

# Service Manual

Portable CD Player

SL-S450

**COMPACT**  
**disc**  
**DIGITAL AUDIO**
**MASH**<sup>※</sup>  
 multi-stage noise shaping

※ • MASH is a trademark of NTT.


**Colour** (A)... Blue Type  
 (H)... Gray Type  
 (S)... Silver Type

**Area**  
 SG ..... Tourist

## Traverse Deck: RAE0142Z Mechanism Series Specifications

### Audio

|                         |                                                                   |
|-------------------------|-------------------------------------------------------------------|
| No. of channels:        | 2 channels (left and right, stereo)                               |
| Output voltage:         | 0.6 V (50 kohm) diameter 3.5 stereo mini jack                     |
| Frequency response:     | 20~20,000 Hz (+0.5 dB, -1.5 dB)                                   |
| S/N:                    | more than 96 dB*                                                  |
| Wow and flutter:        | Below measurable limit                                            |
| DA converter:           | 1 bit, MASH <sup>※</sup>                                          |
| Headphone output level: | max. 9 mW+9 mW/16 ohm (variable)<br>stereo mini jack diameter 3.5 |
| Digital filter:         | 8 times over sampling                                             |

### Signal Format

|                    |                                          |
|--------------------|------------------------------------------|
| Correction system: | Technics New<br>Super Decoding Algorithm |
|--------------------|------------------------------------------|

### Pickup

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

### Playing time

(When used in hold mode, at 25 degree temperature and on flat and stable surface.)

Batteries used: X-DSSP OFF/ON

|                                                                                                          |                        |
|----------------------------------------------------------------------------------------------------------|------------------------|
| Panasonic Alkaline dry cell batteries (LR6, 2pcs.)                                                       | : Approx. 20h / 13h    |
| Rechargeable batteries (When rechargeable 3 hours.)                                                      | : Approx. 10.5h / 6.5h |
| Panasonic Alkaline dry cell batteries (LR6, 4pcs.)                                                       | : Approx. 45h / 30h    |
| Rechargeable batteries (When rechargeable 3 hours.) + Panasonic Alkaline dry cell batteries (LR6, 2pcs.) | : Approx. 30h / 20h    |

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

### General

|                                  |                                                 |
|----------------------------------|-------------------------------------------------|
| Operation temperature range:     | 0—40 degree                                     |
| Rechargeable temperature range:  | 5—40 degree                                     |
| Power supply:                    | DC 4.5 V                                        |
| Power consumption(X-DSSP OFF/ON) |                                                 |
| AC adaptor:                      | 2.8W/3.2W                                       |
| Battery (DC 3V):                 | 0.35W/0.4W                                      |
| When recharging:                 | 5.9W                                            |
| Dimensions :                     | 128(Wide)/25.7(High)/142(Depth)mm               |
| Weight:                          | 230 g without batteries<br>275 g with batteries |

\* These specifications were measured in the X-DSSP OFF mode.

Note: 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 protect the user. Products powered by electricity should be handled by qualified professional technicians. Any attempt to service or repair the product or products without proper training and experience could result in serious injury or death.

**Panasonic**

**Panasonic/Technics**

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## Precaution of Laser Diode

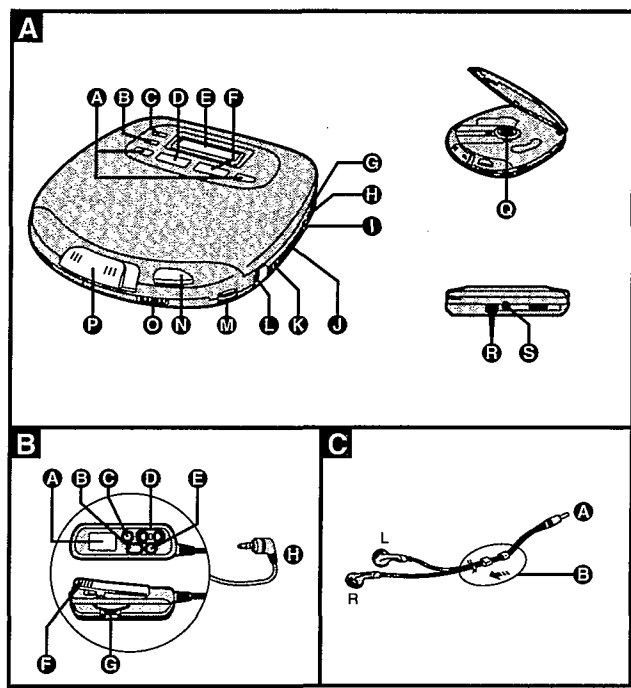
**CAUTION:** This unit utilizes a class 1 laser. Invisible laser radiation is emitted from the optical pickup lens when the unit is turned on :

1. Do not look directly into the pickup lens.
2. Do not use optical instruments to look at the pickup lens.
3. Do not adjust the preset variable resistor on the optical pickup.
4. Do not disassemble the optical pickup unit.
5. If the optical pickup is replaced, use the manufactures specified replacement pickup only.
6. Use of control or adjustments or performance of procedures other than those specified herin may result in hazardous radiation exposure.

## Accessories

- |                                 |       |                                    |       |
|---------------------------------|-------|------------------------------------|-------|
| • AC adaptor .....              | 1 pc. | • Soft case .....                  | 1 pc. |
| (REFA403Z-S)                    |       | (RFC0041-K)                        |       |
| • Stereo earphones .....        | 1 pc. | • Battery case .....               | 1 pc. |
| (RFEV316P-K1S)                  |       | (RFA0627-K4)                       |       |
| • Wired remote controller ..... | 1 pc. | • Rechargeable battery Ass'y ..... | 1 pc. |
| (RFEV006PCKM)                   |       | (RFKFP3GAVT2S)                     |       |
| • Plug adaptor .....            | 1 pc. | • Battery carrying case .....      | 1 pc. |
| (SJP5213-2)                     |       | (RFKNLS370-K)                      |       |

## Location of Controls



### Portable CD player A

- A Skip/search buttons (◀, ▶, ⏮, ⏭)
- B Memory/recall button (MEMORY/RECALL)
- C Repeat button (REPEAT)
- D Stop/power off button (■, POWER OFF)
- E Display
- F Play/pause button (▶, ⏸)
- G DC in jack (DC IN 4.5 V ⏻)
- H Out jack (OUT)
- I Optical digital out jack (OPT OUT)
- J Play mode selector (RESUME, NORMAL, RANDOM)
- K Train/S-XBS selector (TRAIN, S-XBS, OFF)
- L Headphones jack (📶)
- M Headphones volume control (VOLUME)
- N Open button (OPEN)
- O Optical digital out/Extra digital sound shock protector switch (OPT OUT/X-DSSP)

- P Hold switch (HOLD-LOCK)
- Q Push button (PUSH)
- R Connection terminal for battery case
- S Hole for car mounting base/battery case

### Wired remote controller B

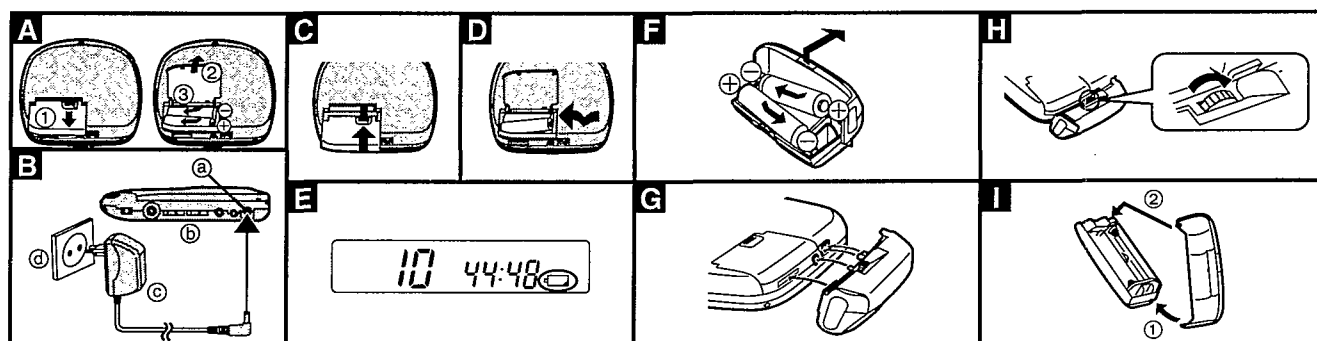
- A Display
- B Play/stop/off button
- C Repeat button (REPEAT)
- D Skip/search buttons (◀, ▶)
- E Light/hold button (•LIGHT/•HOLD)
- F Clip
- G Volume control
- H Plug

### Stereo earphones C

- A Plug
- B Slider

## Power Supply Preparations

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



### Using 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.

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

#### Recharging procedure

- 1 Insert the special rechargeable batteries into the unit.

A

- 2 Connect the AC adaptor. B

- ① DC IN jack (DC IN 4.5 V ⏻)
- ② Side panel of the unit
- ③ AC adaptor
- ④ AC power outlet

The configuration of the AC adaptor differs according to the area.

- 3 When recharging is complete, unplug the AC adaptor from the power outlet and the DC IN jack.

#### Notes

- It takes approximately three hours to fully recharge the supplied rechargeable batteries.
- 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.
- When recharging starts, the "48" charging indicator flashes on and off on the unit's display panel.
- 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.

### 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.

### Using the AC adaptor

Connect the AC adaptor supplied.

Refer to "Using rechargeable batteries" for connection instructions.

#### 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.

### Battery indicator E

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.

#### Notes

- 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 battery case

The battery case allows you to extend the maximum playing time of the unit by loading an additional two LR6 (UM-3) alkaline batteries.

### Notes

- When using the battery case, always insert batteries in the unit body as well. (The unit cannot be operated on the batteries in the external battery case alone.)
- Do not use rechargeable batteries in the battery case.
- If rechargeable batteries and dry-cell batteries are used together, make sure to use fully charged rechargeable batteries and new dry-cell batteries.
- When using four dry-cell batteries, do not mix new and old batteries.

**1 Open the cover of the battery case and insert the batteries.**

Insert the end marked (-) first.

**2 Mount the battery case on the unit body.**

Insert the protrusions on the battery case into the four indentations in the unit body.

**3 Secure in place with the screw.**

Reverse the above procedure to remove the external battery case.

### For your reference:

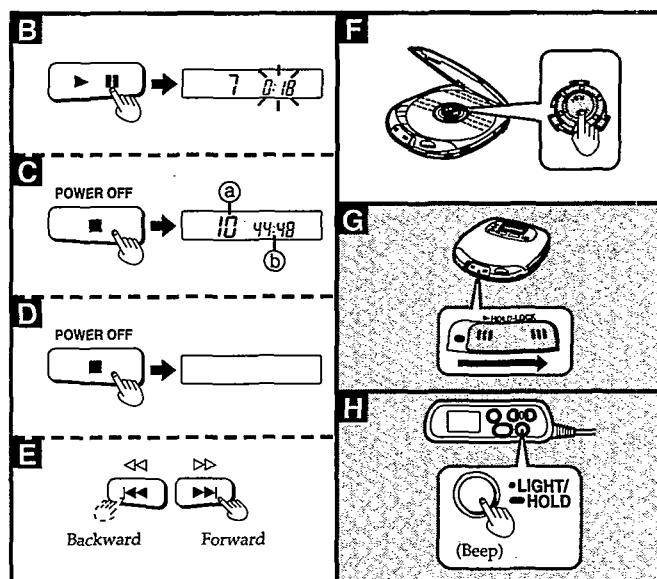
The maximum playing time will differ depending on the type of batteries (rechargeable/dry-cell) loaded in the unit body.

**If the cover of the battery case comes loose:**

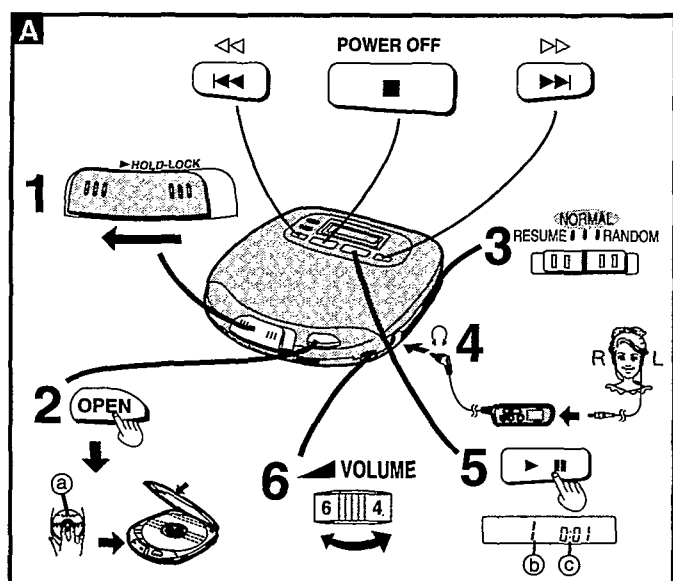
Insert the protrusions into the holes on either end of the lid.

## Using the car adaptor (not included)

Be sure to obtain the car adaptor (SH-CDC9), available as an optional accessory. The car adaptor can be used to recharge the unit's batteries while in the car.



## Sequential Play (Basic Play)



### Following steps 1-6.

- ① Label side up
- ② Track number in play
- ③ Elapsed playing time of each track
- Play stops automatically when all the tracks have been played.
- 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.

### To pause play

Press during play

### To stop play

Press during play

④ Total number of tracks

⑤ Total playing time

### To turn off the unit

Press during stop mode

### Skip forward/backward (skip function)

Press during play

### Rapid forward/backward (search function)

Press and hold during play.

- During program play (see page 5), these buttons are used to skip forward or back through the programmed sequence of tracks.
- During random play (see page 5), 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 (see page 5), search operation is limited to the current track only.

### Removing discs

After the disc has stopped rotating, press the PUSH button 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.

### "no disc" indication

This indication appears for about 30 seconds if the button is pressed when no disc is loaded in the unit or if the disc is not completely seated.

### "OPEN" 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.

## Accidental Operation Prevention Function

This function causes the unit to ignore short, accidental button presses. (When the unit is in hold status, the cover will not open even when the OPEN button is pressed.)

### The misoperation prevention 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 selection.
- The cover opening unexpectedly in the middle of a selection.

The unit body and remote control are equipped with a HOLD-LOCK slider and a HOLD button, respectively, and each operates independently of the other to activate hold status.

### To use the accidental operation prevention function

Slide the HOLD-LOCK slider on the unit body to the HOLD position. (The remote control still functions.)

Hold down the HOLD button on the remote control until the confirmation beep sounds. (The controls on the unit body still function.)

### "ho i d"/"HOLD" Indication

**Unit body:** When the unit is in hold status, pressing any operation button (other than the OPEN button) causes the indication "ho i d" to appear on the display.

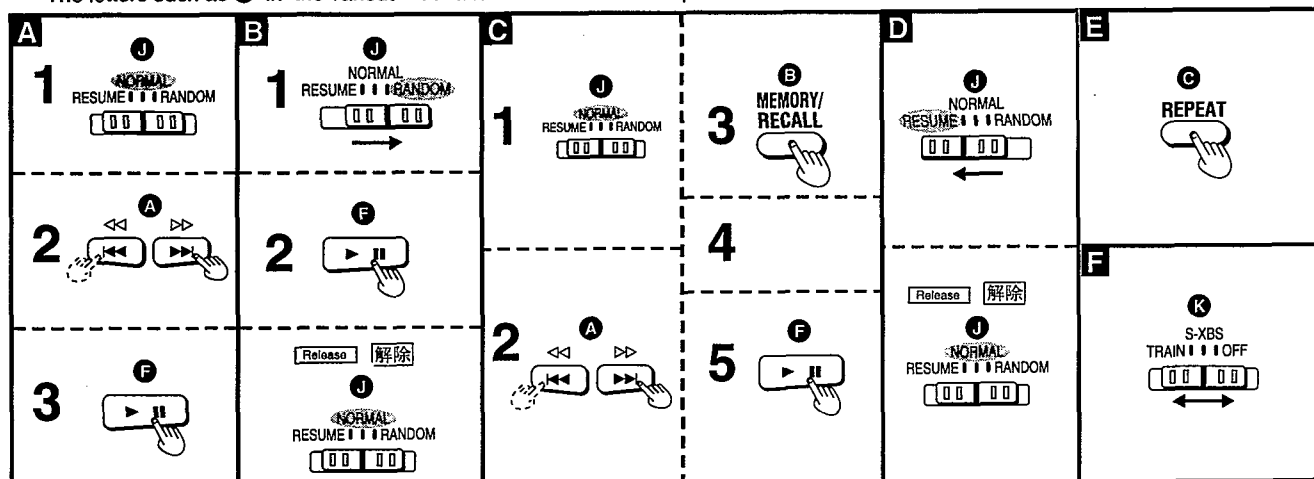
### When the unit is powered off

The "ho i d" indication appears only when the button is pressed.

**Remote control:** The indication "HOLD" appears on the display when hold status is activated.

## Other Play Methods

The letters such as **A** in the various illustrations refer to the descriptions in the "Location of Controls" section.



### Skip play

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

**Preparation:** Put unit in stop mode.  
(See page 4.)

**Following steps 1-3.**  
In step 2, select the desired track.

### Random play

**Following steps 1-2.**

**For your reference:**

- It is also possible to press the **▶▶** button 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.

### Program play

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

**Preparation:** Put unit in stop mode.  
(See page 4.)

**Following steps 1-5.**

In step 2, select the desired track.  
In step 3, register in sequence.  
(The indication "M" and the programmed sequence appear on the display panel.)  
In step 4, repeat steps 2 and 3 to program all the desired tracks.

■ **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 may be added to the sequence.

■ **To confirm the contents of the programmed sequence**

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 **■**, **POWER OFF**.

### Resume play

This function allows you to listen from the beginning to 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.

**For your reference:**

- If the **RESUME**, **NORMAL**, **RANDOM** (play mode switch) 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 old disc.

### Repeat function

Press **REPEAT** while disc is playing or when unit is in stop status.

**For your reference:**

If **REPEAT** is pressed during program play, only the tracks in the programmed sequence are repeated.  
(The indication "ALL" is not displayed.)  
The setting is switched in the sequence indicated below each time **REPEAT** is pressed.

**1-track repeat (1 )**

One track is repeated.

↓  
**All-track repeat (ALL )**

All the tracks on the disc are repeated.

↓  
**Cancel**

### Changing the sound quality

**S-XBS:**

Select this setting to boost the low-range response.

**TRAIN:**

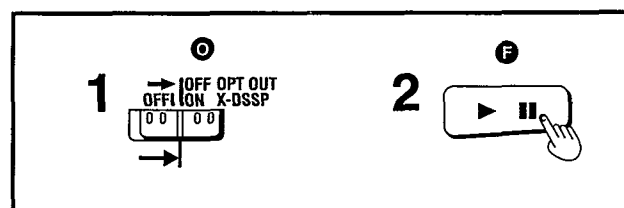
Select this setting to avoid annoying other passengers with noise from your earphones while riding on the train, or to reduce fatigue when listening for a long period of time.

**OFF:**

Select this setting to turn off the S-XBS and TRAIN functions.

#### Note

The sound quality setting does not affect the output from the **OUT** (analog output) and **OPT OUT** (optical digital output) jacks.



## Extra Digital Sound Shock Protector

This function minimizes sound interruption when vibrations are encountered by utilizing audio data that has been stored ahead of time (up to approximately 10 seconds' worth).

Optical digital out jack cannot be used when the X-DSSP slider is in the ON position.

#### Notes

- The position of the X-DSSP slider can be changed during play, but this may cause a slight interruption in the sound because the disc's rotational speed changes.
- During X-DSSP operation, the disc rotates at a higher rate than usual in order to collect extra audio data. This may cause the batteries to run out faster and could result in a slight increase in disc rotation noise.

| M.RESERVE indicator status | Unit body status          | Play status (audio data status)          |
|----------------------------|---------------------------|------------------------------------------|
|                            | Stable                    | Normal (plenty of data is stored)        |
|                            | Bump encountered          | Normal (stored data is used)             |
|                            | Bumping stops             | Normal (data again starts to be stored)  |
|                            | Bumps continue repeatedly | Sound is interrupted (data buffer empty) |

### Using the unit with an audio system

The X-DSSP uses digital signal compression technology. It is recommended that the X-DSSP be kept in the OFF position if the unit is connected to a home audio system.

## Using the Remote Controller

The wired remote controller can be operated regardless of the hold mode of the unit

### Display panel illumination

When hold status is canceled and the remote control is operated, the display panel illuminates for approximately five seconds. This is useful when operating the unit in a dark location.

Also, the display panel illuminates when the **•LIGHT/•HOLD** button is pressed once while the unit is in hold status.

### Operation confirmation beep

When an operation button is pressed, a confirmation beep sounds. However, no confirmation beep sounds when the **•LIGHT/•HOLD** button is pressed once (causing the display panel to illuminate). Refer to the explanations

in parentheses ( ) in the illustration above, etc., for information on the different types of confirmation beeps that sound.

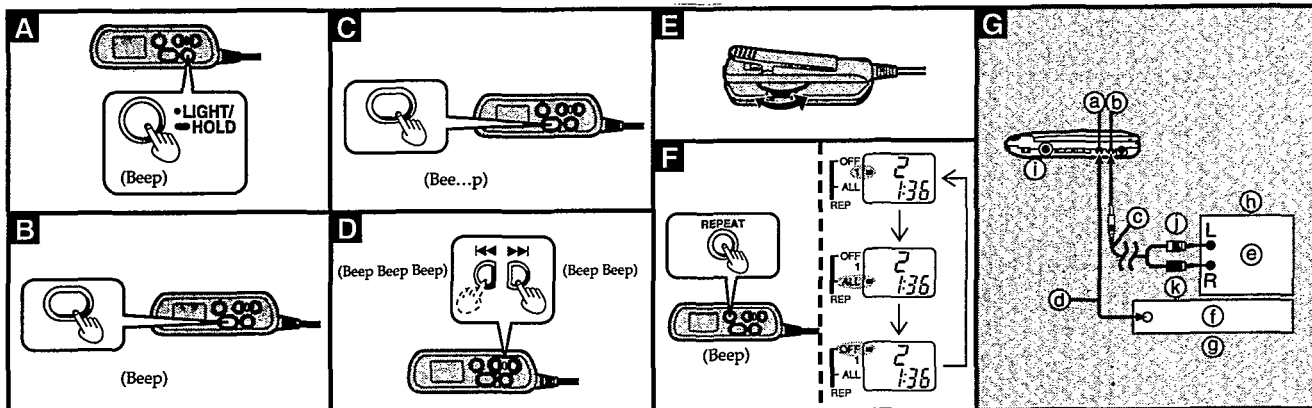
### How to use the wired remote controller

#### Preparation:

Release the remote controller from the hold mode. Hold down until "HOLD" indication disappears.

#### To start play

Press once during off or stop mode.

**To stop play** [A]

Press once during play.

**To turn off the unit** [B]

Press and hold during play or stop mode.

**Skip forward/backward** [C]

Press once during play

▶▶: Forward direction

◀◀: Backward direction

**Rapid forward/backward** [D]

Press and hold during play.

**To adjust the volume** [E]

When adjusting the volume using the remote controller, position the volume control on the unit to between 4 and 6.

**How to use the repeat button** [F]

Press during play or stop mode.

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

One track repeat

↓  
All tracks repeat

↓  
Cancel

**Note**

When the repeat button is operated, the sound will be interrupted for an instant. This is normal and not indicative of a malfunction.

**Using the unit with an audio system** [G]

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.

- ① Optical digital out jack
- ② OUT jack
- ③ Stereo connection cable (not included)
- ④ Optical cable (not included)
- ⑤ To CD or AUX terminals
- ⑥ To optical digital in jack
- ⑦ MD recorder etc.
- ⑧ Amplifier
- ⑨ Side panel of the unit
- ⑩ (White)
- ⑪ (Red)

• To use the player with an optical cable, use the AC adaptor and check that the X-DSSP selector is OFF.

Operation is not possible when rechargeable batteries or dry cell batteries are used to power the player.

**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-CDM9A)

**For securing the unit and connecting the power supply:**

- Car mounting kit (SH-CDF20)
- Car mounting arm, Car mounting base

**Note**

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

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

**Troubleshooting Guide**

First, consult the table below. If the problem persists, contact the dealer from whom you purchased the unit.

| Problem                                                             | Check this                                                                                                                                                                                                                            |
|---------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Cannot open/close cover.                                            | <ul style="list-style-type: none"> <li>• Is the disc properly secured in place?</li> <li>• Is the unit body in hold status?</li> </ul>                                                                                                |
| Cannot play discs.                                                  | <ul style="list-style-type: none"> <li>• Is the unit in hold status?</li> <li>• Is the disc properly secured in place?</li> <li>• Is there moisture condensation on the lens? (Wait for about an hour and then try again.)</li> </ul> |
| Cannot remove disc.                                                 | Did you press the PUSH button to release the disc?                                                                                                                                                                                    |
| Tracks on disk do not play in order, starting with the first track. | Is the RESUME, NORMAL, RANDOM (play mode switch) slider in the NORMAL position?                                                                                                                                                       |
| Cannot hear music—too noisy.                                        | <ul style="list-style-type: none"> <li>• Are the earphone plug and the remote control plug inserted all the way?</li> <li>• Are the plugs dirty?</li> </ul>                                                                           |
| TV picture is distorted. Radio reception is noisy.                  | Are you using the unit body too near a TV or tuner? (If the TV or tuner is connected to a simple indoor antenna, connect it to an outdoor antenna.)                                                                                   |

**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.

**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 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.

**Cautions****Rechargeable batteries**

- Only the P-3GAVT, P-3GAVT/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.
- Do not insert rechargeable batteries into the battery case.

**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.

**When driving a car**

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

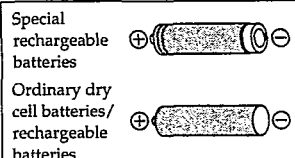
**When purchasing rechargeable batteries**

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-3GAVT/2B, SH-CDB8D (set of 2)

For details, check with your dealer.



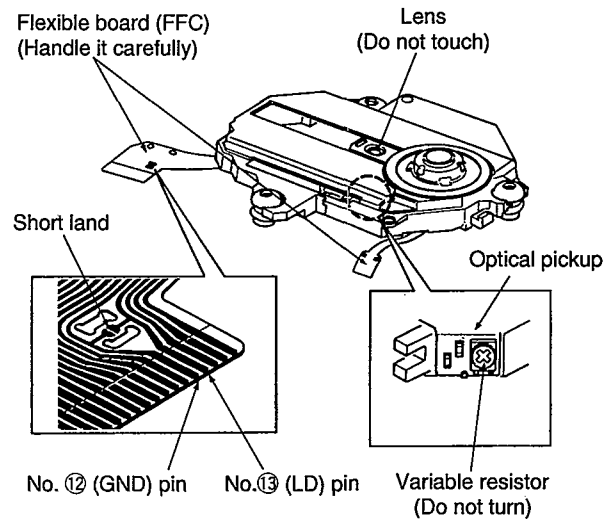
## ■ Handling Precautions for Traverse Deck

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. The short land between the No. ⑫ (GND) and No. ⑬ (LD) pins on the flexible board (FFC) is shorted with a solder build-up to prevent damage to the laser diode.  
To connect to the PC board, be sure to open by removing the solder build-up, and finish the work quickly.
3. Take care not to apply excessive stress to the flexible board (FFC).
4. Do not turn the variable resistor (laser power adjustment). It has already been adjusted.

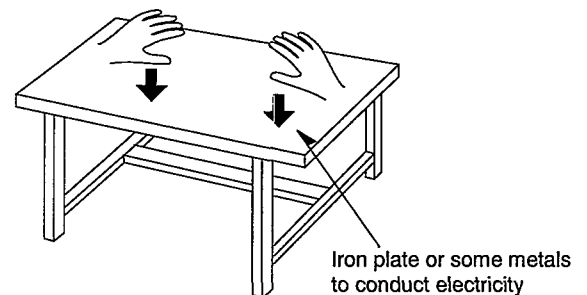
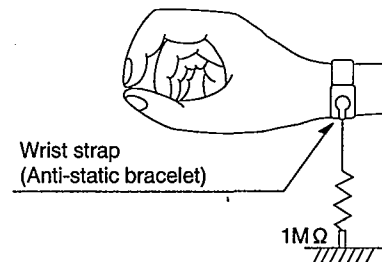


### ● Grounding for electrostatic breakdown prevention

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

#### Caution:

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



## ■ Operation Checks and Main Component Replacement Procedures

### NOTE

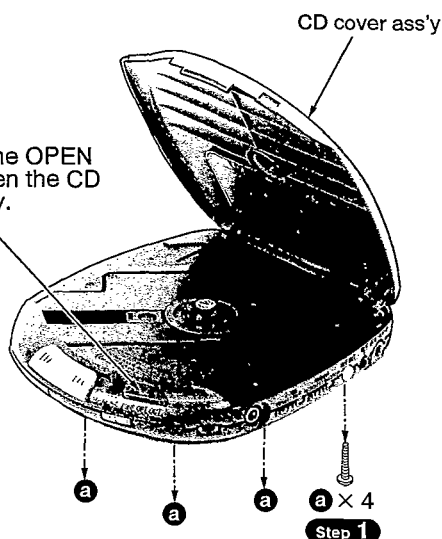
1. This section describes procedures for checking the operation of the major printed circuit boards and replacing the main components.
2. For reassembly after operation checks or replacement, reverse the respective procedures. Special reassembly procedures are described only when required.
3. [ ] indicates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

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

〈Checking for the P.C.B. (Component side)〉

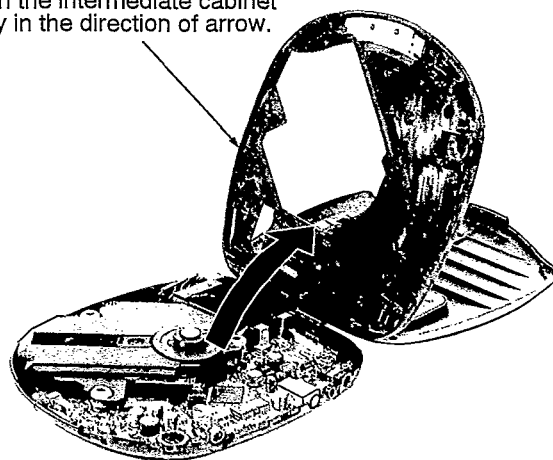
#### Step 2

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



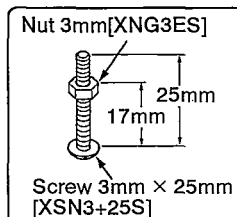
#### Step 3

Open the intermediate cabinet ass'y in the direction of arrow.

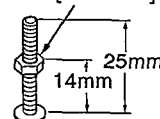


### NOTE

- After checking, unsolder the short land to open circuit.
- 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.



Nut 3mm[XNG3ES]



Screw 3mm × 25mm [XSN3+25S]

#### Step 4

Short-circuit the land by soldering.



Short land

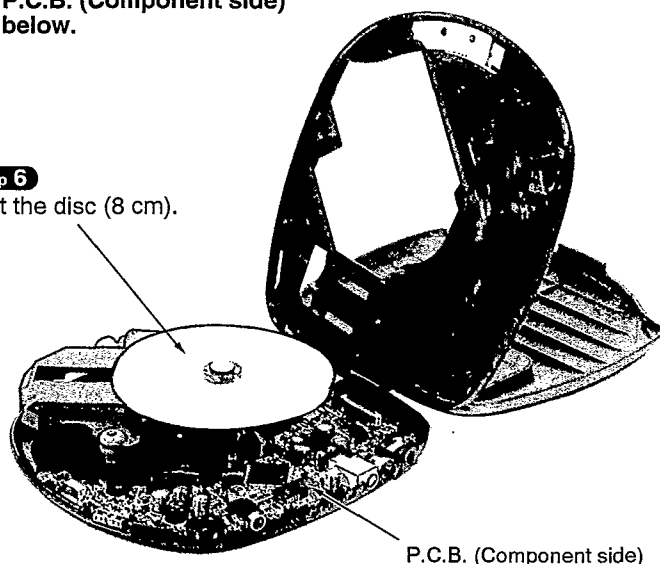
#### Step 5

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

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

**Step 6**

Put the disc (8 cm).



P.C.B. (Component side)

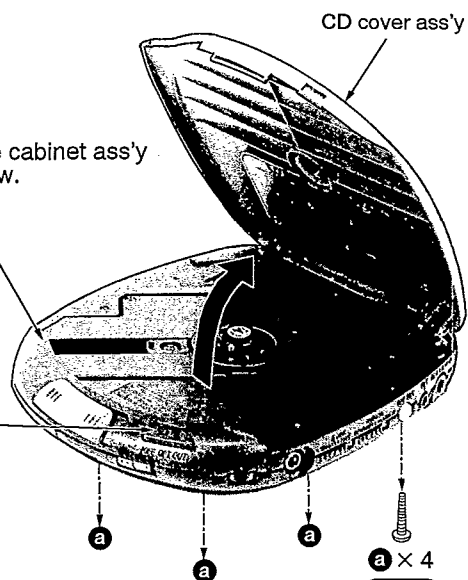
〈Checking for the P.C.B. (Solder side)〉

**Step 3**

Open the intermediate cabinet ass'y in the direction of arrow.

**Step 2**

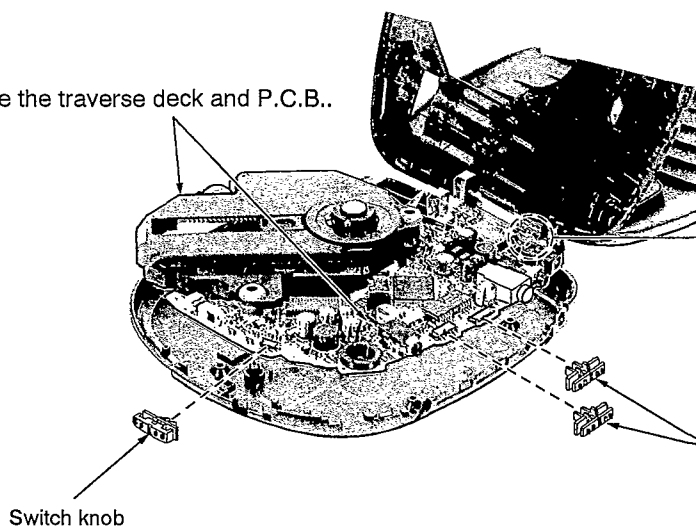
Pressing the OPEN button, open the CD cover ass'y.



a × 4  
**Step 1**

**Step 6**

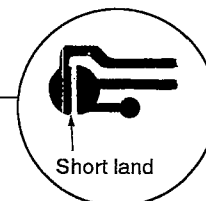
Remove the traverse deck and P.C.B..



Switch knob

**Step 4**

Short-circuit the land by soldering.



Short land

**Step 5**

Remove the 3 switch knobs.

Switch knobs

Traverse deck and P.C.B.

**Step 7**

Align the floating rubber with the boss.

Bosses

Floating rubbers

CD cover ass'y

**Step 8**

Put the test disc.

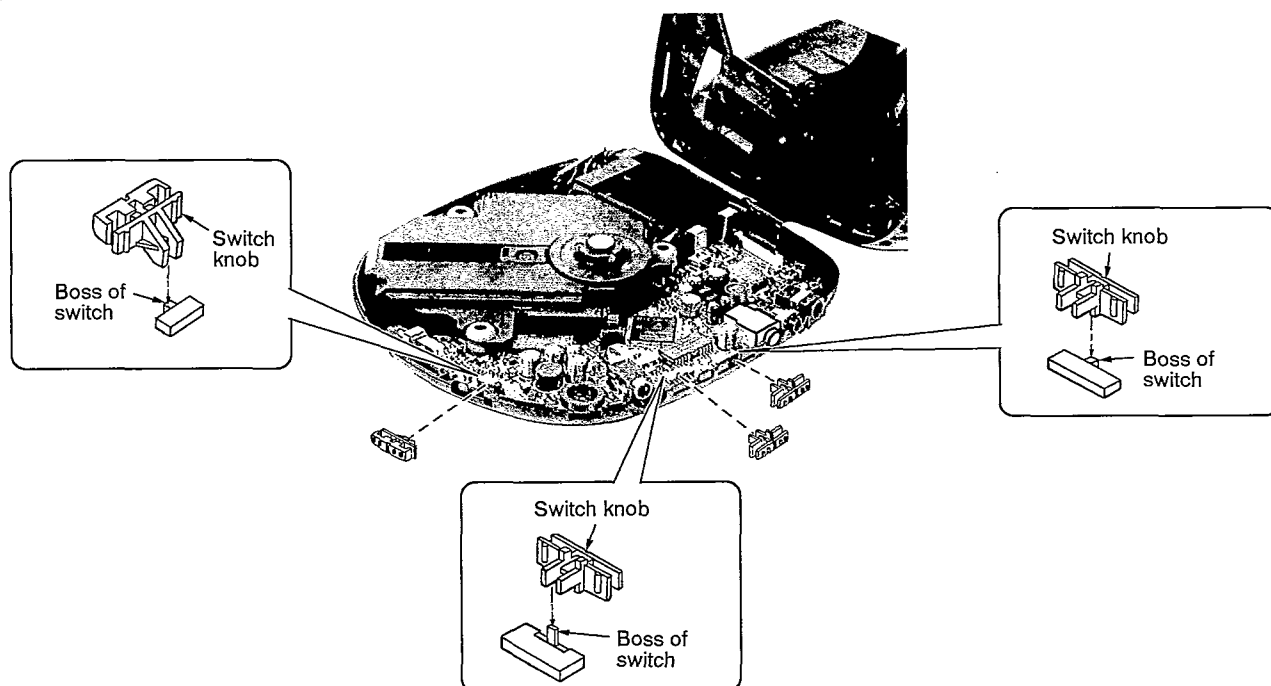
• Check the P.C.B. (Solder side) as shown below.

P.C.B. (Solder side)

**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 3** in item 1.

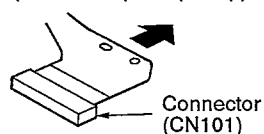
### NOTE

Solder the point between pin 4 (LD) and pin 5 (GND) of FFC board.  
(Refer to "Handling Precautions for Traverse Deck" on page 7.)

#### Step 1

Pull out the FFC from connector (CN101).

FFC  
(From the optical pickup)

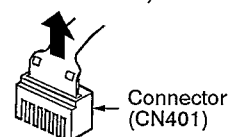


Traverse deck  
[RAE0142Z]

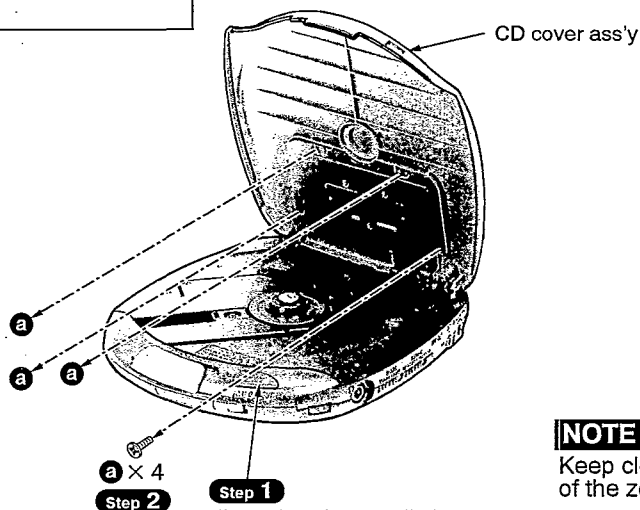
#### Step 2

Pull out the FFC from connector (CN401).

FFC  
(From the motors)



## 3. Replacement for the LCD

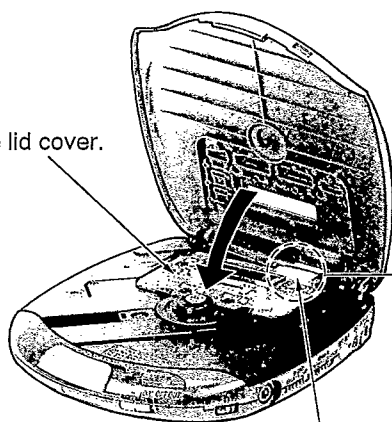


### NOTE

Keep clean the surface of the zebra rubber.

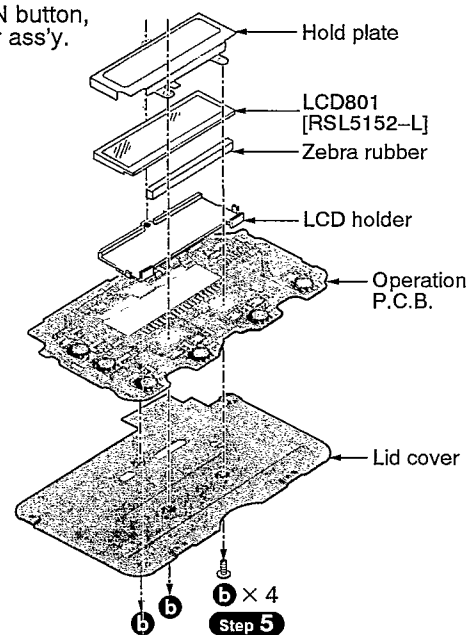
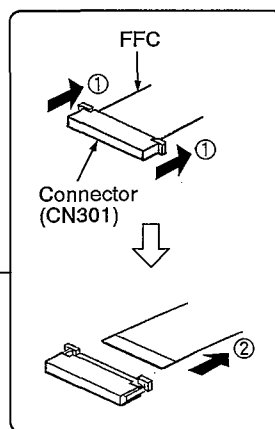
#### Step 3

Remove the lid cover.



#### Step 4

Remove the FFC from the connector (CN301).



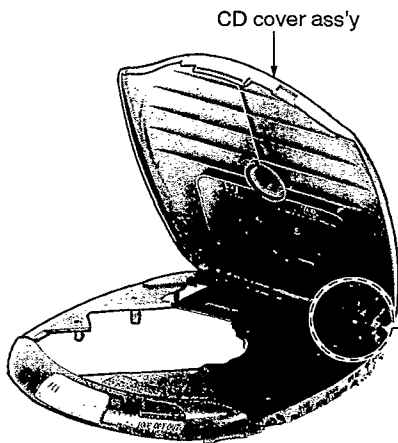
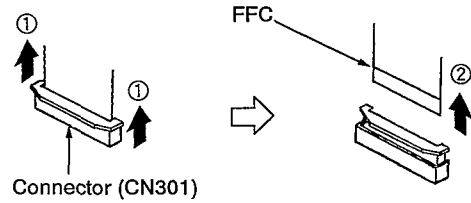
#### 4. Replacement for the CD cover ass'y

- Follow the **Step 1** ~ **Step 3** in item 1.



##### Step 1

Remove the FFC from the connector (CN301).



Minus screwdriver

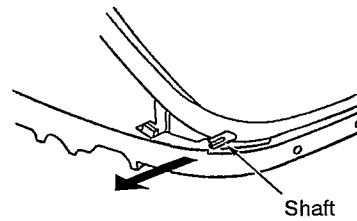
Shaft

##### Step 2

Push the shaft with the thin minus screwdriver.

##### Step 3

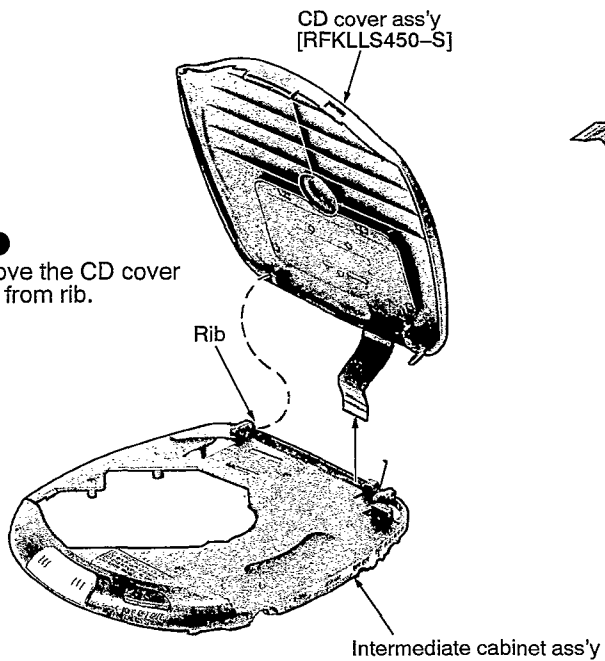
Pull out the shaft.



Shaft

##### Step 4

Remove the CD cover ass'y from rib.



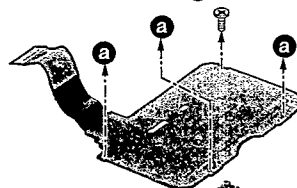
CD cover ass'y  
[RFKLLS450-S]

Rib

Intermediate cabinet ass'y

##### Step 5

a × 4

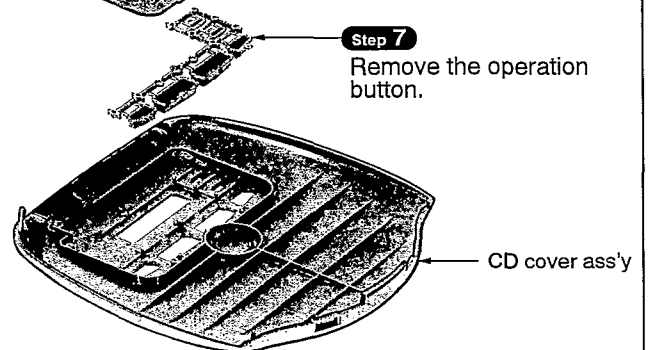


##### Step 6

Remove the lid cover.

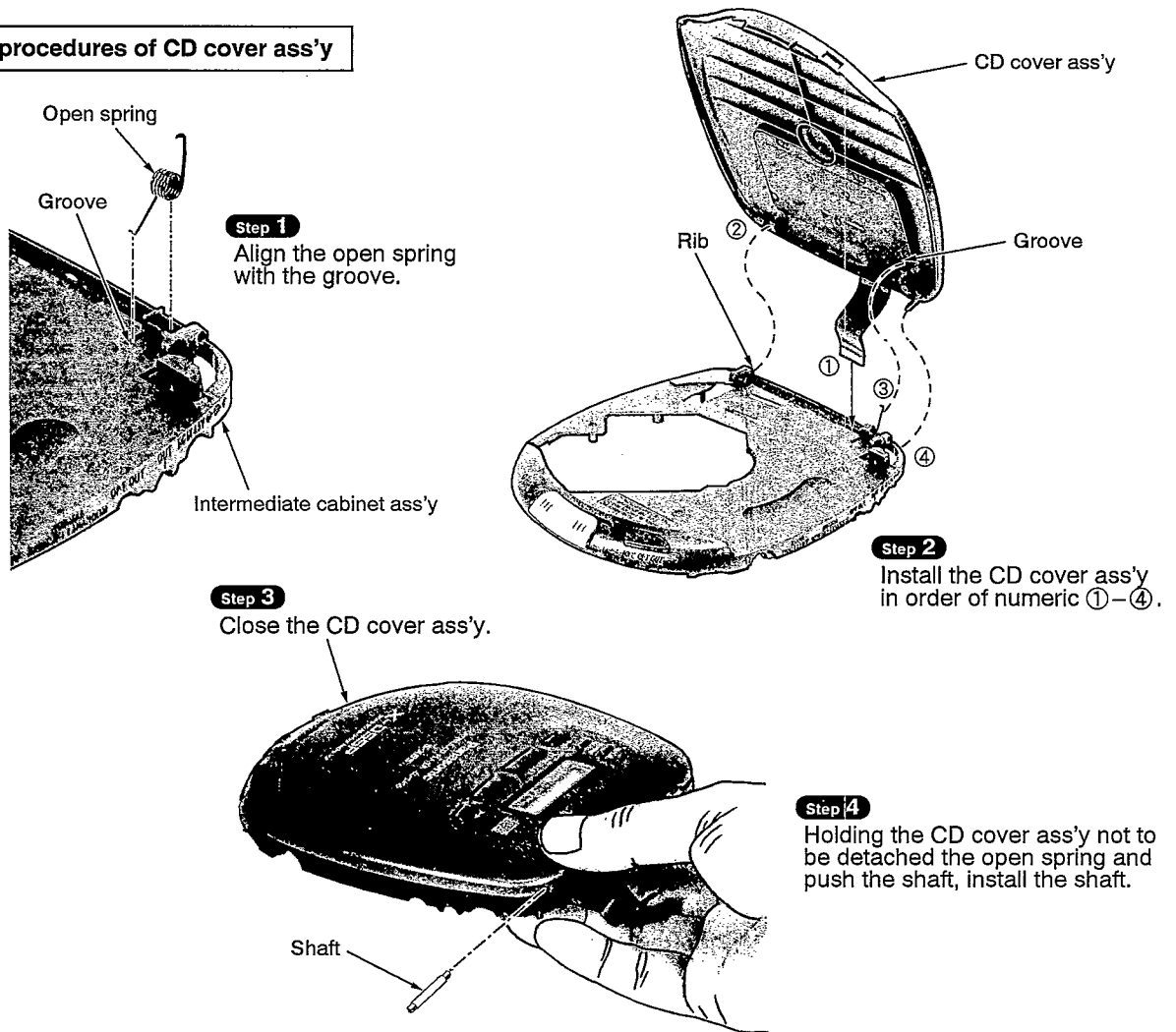
##### Step 7

Remove the operation button.



CD cover ass'y

### Reassembly procedures of CD cover ass'y



## ■ Outline of 10 - Second Sound Keeper Technique Used for Prevention of Sound from Skipping.

### 1. Conventional Shockproofing Technique

Input information read out of the CD at double speed is demodulated, stored in the memory, and while sound-marking signal is supplied at normal speed from the memory to the D/A converter, the residual data is accumulated in the memory.

If reaccess to the break point is accomplished before the memory becomes empty, apparent playback sound is entirely kept free from breaking even when information pauses due to vibration, etc. It was necessary to use the 4M bit memory for securing the accumulation time of about 3 seconds.

### 2. Compression-shockproofing [Outline]

**Fig. 1** is a block diagram showing the compression-shockproofing mechanism, the difference of which from the conventional mechanism is as follows: Input information read out at double speed undergoes data compression (16 bits → 4 bits) by the encoder in the ADPCM (Adaptive Difference PCM) and stored in the external memory; the stored memory information undergoes data elongation (4 bits → 16 bits) by the decoder in the ADPCM and supplied at normal speed to the D/A converter.

The data compression technique has conducted to reduction of required memory capacity from 4M bits to 1M bit for securing the accumulation time equivalent to the conventional.

### All-inclusive Block Diagram

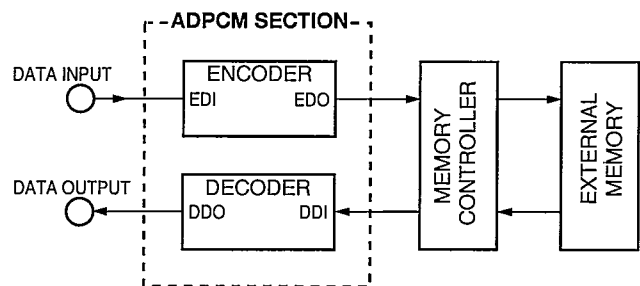
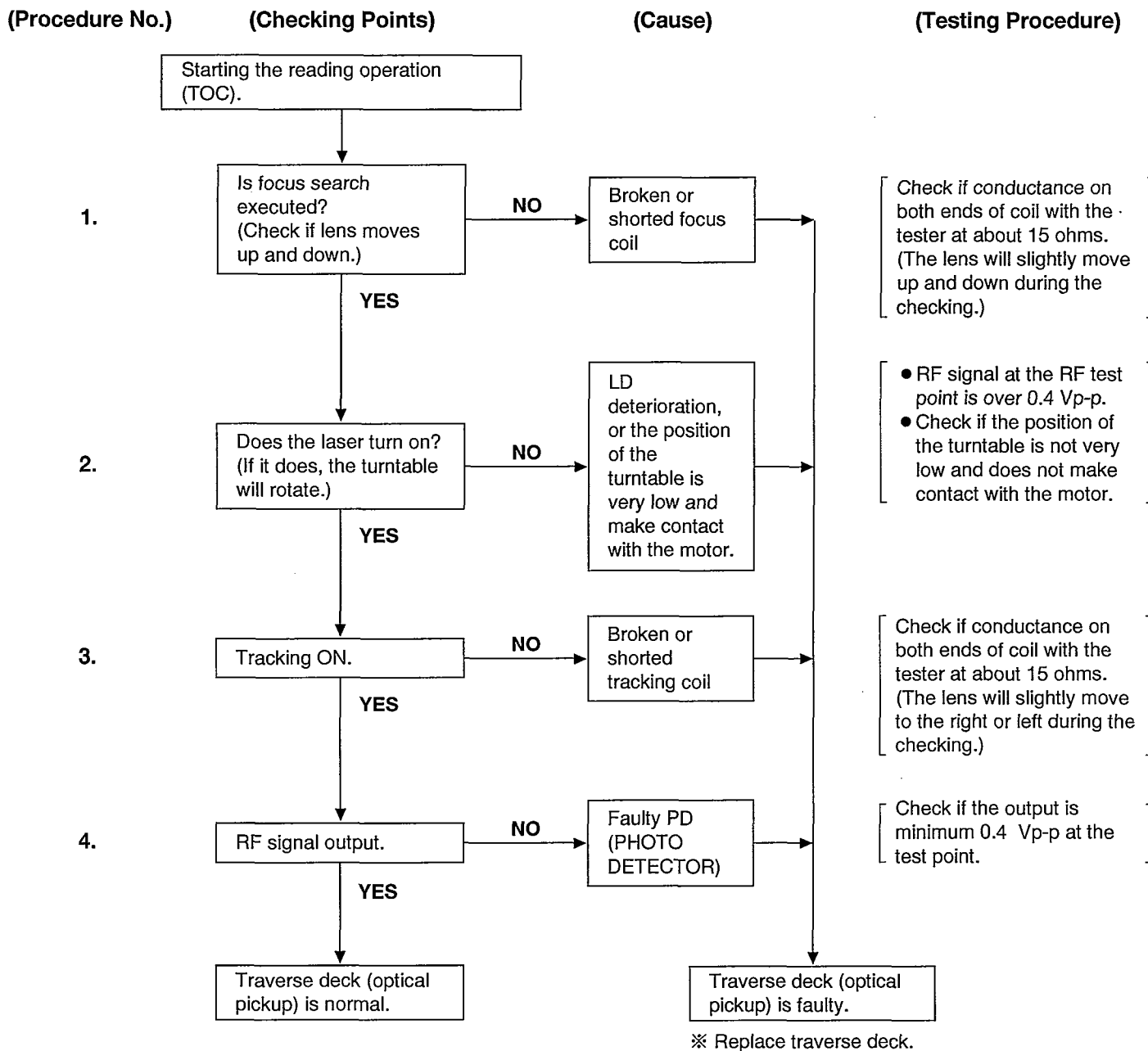


Fig. 1

## ■ Checking the Operation Problems on the Traverse Deck (Optical Pickup)

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



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

### • 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.

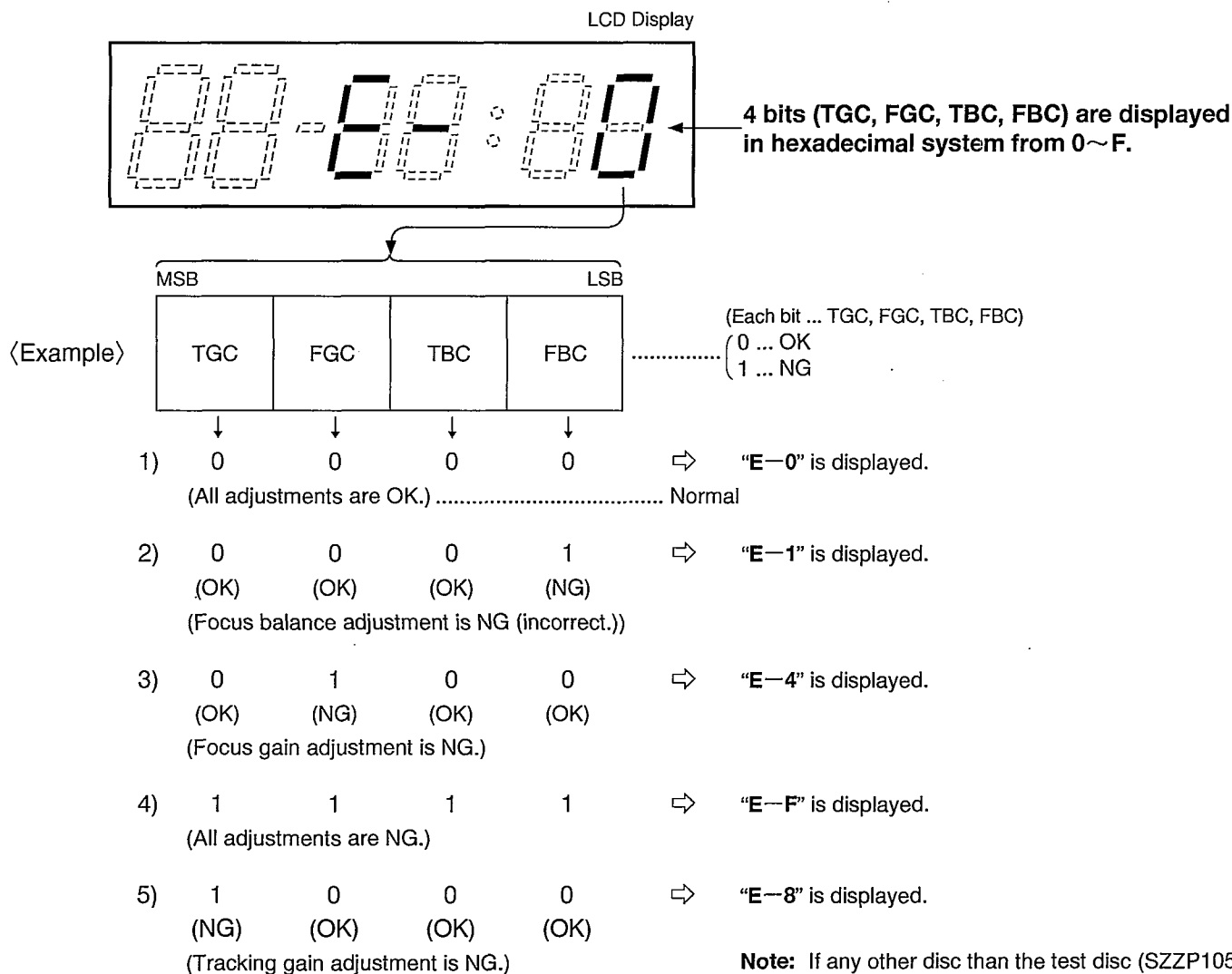
## Automatic Adjustment Results Display Function (Self-check Function)

On this unit (SL-S450), 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)



**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.

## ■ Measurements and Adjustments

**Warning:** This product uses a laser diode. Refer to caution statements on page 2.

**ACHTUNG:** ● Die lasereinheit nicht zerlegen.

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

### ● Measuring instruments and special tools

● Test discs

1. Playability test disc (SZZP1054C)
2. Uneven test disc (SZZP1056C)

● Musical program disc (ordinary)

- DC voltmeter
- Lead wire (for test points)

### ● Test short land

Short-circuit the lands of the laser ON/OFF switch (S201) by soldering them. It turns “ON” position. (Refer to below Fig. 1 or printed circuit board and wiring connection diagram for short land location on page 28.)

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

### ● Adjustment point

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

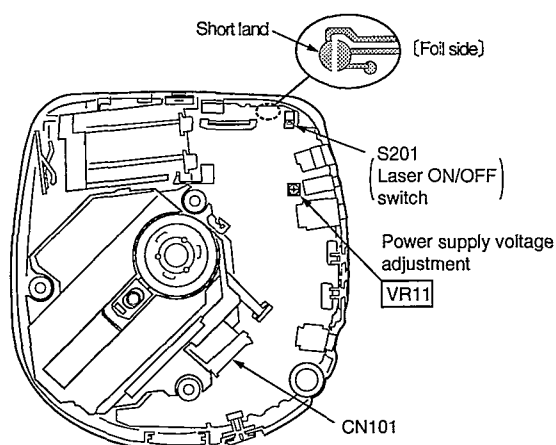


Fig. 1

## ● Adjustment procedure

### (1) POWER SUPPLY VOLTAGE ADJUSTMENT

1. Connect the DC voltmeter to **TP103** (VCC) (+) and **TP104** (GND) on the P.C.B.
2. Connect the AC adaptor cord to the DC (IN) port and move the PLAY switch to the ON position.  
(Use a new dry cell battery or a rechargeable battery that is full charged.)
3. Insert the test disc, and switch the player power ON.
4. Adjust **VR11** on the P.C.B. at  $2.70 + 0.02 - 0.00$  V, as shown in Fig. 1.

### (2) CHECK OF PLAY OPERATION

#### \*Checking Skip Search

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

#### \*Checking Manual Search

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

#### \*Checking Playability

1. Play the 0.7 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

On our conventional type portable CD player, there were mounted 6 semi-fixed controls for each adjustment. Since the SL-S450 servo circuit is equipped with an automatic adjusting circuit, these controls are removed from SL-S450.

#### On conventional portable CD player

Use for Old Servo IC (AN8373SE2, AN8374SE2)

1. Tracking Offset Adjustment VR (TOC) ☐
2. Focus Offset Adjustment VR (FOC) ☐
3. Tracking Gain Adjustment VR (TGC) ☐
4. Focus Gain Adjustment VR (FGC) ☐
5. Tracking Balance Adjustment VR (TBC) ☐
6. Focus Balance Adjustment VR (FBC) ☐

#### On SL-S450

Use for New Servo IC (AN8837SBE1, MN662745RPC)

- ➡ Non Adjustment
- ➡ Automatic Adjusting Circuit

Total 6 Adjustment VRs

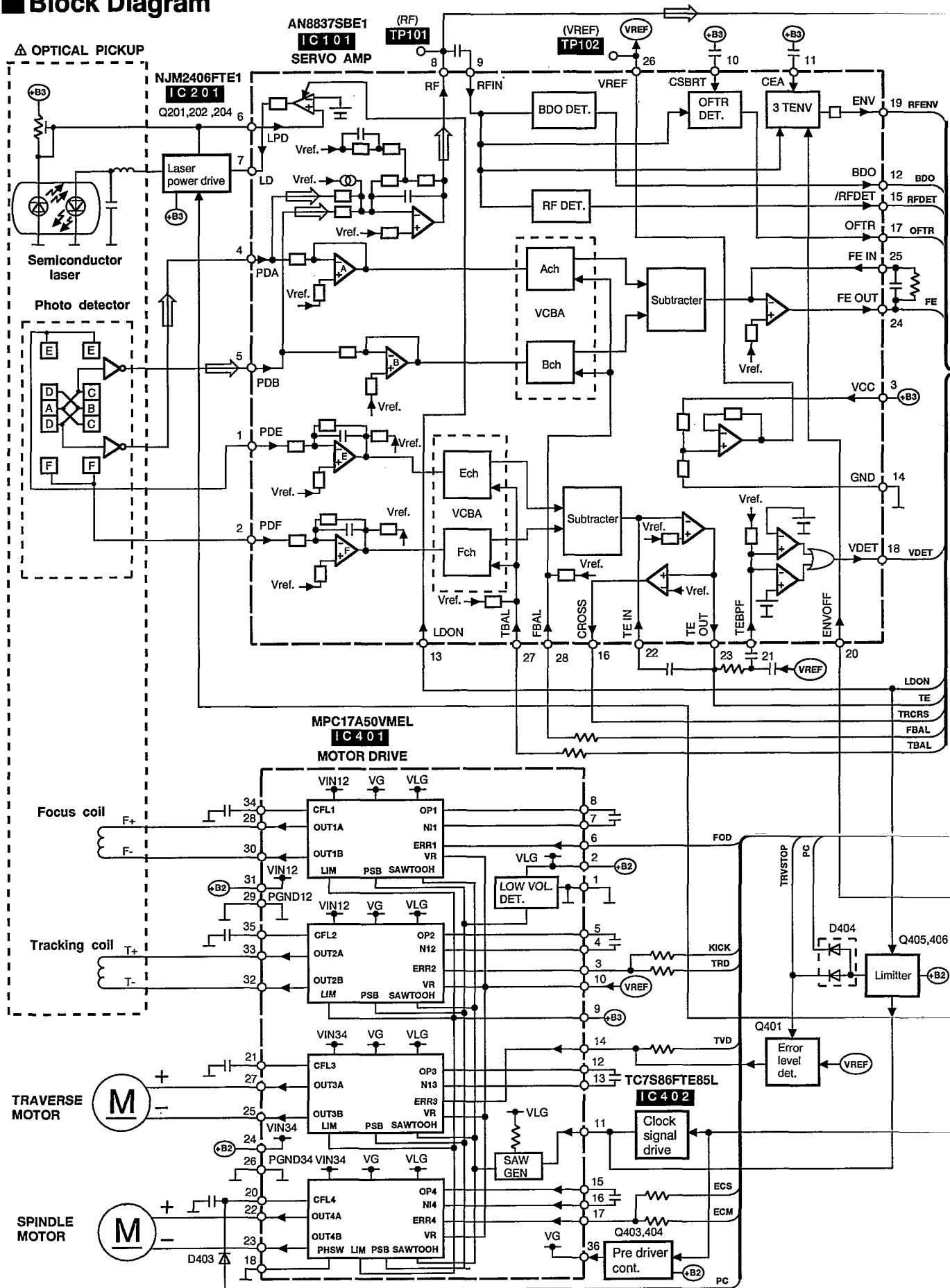
➡ No Adjustment VR

Although all discs are manufactured according to the same specifications, their characteristics are not always precisely the same because they are produced by different manufacturers in various lots, or have different warp etc.

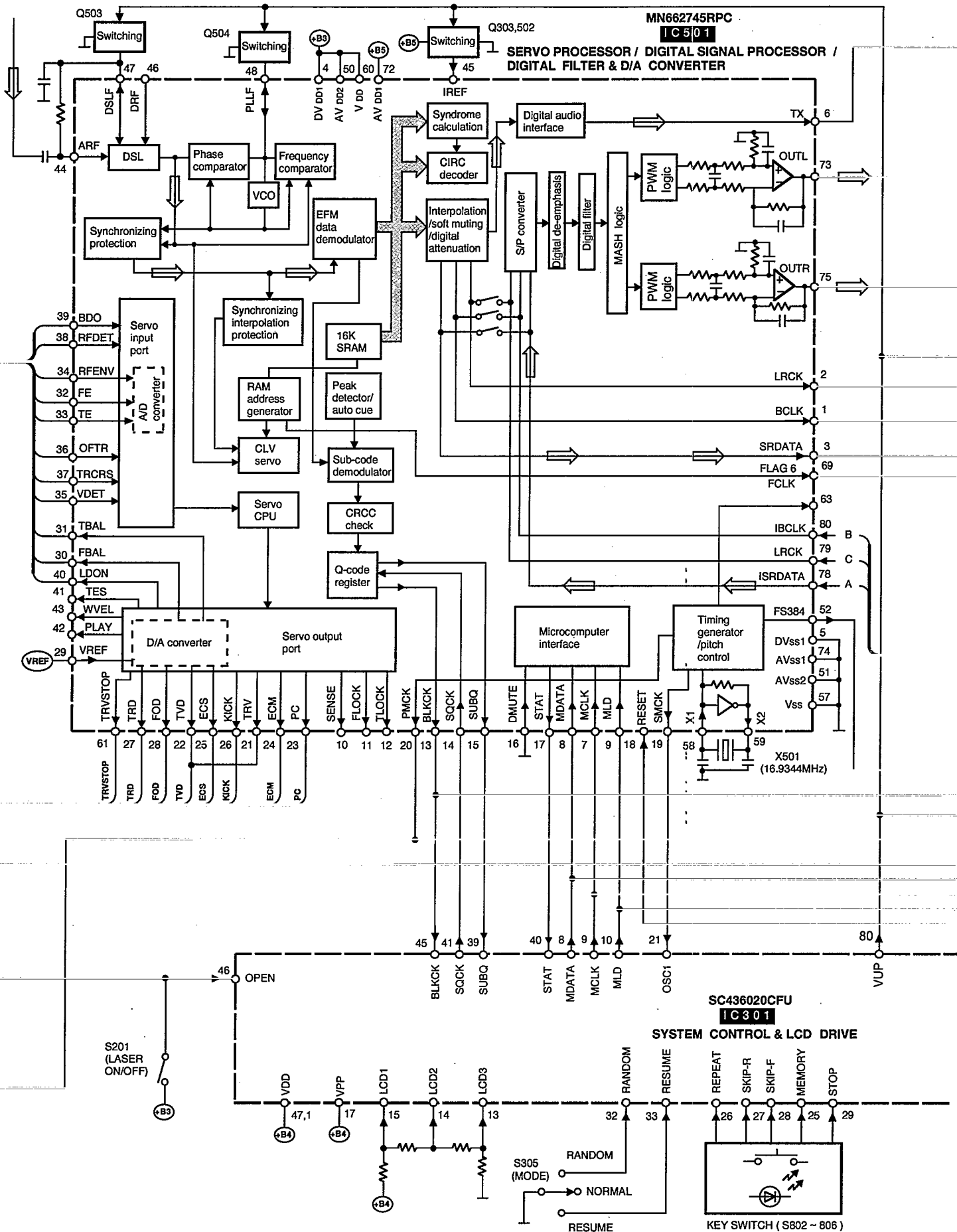
SL-S450 automatically controls the servo circuit to obtain optimum performance according to any disc's characteristics.

Therefore, no malfunction occurs because of mis-adjustment.

# Block Diagram

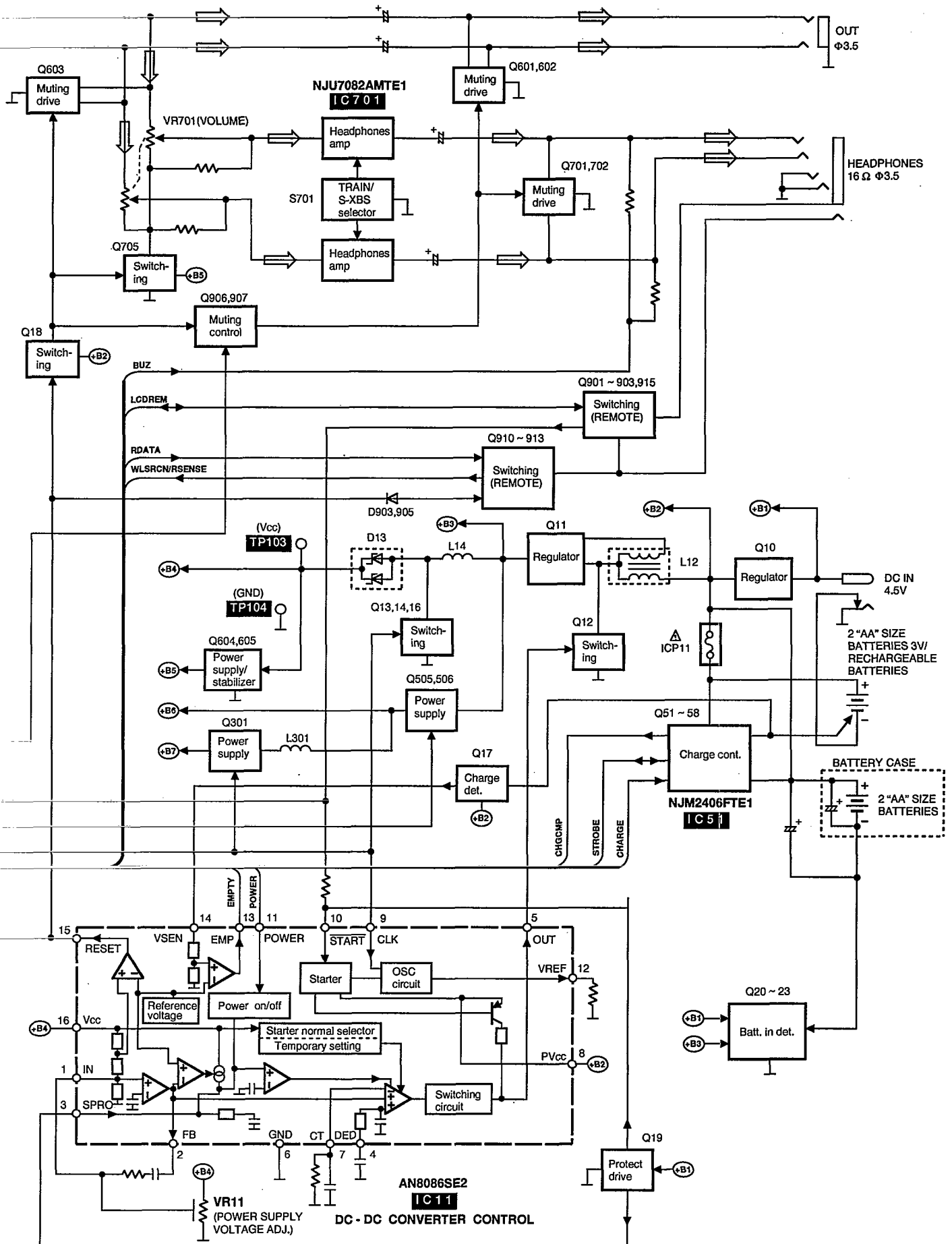


Note: • → : Audio signal lines.





Note: • ➡ : Audio signal lines.



## Schematic Diagram (See parts list on pages 35~38.)

(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 in "OFF" position.  
(It turns "ON" when optical pickup comes to innermost periphery.)
- **S305:** Play mode selector (MODE) in "RANDOM" position.  
(RANDOM↔NORMAL↔RESUME)
- **S306:** Hold lock (HOLD-LOCK) switch in "OFF" position.
- **S501:** Optical Pickup/sound keeper (OPT OUT/X-DSSP) switch in "OFF" position.  
[X-DSSP OFF↔ON(OPT OUT OFF)]
- **S701:** S-XBS switch in "OFF" position.  
(TRAIN/S-XBS/OFF)
- **S801:** Play/pause (▶/⏸) switch.
- **S802:** Stop/power off (■/POWER OFF) switch.
- **S803:** Skip/search (▶▶/▶▶, ◀◀/◀◀) switches.  
S804: [S804: GO BACK, S803: ADVANCE]
- **S805:** Memory/recall (MEMORY/RECALL) switch.
- **S806:** Repeat (REPEAT) switch.
- **VR11:** Power supply voltage adjustment.
- **VR701:** Headphones volume (VOLUME) control.
- 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.

### Measurement conditions:

- \* Set the hold lock and X-DSSP switches to ON.
- \* 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 is used for power supply.

●  : Positive voltage lines.

●  : Audio signal lines.

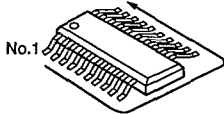
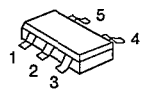
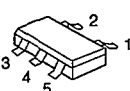
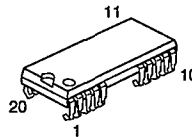
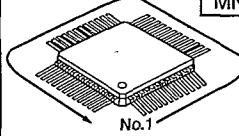
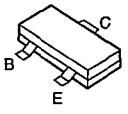
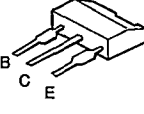
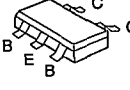
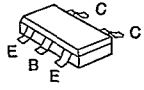
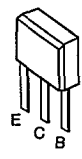
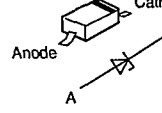
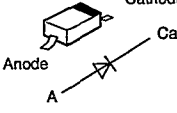
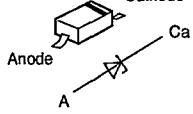
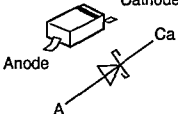
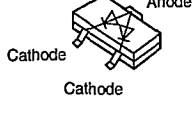
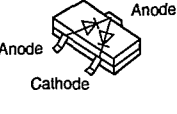
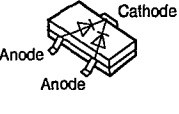
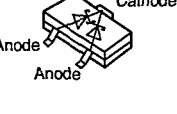
### Important safety notice:

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

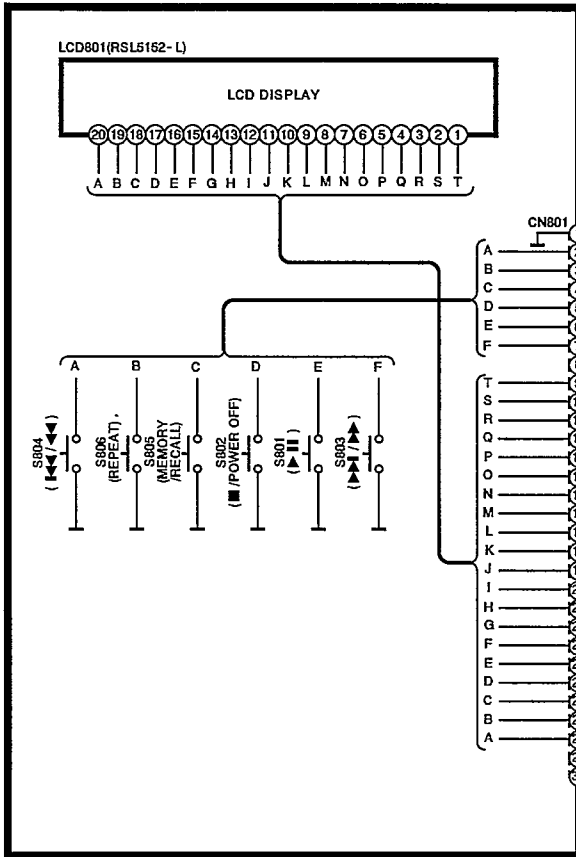
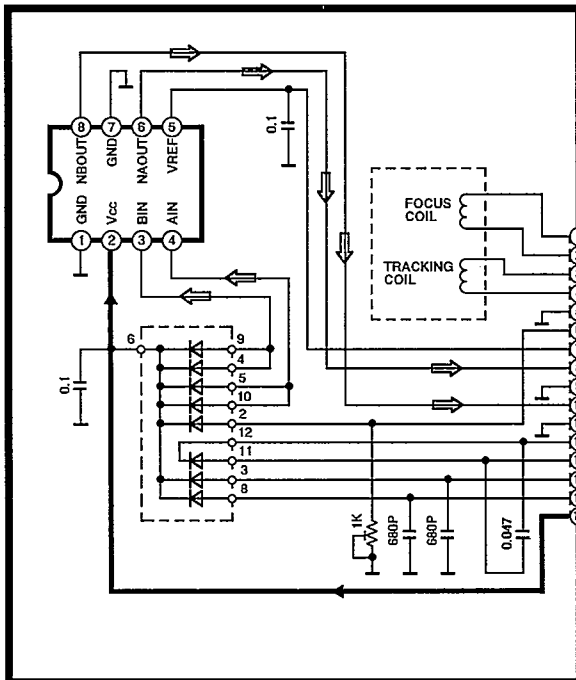
### Caution!

- 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.

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

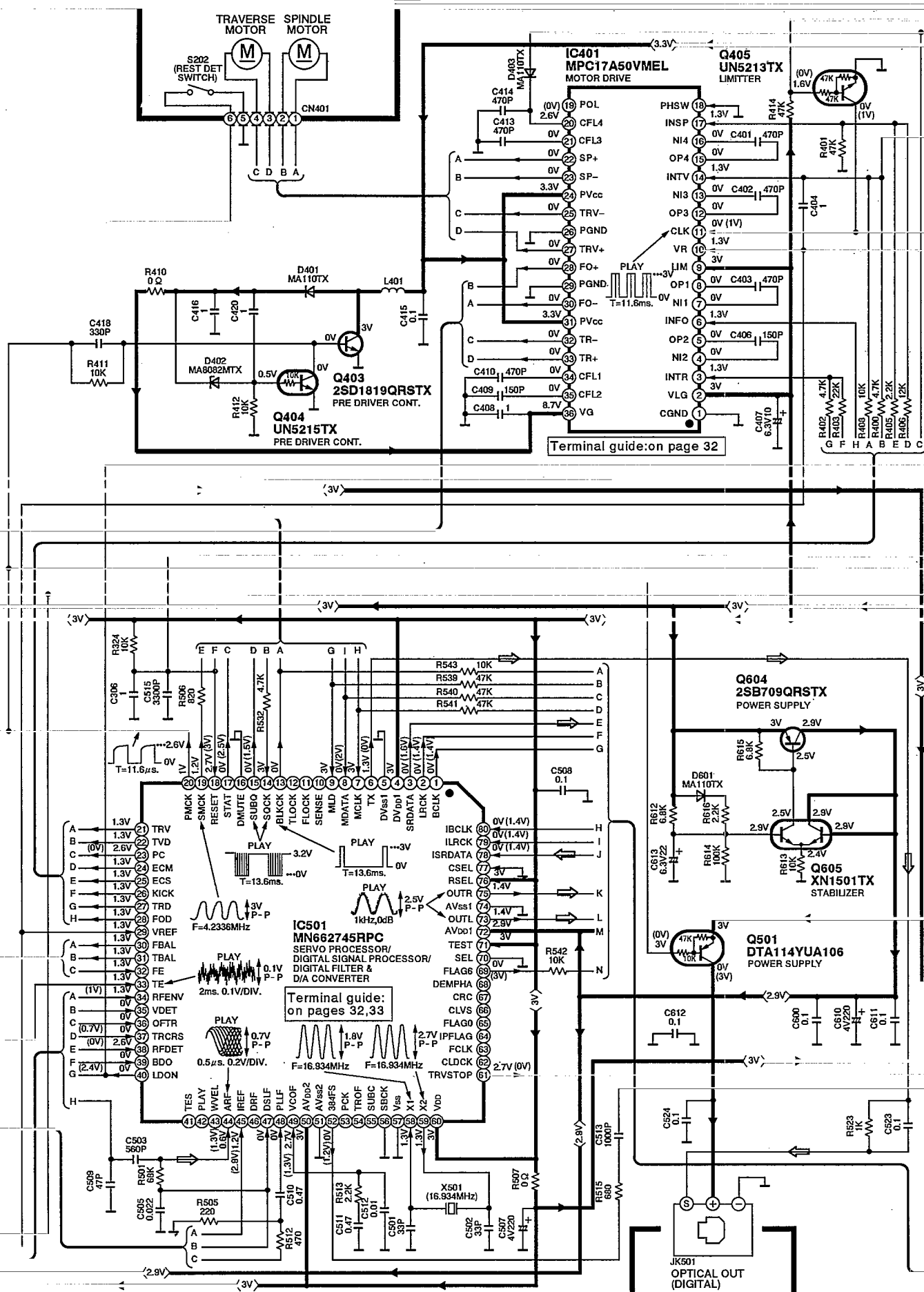
|                                                                                                                                                                                                                                                                                                         |        |                                                                                                                     |        |                                                                                                                       |        |                                                                                                                       |        |                                                                                                                                                                                                                                           |        |                                                                                                                        |  |                                                                                                                          |  |                                                                                                              |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|---------------------------------------------------------------------------------------------------------------------|--------|-----------------------------------------------------------------------------------------------------------------------|--------|-----------------------------------------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|------------------------------------------------------------------------------------------------------------------------|--|--------------------------------------------------------------------------------------------------------------------------|--|--------------------------------------------------------------------------------------------------------------|--|
| <div><p>No.1</p></div> <table><tr><td>NJU7082AMTE1</td><td>8 Pin</td></tr><tr><td>AN8086SE2</td><td>16 Pin</td></tr><tr><td>AN8837SBE1</td><td>28 Pin</td></tr><tr><td>MPC17A50VMEL</td><td>36 Pin</td></tr></table> |        | NJU7082AMTE1                                                                                                        | 8 Pin  | AN8086SE2                                                                                                             | 16 Pin | AN8837SBE1                                                                                                            | 28 Pin | MPC17A50VMEL                                                                                                                                                                                                                              | 36 Pin | TC7S86FTE85L <div></div>            |  | NJM2406FTE1 <div></div>             |  | M44400CJ7E2 <div></div> |  |
| NJU7082AMTE1                                                                                                                                                                                                                                                                                            | 8 Pin  |                                                                                                                     |        |                                                                                                                       |        |                                                                                                                       |        |                                                                                                                                                                                                                                           |        |                                                                                                                        |  |                                                                                                                          |  |                                                                                                              |  |
| AN8086SE2                                                                                                                                                                                                                                                                                               | 16 Pin |                                                                                                                     |        |                                                                                                                       |        |                                                                                                                       |        |                                                                                                                                                                                                                                           |        |                                                                                                                        |  |                                                                                                                          |  |                                                                                                              |  |
| AN8837SBE1                                                                                                                                                                                                                                                                                              | 28 Pin |                                                                                                                     |        |                                                                                                                       |        |                                                                                                                       |        |                                                                                                                                                                                                                                           |        |                                                                                                                        |  |                                                                                                                          |  |                                                                                                              |  |
| MPC17A50VMEL                                                                                                                                                                                                                                                                                            | 36 Pin |                                                                                                                     |        |                                                                                                                       |        |                                                                                                                       |        |                                                                                                                                                                                                                                           |        |                                                                                                                        |  |                                                                                                                          |  |                                                                                                              |  |
| <div><p>No.1</p></div> <table><tr><td>SM5859AF</td><td>44 Pin</td></tr><tr><td>SC436020CFU</td><td>80 Pin</td></tr><tr><td>MN662745RPC</td><td>80 Pin</td></tr></table>                                              |        | SM5859AF                                                                                                            | 44 Pin | SC436020CFU                                                                                                           | 80 Pin | MN662745RPC                                                                                                           | 80 Pin | <div></div> <div>2SB1218QRSTX<br/>2SB709QRSTX<br/>2SB970RSTX<br/>2SD1328STTX<br/>2SD1328RSTTX<br/>2SD1758TLPQR<br/>2SD1819QRSTX<br/>DTA114YUA106</div> |        | <div>DTA143TUT106<br/>UN5113TX<br/>UN5115TX<br/>UN5210TX<br/>UN5211TX<br/>UN5213TX<br/>UN5215TX</div>                  |  | <div>2SD2074HWSTT</div> <div></div> |  |                                                                                                              |  |
| SM5859AF                                                                                                                                                                                                                                                                                                | 44 Pin |                                                                                                                     |        |                                                                                                                       |        |                                                                                                                       |        |                                                                                                                                                                                                                                           |        |                                                                                                                        |  |                                                                                                                          |  |                                                                                                              |  |
| SC436020CFU                                                                                                                                                                                                                                                                                             | 80 Pin |                                                                                                                     |        |                                                                                                                       |        |                                                                                                                       |        |                                                                                                                                                                                                                                           |        |                                                                                                                        |  |                                                                                                                          |  |                                                                                                              |  |
| MN662745RPC                                                                                                                                                                                                                                                                                             | 80 Pin |                                                                                                                     |        |                                                                                                                       |        |                                                                                                                       |        |                                                                                                                                                                                                                                           |        |                                                                                                                        |  |                                                                                                                          |  |                                                                                                              |  |
| <div></div> <div>XN1210TX<br/>XN1213TX<br/>XN1215TX<br/>XN1501TX<br/>XP0121N00L</div>                                                                                                                                |        | <div>XN2401TX</div> <div></div>  |        | <div>2SD1450STTA</div> <div></div> |        | <div>MA8082MTX</div> <div></div> |        | <div>MA110TX</div> <div></div>                                                                                                                       |        |                                                                                                                        |  |                                                                                                                          |  |                                                                                                              |  |
| <div>MA8033LTX</div> <div></div>                                                                                                                                                                                     |        | <div>MA8047MTX</div> <div></div> |        | <div>MA142WATX</div> <div></div>   |        | <div>MA143TX</div> <div></div>     |        | <div>MA141WKTX</div> <div></div>                                                                                                                     |        | <div>RB411DT146</div> <div></div> |  |                                                                                                                          |  |                                                                                                              |  |

Note: ● → : Audio signal lines.

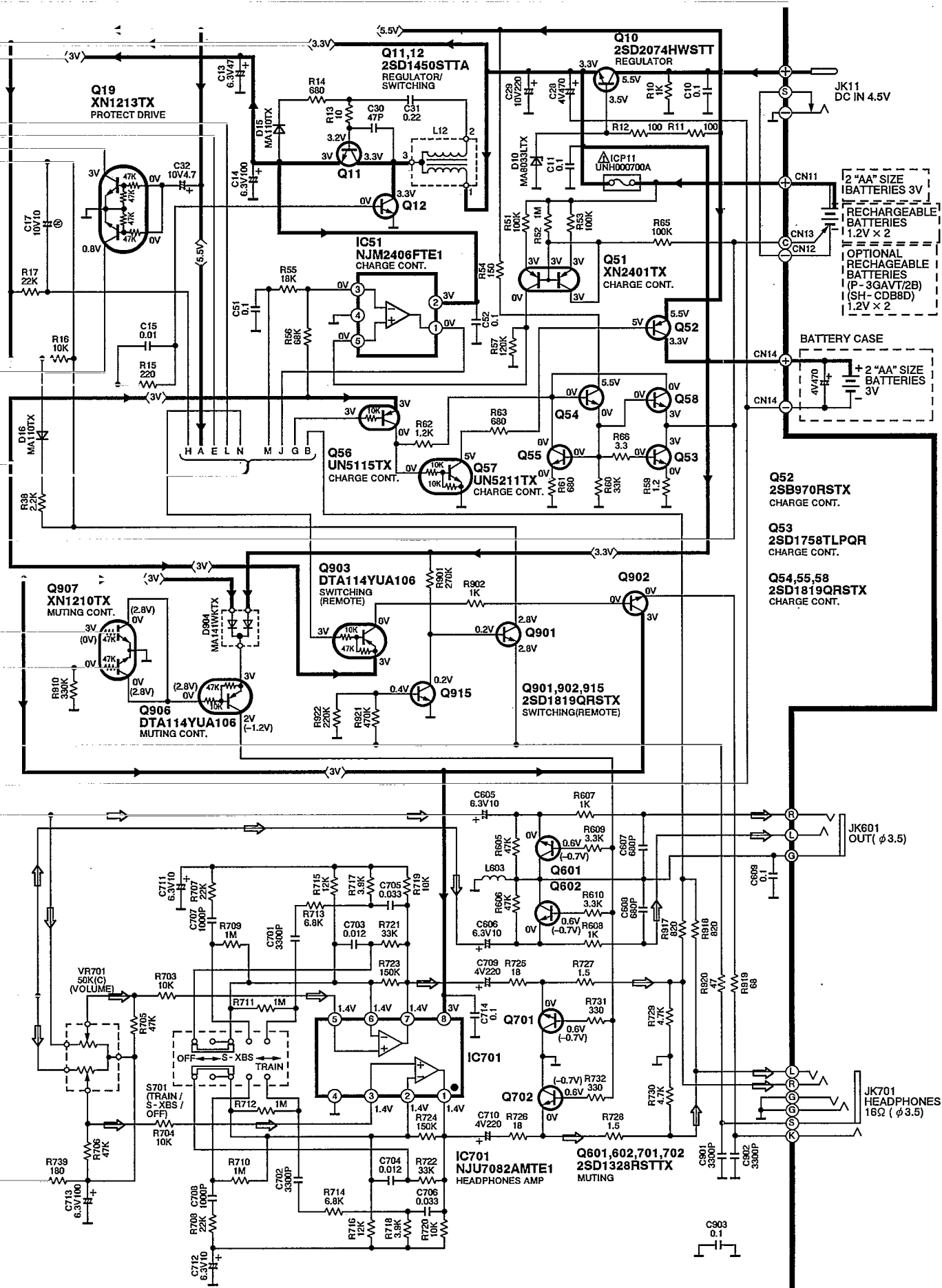
**A** OPERATION CIRCUIT (P.C.Board: on page 28)**B** MAIN CIRCUIT (P.C.Board: on pages 28,29)**Δ** OPTICAL PICKUP



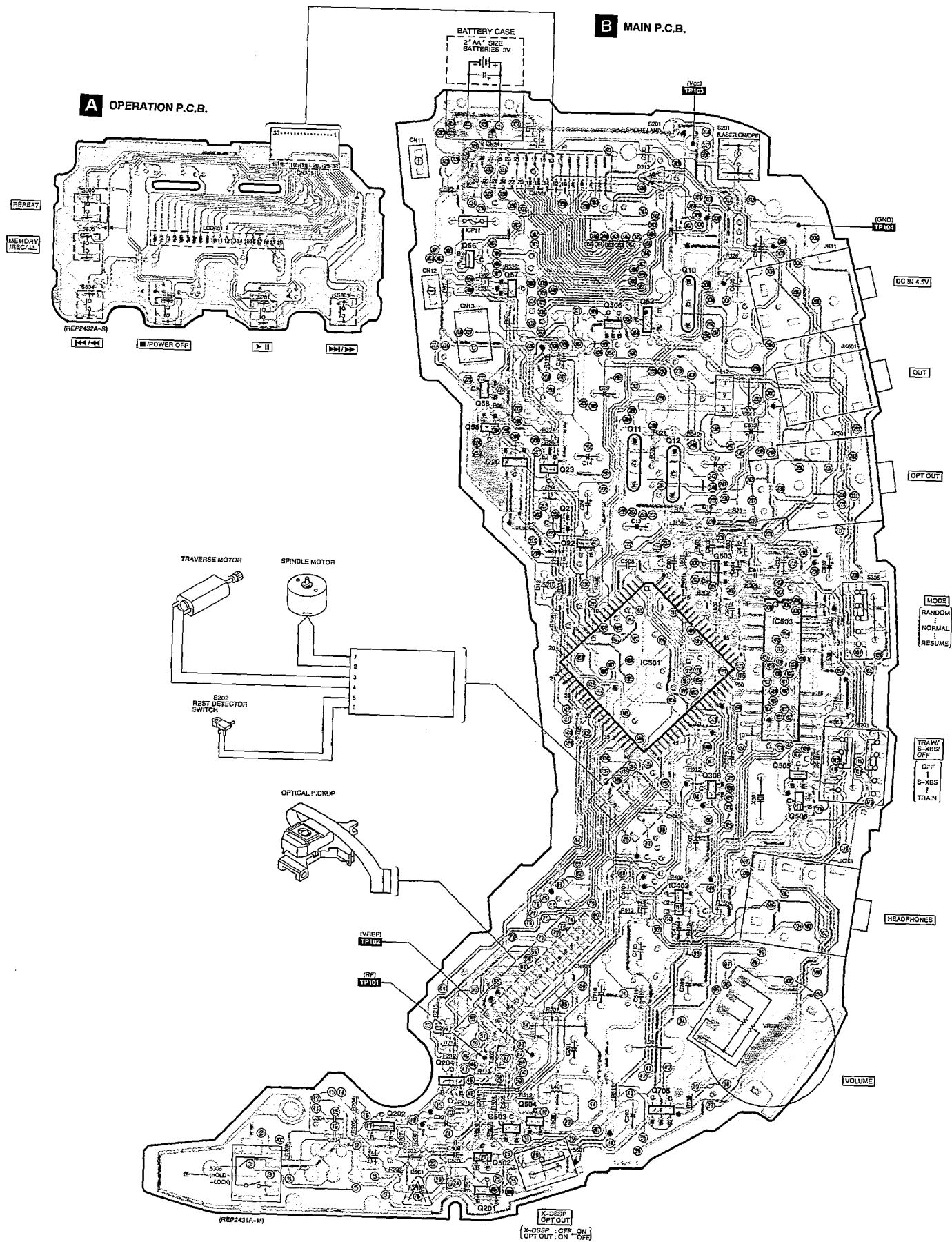
## B MAIN CIRCUIT (P.C.Board: on pages 28,29)

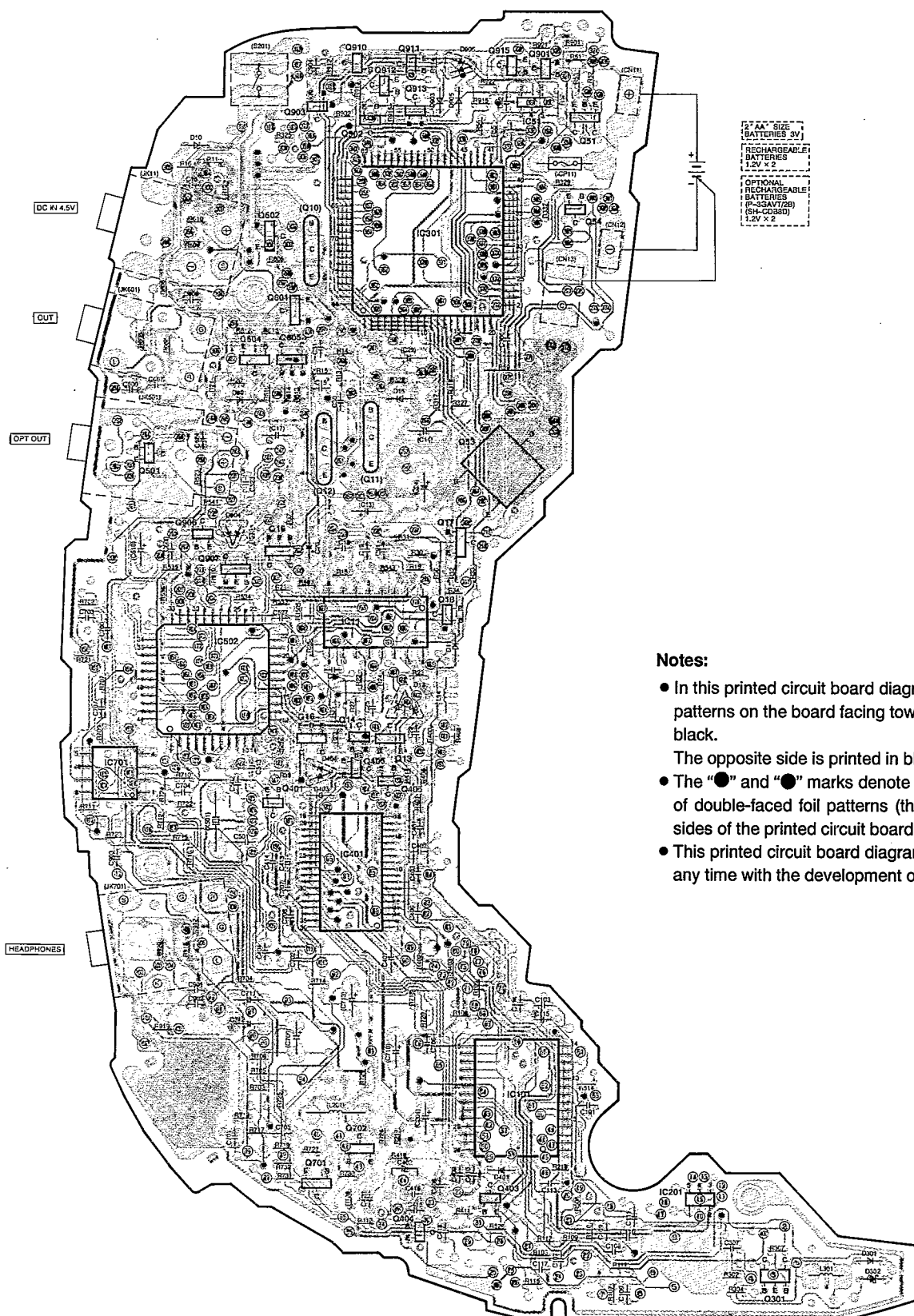




**B** MAIN CIRCUIT (P.C.Board: on pages 28,29)

# Printed Circuit Board and Wiring Connection Diagram





**Notes:**

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

## ■ Terminal Function of IC's

### ● IC11 (AN8086SE2) : DC-DC converter controller

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

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

### ● IC101 (AN8837SBE1): Servo amp.

| Pin No. | Mark  | I/O Division | Function                                       |
|---------|-------|--------------|------------------------------------------------|
| 1       | PDE   | I            | Tracking signal input terminal (1)             |
| 2       | PDF   | I            | Tracking signal input terminal (2)             |
| 3       | Vcc   | 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. | Mark    | I/O Division | Function                                           |
|---------|---------|--------------|----------------------------------------------------|
| 15      | /RFDET  | O            | RF det. signal output terminal ("L" : Det.)        |
| 16      | CROSS   | O            | Track cross signal output terminal                 |
| 17      | OFTR    | O            | Off track signal output terminal ("H" : Off track) |
| 18      | VDET    | O            | Vibration det. signal output terminal ("H" : Det.) |
| 19      | ENV     | O            | RF envelope signal output terminal                 |
| 20      | ENV OFF | I            | ENV control input terminal                         |
| 21      | TEBPF   | I            | VDET input terminal                                |
| 22      | TE IN   | I            | Tracking error amp input terminal                  |
| 23      | TE OUT  | O            | Tracking error amp output terminal                 |
| 24      | FE OUT  | O            | Focus error amp output terminal                    |
| 25      | FE IN   | 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                |

## ● IC301 (SC436020CFU) : System control &amp; LCD drive

| Pin No. | Mark     | I/O Division | Function                                  |
|---------|----------|--------------|-------------------------------------------|
| 1       | VDD      | I            | Power supply terminal                     |
| 2       | RDATA    | O            | Key scan signal output                    |
| 3       | NC       |              |                                           |
| 4       | POWER    | O            | Power ON/OFF signal output                |
| 5       | LIGHT    | O            | LCD backlight control signal output       |
| 6       | MUTE     | O            | Muting signal output ("H" : MUTE)         |
| 7       | LED      | O            | LED drive command signal (Not used, open) |
| 8       | MDATA    | O            | Command data signal output                |
| 9       | MCLK     | O            | Command clock output                      |
| 10      | MLD      | O            | Command load signal output                |
| 11      | TX POWER | O            | Voltage control terminal                  |
| 12      | CHARGE   | O            | Not used, open                            |
| 13      | VLCD3    | I            | Power supply terminal (LCD drive)         |
| 14      | VLCD2    |              |                                           |
| 15      | VLCD1    |              |                                           |
| 16      | Vss      | —            | GND terminal                              |
| 17      | VPP      | I            | Power supply terminal                     |
| 18      | XOSC1    | I            | Reset signal input terminal               |
| 19      | XOSC2    | —            | Not used, open                            |
| 20      | RESET    | I            | Reset detect terminal                     |
| 21      | OSC1     | I            | Main-system clock input                   |
| 22      | OSC2     | —            | Not used, open                            |
| 23      | LCDREM   | I/O          | Remote control signal output              |
| 24      | CHGCMP   | O            | Remote control signal output              |
| 25      | MEMORY   | I            | Key input terminal (MEMORY/RECALL)        |
| 26      | REPEAT   | I            | Key input terminal (REPEAT)               |
| 27      | SKIP-R   | I            | Key input terminal (SKIP. R)              |
| 28      | SKIP-F   | I            | Key input terminal (SKIP. F)              |
| 29      | STOP     | I            | Key input terminal (■ / POWER OFF)        |

| Pin No.       | Mark              | I/O Division | Function                                                             |
|---------------|-------------------|--------------|----------------------------------------------------------------------|
| 30            | PLAY              | I            | Key input terminal (PLAY/PAUSE)                                      |
| 31            | HOLD              | I            | Key input terminal (HOLD)                                            |
| 32            | RANDOM            | I            | Play mode (RANDOM) selector terminal                                 |
| 33            | RESUME            | I            | Play mode (RESUME) selector terminal                                 |
| 34            | SENSE             | I            | Sense signal input                                                   |
| 35            | EMPTY             | I            | Empty detection input terminal                                       |
| 36            | REST              | I            | Reset detection terminal                                             |
| 37            | SHOCKP            | I            | X-DSSP/OPT OUT ON/OFF selector terminal                              |
| 38            | ACDET             | I            | Power supply detection signal input                                  |
| 39            | SUBQ              | I            | Sub-code (Q data) input                                              |
| 40            | STAT              | I            | Status signal (CRC, CUE, CLVS, TTSTOP, FCLV, SQCK) input             |
| 41            | SQCK              | O            | Sub-code Q resistor clock output                                     |
| 42            | WLSRCN/ RSENSE    | I            | Remote control signal input                                          |
| 43            | STROBE            | I/O          | Rechargeable control input/output terminal                           |
| 44            | BUZ               | O            | Beep control output                                                  |
| 45            | BLKCK             | I            | Sub-code block (Q data) clock (75Hz) input                           |
| 46            | OPEN              | I            | Disc holder OPEN det. terminal (Not used, connected to power supply) |
| 47            | VDD               | I            | Power supply terminal                                                |
| 48<br>┌<br>51 | BP3<br>┌<br>BP0   | O            | LCD segment signal output                                            |
| 52<br>┌<br>59 | FP0<br>┌<br>FP7   | O            | LCD segment signal output                                            |
| 60            | Vss               | —            | GND terminal                                                         |
| 61<br>┌<br>69 | FP8<br>┌<br>FP16  | O            | LCD segment signal output                                            |
| 70<br>┌<br>79 | FP17<br>┌<br>FP26 | —            | LCD segment signal output (Not used, open)                           |
| 80            | VUP               | O            | Loop filter control output terminal                                  |

**● IC401 (MPC17A50VMEL) : Motor drive**

| Pin No. | Mark | I/O Division | Function                                        |
|---------|------|--------------|-------------------------------------------------|
| 1       | CGND | —            | GND terminal (control circuit)                  |
| 2       | VLG  | I            | Power supply terminal (control circuit)         |
| 3       | INTR | I            | Tracking coil control signal input              |
| 4       | NI2  | —            | Connected to capacitor filter                   |
| 5       | OP2  |              |                                                 |
| 6       | INFO | I            | Focus coil control signal input                 |
| 7       | NI1  | —            | Connected to capacitor filter                   |
| 8       | OP1  |              |                                                 |
| 9       | LIM  | I            | Limit control level signal input                |
| 10      | VR   | I            | Voltage control terminal                        |
| 11      | CLK  | I            | Clock signal input                              |
| 12      | OP3  | —            | Connected to capacitor filter                   |
| 13      | NI3  |              |                                                 |
| 14      | INTV | I            | Traverse motor control signal input             |
| 15      | OP4  | —            | Connected to capacitor filter                   |
| 16      | NI4  |              |                                                 |
| 17      | INSP | I            | Spindle motor control signal input              |
| 18      | PHSW | I            | CH4 mode input terminal                         |
| 19      | POL  | O            | CH4 monitor output terminal<br>(Not used, open) |

| Pin No. | Mark | I/O Division | Function                                        |
|---------|------|--------------|-------------------------------------------------|
| 20      | CFL4 | —            | Connected to capacitor filter                   |
| 21      | CFL3 |              |                                                 |
| 22      | SP+  | O            | Spindle motor drive signal output               |
| 23      | SP-  |              |                                                 |
| 24      | PVcc | I            | (CH3, CH4 output) Power supply terminal         |
| 25      | TRV- | O            | Traverse motor drive signal output              |
| 26      | PGND | —            | GND terminal (CH3, CH4 output)                  |
| 27      | TRV+ | O            | Traverse motor drive signal output              |
| 28      | FO+  | O            | Focus coil drive signal output                  |
| 29      | PGND | —            | GND terminal (CH1, CH2 output)                  |
| 30      | FO-  | O            | Focus coil drive signal output                  |
| 31      | PVcc | I            | (CH1, CH2 output) Power supply terminal         |
| 32      | TR-  | O            | Tracking coil drive signal output               |
| 33      | TR+  |              |                                                 |
| 34      | CFL1 | —            | Connected to capacitor filter                   |
| 35      | CFL2 |              |                                                 |
| 36      | VG   | I            | Power supply terminal<br>(Print driver circuit) |

**● IC501 (MN662745RPC) : Servo processor/digital signal processor/digital filter /D/A converter**

| Pin No. | Mark   | I/O Division | Function                                                                  |
|---------|--------|--------------|---------------------------------------------------------------------------|
| 1       | BCLK   | O            | Serial bit clock output                                                   |
| 2       | LRCK   | O            | L/R discriminating signal output                                          |
| 3       | SRDATA | O            | Serial data signal output                                                 |
| 4       | DVdd1  | I            | Power supply (digital circuit) terminal                                   |
| 5       | DVss1  | —            | GND (digital circuit) terminal                                            |
| 6       | TX     | O            | Digital audio interface signal                                            |
| 7       | MCLK   | I            | Command clock signal                                                      |
| 8       | MDATA  | I            | Command data signal                                                       |
| 9       | MLD    | I            | Command load signal<br>("L" : LOAD)                                       |
| 10      | SENSE  | O            | Sense signal (OFT, FESL, NACEND, NAJEND, POSAD, SFG)<br>(Not used, open)  |
| 11      | FLOCK  | O            | Optical servo condition<br>(focus) ("L" : lead-in)<br>(Not used, open)    |
| 12      | TLOCK  | O            | Optical servo condition<br>(tracking) ("L" : lead-in)<br>(Not used, open) |

| Pin No. | Mark  | I/O Division | Function                                                  |
|---------|-------|--------------|-----------------------------------------------------------|
| 13      | BLKCK | O            | Sub-code block clock (f=75Hz)                             |
| 14      | SQCK  | I            | Sub-code Q register clock                                 |
| 15      | SUBQ  | O            | Sub-code Q code                                           |
| 16      | DMUTE | I            | Muting input ("H" : MUTE)<br>(Not used, connected to GND) |
| 17      | STAT  | O            | Status signal (CRC, CUE, CLVS, TTSTOP, FCLV, SQCK)        |
| 18      | RESET | I            | Reset signal ("L" : reset)                                |
| 19      | SMCK  | O            | System clock (f=4.2336MHz)                                |
| 20      | PMCK  | O            | Frequency division clock signal<br>(f=1/1.92×ck=88.2kHz)  |
| 21      | TRV   | O            | Traverse servo control                                    |
| 22      | TVD   | O            | Traverse drive signal                                     |
| 23      | PC    | O            | Spindle motor drive signal<br>("L" : ON)                  |
| 24      | ECM   | O            | Spindle motor drive signal<br>(Forced mode)               |
| 25      | ECS   | O            | Spindle motor drive signal<br>(Servo error signal)        |

| Pin No. | Mark  | I/O Division | Function                                                                           |
|---------|-------|--------------|------------------------------------------------------------------------------------|
| 26      | KICK  | O            | Kick pulse output                                                                  |
| 27      | TRD   | O            | Tracking drive signal output                                                       |
| 28      | FOD   | O            | Focus drive signal output                                                          |
| 29      | VREF  | I            | D/A drive output (TVD, ECS, TRD, FOD, FBAL, TBAL)<br>normal voltage input terminal |
| 30      | FBAL  | O            | Focus balance adj. output                                                          |
| 31      | TBAL  | O            | Tracking balance adj. output                                                       |
| 32      | FE    | I            | Focus error signal (analog input)                                                  |
| 33      | TE    | I            | Tracking error signal (analog input)                                               |
| 34      | RFENV | I            | RF envelope signal                                                                 |
| 35      | VDET  | I            | Oscillation det. signal<br>("H" : det)                                             |
| 36      | OFTR  | I            | Off track signal<br>("H" : Off track)                                              |
| 37      | TRCRS | I            | Track cross signal input                                                           |
| 38      | RFDET | I            | RF detection signal<br>("L" : detection)                                           |
| 39      | BDO   | I            | Dropout detection signal<br>("H" : dropout)                                        |
| 40      | LDON  | O            | Laser power control<br>("H" : ON)                                                  |
| 41      | TES   | O            | Tracking error shunt output<br>("H" : dropout) (Not used, open)                    |
| 42      | PLAY  | O            | Play signal ("H" : play)<br>(Not used, open)                                       |
| 43      | WVEL  | O            | Double velocity status signal<br>("H" : double) (Not used, open)                   |
| 44      | ARF   | I            | RF signal input                                                                    |
| 45      | IREF  | I            | Reference current input                                                            |
| 46      | DRF   | —            | DSL bias terminal<br>(Not used, open)                                              |
| 47      | DSLIF | I/O          | DSL loop filter terminal                                                           |
| 48      | PLLIF | I            | PLL loop filter terminal                                                           |
| 49      | VCOF  | I            | VCO loop filter terminal                                                           |
| 50      | AVDD2 | I            | Power supply (analog circuit) terminal (2)                                         |
| 51      | AVSS2 | —            | GND (analog circuit) terminal                                                      |
| 52      | FS384 | O            | 384fs (16.9344MHz) output                                                          |
| 53      | PCK   | —            | PLL extract clock<br>(f=4.3218MHz)<br>(Not used, open)                             |
| 54      | TROF  | —            | Tracking servo OFF signal<br>(Not used, open)                                      |

| Pin No. | Mark    | I/O Division | Function                                                                                  |
|---------|---------|--------------|-------------------------------------------------------------------------------------------|
| 55      | SUBC    | —            | Sub-code serial output data<br>(Not used, open)                                           |
| 56      | SBCK    | —            | Sub-code serial input clock<br>(Not used, connected to GND)                               |
| 57      | Vss     | —            | GND terminal                                                                              |
| 58      | X1      | I            | Crystal oscillator input terminal<br>(f=16.9344MHz)                                       |
| 59      | X2      | O            | Crystal oscillator output terminal<br>(f=16.9344MHz)                                      |
| 60      | VDD     | I            | Power supply terminal                                                                     |
| 61      | TRVSTOP | O            | Traverse motor stop control terminal                                                      |
| 62      | CLDCK   | —            | Sub-code frame clock signal<br>(f CLDCK=7.35kHz: Normal)<br>(Not used, open)              |
| 63      | FCLK    | —            | Crystal frame clock signal<br>[f FCLK=7.35kHz: 2 speed(14.7kHz)]<br>(Not used, open)      |
| 64      | IPFLAG  | —            | Interpolation flag terminal<br>(Not used, open)                                           |
| 65      | FLAG0   | —            | Flag terminal<br>(Not used, open)                                                         |
| 66      | CLVS    | —            | Turntable servo phase synchro signal<br>("H": CLV, "L": Rough servo)<br>(Not used, open)  |
| 67      | CRC     | —            | Sub-code CRC check terminal<br>("H": OK, "L": NG)<br>(Not used, open)                     |
| 68      | DEMPHA  | —            | De-emphasis ON signal<br>("H": ON)<br>(Not used, open)                                    |
| 69      | FLAG6   | O            | Flag terminal                                                                             |
| 70      | SEL     | —            | Not used, connected to GND                                                                |
| 71      | TEST    | I            | Test terminal<br>(Normal : "H")                                                           |
| 72      | AVDD1   | I            | Power supply (analog circuit) terminal (1)                                                |
| 73      | OUTL    | O            | Lch audio signal                                                                          |
| 74      | AVSS1   | —            | GND (analog circuit) terminal (1)                                                         |
| 75      | OUTR    | O            | Rch audio signal                                                                          |
| 76      | RSEL    | I            | Polarity direction control terminal of RF signal<br>(Not used, connected to power supply) |
| 77      | CSEL    | I            | Frequency control terminal of crystal oscillator                                          |
| 78      | ISRDATA | I            | Serial data signal input                                                                  |
| 79      | ILRCK   | I            | L/R discriminating signal input                                                           |
| 80      | IBCLK   | I            | Serial bit clock input                                                                    |

## ● IC502 (SM5859AF) : Shock proof controller

| Pin No. | Mark    | I/O Division | Function                             |
|---------|---------|--------------|--------------------------------------|
| 1       | VDD1    | I            | Power supply terminal                |
| 2       | REMSEL  | —            | Not used, connected to GND           |
| 3       | CHGSEL  | —            | Not used, open                       |
| 4       | RAMSEL  | —            | Not used, open                       |
| 5       | UC4     | —            | Not used, open                       |
| 6       | UC5     | —            | Not used, open                       |
| 7       | NTEST1  | —            | Test terminal<br>(Not used, open)    |
| 8       | NTEST2  |              |                                      |
| 9       | CLK     | I            | Clock signal input<br>(f=16.9344MHz) |
| 10      | Vss     | —            | GND terminal                         |
| 11      | YSRDATA | I            | Serial data input terminal           |
| 12      | YLRCK   | I            | Serial L/R clock input terminal      |
| 13      | YSCK    | I            | Serial bit clock input terminal      |
| 14      | ZSCK    | O            | Serial bit clock output terminal     |
| 15      | ZLRCK   | O            | L/R clock output terminal            |
| 16      | ZSRDATA | O            | Serial data output terminal          |
| 17      | YFLAG   | I            | RAM over-flow flag terminal          |
| 18      | YFCLK   | I            | Crystal frame clock input            |

| Pin No.       | Mark          | I/O Division | Function                                 |
|---------------|---------------|--------------|------------------------------------------|
| 19            | YBLKCK        | I            | Sub-code block clock input terminal      |
| 20            | RESET         | I            | Reset input terminal                     |
| 21            | ZSENSE        | O            | Microcomputer states output terminal     |
| 22            | UC6           | —            | Not used, open                           |
| 23            | YDMUTE        | I            | Mute input terminal                      |
| 24            | YMLD          | I            | Microcomputer latch clock input terminal |
| 25            | YMDATA        | I            | Microcomputer serial data input terminal |
| 26            | YMCLK         | I            | Microcomputer shift clock input terminal |
| 27            | NOE           | O            | D-RAM output enable terminal             |
| 28            | NCAS          | O            | D-RAM column address strobe terminal     |
| 29<br>┌<br>32 | D0<br>┌<br>D3 | I/O          | D-RAM data input/output terminal         |
| 33            | NWE           | O            | D-RAM write enable terminal              |
| 34            | NRAS          | O            | D-RAM low address strobe terminal        |
| 35<br>┌<br>44 | A0<br>┌<br>A9 | O            | D-RAM address output terminal            |

## ● IC503 (M44400CJ7E2) : 4M DRAM

| Pin No.     | Mark          | I/O Division | Function                    |
|-------------|---------------|--------------|-----------------------------|
| 1           | D0            | I/O          | Data input/output terminal  |
| 2           | D1            | I/O          | Data input/output terminal  |
| 3           | NWE           | I            | Write enable terminal       |
| 4           | NRAS          | I            | Low address strobe terminal |
| 5           | A9            | I            | Address input terminal      |
| 6           | A0            | I            | Address input terminal      |
| 7<br>┌<br>9 | A1<br>┌<br>A3 | I            | Address input terminal      |

| Pin No.       | Mark          | I/O Division | Function                       |
|---------------|---------------|--------------|--------------------------------|
| 10            | VCC           | I            | Power supply terminal          |
| 11<br>┌<br>15 | A4<br>┌<br>A8 | I            | Address input terminal         |
| 16            | NOE           | I            | Output enable terminal         |
| 17            | NCAS          | I            | Column address strobe terminal |
| 18            | D3            | I/O          | Data input/output terminal     |
| 19            | D2            | I/O          | Data input/output terminal     |
| 20            | GND           | —            | GND terminal                   |

## Replacement Parts List (Electrical)

**Notes:**

- Important safety notice:  
Components identified by  $\Delta$  mark have special characteristics important for safety.  
Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used.  
When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.
- Warning: This product uses a laser diode. Refer to caution statements on page 2.
- ACHTUNG: Die Lasereinheit nicht zerlegen.  
Die Lasereinheit darf nur gegen eine vom Hersteller spezifizierte Einheit ausgetauscht werden.
- [M] indicates in Remarks column parts that are supplied by MESA.

| Ref. No. | Part No.     | Part Name & Description | Remarks | Ref. No.  | Part No.     | Part Name & Description | Remarks      |
|----------|--------------|-------------------------|---------|-----------|--------------|-------------------------|--------------|
|          |              | INTEGRATED CIRCUIT(S)   |         | Q501      | DTA114YUA106 | TRANSISTOR              | [M]          |
|          |              |                         |         | Q502      | UN5113TX     | TRANSISTOR              | [M]          |
|          |              |                         |         | Q503, 504 | UN5211TX     | TRANSISTOR              | [M]          |
| IC11     | AN8086SE2    | IC                      | [M]     | Q505      | DTA143TUT106 | TRANSISTOR              | [M]          |
| IC51     | NJM2406FTE1  | IC                      | [M]     | Q506      | UN5215TX     | TRANSISTOR              | [M]          |
| IC101    | AN8837SBE1   | IC                      | [M]     | Q601, 602 | 2SD1328QRSTX | TRANSISTOR              | [M]          |
| IC201    | NJM2406FTE1  | IC                      | [M]     | Q603      | XN1215TX     | TRANSISTOR              | [M]          |
| IC301    | SC43602DGFU  | IC                      | [M]     | Q604      | 2SB709QRSTX  | TRANSISTOR              | [M]          |
| IC401    | MPC17A50VMEL | IC                      | [M]     | Q605      | XN1501TX     | TRANSISTOR              | [M]          |
| IC402    | TC7S86FTE85L | IC                      | [M]     | Q701, 702 | 2SD1328QRSTX | TRANSISTOR              | [M]          |
| IC501    | MN662745RPC  | IC                      | [M]     | Q705      | XN1215TX     | TRANSISTOR              | [M]          |
| IC502    | SM5859AF     | IC                      | [M]     | Q901, 902 | 2SD1819QRSTX | TRANSISTOR              | [M]          |
| IC503    | M44400CJ7E2  | IC                      | [M]     | Q903      | DTA114YUA106 | TRANSISTOR              | [M]          |
| IC701    | NJU7082AMTE1 | IC                      | [M]     | Q906      | DTA114YUA106 | TRANSISTOR              | [M]          |
|          |              | TRANSISTOR(S)           |         | Q907      | XN1210TX     | TRANSISTOR              | [M]          |
|          |              |                         |         | Q910      | 2SB1218QRSTX | TRANSISTOR              | [M]          |
| Q10      | 2SD2074HWSTT | TRANSISTOR              | [M]     | Q911      | 2SD1819QRSTX | TRANSISTOR              | [M]          |
| Q11, 12  | 2SD1450STTA  | TRANSISTOR              | [M]     | Q912      | UN5211TX     | TRANSISTOR              | [M]          |
| Q13      | 2SD1328QRSTX | TRANSISTOR              | [M]     | Q913      | UN5215TX     | TRANSISTOR              | [M]          |
| Q14      | 2SD1819QRSTX | TRANSISTOR              | [M]     | Q915      | 2SD1819QRSTX | TRANSISTOR              | [M]          |
| Q16      | XN2401TX     | TRANSISTOR              | [M]     |           |              | DIODE(S)                |              |
| Q17      | 2SB970RSTX   | TRANSISTOR              | [M]     |           |              |                         |              |
| Q18      | UN5115TX     | TRANSISTOR              | [M]     | D10       | MA8033LTX    | DIODE                   | [M]          |
| Q19      | XN1213TX     | TRANSISTOR              | [M]     | D11, 12   | MA110TX      | DIODE                   | [M]          |
| Q20      | 2SD1328-S    | TRANSISTOR              | [M]     | D13       | RB411DT146   | DIODE                   | [M]          |
| Q21      | UN5211TX     | TRANSISTOR              | [M]     | D15, 16   | MA110TX      | DIODE                   | [M]          |
| Q22      | UN5213TX     | TRANSISTOR              | [M]     | D201      | RB411DT146   | DIODE                   | [M]          |
| Q23      | DTA114YUA106 | TRANSISTOR              | [M]     | D202      | MA110TX      | DIODE                   | [M]          |
| Q51      | XN2401TX     | TRANSISTOR              | [M]     | D301      | MA110TX      | DIODE                   | [M]          |
| Q52      | 2SB970RSTX   | TRANSISTOR              | [M]     | D302      | MA8047MTX    | DIODE                   | [M]          |
| Q53      | 2SD1758LTPQR | TRANSISTOR              | [M]     | D313      | MA141WKTX    | DIODE                   | [M]          |
| Q54, 55  | 2SD1819QRSTX | TRANSISTOR              | [M]     | D401      | MA110TX      | DIODE                   | [M]          |
| Q56      | UN5115TX     | TRANSISTOR              | [M]     | D402      | MA8082MTX    | DIODE                   | [M]          |
| Q57      | UN5211TX     | TRANSISTOR              | [M]     | D403      | MA110TX      | DIODE                   | [M]          |
| Q58      | 2SD1819QRSTX | TRANSISTOR              | [M]     | D404      | MA142WATX    | DIODE                   | [M]          |
| Q201     | 2SB970RSTX   | TRANSISTOR              | [M]     | D601      | MA110TX      | DIODE                   | [M]          |
| Q202     | 2SB709QRSTX  | TRANSISTOR              | [M]     | D903      | MA110TX      | DIODE                   | [M]          |
| Q204     | 2SB709QRSTX  | TRANSISTOR              | [M]     | D904      | MA141WKTX    | DIODE                   | [M]          |
| Q301     | XN1501TX     | TRANSISTOR              | [M]     | D905      | MA110TX      | DIODE                   | [M]          |
| Q306     | XP0121N00L   | TRANSISTOR              | [M]     | D906      | MA143TX      | DIODE                   | [M]          |
| Q308     | UN5211TX     | TRANSISTOR              | [M]     |           |              |                         |              |
| Q401     | UN5210TX     | TRANSISTOR              | [M]     |           |              | IC PROTECTOR(S)         |              |
| Q403     | 2SD1819QRSTX | TRANSISTOR              | [M]     |           |              |                         |              |
| Q404     | UN5215TX     | TRANSISTOR              | [M]     | ICP11     | UNHD00700A   | IC PROTECTOR            | [M] $\Delta$ |
| Q405     | UN5213TX     | TRANSISTOR              | [M]     |           |              |                         |              |
| Q406     | UN5210TX     | TRANSISTOR              | [M]     |           |              | VARIABLE RESISTOR(S)    |              |

| Ref. No. | Part No.     | Part Name & Description | Remarks | Ref. No. | Part No.    | Part Name & Description      | Remarks |
|----------|--------------|-------------------------|---------|----------|-------------|------------------------------|---------|
| VR11     | EVMLYSX50B33 | V. R                    | [M]     | S201     | ESE11SV6    | SW                           | [M]     |
| VR701    | EVUTUEB09C54 | V. R                    | [M]     | S202     | ESE11HS4    | SW                           | [M]     |
|          |              | COIL (S)                |         | S305     | RSS3A007-1A | SW                           | [M]     |
| L12      | ELL7URD001   | COIL                    | [M]     | S306     | ESE11MH1T   | SW                           | [M]     |
| L14      | RLQU331KT-W  | COIL                    | [M]     | S501     | RSS2A010-1A | SW                           | [M]     |
| L201     | RLQB471KT1-K | COIL                    | [M]     | S701     | RSS3B018-A  | SW                           | [M]     |
| L202     | ELJPC330KF   | COIL                    | [M]     | S801-806 | RSG0030-P   | SW                           | [M]     |
| L301     | RLQU331KT-W  | COIL                    | [M]     |          |             | CONNECTOR(S) AND JACK(S)     |         |
| L401     | RLQU331KT-W  | COIL                    | [M]     | CN11, 12 | RJC93015-1  | BATTERY TERMINAL (+) (-)     | [M]     |
| L601-603 | RLBV102V-Y   | COIL                    | [M]     | CN13     | RJH5102-1   | R. BATTERY TERMINAL          | [M]     |
|          |              | OSCILLATOR(S)           |         | CN14     | RJH9208     | BATT. CASE CONNECT. TERMINAL | [M]     |
| X501     | RSXC16M9S01T | OSCILLATOR              | [M]     | CN101    | RJS2A5016T  | CONNECTOR (16P)              | [M]     |
|          |              | LCD(S)                  |         | CN301    | RJS1A8830T  | CONNECTOR (30P)              | [M]     |
| LCD801   | RSL5152-L    | LCD                     | [M]     | CN401    | RJS2A5106T  | CONNECTOR (6P)               | [M]     |
|          |              | SWITCH(ES)              |         | CN801    | RJS2A4530T  | CONNECTOR (30P)              | [M]     |
|          |              |                         |         | JK11     | RJJ43K09-C  | DC IN JACK                   | [M]     |
|          |              |                         |         | JK501    | GP1F366X    | OPTICAL DIGITAL OUT          | [M]     |
|          |              |                         |         | JK601    | RJJD3S52B-C | OUT JACK                     | [M]     |
|          |              |                         |         | JK701    | RJJ36T02-C  | HEADPHONES JACK              | [M]     |

## Resistors and Capacitors

**Notes:** \* Capacity values are in microfarads (uF) unless specified otherwise, P=Pico-farads (pF) F=Farads (F)  
 \* Resistance values are in ohms, unless specified otherwise, 1K=1,000 (OHM), 1M=1,000k (OHM)  
 \* [M] indicates in Remarks columns parts that are supplied by MESA.

| Ref. No. | Part No.     | Values & Remarks | Ref. No. | Part No.     | Values & Remarks | Ref. No.  | Part No.     | Values & Remarks |
|----------|--------------|------------------|----------|--------------|------------------|-----------|--------------|------------------|
|          |              | RESISTORS        | R32      | ERJ3GEYJ332V | 1/16W 3. 3K [M]  | R106      | ERJ3GEYJ124V | 1/16W 120K [M]   |
|          |              |                  | R33      | ERJ3GEYJ222V | 1/16W 2. 2K [M]  | R107      | ERJ3GEYJ683V | 1/16W 68K [M]    |
|          |              |                  | R34      | ERJ3GEYJ224V | 1/16W 220K [M]   | R108      | ERJ3GEYJ563V | 1/16W 56K [M]    |
| R10      | ERJ3GEYJ102Z | 1/16W 1K [M]     | R35      | ERJ3GEYJ823V | 1/16W 82K [M]    | R109      | ERJ3GEYJ223V | 1/16W 22K [M]    |
| R11, 12  | ERJ3GEYJ101V | 1/16W 100 [M]    | R36      | ERJ3GEYJ471V | 1/16W 470 [M]    | R110      | ERJ3GEYJ124V | 1/16W 120K [M]   |
| R13      | ERJ3GEYJ100V | 1/16W 10 [M]     | R37, 38  | ERJ3GEYJ222V | 1/16W 2. 2K [M]  | R111      | ERJ3GEYJ102Z | 1/16W 1K [M]     |
| R14      | ERJ3GEYJ681V | 1/16W 680 [M]    | R39      | ERJ3GEYJ223V | 1/16W 22K [M]    | R112      | ERJ3GEYJ472V | 1/16W 4. 7K [M]  |
| R15      | ERJ3GEYJ221V | 1/16W 220 [M]    | R51      | ERJ3GEYJ104Z | 1/16W 100K [M]   | R113, 114 | ERJ3GEYJ330V | 1/16W 33 [M]     |
| R16      | ERJ3GEYJ103Z | 1/16W 10K [M]    | R52      | ERJ3GEYJ105V | 1/16W 1M [M]     | R115      | ERJ3GEYJ102Z | 1/16W 1K [M]     |
| R17      | ERJ3GEYJ223V | 1/16W 22K [M]    | R53      | ERJ3GEYJ104Z | 1/16W 100K [M]   | R201      | ERJ3GEYJ102Z | 1/16W 1K [M]     |
| R18      | ERJ3GEYJ474V | 1/16W 470K [M]   | R54      | ERJ3GEYJ151V | 1/16W 150 [M]    | R202      | ERJ3GEYJ122V | 1/16W 1. 2K [M]  |
| R19      | ERJ3GEYJ472V | 1/16W 4. 7K [M]  | R55      | ERJ3GEYJ183V | 1/16W 18K [M]    | R204      | ERJ3GEYJ104Z | 1/16W 100K [M]   |
| R20      | ERJ3GEYJ392V | 1/16W 3. 9K [M]  | R56      | ERJ3GEYJ683V | 1/16W 68K [M]    | R205      | ERJ3GEYJ332V | 1/16W 3. 3K [M]  |
| R21      | ERJ3GEYJ153V | 1/16W 15K [M]    | R57      | ERJ3GEYJ124V | 1/16W 120K [M]   | R206      | ERJ3GEYJ333V | 1/16W 33K [M]    |
| R22      | ERJ3GEYJ333V | 1/16W 33K [M]    | R59      | ERJ12YJ1R2H  | 1/2W 1. 2 [M]    | R207      | ERJ3GEYJ473V | 1/16W 47K [M]    |
| R23      | ERJ3GEYJ223V | 1/16W 22K [M]    | R60      | ERJ3GEYJ333V | 1/16W 33K [M]    | R208      | ERJ3GEYJ563V | 1/16W 56K [M]    |
| R24      | ERJ3GEYJ184V | 1/16W 180K [M]   | R61      | ERJ3GEYJ681V | 1/16W 680 [M]    | R212      | ERJ3GEYJ333V | 1/16W 33K [M]    |
| R25      | ERJ3GEYJ472V | 1/16W 4. 7K [M]  | R62      | ERJ3GEYJ122V | 1/16W 1. 2K [M]  | R213      | ERJ3GEYJ103Z | 1/16W 10K [M]    |
| R26      | ERJ3GEYJ152V | 1/16W 1. 5K [M]  | R63      | ERJ3GEYJ681V | 1/16W 680 [M]    | R214      | ERJ3GEYJ822V | 1/16W 8. 2K [M]  |
| R27      | ERJ3GEYJ473V | 1/16W 47K [M]    | R65      | ERJ3GEYJ104Z | 1/16W 100K [M]   | R215      | ERJ3GEYJ393V | 1/16W 39K [M]    |
| R28, 29  | ERJ3GEYJ104Z | 1/16W 100K [M]   | R66      | ERJ3GEYJ3R3V | 1/16W 3. 3 [M]   | R216, 217 | ERJ3GEYJ223V | 1/16W 22K [M]    |
| R30, 31  | ERJ3GEYJ334V | 1/16W 330K [M]   | R105     | ERJ3GEYJ333V | 1/16W 33K [M]    | R218      | ERJ3GEYJ224V | 1/16W 220K [M]   |

| Ref. No.  | Part No.     | Values & Remarks | Ref. No.  | Part No.     | Values & Remarks | Ref. No.  | Part No.     | Values & Remarks |
|-----------|--------------|------------------|-----------|--------------|------------------|-----------|--------------|------------------|
| R302      | ERJ3GEYJ182V | 1/16W 1.8K [M]   | R705, 706 | ERJ3GEYJ473V | 1/16W 47K [M]    | C30       | ECUV1H470KCV | 50V 47P [M]      |
| R304      | ERJ3GEYJ103Z | 1/16W 10K [M]    | R707, 708 | ERJ3GEYJ223V | 1/16W 22K [M]    | C31       | ECUVNC224KBN | 16V 0.22U [M]    |
| R307      | ERJ3GEYJ472V | 1/16W 4.7K [M]   | R709-712  | ERJ3GEYJ105V | 1/16W 1M [M]     | C32       | ECST1AY475RR | 10V 4.7U [M]     |
| R317-319  | ERJ3GEYJ473V | 1/16W 47K [M]    | R713, 714 | ERJ3GEYJ682V | 1/16W 6.8K [M]   | C51       | ECUV1C104KBV | 16V 0.1U [M]     |
| R320-322  | ERJ3GEYJ103Z | 1/16W 10K [M]    | R715, 716 | ERJ3GEYJ123V | 1/16W 12K [M]    | C52       | ECUVNC104ZFN | 16V 0.1U [M]     |
| R324      | ERJ3GEYJ103Z | 1/16W 10K [M]    | R717, 718 | ERJ3GEYJ392V | 1/16W 3.9K [M]   | C101      | ECUV1C104KBV | 16V 0.1U [M]     |
| R325, 326 | ERJ3GEYJ102Z | 1/16W 1K [M]     | R719, 720 | ERJ3GEYJ103Z | 1/16W 10K [M]    | C103      | ECUV1C273KBV | 16V 0.027U [M]   |
| R327      | ERJ3GEYJ153V | 1/16W 15K [M]    | R721, 722 | ERJ3GEYJ333V | 1/16W 33K [M]    | C106      | ECUV1H391KBV | 50V 390P [M]     |
| R329-331  | ERJ3GEYJ472V | 1/16W 4.7K [M]   | R723, 724 | ERJ3GEYJ154V | 1/16W 150K [M]   | C107      | ECUV1H221KBV | 50V 220P [M]     |
| R332      | ERJ3GEYJ102Z | 1/16W 1K [M]     | R725, 726 | ERJ3GEYJ180V | 1/16W 18 [M]     | C108      | ECUV1C473KBV | 16V 0.047U [M]   |
| R400      | ERJ3GEYJ472V | 1/16W 4.7K [M]   | R727, 728 | ERJ3GEYJ1R5V | 1/16W 1.5 [M]    | C109      | ECUV1C333KBV | 16V 0.033U [M]   |
| R401      | ERJ3GEYJ473V | 1/16W 47K [M]    | R729, 730 | ERJ3GEYJ472V | 1/16W 4.7K [M]   | C110      | ECUV1E223KBV | 25V 0.022U [M]   |
| R402      | ERJ3GEYJ472V | 1/16W 4.7K [M]   | R731, 732 | ERJ3GEYJ331V | 1/16W 330 [M]    | C111      | ECUV1C273KBV | 16V 0.027U [M]   |
| R403      | ERJ3GEYJ223V | 1/16W 22K [M]    | R739      | ERJ3GEYJ181V | 1/16W 180 [M]    | C113      | ECUVNC104ZFN | 16V 0.1U [M]     |
| R405      | ERJ3GEYJ222V | 1/16W 2.2K [M]   | R901      | ERJ3GEYJ274V | 1/16W 270K [M]   | C114      | ECUVNC474KBN | 16V 0.47U [M]    |
| R406      | ERJ3GEYJ123V | 1/16W 12K [M]    | R902      | ERJ3GEYJ102Z | 1/16W 1K [M]     | C115      | ECUV1E223KBV | 25V 0.022U [M]   |
| R408      | ERJ3GEYJ103Z | 1/16W 10K [M]    | R910      | ERJ3GEYJ334V | 1/16W 330K [M]   | C117      | ECUV1H332KBV | 50V 3300P [M]    |
| R409      | ERJ3GEYJ682V | 1/16W 6.8K [M]   | R912      | ERJ3GEYJ152V | 1/16W 1.5K [M]   | C201      | RCEQJSL470IX | 6.3V 47U [M]     |
| R411, 412 | ERJ3GEYJ103Z | 1/16W 10K [M]    | R913      | ERJ3GEYJ473V | 1/16W 47K [M]    | C202      | ECUVNC224KBN | 16V 0.22U [M]    |
| R413      | ERJ3GEYJ472V | 1/16W 4.7K [M]   | R914      | ERJ3GEYJ103Z | 1/16W 10K [M]    | C203      | ECST1AY225RR | 10V 2.2U [M]     |
| R414      | ERJ3GEYJ473V | 1/16W 47K [M]    | R915      | ERJ3GEYJ183V | 1/16W 18K [M]    | C204      | ECUV1H101KCV | 50V 100P [M]     |
| R501      | ERJ3GEYJ683V | 1/16W 68K [M]    | R916      | ERJ3GEYJ472V | 1/16W 4.7K [M]   | C206      | ECUV1E103KBV | 25V 0.01U [M]    |
| R502      | ERJ3GEYJ223V | 1/16W 22K [M]    | R917, 918 | ERJ3GEYJ821V | 1/16W 820 [M]    | C207, 208 | ECUV1H102KBV | 50V 1000P [M]    |
| R503      | ERJ3GEYJ473V | 1/16W 47K [M]    | R919      | ERJ3GEYJ680V | 1/16W 68 [M]     | C301      | ECST0JY156RR | 6.3V 15U [M]     |
| R504      | ERJ3GEYJ474V | 1/16W 470K [M]   | R920      | ERJ3GEYJ470V | 1/16W 47 [M]     | C304, 305 | ECUVNC104ZFN | 16V 0.1U [M]     |
| R505      | ERJ3GEYJ221V | 1/16W 220 [M]    | R921      | ERJ3GEYJ474V | 1/16W 470K [M]   | C306      | ECUVNC105ZFN | 16V 1U [M]       |
| R506      | ERJ3GEYJ821V | 1/16W 820 [M]    | R922      | ERJ3GEYJ224V | 1/16W 220K [M]   | C307      | ECUVNC104ZFN | 16V 0.1U [M]     |
| R508      | ERJ3GEYJ122V | 1/16W 1.2K [M]   |           |              |                  | C333      | ECUV1H221KBV | 50V 220P [M]     |
| R512      | ERJ3GEYJ471V | 1/16W 470 [M]    |           |              | CHIP JUMPERS     | C401-403  | ECUV1H471KBV | 50V 470P [M]     |
| R513      | ERJ3GEYJ222V | 1/16W 2.2K [M]   |           |              |                  | C404      | ECUVNC105ZFN | 16V 1U [M]       |
| R514      | ERJ3GEYJ333V | 1/16W 33K [M]    | R410      | ERJ3GEY0R00V | CHIP JUMPER [M]  | C406      | ECUV1H151KBV | 50V 150P [M]     |
| R515      | ERJ3GEYJ681V | 1/16W 680 [M]    | R507      | ERJ3GEY0R00V | CHIP JUMPER [M]  | C407      | ECST0JY106RR | 6.3V 10U [M]     |
| R523      | ERJ3GEYJ102Z | 1/16W 1K [M]     | RJ501     | ERJ3GEY0R00V | CHIP JUMPER [M]  | C408      | ECUVNC105ZFN | 16V 1U [M]       |
| R526      | ERJ3GEYJ102Z | 1/16W 1K [M]     | RJ505     | ERJ3GEY0R00V | CHIP JUMPER [M]  | C409      | ECUV1H151KBV | 50V 150P [M]     |
| R532      | ERJ3GEYJ472V | 1/16W 4.7K [M]   |           |              |                  | C410      | ECUV1H471KBV | 50V 470P [M]     |
| R533      | ERJ3GEYJ224V | 1/16W 220K [M]   |           |              | CAPACITORS       | C413, 414 | ECUV1H471KBV | 50V 470P [M]     |
| R534      | ERJ3GEYJ103Z | 1/16W 10K [M]    |           |              |                  | C415      | ECUVNC104ZFN | 16V 0.1U [M]     |
| R535-538  | ERJ3GEYJ152V | 1/16W 1.5K [M]   | C10-12    | ECUVNC104ZFN | 16V 0.1U [M]     | C416      | ECUVNC105ZFN | 16V 1U [M]       |
| R539-541  | ERJ3GEYJ473V | 1/16W 47K [M]    | C13       | RCEQJSA470IX | 6.3V 47U [M]     | C417      | ECUV1H471KBV | 50V 470P [M]     |
| R542, 543 | ERJ3GEYJ103Z | 1/16W 10K [M]    | C14       | ECEA0JKA101I | 6.3V 100U [M]    | C418      | ECUV1H331KBV | 50V 330P [M]     |
| R601, 602 | ERJ3GEYJ681V | 1/16W 680 [M]    | C15       | ECUV1E103KBV | 25V 0.01U [M]    | C420      | ECUVNC105ZFN | 16V 1U [M]       |
| R603, 604 | MCR03PZHJ561 | 1/16W 560 [M]    | C17       | ECEA1AKN100  | 10V 10U [M]      | C501, 502 | ECUV1H330KCV | 50V 33P [M]      |
| R605, 606 | ERJ3GEYJ473V | 1/16W 47K [M]    | C18       | ECUV1H331KBV | 50V 330P [M]     | C503      | ECUV1H561KBV | 50V 560P [M]     |
| R607, 608 | ERJ3GEYJ102Z | 1/16W 1K [M]     | C19       | ECUV1C104KBV | 16V 0.1U [M]     | C504      | ECUV1C473KBV | 16V 0.047U [M]   |
| R609, 610 | ERJ3GEYJ332V | 1/16W 3.3K [M]   | C20       | ECST1AY475RR | 10V 4.7U [M]     | C505      | ECUV1E223KBV | 25V 0.022U [M]   |
| R611      | ERJ3GEYJ471V | 1/16W 470 [M]    | C21       | ECUV1E223KBV | 25V 0.022U [M]   | C507      | ECEV0GA221SP | 4V 220U [M]      |
| R612      | ERJ3GEYJ682V | 1/16W 6.8K [M]   | C22       | ECUVNC104ZFN | 16V 0.1U [M]     | C508      | ECUVNC104ZFN | 16V 0.1U [M]     |
| R613      | ERJ3GEYJ103Z | 1/16W 10K [M]    | C24       | RCE1ASC4R7IX | 10V 4.7U [M]     | C509      | ECUV1H470KCV | 50V 47P [M]      |
| R614      | ERJ3GEYJ104Z | 1/16W 100K [M]   | C25       | ECUVNC224KBN | 16V 0.22U [M]    | C510, 511 | ECUVNC474KBN | 16V 0.47U [M]    |
| R615      | ERJ3GEYJ682V | 1/16W 6.8K [M]   | C26       | ECUV1H331KBV | 50V 330P [M]     | C512      | ECUV1E103KBV | 25V 0.01U [M]    |
| R616      | ERJ3GEYJ222V | 1/16W 2.2K [M]   | C28       | ECEV0GA471P  | 4V 470U [M]      | C513      | ECUV1H102KBV | 50V 1000P [M]    |
| R703, 704 | ERJ3GEYJ103Z | 1/16W 10K [M]    | C29       | ECEA1AKA221I | 10V 220U [M]     | C515      | ECUV1H332KBV | 50V 3300P [M]    |

| Ref. No.  | Part No.     | Values & Remarks | Ref. No.  | Part No.     | Values & Remarks | Ref. No.  | Part No.     | Values & Remarks |
|-----------|--------------|------------------|-----------|--------------|------------------|-----------|--------------|------------------|
| C523-527  | ECUVNC104ZV  | 16V 0.1U [M]     | C610      | ECEAOGPK221I | 4V 220U [M]      | C709, 710 | ECEAOGPK221I | 4V 220U [M]      |
| C600      | ECUVNC104ZV  | 16V 0.1U [M]     | C611, 612 | ECUVNC104ZV  | 16V 0.1U [M]     | C711, 712 | ECSTOJY106RR | 6.3V 10U [M]     |
| C601, 602 | ECUV1H102KBV | 50V 1000P [M]    | C613      | ECSTOJX226RR | 6.3V 22U [M]     | C713      | ECEADJPK101I | 6.3V 100U [M]    |
| C603, 604 | ECUV1H272KBV | 50V 2700P [M]    | C701, 702 | ECUV1H332KBV | 50V 3300P [M]    | C714      | ECUVNC104ZV  | 16V 0.1U [M]     |
| C605, 606 | ECSTOJY106RR | 6.3V 10U [M]     | C703, 704 | ECUV1E123KBV | 25V 0.012U [M]   | C901, 902 | ECUV1H332KBV | 50V 3300P [M]    |
| C607, 608 | ECUV1H681KBV | 50V 680P [M]     | C705, 706 | ECUV1C333KBV | 16V 0.033U [M]   | C903      | ECUVNC104ZV  | 16V 0.1U [M]     |
| C609      | ECUVNC104ZV  | 16V 0.1U [M]     | C707, 708 | ECUV1H102KBV | 50V 1000P [M]    | C904      | ECUV1E223KBV | 25V 0.022U [M]   |

## ■ Replacement Parts List (Cabinet, Packing, Accessories)

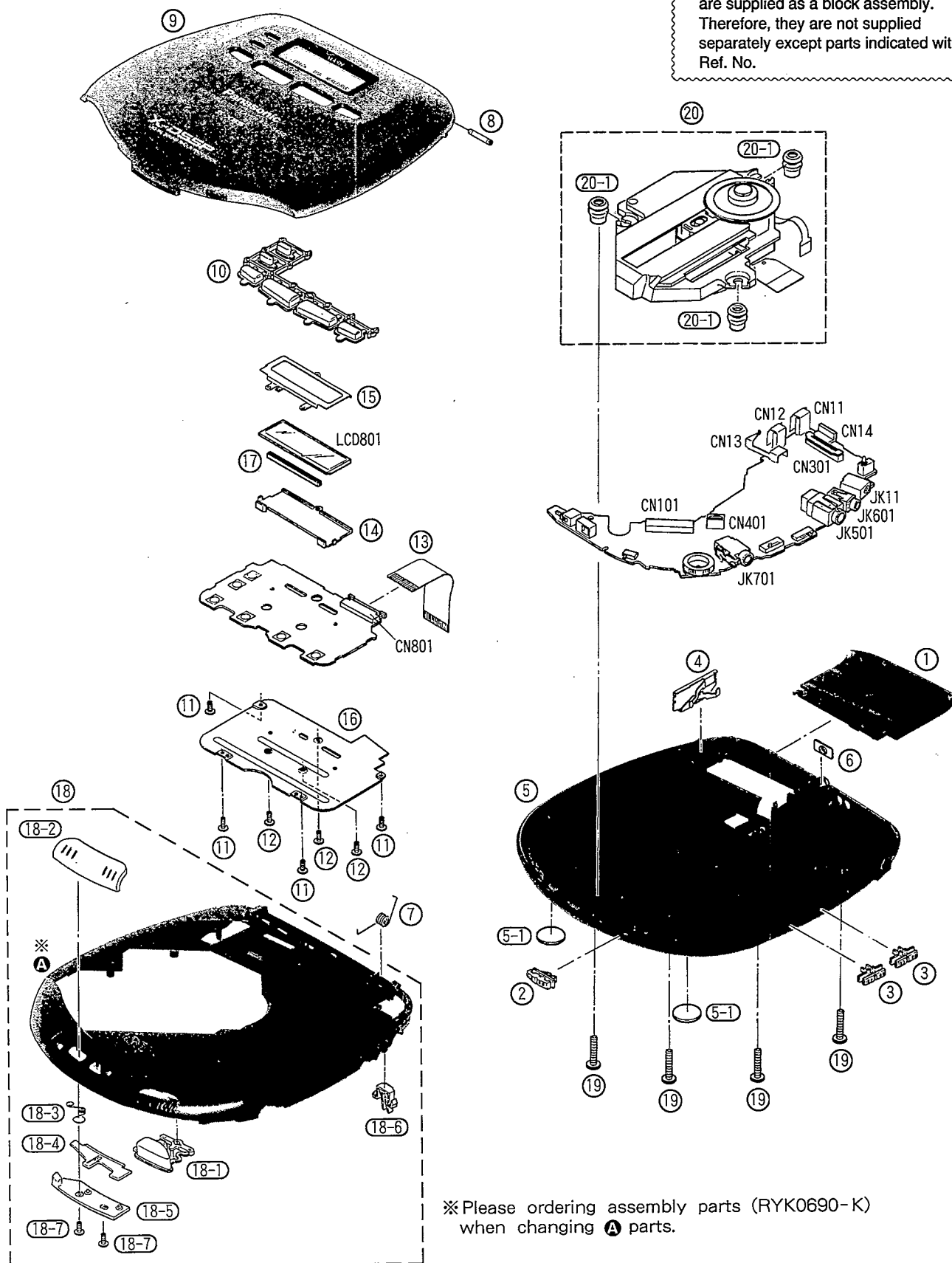
- Notes:**
- Important safety notice:  
Components identified by  $\Delta$  mark have special characteristics important for safety.  
Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used.  
When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.
  - Warning: This product uses a laser diode. Refer to caution statements on page 2.
  - The "(A)" mark parts are used for blue type only.  
The "(H)" mark parts are used for gray type only.  
The "(S)" mark parts are used for silver type only.  
Parts other than "(A)", "(H)" and "(S)" marked are used for both blue, gray and silver types.
  - [M] indicates in Remarks columns parts that are supplied by MESA.

| Ref. No. | Part No.     | Part Name & Description     | Remarks | Ref. No. | Part No.     | Part Name & Description    | Remarks      |
|----------|--------------|-----------------------------|---------|----------|--------------|----------------------------|--------------|
|          |              | CABINET AND CHASSIS         |         | 19       | XTN17+6GFZ   | SCREW                      | [M]          |
|          |              |                             |         | 20       | RAE0142Z     | TRAVERSE DECK              | [M] $\Delta$ |
|          |              |                             |         | 20-1     | RMG0449-H    | FLOATING RUBBER            | [M]          |
| 1        | RKK0102-K    | BATTERY COVER               | [M]     |          |              | PACKING MATERIAL           |              |
| 2        | RGV0199-H    | OPT OUT/X-DSSP KNOB         | [M]     | P1       | RPK0901      | PACKING CASE               | [M] (A)      |
| 3        | RGV0200-K    | TRAIN/S-XBS, PLAY MODE KNOB | [M]     | P1       | RPK0900      | PACKING CASE               | [M] (H)      |
| 4        | RJC93020     | COMMON BATTERY TERMINAL     | [M]     | P1       | RPK0864      | PACKING CASE               | [M] (S)      |
| 5        | RFKJLS450SGS | BOTTOM CABINET ASS'Y        | [M]     | P2       | RPQ0683      | SPACER                     | [M]          |
| 5-1      | RKA0063-K    | FOOT                        | [M]     | P3       | RPF0111      | PROTECTION BAG (UNIT)      | [M]          |
| 6        | RMA0677      | REAR ORNAMENT               | [M]     |          |              | ACCESSORIES                |              |
| 7        | RME0239      | OPEN SPRING                 | [M]     | A1       | RFJLS450SGS  | INSTRUCTION MANUAL         | [M]          |
| 8        | RMS0570      | SHAFT                       | [M]     | A2       | RFKFP3GAVT2S | RECHARGEABLE BATTERY ASS'Y | [M]          |
| 9        | RFKLLS450-A  | CD COVER ASS'Y              | [M] (A) | A2-1     | RFKNLS370-K  | BATTERY CARRYING CASE      | [M]          |
| 9        | RFKLLS450-H  | CD COVER ASS'Y              | [M] (H) | A3       | RFA0627-K4   | BATTERY CASE               | [M]          |
| 9        | RFKLLS450-S  | CD COVER ASS'Y              | [M] (S) | A4       | RFC0041-K    | SOFT CASE                  | [M]          |
| 10       | RGU1488-H    | OPERATION BUTTON            | [M]     | A5       | RFEA403Z-S   | AC ADAPTOR                 | [M] $\Delta$ |
| 11       | RHE5119YA    | SCREW                       | [M]     | A6       | RFEV006PCKM  | WIRED REMOTE CONTROLLER    | [M]          |
| 12       | RHE5155YA    | SCREW                       | [M]     | A7       | RFEV316P-K1S | STEREO EARPHONES           | [M]          |
| 13       | RJB1770A     | FFC(30P)                    | [M]     | A8       | SJP5213-2    | PLUG ADAPTOR               | [M]          |
| 14       | RJF0027      | LCD HOLDER                  | [M]     | A9*      | RKB205ZA-O   | EAR PADS                   | [M]          |
| 15       | RMA0937      | HOLD PLATE                  | [M]     |          |              | <GREASE OR JIG/TOOL>       |              |
| 16       | RMA1029      | LID COVER                   | [M]     |          |              | TEST DISC                  |              |
| 17       | RSQ0048      | ZEBRA RUBBER                | [M]     | SA1      | SZZP1054C    | PLAYABILITY TEST DISC      | [M]          |
| 18       | RYK0690-K    | INTERMEDIATE CABINET ASS'Y  | [M]     | SA2      | SZZP1056C    | UNEVEN TEST DISC           | [M]          |
| 18-1     | RGU1489-K    | OPEN BUTTON                 | [M]     |          |              |                            |              |
| 18-2     | RGV0198-H    | HOLD-LOCK KNOB              | [M]     |          |              |                            |              |
| 18-3     | RME0238      | HOLD SPRING                 | [M]     |          |              |                            |              |
| 18-4     | RMRI048-G    | LOCK PLATE (A)              | [M]     |          |              |                            |              |
| 18-5     | RMRI049-G    | LOCK PLATE (B)              | [M]     |          |              |                            |              |
| 18-6     | RMRI050-K    | STOPPER                     | [M]     |          |              |                            |              |
| 18-7     | RHE5119YA    | SCREW                       | [M]     |          |              |                            |              |

※ This item is not attached to merchandise, but it is supplied as a replacement part.

## Cabinet Parts Location

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



## ■Packaging

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