ORDER NO. AD9008247C2

Service Manual

Portable CD Player

SL-XP300



Color

(K)... Black Type

Area

Country Code	Area	Color
(E)	Continental Europe.	(K)
(EB)	Great Britain.	

■ SPECIFICATIONS

■ Audio

No. of channels: 2 channels (stereo)
Output voltage: 1.0V (50kΩ) φ3.5
Frequency response: 20~20000Hz (+0.5dB, −1.5dB)
Dynamic range: more than 94dB
S/N ratio: more than 96dB
Digital filter: 8 times 18 bit oversampling
D/A converter: 2DAC 16 bit
Phones output: max. 15mW/16Ω φ3.5 (adjustable)

■ 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 AC adaptor
Battery; with optional two "AA" size (LR6/R6 Type) batteries (DC 1.5V×2)
Rechargeable Battery; with the included rechargeable batteries (DC 1.2V×2)
DC IN: 3V ⊕—◉—⊖ (mini jack)
Power consumption:
AC adaptor; 3W
Battery; 0.7W (DC 3V)
Dimensions (W×H×D): 128×29×145mm
Weight: 335g with batteries

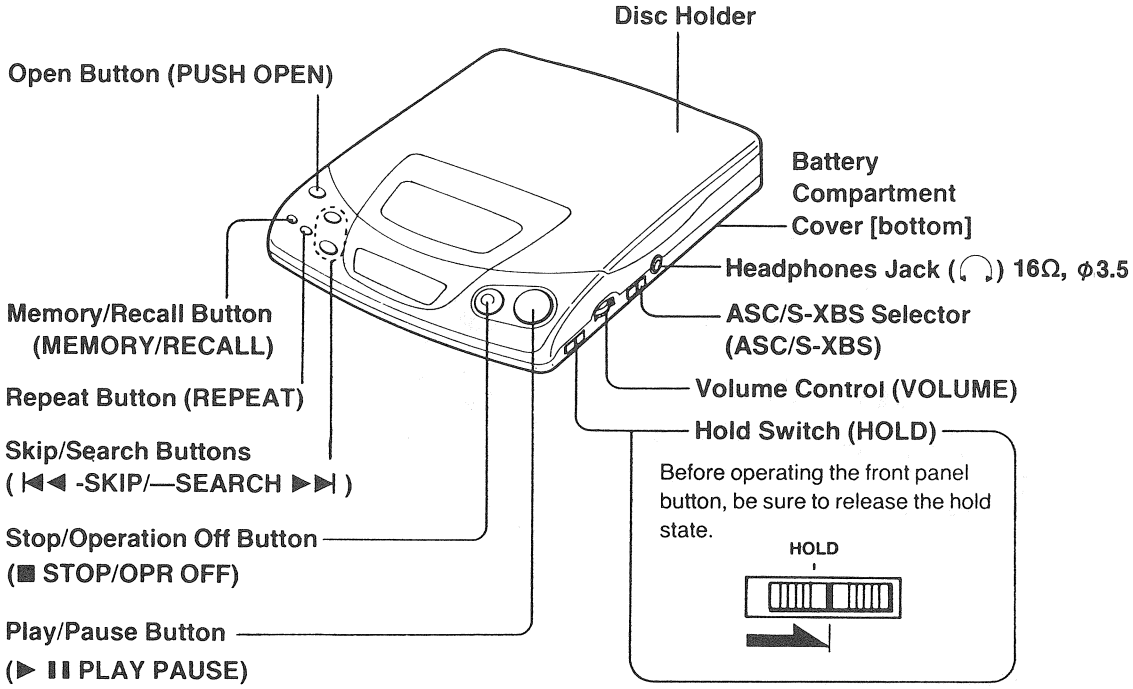
Specifications are subject to change without notice.
Weight and dimensions are approximate.

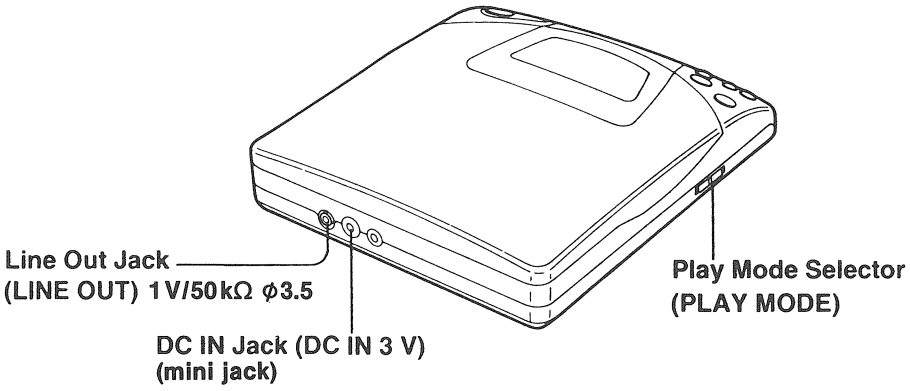
■ CONTENTS

	Page
CONTROLS AND FUNCTIONS	2
ACCESSORIES	2
PRECAUTION OF LASER DIODE	3
OPERATION	4
POWER SOURCE	4
CONNECTIONS	4
HANDLING PRECAUTIONS FOR TRAVERSE DECK	5
DISASSEMBLY INSTRUCTIONS	6~8
HOW TO CHECK THE MAIN P.C.B.	8
CHECKING THE OPERATION PROBLEMS ON THE TRAVERSE DECK (OPTICAL PICKUP)	9, 10
NOTE FOR SERVICE	10
MEASUREMENTS AND ADJUSTMENTS	11~16
TERMINAL FUNCTION OF IC'S	17~21
INTERNAL CONNECTION OF LCD	22
PRINTED CIRCUIT BOARDS AND WIRING CONNECTION DIAGRAM	23~25
SCHEMATIC DIAGRAM	26~30
TERMINAL GUIDE OF IC'S, TRANSISTORS AND DIODES	26
BLOCK DIAGRAM	31~33
EXPLODED VIEW	34
REPLACEMENT PARTS LIST	35~37
RESISTORS & CAPACITORS	38, 39
PACKING	40

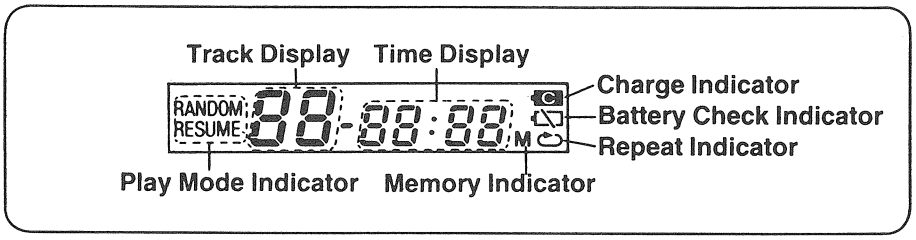
Technics

■ CONTROLS AND FUNCTIONS

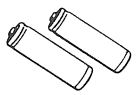
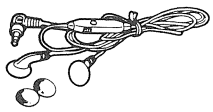
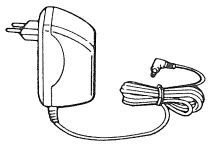




Display (If this unit is used by AC adaptor or Car adaptor, the backlight of the display will be turned on.)



■ ACCESSORIES

Rechargeable Batteries (2 pieces) (SH-CDB8-3)	Stereo Earphones (with remote controller) (RFEV101A-KS)	AC Adaptor (SH-CDA6U-E (E) / SH-CDA6U-EK (EB))	Stereo Connection Cable (SJPD5-2K)
			

■ PRECAUTION OF LASER DIODE

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

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

1. Do not disassemble the optical pick up 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 pick up lens for a long time.

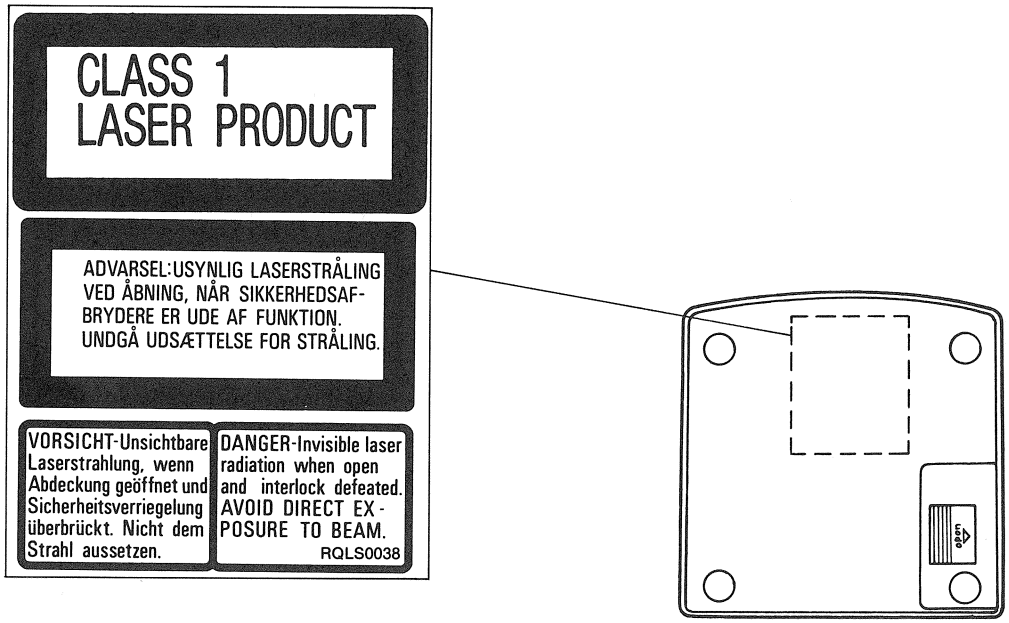
ACHTUNG: Dieses produkt enthält eine laserdiode. Im eingeschalteten zustand wird unsichtbare laserstrahlung von der lasereinheit abgestrahlt.

Wellenlänge: 780nm
Maximale strahlungsleistung der lasereinheit: 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 gefährliich ist.
2. Den werksseitig justierten einstellregler der lasereinreit 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.



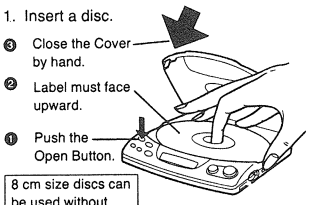
OPERATION

The following explanation is for a disc containing 7 tracks having a total playing time of 49 minutes and 58 seconds.

1 Normal play
(To play a disc from the first track to the end of the disc)

First, set the Play Mode Selector to "NORMAL" position. (The Play Mode Indicator has no display.)

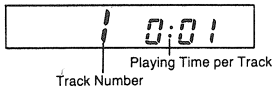
1. Insert a disc.



8 cm size discs can be used without adaptor.

2. Release the hold state.
   Functional buttons except for Open Button cannot be activated in the hold state.
   - The Remote Controller on the Stereo Earphones also has the Hold Switch.
   - Before operation, be sure to release the hold state of whichever (the unit or the Remote Controller) you use.

3. Press the Play/Pause Button.
   - The unit will be turned on and the disc will be played from the first track.

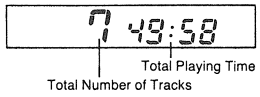


4. Adjust the volume.

First, turn down the level control of the unit or the connected audio system.

- To listen through Stereo Earphones or Headphones, adjust the phones level by the phones level control of the unit.
- To listen through an audio system, adjust the output level on the amplifier or receiver.

5. To stop disc play, press the Stop/Operation Off Button.
   - The disc will stop rotating, and the total number of tracks and total playing time will be displayed.



   - When all tracks have been played, the disc will automatically stop.

6. Press the Stop/Operation Off Button again to turn the unit off.
   - The unit will be turned off automatically after about 4 minutes in the stop mode.

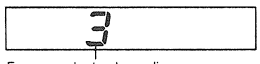
Notes:
- Always press the Stop/Operation Off Button before opening the disc holder to avoid possible damage to disc and/or the disc play mechanism.
- Set the unit to stop mode (Total Number of Tracks and Total Playing Time are displayed) for Program Play, and be sure to press the Stop/Operation Off Button after the track number is displayed.

ASC/S-XBS Selector (Phones Only)

Set the ASC/S-XBS Selector to "S-XBS" to boost the low frequency range.
Setting to the "ASC" position will make the more amenity sound possible.
Also it will lessen the leaking noisy high sound disturbing the people around you and reduce the strain of listening for a long time.

2 Skip play (To start disc play from a specific track)
Before use, release the hold state of the unit.

1. Press the ▶▶| Button (SKIP/SEARCH) in the stop mode to specify the desired track.
   - Each time you press this button, the pickup will advance by one track. If you go past the desired track, return the pickup using the |◀◀ Button.



For example, to play a disc from the track 3, press the ▶▶| Button 3 times.

   - To cancel, press the Stop/Operation Off Button.

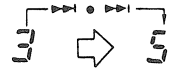
2. Press the Play/Pause Button.
   - Disc play will start from the specified track, and continue to the last track.

■ Skip play during disc play
By pressing the Skip/Search Button (|◀◀ or ▶▶|) during disc play or when disc play is paused, you can easily move the pickup to the beginning of the track being played or a track before or after it.

• Forward skip
Each time the ▶▶| Button is pressed, the Track Number on the display will skip forward and disc play will resume.

For example, to skip from the track 3 to the track 5...

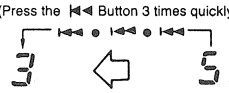
(Press the ▶▶| Button twice.)



• Backward skip
The first time the |◀◀ button is pressed, the unit skips back to the beginning of the track in play. Then it skips back one track for each additional press.

For example, to skip from the track 5 to the track 3...

(Press the |◀◀ Button 3 times quickly.)

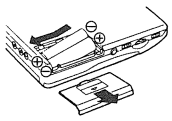


POWER SOURCE

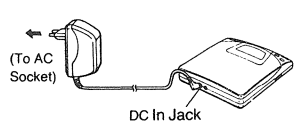
This unit may be used with the included rechargeable batteries, the optional two LR6 type alkaline batteries, the included AC Adaptor or the optional Car Adaptor (SH-CDC6, optional).

■ Rechargeable batteries operation
For its initial use after purchasing or after a long time interval (more than three months), make sure to recharge the rechargeable batteries. Normally 1 hour recharging will give approximately 1.5 hours and 3 hours recharging will give approximately 2.5 hours play.

1. Open the battery compartment cover and insert the rechargeable batteries into the battery compartment, making sure that the proper polarities are maintained.



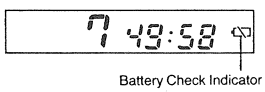
2. Close the cover and connect the AC Adaptor as shown in the figure.
   - The Charge Indicator will begin flashing. When the indicator lights, playing for approximately 1.5 hours can be operated. The indicator will turn off, when the charging is finished.



The shapes of the AC adaptor and plug may differ according to the area.

3. Disconnect the AC Adaptor.
   - The unit can be turned on with the AC Adaptor while the battery is being recharged. In this case, the recharging time will be longer than the specified time.
   - During playing, the Charge Indicator will not come up if the rechargeable batteries are inserted.

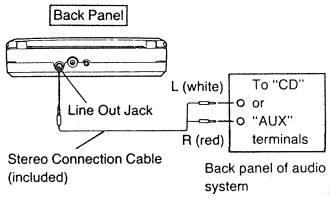
• Rechargeable battery life
This rechargeable battery can be recharged about 300 times. Over 300 times, its operation time will become shortened. That's time for replacing the rechargeable batteries with new ones (SH-CDB8).
- Battery condition can be checked by the Battery Check Indicator on the display. When the batteries are weak, the Battery Check Indicator begins to flash on and off, and then the unit will automatically shut off.



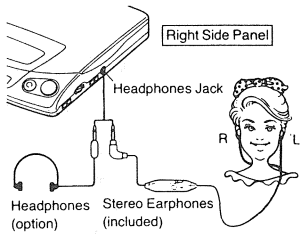
CONNECTIONS

■ Listening through an audio system
Use the Stereo Connection Cable (included) to connect this unit to a receiver or a stereo cassette recorder.

- Switch OFF the power to the receiver or stereo radio cassette recorder before connecting this unit.
- Do not connect this unit to the PHONO terminals of the receiver or stereo radio cassette recorder.



■ Listening through the stereo earphones or headphones
Connect the plug of the Stereo Earphones (included) or headphones (option) to the Headphones Jack.



Note for stereo earphones:
The right earphone cord is longer than the left and is adjustable for your convenience.

Precautions for Listening with the Headphones

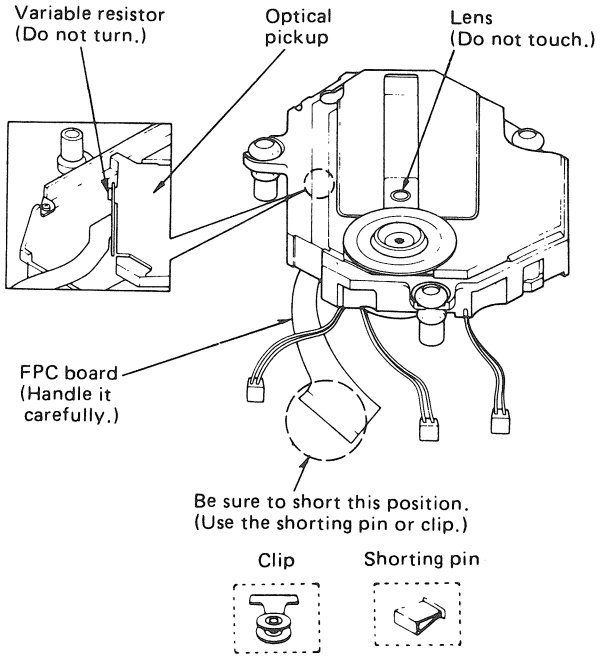
- Do not play your headset at a high volume. Hearing experts advise against continuous extended play.
- If you experience a ringing in your ears, reduce volume or discontinue use.
- Do not use while operating a motorized vehicle. It may create a traffic hazard and is illegal in many areas.
- You should 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.

■ 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)

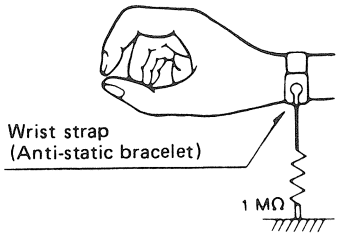
1. Do not subject the traverse deck (optical pickup) to static electricity as it is extremely sensitive to electrical shock.
2. To prevent the breakdown of the laser diode, an anti-static shorting pin is inserted into the flexible board (FPC board).
   When removing or connecting the short pin, finish 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.

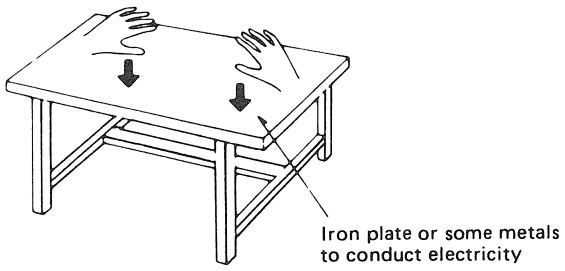


• Grounding for electrostatic breakdown prevention

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).





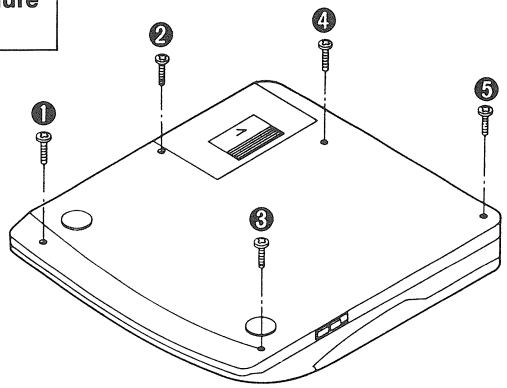
■ DISASSEMBLY INSTRUCTIONS

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

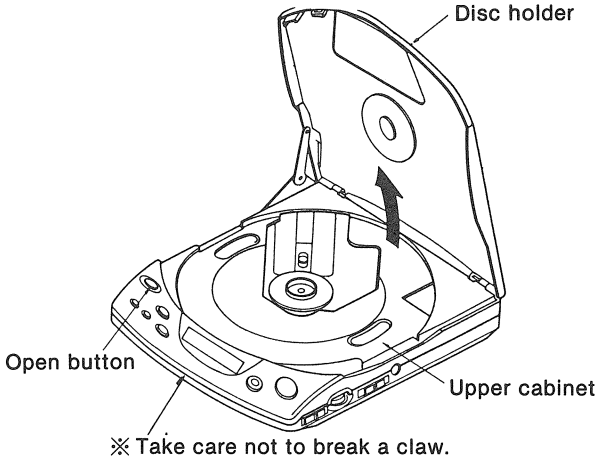
ACHTUNG:
- Die lasereinheit nicht zerlegen.
- Die lasereinheit darf nur gegen eine vom hersteller spezifizierte einheit ausgetauscht werden.

Ref. No. 1 — **Removal of the upper cabinet**

Procedure 1



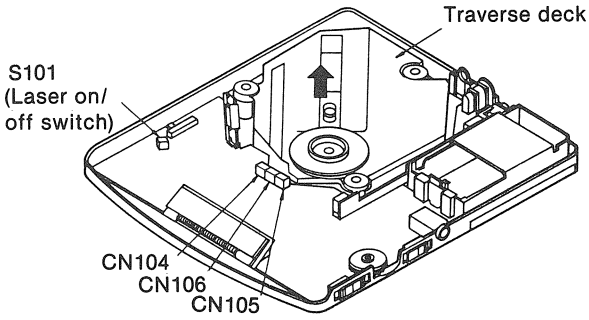
1. Remove the 5 screws (❶~❺).



2. Push the open button and open the disc holder.
3. Remove the upper cabinet in the direction of the arrow.

Ref. No. 2 — **Removal of the traverse deck**

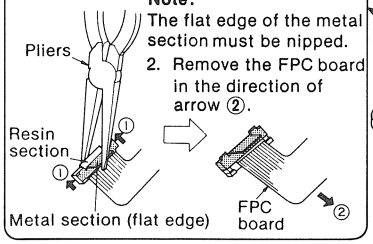
Procedure 1→2

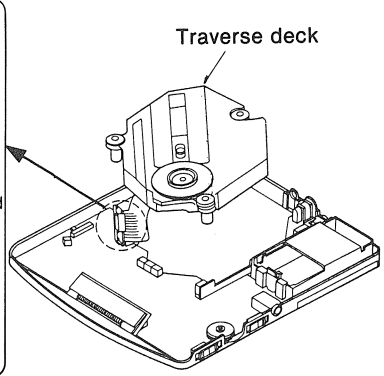


1. Disconnect the connectors (CN104, CN105, CN106).
2. Pull out the traverse deck in the direction of the arrow.

How to Remove the FPC Board.
1. Nip the metal and resin sections of the connector with a pair of pliers and then move the metal section in the direction of arrows ①.

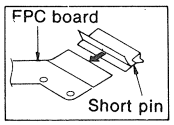
Note:
The flat edge of the metal section must be nipped.
2. Remove the FPC board in the direction of arrow ②.





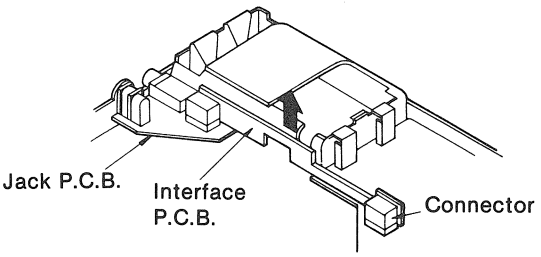
3. Remove the FPC board (CN103).

Caution:
Insert a short pin into the traverse deck's FPC board. (Refer to "handling precautions for traverse deck" on page 5.)

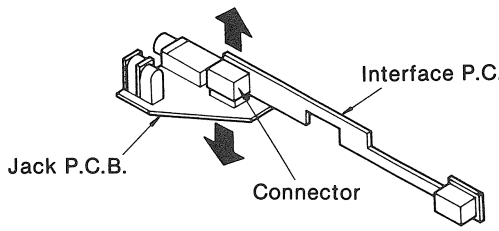


Ref. No. 3 — **Removal of the interface P.C.B. and jack P.C.B.**

Procedure 1→2→3



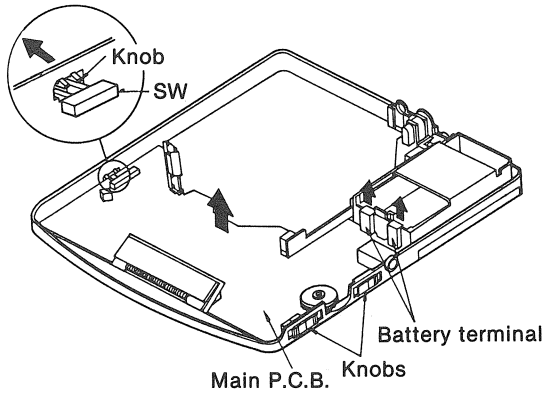
1. Remove the interface P.C.B. in the direction of the arrow.
※Take care of the connector.



2. Remove the interface P.C.B. and jack P.C.B. in the direction of the arrow.

Ref. No. 4	Removal of the main P.C.B.

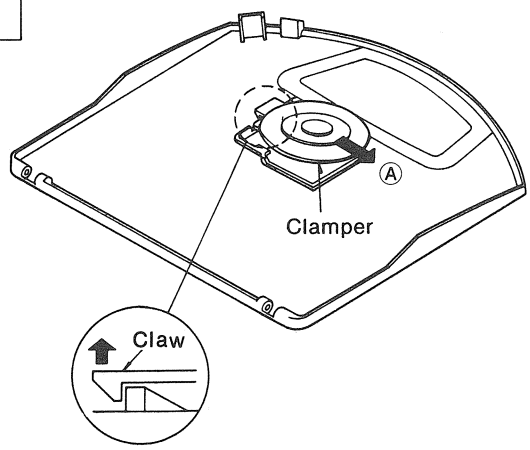
Procedure 1→2→3→4



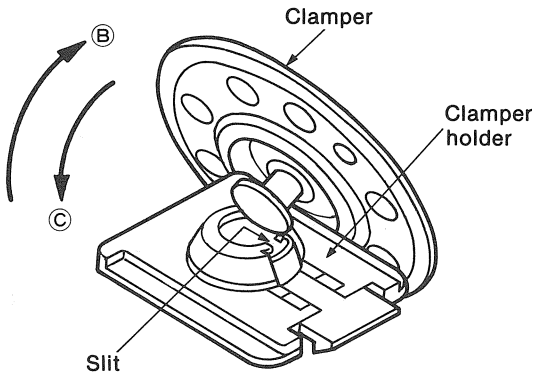
1. Push out the knobs from within.
2. Remove the main P.C.B. and battery terminal in the direction of the arrow.

Ref. No. 6	Removal of the clamper

Procedure 1→5→6



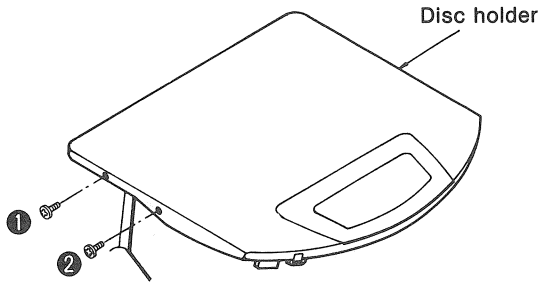
1. Release the 1 claw, and remove the clamper in the direction of the arrow Ⓐ.



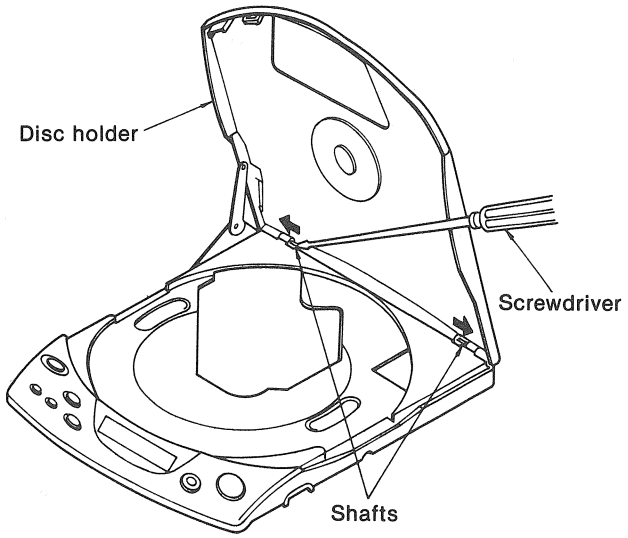
2. Position the clamper and clamper holder relation shown in figure.
3. Remove the clamper from the clamper holder in the direction of the arrow Ⓑ. (Using slit).
4. To reassemble reverse the above way (arrow Ⓒ).

Ref. No. 5	Removal of the disc holder

Procedure 1→5



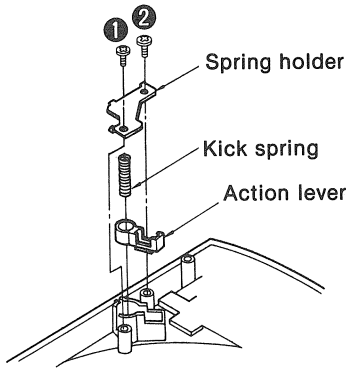
1. Remove the 2 screws (❶, ❷).



2. Use a screwdriver or similar tool to push the shafts in the direction of the arrow and remove it.

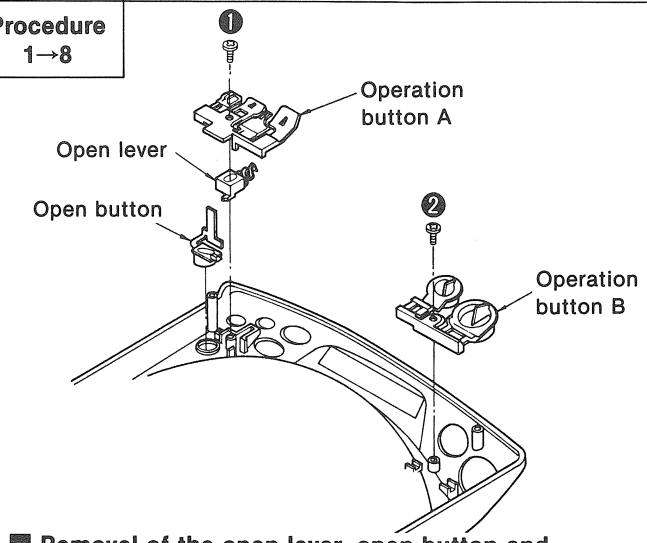
Ref. No. 7	Removal of the kick spring and action lever

Procedure 1→7



1. Remove the 2 screws (❶, ❷).
2. Remove the spring holder.
3. Remove the kick spring and action lever.

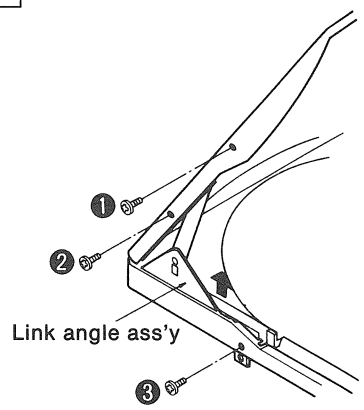
Ref. No. 8	Removal of the open lever, open button and operation button A, B
Procedure 1→8	



■ **Removal of the open lever, open button and operation button A**
- Remove the 1 screw (❶).

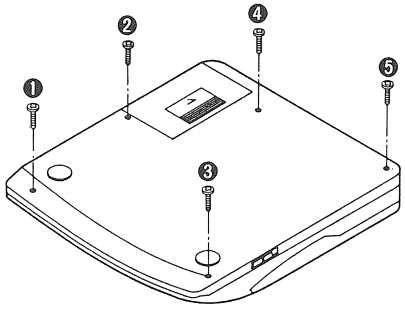
■ **Removal of the operation button B**
- Remove the 1 screw (❷).

Ref. No. 9	Removal of the link angle ass'y
Procedure 1→9	

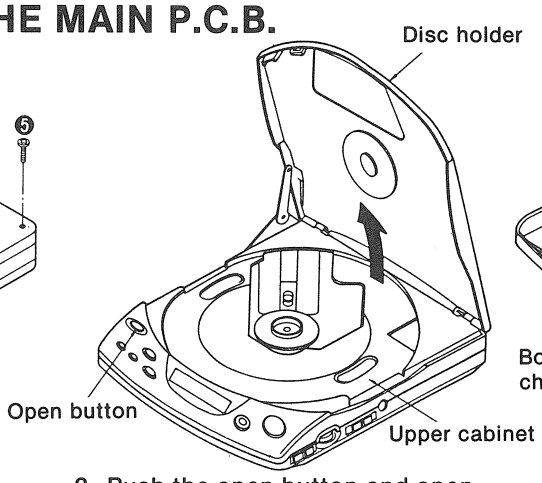


1. Remove the 3 screws (❶~❸).
2. Remove the link angle ass'y in the direction of the arrow.

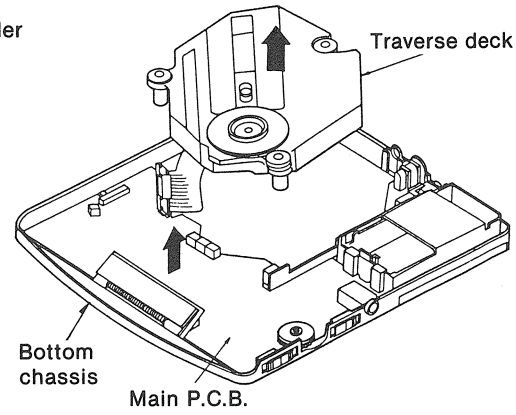
■ HOW TO CHECK THE MAIN P.C.B.



1. Remove the 5 screws (❶~❺).

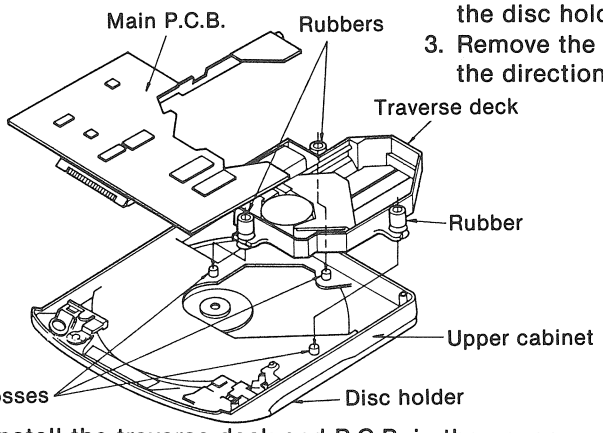


2. Push the open button and open the disc holder.
3. Remove the upper cabinet in the direction of the arrow.



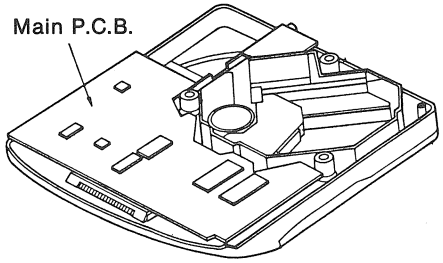
4. Remove the traverse deck and P.C.B. from the bottom chassis.
5. Short-circuit the lands of the laser ON/OFF SW (S101) by soldering them. (See pp. 12 and 13)

Note:
After checking the P.C.B., remove the solders from the lands.



6. Install the traverse deck and P.C.B. in the upper cabinet.
7. Install the unit in place by holding the traverse deck and P.C.B. firmly, and then install the disc.

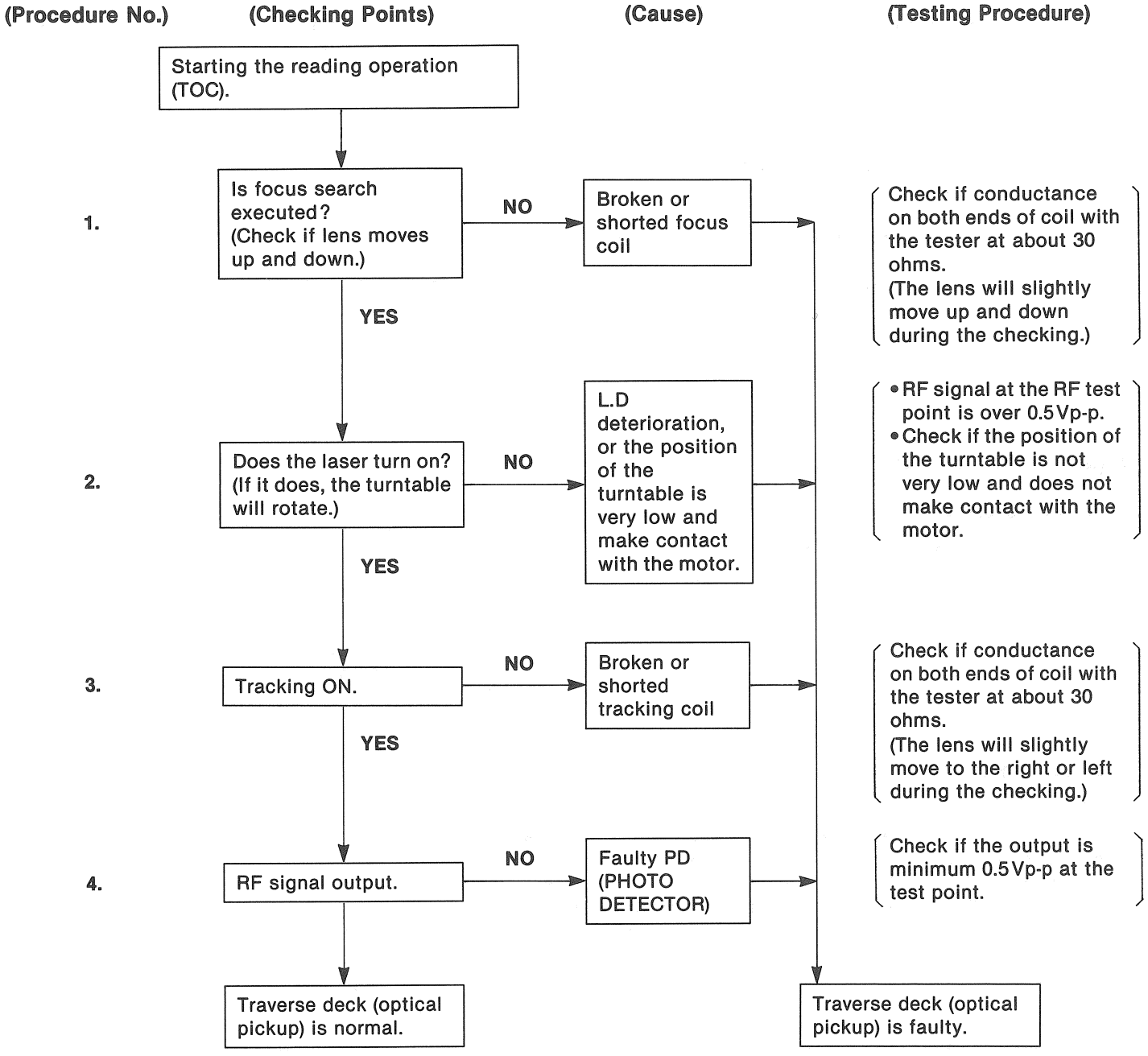
Note:
Engage the rubber sections of the traverse deck in the bosses on the upper cabinet.



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

■ 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.



※ Replace traverse deck.

- Check electrical circuit.
- CD is not adjusted properly. Adjust CD again.
  - (1) Mechanical adjustment.
  - (2) Power supply voltage adjustment.
  - (3) Best eye adjustment (PD balance).
  - (4) Focus gain adjustment.
  - (5) Tracking gain adjustment.
  - (6) Focus offset adjustment.
  - (7) Tracking offset adjustment.
  - (8) Tracking balance adjustment.

  } Refer to pp. 14~16
- Check for flaws on disc or if it is warped or not centered.

※ Checking Operations of Replaced Traverse Deck (New Traverse Deck)

a) 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 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 Using Defect Disc
1. Play the 0.7mm black dot and the 0.7mm wedge on the defect 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.

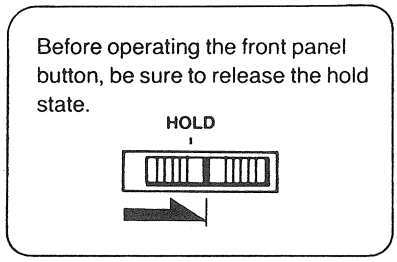
b) If the operations are normal, CD adjustments are not required when the traverse deck is replaced.

Note: CD adjustments are required in the cases below. (Mechanical adjustments are not necessary.) (See item 2-9 on pp. 14～16.)
- If audio is not played back continuously or noises occur after step (a) is executed.
- If the adjustment VRs (VR101～VR106) were rotated before the traverse deck was replaced.
- If the ICs in the servo circuit or adjustment VRs (VR101～VR106) were replaced.

■ NOTE FOR SERVICE

• About hold switch

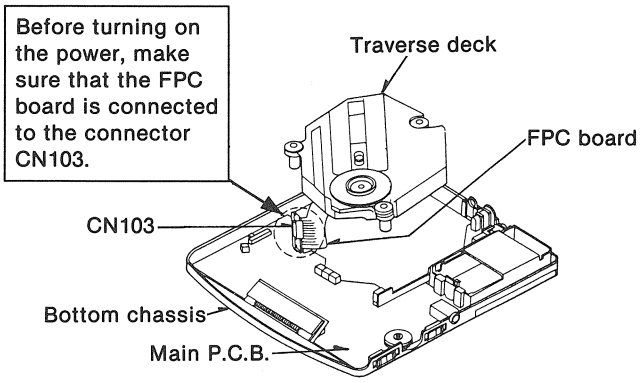
Before checking the operation problems and adjustments, be sure to release the hold state.



• 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 CN103 on the main P.C.B. If you disconnected the FPC board from the connector CN103, the transistor Q12 may be damaged when the PLAY/PAUSE button is pressed with the FPC board disconnected.

The note described above does not apply in the case that the FPC board is connected to the connector CN103 during service.



■ 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.

Caution: During adjustment, never connect CH-2 probe's GND to any place for it may short Vref line. (Connect CH-1 probe's GND to specified TP. described in each section.)

Measuring Instruments and Special Tools

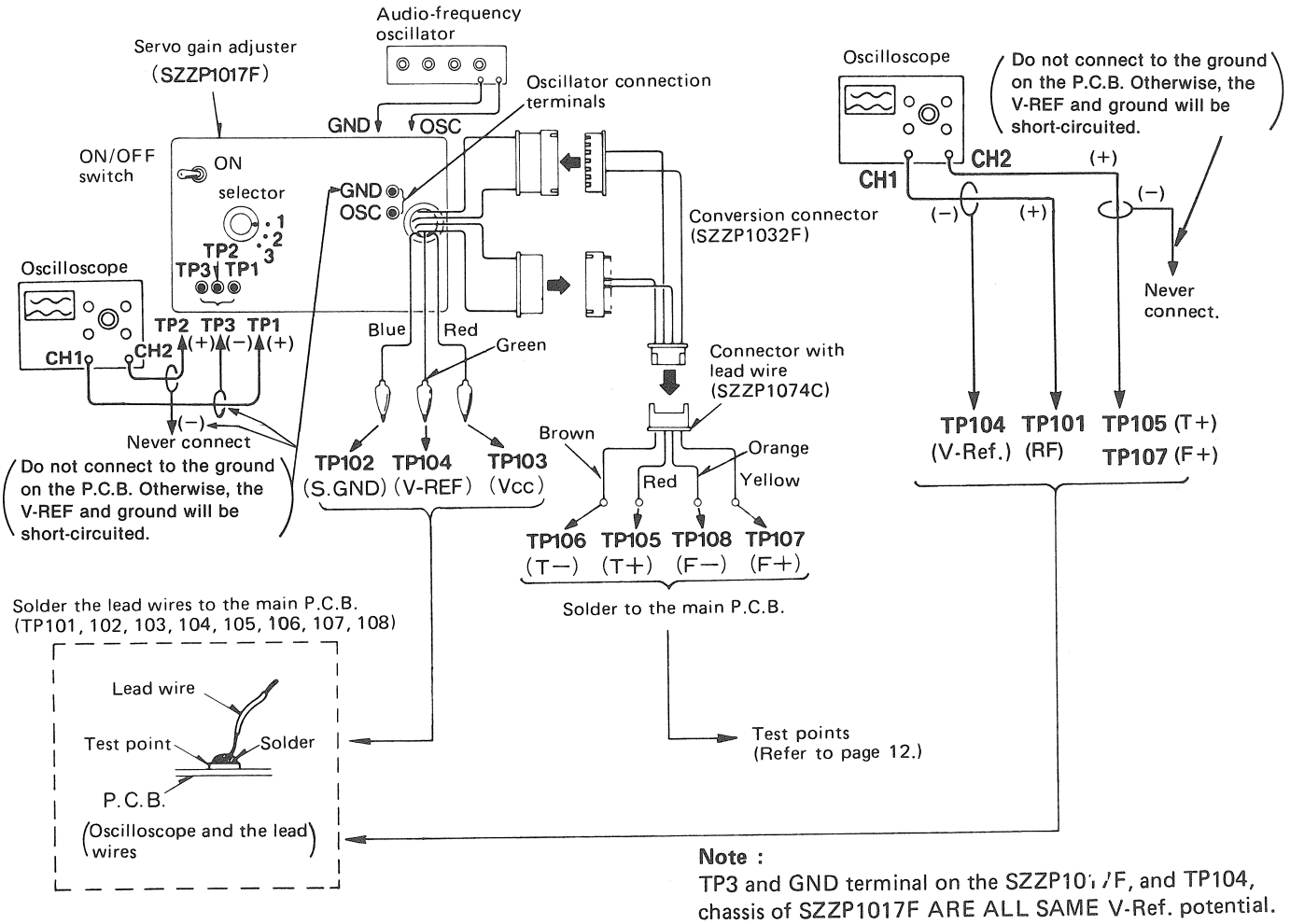
* Servo gain adjuster (SZZP1017F or SZZP1094-1)
* Test discs
1. Playability test disc (SZZP1054C)
2. Uneven test disc (SZZP1056C)
3. Black band test disc (SZZP1057C)
* Normal disc
* Dual-beam oscilloscope with bandwidth of 30 MHz or better (with EXT. trigger and 1 : 1 probe).
* Audio-frequency (AF) oscillator
* Conversion connector (SZZP1032F)
* Lead wire (for test points)
* Allen wrench (M2.0) (SZZP1101C)
* Connector with lead wire (SZZP1074C)
* DC voltmeter
* Disc clamper (RXQ0085 or RXQ0109-2)

• Preparation for servo gain adjuster

(For tracking gain, focus gain and tracking balance adjustments.)

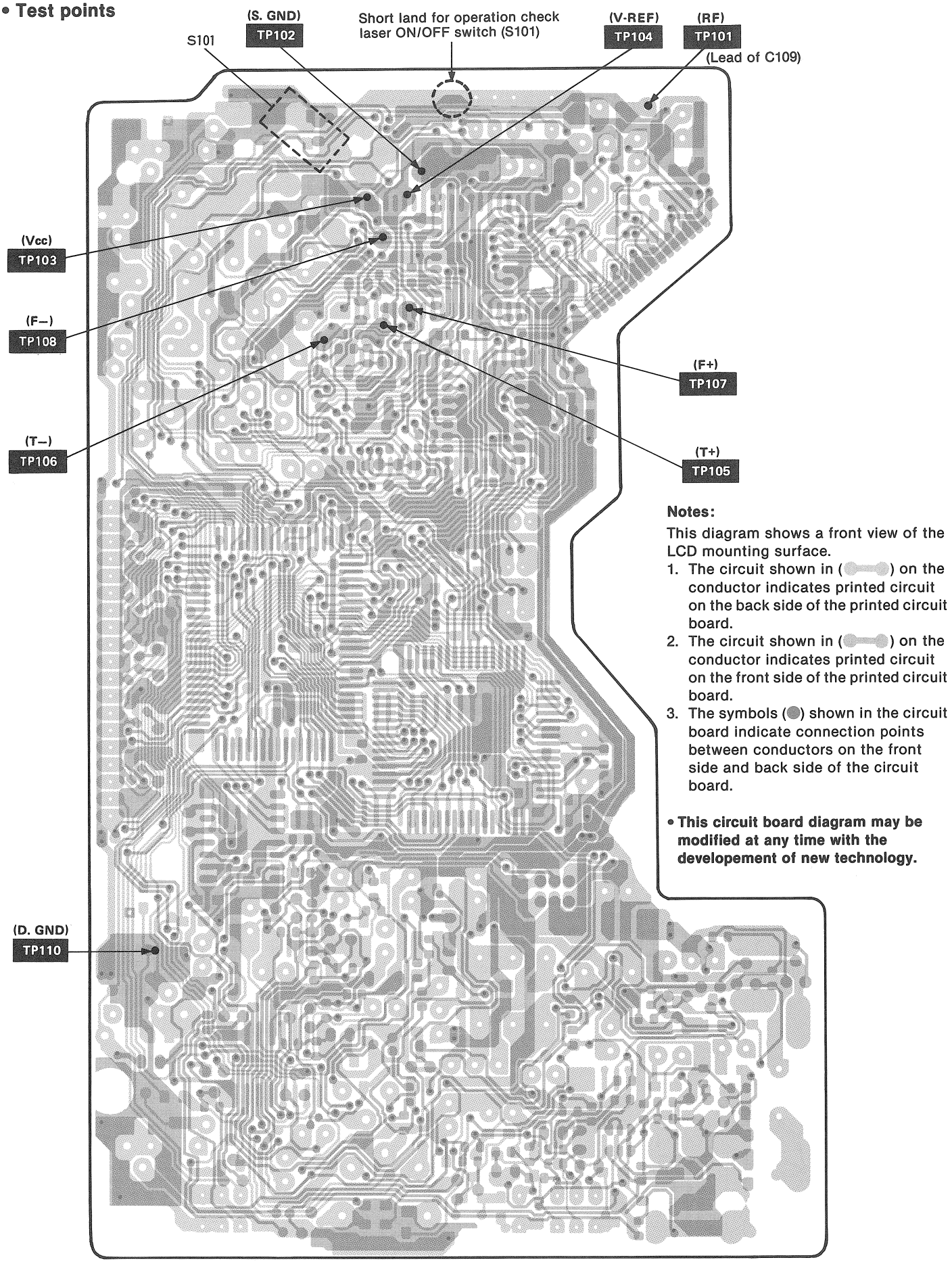
• Connection of oscilloscope

(For best eye, focus offset, tracking offset tracking balance and mechanical adjustments.)



Note :
TP3 and GND terminal on the SZZP101 /F, and TP104, chassis of SZZP1017F ARE ALL SAME V-Ref. potential.

• Test points



Notes:

This diagram shows a front view of the LCD mounting surface.

1. The circuit shown in (▬) on the conductor indicates printed circuit on the back side of the printed circuit board.
2. The circuit shown in (▬) on the conductor indicates printed circuit on the front side of the printed circuit board.
3. The symbols (●) shown in the circuit board indicate connection points between conductors on the front side and back side of the circuit board.

• This circuit board diagram may be modified at any time with the developement of new technology.

• Precaution for adjustments

1. Remove the upper cabinet. (Refer to page 6.)
2. Solder the lead wires and connector with lead wire (SZZP1074C) to the test points on the main P.C.B.
3. Confirm the mechanical center.
   In the focus gain adjustment, if **VR104** is turned too far, the rotation of the turntable will stop. Turn a little at a time to the right or left from the mechanical center, and then switch on the power. After finding the position at which rotation starts, repeat the adjustment.
   • If any of the adjustments is substantially out of adjustment, reset the electrical adjustment VRs back to the mechanical center and readjust.

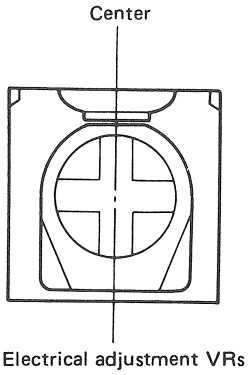
• Test short land

Short-circuit the lands of the laser ON/OFF switch (S101) by soldering them. It turns "ON" position. (Refer to below and left figure.)

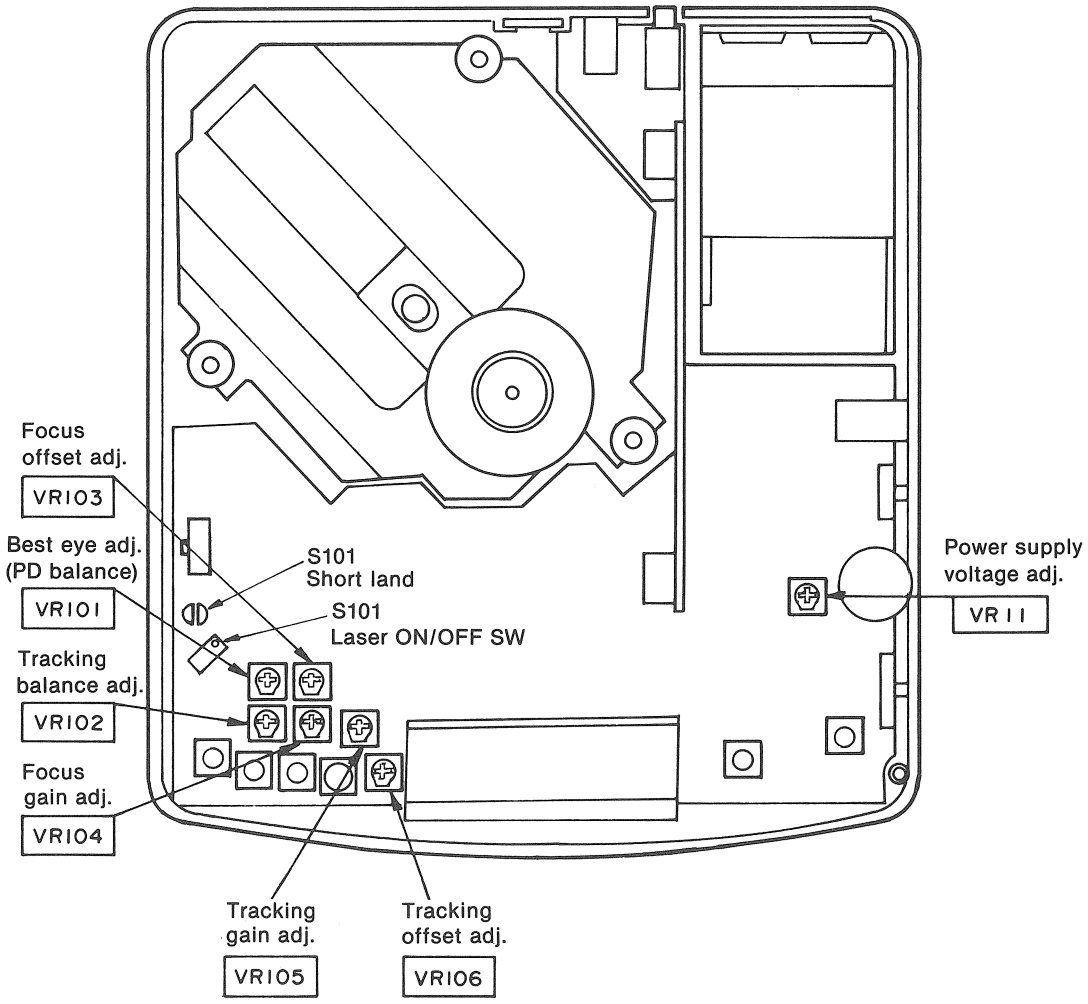
Note: Remove the solders from the lands after adjustment.

• Temporary setting of each VR

Temporary VR setting if any of the electrical adjustment VRs are replaced or require re-adjustment, temporarily set them to the following positions:



• Adjustment points

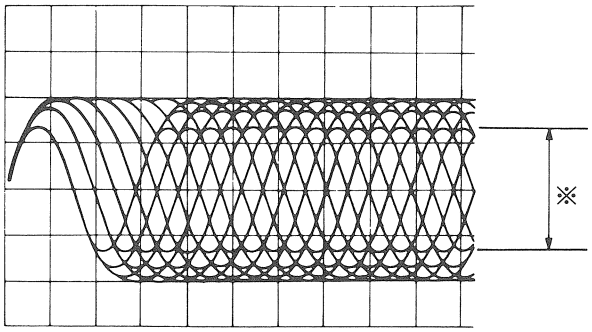


• Adjustment procedure

(1) MECHANICAL ADJUSTMENT

- When the traverse deck is replaced, making adjustments is not necessary. (The traverse deck ass'y is already adjusted.)
- Make adjustments to improve playability if the traverse deck has not been replaced.

1. Connect the oscilloscope's CH. 1 probe across **TP101** (RF) (+) and **TP104** (V-Ref.) (–) on the main P.C.B.
   Oscilloscope setting: VOLT . . . . . .100 mV
   SWEEP . . . . . .0.5 μs.
   Input coupling . . AC
2. Switch the player power **ON**, and play track **9** on the test disc (SZZP1056C).
3. Leave the player in play mode, and place it as shown below.
4. Alternately adjust the two mechanical adjusting screws with the 2.0mm allen wrench (SZZP1101C) until the vertical fluctuation of RF signal is minimized and the eye pattern is most stretched.
5. After completing the adjustment, lock the **mechanical adjustments** with lock paint (RZZOL01).



※ Most stretched eye pattern.

Note : When adjusting the traverse deck, hold it as shown in the figures. Adjust it in either of the ways shown in Figure (A) or (B).

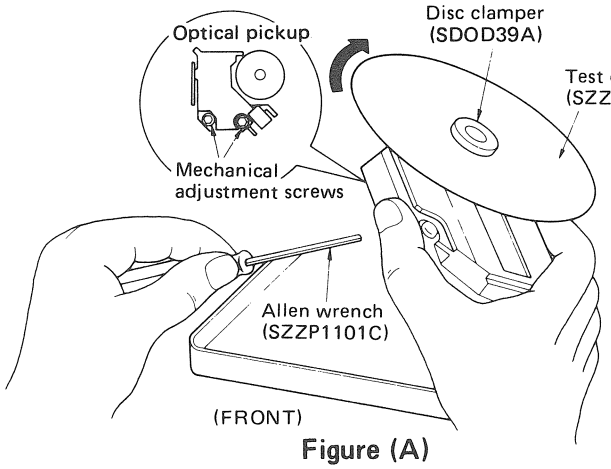
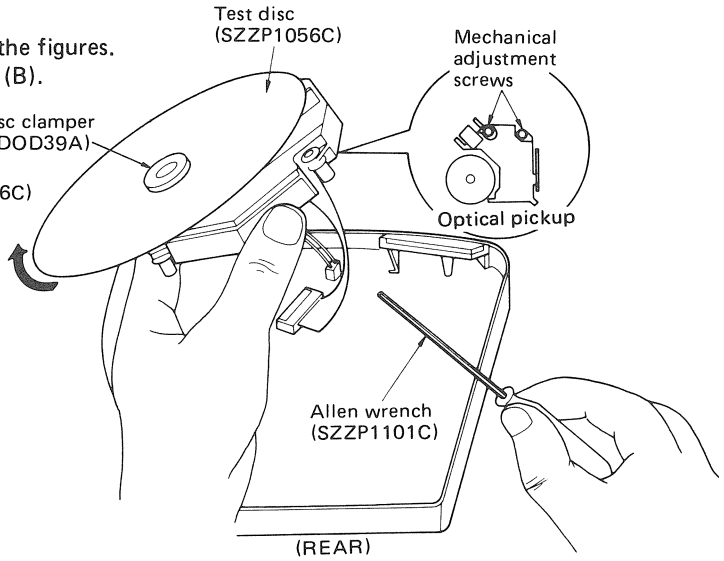


Figure (A)

Figure (B)

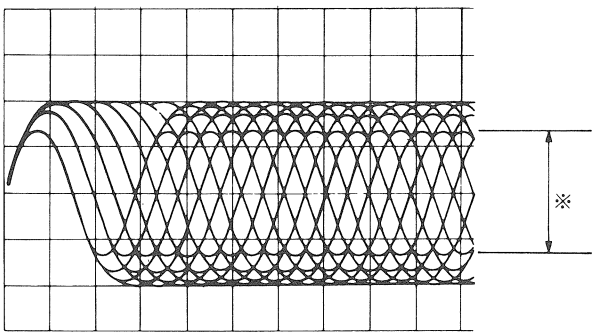


(2) POWER SUPPLY VOLTAGE ADJUSTMENT

1. Connect the DC voltmeter to C14 (+) and **TP110** (D. GND).
2. Insert the test disc, and switch the player power ON.
3. Adjust **VR11** on the main P.C.B. at **4.6±0.04V.**

(3) BEST EYE (PD BALANCE) ADJUSTMENT

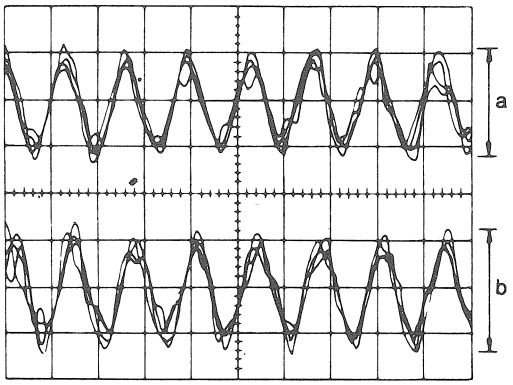
1. Connect the oscilloscope's CH. 1 probe across **TP101** (RF) (+) and **TP104** (V-Ref.) (–) on the main P.C.B.
   Oscilloscope setting: VOLT . . . . . .100 mV
   SWEEP . . . . . .0.5 μs.
   Input coupling . . AC
2. Switch the player power **ON**, and play the 1 kHz (track 1) on the test disc (SZZP1054C).
3. Adjust **VR101** until the vertical fluctuation of RF signal is minimized and the eye pattern is most stretched.



※ Most stretched eye pattern.

(4) FOCUS GAIN ADJUSTMENT

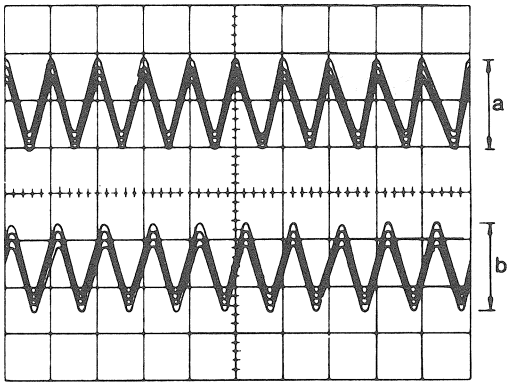
1. Connect the servo gain adjuster to the player.
2. Set the servo gain adjuster's gain switch to position "**2**" and the ON/OFF switch to **ON**.
3. Set up the AF oscillator output for **825 Hz, 200 mVp-p**, and connect it across the OSC and GND terminals on the servo gain adjuster.
4. Connect oscilloscope's CH. 1 and CH. 2 probes to the servo gain adjuster's TP1 and TP2 terminals, and its CH. 1 probe (−) to the servo gain adjuster's TP3 terminal.
   Oscilloscope setting: VOLT . . . . . .100 mV (both channels)
   SWEEP . . . . . .0.5 ms.
   Input coupling . . AC
5. Play the test disc (SZZP1054C).
6. Set the servo gain adjuster's gain switch to position "**3**", and you will see a 825 Hz signal on the oscilloscope. Adjust **VR104** until the signal amplitudes on both channels become identical to each other.
7. Set the gain switch back to position "**2**".



※ Adjust **VR104** until a equals b.

(5) TRACKING GAIN ADJUSTMENT

1. Set up the AF oscillator output for **1.1 kHz, 200 mVp-p**, and connect it across the OSC and GND terminals on the servo gain adjuster.
2. Connect oscilloscope's CH. 1 and CH. 2 probes to the servo gain adjuster's TP1 and TP2 terminals, and its CH. 1 probe (−) to the servo gain adjuster's TP3 terminal.
   Oscilloscope setting: VOLT . . . . . .100 mV (both channels)
   SWEEP . . . . . .0.5 ms.
   Input coupling . . AC
3. Switch the player power **ON**, and play the test disc (SZZP1054C).
4. Set the servo gain adjuster's gain switch to position "**1**", and you will see a 1.1 kHz signal on the oscilloscope. Adjust **VR105** until the signal amplitudes on both channels become identical to each other.
5. Set the gain switch back to position "**2**".

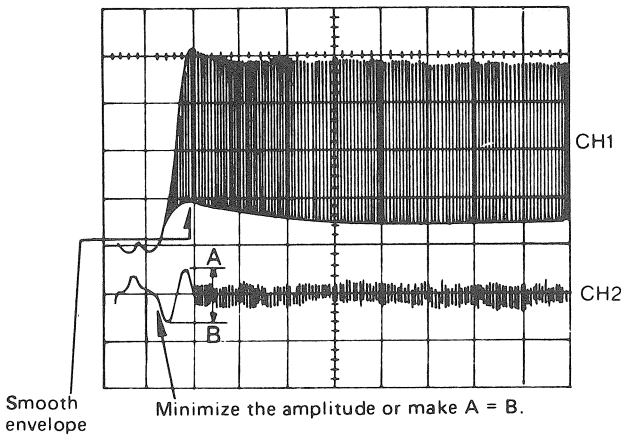


※ Adjust **VR105** until a equals b.

(6) FOCUS OFFSET ADJUSTMENT

Note: Make sure that the servo gain adjuster's gain switch is set to position "**2**".

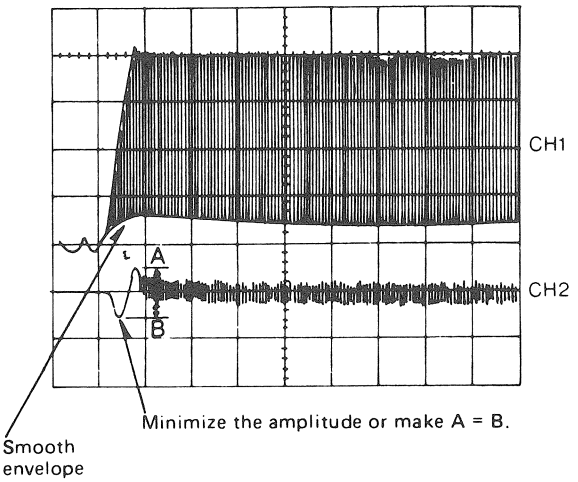
1. Connect the oscilloscope's CH. 1 probe across **TP101** (RF) (+) and **TP104** (V-Ref.) (−) on the main P.C.B., and its CH. 2 probe (+) to **TP107** (F+) terminal.
   Oscilloscope setting: VOLT . . . . . .100 mV (CH. 1)
   500 mV (CH. 2)
   SWEEP . . . . . .0.5 ms.
   Input coupling . . AC (both CH. 1 and CH. 2)
   Trigger mode . . . NORM (trigger CH. 1)
2. Switch the player power **ON**, and play track **9** on the test disc (SZZP1057C).
3. Trigger the oscilloscope's CH. 1 so that the following waveforms are observed. Adjust **VR103** until the dip in the RF signal envelope on CH. 1 is smooth and the signal amplitude on CH. 2 is minimized, i.e. when amplitude A equals amplitude B.



(7) TRACKING OFFSET ADJUSTMENT

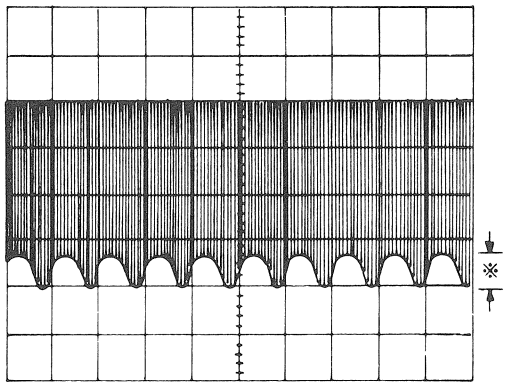
Note: Make sure that the servo gain adjuster's gain switch is set to position "2".

1. Connect the oscilloscope's CH. 1 probe across **TP101** (RF) (+) and **TP104** (V-Ref.) (–) on the main P.C.B., and its CH. 2 probe (+) to **TP105** (T+) terminal.
   Oscilloscope setting: VOLT . . . . . .100 mV (CH. 1)
   500 mV (CH. 2)
   SWEEP . . . . . .0.5 ms.
   Input coupling . . AC (both CH. 1 and 2)
   Trigger mode . . . NORM (trigger CH. 1)
2. Switch the player power **ON**, and play track **9** on the test disc (SZZP1057C).
3. Trigger the oscilloscope's CH. 1 so that the following waveforms are observed. Adjust **VR106** until the dip in the RF signal envelope on CH. 1 is smooth and the signal amplitude on CH. 2 is minimized, i.e. when amplitude A equals amplitude B.



(8) TRACKING BALANCE ADJUSTMENT

1. **Make sure that servo gain adjuster's gain switch is set to position "2".**
2. Set up the AF oscillator output for **1.1 kHz, 600mVp-p,** and connect it across the OSC and GND terminals on the servo gain adjuster.
3. Connect oscilloscope's CH. 1 probe across **TP101** (RF) (+) and **TP104** (V-Ref.) (–) on the main P.C.B. and CH. 2 probe (+) to the OSC terminal on the servo gain adjuster.
   Oscilloscope setting: VOLT . . . . . .100 mV (CH. 1)
   200 mV (CH. 2)
   SWEEP . . . . . .0.5 ms.
   Input coupling . . AC (both CH. 1 CH. 2)
   Trigger mode . . . NORM (trigger CH. 2)
4. Switch the player power **ON**, and play the test disc (SZZP1054C).
5. Set the servo gain adjuster's gain switch to position "**1**", and adjust the **VR102** so that the section of the waveform marked with ※ is balanced on CH. 1.
6. Disconnect the servo gain adjuster's leads from the player.



※ This section of the waveform must be balanced.

(9) 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 Using Defect Disc**

1. Play the 0.7 mm black dot and the 0.7 mm wedge on the defect 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

• IC11 : (AN8083SE2) : 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	I	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 input
10	$\overline{\text{START}}$	I	Start input
11	POWER	I	Power ON/OFF
12	VREF	O	Reference voltage output
13	EMP	O	Empty detection output
14	VSEN	I	Empty detection input
15	RST	O	Reset output
16	VCC	I	Power supply terminal

• IC101 (AN8373SE2) : Servo amp.

Pin No.	Mark	I/O Division	Function
1	AMP1	I	RF signal input (X30 amp.) (Not used, connected to GND)
2	PDAD	I	Photo detector current input (A2)
3	PDA	I	Photo detector current input (A1)
4	PDBD	I	Photo detector current input (A4)
5	PDB	I	Photo detector current input (A3)
6	LPD	I	Non-inverting laser power input
7	LD	O	Laser power auto control output
8	FBL1	I	PD balance adjustment
9	FBL2	I	
10	TBL1	I	Tracking balance adjustment
11	TBL2	I	
12	FOOFS	I	Focus offset adjustment
13	IVA	O	Current/voltage conversion output (A)
14	IVB	O	Current/voltage conversion output (B)
15	FE	O	Focus gain adjustment output
16	FPI	I	Focus error signal input
17	TPI	I	Tracking error signal input
18	C. TPL	I	Tracking error filter capacitor input
19	C. TPH		
20	C. FPL	I	Focus error filter capacitor input
21	C. FPH		

Pin No.	Mark	I/O Division	Function
22	TPO	O	Tracking error signal output
23	FPO	O	Focus error signal output
24	FGC	I	Focus gain up signal input
25	TGC	I	Tracking gain up signal input
26	GD	I	Focus/tracking gain down signal input
27	PTO	O	Position detection amp. output (Not used, open)
28	PTI	I	Position detecting amp. output (Not used, open)
29	PBO	O	Position detection buffer output (Not used, open)
30	POT	I	Position detecting buffer input
31	BDO	O	Dropout detection output
32	$\overline{\text{RFDET}}$	O	RF detection signal output
33	SDO	O	Dropout detection pulse output
34	C. SBDO	I	Dropout detecting capacitor input
35	ARF	O	RF signal output
36	C. AGC	I	AGC detecting capacitor input
37	VCC	I	Power supply terminal
38	LDON	I	Laser power control input
39	RF IN	I	RF signal input
40	AMPO	O	RF signal output (Not used, open)
41	VREF	O	Reference voltage output
42	GND	I	Ground terminal

• IC102 (AN8374SE2) : Servo processor

Pin No.	Mark	I/O Division	Function
1	LSA	I	Phase difference input (A)
2	LSB	I	Phase difference input (B)
3	TEOFS	I	Tracking offset adjustment
4	TE	O	Tracking gain adjustment
5	TEG	I	
6	TE OUT	O	Tracking error signal output
7	TE BPF	I	Tracking error gain detecting filter
8	FEG	I	Focus gain adjustment
9	FE OUT	O	Focus error signal output
10	CLW	O	Triangular wave oscillator capacitor input
11	VREF	I	Reference voltage input
12	ARF	I	RF signal input
13	CDSL	I	Data slice filter capacitor input
14	FPC	I	Frequency difference signal input
15	GND	I	Ground terminal
16	C. PLL	I	PLL loop filter constant
17	VSS	I	Ground terminal
18	CLK	I	Frequency pull-in clock signal (88.2 kHz) input
19	SRF	O	Sliced and digitized RF signal output
20	PCK	O	Clock output extracted from SRF
21	EFM	O	EFM signal output synchronous with PCK

Pin No.	Mark	I/O Division	Function
22	VDD	I	Power supply terminal
23	SPCNT	O	Track crossing speed control output output (Not used, open)
24	SENSE	O	Selector output (track crossing state)
25	TRV	O	Traverse servo control output
26	$\overline{\text{FLOCK}}$	O	Focus lock signal output
27	KICK	O	Track kick signal output
28	LDON	O	Laser power control output
29	VDET	O	Focus/tracking gain up output
30	CNT1	I	Control input ($\overline{\text{FOON}}$: Focus servo ON signal)
31	CNT2	I	Control input ($\overline{\text{TRON}}$: Tracking servo ON signal)
32	CNT3	I	Control input (KICKF: Kick direction (forward) command)
33	CNT4	I	Control input (KICKR: Kick direction (reverse) command)
34	TRVF	I	Traverse forward command signal
35	TRVR	I	Traverse backward command signal
36	$\overline{\text{RFDET}}$	I	RF detection signal input
37	BDO	I	Dropout detection input
38	VCC	I	Power supply terminal
39	TVPO	O	Traverse position detecting resistor/capacitor inputs
40	TVPI	I	
41	BROUT	O	Tracking drive control output
42	BRIN	I	Tracking error signal input

• IC103, 104 : (AN8387SE2): Motor & actuator coil drive

Pin No.	Mark	I/O Division	Function
1	VCC	I	Power supply terminal
2	INI	I	Spindle motor drive signal input and tracking coil drive signal input
3	PCI	I	Spindle motor ON signal input
4	VREF	I	Reference voltage input
5	P. GND	I	Ground terminal
6			
7	S. GND	I	Ground terminal
8	PC2	I	Traverse motor brake control input
9	IN2	I	Traverse motor drive signal input and focus coil drive signal input
10	VCC	I	Power supply terminal

Pin No.	Mark	I/O Division	Function
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–		
15	P. GND	I	Ground terminal
16			
17	D1+	O	Spindle motor drive signal output and tracking coil drive signal output
18	D1–		
19	P. VCC	I	Power supply terminal
20	VLIMI	I	Voltage limit terminal

• IC201 (μPD75308G487): System control & LCD drive

Pin No.	Mark	I/O Division	Function
1 ∫ 12	S12 ∫ S23	O	Segment signal output (7 pin~12 pin) (Not used, open)
13	MLE	O	Mode set latch enable signal
14	LDON	O	Laser power control input
15	TRV • F	O	Traverse forward command signal
16	TRV • R	O	Traverse backward command signal
17	MLD	O	Command load signal output
18	MDATA	O	Command data output
19	MCLK	O	Command clock signal output
20	LED	O	Remote control detection
21 ∫ 24	COM0 ∫ COM3	O	LCD common line output
25	BIAS	O	(Not used, connected to GND)
26	VLC0	—	
27	VLC1	—	(Not used, open)
28	VLC2		
29	PROG	I	Key signal input
30	REPEAT		
31	SKIP • R		
32	SKIP • F		
33	VSS	I	GND terminal
34	STOP	I	Key signal input
35	PLAY		
36	RESUME		
37	RANDOM		
38	BLKCK	I	Sub-code block (Q data) clock (75 Hz)
39	CLDCK	I	Sub-code frame (Q data) clock (7.35 kHz)
40	SUBQ	I	Sub-code (Q data) output
41	STAT	I	Processing condition (CRC, CUE, CLVS, FCLV. TT STOP) input

Pin No.	Mark	I/O Division	Function
42	WLSRCN	I	Offering signal of edge det
43	FLOCK	I	Focus lock signal input
44	OPEN	I	Laser ON/OFF switch detection
45	SENSE	I	Selector input (track crossing state)
46	CHARGE	O	(Not used, open)
47	ACDET	O	Power supply detection
48	POWER	O	Power ON/OFF output
49	BUZ	O	Muting control
50	CHGCMP	I	(Not used, open)
51	EMP	I	Empty detection input
52	REST • SW	I	REST switch signal input
53	WORCN	O	Rechargeable battery detection
54	VDD	I	Power supply terminal
55	XT1	I	Sub-system clock crystal terminal (Not used, open)
56	XT2	—	
57	NC	—	Not connected
58	X1	I	Clock input (4.2336 MHz)
59	X2	I	Clock input (Not used, open)
60	TRVSTOP	O	Traverse motor brake control output
61	MUTE	O	Muting control
62	PWRDWN	—	(Not used, open)
63	LIGHT	O	LED drive command signal
64	CNT1	O	Control input ($\overline{\text{FOON}}$: Focus servo ON signal)
65	CNT2	O	Control input ($\overline{\text{TRON}}$: Tracking servo ON signal)
66	CNT3	O	Control input (KICKF: Kick direction (forward) command)
67	CNT4	O	Control input (KICKR: Kick direction (reverse) command)
68	RESET	I	Reset signal
69 ∫ 80	S0 ∫ S11	O	Segment signal output (69 pin~71 pin) (Not used open)

• IC202 (MN6625A): Digital signal processor

Pin No.	Mark	I/O Division	Function
1	BYTCK	O	Serial data byte clock (Not used, open)
2	FCLK	O	Crystal frame clock (7.35 kHz) (Not used, open)
3	DEMPH	O	De-emphasis ON signal (de-emphasis ON at "H")
4	SRDATA	O	Serial data output (MSB first)
5	SLCK	O	Serial bit clock output
6	LRCK	O	LR discrimination signal output
7	WDCK	O	Serial data output word clock
8	LDG	O	L channel deglitch signal (Not used, open)
9	RDG	O	R channel deglitch signal (Not used, open)
10	IPFLAG	O	Interpolation flag (interpolation at "H")
11	FLAG	O	Error flag terminal
12	XCK	O	Clock (16.9344MHz) output (Not used, open)
13	$\overline{\text{TEST}}$	I	Test mode selection (Not used, connected to +4.0V)
14	TX	O	Digital signal output (Not used, open)
15	SLEEP	I	Mode selector (Not used, connected to GND) ("L": normal, "H": SLEEP mode)
16	CSEL	I	Test terminal ("L": normal) (Not used, connected to GND)
17	X1	I	Clock input (16.9344 MHz)
18	X2	O	Clock output (16.9344 MHz)
19	VSS	I	GND terminal
20	BLKCK	O	Sub-code block (Q data) clock (75 Hz)
21	$\overline{\text{CLDCK}}$	O	Sub-code frame (Q data) clock (7.35 kHz)
22	$\overline{\text{SUBQ}}$	O	Sub-code (Q data) output
23	$\overline{\text{RST}}$	I	Reset signal input (reset at "L")
24	MLD	I	Command load signal input
25	MCLK	I	Command clock signal input
26	MDATA	I	Command data input
27	DMUTE	I	Muting control
28	$\overline{\text{TRON}}$	I	Tracking servo ON signal (tracking servo ON at "L")
29	STAT	O	Processing condition (CRC, CUE, CLVS, TT STOP, FCLV)
30	SUBC	O	Sub-code serial output data (Not used, open)
31	SBCK	I	Clock for sub-code serial output (Not used, open)
32	SMCK	O	Clock output (4.2336 MHz)
33	VDD	I	Power supply terminal
34	MEMP	I	Emphasis signal input (Not used, connected to power supply)
35	FG	I	Spindle motor FG signal input (Not used, connected to power supply)
36	PC	O	Spindle motor ON signal (ON at "L")
37	EC	O	Spindle motor drive signal
38	RESY	O	Resynchronizing signal (Not used, open)
39	DO	I	Drop-out signal (Drop-out at "H")
40	SRF	I	EFM signal input (DSL)
41	EFM	I	EFM signal input (PLL)
42	PCK	I	PLL extract clock input (4.3218 MHz)
43	FPC	O	PLL frequency comparision signal
44 ⟆ 51	D7 ⟆ D0	I/O	16K RAM data input/output
52	RAM/OE	O	16K RAM $\overline{\text{OE}}$ signal
53	RAM/WE	O	16K RAM $\overline{\text{WE}}$ signal
54 ⟆ 64	RAM/A0 ⟆ RAM/A10	O	16K RAM address signal (RAMA0: LSB, RAMA10: MSB)

• IC301 (SM5840AS-ET): Digital filter

Pin No.	Mark	I/O Division	Function
1	CKSL	I	Oscillator and input frequency selector (Not used, connected power supply)
2	XT1	I	Oscillator input
3	XT0	O	Oscillator output (Not used, open)
4	CKO	O	Clock output (Not used, open)
5	VSS	—	GND terminal
6 7	NC	—	(Connected to GND)
8	MDT	I	Mode set data
9	MCK	I	Mode set clock
10	MLE	I	Mode set latch enable
11	RESET	I	Reset input

Pin No.	Mark	I/O Division	Function
12	DG	O	Deglitch signal (Not used, open)
13	DOR	O	Rch data output
14	DOL	O	Lch data output
15	WCKO	O	Word clock output
16	VDD	I	Power supply terminal
17 18	NC	—	Not connected
19	BCKO	O	Serial bit clock output
20	CRCI	I	Input data sample rate (fs) clock
21	BCKI	I	Serial bit clock input
22	DIN	I	Serial data input

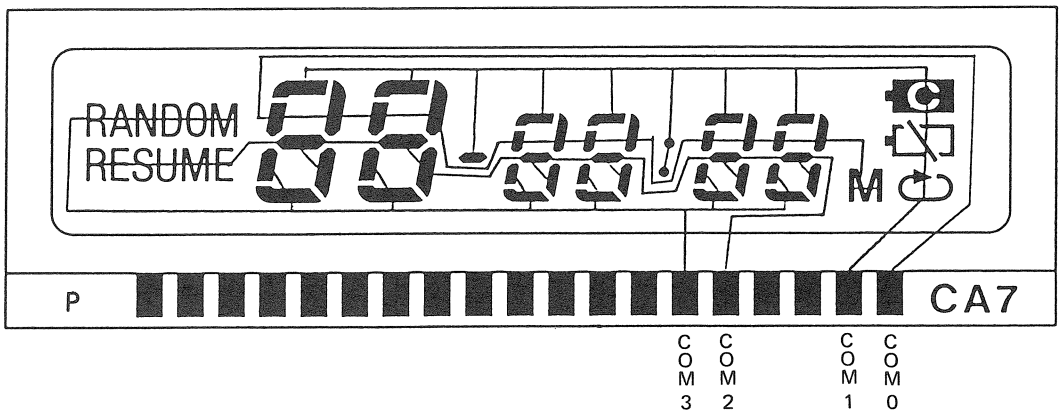
• IC302 (UPD6376GSE1): D/A Converter

Pin No.	Mark	I/O Division	Function
1	FS. SEL	—	(Not used, connected power supply)
2	D. GND	I	GND terminal
3	NC	—	Not connected
4	D. VDD	I	Power supply terminal
5	A. GND	I	GND terminal
6	R. OUT	O	Rch signal output
7	A. VDD	I	Power supply terminal
8			

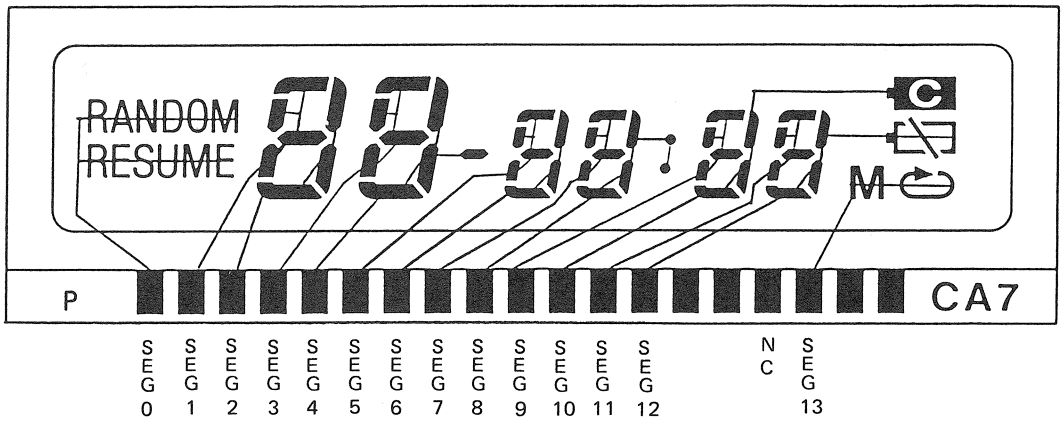
Pin No.	Mark	I/O Division	Function
9	R. REF	O	Rch reference voltage capacitor output
10	L. REF	O	Lch reference voltage capacitor output
11	L. OUT	O	Lch signal output
12	A. GND	I	GND terminal
13	WDCK	I	Word clock input
14	R. SI	I	Rch data input
15	L. SI	I	Lch data input
16	SLK	I	Serial bit clock input

INTERNAL CONNECTIONS OF LCD

• **Common connection diagram**



• **Segment connection diagram**



PRINTED CIRCUIT BOARDS AND WIRING CONNECTION DIAGRAM

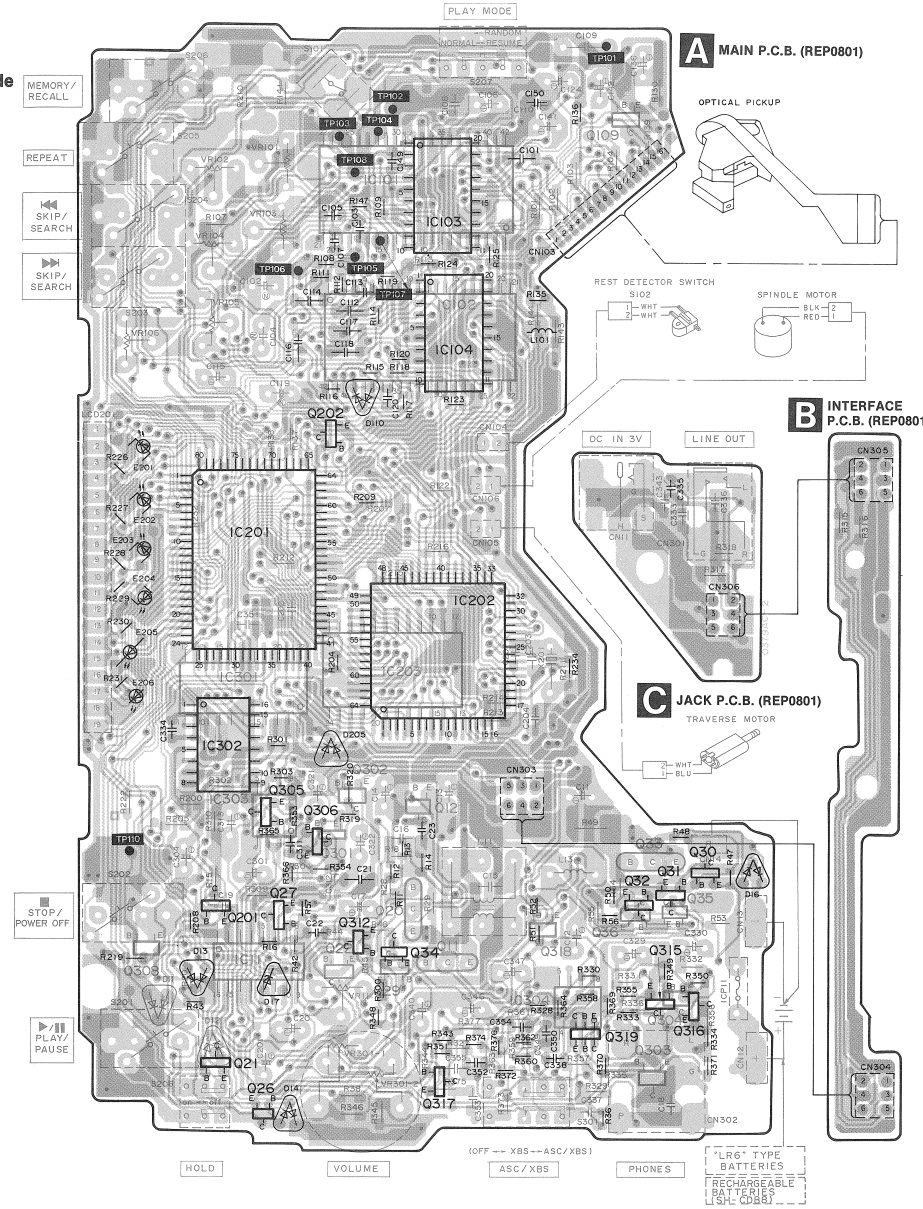
Notes:

This diagram shows a front view of the LCD mounting surface.

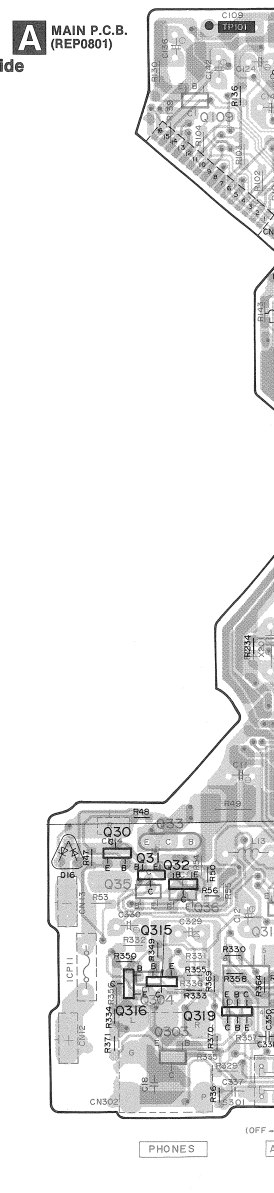
1. The circuit shown in ( ) on the conductor indicates printed circuit on the back side of the printed circuit board.
2. The circuit shown in ( ) on the conductor indicates printed circuit on the front side of the printed circuit board.
3. The symbols (●) shown in the circuit board indicate connection points between conductors on the front side and back side of the circuit board.

• This circuit board diagram may be modified at any time with the developement of new technology.

• Front side



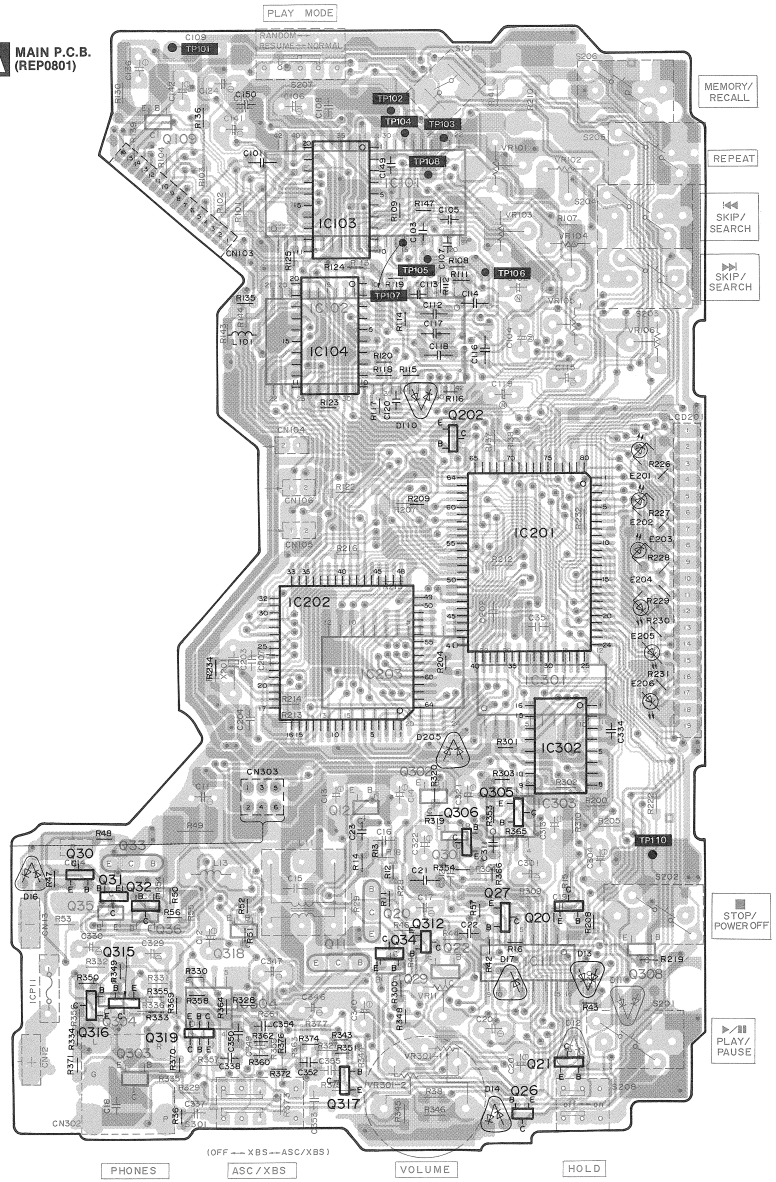
• Back side



10 11 12 13 14

A MAIN P.C.B. (REP0801)

• Back side



■ SCHEMATIC DIAGRAM (Parts list on pages 36~39.)

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

Notes:

- **S101** : Laser ON/OFF switch in **"off"** position. (It turns **"on"** with disc holder closed.)
- **S102** : Rest switch in **"off"** position. (It turns **"on"** when optical pickup comes to inner-most periphery.)
- **S201** : Play/pause switch.
- **S202** : Stop/power off switch.
- **S203** : Skip/search (Forward) switch.
- **S204** : Skip/search (Backward) switch.
- **S205** : Repeat switch.
- **S206** : Memory/recall switch.
- **S207** : Play mode selector switch. (random ⟷ resume ⟷ normal)
- **S208** : Hold switch in **"off"** position.
- **S301** : **ASC/S-XBS selector switch in "off" position.**
- 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 error 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, 0 dB) in play mode, and the other, for no disc in stop mode.
  * AC adaptor (SH-CDA6U) is used for power supply.

※ Headphones volume (VR301) in center (Scale. 5) position.

- ——— : Positive voltage lines.
  ▒▒▒ : Aduio signal lines.
- Important safety notice: Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
- ※ marks indicate printed resistor

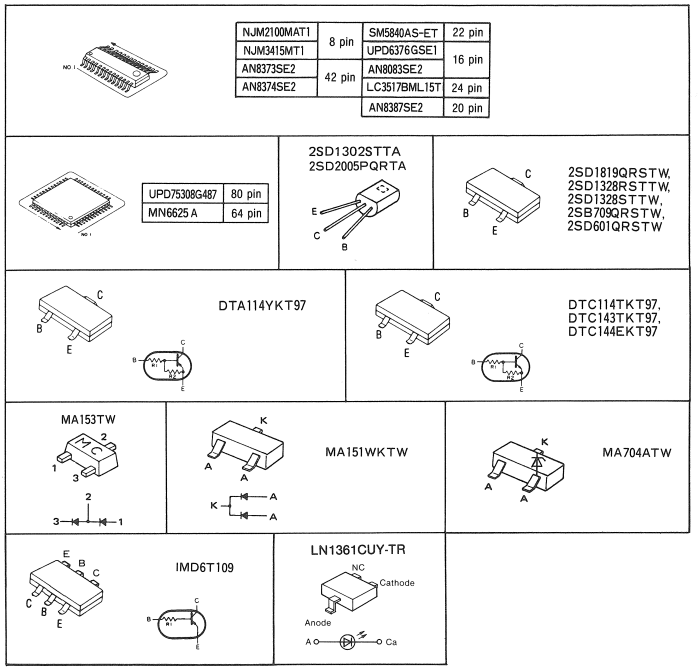
* Caution !

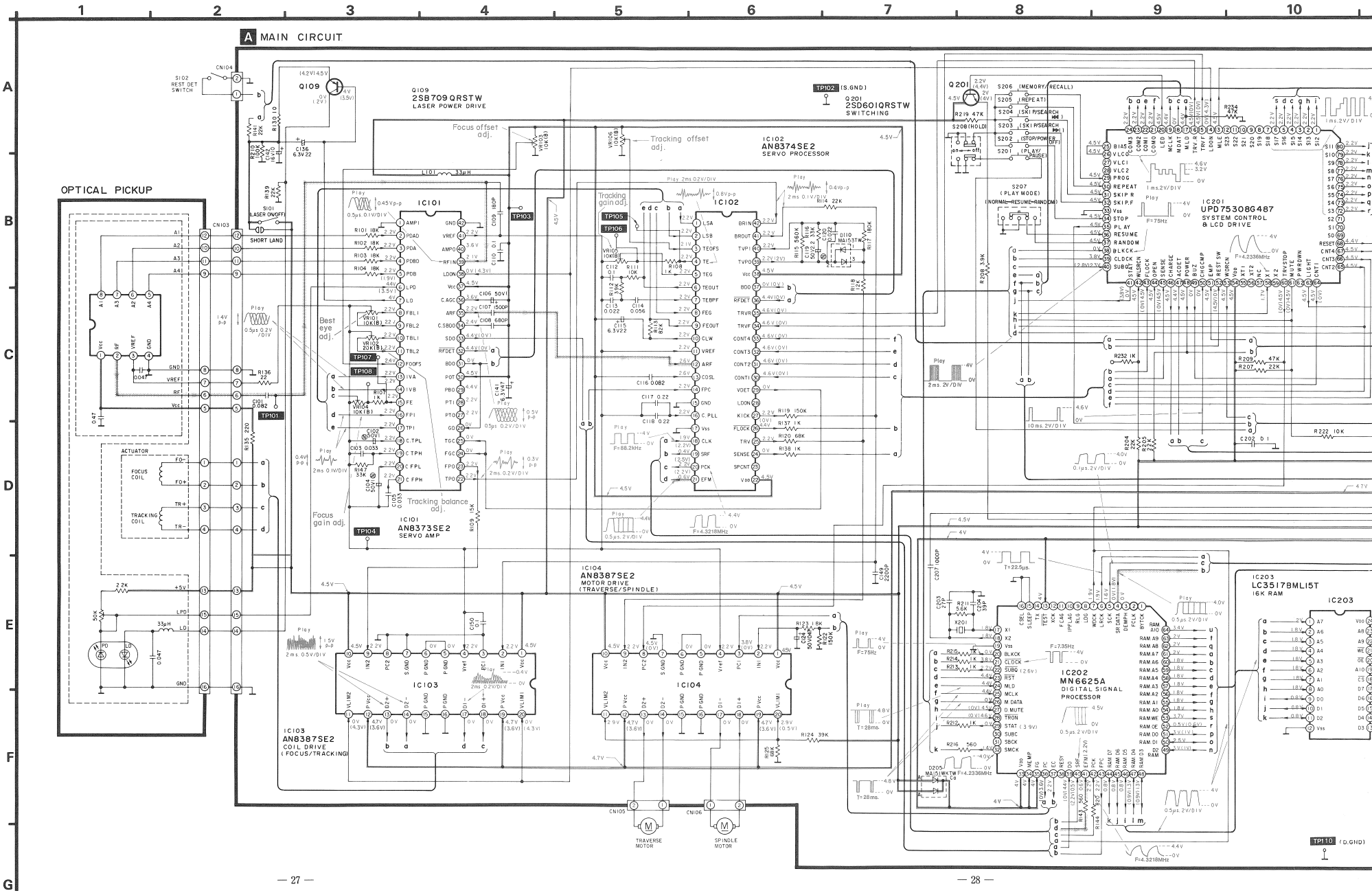
IC and LSI are sensitive to static electricity.

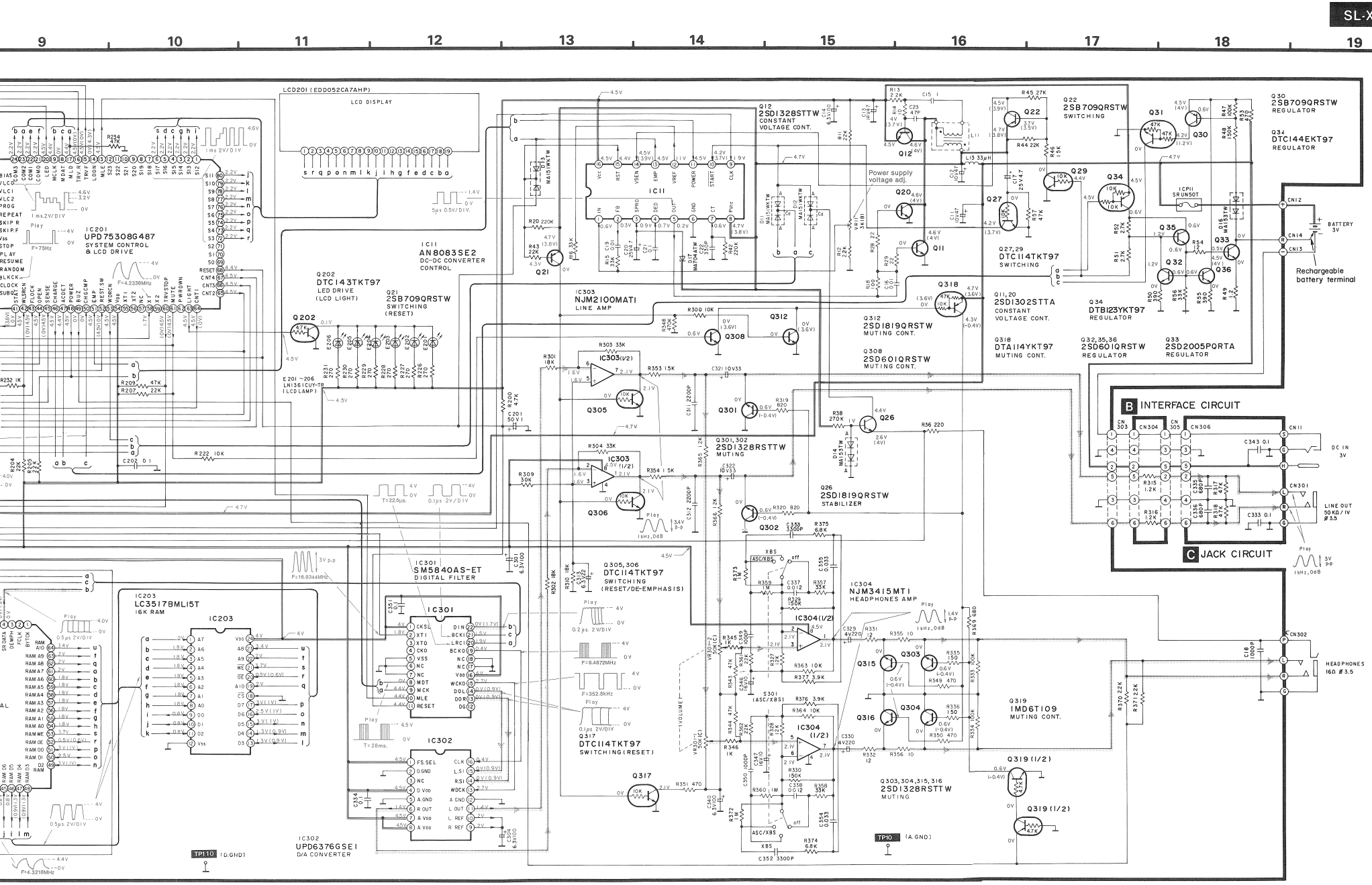
Secondary trouble can be prevented by taking care during repair.

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

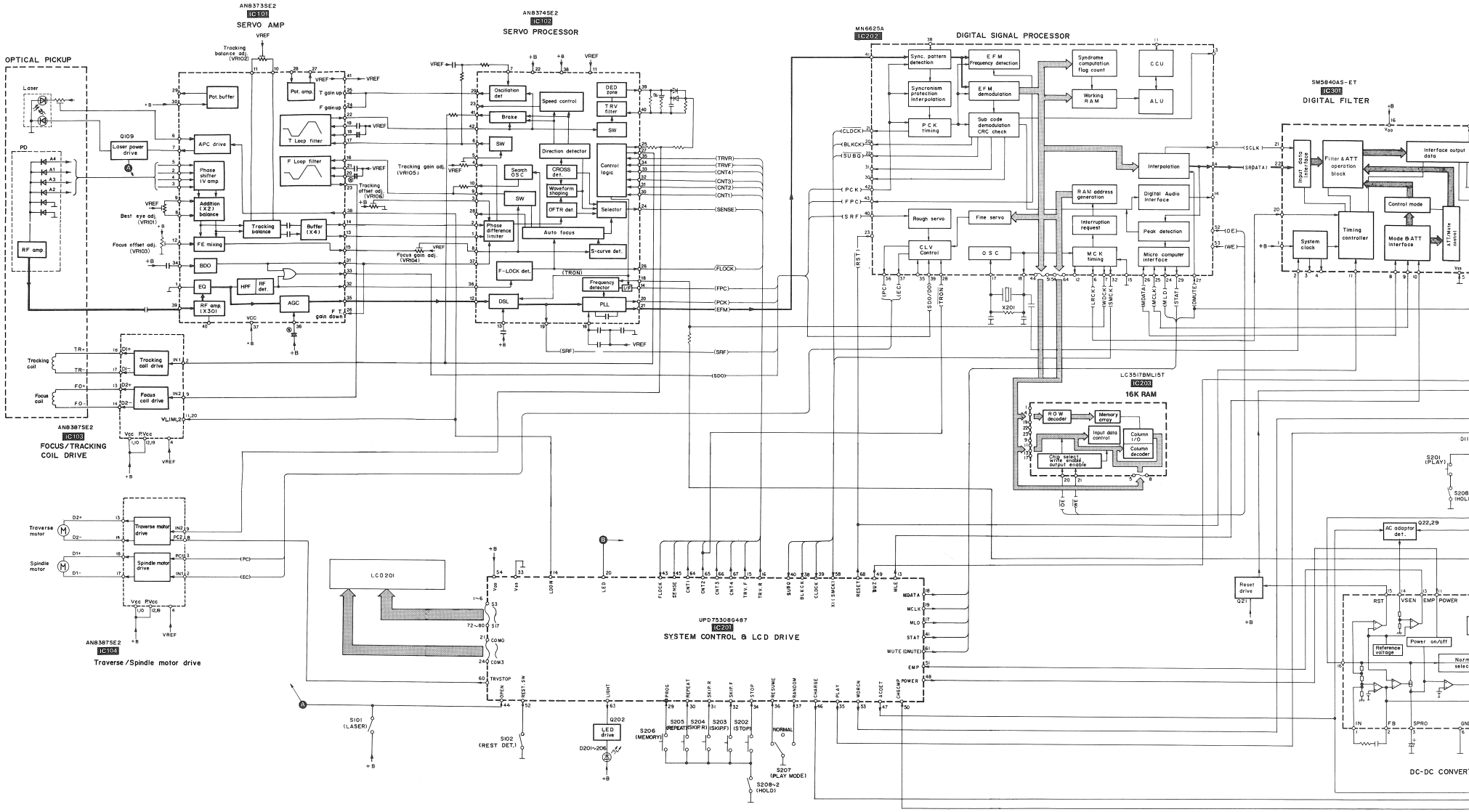
■ TERMINAL GUIDE OF IC'S, TRANSISTORS AND DIODES

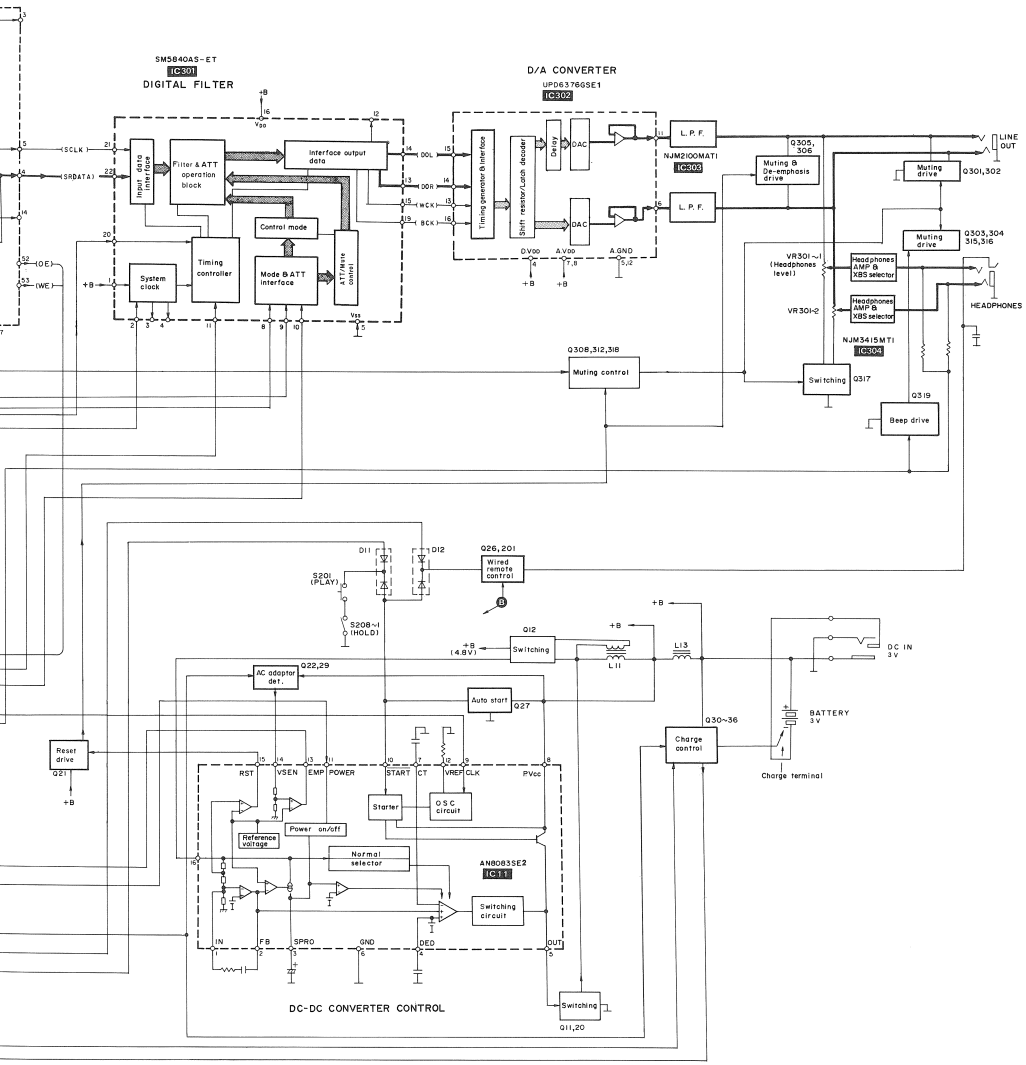



A MAIN CIRCUIT
OPTICAL PICKUP
S102 REST DET SWITCH
Q109 2SB709QRSTW LASER POWER DRIVE
Q201 2SD601QRSTW SWITCHING
IC102 AN8374SE2 SERVO PROCESSOR
IC101 AN8373SE2 SERVO AMP
IC103 AN8387SE2 COIL DRIVE (FOCUS/TRACKING)
IC104 AN8387SE2 MOTOR DRIVE (TRAVERSE/SPINDLE)
IC201 UPD753086487 SYSTEM CONTROL & LCD DRIVE
IC202 MN6625A DIGITAL SIGNAL PROCESSOR
IC203 LC3517BML15T 16K RAM
Focus offset adj.
Tracking offset adj.
Tracking gain adj.
Best eye adj.
Focus gain adj.
Tracking balance adj.
SHORT LAND
LASER ON/OFF
ACTUATOR
FOCUS COIL
TRACKING COIL
TRAVERSE MOTOR
SPINDLE MOTOR
— 27 —
— 28 —


9
10
11
12
13
14
15
16
17
18
19
LCD201 (EDD052CA7AHP)
LCD DISPLAY
IC201
UPD75308G487
SYSTEM CONTROL & LCD DRIVE
IC11
AN8083SE2
DC-DC CONVERTER CONTROL
Q12
2SD1328STTW
CONSTANT VOLTAGE CONT.
Q22
2SB709QRSTW
SWITCHING
Q30
2SB709QRSTW
REGULATOR
Q34
DTC144EKT97
REGULATOR
Power supply voltage adj.
Q202
DTC143TKT97
LED DRIVE (LCD LIGHT)
Q21
2SB709QRSTW
SWITCHING (RESET)
E201 ~206
LN1361CUY-TR
(LCD LAMP)
IC303
NJM2100MATI
LINE AMP
Q27,29
DTC114TKT97
SWITCHING
Q11,20
2SD1302STTA
CONSTANT VOLTAGE CONT.
Q34
DTB123YKT97
REGULATOR
Q318
DTA114YKT97
MUTING CONT.
Q32,35,36
2SD601QRSTW
REGULATOR
Q33
2SD2005PQRTA
REGULATOR
Q312
2SD1819QRSTW
MUTING CONT.
Q308
2SD601QRSTW
MUTING CONT.
Q305
Q301
Q306
Q302
Q26
2SD1819QRSTW
STABILIZER
Q301,302
2SD1328RSTTW
MUTING
Q305,306
DTC114TKT97
SWITCHING (RESET/DE-EMPHASIS)
Q317
DTC114TKT97
SWITCHING (RESET)
Q303,304,315,316
2SD1328RSTTW
MUTING
Q319
IMD6T109
MUTING CONT.
B INTERFACE CIRCUIT
C JACK CIRCUIT
CN303
CN304
CN305
CN306
CN11
CN12
CN13
CN14
CN301
CN302
DC IN 3V
LINE OUT 50KΩ/1V Ø3.5
HEADPHONES 16Ω Ø3.5
BATTERY 3V
Rechargeable battery terminal
IC203
LC3517BML15T
16K RAM
IC301
SM5840AS-ET
DIGITAL FILTER
IC302
UPD6376GSE1
D/A CONVERTER
IC304
NJM3415MTI
HEADPHONES AMP
S301
(ASC/XBS)
TP110 (D.GND)
TP10 (A.GND)
F=4.3218MHz
F=16.9344MHz
F=4.2336MHz
F=75Hz
F=8.4672MHz
F=352.8kHz
T=22.8μs.
T=28ms.
1kHz,0dB

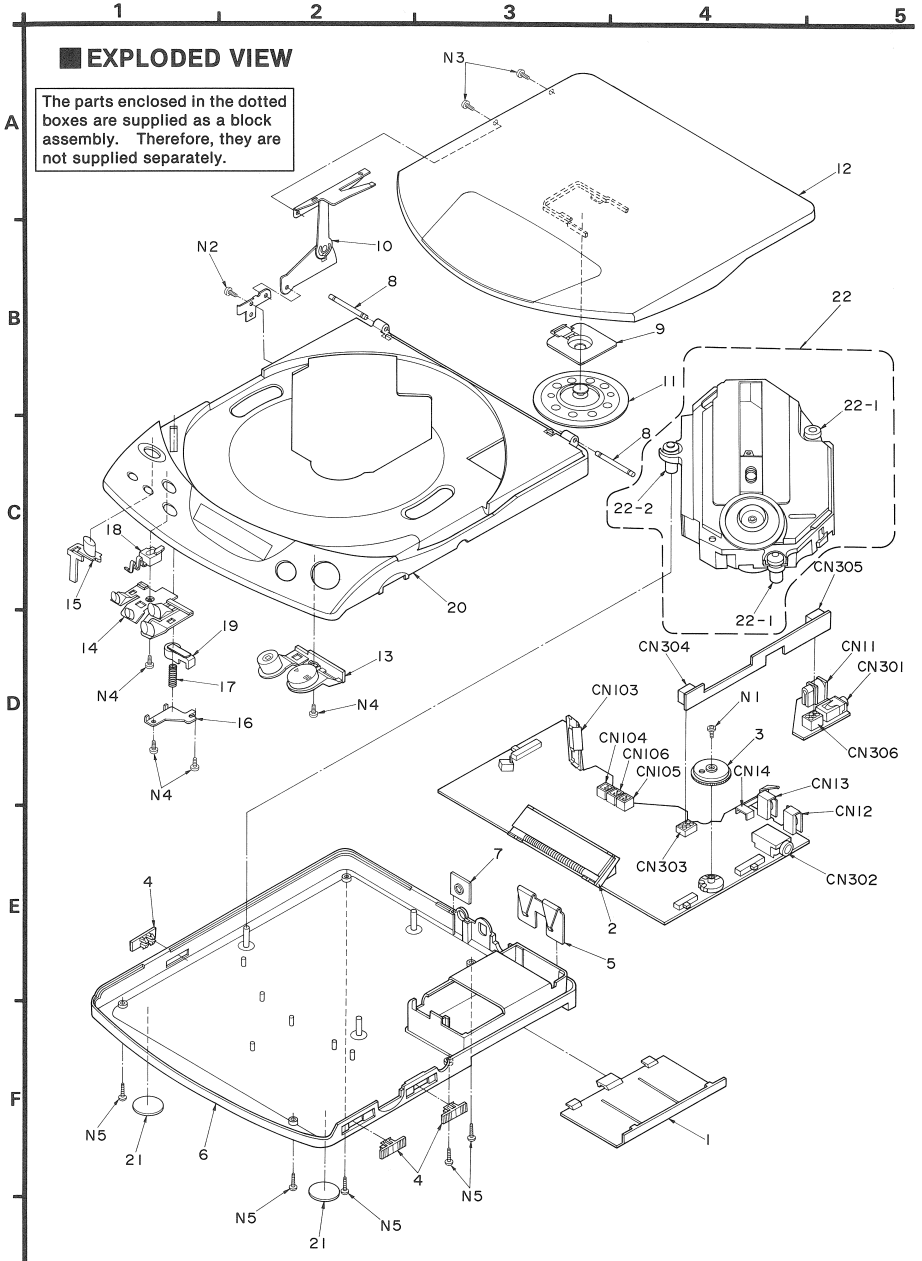
BLOCK DIAGRAM





EXPLODED VIEW

The parts enclosed in the dotted boxes are supplied as a block assembly. Therefore, they are not supplied separately.



REPLACEMENT PARTS LIST

Notes : * Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
* 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	RKK0009-1K1	BATTERY COVER	
2	RJF0004	LCD HOLDER	
3	SBND90ZK0A	KNOB, H.P VOLUME	
4	RGV0052-K	KNOB, HOLD, ASC/S-XBS, P.MODE	
5	RJC93007	BATTERY TERMINAL (COMMON)	
6	RFKJLXP300E	BOTTOM CABINET ASS'Y	
7	RMA0110	ANGLE	
8	RMS0105	SHAFT	
9	RMQ0163-1	CLAMPER HOLDER	
10	RXA0078	LINK ANGLE ASS'Y	
11	RXQ0109-2	CLAMPER	
12	RYF0112-1K	DUST COVER	
13	RGU0408-K	BUTTON, OPERATION A	
14	RGU0409-K	BUTTON, OPERATION B	
15	RGU0410-K	BUTTON, OPEN	
16	RMA0319	SPRING HOLDER	
17	RMB0156	SPRING (KICK)	
18	RML0173	OPEN LEVER	
19	RMR0311	ACTION LEVER	
20	RYK0161-2K	INTERMEDIATE CABINET ASS'Y	
21	SHGD54-1	FOOT	
22	SDD100Z	TRAVERSE DECK UNIT	
22-1	SHGD165	RUBBER SPACER	
22-2	SHGD157	RUBBER SPACER	
		SCREWS	
N1	XQN17+C3FZ	SCREW	
N2	RHE5155YA	SCREW	
N3	RHE5097ZA	SCREW	
N4	XTN17+4J	SCREW	
N5	XTN17+6GFZ	SCREW	
		PACKING MATERIAL	
P1	RPK0185	PACKING CASE	
P2	RPN0367	CUSHION (TOP)	
P3	RPN0368	CUSHION (BOTTOM)	
P4	SPPD1	PROTECTION BAG (UNIT)	
P5	RPQ0059	SPACER	(E)
P6	RPQ0072	PAD	(E)
P6	RPQ0069	PAD	(EB)
P7	RPQ0108	ACCESSORIES BOX	
P8	RPF0046	PROTECTION BAG (F.B.)	
P9	SPSD14	PROTECTION SHEET (T.T.)	
		ACCESSORIES	
A1	RFKSLXP300E	INST. MANUAL ASS'Y	(E)
A1	RQT0718-B	INSTRUCTION MANUAL	(EB)
A3	RFEV101A-KS	STEREO EARPHONES	
A4	SH-CDA6U-E	AC ADAPTOR	⚠ (E)
A4	SH-CDA6U-EK	AC ADAPTOR	⚠ (EB)
A5	SJPD5-2K	STEREO CONNECTION CABLE	
A6	RQA0013	WARRANTY CARD	
A7	RQCB0169	SERVICENTER LIST	
A8	SH-CDB8-3	RECHARGEABLE BATTERY	

Note: Printed circuit board assembly with mark (NLA) is no longer available after discontinuation of the product.

Ref. No.	Part No.	Part Name & Description	Remarks
		<PRINTED CIRCUIT	
		BOARDS ASS'Y>	
PCB1	REP0801	MAIN P.C.B.	(NLA)
		INTERFACE P.C.B.	(NLA)
		JACK P.C.B.	(NLA)

Ref. No.	Part No.	Part Name & Description	Remarks
		INTEGRATED CIRCUIT(S)	
IC11	AN8083SE2	IC, DC-DC CONVERTER CONTROL	
IC101	AN8373SE2	IC, SERVO AMP	
IC102	AN8374SE2	IC, SERVO PROCESSOR	
IC103, 104	AN8387SE2	IC, MOTOR/COIL DRIVE	
IC201	UPD75308G487	IC, SYSTEM CONT. &LCD DRIVE	
IC202	MN6625A	IC, DIGITAL SIGNAL PROCESSOR	
IC203	LC3517BML15T	IC, 16K RAM	
IC301	SM5840AS-ET	IC, DIGITAL FILTER	
IC302	UPD6376GSE1	IC, D/A CONVERTER	
IC303	NJM2100MAT1	IC, L. P. F.	
IC304	NJM3415M	IC, H. P. AMP&XBS SELECTOR	
		IC PROTECTOR(S)	
ICP11	SRUN50T	IC PROTECTOR	
		TRANSISTOR(S)	
Q11	2SD1302STTA	TRANSISTOR	
Q12	2SD1328STTW	TRANSISTOR	
Q20	2SD1302STTA	TRANSISTOR	
Q21, 22	2SB709QRSTW	TRANSISTOR	
Q26	2SD1819QRSTW	TRANSISTOR	
Q27	DTC114TKT97	TRANSISTOR	
Q29	DTC114TKT97	TRANSISTOR	
Q30	2SB709QRSTW	TRANSISTOR	
Q31	DTC144EKT97	TRANSISTOR	
Q32	2SD601QRSTW	TRANSISTOR	
Q33	2SD2005PQRTA	TRANSISTOR	
Q34	DTB123YKT97	TRANSISTOR	
Q35, 36	2SD601QRSTW	TRANSISTOR	
Q109	2SB709QRSTW	TRANSISTOR	
Q201	2SD601QRSTW	TRANSISTOR	
Q202	DTC143TKT97	TRANSISTOR	
Q301-304	2SD1328RSTTW	TRANSISTOR	
Q305, 306	DTC114TKT97	TRANSISTOR	
Q308	2SD601QRSTW	TRANSISTOR	
Q312	2SD1819QRSTW	TRANSISTOR	
Q315, 316	2SD1328RSTTW	TRANSISTOR	
Q317	DTC114TKT97	TRANSISTOR	
Q318	DTA114YKT97	TRANSISTOR	
Q319	IMD6T109	TRANSISTOR	
		DIODE(S)	

Ref. No.	Part No.	Part Name & Description	Remarks
D11-13	MA151WK	DIODE	
D14	MA153-TW	DIODE	
D16	MA153-TW	DIODE	
D17	MA704ATW	DIODE	
D110	MA153-TW	DIODE	
D205	MA151WK	DIODE	
E201-206	LN1361CUY-TR	CHIP LED	
		VARIABLE RESISTOR(S)	
VR11	EVNDXAA00B33	V. R, VOLTAGE ADJ.	
VR101	EVNDXAA00B14	V. R, BEST EYE ADJ.	
VR102	EVNDXAA00B24	V. R, TRACKING BALANCE ADJ.	
VR103	EVNDXAA00B14	V. R, FOCUS OFFSET ADJ.	
VR104	EVNDXAA00B14	V. R, FOCUS GAIN ADJ.	
VR105	EVNDXAA00B14	V. R, TRACKING GAIN ADJ.	
VR106	EVNDXAA00B14	V. R, TRACKING OFFSET ADJ.	
VR301	EVUBPAT50C54	V. R, HEADPHONES	
		COIL(S)	
L11	RLZ0007-0	COIL	
L13	RLQB330KT-K	COIL	
L101	SLQDNL330KT	COIL	
		OSCILLATOR(S)	
X201	RSXZ16M9M01T	OSCILLATOR	
		JACK(S) & CONNECTOR(S)	
CN11	RJJ4301	DC IN JACK	
CN12, 13	RJC30002-3	TERMINAL	
CN14	RJH5102	TERMINAL	
CN103	RJS1A6116	CONNECTOR	
CN104-106	EMCS0255B	CONNECTOR	
CN301	RJJD3S5ZA-C	LINEOUT JACK	
CN302	RJJD5S3MZA-C	HEADPHONES JACK	
CN303	RJU059W006	CONNECTOR	
CN304, 305	RJT059W006	CONNECTOR	
CN306	RJU059W006	CONNECTOR	
		LCD	
LCD201	EDD052CA7AHP	LCD	

Ref. No.	Part No.	Part Name & Description	Remarks
		SWITCH(ES)	
S101	RSH1A91ZA-A	SW, LASER ON/OFF	
S102	SSHD5	SW, REST DET.	
S201	EVQQTJ05R	SW, PLAY/PAUSE	
S202	EVQQTJ05R	SW, STOP	
S203	EVQQTJ05R	SW, F. SKIP/SEARCH	
S204	EVQQTJ05R	SW, R. SKIP/SEARCH	
S205	EVQQTJ05R	SW, REPEAT	
S206	EVQQTJ05R	SW, MEMORY/RECALL	
S207	ESD11H230	SW, PLAY MODE SELECTOR	
S208	ESD11H220	SW, HOLD	
S301	ESD11H230	SW, ASC/S-XBS	

■ RESISTORS & CAPACITORS

Notes : * Capacity valuse 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)

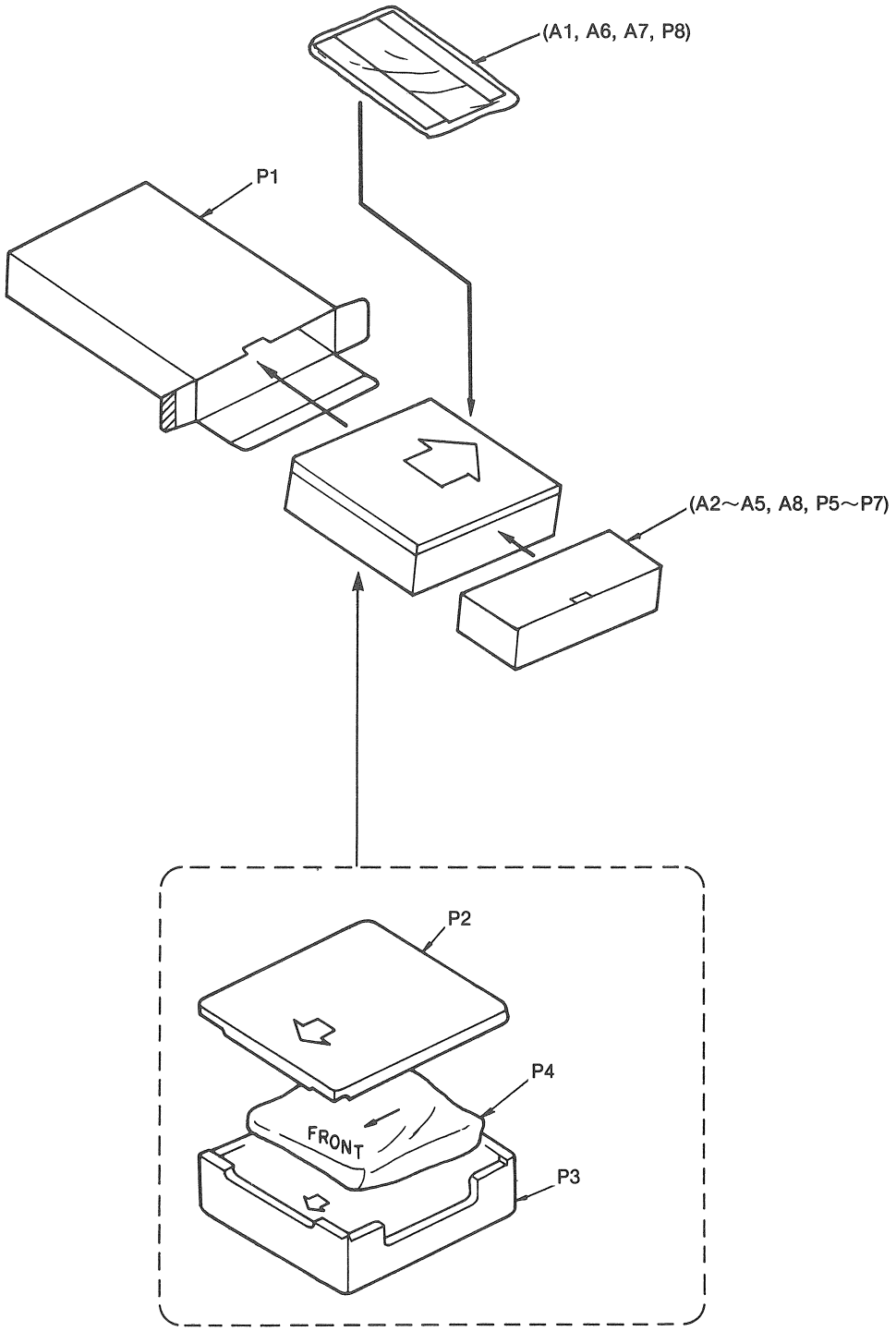
Ref. No.	Part No.	Values & Remarks
		RESISTORS
R11	ERJ3GEYJ223V	1/16W 22K
R12	ERJ3GEYJ272V	1/16W 2.7K
R13	ERJ3GEYJ222V	1/16W 2.2K
R14	ERJ6GEYJ100	1/10W 10
R15	ERJ6GEYJ333V	1/10W 33K
R16	ERJ3GEYJ333V	1/16W 33K
R18	ERJ6GEYJ101V	1/10W 100
R20	ERJ6GEYJ224V	1/10W 220K
R28, 29	ERJ6GEYJ220	1/10W 22
R36	ERJ3GEYJ221V	1/16W 220
R38	ERJ6GEYJ274V	1/10W 270K
R42	ERJ3GEYJ224V	1/16W 220K
R43	ERJ3GEYJ223V	1/16W 22K
R44	ERJ6GEYJ223V	1/10W 22K
R45	ERJ6GEYJ273V	1/10W 27K
R46	ERJ6GEYJ153V	1/10W 15K
R47	ERJ3GEYJ104V	1/16W 100K
R48	ERJ3GEYJ154V	1/16W 150K
R49	ERJ12YJ1R2H	1/2W 1.2
R50	ERJ3GEYJ391V	1/16W 390
R51, 52	ERJ3GEYJ272V	1/16W 2.7K
R53	ERJ6GEYJ471V	1/10W 470
R54	ERJ6GEYJ120V	1/10W 12
R55	ERJ6GEYJ391V	1/10W 390
R56	ERJ3GEYJ333V	1/16W 33K
R57	ERJ3GEYJ473V	1/16W 47K
R101-104	ERJ6GEYJ183V	1/10W 18K
R107	ERJ6GEYJ102V	1/10W 1K
R108	ERJ3GEYJ102V	1/16W 1K
R109	ERJ3GEYJ153V	1/16W 15K
R111	ERJ3GEYJ103V	1/16W 10K
R112	ERJ3GEYJ393V	1/16W 39K
R113	ERJ6GEYJ823	1/10W 82K
R114	ERJ3GEYJ223V	1/16W 22K
R115	ERJ3GEYJ564V	1/16W 560K
R116	ERJ3GEYJ333V	1/16W 33K
R117	ERJ3GEYJ184V	1/16W 180K
R118	ERJ3GEYJ123V	1/16W 12K
R119	ERJ3GEYJ154V	1/16W 150K
R120	ERJ3GEYJ683V	1/16W 68K
R122	ERJ6GEYJ154V	1/10W 150K
R123	ERJ3GEYJ182V	1/16W 1.8K
R124	ERJ3GEYJ393V	1/16W 39K
R125	ERJ3GEYJ683V	1/16W 68K
R130	ERJ6GEYJ100	1/10W 10
R135	ERJ6GEYJ221V	1/10W 220

Ref. No.	Part No.	Values & Remarks
R136	ERJ6GEYJ220	1/10W 22
R137, 138	ERJ6GEYJ102V	1/10W 1K
R139	ERJ6GEYJ223V	1/10W 22K
R141	ERJ6GEYJ223V	1/10W 22K
R143	ERJ6GEYJ561V	1/10W 560
R144	ERJ6GEYJ821V	1/10W 820
R147	ERJ3GEYJ333V	1/16W 33K
R200	ERJ6GEYJ472V	1/10W 4.7K
R204	ERJ3GEYJ223V	1/16W 22K
R205	ERJ6GEYJ223V	1/10W 22K
R207	ERJ6GEYJ223V	1/10W 22K
R208	ERJ3GEYJ392V	1/16W 3.9K
R209	ERJ3GEYJ473V	1/16W 47K
R210	ERJ6GEYJ104V	1/10W 100K
R211	ERJ6GEYJ562V	1/10W 5.6K
R212-215	ERJ6GEYJ102V	1/10W 1K
R216	ERJ6GEYJ561V	1/10W 560
R219	ERJ6GEYJ473V	1/10W 47K
R222	ERJ6GEYJ103V	1/10W 10K
R226-231	ERJ3GEYJ271V	1/16W 270
R232	ERJ6GEYJ102V	1/10W 1K
R234	ERJ3GEYJ473V	1/16W 47K
R300	ERJ3GEYJ103V	1/16W 10K
R301	ERJ3GEYJ183V	1/16W 18K
R302	ERJ6GEYJ183V	1/10W 18K
R303	ERJ3GEYJ333V	1/16W 33K
R304	ERJ6GEYJ333V	1/10W 33K
R309	ERJ6GEYJ303V	1/10W 30K
R310	ERJ6GEYJ183V	1/10W 18K
R315, 316	ERJ6GEYJ122V	1/10W 1.2K
R317, 318	ERJ6GEYJ473V	1/10W 47K
R319, 320	ERJ3GEYJ821V	1/16W 820
R327	ERJ6GEYJ123V	1/10W 12K
R328	ERJ3GEYJ123V	1/16W 12K
R329	ERJ6GEYJ154V	1/10W 150K
R330	ERJ3GEYJ154V	1/16W 150K
R331, 332	ERJ6GEYJ120V	1/10W 12
R333, 334	ERJ3GEYJ104V	1/16W 100K
R335, 336	ERJ6GEYJ151V	1/10W 150
R343	ERJ3GEYJ473V	1/16W 47K
R344	ERJ6GEYJ473V	1/10W 47K
R345, 346	ERJ6GEYJ102V	1/10W 1K
R348	ERJ3GEYJ474V	1/16W 470K
R349-351	ERJ3GEYJ471V	1/16W 470
R353, 354	ERJ3GEYJ152V	1/16W 1.5K
R355	ERJ3GEYJ100V	1/16W 10
R356	ERJ6GEYJ100	1/10W 10
R357	ERJ6GEYJ333V	1/10W 33K
R358	ERJ3GEYJ333V	1/16W 33K

Ref. No.	Part No.	Values & Remarks
R359	ERJ6GEYJ105	1/10W 1M
R360	ERJ3GEYJ105V	1/16W 1M
R361	ERJ6GEYJ223V	1/10W 22K
R362	ERJ3GEYJ223V	1/16W 22K
R363	ERJ6GEYJ103V	1/10W 10K
R364	ERJ3GEYJ103V	1/16W 10K
R365, 366	ERJ3GEYJ122V	1/16W 1.2K
R369	ERJ3GEYJ681V	1/16W 680
R370, 371	ERJ3GEYJ222V	1/16W 2.2K
R372	ERJ3GEYJ105V	1/16W 1M
R373	ERJ6GEYJ105	1/10W 1M
R374	ERJ3GEYJ682V	1/16W 6.8K
R375	ERJ6GEYJ682V	1/10W 6.8K
R376	ERJ3GEYJ392V	1/16W 3.9K
R377	ERJ6GEYJ392V	1/10W 3.9K
		CAPACITORS
C11, 12	ECEA1AKA470I	10V 47U
C13	SRX01C470GNJ	16V 47U
C14	ECEA0JK101	6.3V 100U
C15	ECUV1C105ZFM	16V 1U
C16	ECUV1E103KBN	25V 0.01U
C17	ECEA1EK4R7	25V 4.7U
C18	ECUV1H102KBN	50V 1000P
C19	ECUV1E103KBN	25V 0.01U
C20	ECEA1EKS4R7	25V 4.7U
C21	ECUV1C104KBM	16V 0.1U
C22	ECUV1H331KBN	50V 330P
C23	ECUV1H470KCN	50V 47P
C101	ECUV1C823KBM	16V 0.082U
C102	ECEA1HKN010I	50V 1U
C103	ECUV1C333KBN	16V 0.033U
C104	ECEA1HKN010I	50V 1U
C105	ECUV1C333KBN	16V 0.033U
C106	ECEA1HK010I	50V 1U
C107	ECUV1H152KBN	50V 1500P
C108	ECUV1H681KBN	50V 680P
C109	ECKR1H181KB5	50V 180P
C110	ECUV1C104ZFN	16V 0.1U
C112	ECUV1C104KBM	16V 0.1U
C113	ECUV1C223KBN	16V 0.022U
C114	ECUV1C563KBM	16V 0.056U
C115	ECEA0JK220I	6.3V 22U
C116	ECUV1C823KBM	16V 0.082U
C117, 118	ECUV1C224KBM	16V 0.22U
C119	ECEA1HKN2R2I	50V 2.2U
C120	ECUV1C223KBN	16V 0.022U
C124	ECEA1HKR47I	50V 0.47U

Ref. No.	Part No.	Values & Remarks
C136	ECEA0JK220I	6.3V 22U
C141	ECEA0JK470	6.3V 47U
C142	ECEA1CK100I	16V 10U
C149	ECUV1H222KBN	50V 2200P
C150	ECUV1C104ZFN	16V 0.1U
C201	ECEA1HKS010	50V 1U
C202	ECUV1C104ZFN	16V 0.1U
C203	ECUV1H270KCN	50V 27P
C204	ECUV1H390KCN	50V 39P
C207	ECUV1H102KBN	50V 1000P
C301	ECEA0JPK101I	6.3V 100U
C304	ECEA0JPK101I	6.3V 100U
C311, 312	ECUV1H222KBN	50V 2200P
C313	ECEA0JK220I	6.3V 22U
C321, 322	ECEA1APK330I	10V 33U
C329, 330	ECEA0GPK221I	4V 220U
C333, 334	ECUV1C104ZFN	16V 0.1U
C335, 336	ECUV1H681KBN	50V 680P
C337, 338	ECUV1E123KBN	25V 0.012U
C340	ECEA0JPK101I	6.3V 100U
C343	ECUV1C104ZFN	16V 0.1U
C346, 347	ECEA1CPK100I	16V 10U
C349, 350	ECUV1H102KBN	50V 1000P
C351	ECUV1C104ZFN	16V 0.1U
C352, 353	ECUV1H332KBN	50V 3300P
C354, 355	ECUV1C333KBN	16V 0.033U

■ PACKING



Printed in Japan
H900811500 YU/TN