

# Service Manual

**COMPACT**  
**disc**  
**DIGITAL AUDIO**

**MASH**<sup>®</sup>  
multi-stage noise shaping

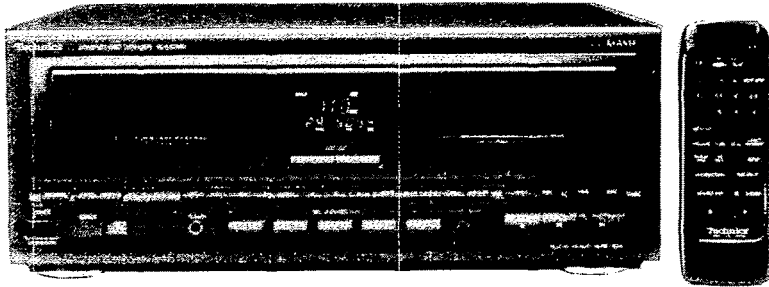
※ MASH is a trademark of NTT.

Compact Disc Changer

## SL-MC400

**Colour**

(K)...Black Type



**RAE0150Z MECHANISM SERIES**

### ■ Specifications

#### ■ AUDIO

No. of channels	2 (left and right, stereo)
Frequency response	2~20,000 Hz, ±1 dB
Output voltage	2 V (at 0 dB)
Dynamic range	92 dB
S/N	100 dB
Total harmonic distortion	0.007% (1 kHz, 0 dB)
Wow and flutter	Below measurable limit
DA converter	* MASH (1 bit)
Output impedance	Approx. 1 kΩ
Load impedance	More than 10 kΩ

#### ■ PICKUP

Wavelength 780 nm

#### ■ GENERAL

Power consumption 14 W  
GC only 17 W

Power supply  
for continental Europe and Australia AC 50/60 Hz, 230 ~240 V  
for others AC 50/60 Hz, 110 V/127 V/220 V/230~240 V  
Dimensions (W×H×D) 430×170×387 mm  
Weight 7.0 kg

#### Note:

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

### Areas

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

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# Technics<sup>®</sup>

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**⚠ WARNING**

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

**■ Before Repair**

- (1) Turn off the power supply using a 10Ω, 10 W resistor, connect both ends of power supply capacitors (C12, C21, C22) in order to discharge the voltage.
- (2) Before turning the power supply on, after completion of repair, slowly apply the primary voltage by using a power supply voltage controller to make sure that the consumed current at 50 Hz in NO SIGNAL mode should be shown below with respect to supply voltage 240 V/110 V/120 V/220 V/230~240 V.

Power supply voltage	AC 240 V	AC 110 V	AC 120 V	AC 220 V	AC 230~240 V
Consumed current 50 Hz	30~45 mA	80~100 mA	70~90 mA	30~50 mA	35~55 mA

**■ Protection Circuitry**

The protection circuitry may have operated if either of the following conditions is noticed:

- \* No sound is heard when the power is switched ON.
- \* Sound stops during a performance.

The function of this circuitry is prevent circuitry damage if, for example, the positive and negative speaker connection wires are "shorted", or if speaker systems with an impedance less than the indicated rated impedance of this unit are used.

If this occurs, follow the procedure outlined below:

1. Switch OFF the power.
2. Determine the cause of the problem and correct it.
3. Switch ON the power once again.

**Note:**

When the protection circuitry functions, the unit will not operate unless the power is first switched OFF and then ON again.

**CAUTION!**

THIS PRODUCT UTILIZES A LASER.

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

**■ Precaution of Laser Diode**

**CAUTION:** This product utilizes a laser diode with the unit turned "on", invisible laser radiation is emitted from the pickup lens.

Wave length: 780 nm

Maximum output radiation power from pickup: 100 μW/VDE

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

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

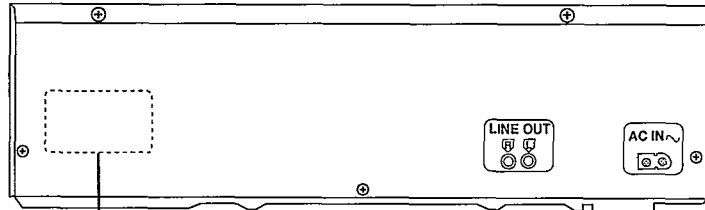
**ACHTUNG:** Dieses Produkt enthält eine Laserdiode. Im eingeschalteten Zustand wird unsichtbare Laserstrahlung von der Lasereinheit abgestrahlt.

Wellenlänge: 780 nm

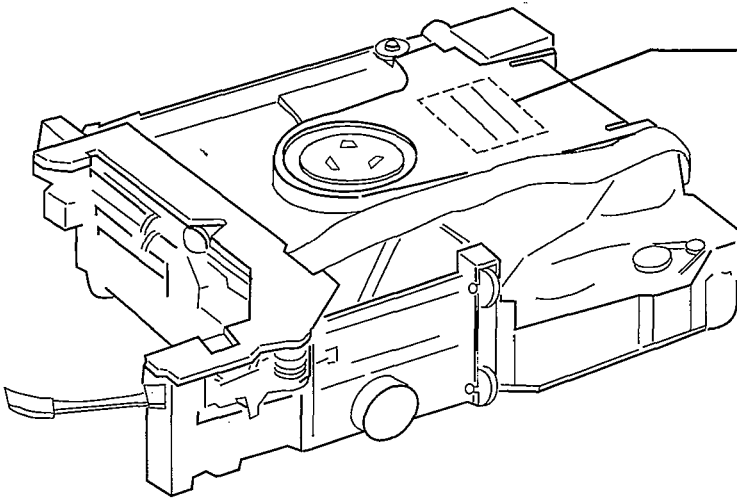
Maximale Strahlungsleistung der Lasereinheit: 100 μW/VDE

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

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



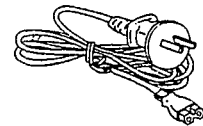
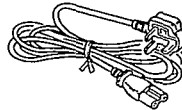
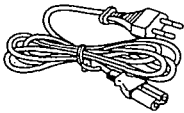
**CLASS 1  
LASER PRODUCT**



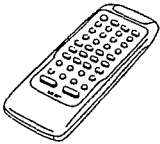
<b>DANGER</b>	INVISIBLE LASER RADIATION WHEN OPEN. AVOID DIRECT EXPOSURE TO BEAM.
<b>ADVARSEL</b>	USYNLIG LASERSTRÅLING VED ÅBNING. UNNGÅ DIREKTE UDSETTELSE FOR STRÅLING.
<b>VARO!</b>	AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALLTTIINA NÄKYMÄTÖNTÄ LASERSÄTELYLLE. ÄLÄ KATSO SÄTEESSEEN.
<b>VARNING</b>	OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD OCH SPÄRREN ÄR URKOPPLAD. BETRAKTA EJ STRÅLEN.
<b>ADVARSEL</b>	USYNLIG LASERSTRÅLING NÄR DEKSEL ÅPNES OG SIKKERHEDSLÅS BRYTES. UNNGÅ EKSPONERING FOR STRÅLEN.
<b>VORSICHT</b>	UNSIICHTBARE LASERSTRÄHLUNG, WENN ABDECKUNG GEÖFFNET. NICHT DEM STRAHL AUSSETZEN. ROLSD104

**Accessories**

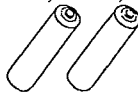
- AC power supply cord  
(E, EG,GC) areas : (RJA0019-2K).....1                      (EB) area : (RJA0049-K).....1                      (GN) area : (RJA0036-K).....1



- Remote control transmitter (RAK-SL186WH) .....1



- Batteries for remote control transmitter.....2 pcs. (UM-4, "AAA", R03)

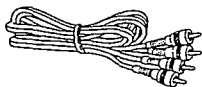


- Power plug adaptor [for (GC) area only] (SJP5213-2).....1



**Note:** These are available on sales route.

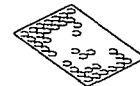
- Stereo connection cable.....1 pc. (SJP2249-3)



- Notebook-like binder.....1 pc. [Liner notes organizer] (RFA0623-K1)



- Adhesive number.....1 pc. (RQLA0326)



## ■ Caution for AC Main Lead

[For (EB) area only.]

For your safety, please read the following text carefully.

This appliance is supplied with a moulded three pin mains plug for your safety and convenience.

A 5-ampere fuse is fitted in this plug.

Should the fuse need to be replaced please ensure that the replacement fuse has a rating of 5-ampere and that it is approved by ASTA or BSI to BS1362.

Check for the ASTA mark or the BSI mark on the body of the fuse.

If the plug contains a removable fuse cover you must ensure that it is refitted when the fuse is replaced.

If you lose the fuse cover the plug must not be used until a replacement cover is obtained.

A replacement fuse cover can be purchased from your local dealer.

### CAUTION!

IF THE FITTED MOULDED PLUG IS UNSUITABLE FOR THE SOCKET OUTLET IN YOUR HOME THEN THE FUSE SHOULD BE REMOVED AND THE PLUG CUT OFF AND DISPOSED OF SAFELY. THERE IS A DANGER OF SEVERE ELECTRICAL SHOCK IF THE CUT OFF PLUG IS INSERTED INTO ANY 13-AMPERE SOCKET.

If a new plug is to be fitted please observe the wiring code as shown below.

If in any doubt please consult a qualified electrician.

### IMPORTANT

The wire in this mains lead are coloured in accordance with the following code:

Blue: Neutral

Brown: Live

As the colours of the wires in the mains lead of this appliance may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

The wire which is coloured BLUE must be connected to the terminal in the plug which is marked with the letter N or coloured BLACK.

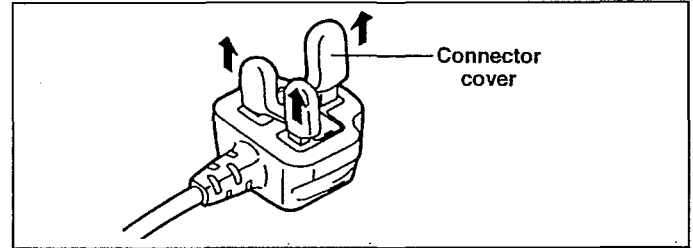
This apparatus was produced to BS 800.

The wire which is coloured BROWN must be connected to the terminal in the plug which is marked with the letter L or coloured RED.

Under no circumstances should either of these wires be connected to the earth terminal of the three pin plug, marked with the letter E or the Earth Symbol

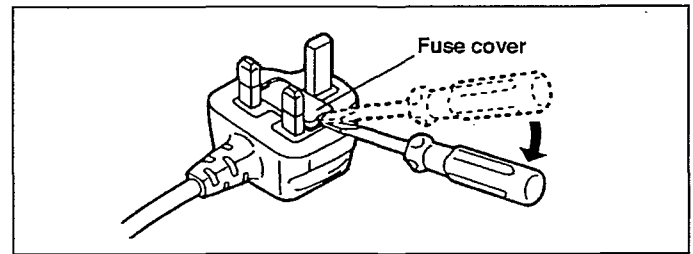
### Before use

Remove the connector cover as follows.

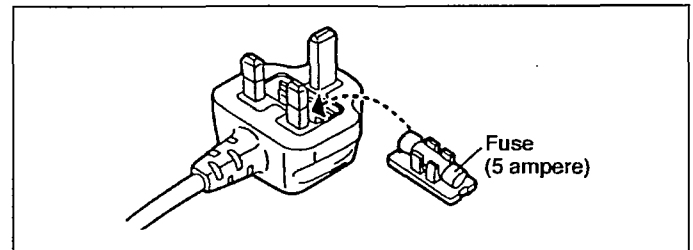


### How to replace the fuse

1. Remove the fuse cover with a screwdriver.



2. Replace the fuse and attach the fuse cover.



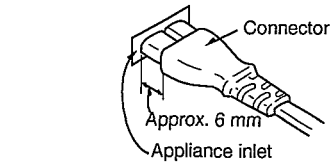
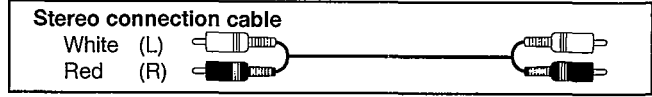
# Connections

Before connecting the changer to your audio system, make sure that the power of the changer and all other system components is turned off.

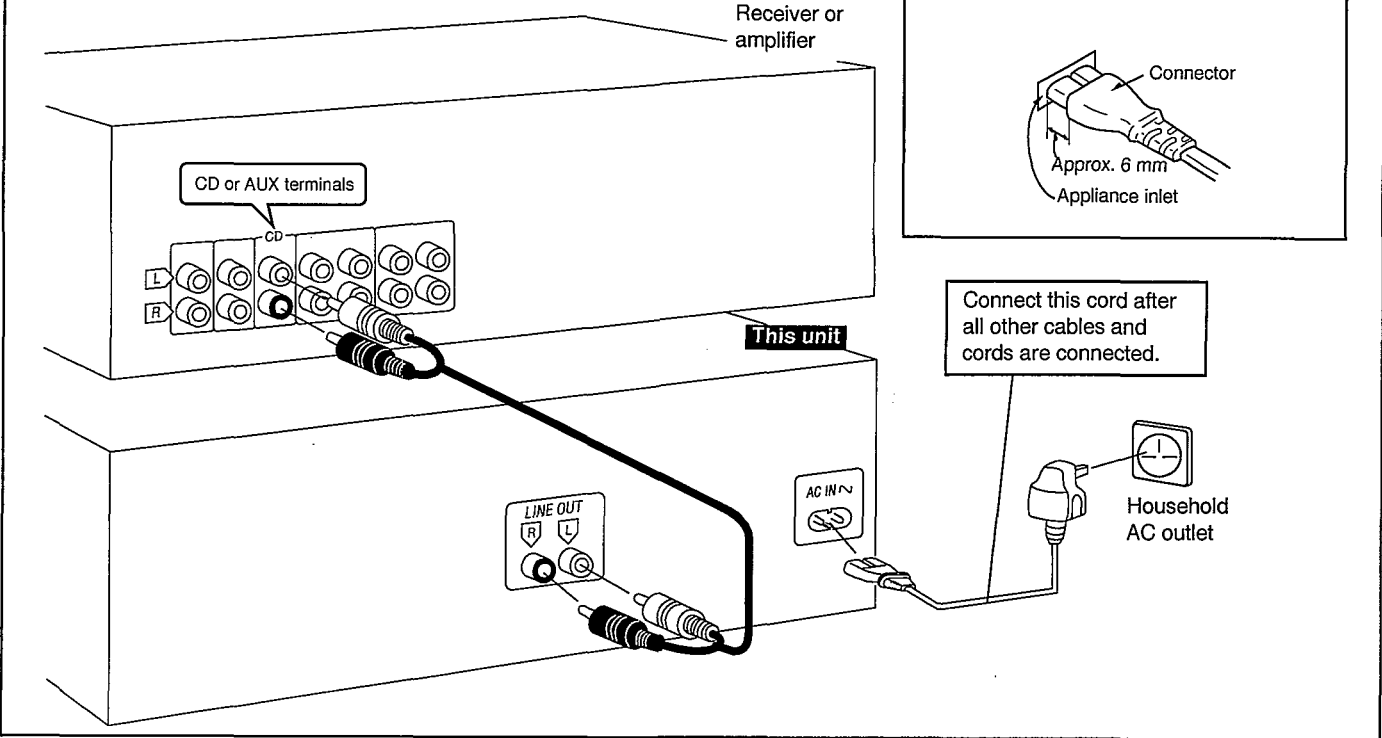
- Although the figure below shows the AC power supply cord being connected to a household AC outlet, if the amplifier (or receiver) is equipped with an AC outlet, connect the cord to that outlet.
- The configuration of the AC outlet differs according to area.

**(For United Kingdom only)**  
**BE SURE TO READ THE CAUTION FOR AC POWER SUPPLY CORD ON PAGE 3 BEFORE THE FOLLOWING CONNECTIONS.**

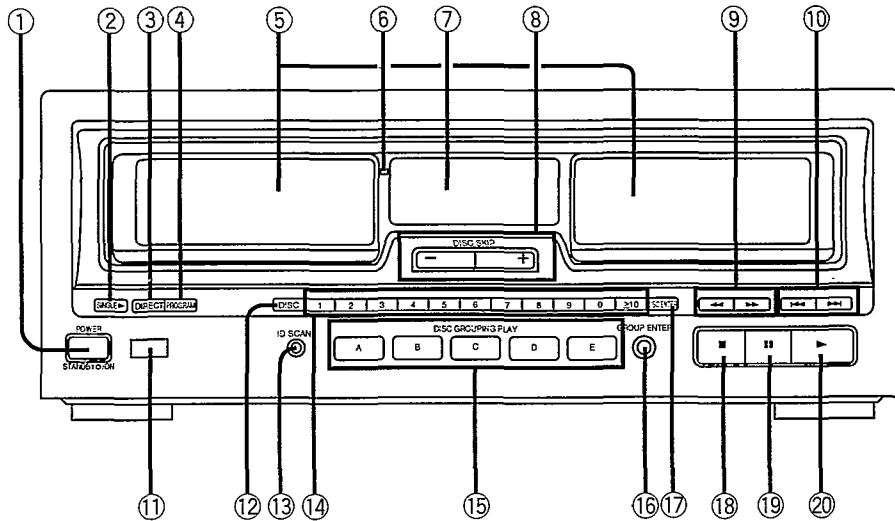
**(For areas except Australia and N.Z.)**  
**Insertion of Connector**  
 Even when the connector is perfectly inserted, depending on the type of inlet used, the front part of the connector may jut out as shown in the drawing. However there is no problem using the unit.



Connect this cord after all other cables and cords are connected.

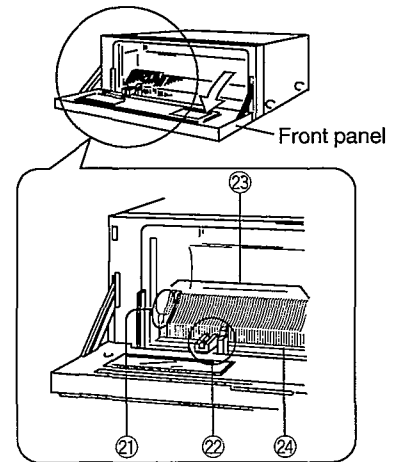


## ■ Front Panel Controls



**Note**

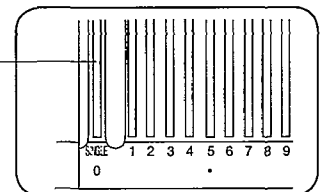
For an explanation on how to open the front panel, see p. 7 "How to set discs".



No.	Name	Ref. page
①	Power "STANDBY  /ON" switch (POWER, STANDBY  /ON)	8 Press to switch the unit from on to standby mode or vice versa. In standby mode, the unit is still consuming a small amount of power.
②	Single disc play button (SINGLE  )	9
③	Direct programming button (DIRECT)	13
④	Programming button (PROGRAM)	12
⑤	Windows	—
⑥	"STANDBY" indicator (STANDBY)	— When the unit is connected to the AC mains supply, this indicator lights up in standby mode and goes out when the unit is turned on.
⑦	Display	—
⑧	Disc skip buttons (DISC SKIP  )	16
⑨	Search buttons (  ,  )	15
⑩	Track skip buttons (  ,  )	16
⑪	Remote control signal sensor	—
⑫	Disc selector button (DISC)	9
⑬	ID scan button (ID SCAN)	17
⑭	Numeric buttons (1-9, 0, $\geq 10$ )	9

No.	Name	Ref. page
⑮	Disc group buttons (DISC GROUPING PLAY, A, B, C, D, E)	10
⑯	Group enter button (GROUP ENTER)	10
⑰	Disc enter button (DISC ENTER)	12
⑱	Stop button (  )	8
⑲	Pause button (  )	8
⑳	Play button (  )	8
㉑	Disc slot for single disc play (SINGLE)	9

Disc slot for single disc play



㉒	Loader carriage	7
㉓	Disc slots	7
㉔	Slot numbers	7

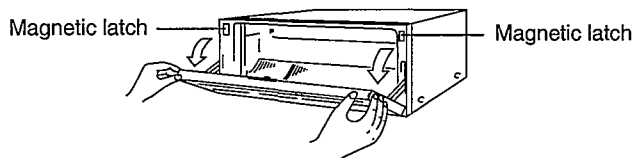
## Setting/Removing Discs

### Special notes

- You can set discs in the slots and remove them too, while playing discs.
- Never set a disc in the slot of the disc being played.
- Sometimes the front panel cannot be opened while a disc is playing. It is a question of time. In such case, wait until you can open it.

### How to set discs

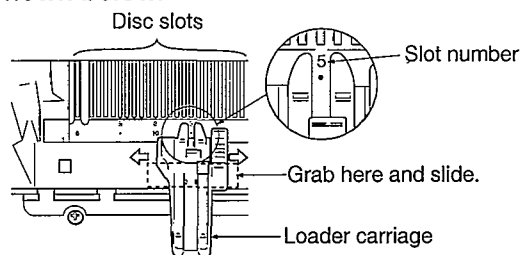
1. Pulling gently from both ends, open the front panel.



#### Cautions

- Except when setting or removing discs, keep hands out of the changer while open. You could injure yourself if somehow entangled in the internal mechanism.
- Keep cassette tapes away from the magnetic latches.

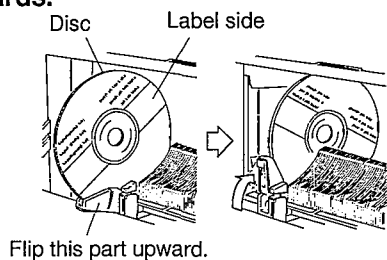
2. Slide the loader carriage to the slot you want. You can read the numbers between the prongs as shown below.



#### Note

Slot No. 0 ( SINGLE) is reserved for single disc play (p. 9).

3. Set the disc on the loader and flip the loader upwards.



#### Cautions

- Do not use 8 cm discs fitted with expander rings. Expander rings could damage the disc slots.
- Do not use cleaning discs, discs with stickers on the label side or warped discs. All of these could damage your changer.
- Do not put anything other than discs in the changer.
- Do not set a disc in the slot of the disc being played (slot flashes). The disc in play is returned to its slot when finished. If two discs somehow jam the slot, one or both could be damaged. When this happens, the message "TAKE OUT" will appear on the display. Remove the disc that doesn't belong in the slot and press the stop button.
- Do not open the front panel while the changer is changing discs.

#### Note

- Set discs with the label facing to the right.
- Never load more than one disc in any given slot.

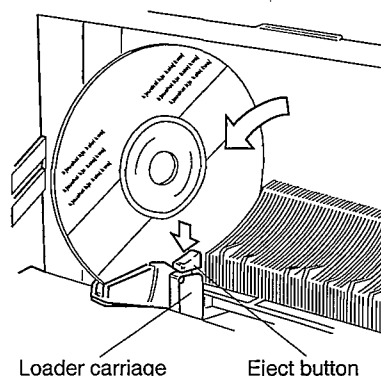
4. Gently close the front panel.

#### Note

If you leave the front panel open while a disc is in play, when the disc is over, the changer will stop.

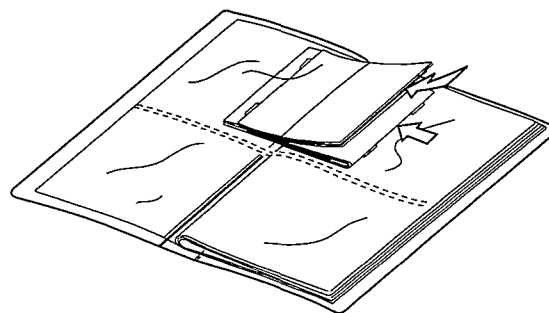
### How to remove discs

1. Open the front panel.
2. Slide the loader carriage to the slot you want.
3. Press the eject button on the loader carriage.

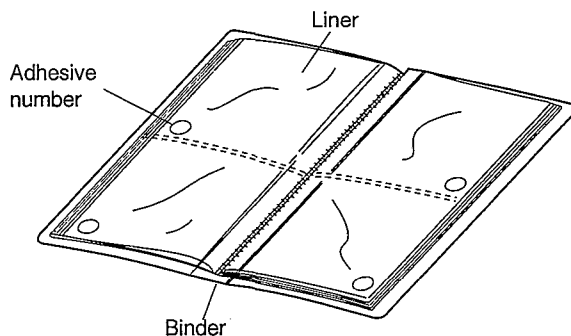


### How to know what disc is in what slot

Your changer comes with a notebook-like binder (liner notes organizer) in which you can keep your CD liners. There are also adhesive numbers for indicating slot numbers in the binder. This is a convenient way to keep track of what disc is in what slot.



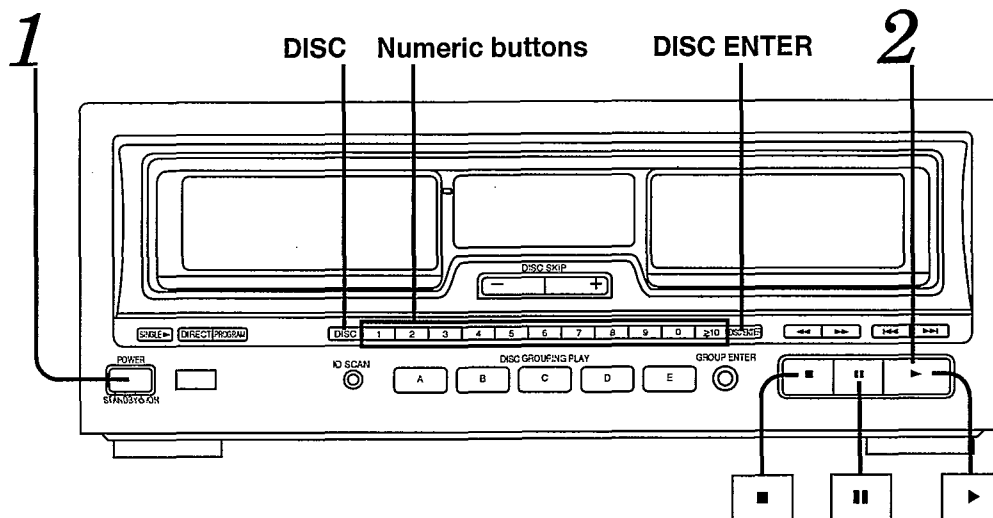
Put two liners back-to-back inside each pocket, as shown above.



## Basic Operations

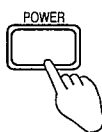
### Sequential play

The changer plays all the tracks on all the discs in order and stops automatically when the last track on the last disc finishes playing.



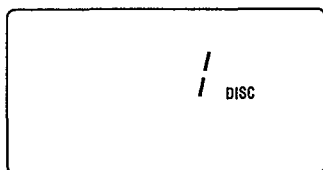
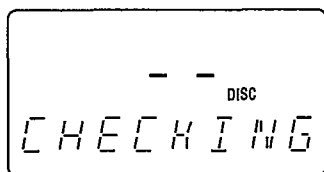
Before starting, load your discs (see p. 7).

**1**

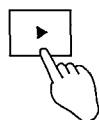


**Press POWER.**

The unit will switch on. Momentarily, the message "CHECKING DISCS" will appear on the display. When it goes out, the last disc played will be displayed.



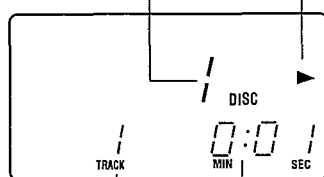
**2**



**Press ▶.**

Play will begin.

Disc number in play      Play indicator

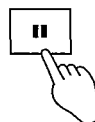


Track number in play      Elapsed play time

**Note**

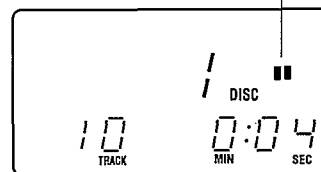
The disc number is the same as the slot number.

### To temporarily stop play



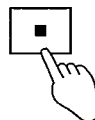
**Press ||.**

Illuminates



Press ▶ to resume play.

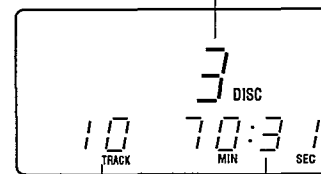
### To stop play



**Press ■.**

The display will show the total number of tracks and the total playing time of the current disc.

Current disc



Total number of tracks      Total playing time

The total playing time displayed includes the silent sections between tracks. For this reason, it may be a few seconds longer than the playing time indicated on the disc.

When you open the front panel, the total number of tracks and the total playing time go out.

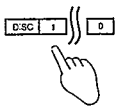
Press ▶ to re-start play.

**Note**

It takes roughly 3 seconds from the time you press ■ until the disc is returned to the slot.



## To directly access a specific disc



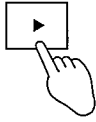
Select the disc you want with the numeric buttons.

To select a disc from 1 to 9

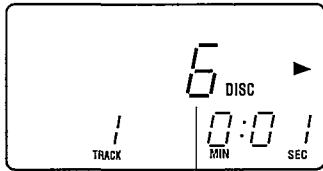
For example: "6"

DISC → 6

↓ (Press within 7 seconds.)



Press ►.



Disc number

The changer will start playing the selected disc from the first track.

To select a disc from 10 to 110

For example: "109"

DISC → 1 → 0 → 9

↓ (Press within 7 seconds.)

Press ►.

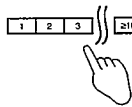
Note

When selecting discs, the  $\geq 10$  button does not respond to touch.

## For your reference

- If you press DISC ENTER instead of ► to select a disc, the disc number will be displayed but play will not start automatically.
- When in the stop mode, if you select an empty slot, the message "NO DISC" will appear on the display.
- While a disc is playing, if you select an empty slot, the changer will automatically play the next disc available.
- If you select "0", the changer will switch to the single disc play mode (See the right side of this page.).

## To directly access a specific track

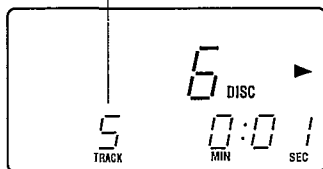


After selecting a disc, select a track with the numeric buttons.

Press the numeric button(s) to select the track.

Play will begin from the selected track.

Track number



To select a track between 1 and 9:

Press the corresponding numeric button.

To select a two-digit track number 10 or higher:

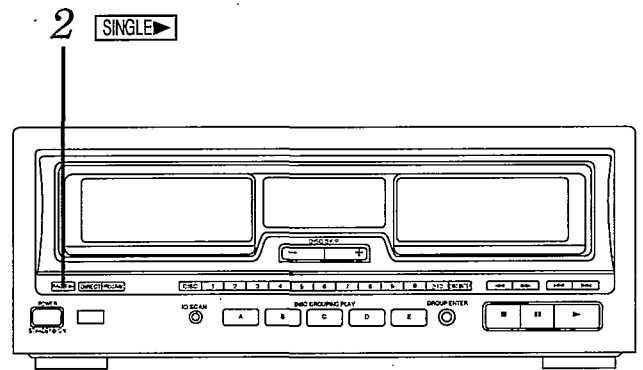
First press  $\geq 10$ , and then press the numbers for the two digits

For example; number 20:

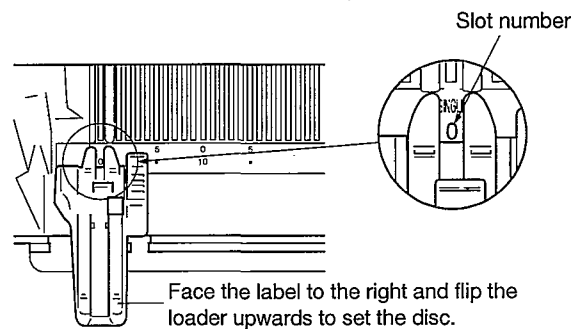
Press  $\geq 10$ , then 2, and then 0.

## Single Disc Play

Single disc play is for that special disc of yours, perhaps one you just bought. You see, the changer has a slot for one special disc which you can use even when the rack is full (max. 110 discs).



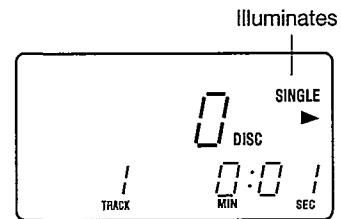
### 1 Open the front panel, and set the disc in the slot No. 0.



Face the label to the right and flip the loader upwards to set the disc.

### 2 Close the front panel and press SINGLE ►.

The disc will start playing from the first track.



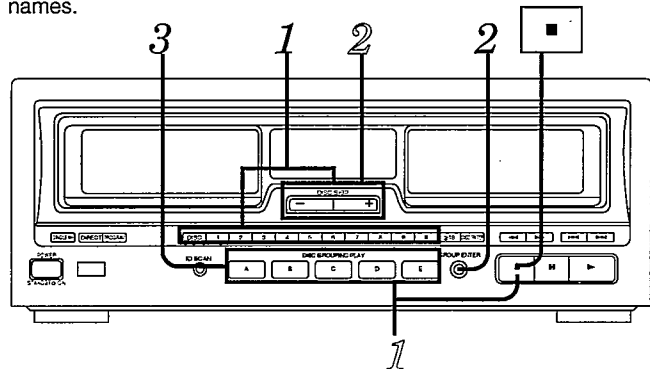
The changer plays all the tracks in order and stops automatically when the last track finishes playing.

## To cancel single disc play mode

- Select another disc with the numeric buttons.
- Skip to another disc with DISK SKIP -/+ (See p. 16)
- Select a group. (See p. 10)

## Disc Grouping Play

Sometimes, you want to block off your CDs into groups. For example, by the type of music, or your favorite CDs, etc. Well, this changer lets you make up to five groups, A through E. Basically, it's like dropping a disc into a box, then playing just discs from that box. What's more, you can name the groups with any of the preset names.



### To make groups

- Any single group can hold up to 110 CDs.
- You can enter the same CD into as many of the 5 groups, A through E, as you like.
- You can assign any one of the preset names to a registered group (see step 2 on p. 11). We recommend that you name your groups by the type of discs you put in them.

**1**

(During sequential play or while it is on stop)

#### Select a disc.

- Using the numeric buttons

To select a disc from 1 to 9  
For example: "6"

DISC → 6

(Press within 7 seconds.)

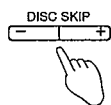
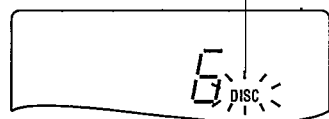
To select discs from 10 to 110

For example: "109"

DISC → 1 → 0 → 9

(Press within 7 seconds.)

Flashing



- Using DISC SKIP -/+

Press either DISC SKIP - or + until reaching the disc you want.

#### Note

You cannot select slot No. 0.

**2**

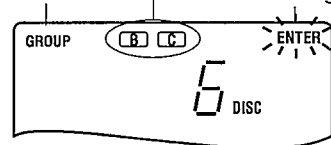
GROUP ENTER



#### Press GROUP ENTER.

If any groups have been registered already, their letters will light up.

Illuminates      Flashing



(Perform step 3)

You have to select a group within 7 seconds from when the indication "ENTER" starts flashing on the display. Unless you do so, the changer will return to the way it was before you pressed GROUP ENTER.

**3**

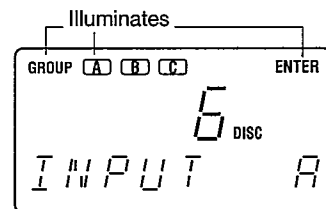
A B C D E



Press the DISC GROUPING PLAY button(s) you want. (This "INPUT" the disc in the group.)

For example: To input disc No. 6 in group A.

Press A.



To enter the same disc into different groups Repeat steps 2 and 3 selecting the specific groups.

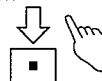
**4**

Repeat steps 1, 2 and 3 until you have completed all items.

### To check what discs are in what groups

**1**

A B C D E



(During sequential play or while it is on stop)

Press the DISC GROUPING PLAY button you want and then press ■.

**2**

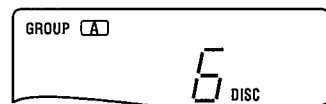
DISC SKIP



Press either DISC SKIP (- or +).

Every time you press DISC SKIP, the next disc number in order is displayed.  
- : Numbers progress in reverse order.  
+ : Numbers progress in regular order.

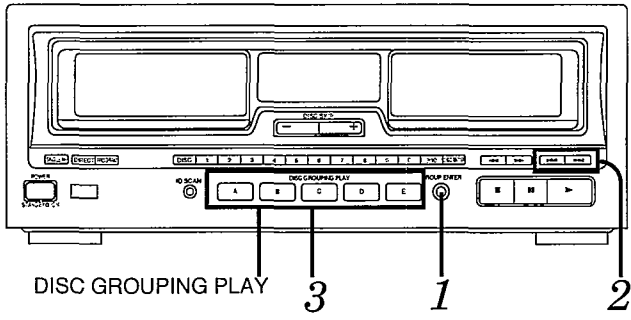
Example



Disc number of disc registered in group A

#### Note

After checking, if you press the button of a group that is lit on the display, the changer reverts back to sequential play but does not automatically start playing the group.



### To name groups

You can name your groups. The changer has several preset names to choose from.

**1** GROUP ENTER (During sequential play or while it is on stop)  
**Press GROUP ENTER.**  
 If any groups have been registered already, their letters will light up.

Illuminates      Flashing

**2** (Press within 7 seconds.) **Select the name you want with ◀◀ and ▶▶.**  
 Names change in rotation as shown below, every time you press ◀◀ or ▶▶.

**3** (Press within 7 seconds.) **Press the DISC GROUPING PLAY button for the group you want to name.**  
**For example: To name group A Press [A].**

For example: To name group A Press [A].

Illuminates

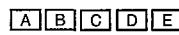
**4** **Repeat steps 1, 2 and 3 to name other groups.**

### To cancel names

Select "RESET" in step 2 and then the name of the group you want to cancel in step 3. Thereafter, the group will appear as "GROUP ..." (A,B,C,D or E)."

### To start play

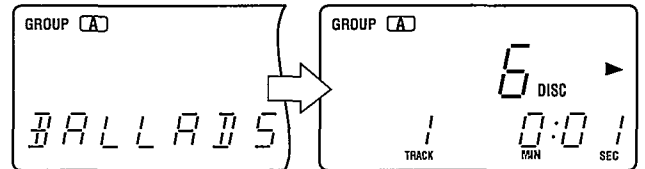
Unless otherwise specified, the changer selects sequential play.



(During sequential play or while it is on stop)

**Press the DISC GROUPING PLAY button of the group you want.**

**For example: To hear group A Press [A].**



### Notes

- Unnamed groups will be displayed as "GROUP A, B, C..." and so forth. In the above example, "GROUP A" appears in the place of "BALLADS".
- If you press the group button of a group which has no discs registered in it, the message "NO INPUT" will appear on the display.

### To cancel group play

(In the stop mode)

**Press the DISC GROUPING PLAY button indicated on the display.**

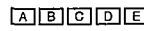
(The group indication on the display will go out.)

### For your reference

The group contents will remain stored in memory even after the unit is switched off.

However, if the power cord is unplugged or the power supply is otherwise interrupted for an extended length of time, the contents will be erased from memory.

### To cancel discs from groups



Perform steps 1 and 2 shown on page 10, and then in step 3, press the DISC GROUPING PLAY button(s) you want.

**For example: To cancel disc No. 7 from group A.**

**Press [A].**

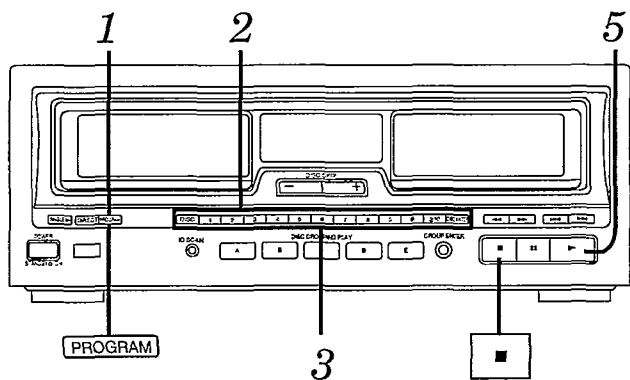
If any groups have been registered already, their letters will light up.

Illuminated      Indication goes out.

You can cancel a disc from two or more groups at one time, provided it has been entered in each of the groups, of course. Press [■] in step 3 on page 10. (In the stop mode)

## Program Play

Everyone has his/her favorite tracks. You can program the changer to play them in a specific order. With this changer, you can make one program and fill it with up to 32 selections from any of the discs in the rack.

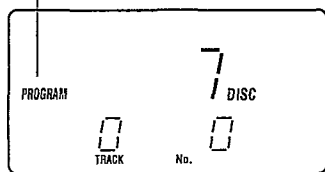


**1**



[In the stop mode]  
**Press PROGRAM.**

Illuminates

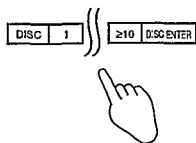


**2**

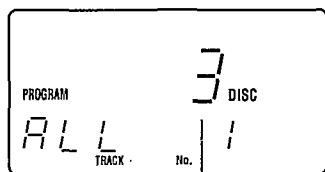
**Select the disc(s) you want with the numeric buttons.**

**For example:**

To select disc 3.



DISC → 3 → DISC ENTER



Specified disc number

The "ALL" indication shows that all the tracks on the disc are selected.

To program by means of disc numbers only, repeat the above operation. (The count will increase by one for each operation.)

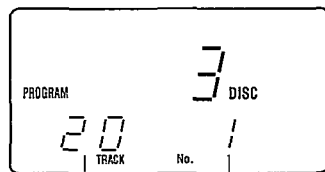
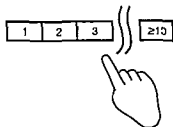
You can select slot No. 0.

**3**

**Press the numeric button(s) to specify the track.**

**For example:**

To select track No. 20, press  $\geq 10$ , then 2, and then 0.



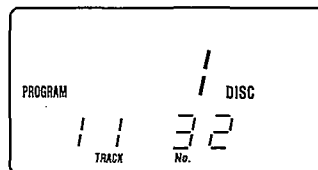
Specified track number

Program order

**4**

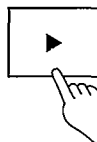
**Repeat steps 2 and 3 until you have completed all entries.**

If you enter non-existing disc(s) or track(s), the corresponding indicator illuminates and the entry is included in the count. In the play mode, the changer will cancel the non-existing entry.



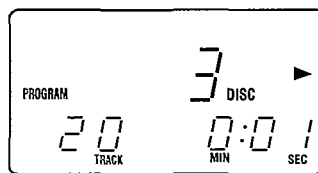
If you attempt a 33rd selection, the "PGM FULL" indication will be displayed.

**5**

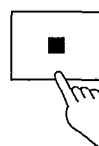


**Press ► to start play.**

To enter additional selections during play, repeat steps 2 and 3.



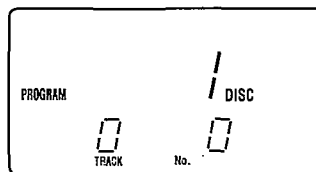
### To clear all programmed contents



[In the stop mode]

**Press ■.**

The display will look as below.



### To quit the program mode



[In the stop mode]

**Press PROGRAM.**

The changer will return to the sequential play mode.

The programmed contents will remain stored in memory until they are cleared, even after the program mode is canceled.

Therefore, after program, it is possible to cancel the program mode and use another play mode and then hear the same program again at a later time.

In addition, if discs are changed, the program will be played using the new discs. If non-existing entries are found at this time, the changer will cancel them.

### For your reference

The program will remain stored in memory even after the unit is switched off.

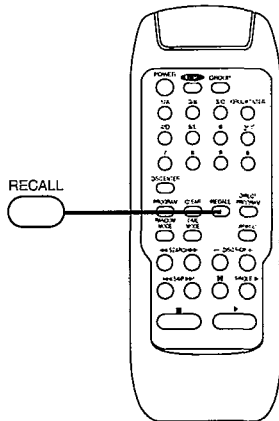
However, if the power cord is unplugged or the power supply is otherwise interrupted for an extended length of time, the contents will be erased from memory.

### Special note on recording programs

The changer needs time to change the discs and find the tracks. This time will vary depending on what you put into the program. In any case, the total playing time will be longer than that of the actual tracks.

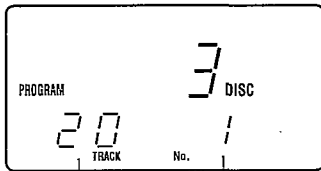
## To check programmed contents

(only available from the remote control)



### Press RECALL.

Each time you press RECALL, the display shows the programmed disc and track number in the sequence you have entered.

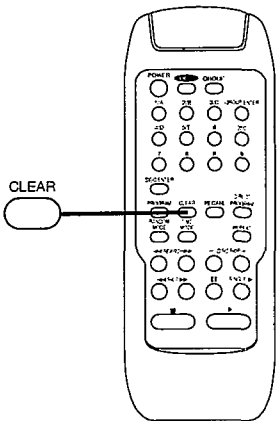


Programmed track

Programmed order

## To clear a single item from the program

(only available from the remote control)



(In the stop mode)

### Press CLEAR.

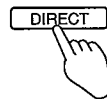
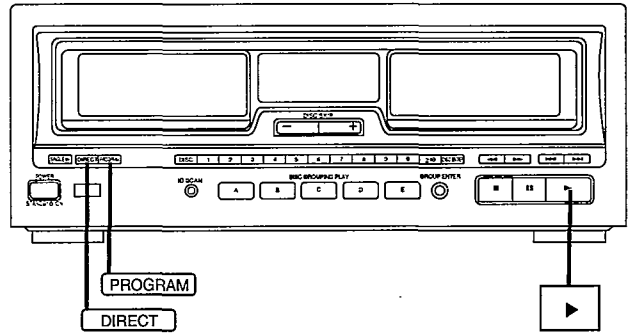
Each time you press CLEAR, you will cancel the last entry in the order you have entered all selections.

To clear an entry in the middle of the program sequence, press RECALL repeatedly until the display shows the selection to be cleared, and then press CLEAR within three seconds after that.

## Direct Programming

You can add the track in play to your program.

In fact, a good way to build up your program is to listen to tracks and add those you like while they are still being played. It sure makes programming easier if you listen-and-program.

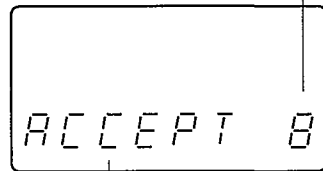


(In the play mode)

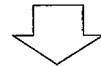
### Press DIRECT. (Or, press DIRECT PROGRAM on the remote control.)

The current track will be added to the tail end of the program.

**Example** Programmed order of the newly added track



Illuminates for about 2 seconds when DIRECT is pressed.



Returns to the original indication.

### Note

When you make a program as explained under "Program play" on the left page, and then perform the above procedure without clearing the program first, the selected track is added to the end of the program.

## To listen to programmed tracks

(In the stop mode)

Press PROGRAM and check "PROGRAM" appears on the display, then press ►.

The program will start from the first track.

## To clear all programmed contents.

See p. 12.

## To check programmed contents.

See the left side of the page.

## To clear a single item from the program.

See the left side of the page.

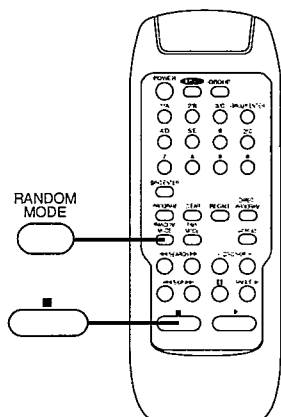
### Notes

- You cannot add to the program if already full, that is, if already 32 selections have been programmed. If you press DIRECT in such case, the message "PGM FULL" will be displayed. Therefore, direct programming is possible only when 31 or less tracks have been programmed.
- During program play, the DIRECT button does not respond to touch.

## ■ Random Play

(Only available from the remote control)

The tracks will be played in random order. There are two types of random play as described below.



### One disc random play

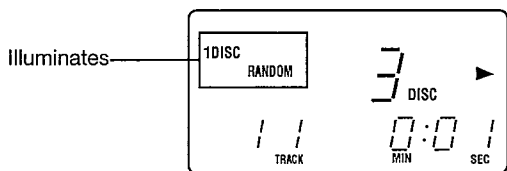
The changer will play all tracks on the current disc in random order. Then, it will choose a new disc randomly, excluding the discs already played, and play all tracks on that disc in random order.



[In the stop or play mode]

Press **RANDOM MODE** so that the "1 DISC RANDOM" indicator illuminates.

Each time the button is pressed, the display will change in the following order: 1 DISC RANDOM → FULL RANDOM → (off).

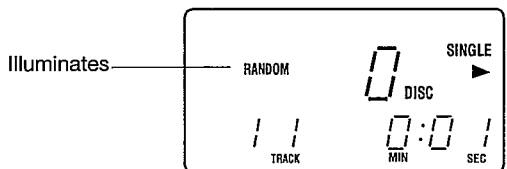


The changer will stop automatically when all the tracks on all discs have been played once.

**In the single disc play mode**

Only tracks from the disc in slot No.0 are played, though played in random order.

Every time you press RANDOM MODE, the display switches between OFF and "RANDOM".



**In the disc grouping play mode.**

Only tracks from one of the discs, selected at randomly from all discs in the group by the changer, are played. The tracks too are played in random order.

## Full random play

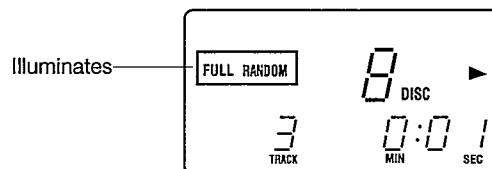
The changer will play tracks from all of the discs at random. However, it may choose the same track twice. In a single pass, the changer can play up to 250 tracks.



[In the stop or play mode]

Press **RANDOM MODE** so that the "FULL RANDOM" indicator illuminates.

Each time the button is pressed, the display will change in the following order: 1 DISC RANDOM → FULL RANDOM → (off).



Once the changer has played the maximum 250 tracks, it stops automatically.

**Note**

The disc in slot No.0 will not be played.

**In the disc grouping play mode.**

The changer selects tracks randomly from all discs in the group but not from other groups.

### To cancel random play mode



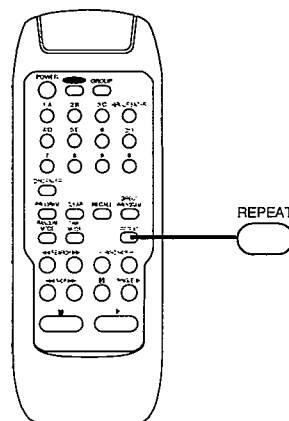
Press **■**.

The "1 DISC (or FULL) RANDOM" indicator will go out.

## ■ Repeat Function

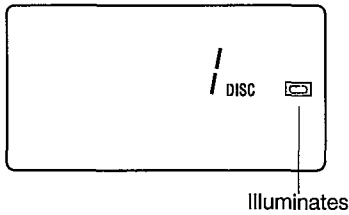
(Only available from the remote control.)

Play will continue endlessly in accordance with the specific play mode selected.





[Before or during play]  
**Press REPEAT.**



**In the sequential play mode**

All tracks of all discs will be played repeatedly.

**In the single disc play mode**

The changer will repeatedly play all tracks on the disc in slot No. 0.

**In the program play mode**

The changer plays only the programmed selections in the programmed sequence repeatedly.

**In the one disc random play mode**

When the changer has played all the tracks on the current disc in random order. Then, it will choose a new disc randomly, excluding the discs already played, and play continuously. The sequence differs each time.

**In the full random play mode**

Once the changer has played the maximum 250 tracks, it will select a new random sequence and will continue playing.

**To repeat the same track over and over**

**To repeat the programmed tracks**

1. Select the desired track using the program play procedure on page 12.
2. Press REPEAT to display "Ⓜ".
3. Press ▶.

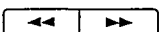
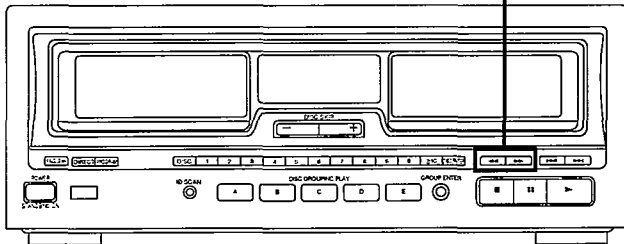
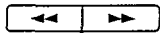
**To cancel repeat mode**



**Press REPEAT again.**  
The "Ⓜ" indicator will go out.

**Search Function**

You can search rapidly forward or backward on the disc for specific sections.



[In the play or pause mode]  
**Press and hold ◀◀ or ▶▶.**  
◀◀ : You can search backward.  
▶▶ : You can search forward.

Release the button when you reach the desired point.  
The changer will return to the previous mode (play or pause).

**In the program/random play mode**

You can search forward or backward only within the current track.

**In the single disc play mode**

You can search forward or backward only within the current disc.

**In the sequential/disc grouping play mode**

When the changer finishes searching the current disc, it starts searching the next one.

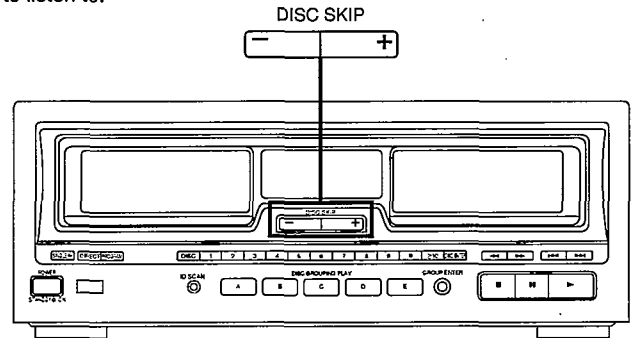
**For your reference**

The search function will begin slowly, and then, if the button is held down for longer than 3 seconds, it will change to high-speed search.

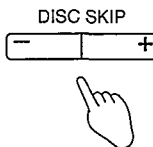
**Skip Function**

**To skip discs**

Use this function to skip discs when selecting a disc which you wish to listen to.



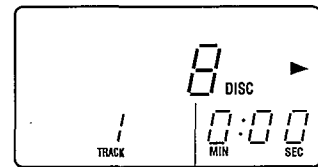
You can use this function in stop, sequential play, one disc random play and disc grouping play modes.



**Press either DISC SKIP (- or +) until you reach the desired disc.**

- : Skips backwards to the preceding disc.
- +: Skips forward to next disc.

**Note:**  
The changer skips over empty slots.



Disc number at the playing position

**Notes**

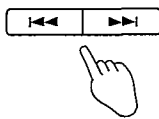
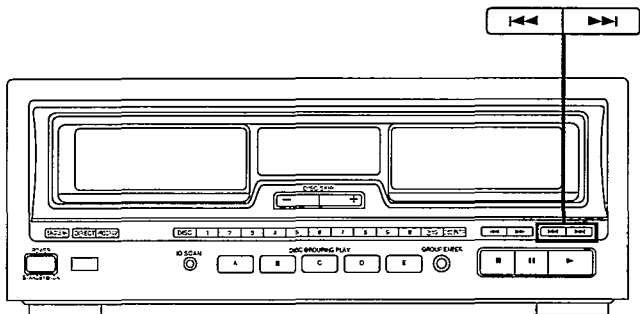
- This function does not work in the full disc random play mode or during program play.
- If you attempt to use this function during single disc play, the changer will cancel single disc play.

**For your reference**

If you press the DISC SKIP buttons intermittently, the slot Nos change slowly. If you hold the buttons down, the changer fastskips through numbers.

**To skip tracks**

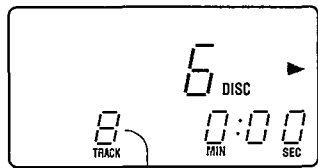
Use this function to skip tracks when selecting a track which you wish to listen to.



Press either **◀◀** or **▶▶** until you reach the desired track.

**◀◀** : You can skip backward.

**▶▶** : You can skip forward.



Track number at the playing position

**In the sequential/single disc/disc grouping/program play mode**

You can skip only within the current disc.

In the program play mode, you can skip from one track to another in the programmed sequence.

**◀◀** : You can skip to the beginning of the track being played. If you press this button again quickly, you can skip to the beginning of the previous track.

Remember that in a backward skip, the current track is included in the count.

**▶▶** : You can skip as many tracks as the number of times you press the button.

**In the random play mode**

**◀◀** : You can skip to the beginning of the current track.

**▶▶** : You can skip to the beginning of a next track in the random order the changer has selected.

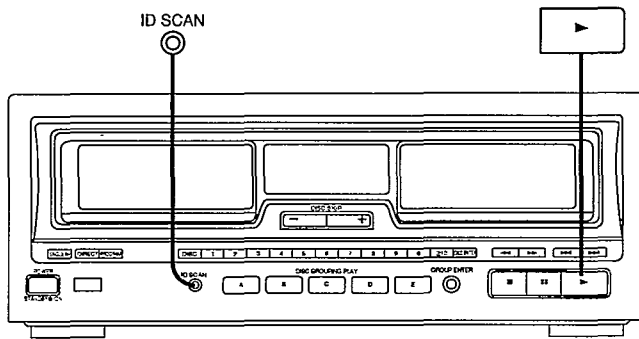
You can also skip tracks when the changer is in the stop mode (except during random play) or pause mode.

**ID Scan Function**

This function is convenient to use when searching for a desired track.

The function will search from the beginning of the track for a loud section, and will play 10 seconds of the track centering around that point.

The order of scanning is the same as for play mode.



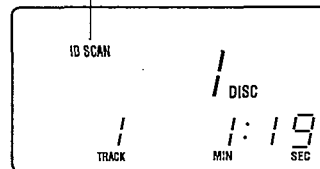
ID SCAN



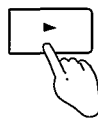
**Press ID SCAN.**

ID scan will start.

Illuminates



**When the desired track has been found:**



**Press ▶.**

The changer will play the track from the beginning.

**To cancel ID scan**

ID SCAN



**Press ID SCAN while this function is in operation.**

The "ID" indicator will go out.

The changer will continue to play from the track being played.



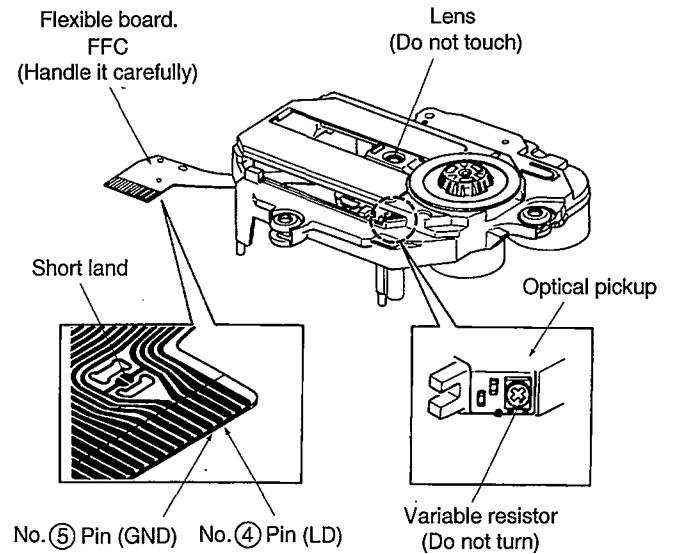
## ■ Handling Precautions for Traverse Deck

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. ④ (LD) and No. ⑤ (GND) 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.

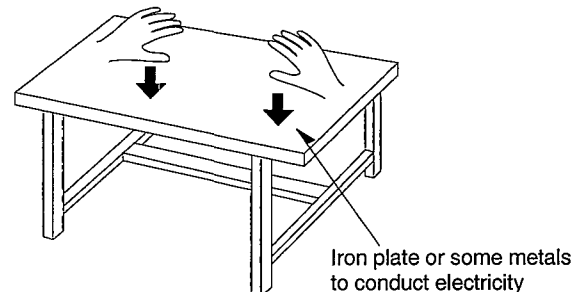
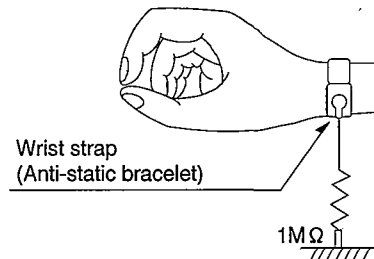


### ● Grounding for electrostatic breakdown prevention

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.

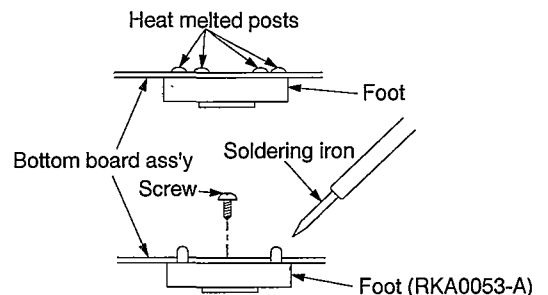
#### Caution:

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).



## ■ Replacement of the Foot

1. Remove the 4 heat melted posts on the Bottom board ass'y with a pair of nippers or similar tool.
2. To replace the foot (RKA0053-A) on the Bottom board ass'y melt the 4 posts with a soldering iron or install it with a screw (XTB3+6J).



## Self-Diagnosis Mode

### Self-diagnosis mode list

Mode	Procedure	Content	Use	Page
FL display mode	<p>Turn ON power button with no disc loaded.</p> <p>Press the following 3 buttons simultaneously: PLAY(▶),STOP(■),TRACK SKIP(◀◀)</p> <p>FL all unlit</p> <p>Press DISC button</p> <p>Press specified button</p> <p>FL all lit</p>	FL all unlit / all lit	Enables checking of whether FL and each SW are okay or not, before set disassembly.	P19
Mechanical mode	<p>Turn ON power button with no disc loaded.</p> <p>Hold down the STOP (■) button for at least 2 seconds.</p> <p>Simultaneously press the TRACK SKIP (▶▶) button for at least 2 seconds, while holding down the STOP (■) button.</p> <p>C (Appears on display)</p>	<p>Displays defective points while performing a series of mechanism operations.</p> <p>C F-15: PU rest SW etc. C F-27: Slide drive system C F-28/ C F-29: Loading system</p> <p>F26: Main IC defect (Automatically displayed when power is turned ON, regardless of mode setting.)</p>	Enables fault to be diagnosed, before set disassembly.	P20 P22
Test mode	<p>Turn OFF power button once, with no disc loaded.</p> <p>Turn ON power while simultaneously holding down the following button: PLAY(▶), STOP(■)</p> <p>TEST MODE (Appears on display)</p>	<b>A</b> button: Results in independent operation of traverse deck.	Use to check correct operation after disassembly.	P23
	<p>Press <b>A</b> button</p> <p>Press <b>B</b> button</p>	<b>B</b> button: Repeats loading / unloading operation.	Use to check correct operation after repair.	P24
	<p>Mount disc in single (slot 0) position.</p> <p>Press <b>C</b> button</p>	<b>C</b> button: Automatically repeats loading / unloading / slide operation.		P25
Servo adjustment mode	<p>After mounting disc in slot, turn OFF power button once.</p> <p>Turn ON power while simultaneously pressing the following three buttons: PLAY(▶),PAUSE(⏸),STOP(■)</p> <p>Press the PLAY(▶) button.</p>	<p>Displays servo circuit status on FL.</p> <div style="border: 1px solid black; padding: 5px; text-align: center; width: fit-content; margin: 10px auto;"> <p>F _ T _ C -</p> </div>	<p>Enables checking of servo status.</p> <p>* F = Focus servo * T = Tracking servo * C = CLV servo</p>	P26 P27

## Before set disassembly

Before set disassembly, perform **Self-diagnosis** ( **FL display mode** and **Mechanical mode** ) and **CD basic operation checking**, and develop an idea of the cause of the problem.

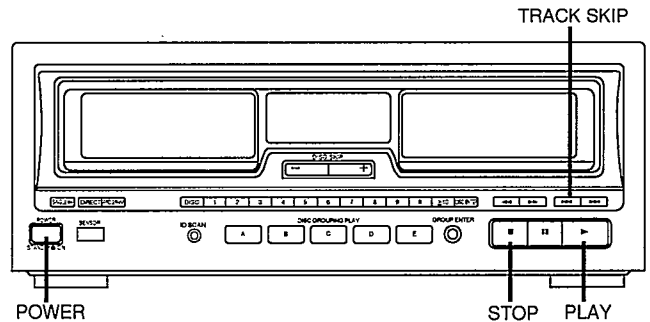
## Self-diagnosis FL display mode

### FL all unlit test

Press **POWER** with no disc loaded.

Press **STOP**( ■ ), **PLAY**( ► ), **TRACK SKIP**( ◀◀ ) simultaneously.

FL is all unlit.

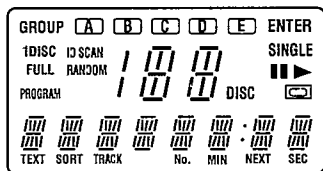
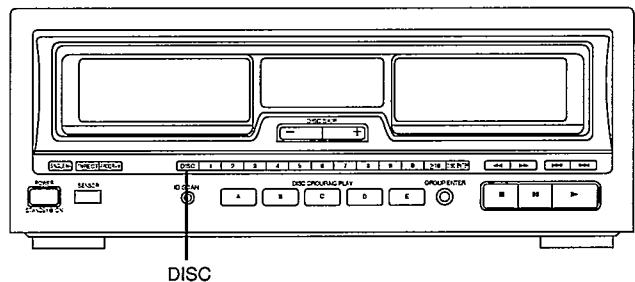


Previous display remains unchanged:  
 \* Check switches( ■, ►, ◀◀ ).  
 Characters remain displayed:  
 \* Check the grid of the characters.

### FL all lit test

Press **DISC** (FL remains all unlit)

Press all buttons except **STOP**( ■ ), **PAUSE**( ■■ ), **PLAY**( ► ), **SEARCH**( ◀◀, ►► ), **DISC**, **DISC ENTER** and **POWER**.



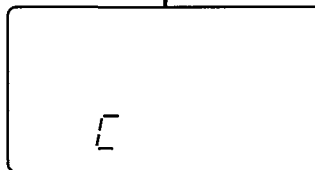
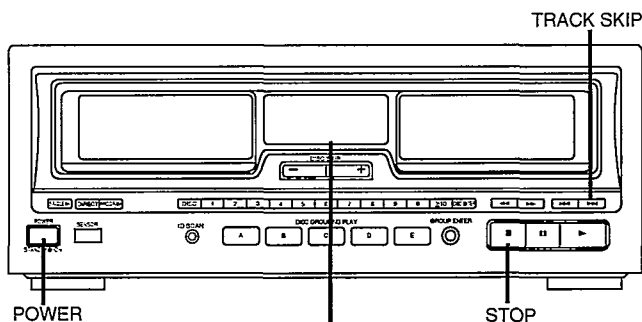
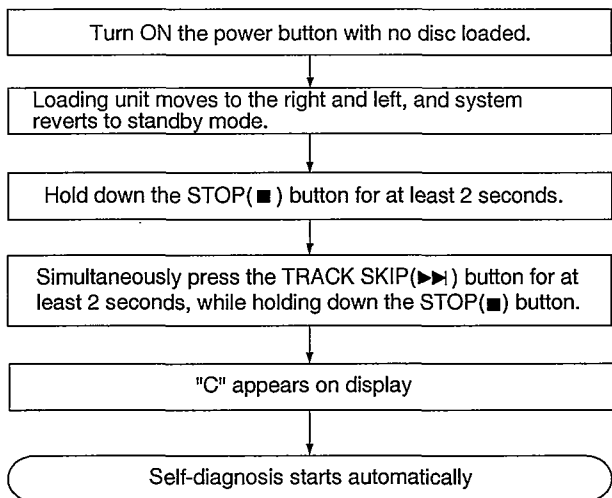
Result	Handling
All lit	Normal (Pressed button and FL normal)
All remain unlit	Check all buttons pressed above
Missing letters	Check grid of missing letters

### Cancellation

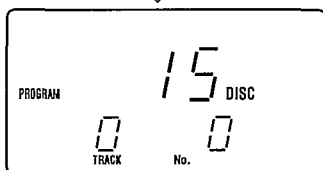
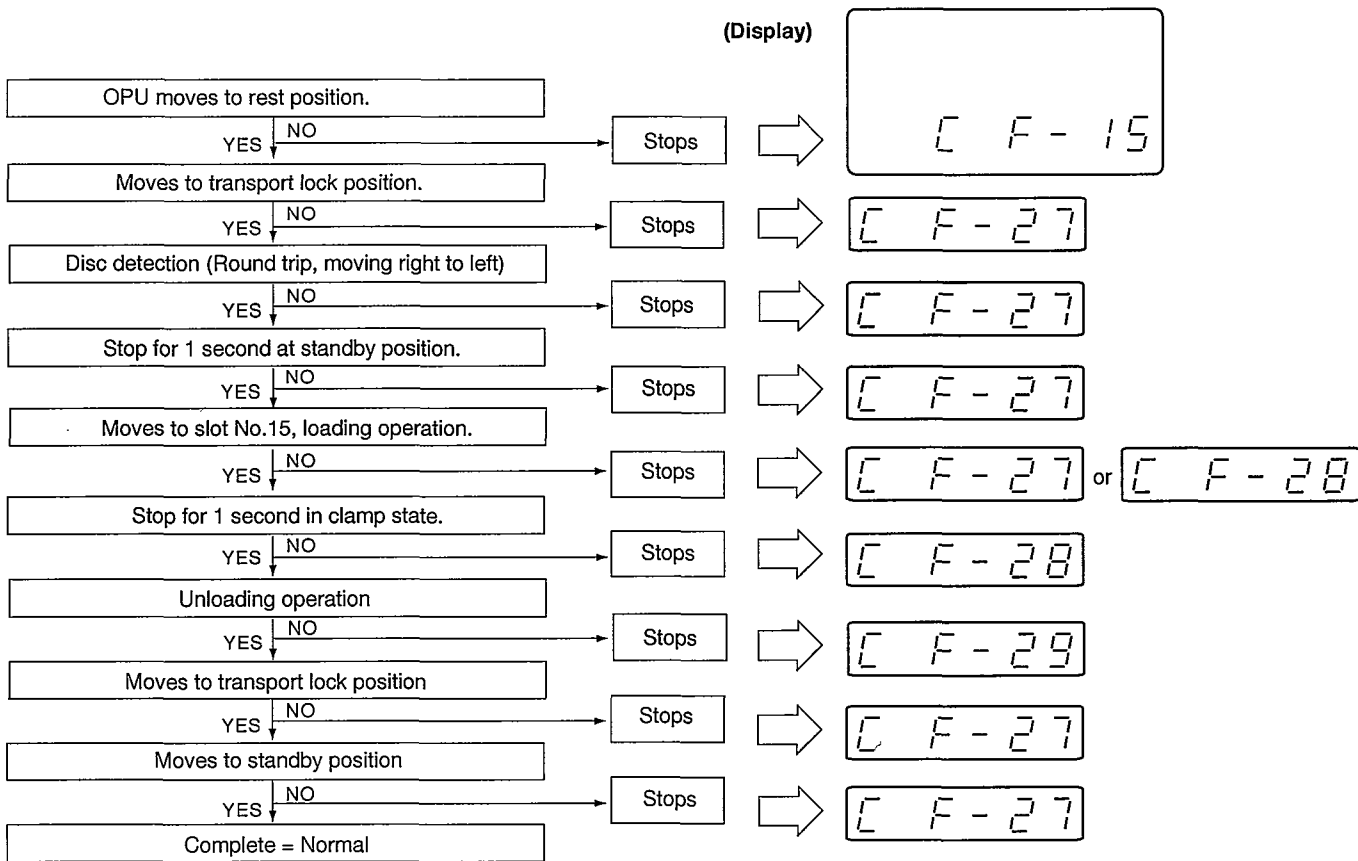
- Press **STOP**( ■ ) or turn OFF/ON power button.

## Self-diagnosis Mechanical mode

### Setting



### Loading unit operation and display



### Cancellation

- Turn power button OFF/ON.

# Self-diagnosis Mechanical mode

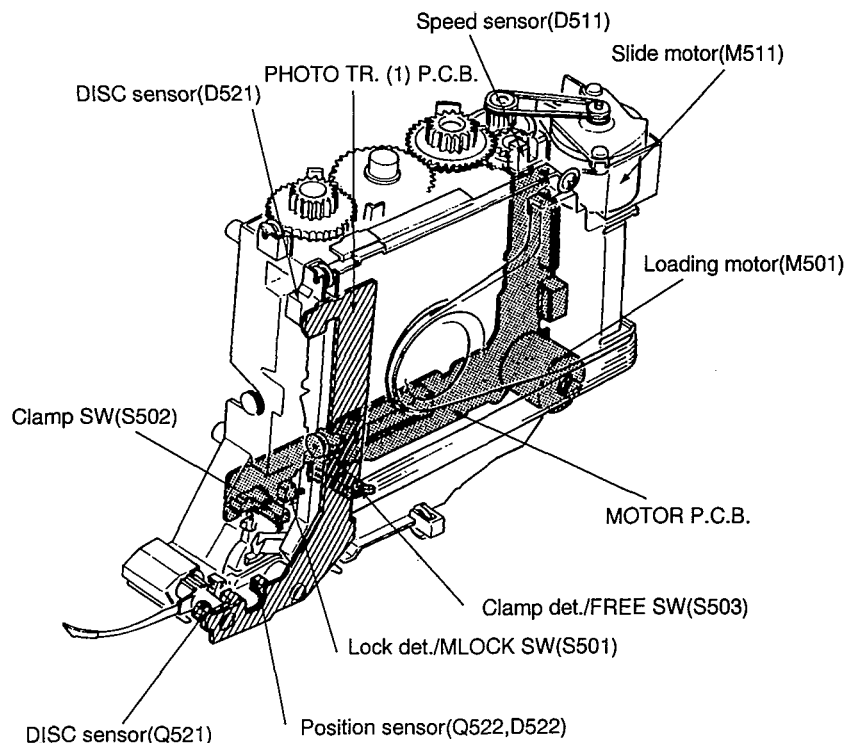
## Display and handling

Display	Cause	Handling
F-15	The symptom is slow start-up of the CD when power is turned ON. The cause is defective contact of the OPU rest switch.	Abnormal rest detection switch (S701).
F-26 (Automatic display)	Sympton is that the unit does not operate when the play button is pressed, or the CD is skipping etc. The probable cause is defective system control IC. Lock det./MLOCK SW (S501) does not go ON/OFF in initial operation.	* Check system control (IC401) and servo IC (IC702). * Check each IC and the servo circuit.  * Check Lock det./MLOCK SW (S501).
F-27	Sensor abnormal. Load on slide drive system is too great. Loading unit does not move to the right and left. Slide motor malfunction.	* Check slide motor (M511). * Check position sensor (Q522, D522) and speed sensor (D511). * Check gears of slide drive system. (Jammed by foreign matter or great teeth missing.)
F-28	Clamp det./FREE SW does not go OFF, and Clamp det.SW (S502) does not go ON within 5 seconds during loading.	* Check Clamp det./FREE SW (S503) and Clamp SW (S502). * Check loading motor (M501). * Check loading drive system.
F-29	Clamp det./FREE SW (S503) and clamp SW do not go ON within 5 seconds during unloading.	(Riding-up, shifting or foreign matter jamming of levers, missing gear teeth etc.)

<Method for returning from error display to normal display>

\* C F-26: When repair is complete, the error display disappears automatically.

\* C F-15/ 27/ 28/ 29: Power SW ON/ OFF.

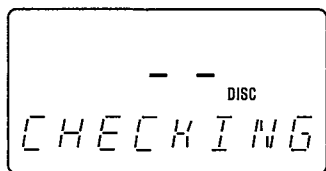


Ref. No.	Part name (Part number)
IC401	System control IC (UPD78044A172)
IC702	Servo processor IC (MN662741RPA)
S501	Lock det./MLOCK SW (RSP1A017-A)
S502	Clamp det. SW (RSH1A005)
S503	Clamp det./FREE SW (RSH1A005)
S701	Rest detection SW (RSM0006-P)
Q521	Disc sensor (PT4810F)
Q522	Position sensor (PT480F)
D511	Speed sensor (RSQGP1S53V)
D521	Disc sensor (LN66S)
D522	Position sensor (GL480V)
M501	Loading motor (RFKPLMC50PAK)
M511	Slide motor (RFKPLMC50PBK)

**Check of basic CD operation**

**1** [With power supply OFF]  
Place one disc in stocker. For example, place a disc in slot No.30.

**2** Press power  
[CHECKING DISCS] scrolls across the display, and the number of the slot containing the disc is displayed.



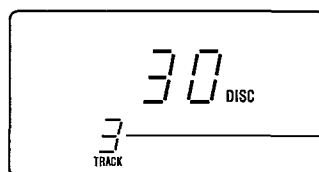
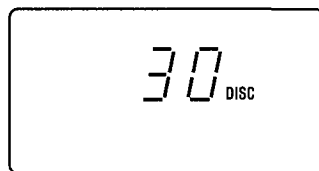
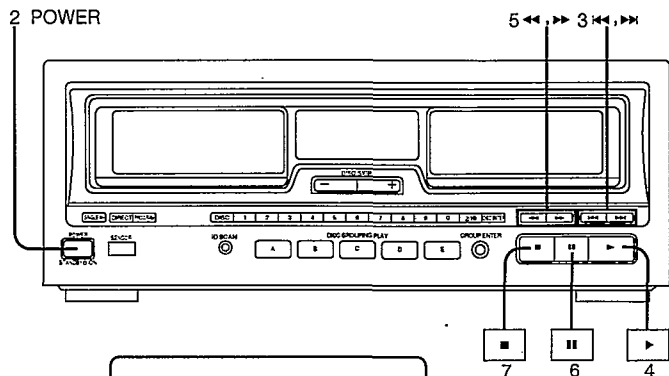
**3** Press either (◀◀ or ▶▶) until you reach the desired track.  
◀◀ : You can skip backward.  
▶▶ : You can skip forward.

**4** Press PLAY (▶).

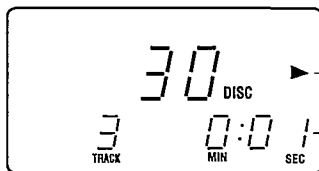
**5** [In the play or pause mode]  
Press and hold ◀◀ or ▶▶  
◀◀ : you can search backward.  
▶▶ : You can search forward.

**6** Press PAUSE (⏸).

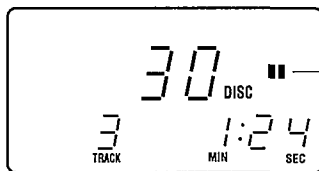
**7** Press STOP (■).



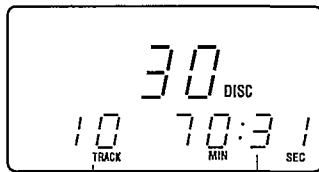
Track number at the playing position.



Play indicator  
Elapsed play time



Illuminates

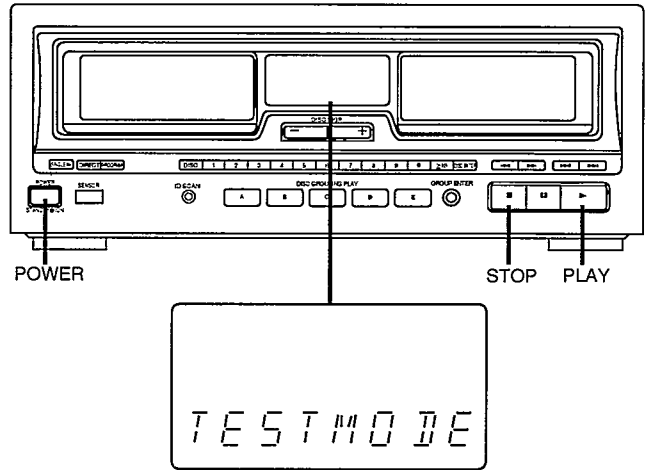
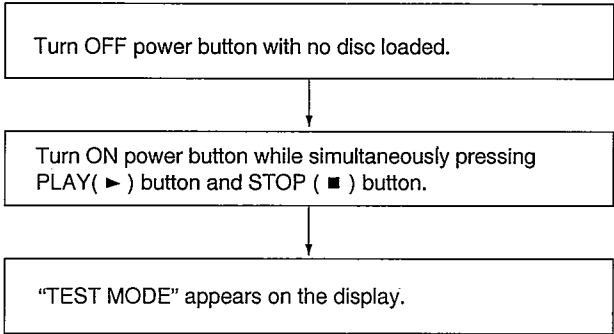


Total number of tracks Total playing time

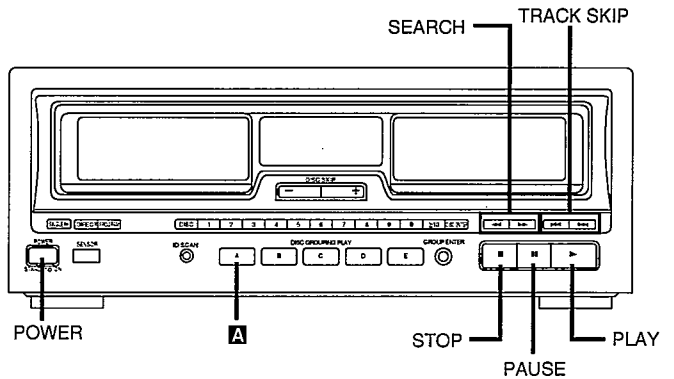
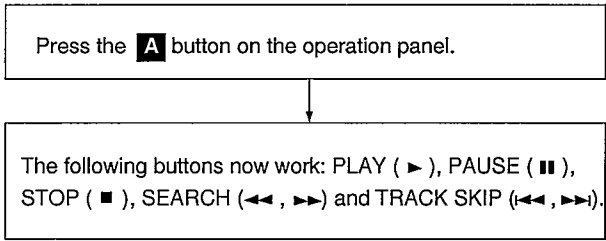
Result	Handling
No abnormalities in any operation	In accordance with the buttons operated in <b>Self-diagnosis: FL display</b> mode , all operation buttons (32 buttons) except the <b>DISC ENTER</b> button are normal. Perform <b>PROGRAM</b> and other operation.
Fails to play or play performance is poor.	Perform servo adjustment mode (p26, 27).
Failure of operation other than play. (Example) Does not skip tracks.	Check between button which does not work and servo module. Check for FFC catching of the OPU. Check for bending of the traverse deck worm gear.

**Self-diagnosis Test mode A**

**Setting**



**To independently operate the traverse deck,**

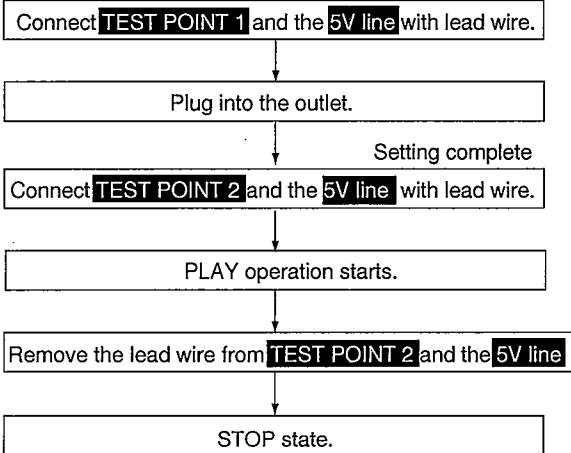


**Cancellation**

Turn the power button OFF/ON

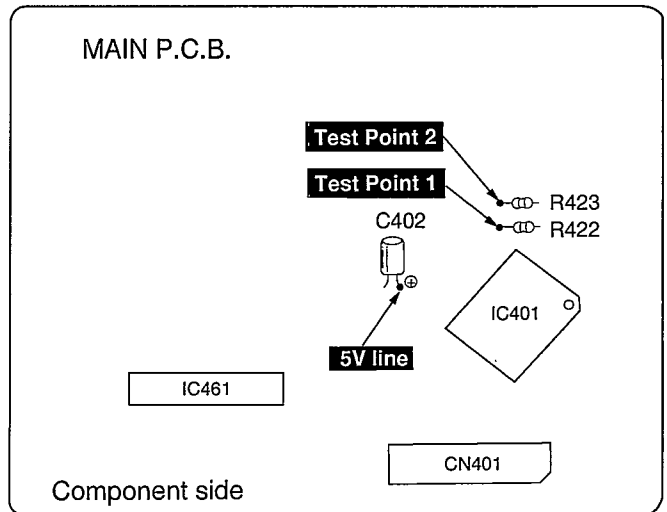
**In case of a panel block malfunction**

With this equipment, the traverse deck can be operated independently even if the panel block malfunctions.



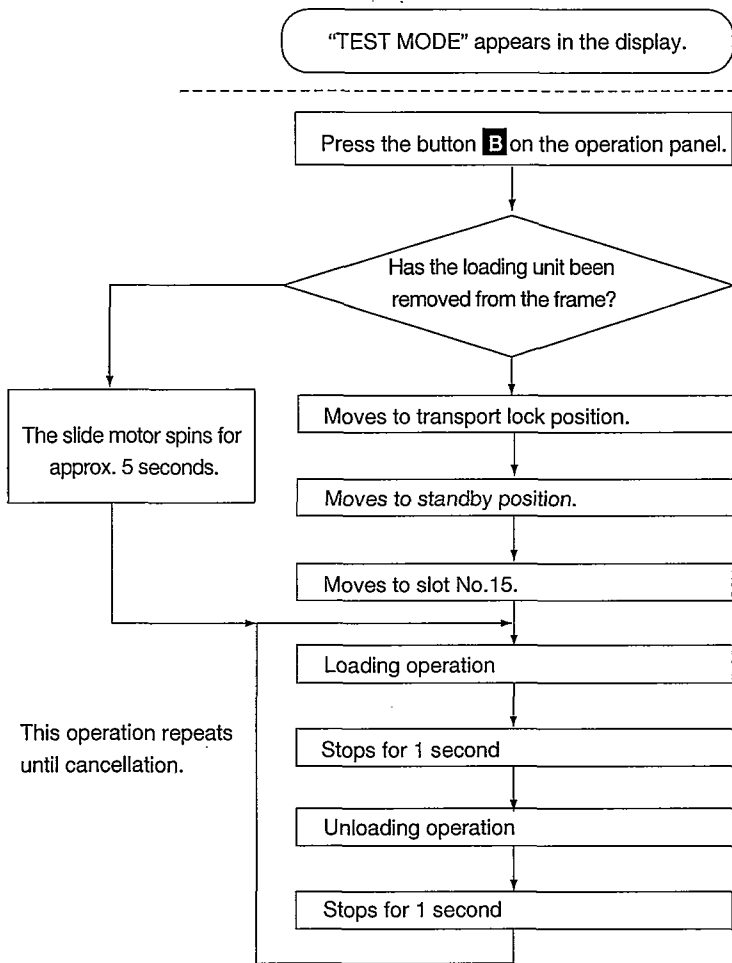
\* To cancel, remove all lead wires.

**TEST POINT location diagram**

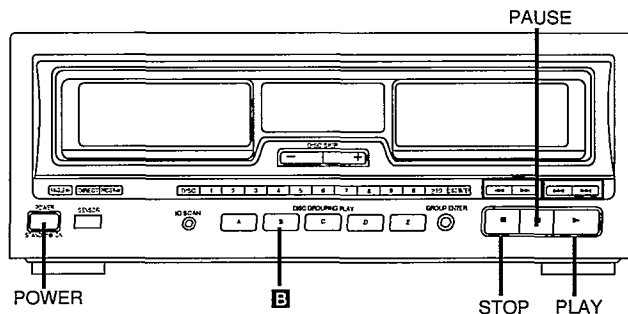
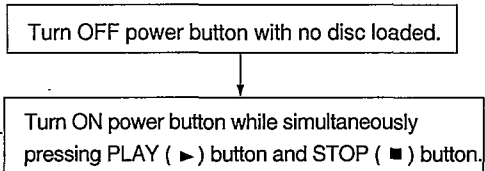


# Self-diagnosis Test mode B

## To perform load and unload operations at the loading unit,



### Setting the “TEST MODE”

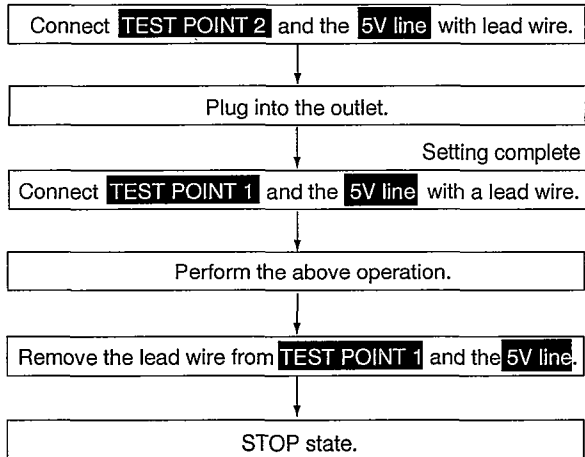


### Cancellation

Turn the power button OFF/ON

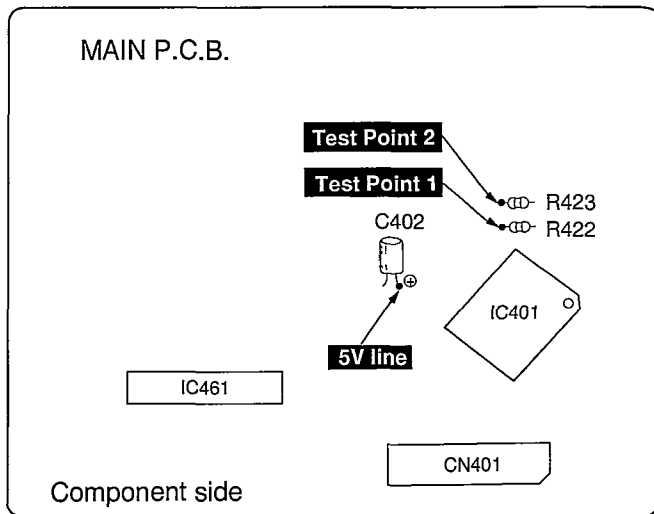
### In case of a panel block malfunction

With this equipment, the traverse can be operated independently even if the panel block malfunctions.



\* To cancel, remove all lead wires.

### • TEST POINT location diagram

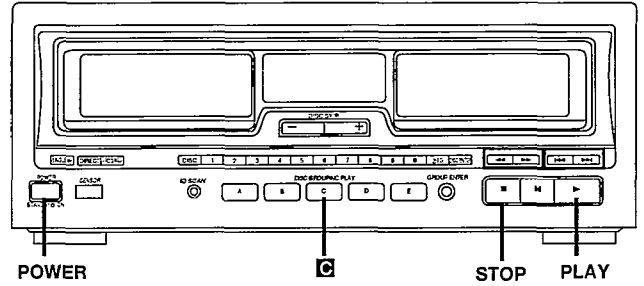
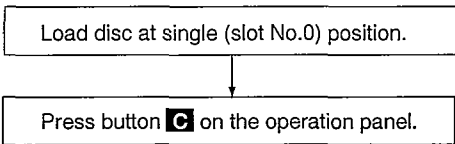
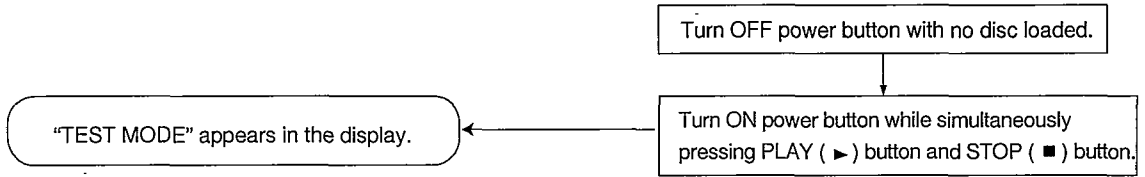




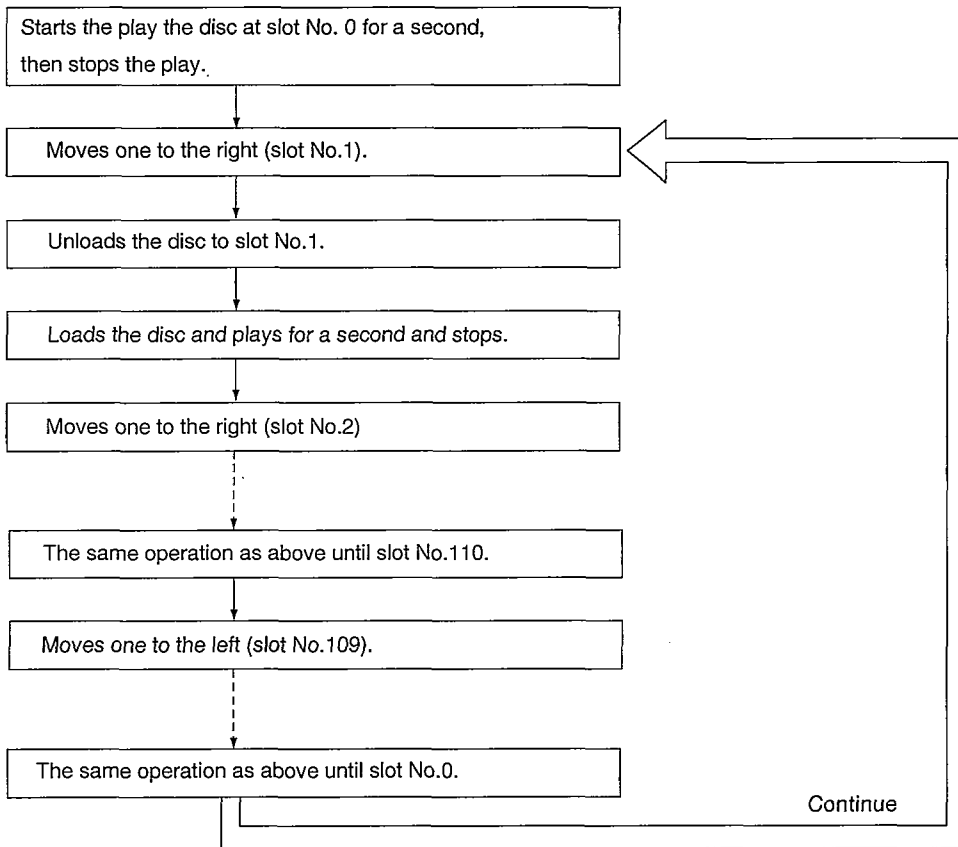
**Self-diagnosis Test mode C**

**To perform linked operation of the loading unit,**

**Setting the "TEST MODE"**



The following automatic operation begins.

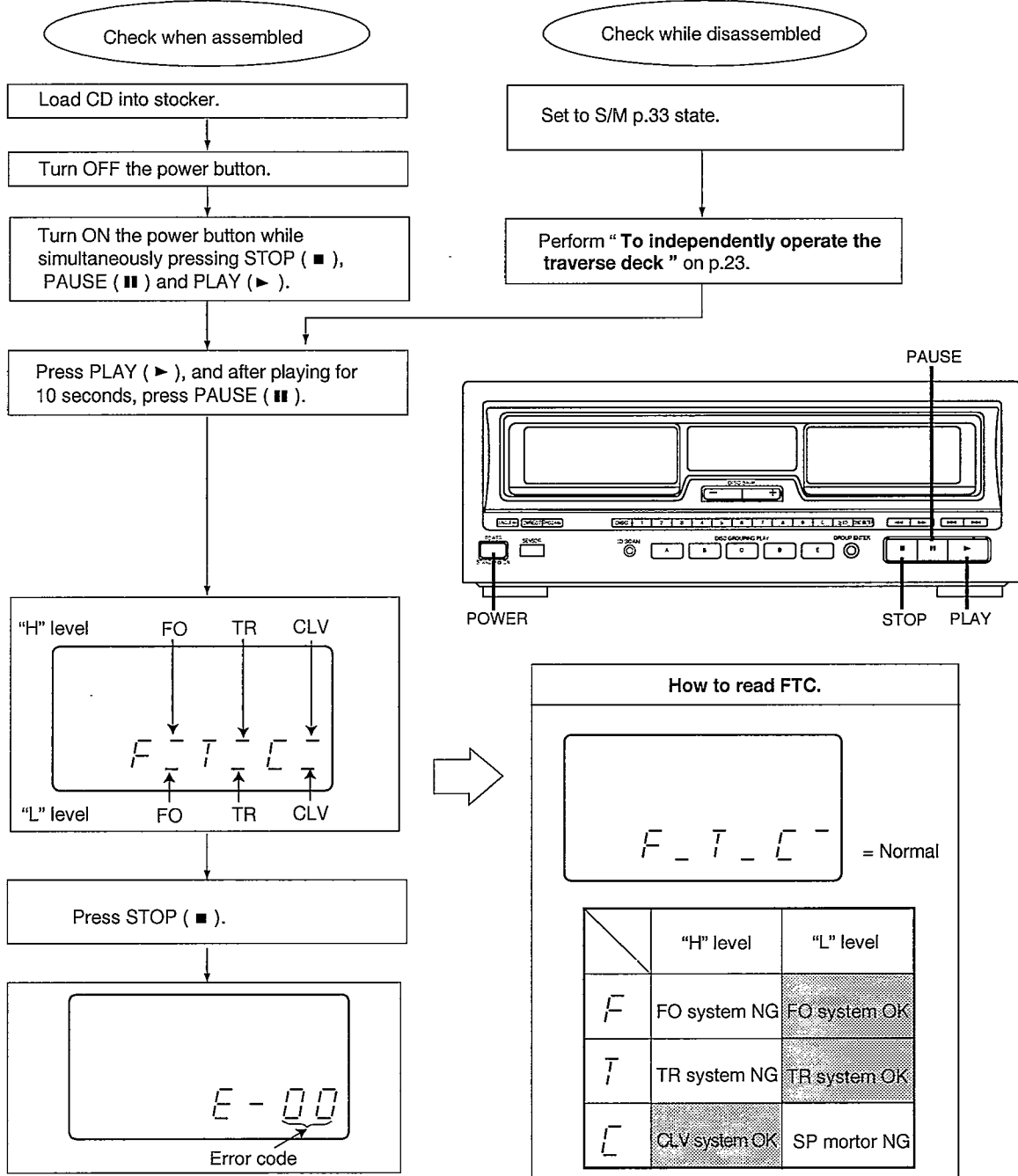


**Cancellation**

\* Turn power button OFF/ON.

# Self-diagnosis Servo adjustment mode

This function shows the operating status of the servo system circuits (focus, tracking, CLV) on the FL display.  
The results of automatic adjustment of the servo circuit are also displayed, using error codes.



**How to read FTC.**

F \_ T \_ C \_ = Normal

	"H" level	"L" level
F	FO system NG	FO system OK
T	TR system NG	TR system OK
C	CLV system OK	SP motor NG


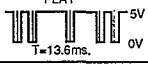
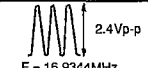
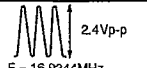
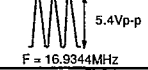
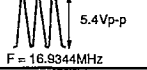

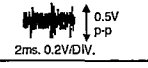
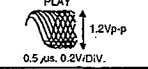



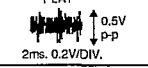
FO: Focus  
TR: Tracking  
CLV: CLV servo

Result	Handling
E - 00	Normal
Other display, (Example) E-01	Refer to p.27 to remedy.

● Error code based on troubleshooting

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

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

FL error code display	Symptom	Probable cause	Signal to check		Normal voltage and waveform values		
			Signal name	Location	PLAY	STOP	
E - 01	Focus and tracking offset adjustments not completed in the specified time period.	1. Clocks X1 and X2, power supply V <sub>DD</sub> and reset/RST, all on IC702. 2. MDATA, MCLK, MLD and SENSE signal to/from mechanism controller.	MDATA	IC702 ⑥ pin		4.9V	
			MCLK	IC702 ⑦ pin		4.8V	
			MLD	IC702 ⑨ pin		4.9V	
			SENSE	IC702 ⑩ pin	0V	0V	
			/RST	IC702 ⑱ pin	4.9V	4.9V	
			X1	IC702 ⑤⑧ pin		2.4Vp-p	
X2	IC702 ⑤⑨ pin		5.4Vp-p		5.4Vp-p		
E - 03 E - 05 E - 07 E - 09 E - 0B E - 0D E - 0F	Disc play unstable.	1. Scratches or contaminants on disc surface. 2. Focus and tracking servo circuits (check waveforms, voltages, and part values.) 3. Spindle driver circuit. 4. Optical pickup.	FE	IC702 ③② pin		2.5V	
			TE	IC702 ③③ pin		2.5V	
			FOD	IC702 ②⑧ pin	2.5V	2.5V	
			TRD	IC702 ②⑦ pin	2.5V	2.5V	
			KICK	IC702 ②⑥ pin	2.5V	2.5V	
			/FLOCK	IC702 ①① pin	0V	4.9V	
			/RF DET	IC702 ③⑧ pin	0V	4.9V	
			RF	TJ701		1.2Vp-p	2.4V
			STAT	IC702 ①⑦ pin	1.3V	0V	
E - 04 E - 06 E - 0C E - 0E	Best "Eye" (PD Balance) adjustment not completed in the specified time period.	1. Scratches or contaminants on disc surface. 2. Focus and Tracking servo circuit (check waveforms, voltages, and part values.) 3. Optical pickup.	FBAL	IC702 ③① pin	2.5 ± 1.25V	2.5 ± 1.25V	
			RF	TJ701		1.2Vp-p	2.4V
			FE	IC702 ③② pin		0.3Vp-p	2.5V
			/TLOCK	IC702 ①② pin	0.1V	0V	
			OFT	IC702 ③⑥ pin	0V	0V	
E - 08 E - 0A	Focus or Tracking gain adjustment not completed in the specified time period.	1. Scratches or contaminants on disc surface. 2. Focus and Tracking servo circuit (check waveforms, voltages, and part values.) 3. Optical pickup.	FE	IC702 ③② pin		0.3Vp-p	2.5V
			TE	IC702 ③③ pin		0.5Vp-p	2.5V
			/TLOCK	IC702 ①② pin	0.1V	0V	
			OFT	IC702 ③⑥ pin	0V	0V	