

# Service Manual

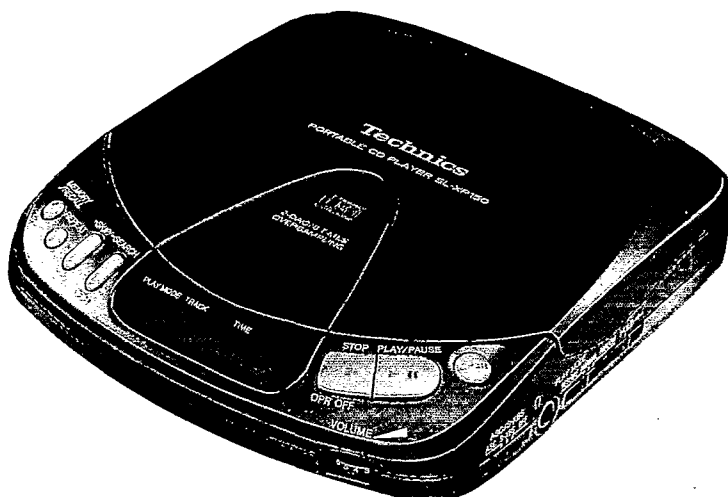
COMPACT  
disc  
DIGITAL AUDIO

DIGITAL

Portable CD Player  
**SL-XP150**

Colour

(K)... Black Type



Area

Suffix for Model No.	Area	Colour
(EB)	Great Britain.	(K)
(EG)	Europe.	
(GC)	Asia, Latin America, Middle Near East and Africa.	
(GN)	Oceania.	

## NEW MECHANISM SERIES (RAE0131Z)

### ■ SPECIFICATIONS

#### ■ Audio

**No. of channels:** 2 channels (left and right, stereo)  
**Output voltage:** 0.7V (50k $\Omega$ )  $\phi$ 3.5 stereo mini jack  
**Frequency response:** 20~20000Hz (+0.5dB, -2.5dB)  
**S/N:** more than 92dB  
**Wow and flutter:** Below measurable limit  
**Digital filter:** 8 times over sampling  
**DA converter:** 2 DAC  
**Headphones output level:** max. 5mW+5mW/16 $\Omega$   $\phi$ 3.5 stereo mini jack (variable)

#### ■ Signal Format

**Correction system:** Technics New Super Decoding Algorithm

#### ■ Pickup

**Type:** One beam  
**Light source:** Semiconductor laser  
**Wavelength:** 780nm  
**Lens:** Glass pressed lens

#### ■ General

**Power requirement:** AC; with an included panasonic AC adaptor  
 (RFEA404B-W): (EB)  
 (RFEA401E-1S): (EG)  
 (RFEA402Z-W): (GC)  
 (RFEA401A-W): (GN)  
 Batteries; 3V (two "AA" size batteries, not included)  
 (Panasonic UM-3/R6P, AM3/LR6 or equivalent, not included)  
 Rechargeable Batteries; DC 2.4V with an optional Panasonic Rechargeable Batteries (SH-CDB8D)  $\times$  2  
 Car Battery; with an optional panasonic car adaptor (SH-CDC9)  
 4.5V  $\diamond$   $\text{C}$   $\diamond$

#### DC IN:

**Power consumption:**  
**AC adaptor;** 3.5W  
**Battery;** 0.6W  
**Dimensions (W  $\times$  H  $\times$  D):** 128  $\times$  30.3  $\times$  145 mm  
**Weight:** 265g without batteries  
 305g with batteries

**Note:** Design and specifications are subject to change without notice.

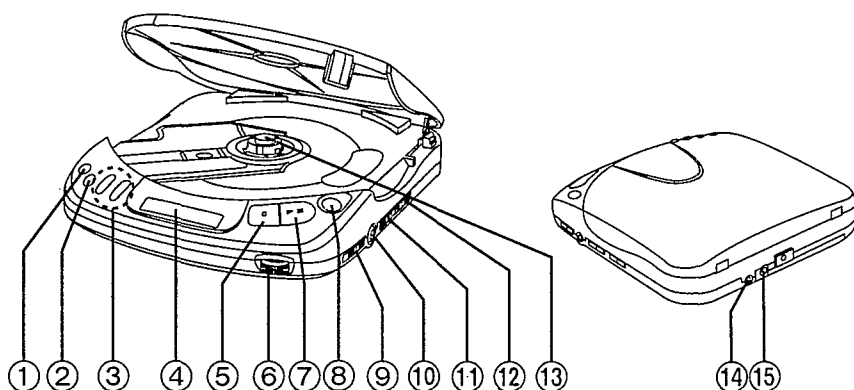
Weight and dimensions are approximate.

# Technics

## CONTENTS

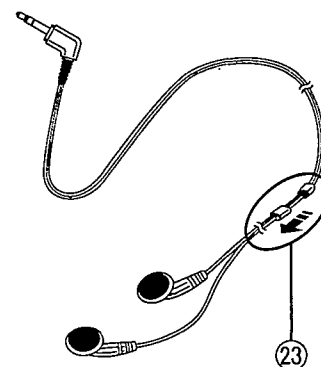
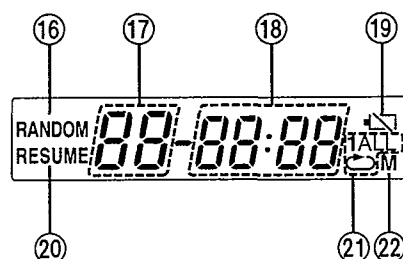
	Page		Page
LOCATION AND FUNCTION OF CONTROLS.....	2	INTERNAL CONNECTIONS OF LCD .....	12
ACCESSORIES .....	3	MEASUREMENTS AND ADJUSTMENTS .....	13, 14
PRECAUTION OF LASER DIODE .....	3	DISPLAY FUNCTION OF AUTOMATICALLY-ADJUSTED RESULTS (SELF-CHECK FUNCTION).....	14, 15
CONNECTIONS .....	4	BLOCK DIAGRAM.....	16~18
POWER SOURCE .....	4, 5	SCHEMATIC DIAGRAM .....	19~22
BASIC OPERATING PROCEDURES.....	6	PRINTED CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM .....	23, 24
HANDLING PRECAUTIONS FOR TRAVERSE DECK.....	7	TERMINAL FUNCTION OF IC'S.....	25~29
DISASSEMBLY INSTRUCTIONS .....	8, 9	REPLACEMENT PARTS LIST .....	30, 32
HOW TO CHECK THE P.C.B. ....	10	RESISTORS AND CAPACITORS .....	31
HOW TO INSTALL THE SWITCH KNOB .....	10	PACKAGING .....	31
CHECKING THE OPERATION PROBLEMS ON THE TRAVERSE DECK (OPTICAL PICKUP).....	11, 12	CABINET PARTS LOCATION.....	33
NOTE FOR SERVICE .....	12		

## LOCATION AND FUNCTION OF CONTROLS



- ① **Memory/recall button (MEMORY/RECALL)**
- ② **Repeat button (REPEAT)**
- ③ **Skip/search buttons (◀◀-SKIP/-SEARCH▶▶)**
- ④ **Display**
- ⑤ **Stop/operation off button (■ STOP/OPR OFF)**
- ⑥ **Earphones/headphones' volume control (VOLUME)**  
(See page 6.)
- ⑦ **Play/pause button (▶ II PLAY/PAUSE)**  
(See page 6.)
- ⑧ **Open button (OPEN)**  
(See page 6.)
- ⑨ **ASC/S-XBS selector (ASC/S-XBS)**
- ⑩ **Earphones/headphones jack ( ) 16Ω φ3.5**  
(See page 4.)
- ⑪ **Play mode selector (PLAY MODE)**  
Use to select the following play modes:  
**RESUME:** Resume function  
**NORMAL:** Sequential and program play  
**RANDOM:** Random play

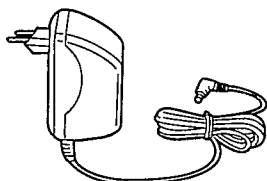
- ⑫ **Hold switch (HOLD)**  
Use to prevent unintended operation. You cannot activate functional buttons when player is in the hold state. The display window shows "hold". Before operating the front panel buttons (except for open button), be sure to release the player from the hold state. (See page 6.)
- ⑬ **Push button (PUSH)**  
Press to release the fixed state of the disc. (See page 6.)
- ⑭ **Out jack (OUT)**
- ⑮ **DC in jack (DC IN 4.5 V ⬡-⬡)**
- ⑯ **Random indicator (RANDOM)**
- ⑰ **Track display**  
Shows the total number of tracks and the track number in play (up to 99).
- ⑱ **Time display**  
Shows the elapsed playing time of the current track and the total playing time of the disc.
- ⑲ **Battery check indicator ( )**
- ⑳ **Resume indicator (RESUME)**
- ㉑ **Repeat indicators**  
One track repeat indicator (1 )  
All tracks repeat indicator (ALL )
- ㉒ **Memory indicator (M)**
- ㉓ **Slider**  
Sliders up to prevent entangling of the cord when the stereo earphones are not in use.



### Precautions for Listening with the Headphones

- Do not play your headset at a high volume. Hearing experts advise against continuous extended play.
- If you experience a ringing in your ears, reduce volume or discontinue use.
- Do not use while operating a motorized vehicle. It may create a traffic hazard and is illegal in many areas.
- You should use extreme caution or temporarily discontinue use in potentially hazardous situations.
- Even if your headset is an open-air type designed to let you hear outside sounds, don't turn up the volume so high that you can't hear what's around you.

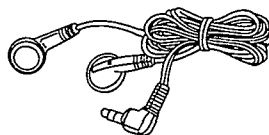
## ACCESSORIES



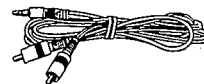
AC adaptor ..... 1 pc.  
 (RFEA404B-W): (EB) (RFEA402Z-W): (GC)  
 (RFEA401E-1S): (EG) (RFEA401A-W): (GN)

### Note:

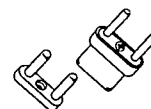
The configuration of the AC adaptor differs according to area.



Stereo earphones ..... 1 pc.  
 (RP-HV135GY)



Stereo connection cable ..... 1 pc.  
 (RJL2P001X10)



Power plug adaptor ..... 1 pc.  
 (RJP120ZDS-K): (GC)

## 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: 100 $\mu$ W/VDE

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

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

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

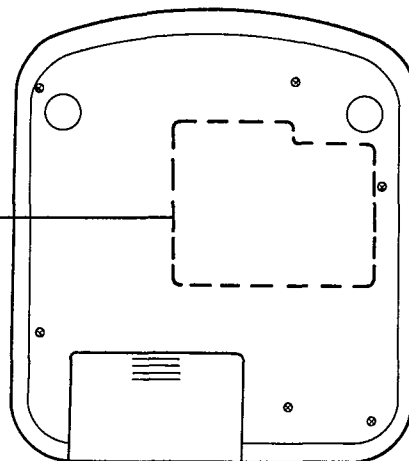
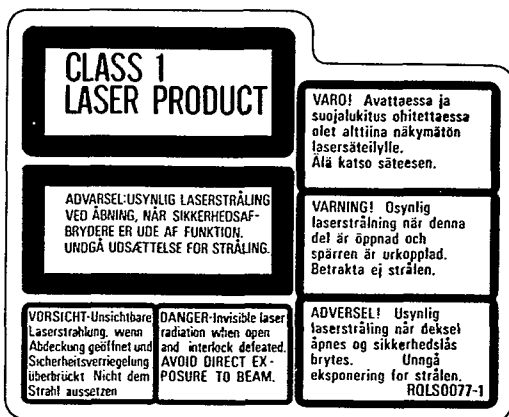
Wellenlänge: 780nm  
 Maximale Strahlungsleistung der Lasereinheit: 100 $\mu$ W/VDE

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 Fokussierlinse blicken.
4. Nicht über längere Zeit in die Fokussierlinse blicken.

**ADVARSEL:** I dette a apparat anvendes laser.

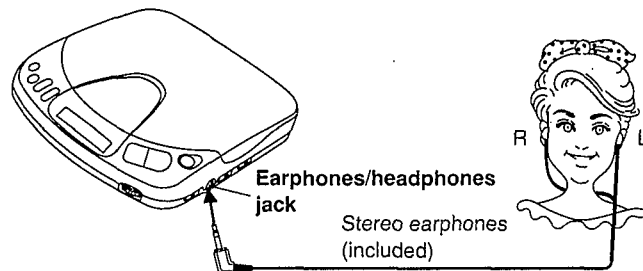
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(Bottom side)

## ■ CONNECTIONS

### Listening through the stereo earphones (or stereo headphones)

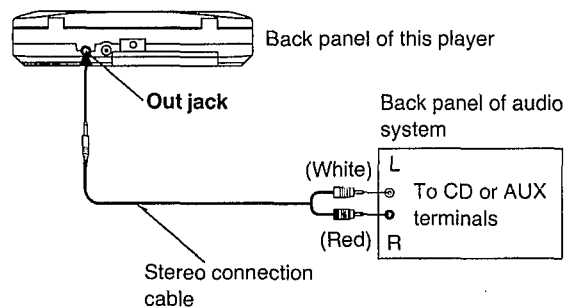


Connect the plug of the stereo earphones (included) or stereo headphones (not included) to the earphones/headphones jack.

### Listening through an audio system

Before connecting the player to your audio system, make sure to turn off the power on all other system components.

See operating instructions for your system components or portable AM/FM cassette system for details.



Use the stereo connection cable (included) to connect this player to your system components or portable AM/FM cassette system.

## ■ POWER SOURCE

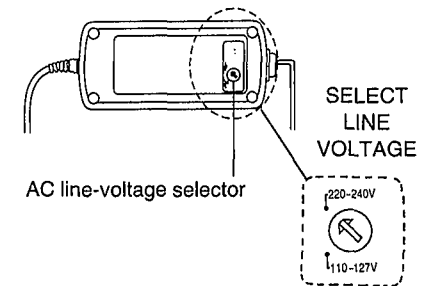
This player can operate on any of 4 different power sources:

1. AC adaptor (included)
2. Two rechargeable batteries (not included)
3. Two R6/LR6 (UM-3) dry cell batteries (not included)
4. Car adaptor (not included)

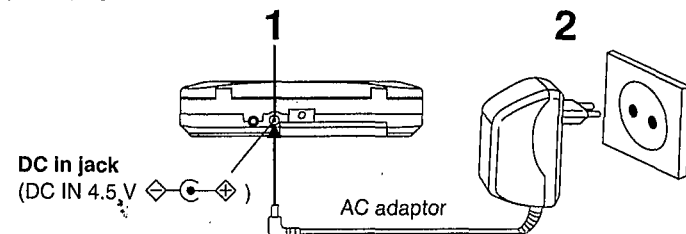
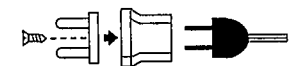
### AC adaptor

Use only the AC adaptor provided with this player.

**Before use**  
 (For areas except Continental Europe, United Kingdom and Australia)  
 Make sure the preset voltage of your AC adaptor fits to your local voltage before plugging it into the AC power outlet. If it doesn't, turn the AC line-voltage selector with a screwdriver so that it corresponds to your local voltage.



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

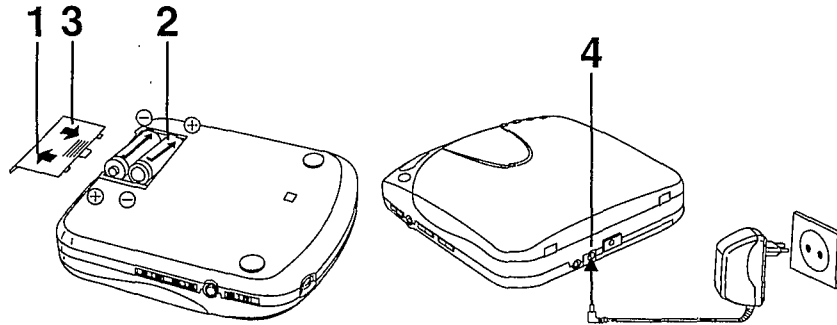


- 1 Insert the plug at the end of the AC adaptor cord into the DC in jack.
- 2 Plug the AC adaptor into your household AC power outlet.

**CAUTION**  
 Do not use the AC adaptor provided with this player for other products.

**Note:**  
 To operate on battery power, unplug the AC adaptor from the household AC power outlet and the DC in jack on the player.

## Rechargeable batteries (not included)



### CAUTION

Only Panasonic optional SH-CDB8D rechargeable batteries can be recharged with this player.

Normally, 3 hours of recharging will give approximately 2 hours 30 minutes of play.

### For areas except Continental Europe, United Kingdom and Australia

If the power supply in your area is 110 V or 220 V, the time for complete recharging takes 5 hours, which is different from the time described in this booklet.

### 1 Open the battery compartment cover.

- Recharge the rechargeable batteries for 3 hours before using them for the first time and any time they have not been used for a long period (more than three months). If 3 hours recharging does not provide normal operation time (2 hours 30 minutes), repeat the recharging for three more hours.
- You can recharge these rechargeable batteries about 300 times. After that, their operating time will be shortened, and you will need to replace them.
- Observe the battery check indicator on the display to determine battery condition. When the batteries are weak, the battery check indicator begins to flash on and off and then the player will be automatically turned off.

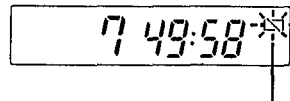
### 2 Install two rechargeable batteries.

Be sure to insert the batteries with correct polarities and then push in the direction of the arrow.

### 3 Close the battery compartment cover.

### 4 Connect the AC adaptor to the player and to your household AC power outlet.

### 5 Disconnect the AC adaptor in about 3 hours.



Battery check indicator

- You can operate the player with the AC adaptor while recharging the batteries, but it will lengthen the recharging time.
- While recharging, the AC adaptor and rechargeable batteries may get warm. This is normal.

### CAUTIONS

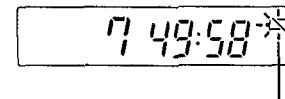
- Do not allow metal objects to touch the terminals. (A hazardous short circuit may result.)
- Avoid recharging or placing the rechargeable battery near sources of heat or humidity. Recharging should be performed at 0°C–40°C.

## Dry cell batteries (not included)

Two LR6 type alkaline batteries can be inserted into the battery compartment in the same way as the rechargeable batteries.

Make sure that the AC adaptor is disconnected from the AC power outlet and the player.

You can also check battery condition by the battery check indicator. The indicator begins flashing on and off when the battery is half-used. Use of alkaline batteries will give approximately 8 hours play.



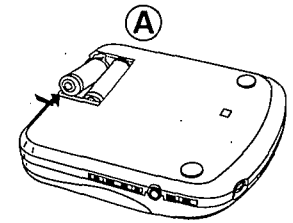
Battery check indicator

### ■ Use of batteries

- Do not use old and new batteries or batteries of different types (carbon and alkaline, etc.) together.
- Always remove old, weak, or worn-out batteries promptly and dispose of them properly.
- 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 use this player for a long period of time, remove the batteries and store them in a cool, dark place.

### ■ Battery removal

Press batteries toward (A) and remove them.



- 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 attempt to recharge alkaline or carbon batteries.

## Car adaptor (not included)

### CAUTION

Use only car adaptor, Model: SH-CDC9, manufactured by Matsushita Electric Industrial Co., Ltd.

See operating instructions for the optional car adaptor for details.

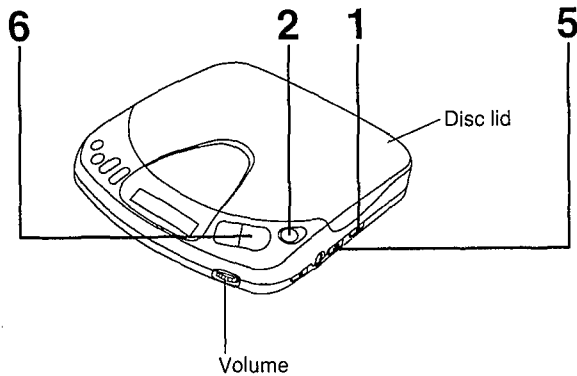
The rechargeable battery can be recharged with the car adaptor.

When listening to your car audio system, load the car stereo cassette adaptor (SH-CDM7 or SH-CDM9) to enjoy CD sound in your car.

An optional car mounting kit (SH-CDF7) is available to prevent the CD from skipping due to car vibrations.

# BASIC OPERATING PROCEDURES

Sequential play refers to play beginning with the first track and continuing in order to the last track.



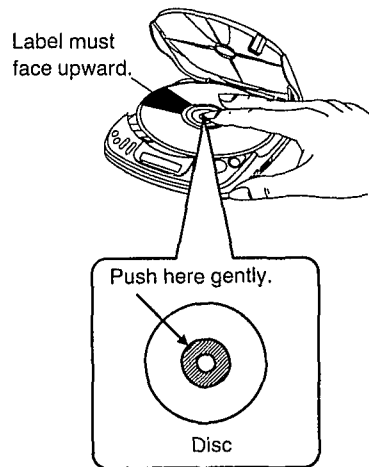
**1 Move the hold switch to the right.**

When the player is not in use, moving the hold switch to the left will put all functions on hold, preventing an unintended operation. If the player is in the hold state, you cannot activate the function buttons.

**2 Press OPEN to open the disc lid.**

**3 Insert the disc.**

Push the disc gently until it clicks so that the disc fits into the pivot, black portion.



**4 Close the disc lid by pressing in the direction of the arrow after setting the disc.**

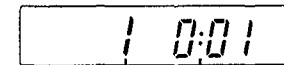


**5 Set the play mode selector to NORMAL.**

**6 Press PLAY/PAUSE.**

The pickup (a laser device that reads the information on the disc surface) moves across the disc as the disc is played.

This turns on the power and begins the first track.



Track number in play  
Elapsed playing time

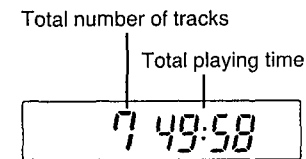
**7 Adjust the volume level.**

**When listening through the ear-phones**

Use the volume control on the player.

**When listening through an audio system**

Adjust the output level on the amplifier/receiver.



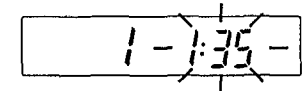
Total number of tracks  
Total playing time

The player plays the tracks on the disc in order and stops automatically when the last track ends. The display shows the total number of tracks and total playing time on the disc.

**To temporarily stop disc play**

**Press PLAY/PAUSE.**

This switches the player to the pause mode, and the elapsed time display will begin flashing.



Play is stopped, but the pickup remains where it was when **PLAY/PAUSE** was pressed. The disc continues to rotate.

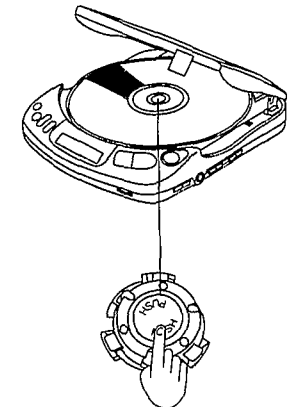
If you leave the player in the pause mode, it will automatically shut off after 4 minutes.

**To resume play**

Press **PLAY/PAUSE** again.

**To release the fixed state of the disc**

Press **OPEN** to open the disc lid and press **PUSH**.



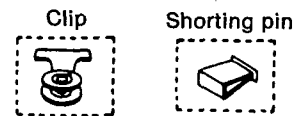
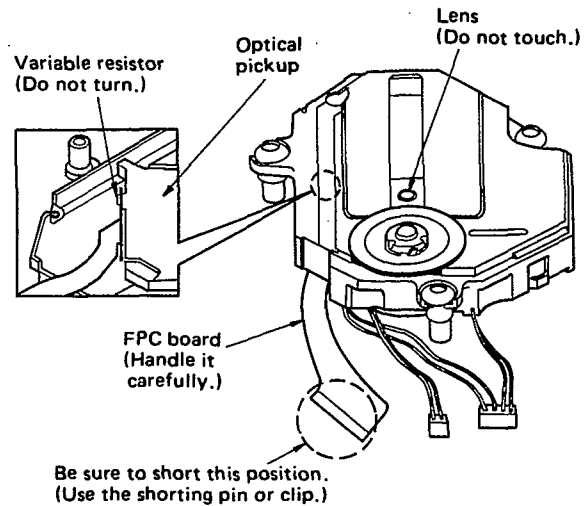
## HANDLING PRECAUTIONS FOR TRAVERSE DECK

The laser diode in the traverse deck (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 traverse deck (optical pickup).

### • Handling of traverse deck (optical pickup)

1. Do not subject the traverse deck (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.

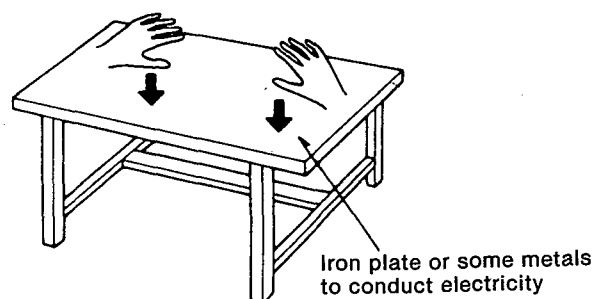
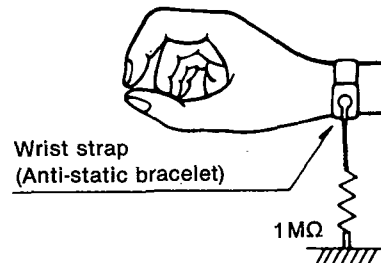


### • Grounding for electrostatic breakdown prevention

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 traverse deck (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 traverse deck (optical pickup).

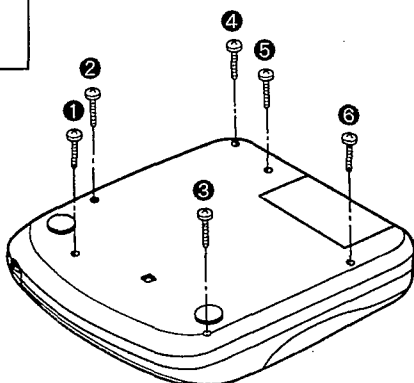
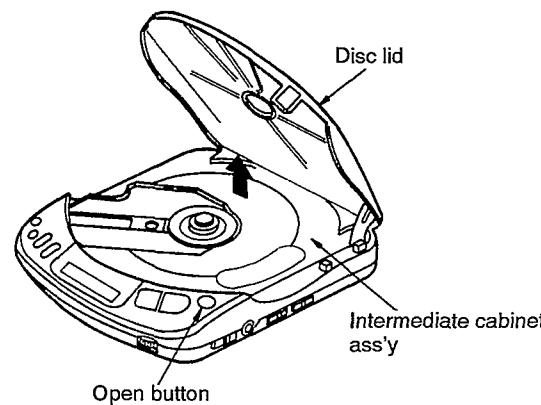


# DISASSEMBLY INSTRUCTIONS

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

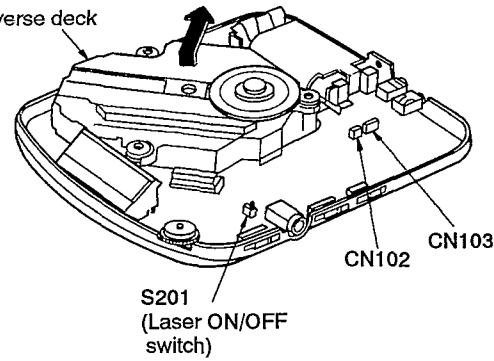
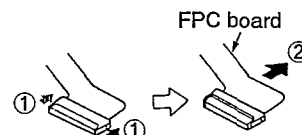
**ACHTUNG:** • Die lasereinheit nicht zerlegen.  
• Die lasereinheit darf nur gegen eine vom hersteller spezifizierte einheit ausgetauscht werden.

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

<b>Ref.No.</b> 1	<b>Removal of the intermediate cabinet ass'y</b>		 <p>Disc lid</p> <p>Open button</p> <p>Intermediate cabinet ass'y</p>
<b>Procedure</b> 1			

1. Remove the 6 screws(① ~ ⑥).

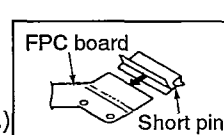
2. Push the open button and open the disc lid.  
3. Remove the intermediate cabinet ass'y in the direction of arrow.

<b>Ref.No.</b> 2	<b>Removal of the traverse deck</b>	 <p>Traverse deck</p> <p>S201 (Laser ON/OFF switch)</p> <p>CN102</p> <p>CN103</p>	 <p>FPC board</p>
<b>Procedure</b> 1 → 2			

1. Disconnect the 2 connectors(CN102, CN103).  
2. Pull out the traverse deck in the direction of arrow.

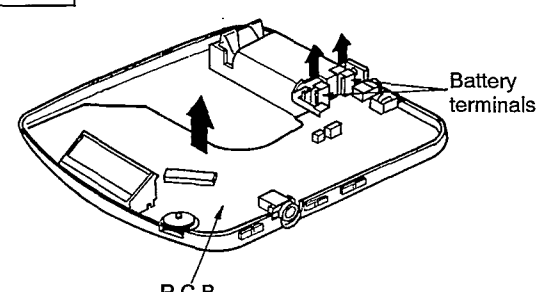
3. Remove the FPC board(CN101).

**Caution:** Insert a short pin into the traverse deck's FPC board. (Refer to "handling precautions for traverse deck" on page 7.)

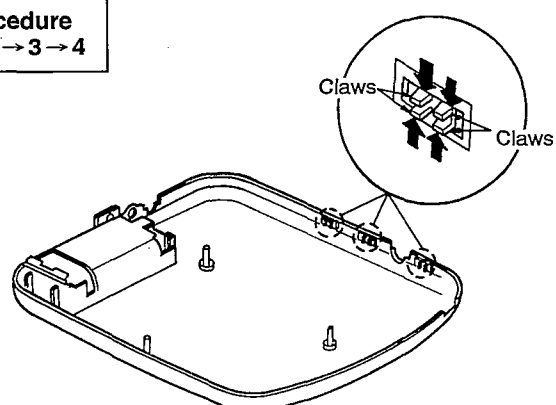


FPC board

Short pin

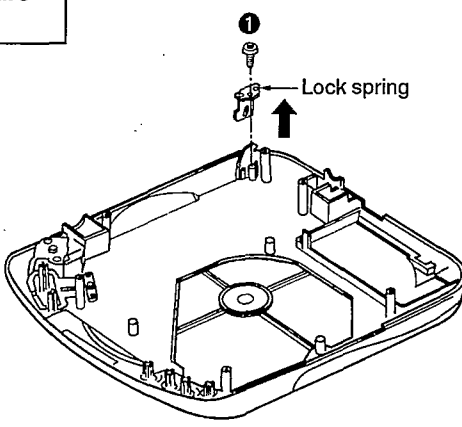
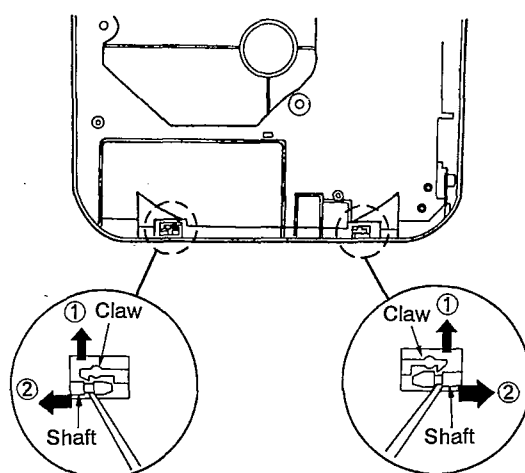
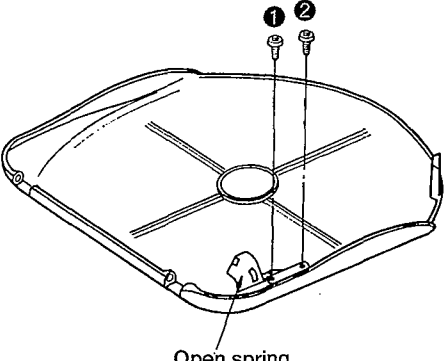
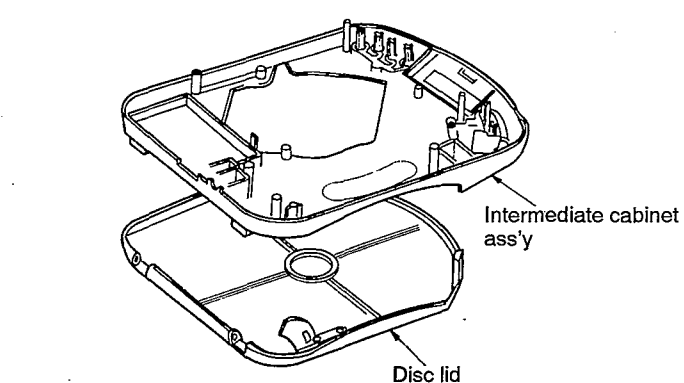
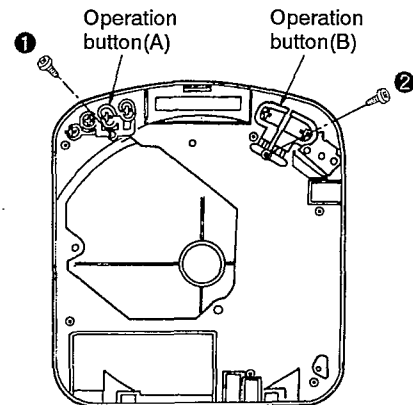
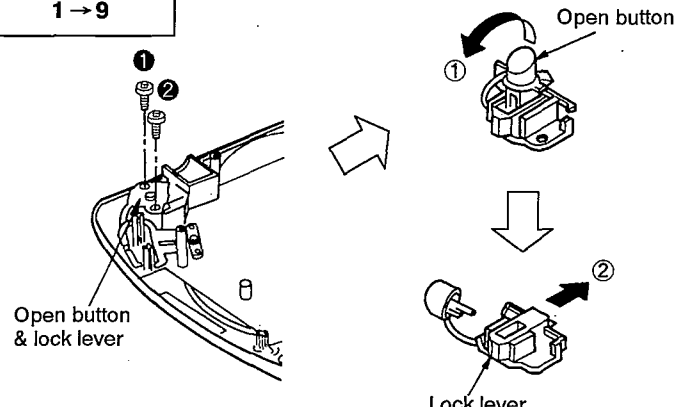
<b>Ref.No.</b> 3	<b>Removal of the P.C.B.</b>	 <p>Battery terminals</p> <p>P.C.B.</p>
<b>Procedure</b> 1 → 2 → 3		

• Remove the P.C.B. and battery terminals in the direction of arrow.

<b>Ref.No.</b> 4	<b>Removal of the switch knob (HOLD, PLAY MODE, ASC/S-XBS)</b>	 <p>Claws</p> <p>Claws</p>
<b>Procedure</b> 1 → 2 → 3 → 4		

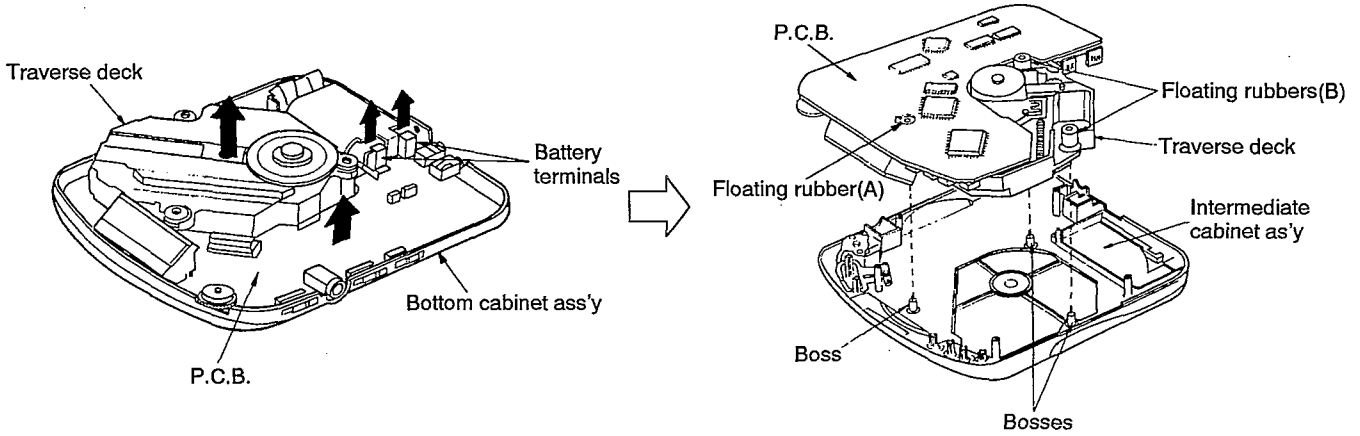
• Release the 4 claws.



<p><b>Ref.No.</b> 5</p>	<p><b>Removal of the lock spring</b></p>	<p><b>Ref.No.</b> 6</p>	<p><b>Removal of the disc lid</b></p>
<p><b>Procedure</b> 1 → 5</p>	 <p>1. Remove the 1 screw (1). 2. Remove the lock spring in the direction of arrow.</p>	<p><b>Procedure</b> 1 → 5 → 6</p>	 <p>1. Remove the shaft in the direction of arrow ② by keeping the claw pressed in the direction of arrow ①.</p>  <p>• Remove the 2 screws (1, 2).</p>
<p><b>Ref.No.</b> 7</p>	<p><b>Removal of the open spring</b></p>	<p><b>Ref.No.</b> 9</p>	<p><b>Removal of the open button and lock lever</b></p>
<p><b>Procedure</b> 1 → 5 → 6 → 7</p>	 <p>2. Remove the disc lid.</p>	<p><b>Procedure</b> 1 → 8</p>	<p><b>Procedure</b> 1 → 9</p>
<p><b>Ref.No.</b> 8</p>	<p><b>Removal of the operation button (A) and operation button (B)</b></p>	<p><b>Ref.No.</b> 8</p>	<p><b>Removal of the operation button (A) and operation button (B)</b></p>
<p><b>Procedure</b> 1 → 8</p>	 <p>■ <b>Removal of the operation button (A)</b> • Remove the 1 screw (1).</p> <p>■ <b>Removal of the operation button (B)</b> • Remove the 1 screw (2).</p>	<p><b>Procedure</b> 1 → 8</p>	 <p>1. Remove the 2 screws (1, 2). 2. Remove the open button in the direction of arrow ①. 3. Remove the lock lever in the direction of arrow ②.</p>

## HOW TO CHECK THE P.C.B.

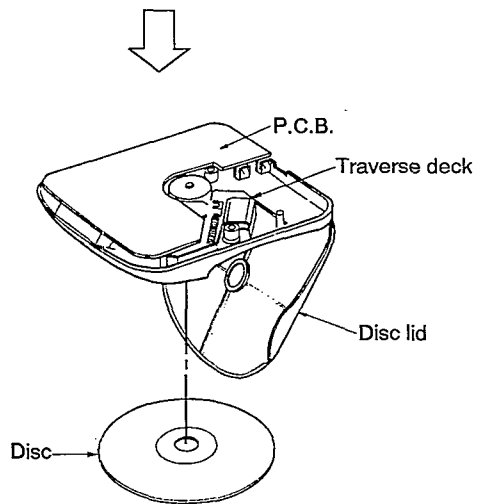
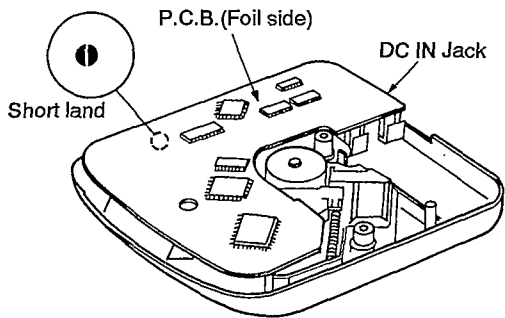
1. Remove the intermediate cabinet ass'y. (See Ref.No.1 of the disassembly instructions.)



2. Remove the traverse deck, P.C.B. and battery terminals from the bottom cabinet ass'y.

3. Install the traverse deck and P.C.B. in the intermediate cabinet ass'y.

**Note:** Engage the floating rubbers of the traverse deck in the bosses on the intermediate cabinet ass'y.



7. Short the short land of the laser ON/OFF SW(S201) by soldering it. (See page 13.)

**Note:** After checking the P.C.B., remove the solder from the short land.

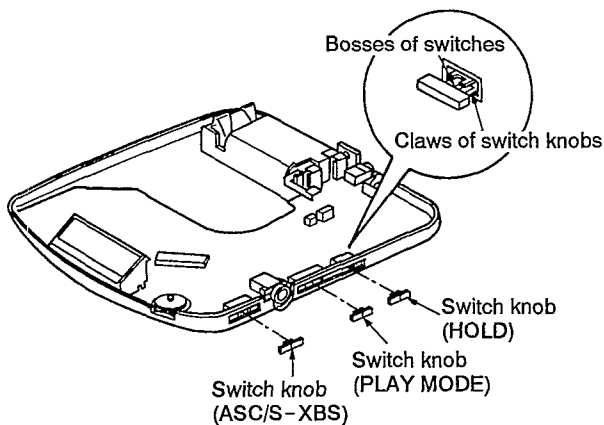
8. With the P.C.B. in place as shown in the figure right, connect the AC adaptor to the DC IN Jack, press the play button and then measure the voltage and waveform.

4. Open the disc lid.

5. Install the unit in place by holding the traverse deck and P.C.B. firmly, and then install the disc.

6. Close the disc lid.

## HOW TO INSTALL THE SWITCH KNOB

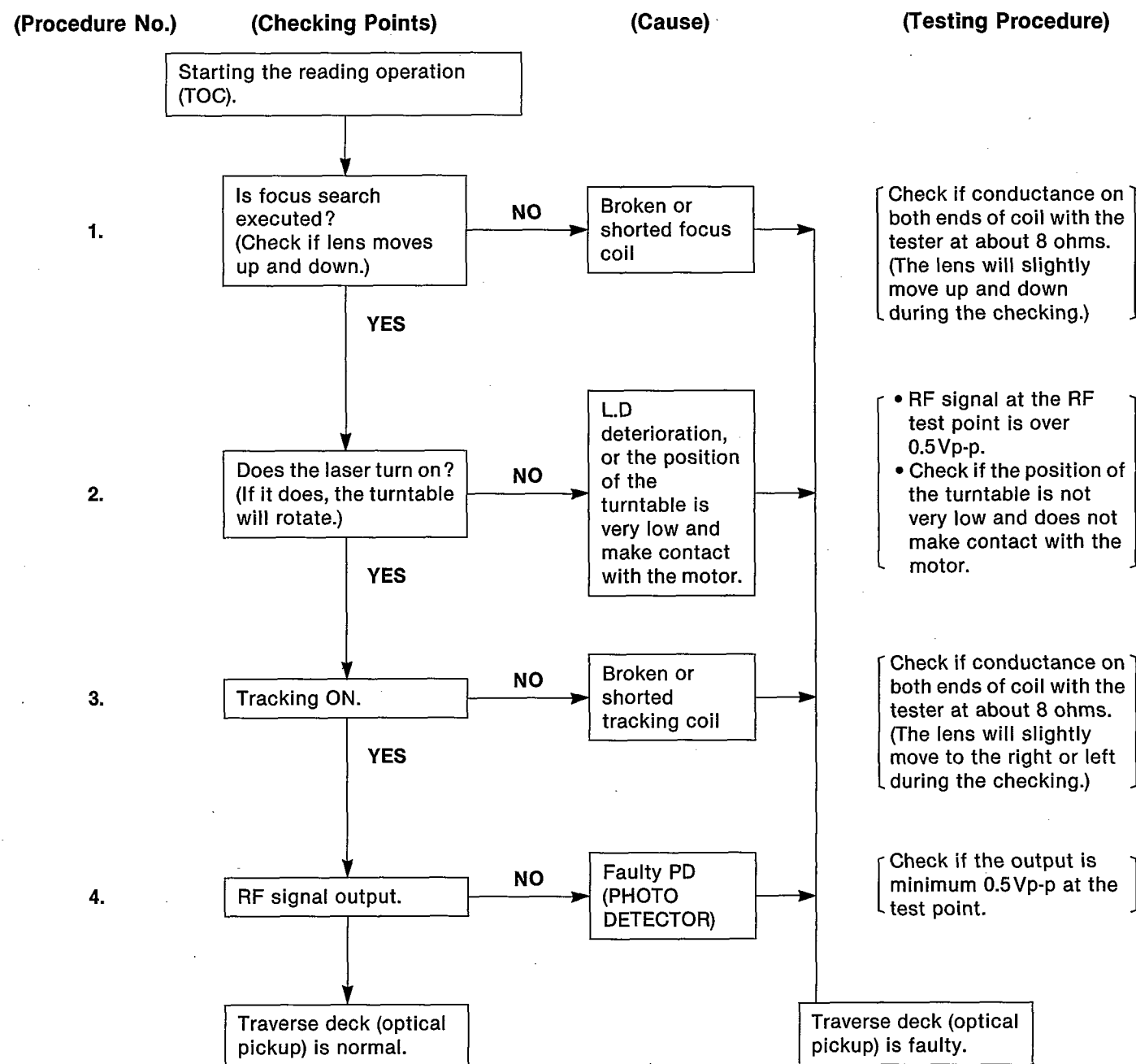


• Make sure the bosses of the switches are fit in the claws of switch knobs when inserting the switch knob.

※ Before installing the switch knob, be sure to check the claws for defects that would render the claws unserviceable. (If a white line like white wax on a claw is found, the claw may be broken when installing the switch knob.)

## CHECKING THE OPERATION PROBLEMS ON THE TRAVERSE DECK (OPTICAL PICKUP)

Make sure to follow the procedures below to check the operation problems of the traverse deck (optical pickup) before replacing it. Replace the traverse deck only after the problem is identified.



- Check electrical circuit.
- Check for flaws on disc or if it is warped or not centered.

※ Replace traverse deck.

• Check the operations described below on the traverse deck after replacing it.

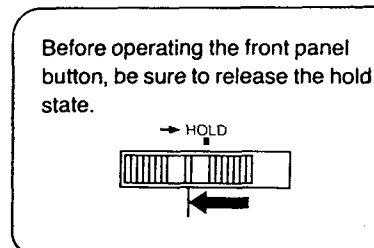
- \* Checking Skip Search
  1. Play an ordinary musical program disc.
  2. Press the skip button to check for normal skip search operation (in both the forward and reverse directions).

- \* Checking 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.

- \* 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).

### NOTE FOR SERVICE

- About hold switch  
Before checking the operation problems and adjustments, be sure to release the hold state.

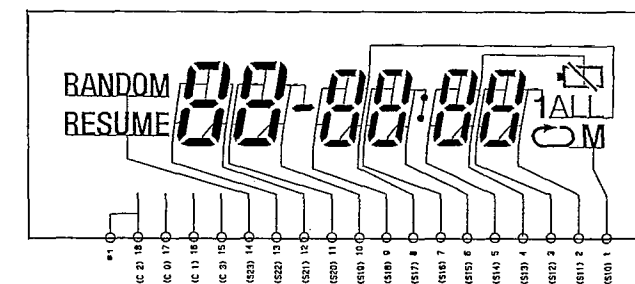


### Connection of the FPC board of the optical pickup

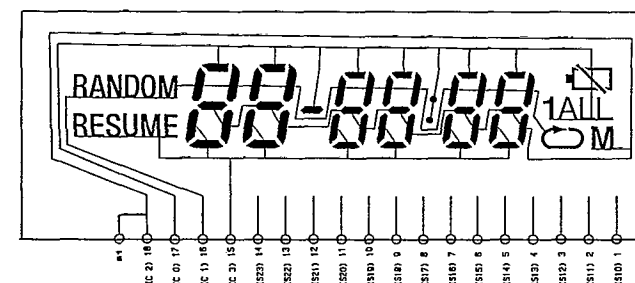
Before you put the power supply to work from the AC adaptor or batteries to check the set's operations and voltage, be sure to connect the FPC board of the optical pickup to the connector CN101 on the main P.C.B. If you disconnected the FPC board from the connector CN101, the protection circuitry may be operated when the PLAY/PAUSE button is pressed with the FPC board disconnected.

### INTERNAL CONNECTIONS OF LCD

#### Segment connection diagram



#### Common connection diagram



## MEASUREMENTS AND ADJUSTMENTS

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

### Measuring instruments and special tools

#### Test discs

- |                                      |                                   |
|--------------------------------------|-----------------------------------|
| 1. Playability test disc (SZZP1054C) | • Musical program disc (ordinary) |
| 2. Uneven test disc (SZZP1056C)      | • DC voltmeter                    |
|                                      | • Lead wire (for test points)     |

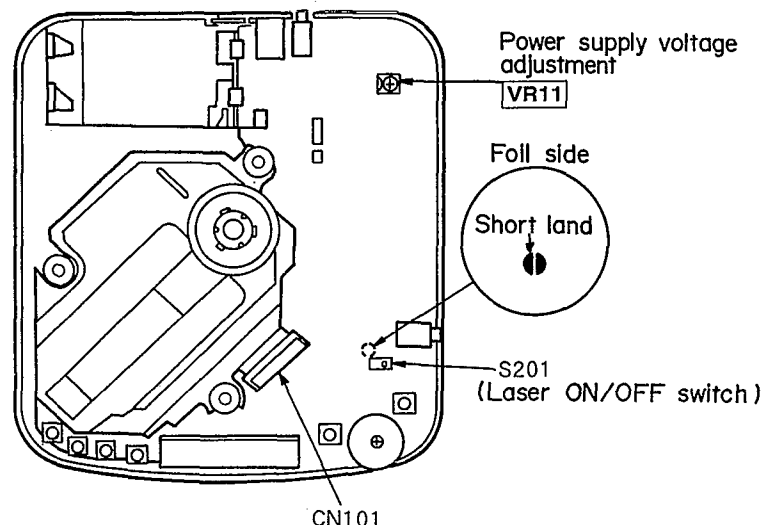
#### Test short land

Short-circuit the lands of the laser ON/OFF switch (S201) by soldering them. It turns "ON" position. (Refer to below figure or printed circuit board and wiring connection diagram for short land location.)

**Note:** Remove the solders from the lands after adjustment.

#### Adjustment point

- Notes:** 1. Please refer to the printed circuit board and wiring connection diagram for test point locations.  
2. Take care to connect CN101.



### Adjustment procedure

#### (1) POWER SUPPLY VOLTAGE ADJUSTMENT

- |  |   |
|--|---|
| 1. Connect the DC voltmeter to <b>TP1</b> (VCC) (+) and <b>TP2</b> (GND) on the P.C.B.   | 3. Insert the test disc, and switch the player power ON.  |
| 2. Connect the AC adaptor cord to the DC (IN) port and move the PLAY switch to the ON position. (Use a new dry cell battery or a rechargeable battery that is full charged.) | 4. Adjust <b>VR11</b> on the P.C.B. at $3.45 \pm 0.05V$ . |

#### (2) CHECK OF PLAY OPERATION

##### \*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 backward 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 backward 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.

### Automatic adjustment

On our conventional type portable CD player, there were mounted 6 semi-fixed controls for each adjustment. Since the SL-XP150 servo circuit is equipped with an automatic adjusting circuit, these controls are removed from SL-XP150.

**On conventional portable CD player**  
Use for Old Servo IC (AN8373, AN8374)

**On SL-XP150**  
Use for New Servo IC (AN8383, AN8384)

- |   |   |                             |
|---|---|-----------------------------|
| 1. Tracking Offset Adjustment VR (TOC)  | → | Non Adjustment              |
| 2. Focus Offset Adjustment VR (FOC)     | → |                             |
| 3. Tracking Gain Adjustment VR (TGC)    | → |                             |
| 4. Focus Gain Adjustment VR (FGC)       | → |                             |
| 5. Tracking Balance Adjustment VR (TBC) | → | Automatic Adjusting Circuit |
| 6. Focus Balance Adjustment VR (FBC)    | → |                             |

Total 6 Adjustment VRs → No Adjustment VR

Although all discs are manufactured according to the same specifications, their characteristics are not always precisely the same because they are produced by different manufacturers in various lots, or have different warp etc. SL-XP150 automatically controls the servo circuit to obtain optimum performance according to any disc's characteristics. Therefore, no malfunction occurs because of mis-adjustment.

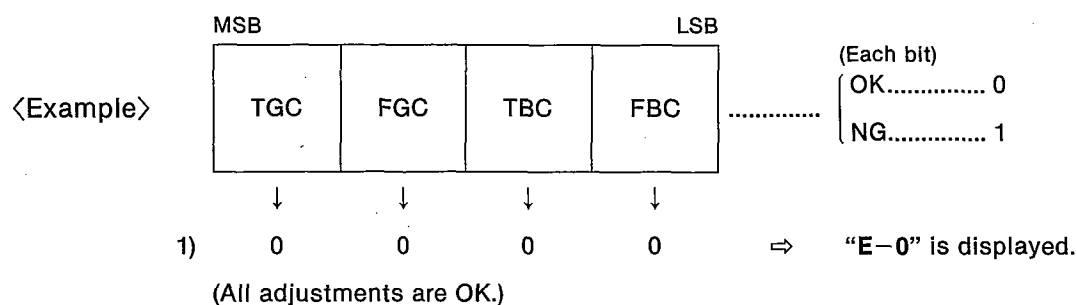
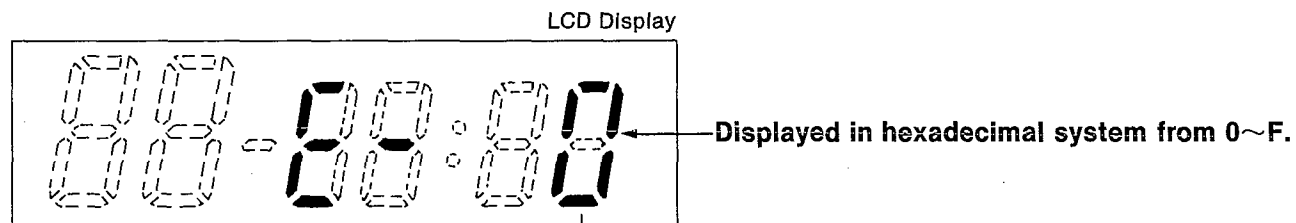
## DISPLAY FUNCTION OF AUTOMATICALLY-ADJUSTED RESULTS (SELF-CHECK FUNCTION)

On this unit (SL-XP150), each automatically-adjusted result are displayed on the LCD. This function is convenient to check or identify which automatic adjustment circuit is incorrect. The followings are the contents of the automatically-adjusted result displays (self-check function).

### How to display automatically-adjusted results

1. Load the test disc (SZZP1054C).
2. Press the I◀◀ (SKIP/SEARCH) and ▶▶I (SKIP/SEARCH) Buttons simultaneously and hold them, and additionally press the ▶/II (PLAY/PAUSE) Button.
3. Press the ■ (STOP/POWER OFF) Button once.
4. An automatically-adjusted result is displayed on the LCD. (Refer to the next page.)

### Display of automatically-adjusted results (self-check function)



2) 0 1 0 0 ⇒ "E-4" is displayed.  
 (OK) (NG) (OK) (OK)  
 (Focus gain adjustment is NG (incorrect).)

3) 1 0 1 0 ⇒ "E-A" is displayed.  
 (NG) (OK) (NG) (OK)  
 (Tracking gain and tracking balance adjustments are NG.)

4) 1 1 1 1 ⇒ "E-F" is displayed.  
 (All adjustments are NG.)

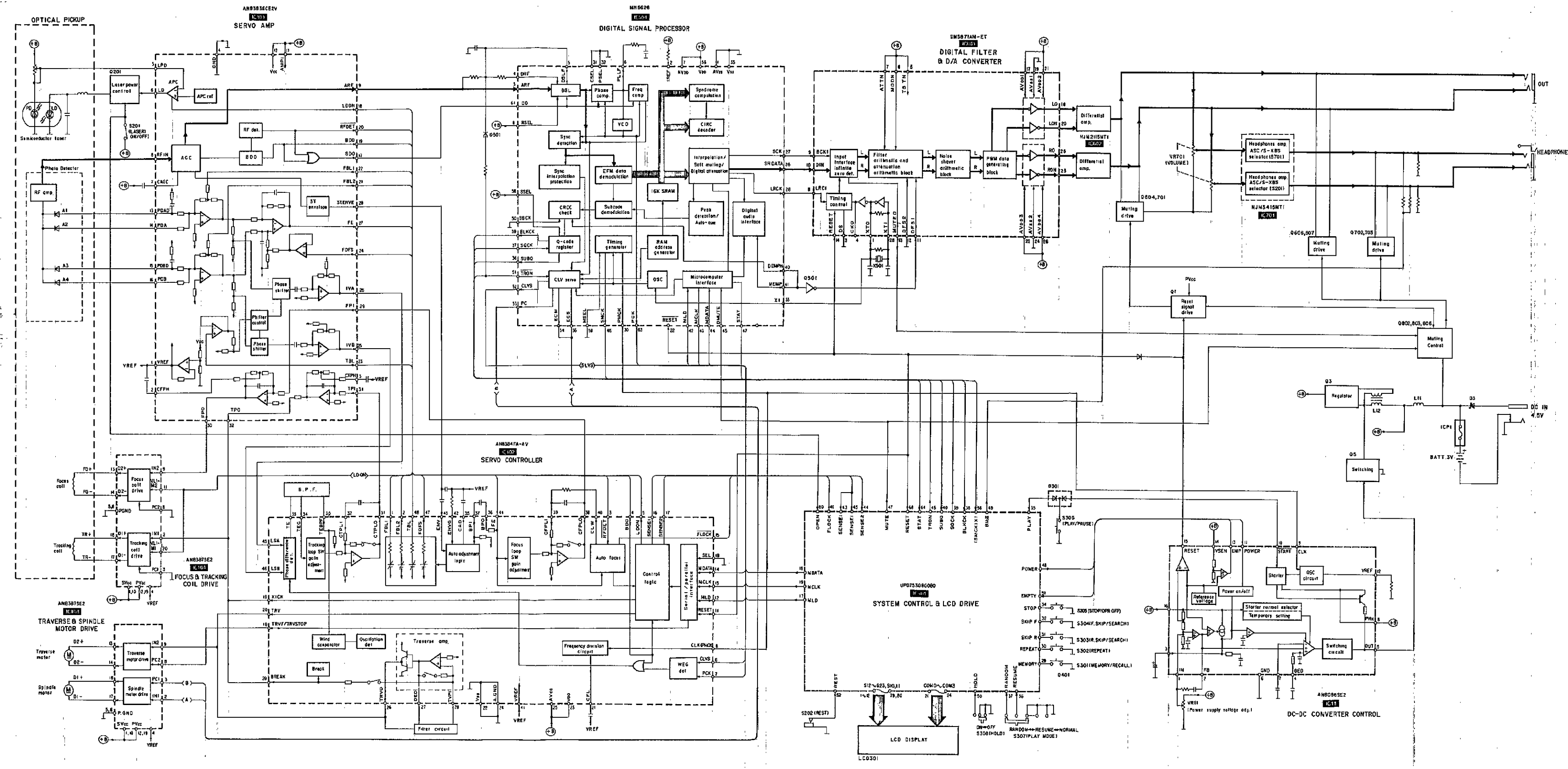
<Example> Follow the below steps when "E-4" is displayed.  
 (Cause: Focus gain is set beyond the limit.)  
 • Check if  
 (1) the waveform or voltage of the focus servo circuit is correct,  
 (2) the focus coil of the optical pickup is correct (around 8 ohms), and  
 (3) the optical pickup returns to the normal state by exchanging the traverse deck.

Follow the below steps when "E-1" is displayed.  
 (Cause: Focus balance is set beyond the limit.)  
 • Check if  
 (1) R101 (4 resistors) is not defective by measuring the value,  
 (2) the waveform or voltage of the focus servo circuit is correct, and  
 (3) the optical pickup returns to the normal state by exchanging the traverse deck.

Note:  
 It is not always necessary to exchange the traverse deck when an error message is displayed. Be sure to check if the circuit is defective or not before exchanging the traverse deck.

Note:  
 If any other disc than the test disc (SZZP1054C) is used, an error message may be displayed. This is not a malfunction.

**BLOCK DIAGRAM**



Note:  
 → Audio signal

**SCHEMATIC DIAGRAM** (Parts list on pages 30, 31)

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

**Notes:**

- **S201**: Laser ON/OFF switch in "OFF" position. (It turns "ON" with disc holder closed).
- **S202**: Rest detector in "OFF" position. (It turns "ON" when optical pickup comes to innermost periphery).
- **S301**: Memory/recall (MEMORY/RECALL) switch.
- **S302**: Repeat (REPEAT) switch.
- **S303, S304**: Skip/search (SKIP-SEARCH) switches. (S303: Backward, S304: Forward)
- **S305**: Stop/Operation off (STOP/OPR OFF) switch.
- **S308**: Play/pause (PLAY/PAUSE) switch.
- **S307**: Play mode selector (PLAY MODE) switch in "NORMAL" position. (RESUME ← NORMAL → RANDOM)
- **S308**: Hold (HOLD) switch in "OFF" position.
- **S701**: ASC/S-XBS selector (ASC/S-XBS) switch in "OFF" position. (OFF → S-XBS → ASC)
- The voltage value and waveforms are the reference voltage of this measured by DC electronic voltmeter (high impedance) and oscilloscope on the basis of GND terminal (DC IN Jack). Accordingly, there may arise some errors in the voltage values and waveforms depending upon the internal impedance of the tester or measuring unit.
- \* The parenthesized is the voltage for test disc (1 kHz, L+R, 0dB) in play mode, and the other, for no disc in stop mode.
- \* AC adaptor is used for power supply.

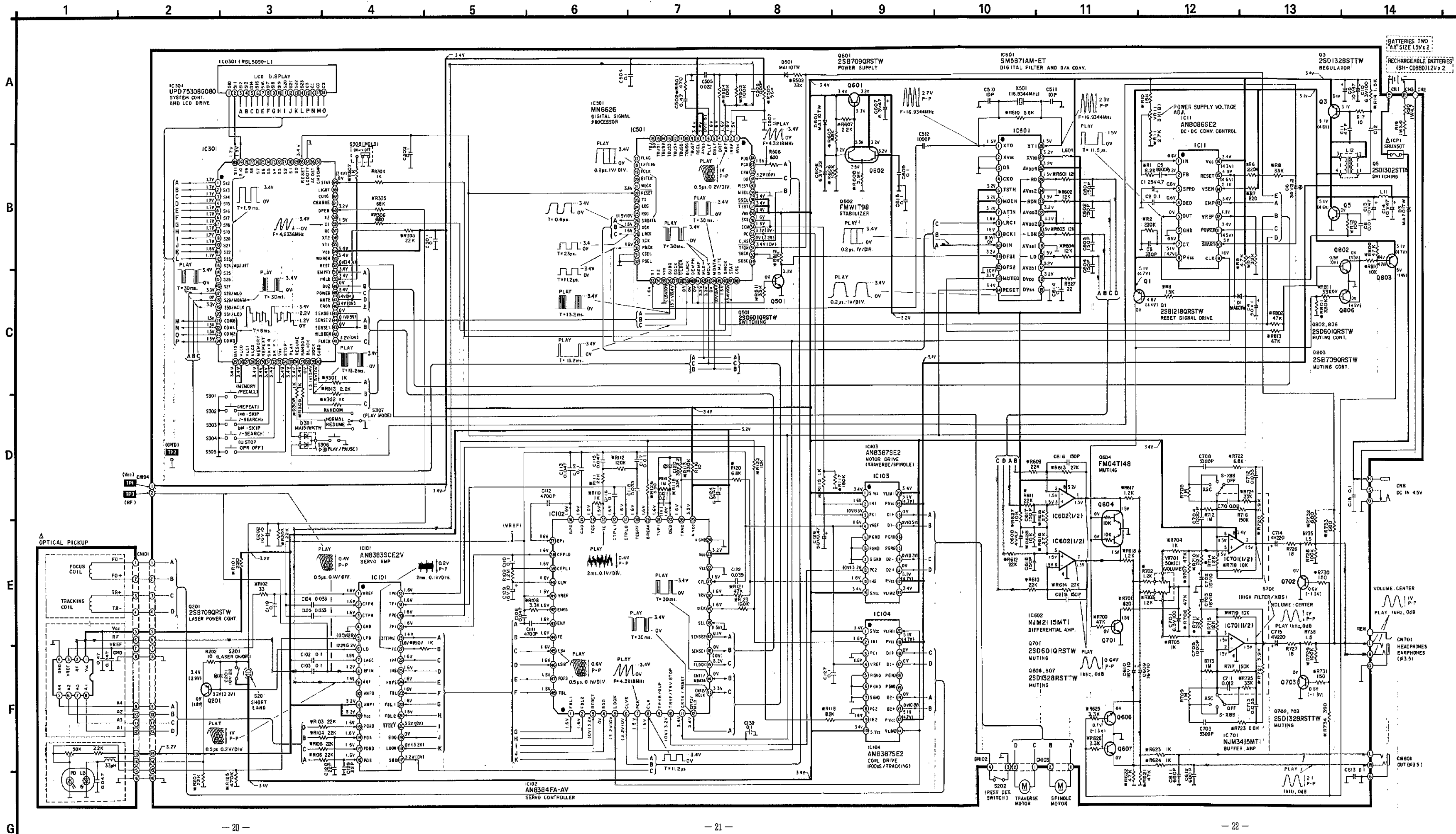
- **Positive voltage lines.**
- **Audio signal lines.**
- **Important safety notice:** Components identified by  $\Delta$  mark have special characteristics important for safety. Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), 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.

Part No.	Production Part No.	Supply Part No.
IC701	NJM3415MT1	NJM3415M

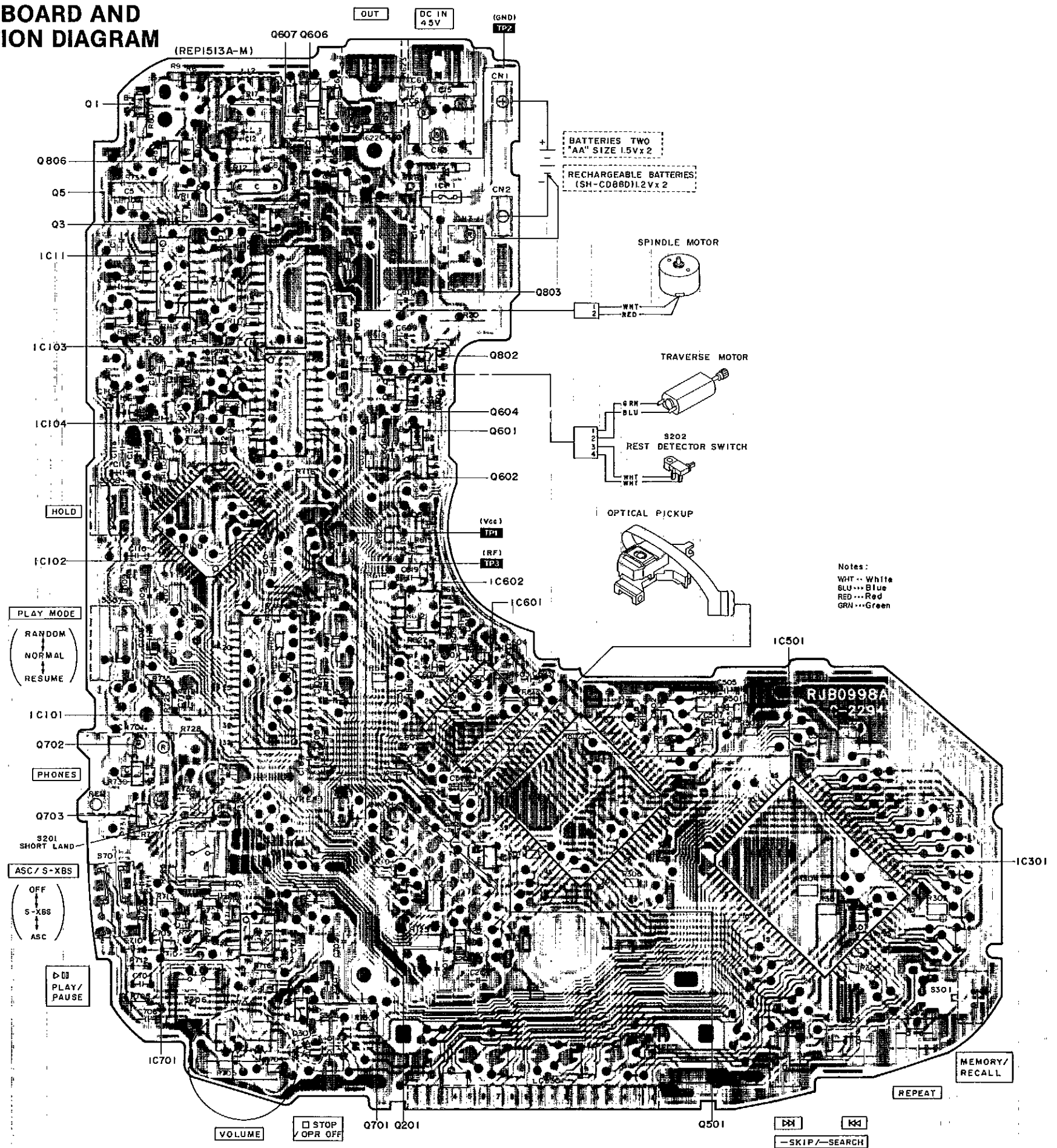
- $\times$  marks indicate printed resistor.
- **Caution!** IC and LSI are sensitive to static electricity. Secondary trouble can be prevented by taking care during repair.
- Cover the parts boxes made of plastics with aluminum foil.
- Ground the soldering iron.
- Put a conductive mat on the work table.
- Do not touch the pins of IC or LSI with fingers directly.

**Terminal guide of IC's, transistors and diodes**

 NJM2115MT1 8 Pin NJM3415MT1 8 Pin AN8086SE2 16 Pin AN8387SE2 20 Pin	 SM6871AM-ET 28 Pin AN8383SCE2V 32 Pin	 AN8384FA-AV 48 Pin MN6626 64 Pin
 UPD75308G000	 2SB709QRSTW 2SB218QRSTW 2SD601QRSTW 2SD1328RSTTW 2SD1328STTW	 FMG4T148 FMW1T98
 MA151WKTW	 MA110TW	 MA701TW



**PRINTED CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM**



**Notes:**

- In this printed circuit board diagram, the parts and foil patterns on the board facing toward you are printed in black. The opposite side is printed in blue.
- The "●" mark denotes the connection points of double-faced foil patterns (through holes) on both sides of the printed circuit board.
- This printed circuit board diagram may be modified at any time with the development of new technology.

**TERMINAL FUNCTION OF IC'S**

**• IC11 (AN8086SE2): DC-DC converter control**

Pin No.	Mark	I/O Division	Function
1	IN	I	Error amp input
2	FB	O	Error amp output
3	SPRO	I	Short protect input
4	DED	I	Dead time input
5	OUT	O	Switching output
6	GND	—	Ground terminal
7	CT	I	Triangular wave oscillator capacitor input
8	PVCC	I	Power supply terminal

Pin No.	Mark	I/O Division	Function
9	CLK	I	Clock signal input (f=88.2kHz)
10	START	I	Start detection input
11	POWER	I	Power ON/OFF detection terminal
12	VREF	O	Reference voltage output
13	EMP	O	Empty detection output
14	VSEN	I	Empty detection input
15	RESET	O	Reset signal output
16	VCC	I	Power supply terminal

**• IC101 (AN8383SCE2V): Servo amp**

Pin No.	Mark	I/O Division	Function
1	VREF	O	Reference voltage output
2	CFPH	I	Focus phase compensating capacitor terminal
3	CTPH	I	Tracking phase compensating capacitor terminal
4	GND	—	Ground terminal
5	LPD	I	Non-inverting laser power input
6	LD	O	Laser power auto control output
7	CAGC	I	AGC detecting capacitor terminal
8	RFIN	I	RF signal input
9	ARF	O	RF signal output
10	AMP0	O	RF signal output (Not used, open)
11	AMP1	I	RF signal input (×30 amp)
12	VCC	I	Power supply terminal
13	PDAD	I	Photo detector current input
14	PDA	I	Photo detector current input
15	PDBD	I	Photo detector current input
16	PDB	I	Photo detector current input
17	SDO	O	Dropout detection pulse output
18	LDON	I	Laser ON/OFF control input

Pin No.	Mark	I/O Division	Function
19	BDO	O	Dropout detection output
20	RFDET	O	RF detection signal output
21	FBL2	I	PD balance adjustment terminal (PDB)
22	FBL1	I	PD balance adjustment terminal (PDA)
23	TBL	I	Tracking balance adjustment terminal
24	FOFS	I	Focus offset adjustment terminal
25	IVB	O	Current/voltage conversion output (B)
26	IVA	O	Current/voltage conversion output (A)
27	FE	O	Focus error signal output
28	3TENVE	O	3T envelope signal output
29	FPI	I	Focus phase compensating amp input
30	FPO	O	Focus phase compensating output
31	TPI	I	Tracking phase compensating input
32	TPO	O	Tracking phase compensating output

• IC102 (AN8384FA-AV): Servo controller

Pin No.	Mark	I/O Division	Function
1	FBL1	O	PD balance adjustment (PDA) terminal
2	FBL2	O	PD balance adjustment (PDB) terminal
3	RFDET	I	RF detection signal input
4	BDO	I	Dropout detection input
5	LDON	O	Laser ON/OFF control output
6	CLVS	I	Spindle servo condition det. terminal ("H": CLV, "L": Rough servo)
7	PCK	I	PLL extract clock (f=4.3218MHz)
8	CLK	I	Frequency division clock signal (f=88.2kHz) input
9	TRVR/GUP	I/O	Traverse backward input/gain up output (Not used, open)
10	TRVF/TRV STOP	I/O	Traverse forward input/stop output terminal
11	CNT4/RESET	I/O	CNT4 input/reset signal output terminal
12	CNT3/MLD	I/O	CNT3 input/command load signal output terminal
13	CNT2/MCLK	I/O	CNT2 input/command clock signal output terminal
14	CNT1/MDATA	I/O	CNT1 input/command data signal output terminal
15	FLOCK	O	Focus lock signal output
16	SENSE1	O	Selector output (1) terminal
17	SENSE2	O	Selector output (2) terminal
18	SEL	I	Parallel/serial select terminal (Not used, connected to GND)
19	KICK	O	Track kick F/B control terminal
20	TRV	O	Traverse F/B control terminal
21	CFL	I	Capacitor connection terminal
22	VSS	—	Ground terminal
23	VDD	I	Power supply terminal
24	A. GND	—	Ground terminal
25	A. VCC	I	Power supply terminal
26	TRVO	O	Traverse amp. output terminal (2)

Pin No.	Mark	I/O Division	Function
27	DED	O	Traverse amp. output terminal (1)
28	TVPI	I	Traverse amp. input terminal
29	BREAK	I	Break input terminal
30	TEBPF	I	Tracking error gain detecting filter
31	CTPLO	O	Tracking low level compensation amp. output terminal
32	CTPLI	I	Tracking low level compensation amp. input terminal
33	TE	O	Tracking error output
34	TEG	I	Tracking SW amp. input
35	CAD	O	Auto adjustment multiplier output terminal
36	BPO	O	Focus error for B.P.F. output terminal
37	BPI	I	Focus error for B.P.F. input terminal
38	CFPLO	O	Focus low level compensation amp. output terminal
39	CFPLI	I	Focus low level compensation amp. input terminal
40	CLW	O	Triangular wave oscillator output
41	VREF	I	Reference voltage input
42	ENVG	I	Envelope amp. gain adjustment terminal
43	ENV	I	Envelope amp. input terminal
44	FE	I	Focus SW amp. input terminal
45	LSA	I	Current/voltage conversion input (A)
46	LSB	I	Current/voltage conversion input (B)
47	FOFS	O	Focus offset adjustment output terminal
48	TBL	O	Tracking balance adjustment output terminal

• IC103, 104 (AN8387SE2): Motor/coil drive

Pin No.	Mark	I/O Division	Function
1	S. VCC	I	Power supply terminal
2	IN1	I	Spindle motor drive signal input and tracking coil drive signal input
3	PC1	I	Spindle motor power control signal input
4	VREF	I	Reference voltage input
5	P. GND	—	Ground terminal
6	S. GND	—	Ground terminal
7	PC2	I	Traverse motor power control input (Not used, connected to GND)
8	IN2	I	Traverse motor drive signal input and focus coil drive signal input

Pin No.	Mark	I/O Division	Function
10	S. VCC	I	Power supply terminal
11	VLIM2	I	Voltage limit terminal
12	P. VCC	I	Power supply terminal
13	D2+	O	Traverse motor drive signal output and focus coil drive signal output
14	D2-	O	Traverse motor drive signal output and focus coil drive signal output
15	P. GND	—	Ground terminal
16	P. GND	—	Ground terminal
17	D1-	O	Spindle motor drive signal output and tracking coil drive signal output
18	D1+	O	Spindle motor drive signal output and tracking coil drive signal output
19	P. VCC	I	Power supply terminal
20	VLIM1	I	Voltage limit terminal

• IC601 (SM5871AM-ET): Digital filter & D/A converter

Pin No.	Mark	I/O Division	Function															
1	XTO	O	Crystal OSC terminal (F=16.9344MHz)															
2	XVSS	—	GND terminal of crystal OSC															
3	DS	I	Normal/high speed play mode select terminal (DS: "L" - Normal, DS: "H" - High speed)															
4	CKO	O	Oscillator clock terminal (DS: "L" - 384fs, DS: "H" - 192fs) (Not used, open)															
5	TSTN	I	Test terminal															
6	MODN	I	Mode control terminal <table border="1" style="display: inline-table; vertical-align: middle;"> <tr><td rowspan="2">Select</td><td>"H"</td><td>MODN</td></tr> <tr><td>"L"</td><td>MODN</td></tr> <tr><td rowspan="2">Soft mute:</td><td>OFF</td><td>HOLD</td></tr> <tr><td>ON</td><td>HOLD</td></tr> </table>	Select	"H"	MODN	"L"	MODN	Soft mute:	OFF	HOLD	ON	HOLD					
Select	"H"	MODN																
	"L"	MODN																
Soft mute:	OFF	HOLD																
	ON	HOLD																
7	ATTN	I	Soft mute control terminal <table border="1" style="display: inline-table; vertical-align: middle;"> <tr><td rowspan="2">Select</td><td>"H"</td><td>Soft mute: OFF</td></tr> <tr><td>"L"</td><td>Soft mute: ON</td></tr> </table>	Select	"H"	Soft mute: OFF	"L"	Soft mute: ON										
Select	"H"	Soft mute: OFF																
	"L"	Soft mute: ON																
8	LRCI	I	L/R discriminating signal ("H": Lch, "L": Rch)															
9	BCKI	I	Serial bit clock input terminal															
10	DIN	I	Serial data input terminal															
11	DFS1	I	De-emphasis control terminal <table border="1" style="display: inline-table; vertical-align: middle;"> <tr><td rowspan="2">Select</td><td colspan="2">DFS1</td></tr> <tr><td>"L"</td><td>"H"</td></tr> <tr><td rowspan="2">DFS2</td><td>"L"</td><td>De-emphasis: ON (44.1kHz)</td></tr> <tr><td>"H"</td><td>De-emphasis: OFF</td></tr> <tr><td rowspan="2">DFS2</td><td>"L"</td><td>De-emphasis: ON (48.0kHz)</td></tr> <tr><td>"H"</td><td>De-emphasis: ON (32.0kHz)</td></tr> </table>	Select	DFS1		"L"	"H"	DFS2	"L"	De-emphasis: ON (44.1kHz)	"H"	De-emphasis: OFF	DFS2	"L"	De-emphasis: ON (48.0kHz)	"H"	De-emphasis: ON (32.0kHz)
Select	DFS1																	
	"L"	"H"																
DFS2	"L"	De-emphasis: ON (44.1kHz)																
	"H"	De-emphasis: OFF																
DFS2	"L"	De-emphasis: ON (48.0kHz)																
	"H"	De-emphasis: ON (32.0kHz)																
12	DFS2	I	De-emphasis control terminal <table border="1" style="display: inline-table; vertical-align: middle;"> <tr><td rowspan="2">Select</td><td colspan="2">DFS2</td></tr> <tr><td>"L"</td><td>"H"</td></tr> <tr><td rowspan="2">DFS2</td><td>"L"</td><td>De-emphasis: ON (44.1kHz)</td></tr> <tr><td>"H"</td><td>De-emphasis: OFF</td></tr> <tr><td rowspan="2">DFS2</td><td>"L"</td><td>De-emphasis: ON (48.0kHz)</td></tr> <tr><td>"H"</td><td>De-emphasis: ON (32.0kHz)</td></tr> </table>	Select	DFS2		"L"	"H"	DFS2	"L"	De-emphasis: ON (44.1kHz)	"H"	De-emphasis: OFF	DFS2	"L"	De-emphasis: ON (48.0kHz)	"H"	De-emphasis: ON (32.0kHz)
Select	DFS2																	
	"L"	"H"																
DFS2	"L"	De-emphasis: ON (44.1kHz)																
	"H"	De-emphasis: OFF																
DFS2	"L"	De-emphasis: ON (48.0kHz)																
	"H"	De-emphasis: ON (32.0kHz)																

Pin No.	Mark	I/O Division	Function
13	MUTEO	O	Infinity zero detect terminal
14	RESET	I	Reset detect terminal ("H": Normal, "L": Reset)
15	DVSS	—	Digital GND terminal
16	DVDD	I	Digital power supply terminal
17	AVDD1	I	Analog power supply (1) terminal
18	LO	O	Lch PWM output (+) terminal
19	AVSS1	—	Analog GND (1) terminal
20	LON	O	Lch PWM output (-) terminal
21	AVDD2	I	Analog power supply (2) terminal
22	AVDD3	I	Analog power supply (3) terminal
23	RON	O	Rch PWM output (-) terminal
24	AVSS2	—	Analog GND (2) terminal
25	RO	O	Rch PWM output (+) terminal
26	AVDD4	I	Analog power supply (4) terminal
27	XVDD	I	Power supply terminal of crystal OSC
28	XTI	I	Crystal OSC terminal (F=16.9344MHz)

• IC301 (UPD75308G080): System control & LCD drive

Pin No.	Mark	I/O Division	Function
1	S12	O	Segment signal output
2	S23	O	Segment signal output
3	S24	—	Segment signal output (Not used, open)
4	S27	—	Segment signal output (Not used, open)
5	S28/MLD	O	Command load signal output
6	S29/MDATA	O	Command data signal output
7	S30/MCLK	O	Command clock signal output
8	S31/LED	O	Remote control detection
9	COM0	O	LCD common signal output
10	COM3	O	LCD common signal output
11	BIAS	O	Power supply terminal for LCD drive (Not used, connected to each other)
12	VLC0	I	Power supply terminal for LCD drive (Not used, open)
13	VLC1	—	Power supply terminal for LCD drive (Not used, open)
14	VLC2	—	Power supply terminal for LCD drive (Not used, open)
15	MEMORY	I	Key switch (MEMORY/RECALL) detection terminal
16	REPEAT	I	Key switch (REPEAT) detection terminal
17	SKIP R	I	Key switch (SKIP/SEARCH: Backward) detection terminal
18	SKIP F	I	Key switch (SKIP/SEARCH: Forward) detection terminal
19	VSS	—	GND terminal
20	STOP	I	Key switch (STOP/POWER OFF) detection terminal
21	PLAY	I	Key switch (PLAY/PAUSE) detection terminal
22	RESUME	I	Key switch (PLAY MODE: RESUME) detection terminal
23	RANDOM	I	Key switch (PLAY MODE: RANDOM) detection terminal
24	BLKCK	I	Sub-code block (Q data) clock (75Hz) output
25	SQCK	O	Sub-code Q register clock output
26	SUBQ	O	Sub-code (Q data) output
27	FLOCK	I	Focus lock signal input
28	WLSRCN	I	Selector input (1) terminal (Not used, open)

Pin No.	Mark	I/O Division	Function
29	SENSE 1	I	Selector input (1) terminal
30	SENSE 2	I	Selector input (2) terminal
31	SENSE 1	I	Selector input (1) terminal
32	TRON	O	Tracking servo ON signal (Tracking servo ON at "L")
33	MUTE	O	Muting signal output ("H": MUTE)
34	POWER	O	Power ON/OFF output terminal
35	BUZ	O	Beep control output terminal
36	HOLD	I	Hold ON/OFF detection terminal
37	EMPTY	I	Empty detection input terminal
38	REST	I	Rest detection terminal
39	WDRCN	O	Remote control signal output
40	VDD	I	Power supply terminal
41	XT1	—	Sub-system clock crystal terminal (Not used, open)
42	XT2	—	Sub-system clock crystal terminal (Not used, open)
43	NC	—	Not connected
44	X1	I	Main-system clock crystal terminal
45	X2	—	Main-system clock crystal terminal (Not used, open)
46	OPEN	I	Disc holder open detection terminal
47	CHARGE	—	Not connected
48	CCHG	—	Not connected
49	LIGHT	O	LED drive command signal
50	STAT	I	Processing condition (CRC, CUE, CLVS, FCLV, TTSTOP) input
51	CHGCMP	—	Not connected
52	ACDET	I	Power supply detection signal input
53	LCDDTY	I	LED drive detect terminal
54	RESET	I	Reset detection terminal
55	S0	O	Segment signal output (Not used, open)
56	S9	O	Segment signal output (Not used, open)
57	S10	O	Segment signal output
58	S11	O	Segment signal output



## • IC501 (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	DSL F	I/O	DSL loop filter terminal
6	PLL F	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	RESET	I	Reset terminal
23	TX	O	Digital audio signal
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=7.35kHz) (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)
49	SUBC	O	Sub-code serial output data (Not used, open)
50	SBCK	I	Sub-code serial input clock (Not used, connected to GND)
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) (Connected to GND)
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)
64	PDO	O	Phase compared signal of EFM and PCK (Not used, open)

# REPLACEMENT PARTS LIST

**Notes:** \*Important safety notice:

 Components identified by  $\Delta$  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.

\*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.

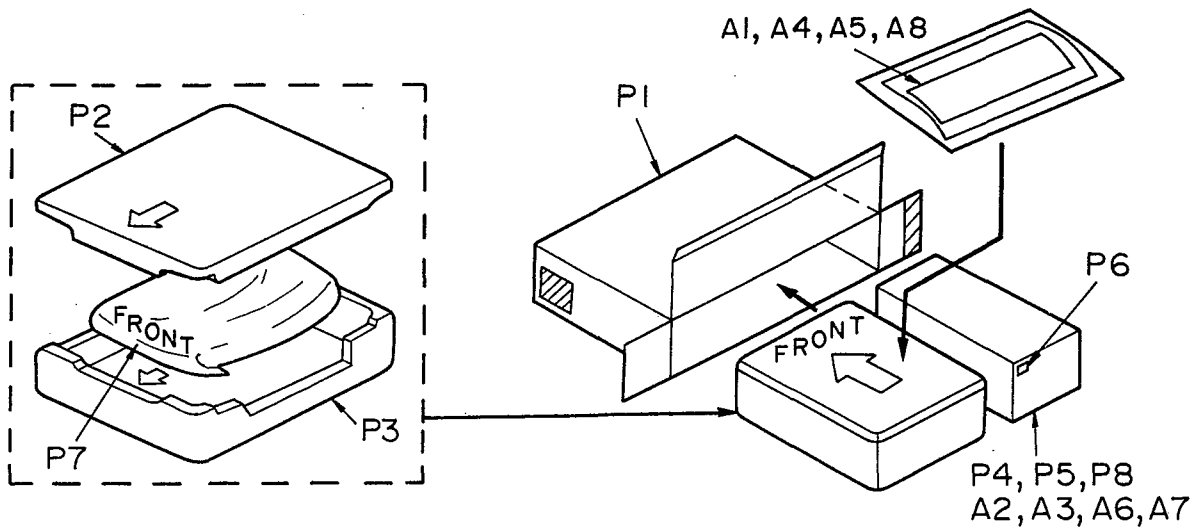
Ref. No.	Part No.	Part Name & Description	Remarks	Ref. No.	Part No.	Part Name & Description	Remarks
		INTEGRATED CIRCUIT(S)				COIL(S)	
IC11	AN8086SE2	IC, DC-DC CONV. CONTROL		L11	RLQB330KT-K	COIL	
IC101	AN8383SCE2V	IC, SERVO AMP		L12	RLZ0007-0	COIL	
IC102	AN8384FA-AV	IC, SERVO CONTROLLER		L601	RLB0003	COIL	
IC103, 104	AN8387SE2	IC, MOTOR/COIL DRIVE				OSCILLATOR(S)	
IC301	UPD75308G080	IC, SYSTEM CONT. /LCD DRIVE					
IC501	MN6626	IC, DIGITAL SIGNAL PROCESSOR		X501	RSX216M9M01T	OSCILLATOR (16.9344MHz)	
IC601	SM5871AM-ET	IC, DIGITAL FILTER&D/A CONV.				LCD(S)	
IC602	NJM2115MT1	IC, OUTPUT AMP					
IC701	NJM3415M	IC, HEADPHONES AMP		LCD301	RSL5090-L	LCD	
		TRANSISTOR(S)				SWITCH(ES)	
Q1	2SB1218QRSTW	TRANSISTOR		S201	RSHIA91ZA-A	SW, LASER ON/OFF	
Q3	2SD1328STTW	TRANSISTOR		S202	SSH5	SW, REST DETECTOR	
Q5	2SD1302STTA	TRANSISTOR		S301	EVQ21405R	SW, MEMORY/RECALL	
Q201	2SB709QRSTW	TRANSISTOR		S302	EVQ21405R	SW, REPEAT	
Q501	2SD601QRSTW	TRANSISTOR		S303	EVQ21405R	SW, R. SKIP/SEARCH	
Q601	2SB709QRSTW	TRANSISTOR		S304	EVQ21405R	SW, F. SKIP/SEARCH	
Q602	FMW1T98	TRANSISTOR		S305	EVQ21405R	SW, STOP/OPR OFF	
Q604	FMG4T148	TRANSISTOR		S306	EVQ21405R	SW, PLAY/PAUSE	
Q606, 607	2SD1328RSTTW	TRANSISTOR		S307	ESD11H230	SW, PLAY MODE	
Q701	2SD601QRSTW	TRANSISTOR		S308	ESD11H220	SW, HOLD	
Q702, 703	2SD1328RSTTW	TRANSISTOR		S701	ESD11H230	SW, ASC/S-XBS	
Q802	2SD601QRSTW	TRANSISTOR				CONNECTOR(S) AND JACK(S)	
Q803	2SB709QRSTW	TRANSISTOR		CN1	RJC93015	BATTERY TERMINAL (+)	
Q806	2SD601QRSTW	TRANSISTOR		CN2	RJC93015	BATTERY TERMINAL (-)	
		DIODE(S)		CN3	RJH5102-1	RECHARGEABLE BATT. TERMINAL	
D1	MA110TW	DIODE		CN8	RJJ4303	DC IN JACK	
D3	MA701TX	DIODE		CN101	RJU035T016	CONNECTOR (16P)	
D301	MA151WK	DIODE		CN102	RJT068W04V	CONNECTOR (4P)	
D501	MA110TW	DIODE		CN103, 104	RJT068W02V	CONNECTOR (2P)	
D601	MA110TW	DIODE		CN601	RJJD3S5ZA-C	OUT JACK	
		IC PROTECTOR(S)		CN701	RJJD5S3MZA-C	HEADPHONES JACK	
ICP1	SRUN50T	IC PROTECTOR	$\Delta$				
		VARIABLE RESISTOR(S)					
VR11	EVNDXAA00B33	V. R. POWER SUPPLY VOLT. ADJ.					
VR701	EVUBPAT50C54	V. R. VOLUME					

# 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, 1K=1,000 (OHM), 1M=1,000k (OHM)

Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks	Ref. No.	Part No.	Values & Remarks
		RESISTORS	C5	ECUV1E822KBN	25V 8200P	C130	ECUV1C104ZFN	16V 0.1U
R17	ERJ6GEYJ100	1/10W 10	C6	ECEA1VKN2R2I	35V 2.2U	C201	ECEA1AKN220I	10V 22U
R19	ERJ1WYK3R9H	1W 3.9	C8	ECUV1E103KBN	25V 0.01U	C202	ECEA1CKA100I	16V 10U
R20	ERJ1WYK4R7H	1W 4.7	C9	RCE1ASC470IX	10V 47U	C301, 302	ECUV1C104ZFN	16V 0.1U
R109	ERJ6GEYJ125V	1/10W 1.2M	C10	ECEA0JKA101I	6.3V 100U	C502	ECUV1C474KBM	16V 0.47U
R114	ERJ6GEYJ105	1/10W 1M	C11	ECUV1H470KCN	50V 47P	C504	ECUV1C104ZFN	16V 0.1U
R116	ERJ6GEYJ100	1/10W 10	C12	ECUVNC105ZFM	16V 1U	C505	ECUV1E223KBN	25V 0.022U
R202	ERJ6GEYJ100	1/10W 10	C13, 14	ECEA1AKA470I	10V 47U	C506	ECUV1H102KBN	50V 1000P
R506	ERJ6GEYJ681V	1/10W 680	C15	ECUV1C104ZFN	16V 0.1U	C507	ECUV1C104KBN	16V 0.1U
R627	ERJ6GEYJ220	1/10W 22	C102, 103	ECUV1C104KBN	16V 0.1U	C510, 511	ECUV1H100DCN	50V 10P
R708, 709	ERJ6GEYJ105	1/10W 1M	C104, 105	ECUV1C333KBN	16V 0.033U	C512	ECUV1H102KBN	50V 1000P
R712, 713	ERJ6GEYJ105	1/10W 1M	C108	ECUV1C473KBN	16V 0.047U	C601-604	ECUV1H151KCN	50V 150P
R716, 717	ERJ6GEYJ154V	1/10W 150K	C109	ECEA1CKA100I	16V 10U	C605	ECUV1C104ZFN	16V 0.1U
R726, 727	ERJ6GEYJ180V	1/10W 18	C110	ECUV1C104KBN	16V 0.1U	C606	ECEA0JKA220	6.3V 22U
R728	ERJ6GEYJ104V	1/10W 100K	C111, 112	ECUV1H472MBN	50V 4700P	C607	ECEA0JKA470I	6.3V 47U
R735, 736	ERJ6GEYK1R5V	1/10W 1.5	C113	ECUV1C473KBN	16V 0.047U	C608	ECST0GY475RR	4V 4.7U
		CHIP JUMPERS	C114	ECUV1C104KBN	16V 0.1U	C609, 610	ECEA1CKA100I	16V 10U
RJ10	ERJ6GEYOR00V	CHIP JUMPER	C115	ECUV1C473KBN	16V 0.047U	C611, 612	ECUV1H681KBN	50V 680P
		CAPACITORS	C116	ECUV1C104KBN	16V 0.1U	C613-615	ECUV1C104ZFN	16V 0.1U
C1	ECEA1EKA4R7I	25V 4.7U	C117	ECUV1E103KBN	25V 0.01U	C616-619	ECUV1H151KCN	50V 150P
C2	ECUV1C104KBN	16V 0.1U	C118	ECUV1C333KBN	16V 0.033U	C701	ECEA0JKA101I	6.3V 100U
C3	ECUV1H331KBN	50V 330P	C119	ECUV1C104ZFN	16V 0.1U	C702, 703	ECEA1CKA100I	16V 10U
C4	ECEA1HKA010I	50V 1U	C120	ECEA1VKN2R2I	35V 2.2U	C704, 705	ECUV1H102KBN	50V 1000P
			C121	ECUV1E103KBN	25V 0.01U	C708, 709	ECUV1H332KBN	50V 3300P
			C122	ECUV1C393KBN	16V 0.039U	C710, 711	ECUV1E123KBN	25V 0.012U
			C124	ECEA0JKA470I	6.3V 47U	C712, 713	ECUV1E333KBN	25V 0.033U
			C126	ECEA1HKAR47I	50V 0.47U	C714, 715	ECEA0GKA22I	4V 220U
			C127	ECUV1C104ZFN	16V 0.1U			
			C128, 129	ECUV1H220JCN	50V 22P			

# PACKAGING



# REPLACEMENT PARTS LIST

**Notes:** \*Important safety notice:

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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.

\*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
		CABINET AND CHASSIS	
1	RKK0048-1K	BATTERY COVER	
2	RJF0013	LCD HOLDER	
3	SBND90ZK0A	VOLUME KNOB	
4	XQN17+C3FZ	SCREW	
5	RGV0052-K	HOLD/P. MODE/ASC KNOB	
6	RJC93007	COMMON BATTERY TERMINAL	
7	RFKJLXP150EG	BOTTOM CABINET ASS'Y	(EG)
7	RFKJLXP150EB	BOTTOM CABINET ASS'Y	(EB, GC, GN)
7-1	SHGD54-1	FOOT	
8	RMA0677	REAR ORNAMENT	
9	RMS0105-1	SHAFT	
10	RGD0026B-K	DISC LID	
11	RHE5079YA	SCREW	
12	RMCO204-1	OPEN SPRING	
13	RFKJLXP150EG	INTERMEDIATE CABINET ASS'Y	
14	RGU0862-K	OPEN BUTTON	
15	RGU0863-K	OPERATION BUTTON (A)	
16	RGU0864-K	OPERATION BUTTON (B)	
17	RMCO203	LOCK SPRING	
18	RML0300-1	LOCK LEVER	
19	XTN17+6GFZ	SCREW	
20	RAED131Z	TRAVERSE DECK	
20-1	SHGD165	FLOATING RUBBER (B)	
20-2	SHGD157	FLOATING RUBBER (A)	

※ This parts is supplied only with replacement parts list.

**Note:**

The marking (RTL) indicates that the Retention Time is limited for this item. After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retention period of availability is dependant on the type of assembly, and in accordance with the laws governing part and product retention. After the end of this period, the assembly will no longer be available.

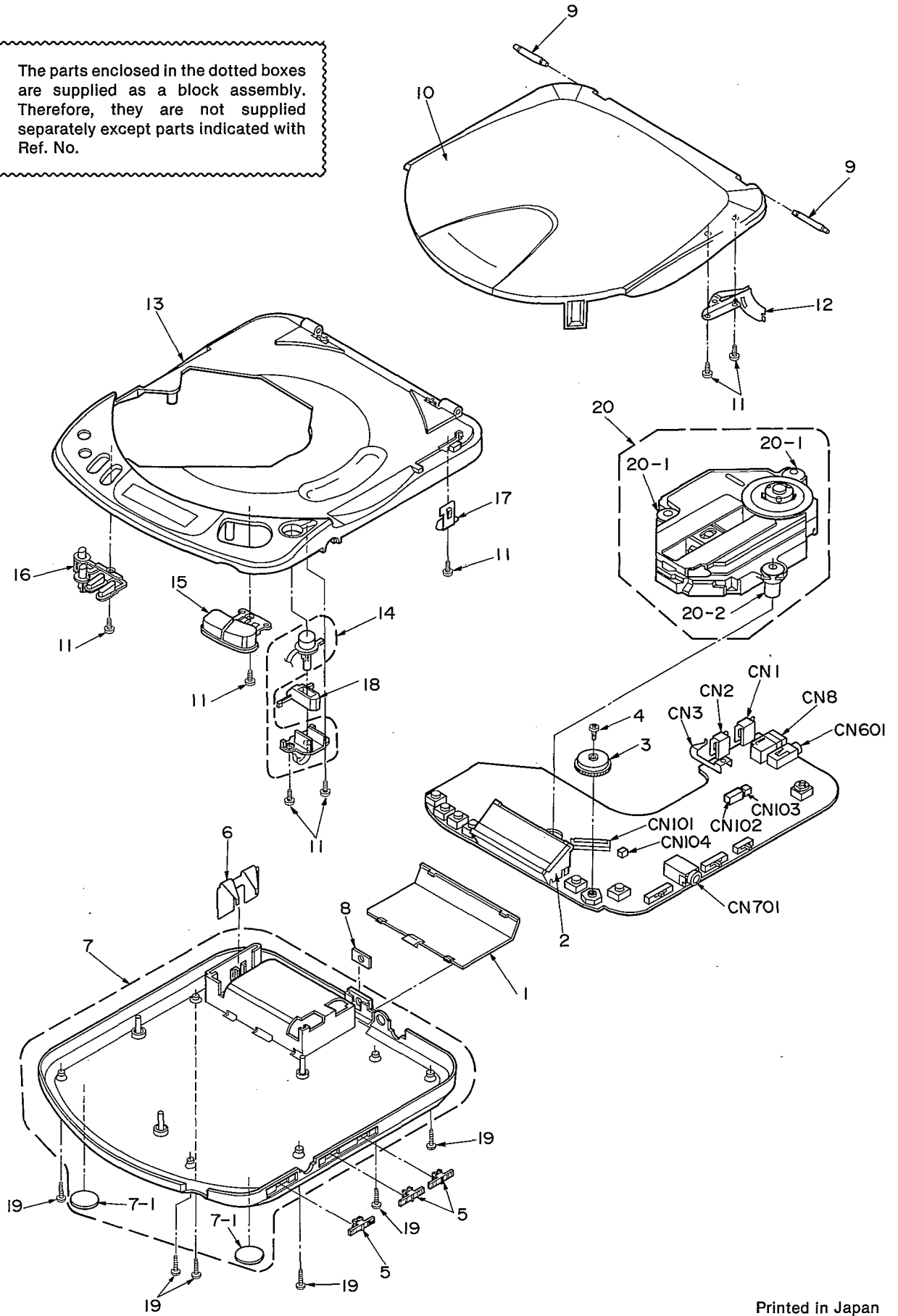
Ref. No.	Part No.	Part Name & Description	Remarks
		PACKING MATERIAL	
P1	RPK0387	PACKING CASE	(EG)
P1	RPK0386	PACKING CASE	(EB, GC, GN)
P2	RPN0677	CUSHION (UPPER)	
P3	RPN0676	CUSHION (LOWER)	
P4	RPQF0077	ACCESSORIES BOX	
P5	RPQ0072	PAD	(EG)
P5	RPQ0341	PAD	(EB)
P5	RPQ0069	PAD	(GC)
P5	RPQ0070	PAD	(GN)
P6	SQZD6	AREA LABEL	(EG)
P6	SQZD7	AREA LABEL	(EB)
P6	RQLA0066	AREA LABEL	(GC)
P6	RQLA0067	AREA LABEL	(GN)
P7	SPPD1	PROTECTION BAG	
P8	RPQ0059	SPACER	(EB, EG, GN)
		ACCESSORIES	
A1	RFKSLXP150EG	INSTRUCTION MANUAL ASS'Y	(EG)
A1	RQT1976-B	INSTRUCTION MANUAL	(EB, GN)
A1	RFKSLXP150GC	INSTRUCTION MANUAL ASS'Y	(GC)
A2	RP-HV135GY	STEREO EARPHONES	
A3	RFEA401E-1S	AC ADAPTOR	(EG) $\Delta$
A3	RFEA404B-W	AC ADAPTOR	(EB) $\Delta$
A3	RFEA402Z-W	AC ADAPTOR	(GC) $\Delta$
A3	RFEA401A-W	AC ADAPTOR	(GN) $\Delta$
A4	RQA0013	WARRANTY CARD	(EB, EG)
A4	RQX7433ZA	WARRANTY CARD	(GN)
A5	RQCB0169	SERVICENTER LIST	
A6	RJL2P001X10	STEREO CONNECTION CABLE	
A7	RJP120ZDS-K	POWER PLUG ADAPTOR	(GC) $\Delta$
A8	RQCA0276	INSTRUCTION MANUAL	
A9	※ RKB205ZA-D	EAR PADS	
		<PRINTED CIRCUIT BOARDS	
		ASS'Y>	
PCB1	REP1513A-M	P. C. B.	(RTL)

1 2 3 4 5

**■ CABINET PARTS LOCATION**

The parts enclosed in the dotted boxes are supplied as a block assembly. Therefore, they are not supplied separately except parts indicated with Ref. No.

A  
B  
C  
D  
E  
F  
G



1080