit and all other system components are turned off.

Note:

The configuration of the AC outlet and AC power supply cord differs according to area.



(For (GC) area.)

Voltage selector (VOLT ADJ)

Set the voltage selector to the voltage setting for the area in which the unit will be used. [Use a minus (-) screwdriver.]

Note that this unit will be seriously damaged if this setting is not made correctly.

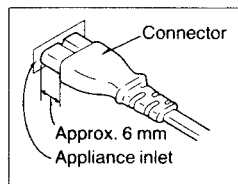
If the power supply in your area is 117 V or 120 V, set to the "127 V" position.

- 1** Connect the stereo connection cable (included) to CD or AUX terminals of the amplifier.
- 2** Connect the power supply cord (included) to the household AC outlet or the AC OUTLET of Technics component.

For Europe:

Insertion of Connector

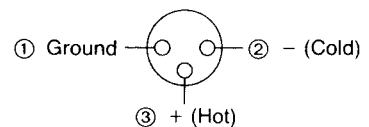
Even when the connector is perfectly inserted, depending on the type of inlet used, the front part of the connector may jut out as shown in the drawing. However there is no problem using the unit.



BALANCED OUT

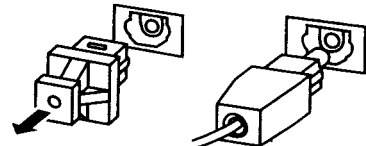
Connect to an amplifier that has a cannon type in put terminal (balanced output).

Cannon terminal



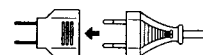
DIGITAL OPTICAL OUT

This terminal can be used for connection with other equipment that has a digital input terminal, such as an amplifier, by using an optical cable (optional). A dust-protection cap is inserted in this terminal. Remove this cap only when a connection is to be made to this terminal.

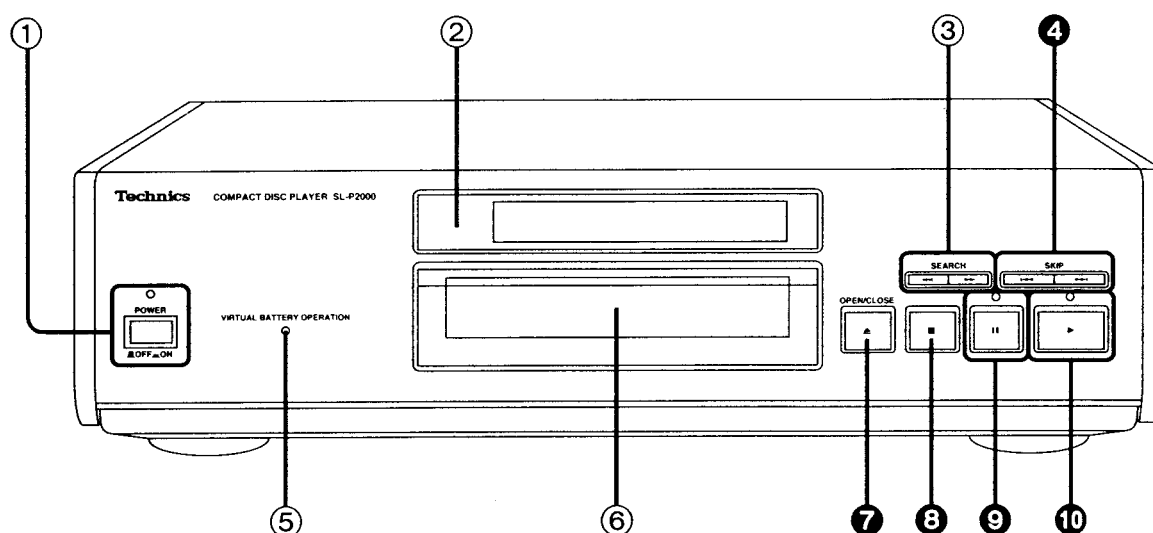


For areas except Europe

If the power plug will not fit your socket, use the power plug adaptor (included).



FRONT PANEL CONTROLS AND FUNCTIONS



Numbers with black background (for example ④) indicate functions available on the remote control. (See page 6.)

① **Power switch and indicator** (■ OFF, ■ ON)

② **Remote control signal sensor**

③ **Search buttons** (◀◀ SEARCH ▶▶)

These buttons are used for fast forward and backward searching during play.

④ **Skip buttons** (◀◀ SKIP ▶▶)

These buttons are used to skip by track in the forward or reverse direction.

⑤ **Virtual battery operation indicator**
(VIRTUAL BATTERY OPERATION)

⑥ **Disc tray**

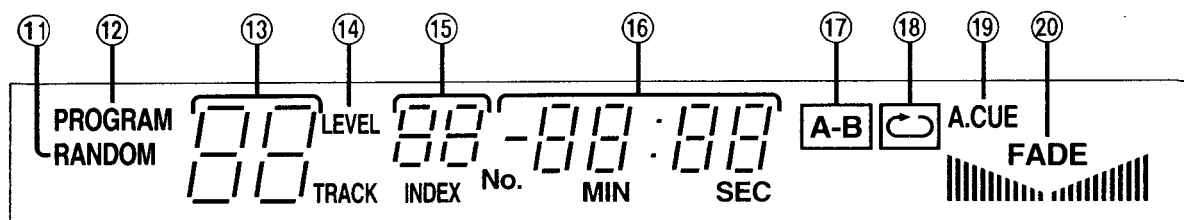
⑦ **Disc tray open/close button**
(▲ OPEN/CLOSE)

⑧ **Stop button** (■)

⑨ **Pause button and indicator** (||)

⑩ **Play button and indicator** (▶)

Display section



⑪ **Random indicator** (RANDOM)

⑫ **Program indicator** (PROGRAM)

⑬ **Track number display** (TRACK)

⑭ **Level control indicator** (LEVEL)

⑮ **Index/Program number display** (INDEX, No.)

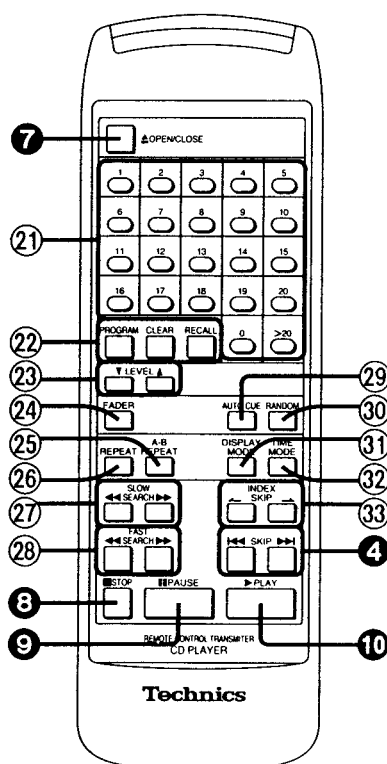
⑯ **Time display** (MIN, SEC)

⑰ **A-B repeat indicator** (A-B)

⑱ **Repeat indicator** ()

⑲ **Auto cue indicator** (A. CUE)

⑳ **Fade in/out indicator** (FADE)



Remote control section

Numbers with black background (for example ④) indicate functions available on the main unit.

②① Numeric buttons (1–20, 0, > 20)

②② Buttons for program function

●Program button (PROGRAM)

Pressing this button initiates the program play mode. You can then enter specific tracks using the numeric buttons.

●Clear button (CLEAR)

Each pressing this button makes one track cleared from the programmed sequence.

●Recall button (RECALL)

This button can be used to display the contents of the programmed track sequence for confirmation.

②③ Level buttons (▼ LEVEL ▲)

These buttons can be used to control output level.

②④ Fade in/out button (FADER)

Pressing this button in the pause mode initiates the fade-in. Pressing this button in the play mode initiates the fade-out.

②⑤ A–B repeat button (A–B REPEAT)

Pressing this button enables the programs in the selected range to be played repeatedly.

②⑥ Repeat button (REPEAT)

Pressing this button enables all the tracks or programmed tracks to be played repeatedly.

②⑦ Slow search buttons (◀◀ SLOW SEARCH ▶▶)

These buttons can be used to move forward or backward on the disc during play at slow speed.

②⑧ Fast search buttons (◀◀ FAST SEARCH ▶▶)

These buttons can be used to move forward or backward on the disc during play at high speed.

②⑨ Auto cue button (AUTO CUE)

Pressing this button enables the unit to stop at the beginning of every track and switch to the play standby mode.

③⑩ Random button (RANDOM)

This button can be used to play the tracks on a disc in a random sequence.

③① Display mode button (DISPLAY MODE)

Pressing this button enables the unit to turn off the indicators on the display.

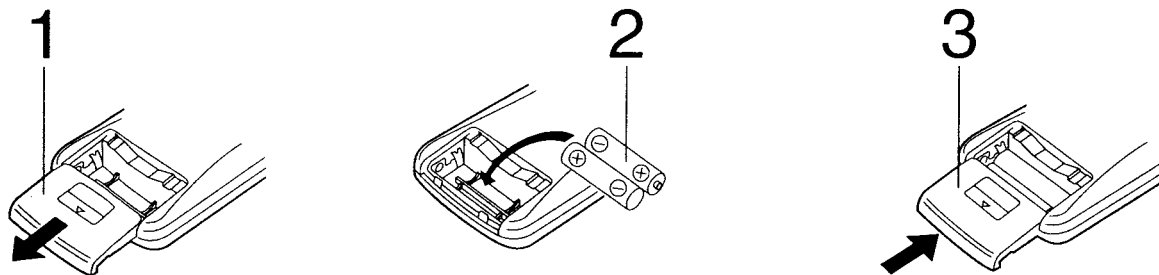
③② Time mode select button (TIME MODE)

③③ Index skip button (— INDEX SKIP —)

These buttons are used to skip by index number (subdivisions within the current track).

■ CONCERNING THE REMOTE CONTROL

Battery installation



1 Open the cover.

Press gently and slide the cover out.

2 Insert the batteries included with this unit.

When you need to replace these batteries, use two UM-4 AAA, IEC R03 (1.5 V) or equivalent batteries.

- Be sure that you insert the batteries so that their positive (+) and negative (–) polarities match the polarities indicated in the compartment. Batteries installed with incorrect polarities may leak and damage.
- Refer to “Use of batteries” for additional information.

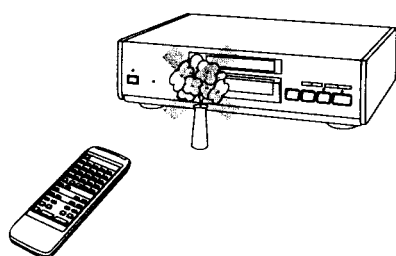
3 Close the cover.

Use of batteries

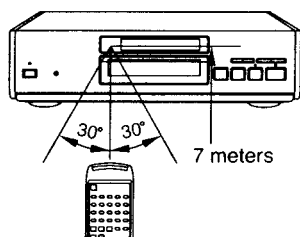
- Do not mix old and new batteries or batteries of different types (carbon and alkaline, etc.).
- The average battery life is about one year. Although the battery life varies depending on how often the device is used, you should generally replace the batteries about once a year.
- Replace the batteries if commands from the remote control transmitter do not operate the unit even when the transmitter is held close to the front panel.
- Never subject batteries to excessive heat or flame; do not attempt to disassemble them; and be sure they are not short-circuited.
- If you will not be using the remote control for a long period of time, remove the batteries and store them in a cool, dark place.

- If a battery leaks, remove all batteries and dispose of them properly. Thoroughly clean the battery compartment before inserting new batteries. If the leaking electrolyte comes into contact with skin or clothes, flush with water immediately.
- Keep batteries out of reach of children.
- Do not use rechargeable type (nickel-cadmium) batteries.
- Do not attempt to recharge alkaline or carbon batteries.
- Always remove old, weak, or worn-out batteries promptly and dispose of them properly.
- Do not dispose of used batteries in household rubbish.

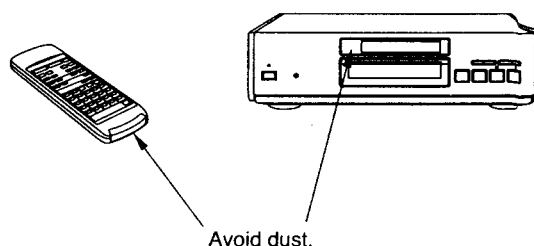
Operation notes



Aim the remote control transmission window toward the unit's sensor. Avoid any obstacles.



Use the remote control within a 60-degree angle of the unit. The reachable distance is within 7 meters directly facing toward the unit.



- Be sure the transmission window and the unit's sensor are free from dust. Excessive dust might prevent reception.
- If direct sunlight or other strong light sources strike the remote control signal sensor of the unit, operation may be impaired. If there is a problem, place the unit away from the light source.
- If this unit is installed in a rack with glass doors, the glass doors' thickness or color might make it necessary to use the remote control transmitter a shorter distance from the unit.

■ HANDLING PRECAUTIONS FOR OPTICAL PICKUP

The laser diode in the optical pickup may break down due to potential difference caused by static electricity of clothes or human body.

So, be careful of electrostatic breakdown during repair of the optical pickup.

• Handling of optical pickup

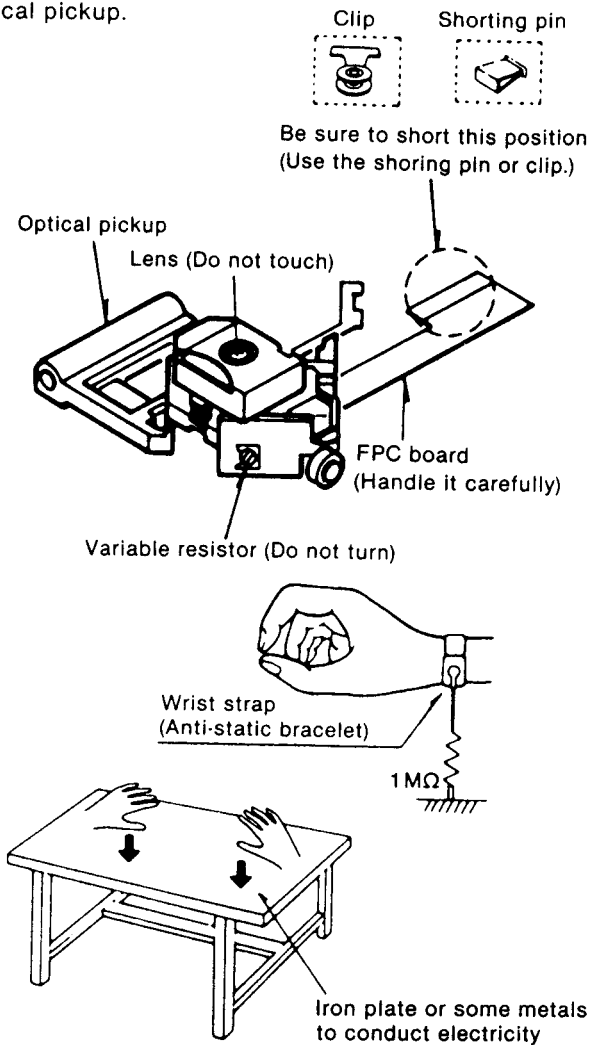
1. Do not subject the optical pickup to static electricity as it is extremely sensitive to electrical shock.
2. To prevent the breakdown of the laser diode, an antistatic shorting pin is inserted into the flexible board (FPC board).
When removing or connecting the short pin, finish the job in as short time as possible.
3. Take care not to apply excessive stress to the flexible board (FPC board).
4. Do not turn the variable resistor (laser power adjustment). It has already been adjusted.

• Grounding for electrostatic breakdown prevention

1. Human body grounding
Use the anti-static wrist strap to discharge the static electricity from your body.
2. Work table grounding
Put a conductive material (sheet) or steel sheet on the area where the optical pickup is placed, and ground the sheet.

Caution:

The static electricity of your clothes will not be grounded through the wrist strap. So, take care not to let your clothes touch the optical pickup.

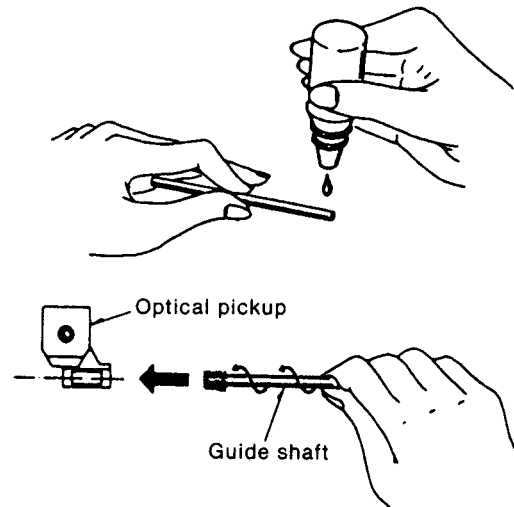


■ INSTRUCTIONS FOR TRAVERSE OIL (Part No. SZZ0L31)

The container contains 6g (approx. 3ml) of oil.
One application (one shaft) uses 0.05ml of oil.

How to Use

- (1) Remove the guide shaft in the traverse deck from the optical pickup and clean off any dust from the guide shaft.
- (2) Apply one drop of the SZZ0L31 to the tip of the guide shaft.
- (3) Hold the guide shaft so that its oiled end touches the optical pickup and insert it into the bearing while rotating it slowly.
- (4) After securing the guide shaft, move the optical pickup by hand several times to the left and right to distribute the oil on the guide shaft.



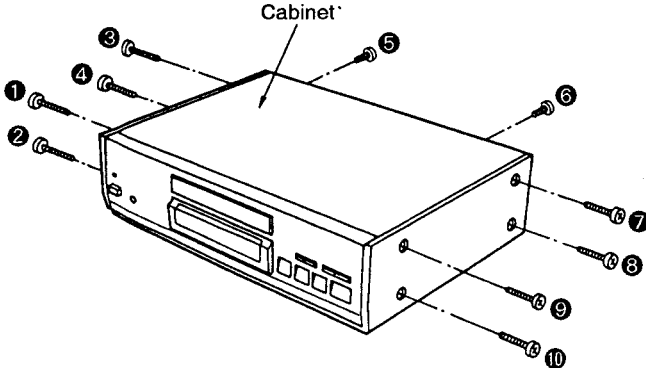
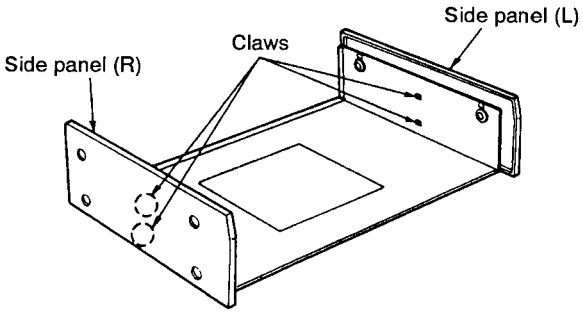
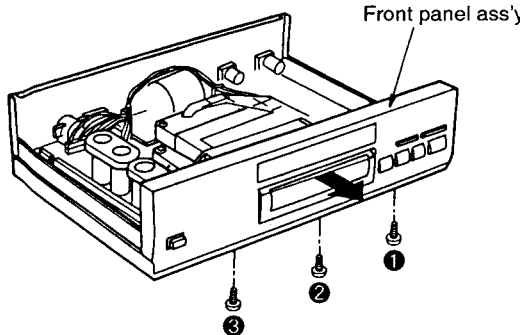
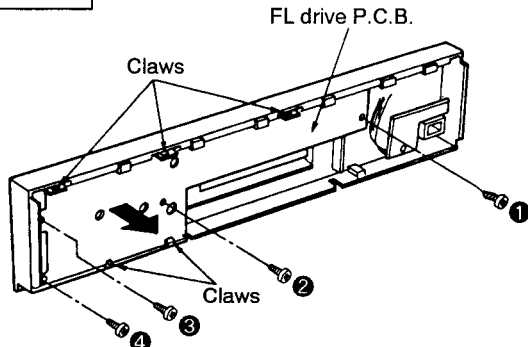
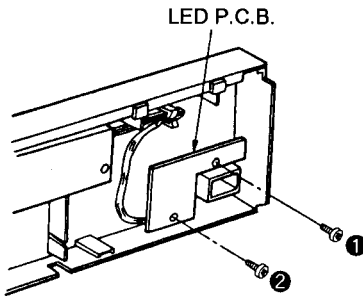
DISASSEMBLY INSTRUCTIONS

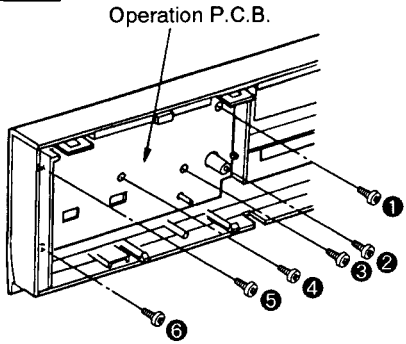
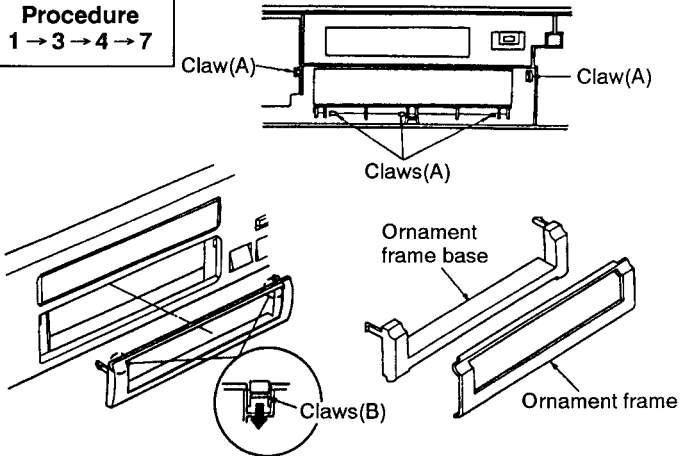
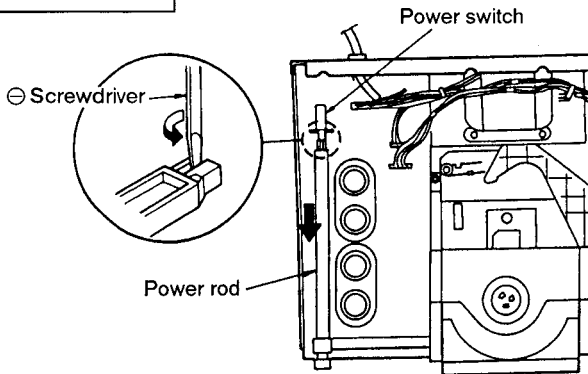
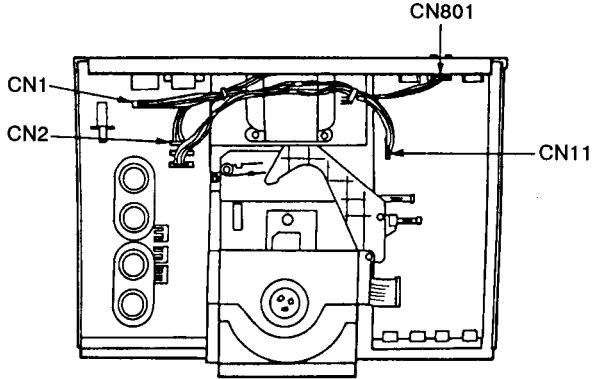
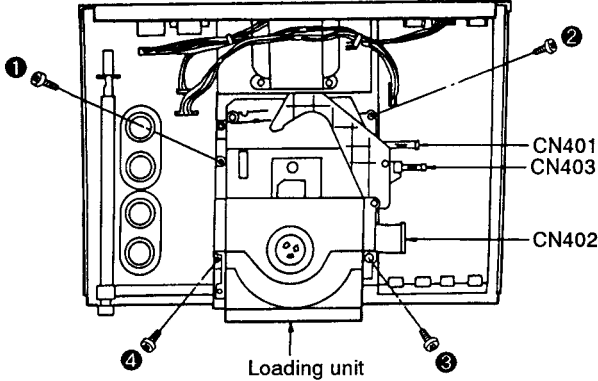
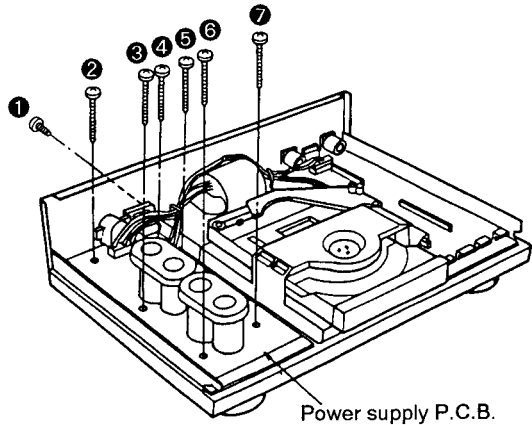
Warning: This product uses a laser diode. Refer to caution statements on page 3.

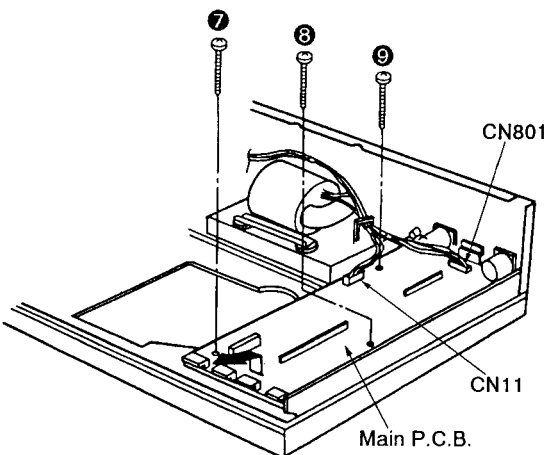
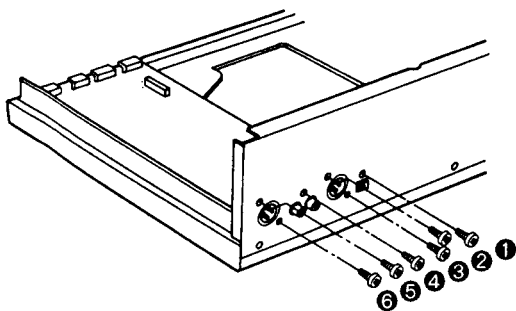
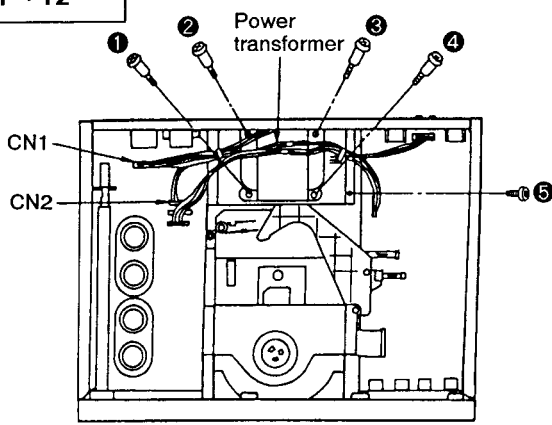
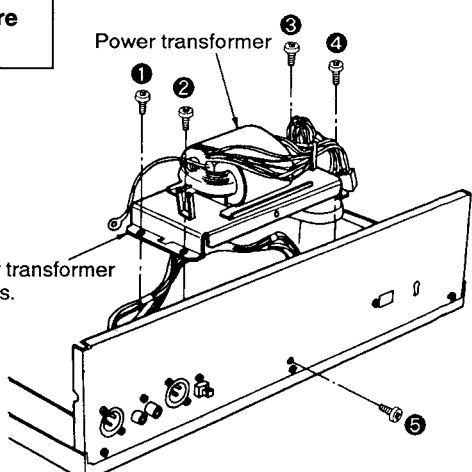
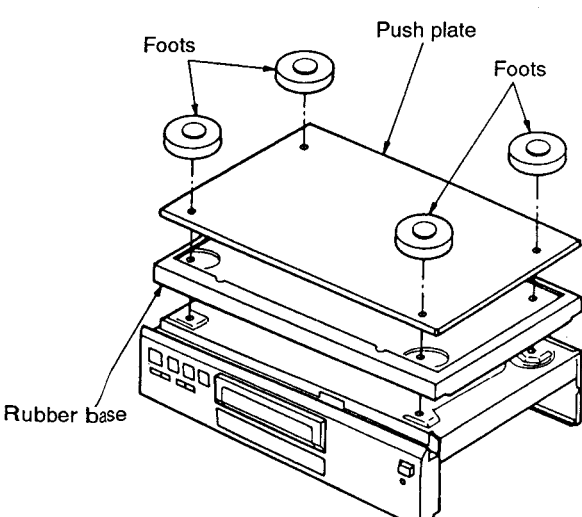
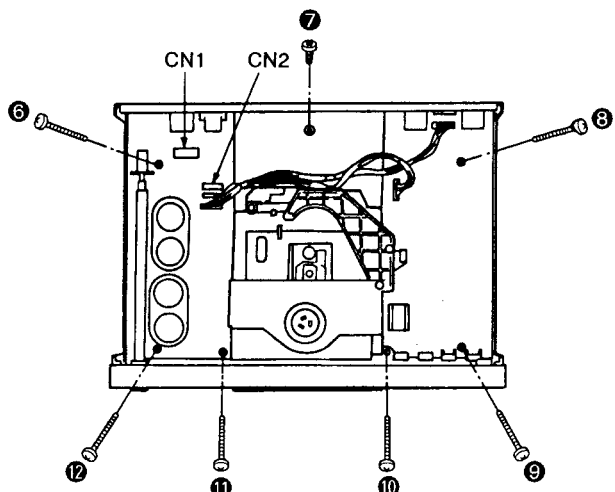
ACHTUNG: • Die lasereinheit nicht zerlegen.

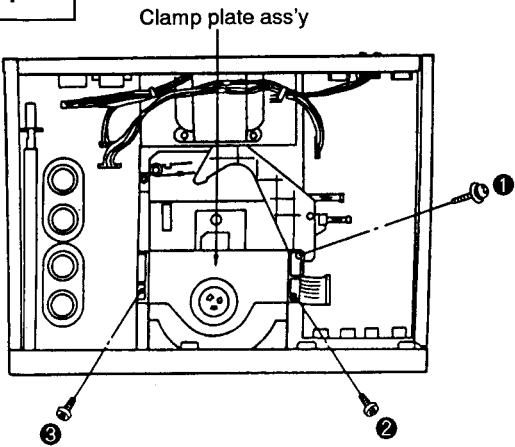
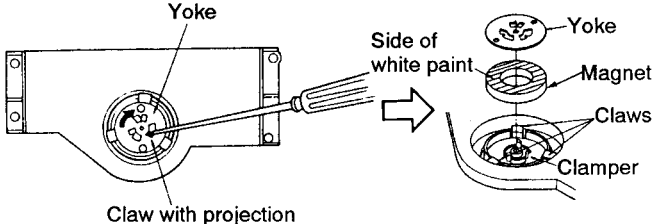
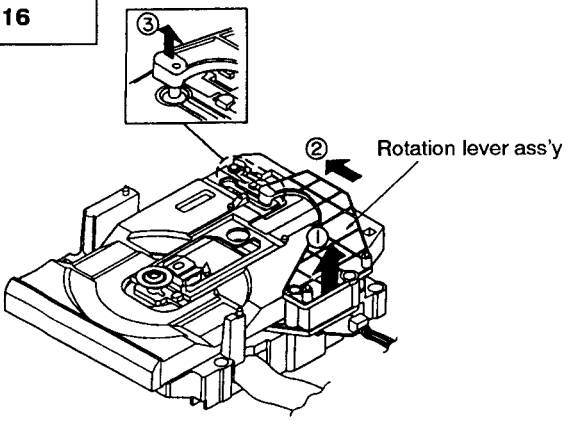
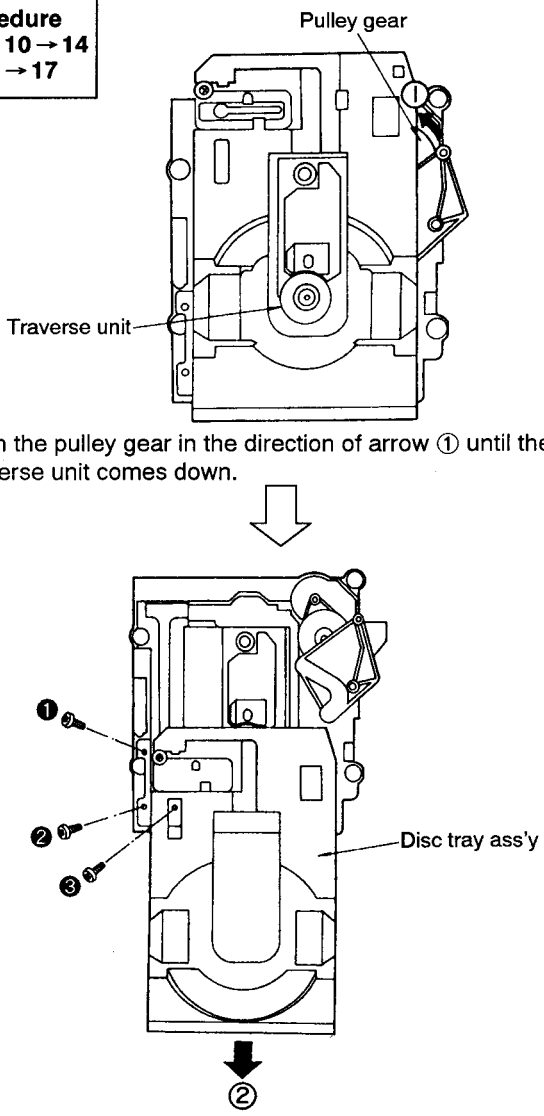
• Die lasereinheit darf nur gegen eine vom hersteller spezifizierte einheit ausgetauscht werden.

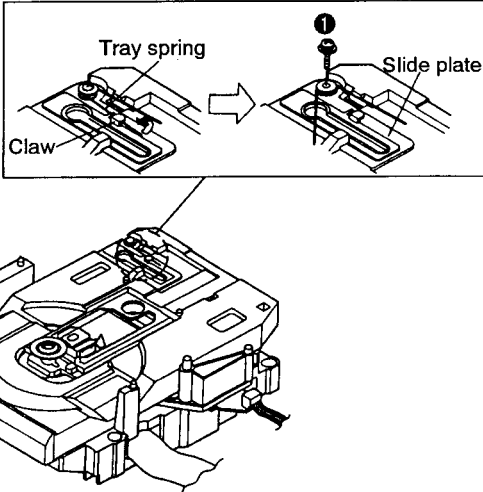
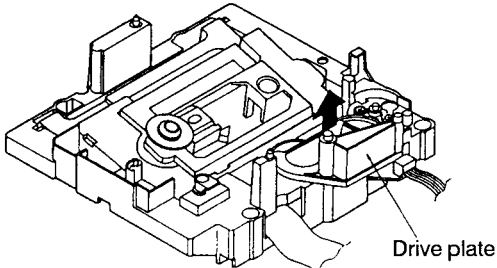
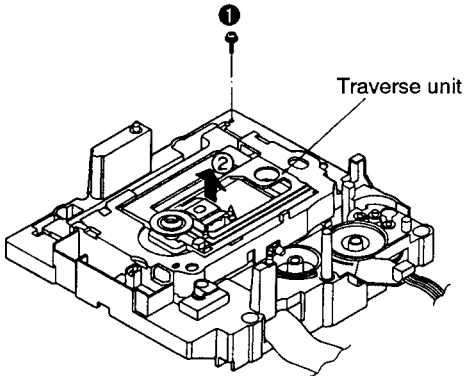
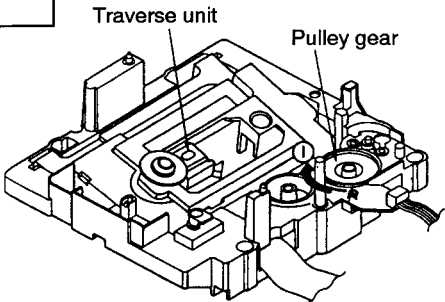
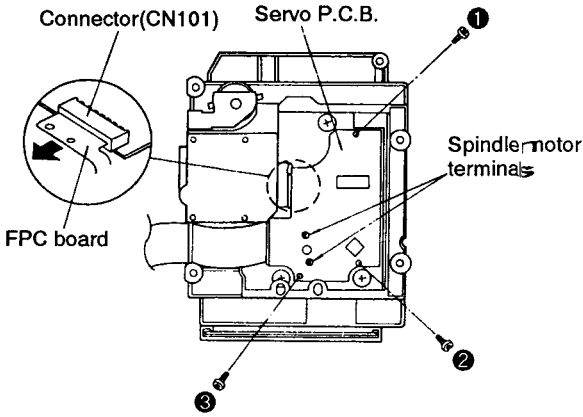
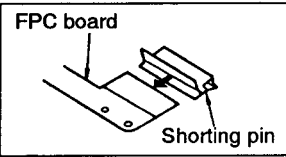
※ This CD player is equipped with FPC boards, so handle them with care during disassembly and reassembly.

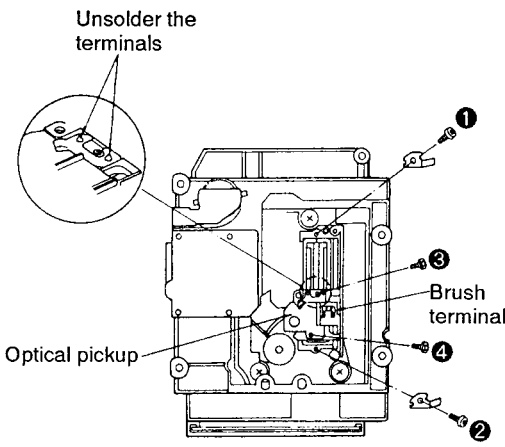
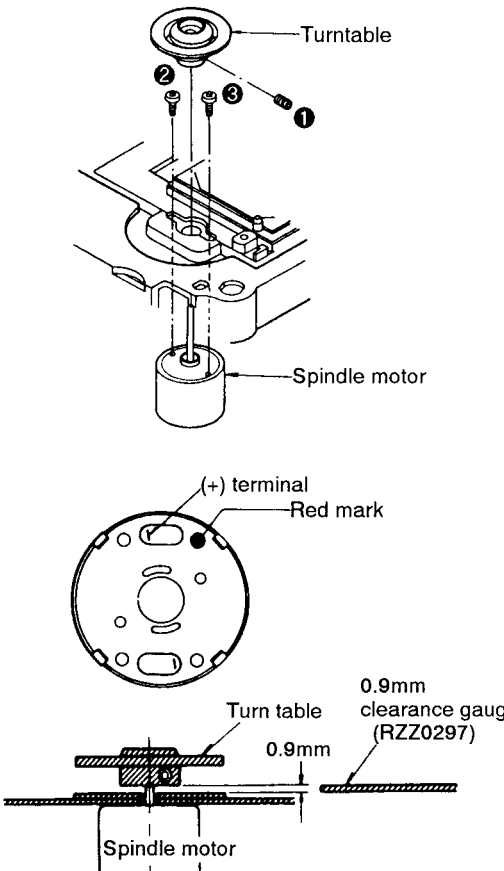
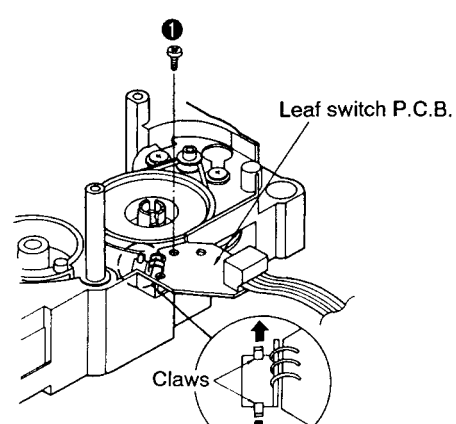
Ref.No. 1	Removal of the cabinet	Ref.No. 2	Removal of the side panel (L), (R)
Procedure 1		Procedure 1 → 2	
	 • Remove the 10 screws(❶ ~ ❿).		 • Release the 4 claws.
Ref.No. 3	Removal of the front panel ass'y	Ref.No. 4	Removal of the FL drive P.C.B.
Procedure 1 → 3		Procedure 1 → 3 → 4	
	 1. Remove the 3 screws(❶ ~ ❸). 2. Remove the front panel ass'y in the direction of arrow.		 1. Remove the 4 screws(❶ ~ ❹). 2. Release the 5 claws. 3. Remove the FL drive P.C.B. in the direction of arrow.
Ref.No. 5	Removal of the LED P.C.B.		
Procedure 1 → 3 → 5			
	• Remove the 2 screws(❶ , ❷).		

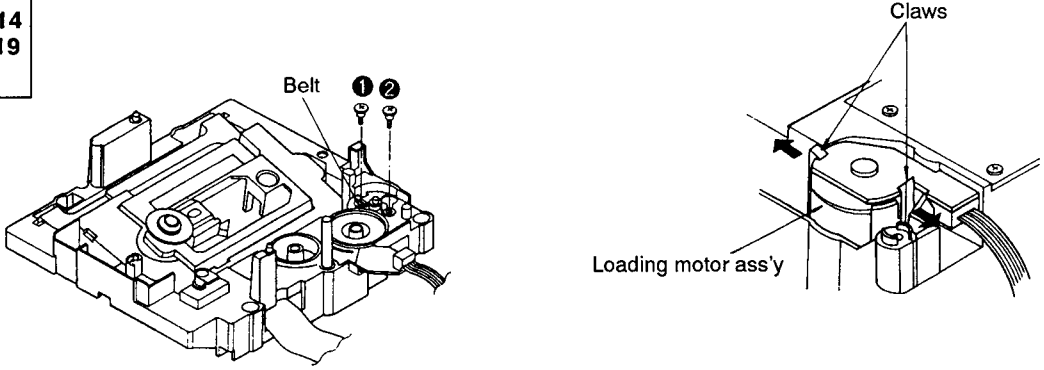
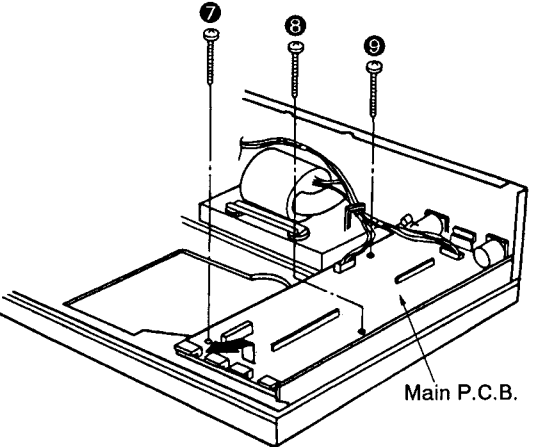
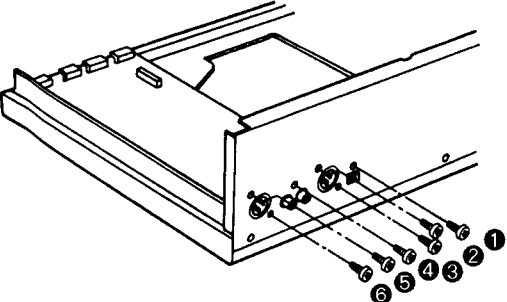
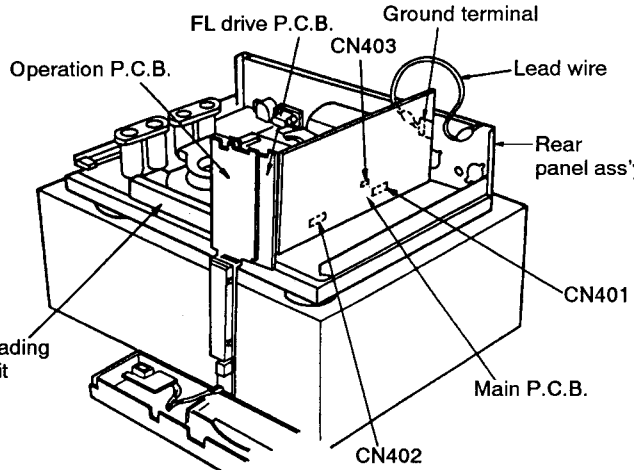
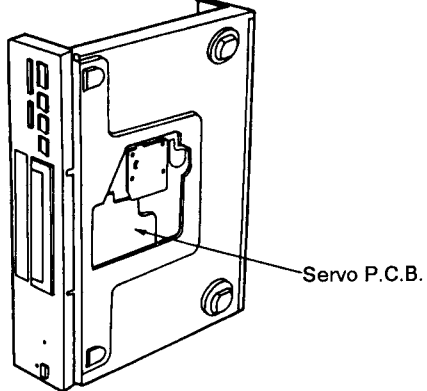
Ref.No. 6	Removal of the operation P.C.B.	Ref.No. 7	Removal of the ornament frame and ornament frame base
Procedure 1 → 3 → 4 → 6	 Operation P.C.B. • Remove the 6 screws (① ~ ⑥).	Procedure 1 → 3 → 4 → 7	 Claw(A) Claws(A) Ornament frame base Ornament frame Claws(B) 1. Release the 5 claws(A). 2. Release the 2 claws(B).
Ref.No. 8	Removal of the power rod	Ref.No. 9	Removal of the power supply P.C.B.
Procedure 1 → 3 → 8	 Power switch ⊖ Screwdriver Power rod 1. Set the power switch to the "OFF" position. 2. Remove the power rod by using a ⊖ screwdriver.	Procedure 1 → 3 → 8 → 9	 CN801 CN1 CN2 CN11 1. Remove the 4 connectors(CN1, CN2, CN11, CN801).
Ref.No. 10	Removal of the loading unit	 CN401 CN403 CN402 Loading unit 1. Remove the 3 flat cables(CN401, CN402, CN403). 2. Remove the 4 screws(① ~ ④).	
Procedure 1 → 3 → 10	 Power supply P.C.B. 2. Remove the 7 screws(① ~ ⑦).		

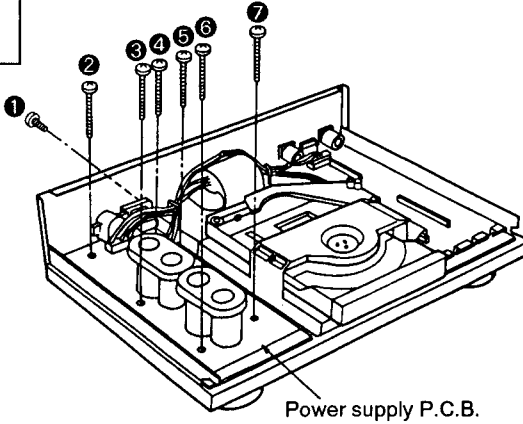
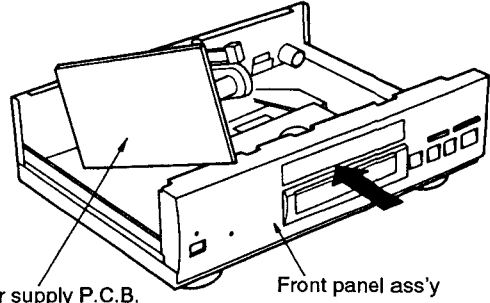
Ref.No. 11	Removal of the main P.C.B.		
Procedure 1 → 3 → 10 → 11			
1. Remove the 6 screws(❶ ~ ❺).		2. Remove the 2 flat cables(CN11, CN801). 3. Remove the 3 screws(❷ ~ ❸). 4. Remove the main P.C.B. in the direction of arrow.	
Ref.No. 12	Removal of the power transformer	Ref.No. 13	Removal of the push plate and rubber base
Procedure 1 → 12		Procedure 1 → 13	
1. Remove the 2 connectors(CN1, CN2). 2. Remove the 5 screws(❶ ~ ❺).		1. Remove the 5 screws(❶ ~ ❺). 2. Remove the power transformer and power transformer chassis.	
			
5. Remove the 4 feet. 6. Remove the push plate and rubber base.		3. Remove the 2 connectors(CN1, CN2). 4. Remove the 7 screws(❻ ~ ❿).	

Ref.No. 14	Removal of the clamp plate ass'y	Ref.No. 15	Removal of the yoke, magnet and clamber
Procedure 1 → 14	 Clamp plate ass'y • Remove the 3 screws(① ~ ③).	Procedure 1 → 14 → 15	 Yoke Side of white paint Claw with projection Yoke Magnet Claws Clamber 1. While lifting the claw with a screwdriver, rotate yoke in the direction of arrow and remove the yoke and magnet. 2. Release the 3 claws of the clamber.
Ref.No. 16	Removal of the rotation lever ass'y	Ref.No. 17	Removal of the disc tray ass'y
Procedure 1 → 3 → 10 → 14 → 16	 Rotation lever ass'y • Remove the rotation lever ass'y in the directions of arrow ①, ②, ③.	Procedure 1 → 3 → 10 → 14 → 16 → 17	 Pulley gear Traverse unit 1. Turn the pulley gear in the direction of arrow ① until the traverse unit comes down. 2. Pull the disc tray ass'y in the direction of arrow ②. 3. Remove the 3 screws(① ~ ③). Disc tray ass'y 4. Remove the disc tray ass'y in the direction of arrow ③, ④.

Ref.No. 18	Removal of the tray spring and slide plate	Ref.No. 19	Removal of the drive plate
Procedure 1 → 3 → 10 → 14 → 16 → 18	 1. Remove the tray spring from claw. 2. Remove the 1 screw (❶). 3. Remove the tray spring and slide plate.	Procedure 1 → 3 → 10 → 14 → 16 → 17 → 19	 • Remove the drive plate in the direction of arrow.
Ref.No. 20	Removal of the traverse unit	 2. Remove the 1 screw (❶). 3. Remove the traverse unit in the direction of arrow ❷.	
Procedure 1 → 3 → 10 → 14 → 16 → 17 → 19 → 20	 1. Rotate the pulley gear in the direction of arrow ❶ until the traverse unit comes up.		
Ref.No. 21	Removal of the servo P.C.B.	 1. Remove the 3 screws (❶ ~ ❸). 2. Unsolder the 2 terminals of spindle motor. 3. Remove the FPC board from the optical pickup. Caution: To prevent the breakdown of the laser diode, antistatic shorting pin is inserted into the FPC board.	
Procedure 1 → 3 → 10 → 21			

Ref.No. 22	Removal of the optical pickup	
Procedure 1 → 3 → 10 → 21 → 22	1. Remove the 2 screws(❶, ❷). 2. Unsolder the 2 terminals and the 2 screws(❸, ❹). Caution: Take care not to touch the brush terminal. Refer to the handling precautions for optical pickup and instructions for traverse oil. (See page 8.)	
Ref.No. 23	Removal of the spindle motor	
Procedure 1 → 3 → 10 → 14 → 16 → 17 → 19 → 20 → 21 → 22 → 23	1. Loosen the screw(❶) by using a 1.27mm allen wrench and remove the turntable. 2. Remove the 2 screws(❷, ❸). Caution: 1. Turntable height adjustment is necessary any time the turntable or spindle motor is replaced. 2. The (+)terminal of the spindle motor is indicated by the red mark. Adjustment of turntable height 1. Insert a 0.9mm clearance gauge(RZZ0297)between the turntable and loading base as shown in the figure. 2. Tighten the turntable set- screw by using a 1.27mm allen wrench. Caution: Refer to turntable height adjustment. (See page 21.)	
Ref.No. 24	Removal of the leaf switch P.C.B.	
Procedure 1 → 3 → 10 → 14 → 16 → 17 → 19 → 24	1. Remove the 1 screw(❶). 2. Release the 2 claws and then remove the leaf switch P.C.B. in the direction of arrow.	

Ref.No. 25	Removal of the loading motor ass'y	 1. Remove the belt. 2. Remove the 2 screws(①, ②). 3. Release the 2 claws and then remove the loading motor ass'y.
Procedure 1 → 3 → 10 → 14 → 16 → 17 → 19 → 25		
Ref.No. 26	How to check the main P.C.B.	 2. Remove the 3 screws(⑦ ~ ⑨). 3. Remove the main P.C.B. in the direction of arrow.
Procedure 1 → 3 → 4 → 6 → 10 → 26	 1. Remove the 6 screws(① ~ ⑥).	
Ref.No. 27	How to check the servo P.C.B.	 4. Attach the loading unit to the unit. 5. Connect the 3 flat cables(CN401, CN402, CN403) to the corresponding terminals on the main P.C.B. 6. Connect the main P.C.B. ground terminal(LINE OUT terminal) to the rear panel ass'y with a lead wire. 7. When checking the soldered surface of the main P.C.B. and replacing the parts, do as shown.
Procedure 1 → 13 → 27	 • When checking the soldered surface of the servo P.C.B. and replacing the parts, do as shown.	

Ref.No. 28	How to check the power supply P.C.B.	 1. Remove the 7 screws(① ~ ⑦). 2. Remove the power supply P.C.B.. 3. Attach the front panel ass'y to the unit. 4. When checking the soldered surface of the power supply P.C.B. and replacing the parts, do as shown.
Procedure 1 → 3 → 28		

HANDLING P.C.B. WITH DUAL DC POWER SUPPLY OF DIGITAL LINEAR SERVO CIRCUIT

To make the SL-P2000 more refined, the digital servo circuit uses a dual DC power supply for its driver stage. For this reason, the present circuit diagram and printed circuit board used in the SL-PS700 and SL-PS900 have been modified.

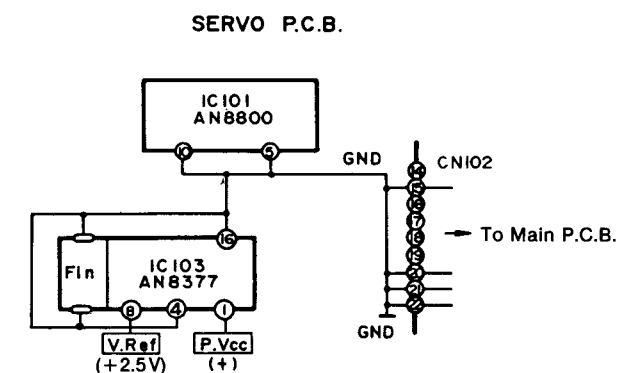
Caution: The new servo P.C.B. (marked with Ⓐ and white line) for the SL-P2000 cannot be replaced by the present servo P.C.B. used in the SL-PS700 and SL-PS900. Refer to "How to distinguish New P.C.B.". (How to distinguish P.C.B. on next page.)
The present servo P.C.B. (without the Ⓐ mark and white line), if improperly used for the SL-P2000, may cause a short-circuit between P. Vee (–) and GND.

Changes in the Circuit

The new digital linear servo P.C.B. is similar in shape to the present digital linear servo P.C.B., with the circuit modified as follows.

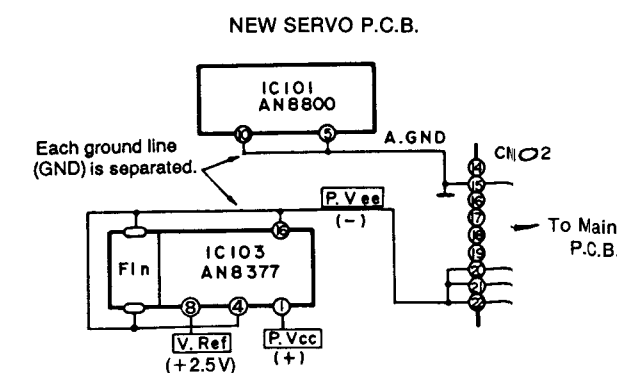
(Present Servo Circuit)

SINGLE DC POWER SUPPLY TYPE
SERVO CIRCUIT
(used in Present Model) Ex: SL-PS900



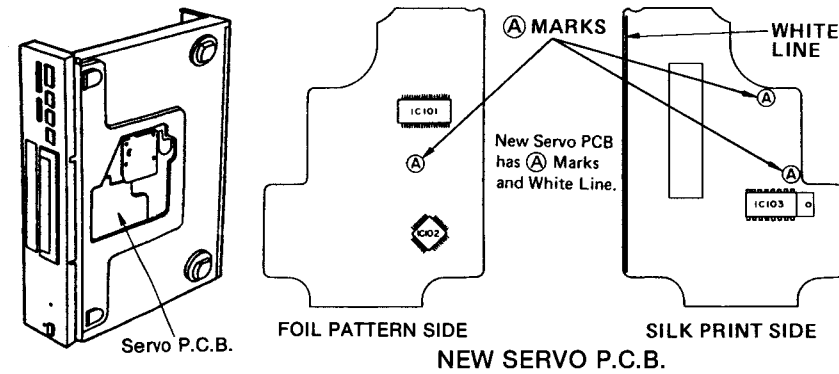
(New Servo Circuit)

DUAL DC POWER SUPPLY TYPE
SERVO CIRCUIT
(used in SL-P2000 '93 New Model)



• How to distinguish New P.C.B.

According to the change of circuit, the P.C.B. foil pattern is also partly changed as shown below:



• Compatibility

This model (SL-P2000) is only applied to the new servo P.C.B.

P.C.B.	Model	SL-P2000	Remarks
Present Servo P.C.B.		×	Without A mark and white line
New Servo P.C.B.		○	With A mark and white line

Note:

The new servo P.C.B. has also been used for the SL-PS700 and SL-PS900, particularly in recent production. For details, please refer to technical Information (Order No. AD9210357T0).

■ DISPLAY FUNCTION OF AUTOMATICALLY-ADJUSTED RESULTS (SELF-CHECK FUNCTION)

The unit contains a function which displays the result of the automatically adjustment of the servo circuits (tracking, focus servo, etc.) as an error code on the FL display.

The error code display serves as a repair guide showing the automatically adjustment circuit is at fault. The procedures for displaying the error codes are given below.

• Procedures to display the error code

(1) While simultaneously pressing and holding the three keys, **STOP**, **PAUSE**, and **PLAY**, press the **POWER** key. When the unit is turned on and the FL display is lit up, immediately release the three keys.

(2) Press the **OPEN/CLOSE** key to open the disc tray, load the test disc (SZZP1054C) on the tray, close the tray by pressing the **OPEN/CLOSE** key again.
An error code will appear on the FL display (e.g. "E-00").

(3) The error code provides a rough indication of which servo circuit is malfunctioning.

• Error code based troubleshooting

※ The unit is satisfactory if the error code is E-00 or E-02.

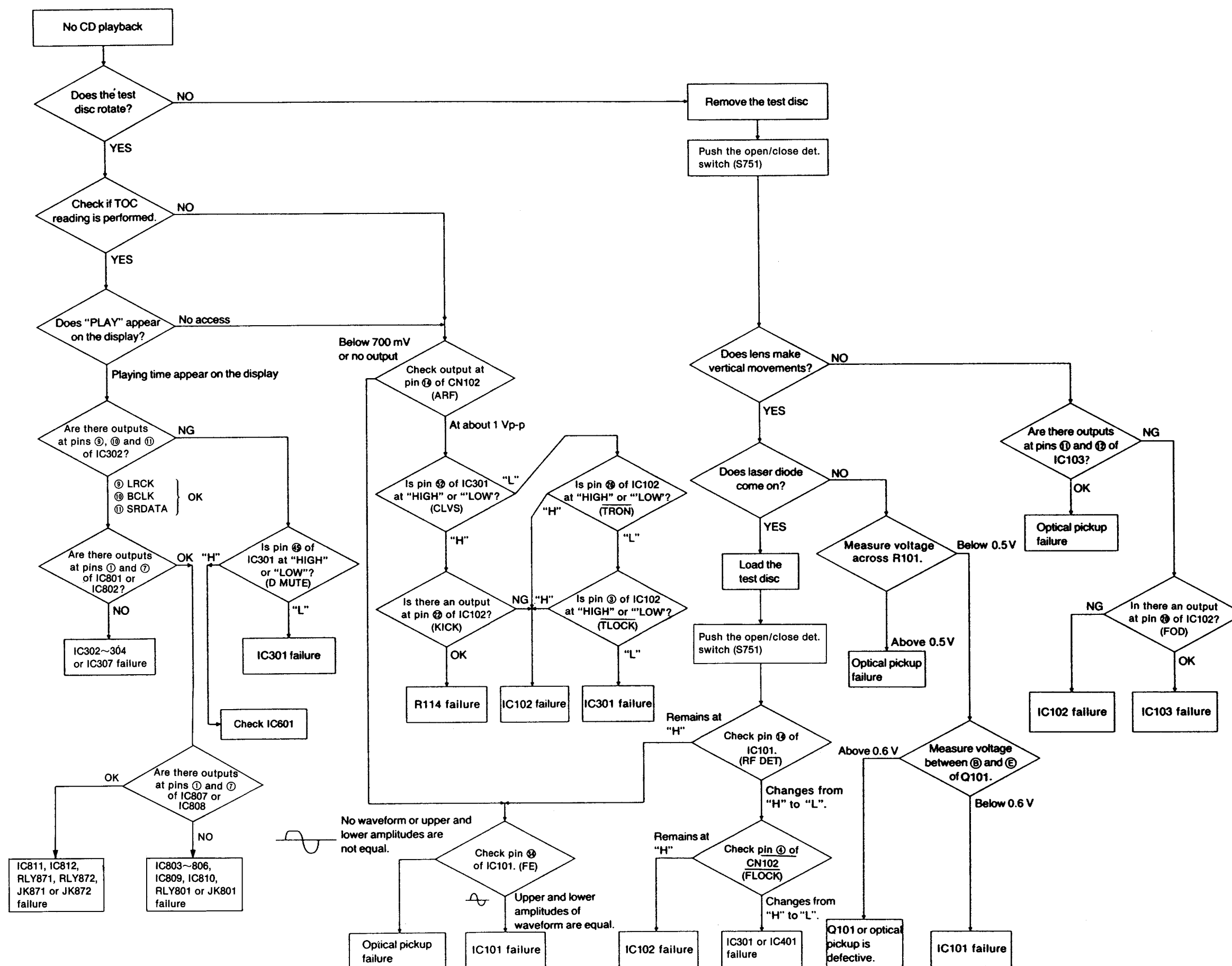
※ Before testing, check that the test disc is free of scratches and dirt and optical pickup is clean.

FL error code display	Symptom	Probable cause	Signal to check		Normal the values of voltage and waveform	
			Signal name	Location	PLAY	STOP
E-01	Incomplete focus, tracking or offset adjustment	1. Data transfer with IC401 2. IC102 setup condition	MDATA	IC102 ⑦ pin		4.7V
			MCLK	IC102 ⑧ pin		4.6V
			MLD	IC102 ⑨ pin		4.7V
			SENSE	IC102 ⑩ pin	0V	4.9V
			/RST	IC102 ⑪ pin	4.6V	4.6V
			XI	IC102 ⑫ pin		

FL error code display	Symptom	Probable cause	Signal to check		Normal the values of voltage and waveform	
			Signal name	Location	PLAY	STOP
E-03 E-05 E-07 E-09 E-11 E-13 E-15	Disc cannot be played reliably.	1. Scratched or dirty disc 2. Focus and tracking servo circuits 3. Spindle drive circuit 4. Optical pickup	FE	IC102 ⑩ pin		2.4V
			TE	IC102 ⑨ pin		2.5V
			FOD	IC102 ⑫ pin		2.5V
			TRD	IC102 ⑬ pin		
			KICK	IC102 ⑭ pin	2.5V	2.5V
			VR1	IC102 ⑮ pin	3.9V	3.9V
			VR2	IC102 ⑯ pin	0.9V	0.9V
			/FLOCK	IC102 ⑰ pin	0V	4.9V
			/RF DET	IC102 ⑱ pin	0V	4.7V
			RF	TJ101		2.5V
E-04 E-06	Incomplete focus gain adjustment	1. Scratched or dirty disc 2. Focus servo circuit 3. Optical pickup	STAT	IC301 ④ pin	4.8V	0V
			FE	IC102 ⑩ pin		2.4V
			VR1	IC102 ⑮ pin	3.9V	3.9V
			VR2	IC102 ⑯ pin	0.9V	0.9V
			OFT	IC102 ⑤ pin	0V	4.7V
E-08 E-10 ※ See note	Incomplete tracking gain adjustment	1. Scratched or dirty disc 2. Tracking servo circuit 3. Optical pickup	/TLOCK	IC102 ⑥ pin	0V	4.9V
			TE	IC102 ⑨ pin		2.5V
			VR1	IC102 ⑮ pin	3.9V	3.9V
			VR2	IC102 ⑯ pin	0.9V	0.9V
			OFT	IC102 ⑤ pin	0V	4.7V
E-12 E-14	See error codes E-04, E-06, E-08 and E-10	See error codes E-04, E-06, E-08 and E-10	/TLOCK	IC102 ⑥ pin	0V	4.9V
			FE	IC102 ⑩ pin		2.4V
			TE	IC102 ⑨ pin		2.5V
			VR1	IC102 ⑮ pin	3.9V	3.9V
			VR2	IC102 ⑯ pin	0.9V	0.9V
			OFT	IC102 ⑤ pin	0V	4.7V
			/TLOCK	IC102 ⑥ pin	0V	4.9V

※ **Note:** For a unit showing error code E-08 or E-10, check the error code several times. If error code E-00 or E-02 appears, the unit can be assumed to be satisfactory.

TROUBLESHOOTING GUIDE



MEASUREMENTS AND ADJUSTMENTS

Warning: This product uses a laser diode. Refer to caution statements on page 3.
ACHTUNG: • Die Lasereinheit nicht zerlegen.
 • Die Lasereinheit darf nur gegen eine vom Hersteller spezifizierte Einheit ausgetauscht werden.

Measuring Instruments and Special Tools

- | | |
|---|-----------------------------------|
| * Test discs | * Allen wrench (M2.0) (SZZP1101C) |
| 1. Playability test disc (SZZP1054C) | * Allen wrench (M1.27) |
| 2. Uneven test disc (SZZP1056C) | * 0.9mm clearance gauge (RZZ0297) |
| * Musical program disc (ordinary) | * Filter |
| * Dual-beam oscilloscope with bandwidth of 30MHz or better (with EXT. trigger and 1:1 probe). | * Lock paint (RZZ0L01) |

PREPARATION

1. Remove the cabinet and front panel ass'y (See Ref. No. 1, 2 of the disassembly instructions).
2. Remove the clamp plate ass'y, yoke, magnet and clumper (see Ref. No. 14, 15 of the same).
3. Remove the rotation lever, disc tray ass'y and drive plate (see Ref. No. 16, 17, 19 of the same).
4. Attach the front panel ass'y to the unit.
5. Turn the pulley gear fully in the direction of arrow until traverse unit comes up.
6. Place the test disc and fix it by using the yoke, magnet and clumper.
7. Power switch to ON.
8. While pushing the open/close det. switch (S751) in the direction of arrow, push the play switch.

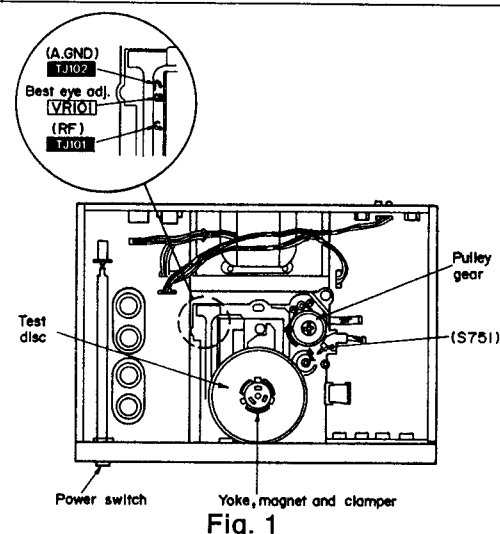


Fig. 1

Adjusting Procedure

- * If you have replaced the optical pickup, spindle motor, or turntable, do the following adjustment:

(1) TURNTABLE HEIGHT ADJUSTMENT

1. Insert the 0.9mm clearance gauge (RZZ0297) between the turntable and the loading base. (Refer to Fig. 2).
2. Tighten the turntable retention screw with the 1.27mm allen wrench.

3. Connect the oscilloscope's CH. 1 probe across TP1 (+) and TP2 (-) terminal via a filter (Refer to Fig. 3).
- Note:** For the connection of oscilloscope's CH. 1 probe to servo P.C.B. on foil side, refer to fig. 2.

Oscilloscope setting: VOLT 500mV
 SWEEP 5ms.
 Input coupling DC

4. Adjust oscilloscope's DC zero balance.
5. Switch the play power ON, and play the test disc (SZZP1054C).
6. Measure the voltage amplitude of the signal on the oscilloscope.

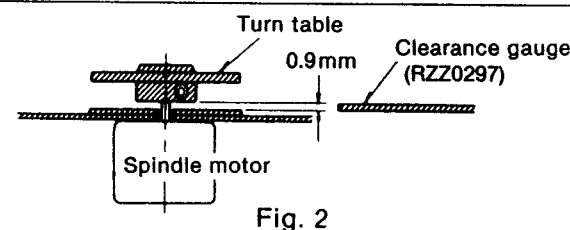


Fig. 2

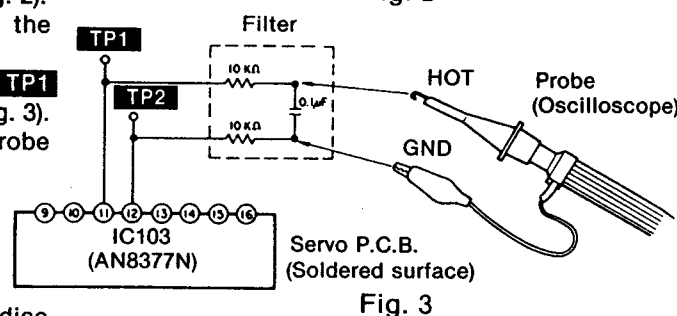


Fig. 3

7. Adjust the height until the voltage is $0 \pm 1.0V$.
 If the voltage exceeds $+1.0V$, lower turntable.
 If the voltage is below $-1.0V$, elevate the turn table.
- Note:** Measure the voltage as 0V as possible.

(2) MECHANICAL ADJUSTMENT

1. Connect the oscilloscope's CH. 1 probe across TJ101 (+) and TJ102 (GND) on the servo P.C.B. (Refer to Fig. 1)
Oscilloscope setting: VOLT 100mV
 SWEEP 0.5μs.
 Input coupling AC
2. Switch the player power ON, and play track 7 on the test disc (SZZP1056C). (Playing any other track will prevent the HEX screws from being accessed.)
3. Leave the player in play mode and place it as shown Fig. 5.
4. Alternately adjust the HEX screws with the 2.0mm allen wrench (SZZP1101C) until the vertical fluctuation of RF signal is minimized and the eye pattern is most stretched. (Refer to Fig. 4)
5. After completing the adjustment, lock the HEX screws with lock paint (RZZ0L01).

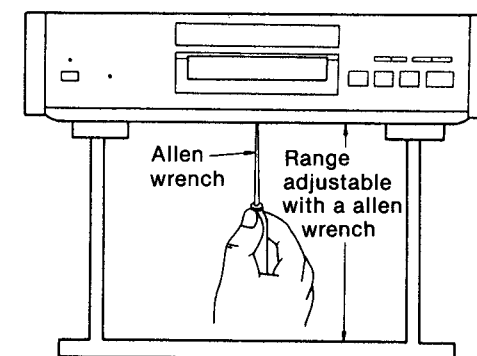
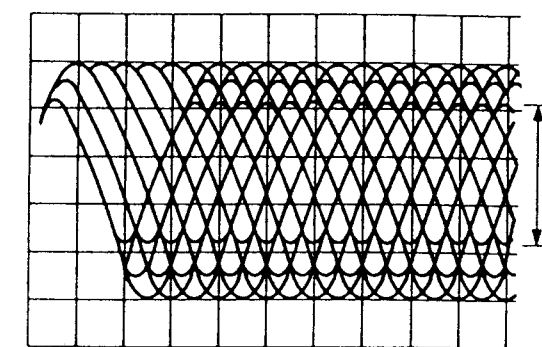
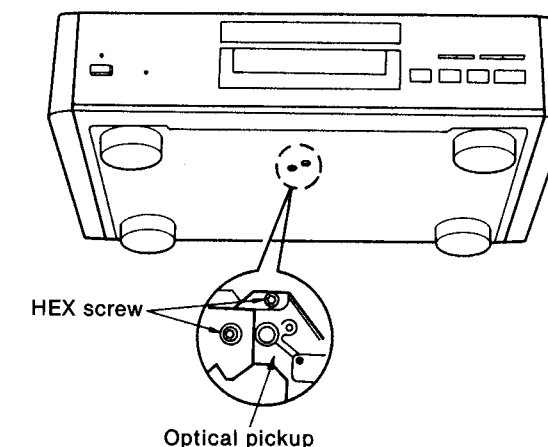


Fig. 5



※ Most stretched eye pattern.

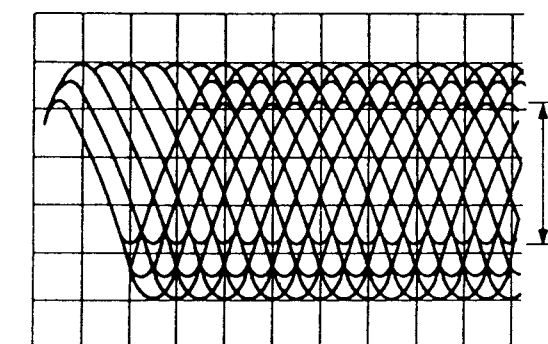
Fig. 4



Optical pickup

(3) BEST EYE (PD BALANCE) ADJUSTMENT

1. Connect the oscilloscope's CH. 1 probe across TJ101 (+) and TJ102 (GND) on the servo P.C.B. (Refer to Fig. 1)
Oscilloscope setting: VOLT 100mV
 SWEEP 0.5μs.
 Input coupling AC
2. Switch the player power ON, and play the 1kHz (track 1) on the test disc (SZZP1054C).
3. Adjust VR101 until the vertical fluctuation of RF signal is minimized and the eye pattern is most stretched. (Refer to Fig. 6)



※ Most stretched eye pattern.

Fig. 6

(4) CHECK OF PLAY OPERATION AFTER ADJUSTMENT

* Checking Skip Search

1. Play an ordinary musical program disc.
2. Press the skip button to check for normal skip search operation (in both the forward and reverse directions).

* Checking Manual Search

1. Play an ordinary musical program disc.
2. Press the manual search button to check for smooth manual search operations at either low or high speed (in both the forward and reverse directions).

* Checking Playability

1. Play the 0.7mm black dot and the 0.7mm wedge on the playability test disc (SZZP1054C) and verify that no sound skip or noise occurs.
2. Play the middle tracks of the uneven test disc (SZZP1056C) and verify that no sound skip or noise occurs.

■ TERMINAL FUNCTION OF IC'S

• IC101 (AN8800SCE2): Servo amp

Pin No.	Mark	I/O Division	Function
1	LDG	I	APC loop gain select
2	LDP	I	APC monitor PD polarity select (Not used, open)
3	LD	O	Laser power auto control output
4	LPD	I	LD power monitor PD signal
5	GND	—	GND terminal
6	LDON	I	LD APC ON/OFF ("H": ON, "L": OFF)
7	AMP I	I	RF signal (X30 amp)
8	AMP O	O	
9	RF IN	I	RF AGC signal input
10	RF EQ	—	GND terminal
11	C. AGC	I	AGC detection capacitor input
12	ARF	O	RF signal output
13	C. SBDO	I	Dropout detection capacitor input
14	RF DET	O	RF detection signal ("L": detecting)
15	BDO	O	Dropout detection output
16	V _{cc}	I	Power supply terminal
17	SDO	O	Dropout detection pulse output
18	VAD+	O	Power supply terminal for A/D converter (+)
19	VREF	O	Reference voltage output
20	VAD-	O	Power supply terminal for A/D converter (-)
21	OFTR	O	Off track detection ("H": det.)

Pin No.	Mark	I/O Division	Function
22	PLAY	I	Play signal ("H": ON, "L": OFF)
23	WVEL	I	Double velocity ("H": double, "L": single)
24	TES	I	Tracking error shunt ("H": shunt, "L": output)
25	PTO	O	Potential amp output
26	PTI	I	Potential amp input
27	PBO	O	Potential buffer output
28	POT	I	Potential buffer input
29	CROSS	O	Tracking error zero cross output
30	TE	O	Tracking error signal
31	TE BAL	I	Oscillation det. signal
32	TBAL	I	Tracking balance adj. input
33	VDET	O	Oscillation det. signal ("H": det.)
34	FE	O	Focusing error signal
35	FBL 2	I	Focusing balance 2
36	FBL 1	I	Focusing balance 1
37	V _{cc}	I	Power supply terminal
38	GND	—	GND terminal
39	PDBD	I	Photo detector Bch input with delay
40	PDA	I	Photo detector Ach input without delay
41	PDB	I	Photo detector Ach input with delay
42	PDAD	I	Photo detector Bch input without delay

• IC102 (MN6650A): Digital servo processor

Pin No.	Mark	I/O Division	Function
1	TES	O	Tracking error shunt signal ("H": shunt)
2	PLAY	O	Play signal ("H": play)
3	/RFDET	I	RF det. signal ("L": det.)
4	DO	I	Dropout signal ("H": dropout)
5	OFT	I	Off track signal ("H": off track)
6	ARF	I	RF signal input
7	WVEL	O	Double velocity status signal ("H": double)
8	PBO	I	Potensio buffer signal (analog input)
9	TE	I	Tracking error signal (analog input)
10	FE	I	Focus error signal (analog input)
11	VR2	I	Reference voltage for A/D (Low)
12	VR1	I	Reference voltage for A/D (High)
13	LDON	O	Laser power control ("H": ON)
14	V _{SS}	—	GND terminal
15	AV _{SS}	—	GND terminal
16	AV _{DD}	I	Power supply terminal
17	V _{DD}	I	Power supply terminal
18	TRV	O	Traverse servo control output
19	TVD	O	Traverse drive signal output
20	FOD	O	Focus drive signal output
21	TRD	O	Tracking drive signal output

Pin No.	Mark	I/O Division	Function
22	KICK	O	Kick pulse output
23	/TEST	I	Test terminal
24	V _{SS}	—	GND terminal
25	CLVS	I	Spindle servo phase synchro signal ("H": CLV, "L": Rough servo)
26	/TRON	O	Tracking servo ON signal ("L": ON)
27	MDATA	I	Command data signal
28	MCLK	I	Command clock signal
29	MLD	I	Command load signal ("L": LOAD)
30	SENSE	O	Sense signal
31	/FLOCK	O	Optical servo condition (focus) output
32	/TLOCK	O	Optical servo condition (tracking) output
33	/RST	I	Reset signal ("L": reset)
34	XI	I	Clock input (f = 16.9344 MHz)
35 }	T0 }	O	Test terminal (Ordinary: open)
38	T3		
39 }	T4 }	I	Test terminal (Ordinary: L)
41	T6		
42	VDET	I	Oscillation det. signal ("H": det.)
43	TBAL	O	Tracking balance adj. output
44	TRCRS	I	Track cross signal input

• IC301 (MN6626): Digital signal processor

Pin No.	Mark	I/O Division	Function
1	AVSS	—	GND terminal
2	IREF	I	Reference current input
3	ARF	I	RF signal input
4	DRF	I	DSL bias terminal (Not used, open)
5	DSLIF	I/O	DSL loop filter stermental
6	PLLIF	I/O	PLL loop filter terminal
7	AVDD	I	Power supply terminal
8	RSEL	I	RF signal polarity setting terminal (Not used, connected to VDD)
9 16	TBUS7 TBUS0	O	Test terminal
17	FLAG	O	Flag terminal (Not used, open)
18	IPFLAG	O	Interpolation flag terminal (Not used, open)
19	FCLK	O	Crystal frame clock (Not used, open)
20	BYTCK	O	Byte clock (Not used, open)
21	WDCK	O	Word clock (Not used, open)
22	/RST	I	Reset terminal
23	TX	O	Digital audio signal (Not used, open)
24	LDG	O	Lch deglitch signal (Not used, open)
25	RDG	O	Rch deglitch signal (Not used, open)
26	SRDATA	O	Serial data output (MSB first)
27	SCK	O	Serial bit clock output
28	LRCK	O	L/R discriminating signal
29	XCK	O	Crystal OSC terminal (f = 16.9344 MHz) (Not used, open)
30	PMCK	O	Frequency division clock signal (Not used, open) $(f = \frac{1}{192} \times CK = 88.2 \text{ kHz})$
31	CSEL	I	Test terminal (Connected to GND)
32	PSEL		
33	X1	I	Crystal OSC terminal (f = 16.9344 MHz)
34	X2	O	Crystal OSC terminal (f = 16.9344 MHz) (Not used, open)
35	VSS	—	GND terminal
36	SUBQ	O	Sub-code Q data
37	SQCK	I	Sub-code Q register clock

Pin No.	Mark	I/O Division	Function
38	/CLDCK	O	Sub-code frame clock (f = 735 kHz) (Not used, open)
39	BLKCK	O	Sub-code block clock (f = 75 Hz)
40	DEMPH	O	De-emphasis ON signal ("H": ON)
41	MEMP	I	Emphasis signal
42	MLD	I	Command load signal ("L": LOAD)
43	MCLK	I	Command clock signal
44	MDATA	I	Command data signal
45	D MUTE	I	Muting input ("H": MUTE)
46	SMCK	O	System clock (f = 4.2336 MHz)
47	STAT	O	Status signal (CRC, CUE, CLVS, TTSTOP, FCLV, SQOK)
48	CRC	O	Sub-code CRC check terminal ("H": OK, "L" NG) (Not used, open)
49	SUBC	O	Sub-code serial output data (Not used, open)
50	SBCK	I	Sub-code serial output clock (Not used, open)
51	/TRON	I	Tracking servo ON signal ("L": ON)
52	CLVS	O	Turntable servo phase synchro signal ("H": CLV, "L": Rough servo)
53	PC	O	Turntable motor ON signal ("L": ON)
54	ECM	O	Turntable motor drive signal (Forced mode)
55	ECS	O	Turntable motor drive signal (Servo error signal)
56	VDD	I	Power supply terminal
57	/TEST	I	Test terminal (Normal: "H")
58	SSEL	I	"SUBQ" terminal mode select ("H": Q code buffer)
59	MSEL	I	"SMCK" terminal frequency select ("L": SMCK = 4.2336 MHz)
60	RESY	O	Re-synchronizing signal of frame sync. (Not used, open)
61	DO	I	Drop-out detection signal ("H": Drop-out)
62	EFM	O	EFM signal (Not used, open)
63	PCK	O	PLL extract clock (f = 4.3218 MHz) (Not used, open)
64	PDO	O	Phase comparated signal of EFM and PCK (Not used, open)

• IC103 (AN8377N): Tracking focus/Traverse coil drive

Pin No.	Mark	I/O Division	Function
1	PV _{CC}	I	Drive power supply
2	V _{CC}	I	Power supply terminal
3	TB	O	External transistor base driving output
4	VMON	O	Voltage output (connected to GND)
5	TVD1	I	Traverse error signal input
6	FD1	I	Focus error signal input
7	TD1	I	Tracking error signal input
8	VREF	I	Reference voltage input

Pin No.	Mark	I/O Division	Function
9	TD ⁻	O	Non-inverting output of focus driver
10	TD ⁺	O	Inverting output of focus driver
11	FD ⁻	O	Non-inverting output of tracking driver
12	FD ⁺	O	Inverting output of tracking driver
13	TVD ⁻	O	Non-inverting output of traverse driver
14	TVD ⁺	O	Inverting output of driver
15	RESET	O	Reset signal output (Not used, open)
16	PC	I	PC input (connect to GND)

• IC401 (AN8389SE1): Motor drive

Pin No.	Mark	I/O Division	Function
1	VCC	I	Power supply (+) terminal
2	VREF	I	Reference voltage terminal
3	IN4	I	Motor driver (4) input terminal
4	IN3	I	Motor driver (3) input terminal
5	GND	I	Power supply (-) terminal
6	NC	—	Not used, connected to power supply
7	NRESET	I	Reset input terminal (Not used, open)
8	GND	I	Power supply (-) terminal
9	IN2	I	Motor driver (2) input terminal
10	PC2	I	Power cut input terminal
11	IN1	I	Motor driver (1) input terminal
12	PC1	I	Power cut input terminal (Not used, connected to power supply)
13	PVCC1	I	Power supply terminal (+) of driver
14	PGND1	I	Power supply terminal (-) of driver

Pin No.	Mark	I/O Division	Function
15	D1 ⁻	O	Inverting output terminal of motor driver (1) (Not used, open)
16	D1 ⁺	O	Non-inverting output terminal of motor driver (1) (Not used, open)
17	D2 ⁻	O	Inverting output terminal of motor driver (2)
18	D2 ⁺	O	Non-inverting output terminal of motor driver (2)
19	D3 ⁻	O	Inverting output terminal of motor driver (3)
20	D3 ⁺	O	Non-inverting output terminal of motor driver (3) (Not used, open)
21	D4 ⁻	O	Inverting output terminal of motor driver (4)
22	D4 ⁺	O	Non-inverting output terminal of motor driver (4) (Not used, open)
23	PGND2	I	Power supply (-) terminal of driver (2)
24	PVCC2	I	Power supply (+) terminal of driver (2)

• IC303, 304 (MN64731): D/A converter

Pin No.	Mark	I/O Division	Function
1	DVDD4	I	Digital power supply terminal
2	DVDD1		
3	DVSS1	—	Digital GND terminal
4	XOUT	O	Not used, open
5	NC	—	Not used, connected to GND
6	X1	I	External clock input terminal (F=33.8688MHz) (Clock input with CSEL: "H")
7	X2	O	Crystal oscillator output terminal (F=33.8688MHz)
8	DVSS2	—	Digital GND terminal
9	DVDD2	I	Digital power supply terminal
10	CSEL	I	Clock input select terminal
11	PSEL	I	PWM mode select terminal
12	WCLK	I	Data synchronizing signal input
13 } 16	D3 } D0	I	Data signal input
17	RST	I	Reset signal input
18	CLKOUT	O	Clock signal output (Not used, open)
19	CLKIN	I	Clock signal input (Not used, connected to GND)

Pin No.	Mark	I/O Division	Function
20	DVSS3	—	Digital GND terminal
21	DVDD3	I	Digital Power supply terminal
22	AVDD2	I	Analog power supply terminal
23 } 28	NC	—	Not used, connected to GND
29	N1—	O	Anti-phase PWM output terminal of L1/R1ch
30	N1+	O	Positive-phase PWM output terminal of L1/R1ch
31	AVSS2	—	Analog GND terminal
32	NC	—	Not used, connected to GND
33	AVSS1	—	Analog GND terminal
34	P1+	O	Positive-Phase PWM output terminal of L2/R2ch
35	P1—	O	Anti-phase PWM output terminal of L2/R2ch
36 } 40	NC	—	Not used, connected to GND
41	AVDD1	I	Analog power supply terminal
42	NSUB	I	Voltage fixed terminal (Not used, connected to power supply)

• IC307 (F254017PE): Gate array

Pin No.	Mark	I/O Division	Function
1	FREQ	I	Not used, connected to power supply
2	PDPOL	I	Not used, connected to GND
3	PD2	O	Not used, open
4	PD1		
5	EMPH	I	Emphasis signal input
6	NRSTIN	I	Reset input terminal
7	RSTOUT	O	Reset output terminal
8	OSRDATA	O	Serial data signal output terminal
9	LRCK	I	L/R discriminating signal
10	SCK	I	Serial bit clock input terminal
11	ISRDATA	I	Serial data signal input terminal
12	TXIN	I	Not used, connected to GND
13	TXOUT	O	Not used, open

Pin No.	Mark	I/O Division	Function
14	CLK	I	Clock (192Fs=8.4672MHz) input terminal
15	BIT	I	Not used, connected to power supply
16	TEST	I	Test terminal
17	V _{CC}	I	Power supply terminal
18	GND	—	GND terminal
19 } 30	Q0 } Q11	—	Not used, connected to GND or power supply
31 } 38	P0 } P7	—	Not used, connected to power supply or GND
39	V _{CC}	I	Power supply terminal
40	GND	—	GND terminal
41 } 44	P8 } P11	—	Not used, connected to power supply or GND

• IC302 (MN64732): Digital filter/MASH

Pin No.	Mark	I/O Division	Function				
1	V _{DD3}	I	Power supply terminal				
2	FSEL	I	MASH clock select terminal (“L”: 32Fs, “H”: 64Fs)				
3	V _{DD2}	I	Power supply terminal				
4	BSEL	I	Input data bit select terminal (“L”: 16bit, “H”: 20bit)				
5	ZFLG	O	Zero input detect output terminal				
6	ALLOW	O	All zero detect terminal (Not used, open)				
7	CK192	O	Clock (192Fs=8.4672MHz) output terminal				
8	LRPOL	I	LRCK polarity select terminal				
			LRPOL	“L”		“H”	
			LRCK	“L” Lch “H” Rch		“L” Rch “H” Lch	
9	LRCK	I	L/R discriminating signal				
10	BCK	I	Serial bit clock input terminal				
11	SDATA	I	Serial data signal input terminal				
12	V _{SS3}	—	GND terminal				
13	CK384	O	Clock (384Fs=16.9344MHz) output terminal				
14	MDATA	I	Attenuation command data input terminal (Not used, connected to power supply)				
15	MCLK	I	Attenuation command clock input terminal (Not used, connected to power supply)				
16	MLD	I	Attenuation command load input terminal (Not used, connected to power supply)				
17	RSTB	I	Reset terminal (“L”: Active)				
18	IE	I	Input format select terminal of serial data (Not used, connected to power supply)				
19	TPI	O	Test terminal (1) of digital filter section				

Pin No.	Mark	I/O Division	Function														
20	TP2	O	Test terminal (2) of digital filter section														
21	TEST1	I	Test signal input terminal of digital filter section														
22	TEST2																
23	SEL2	I	L/R select terminal <table><tr><td>⑬</td><td>"L"</td><td rowspan="2">Normal out</td><td>"L"</td><td rowspan="2">Lch out</td><td>"H"</td><td rowspan="2">Rch out</td><td>"H"</td><td rowspan="2">Lch anti-phase out</td></tr><tr><td>⑭</td><td>"L"</td><td>"H"</td><td>"L"</td><td>"H"</td></tr></table>	⑬	"L"	Normal out	"L"	Lch out	"H"	Rch out	"H"	Lch anti-phase out	⑭	"L"	"H"	"L"	"H"
⑬	"L"		Normal out	"L"	Lch out		"H"		Rch out		"H"		Lch anti-phase out				
⑭	"L"	"H"		"L"		"H"											
24	SEL1																
25	RO0	O	Rch data (0) output terminal														
26	NC	—	Not used, connected to GND														
27	RO1	O	Rch data (1) output terminal														
28	RO2	O	Rch data (2) output terminal														
29	RO3	O	Rch data (3) output terminal														
30	V _{SS} 1	—	GND terminal														
31	XO	O	Crystal oscillator terminal (Not used, open)														
32	XI	I	External clock (F=33.8688MHz) input terminal														
33	V _{DD} 1	I	Power supply terminal														
34	WCLK	O	Data synchronizing signal output terminal														
35	RESB	O	Reset output terminal														
36	LO0	O	Lch data (0) output terminal														
37	NC	—	Not used, connected to GND														
38	LO1	O	Lch data (1) output terminal														
39	LO2	O	Lch data (2) output terminal														
40	LO3	O	Lch data (3) output terminal														
41	CSEL	I	Clock input frequency select terminal ("L": 768Fs, "H": 384Fs)														
42	V _{SS} 2	—	GND terminal														

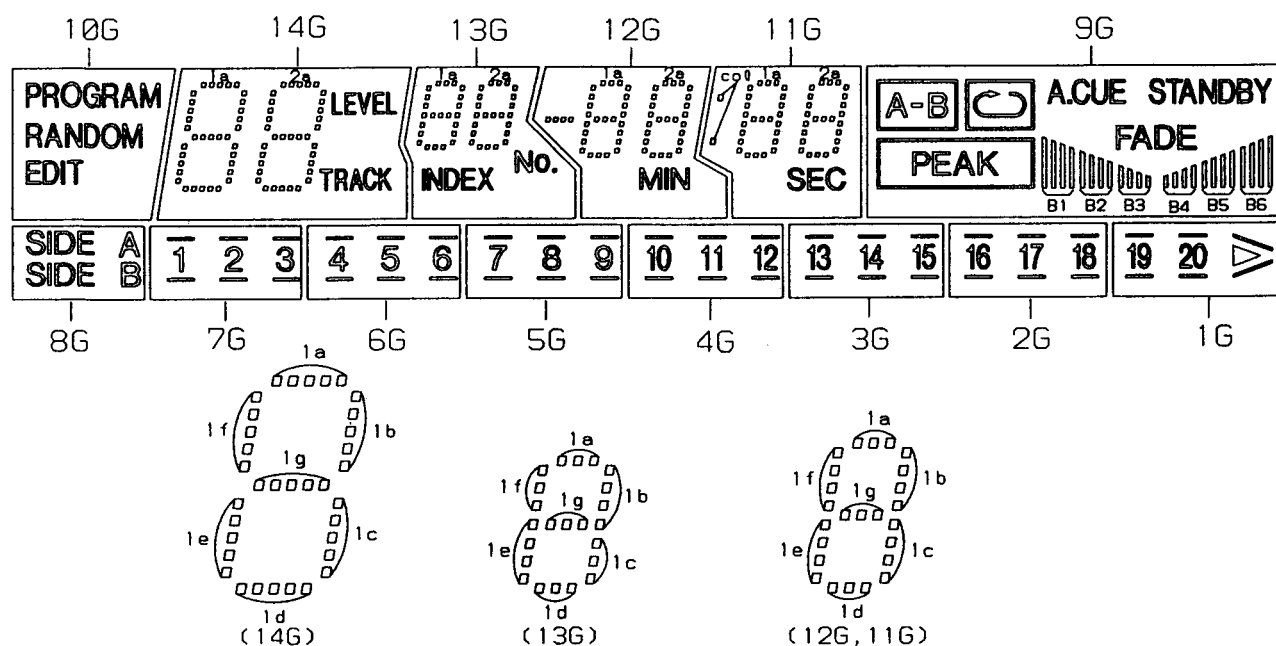
• IC601 (MND1617RJAA2): System control & FL drive

Pin No.	Mark	I/O Division	Function
1	VDD	I	Power supply terminal
2	OSC2	O	Crystal OSC terminal (F: 4.2336MHz)
3	OSC1	I	
4	V _{SS}	—	GND terminal
5	XI	—	Not used, connected to GND
6	XO	—	Not used, open
7	P47		
8	P46		
9 └ 14	P45 └ P40	I	Key return signal
15 └ 18	P37 └ P34	O	Key scan signal
19	P33	O	LED drive (PAUSE) terminal
20	P32	O	LED drive (PLAY) terminal
21	P31 (SENSE)	I	Sense signal
22	P30 (FLOCK)	I	Optical servo condition (focus) input
23	P27 (TLOCK)	I	Optical servo condition (tracking) input
24	P26 (RESET)	O	Reset signal ("L": reset)
25	P25 (DMUTE)	O	Muting signal ("H": MUTE)
26	P24 (STAT)	I	Status signal
27	P23 (EMPH)	O	Emphasis signal
28	P22 (REC. E)	I	Synchro rec control terminal
29	P21 (SINC. R)	O	
30	P20	—	Not used, connected to GND
31	IRQ1	I	Remote control terminal

Pin No.	Mark	I/O Division	Function
32	P14	—	Not used, connected to GND
33	P13 (OPEN)	O	Motor (OPEN) drive terminal
34	P12 (CLOSE)	O	Motor (CLOSE) drive terminal
35	P11 (OPEN SW)	I	Disc tray (OPEN) detect terminal
36	P10 (CLOSE SW)	I	Disc tray (CLOSE) detect terminal
37	/RST	I	Reset signal ("L": reset)
38	P05 (MCLK)	O	Command clock signal
39	P04 (MLD)	O	Command load signal ("L": load)
40	P03 (MDATA)	O	Command data signal
41	P02 (SQCK)	O	Sub-code Q register clock signal
42	P01 (SUBQ)	I	Sub-code Q data signal
43	P00 (BLKCK)	I	Sub-code block clock (F=75Hz) signal
44	P95 (MUTE)	O	Muting signal ("H": MUTE)
45	P94	O	Key scan signal
46	P93		
47 └ 49	P92 └ P90	I	Key return signal
50	CM	—	Not used, connected to GND
51	SYNC	—	Not used, open
52	V _{PP}	I	Power supply terminal
53	P70	O	LED drive (VIRTUAL BATTERY OPERATION) terminal
54	P71	—	Not used, open
55 └ 68	DGT13 └ DGT0	O	Digit signal of FL display
69 └ 84	SEG0 └ SEG15	O	Segment signal of FL display

INTERNAL CONNECTION OF FL

- **Grid connection diagram**



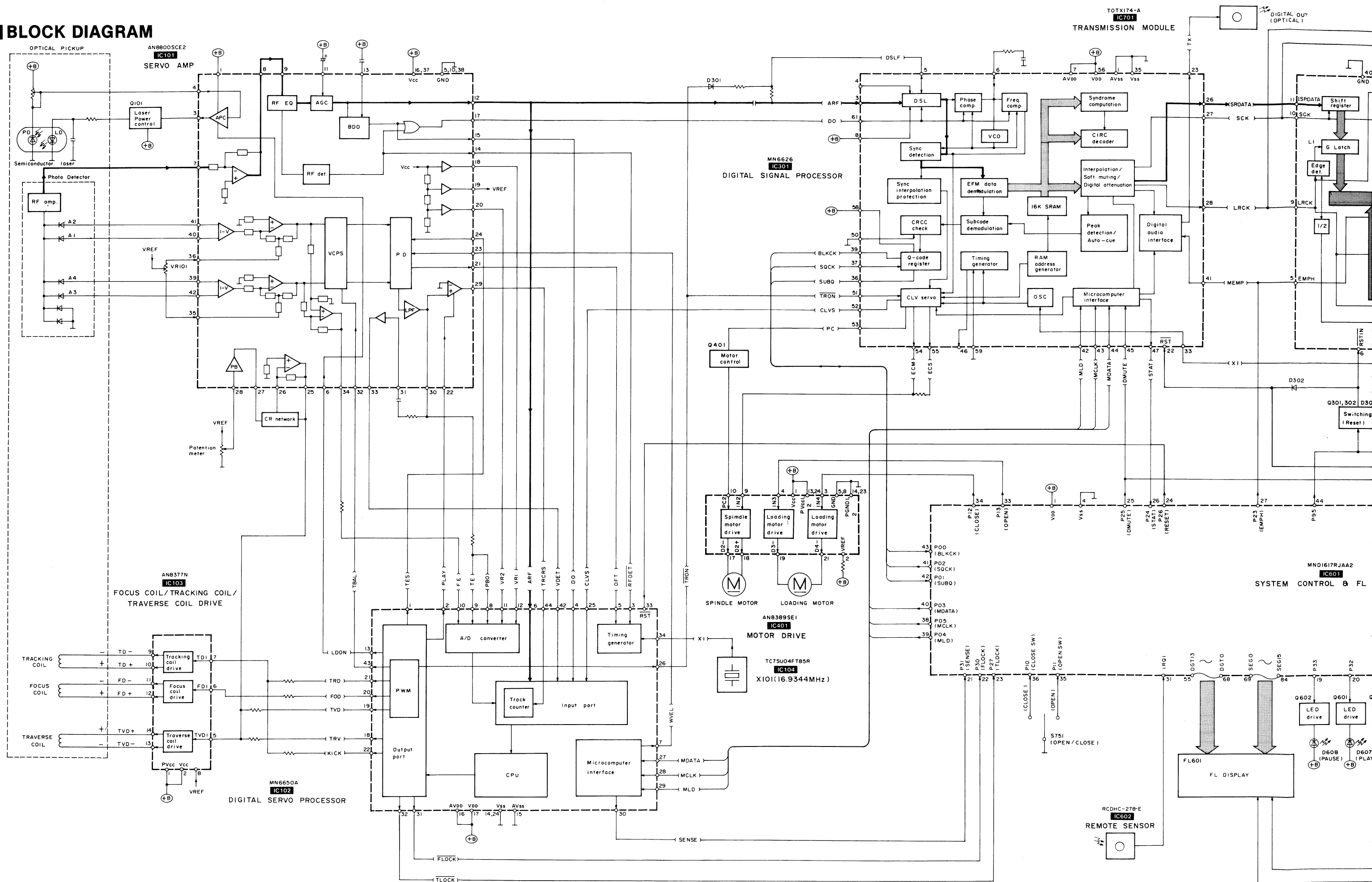
- **Anode connection diagram**

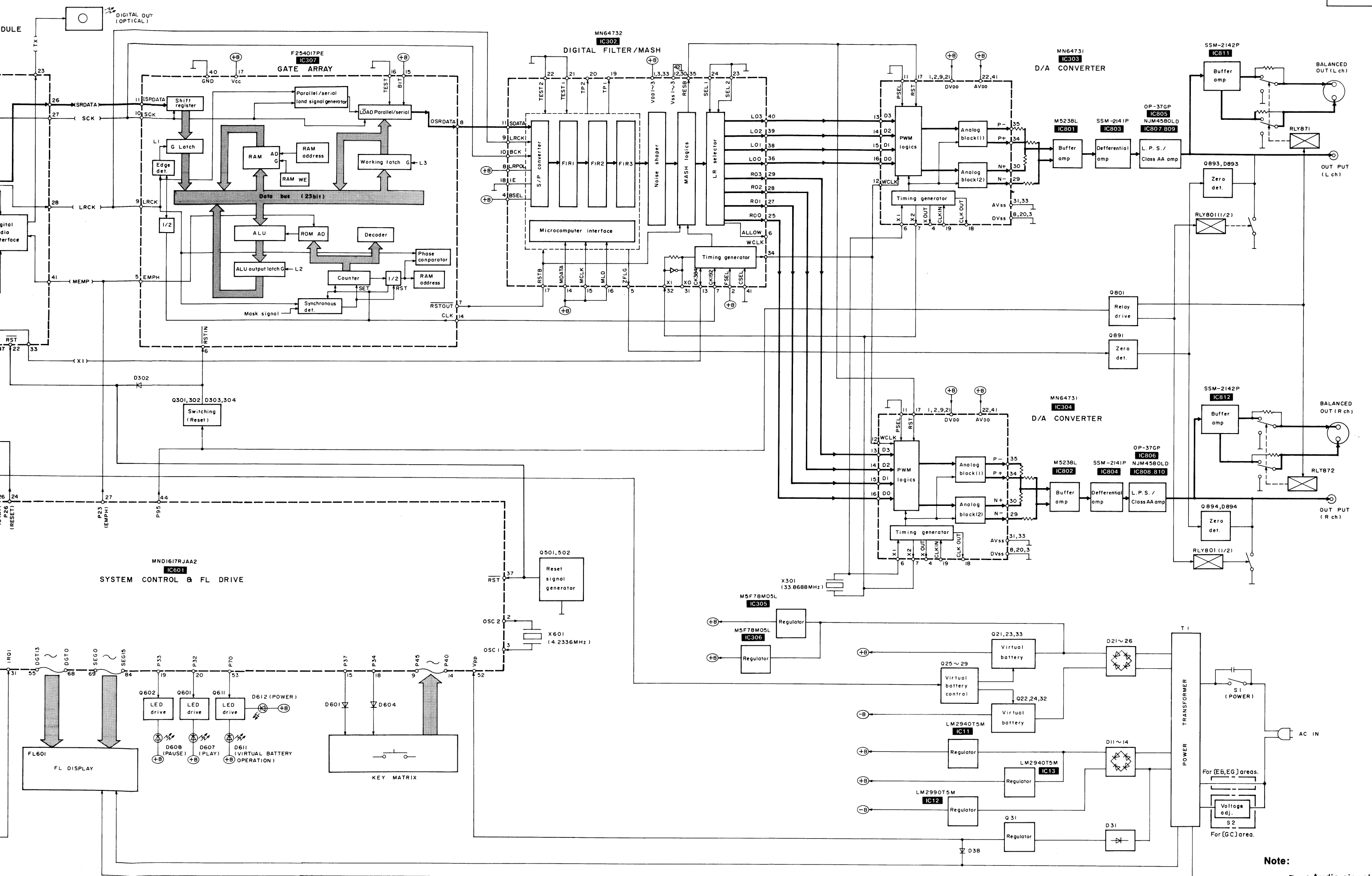
	14G	13G	12G	11G	10G	9G	8G	7G	6G	5G	4G	3G	2G	1G
P1	1a	1a	1a	1a	RANDOM	ACUE	-	(1)	(4)	(7)	(10)	(13)	(16)	(19)
P2	1b	1b	1b	1b	PROGRAM	-	-	(2)	(5)	(8)	(11)	(14)	(17)	(20)
P3	1f	1f	1f	1f	-	STANDBY	SIDE A	(3)	(6)	(9)	(12)	(15)	(18)	↖
P4	1g	1g	1g	1g	-	-	SIDE B	1	4	7	10	13	16	19
P5	1c	1c	1c	1c	-	PEAK	-	(1)	(4)	(7)	(10)	(13)	(16)	(19)
P6	1e	1e	1e	1e	-	A-	-	(2)	(5)	(8)	(11)	(14)	(17)	(20)
P7	1d	1d	1d	1d	-	B	-	(3)	(6)	(9)	(12)	(15)	(18)	↗
P8	LEVEL	No.	0000	COIL	-	C	-	2	5	8	11	14	17	20
P9	2a	2a	2a	2a	-	-	-	-	-	-	-	-	-	-
P10	2b	2b	2b	2b	-	B1	-	-	-	-	-	-	-	-
P11	2f	2f	2f	2f	EDIT	B2	-	-	-	-	-	-	-	-
P12	2g	2g	2g	2g	-	B3	-	3	6	9	12	15	18	▷
P13	2c	2c	2c	2c	-	FADE	-	-	-	-	-	-	-	-
P14	2e	2e	2e	2e	-	B4	-	-	-	-	-	-	-	-
P15	2d	2d	2d	2d	-	B5	-	-	-	-	-	-	-	-
P16	TRACK INDEX	MIN	SEC		-	B6	-	-	-	-	-	-	-	-

- **Pin connection**

PIN NO.	442	441	430	339	338	337	336	335	334	333	332	331	220	221	222	223	224	225	226	227	228	229	110	111	112	113	114	115	116	117	118	119	000	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021	022	023	024	025	026	027	028	029	030	031	032	033	034	035	036	037	038	039	040	041	042	043	044	045	046	047	048	049	050	051	052	053	054	055	056	057	058	059	060	061	062	063	064	065	066	067	068	069	070	071	072	073	074	075	076	077	078	079	080	081	082	083	084	085	086	087	088	089	090	091	092	093	094	095	096	097	098	099	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500																											
CONNECTION	F22	F22	NPP	NNP	NNP	166	233	233	466	566	566	788	900	900	111	111	233	233	466	466	NNP	NNP	P11	P23	P34	P45	P56	P67	P78	P89	P90	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	1

BLOCK DIAGRAM





SCHEMATIC DIAGRAM (Parts list on pages 49, 50, 55, 56.)

(This schematic diagram may be modified any time with development of new technology.)

Note:

- **S1** : Power (■ OFF, ▲ ON) switch and indicator.
- **S2** : Voltage adj. switch in "240V" position.
[For (GC) area only.]
(110V ↔ 127V ↔ 220V ↔ 240V)
- **S613, 614** : Skip (◀◀ SKIP ▶▶) switches.
[S613: ◀◀, S614: ▶▶]
- **S615** : Disc tray open/close (▲ OPEN/CLOSE) switch.
- **S616** : Stop (■) switch.
- **S617** : Pause (■) switch and indicator.
- **S618** : Play (▶) switch and indicator.
- **S619, 620** : Search (◀◀ SEARCH ▶▶) switches.
[S619: ◀◀, S620: ▶▶]
- **S751** : Disc tray open/close detector switch.
- The voltage value and waveforms are the reference voltage of this unit measured by DC electronic voltmeter (high impedance) and oscilloscope on the basis of chassis. Accordingly, there may arise some error in voltage values and waveforms depending upon the internal impedance of the tester or the measuring unit.
*The parenthesized are the values of voltage generated during playing (Test disc 1kHz, L+R, 0dB), others are voltage values in stop mode.
-  /  : Positive voltage lines and negative voltage lines.
 : audio signal lines.

Important safety notice:

Components identified by  mark have special characteristics important for safety. Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used. When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.

- The supply part number is described alone in the replacement parts list.

Part No.	Production Part No.	Supply Part No.
IC11, 13	LM2940T5M	LM2940T5
IC602	RCDHC-278-E	RCDHC-278

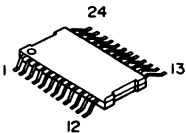
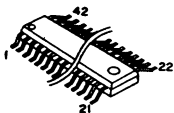
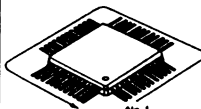
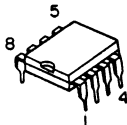
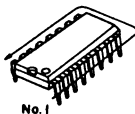
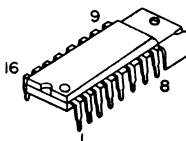
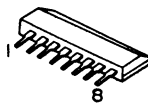
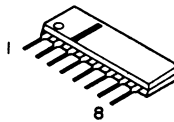
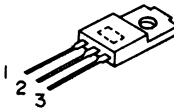
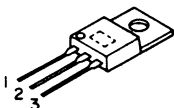
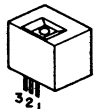
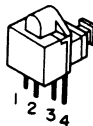
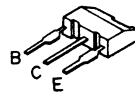
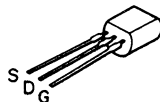
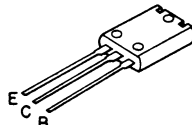
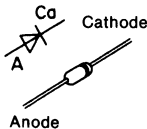
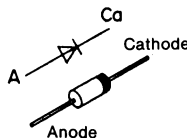
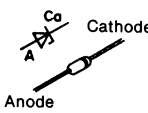
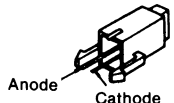
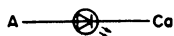
Caution!

IC and LSI are sensitive to static electricity.

Secondary trouble can be prevented by taking care during repair.

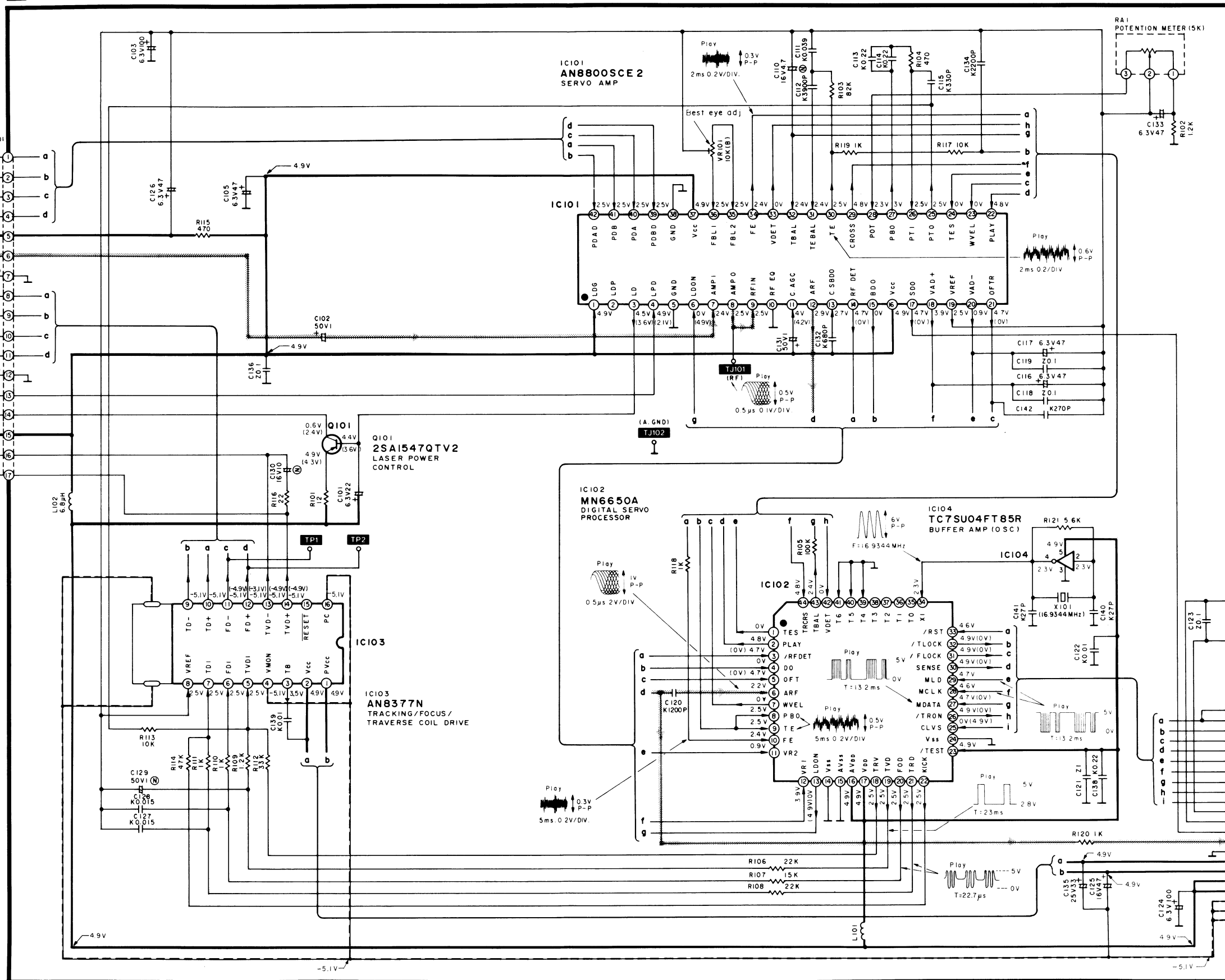
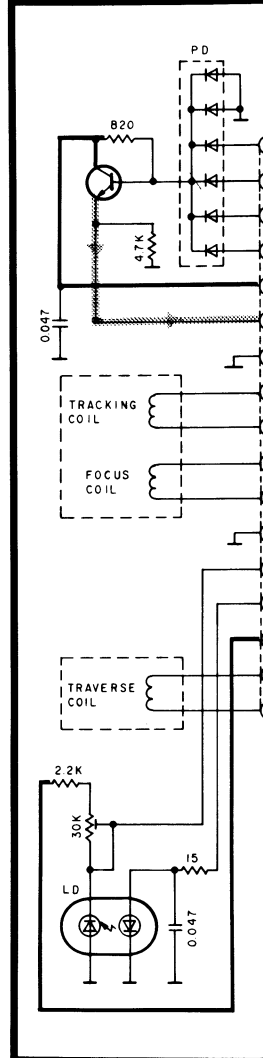
- Cover the parts boxes made of plastics with aluminum foil.
- Ground the soldering iron.
- Put a conductive mat on the work table.
- Do not touch the pins of IC or LSI with fingers directly.

Terminal guide of IC's, transistors and diodes

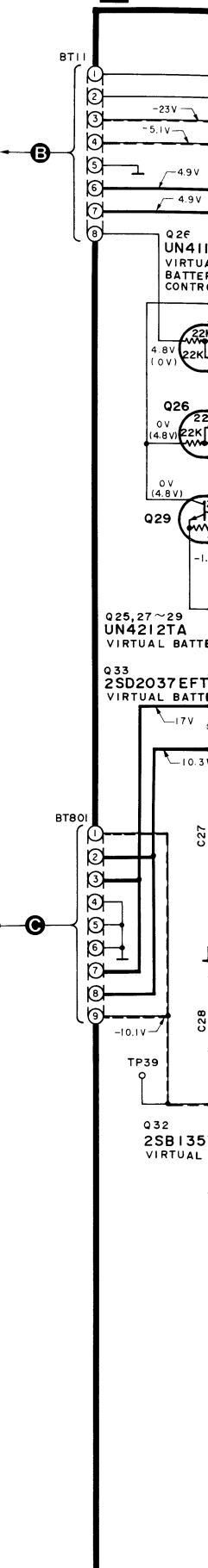
TC7SU04FT85R 	AN8389SE1 	AN8800SCE2 	<table><tr><td>F254017PE</td><td>44 Pin</td></tr><tr><td>MN6650A</td><td>44 Pin</td></tr><tr><td>MN6626</td><td>64 Pin</td></tr><tr><td>MND1617RJAA2</td><td>84 Pin</td></tr></table> 	F254017PE	44 Pin	MN6650A	44 Pin	MN6626	64 Pin	MND1617RJAA2	84 Pin	SSM-2141P SSM-2142P 
F254017PE	44 Pin											
MN6650A	44 Pin											
MN6626	64 Pin											
MND1617RJAA2	84 Pin											
 <table><tr><td>OP-37GP</td><td>8 Pin</td></tr><tr><td>MN64731</td><td>42 Pin</td></tr><tr><td>MN64732</td><td>42 Pin</td></tr></table>	OP-37GP	8 Pin	MN64731	42 Pin	MN64732	42 Pin	AN8377N 	M5238L 	NJM4580LD 	M5F78M05L 		
OP-37GP	8 Pin											
MN64731	42 Pin											
MN64732	42 Pin											
LM2940T5M LM2990T5M 	RCDHC-278-E 	T0TX174-A 	 <table><tr><td>2SC3311QRSTA</td></tr><tr><td>UN4112TA</td></tr><tr><td>UN4114TA</td></tr><tr><td>UN4211TA</td></tr><tr><td>UN4212TA</td></tr></table>	2SC3311QRSTA	UN4112TA	UN4114TA	UN4211TA	UN4212TA	2SA1547QTV2 2SB1238QSTV6 			
2SC3311QRSTA												
UN4112TA												
UN4114TA												
UN4211TA												
UN4212TA												
2SJ148TPE2 2SK982TPE2 	2SB1357EFTA 2SD2037EFTA 	SVD1SR35200V MA165TA 	D1NK20H-4084 	MTZJ13BTA MTZJ24DTA MTZJ3R9ATA MTZJ9R1CTA 								
 <table><tr><td>LN013304P</td></tr><tr><td>LN014304P</td></tr><tr><td>LN018304P</td></tr></table> 	LN013304P	LN014304P	LN018304P									
LN013304P												
LN014304P												
LN018304P												

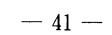
A SERVO CIRCUIT

ΔOPTICAL PICKUP

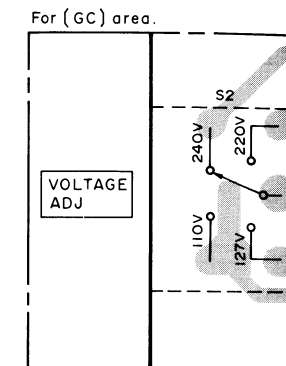
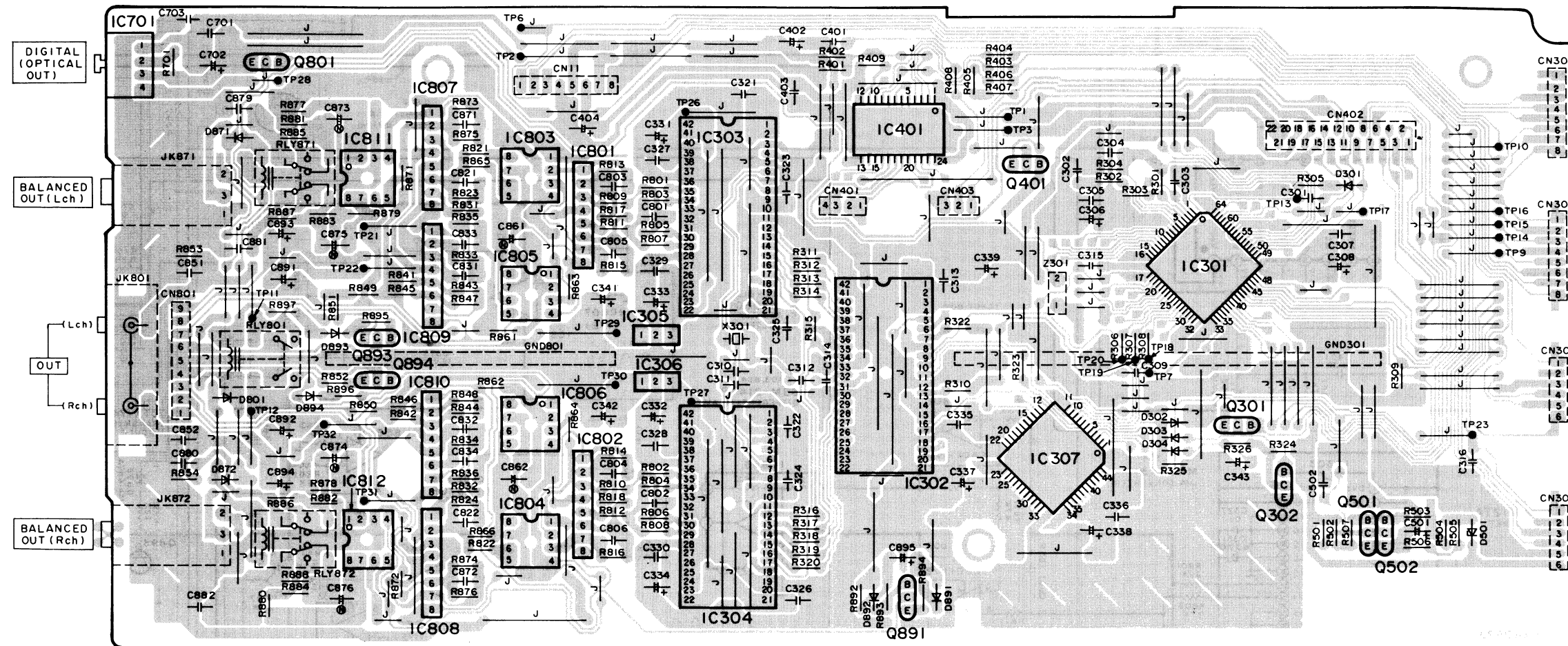


H POWER

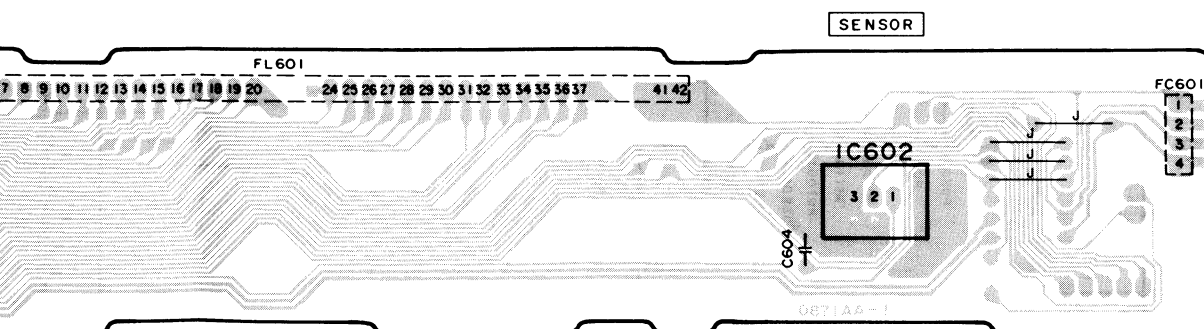
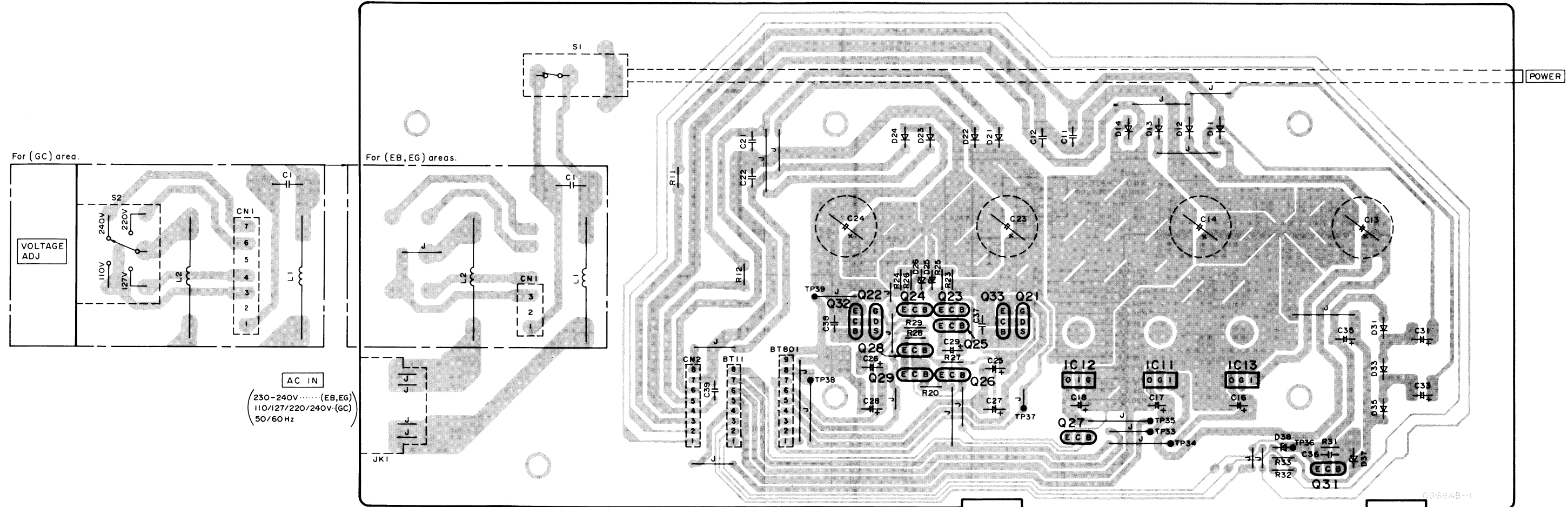




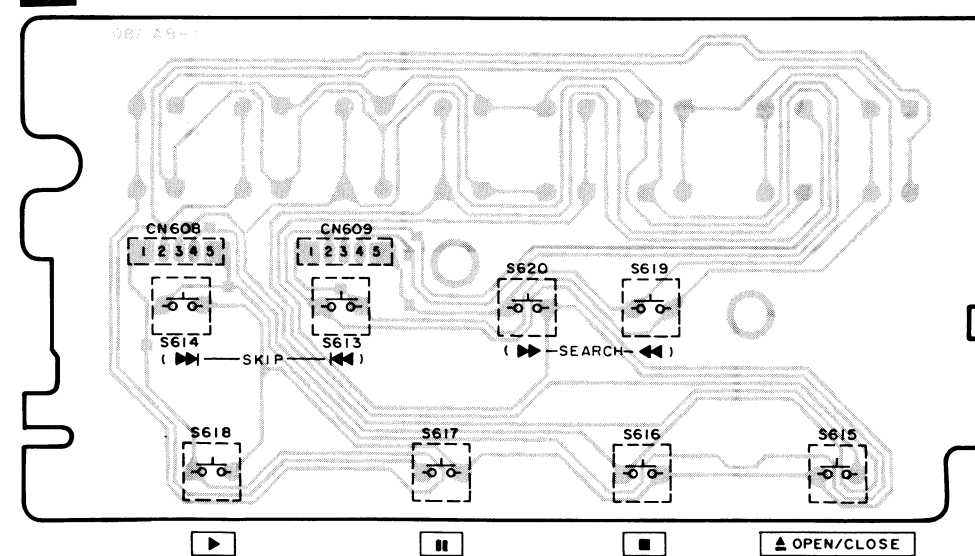
F MAIN P.C.B. (REP I466 B - M... {EB, EG})
(REP I466 C - M... {GC})



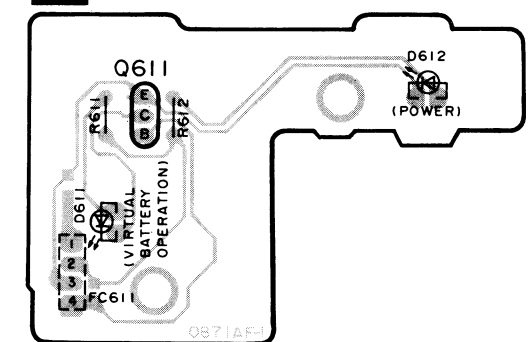
H POWER SUPPLY P.C.B. (REPI466B-M... (EB,EG) REPI466C-M... (GC)



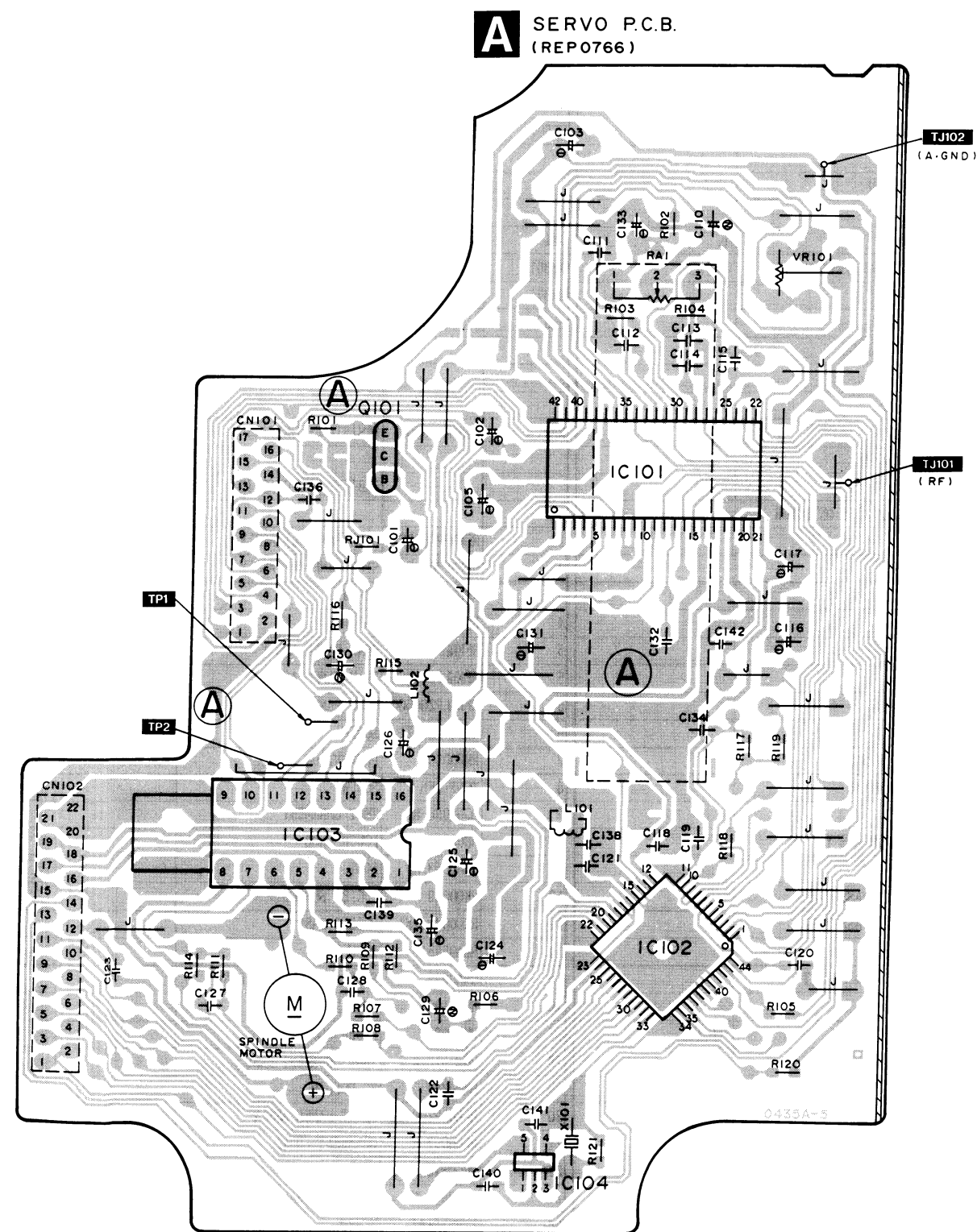
C OPERATION P.C.B. (REPI385B-S)



D LED P.C.B. (REPI385B-S)

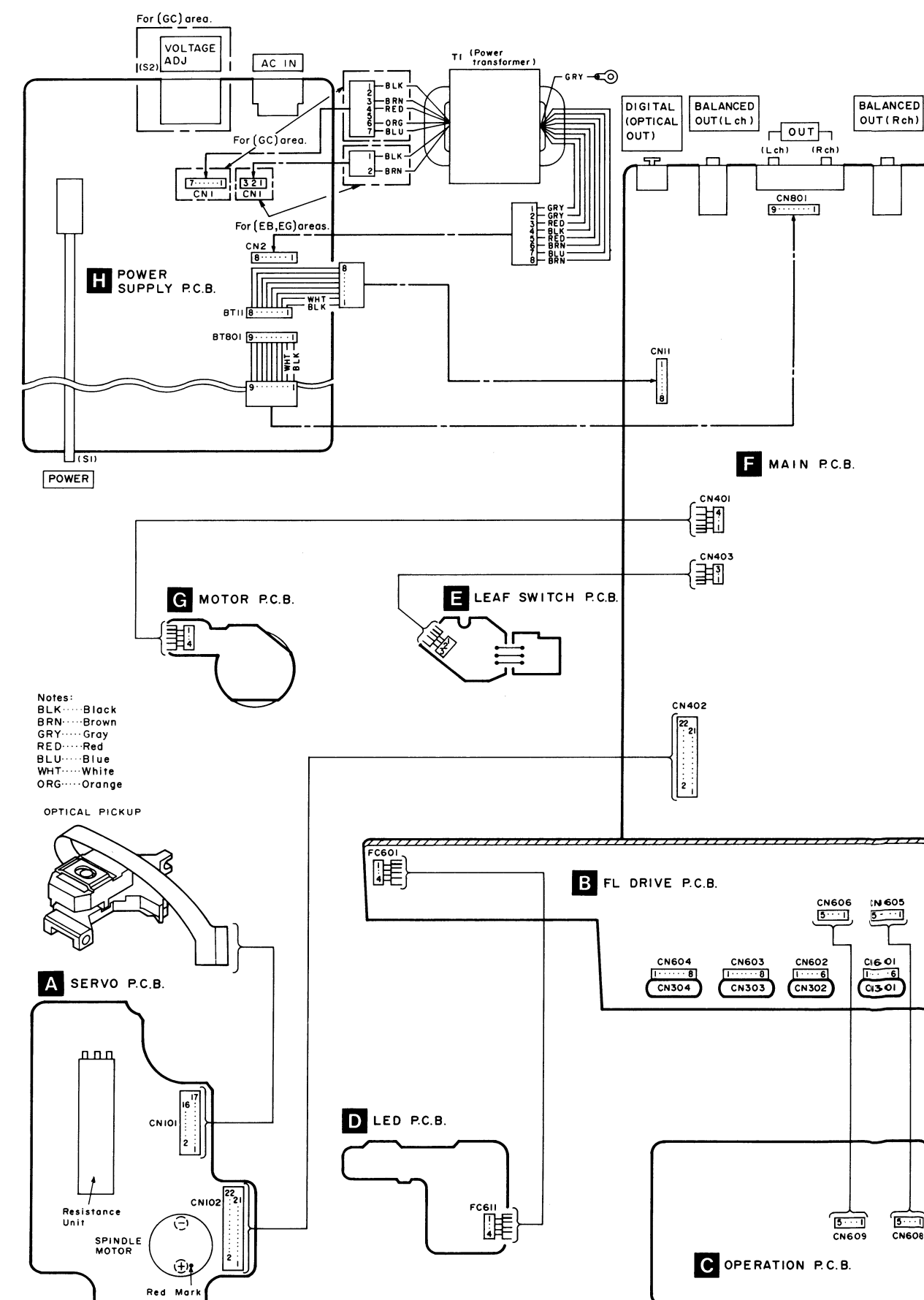


20 21 22 23 24



Note) The servo P.C.B. of dual DC power supply type has Ⓐ marks and white line (—).
(See page 17.)

■ WIRING CONNECTION DIAGRAM



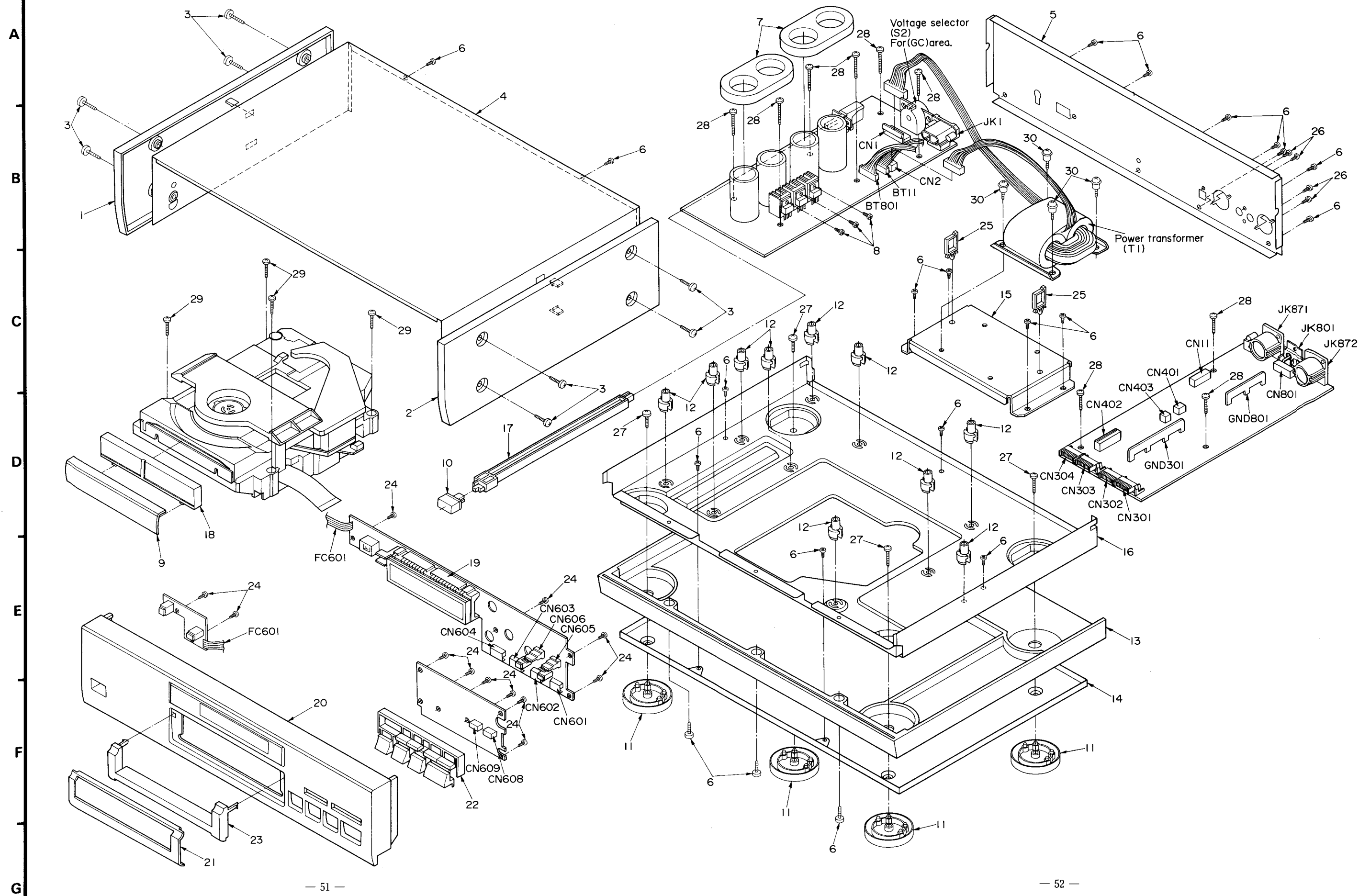
■ REPLACEMENT PARTS LIST

Notes: *Important safety notice:
Components identified by △ mark have special characteristics important for safety.
Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used.
When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.
*The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.)
Parts without these indications can be used for all areas.
*Remote Control Ass'y:
Supply period for three years from termination of production.
*Warning: This product uses a laser diode. Refer to caution statements on page 3.
*ACHTUNG: Die Lasereinheit nicht zerlegen.
Die Lasereinheit darf nur gegen eine vom Hersteller spezifizierte Einheit ausgetauscht werden.

Ref. No.	Part No.	Part Name & Description	Remarks	Ref. No.	Part No.	Part Name & Description	Remarks
		INTEGRATED CIRCUIT (S)		Q893, 894	ZSC3311A-Q	TRANSISTOR	
						DIODE (S)	
IC11	LM2940T5	IC, REGULATOR	△	D11-14	SVD1SR35200A	DIODE	△
IC12	LM2990TSM	IC, REGULATOR	△	D21-24	D1NK20H-4084	DIODE	△
IC13	LM2940T5	IC, REGULATOR	△	D25, 26	MTZJ13BTA	DIODE	△
IC101	AN8800SCE2	IC, SERVO AMP		D31	SVD1SR35200A	DIODE	△
IC102	MN6650A	IC, DIGITAL SERVO PROCESSOR		D33	SVD1SR35200A	DIODE	△
IC103	AN8377N	IC, TRACKING/FOCUS/TRVERSE		D35	SVD1SR35200A	DIODE	△
IC104	TC7SU04FT85R	IC, BUFFER AMP		D37	MTZJ24DTA	DIODE	△
IC301	MN6626	IC, DIGITAL SIGNAL PROCESSOR		D38	MTZJ9R1CTA	DIODE	
IC302	MN64732	IC, DIGITAL FILTER/MASH		D301-304	MA165	DIODE	
IC303, 304	MN64731	IC, D/A CONVERTER		D501	MTZJ3R9ATA	DIODE	
IC305, 306	M5F78M05L	IC, REGULATOR	△	D601	MA165	DIODE	
IC307	F254017PE	IC, GATE ARRAY		D604	MA165	DIODE	
IC401	AN8389SE1	IC, MOTOR DRIVE		D607	LN013304P	L. E. D.	
IC601	MND1617RJAA2	IC, SYSTEM CONTROL&FL DRIVE		D608	LN014304P	L. E. D.	
IC602	RCDHC-278	IC, REMOTE SENSOR		D611	LN014304P	L. E. D.	
IC701	T0TX174-A	IC, TRANSMISSION MODULE		D612	LN018304P	L. E. D.	
IC801, 802	M5238L	IC, BUFFER AMP		D801	MA165	DIODE	
IC803, 804	SSM-2141P	IC, DIFFERENTIAL AMP		D871, 872	MA165	DIODE	
IC805, 806	OP-37GP	IC, CLASS AA AMP		D891-894	MA165	DIODE	
IC807-810	NJM4580LD	IC, CLASS AA/L. P. FILTER AMP				VARIABLE RESISTOR (S)	
IC811, 812	SSM-2142P	IC, BUFFER AMP					
		TRANSISTOR (S)		VR101	EVND3AA00B14	V. R, BEST EYE ADJUSTMENT	
						COMPONENT COMBINATION (S)	
Q21	ZSK982TPE2	TRANSISTOR		Z301	BL02RN2R62T4	COMBINATION PART	
Q22	ZSJ148TPE2	TRANSISTOR				COIL (S)	
Q23	UN4112	TRANSISTOR					
Q24, 25	UN4212TA	TRANSISTOR		L1, 2	SLQX400-D	COIL	△
Q26	UN4112	TRANSISTOR		L101	RLB0003	COIL	
Q27-29	UN4212TA	TRANSISTOR		L102	RELJHC6R8KTD	COIL	
Q31	ZSB1238QSTV6	TRANSISTOR	△			TRANSFORMER (S)	
Q32	ZSB1357EFTA	TRANSISTOR		T1	RTP7B4B001-W	POWER TRANSFORMER	(EG, EB) △
Q33	ZSD2037EFTA	TRANSISTOR		T1	RTP7B4E001-W	POWER TRANSFORMER	(GC) △
Q101	ZSA1547QTV2	TRANSISTOR				OSCILLATOR (S)	
Q301	UN4112	TRANSISTOR					
Q302	UN4212TA	TRANSISTOR		X101	RSXZ16M9M01T	OSCILLATOR (16.9344MHz)	
Q401	UN4112	TRANSISTOR					
Q501, 502	ZSC3311A-Q	TRANSISTOR					
Q601, 602	UN4211	TRANSISTOR					
Q603	UN4212TA	TRANSISTOR					
Q611	UN4211	TRANSISTOR					
Q801	UN4114TA	TRANSISTOR					
Q891	UN4112	TRANSISTOR					

Ref. No.	Part No.	Part Name & Description	Remarks	Ref. No.	Part No.	Part Name & Description	Remarks
X301	RSXA33M8G	OSCILLATOR (33.8688MHz)		CN608, 609	SJS50581BB	SOCKET (5P)	
X601	RSXY4M23M01T	OSCILLATOR (4.2336MHz)		CN801	SJT3907	CONNECTOR (9P)	
						FLAT CABLE (S)	
		DISPLAY TUBE					
FL601	RSL0142-F	DISPLAY TUBE		FC601	REZ0331	FLAT CABLE	
						JACK (S)	
		SWITCH (ES)					
S1	ESB8249V	SW, POWER	△	JK1	SJS9236	AC INLET	△
S2	SSR187-1	SW, VOLTAGE SELECTOR	(GC) △	JK801	RJH3201A	OUT	
S613	EVQ21405R	SW, SKIP (R)		JK871	RJS1A9703-R	BALANCED OUT (Lch)	
S614	EVQ21405R	SW, SKIP (F)		JK872	RJS1A9703-R	BALANCED OUT (Rch)	
S615	EVQ21405R	SW, OPEN/CLOSE				MAGNET RESISTOR ELEMENTS	
S616	EVQ21405R	SW, STOP					
S617	EVQ21405R	SW, PAUSE		RA1	EWS7M0A00Q53	RESISTANCE UNIT	
S618	EVQ21405R	SW, PLAY				CABINET AND CHASSIS	
S619	EVQ21405R	SW, SEARCH (R)					
S620	EVQ21405R	SW, SEARCH (F)					
S751	RSH2B001	SW, OPEN/CLOSE DETECTOR		1	RFKNP2000EGA	SIDE PANEL (L) ASS'Y	
				2	RFKNP2000EGB	SIDE PANEL (R) ASS'Y	
		RELAY (S)		3	RHD30034	SCREW	
RLY801	AG80239	RELAY		4	RKM0216-K	CABINET	
RLY871, 872	AG80239	RELAY		5	RFKHLP2000EG	REAR PANEL ASS'Y	(EG)
				5	RFKHLP2000EB	REAR PANEL ASS'Y	(EB)
		TERMINAL		5	RFKHLP2000GC	REAR PANEL ASS'Y	(GC)
				6	XTBS3+8JFZ1	SCREW	
GND301	SJT75-1	GND TERMINAL		7	RMF0050	PREVENTION SPONGE	
GND801	RJR0027	GND TERMINAL		8	XSN3+8FB	SCREW	
				9	RG0096-K	TRAY ORNAMENT	
		CONNECTOR ASS'Y		10	RGU0030	POWER KNOB	
				11	RKA0053-A	FOOT	
BT11	REX0464	CONNECTOR ASS'Y (8P)		12	RKQ0089	P. C. B. SUPPORT	
BT801	REX0465	CONNECTOR ASS'Y (9P)		13	RKU0044A-K1	RUBBER BASE	
				14	RMA0615A	PUSH PLATE	
		CONNECTOR & SOCKET		15	RMA0619	POWER TRANSFORMER BASE	
				16	RMK0190	CHASSIS	
CN1	RJP1A4103	CONNECTOR (3P)	(EG, EB)	17	RMMD096	POWER ROD	
CN1	RJP1A6007	CONNECTOR (7P)	(GC)	18	RMRO612-K	TRAY ORNAMENT BASE	
CN2	SJT3809	CONNECTOR (8P)		19	RMN0200	FL HOLDER	
CN11	SJT3809	CONNECTOR (8P)		20	RFKGLP2000EG	FRONT PANEL ASS'Y	
CN101	RJS1A6717-1Q	SOCKET (17P)		21	RG0097-K	ORNAMENT FRAME	
CN102	RJS1A6722-1Q	SOCKET (22P)		22	RGU0815-K	MAIN KNOB	
CN301, 302	RJU003K006M1	SOCKET (6P)		23	RMRO613-K	ORNAMENT FRAME BASE	
CN303, 304	RJU003K008M1	SOCKET (8P)		24	XTBS26+8J	SCREW	
CN401	RJS1A6604	SOCKET (4P)		25	SHR9814	CLAMPER	
CN402	RJS1A6822	SOCKET (22P)		26	XSN3+6FZS	SCREW	
CN403	RJS1A6603	SOCKET (3P)		27	XTB3+14G	SCREW	
CN601, 602	RJT003K006-1	CONNECTOR (6P)		28	XTB3+20JFZ	SCREW	
CN603, 604	RJT003K008-1	CONNECTOR (8P)		29	XTB3+8F	SCREW	
CN605, 606	SJT30549BB1	CONNECTOR (5P)		30	SHDD4	SCREW	

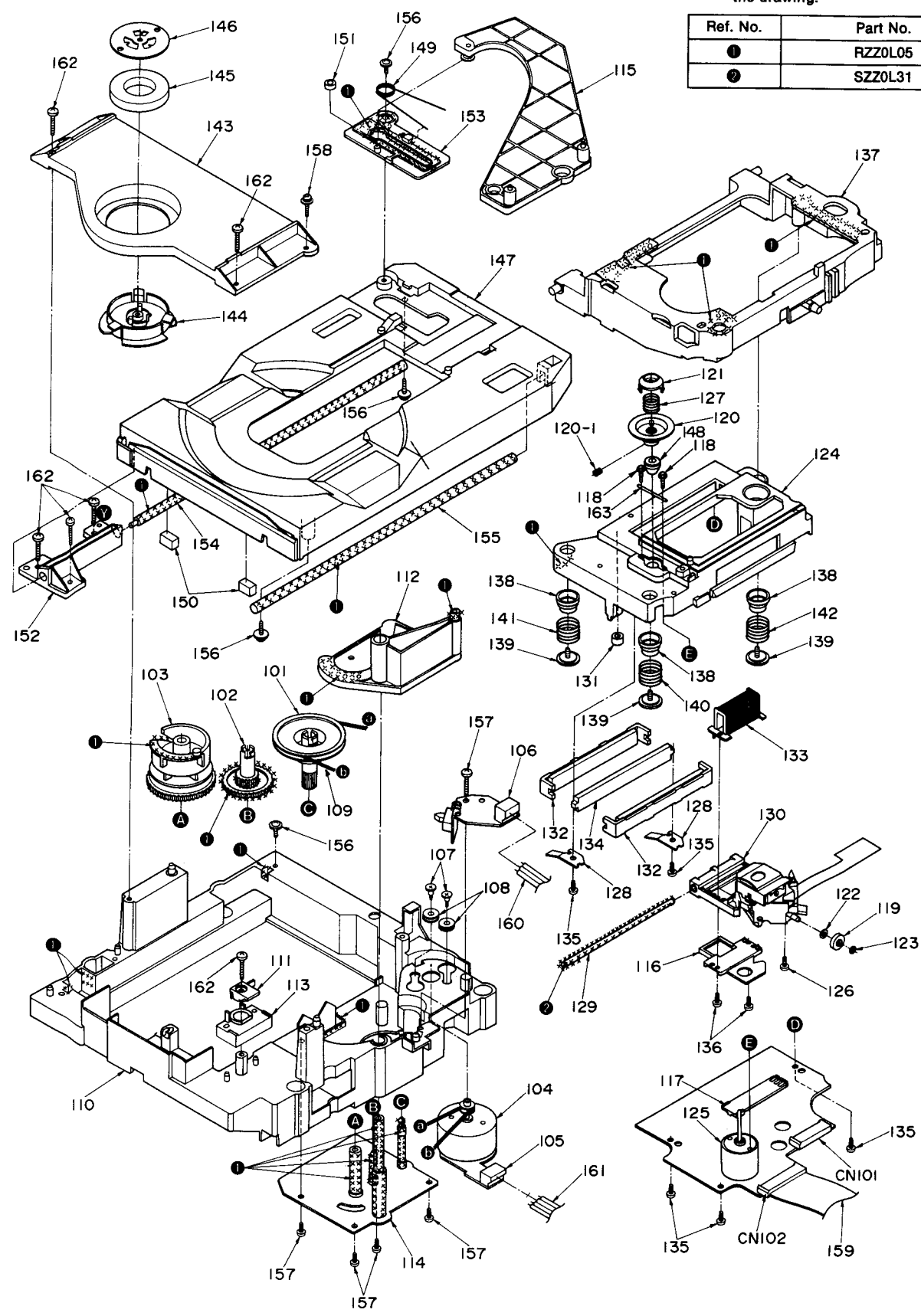
CABINET PARTS LOCATION



LOADING MECHANISM

Note: When changing loading mechanism parts, apply the specified grease to the areas marked "x x" as shown in the drawing.

Ref. No.	Part No.
①	RZZ0L05
②	SZZ0L31



REPLACEMENT PARTS LIST

Notes: *Important safety notice:
Components identified by Δ mark have special characteristics important for safety.
Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used.
When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.
*The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.)
Parts without these indications can be used for all areas.
*Remote Control Ass'y:
Supply period for three years from termination of production.
*Warning: This product uses a laser diode. Refer to caution statements on page 3.
*ACHTUNG: Die Lasereinheit nicht zerlegen.
Die Lasereinheit darf nur gegen eine vom hersteller spezifizierte Einheit ausgetauscht werden.

Ref. No.	Part No.	Part Name & Description	Remarks	Ref. No.	Part No.	Part Name & Description	Remarks
		LOADING MECHANISM		142	SUSD145-1	FLOATING SPRING(SILVER)	
				143	RFKNP2000EGC	CLAMP PLATE ASS'Y	(EG)
				143	RFKNP2000EBD	CLAMP PLATE ASS'Y	(EB, GC)
101	RDG0154	PULLEY GEAR		144	SIRD51-1	CLAMPER	
102	RDG0155	REDUCTION GEAR		145	SOMD4	MAGNET	
103	RDG015-1	DRIVE CAM		146	SOYD2	YOKE	
104	REM0026	LOADING MOTOR ASS'Y		147	RFKNP2000EGE	DISC TRAY ASS'Y	
105	SJT30444-H	CONNECTOR(4P) (CN401)		148	RXQ0232	SIDE PRESSURE PULLEY	
106	SJT30344-H	CONNECTOR(3P) (CN403)		149	RME0074	TRAY SPRING	
107	RHD26002	SCREW		150	RMG0199	TRAY CUSHION RUBBER	
108	RHG30322A	MOTOR CUSHION RUBBER		151	RMG0200	CUSHION RUBBER	
109	RMG0121	BELT		152	RMRO383-1	SHAFT HOLDER(L)	
110	RMRO381-4	LOADING BASE		153	RMRO412-2	SLIDE PLATE	
111	RMRO384-3	SHAFT HOLDER(R)		154	RMS0265-1	GUIDE SHAFT(L)	
112	RMRO386-2	DRIVE PLATE		155	RMS0309-1	GUIDE SHAFT(R)	
113	RMRO411-2	SHAFT HOLDER PLATE		156	XTWS3+10Q	SCREW	
114	RXAO093	GEAR BASE ASS'Y		157	XTB3+10JFZ	SCREW	
115	RXLO066	ROTATION LEVER ASS'Y		158	RHD30017-1	SCREW	
116	SHRD176-E	BRUSH HOLDER		159	REZ0328	FLAT CABLE (22P)	
117	SJED10	POTENTION METER HOLDER		160	REZ0338-1	FLAT CABLE (3P)	
118	RMQ0299	SCREW		161	REZ0341	FLAT CABLE (4P)	
119	RMRO463	ROLLER		162	XTB3+12JFZ	SCREW	
120	SD0D28-2E	TURNABLE		163	RME0115	SIDE PRESSURE SPRING	
120-1	XXE26D5	SCREW				PACKING MATERIALS	
121	SD0D29-2	TURNABLE RING					
122	SHWD33	WASHER		P1	RPG1419	PACKING CASE	(EB)
123	SHWD34	WASHER		P1	RPG1400	PACKING CASE	(EG, GC)
124	SISD22-7	TRAVERSE BASE		P2	RPQ0333	PAD	(EB)
125	SJGDRF310T-2	SPINDLE MOTOR		P2	RPQ0332	PAD	(EG, GC)
126	SNSD31	SCREW		P3	RPN0658	CUSHION	(EB)
127	SRQA010N04	TURNABLE SPRING		P3	RPN0657	CUSHION	(EG, GC)
128	SUWD112-2	SHAFT PUSH PLATE		P4	SPP730	PROTECTION BAG(UNIT)	
129	SUXD123-1	GUIDE SHAFT		P5	XZB22X20C03	PROTECTION BAG(CORD)	
130	SOAD70A	OPTICAL PICKUP		P6	RPH0100	PROTECTION SHEET	
131	SHGD148	STOPPER RUBBER		P7	RPH0101	KRAFT PAPER	
132	RFKNLP363P	YOKE (A) ASS'Y		P8	RPH0086	PROTECTION SHEET	
133	SORD46-E	COIL ASS'Y					
134	SOYD22-1	YOKE (B)					
135	XTB3+10G	SCREW					
136	XTN2+5G	SCREW					
137	RXQ0157	SUB BASE ASS'Y					
138	SHGD153-1	FLOATING RUBBER					
139	RHD30031	SCREW					
140	SUSD136-1	FLOATING SPRING(BLACK)					
141	SUSD137-1	FLOATING SPRING(GOLD)					

RESISTORS AND CAPACITORS

Notes : * Capacity values are in microfarads (uF) unless specified otherwise, P=Pico-farads (pF) F=Farads (F)
* Resistance values are in ohms, unless specified otherwise, 1 K=1,000 (OHM), 1 M=1,000k (OHM)

Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks
		RESISTORS	R502	ERDS2TJ222	1/4W 2.2K	C101	ECEAJKA220	6.3V 22U
			R503, 504	ERDS2TJ272T	1/4W 2.7K	C102	ECEAHKS010	50V 1U
			R505, 506	ERDS2TJ101	1/4W 100	C103	ECAQJF101I	6.3V 100U
R11, 12	ERQ16NKNR15E	1W 0.15	R507	ERDS2TJ222	1/4W 2.2K	C105	ECEAJKS470	6.3V 47U
R20	ERDAS3G473	1/4W 47K	R601, 602	ERDS2TJ151	1/4W 150	C110	ECEACSN4R7I	16V 4.7U
R23, 24	ERDAS3G221T	1/4W 220	R611	ERDS2TJ151	1/4W 150	C111	ECUV1C393KBN	16V 0.039U
R25, 26	ERDAS3G331T	1/4W 330	R612	ERDS2TJ221	1/4W 220	C112	ECUV1H392KBN	50V 3900P
R27	ERDAS3G682T	1/4W 6.8K	R701	ERDS2TJ822	1/4W 8.2K	C113, 114	ECUV1C224KBM	16V 0.22U
R28	ERDAS3G102T	1/4W 1K	R801-808	ERDAS3G273T	1/4W 27K	C115	ECUV1H331KBN	50V 330P
R29	ERDAS3G562T	1/4W 5.6K	R809-816	ERDAS3G103T	1/4W 10K	C116, 117	ECEAJKA470I	6.3V 47U
R31	ERDS2TJ103	1/4W 10K	R817, 818	ERDAS3G473	1/4W 47K	C118, 119	ECUV1C1042FN	16V 0.1U
R32	ERDS2TJ472	1/4W 4.7K	R821-824	ERDAS3G103T	1/4W 10K	C120	ECUV1H122KBN	50V 1200P
R33	ERDS2TJ392T	1/4W 3.9K	R831-836	ERDAS3G103T	1/4W 10K	C121	ECUV1C1052FM	16V 1U
R101	ERJ6GEYJ120V	1/10W 12	R841, 842	ERDAS3G100T	1/4W 10	C122	ECUV1E103KBN	25V 0.01U
R102	ERJ6GEYJ122V	1/10W 1.2K	R843, 844	ERDAS3G330T	1/4W 33	C123	ECUV1C1042FN	16V 0.1U
R103	ERJ6GEYJ823	1/10W 82K	R845, 846	ERDAS3G102T	1/4W 1K	C124	ECAQJF101I	6.3V 100U
R104	ERJ6GEYJ471V	1/10W 470	R847, 848	ERDAS3G332T	1/4W 3.3K	C125	ECEACKS470I	16V 47U
R105	ERJ6GEYJ104V	1/10W 100K	R849, 850	ERDAS3G561	1/4W 560	C126	ECEAJKS470	6.3V 47U
R106	ERJ6GEYJ223V	1/10W 22K	R851, 852	ERDAS3G100T	1/4W 10	C127, 128	ECUV1E153KBN	25V 0.015U
R107	ERJ6GEYJ153V	1/10W 15K	R853, 854	ERDAS3G473	1/4W 47K	C129	ECEAHSN010I	50V 1U
R108	ERJ6GEYJ223V	1/10W 22K	R861-866	ERDAS3G103T	1/4W 10K	C130	ECEACSN100I	16V 10U
R109	ERJ6GEYJ122V	1/10W 1.2K	R871-876	ERDAS3G103T	1/4W 10K	C131	ECEAHKS010	50V 1U
R110, 111	ERJ6GEYJ102V	1/10W 1K	R877-884	ERDAS3G473	1/4W 47K	C132	ECUV1H681KBN	50V 680P
R112	ERJ6GEYJ333V	1/10W 33K	R885-888	ERDAS3G331T	1/4W 330	C133	ECEAJKS470	6.3V 47U
R113	ERJ6GEYJ103V	1/10W 10K	R892	ERDS2TJ223	1/4W 22K	C134	ECUV1H222KBN	50V 2200P
R114	ERJ6GEYJ473V	1/10W 47K	R893, 894	ERDS2TJ102	1/4W 1K	C135	ECEAEKS330I	25V 33U
R115	ERJ6GEYJ471V	1/10W 470	R895-897	ERDAS3G223T	1/4W 22K	C136	ECUV1C1042FN	16V 0.1U
R116	ERJ6GEYJ220	1/10W 22				C138	ECUV1C224KBM	16V 0.22U
R117	ERJ6GEYJ103V	1/10W 10K			CHIP JUMPERS	C139	ECUV1E103KBN	25V 0.01U
R118-120	ERJ6GEYJ102V	1/10W 1K				C140, 141	ECUV1H270KCN	50V 27P
R121	ERJ6GEYJ562V	1/10W 5.6K	RJ101	ERJ6GEYOR00V	CHIP JUMPER	C142	ECUV1H271KN	50V 270P
R301	ERIS2TJ473	1/4W 47K	TJ101, 102	ERD25VOR00T	CHIP JUMPER	C301	ECBT1H102KB5	50V 1000P
R302	ERIS2TJ471	1/4W 470				C302	ECQV1H474JM3	50V 0.47U
R303	ERIS2TJ823T	1/4W 82K			CAPACITORS	C303	ECBT1C103NS5	16V 0.01U
R304	ERIS2TJ105T	1/4W 1M				C304	ECQV1H823JM3	50V 0.082U
R305	ERIS2TJ473	1/4W 47K	C1	ECKWKC103PF2	400V 0.01U △	C305	ECBT1H104ZF5	50V 0.1U
R306-308	ERIS2TJ561	1/4W 560	C11, 12	ECQB1H103JF3	50V 0.01U	C306	ECAQJF101B	6.3V 100U
R309	ERIS2TJ472	1/4W 4.7K	C13, 14	ECES1CV103UM	16V 10000U △	C307	ECBT1H104ZF5	50V 0.1U
R310-320	ERIS2TJ561	1/4W 560	C16-18	ECAQJF101B	6.3V 100U	C308	ECAQJF101B	6.3V 100U
R322, 323	ERIS2TJ561	1/4W 560	C21, 22	ECQB1H103JF3	50V 0.01U	C309	ECBT1C103NS5	16V 0.01U
R324	ERIS2TJ472	1/4W 4.7K	C23, 24	ECESX1H332UX	50V 3300U △	C310, 311	ECBT1H4R7K5	50V 4.7P
R325	ERIS2TJ473	1/4W 47K	C25, 26	ECA1CPXS471B	16V 470U	C312	ECBT1H101KB5	50V 100P
R326	ERIS2TJ102	1/4W 1K	C27-29	ECA1CPXS470B	16V 47U	C313, 314	ECBT1H104ZF5	50V 0.1U
R401, 402	ERIS2TJ472	1/4W 4.7K	C31	ECA1HM221B	50V 220U	C315, 316	ECBT1C103NS5	16V 0.01U
R403, 404	ERIS2TJ393	1/4W 39K	C33	ECA1HM221B	50V 220U	C321-330	ECQV1H104JR3	50V 0.1U
R405, 406	ERIS2TJ272T	1/4W 2.7K	C35	ECA1HM221B	50V 220U △	C331-334	ECAQJXS101B	6.3V 100U
R407	ERIS2TJ473	1/4W 47K	C36	ECBT1H102KB5	50V 1000P	C335, 336	ECBT1H104ZF5	50V 0.1U
R408, 409	ERIS2TJ472	1/4W 4.7K	C37, 38	ECHR1H102JZ3	50V 1000P	C337-339	ECAQJF101B	6.3V 100U
R501	ERIS2TJ472	1/4W 4.7K	C39	ECBT1H104ZF5	50V 0.1U	C341, 342	ECA1EPXS221B	25V 220U

Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks
C343	ECEA1HKA010B	50V 1U	C603, 604	ECBT1C103NS5	16V 0.01U	C851, 852	ECHR1H102JZ3	50V 1000P
C401	ECQV1H224JM3	50V 0.22U	C701	ECBT1H104ZF5	50V 0.1U	C861, 862	ECEA1CBZ101B	16V 100U
C402	ECA0JKF101B	6.3V 100U	C702	ECA0JKF101B	6.3V 100U	C871, 872	ECHR1H101JZ3	50V 100P
C403	ECBT1H104ZF5	50V 0.1U	C703	ECBT1H104ZF5	50V 0.1U	C873-876	ECEA1CBZ101B	16V 100U
C404	ECEA1CKA101B	16V 100U	C751	ECBT1E223ZF	25V 0.022U	C879-882	ECHR1H102JZ3	50V 1000P
C501	ECEA1HKA010B	50V 1U	C801-806	ECHR1H101JZ3	50V 100P	C891-894	ECA1CPXS470B	16V 47U
C502	ECBT1C103NS5	16V 0.01U	C821, 822	ECHR1H101JZ3	50V 100P	C895	ECEA1EKA4R7B	25V 4.7U
C601	ECBT1C103NS5	16V 0.01U	C831, 832	ECHR1H122JZ3	50V 1200P			
C602	ECEA1CKS100L	16V 10U	C833, 834	ECHR1H151JZ3	50V 150P			

■ REPLACEMENT PARTS LIST

Notes: *Important safety notice:

Components identified by mark have special characteristics important for safety.

Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used. When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.

*The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.)

Parts without these indications can be used for all areas.

*Remote Control Ass'y:

Supply period for three years from termination of production.

Ref. No.	Part No.	Part Name & Description	Remarks
		ACCESSORIES	
A1	RFKSLP2000EG	INSTRUCTION MANUAL ASS'Y	(EG)
A1	RQT1712-B	INSTRUCTION MANUAL	(EB)
A1	RFKSLP2000GC	INSTRUCTION MANUAL ASS'Y	(GC)
A2	RQCA0235	INSTRUCTION MANUAL	
A3	VJA0733	AC POWER SUPPLY CORD	(EB) △

Ref. No.	Part No.	Part Name & Description	Remarks
A3	RJA0019-2K	AC POWER SUPPLY CORD	(EG, GC) △
A4	RQA0013	WARRANTY CARD	(EG, EB)
A5	RQCB0169	SERVICENTER LIST	
A6	SJPD18	STEREO CONNECTION CABLE	
A7	RAK-SL512W	REMOTE CONTROL TRANSMITTER	
A7-1	RKK0020-K	BATTERY COVER	FOR R/C TRANSMITTER
A8	RQLA0134	VOLTAGE CAUTION LABEL	(GC)
A9	SJP5213-2	POWER PLUG ADAPTOR	(GC) △

■ PACKAGING

