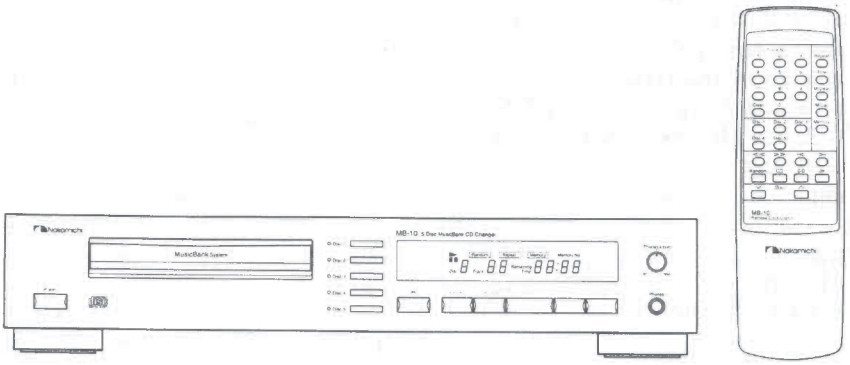
Service Manual

MB-10

5 Disc MusicBank CD Changer



Nakamichi

CONTENTS

General

1.1. Product Code
V662

1.2. Destinations
UL

Abbreviations
CSA --- Canada

1.3. Cautions/Warnings
(1) Product Safety Notice
Parts marked with the symbol ⚠ in the schematic diagram have critical characteristics.
Use ONLY replacement parts recommended by the manufacturer. It is recommended that the unit be operated from a suitable DC supply or batteries during initial check-out procedures.

(2) Leakage Current Check/Resistance Check
Before returning the unit to the customer, make sure you make either (1) a leakage current check or (2) a line to chassis resistance check. If the leakage current exceeds 0.5 milliamp, or if the resistance from chassis to either side of the power cord is less than 240 k ohms, the unit is defective.

WARNING — DO NOT return the unit to the customer until the problem is located and corrected.

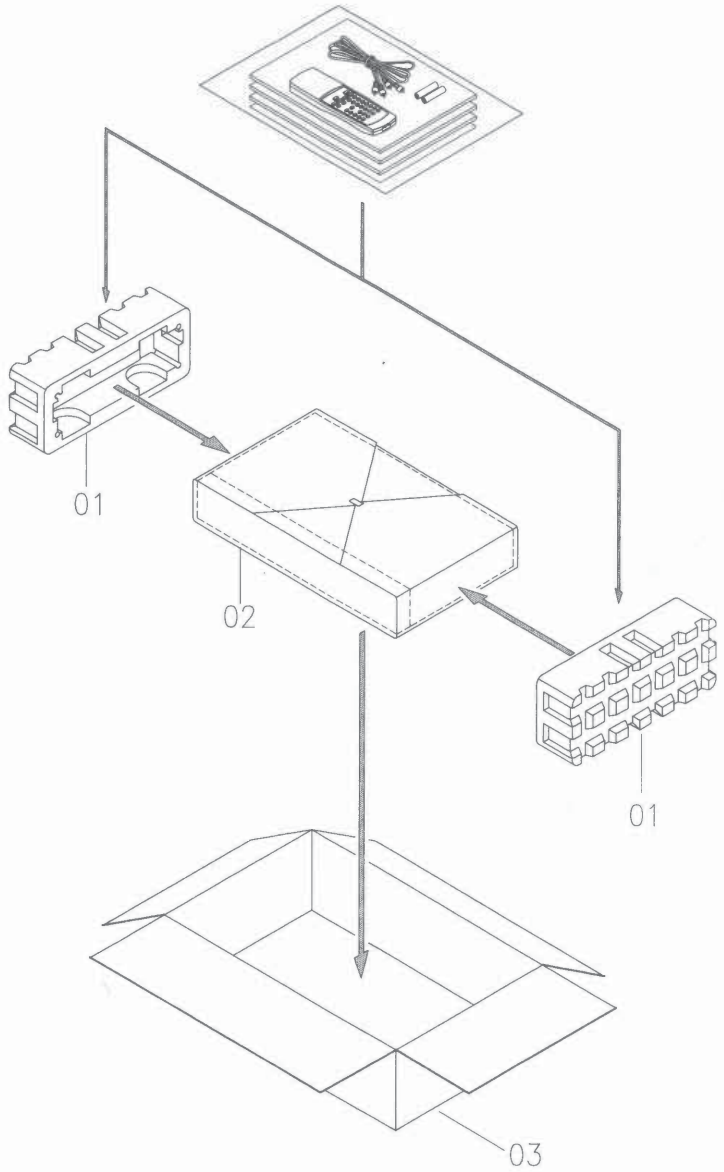
(3) Protection of Eyes from Laser Beam
To protect eyes from invisible laser beam during servicing, *DO NOT LOOK AT THE LASER BEAM.*

- Laser Diode Properties
  Material: GaAs+GaAlAs
  Laser output: 0.4mW Max.
  Wavelength: 760 - 800 nm
  Emission duration: Continuous

(4) Laser Caution
CAUTION
Adjusting the knobs, switches, and controls, etc. or taking actions not specified herein may result in a harmful emission of laser beams. This CD Changer must be adjusted and repaired only by qualified service personnel.

OBSERVERA!
Sådana inställningar av rattarna, omkopplarna eller övriga kontrollknappar som inte är beskriva i bruksanvisningen kan resultera i farlig laserutstrålning. Justering eller reparation av denna kompaktskivspelare skall endast utföras av kvalificerad servicepersonal.

1. PACKAGE ASS'Y AND ACCESSORY ASS'Y



Ref. No.	Part Number	Description	Q'ty
		Package Ass'y	
01	9001070055	Poly foam	2
02	900407E440	Soft sheet 830x540	1
03	9002070055	Carton	1

Ref. No.	Part Number	Description	Q'ty
		Accessory Ass'y	
	RE34-D1	Remote trans. ass'y	1
	9080024270	Instruction book (E)	1
	9080024440	Instruction book (F)	1
	9080024530	Instruction book (SP)	1
	4620620031	Battery R03(E)/2UM-4E	2
	5620100051	Patch cord BLK-1M	1
	9120005710	Warranty card (USA)	1
	9902304080	Poly bag 23x40 (I/B)	1

2. REMOVAL PROCEDURES

2.1. Top Cover & Front Panel Ass'y

Refer to Fig. 2.1.1 and Fig. 2.1.2

(1) Remove screws F01 (7 pcs.), then F02 (Top Cover) can be removed.
(2) Loose screws F03 (2 pcs.) to remove F04 (Foot).
(3) Loose screws F05 (3 pcs.) and disconnect wire from Decoder PCB ass'y.
(4) Loose screws F07 (2 pcs.) and F08 (3 pcs.) to remove PCB ass'y (3 pcs.).
(5) Now F06 (Front Panel Ass'y) can be removed.

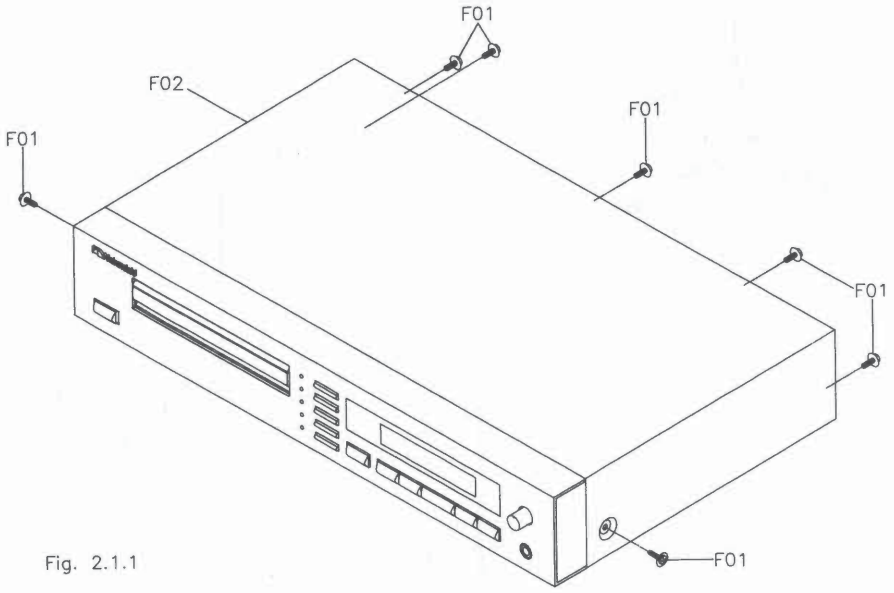


Fig. 2.1.1

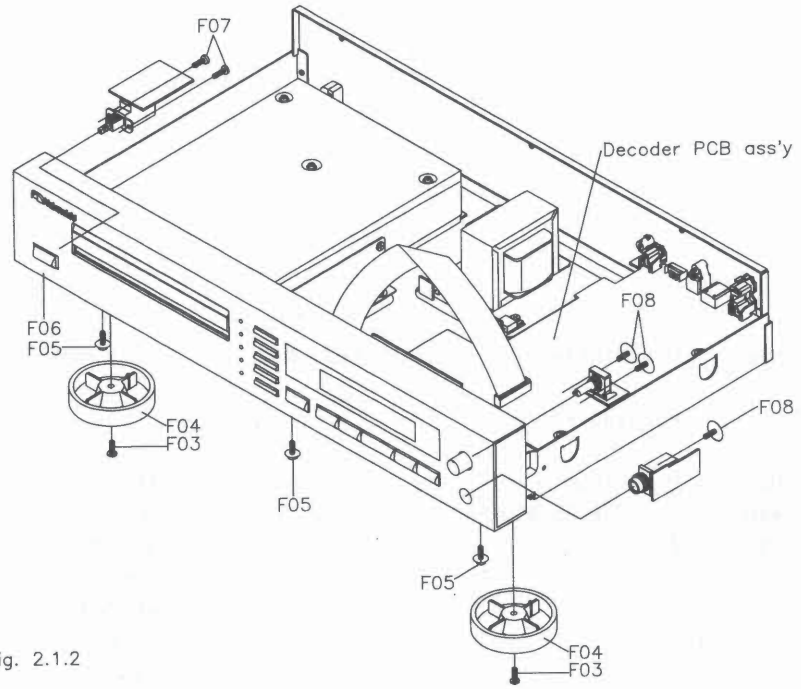


Fig. 2.1.2

2.2. CD Mechanism Ass'y & Decoder PCB Ass'y

Refer to Fig. 2.2.1 and Fig. 2.2.2

(1) Loose screws F01 (4 pcs.) and disconnect wire, then F02 (CD Mechanism Ass'y) can be removed.
(2) Loose screws F03 (2 pcs.), F04 (3 pcs.) and F05 (2 pcs.).
(3) Decoder PCB ass'y can be removed.

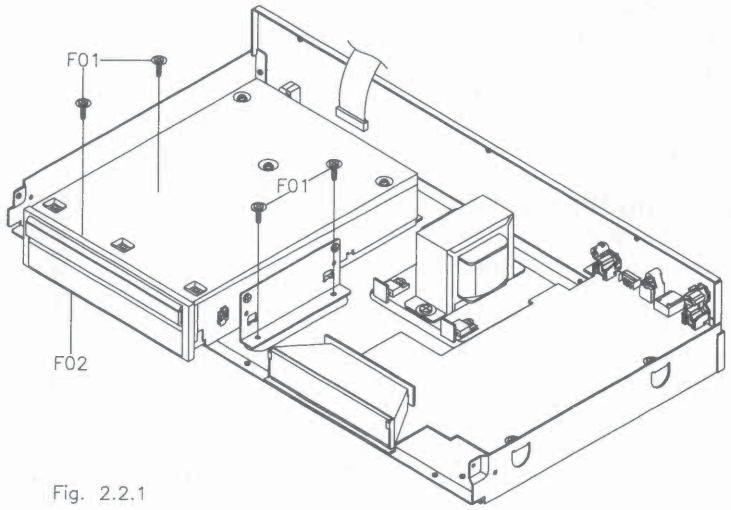


Fig. 2.2.1

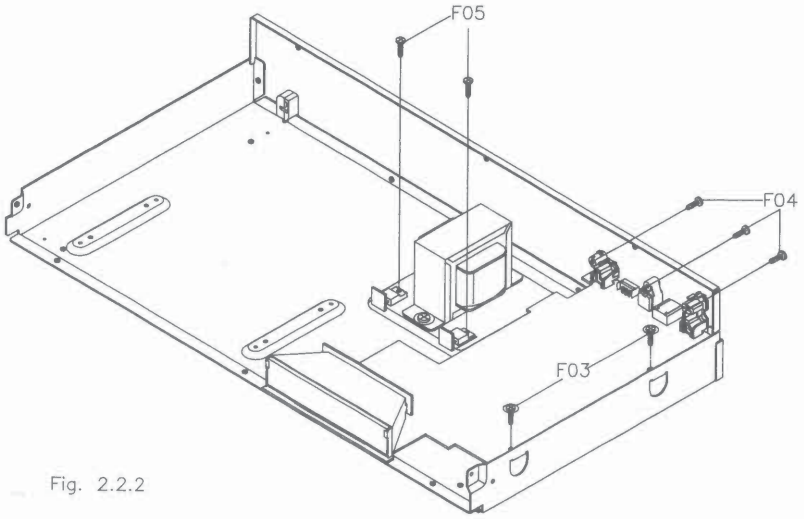


Fig. 2.2.2

2.3. Top Cover SL S Ass'y, Bottom Cover MF Ass'y, and Front Panel Ass'y

Refer to Figs. 2.3.1 to 2.3.3.

(1) Remove the Mechanism Synthesis Ass'y. See item 2.2.
(2) Remove screws F01 (2 pcs.) and detach F02 (Top Cover SL S Ass'y). Refer to Fig. 2.3.1.
(3) Remove screws F03 (6 pcs.) and detach F04 (Bottom Cover MF Ass'y). Refer to Fig. 2.3.1.
(4) Remove F05 (Front Panel Ass'y) from the unit.

NOTES: 1. Before reassembling F05 (Front Panel Ass'y), be sure that the end of the Mecha UD Sub Cam SL on the right front does not protrude as shown in Fig. 2.3.2. If it protrudes, move it backward as follows:
   1) Carefully remove the left side adhesive label (Dust Seal Emergency SL) on the left side of the unit. Refer to Fig. 2.3.3.
   2) Turn the Emergency Gear with your finger tip in the direction of the arrow until the end of the Mecha UD Sub Cam SL is drawn inside the unit. (See Fig. 2.3.3.)
   When turning the Gear, **DO NOT use nail** as the gear tooth can be broken.
   3) Reattach the adhesive label (Dust Seal Emergency SL).
2. Be sure that the claws of F05 (Front Panel Ass'y) are securely inserted into each holes in F02 (Top Cover SL S Ass'y) and F04 (Bottom Cover MF Ass'y).

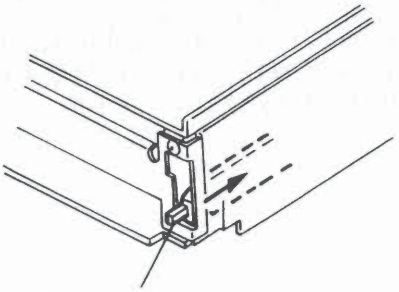


Fig. 2.3.2

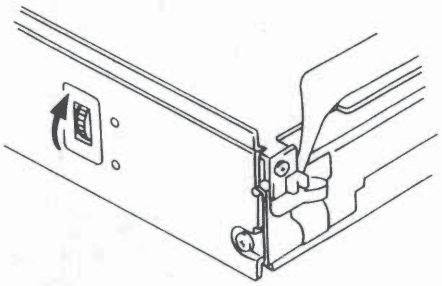


Fig. 2.3.3

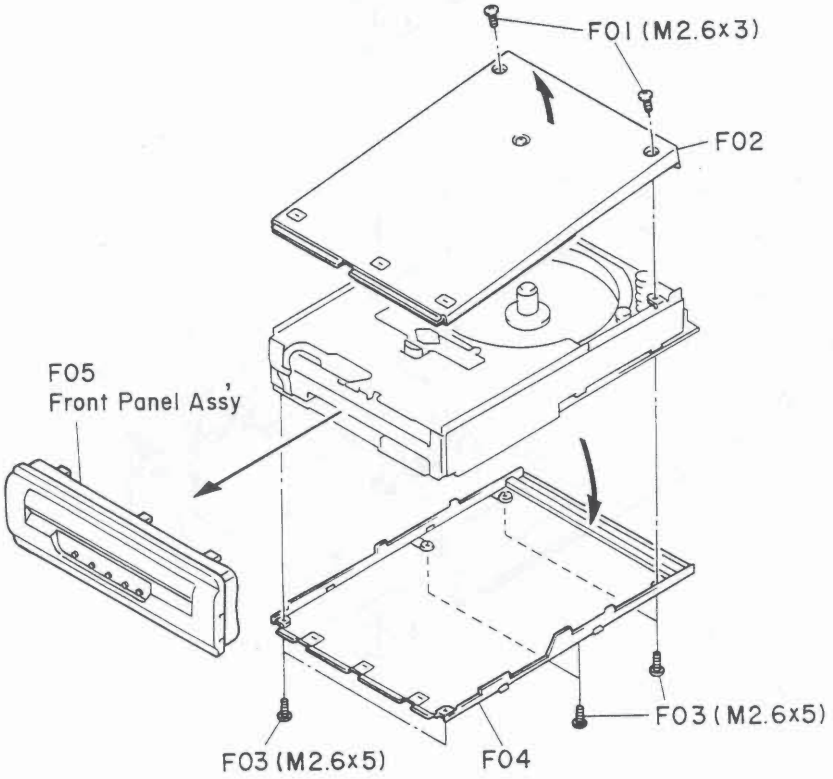


Fig. 2.3.1

(Main P.C.B. Ass'y indicated same as HMB-5 P.C.B. Ass'y)

2.4. Main P.C.B. Ass'y

2.4.1. Removing the Main P.C.B. Ass'y

Refer to Figs. 2.4.1 and 2.4.2.

NOTE: Three flexible P.C.B.s are connected to the Main P.C.B. Ass'y. When disconnecting these flexible P.C.B.s, do not open the Main P.C.B. Ass'y wide to avoid damage to the flexible P.C.B.

(1) Remove the Top Cover SL S Ass'y, Bottom Cover SL S Ass'y, and Front Panel Ass'y. Refer to item 2.3.
(2) Short the laser diode shorting lands on the Pickup Flexible P.C.B. with a soldering iron whose metal part is grounded or with a ceramic soldering iron. Refer to Fig. 2.4.1.
(3) Remove screws F01 (1 pce.) and F02 (1 pce). Refer to Fig. 2.4.2.
(4) Disconnect F03 (Mecha Flexible P.C.B. Ass'y) by pulling the edges of the connector CP103 on the Main P.C.B. Ass'y to unlock the connector edges. Refer to Fig. 2.4.2.
(5) Pull the edges of the connector CP102 on the Main P.C.B. Ass'y to unlock the connector edges and carefully pull out F04 (Traverse Flexible P.C.B. Ass'y).
(6) Pull the edges of the connector CP101 on the Main P.C.B. Ass'y to unlock the connector edges and carefully pull out F05 (Pickup Flexible P.C.B.).
(7) Remove F06 (Main P.C.B. Ass'y).

2.4.2. Installing the Main P.C.B. Ass'y

NOTE: To allow easier installation of the Main P.C.B. Ass'y, move the Laser Pickup Block to the outermost position, before removing the Main P.C.B. Ass'y.

(1) Reconnect the flexible P.C.B.s to the Main P.C.B. Ass'y in the following order to make the connection easier.
  1) F05 (Pickup Flexible P.C.B.)
  2) F03 (Mecha Flexible P.C.B. Ass'y)
  3) F04 (Traverse Flexible P.C.B. Ass'y)
(2) Install the Main P.C.B. Ass'y with one screws F01 and F02.
(3) Unsolder the shorting lands on the Pickup Flexible P.C.B.

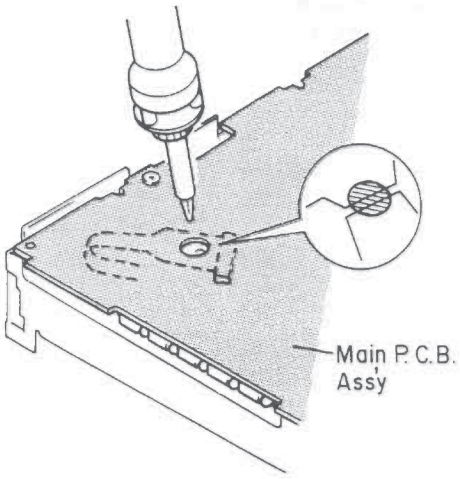


Fig. 2.4.1 Bottom View

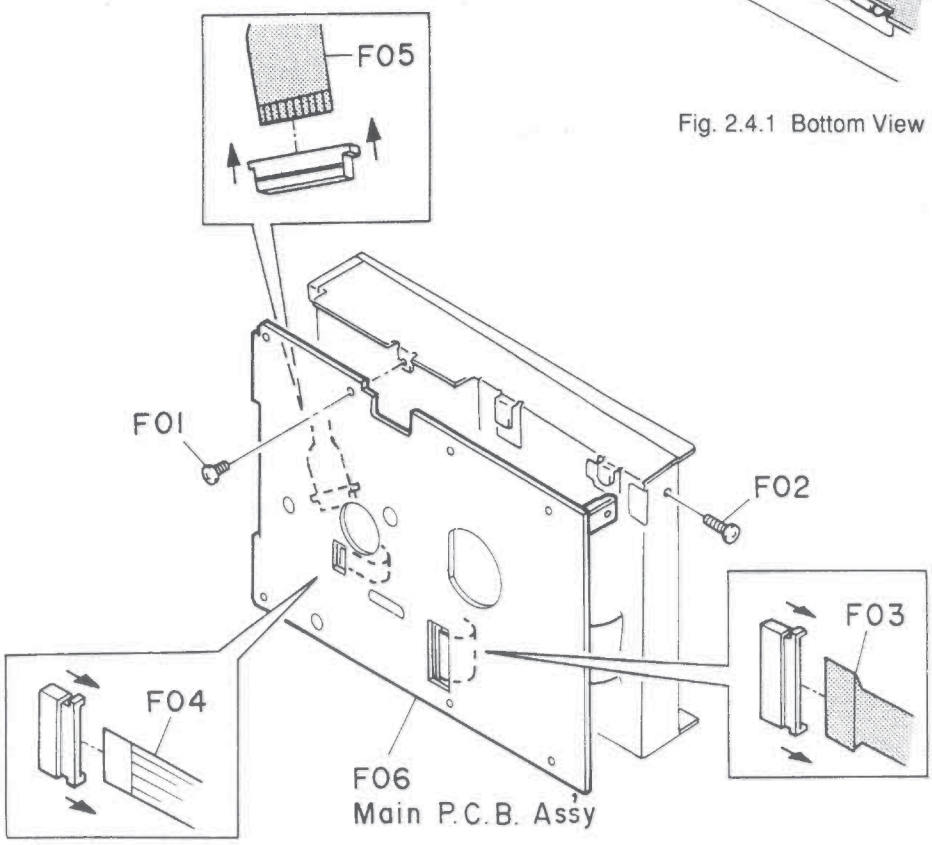


Fig. 2.4.2 Bottom View

(Main P.C.B. Ass'y indicated same as HMB-5 P.C.B. Ass'y)

2.5. Loading MF Ass'y

Refer to Fig. 2.5.

(1) Remove the Main P.C.B. Ass'y. Refer to item 2.4.
TIPS: The Loading MF Ass'y can be removed without taking off the Main P.C.B. Ass'y since you can access to the screw F04 from the bottom of the unit.

(2) Remove screws F01 (3 pcs.) and unsolder two wires to detach F02 (LED P.C.B. Ass'y).

(3) Remove screws F03 (4 pcs.) and F04 (1 pce.).

(4) While pushing F05 inward, remove F06 (Loading MF Ass'y) by lifting it upward.

(5) Remove one cut washer (F07) and detach F08 (Loading Link SL Ass'y) from F06 (Loading MF Ass'y).

Notes When Reassembling the Loading MF Ass'y:

1. Before reassembling F06 (Loading MF Ass'y) together with F08 (Loading Link SL Ass'y), move F08 (Loading Link SL Ass'y) so that its shaft is inserted into the shaft hole as shown in the figure.
2. During reassembling F06 (Loading MF Ass'y), push F05 inward as it will be caught by the chassis.
3. When reassembling F06 (Loading MF Ass'y), insert its "A" on both sides into the plates of the chassis.
4. When installing F02 (LED P.C.B. Ass'y) to the Mecha Flexible P.C.B. Ass'y, correctly solder the two wires.
5. When reassembling the Mecha Flexible P.C.B. Ass'y with screws F01, tighten the screws with a torque of 2.0 kg-cm. Tighten the screws F01 in the order of ① and ②.

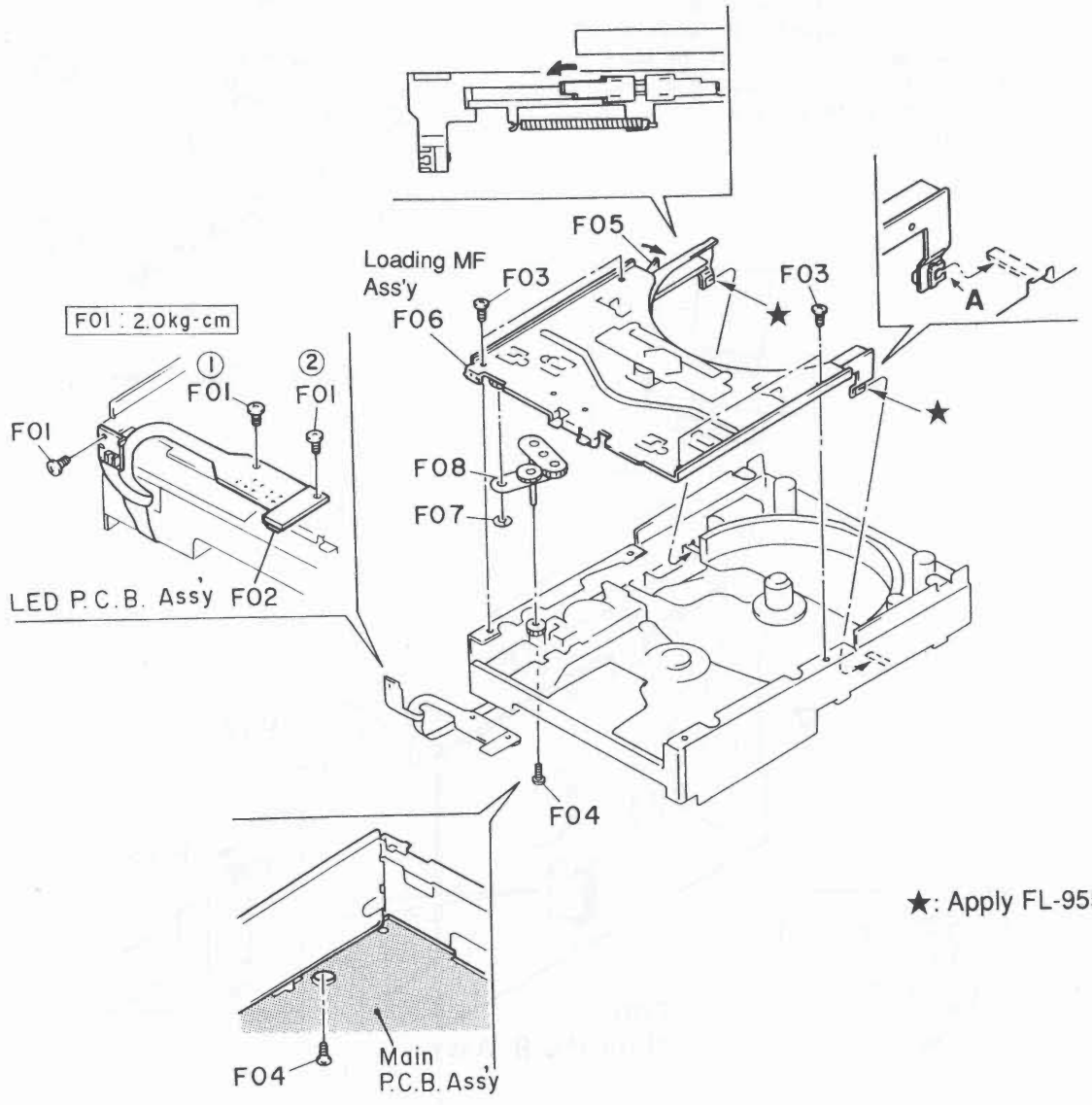


Fig. 2.5

2.6. Traverse Mecha Ass'y

Refer to Fig. 2.6.

(1) Remove the Loading MF Ass'y. Refer to item 2.5.
(2) Remove screws F01 (3 pcs.) and detach F02 (Front Chassis Ass'y).
(3) Remove screws F03 (4 pcs.) and detach F04 (Traverse Mecha Ass'y).

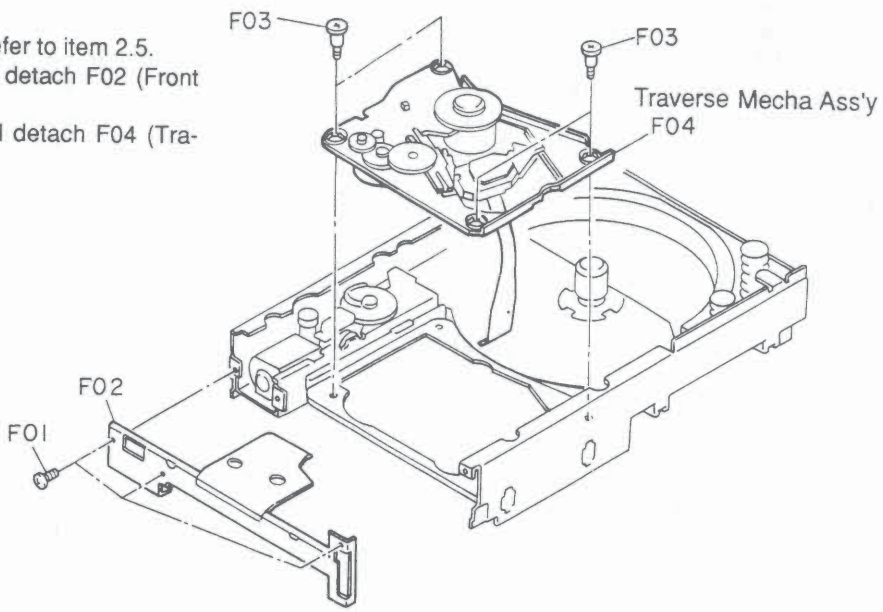


Fig. 2.6

2.7. Sled Motor

2.7.1. Removing the Sled Motor

Refer to Fig. 2.7.1.

(1) Remove the Traverse Mecha Ass'y. Refer to item 2.6.
(2) Remove a cut washer F01 and pull out F02 (Second Gear).
(3) Remove screws F03 (2 pcs.) and detach the Sled Motor Ass'y.
(4) Remove F05 (First Gear) from F04 (Sled Motor).
(5) Unsolder the wires of F04 (Sled Motor) from the Traverse P.C.B. Ass'y.

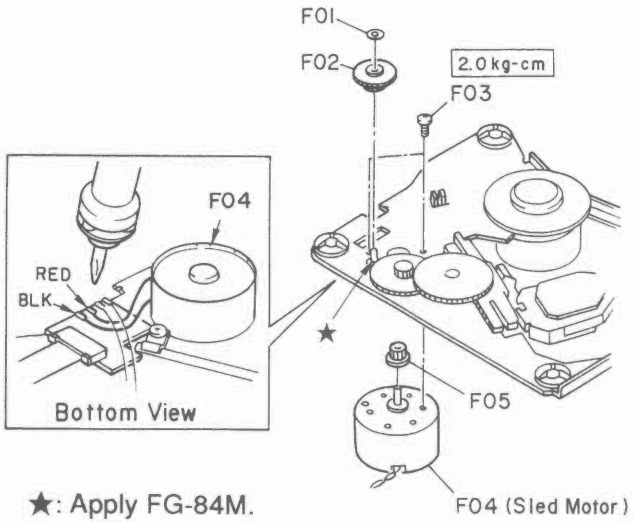


Fig. 2.7.1

2.7.2. Installing a new Sled Motor

(1) Reassemble F04 (Sled Motor) with screws F03 (2 pcs.) with a torque of 2.0 kg-cm.
NOTE: Pay attention to the sled motor installing direction. Install it as shown in Fig. 2.7.1.
(2) Press fit a new F05 (First Gear) so that the gap between the chassis surface and the bottom of F05 (First Gear) is 0.1 mm as shown in Fig. 2.7.2.
(3) Solder the wires of F04 (Sled Motor) to the Traverse P.C.B. Ass'y.
(4) Reassemble other removed parts by reversing the removal procedure.

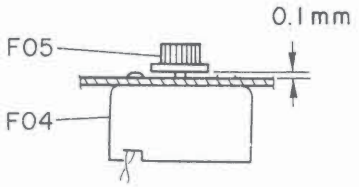


Fig. 2.7.2

2.8. Laser Pickup

2.8.1. Removing the Laser Pickup

Refer to Fig. 2.8.1.

(1) Remove the Traverse Mecha Ass'y. Refer to item 2.6.
(2) Remove screws F01 (2 pcs.) and F02 (2 pcs.), and F03 (4 pcs.), and disassemble F04 (Laser Pickup Block).
(3) Pull out the PU Guide Shaft SL from the Laser Pickup Block.

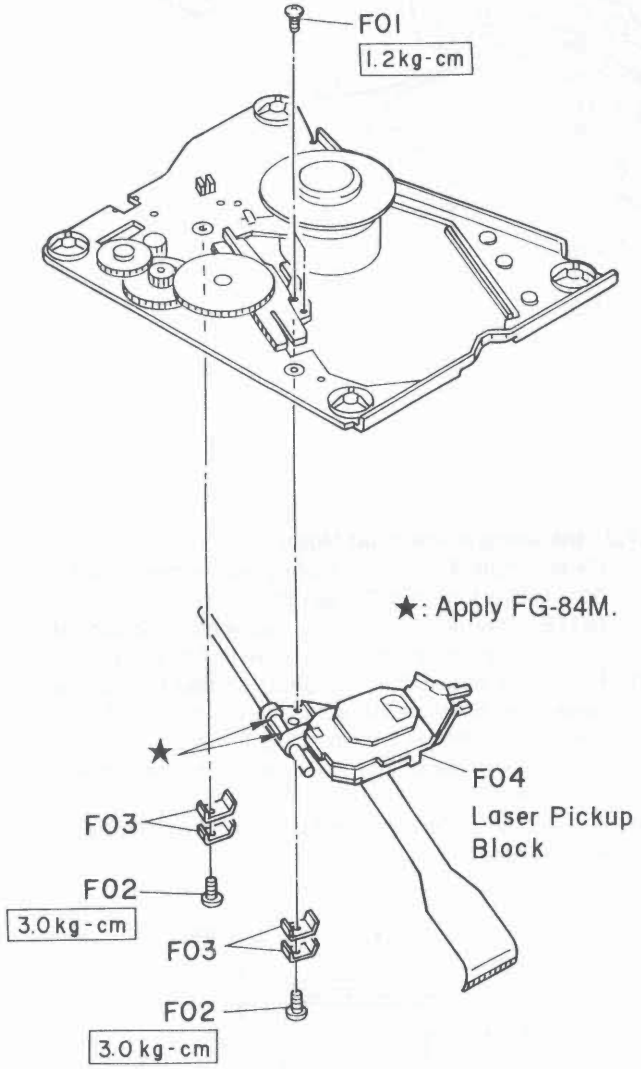


Fig. 2.8.1

(4) Before disconnecting the Pickup Flexible P.C.B. from the Laser Pickup, short the laser diode shorting lands on the bottom of the Laser Pickup. Refer to Fig. 2.8.2.
NOTE: Use the soldering iron whose metal part is grounded or a ceramic soldering iron.
(5) Disconnect the Pickup Flexible P.C.B. from the Laser Pickup.

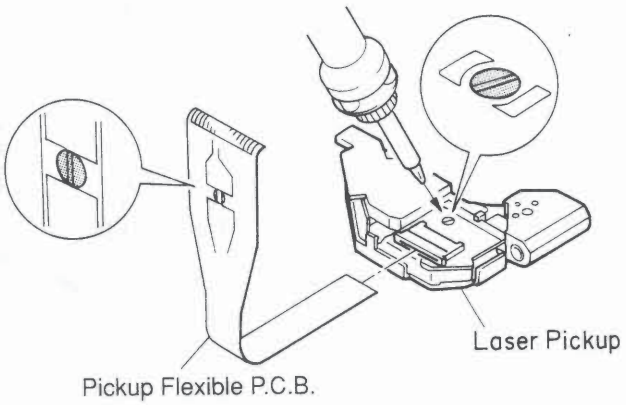


Fig. 2.8.2

2.8.2. Installing a New Laser Pickup

(1) Connect the Pickup Flexible P.C.B. to the Laser Pickup. Refer to Fig. 2.8.2.
(2) Open the laser diode shorting lands on the bottom of the Laser Pickup. Refer to Fig. 2.8.2.
NOTE: Use the soldering iron whose metal part is grounded or a ceramic soldering iron.
(3) Insert the PU Guide Shaft SL into the Laser Pickup.
(4) Assemble F04 (Laser Pickup Block) with F03 (4 pcs.) by tightening screws F02 (2 pcs.) with a torque of 3.0 kg-cm.
(5) Assemble F04 (Laser Pickup Block) with screws F01 (2 pcs.) with a torque of 1.2 kg-cm. Refer to Fig. 2.8.1.

2.9. PU Guide Plate H SL

2.9.1. Removing the PU Guide Plate H SL

Refer to Fig. 2.9.

(1) Remove the Laser Pickup Block. Refer to item 2.8.
(2) Remove screws F01 (3 pcs.) and disassemble F02 (PU Guide Plate H SL).

2.9.2. Installing the PU Guide Plate H SL

Refer to Fig. 2.9.

(1) Assemble F02 (PU Guide Plate H SL) with screws F01 (3 pcs.) with a torque of 1.2 kg-cm.
NOTE: Tighten screws F01 in the order of ① to ③.

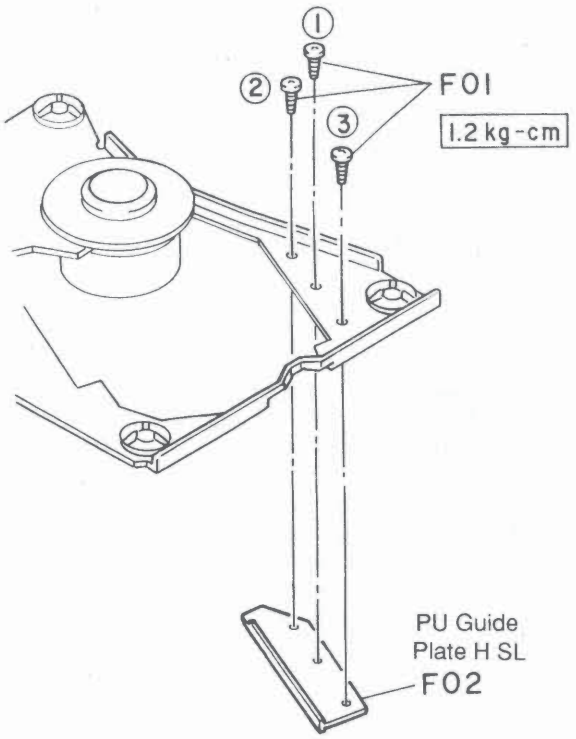


Fig. 2.9

2.10. Mecha Flexible P.C.B. Ass'y

Refer to Figs. 2.10.1 and 2.10.2.

(1) Remove the Main P.C.B. Ass'y. Refer to item 2.4.
(2) Unsolder the four motor lead wires (red , black, yellow, and gray) from F01 (Mecha Flexible P.C.B. Ass'y) and remove one screw F02. Refer to Fig. 2.10.1.
(3) Unsolder F03 (Flexible ST Motor P.C.B.) from F01 (Mecha Flexible P.C.B. Ass'y) and remove screws F04 (2 pcs.). Refer to Fig. 2.10.2.
(4) Carefully remove F01 (Mecha Flexible P.C.B. Ass'y).

NOTE: When reassembling F01 (Mecha Flexible P.C.B. Ass'y), tighten the screws F04 and F02 with a torque of 2.0 kg-cm.
2. When reassembling, tighten the screw F01 with a torque of 2.0 kg-cm.

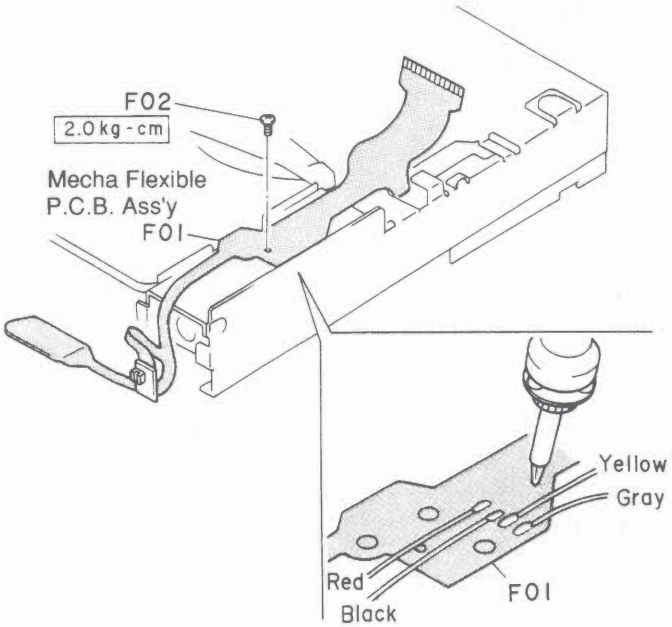


Fig. 2.10.1 Bottom View

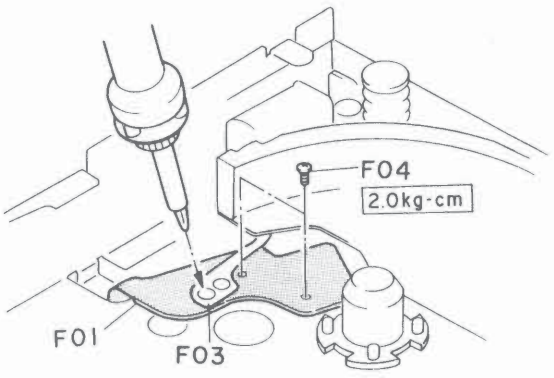


Fig. 2.10.2 Bottom View

2.11. UD Link Arm SL

Refer to Fig. 2.11.

(1) Remove the Main P.C.B. Ass'y. Refer to item 2.4.
(2) Remove one cut washer F01 and detach F02 (UD Link Arm SL).

★: Apply FL-955.

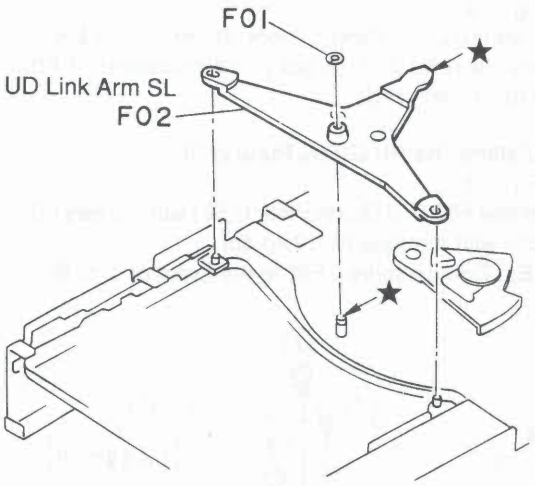


Fig. 2.11 Bottom View

2.12. Motor Chassis SL Ass'y

2.12.1. Removing the Motor Chassis SL Ass'y

Refer to Fig. 2.12.1.

(1) Remove the Mecha Flexible P.C.B. Ass'y. Refer to item 2.10.
(2) Remove the UD Link Arm SL. Refer to item 2.11.
(3) Unhook F01 (Anti Rattle Spring SL) from F03 (Motor Chassis SL Ass'y).
(4) Remove screws F02 (3 pcs.) and detach F03 (Motor Chassis SL Ass'y).
(5) Remove washers F04 (2 pcs.), F05 (SUS Base X Sub Ass'y), and washers F06 (2 pcs.).
(6) Remove F07 (Mecha UD Sub Cam SL) and F08 (UD S Cam Guide SL).

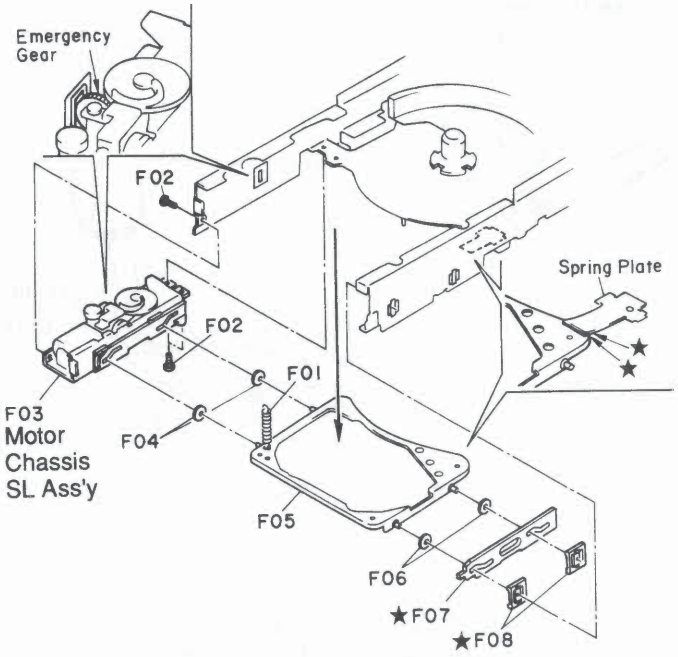


Fig. 2.12.1

2.12.2. Installing the Motor Chassis SL Ass'y

(1) Reassemble F08 (UD S Cam Guide SL) to F07 (Mecha UD Sub Cam SL) as shown in Fig. 2.12.2.
NOTE: Reassemble F08 (UD S Cam Guide SL) so that their wider sides come upper as shown in Fig. 2.12.2.

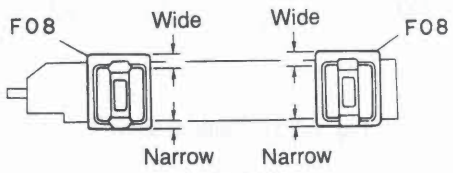


Fig. 2.12.2

(2) Reassemble F06 and F05.
NOTE: Be sure that the Spring Plate SL is put on F05 (SUS Base X Sub Ass'y) as shown in Fig. 2.12.1.
(3) Reassemble F04 and F03.
CAUTION: *When reassembling F03 (Motor Chassis SL Ass'y) with the screws F02,* ***DO NOT*** *let its* ***Emergency Gear Teeth touch*** *the edge of the Main Chassis as they can be broken.*
(4) Hook F01 (Anti Rattle Spring SL) on F03 (Motor Chassis SL Ass'y) as shown in Fig. 2.12.3.

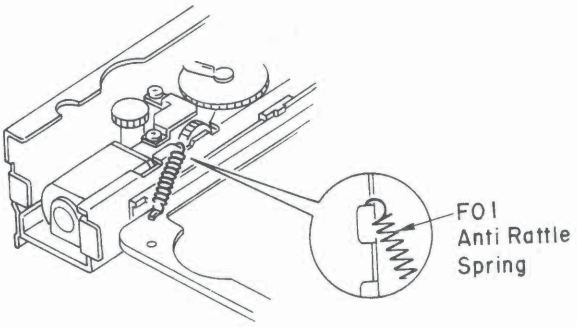


Fig. 2.12.3

2.13. Disc Lock Arm SL

2.13.1. Removing the Disc Lock Arm SL

Refer to Figs. 2.13.1 and 2.13.2.

(1) Remove the UD Link Arm SL. Refer to item 2.11.
(2) Remove the two screws and lift the edge of the Mecha Flexible P.C.B. Ass'y to remove the Photointerrupter from the chassis. Refer to Fig. 2.13.1.

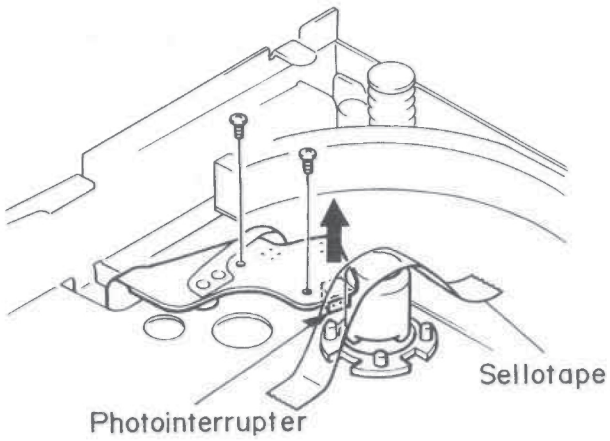


Fig. 2.13.1

(3) Apply Sellotape to the Disc Lock SL Ass'y as shown in Fig. 2.13.1 to prevent the Disc Lock from falling off while removing the Disc Lock Arm SL.
(4) Remove a cut washer F01 and detach F02 (Disc Lock Arm SL) and F03 (Disc Lock Spring SL). Refer to Fig. 2.13.2.

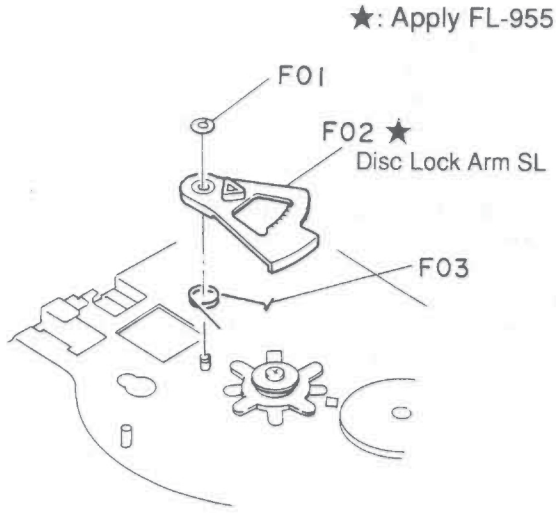


Fig. 2.13.2 Bottom View

2.13.2. Installing the Disc Lock Arm SL

NOTE: Positioning of the Disc Lock Arm SL is required.
Refer to Fig. 2.13.3.

(1) Place the Disc Lock Spring SL as shown in the figure.
(2) Insert the Disc Lock Pinion into the hole of the Disc Lock Arm SL.
(3) Adjust the position of the Disc Lock Arm SL until its mark meets the V-cut of the Disc Lock Pinion as shown in the figure.
(4) Insert the shaft hole of the Disc Lock Arm SL into the shaft.
(5) Hook the end of the Disc Lock Spring SL on the chassis hole as shown in the figure.
(6) Reassemble the cut washer F01 in place.
(7) Peel off the Sellotape and fasten the screws to seat the photointerrupter. Refer to Fig. 2.13.1.

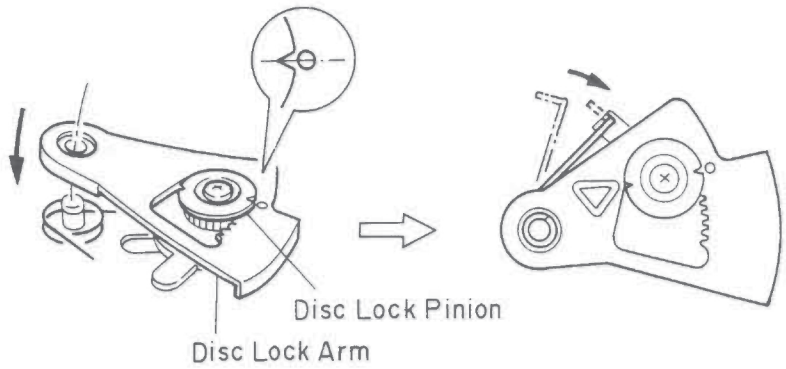


Fig. 2.13.3 Bottom View

2.14. Stocker Position Gear SL

2.14.1. Removing the Stocker Position Gear SL

Refer to Fig. 2.14.

(1) Remove the Main P.C.B. Ass'y. Refer to item 2.4.

(2) Remove a cut washer F01 and detach F02 (Stocker Position Gear SL).

CAUTION: DO NOT remove the Stocker Position Gear SL together with the Stocker Motor SL Ass'y (Ref. No. 06 in Fig. 5.1), always replace it alone.
If they are removed at the same time and the gear in the stocker lift mechanism is turned, the stocker height becomes out of position.

2.14.2. Installing the Stocker Position Gear SL

NOTE: Positioning of the Stocker Position Gear SL is required.

Refer to Fig. 2.14.

(1) Assemble the Stocker Position Gear SL so that the mark on the Stocker Position Gear SL meets the mark on the Main Chassis.

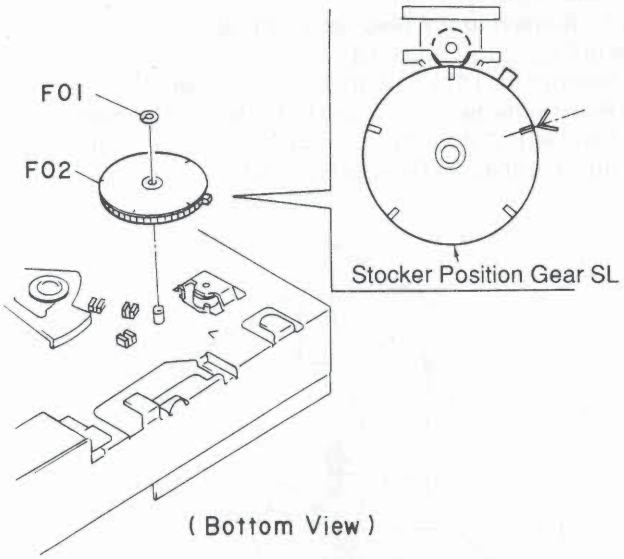


Fig. 2.14 Bottom View

2.15. Loading Plate Cam SL

2.15.1. Removing the Loading Plate Cam SL

Refer to Fig. 2.15.1.

(1) Remove the Loading MF Ass'y. Refer to item 2.5.

(2) Remove a cut washer F01 and pull out F02 (Loading Plate Cam SL).

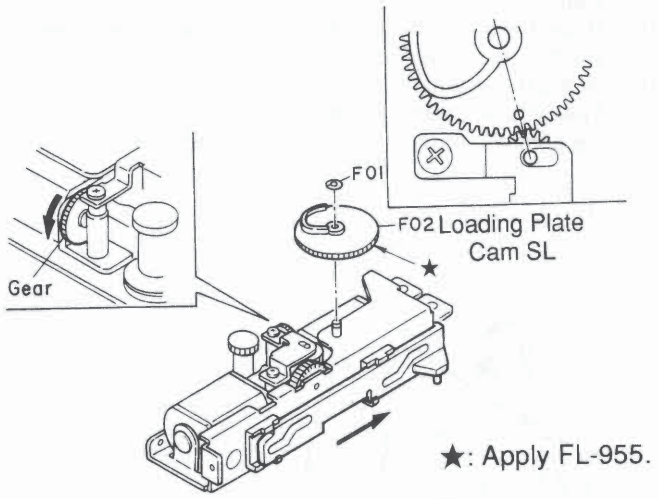


Fig. 2.15.1

2.15.2. Installing the Loading Plate Cam SL

NOTE: Positioning of the Loading Plate Cam SL is required.

Refer to Figs. 2.15.1 and 2.15.2.

(1) Turn the Emergency Gear in the direction of the arrow as shown in Fig. 2.15.1 until it stops.

(2) Assemble F02 (Loading Plate Cam SL) so that the center of the Loading Plate Cam SL, mark on the Loading Plate Cam SL, and the center of the shaft are aligned on one line as shown in Fig. 2.15.1.

(3) Turn the Emergency Gear in reverse until the marks on F02 (Loading Plate Cam SL) are almost aligned as shown in Fig. 2.15.2. (This operation is required to return to the mechanism in Standby state.)

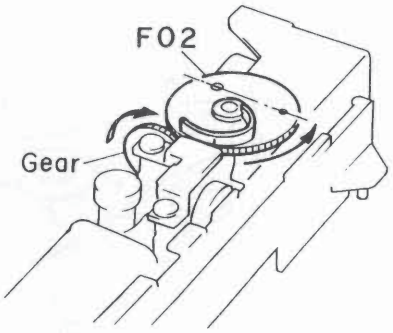


Fig. 2.15.2

Disc Ejection in Emergency

In case of emergency, remove the discs inside the unit as follows:

(1) Disconnect the DC power.

(2) Remove the Mechanism Synthesis Ass'y. Refer to item 2.2.

(3) Remove two top cover fastening screws at the rear of the unit, and take off the Top Cover SL S Ass'y. Refer to Fig. A.

(4) Remove the left side adhesive label (Dust Seal Emergency SL) on the left side of the unit. Refer to Fig. A.
NOTE: Carefully remove it since it will be used again later.

(5) Turn the Emergency Gear up or down until the disc lock pin is pushed down as shown in Fig. B.
CAUTION: ***Never use nail*** *when turning the Emergency Gear. Otherwise, the* ***gear tooth may be broken.***

(6) Raise the front section of the unit as illustrated in Fig. B. Then, carefully spread the left and right disc guide plates so that the disc drops into the Stocker.

(7) While keeping the left and right disc guide plates spread, remove the discs.
NOTE: When removing the discs, take care not to scrape them against other parts, to prevent damage.

(8) Replace the removed parts by reversing the above procedure.
NOTE: To prevent dust from entering the unit, reattach the adhesive label on the opening for the Emergency Gear.

(9) While pressing and holding down the **DISC1** and **DISC5** buttons simultaneously, turn power ON.
Then, the initialization is performed and the disc information stored in the unit is cleared.

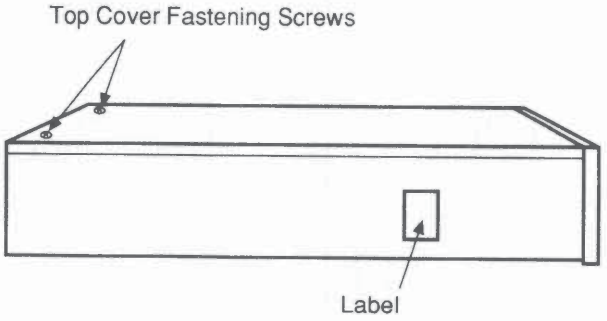
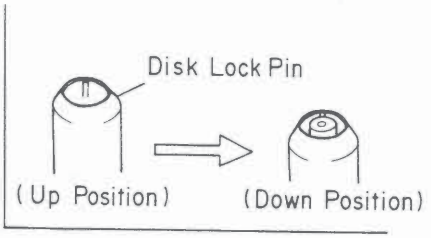


Fig. A



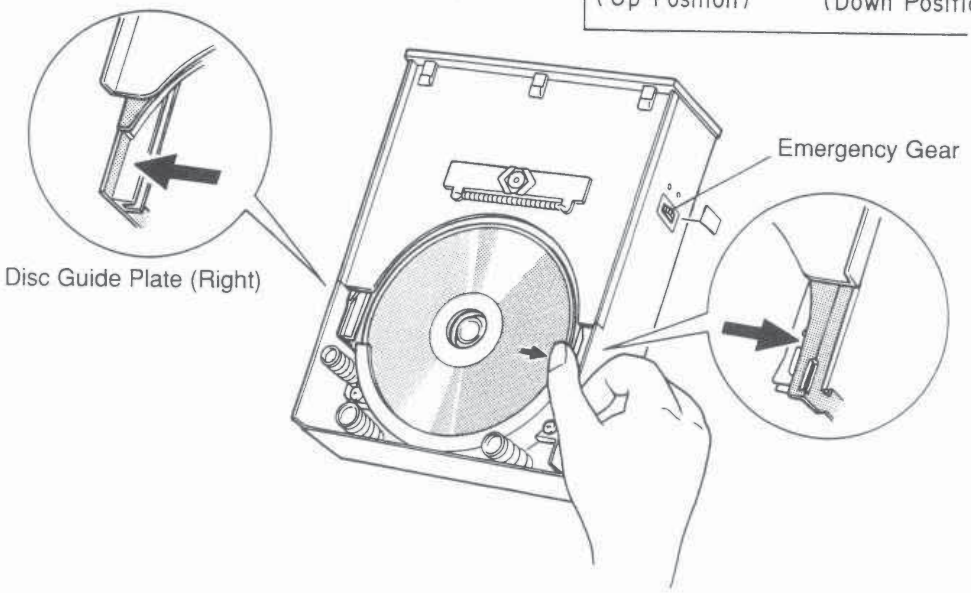


Fig. B

3. MEASUREMENT INSTRUMENTS AND JIGS

(1) Oscilloscope (40 MHz or more)
(2) Oscillator
(3) DC Voltmeter
(4) AC Voltmeter (Input impedance: 1 MΩ or more)
(5) DC Power Supply Unit (+14.4V DC)
(6) ABEX Test Disc TCD-725A (DA09193A)
(7) ABEX Test Disc TCD-784 (DA09195A)
(8) CD-ROM Test Unit (DA09190A)
(9) Extension Cable (DA09196A)
(10) Tracking Offset Meter LTM-9055 (Leader Electronics Corp.)

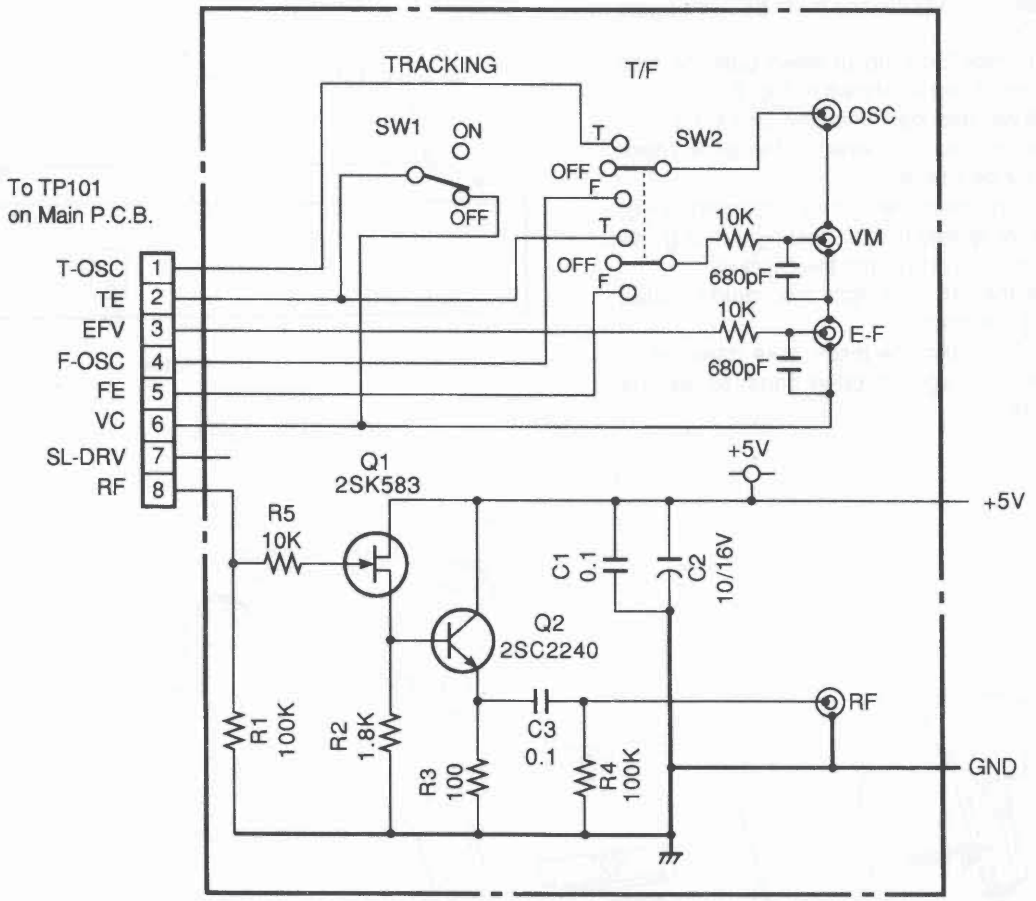


Fig. 3.1 CD-ROM Test Unit

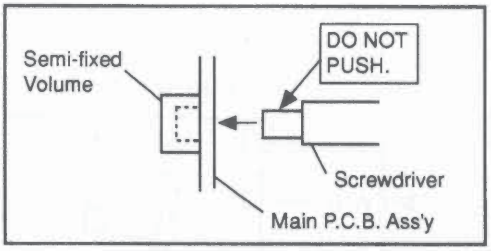
4. ELECTRICAL ADJUSTMENTS

NOTES:

1. Preset position of the semi-fixed volumes:
   When the Main P.C.B. Ass'y or semi-fixed volume VR101, VR102, VR103, or VR104 is replaced with new one, preset the semi-fixed volumes to their mechanical center positions before starting adjustment.

2. Connecting Measurement Instruments:
   Connect measurement instruments to the Main P.C.B. Ass'y as shown in Fig. 4.1. Fig. 4.1 also indicates the parts location for adjustment.

3. When adjusting the semi-fixed volume, **DO NOT** push it with the screwdriver. The semi-fixed volumes mounted on the component side of the Main P.C.B. Ass'y **can be easily detached** from the P.C.B. Ass'y.
   Also, use the suitable insulating type screwdriver whose tip fits the groove of the semi-fixed volume.



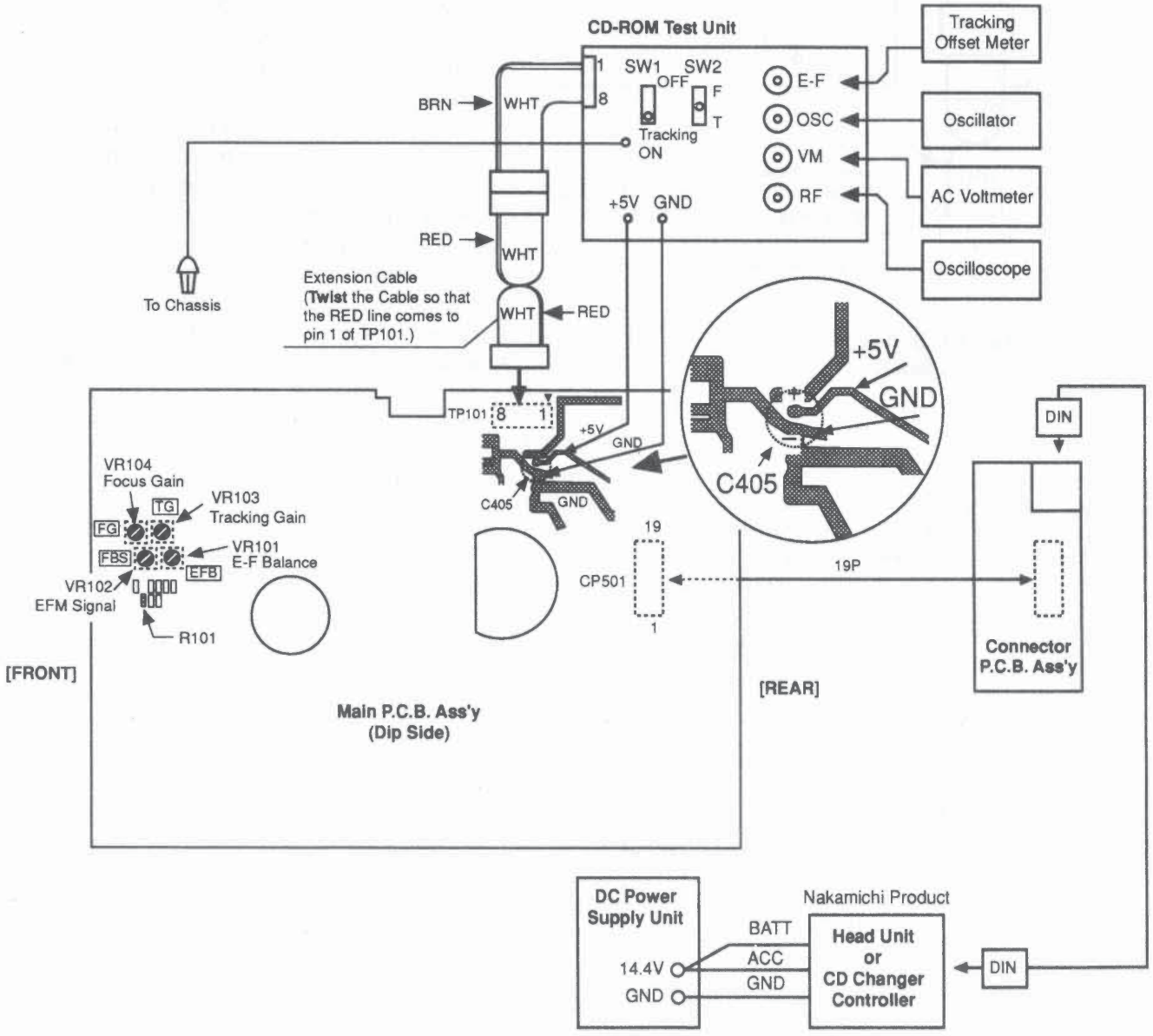
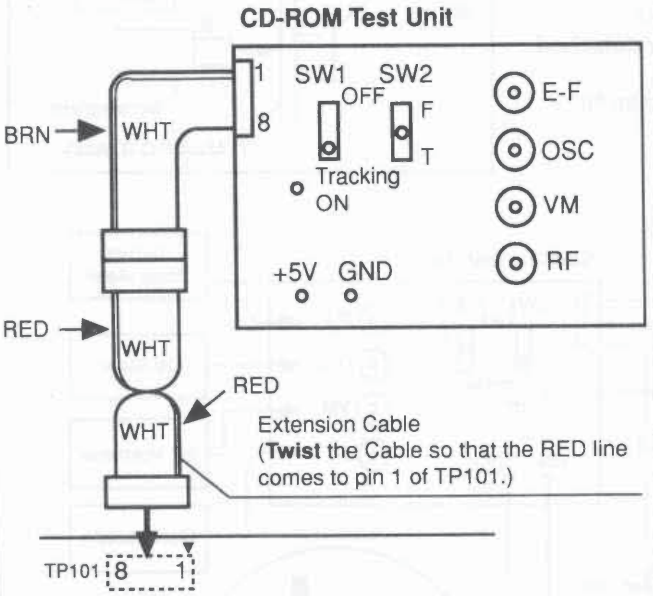
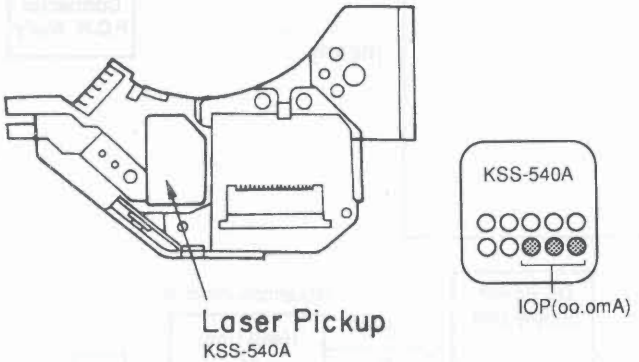
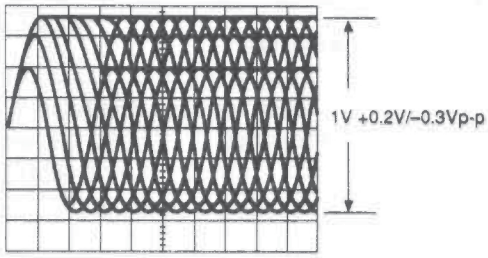
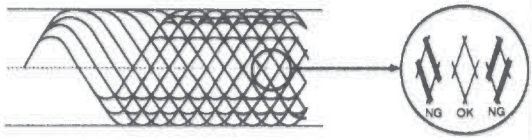


Fig. 4.1 Measurement Instrument Connecting Diagram

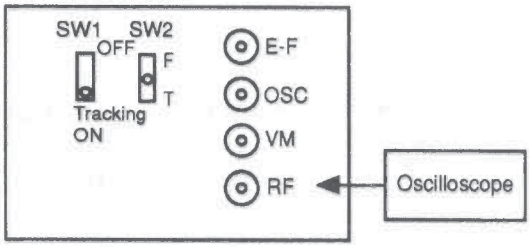
STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	ADJUST-MENT	REMARKS
1	Preparation		See Fig. 4.1.		1. Remove the Mechanism Synthesis Ass'y. (See item 2.2.) 2. Remove the Bottom Cover SL S Ass'y. (See item 2.3.) 3. Connect the Connector P.C.B. Ass'y to the Main P.C.B. Ass'y. 4. Attach the Front Panel Ass'y and fix it to the Mechanism Synthesis Ass'y using tape or a rubber band. **NOTE:** If it floats, the Mechanism Synthesis Ass'y does not work. 5. Connect one end of the additional extension cable to the 8P cable of the CD-ROM Test Unit. 6. Connect the other end of the additional extension cable to TP101 of the Main P.C.B. Ass'y. ***CAUTION: Pay attention to its direction. The RED color side of the cable must be set as shown in the figure. Otherwise, circuit will be damaged.*** 7. Connect the Ground Wire with Clip of the CD-ROM Test Unit to the chassis. 8. Connect the CD control cable of the Nakamichi Head Unit or CD Changer Controller to the DIN socket of the Connector P.C.B. Ass'y. 9. Solder +5V and GND wires of the CD-ROM Test Unit to the Main P.C.B. Ass'y (across C405) as shown in Fig. 4.1. 10. Supply +14.4V DC to ACC and BATT lines of the Head Unit or CD Changer Controller.
2	Laser Current Check	ABEX Test Disc TCD-784	DC Voltmeter across R101 on Main P.C.B.		1. Press the **DISC1** button to open the Front Door. (The LED of **DISC1** button flashes.) 2. Load the test disc and play back the test disc. (Press the **CDC** button of the Head Unit, or press the **Play** button of the CD Changer Controller.) 3. Calculate the current flowing into **R101** on the Main P.C.B. Ass'y from the following formula. $I(\text{Measured}) = \frac{\text{Voltmeter Value}}{\text{R101 (10 Ohms)}} = \text{oo.o mA}$ Example) • I(Measured) $I(\text{Measured}) = \frac{510.3\ (\text{mV})}{10\ (\text{ohms})} = 51.03\ \text{mA}$ (to be continued on the next page)





STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	ADJUST-MENT	REMARKS
					4. Check that the I(Measured) obtained in 3 and the rated current value (IOP) shown on the label are almost the same. Example) • Rated current value (IOP) on the label of the laser pickup: 47.5mA (How to read the IOP is shown on the left figure.) **NOTE**: The calculated current (I(Measured)) will be in a range of 30 to 60 mA. If its value doubles, pickup will be defective.
3	EFM Signal Adjustment	ABEX Test Disc TCD-784	Oscilloscope to RF Connector of the CD-ROM Test Unit	Main P.C.B. VR102	1. Set **SW1** of the CD-ROM Test Unit to **Tracking ON** position and **SW2** to **OFF (center)** position. 2. Slant the drive unit to the right by **26 degrees** viewing from the bottom. (See **Fig. 4.2.**) In this position, the pickup can move horizontally. 3. Play back the first track of the test disc (within 1 minute). 4. Adjust **VR102** until waveform amplitude becomes maximum and the waveform becomes clear (not thick) as shown below:  Oscilloscope Setting: AC Mode, 0.2 V/div, 0.5 µs/div  5. Stop the test disc.

SW1: TRACKING ON
SW2: OFF



Connecting Diagram

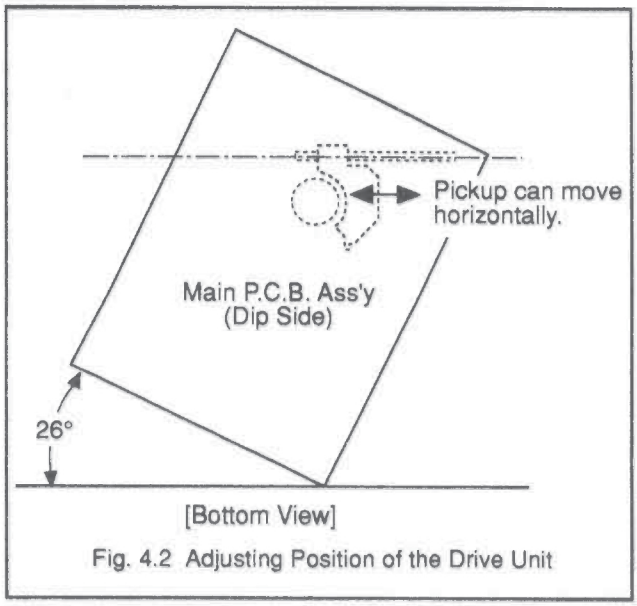
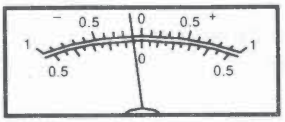
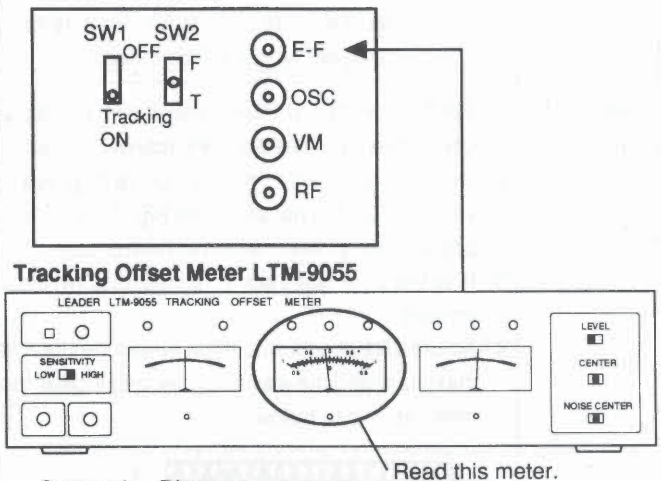
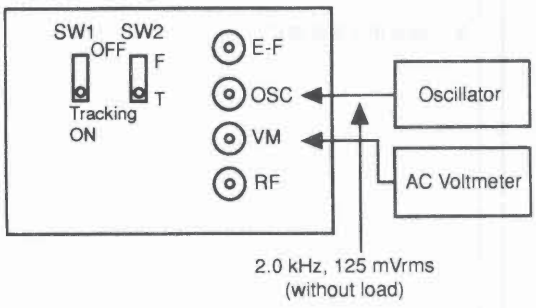


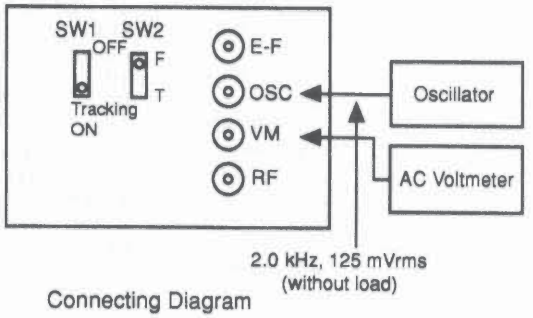
Fig. 4.2 Adjusting Position of the Drive Unit

<table>
<tr><th>STEP</th><th>ITEM</th><th>SIGNAL SOURCE</th><th>OUTPUT CONNECTION</th><th>ADJUST-MENT</th><th>REMARKS</th></tr>
<tr><td>4</td><td>E-F Balance Adjustment</td><td>ABEX Test Disc TCD-784</td><td>Tracking Offset Meter to E-F Connector of the CD-ROM Test Unit</td><td>Main P.C.B. VR101</td><td rowspan="2">1. Set SW1 of the CD-ROM Test Unit to Tracking ON position and SW2 to OFF (center) position.
2. Connect a tracking offset meter to the E-F connector of the CD-ROM Test Unit, and set the Sensitivity switch of the meter to HIGH (right side), the Level switch to MEASURE (left side), and the Center switch to MEASURE (center position).
3. Slant the drive unit to the right by 26 degrees viewing from the bottom. (See Fig. 4.2.) In this position, the pickup can move horizontally.
4. Play back the first track of the test disc (within 1 minute).
5. Set SW1 of the CD-ROM Test Unit to OFF position.
6. Adjust VR101 to obtain -50mV DC on meter located in the center of the Tracking Offset Meter.
 
7. Set SW1 of the CD-ROM Test Unit to Tracking ON position.
8. Stop the test disc.</td></tr>
<tr><td colspan="4">SW1: TRACKING ON
SW2: OFF
CD-ROM Test Unit
 

Connecting Diagram</td></tr>
<tr><td>5</td><td>Tracking Gain Adjustment</td><td>ABEX Test Disc TCD-784</td><td>Oscillator to OSC Connector of CD-ROM Test Unit

AC Voltmeter to VM Connector of CD-ROM Test Unit</td><td>Main P.C.B. VR103</td><td>1. Set SW1 of the CD-ROM Test Unit to Tracking ON position.
2. Set the output of oscillator to 2.0 kHz, 125 mVrms without connecting it to the CD-ROM Test Unit.
3. Connect the oscillator output to OSC connector of the CD-ROM Test Unit.
4. Set SW2 of the CD-ROM Test Unit to T (Tracking) position.
5. Slant the drive unit to the right by 26 degrees viewing from the bottom. (See Fig. 4.2.) In this position, the pickup can move horizontally.
6. Play back the first track of the test disc (within 1 minute).
7. Adjust VR103 so that the reading on the AC voltmeter is 13 mV.
8. Set SW2 to OFF (center) position.
9. Stop the test disc.</td></tr>
<tr><td colspan="4">SW1: TRACKING ON
SW2: T (TRACKING)
CD-ROM Test Unit
 

Connecting Diagram</td></tr>
</table>

STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	ADJUST-MENT	REMARKS
6	Focus Gain Adjustment	ABEX Test Disc TCD-784	Oscillator to OSC Connector of CD-ROM Test Unit AC Voltmeter to VM Connector of CD-ROM Test Unit	Main P.C.B. VR104	1. Set **SW1** of the CD-ROM Test Unit to **Tracking ON** position. 2. Set the output of oscillator to 2.0 kHz, 125 mVrms without connecting it to the CD-ROM Test Unit. 3. Connect the oscillator output to OSC connector of the CD-ROM Test Unit. 4. Set **SW2** of the CD-ROM Test Unit to **F (Focus)** position. 5. Slant the drive unit to the right by **26 degrees** viewing from the bottom. (See **Fig. 4.2.**) In this position, the pickup can move horizontally. 6. Play back the first track of the test disc (within 1 minute). 7. Adjust **VR104** so that the reading on the AC voltmeter is **7 mV**. 8. Set **SW2** to **OFF (center)** position. 9. Stop the test disc. 10. After adjustment, perform "EFM Signal Adjustment" in Step 3.
	SW1: TRACKING ON SW2: F (FOCUS) **CD-ROM Test Unit**  Connecting Diagram				
7	Operation Check	ABEX Test Disc TCD-725A			Make sure that no noise nor track-jumping is found in the following programs of the test disc. To select the desired program, press **FWD. Skip (>>)** button or **REV. Skip (<<)** button of the Control Button Unit. • Interruption 600 µm: 4th program • Black dot 500 µm: 8th program • Simulated fingerprint: 13th program
8	Termination				1. Press the **DISC1** button to eject the disc. (DISC1 LED will flash.) 2. Remove the test disc.

Maintenance Operation (Mechanism Initialization)

STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	ADJUST-MENT	REMARKS
1	Maintenance Operation				1. Remove the Top Cover SL S Ass'y to see disc change operation. 2. Turn the power ON while pressing and holding down the **DISC1** and **DISC5** buttons simultaneously. Then, the mechanism Initialization operation begins and disc change operation starts. You can check the operation of the mechanism. Also you can see if any CD is left inside the unit before returning the unit to the customer.

5. MECHANISM ASS'Y AND PARTS LIST

5.1. Mechanical Exploded View

Ref. No.	Part Number	Description	Q'ty
M1	1005070055	Power knob	1
M2	101007985A	Badge	1
M3	1001070055	Front panel (BLK)	1
M4	8962300800	9 (Taptite-B) CUP3008 ZN3K	12
M5	1006070055	Volume knob	1
M6	1009070055	Display window	1
M7	1047071600	Indicator	5
M8	1002070055	Front chassis	1
M9	C04A265860	Headphone PCB assembly	1
M10	8741301014	7 (Taptite-P) BID3010 WF14 ZN3A	3
M11	C04A265870	VR PCB assembly	1
M12	1003070055	Control knob	1
M13	1004070055	Disc. knob	1
M14	C14A265820	Front PCB assembly	1
M15	8741300800	7 (Taptite-P) BID3008 ZN3A	6
M16	C04A265840	Sensor PCB assembly	1
M17	2006070055	LED holder (LED7x3)	5
M18	8241300400	2 (Machine-ISO) BID3004 ZN3A	4
M19	2002070055	CD bracket	2
M20	C486040441	CD mechanism HMB-5 assembly	1
M21	8961300600	9 (Taptite-B) CUP3006 ZN3A	6
M22	C04A265830	Power switch PCB assembly	1
M23	2000000434	Switch cover	1
M24	1007070055	Top cabinet (BLK)	1
M25	C14A265810	CD decoder PCB assembly	1
M26	2004070055	Filter	1
M27	2003070055	Display holder	1
M28	C04A265850	LED PCB assembly	1
M29	1008070055	Rear panel	1
M30	8742300800	7 (Taptite-P) BID3008 ZN3K	2
M31	8942300800	9 (Taptite-B) BID3008 ZN3K	1
M32	8941300800	9 (Taptite-B) BID3008 ZN3A	6
M33	JS27593800	Foot sheet (20)	4
M34	JS85047200	55 foot A	4
M35	2001070055	Bottom cabinet	1
M36	2005070055	Spacer supports (SCB-24)	1
M37	C04A2658A0	IC PCB assembly	1
M38	8661400800	6 (Taptite-S) CUP4008 ZN3A	2
M39	C04A265890	TR. PCB assembly	1
M40	2000000767	Bushing (3x1.4)	1
M41	2000000909	Insulator TO-220	1
E1	4580000021	Cord stopper (2271)	1
E2	4430102450	Power switch SDDLB1017U-CP	1
E3	420D572294	Power transformer EI-57	1
E4	463167M065	AC cord UL/CSA 6.5F BLK SPT-1	1

5.1. Mechanical Exploded View

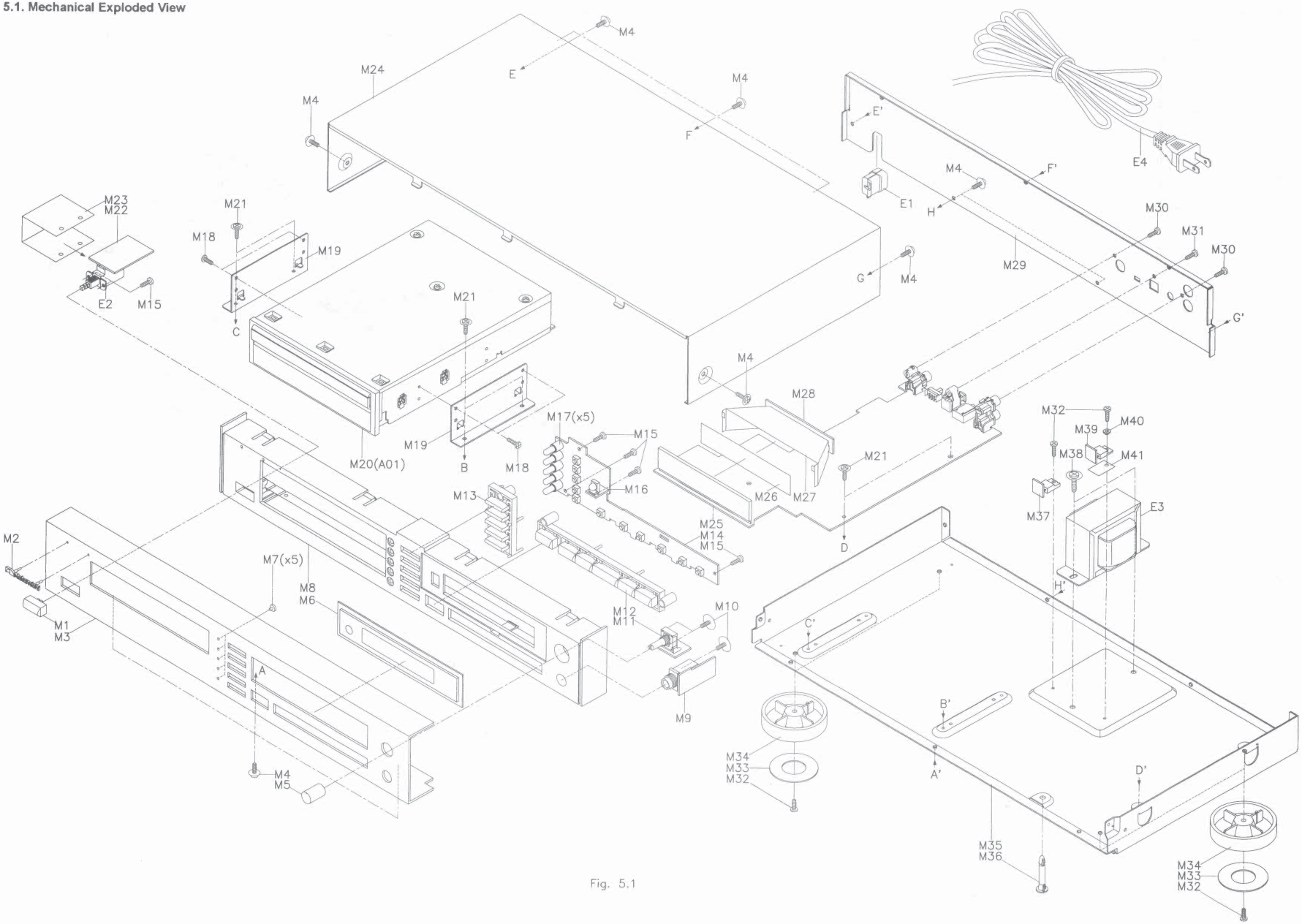


Fig. 5.1

5.2. CD Mechanism HMB-5 Ass'y (A01)

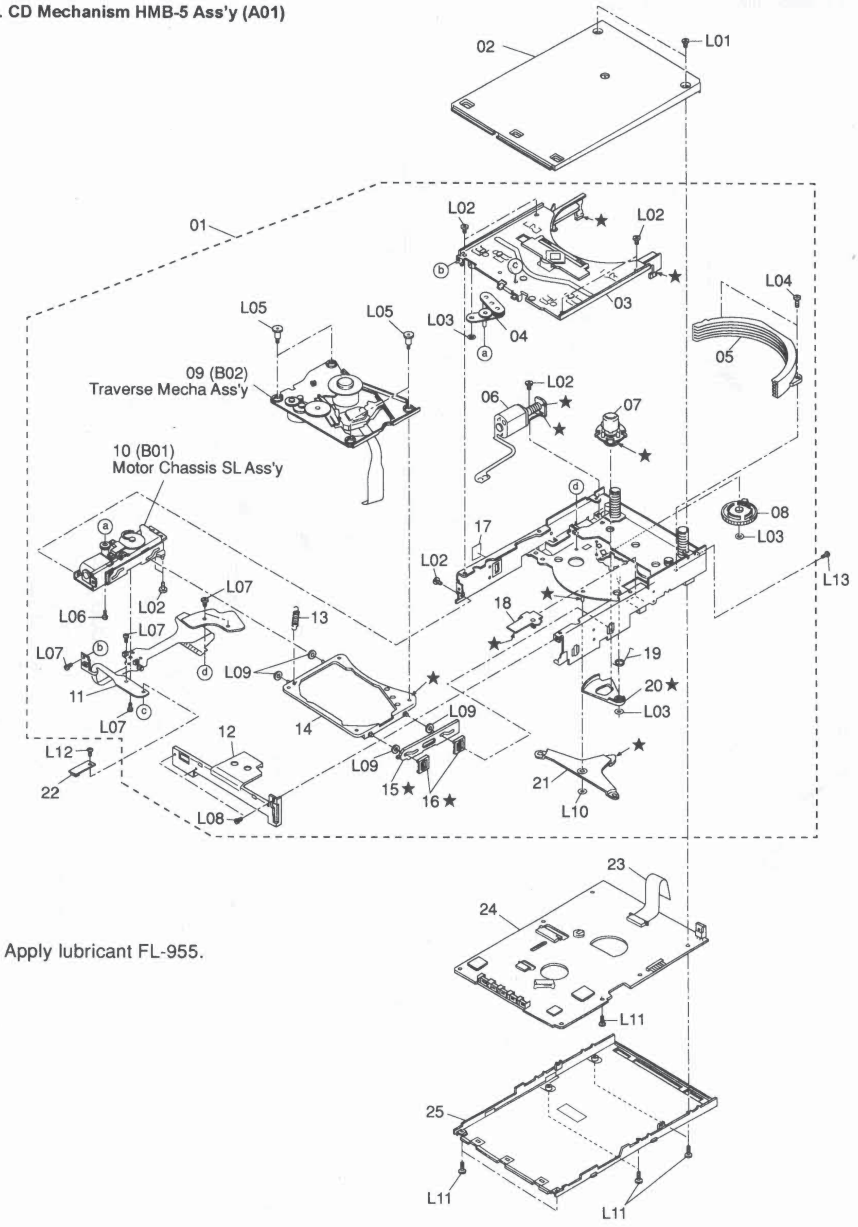
Ref. No.	Part Number	Description	Q'ty	Ref. No.	Part Number	Description	Q'ty
01	B0CG09367A	Mechanism deck MF assembly	1	18	0C10211A	Plate spring SL	1
				19	0C10184A	Disc lock spring SL	1
02	B0CA09333A	Top cover SL S assembly	1	20	0C10183A	Disc lock arm SL	1
				21	0C10187A	UD link arm SL	1
03	B0CA09365B	Loading MF assembly	1	22	B0BA09819A	LED PCB assembly	1
04	B0CA09354A	Loading link SL assembly	1	23	0B84818A	Wire flex 19P	1
				24	C1BA09911A	HMB-5 PCB assembly	1
05	0C10172A	Stocker CD SL	1	25	B0CA09362A	Bottom cover MF assembly	1
06	B0CA09351A	Stocker motor SL assembly	1				
				L01	0E00120A	M2.6x3 + PAN	
07	B0CA09344A	Disc lock SL assembly	1	L02	0E03964A	ST2.6x3 + PAN (#0 type 3)	
08	0C10175A	Stocker position gear SL	1	L03	0E03955A	Cut washer 2.2x4.2x0.2	
09	B0CA09363A	Traverse mechanical assembly	1	L04	0E03457A	M2.6x4.5 + PAN (Black chromate)	
10	B0CA09345A	Motor chassis SL assembly	1	L05	0C10287A	Damper screw SL	
				L06	0E03845A	M1.7x2.5 + PAN (#0 type 3 black)	
11	B0BA09736A	Mechanical flexible PCB assembly	1	L07	0E03945A	M2x2 + PAN (#0 type 3 black)	
12	B0CA09352B	Front chassis SL assembly	1	L08	0E03953A	M2x2 + PAN (#0 type 1)	
13	0C10286A	Anti rattle spring SL	1	L09	0E03971A	Pet washer	
				L10	0E03956A	Cut washer 3.2x5.2x0.2	
14	B0CA09325B	SUS base X sub assembly	1	L11	0E04032A	M2.6x5 + PAN (#0 type 3)	
15	0C10185B	Mechanism UD sub cam SL	1	L12	0E00922A	M2x3 + PAN (Black chromate)	
16	0C10186A	UD S cam guide SL	2	L13	0E04036A	M2.6x8 + PAN	
17	0J08004A	Dust seal emergency SL	1				

Apply **FL-955** (grease) to the following places when parts are replaced.

Ref No.	Location	Remarks
03	Loading MF assembly Edges which are inserted into the chassis plate	
06	Stocker motor SL assembly * Motor shaft worm gear * Motor shaft end	
07	Disc lock SL assembly * Disc lock pinion	
14	SUS base X sub assembly * Contact part with the plate spring SL (Ref. No. 18)	
15	Mechanical UD sub cam SL	Whole surface
16	UD S cam guide SL (2 pcs.)	whole surface
18	Plate spring SL Contact part (Bottom end) with the SUS base X sub assembly (Ref. No. 14)	
20	Disc lock arm SL	Whole surface
21	UD link arm SL * Around the top end Shaft for UD link arm SL (Ref. No. 21)	

Lubricant:
We suggest that you use grease FL-955/FG-84M or equivalent type.
The company dealing FL-955/FG-84M is as follows:
* FL-955
Kanto Chemicals Co. Ltd., 2-7 Kanda Sakuma-cho, Chiyoda-Ku, Tokyo, Japan
* FG-84M
Wada Kousan Co. Ltd., 7-35-5 Higashi Oizumi, Nerima-Ku, Tokyo, Japan

5.2. CD Mechanism HMB-5 Ass'y (A01)



★: Apply lubricant FL-955.

Fig. 5.2

5.3. Motor Chassis SL Ass'y (B01)

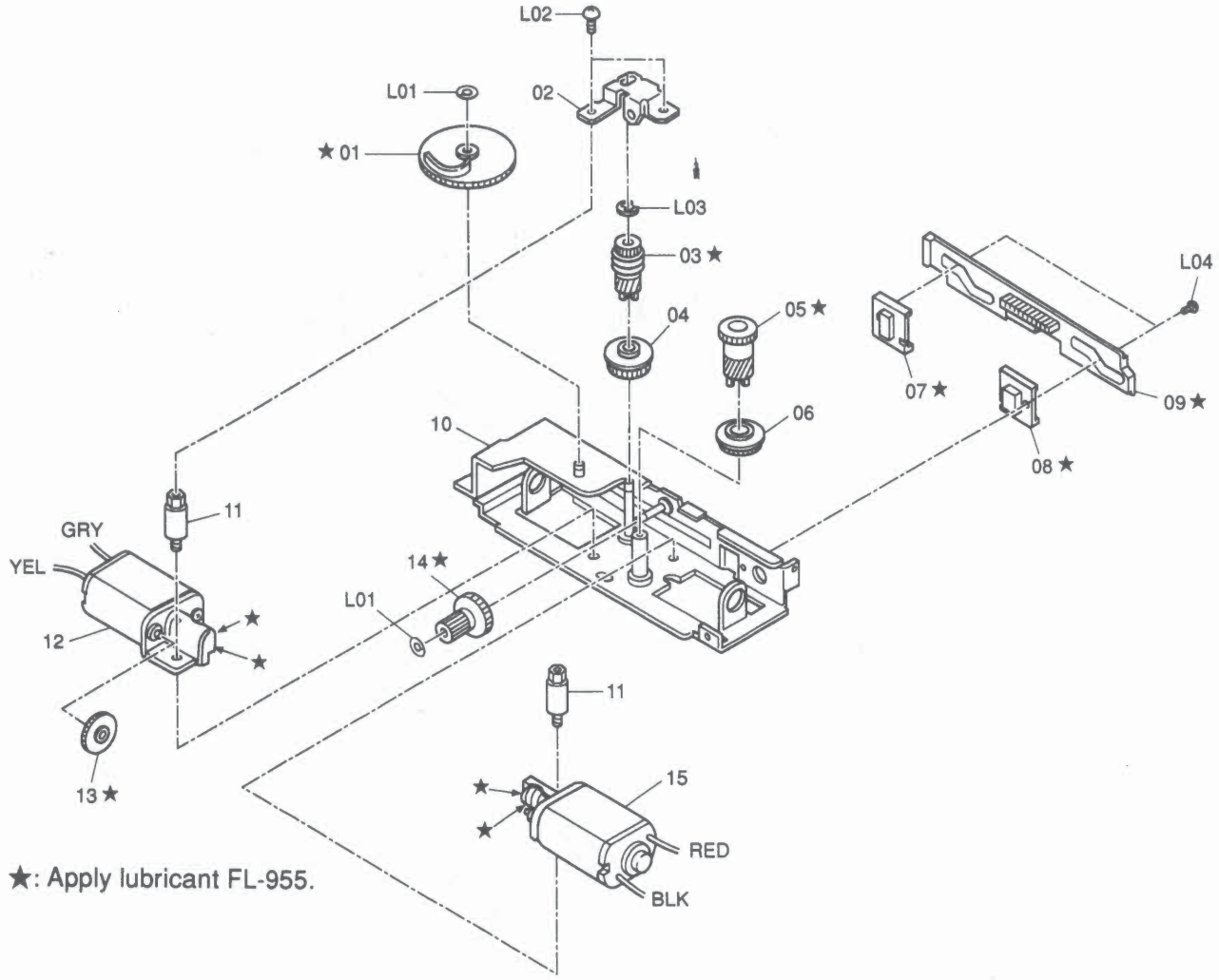


Fig. 5.3

5.3. Motor Chassis SL Assembly (B01)

Ref. No.	Part Number	Description	Q'ty
01	0C10238A	Loading plate cam SL	1
02	0C10240A	UD worm plate SL	1
03	0C10233A	UD worm gear SL	1
04	0C10235A	Mechanical sensor ring SL	1
05	0C10236A	Loading worm gear SL	1
06	0C10237A	Loading sensor ring SL	1
07	0C10208A	UD cam guide SL	1
08	0C10242A	UD cam guide W SL	1
09	0C10232A	UD cam SL	1
10	CA09338A	Motor chassis SL S assembly	1
11	0C10241A	Bracket screw SL	2
12	CA09350A	UD motor SL assembly	1
13	0C10239A	Emergency gear SL	1
14	0C10234A	Mechanical UD gear SL	1
15	B0CA09349A	Loading motor SL assembly	1
L01	0E03955A	Cut washer 2.2x4.2x0.2	
L02	0E03947A	M2.6x3.5 + PAN (#0 type 3)	
L03	0E00222A	E-ring 2.0mm	
L04	0E03967A	M1.4x2 + PAN (#0 type 1 black)	

Apply **FL-955** (grease) to the following places when parts are replaced.

Ref. No.	Location	Remarks
01	Loading plate cam SL	Whole surface
03	UD worm gear SL	Whole surface
05	Loading worm gear SL	Whole surface
07	UD cam guide SL	Whole surface
08	UD cam guide W SL	Whole surface
09	UD cam SL	Whole surface
12	UD motor SL assembly	
	* Motor shaft worm gear	
	* Motor shaft end	
13	Emergency gear SL	Whole surface
14	Mechanical UD gear SL	Whole surface
15	Loading motor SL assembly	
	* Motor shaft worm gear	
	* Motor shaft end	

5.4. Traverse Mecha Ass'y (B02)

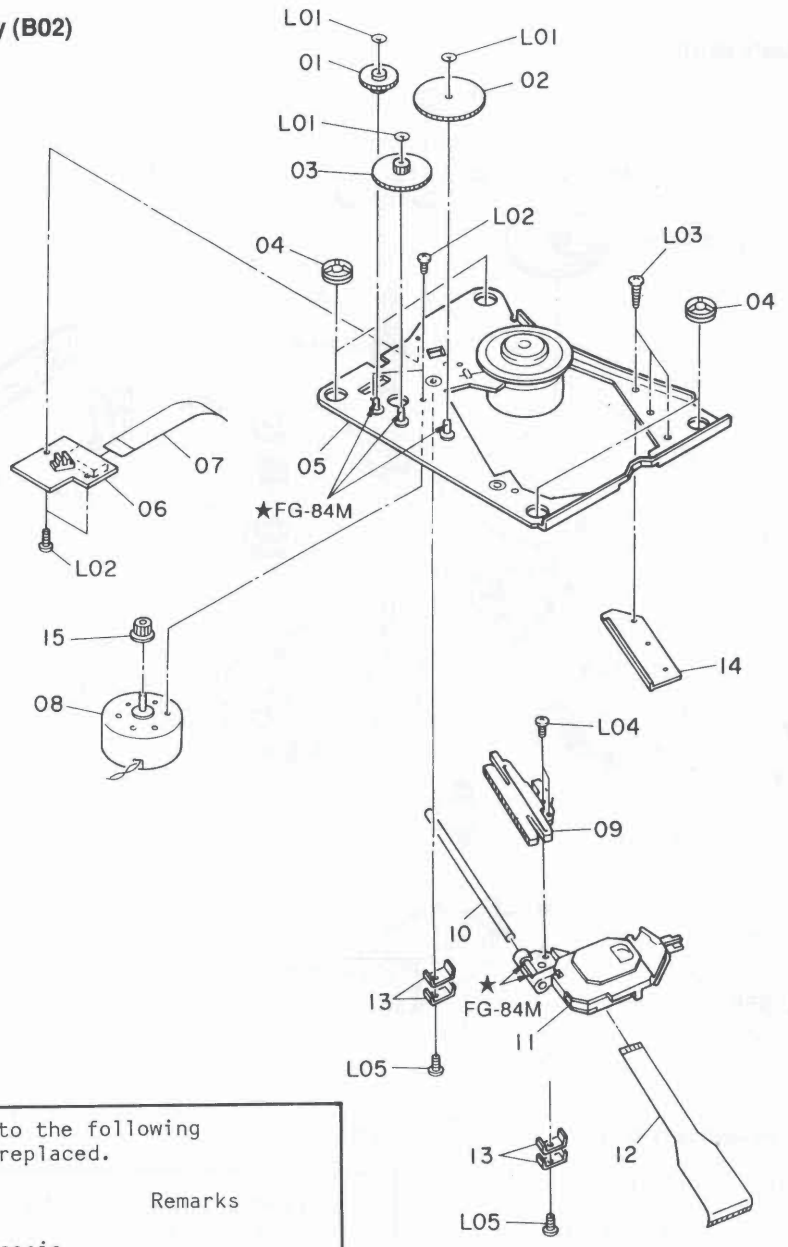


Fig. 5.4

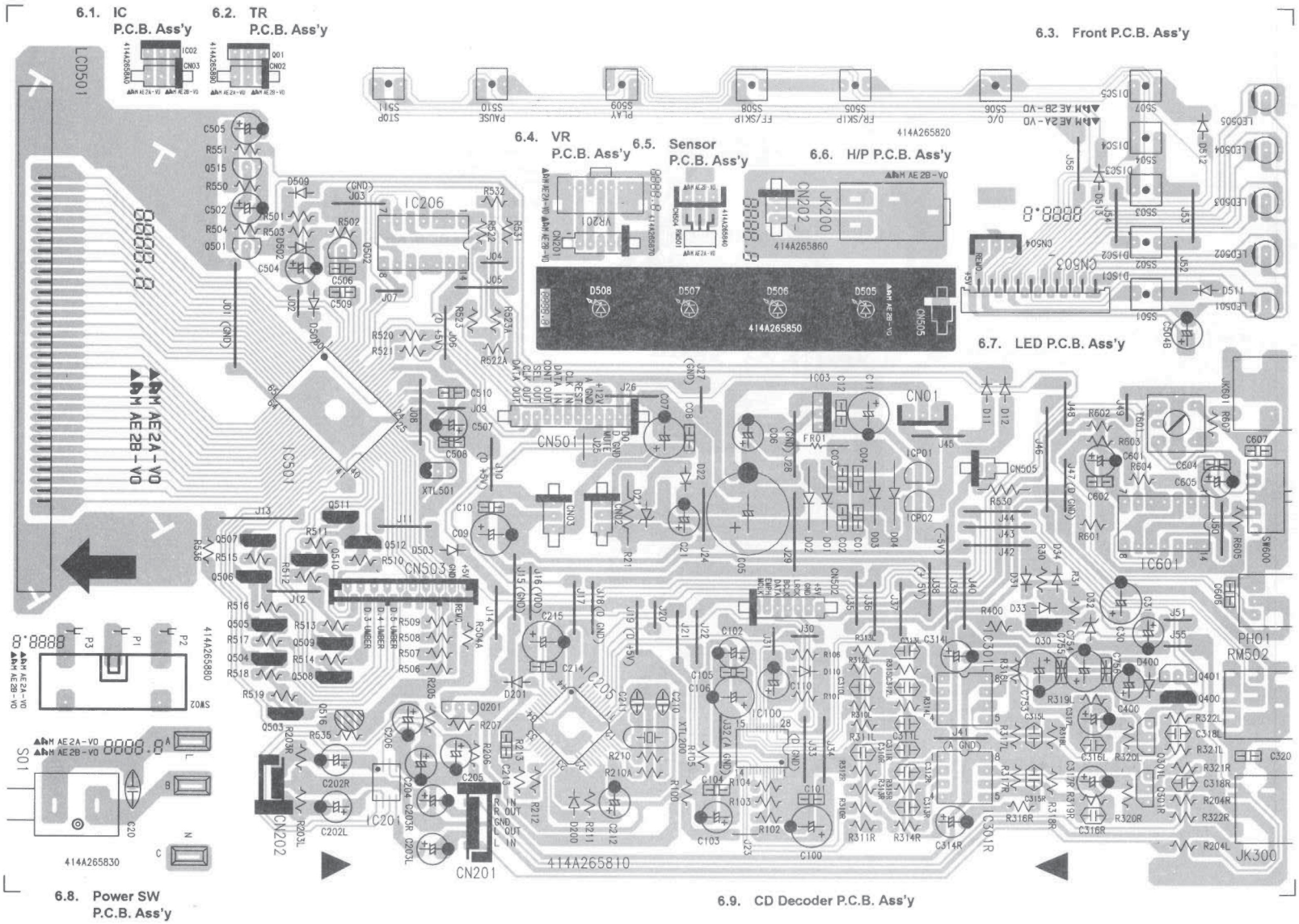
Apply **FL-955** (grease) to the following places when parts are replaced.		
Ref. No.	Location	Remarks
05	Disc motor chassis assembly * Shaft for second gear * Shaft for third gear * Shaft for power gear	
11	Pickup KSS-540A	PU guide shaft SL contacting surface

★: Apply lubricant FG-84M.

5.4. Traverse Mechanical Assembly (B02)

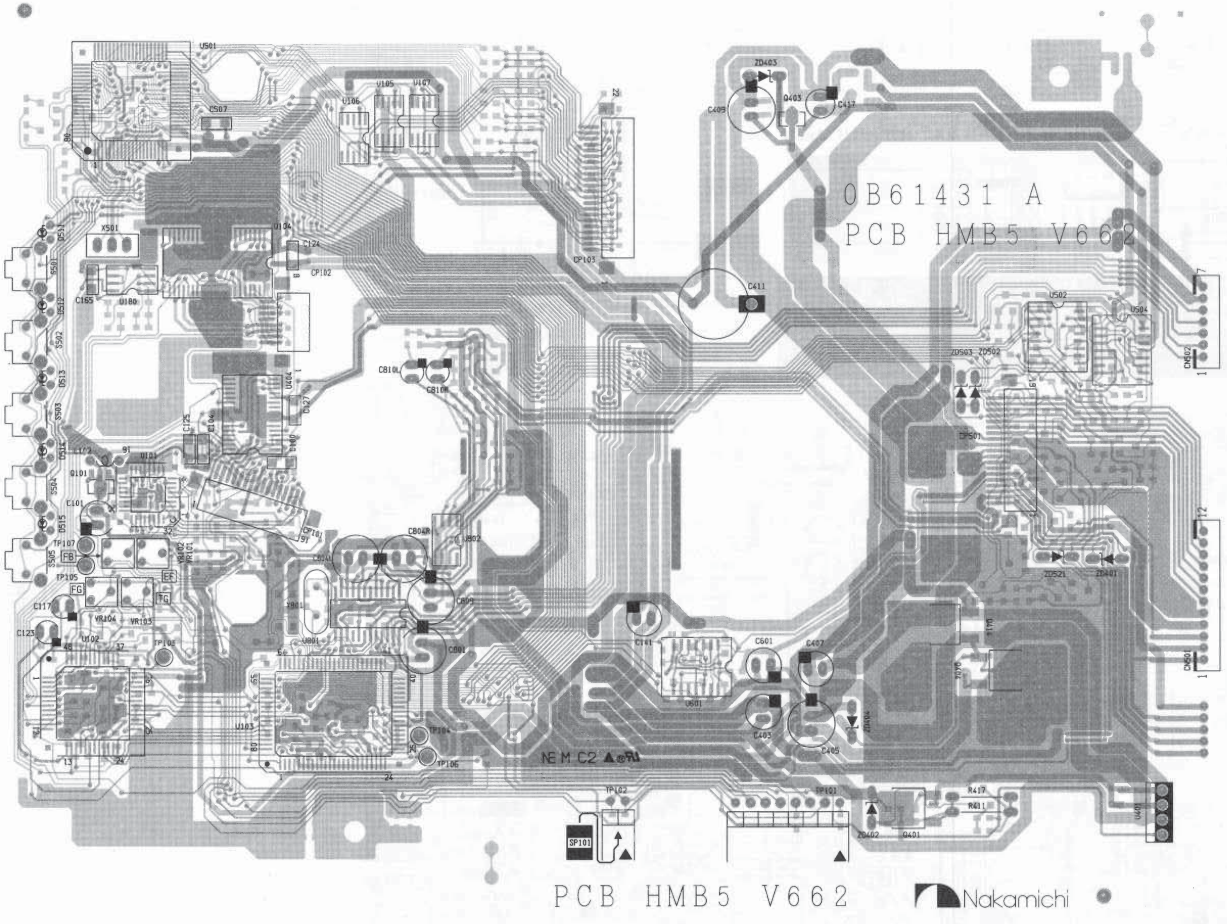
Ref. No.	Part Number	Description	Q'ty	Ref. No.	Part Number	Description	Q'ty
01	0C10139A	Second gear	1	11	0B90741A	Pickup KSS-540A	1
02	0C09923B	Power gear	1	12	0B61355A	Pick up flexible PCB	1
03	0C10140A	Third gear	1	13	0C10278A	Shaft lock plate SL	4
04	0C10279A	Damper S SL	4	14	0C10282A	PU guide plate H SL	1
05	B0CA09364A	Disc motor chassis assembly	1	15	0C10138A	First gear	1
			1	L01	0E03954A	Cut washer 1.6x3.2x0.2	
06	B0BA09777A	Traverse PCB assembly	1	L02	0E03845A	M1.7x2.5 + PAN (#0 type 3 black)	
07	0B84608A	8P flexible wire	1	L03	0E00955A	BT2x4 + Binding	
08	B03B90704A	Sled motor	1	L04	0E00887A	M1.7x4 + PAN	
09	0C10141B	Rack CA	1	L05	0E03947A	M2.6x3.5 + PAN (#0 type 3)	
10	0C10277A	PU guide shaft SL	1				

6. MOUNTING DIAGRAMS AND PARTS LIST

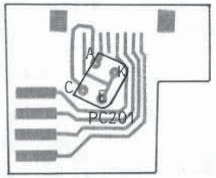


(Component Side View)

6.10. HMB-5 P.C.B. Ass'y

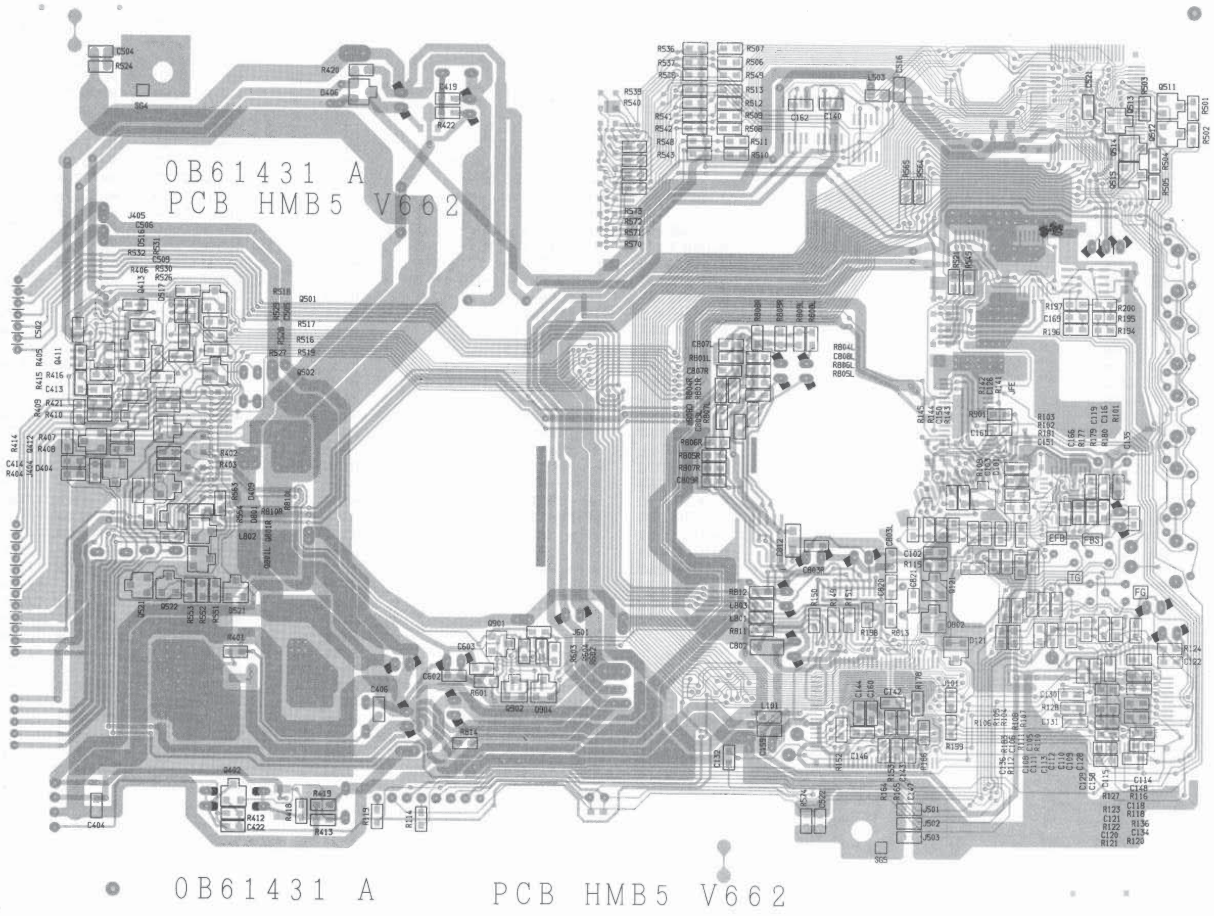


(Component Side View)

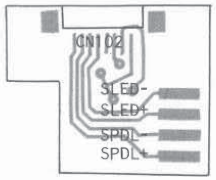


6.11. Traverse P.C.B. Ass'y

6.10. HMB-5 P.C.B. Ass'y



(Dip Side View)



6.11. Traverse P.C.B. Ass'y

NOTES: Abbreviations
TR-Transistor, SID-Silicon Diode, ZD-Zener Diode
RK-Carbon Resistor, RM-Metal Film Resistor, RC-Cement Resistor
CE-Electrolytic Capacitor, CM-Mylar Capacitor, CG-Gold Capacitor
CML-Multi-layer Ceramic Capacitor, CC-Ceramic Capacitor
CSP-Polystyrene Capacitor, C-Mica Capacitor, CMEM-Metalized Polyester Capacitor
Parts Marked With * Show Chip Parts.

CD Decoder P.C.B. Ass'y

Schematic Ref. No.	Part No.	Description
	DA4A265810	CD Decoder P.C.B Ass'y
ICP01,02	4159ICPN50	IC ICP-N50 (T)
IC03	415979M5FA	IC NJM79M05FA
IC100	4159018550	IC AD1855
IC201	415903543F	IC BH3543F
IC205	415Y03436D	IC YM3436D
IC206	41537414AP	IC TC74HC14AP
IC301L,301R	415902114D	IC NJM2114D
IC501	415258706X	IC LC587006-XXX
IC601	41537400AP	IC TC74HC00AP
D01-04	4138104002	SID 1N4002L
D11,12	4121901330	SID 1SS133
D21	41215J120B	ZD MTZJ12B
D22	4121901330	SID 1SS133
D31	4121901330	SID 1SS133
D32	41215J0688	ZD MTZJ6.8BSB-TA
D33,34	4121901330	SID 1SS133
D110	4121901330	SID 1SS133
D200,201	4121901330	SID 1SS133
D400	4121901330	SID 1SS133
D501-503	4121901330	SID 1SS133
D509	4121901330	SID 1SS133
LCD501	4110440253	LCD Display DLC-A1991PN
XTL200	4100912288	X'tal 12.288MHz
XTL501	41609040OG	Resonator CST 4.0MGW
SW600	4410102136	Slide Switch HTSS-12F23G6
R21	4272022155	RM 220 2W J
R30	4050110455	RK 100K 1/6W J
R31	4050110255	RK 1K 1/6W J
R100	4050110055	RK 10 1/6W J
R101-104	4050110355	RK 10K 1/6W J
R105	4050110055	RK 10 1/6W J
R106	4050110355	RK 10K 1/6W J
R203L,203R	4050110255	RK 1K 1/6W J
R204L,204R	4050147355	RK 47K 1/6W J
R205	4050182355	RK 82K 1/6W J
R206	4050110055	RK 10 1/6W J
R207	4050122355	RK 22K 1/6W J
R210	4050110555	RK 1M 1/6W J
R210A	4050151155	RK 510 1/6W J
R211	4050147355	RK 47K 1/6W J
R212	4050133255	RK 3.3K 1/6W J
R213	4050110155	RK 100 1/6W J
R310L,310R	4050112355	RK 12K 1/6W J
R311L,311R	4050112355	RK 12K 1/6W J
R312L,312R	4050112355	RK 12K 1/6W J
R313L,313R	4050112355	RK 12K 1/6W J
R314L,314R	4050133255	RK 3.3K 1/6W J
R315L,315R	4050133255	RK 3.3K 1/6W J
R316L,316R	4050110255	RK 1K 1/6W J
R317L,317R	4050110255	RK 1K 1/6W J
R318L,318R	4050110255	RK 1K 1/6W J
R319L,319R	4050110255	RK 1K 1/6W J
R320L,320R	4050156155	RK 560 1/6W J
R321L,321R	4050110455	RK 100K 1/6W J
R322L,322R	4050110155	RK 100 1/6W J
R400	4050110455	RK 100K 1/6W J
R501	4050168355	RK 68K 1/6W J
R502,503	4050110455	RK 100K 1/6W J

Schematic Ref. No.	Part No.	Description
R504	4050112355	RK 12K 1/6W J
R504A	4050147055	RK 47 1/6W J
R506-509	4050110455	RK 100K 1/6W J
R510-519	4050118155	RK 180 1/6W J
R520,521	4050110155	RK 100 1/6W J
R522	4050110155	RK 100 1/6W J
R522A	4050110455	RK 100K 1/6W J
R523	4050110155	RK 100 1/6W J
R523A	4050110455	RK 100K 1/6W J
R530	4050456055	RK 56 1/6W J
R531	4050110355	RK 10K 1/6W J
R532	4050110455	RK 100K 1/6W J
R535,536	4050110255	RK 1K 1/6W J
R550,551	4050122355	RK 22K 1/6W J
R601,602	4050122155	RK 220 1/6W J
R603	4050147255	RK 4.7K 1/6W J
R604	4050122255	RK 2.2K 1/6W J
R605	4050110355	RK 10K 1/6W J
R607	4050175055	RK 75 1/6W J
C01-04	7308622345	CML 0.022u 25V Z
C05	5154222225	CE 2200u 25V M
C06	5154102225	CE 1000u 25V M
C07	5153221216	CE 220u 16V M
C08	7306610445	CML 0.1u 50V Z
C09	5153221216	CE 220u 16V M
C10	7306610445	CML 0.1u 50V Z
C11	5153221216	CE 220u 16V M
C12	7306610445	CML 0.1u 50V Z
C21	5153101216	CE 100u 16V M
C30	5153221210	CE 220u 10V M
C31	5153470225	CE 47u 25V M
C100	5153221210	CE 220u 10V M
C101	7306610445	CML 0.1u 50V Z
C101A,102A	7306510215	CML 0.001u 50V K*
C102,103	5153100250	CE 10u 50V M
C104,105	7306610445	CML 0.1u 50V Z
C106	5153221210	CE 220u 10V M
C110	5153101210	CE 100u 10V M
C202L,202R	5153331210	CE 330u 10V M
C203L,203R	5153109250	CE 1u 50V M
C204	5153109250	CE 1u 50V M
C205	5153221210	CE 220u 10V M
C206	5153470210	CE 47u 10V M
C210,211	5121220552	CC 22P 50V J (CH)
C212	5153100250	CE 10u 50V M
C213	7307847215	CML 0.0047u 16V K
C214	7306610445	CML 0.1u 50V Z
C215	5153221210	CE 220u 10V M
C310L,310R	5091122513	CSP 0.0012u 100V J
C311L,31RR	5091122513	CSP 0.0012u 100V J
C312L,312R	5091221513	CSP 220P 100V J
C313L,313R	5091221513	CSP 220P 100V J
C314L,314R	5153220216	CE 22u 16V M
C315L,315R	5091221513	CSP 220P 100V J
C316L,316R	5091221513	CSP 220P 100V J
C317L,317R	5153220216	CE 22u 16V M
C318L,318R	5091222513	CSP 0.0022u 100V J
C320	7306610445	CML 0.1u 50V Z
C400	5154102210	CE 1000u 10V M
C502	5153229250	CE 2.2u 50V M

Schematic Ref. No.	Part No.	Description
C504	5153229250	CE 2.2u 50V M
C505	5153109250	CE 1u 50V M
C506	7306610445	CML 0.1u 50V Z
C507	5153101210	CE 100u 10V M
C508-510	7306610445	CML 0.1u 50V Z
C601	5153101210	CE 100u 10V M
C602	7306610445	CML 0.1u 50V Z
C604	7308610345	CML 0.01u 25V Z
C605	5153330216	CE 33u 16V M
C606,607	7306610445	CML 0.1u 50V Z
C753,754	5153221210	CE 220u 10V M
C755,756	7306610445	CML 0.1u 50V Z
L100A-100A	708055N081	Territe Chip Bead 600 OHM/100 MHz*
T601	4360900870	Pulse Trans. Coil TC-1027-04
JK300	4500800463	2P RCA Jack HSP-242V1-03
JK601	4500800471	1P RCA Jack HSP-241V0
PH01	71498800C5	Photo Socket TOTX-178
RM502	4500100427	H/P Jack HTJ-035-10FB
FR01	4180422057	Fuse Resistor 22 1/4W
Q30	4109101445	TR DTA144ES
Q201	410920114T	TR DTC114TS
Q301L,301R	41092323TS	TR DTC323TS
Q400	4109101145	TR DTA114ES
Q401	4109201445	TR DTC144ES
Q501,502	410520945P	TR 2SC945P
Q503-512	4109101245	TR DTA124ES
Q515	410520945P	TR 2SC945P
Q516	410500952L	TR 2SA952L
CN01	4490301002	EH 3P Top Base (2.5)
CN02,03	4490300268	Wire Holder 3P25
CN201	4490500270	5P FTW Top Base (2.0)
CN202	4490300270	3P FTW Top Base (2.0)
CN501	4491200261	Wire Holder 12P20
CN503	4492000263	FFC 20P Top Base (1.25MM)
CN505	4490200261	Wire Holder 2P20

Front P.C.B. Ass'y

Schematic Ref. No.	Part No.	Description
	C14A265820	Front P.C.B Ass'y
D511-513	4121901330	SID 1SS133
C504B	5159470210	CE 47u 10V M (MINI)
S501,502	4400000156	Tact Switch SKHVBE3520-CP
S503,504	4400000156	Tact Switch SKHVBE3520-CP
S505,506	4400000156	Tact Switch SKHVBE3520-CP
S507,508	4400000156	Tact Switch SKHVBE3520-CP
S509,510	4400000156	Tact Switch SKHVBE3520-CP
S511	4400000156	Tact Switch SKHVBE3520-CP
LED501-505	4120659YGW	LED 5Q L-59YGW (YEL/GRN)
CN503-	4492000265	FFC 20P Side Base (1.25MM)

HMB-5 P.C.B Ass'y

Schematic Ref. No.	Part No.	Description
	C1BA09911A	HMB-5 P.C.B Ass'y
U101	415C2521AQ	IC CXA2521AQ
U102	415C1372BQ	IC CXA1372BQ
U103	415C02510Q	IC CXD2510Q
U104	41596398FP	IC BA6398FP
U105-107	415308409F	IC TA8409F
U180	415902100M	IC NJM2100M-T1
U401	4159009RF1	IC PQ09RF1
U404	41596792FP	IC BA6792FP-Y
U501	0B12785V	IC HD6433396
U502	41534049BF	IC TC4049BF
JFE	4050A0000D	RK 0 1/10W J*

Schematic Ref. No.	Part No.	Description
J404,405	4050A0000D	RK 0 1/10W J*
J601	708055N081	600 OHM/100 MHz* Territe Chip Bead*
R101	407A11005Q	RN 10 1/10W J*
R102	4050A2235D	RK 22K 1/10W J*
R103	4050A1345D	RK 130K 1/10W J*
R104	4050A2245D	RK 220K 1/10W J*
R105,106	4050A9125D	RK 9.1K 1/10W J*
R107,108	4050A5125D	RK 5.1K 1/10W J*
R109	4050A9105D	RK 91 1/10W J*
R110	4050A1035D	RK 10K 1/10W J*
R111	4050A7535D	RK 75K 1/10W J*
R112	4050A5135D	RK 51K 1/10W J*
R114	4050A2245D	RK 220K 1/10W J*
R115	4050A5125D	RK 5.1K 1/10W J*
R116	4050A1545D	RK 150K 1/10W J*
R118,119	4050A2245D	RK 220K 1/10W J*
R120	4050A2745D	RK 270K 1/10W J*
R121	407A11245R	RN 120K 1/10W J*
R122	4050A1835D	RK 18K 1/10W J*
R123	4050A3345D	RK 330K 1/10W J*
R124	4050A5635D	RK 56K 1/10W J*
R127	4050A2445D	RK 240K 1/10W J*
R128	4050A1025D	RK 1K 1/10W J*
R136	4050A1045D	RK 100K 1/10W J*
R141	4050A4725D	RK 4.7K 1/10W J*
R142	4050A2235D	RK 22K 1/10W J*
R143	4050A1645D	RK 160K 1/10W J*
R144	4050A3935D	RK 39K 1/10W J*
R145	4050A2235D	RK 22K 1/10W J*
R149-151	4050A1015D	RK 100 1/10W J*
R152	4050A9125D	RK 9.1K 1/10W J*
R153	4050A5145D	RK 510K 1/10W J*
R164	4050A6825D	RK 6.8K 1/10W J*
R165	4050A3325D	RK 3.3K 1/10W J*
R166	4050A1035D	RK 10K 1/10W J*
R177	4050A2225D	RK 2.2K 1/10W J*
R178	4050A1025D	RK 1K 1/10W J*
R179,180	4050A5125D	RK 5.1K 1/10W J*
R181	4050A3935D	RK 39K 1/10W J*
R183	4050A2445D	RK 240K 1/10W J*
R194	4050A1035D	RK 10K 1/10W J*
R195-197	4050A3335D	RK 33K 1/10W J*
R198	4050A1015D	RK 100 1/10W J*
R199	4050A1035D	RK 10K 1/10W J*
R200	4050A3935D	RK 39K 1/10W J*
R401	4050A3315D	RK 330 1/10W J*
R402	4050A5635D	RK 56K 1/10W J*
R403	4050A1025D	RK 1K 1/10W J*
R404	4050A1045D	RK 100K 1/10W J*
R405	4050A1035D	RK 10K 1/10W J*
R406	4050A2245D	RK 220K 1/10W J*
R407	4050A4735D	RK 47K 1/10W J*
R408,409	4050A1045D	RK 100K 1/10W J*
R410	4050A1015D	RK 100 1/10W J*
R411	0B20068Y	RK 220 1/2W J
R412	4050A1035D	RK 10K 1/10W J*
R413	4050A5615D	RK 560 1/10W J*
R414-416	4050A1045D	RK 100K 1/10W J*
R417	0B20068Y	RK 220 1/2W J
R418	4050A1025D	RK 1K 1/10W J*
R419	4050A2245D	RK 220K 1/10W J*
R420	4050A1055D	RK 1M 1/10W J*
R421	4050A1035D	RK 10K 1/10W J*
R422	4050A1535D	RK 15K 1/10W J*
R506-513	4050A1035D	RK 10K 1/10W J*
R516	4050A1235D	RK 12K 1/10W J*
R517	4050A2225D	RK 2.2K 1/10W J*
R518	4050A1045D	RK 100K 1/10W J*
R519	4050A1035D	RK 10K 1/10W J*
R521	4050A4735D	RK 47K 1/10W J*
R524	4050A5105D	RK 51 1/10W J*
R527	4050A4725D	RK 4.7K 1/10W J*

Schematic Ref. No.	Part No.	Description
R528	4050A1055D	RK 1M 1/10W J*
R529,530	4050A4725D	RK 4.7K 1/10W J*
R531	4050A1055D	RK 1M 1/10W J*
R532	4050A4725D	RK 4.7K 1/10W J*
R536	4050A4735D	RK 47K 1/10W J*
R537-543	4050A4735D	RK 47K 1/10W J*
R545	4050A4715D	RK 470 1/10W J*
R548	4050A4735D	RK 47K 1/10W J*
R549	4050A1035D	RK 10K 1/10W J*
R551	4050A3345D	RK 330K 1/10W J*
R552	4050A1045D	RK 100K 1/10W J*
R553	4050A8235D	RK 82K 1/10W J*
R554	4050A1025D	RK 1K 1/10W J*
R563	4050A1035D	RK 10K 1/10W J*
R564,565	4050A4715D	RK 470 1/10W J*
R570	4050A2415D	RK 240 1/10W J*
R571	4050A5605D	RK 56 1/10W J*
R572	4050A1215D	RK 120 1/10W J*
R573	4050A8205D	RK 82 1/10W J*
R813,814	4050A0000D	RK 0 1/10W J*
C100	MU22250224	Multi 2.2u 16V Z*
C101	5158101M06	CE 100u 6.3V M (MINI)
C102	510127215D	CC 0.0027u 50V K*
C103	510410442D	CC 0.1u 25V Z*
C104	MU42250251	Multi 2.2u 16V K*
C105	510122215D	CC 0.0022u 50V K*
C106	510410442D	CC 0.1u 25V Z*
C108	510122215D	CC 0.0022u 50V K*
C109,110	510410442D	CC 0.1u 25V Z*
C111	510147215D	CC 0.0047u 50V K*
C112,113	510110315D	CC 0.01u 50V K*
C114	510410442D	CC 0.1u 25V Z*
C115	510147312D	CC 0.047u 25V K*
C116	510147215D	CC 0.0047u 50V K*
C117	5158479M25	CE 4.7u 25V M (MINI)
C118	510410442D	CC 0.1u 25V Z*
C119	510115215D	CC 0.0015u 50V K*
C120	510122315D	CC 0.022u 50V K*
C121	510110315D	CC 0.01u 50V K*
C122	510410442D	CC 0.1u 25V Z*
C123	5158100M16	CE 10u 16V M (MINI)
C124	MU22250224	Multi 2.2u 16V Z*
C125	MU42250251	Multi 2.2u 16V K*
C126	510410442D	CC 0.1u 25V Z*
C127	MU22250224	Multi 25P 16V Z*
C128,129	510410442D	CC 0.1u 25V Z*
C130	510133315D	CC 0.033u 50V K*
C131	510410442D	CC 0.1u 25V Z*
C132	510110315D	CC 0.01u 50V K*
C134	510110315D	CC 0.01u 50V K*
C135	510410442D	CC 0.1u 25V Z*
C136	512B10255D	CC 0.001u 50V J* (CH)
C140	510410442D	CC 0.1u 25V Z*
C141	5158470M16	CE 47u 16V M (MINI)
C142,143	510410442D	CC 0.1u 25V Z*
C144	510133315D	CC 0.033u 50V K*
C146	510115215D	CC 0.0015u 50V K*
C147	510147312D	CC 0.047u 25V K*
C148	512B10155D	CC 100P 50V J* (CH)
C150,151	512B33055D	CC 33P 50V J* (CH)
C158-162	510410442D	CC 0.1u 25V Z*
C165	510115412E	CC 0.15u 25V K*
C166	512B47055D	CC 47P 50V J* (CH)
C169	512B10155D	CC 100P 50V J* (CH)
C403	5158101M10	CE 100u 10V M (MINI)
C404	510410442D	CC 0.1u 25V Z*
C405	5158221M10	CE 220u 10V M (MINI)
C406	510147312D	CC 0.047u 25V K*
C407	5158330M16	CE 33u 16V M (MINI)
C409	5158101M16	CE 100u 16V M (MINI)
C411	2000001134	CG 0.1F 5.5V Z (Gold)

Schematic Ref. No.	Part No.	Description
C413,414	510410442D	CC 0.1u 25V Z*
C417	5158330M10	CE 33u 10V M (MINI)
C419	510147312D	CC 0.047u 25V K*
C422	512B10255D	CC 0.001u 50V J* (CH)
C504	510410442D	CC 0.1u 25V Z*
C505,506	512B56155D	CC 560P 50V J* (CH)
C507	MU22250224	CC Multi 25P 16V Z*
C509	512B47055D	CC 47P 50V J* (CH)
C516	510410442D	CC 0.1u 25V Z*
C521	510410442D	CC 0.1u 25V Z*
C820,821	512B18055D	CC 18P 50V J* (CH)
D101	412MA152WK	SID MA152WK*
D121	412MA152WK	SID MA152WK*
D404	412MA152WA	SID MA152WA*
D406	412MA152WA	SID MA152WA*
D409	412MA152WA	SID MA152WA*
D516	412MA152WK	SID MA152WK*
D521	412MA152WK	SID MA152WK*
ZD401	412152056J	ZD RD5.6JSB2
ZD402	412153075J	ZD RD7.5JSB3
ZD403	412152062J	ZD RD6.2JSB2
ZD404	412152056J	ZD RD5.6JSB2
ZD502,503	41215J062B	ZD MTZJ6.2B
ZD521	412152051J	ZD RD5.1JSB2
L101	4320121147	Peaking Coil 120uH*
L102	4325010094	Peaking Coil 10uH
L503	4320121147	Peaking Coil 120uH*
Q101	SA10011320	TR 2SB1132-P,Q,R*
Q121	SA50144EKA	TR DTC144EKA*
Q401	SA11182TLQ	TR 2SB1182TLQR*
Q402	SA2002412K	TR 2SC2412K-Q,R,S*
Q403	SA32153TLV	TR 2SD2153TLVW*
Q404	SA31758F5Q	TR 2SD1758F5-Q*
Q411-413	SA2002412K	TR 2SC2412K-Q,R,S*
Q414	SA31758F5Q	TR 2SD1758F5-Q*
Q501	SA2002412K	TR 2SC2412K-Q,R,S*
Q502	SA50144EKA	TR DTC144EKA*
Q521	SA40114EKA	TR DTA114EKA*
Q522	SA2002412K	TR 2SC2412K-Q,R,S*
VR101-104	0B32186A	SVR 22K PH0411CJ4J
X501	416090600M	Resonator CST-6.00MGW
X801	0B92063A	X'tal 16.9344M AT-51
TP101	4490800328	8P CON. Header Base
TP102	0B84894A	CON. Header 2P RE-H022SD-1190
SP101	0B80998A	CON. Short Socket JM-2BK-61
CN501	4491201004	PH 12P Top Base
CN502	4490701004	PH 7P Top Base
CP101	4491600302	Molex-Smt 16P Top Base
CP102	4490800301	Molex-Smt 8P Side Base
CP103	4492200301	Molex-Smt 22P Side Base

Power Switch P.C.B. Ass'y

Schematic Ref. No.	Part No.	Description
	C04A265830	Power Switch Ass'Y
C20	5100472243	Spark "K" 0.0047u/AC400V

Sensor P.C.B. Ass'y

Schematic Ref. No.	Part No.	Description
	C04A265840	Sensor P.C.B. Ass'y
CN504-	4494000314	40P Side Pin Header
RM501	714SPS4471	Remote Receiver SPS-447-1

LED P.C.B. Ass'y

Schematic Ref. No.	Part No.	Description
	C04A265850	LED P.C.B. Ass'y
D505-508	412064240D	LED 5Q EL424-6USOD/S283 (Amber)
CN505-	4490200261	Wire Holder 2P20

H/P P.C.B. Ass'y

Schematic Ref. No.	Part No.	Description
	C04A265860	H/P P.C.B. Ass'y
JK200	4500700390	H/P Jack JY-6317-01-030G2
CN202-	4490300261	Wire Holder 3P20

VR P.C.B. Ass'y

Schematic Ref. No.	Part No.	Description
	C04A265870	VR P.C.B. Ass'y
VR201	5025254324	VR 50KBX2 RK14K12B
CN201-	4490500261	Wire Holder 5P20

TR P.C.B. Ass'y

Schematic Ref. No.	Part No.	Description
	C04A265890	TR P.C.B. Ass'y
Q01	410030313F	TR 2SD313F
CN02-	4490300268	Wire Holder 3P25

IC P.C.B. Ass'y

Schematic Ref. No.	Part No.	Description
	C04A2658A0	IC P.C.B. Ass'y
IC02	41597805FA	IC NJM7805FA
CN03-	4490300268	Wire Holder 3P25

Traverse P.C.B. Ass'y

Schematic Ref. No.	Part No.	Description
	C0BA09777A	Traverse P.C.B. Ass'y
CN102	4490800301	Molex-SMT Side Base
PC201	4120GP1S93	Photo Interlapt GP1S93
	0C10111A	Sensor Adaptor-2

7. IC BLOCK DIAGRAMS

System Control MPU (U501)

Pin No.	Pin Name	Signal Name	I/O	Function
1	$\overline{\text{RES}}$	$\overline{\text{RESET}}$	I	Reset signal.
2	XTAL	XTAL	—	MPU clock (6MHz).
3	EXTAL	EXTAL	—	MPU clock (6MHz).
4	MD1	MD1	I	MPU mode select signal. (Fixed at H.)
5	MD0	MD0	I	MPU mode select signal. (Fixed at H.)
6	$\overline{\text{NMI}}$	$\overline{\text{NMI}}$	I	Non-maskable interrupt. (Fixed at H.)
7	$\overline{\text{STBY}}$	$\overline{\text{STBY}}$	I	Standby signal. (Fixed at H.)
8	VCC	VCC	—	+5V.
9	CLK-IN	CLK-IN	I	S-bus clock input (SCI).
10	DAT-IN	DAT-IN	I	S-bus data input (SCI).
11	SYS-ON	SYS-ON	O	System ON control signal. (Active H.)
12	VSS	VSS	—	GND
13	NC	NC	—	—
14	NC	NC	—	—
15	NC	NC	—	—
16	NC	NC	—	—
17	NC	NC	—	—
18	$\overline{\text{BSENS}}$	$\overline{\text{BSENS}}$	I	Battery voltage sensing signal.
19	$\overline{\text{ACC-CNT}}$	$\overline{\text{ACC-CNT}}$	I	ACC control signal.
20	SQCK	SQCK	O	Sub-Q clock for DSP (Digital Signal Processor) IC.
21	KEY1	KEY1	I	Key 1 signal.
22	KEY2	KEY2	I	Key 2 signal.
23	$\overline{\text{SCOR}}$	$\overline{\text{SCOR}}$	I	Sub-Q interrupt from DSP IC.
24	LD-PLS	LD-PLS	I	Loading pulse.
25	UD-PLS	UD-PLS	I	Up/down pulse.
26	KEY3	KEY3	I	Key 3 signal.
27	KEY4	KEY4	I	Key 4 signal.
28	KEY5	KEY5	I	Key 5 signal.
29	AVCC	AVCC	—	Analog GND.
30	SENSE	SENSE	I	Sense signal from DSP IC.
31	SQSO	SQSO	I	Sub-Q data from DSP IC.
32	FOK	FOK	I	Focus OK signal.
33	GFS	GFS	I	GFS OK signal from DSP IC.
34	UD-HOME	UD-HOME	I	Up/down ref. position signal.
35	DOOR	DOOR	I	Door open signal.
36	SHUTTER	SHUTTER	I	Shutter signal.
37	LD-INOUT	LD-INOUT	I	Loading in signal.
38	AVSS	AVSS	—	Analog GND.

Pin No.	Pin Name	Signal Name	I/O	Function
39	DLOCK	DLOCK	I	Disc lock signal.
40	DCNT	DCNT	I	Disc count signal.
41	DCNTHOME	DCNTHOME	I	Disc count home position signal.
42	UD-UP	UD-UP	O	Up/down motor down signal. (Active H.)
43	UD-DOWN	UD-DOWN	O	Up/down motor up signal. (Active H.)
44	DSPSEL	DSPSEL	I	DSP select signal.
45	FRONT	FRONT	O	Loading motor rear signal. (Active H.)
46	REAR	REAR	O	Loading motor front signal. (Active H.)
47	VCC	VCC	—	+5V.
48-55	NC	NC	—	—
56	VSS	VSS	—	—
57-59	NC	NC	—	—
60	DATA	DATA	O	Command data to DSP IC.
61	$\overline{\text{IR-ON}}$	$\overline{\text{IR-ON}}$	O	Interruption ON signal. (Active L.)
62	$\overline{\text{LDON}}$	$\overline{\text{LDON}}$	O	Laser ON signal. (Active L.)
63	CDRST	CDRST	O	CD reset signal. (Active L.)
64	ENCLK	ENCLK	O	Output enable control signal. (Active H.)
65	LED1	LED1	O	DISC1 LED ON/OFF signal. H:ON
66	LED2	LED2	O	DISC2 LED ON/OFF signal. H:ON
67	LED3	LED3	O	DISC3 LED ON/OFF signal. H:ON
68	LED4	LED4	O	DISC4 LED ON/OFF signal. H:ON
69	LED5	LED5	O	DISC5 LED ON/OFF signal. H:ON
70-72	NC	NC	—	—
73	VSS	VSS	—	—
74	ST-DOWN	ST-DOWN	O	Stocker motor down signal. (Active H.)
75	ST-UP	ST-UP	O	Stocker motor up signal. (Active H.)
76	CLK	CLK	O	Command clock to DSP IC.
77	MUTE	MUTE	O	Mute signal. (Active H.)
78	DATA-OUT	DATA-OUT	O	S-bus data output.
79	XLAT	XLAT	O	Latch signal to DSP IC. (Active L.)
80	CLK-OUT	CLK-OUT	O	S-bus clock output.

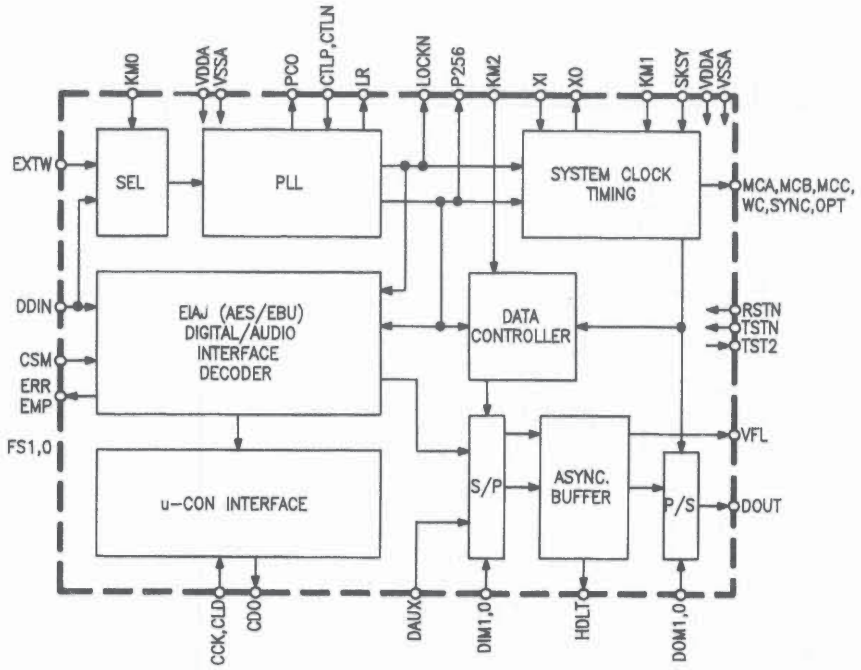


Fig. 7.1 D/A Inverter YM3436D (IC205)

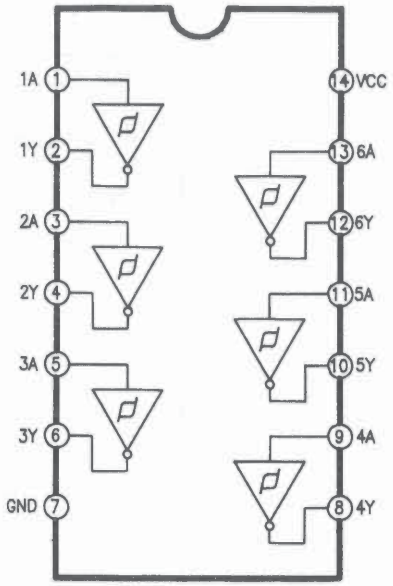


Fig. 7.3 Schmitt-trigger Inverters TC74HC14AP (IC206)

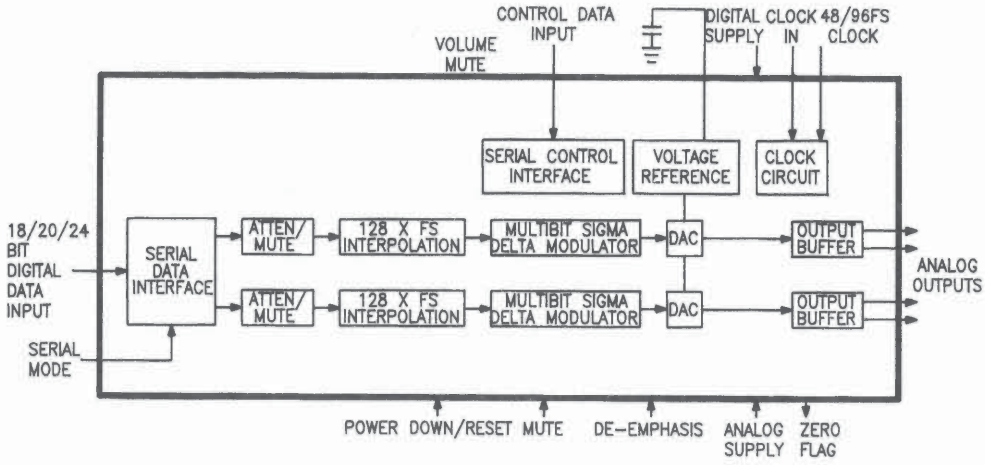


Fig. 7.2 D/A Converter AD1855 (IC100)

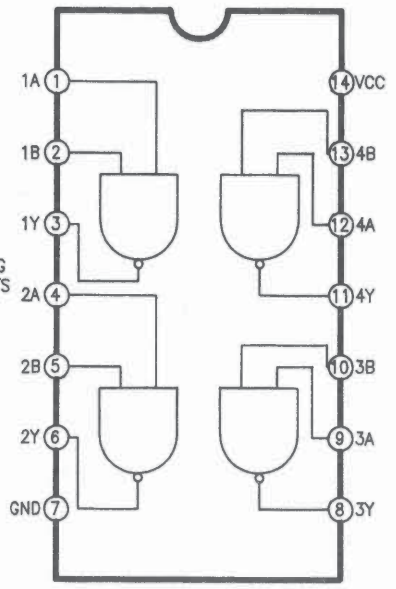


Fig. 7.4 NAND Gates TC74HC00AP (IC601)

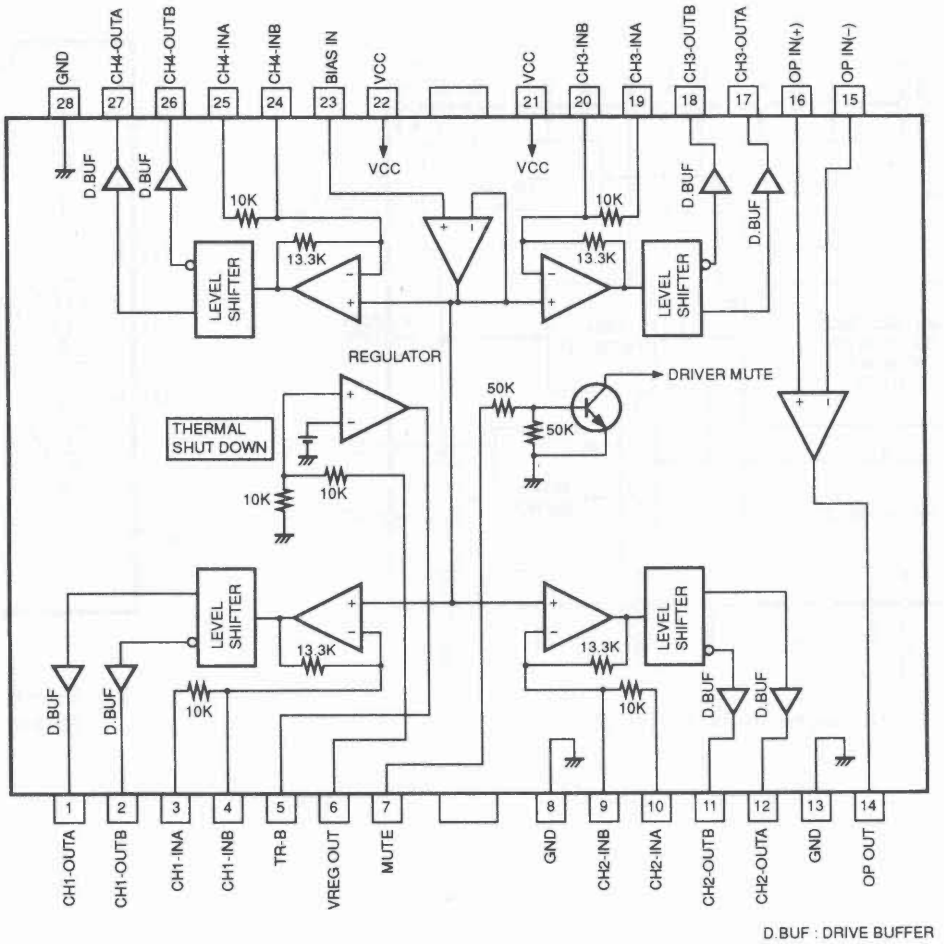


Fig. 7.5 BTL Driver BA6398FP (U104)

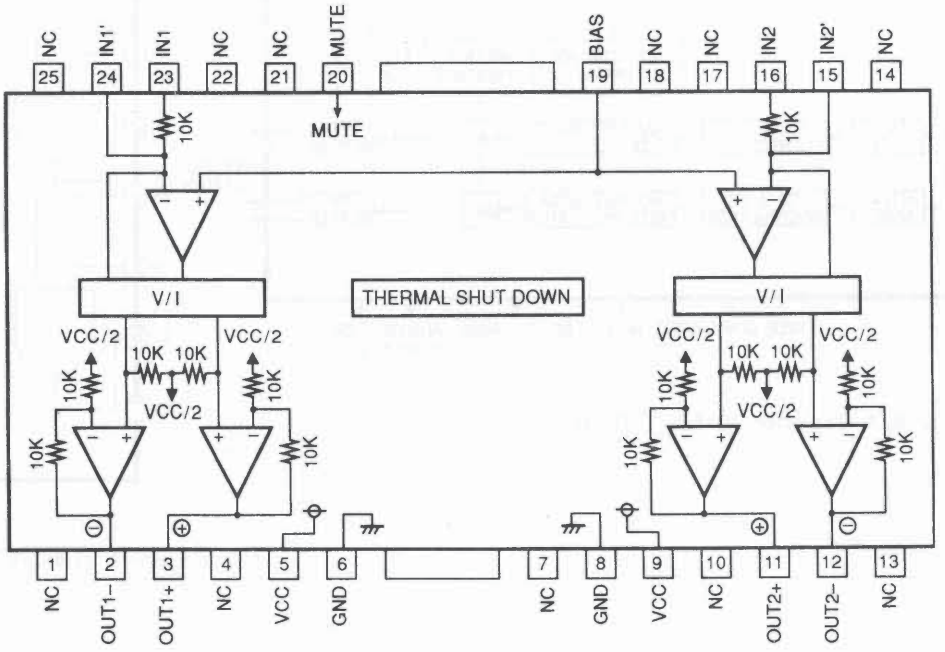


Fig. 7.6 Motor Driver BA6792FP (U404)

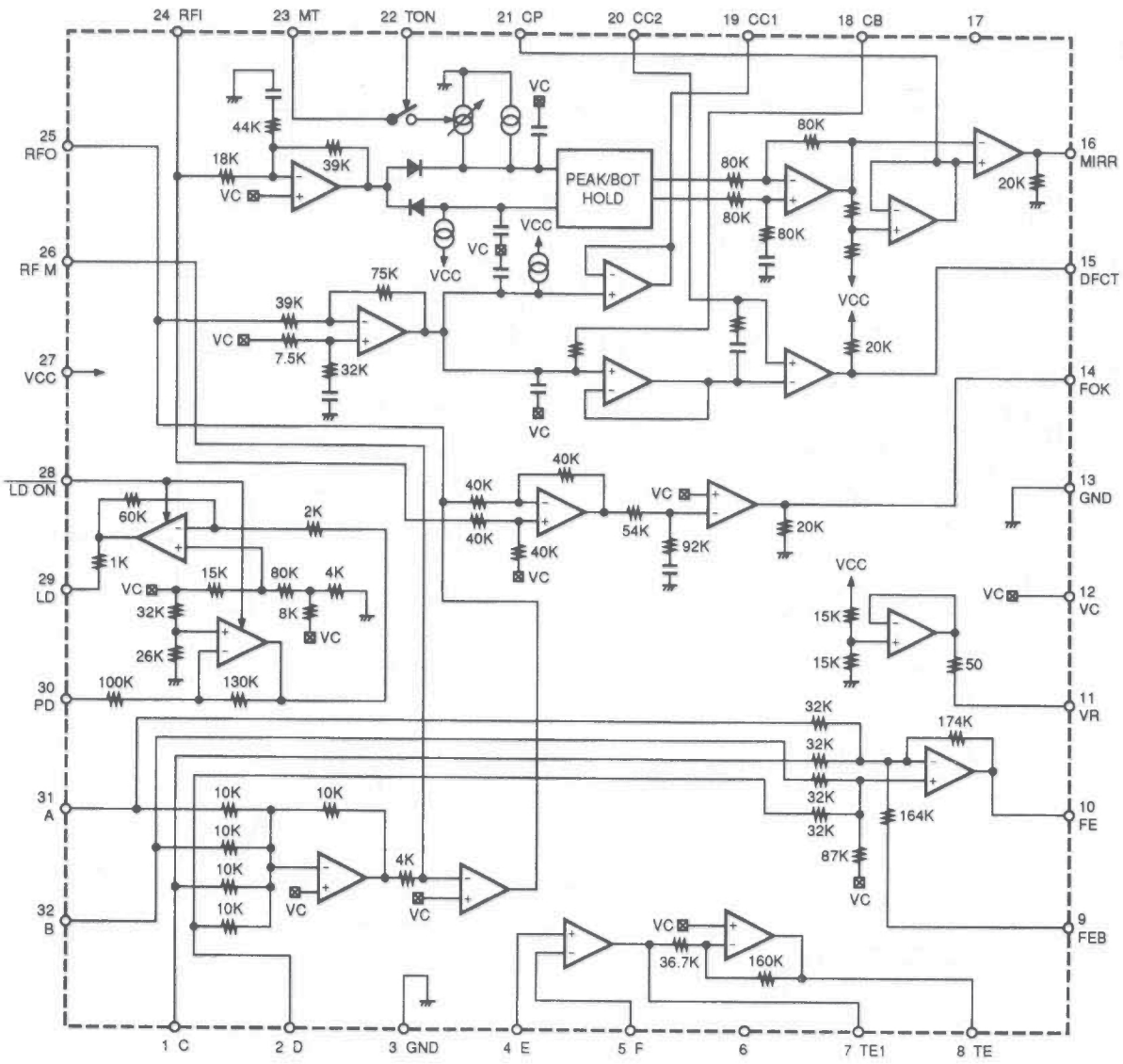


Fig. 7.7 RF Amp. CXA2521Q (U101)

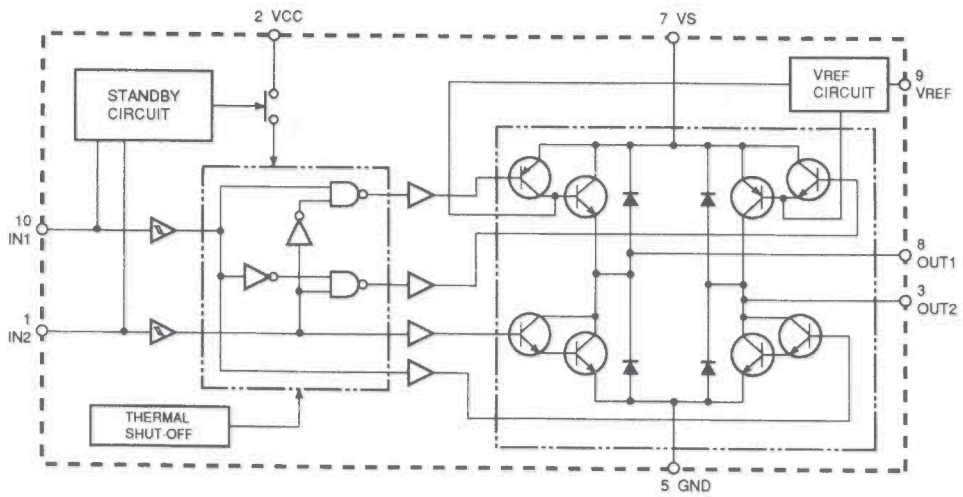


Fig. 7.8 Motor Driver TA8409F (U105, 106, 107)

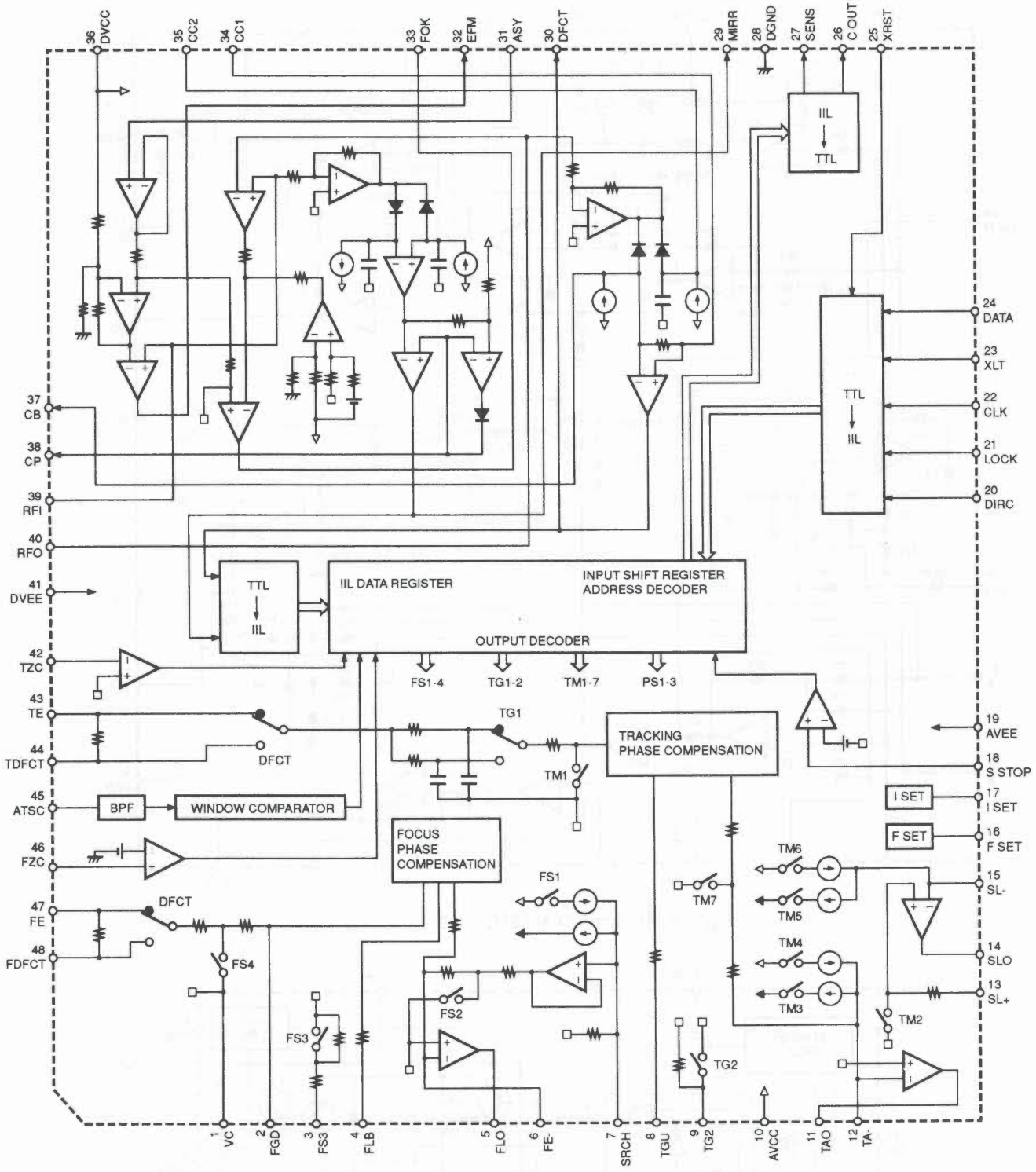


Fig. 7.9 Servo Amp. CXA1372AQ (U102)

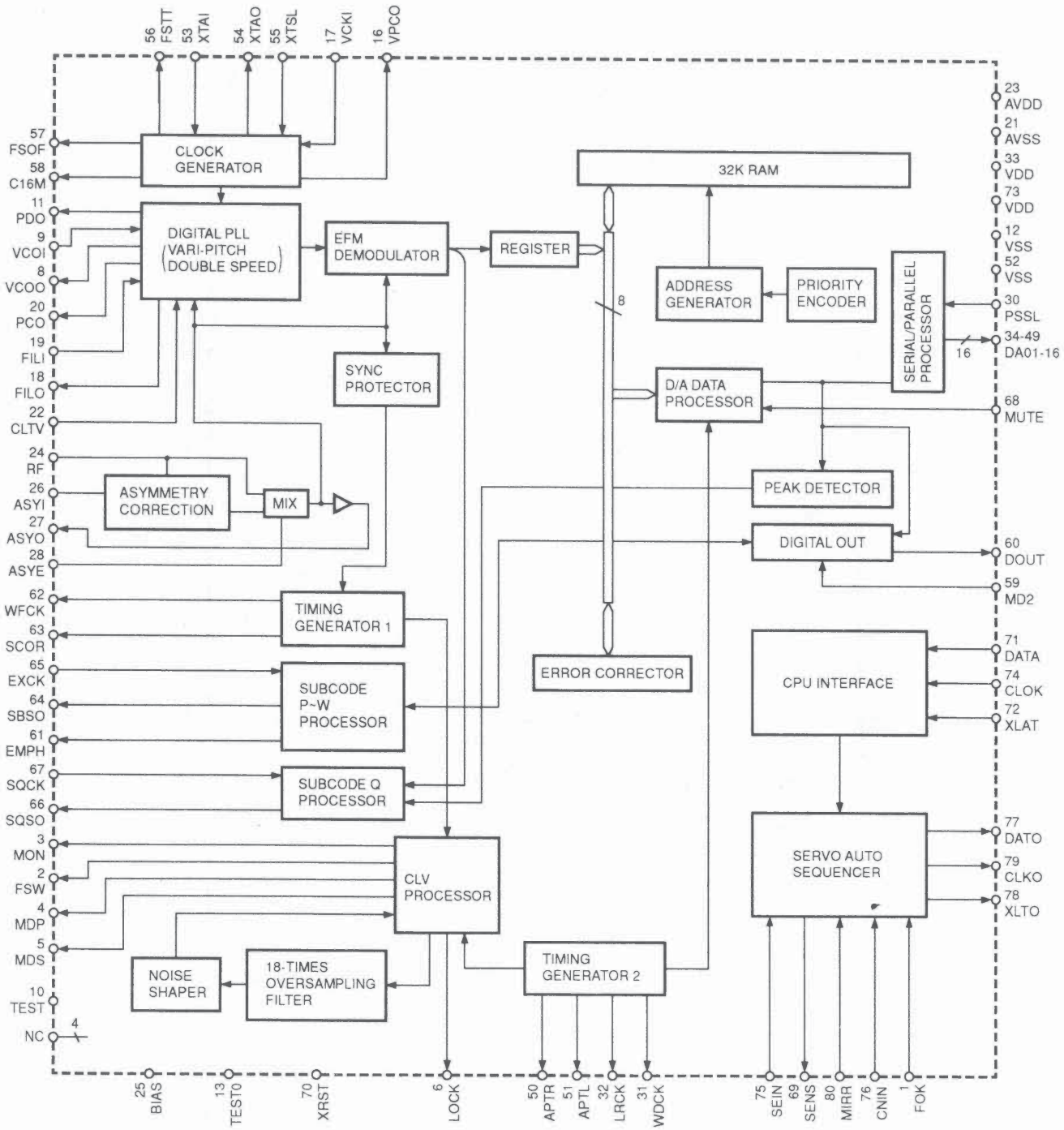


Fig. 7.10 Digital Signal Processor CXD2510Q (U103)

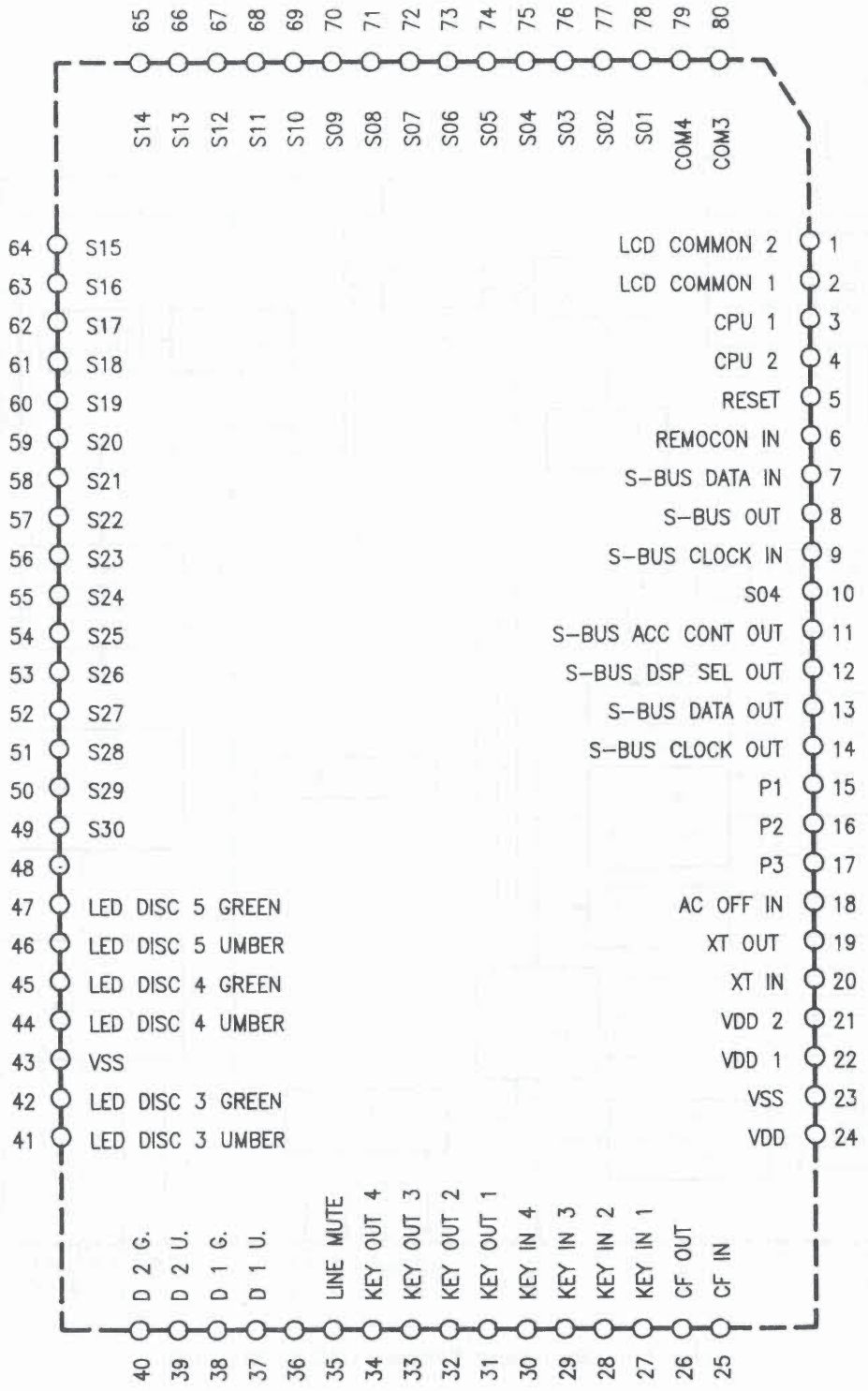


Fig. 7.11 u-con. LC587006-XXX (IC501)

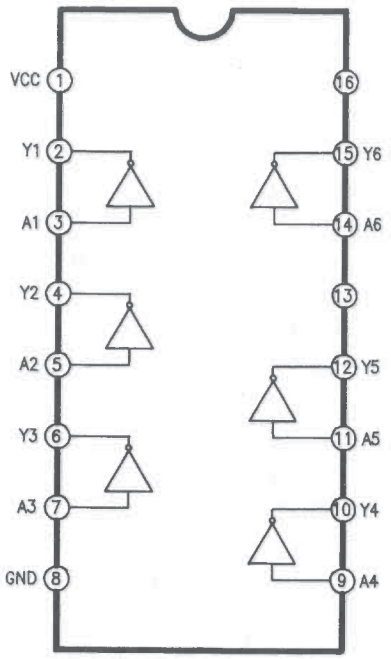


Fig. 7.12 Inverter TC4049BF (U502)

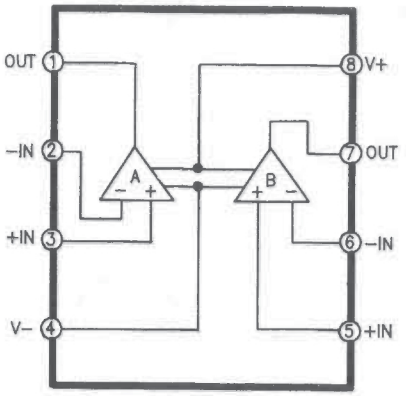


Fig. 7.13 O/P Amp. NJM2114D (IC301L/R) NJM2100M (U180)

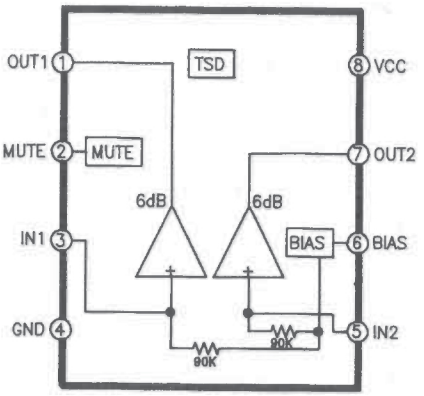
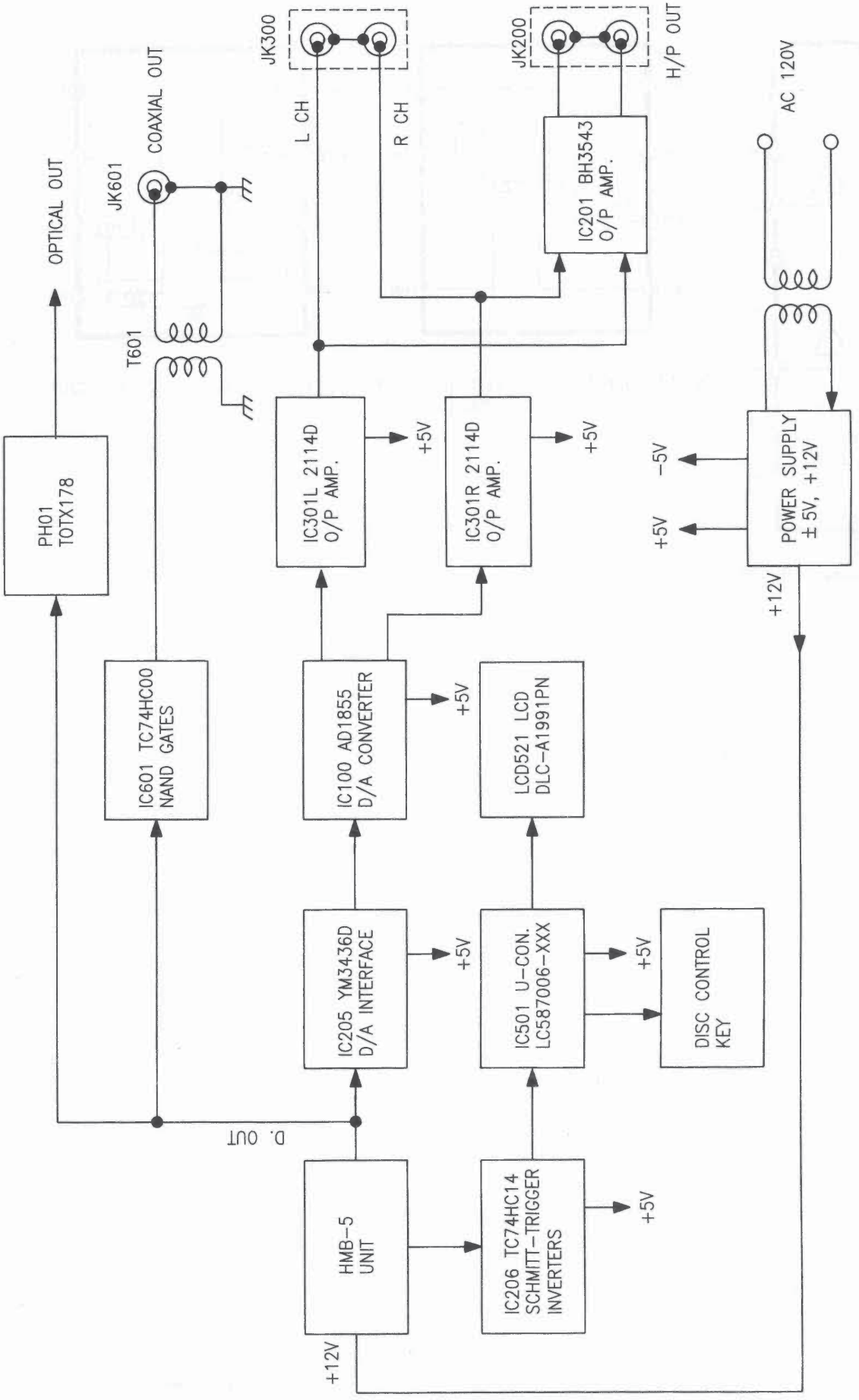


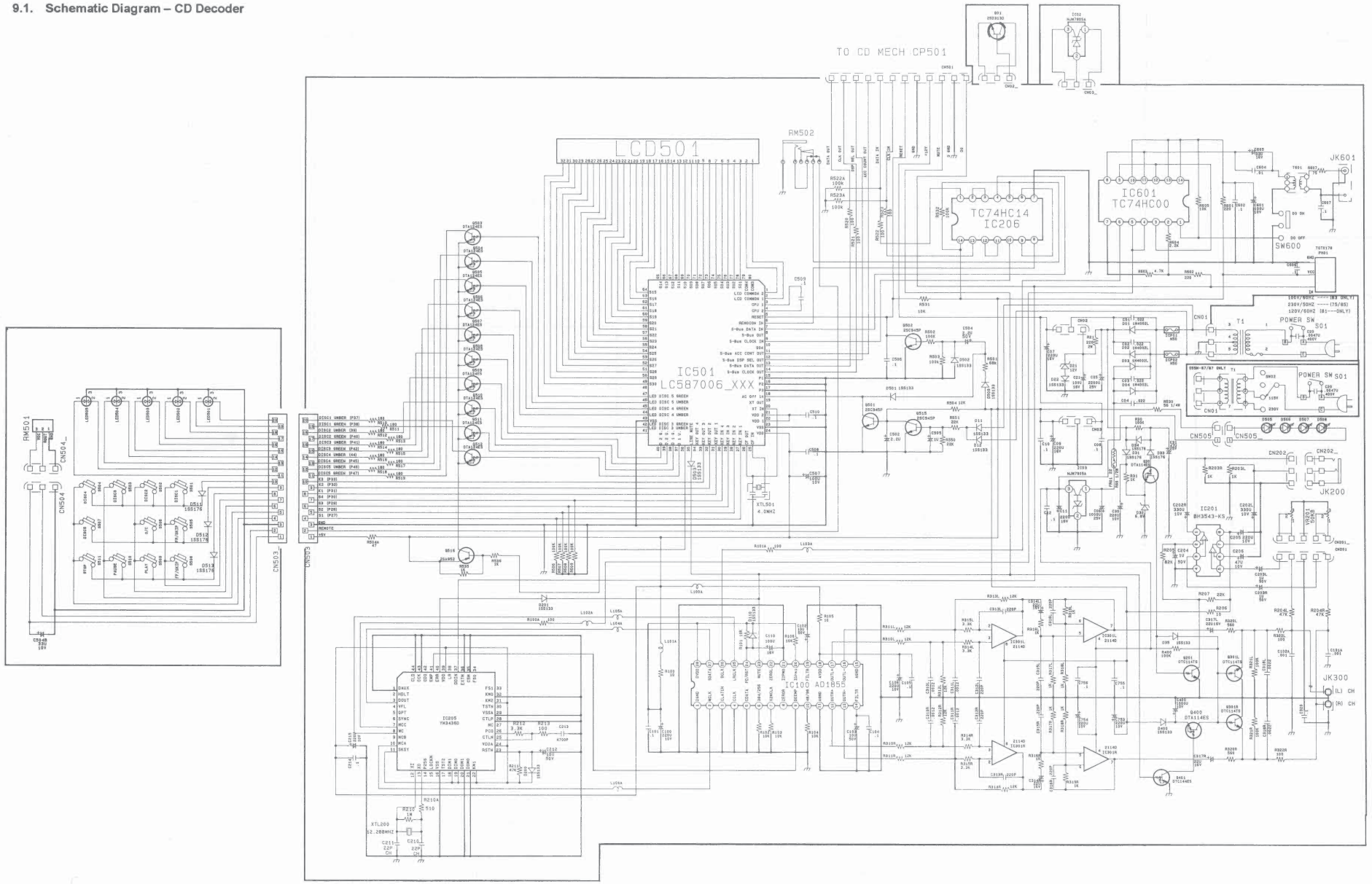
Fig. 7.14 O/P Amp. BH3543F (IC201)

8. BLOCK DIAGRAM

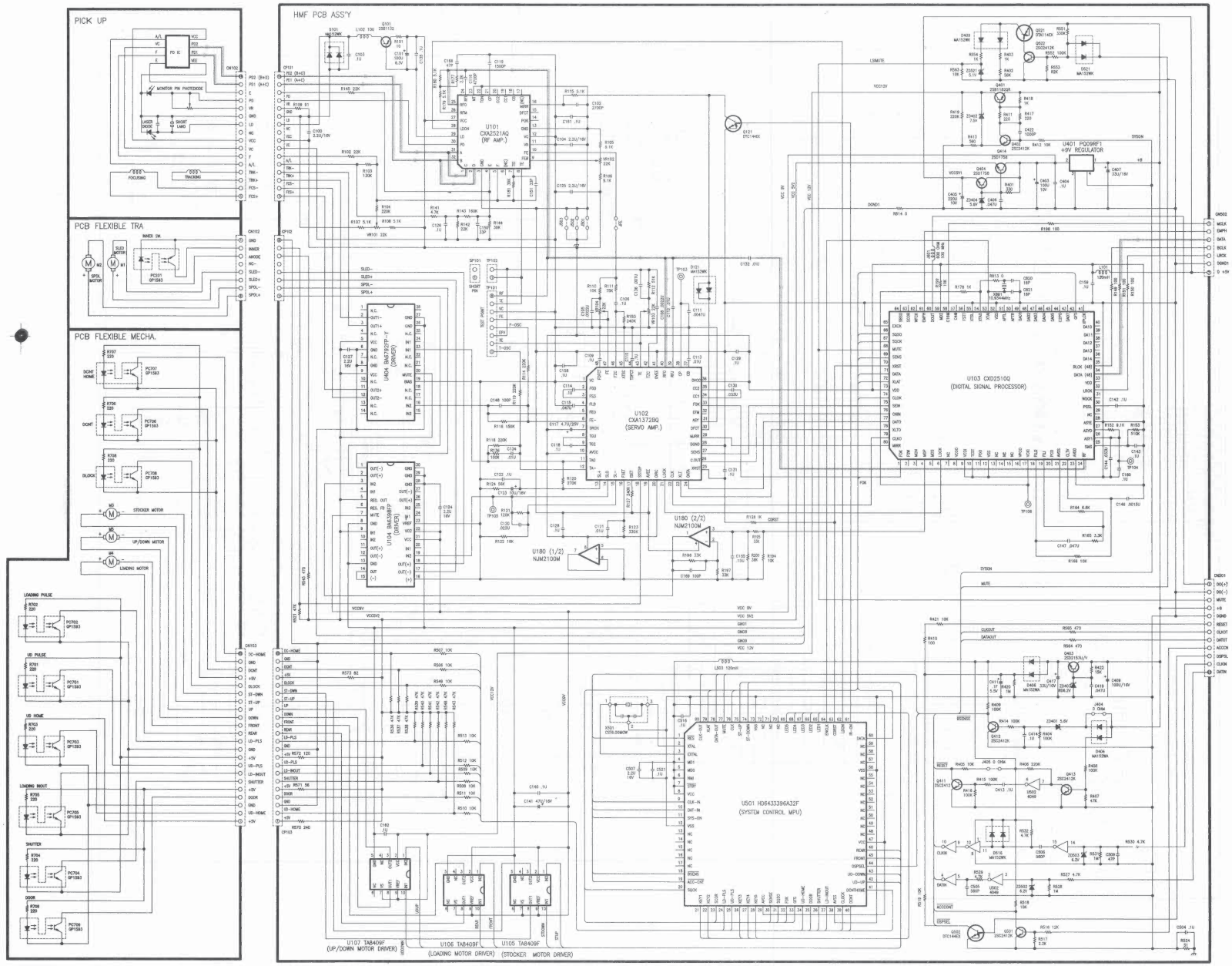


9. SCHEMATIC DIAGRAM

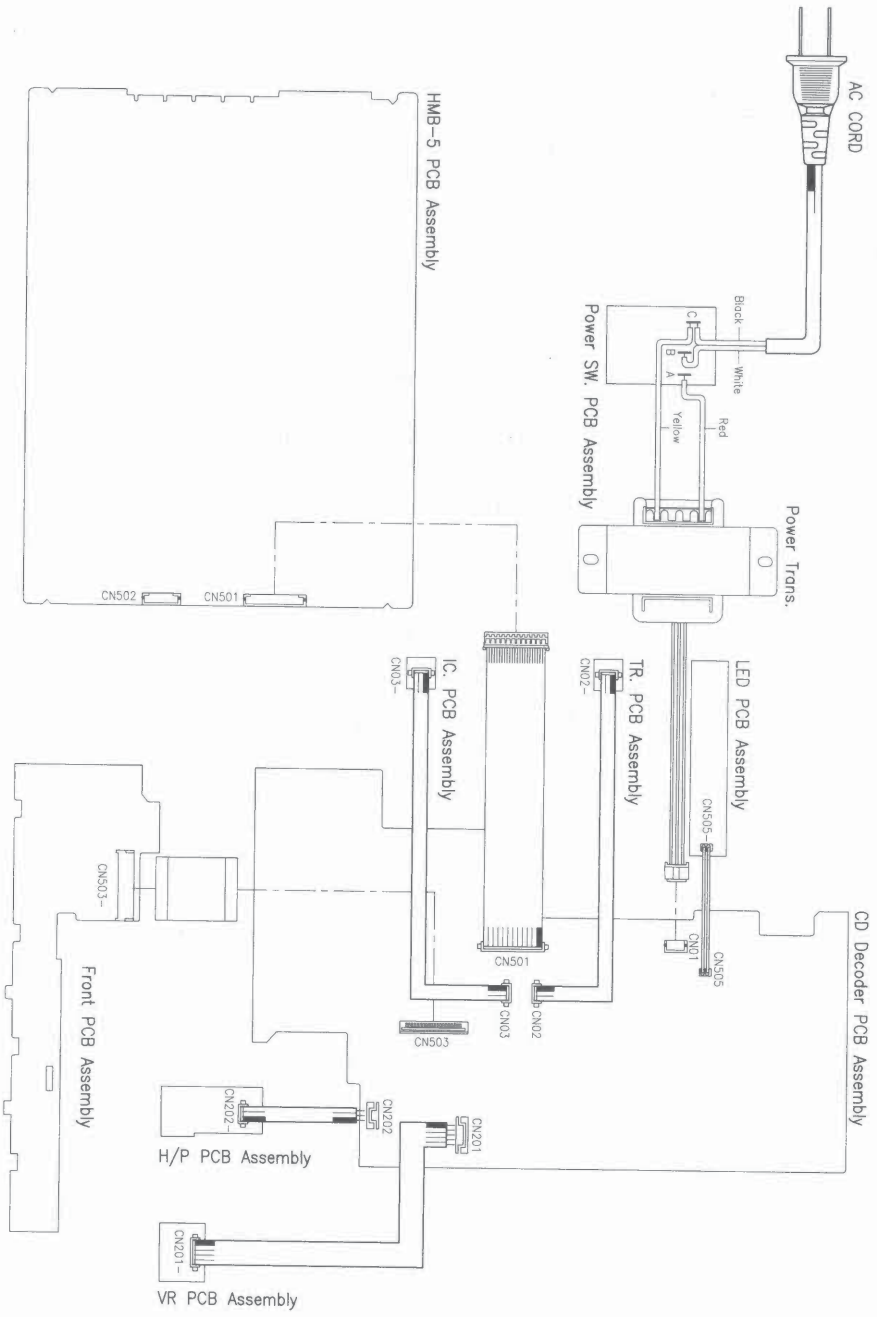
9.1. Schematic Diagram – CD Decoder



9.2. Schematic Diagram – HMB-5



10. WIRING DIAGRAM



11. SPECIFICATIONS

Main Unit

System.....Compact Disc digital audio
Signal Readout.....Optical (semiconductor laser)
Error Correction.....CIRC principle
Number of channels.....2 channels, stereo
D/A Converter type.....24-bit Dual D/A Converters
with 8-times oversampling digital filter
Sampling Frequency.....44.1 kHz
Quantization.....16-bit linear
Disc Rotational Velocity.....Approx. 200 to 500 rpm
(constant linear velocity)
Wow-and-Flutter.....Below measurement limit
Frequency Response.....5 - 20,000 Hz ± 0.5 dB
Total Harmonic Distortion.0.003% or less (1 kHz,0 dB)
T.H.D. + Noise.....0.004% (1 kHz)
Signal-to-Noise Ratio...Better than 100 dB(IHF A-WTD)
Dynamic Range.....Better than 100 dB
Channel Separation.....Better than 90 dB
Output Level/Impedance
Line (Fixed).....2.0V/600 ohms (1 kHz, 0 dB)
Headphone (Variable)..... 40 mW/40 ohms
(Phones Level Max.)
Digital Output
Coaxial.....75 ohms
Optical.....660 nm,-18 dBm
Power Source.....AC 120V, 60 Hz
AC 110 - 120 V or AC 220 - 240 V, 50/60 Hz
(According to country of sale)
Power Consumption.....25W max.
Dimensions.....430 (W)x70 (H)x270 (D) mm,
16-15/16 (W)x2-3/4 (H)x10-5/8 (D) inches
Approximate Weight.....5.5 kg, 12 lbs. 2 oz.

Remote Control Unit

Principle.....Infrared pulse system
Power supply.....3V DC (1.5V x2)
Dimensions.....55 (W)x19 (H)x182 (D) mm,
2-3/16 (W)x3/4 (H)x7-3/16 (D) inches
Approximate Weight..100 g,4 oz. (including batteries)

Supplied Accessories

Shielded cable with RCA-type plug (1)
IEC R03 (size AAA) batteries (2)

* Dimensions do not include protruding parts. Height is the panel height.
Specifications and design are subject to change for further improvement without notice.

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