

# Service Manual

COMPACT  
disc  
DIGITAL AUDIO

MASH\*  
multi-stage noise shaping

Portable CD Player  
**SL-S210**

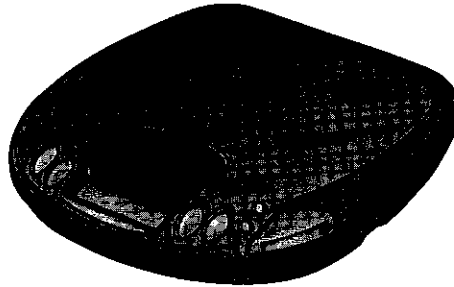
\* MASH is a trademark of NTT.

## Colour

(H) ..... Gray Type  
(EG) area only  
(S) ..... Silver Type

## Areas

(EB) ..... Great Britain.  
(EG) ..... Europe.



## Specifications

### Specifications

#### Audio

No. of channels:  
Frequency response:  
Output voltage:

#### S/N:

#### Wow and flutter:

DA converter:  
Headphone output level:

#### Pickup

Light source:  
Wavelength:

#### General

Operational temperature range: 0-40 degree (32-104 fahrenheit)

Rechargeable temperature range: 5-40 degree (41-104 fahrenheit)



Power supply: DC 4.5 V

Power consumption: Anti-shock memory OFF/ON

AC adaptor: 3.5 W /3.6 W

Battery (DC 3V): 0.4 W /0.4 W

When recharging: 4.6 W

 <b>KRBS</b>		Door No. 3
<b>Customer: TECHNICA42</b>		Drop No. 0
<b>Load: SPOWE1</b>		 <b>511</b>
<b>Model: AD9902024C2</b>	<b>Qty: 1</b>	
<b>Assemble at: 60</b>	<b>05/07/00</b>	

below measurable limit  
1 bit, MASH\*  
Max.9 mW+9 mW/16 Ω (adjustable)  
stereo mini jack diameter 3.5

#### Optional Rechargeable batteries (P-3GAVA/2B);

25 degree (77 fahrenheit) temperature

Anti-shock memory OFF/ON  
batteries(LR6, 2pcs.);  
Approx. 22 h /19 h

Approx. 10 h /8.5 h

The play time may be less depending on the operating conditions.

Recharging time: Approx. 5 h

Dimensions (W x H x D): 128 x 25.8 x 144 mm

Weight: 257 g with batteries

212 g without batteries

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

### ⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

# Panasonic®

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## ■ Accessories

AC adaptor for (EB) area	AC adaptor for (EG) area	Stereo earphones
(RFEA403B-S) .....	(RFEA401E-3S) .....	(RFEV324P-KS) .....
1	1	1

## ■ 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)

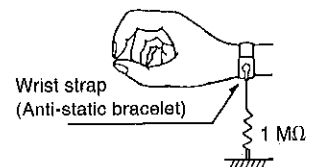
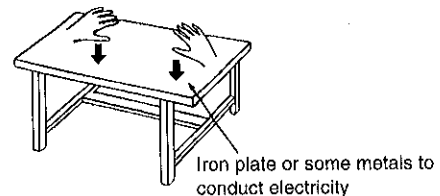
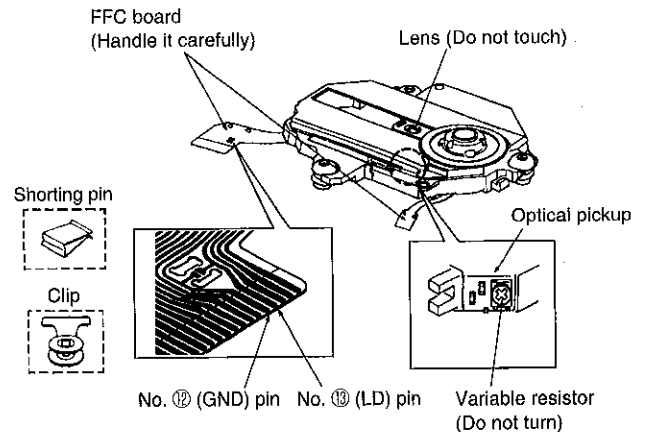
1. Do not subject the traverse deck (optical pickup) to static electricity as it is extremely sensitive to electrical shock.
2. To protect the laser diode against electrostatic breakdown, short the flexible board (FFC board) with a clip or similar object.
3. Take care not to apply excessive stress to the flexible board (FFC 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).



**CAUTION:**

THIS PRODUCT UTILIZES A LASER.

USE OF CONTROLS OR ADJUSTMENTS OR PERFORMANCE OF PROCEDURES OTHER THAN THOSE SPECIFIED HEREIN MAY RESULT IN HAZARDOUS RADIATION EXPOSURE.

**■ 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: 780 nm  
Maximum output radiation power from pick up: 100  $\mu$ W/VDE

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

1. Do not disassemble the pick up unit, since radiation from exposed laser diode is dangerous.
2. Do not adjust the variable resistor on the pick up 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 laserdioden. Im eingeschalteten zustand wird unsichtbare laserstrahlung von der lasereinheit adgestrahlt.

Wellenlänge: 780 nm

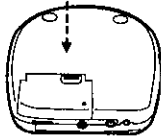
Maximale strahlungsleistung der lasereinheit: 100  $\mu$ W/VDE

Die strahlung an der lasereinheit ist ungefährlich, wenn folgende punkte beachtet werden:

1. Die lasereinheit nicht zerlegen, da die strahlung an der freigelegten laserdioden gefährlich ist.
2. Den werksseitig justierten einstellregler der lasereinheit nicht verstellen.
3. Nicht mit optischen instrumenten in die fokussierlinse blicken.
4. Nicht über längere zeit in die fokussierlinse blicken.



**LUOKAN 1 LASERLAITE**  
**KLASS 1 LASER APPARAT**



Bottom of the unit

DANGER	INVISIBLE LASER RADIATION WHEN OPEN AND INTERLOCK DEFEATED. AVOID DIRECT EXPOSURE TO BEAM.	(Inside of product)
ADVARSEL	USYNLIG LASERSTRÅLING VED ÅBNING, NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION. UNDGÅ UDSÆTTELSE FOR STRÅLING.	(Indersiden af apparatet)
VARO!	AVATTAESSA JA SUOJALUKITUS OHTETTAESSA OLET ALTIHINA NÄKYMÄTÖNÄ LASERSÄTEILYLLÄ. ÄLÄ KATSO SÄTEESEEN.	(Tuotteen sisällä)
VARNING	OSYNLIG LASERSTRÅLING NÅR DENNA DEL ÄR ÖPPNAD OCH SPÄRREN ÄR URKOPPLAD. BETRakta EJ STRÅLEN.	(Apparatens insida)
ADVARSEL	USYNLIG LASERSTRÅLING NÅR DEKSEL ÅPNES OG SIKKERHEDSLÅS BRYTES. UNNGÅ EKSPONERING FOR STRÅLEN.	(Produktets innside)
VORSICHT	UNSIHTBARE LASERSTRÄHLUNG, WENN ABDECKUNG GEÖFFNET UND SICHERHEITSVERRIEGELUNG ÜBERBRÜCKT. NICHT DEM STRAHL AUSSETZEN.	(Im Inneren des Gerätes)

## Power Supply Preparations

Refer to the specifications for information on operating times when using rechargeable batteries or dry-cell batteries.

### Using rechargeable batteries (not included)

Obtain the optional rechargeable batteries. Make sure to recharge the batteries before using them. The unit cannot be used to charge rechargeable batteries other than those specifically designed for it.

- Optional batteries (P-3GAIVE/2B, SH-CDB8D)

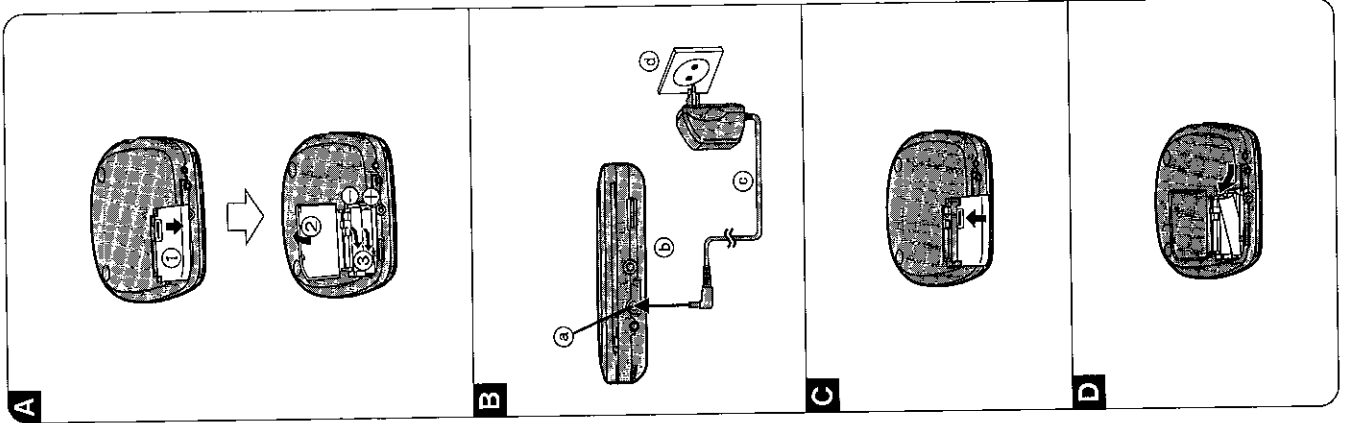
#### Recharging procedure

- 1 Insert the special rechargeable batteries into the unit. **A**
- 2 Connect the AC adaptor. **B**
  - a DC IN jack (  $\leftrightarrow$   $\leftrightarrow$  DC IN 4.5 V )
  - b Back panel of the unit
  - c AC adaptor
  - d AC power outlet

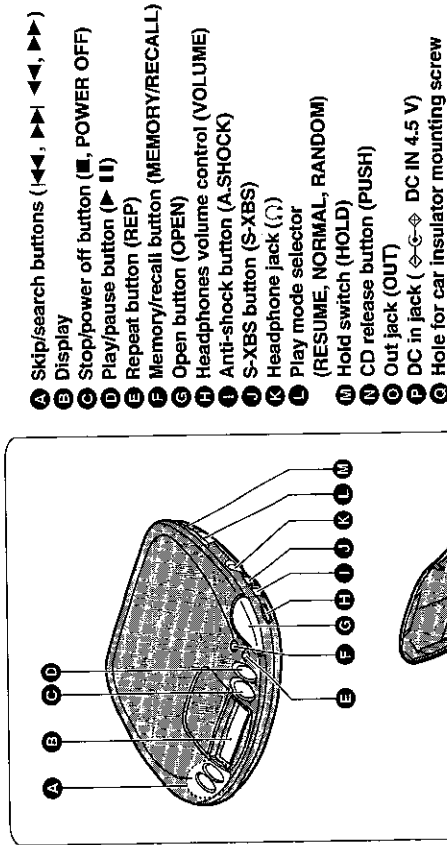
Recharging starts and the "G" charging indicator flashes on and off on the unit's display panel. When the rechargeable batteries fully recharge the charging indicator disappears.
- 3 When recharging is complete, unplug the AC adaptor from the power outlet and the DC IN jack.

#### Note

- Rechargeable batteries have a service life of approximately 300 charge-discharge cycles. If the operating time on one full charge becomes noticeably shorter than it used to be, the battery has reached the end of its service life and should be replaced.
- The AC adaptor and rechargeable batteries may become warm while recharging is in progress. This is not a malfunction.
- Recharging may only be performed when the unit is powered off. (It is not possible to recharge the batteries while playing a CD.)
- If the battery lid compartment comes loose **C** Slide the lid back into place horizontally.
- Removing batteries **D** Push up on the battery in the direction indicated by the arrow. Then lift it out.



## Location of Controls



## HOLD Function

This function causes the unit to ignore short, accidental button presses. (The disc lid can still be opened and closed.)

#### The HOLD function prevents the following:

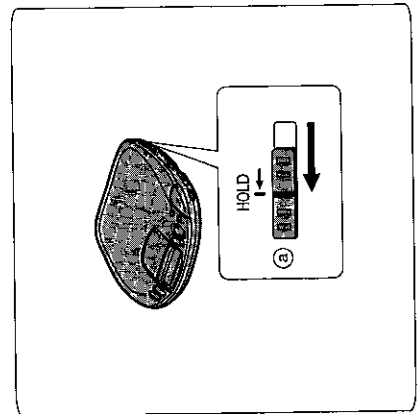
- Powering on the unit accidentally (which can cause the batteries to go dead).
- Play being cut off unexpectedly in the middle of a section.

#### To use the HOLD function

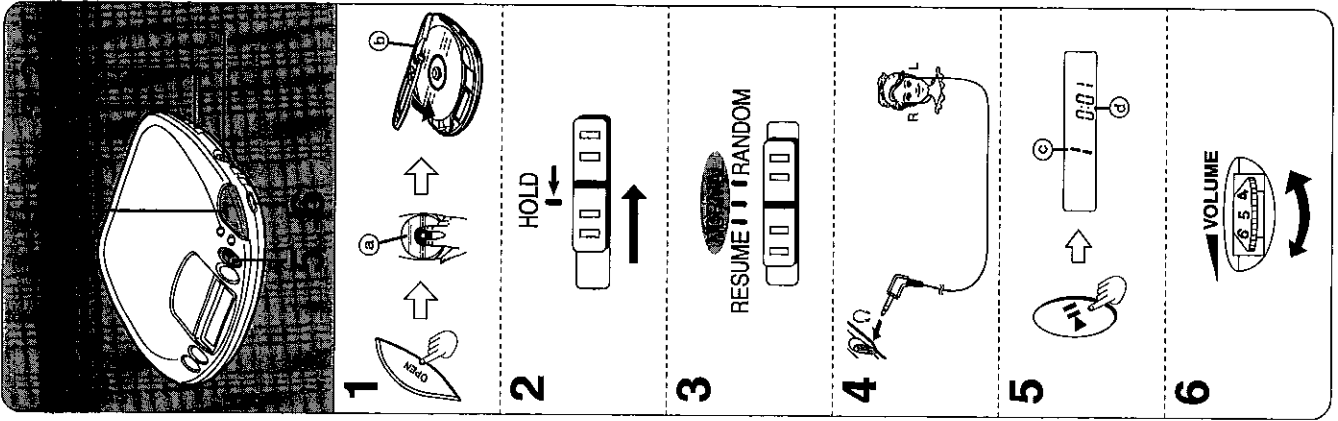
- Set [HOLD] to the HOLD position.
- a HOLD mode

#### "hold" Indication

When the unit is in hold status, pressing any button (other than the OPEN button) causes the indication "hold" to appear on the display. When the unit is powered off The "hold" indication appears only when [HOLD] is pressed.



# Sequential Play



- 1 Press [OPEN] to open the lid, and insert the disc.**
  - ⓐ Label must face upward.
  - ⓑ Press the area near the center hole of the disc until it clicks into position.
  - ⓒ Close the lid.
- 2 Release the hold mode.**
- 3 Set play mode selector to [NORMAL].**
- 4 Connect the stereo earphones to the [L] jack. (Plug in firmly.)**
- 5 Press [▶ II].**
  - ⓐ Play now starts.
  - ⓑ Track number in play
  - ⓒ Elapsed playing time of each track
- 6 Adjust the volume level.**
  - ⓐ If the unit has been connected to the car audio system, adjust the volume level between 4 and 6 on the unit, then adjust the volume level on the system.)

**For your reference:**

**"RND 1/5C" indication**  
 This indication appears for about 30 seconds if [▶ II] is pressed when no disc is loaded in the unit or if the disc is not completely seated.

**"Sp Eff" indication**  
 This indication appears for about 10 minutes when the cover is opened. (However, the indication does not appear when the unit is powered off.)

**Auto power off function**  
 If the unit is left in stop or paused status for approximately 10 minutes, the unit powers itself off automatically in order to prevent the battery from running down.  
 (If no disc is loaded in the unit, it powers itself off in about 30 seconds.)

## Using the AC adaptor

### Connect the AC adaptor supplied.

- ⓐ DC IN jack ( DC IN 4.5 V)
- ⓑ Back panel of the unit
- ⓒ AC adaptor
- ⓓ AC power outlet

**Note**

The unit is in the standby condition when the AC adaptor is connected. The primary circuit is always "live" as long as the AC adaptor is connected to an electrical outlet.

## Using dry-cell batteries (not included)

After disconnecting the AC adaptor, insert two LR6 (UM-3) alkaline batteries.

The procedure for inserting and removing dry-cell batteries is identical to that for rechargeable batteries.

## Battery indicator

### ⓐ Battery indicator

This indicator flashes on and off when the batteries are almost out of power. Power is cut off completely a short while later.

### Rechargeable batteries: Recharge batteries.

### Dry-cell batteries: Replace batteries with new ones.

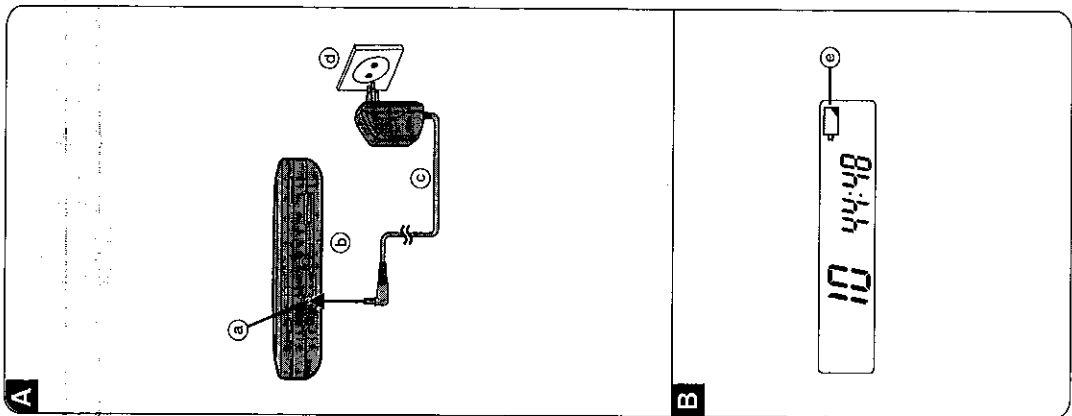
**Note**

- The length of time the unit will continue to operate between when the battery indicator starts flashing and when the power is cut off differs depending on the type of batteries used.
- The battery indicator may not flash if rechargeable batteries, other than those designated by Panasonic, are used.

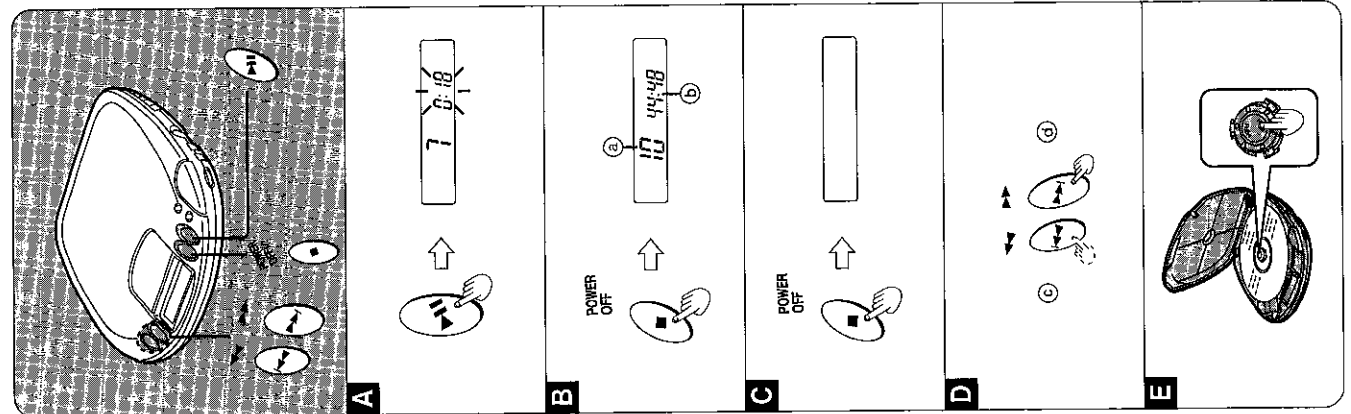
## Using the car adaptor (not included)

Be sure to obtain the car adaptor (SH-CDC8), available as an optional accessory. The car adaptor can be used to recharge the unit's batteries while in the car.

If the unit malfunctions or freezes during use, then disconnect the power sources (the AC adaptor and batteries).  
 Re-connect the power source and continue operation.



# Other Play Methods



**To pause play** **A**

Press during play.  
Press again to restart play.

**To stop play** **B**

Press during play.  
Total number of tracks

**To turn off the unit** **C**

Press during stop mode.

**Skip forward/backward (skip function)** **D**

Press during play.

Backward direction

Forward direction

**Rapid forward/backward (search function)** **E**

Press and hold during play.

Backward direction

Forward direction

During program play, these buttons are used to skip forward or back through the programmed sequence of tracks.

During random play, the skip buttons cannot be used to skip back to tracks that were played previously in the random sequence.

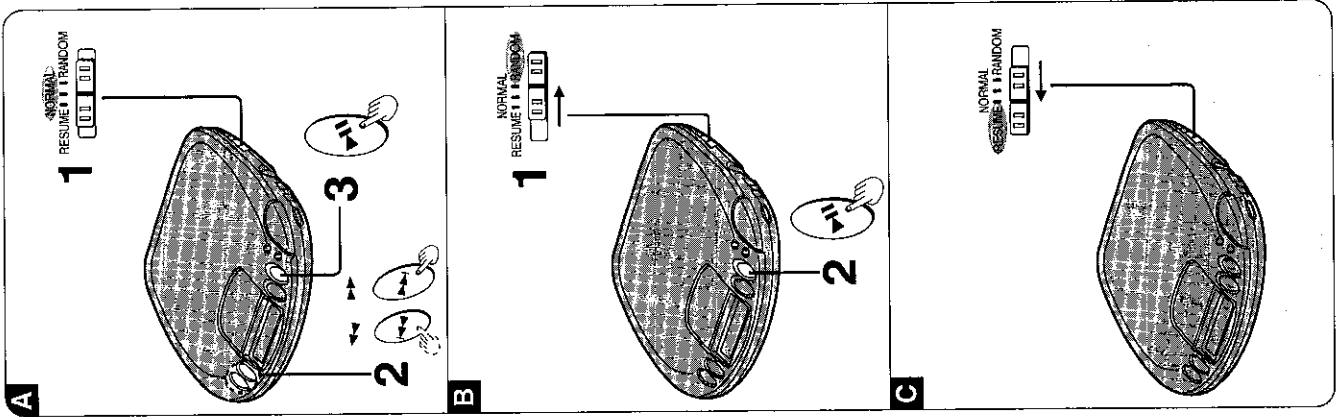
During program play, random play or 1 track repeat play, search operation is limited to the current track only.

**Removing discs** **E**

After the disc has stopped rotating, press [PUSH] to release the disc. (To protect the disc, never open the cover while it is playing.)

**Note**

Never insert foreign objects into the unit body.



**Skip play** **A**

The disc plays from the specified track through to the end, then play stops automatically.

**Preparation:** Put unit in stop mode.

**Follow steps 1-3.**

In step 2, select the desired track.

**Random play** **B**

Follow steps 1-2.

**To cancel the random mode**

Set play mode selector to [NORMAL].

**For your reference:**

- It is also possible to press [▶▶] while the unit is in stop status to change the first track to be played. (All tracks are played eventually, regardless of which is played first.)
- Program play is not possible in the random mode.

**Resume play** **C**

This function allows you to listen from the beginning of the track where play stopped because the unit was powered off (or switched to stop status). It is useful when listening to CDs in the car, etc.

**To cancel the resume mode**

Set play mode selector to [NORMAL].

**For your reference:**

- If the [RESUME, NORMAL, RANDOM] (play mode) slider is put in the [RESUME] position, the all-repeat function will be activated automatically as soon as the unit is powered on.
- If power is cut off near the end of a track (power off status), playback may resume from the beginning of the next track in some cases.
- If the unit is powered off while a disc was playing and then a new disc is inserted, play will begin from the middle of the new disc because the unit remembers the position where play stopped on the previous disc.

# Anti-Shock Function

Anti-shock works by reading audio data and storing it in memory (up to 3 seconds worth). The unit then fills in interruptions caused by bumps and vibrations with data from the memory. This unit also incorporates a powerful anti-shock mechanism that prevents skipping caused when play speed is changed by swinging of the unit.

**Press [A.SHOCK] during play or stop mode.**  
The indicator appears on the display panel. **A**

**When bumps continue repeatedly **B****

The indicator appears on the display and sound is interrupted.

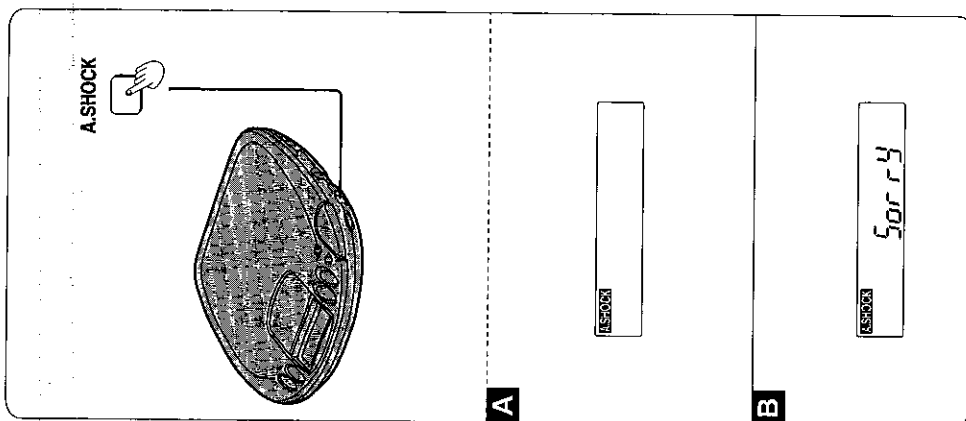
**To cancel anti-shock function**  
Press [A.SHOCK] again.

**Note**

- The [A.SHOCK] setting can be changed during play, but this may cause a slight interruption in the sound because the disc's rotation speed changes.
- During the anti-shock operation, the disc rotates at a higher rate than usual in collecting extra audio data. This could result in a slight increase in disc rotation noise.

**Listening to sound with the unit connected to an audio system**

The anti-shock function incorporates digital signal compression technology. It is recommended that the anti-shock function be canceled if the unit is connected to a home audio system.



## Program play

Up to 24 tracks can be entered in the programmed sequence.

Preparation: Put unit in stop mode.

Follow steps 1-5.

- 1 Set play mode selector to [NORMAL].
- 2 Select the desired track.
- 3 Register in sequence.  
(The indication "M" and the programmed sequence appear on the display panel.)
- 4 Repeat steps 2 and 3 to program all the desired tracks.
- 5 Press [▶ II].

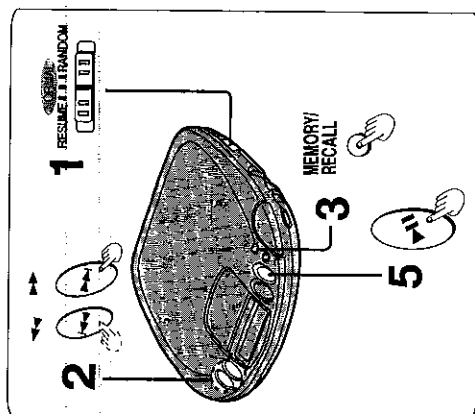
■ To program the same track in the sequence more than once  
After step 3, press [MEMORY/RECALL] the desired number of times.

■ If "f" is displayed  
No more tracks can be programmed.

■ To confirm the contents of the program  
Press [MEMORY/RECALL] while the disc is playing.

(The number of the programmed tracks appear on the display panel in sequence.)

■ To delete the entire programmed sequence  
Press [M], [POWER OFF].



## Repeat function **A**

**Press [REP] while disc is playing or when unit is in stop status.**

The setting is switched in the sequence indicated below each time [REP] is pressed.

1-track repeat (1 ↺) ←

One track is repeated.

All-track repeat (ALL ↺) ←

All the tracks on the disc are repeated.

Cancel

↓

Cancel

↓

For your reference:

If [REP] is pressed during program play, only the tracks in the programmed sequence are repeated.

(The indication "ALL" is not displayed.)

## Changing the sound quality **B**

**Press [S-XBS] while disc is playing or when unit is in stop status.**

The setting is switched in the sequence indicated below each time [S-XBS] is pressed.

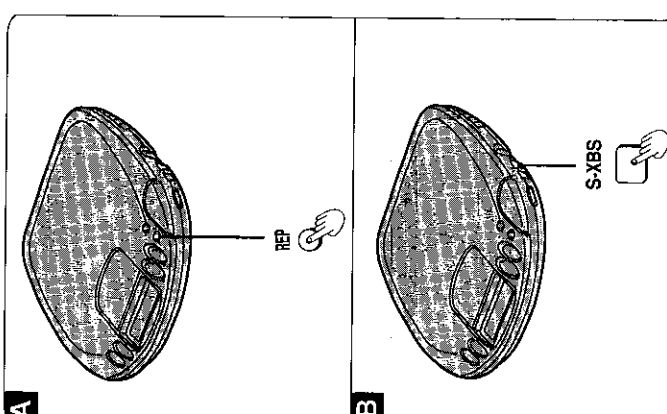
S-XBS ←

Cancel

↓

S-XBS:

Select this setting to boost the low-range response.

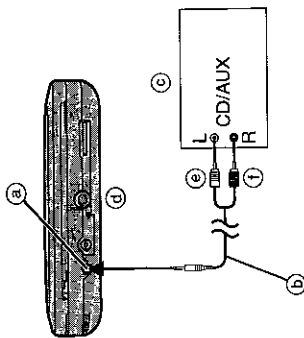


## Using the Unit Optional Accessories

### Using the unit with an audio system

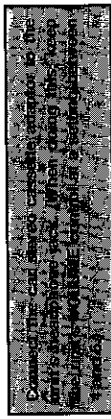
- Using the stereo connection cable (not included), you can hear CDs on your audio system.
- Connect the cable to the amplifier after turning off its power.
- Do not connect the cable to the PHONO jacks on the amplifier.
- Obtain the optional connecting cable if the amplifier comes with mini-phone jacks.
- Adjust the volume level on the amplifier.
- Sound quality changes when S-XBS is selected, but volume is reduced by approximately fifty percent.

- (a) OUT jack
- (b) Stereo connection cable (not included)
- (c) Amplifier
- (d) Back panel of the unit
- (e) (White)
- (f) (Red)



### Using the unit with a car audio system stereo

- Items to be purchased
- For connection to the car audio system:
- Car stereo cassette adaptor (SH-CDM10A)



- For securing the unit and connecting the power supply:
- Car adaptor (SH-CDC9)
- Car mounting kit (SH-CDF7)

**Note**

It may not be possible to use the unit with some types of car stereos owing to restrictions imposed by the construction of the car stereo cassette adaptor.

For further details, refer to the instructions of the part concerned.

## Cautions

### Rechargeable batteries

- Only the P-3GAVE/2B, SH-CDB8D batteries can be recharged.
- If the power delivered by the batteries lasts for a very short time after recharging, it means that the batteries' service life is over. Do not use them any more.
- Recharging already charged batteries will shorten their service life.
- When recharging batteries for the first time or when they have not been used for a long period of time, the play time may be shorter than usual. In a case like this, repeatedly recharge and discharge the batteries. This will restore them to their regular state.
- Do not allow any metal objects to touch the terminals of rechargeable batteries since this may cause short-circuiting which is dangerous.

### Dry cell batteries/rechargeable batteries

- To prevent damage to the batteries and electrolyte leakage, heed the following points.
- Align the ⊕ and ⊖ polarities properly when inserting the batteries.
- Do not mix different types or makes of batteries or old and new batteries.
- Remove the batteries if you do not plan to use the unit for a long period of time.
- Do not throw batteries into a fire, and do not short-circuit, disassemble or subject them to excessive heat.
- Do not attempt to recharge dry cell batteries.
- Do not peel off the plastic covering on the rechargeable batteries. Short-circuiting may occur which is dangerous.

### Carrying dry cell batteries/rechargeable batteries around

- When putting dry cell or rechargeable batteries in a pocket or bag, ensure that no other metal objects such as a necklace are placed together with them. Contact with metal may cause short-circuiting which, in turn, may cause a fire.
- Be absolutely sure to carry the rechargeable batteries in the battery carrying case.

### Precautions for Listening with the Headphones or Earphones

- Do not play your headphones or earphones 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 headphones or earphones 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.

### AC adaptor

- Handle the AC adaptor carefully. Improper handling is dangerous.
  - Do not touch it with wet hands.
  - Do not place heavy objects on top of it.
  - Do not forcibly bend it.
- Be sure to connect only the AC adaptor provided with the unit.
- Disconnect the AC adaptor from the power outlet if the unit is not going to be used for a long time.

### Unit

**No altering or remodeling**  
This can cause malfunctioning.

**No dropping or strong impacts**  
This may damage the unit.

**Locations to be avoided**

Avoid using the unit in the following locations since they can cause malfunctioning.

1. Bathrooms and other moisture-prone places.
2. Warehouses and other dusty places
3. Very hot places near heating appliances, etc.

**Do not leave the unit exposed to direct sunlight for long periods of time**  
This may deform or discolor the cabinet and may also cause malfunctioning.

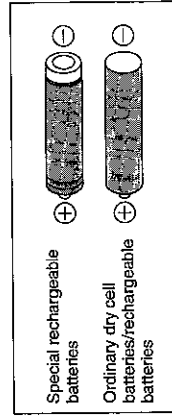
### When driving a car

In the interest of traffic safety, do not operate the unit while driving.

### When purchasing rechargeable batteries

As a safety precaution, the portable CD players made by Panasonic have a construction designed to make it impossible to recharge ordinary batteries. To use rechargeable batteries, be absolutely sure to purchase the rechargeable Ni-Cd batteries designed especially for this unit.

**Special rechargeable Ni-Cd batteries:**  
P-3GAVE2B, SH-CDB8D (set of 2)



**Notice about the rechargeable battery**  
The battery is designated recyclable. Please follow your local recycling regulations.

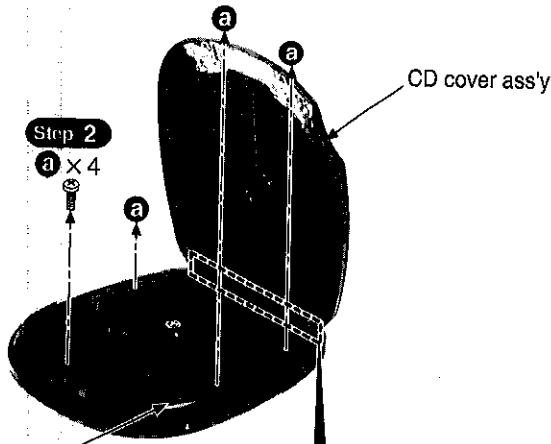


# Operation Checks and Component Replacement Procedures

- NOTE**
1. This section describes procedures for checking the operation of the major printed circuit boards and replacing the main components.
  2. For reassembly after operation checks or replacement, reverse the respective procedures. Special reassembly procedures are described only when required.
  3. [ ] indicates parts No.

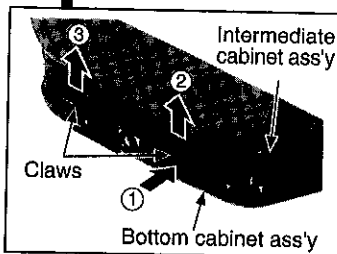
## 1. Checking for the P.C.B.

〈Checking for the P.C.B. (A side)〉

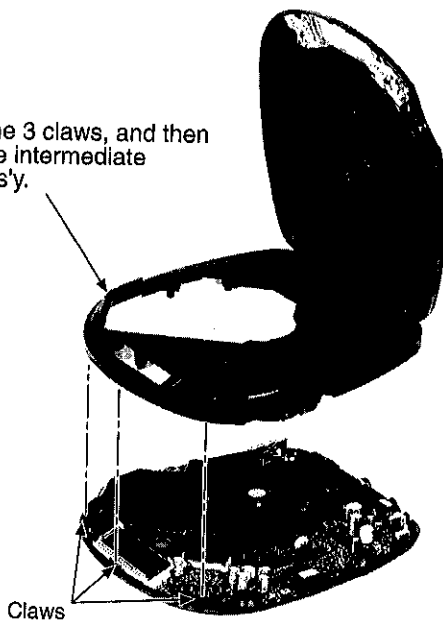


**Step 1**  
Pressing the OPEN button, open the CD cover ass'y.

**Step 3**  
Lift the intermediate cabinet ass'y with holding the rear part of bottom cabinet ass'y, and then release the claws.

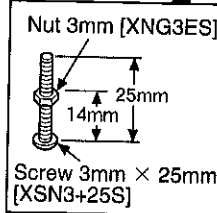
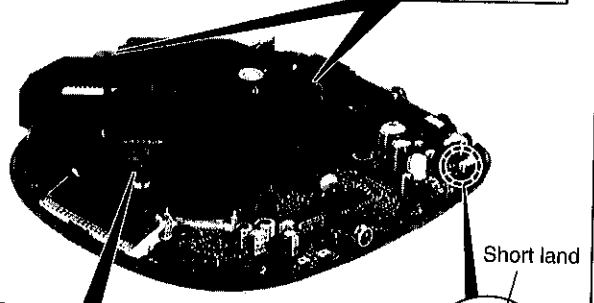
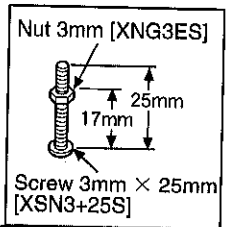


**Step 4**  
Release the 3 claws, and then remove the intermediate cabinet ass'y.



**NOTE**

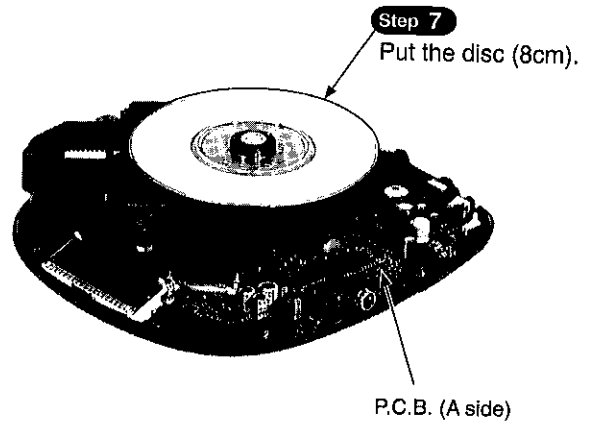
- The tip of screw must not protrude above the floating rubber.
- To keep insulation, place the insulator sheet (paper etc.) between the P.C.B. and the head of screws.



**Step 5**  
Short-circuit the land by soldering.

**Step 6**  
Sustain the traverse deck with the floating rubber inserted screws and nuts as shown above.

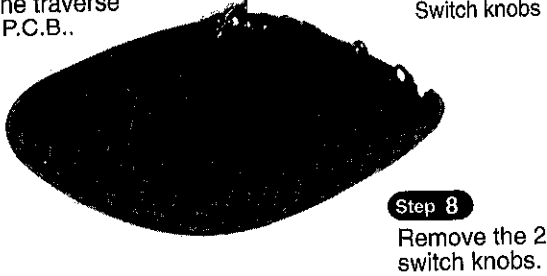
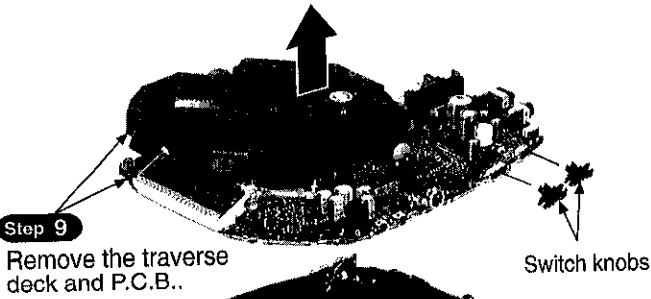
• Check the P.C.B. (A side) as shown below.



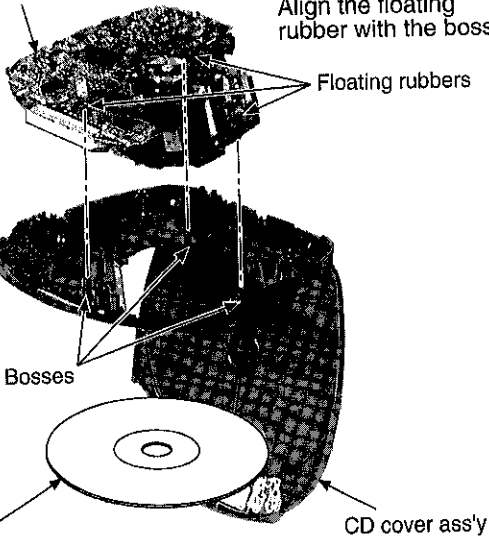
**NOTE**

After checking, unsolder the short land to open circuit.

<Checking for the P.C.B. (B side)>

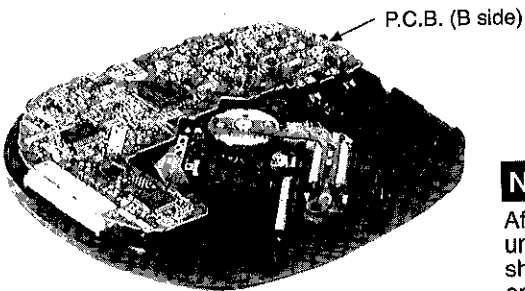


Traverse deck and P.C.B.



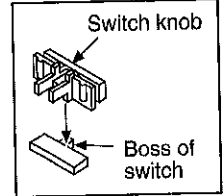
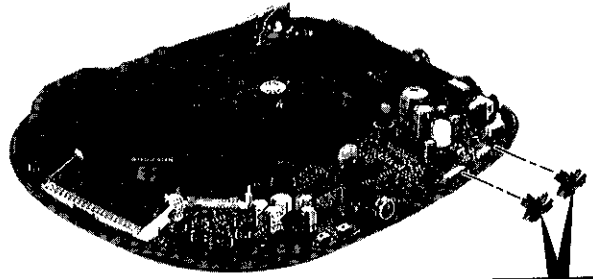
**Step 11**  
Put the test disc.

· Check the P.C.B. (B side) as shown below.



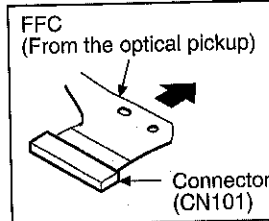
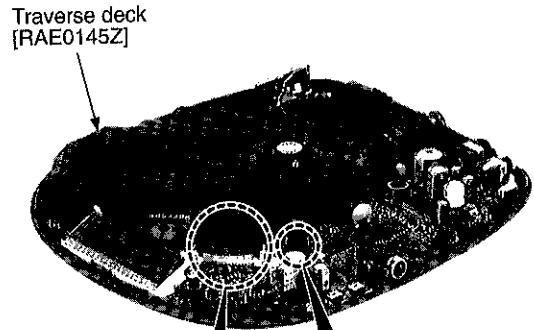
**NOTE**  
After checking, unsolder the short land to open circuit.

**Notice for installation of switch knobs**

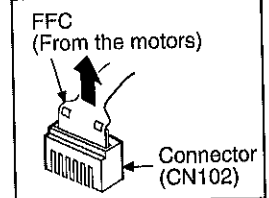


**2. Replacement for the traverse deck**

· Follow the **Step 1** ~ **Step 4** in item 1 on page 9.

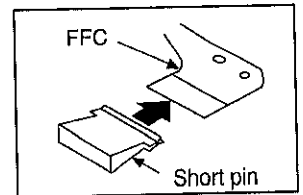


**Step 1**  
Pull out the FFC from connector (CN101).



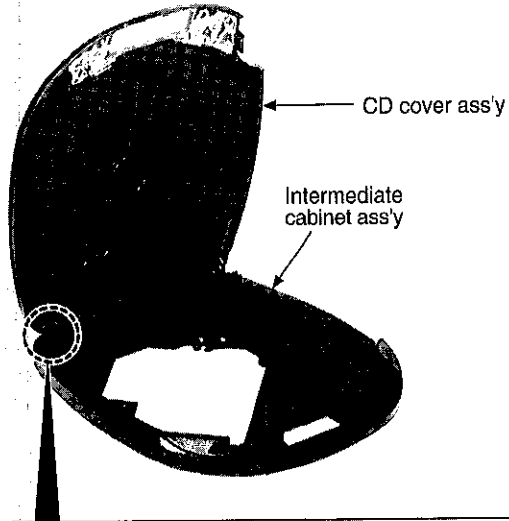
**Step 2**  
Pull out the FFC from connector (CN102).

**NOTE**  
Insert a short pin into the traverse deck's FFC. (Refer to "Handling Precautions for Traverse Deck" on page 2.)



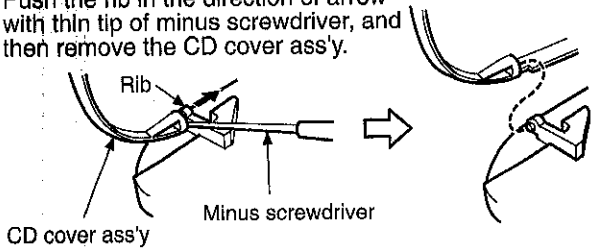
### 3. Replacement for the CD cover ass'y

Follow the **Step 1** ~ **Step 4** in item 1 on page 9.

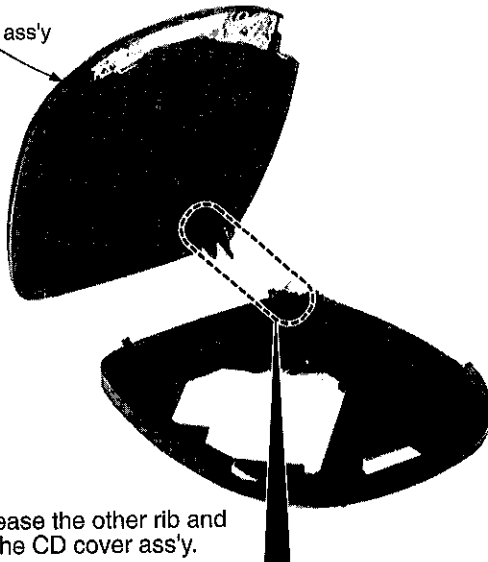


#### Step 1

Push the rib in the direction of arrow with thin tip of minus screwdriver, and then remove the CD cover ass'y.

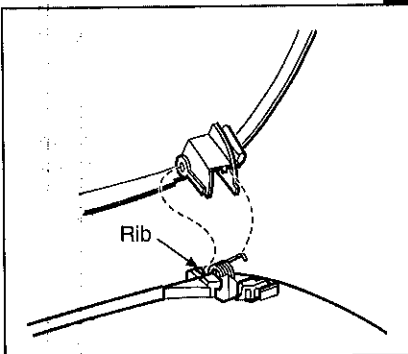


CD cover ass'y



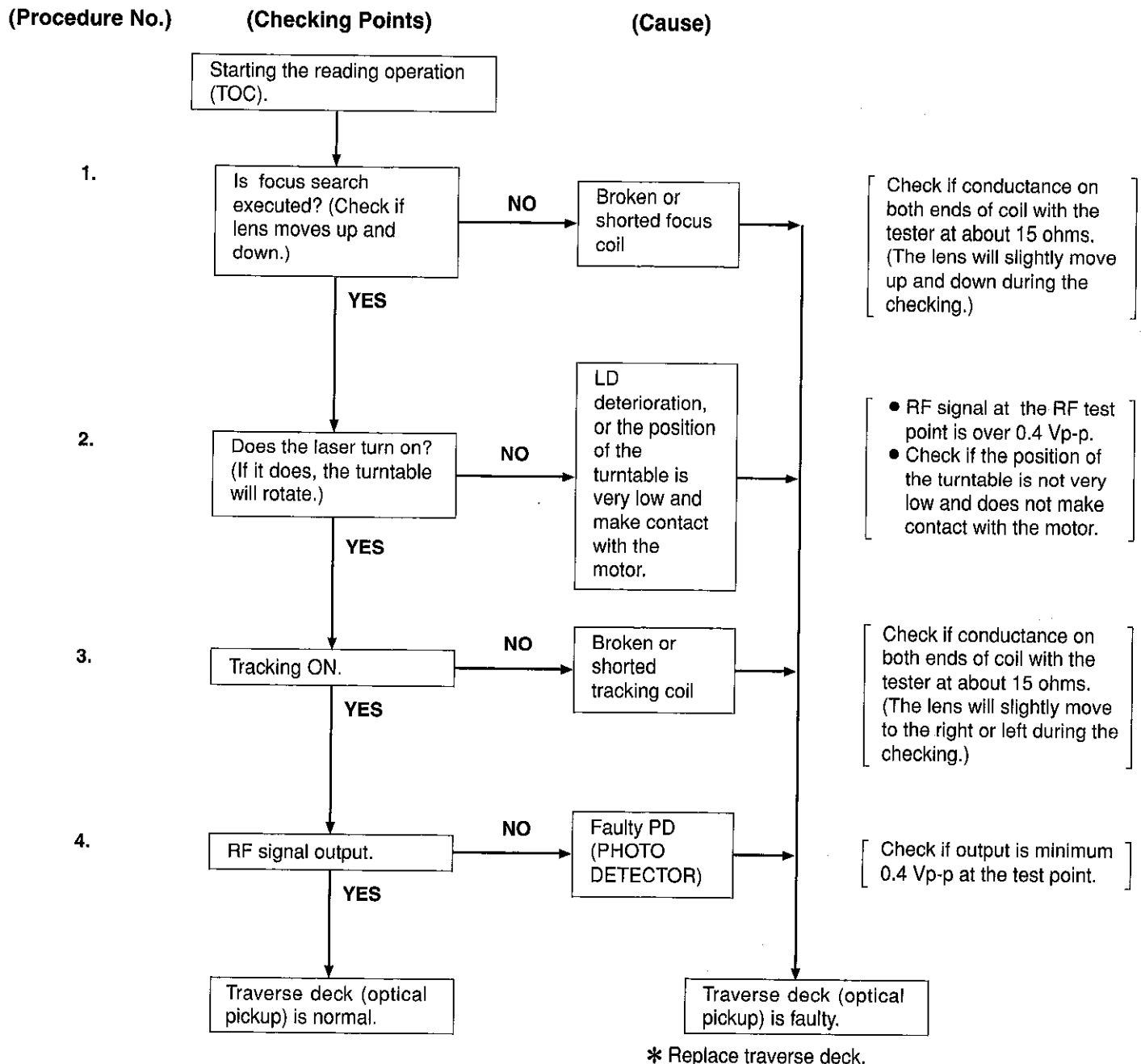
#### Step 2

Then release the other rib and remove the CD cover ass'y.



## ■ 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 wrapped or not centered.
- **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 Playability

1. Play the 0.7 mm black dot and the 0.7 mm 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 Results Display Function (Self-Check Function)

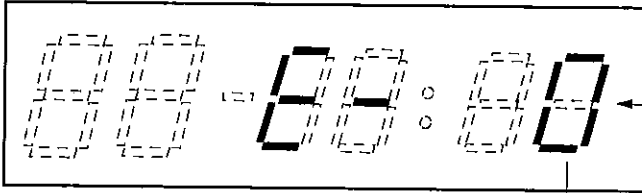
On the unit (SL-S210), each automatic adjustment result are displayed on the LCD. This function is convenient to check or identify which automatic adjustment circuit is incorrect. The followings are the contents of the automatic adjustment result displays (Self-Check Function).

### How to display automatic adjustment results

1. Load the test disc (SZZP1054C).
2. Press the ◀◀ (SKIP/SEARCH) and ▶▶ (SKIP/SEARCH) Buttons simultaneously and hold them, and additionally press the ▶/|| (PLAY/PAUSE) Button.
3. Press the ■ (STOP/POWER OFF) Button once.
4. An automatic adjustment result is displayed on the LCD.

### Display of automatic adjustment results (Self-Check Function)

LCD Display



4 bits (TGC, FGC, TBC, FBC) are displayed in hexadecimal system from 0~F.

<Example>	MSB				LSB	(Each bit ... TGC,FGC,TBC,FBC)
	TGC	FGC	TBC	FBC		
1)	0	0	0	0	⇒	"E - 0" is displayed. (All adjustments are OK.) ..... Normal
2)	0	0	0	1	⇒	"E - 1" is displayed. (OK) (OK) (OK) (NG) (Focus balance adjustment is NG (incorrect).)
3)	0	1	0	0	⇒	"E - 4" is displayed. (OK) (NG) (OK) (OK) (Focus gain adjustment is NG.)
4)	1	1	1	1	⇒	"E - F" is displayed. (All adjustments is NG.)
5)	1	0	0	0	⇒	"E - 8" is displayed. (NG) (OK) (OK) (OK) (Tracking gain adjustment is NG.)

**Note:** If any other disc than the test disc (SZZP1054C) is used, an "E - 8" may be displayed.

#### <Example> Follow the below steps when "E - 1" is displayed.

(Cause: Focus balance (FBC) is set beyond the limit.)

##### • Check if

- (1) the waveform or voltage of the focus servo circuit is correct, and
- (2) the optical pickup returns to the normal state by exchanging the traverse deck.

#### Follow the below steps when "E - 4" is displayed.

(Cause: Focus gain (FGC) 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 15 ohms), and
- (3) the optical pickup returns to the normal state by exchanging the traverse deck.

#### Follow the below steps when "E - F" is displayed.

(Cause: All adjustments (TGC,FGC,TBC,FBC) are set beyond the limit.)

##### • Check if

- (1) the optical pickup returns to the normal state by exchanging the traverse deck, and
- (2) the waveform or voltage of the servo IC's (IC101,501) are correct.

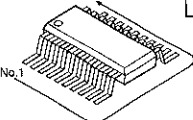
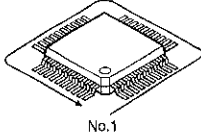
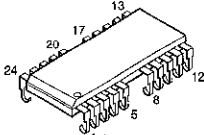
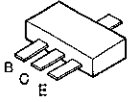
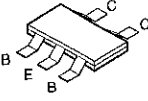
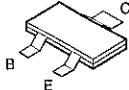
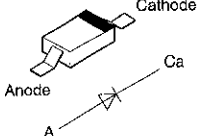
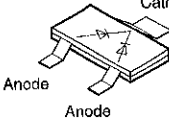
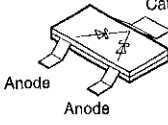
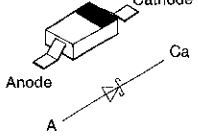
##### **Note:**

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.

## ■ Type Illustration of IC's, Transistor and Diodes

 <table border="1" data-bbox="309 181 552 282"> <tr><td>AN8746SAE1</td><td>32PIN</td></tr> <tr><td>AN8839NSBE1</td><td>28PIN</td></tr> <tr><td>NJU7082BVTE1</td><td>8PIN</td></tr> <tr><td>RS10002E2</td><td>40PIN</td></tr> </table>	AN8746SAE1	32PIN	AN8839NSBE1	28PIN	NJU7082BVTE1	8PIN	RS10002E2	40PIN	<table border="1" data-bbox="762 174 999 230"> <tr><td>SC502171CPB</td><td>52PIN</td></tr> <tr><td>MN662782RPT1</td><td>80PIN</td></tr> </table> 	SC502171CPB	52PIN	MN662782RPT1	80PIN		
AN8746SAE1	32PIN														
AN8839NSBE1	28PIN														
NJU7082BVTE1	8PIN														
RS10002E2	40PIN														
SC502171CPB	52PIN														
MN662782RPT1	80PIN														
<p>XN1210TX XN1215TX</p> 	<p>MSB709RST1 2SD1328TX DTA114YUA106</p> 	<p>MA111TX</p> 	<p>MA142WKTX</p> 	<p>MA741WKTX</p> 	<p>MA1070400L</p> 										

## ■ Schematic Diagram

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

### Notes:

- S201 : Laser ON/OFF switch in "OFF" position.  
(It turns "ON" with disc holder closed.)
- S202 : Rest detector switch in "OFF" position.  
(It turns "ON" when optical pickup comes to innermost periphery.)
- S301 : Play/pause (▶ ||) switch.
- S302 : Stop/power off (■ POWER OFF) switch.
- S303, 304: Skip/search (S303:▶▶,▶▶ S304:◀◀,◀◀) switches.
- S305 : Repeat (REP) switch.
- S306 : Memory/recall (MEMORY/RECALL) switch.
- S307 : S-XBS Selector (S-XBS) switch.
- S308 : Anti-shock (A.SHOCK) switch.
- S309 : Play mode selector (MODE) in "NORMAL" position.  
(RANDOM↔NORMAL↔RESUME)
- S310 : Hold (HOLD) switch in "OFF" position.
- VR11 : Power supply voltage adjustment VR.
- VR701-1, VR701-2: Volume control VR.

- 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 (1kHz, L+R, 0 dB) in play mode, and the other, for no disc in stop mode.
- AC adaptor is used for power supply.
- Signal line
  - ➡ : Positive voltage line.
  - ➡ : Audio signal line.
- Important safety notice:  
Components identified by ⚠ mark have special characteristics important for safety. Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used. When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.

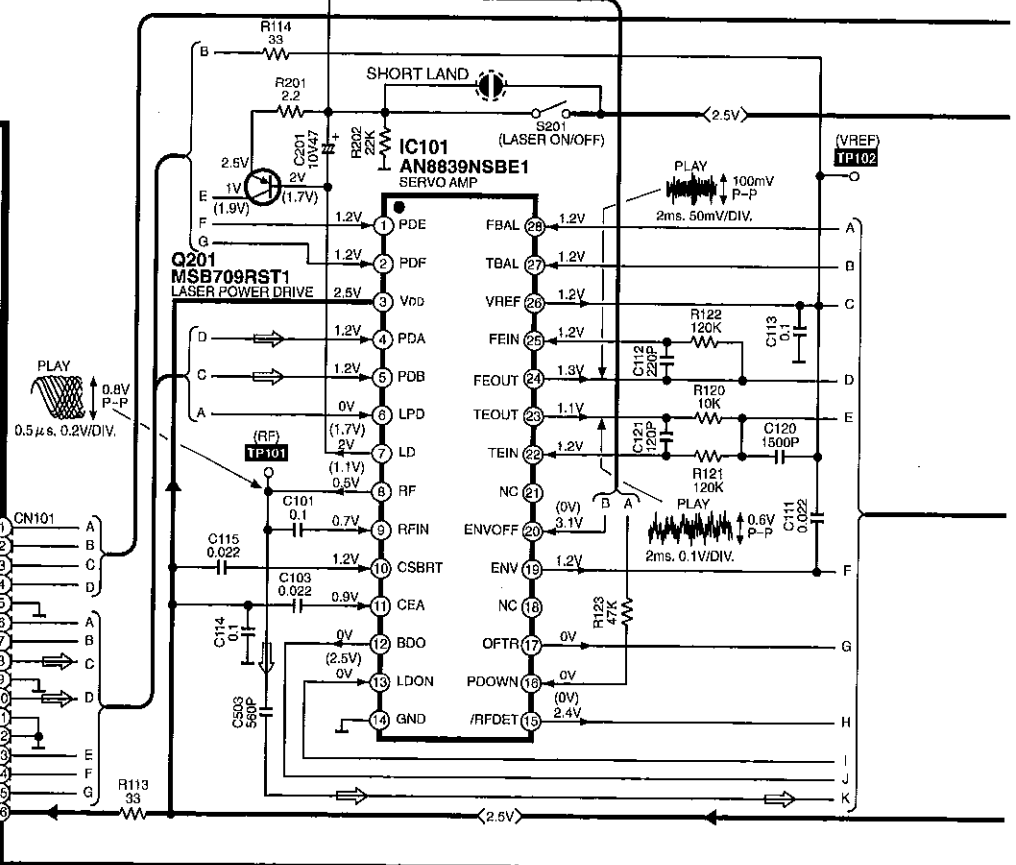
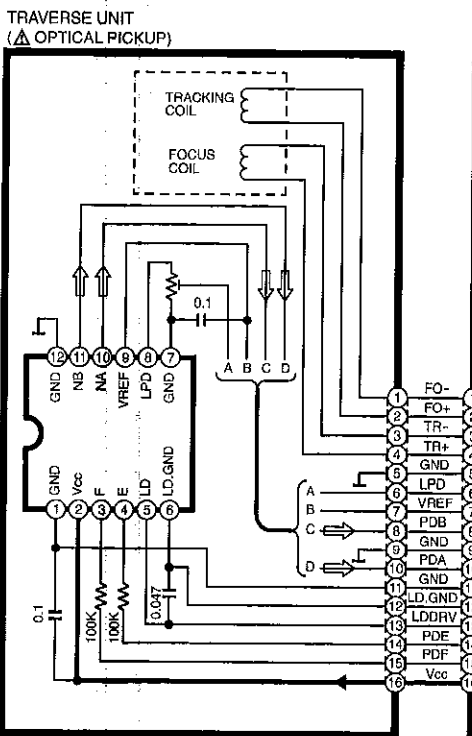
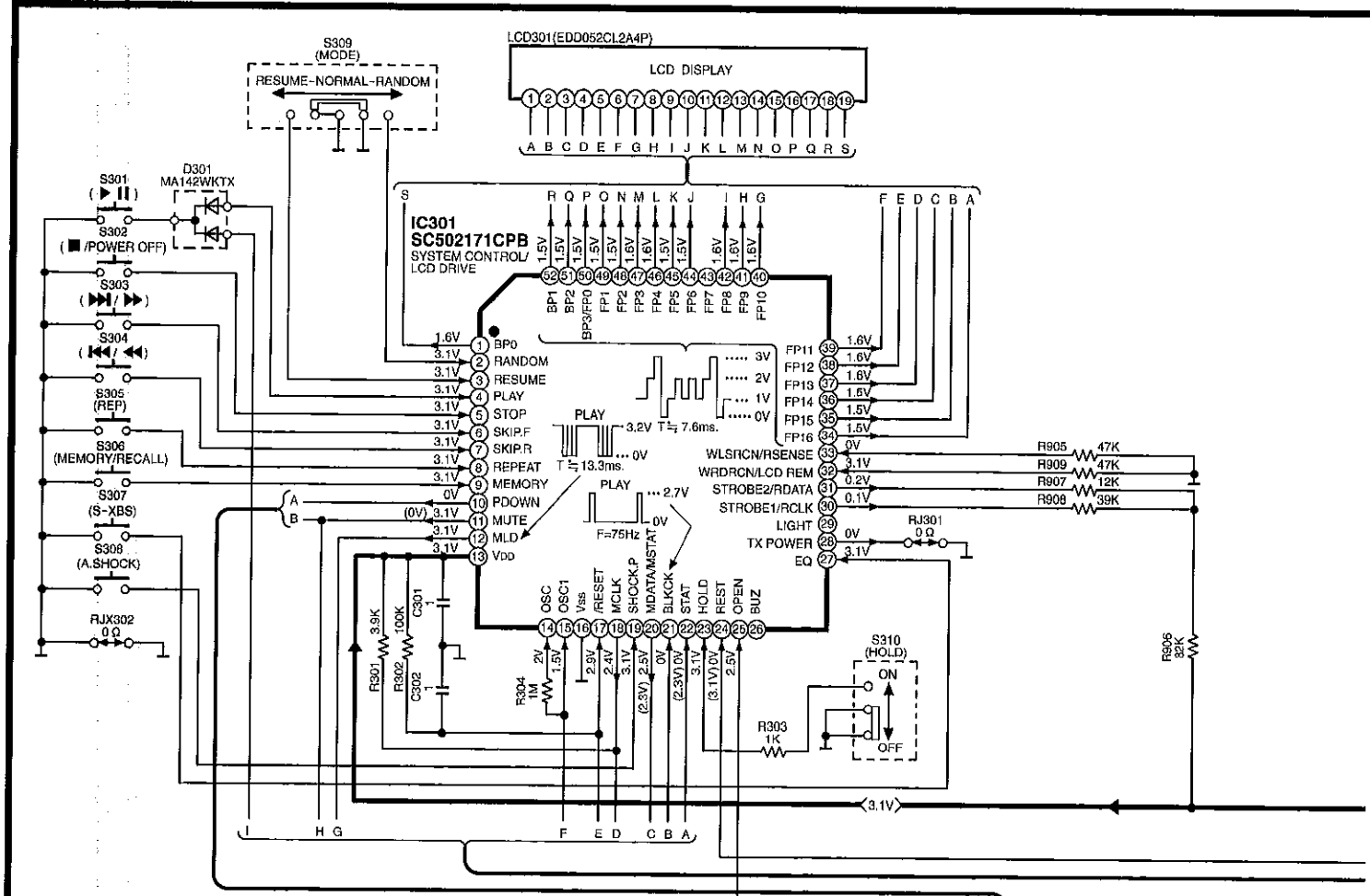
### Caution!

IC and LSI are sensitive to static electricity.

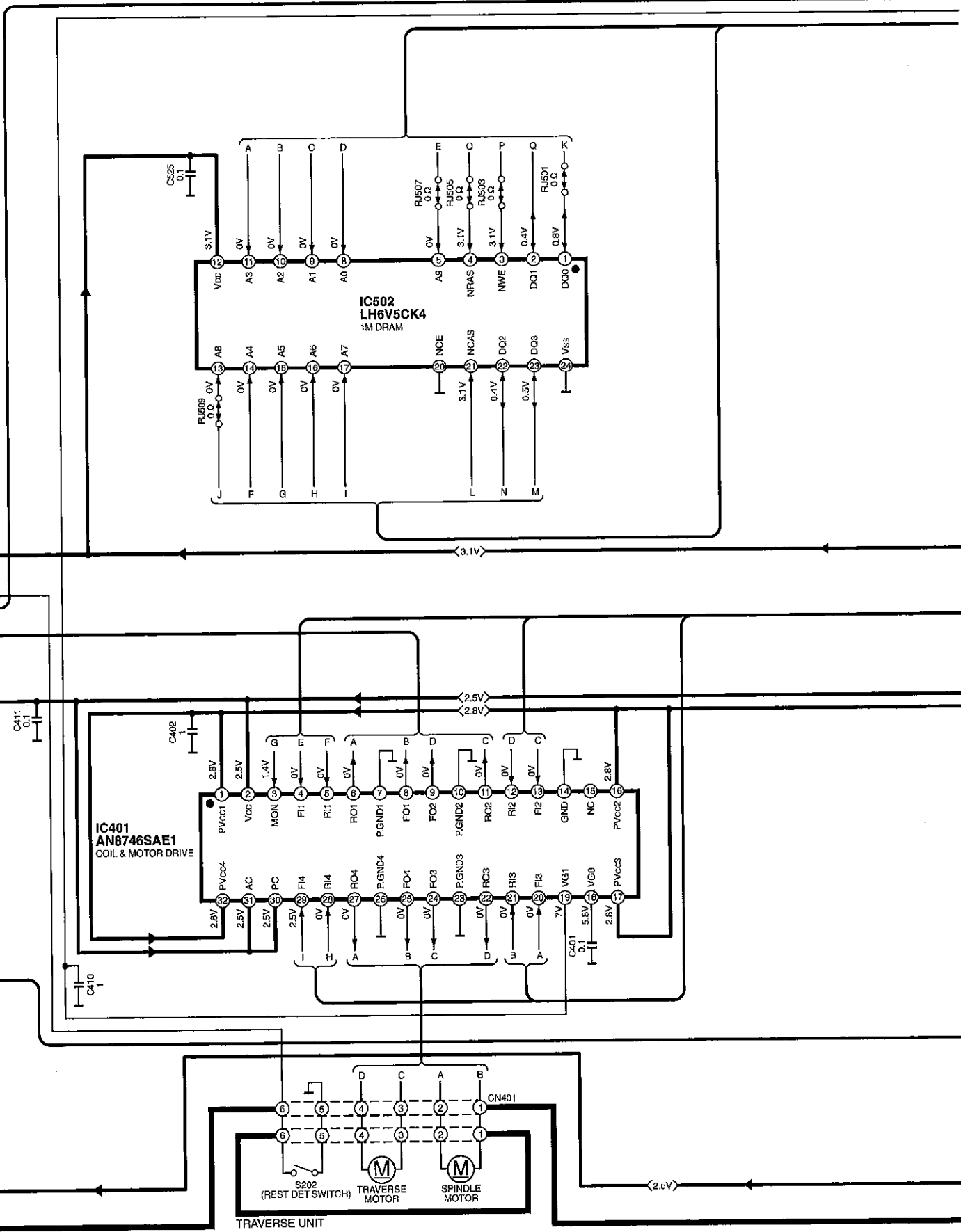
Secondary trouble can be prevented by taking care during repair.

- 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.

→ POSITIVE VOLTAGE LINE    ⇨ AUDIO SIGNAL LINE

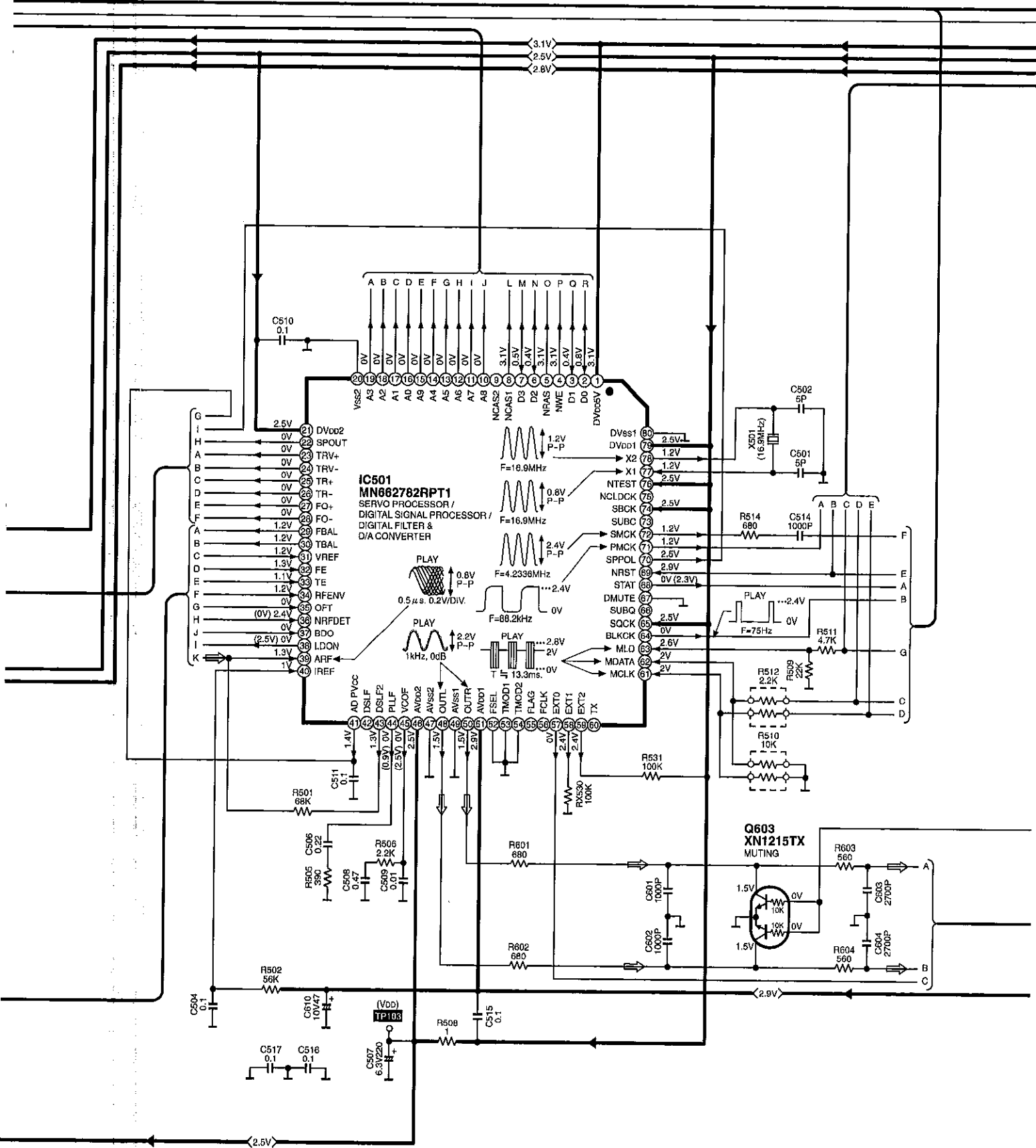


→ POSITIVE VOLTAGE LINE

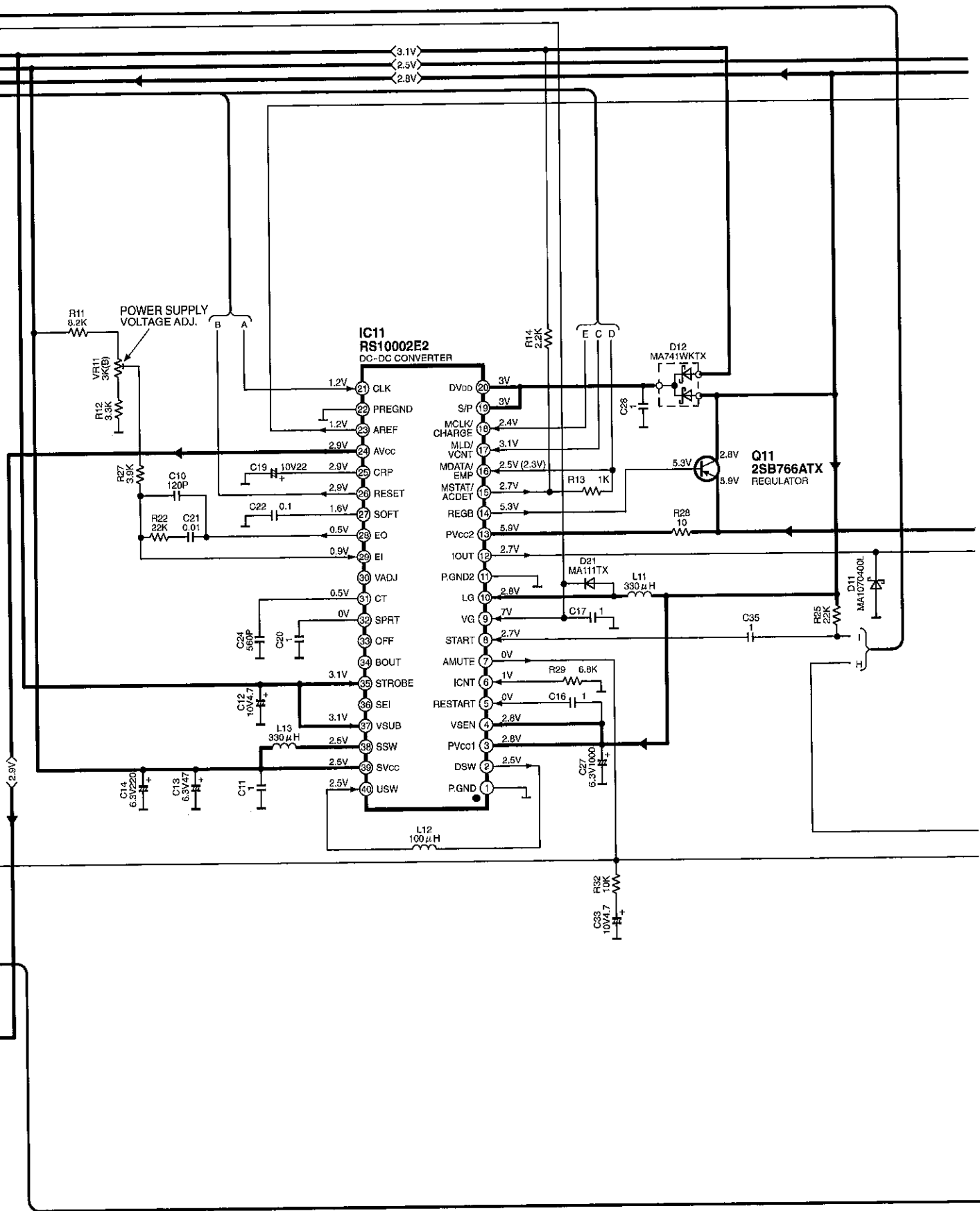


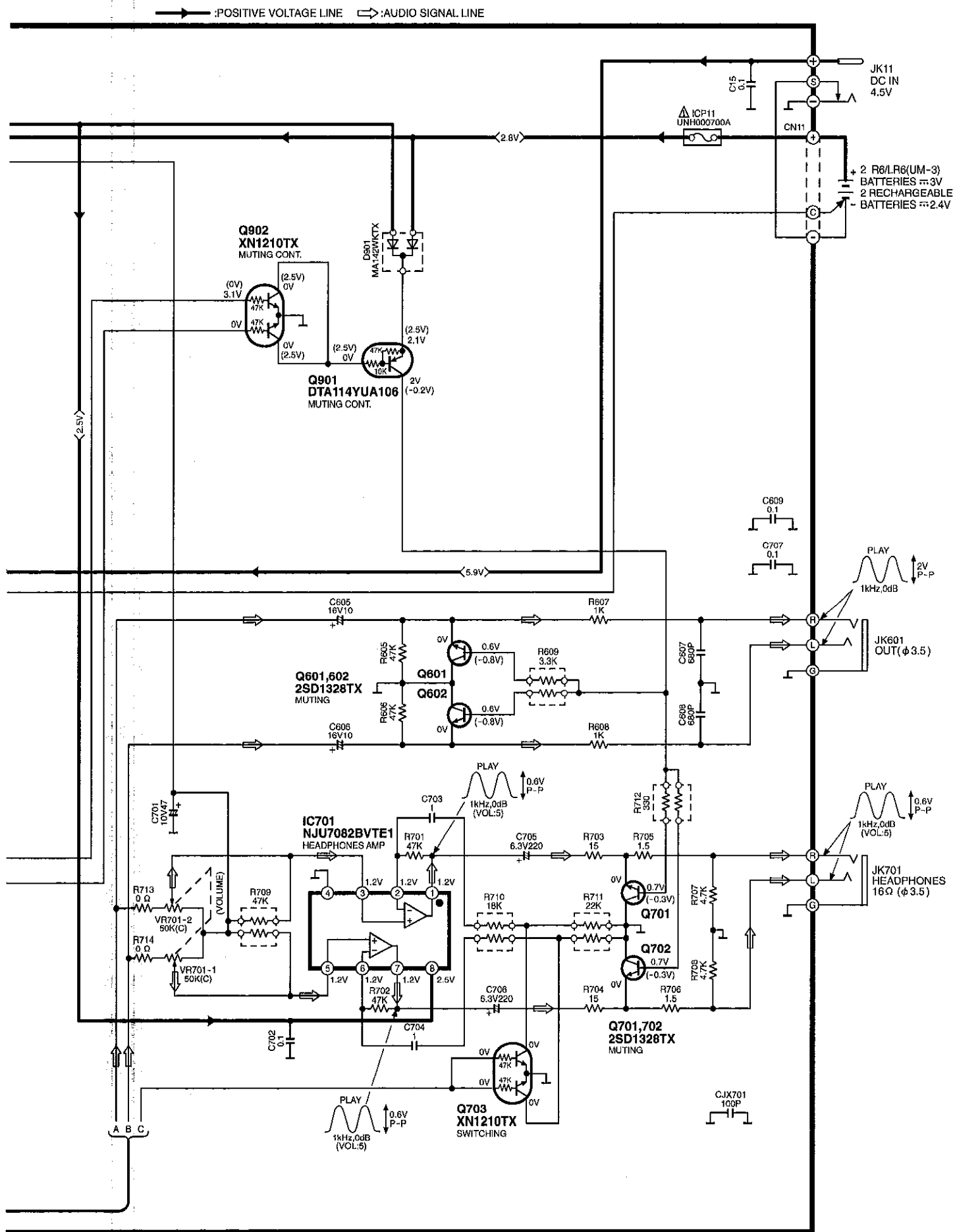


→ : POSITIVE VOLTAGE LINE ⇨ : AUDIO SIGNAL LINE



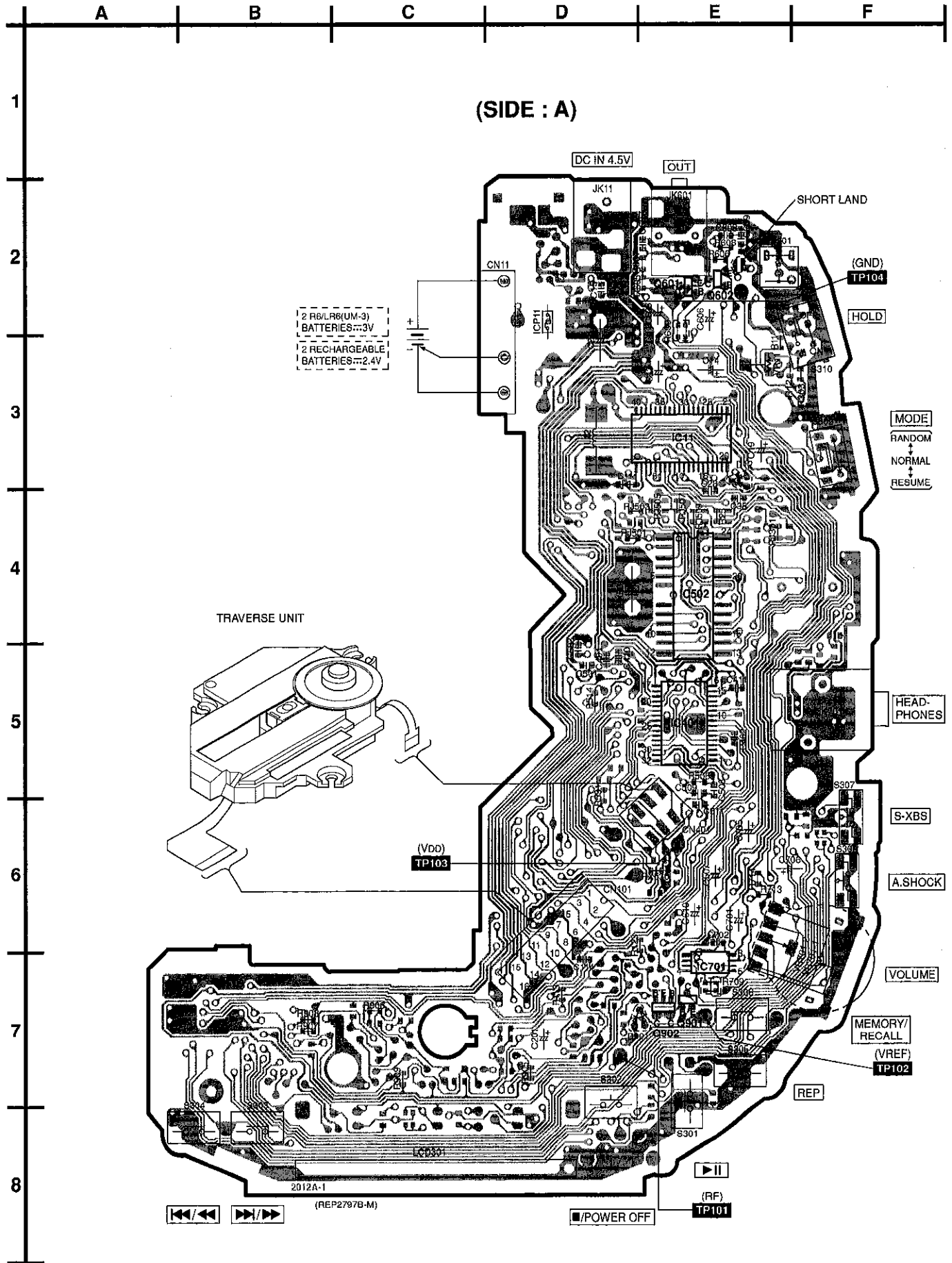
→ POSITIVE VOLTAGE LINE



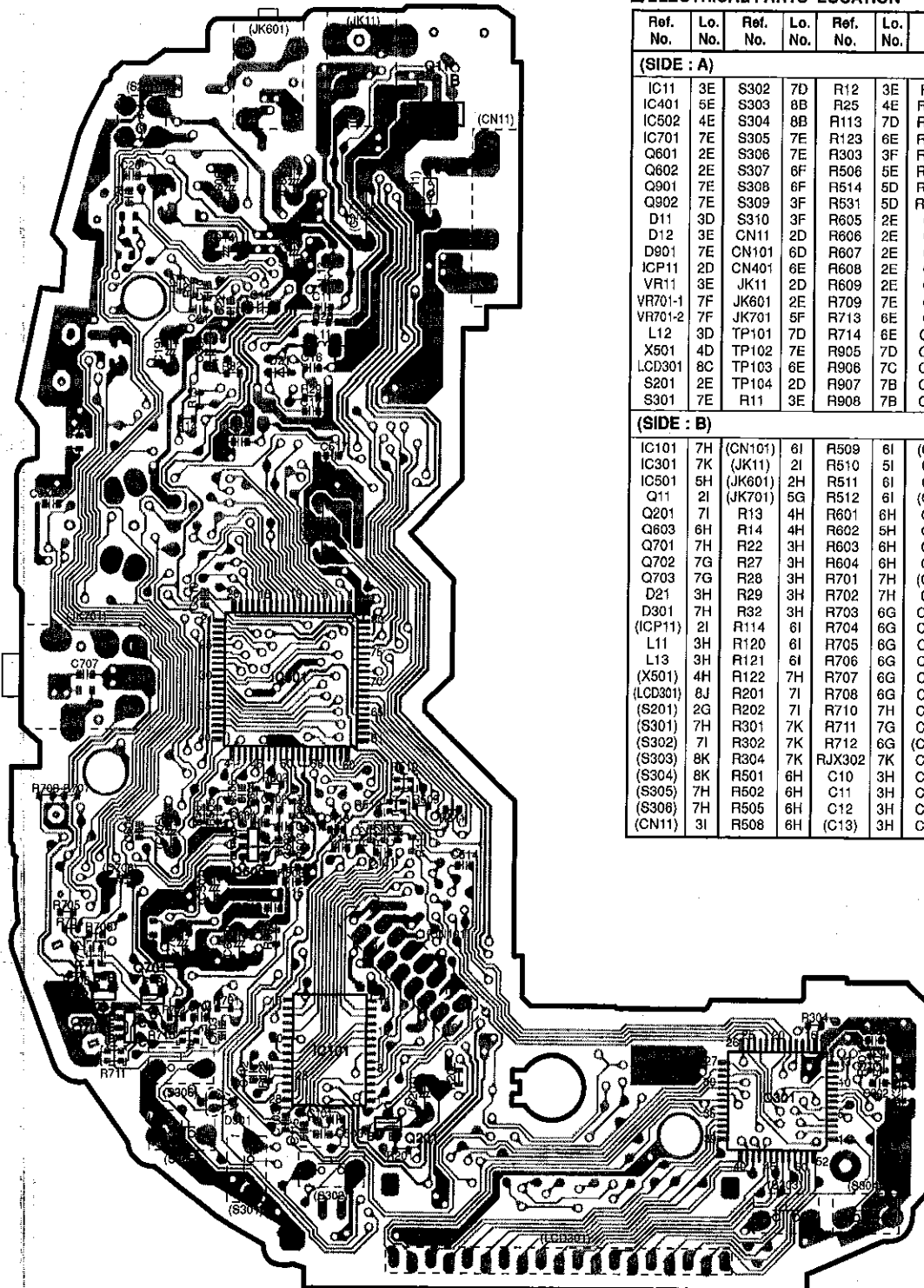


# Printed Circuit Board and Wiring Connection Diagram

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



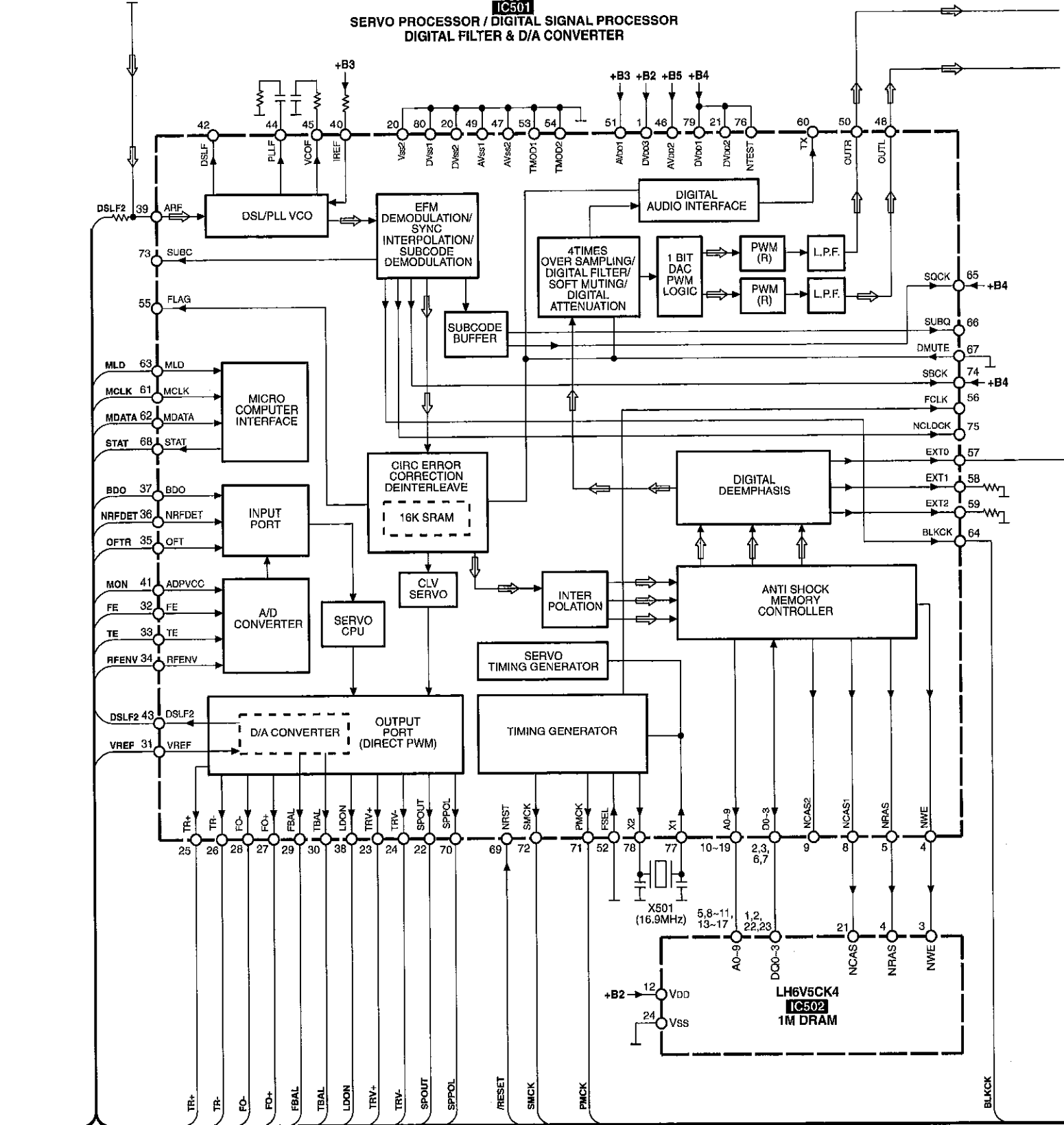
(SIDE : B)

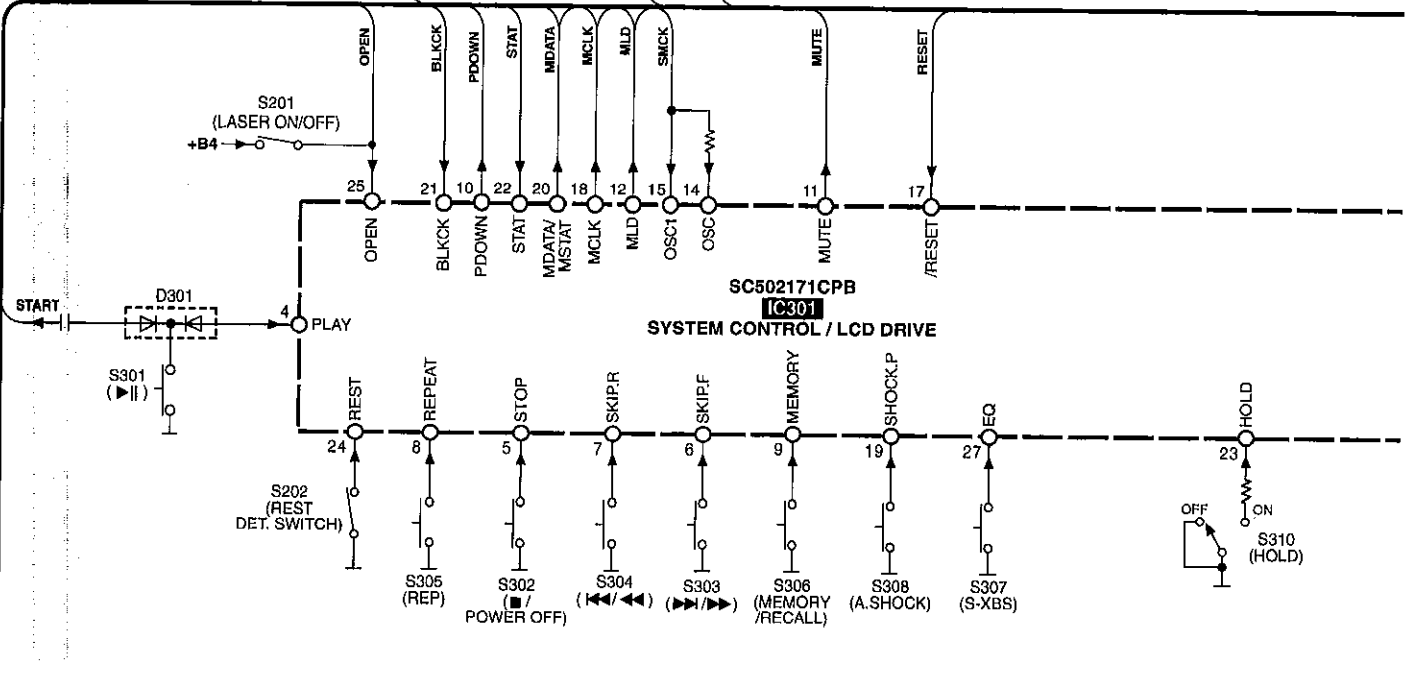
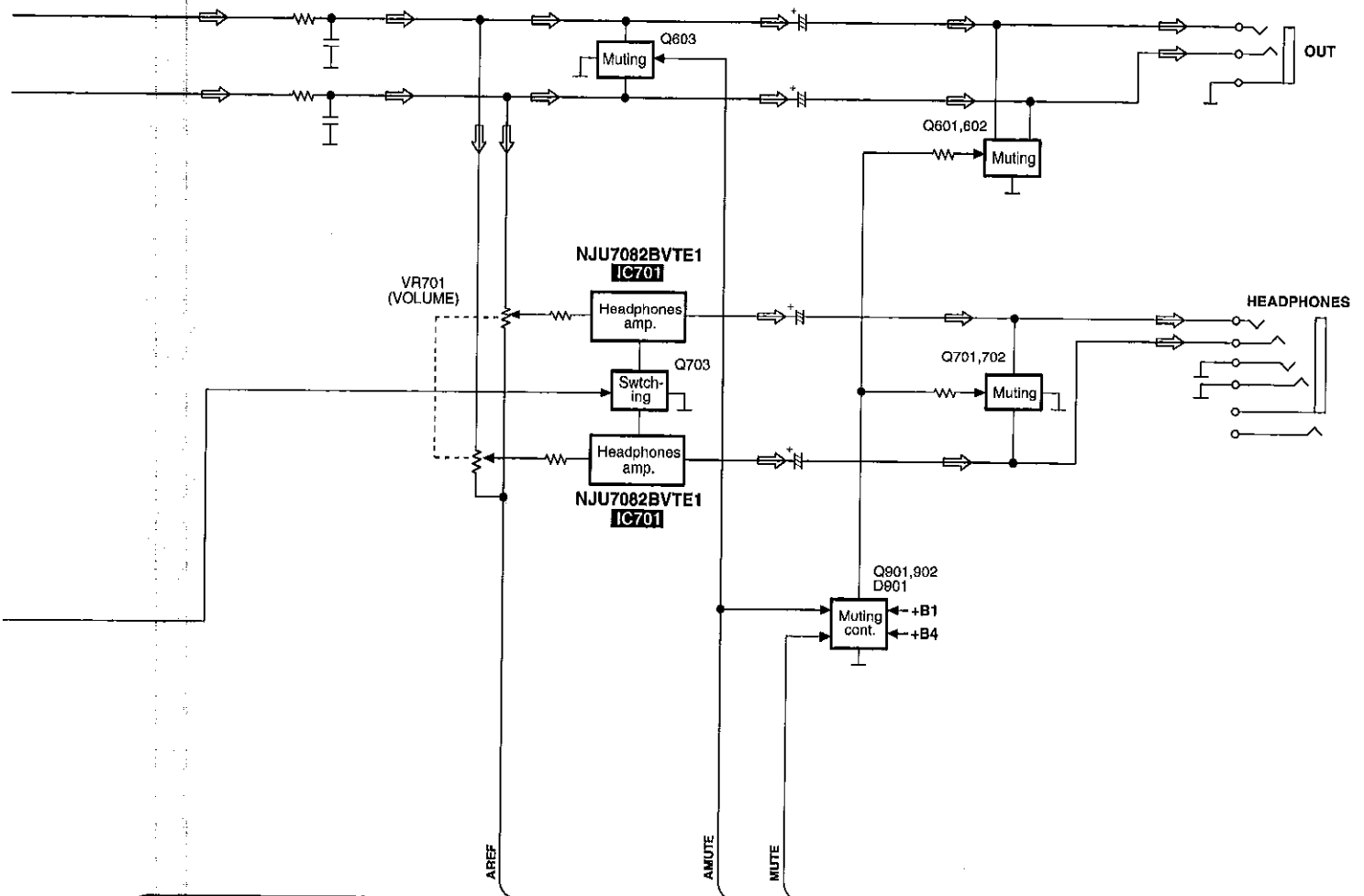


■ ELECTRICAL PARTS LOCATION

Ref. No.	Lo. No.	Ref. No.	Lo. No.	Ref. No.	Lo. No.	Ref. No.	Lo. No.	Ref. No.	Lo. No.
<b>(SIDE : A)</b>									
IC11	3E	S302	7D	R12	3E	R909	7C	C411	5E
IC401	5E	S303	8B	R25	4E	RJ301	4E	C501	5D
IC502	4E	S304	8B	R113	7D	RJ503	4D	C502	5D
IC701	7E	S305	7E	R123	6E	RJ503	4D	C507	6E
Q601	2E	S306	7E	R303	3F	RJ505	4E	C508	5E
Q602	2E	S307	6F	R506	5E	RJ507	4E	C509	5E
Q901	7E	S308	6F	R514	5D	RJ609	4E	C511	6E
Q302	7E	S309	3F	R531	5D	RX530	6E	C605	2E
D11	3D	S310	3F	R605	2E	C13	3E	C606	2E
D12	3E	CN11	2D	R606	2E	C14	3E	C607	2E
D901	7E	CN101	6D	R607	2E	C15	2D	C608	2E
ICP11	2D	CN401	6E	R608	2E	C19	3E	C609	2E
VR11	3E	JK11	2D	R609	2E	C27	3D	C610	6E
VR701-1	7F	JK601	2E	R709	7E	C28	4E	C701	6E
VR701-2	7F	JK701	5F	R713	6E	C35	4E	C702	6E
L12	3D	TP101	7D	R714	6E	C114	7D	C705	6E
X501	4D	TP102	7E	R905	7D	C201	7D	C706	6E
LCD301	8C	TP103	6E	R906	7C	C401	5D		
S201	2E	TP104	2D	R907	7B	C402	5E		
S301	7E	R11	3E	R908	7B	C410	5D		
<b>(SIDE : B)</b>									
IC101	7H	(CN101)	6I	R509	6I	(C14)	3H	(C507)	6H
IC301	7K	(JK11)	2I	R510	5I	C16	3H	C510	5H
IC501	5H	(JK601)	2H	R511	6I	C17	4H	C514	6I
Q11	2I	(JK701)	5G	R512	6I	(C19)	3H	C515	6H
Q201	7I	R13	4H	R601	6H	C20	2G	C516	6H
Q603	6H	R14	4H	R602	5H	C21	3H	C517	4H
Q701	7H	R22	3H	R603	6H	C22	3H	C525	4H
Q702	7G	R27	3H	R604	6H	C24	2G	C601	6H
Q703	7G	R28	3H	R701	7H	(C27)	3I	C602	6H
D21	3H	R29	3H	R702	7H	C33	3H	C603	6H
D301	7H	R32	3H	R703	6G	C101	7I	C604	6H
(ICP11)	2I	R114	6I	R704	6G	C103	7H	(C605)	2H
L11	3H	R120	6I	R705	6G	C111	6I	(C606)	2H
L13	3H	R121	6I	R706	6G	C112	7H	(C610)	6H
(X501)	4H	R122	7H	R707	6G	C113	6I	(C701)	6H
(LCD301)	8J	R201	7I	R708	6G	C115	7H	C703	7H
(S201)	2G	R202	7I	R710	7H	C120	6I	C704	7H
(S301)	7H	R301	7K	R711	7G	C121	6I	(C705)	6H
(S302)	7I	R302	7K	R712	6G	(C201)	7I	(C706)	6G
(S303)	8K	R304	7K	RJX302	7K	C301	7K	C707	5G
(S304)	8K	R501	6H	C10	3H	C302	7K	CJX701	4G
(S305)	7H	R502	6H	C11	3H	C503	7H		
(S306)	7H	R505	6H	C12	3H	C504	6H		
(CN11)	3I	R508	6H	(C13)	3H	C506	6H		

MN662782RPT1  
**IC501**  
 SERVO PROCESSOR / DIGITAL SIGNAL PROCESSOR  
 DIGITAL FILTER & D/A CONVERTER





## ● IC101 (AN8839NSBE1): Servo Amp

Pin No.	Terminal Name	I/O	Function
1	PDE	I	Tracking signal input terminal (1)
2	PDF	I	Tracking signal input terminal (2)
3	V <sub>DD</sub>	I	Power supply terminal
4	PDA	I	Focus signal input terminal (1)
5	PDB	I	Focus signal input terminal (2)
6	LPD	I	APC amp input terminal
7	LD	O	APC amp output terminal
8	RF	O	RF summing output terminal
9	RF IN	I	RF signal input terminal
10	CSBRT	I	Capacitor connection terminal for OFTR
11	CEA	I	Capacitor connection terminal for H.P.F. amp
12	BDO	O	Dropout signal output terminal ("H" : Dropout)
13	LDON	I	APC control input terminal
14	GND	-	GND terminal

Pin No.	Terminal Name	I/O	Function
15	/RFDET	O	RF det. signal output terminal ("L" : Det.)
16	PDOWN	O	Power down input terminal
17	OFTR	O	Off track signal output terminal ("H" : Off track)
18	NC	-	Not used, open
19	ENV	O	RF envelope signal output terminal
20	ENVOFF	I	ENV control input terminal
21	NC	-	Not used, open
22	TEIN	I	Tracking error amp input terminal
23	TEOUT	O	Tracking error amp output terminal
24	FEOUT	O	Focus error amp output terminal
25	FEIN	I	Focus error amp input terminal
26	VREF	O	Reference voltage output terminal
27	TBAL	I	Tracking balance signal input terminal
28	FBAL	I	Focus balance signal input terminal

## ● IC501 (MN662782RPT1): Servo Processor / Digital Signal Processor / Digital Filter / D/A Converter

Pin No.	Terminal Name	I/O	Function
1	DV <sub>DD</sub> 5V	I	Power supply terminal
2	D0	I/O	Data 0 input/output terminal
3	D1	I/O	Data 1 input/output terminal
4	NWE	O	Write enable output terminal
5	NRAS	O	RAS control signal output terminal
6	D2	I/O	Data 2 input/output terminal
7	D3	I/O	Data 3 input/output terminal
8	NCAS1	O	CAS control 1 signal output terminal
9	NCAS2	O	Address 10 signal output terminal

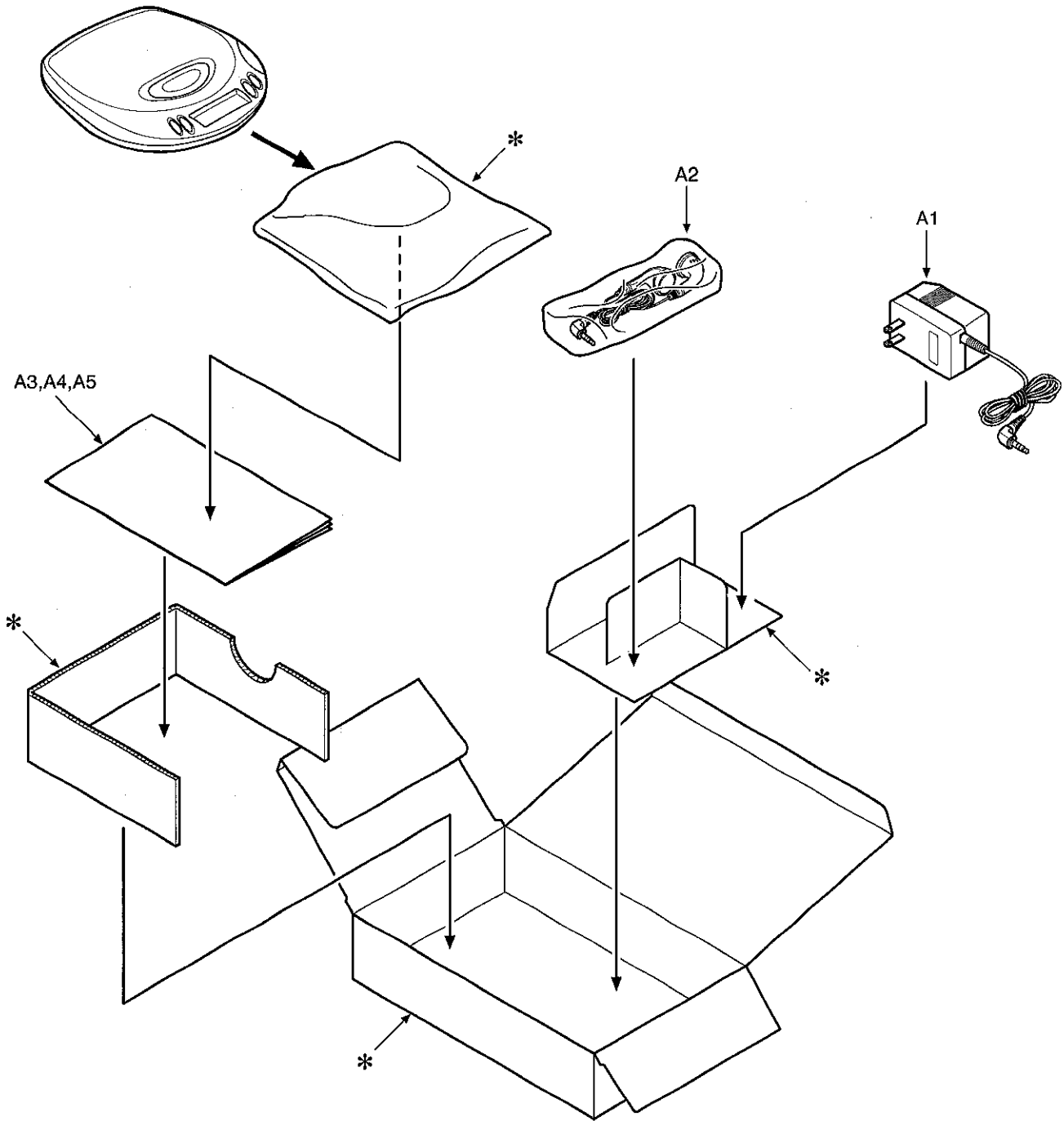
Pin No.	Terminal Name	I/O	Function
10	A8	O	Address 8 ~ 4 output terminal
14	A4		
15	A9	O	Address 9 output terminal
16	A0	O	Address 0 ~ 3 output terminal
19	A3		
20	V <sub>SS</sub> 2		
21	DV <sub>DD</sub> 2	I	Power supply terminal
22	SPOUT	O	Spindle motor drive output terminal
23	TRV+	O	Traverse motor drive output terminal



Pin No.	Terminal Name	I/O	Function
24	TRV-	O	Traverse motor drive output terminal
25	TR+	O	Tracking coil drive output terminal
26	TR-	O	Tracking coil drive output terminal
27	F $\Phi$ +	O	Focus coil drive output terminal
28	F $\Phi$ -	O	Focus coil drive output terminal
29	FBAL	O	Focus balance adj. output terminal
30	TBAL	O	Tracking balance adj. output terminal
31	VREF	I	Reference voltage input terminal
32	FE	I	Focus error signal input terminal
33	TE	I	Tracking error signal input terminal
34	RFENV	I	RF envelope signal input terminal
35	OFT	I	OFF track signal input terminal ("H" : off track)
36	NRFDET	I	RF detect signal input terminal ("L" : detect)
37	BDO	I	Drop out signal input terminal ("H" : drop out)
38	LDON	O	Laser on signal output terminal ("H" : ON)
39	ARF	I	RF signal input terminal
40	IREF	I	Reference current input terminal
41	AD PVcc	O	A/D converter reference voltage output
42	DSL $\bar{F}$	-	DSL loop filter output terminal (Not used, open)
43	DSL $\bar{F}$ 2	O	DSL unbalance current correction output terminal
44	PLL $\bar{F}$	O	PLL loop filter output terminal
45	VCOF	O	Loop filter output terminal
46	AV $\Phi$ p2	I	Power supply terminal
47	AV $\Phi$ s2	-	GND terminal
48	OUTL	O	Audio Lch output terminal
49	AV $\Phi$ s1	-	GND terminal
50	OUTR	O	Audio Rch output terminal
51	AV $\Phi$ p1	I	Power supply terminal
52	FSEL	-	Noise filter select terminal ("H" : ON, "L" : OFF)

Pin No.	Terminal Name	I/O	Function
53	TMOD1	-	Terminal mode select 1 terminal ("L" : normal)
54	TMOD2	-	Terminal mode select 2 terminal ("L" : normal)
55	FLAG	-	Flag signal output terminal (Not used, open)
56	FCLK	-	Frame clock signal output terminal (Not used, open)
57	EXT0	O	Expansion port 0 output terminal
58	EXT1	O	Expansion port 1 output terminal
59	EXT2	O	Expansion port 2 output terminal
60	TX	-	Digital audio interface signal output terminal (Not used, open)
61	MCLK	I	Micon command clock signal input terminal
62	MDATA	I	Micon command data input terminal
63	MLD	I	Micon command load signal input terminal ("L" : load)
64	BLKCK	O	Sub code block clock signal output terminal (fBLKCK=75kHz)
65	SQCK	I	Sub code Q resistor clock input terminal
66	SUBQ	-	Sub code Q data output terminal (Not used, open)
67	DMUTE	I	Muting input terminal ("H" : mute)
68	STAT	O	Status signal output terminal (RESY,CLVS,NTTSTOP,SQCK,FLAG6,SENSE,NTLOCK,BSEL,SUBQ DATA,CD TEXT DATA,ANTISHOCK LOAD DATA)
69	NRST	I	Reset input terminal ("L" : reset)
70	SPPOL	O	Spindle motor drive signal output
71	PMCK	O	Clock signal output terminal (88.2kHz)
72	SMCK	O	Clock signal output terminal (4.2336MHz)
73	SUBC	-	Sub code output terminal (Not used, open)
74	SBCK	I	Sub code output clock input terminal
75	NCLDCK	-	Sub code frame clock output terminal (fCLOCK=7.35kHz) (Not used, open)
76	NTEST	I	Test terminal ("H" : normal)
77	X1	I	Crystal oscillator input terminal (f=16.9344MHz)
78	X2	O	Crystal oscillator output terminal (f=16.9344MHz)
79	DV $\Phi$ p1	I	Power supply terminal
80	DV $\Phi$ s1	-	GND terminal

# ■ Packaging



Note : We do not supply those items of parts marked \*.

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
△ A1	RFEA401E-3S	AC ADAPTOR	1	(EG)
△ A1	RFEA403B-S	AC ADAPTOR	1	(EB)
A2	RFEV324P-KS	INSIDEPHONE	1	
A3	RQA0117	WARRANTY CARD	1	
A4	RQCB0169	SERVICE CENTER LIST	1	
A5	RQT4822-E	OPERATING INSTRUCTIONS	1	(EG) <IA>
A5	RQT4826-B	OPERATING INSTRUCTIONS	1	(EB) <IB>
A5	RQT4824-H	OPERATING INSTRUCTIONS	1	(EG) <IC>