

Service Manual

COMPACT
disc
DIGITAL AUDIO

MASH*
multi-stage noise shaping

CD Stereo System

SA-CH64M

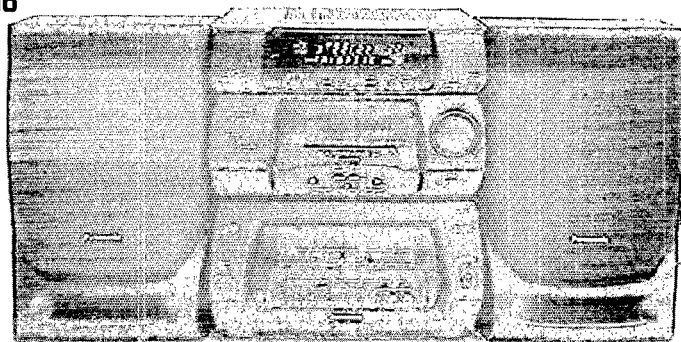
Colour

(K) Black Type

Area

Suffix for Model No.	Area	Colour
(E)	Continental Europe	(K)
(EB)	Great Britain	
(EG)	Germany and Italy	

Remote
Control
Transmitter



SB-CH64

SA-CH64M

SB-CH64

* MASH is a trademark of NTT.

TAPE SECTION : AR-2 MECHANISM SERIES
CD SECTION : RAE0150Z TRAVERSE DECK SERIES

Specifications

Amplifier Section

1 kHz continuous power output, both channels driven	
DIN	2 x 20 W (THD 1%, 6 Ω)
RMS	2 x 25 W (THD 10%, 6 Ω)
Total harmonic distortion	
Half power at 1 kHz	0.07% (6 Ω)
Frequency response	
AUX	60 Hz – 20 kHz (–3 dB)
Input sensitivity and impedance	
AUX	250 mV, 22 kΩ
Tone controls	
6-EQ SPACE modes	HEAVY, CLEAR, SOFT, DISCO, LIVE, HALL
V. Bass (Volume at –30 dB)	63 Hz, 7 dB
Load impedance	6 Ω

FM Tuner Section

Frequency range	87.50 – 108.00 MHz
Sensitivity	23.3 dBf (4.0 μV, IHF '58)
Total harmonic distortion	
MONO	0.3%
STEREO	0.5%
S/N MONO	60 dB (65 dB, IHF)
Antenna terminal(s)	75 Ω (unbalanced)

CD Section

Sampling frequency	44.1 kHz
Decoding	16 bit linear
Beam source / wave length	Semiconductor laser / 780 nm
Number of channels	Stereo
Frequency response	20 Hz – 20 kHz (+1 dB, –2 dB)
S/N ratio	
SP OUT	85 dB (JIS.A)
Wow and flutter	Below measurable limit
Digital filter	8 fs
D/A converter	MASH (1 bit DAC)

System	Music Center	Speaker
SC-CH64M (E)	SA-CH64M (E)	SB-CH64 (E) (made in PAES)
SC-CH64M (EB)	SA-CH64M (EB)	
SC-CH64M (EG)	SA-CH64M (EG)	

AM Tuner Section

Frequency range	
MW	522 – 1611 kHz
LW	144 – 288 kHz
Sensitivity (for 500 mW)	
MW (at 999 kHz)	250 μV/m
LW (at 252 kHz)	500 μV/m

Cassette Deck Section

Track system	4 track, 2 channels
Heads	
Record/playback	Solid permalloy head (Rotary head)
Erasure	Double gap ferrite head
Motor	DC servo motor
Recording system	AC bias 100 kHz
Erasing system	AC erase 100 kHz
Tape speed	4.8 cm/s
Frequency response [(+3 dB, –6 dB) at deck out]	
NORMAL	35 Hz – 14 kHz
S/N ratio	50 dB (A weighted)
Wow and flutter	0.18% (WRMS)
Fast forward and rewind time	Approx. 120 seconds with C-60 cassette tape

General

Power supply	AC 50 Hz, 230 V (E, EG) AC 50 Hz, 230 – 240 V (EB)
Power consumption	100 W
Dimensions (W x H x D)	270 x 347 x 424 mm
Weight	9.7 kg

Notes :

- Specifications are subject to change without notice.
Weight and dimensions are approximate.
- Total harmonic distortion is measured by the digital spectrum analyzer.

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Panasonic®

⚠ WARNING

This service information is designed for experience 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.

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■ Before Repair and Adjustment

Disconnect AC power, discharge Power Supply Capacitors C547, C548 and C549 through a 10Ω, 5W resistor to ground. DO NOT SHORT-CIRCUIT DIRECTLY (with a screwdriver blade, for instance), as this may destroy solid state devices. After repairs are completed, restore power gradually using a variac, to avoid overcurrent. Current consumption at 230V (for E, EG) or 230 – 240V (for EB), 50 Hz in NO SIGNAL mode should be less than 250mA.

■ 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)

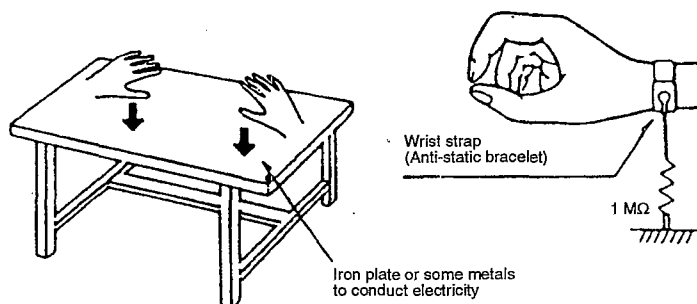
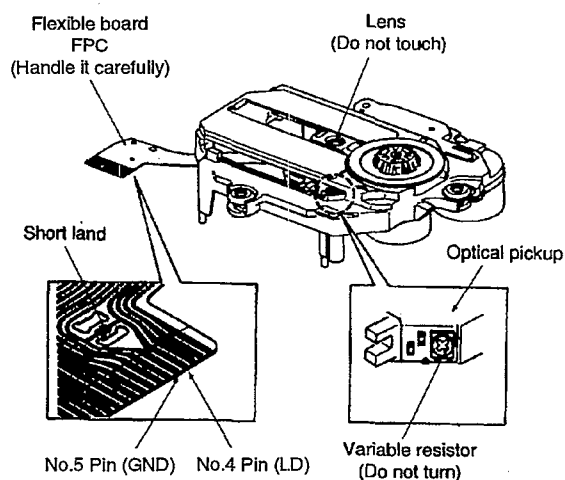
1. Do not subject the traverse deck (optical pickup) to static electricity as it is extremely sensitive to electrical shock.
2. The short land between the No.4 (LD) and No.5 (GND) pins on the flexible board (FPC) is shorted with a solder build-up to prevent damage to the laser diode.
To connect to the 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 (FPC board).
4. Do not turn the variable resistor (laser power adjustment). It has already been adjusted.

• Grounding for electrostatic breakdown prevention

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

Caution :

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



■ Protection Circuitry

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

- No sound is heard when the power is turned on.
- Sound stops during a performance.

The function of this circuitry is to 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 the amplifier are used.

If this occurs, follow the procedure outlines below:

1. Turn off the power.
2. Determine the cause of the problem and correct it.
3. Turn on the power once again after one minute.

Note:

When the protection circuitry functions, the unit will not operate unless the power is first turned off and then on again.

■ Precaution of Laser Diode

CAUTION : This product utilizes a laser diode with the unit turned "ON", invisible laser radiation is emitted from the pick up lens.
Wavelength : 780 nm
Maximum output radiation power from pick up : 100 μ W/VDE

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

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

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

Wellenlänge : 780nm
Maximale strahlungsleistung der lasereinheit : 100 μ W/VDE

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

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

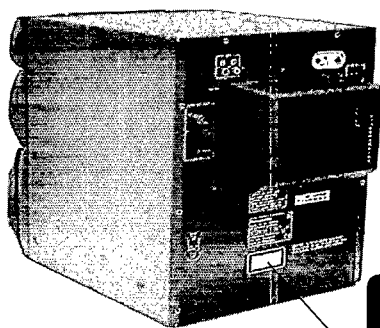
ADVASEL: I dette a apparat anvendes laser.

CAUTION!

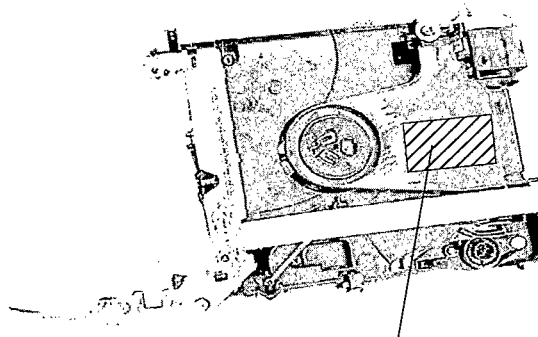
THIS PRODUCT UTILIZES A LASER.

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

■ Use of Caution Labels



**LUOKAN 1 LASERLAITE
KLASS 1 LASER APPARAT**



DANGER	INVISIBLE LASER RADIATION WHEN OPEN. AVOID DIRECT EXPOSURE TO BEAM.
ADVASEL	USYNLIG LASERSTRÅLING VED ÅBNING. UNDR SKIKKERHEDSAFBRYDDE ERUDEAF FUNKTIONEN OG UDSÆTTELSE FOR STRÅLING.
VARO!	AVAITTAESSA JA SUOJALUKITUS OHITETTÄESSA OLET ALTIINA NÄKYMÄTÖNÄ LASERSÄTELYLLE. ÄLÄ KATSO SÄTEESEEN.
WARNING	OSYNLIG LASERSTRÅLING NÄR DENNA DEL ÄR ÖPPNAD OCH SPÄRREN ÄR URKOPPLAD. BETRÄKTA EJ STRÅLEN.
ADVASEL	USYNLIG LASERSTRÅLING NÄR DEKSEL ÖPNES OG SIKKERHEDSLÅS BRYTES. UNNGÅ EKSPONERING FOR STRÅLEN.
VORSICHT	UNSIHTBARE LASERSTRÅLUNG, WENN ABDECKUNG GEÖFFNET. NICHT DEM STRAHLEN AUSSETZEN.

■ Caution for AC Mains Lead

[For [EB] area.]

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 OFF 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 wires in this 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:

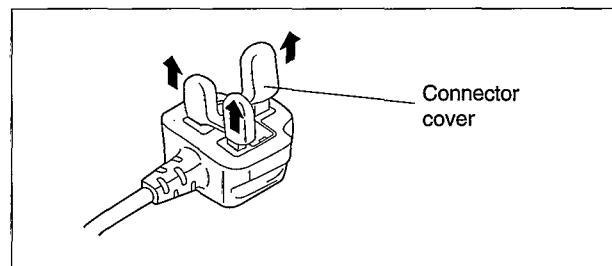
The wire which is coloured BLUE must be connected to the terminal in the plug which is marked with the letter N or coloured BLACK.

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 or these wires be connected to the earth terminal of the three pin plug, marked with the letter E or the Earth symbol \perp .

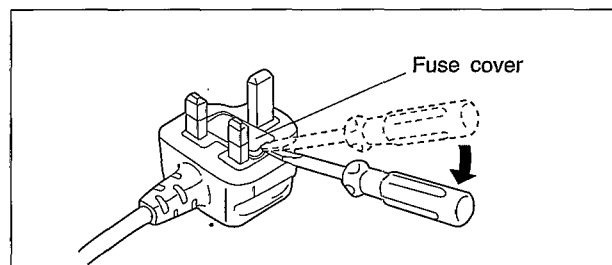
Before use

Remove the connector cover as follows.

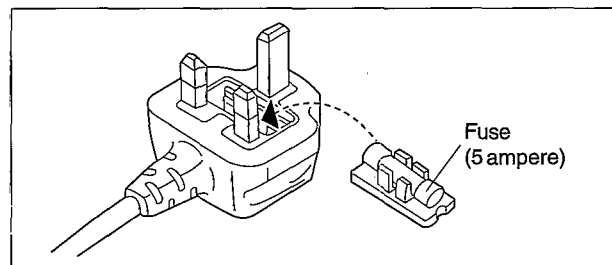


How to replace the fuse

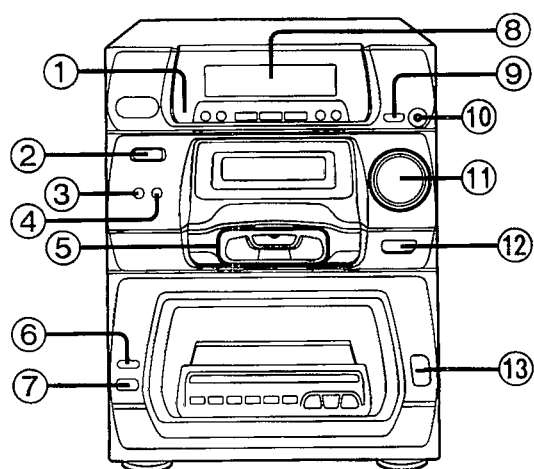
1. Remove the fuse cover with a screwdriver.



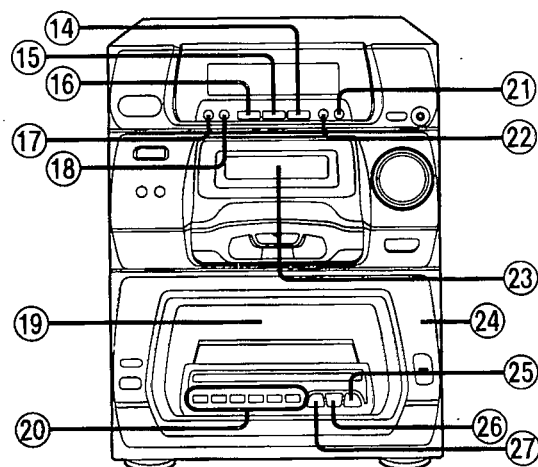
2. Replace the fuse and attach the fuse cover.



■ Location of Controls



No.	Name
①	Remote control sensor
②	Power "STANDBY \odot /ON" switch (POWER, STANDBY \odot /ON)
③	Reverse mode select button (REV MODE)
④	Recording start/stop button (REC START/STOP)
⑤	Basic operating buttons Buttons change according to the source.
⑥	CD edit button (CD EDIT)
⑦	Single play button (SINGLE PLAY)
⑧	Display
⑨	V. BASS/DEMO button (-V. BASS/-DEMO)
⑩	Headphones jack (PHONES)
⑪	Volume control (VOLUME)
⑫	Cassette holder open button (\blacktriangle OPEN)
⑬	Disc skip/group name select button (DISC SKIP/GROUP NAME)



No.	Name
⑭	Tuner/band select button (TUNER, BAND)
⑮	CD button (CD)
⑯	Tape button (TAPE)
⑰	Record timer/play timer button (\odot REC/ \odot PLAY)
⑱	Clock/timer button (CLOCK/TIMER)
⑲	Window
⑳	Group file select buttons (GROUP FILE)
㉑	EQ space select button (EQ SPACE)
㉒	AUX button (AUX)
㉓	Cassette holder
㉔	Rack panel
㉕	Group name enter button (NAME ENTER)
㉖	Group disc enter button (DISC ENTER)
㉗	Group mode select button (MODE)

■ Operation Checks and Main Component Replacement Procedures

“ATTENTION SERVICER” Some chassis components may have sharp edges.
Be careful when disassembling and servicing.

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

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

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. Select items from the following index when checks or replacement are required.

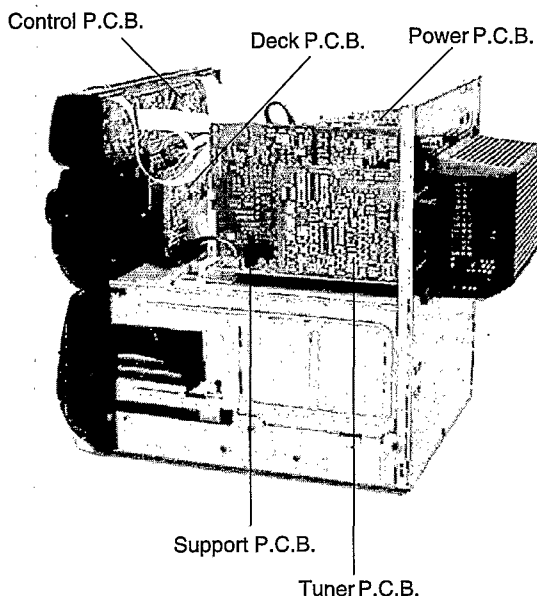
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■ Checking Procedure for Major P.C.B.

1. Checking of Tuner P.C.B., Deck P.C.B., Power P.C.B., Support P.C.B. and Control P.C.B.

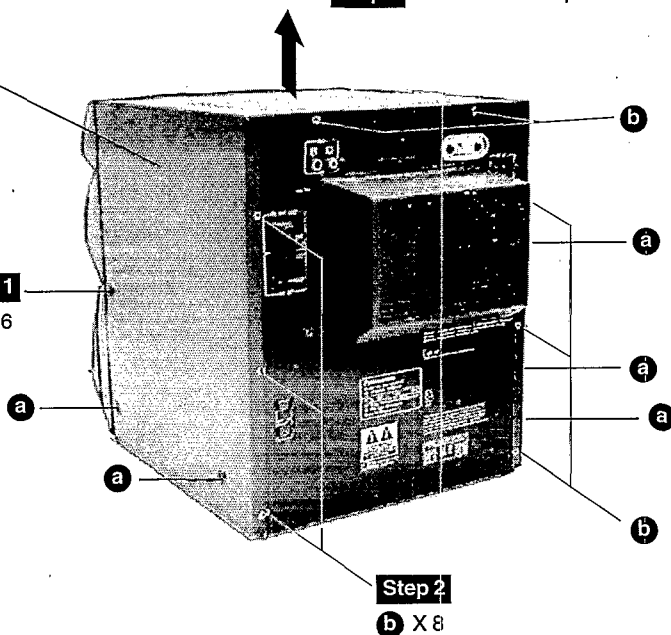
Step 4 Check the Tuner P.C.B., Deck P.C.B., Power P.C.B., Support P.C.B. and Control P.C.B. as shown below.



Top Cabinet

Step 1
a X 6

Step 3 Remove the Top Cabinet.



a
[RHD30007]
(Black)

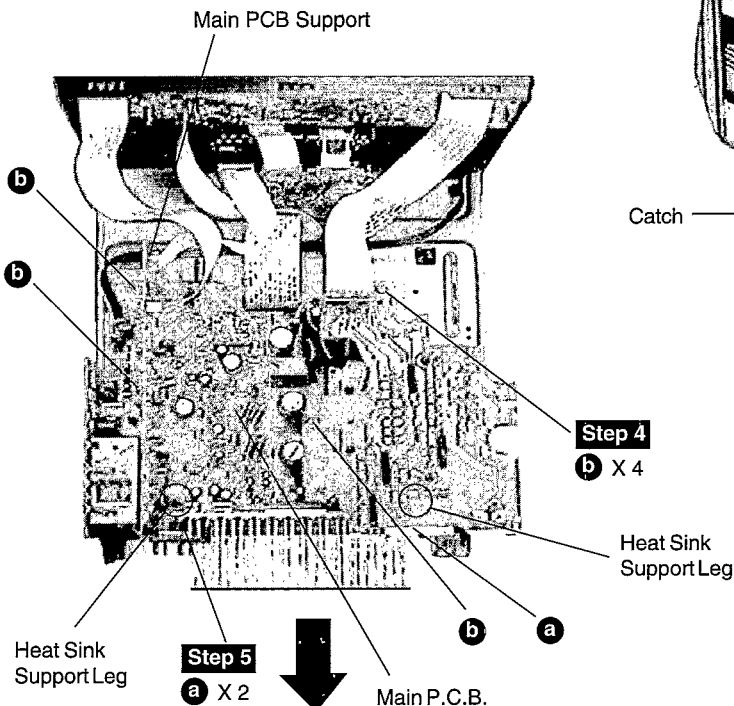
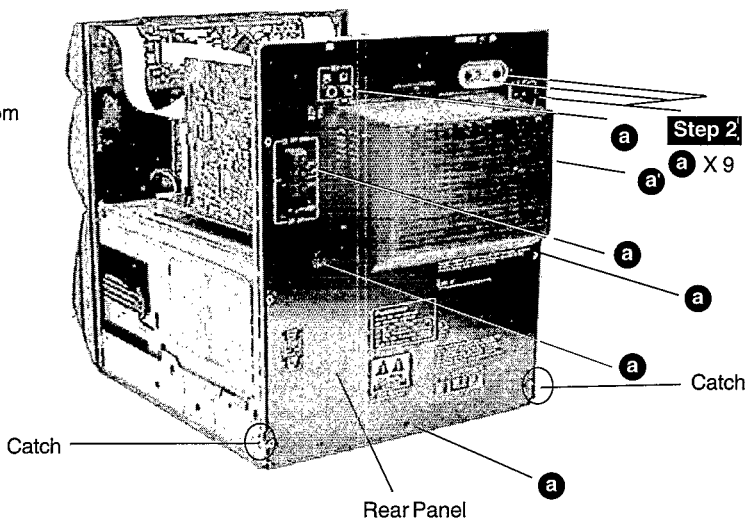


b
[XTBS3+8JFZ1]
(Black)

2. Checking of Main P.C.B.

Step 1 Follow the Checking of Tuner P.C.B., Deck P.C.B., Power P.C.B., Support P.C.B. and Control P.C.B. procedures from Step 1 to 3.

Step 3 Release the two catches and remove the rear panel.

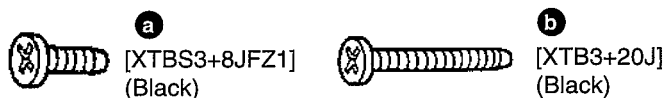
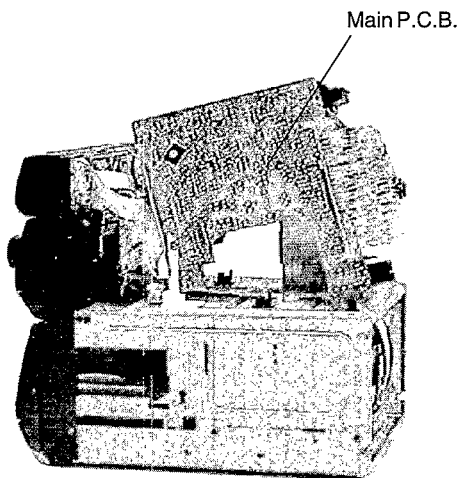


Step 5
a X 2

Step 6
Slide the Main P.C.B. backwards and remove it.
(Take note of the Main PCB Support and the two Heat Sink Support Legs)

Step 4
b X 4

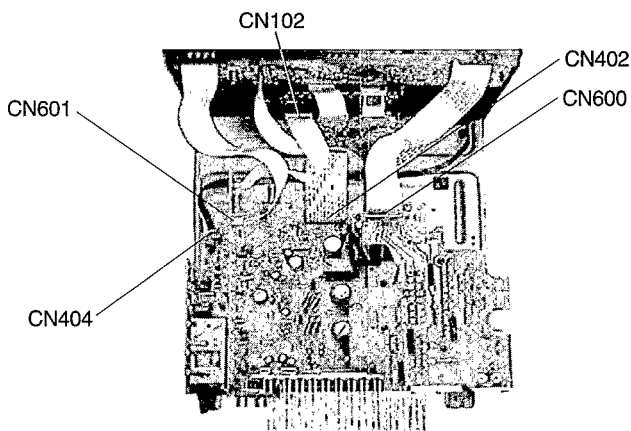
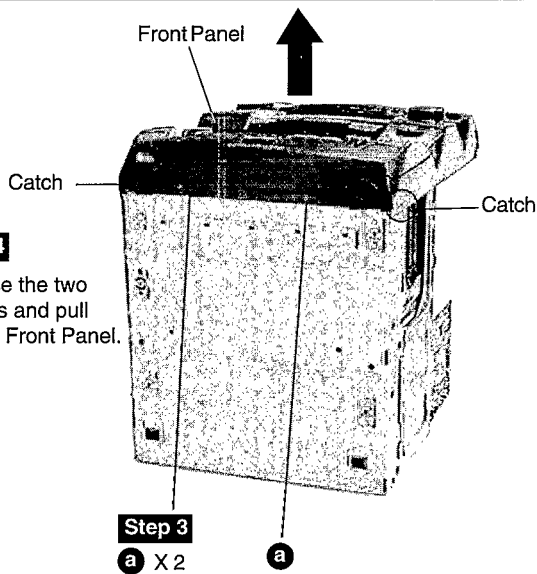
Step 7 Position and check the Main P.C.B. as shown on the right.



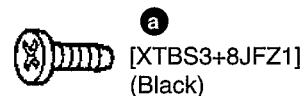
3. Checking of Servo P.C.B.

Step 1 Follow the Checking of Main P.C.B. procedures from Step 1 to 5.

Step 4
Release the two catches and pull out the Front Panel.



Step 2 Disconnect the connections from CN600, CN402, CN102, CN601 and CN404.



Step 5
Lift up the Main P.C.B. and remove the tape and pull out the FFC.

Step 7
Fix back the Main P.C.B. and lift up the Sub Chassis from the Bottom Chassis.

Step 8
Fix back the Front Panel and connect back the connections for CN600, CN402, CN102, CN601, CN404. Push the Loading Unit to the extreme left (as shown on the left) and check the Servo P.C.B.

Step 6
b X 4

Bottom Chassis

b
[XTB3+10JFZ]
(Black)

Disassembly of the Loading Unit, Operational Parts and Traverse Unit.

1. Disassembly of the Loading Unit

Step 1 Follow the Checking of Servo P.C.B. procedures from Step 1 to 8.

Take note of the rear lock plate and the rear lock gear during disassembly and assembly.

Step 2
a X 8

Step 3
Unlock the loading unit by moving the front lock gear manually in the direction of arrow

Step 4
Move the loading unit manually in the right direction. (Move the loading unit beyond the center of the frame.) The pointers on the frame (shown above) are for checking purposes during assembly.

Step 5
Remove the upper rail and the stocker.

Step 6
Remove the guard rope.

Step 7
Remove the Loading unit.

a
[XTB3+6F]
(Brass)

2. Disassembly of the Disc Guide (L), Return Lever A, Rear Feed Lever, Guide Lever, Feed Sub Lever and Front Feed Lever.

Step 1 Follow the Disassembly of the Loading Unit procedures from Step 1 to 7.

Step 2 a X 1

Clamp plate

Step 4 Tilt the clamp plate backward.

Step 3

Remove the feed lever spring.

Feed lever spring

Disc guide (R)

Step 5

b X 5

LED

Step 6 Remove the disc guide (R).
(Do not touch the LED or the photo coupler by hand.)

Photo coupler

Disc guide (L)

Claws

Step 7 Rotate the pulley (or rotate with 2mm hexagonal wrench, SZZP1101C, as shown below) clockwise in order to shift the return lever A away from the disc guide (L).

Step 8 Release the 2 claws and then remove the disc guide (L).
Note : Some of the operational parts can be removed easily (eg. return lever A, rear feed lever, guide lever, feed sub lever and front feed lever).

Return lever A

Pulley

- Rotate clockwise : Loading operation
- Rotate counterclockwise : Unloading operation

Rear feed lever

Guide lever

Servo P.C.B.

Feed sub lever

Front feed lever

Motor P.C.B.

Hexagonal wrench (SZZP1101C)

- Rotate clockwise : Loading operation
- Rotate counterclockwise : Unloading operation

Hole

Hexagonal wrench (SZZP1101C)

Motor P.C.B.

Reduction gear



a

[XTWS3+10T]
(Black)



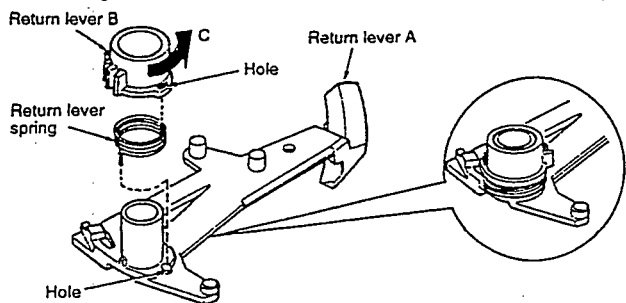
b

[XTBS26+10J]
(Black)

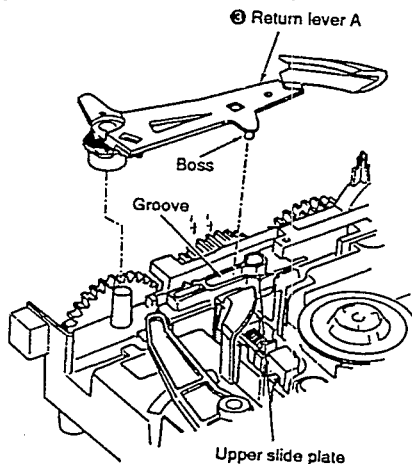
Reassembly

① Rotate the pulley clockwise fully.

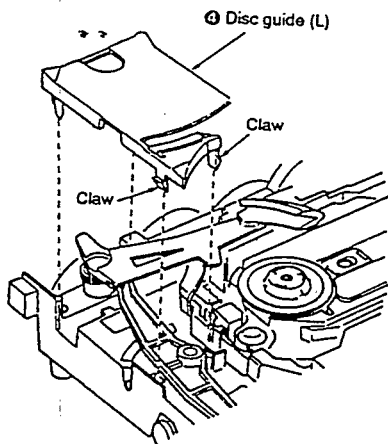
② Align the both ends of the spring with the holes of return lever A and B and then, install the return lever A with rotating the return lever B in the direction of arrow (→) C.



③ Install the return lever A.
(Align the boss of return lever A with the groove of upper slide plate.)

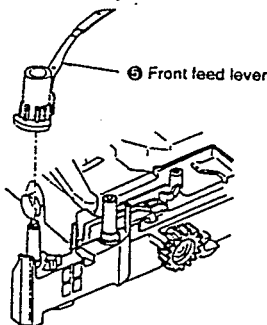


④ Install the disc guide(L).
(Press the disc guide (L) until the claws are hooked completely.)

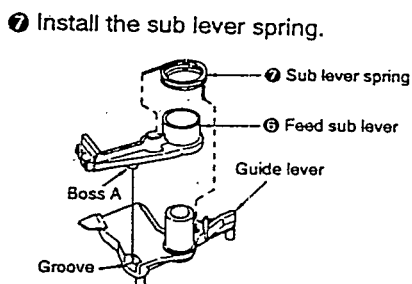


⑤ Install the front feed lever.

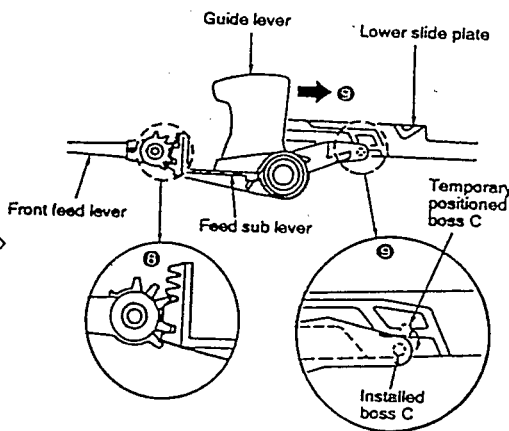
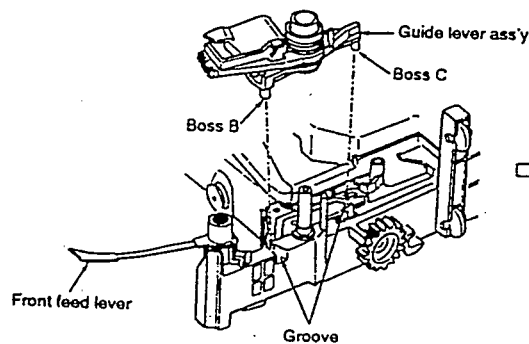
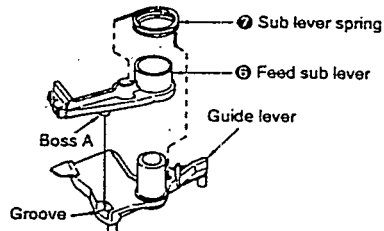
(The state of pulley rotated clockwise fully.)



⑥ Install the feed sub lever to the guide lever.
• Align the boss A of feed sub lever with the groove of the guide lever.

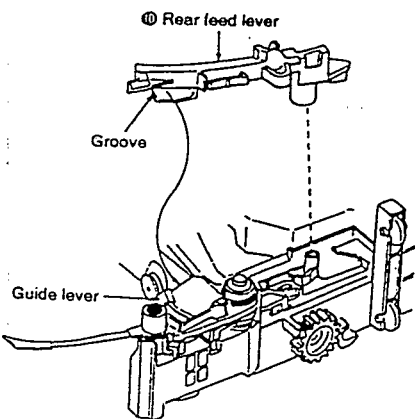


⑦ Install the sub lever spring.



⑧ Engage the gear of guide lever ass'y with the gear of front feed lever temporary.
• Boss B must be placed in the groove.
• Boss C must be run over the lower side plate.

⑨ With fixing the gear by finger not to slip off the gear clench, rotate the guide lever in the direction of arrow.
• The boss C will fit in the groove.



⑩ Install the rear feed lever.
(Align the guide lever with the groove of rear feed lever.)

3. Disassembly of the Traverse Unit

Step 1 Follow the Disassembly of the Loading Unit procedures from Step 1 to 7.

Opening of the loading unit

Guide lever

Front feed lever

Lower slide plate

Lock piece

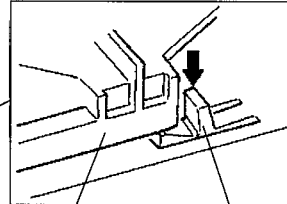
Pulley

Traverse unit

Loading unit

CN702

Step 2 Rotate the pulley counterclockwise until the lower slide plate touches the lock piece.



Lower slide plate

Lock piece

Step 3

Rotate the pulley counterclockwise fully with pressing the rib of lock piece. (The lower side plate runs over the lock piece.)

Step 4 Slide the lower slide plate manually until the lower slide plate touches the rib of lock piece.

Step 5 Remove the traverse unit from the loading unit.

Step 6 Remove the FFC from the connector, CN702.

Reassembly

Reverse the steps above. But during Step 3, push the guide lever towards the opening of the loading unit while rotating the pulley clockwise.

Replacement of the Traverse Deck

Step 1 Follow the Disassembly of the Traverse Unit procedures from Step 1 to 6.

Traverse Deck

Step 2

a X 2

Step 4

Desolder the 4 legs of the 2 motors and pull out the Servo P.C.B.

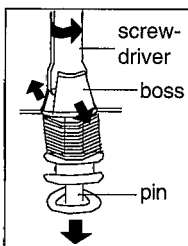
Servo P.C.B.

Step 6

Remove the flexible cable CN701.

Step 5

Widen the 2 bosses with a flat screwdriver and pull out the 2 pins. Then remove the Traverse Deck.

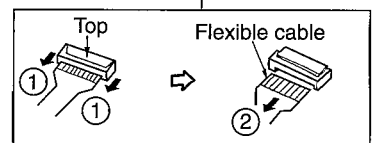
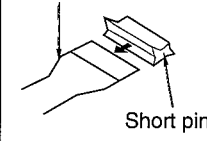


Step 3

b X 1

Note: Insert a short pin into the flexible cable for traverse unit.

Flexible cable



• Removal of the flexible cable
Push the top of the connector in the direction of the arrow ①, and then pull out the flexible cable in the direction of the arrow ②.

a

[XTV2+6G] (Brass)

b

[XTN2+6G] (Brass)

■ Measurements and Adjustments

• CASSETTE DECK SECTION

MEASUREMENT CONDITION :

- Make sure heads are clean
- Make sure capstan and pressure roller are clean

MEASURING INSTRUMENT :

- EVM(electronic Voltmeter)
- Digital frequency counter

TEST TAPE:

- Head azimuth adjustment (8 kHz, -20 dB): QZZCFM
- Tape speed adjustment (3 kHz, -10 dB): QZZCWAT
- Normal reference blank tape: QZZCRA

HEAD AZIMUTH ADJUSTMENT

Caution :

- Please replace both azimuth adjustment screws (RHE5152ZB) and springs (RMB0331) simultaneously when readjusting the head azimuth. (shown in Fig. 2)
- Even if you wish to readjust the head azimuth without replacing the screws and springs, a fine adjustment cannot be done because of the screw-locking bond adhered to the azimuth screw and spring.
- Please remove the screw-locking bond left on the head base when replacing the azimuth screw.
- If you wish to readjust the head azimuth, be sure to adjust with adhering the cassette tape closely to the mechanism by pushing the center of cassette tape with your finger. (shown in Fig. 3)

1. Playback the azimuth adjustment portion (8 kHz, -20 dB) of the test tape (QZZCFM) in the forward play mode. Vary the azimuth adjusting screw until the output of the R-CH (PB OUT-R) are maximized.
2. Perform the same adjustment in the reverse play mode.
3. After the adjustment, apply screwlock to the azimuth adjusting screw.

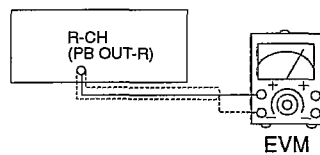


Fig. 1

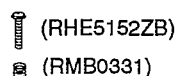


Fig. 2

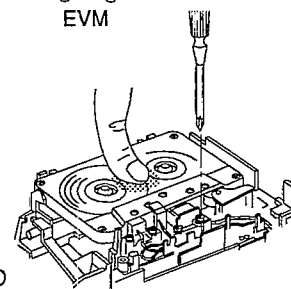


Fig. 3

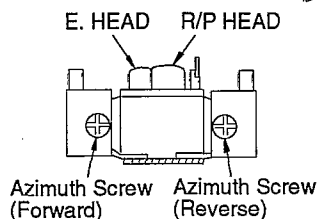
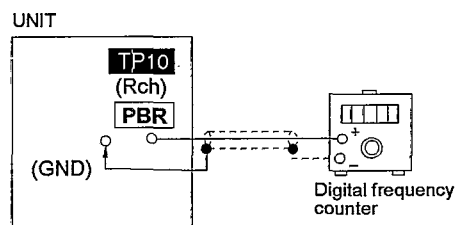


Fig. 4

TAPE SPEED ADJUSTMENT

1. Test equipment connection is shown on the right.
2. Set the unit to "TAPE" position.
3. Playback the middle part of the test tape (QZZCWAT).
4. Adjust **MOTOR VR** so that the output is within the standard value.

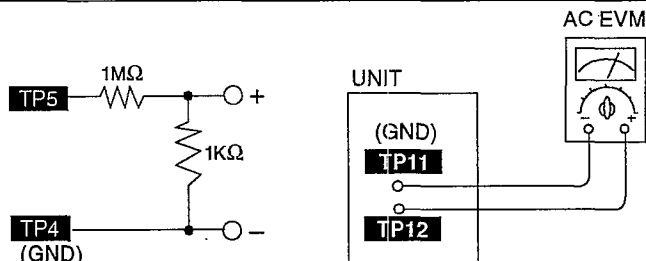
Standard value : 3000 ± 60 Hz



BIAS AND ERASE VOLTAGE CHECK

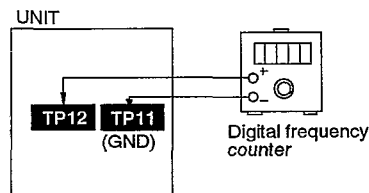
1. Test equipment connection is shown on the right.
2. Insert the normal tape (QZZCRA).
3. Place cassette deck into **REC** mode.
4. Make sure that the output is within the standard value.

Bias Voltage Standard value : 19 ± 4 mV
Erase Voltage Standard value : more than 65 mV



BIAS FREQUENCY ADJUSTMENT

1. Test equipment connection is shown on the right.
2. Set the unit to "TAPE" position.
3. Place cassette deck into **REC** mode.
4. Adjust **L101** for 98 ± 8 kHz on frequency counter reading.



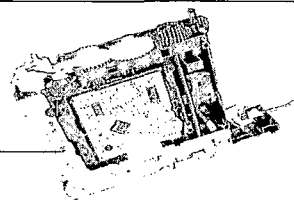
• CD LOADING MECHANISM SECTION

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

• DISC SENSOR ADJUSTMENT

1. Set the unit to "CD TEST MODE" as shown below.
2. Connect the DC electronic voltmeter across **TP501** (+) and **TP502** (-) on the motor P.C.B. (Fig. 6).
3. Adjust VR501 so that the DC electronic voltmeter reads $2.8 \pm 0.1V$.
4. Check the play operation after adjustment.

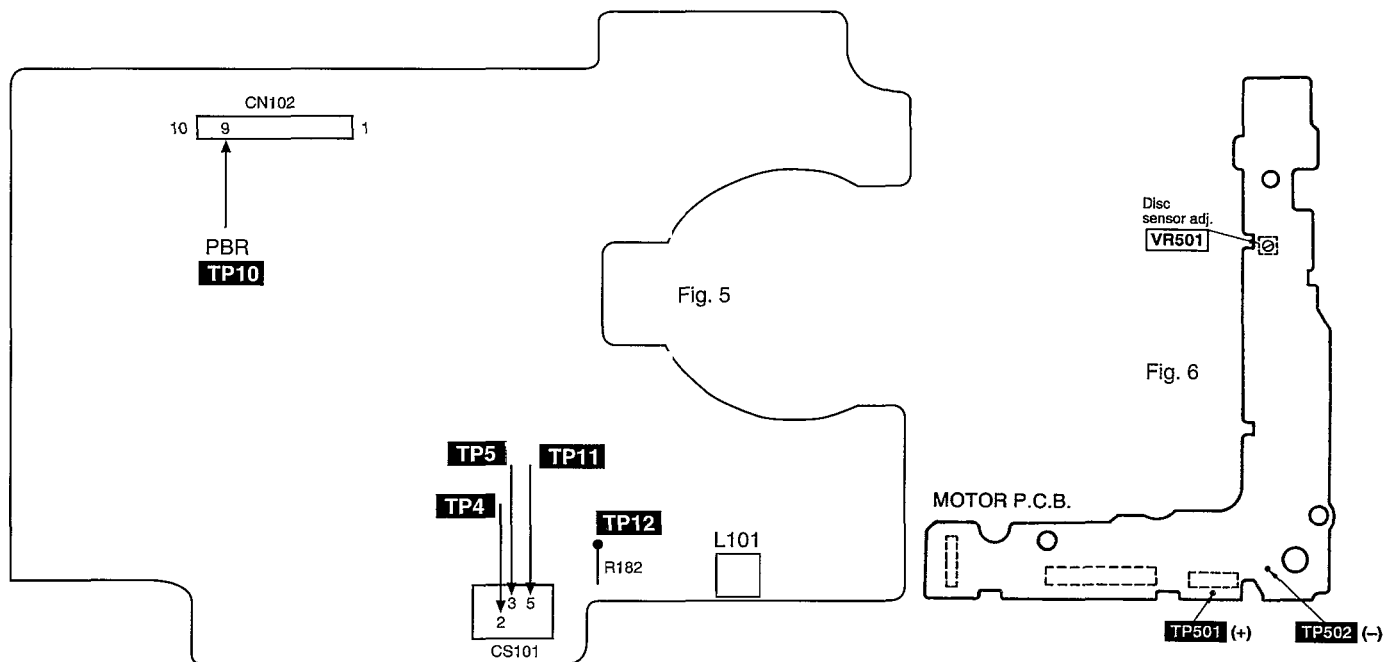
Motor P.C.B.



• Alignment points

<Cassette deck section>

<CD Loading Mechanism Section>

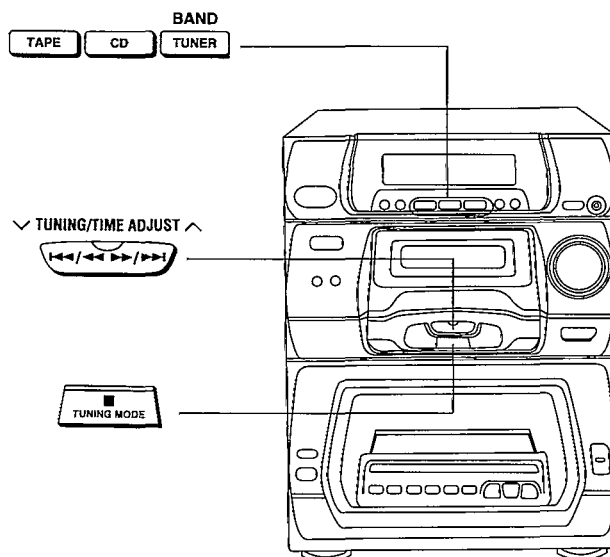
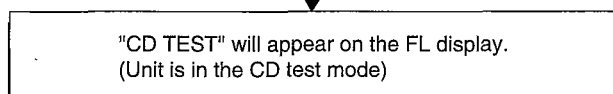
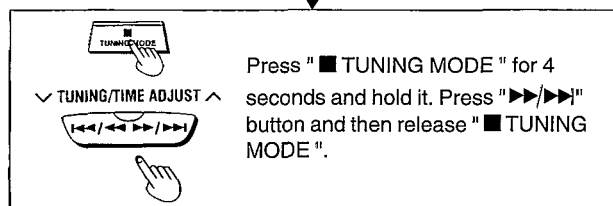
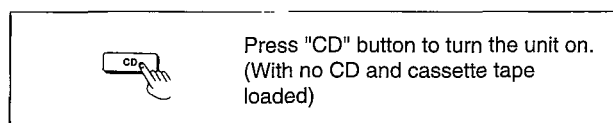


■ CD Test Mode

This unit contains some functions which check operations by internal micro-processor program. Use these functions when performing repair or maintenance on the unit. These function include :

1. CD automatically-adjusted result display.
2. Servo module test mode. (CD can be play without changer mechanism)
3. Changer mechanism test mode. (Changer can be operated without servo module)
4. Changer continuous play test.

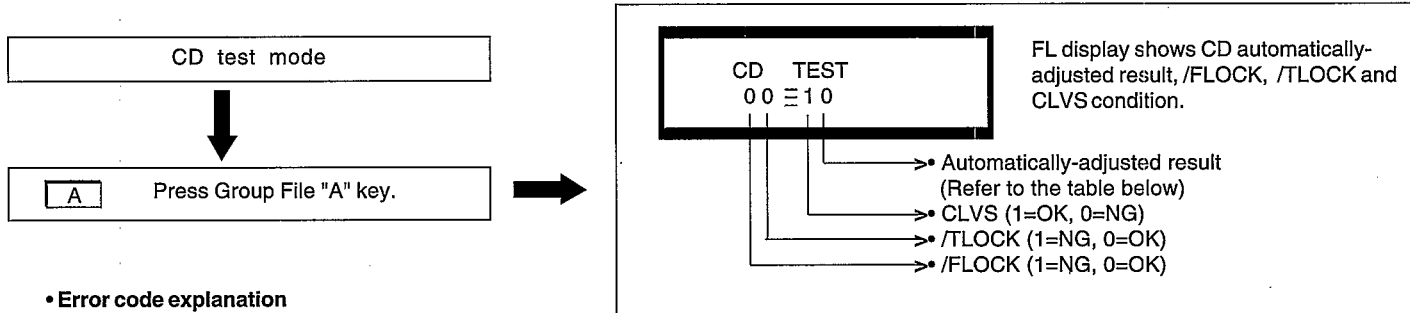
■ HOW TO ENTER CD TEST MODE



CD AUTOMATICALLY-ADJUSTED RESULT DISPLAY MODE

* This function provides indication of error codes as the result of automatically-adjustment of CD (tracking, focus, offset, etc.). Based on these error codes, the faulty areas can be located.

• How to set the CD automatically-adjusted result display mode



• Error code explanation

Error Code	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Focus Offset	0	X	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tracking Offset	0	X	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Focus Gain (Rough)	0	X	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tracking Gain (Rough)	0	-	0	X	0	X	0	X	0	X	0	X	0	X	0	X
Tracking Balance	0	-	X	X	0	0	X	X	0	0	X	X	0	0	X	X
Focus Gain (Fine)	0	-	0	0	X	X	X	X	0	0	0	0	X	X	X	X
Tracking Gain (Fine)	0	-	0	0	0	0	0	0	X	X	X	X	X	X	X	X

0 = OK (Satisfactory)
X = NG (Faulty)

* Before testing, make sure that the test disc is free from scratches, dirt and the optical pick up len is clean.

• How to go out from CD automatically-adjusted result display mode

Press the "POWER" button.

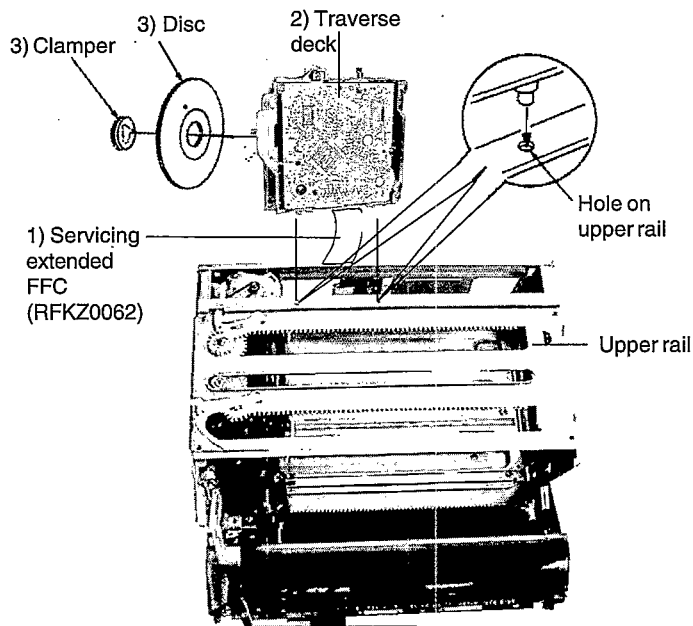
SERVO MODULE TEST MODE

* This function provides operation test for CD traverse unit (by itself). You can use this test for traverse unit operation checking and troubleshooting.

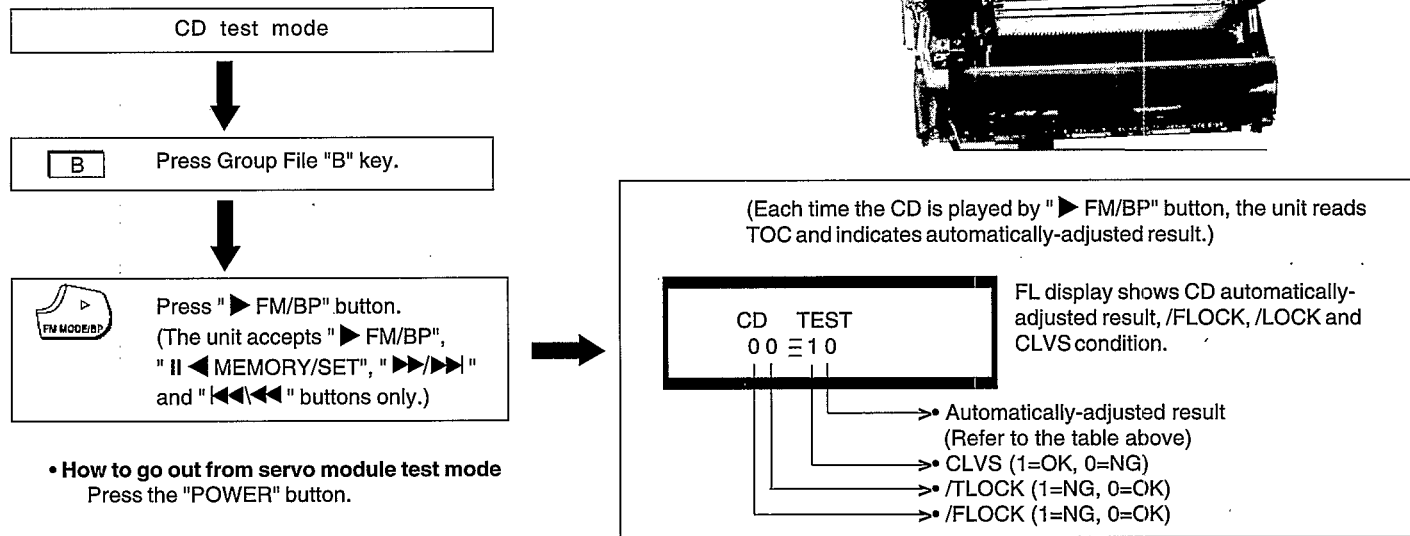
• Prepare for set up.

* Remove the traverse deck and set up as shown on the left.

- 1) Connect the servicing extension FFC between the traverse deck and the loading unit.
- 2) Position the traverse deck on top of the holes of the upper rail.
- 3) Attach the disc to the clamper with magnet.



• How to enter the servo module test mode



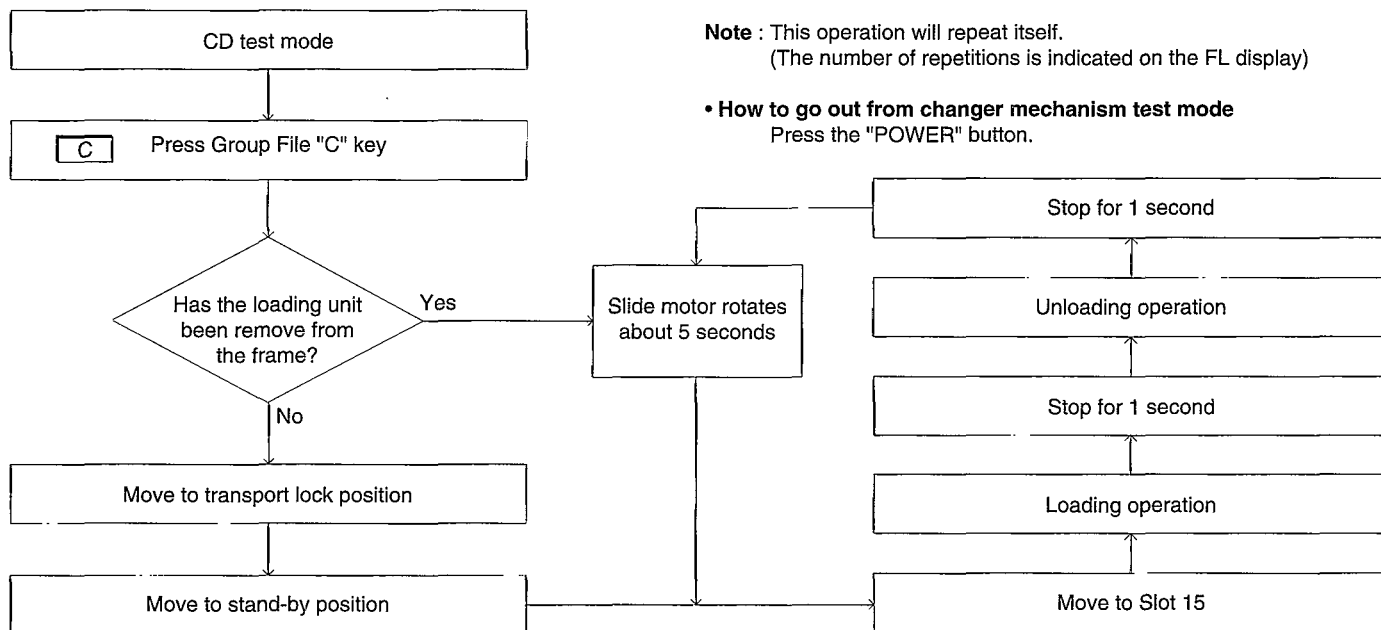
• How to go out from servo module test mode

Press the "POWER" button.

■ CHANGER MECHANISM TEST MODE

*This function provides operation test for changer mechanism individually. You can use this test mode for changer mechanism troubleshooting without CD traverse unit. (It can also be checked with traverse unit)

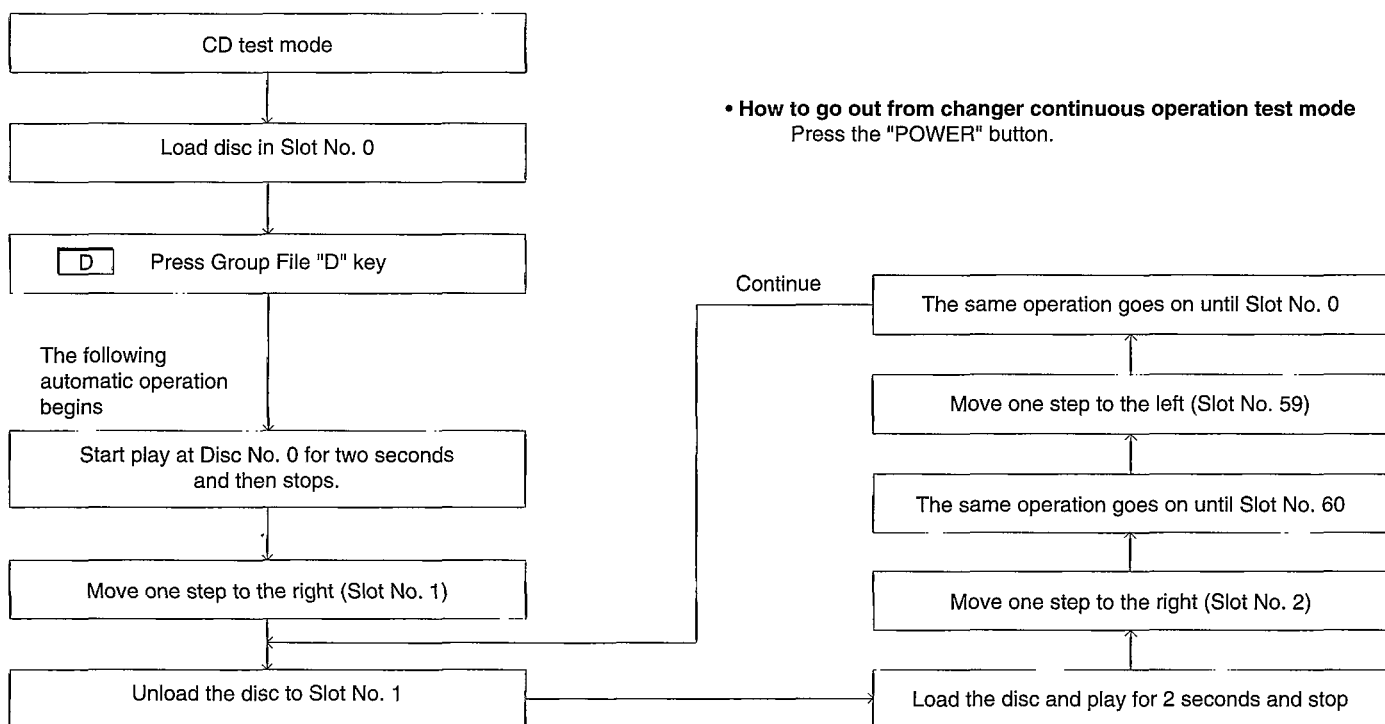
• How to enter the changer mechanism test mode. (Load disc at Disc No.15)



■ CHANGER CONTINUOUS OPERATION TEST MODE

*This function provides the continuous play operation for checking changer mechanism. You can use this function to find out the intermittent problem or operation check after repair.

• How to enter the changer continuous operation mode



Self-Diagnostic Display Function

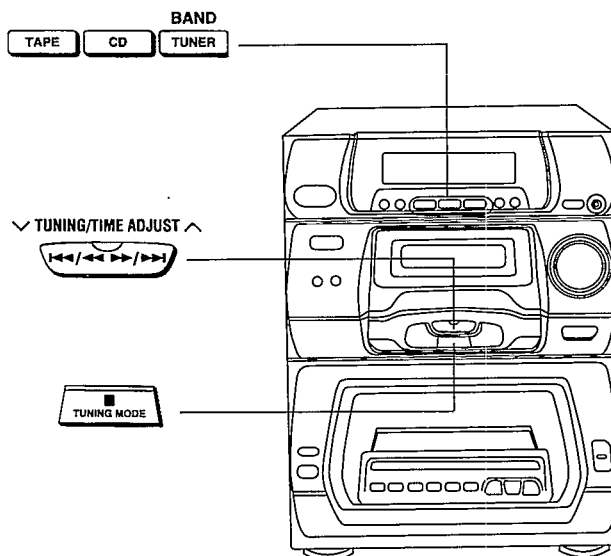
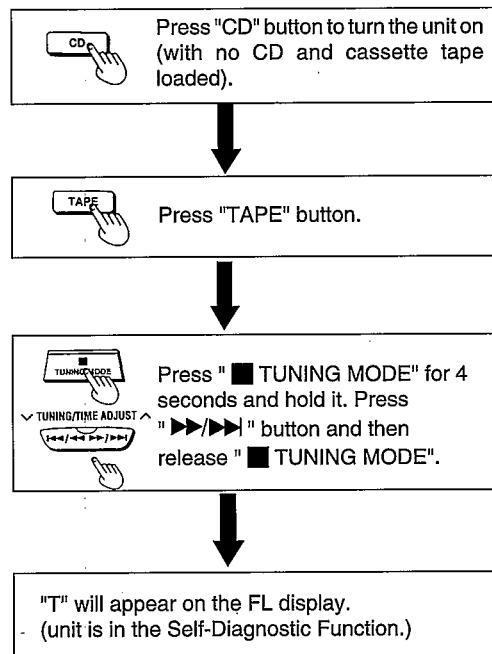
Self-diagnostic display

This unit is equipped with a self-diagnosis display function which, if a problem occurs at cassette mechanism and CD mega changer, will display an error code corresponding to the problem. Use this function when performing maintenance on the unit.

Preparation

- * Normal blank tape with recording prevention tab on one side.
- * Normal pre-recorded tape with data on both sides and recording prevention tabs intact.
- * Normal pre-recorded tape with recording prevention tabs on both sides.

How to enter the Self-Diagnostic Function mode.



Cassette Mechanism Test

1. Load the normal blank tape. (Recording prevention tab at the right hand side)
2. Press the "▶▶▶▶" button. (Tape will fast forward for about 2 seconds and stop automatically)
3. Load the normal blank tape. (Recording prevention tab at the left hand side)
4. Press the "◀◀◀◀" button. (Tape will fast forward for about 2 seconds and stop automatically)
5. Load the normal pre-recorded tape. (Recording prevention tab on both sides.)
6. Press "▶ FM/BP" button. (TPS function starts and will stop automatically.)
7. Load the normal blank tape. (Recording prevention tab on both sides)
8. Press "REC START/STOP" button.

CD / CD Mega Changer Test

1. Press "∧ DISC SKIP / GROUP NAME" button.
 - * CD Mega Changer will operate the following functions automatically for test an error detection:
 - a) Mechanism moves to the transportation position.
 - b) Mechanism moves to the initial position. (Stop for 1 second)
 - c) Mechanism moves to Disc Number 15.
 - d) Disc loading operation. (Stop for 1 second)
 - e) Disc unloading operation.
 - f) Mechanism moves back to the initial position.

To Display Self-Diagnostic Result

1. Press "■ TUNING MODE" button.
 - * If several problems exist, error code will change each time you press "■ TUNING MODE" button is pressed. (e.g. H02 → H03 → F02 etc.)
 - * Press "TAPE" button to display error code for the desired cassette deck.
 - * If there is no problem, FL will still display "T".

■ To Clear The Error Codes

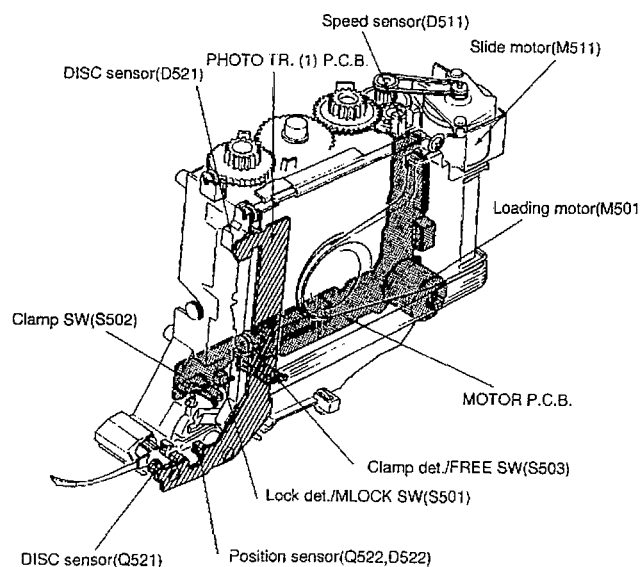
1. Press the "■ TUNING MODE" button for at least 5 seconds.
2. FL indicator shows "CLEAR" for 1 second and change to "T".

■ How To Get Out From Self-Diagnostic Function

- * Press "POWER" button to switch off the unit.

■ Interpretation of error codes

Error code	Problem condition	Correction procedure
H01	Faulty operation of cassette mechanism. Example: Reverse-play operation performs when "▶▶▶▶" button is pressed.	Faulty cassette mechanism mode switch [S971] and plunger. (Check and replace)
H02	Recording not possible, or recording mode entered even though erasure prevention tabs have been removed.	Faulty contact or short-circuit of erasure prevention switches [S974, S975]. (Check and replace)
H03	Playback not performed when "▶ FM/BP" button is pressed. Motor turns when "▶ FM/BP" button is pressed even though there is no tape cassette loaded in cassette holder.	Faulty contact or short-circuit of cassette half detect switch. [S972] (Check and replace)
F01	When the "▶ FM/BP" button is pressed, the tape advances slightly and then stops.	Faulty reel pulse, faulty hole detect IC. [IC971] (Check and replace)
F02	Cassette deck will not perform TPS function.	Faulty playback EQ/recording amplifier IC. [IC101] (Check and replace)
F15	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).
F26 (Automatic display)	Symptom is that the unit does not operate when the "▶ FM/BP" 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.	<ul style="list-style-type: none"> • Check system control (IC401) and servo IC (IC702). • Check each IC and servo circuit. • Check Lock det./MLOCK SW (S501).
F27	Sensor abnormal. Load on slide drive system is too great. Loading unit does not move to the right or left. Slide motor malfunction.	<ul style="list-style-type: none"> • 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.)
F28	Clamp det./FREE SW does not go OFF, and Clamp det. SW (S502) does not go ON within 5 seconds during loading.	<ul style="list-style-type: none"> • Check Clamp det./FREE SW (S503) and Clamp SW (S502). • Check loading motor (M501).
F29	Clamp det./FREE SW (S503) and clamp SW does not go ON within 5 seconds during unloading.	<ul style="list-style-type: none"> • Check loading drive system. (Riding-up, shifting or foreign matter jamming of levers, missing gear teeth etc.)
F61	When power is switched on it automatically switches immediately back off, and cannot be switched on. (DCDET become L during normal operation.)	<ul style="list-style-type: none"> • Faulty power detector (Q512). (Check and replace) • Power supply circuit



Ref. No.	Part name (Part No.)	Ref. No.	Part name (Part No.)
IC401	System control IC (UPD78043A042)	Q522	Position sensor (PT480F)
IC702	Servo processor IC (MN662741RPA)	D511	Speed sensor (RSQGP1S53V)
S501	Lock det./MLOCK SW (RSP1A017-A)	D521	Disc sensor (LN66S)
S502	Clamp det. SW (RSH1A005)	D522	Position sensor (GL480V)
S503	Clamp det./FREE SW (RSH1A005)	M501	Loading motor (RFKPLMC50PAK)
S701	Rest detection SW (RSM0006-P)	M511	Slide motor (RFKPLMC50PBK)
Q521	Disc sensor (PT4810F)		