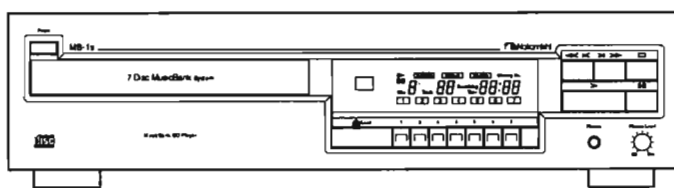


# Service Manual

## MB-1s MB-2s MB-3s

MusicBank CD Player



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## Specifications

Schematic Diagram (See attached sheet except for DAC circuit [MB-1s].)

## 1. GENERAL

### 1.1. Product Code

V328 (MB-1s)  
V329 (MB-2s)  
V330 (MB-3s)

### 1.2. Destinations


USA, CAN, EP, UK, AUS, OTR, JPN

#### Abbreviations

USA — U.S.A.  
CAN — Canada  
EP — Europe  
UK — United Kingdom  
AUS — Australia  
OTR — Other  
JPN — Japan

### 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: GaAlAs  
Laser output: 0.5mW Max.  
Wavelength: 790 ± 25 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 Compact Disc Player must be adjusted and repaired only by qualified service personnel.

#### OBSERVERA!

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

#### OBS!

Indstilling af knapper, omskiftere og øvrige kontrolknapper, som ikke følger den i brugsanvisningen beskrevne måde, kan resultere i farlig laserudstråling. Justering eller reparation af denne CD-afspiller må kun udføres af kvalificeret servicepersonale.

#### OBS!

Justering av ratt, brytere og kontroller andre enn de som er beskrevet her, kan resultere i farlig laserbestråling. Justering eller reparasjon av denne kompaktdiskspilleren må bare utføres av kvalifiserte fagfolk.

#### HUOMAUTUS

Jos nuppeja, kytkimiä ja säätimiä ym, säädetään tai laitetta käytetään toisella tavalla kuin on selostettu, tuloksena saattaa olla vaarallista lasersäteiden vuotoa. CD-soittimen säätö ja korjaus on jätettävä aina asiantuntevan huoltoteknikon tehtäväksi.

ADVERSEL: USYNLIG LASERSTRÅLING VED ÅBNING.  
UNDGÅ UDSAETTEELSE FOR STRÅLING.

VARO!: AVATTAESSA OLET ALTTIINA  
NÄKYMÄTTÖMÄLLE LASERSÄTEILYLLE.  
ÄLÄ KATSO SÄTEESEEN.

VARNING — OSYNLIG LASERSTRÅLNING NAR  
DENNA DEL ÄR ÖPPNAD. BETRakta  
EJ STRÅLEN.

CLASS 1  
LASER PRODUCT

THIS COMPACT DISC PLAYER IS CLASSIFIED AS A CLASS 1 LASER PRODUCT. THE CLASS 1 LASER PRODUCT LABEL IS LOCATED ON THE REAR EXTERIOR.

### 1.4. Voltage Selectors

Voltage selector is installed on the Rear Panel of the MB-1s/2s/3s (OTR). The voltage selector can select either 110-127V or 220-240V at customer's disposal.

### 1.5. Handling the Laser Pickup

In case of repair or replacement of the Laser Pickup, pay attention to the following handling instructions since the laser diode in the Laser Pickup is not resistant to static electricity.

#### (1) Grounding

When you repair a Laser Pickup, first ground the human body, as well as the measuring instruments and other tools (with particular caution to soldering iron). What's more, your workbench and floor should desirably be grounded using conductive sheet or copper plate. See Fig. 1.1 on next page.

**NOTE:** Be careful so as not to let your clothes touch the Laser Pickup, as static electricity on the clothes will not be released even if your body is grounded.

#### (2) Discharge of Electricity

Be sure to discharge electricity from objects brought into contact with the Laser Pickup (i.e., soldering iron, tweezers, probes, volt-ohm-meter probes, etc.) before starting work by contacting them with the body chassis. Besides, never touch the Laser Pickup while power is applied.

#### (3) Soldering Iron to be Used

The soldering iron for use in repair work should be: (1) a ceramic soldering iron, (2) a soldering iron with its metal part grounded, or (3) a soldering iron whose insulation resistance after five minutes of power application is 10 M-ohm or more at 500 VDC. Soldering should be completed promptly, at a soldering iron temperature of 320° max (39 W). A soldering iron heated above this temperature can break down the laser diode.

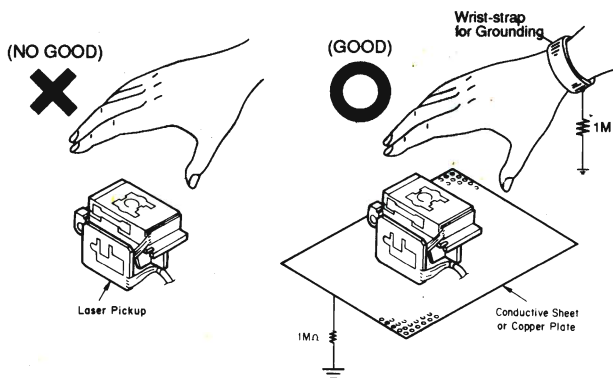


Fig. 1.1 Handling the Laser Pickup

### 1.6. Sticker Operation Check Function at Power ON

A series of sticker operation can be checked at power ON by grounding the RAM Reset signal line on the Main P.C.B. Ass'y. This function is useful to check whether any CD is left in the sticker before returning the unit to the customer.

- (1) Turn OFF the power.
- (2) Remove the Top Cover Ass'y.
- (3) Short the RAM Reset jumper wires. See Fig. 1.2.
- (4) Turn ON the power and then remove shorting.
- (5) The sticker raises to the uppermost position, and then starts a series of CD unload operation as follows:

Disc No.: 7 → 6 → 5 → 4 → 3 → 2 → 1

- (6) After completion of the sticker operation, the unit returns to standby condition.

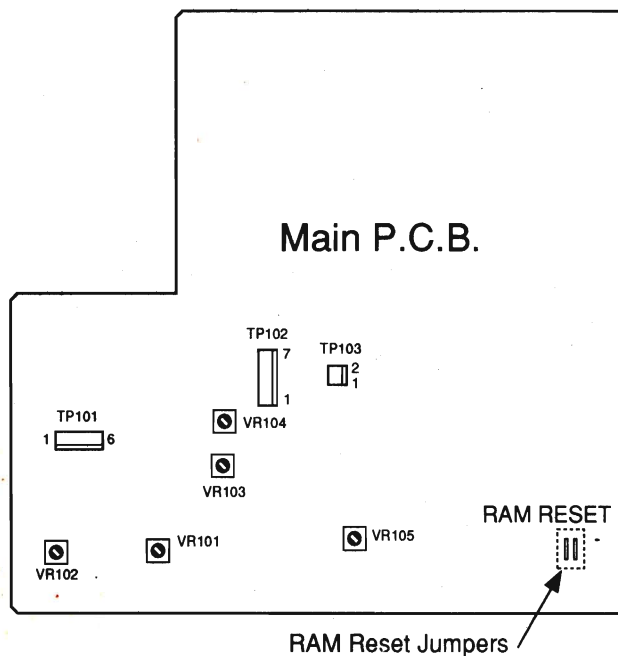


Fig. 1.2 Sticker Operation Check at Power ON

### 1.7. Package Ass'y and Accessory Ass'y

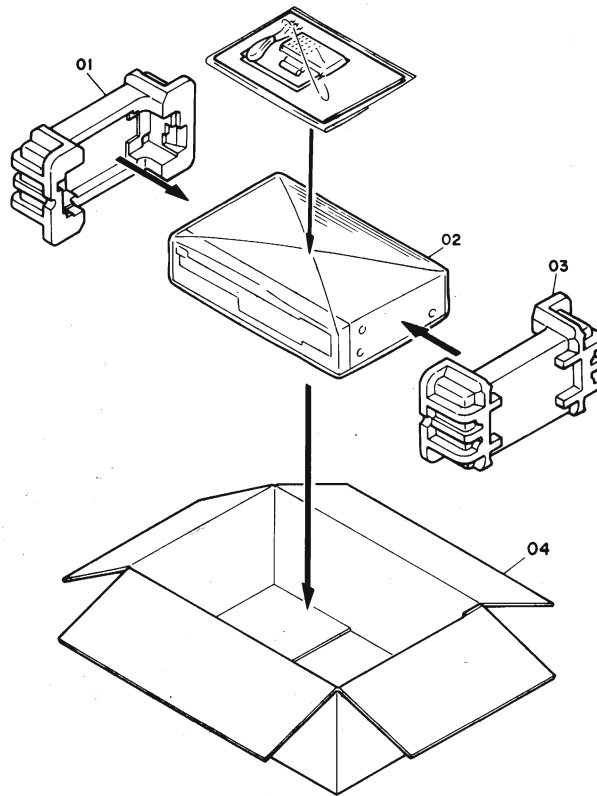


Fig. 1.3

| Schematic Ref. No.     | Part No. | Description                            | Q'ty |
|------------------------|----------|--|------|
| <b>Package Ass'y</b>   |          |  |      |
| 01                     | 0F04817A | Packing L                              | 1    |
| 02                     | 0F04818A | Soft Sheet                             | 1    |
| 03                     | 0F04822B | Packing R                              | 1    |
| 04                     | 0F04813A | Carton Box [MB-1s]                     | 1    |
|                        | 0F04814A | Carton Box [MB-2s]                     | 1    |
|                        | 0F04815A | Carton Box [MB-3s]                     | 1    |
| <b>Accessory Ass'y</b> |          |  |      |
|                        | DA04777A | Accessory Ass'y [MB-1s, 2s] (USA, CAN) | 1    |
|                        | DA04782A | Accessory Ass'y [MB-1s, 2s] (EP)       | 1    |
|                        | DA04779A | Accessory Ass'y [MB-1s, 2s] (UK)       | 1    |
|                        | DA04781A | Accessory Ass'y [MB-1s, 2s] (AUS, OTR) | 1    |
|                        | DA04780A | Accessory Ass'y [MB-1s, 2s] (JPN)      | 1    |
|                        | DA04778A | Accessory Ass'y [MB-3s] (USA, CAN)     | 1    |
|                        | DA04786A | Accessory Ass'y [MB-3s] (EP)           | 1    |
|                        | DA04783A | Accessory Ass'y [MB-3s] (UK)           | 1    |
|                        | DA04785A | Accessory Ass'y [MB-3s] (AUS, OTR)     | 1    |
|                        | DA04784A | Accessory Ass'y [MB-3s] (JPN)          | 1    |
|                        | DG04773A | Remote Control Unit [MB-1s, 2s]        | 1    |
|                        | DG04775A | Remote Control Unit [MB-3s]            | 1    |
|                        | 0B90462A | Battery UM4x1                          | 2    |
|                        | 0D03092B | Poly Bag                               | 1    |
|                        | 0D06142A | W Pin Pin Cord Ass'y [MB-1s, 2s]       | 1    |
|                        | 0D06431A | Pin Plug Cord [MB-3s]                  | 1    |
|                        | 0D06503B | Owner's Manual (English)               | 1    |
|                        | 0D06504B | Owner's Manual (French)                | 1    |
|                        | 0D06505B | Owner's Manual (German)                | 1    |
|                        | 0D06506B | Owner's Manual (Japanese)              | 1    |



## 2. REMOVAL PROCEDURES

### 2.1. Mechanism Ass'y

- (1) Remove the Tope Cover.
- (2) Turn ON the power and press the Eject/Load button to eject the Tray Ass'y.
- (3) Remove the Tray Panel Ass'y from the Tray Ass'y upwardly.
- (4) Press the Eject/Load button to load the Tray Ass'y.
- (5) Turn OFF the power and unplug the power cord from the wall outlet.
- (6) To disassemble the Front Panel Ass'y, remove 4 screws at both ends and 4 screws (3 screws for MB-3s) on the bottom.
- (7) Shortcircuit the lands "A" of the Laser Pickup. Refer to Fig. 2.1.

**CAUTIONS:** 1. Use a soldering iron whose metal part is grounded, or a ceramic soldering iron.

2. Do not forget shortcircuiting the lands "A" as the laser diode in the Laser Pickup will be damaged when the connectors of the Laser Pickup are removed from the Main P.C.B. Ass'y.

- (8) Disconnect 5 connectors of the Mechanism Ass'y.
- (9) Remove screws F01 (3 pcs.) and F02 (2 pcs.), and disassemble F03 (Mechanism Ass'y) and F04 (Mecha Holder).
- (10) Remove 7 screws to remove F04 (Mecha Holder) from F03 (Mechanism Ass'y).

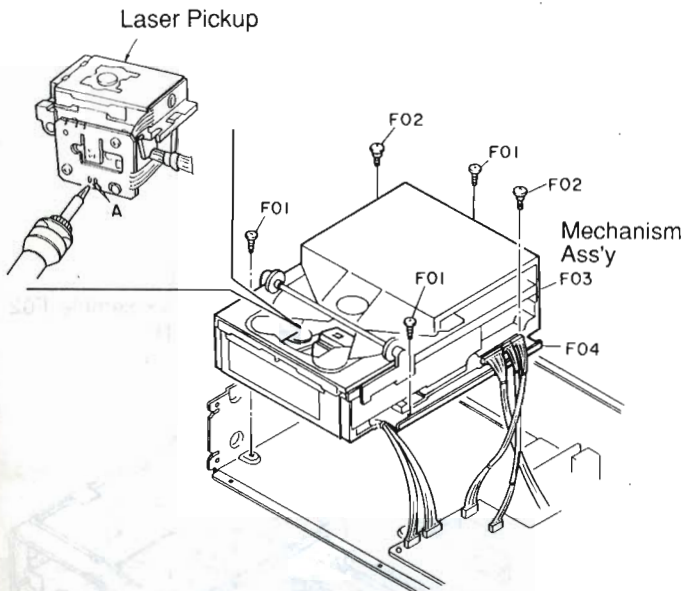


Fig. 2.1

### 2.2. Mechanism Top Cover

Refer to Figs. 2.2.1 and 2.2.2.

- (1) Remove the Mechanism Ass'y. Refer to item 2.1.
- (2) Remove screws F01 (4 pcs.) and disassemble F02 (Top Cover).
- (3) Remove F03 (Assist Arm).

**NOTE:** When assembling F03 (Assist Arm), make sure that F03 (Assist Arm) is in place as shown in the figure.

Also, make sure that the lowest carriage is held by the angle "B" of F03 (Assist Arm) as shown in Fig. 2.2.2 so that the carriages are in horizontal position. (Refer to "Leveling the carriages at the left side" in item 2.7.3.)

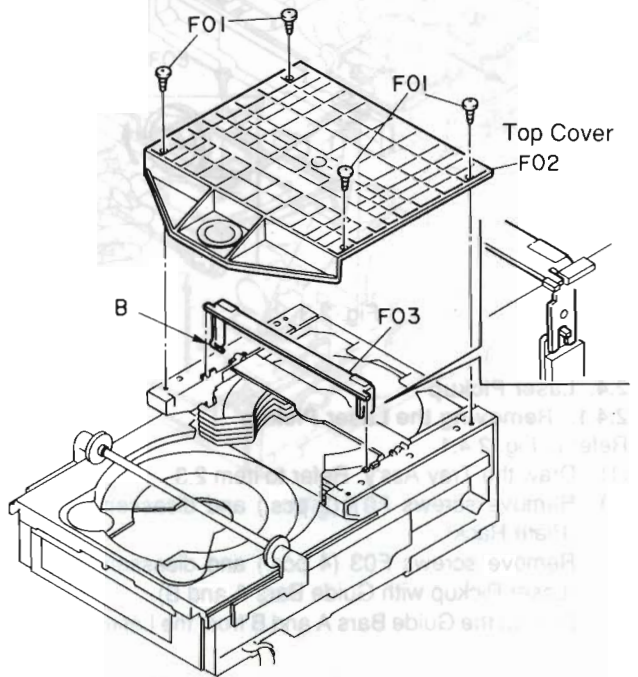


Fig. 2.2.1

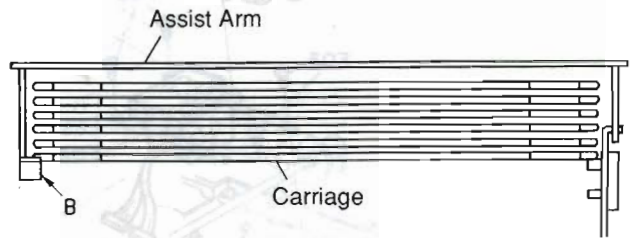


Fig. 2.2.2 Leveling the carriages at the left side

### 2.3. Drawing the Tray Ass'y

Refer to Fig. 2.3.

- (1) Remove the Mechanism Ass'y. Refer to item 2.1.
- (2) Turn the pulley in the direction of the arrow to draw the Tray Ass'y. (You can only access to the bottom part of the pulley.)
- (3) After drawing the Tray Ass'y about 3cm or so, you can draw the rest of it by hand.

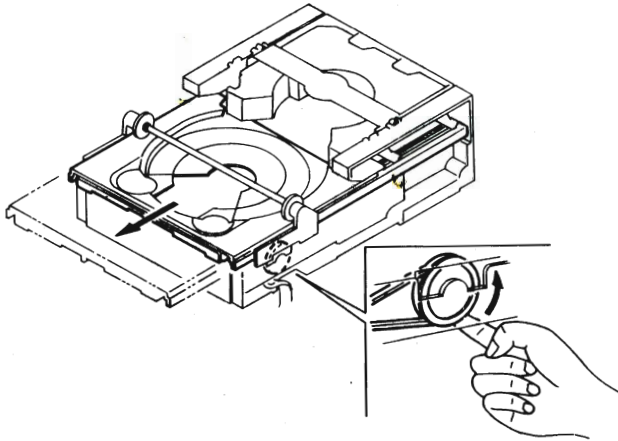


Fig. 2.3

### 2.4. Laser Pickup

#### 2.4.1. Removing the Laser Pickup

Refer to Fig. 2.4.1.

- (1) Draw the Tray Ass'y. Refer to item 2.3.
- (2) Remove screws F01 (2 pcs.) and disassemble F02 (Plate Rack).
- (3) Remove screws F03 (4 pcs.) and disassemble F04 (Laser Pickup with Guide Bars A and B).
- (4) Pull out the Guide Bars A and B from the Laser Pickup.

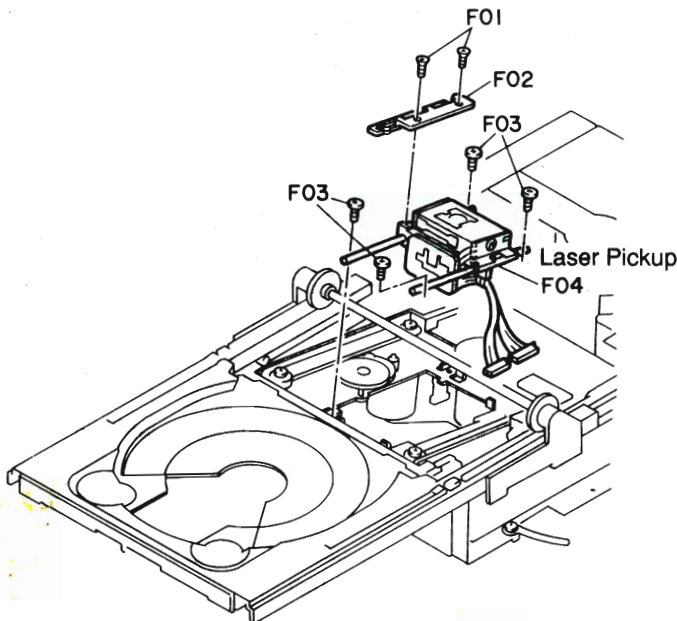


Fig. 2.4.1

### 2.4.2. Installing a New Laser Pickup

Refer to Fig. 2.4.2.

**NOTE:** As a Laser Pickup is packed in a conductive pack, do not take it out of the pack until you need it.

- (1) Install the Laser Pickup by reversing the above procedure.
- (2) Before fixing the Mechanism Ass'y with screws F01 and F02, connect the connectors of the Laser Pickup to the Main P.C.B. Ass'y. Then, remove the soldering bridge on the lands "A" shown in the figure with a soldering iron whose metal part is grounded or with a ceramic iron.

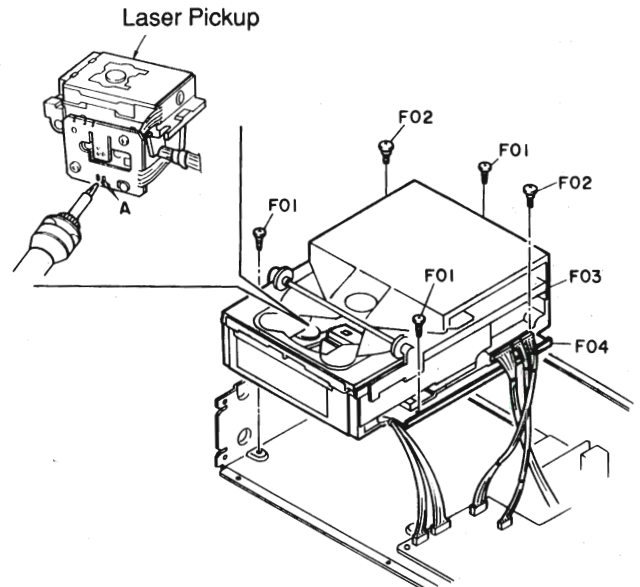


Fig. 2.4.2

### 2.5. Tray Ass'y

#### 2.5.1. Removing the Tray Ass'y

Refer to Fig. 2.5.1.

- (1) Draw the Tray Ass'y. Refer to item 2.3.
- (2) Remove screws F01 (4 pcs.) and disassemble F02 (Tray Holder L) and F03 (Tray Holder R).
- (3) Remove F04 (Timing Ass'y).
- (4) Remove F05 (Tray Ass'y).

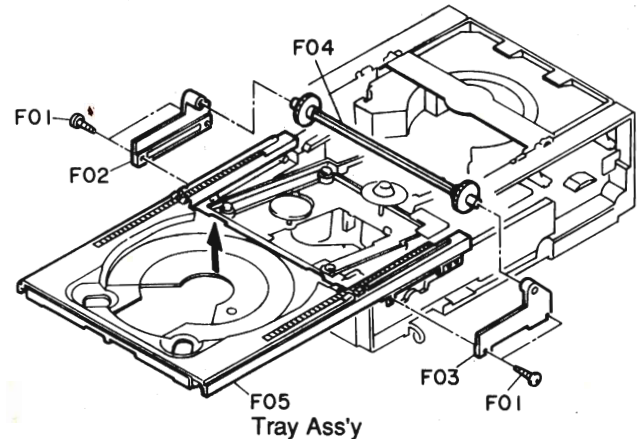


Fig. 2.5.1



### 2.5.2. Installing the Tray Ass'y

When installing the Tray Ass'y, perform positioning as follows:

- (1) Turn the pulley in the direction of the arrow until it stops. Refer to Fig. 2.5.2.
- (2) Turn the pulley in the opposite direction a little so that the center of two marks (holes) "C" on the S-F-Gear is in the vertical position. Refer to Fig. 2.5.2.
- (3) Place the Tray Ass'y so that the protrusion "D" of the Tray Ass'y is positioned between the marks (holes) "C" on the S-F-Gear. Refer to Fig. 2.5.3.
- (4) Reverse the removal procedure in item 2.5.1.

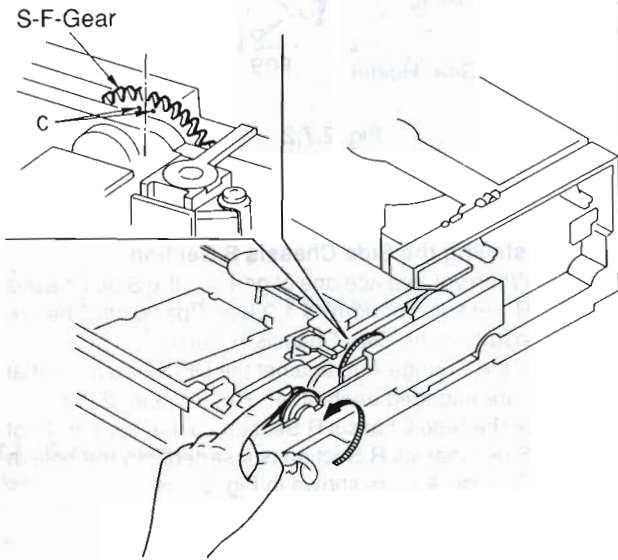


Fig. 2.5.2

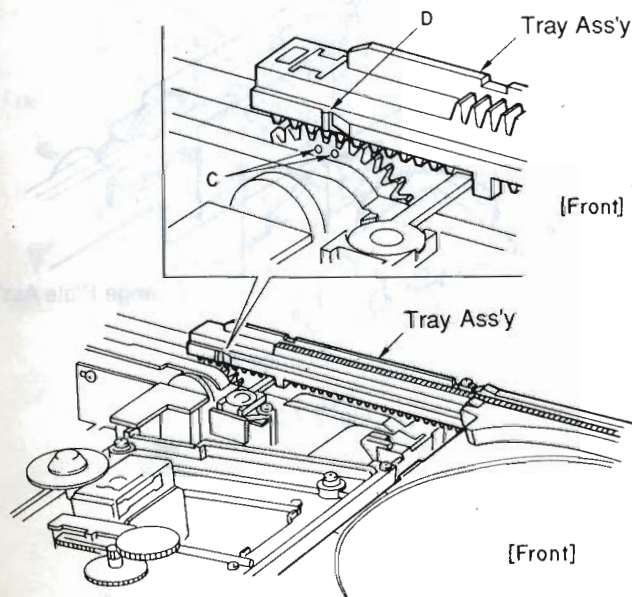


Fig. 2.5.3

### 2.6. Drive Unit Section

Refer to Fig. 2.6.

- (1) Remove the Laser Pickup. Refer to item 2.4.
- (2) Remove the Tray Ass'y. Refer to item 2.5.
- (3) Remove screws F01 (2 pcs.) and disassemble F02 (Disc Det. P.C.B.).
- (4) Remove screws F03 (2 pcs.) and disassemble F04 (Mecha B Stopper).
- (5) Disconnect a connector and remove F05 (Drive Unit Section).

**NOTE:** When installing F05 (Drive Unit Section), insert the pin "E" of the Drive Unit Section into the groove of the Mecha UD Cam as shown in the figure.

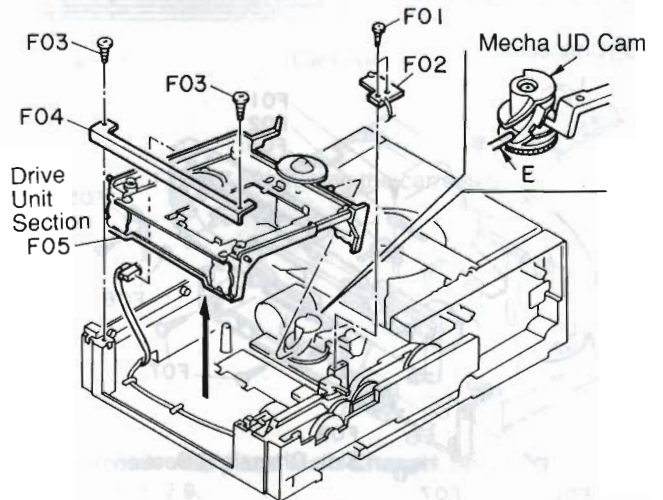


Fig. 2.6

## 2.7. Side Chassis R Section

### 2.7.1. Removing the Side Chassis R Section

Refer to Fig. 2.7.1.

- (1) Remove the Drive Unit Section. Refer to item 2.6.
- (2) Remove a screw F01 and F02 (Wire Clamper), and disassemble F03 (Eject/Close P.C.B.).
- (3) Remove a screw F04 and disassemble F05 (Store P.C.B.).
- (4) Disconnect 2P connector of the Loading Motor from the Connector P.C.B. at the back of the Mechanism Unit.
- (5) Remove screws F06 (2 pcs.) and F07 (3 pcs.), and disassemble F08 (Side Chassis R Section) in the direction of the arrow.

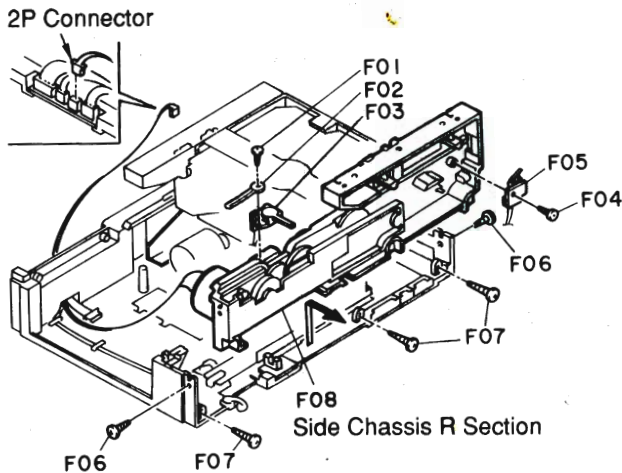


Fig. 2.7.1

### 2.7.2. Accessing to the Gears and Loading Motor Belt

Refer to Fig. 2.7.2.

- (1) Remove screws F09 (3 pcs.), F10 (1 pce.) and F11 (2 pcs.), and disassemble F12 (Gear Holder). Then, you can access to the gears (S-F-Gear, S-I-Gear and S-M-Gear) and Loading Motor Belt F13 (Belt-C-S).

**NOTE:** When you replace one of gears, perform gear positioning according to 3.1 "Gear Positioning".

- (2) Remove screws F14 (3 pcs.) and disassemble F15 (Change Plate Ass'y) and F16 (Carriage Opener). Then, you can access to the Change Gear.

**NOTE:** When you replace the Change Gear, perform gear positioning according to 3.1 "Gear Positioning".

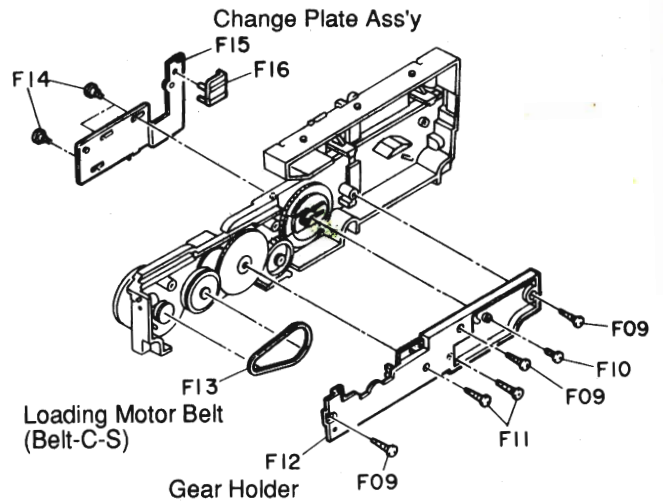


Fig. 2.7.2

### 2.7.3. Installing the Side Chassis R Section

**NOTE:** When you replace one of gears in the Side Chassis R Section, perform 3.1 "Gear Positioning" before installing the Side Chassis R Section.

- (1) Push the Change Arm against the D6-ST-Gear so that they are engaged each other. Refer to Fig. 2.7.3.
- (2) Place the Side Chassis R Section so that the pin "F" of the Side Chassis R Section is inserted into the hole in the Change Arm, as shown in Fig. 2.7.3.

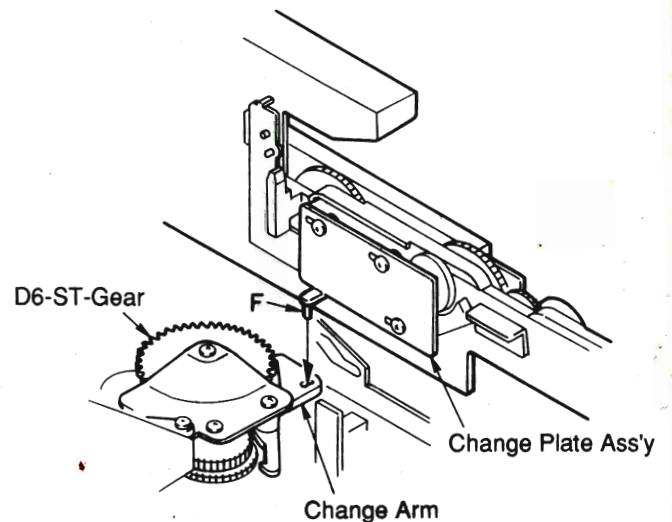


Fig. 2.7.3



- (3) **Leveling the carriages:**  
The carriages must be set in correct position where they are in horizontal position.

• **Leveling carriages at the right side**

Lift the right end of the carriages (6 pcs.) with your finger tip as shown in Fig. 2.7.4, and place the lowest carriage onto the pin "G" (white one).

• **Leveling the carriages at the left side**

Lift the left end of the carriages (6 pcs.) with your finger tip and place the lowest carriage onto the angle "B" of the Assist Arm. Refer to Fig. 2.7.5.

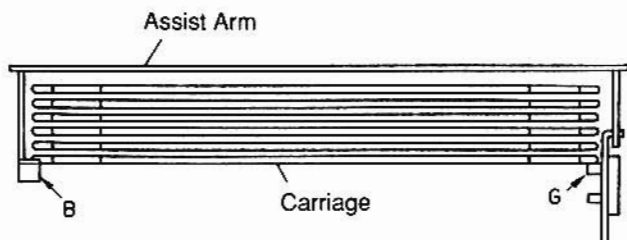
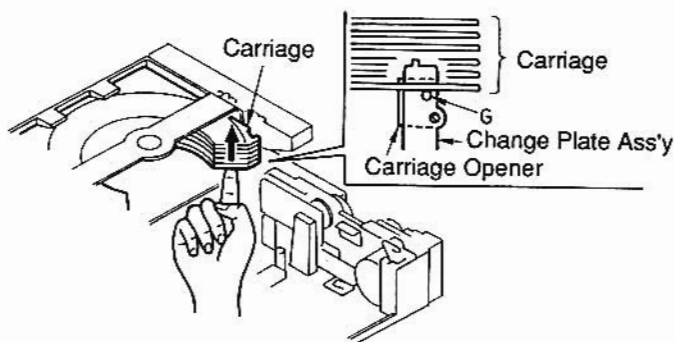


Fig. 2.7.5 Leveling the carriages

Fig. 2.7.4 Leveling the carriages at the right side

**2.8. Side Chassis L**

Refer to Fig. 2.8.

- (1) Remove the Drive Unit Section. Refer to item 2.6.
- (2) Remove screws F01 (3 pcs.) and F02 (2 pcs.), and disassemble F03 (Side Chassis L).

**2.9. Stoker Ass'y and Main Chassis Section**

Refer to Fig. 2.9.

- (1) Remove the Side Chassis R Section and Side Chassis L. Refer to items 2.7 and 2.8.
- (2) Remove F01 (Stoker Ass'y including the carriages) from F02 (Main Chassis Section) as shown in the figure.

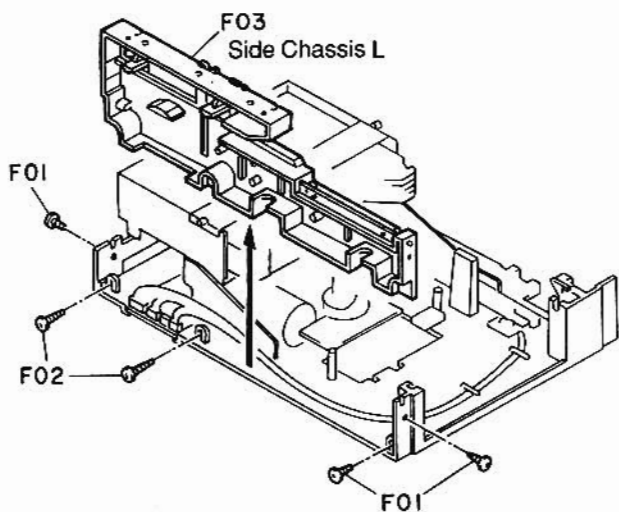


Fig. 2.8

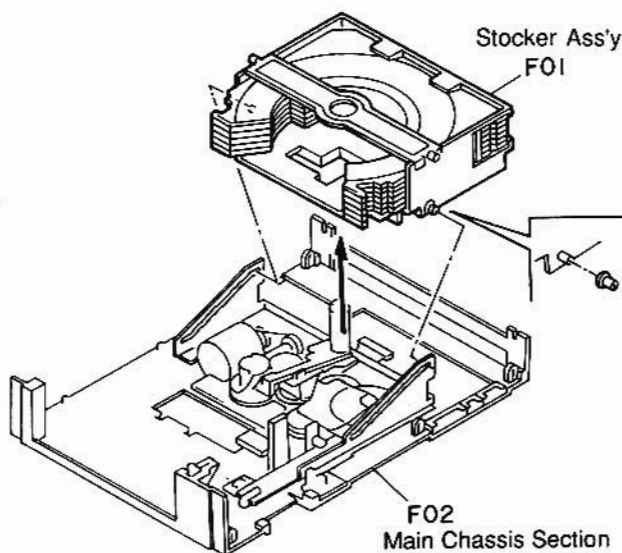


Fig. 2.9

### 3. MECHANICAL ADJUSTMENTS

#### 3.1. Gear Positioning in the Side Chassis R Section

When one of the gears in the Side Chassis R section is replaced, perform the following gear positioning. (To access to the gears, refer to 2.7 "Side Chassis R Section".)

##### 3.1.1. Positioning Three Gears

Refer to Fig. 3.1.1.

- (1) Align the marks (holes) of the S-I-Gear with the mark (hole) of the S-F-Gear and S-M-Gear as shown in the figure.

**NOTE:** The S-F-Gear and S-M-Gear have another mark (hole). Pay attention so as not to align with the wrong hole.

- (2) Insert the pin of the Tray Arm Ass'y into the groove of the S-M-Gear as shown in the figure.

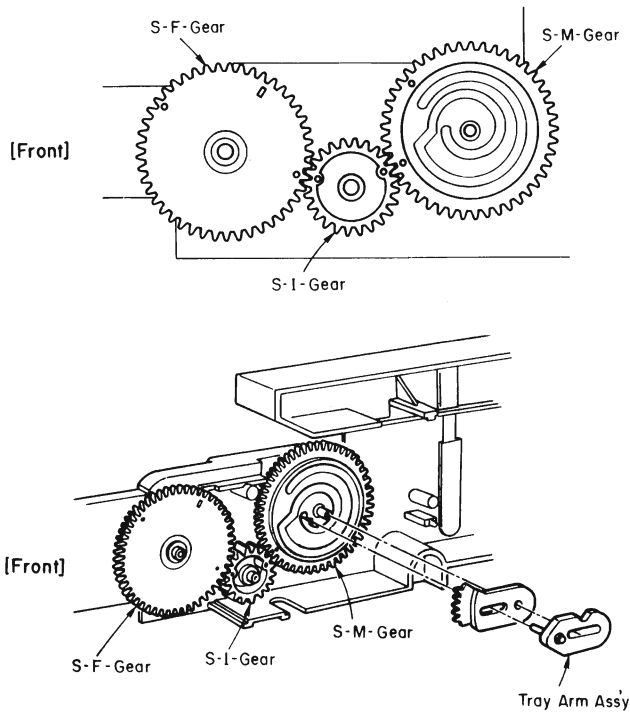


Fig. 3.1.1 Positioning of Three Gears

##### 3.1.2. Positioning the Change Gear

Refer to Fig. 3.1.2.

- (1) Position the Change Gear so that the notch of the Change Gear meets the mark "A" of the S-F-Gear.
- (2) Insert the pin of the Change Plate Ass'y into the groove of the Change Gear, and mount the Change Plate Ass'y with three screws.

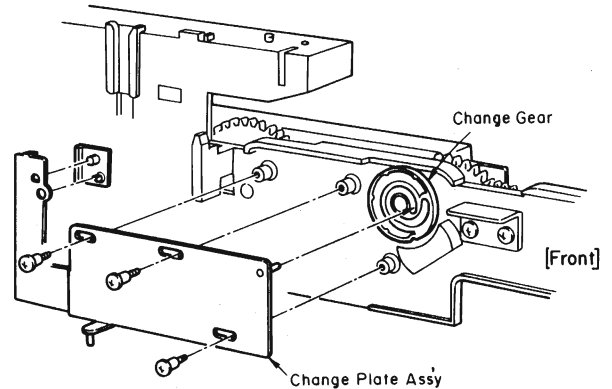
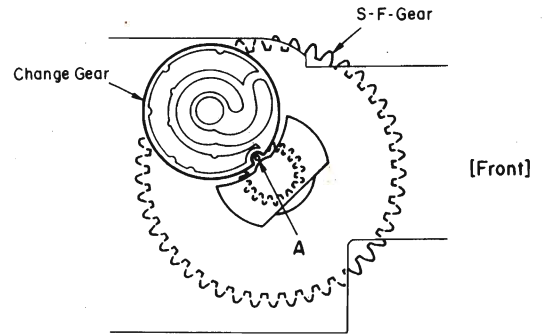


Fig. 3.1.2 Positioning of the Change Gear

#### 3.2. Positioning the Tray Ass'y

When installing the Tray Ass'y on the mechanism unit, perform the following positioning. (Refer to 2.5.2 "Installing the Tray Ass'y".)

- (1) Install the Tray Ass'y so that the protrusion "B" of the Tray Ass'y is positioned between two marks (holes) "C" of the S-F-Gear. Refer to Fig. 3.2.

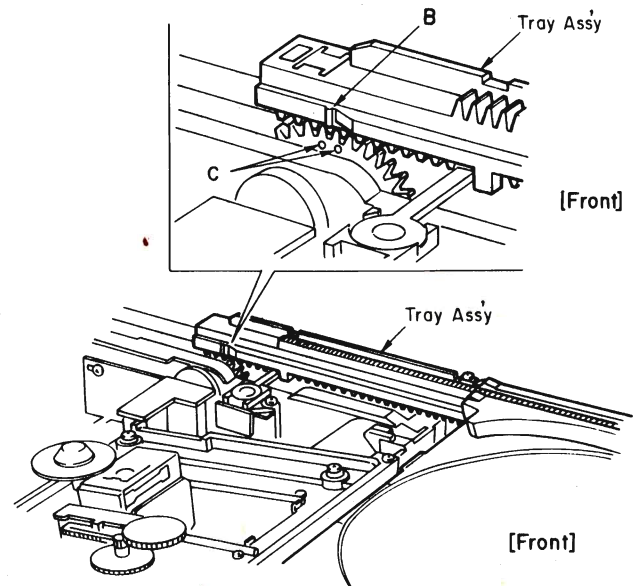


Fig. 3.2 Positioning of the Tray Ass'y

### 3.3. Lubrication

Apply the specified lubricant (grease) to the following places when parts are replaced. (Refer to Figs. 7.3 to 7.5.)

| Fig.                            | Ref. No. | Location  | Lubricant         |
|---------------------------------|----------|---|-------------------|
| <b>(Mechanism Ass'y)</b>        |          |   |                   |
| 7.3                             | 07       | Stocker Ass'y   |                   |
|                                 |          | • Carriage contacting surface (both sides)              | FLOIL FL777       |
|                                 |          | • Boss (both sides)                                     | FLOIL G425        |
|                                 | 09       | Side Chassis L  | FLOIL G425, FL777 |
|                                 | 10       | Side Chassis Section                                    | FLOIL G425, FL777 |
|                                 | 13       | Tray Ass'y  |                   |
|                                 |          | • Carriage contacting surface (Upper/Lower, both sides) | FLOIL FL777       |
|                                 |          | • Carriage Shaft R                                      | FLOIL G425        |
|                                 |          | • Carriage Shaft L                                      | FLOIL FL777       |
| <b>(Side Chassis R Section)</b> |          |   |                   |
| 7.4                             | 01       | Change Plate Ass'y (3 places)                           | FLOIL G425        |
|                                 | 03       | Change Gear (Groove)                                    | FLOIL G425        |
|                                 | 06       | Side Chassis R Sub Ass'y (5 places)                     | FLOIL G425        |
|                                 | 09       | Side Idler  | FLOIL G425        |
|                                 | 12       | S-M-Gear (Groove)                                       | FLOIL G425        |
|                                 | 13       | Tray Stopper  | FLOIL G425        |
|                                 | 14       | Tray Arm Ass'y  | FLOIL G425        |
|                                 | 15       | Gear Holder (Groove)                                    | FLOIL G425        |
| <b>(Main Chassis Section)</b>   |          |   |                   |
| 7.5                             | 04       | Mecha UD Cam  | FLOIL G425        |
|                                 | 11       | D5-ST-Gear  | FLOIL G425        |
|                                 | 12       | Lock Idler  | FLOIL G425        |
|                                 | 13       | D7-ST-Gear  | FLOIL G425        |
|                                 | 14       | D6-ST-Gear  | FLOIL G425        |
|                                 | 16       | Stocker Cam (5 places)                                  | FLOIL G425        |
|                                 | 18       | ST-Worm-Gear  | FLOIL FL777       |
|                                 | 20       | Worm Shaft (Shaft head and shaft end)                   | FLOIL G425        |
|                                 | 24       | Main Chassis Ass'y (7 places)                           | FLOIL G425        |

**NOTE:** We suggest that you use the above specified lubricant or equivalent type.

The company dealing in the above lubricant is as follows:

Kanto Chemicals CO., Ltd., 2-7 Kanda Sakuma-cho, Chiyoda-Ku, Tokyo, Japan

•Name of Lubricant: FLOIL G425/FLOIL FL777



## 4. MEASUREMENT INSTRUMENTS AND JIGS

- (1) Oscilloscope (15 MHz or more)
- (2) DC Voltmeter
- (3) Oscillator
- (4) Frequency Counter
- (5) Distortion Meter (MB-1s only)
- (6) Philips Test Disc 5/5A or 444/444A
- (7) SONY Test Disc YEDS-7 (Type 3)
- (8) CD Player Test Unit Set (DA09157A)

Consisting of the following items:

- CD Player Test Unit 1 pce.
- Test Unit Cable for MB-1s/2s/3s/4s, 1000Mb, CD Player 1/2/3, Sound Space 7 (DA09158A) 1 pce.
- CD Player 4 Test Unit Cable (DA09156A) 1 pce.
- CD Cassette Player 1 Test Unit Cable (DA09162A) 1 pce.

**NOTE:** If you already have the CD Player Test Unit for the following Models, you can use it for MB-1s/2s/3s.

- MB-4s
- Sound Space 7
- 1000Mb/i, 1000Mb
- CD Player 1/2/3
- CD Cassette Player 1
- CD Player 4 (The test unit cable is not compatible with that for MB-1s/2s/3s.)

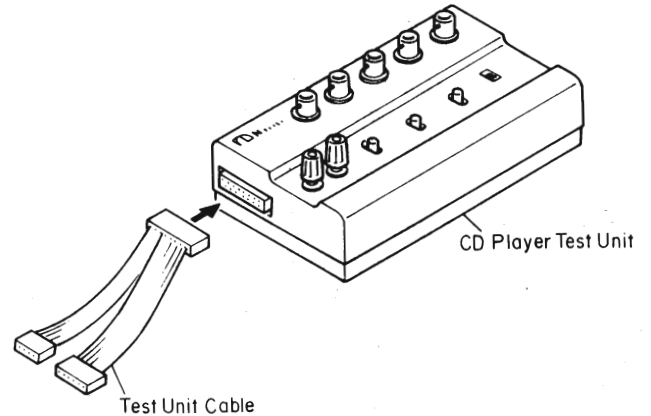


Fig. 4.1 Test Unit

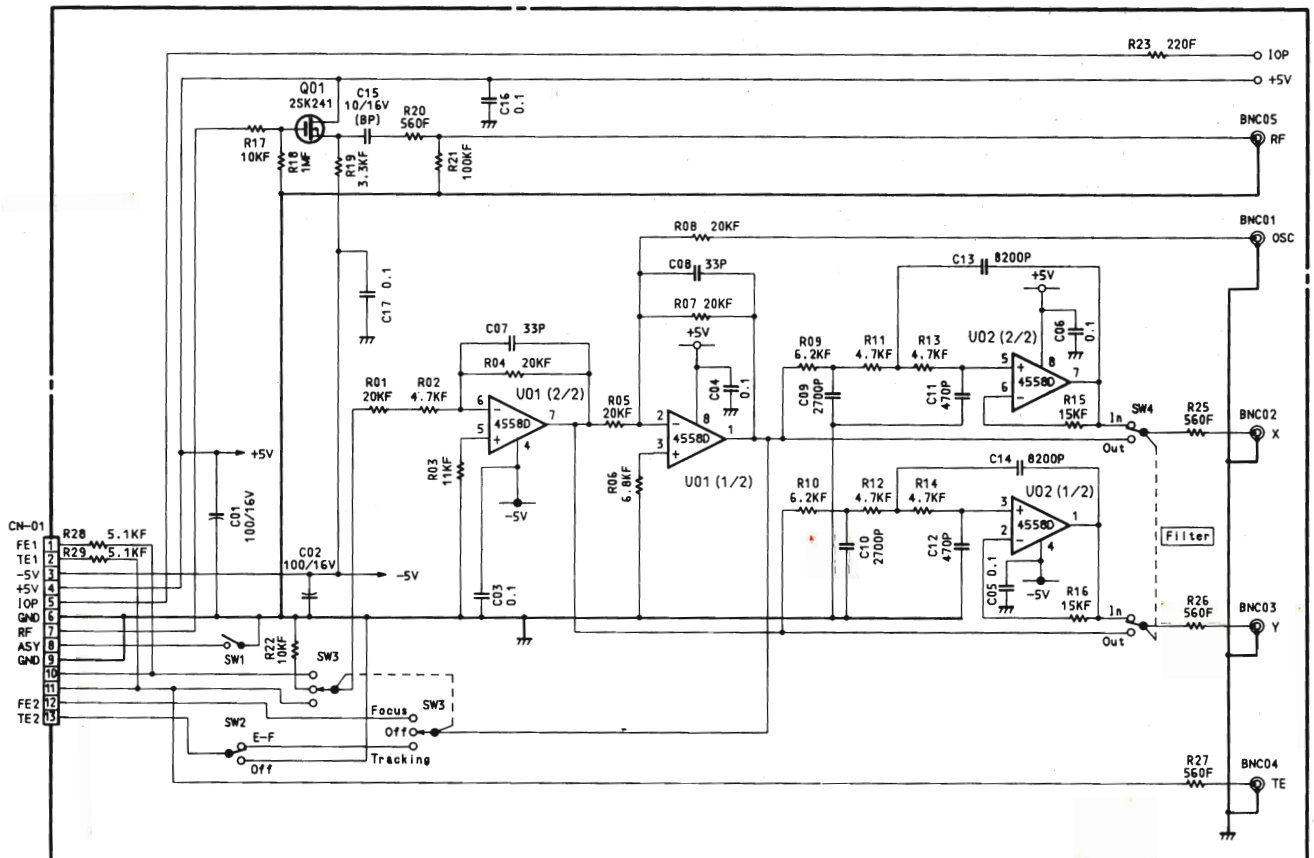


Fig. 4.2 Circuit of the Test Unit

# PARTS LOCATION FOR ELECTRICAL ADJUSTMENT

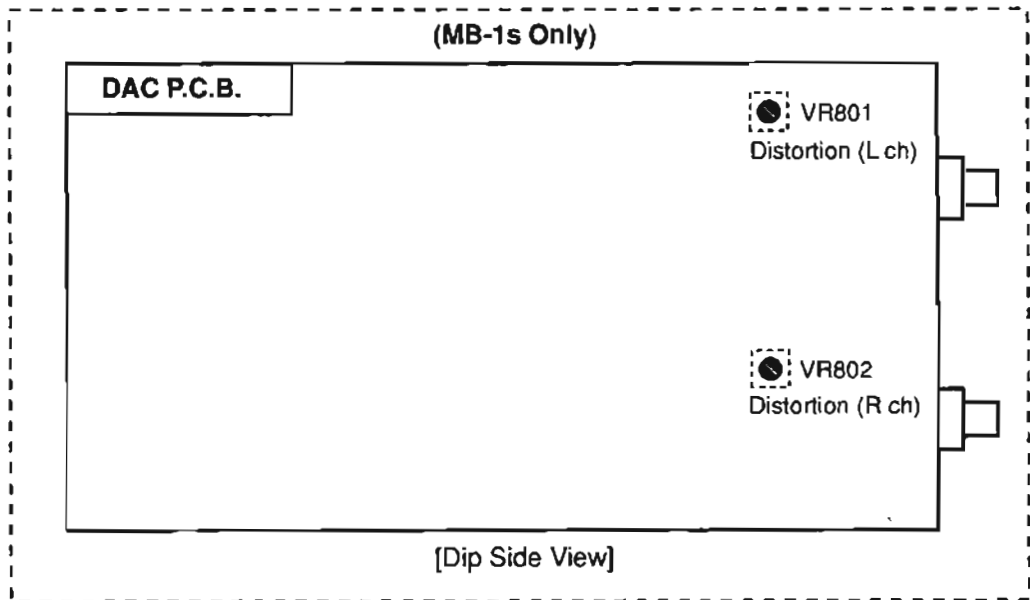
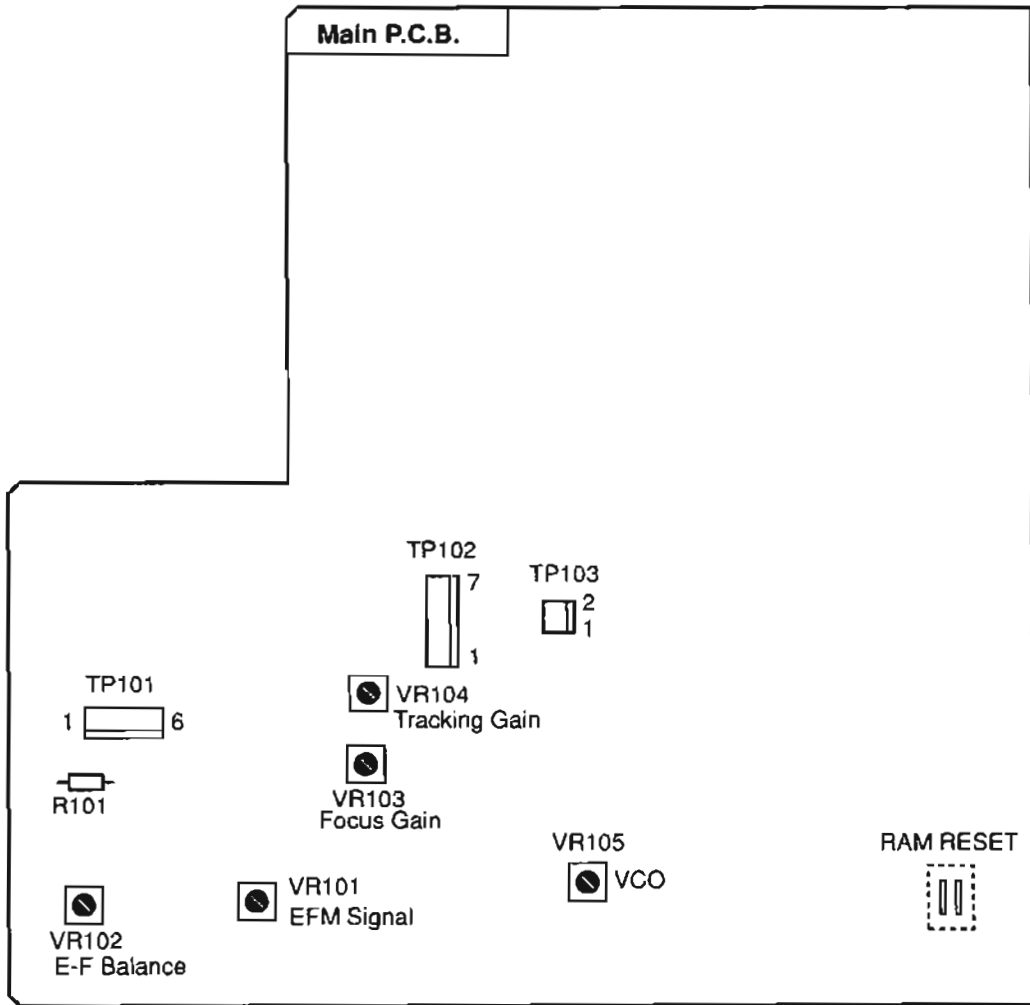


Fig. 5

## 6. 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 following semi-fixed volumes to their mechanical center positions before starting adjustment.  
VR101, VR102, VR103 and VR104

2. Connecting the Test Unit:

For adjusting the steps 4 through 6, the Test Unit is required. In steps 4 through 6 **ONLY**, connect the 7P cable of the Test Unit to the test connector TP102 on the Main P.C.B. Ass'y.

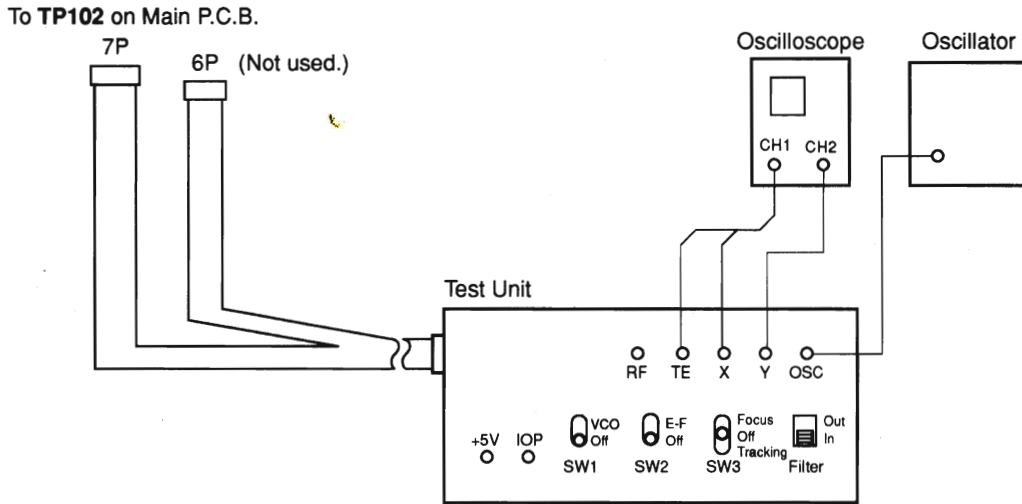
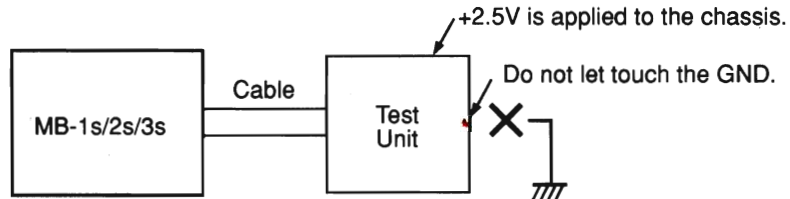


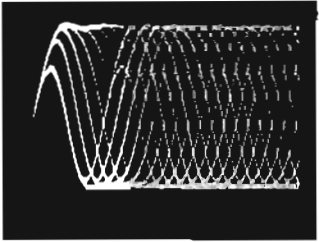

Fig. 6 Test Unit Connecting Diagram

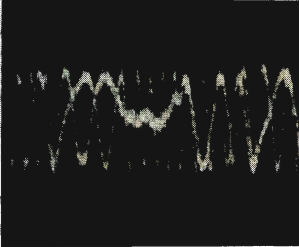
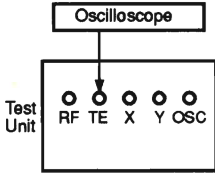
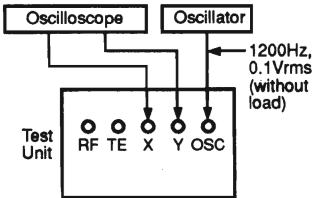
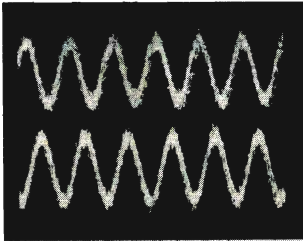

### CAUTION:

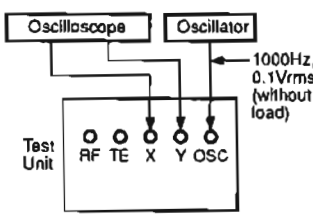
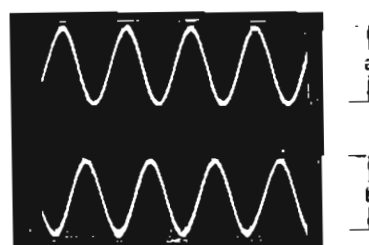
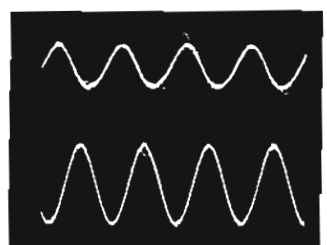
DO NOT let touch the chassis of the Test Unit to the measurement instrument as well as the MB-1s/2s/3s since +2.5V is applied to the chassis of the Test Unit when the test unit cable is connected to the MB-1s/2s/3s.





| STEP | ITEM   | SIGNAL SOURCE                | OUTPUT CONNECTION  | ADJUSTMENT        | REMARKS  |
|------|--|------------------------------|--|-------------------|--|
| 1    | Laser Current Check  | Philips Test Sample 5 or 444 | DC Voltmeter between pins 1 (IOP) and 3 (+5V) of TP101 on Main P.C.B.<br><br>DC Voltmeter Common:<br>Pin 3 (+5V) |                   | <ol style="list-style-type: none"> <li>Turn the power ON and load the test disc.</li> <li>Play back the test disc and calculate the current flowing into R101 on the Main P.C.B. Ass'y from the following formula.<br/> <math display="block">I = \frac{\text{Voltmeter Value}}{R101 (10 \text{ Ohms})} = \text{oo.o mA}</math> </li> <li>Check that the calculated current is in a range of 50 to 60 mA.</li> </ol> <p><b>Note:</b> If the current doubles, pickup will be defective.</p>   |
| 2    | VCO Frequency Adjustment                                       | None                         | Frequency Counter (10/1 probe) between pins 2 (PLCK) and 1 (GND) of TP-103 on Main P.C.B.                        | Main P.C.B. VR105 | <ol style="list-style-type: none"> <li>Set the shorting pin between pins 5 (GND) and 6 (ASY) of TP101 on Main P.C.B.</li> <li>Adjust VR105 to obtain 4.322 ±0.005 MHz on the frequency counter.</li> <li>Remove the shorting pin.</li> </ol>   |
| 3    | EFM Signal Adjustment  | Philips Test Sample 5 or 444 | Oscilloscope between pins 2 (RF) and 4 (VR) of TP101 on Main P.C.B.<br><br>Oscilloscope Common:<br>Pin 4 (VR)    | Main P.C.B. VR101 | <ol style="list-style-type: none"> <li>Play back the first track of the test disc.</li> <li>Adjust VR101 until waveform amplitude becomes maximum and the waveform becomes clear (not thick) as shown below:</li> </ol> <div style="text-align: center;">  </div> <div style="text-align: center;">  </div> <p>Oscilloscope Setting:<br/>AC Mode, 0.2 V/div, 0.5 μs/div</p> |
| 4    | E-F Balance Adjustment (Supplementary Beam Balance Adjustment) | Philips Test Sample 5 or 444 | Oscilloscope to TE Connector of Test Unit  | Main P.C.B. VR102 | <ol style="list-style-type: none"> <li>Connect the 7P cable of the Test Unit to TP102 on the Main P.C.B. Ass'y.</li> <li>Play back the first track of the test disc.</li> <li>Set SW2 of the Test Unit to E-F position.</li> <li>Adjust VR102 so that the center level of the waveform is within the range of 0 V ±0.1 V DC as shown below:</li> </ol> <p>(To be continued.)</p>   |

| STEP | ITEM                     | SIGNAL SOURCE                | OUTPUT CONNECTION   | ADJUSTMENT        | REMARKS   |
|------|--------------------------|------------------------------|---|-------------------|---|
|      |                          | SW1: OFF<br>SW2: E-F         | SW3: OFF<br>Filter: OUT   |                   |  <p style="text-align: right;">--- Center Level</p> <div style="display: flex; align-items: center; justify-content: center;"> <div style="text-align: center;">  <p>Test Unit<br/>RF TE X Y OSC</p> </div> <div style="margin-left: 20px;"> <p>Connecting Diagram</p> </div> </div> <p>Oscilloscope Setting:<br/>DC Mode, 1 V/div, 1 ms/div</p> <ol style="list-style-type: none"> <li>Set SW2 to OFF position.</li> <li>Remove the 7P cable from TP102.</li> </ol>   |
| 5    | Tracking Gain Adjustment | Philips Test Sample 5 or 444 | Oscillator to OSC Connector of Test Unit<br><br>Oscilloscope to Test Unit<br>• CH1 to X<br>• CH2 to Y | Main P.C.B. VR104 | <ol style="list-style-type: none"> <li>Connect the 7P cable of the Test Unit to TP102 on the Main P.C.B. Ass'y.</li> <li>Set the output of oscillator to 1200 Hz, 0.1 Vrms without connecting it to the Test Unit.</li> <li>Note the position of the output control of the oscillator.</li> <li>Connect the oscillator output to OSC connector of the Test Unit and set its output to 0 V.</li> <li>Set the Filter switch of the Test Unit to IN position.</li> <li>Play back the first track of the test disc.</li> <li>Set the output control of the oscillator to the position noted in 3.</li> <li>Set SW3 of the Test Unit to TRACKING position.</li> <li>Adjust VR104 so that the amplitude of both waveforms on the oscilloscope are equal. (a=b)</li> <li>Set SW3 to OFF position.</li> <li>Remove the 7P cable from TP102.</li> </ol> <p>SW1: OFF      SW3: TRACKING<br/>SW2: OFF      Filter: IN</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>Test Unit<br/>RF TE X Y OSC</p> <p>Oscillator<br/>1200Hz, 0.1Vrms (without load)</p> </div> <div style="text-align: center;"> <p>Good waveforms</p>  <p>CH1<br/>CH2</p> <p>a = b</p> </div> <div style="text-align: center;"> <p>NG waveforms</p>  </div> </div> <p>Connecting Diagram</p> <p>Oscilloscope Setting:<br/>CH1, CH2: 0.2 V/div, DC Mode<br/>Time: 0.5 ms/div<br/>Mode: Auto, ALT<br/>Trigger: CH1</p> |

| STEP   | ITEM                               | SIGNAL SOURCE                  | OUTPUT CONNECTION   | ADJUSTMENT                     | REMARKS  |
|--|------------------------------------|--------------------------------|---|--------------------------------|--|
| 6  | Focus Gain Adjustment              | Philips Test Sample 5 or 444   | Oscillator to OSC connector of Test Unit<br><br>Oscilloscope to Test Unit<br>• CH1 to X<br>• CH2 to Y | Main P.C.B. VR103              | <ol style="list-style-type: none"> <li>1. Connect the 7P cable of the Test Unit to TP102 on the Main P.C.B. Ass'y.</li> <li>2. Set the output of oscillator to 1000 Hz, 0.1 Vrms without connecting it to the Test Unit.</li> <li>3. Note the position of the output control of the oscillator.</li> <li>4. Connect the oscillator output to OSC connector of the Test Unit and set its output to 0 V.</li> <li>5. Set the Filter switch of the Test Unit to IN position.</li> <li>6. Play back the first track of the test disc.</li> <li>7. Set the output control of the oscillator to the position noted in 3.</li> <li>8. Set SW3 of the Test Unit to FOCUS position.</li> <li>9. Adjust VR103 so that the amplitude of both waveforms on the oscilloscope are equal. (a=b)</li> <li>10. Set SW3 to OFF position.</li> <li>11. Set the Filter switch to OUT position.</li> <li>12. Remove the 7P cable from TP102.</li> <li>13. After adjustment, perform "EFM Signal Adjustment" in Step 3.</li> </ol> |
| <p>SW1: OFF            SW3: FOCUS<br/>SW2: OFF            Filter: IN</p>  <p>Connecting Diagram</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Good waveforms</p>  <p>CH1</p> <p>CH2</p> <p>a = b</p> </div> <div style="text-align: center;"> <p>NG waveforms</p>  </div> </div> <p>Oscilloscope Setting:<br/> CH1, CH2: 0.2 V/div, DC Mode<br/> Time: 0.5 ms/div<br/> Mode: Auto, ALT<br/> Trigger: CH1</p> |                                    |                                |   |                                |  |
| 7  | Distortion Adjustment (MB-1s only) | Sony YEDS-7 (Type 3)           | Distortion Meter to Output Jacks  | DAC P.C.B. VR801 (L) VR802 (R) | <ol style="list-style-type: none"> <li>1. Play back the first program (1 kHz, 0 dB) of the test disc.</li> <li>2. Adjust VR801 (L ch) and VR802 (R ch) to obtain minimum distortion.</li> </ol>  |
| 8  | Operation Check                    | Philips Test Sample 5A or 444A |   |                                | <p>Play back the following test programs on the test disc (Philips Test Sample 5A or 444A) and make sure that there is no noise and track-jumping.</p> <ul style="list-style-type: none"> <li>• Interruption 500 μm: 6th program</li> <li>• Black Dot 800 μm: 17th program</li> <li>• Simulated fingerprint: 19th program</li> </ul>   |



# 7. MECHANISM ASS'Y AND PARTS LIST

## 7.1. Synthesis

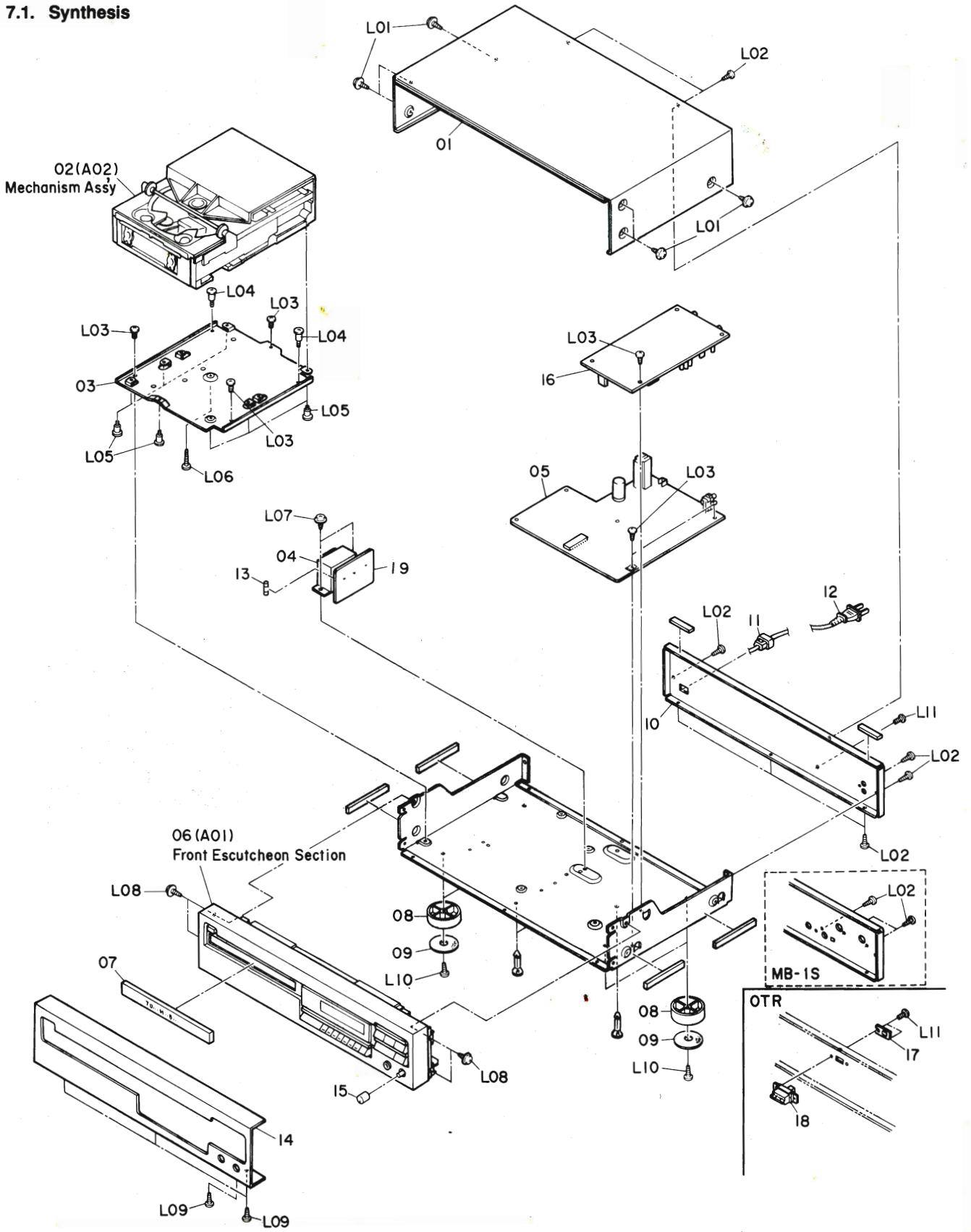


Fig. 7.1

## 7.1. Synthesis

| Schematic Ref. No. | Part No. | Description   | Qty |
|--------------------|----------|---|-----|
|                    |          | <b>Synthesis</b>  |     |
| 01                 | 0H06737A | Top Cover   | 1   |
| 02                 | CG09210A | Mechanism Ass'y   | 1   |
| 03                 | 0J07235D | Mecha Holder  | 1   |
| 04                 | 0B50249A | Power Transformer 120V [MB-1s]<br>(USA, CAN)            | 1   |
|                    | 0B50252A | Power Transformer 230V [MB-1s]<br>(EP, UK, AUS)         | 1   |
|                    | 0B50253A | Power Transformer 115/230V [MB-1s]<br>(OTR)             | 1   |
|                    | 0B50251A | Power Transformer 100V [MB-1s]<br>(JPN)                 | 1   |
|                    | 0B50250A | Power Transformer 120V<br>[MB-2s, 3s, 4s] (USA, CAN)    | 1   |
|                    | 0B50255A | Power Transformer 230V<br>[MB-2s, 3s, 4s] (EP, UK, AUS) | 1   |
|                    | 0B50256A | Power Transformer 115/230V<br>[MB-2s, 3s, 4s] (OTR)     | 1   |
|                    | 0B50254A | Power Transformer 100V<br>[MB-2s, 3s, 4s] (JPN)         | 1   |
| 05                 | BA09088A | Main P.C.B. Ass'y [MB-1s]                               | 1   |
|                    | BA09076A | Main P.C.B. Ass'y [MB-2s]                               | 1   |
|                    | BA09078A | Main P.C.B. Ass'y [MB-3s]                               | 1   |
| 06                 | —        | Front Escutcheon Section                                | 1   |
| 07                 | HA06848A | Tray Panel Ass'y [MB-1s, 2s]                            | 1   |
|                    | HA06849A | Tray Panel Ass'y [MB-3s]                                | 1   |
| 08                 | 0J07247B | Leg   | 4   |
| 09                 | 0J07283A | Leg Cushion   | 4   |
| 10                 | 0H06729A | Rear Panel [MB-1s] (Except OTR)                         | 1   |
|                    | 0H06730A | Rear Panel [MB-1s] (OTR)                                | 1   |
|                    | 0H06731A | Rear Panel [MB-2s] (Except OTR)                         | 1   |
|                    | 0H06732A | Rear Panel [MB-2s] (OTR)                                | 1   |
|                    | 0H06733A | Rear Panel [MB-3s] (Except OTR)                         | 1   |
|                    | 0H06734A | Rear Panel [MB-3s] (OTR)                                | 1   |
| 11                 | 0B90280A | Cord Bushing  | 1   |
| 12                 | 0B90205A | Power Cord (USA, CAN)                                   | 1   |
|                    | 0B08093U | Power Cord (EP)   | 1   |
|                    | 0B08348A | Power Cord (UK)   | 1   |
|                    | 0B05241A | Power Cord (AUS)  | 1   |
|                    | 0B80336A | Power Cord KP-235 (OTR, JPN)                            | 1   |
| 13                 | 0B90376A | Fuse 2A/125V (GGS2) (USA, CAN,<br>OTR, JPN) [F401]      | 1   |
|                    | 0B90382A | Fuse T1.25A/250V (EP, UK, AUS)<br>[F401]                | 1   |
| 14                 | 0H06714A | Front Panel [MB-1s]                                     | 1   |
|                    | 0H06715A | Front Panel [MB-2s]                                     | 1   |
|                    | 0H06716A | Front Panel [MB-3s]                                     | 1   |
| 15                 | 0H06725A | VR Knob [MB-1s, 2s]                                     | 1   |
| 16                 | BA09074A | DAC P.C.B. Ass'y [MB-1s]<br>(Except EP)                 | 1   |
|                    | BA09188A | DAC P.C.B. Ass'y [MB-1s] (EP)                           | 1   |
| 17                 | 0H06746A | V. Lock Plate-C (OTR)                                   | 1   |
| 18                 | 0B07092U | Voltage Selector (OTR)                                  | 1   |
| 19                 | —        | Transformer P.C.B. Ass'y                                | 1   |
| L01                | 0E03592A | BT4x6 + Binding Washer-Faced<br>(Black Chromate)        |     |
| L02                | 0E00921A | BT3x8 + Binding (Black Chromate)                        |     |
| L03                | 0E00800A | ST3x6 + Binding   |     |
| L04                | 0E03803A | BT3x7 + Binding   |     |
| L05                | 0E03805A | PT3x9.5 + Binding                                       |     |
| L06                | 0E03806A | PT3x12 + Binding  |     |
| L07                | 0E03664A | ST4x8 + Tapping   |     |
| L08                | 0E03634A | BT3x6 + Binding Washer-Faced                            |     |
| L09                | 0E03666A | BT3x8 + Binding Projected<br>(Black Chromate)           |     |
| L10                | 0E03217A | BT4x8 + Binding (Black Chromate)                        |     |
| L11                | 0E00985A | M3x6 + Binding  |     |

## 7.2. Front Escutcheon Section (A01)

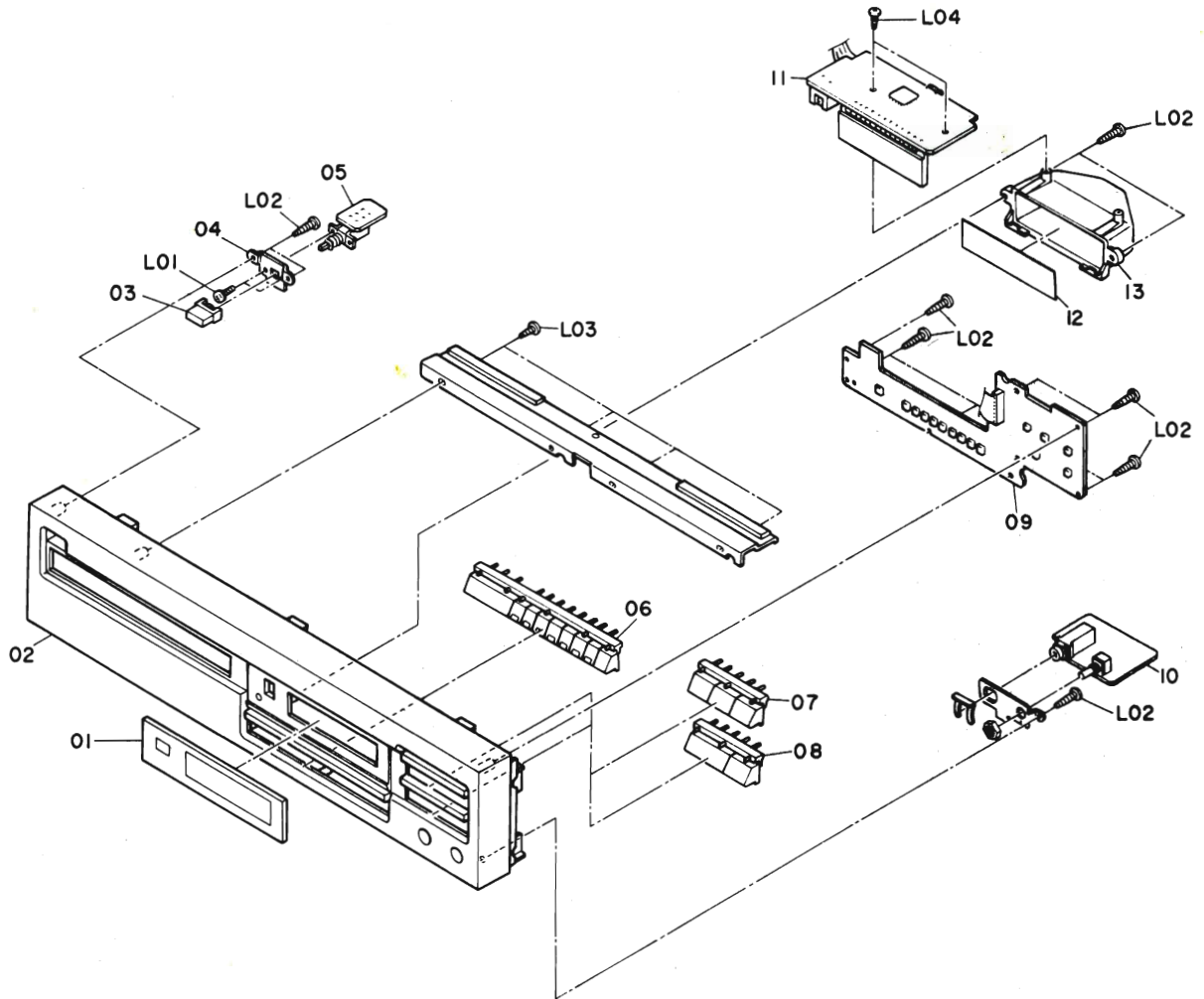
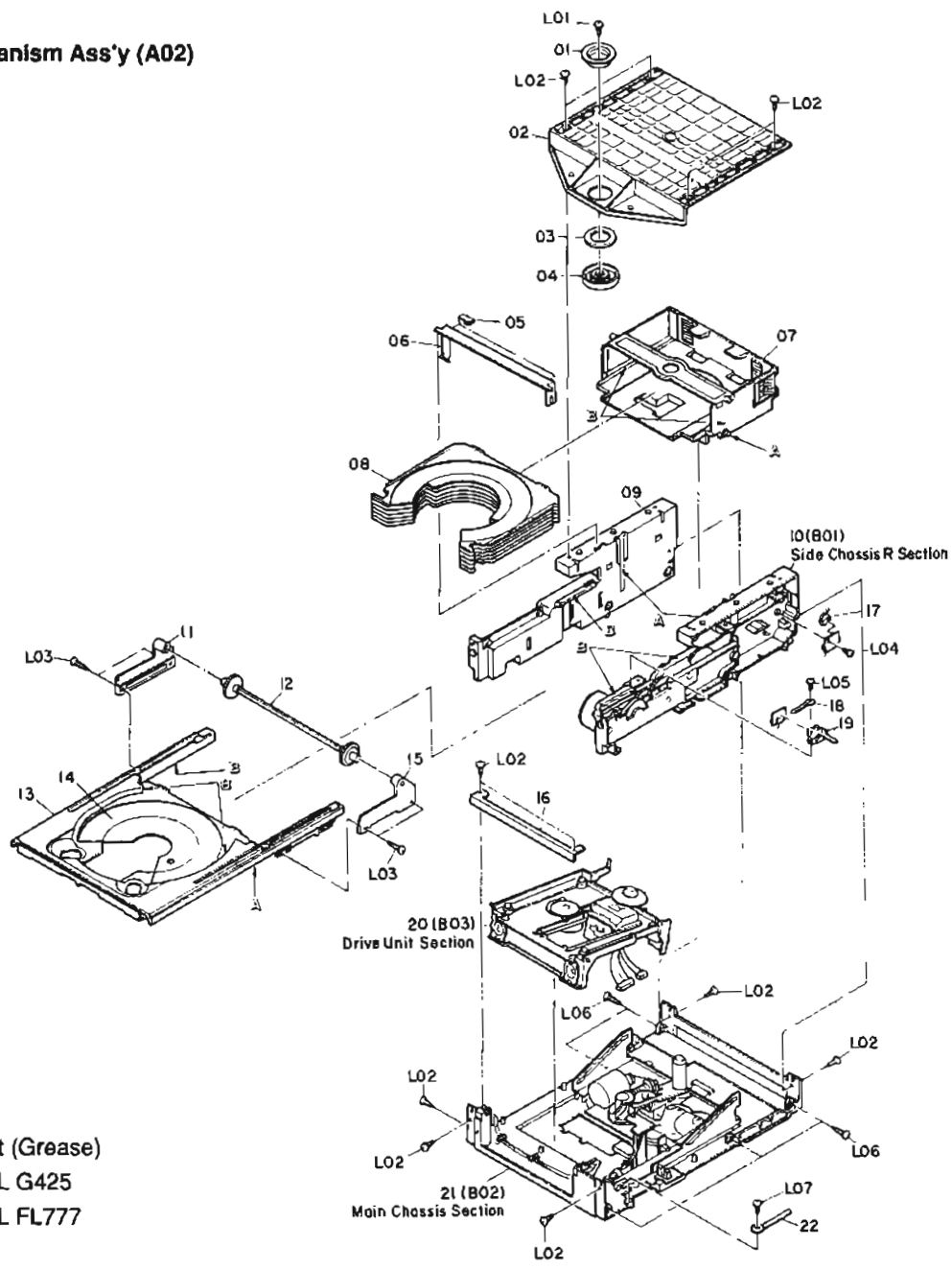


Fig. 7.2

### 7.2. Front Escutcheon Section

| Schematic Ref. No. | Part No. | Description                     | Q'ty     |
|--------------------|----------|---------------------------------|----------|
| <b>A01</b>         | —        | <b>Front Escutcheon Section</b> | <b>1</b> |
| 01                 | 0H06722B | Window                          | 1        |
| 02                 | 0H06717B | Front Escutcheon [MB-1s, 2s]    | 1        |
|                    | 0H06742A | Front Escutcheon [MB-3s]        | 1        |
| 03                 | 0H06724A | Power Knob                      | 1        |
| 04                 | 0J07245B | Power Switch Holder             | 1        |
| 05                 | BA09071A | Power Switch P.C.B. Ass'y       | 1        |
| 06                 | 0H06719A | Control Knob 9                  | 1        |
| 07                 | 0H06720A | Control Knob 3                  | 1        |
| 08                 | 0H06721A | Control Knob 2                  | 1        |
| 09                 | BA09070A | Key P.C.B. Ass'y                | 1        |
| 10                 | BA09072A | Headphone P.C.B. Ass'y [MB-1s]  | 1        |
|                    | BA09084A | Headphone P.C.B. Ass'y [MB-2s]  | 1        |
| 11                 | BA09069A | Display P.C.B. Ass'y            | 1        |
| 12                 | 0J07241A | LCD Sheet                       | 1        |
| 13                 | 0J07239A | LCD Holder                      | 1        |
| L01                | 0E00696A | M2x5 + Pan                      |          |
| L02                | 0E03769A | PT2.6x8 + Binding               |          |
| L03                | 0E03813A | PT2.6x6 + Binding               |          |
| L04                | 0E03638A | PT2x6 + Binding                 |          |

7.3. Mechanism Ass'y (A02)



Lubricant (Grease)

A: FLOIL G425

B: FLOIL FL777

Fig. 7.3

7.3. Mechanism Ass'y

| Schematic Ref. No. | Part No. | Description            | Q'ty | Schematic Ref. No. | Part No. | Description                         | Q'ty |
|--------------------|----------|------------------------|------|--------------------|----------|-------------------------------------|------|
| A02                | CG09210A | Mechanism Ass'y        | 1    | 15                 | 2C00097A | Tray Holder R                       | 1    |
| 01                 | 2C00014A | Clamper HI             | 1    | 16                 | 2C00086A | Mecha B Stopper                     | 1    |
| 02                 | 2C00094A | Top Cover              | 1    | 17                 | 2B70009A | Store Switch MSS-10L2-1             | 1    |
| 03                 | 2C00016A | Magnet 17x27x5         | 1    | 18                 | 2C00107A | Wire Clamper 3B40                   | 1    |
| 04                 | 2C00015A | Clamper LO             | 1    | 19                 | 2B70007A | Eject /T-Close Switch SSS-13        | 1    |
| 05                 | 2C00101A | A Arm Cushion          | 1    | 20                 | —        | Drive Unit Section                  | 1    |
| 06                 | 2C00071A | Assist Arm             | 1    | 21                 | —        | Main Chassis Section                | 1    |
| 07                 | CB00215A | Stocker Ass'y          | 1    | 22                 | 2C00106A | Wire Clamper 3A60                   | 1    |
| 08                 | 2C00012A | Carriage               | 6    | L01                | 0E03610A | BT2.6x6 + Binding (Black Chromate)  | 1    |
| 09                 | 2C00090A | Side Chassis L         | 1    | L02                | 0E00825A | BT2.6x8 + Binding (Black Chromate)  | 1    |
| 10                 | —        | Side Chassis R Section | 1    | L03                | 2E00005A | M2.6x12 + Binding                   | 1    |
| 11                 | 2C00098A | Tray Holder L          | 1    | L04                | 0E00961A | BT2x5 + Binding                     | 1    |
| 12                 | CB00230A | Timing Ass'y           | 1    | L05                | 0E03442A | ST2.6x5 + Pan                       | 1    |
| 13                 | CB00214A | Tray Ass'y             | 1    | L06                | 0E03612A | BT2.6x10 + Binding (Black Chromate) | 1    |
| 14                 | 2C00013A | Carriage S             | 1    | L07                | 0E00873A | BT2.6x5 + Binding                   | 1    |

### 7.4. Side Chassis R Section (B01)

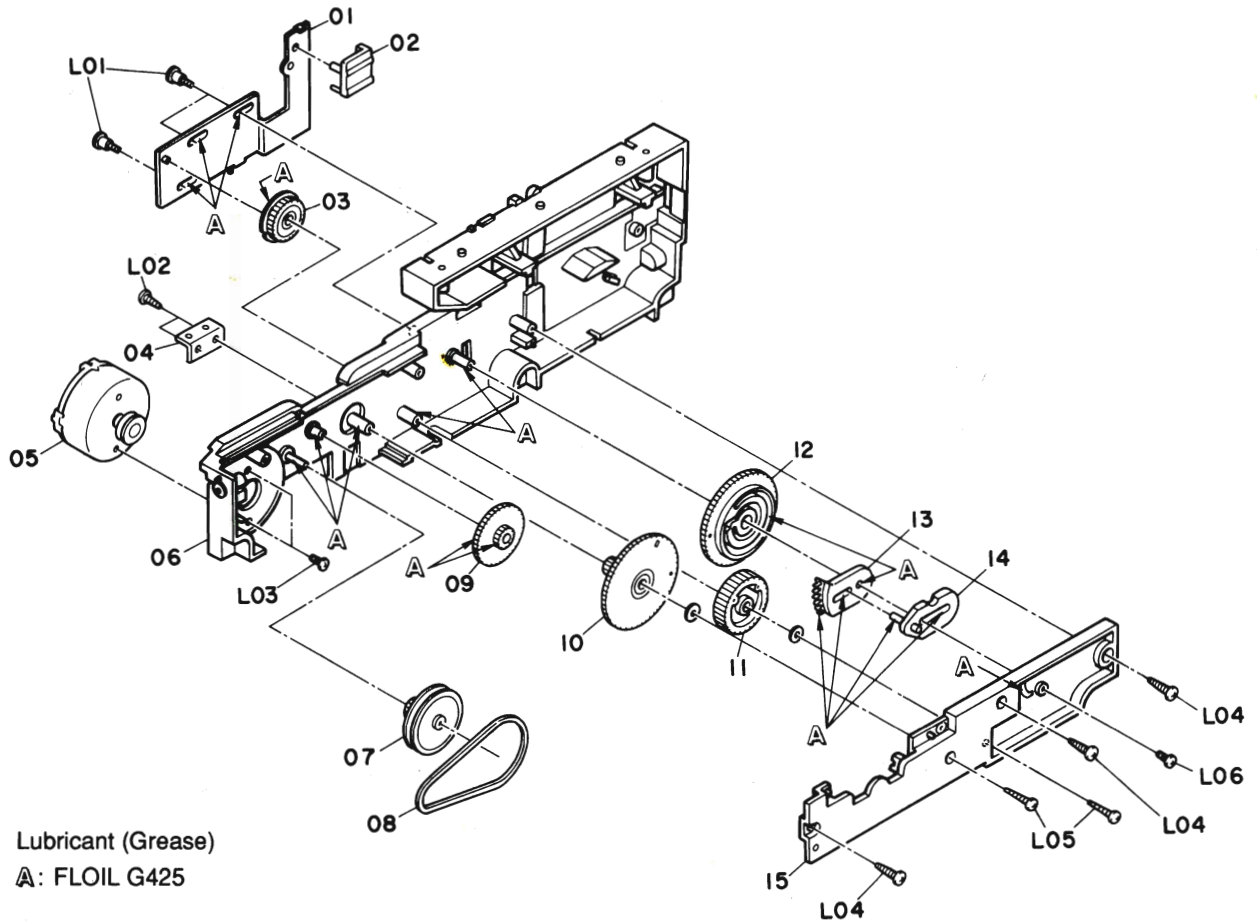


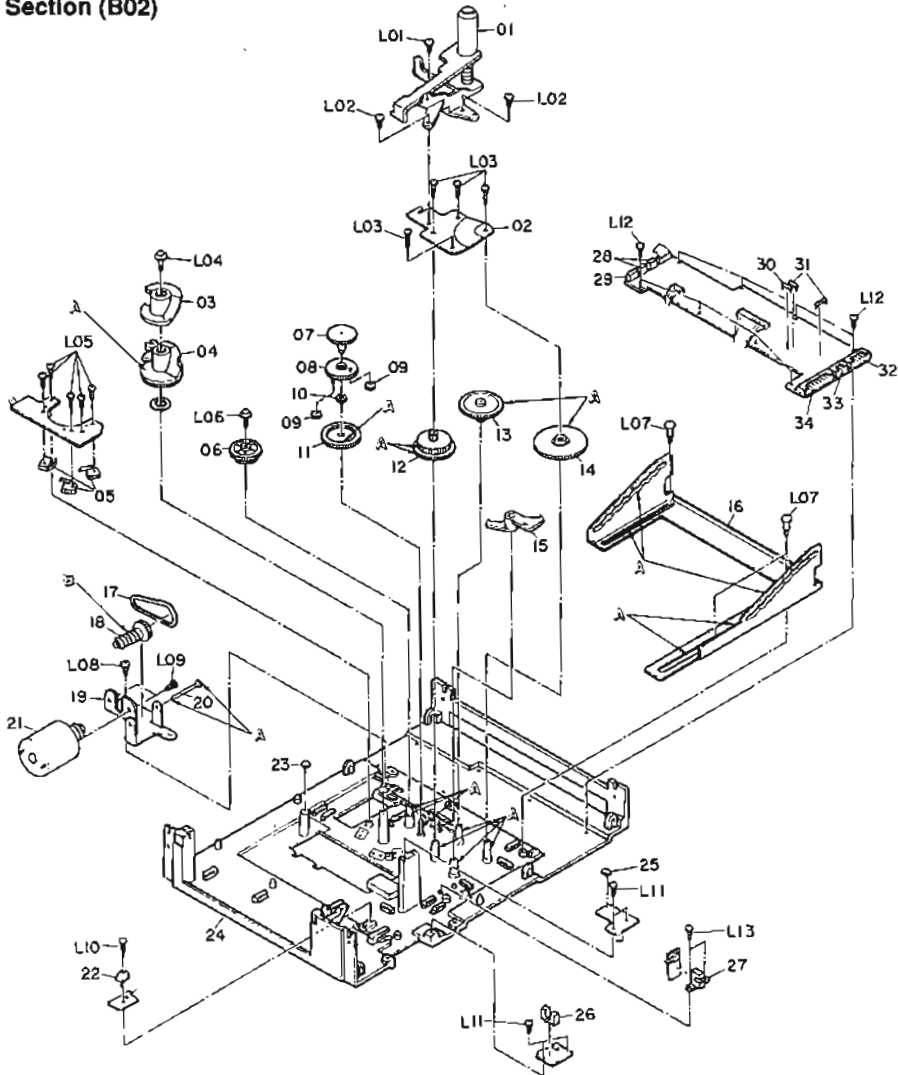
Fig. 7.4

#### 7.4. Side Chassis R Section

| Schematic Ref. No. | Part No. | Description                        | Q'ty     |
|--------------------|----------|------------------------------------|----------|
| <b>B01</b>         | —        | <b>Side Chassis R Section</b>      | <b>1</b> |
| 01                 | CB00223A | Change Plate Ass'y                 | 1        |
| 02                 | 2C00072A | Carriage Opener                    | 1        |
| 03                 | 2C00039A | Change Gear                        | 1        |
| 04                 | 2C00093A | SW-Bracket                         | 1        |
| 05                 | CB00216A | Loading Motor Ass'y                | 1        |
| 06                 | CB00222A | Side Chassis R Sub Ass'y           | 1        |
| 07                 | 2C00044A | S-P-Gear                           | 1        |
| 08                 | 2C00017A | Belt-C-S                           | 1        |
| 09                 | 2C00041A | Side Idler                         | 1        |
| 10                 | 2C00054A | S-F-Gear                           | 1        |
| 11                 | 2C00042A | S-I-Gear                           | 1        |
| 12                 | 2C00043A | S-M-Gear                           | 1        |
| 13                 | 2C00045A | Tray Stopper                       | 1        |
| 14                 | CB00225A | Tray Arm Ass'y                     | 1        |
| 15                 | 2C00040A | Gear Holder                        | 1        |
| L01                | 2E00002A | BT2.0x1.4x5.9                      |          |
| L02                | 0E03610A | BT2.6x6 + Binding (Black Chromate) |          |
| L03                | 0E00945A | M2.6x4 + Binding (Black Chromate)  |          |
| L04                | 0E00825A | BT2.6x8 + Binding (Black Chromate) |          |
| L05                | 0E03756A | BT2x10 + Binding (Black Chromate)  |          |
| L06                | 2E00013A | M2x4 + Binding (Black Chromate)    |          |



## 7.5. Main Chassis Section (B02)



Lubricant (Grease)  
**A**: FLOIL G425  
**B**: FLOIL FL777

Fig. 7.5

### 7.5. Main Chassis Section

| Schematic Ref. No. | Part No. | Description               | Q'ty | Schematic Ref. No. | Part No. | Description                        | Q'ty |
|--------------------|----------|---------------------------|------|--------------------|----------|------------------------------------|------|
| B02                | —        | Main Chassis Section      | 1    | 27                 | 2B10020A | Photo Interrupter GS1S51V          | 1    |
| 01                 | CB00224A | Disc Lock Arm Ass'y       | 1    | 28                 | 0B81459A | B2B-PH-K-S                         | 2    |
| 02                 | 2C00081A | Gear Plate                | 1    | 29                 | 0B81460A | B3B-PH-K-S                         | 1    |
| 03                 | 2C00085A | ME UD Cam Top             | 1    | 30                 | 0B09665A | RK 270 1/ 6WJ                      | 1    |
| 04                 | 2C00084A | Mecha UD Cam              | 1    | 31                 | 0B09663A | RK 330 1/6W J                      | 2    |
| 05                 | 2B70008A | Cam Switch MSS-10R2-16    | 3    | 32                 | 0B81470A | S6B-PH-K-S                         | 1    |
| 06                 | 2C00082A | ID-ST-Gear                | 1    | 33                 | 0B81468A | S4B-PH-K-S                         | 1    |
| 07                 | 2C00074A | D1-ST-Gear                | 1    | 34                 | 0B84475A | S12B-PH-K-S                        | 1    |
| 08                 | CB00226A | D2-ST-Gear Ass'y          | 1    | L01                | 0E03610A | BT2.6x6 + Binding (Black Chromate) |      |
| 09                 | 2C00075A | D3-ST-Gear                | 2    | L02                | 0E00945A | M2.6x4 + Binding (Black Chromate)  |      |
| 10                 | 2C00076A | D4-ST-Gear                | 1    | L03                | 0E00969A | BT2x8 + Binding                    |      |
| 11                 | 2C00077A | D5-ST-Gear                | 1    | L04                | 2E00010A | BT3x10 + Binding Washer-Faced      |      |
| 12                 | 2C00083A | Lock Idler                | 1    | L05                | 2E00008A | BT1.7x5.5 + Binding                |      |
| 13                 | 2C00079A | D7-ST-Gear                | 1    | L06                | 2E00009A | BT2x8 + Binding Washer-Faced       |      |
| 14                 | 2C00078A | D6-ST-Gear                | 1    | L07                | 2E00001A | BT2.6x1.4x7.4                      |      |
| 15                 | 2C00073A | Change Arm                | 1    | L08                | 0E00873A | BT2.6x5 + Binding                  |      |
| 16                 | 2C00091A | Stocker Cam               | 1    | L09                | 0E00501A | M3x3 + Pan                         |      |
| 17                 | 2C00018A | Beit-T-C                  | 1    | L10                | 2E00007A | BT1.7x8 + Binding                  |      |
| 18                 | 2C00092A | ST-Worm-Gear              | 1    | L11                | 0E00961A | BT2x5 + Binding                    |      |
| 19                 | 2C00088A | Motor Bracket             | 1    | L12                | 2E00006A | BT1.7x4 + Binding                  |      |
| 20                 | 2C00100A | Worm Shaft                | 1    | L13                | 0E00869A | BT2.6x4 + Binding                  |      |
| 21                 | CB00213A | Stocker Motor Ass'y       | 1    | —                  | 2B80006A | Wire CNW-W6P                       | 1    |
| 22                 | 2B70012A | Home Position MSS-10R2-17 | 1    | —                  | 2B80007A | Wire CNW-2P175                     | 1    |
| 23                 | 2C00099A | Mecha Cushion             | 2    | —                  | 2B80008A | Wire CNW-2P330                     | 1    |
| 24                 | CB00221A | Main Chassis Ass'y        | 1    | —                  | 2B80009A | Wire CNW-W4P                       | 1    |
| 25                 | 2B10019A | Photo Reflector GP2S40    | 1    | —                  | 2B80010A | Wire CNW-W2P50                     | 1    |
| 26                 | 2B10021A | Photo Interrupter GP1S52V | 1    | —                  | 2B80011A | Wire CNW-W11P                      | 1    |
|                    |          |                           |      | —                  | 2B80012A | Wire CNW-3P                        | 1    |

### 7.6. Drive Unit Section (B03)

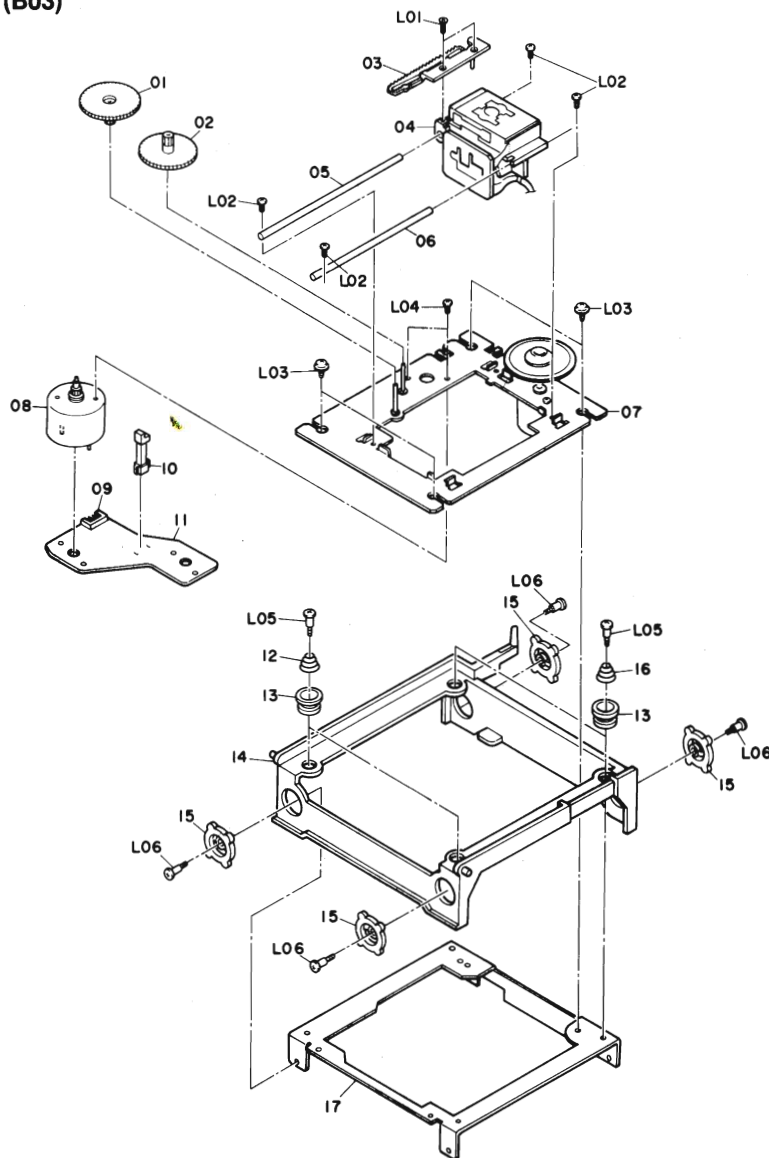


Fig. 7.6

### 7.6. Drive Unit Section

| Schematic Ref. No. | Part No. | Description               | Q'ty     | Schematic Ref. No. | Part No. | Description                   | Q'ty |
|--------------------|----------|---------------------------|----------|--------------------|----------|-------------------------------|------|
| <b>B03</b>         | —        | <b>Drive Unit Section</b> | <b>1</b> | L02                | 2E00011A | ST2.6x6 + Binding             |      |
| 01                 | 2C00023A | Gear Power                | 1        | L03                | 2E00012A | ST2.6x6 + Cup Screw           |      |
| 02                 | 2C00022A | Gear Middle               | 1        | L04                | 0E03439A | M2x2.5 + Pan (Black Chromate) |      |
| 03                 | 2C00105A | Plate Rack                | 1        | L05                | 2E00004A | ST2.0x10x15                   |      |
| 04                 | 2C00019A | Pick-up SF91NC            | 1        | L06                | 2E00003A | ST2.0x3.0x8.0                 |      |
| 05                 | 2C00021A | Guide Bar B               | 1        |                    |          |                               |      |
| 06                 | 2C00020A | Guide Bar A               | 1        |                    |          |                               |      |
| 07                 | CB00217A | Disc Motor Ass'y          | 1        |                    |          |                               |      |
| 08                 | CB00218A | Feed Motor Ass'y          | 1        |                    |          |                               |      |
| 09                 | 0B81470A | 6P S-Post S6B-PH          | 1        |                    |          |                               |      |
| 10                 | 2B70011A | Leaf SW BSW-333A          | 1        |                    |          |                               |      |
| 11                 | 2B60002A | Motor P.C.B. 90V1-M       | 1        |                    |          |                               |      |
| 12                 | 2C00027A | Mecha SP B                | 2        |                    |          |                               |      |
| 13                 | 2C00025A | Mecha Limit               | 4        |                    |          |                               |      |
| 14                 | CB00227A | Mecha Base Ass'y          | 1        |                    |          |                               |      |
| 15                 | 2C00024A | Mecha Sus                 | 4        |                    |          |                               |      |
| 16                 | 2C00026A | Mecha SP A                | 2        |                    |          |                               |      |
| 17                 | 2C00087A | Mecha Chassis             | 1        |                    |          |                               |      |
| L01                | 0E03648A | M2x5 + Countersunk        |          |                    |          |                               |      |



# 8. MOUNTING DIAGRAMS AND PARTS LIST

## 8.1. Main P.C.B. Ass'y

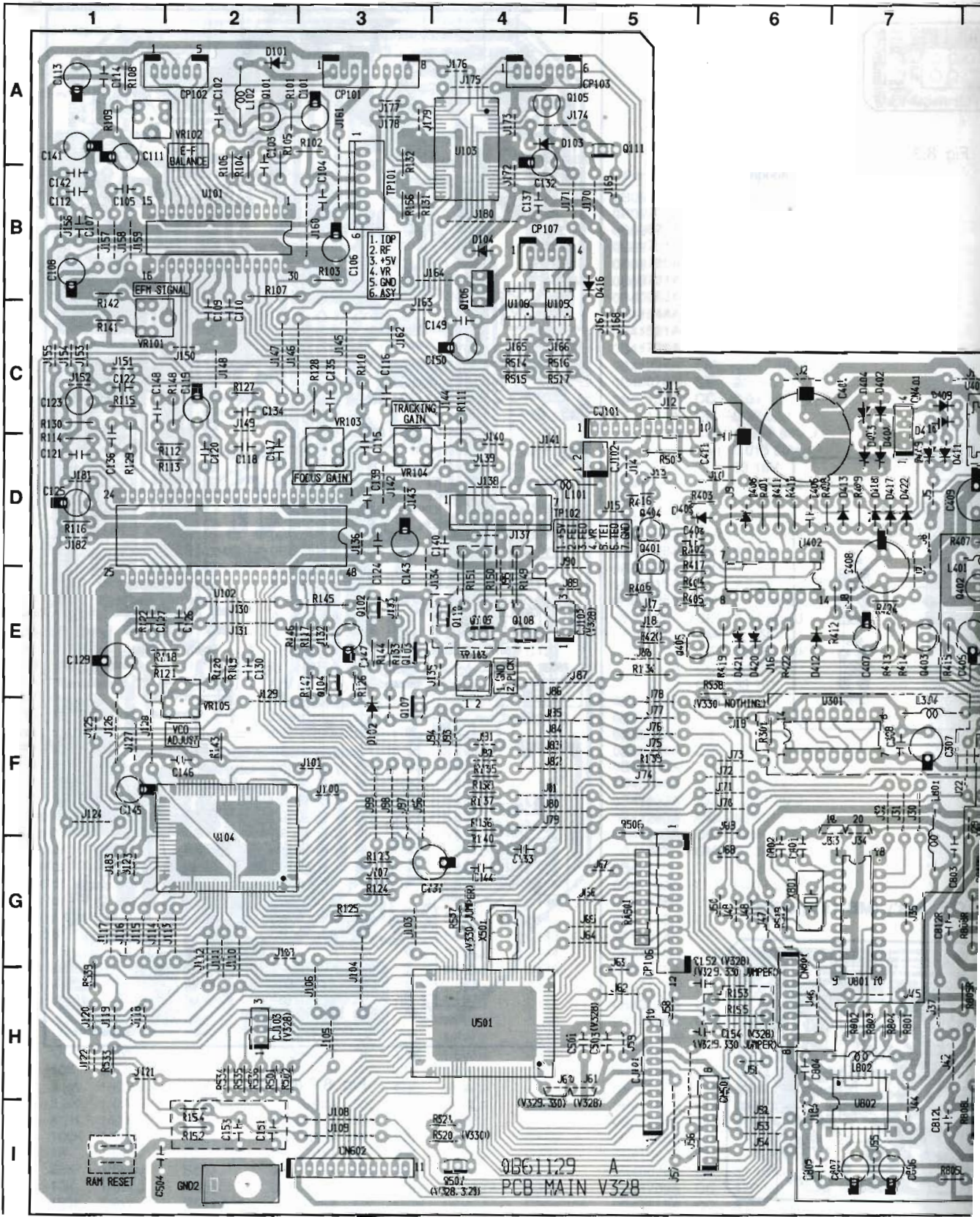


Fig. 8.1







Switch P.C.B. Ass'y

8.7. DAC P.C.B. Ass'y (MB-1s)

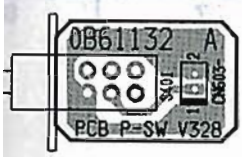
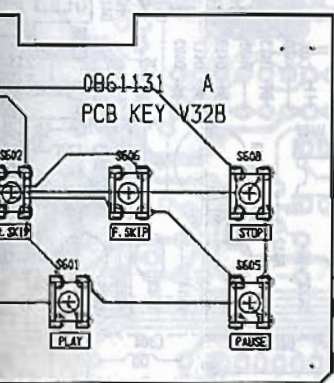


Fig. 8.3



Phone P.C.B. Ass'y (MB-1s and -2s)

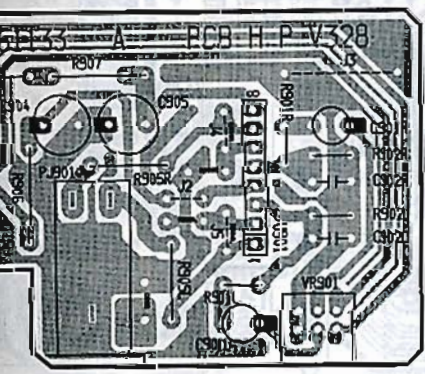


Fig. 8.6 (MB-1s and -2s)

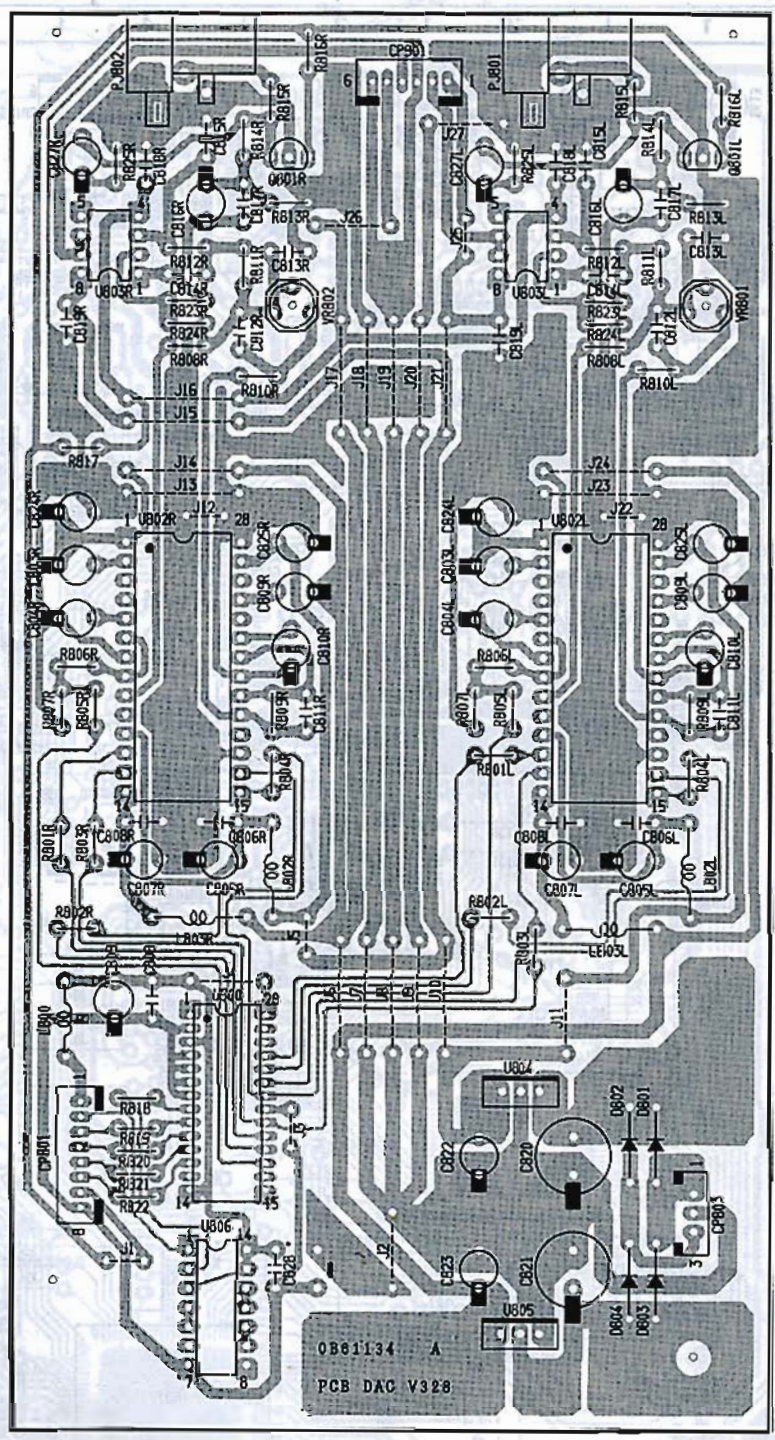


Fig. 8.7 (MB-1s)



8.2. Transformer P.C.B. Ass'y

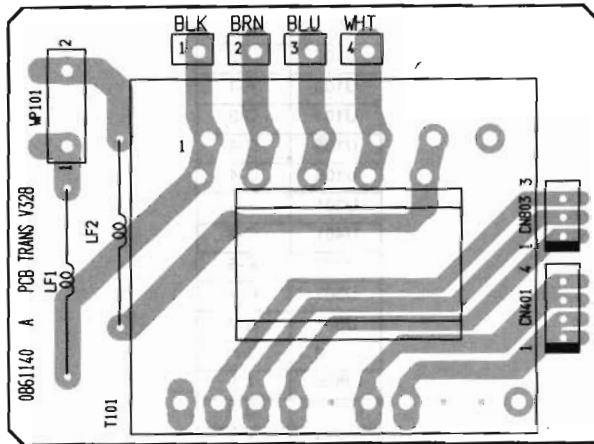


Fig. 8.2

8.3. Power Switch P.C.B. Ass'y

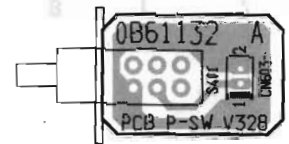


Fig. 8.3

8.4. Key P.C.B. Ass'y

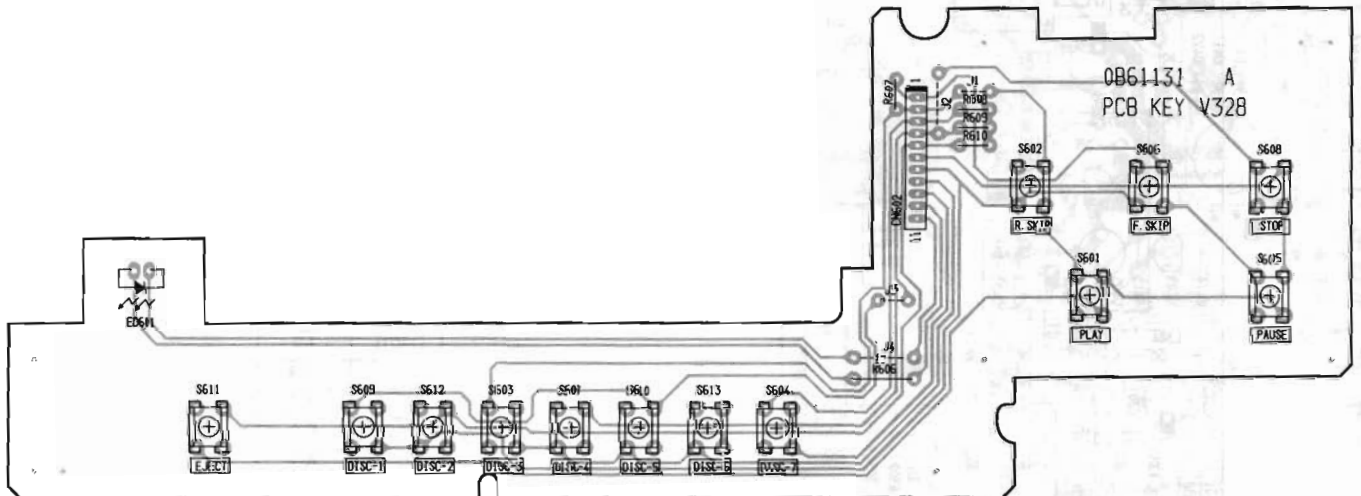


Fig. 8.4

8.5. Display P.C.B. Ass'y

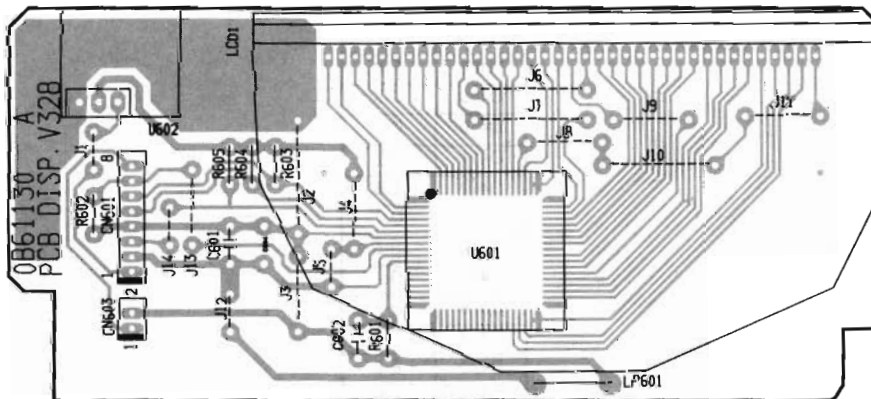


Fig. 8.5

8.6. Headphone P.C.B. Ass'y (MB-1s and -2s)

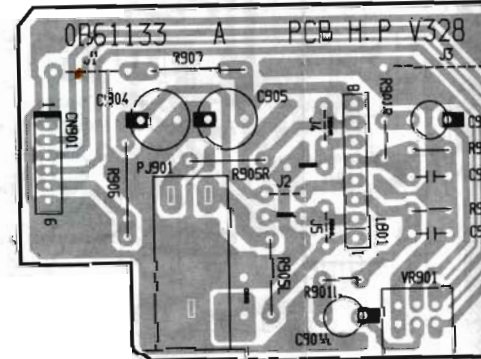


Fig. 8.6 (MB-1s and -2s)



**NOTES: 1. Abbreviations**

TR – Transistor, SID – Silicon Diode, ZD – Zener Diode, Varicap – Variable Capacitance Diode  
 RK – Carbon Resistor, RM – Metal Film Resistor, RF – Fail Safe Type Resistor,  
 RC – Cement Resistor, CE – Electrolytic Capacitor, CML – Mylar Capacitor,  
 CC – Ceramic Capacitor, CPP – PP Capacitor, CMM – Metalized Mylar Capacitor,  
 CSP – Polystyrene Capacitor, C – Mica Capacitor, CT – Tantalum Capacitor

2. Description of capacitor: 10 16V = 10µ 16V

3. Parts marked with \* show chip parts.

**8.1. Main P.C.B. Ass'y**

| Schematic Ref. No. | Part No.        | Description              | Schematic Ref. No. | Part No. | Description    | Schematic Ref. No. | Part No. | Description     |
|--------------------|-----------------|--------------------------|--------------------|----------|----------------|--------------------|----------|-----------------|
|                    | <b>BA09068A</b> | <b>Main P.C.B. Ass'y</b> | R117               | 0B09713A | RK 33K 1/6W J  | R534,535           | 0B09717A | RK 47K 1/6W J   |
|                    |                 |                          | R118               | 0B25291A | RM 10K 1/4W F  | R536               | 0B09717A | RK 47K 1/6W J   |
|                    |                 |                          | R119               | 0B25666A | RM 3.6K 1/4W F | R537               | 0B09677A | RK 1K 1/6W J    |
|                    |                 |                          | R120               | 0B09734A | RK 240K 1/6W J | R538               | 0B09701A | RK 10K 1/6W J   |
|                    |                 |                          | R121               | 0B09701A | RK 10K 1/6W J  | R539               | 0B09725A | RK 100K 1/6W J  |
|                    |                 |                          | R122               | 0B25291A | RM 10K 1/4W F  | R540,541           | 0B09701A | RK 10K 1/6W J   |
|                    |                 |                          | R123               | 0B09721A | RK 68K 1/6W J  | C101               | 0B40063A | CE 100 10V      |
|                    |                 |                          | R124               | 0B09701A | RK 10K 1/6W J  | C102               | 0B41944A | CC 1000P 50V K  |
|                    |                 |                          | R125,126           | 0B09725A | RK 100K 1/6W J | C103               | 0B41521A | CML 3300P 50V J |
|                    |                 |                          | R127               | 0B09737A | RK 330K 1/6W J | C104               | 0B41708A | CC 22P 50V J    |
|                    |                 |                          | R128               | 0B09729A | RK 150K 1/6W J | C105               | 0B41294A | CML 0.047 50V J |
|                    |                 |                          | R129               | 0B09720A | RK 62K 1/6W J  | C106               | 0B40076A | CE 33 16V       |
|                    |                 |                          | R130               | 0B09704A | RK 13K 1/6W J  | C107               | 0B47137A | CC 0.047 25V Z  |
|                    |                 |                          | R131               | 0B09710A | RK 24K 1/6W J  | C108               | 0B40111A | CE 0.47 50V     |
|                    |                 |                          | R132               | 0B09701A | RK 10K 1/6W J  | C109               | 0B41522A | CML 4700P 50V J |
|                    |                 |                          | R133               | 0B09725A | RK 100K 1/6W J | C110               | 0B41525A | CML 0.015 50V J |
|                    |                 |                          | R134               | 0B09701A | RK 10K 1/6W J  | C111               | 0B40076A | CE 33 16V       |
|                    |                 |                          | R135               | 0B09677A | RK 1K 1/6W J   | C112               | 0B47133A | CC 0.01 50V Z   |
|                    |                 |                          | R136,137           | 0B09653A | RK 100 1/6W J  | C113               | 0B40114A | CE 3.3 50V      |
|                    |                 |                          | R138,139           | 0B09653A | RK 100 1/6W J  | C114               | 0B47137A | CC 0.047 25V Z  |
|                    |                 |                          | R140               | 0B09749A | RK 1M 1/6W J   | C115,116           | 0B41278A | CML 2200P 50V J |
|                    |                 |                          | R141,142           | 0B09705A | RK 15K 1/6W J  | C117               | 0B41298A | CML 0.1 50V J   |
|                    |                 |                          | R143               | 0B09701A | RK 10K 1/6W J  | C118               | 0B41294A | CML 0.047 50V J |
|                    |                 |                          | R144               | 0B09713A | RK 33K 1/6W J  | C119               | 0B40115A | CE 4.7 50V      |
|                    |                 |                          | R145               | 0B09701A | RK 10K 1/6W J  | C120               | 0B41298A | CML 0.1 50V J   |
|                    |                 |                          | R146,147           | 0B09713A | RK 33K 1/6W J  | C121               | 0B41823A | CML 0.01 50V J  |
|                    |                 |                          | R148               | 0B09731A | RK 180K 1/6W J | C122               | 0B41298A | CML 0.1 50V J   |
|                    |                 |                          | R149               | 0B09697A | RK 6.8K 1/6W J | C123               | 0B09163A | CE 10 16V (BP)  |
|                    |                 |                          | R150               | 0B09708A | RK 20K 1/6W J  | C124               | 0B47117A | CC 0.1 50V Z    |
|                    |                 |                          | R151               | 0B09701A | RK 10K 1/6W J  | C125               | 0B40076A | CE 33 16V       |
|                    |                 |                          | R152,153           | 0B09709A | RK 22K 1/6W J  | C126               | 0B41298A | CML 0.1 50V J   |
|                    |                 |                          | R154,155           | 0B09709A | RK 22K 1/6W J  | C127               | 0B41974A | CC 100P 50V J   |
|                    |                 |                          | R156               | 0B09701A | RK 10K 1/6W J  | C129               | 0B40078A | CE 100 16V      |
|                    |                 |                          | R157               | 0B09697A | RK 6.8K 1/6W J | C130               | 0B41274A | CML 1000P 50V J |
|                    |                 |                          | R158               | 0B09701A | RK 10K 1/6W J  | C131               | 0B40111A | CE 0.47 50V     |
|                    |                 |                          | R301               | 0B09701A | RK 10K 1/6W J  | C132               | 0B40063A | CE 100 10V      |
|                    |                 |                          | R302               | 0B09655A | RK 120 1/6W J  | C133               | 0B41823A | CML 0.01 50V J  |
|                    |                 |                          | R303               | 0B09650A | RK 75 1/6W J   | C134               | 0B41283A | CML 5600P 50V J |
|                    |                 |                          | R304               | 0B09637A | RK 22 1/6W J   | C135               | 0B41885A | CC 220P 50V J   |
|                    |                 |                          | R401               | 0B09749A | RK 1M 1/6W J   | C136               | 0B41823A | CML 0.01 50V J  |
|                    |                 |                          | R402               | 0B09701A | RK 10K 1/6W J  | C137               | 0B47117A | CC 0.1 50V Z    |
|                    |                 |                          | R403               | 0B09749A | RK 1M 1/6W J   | C139,140           | 0B47133A | CC 0.01 50V Z   |
|                    |                 |                          | R404               | 0B09701A | RK 10K 1/6W J  | C141               | 0B40076A | CE 33 16V       |
|                    |                 |                          | R405               | 0B09717A | RK 47K 1/6W J  | C142               | 0B47133A | CC 0.01 50V Z   |
|                    |                 |                          | R406               | 0B09693A | RK 4.7K 1/6W J | C143               | 0B40074A | CE 10 16V       |
|                    |                 |                          | R408,409           | 0B09701A | RK 10K 1/6W J  | C144               | 0B41526A | CML 0.018 50V J |
|                    |                 |                          | R410               | 0B09749A | RK 1M 1/6W J   | C145               | 0B40078A | CE 100 16V      |
|                    |                 |                          | R411               | 0B09701A | RK 10K 1/6W J  | C146               | 0B47117A | CC 0.1 50V Z    |
|                    |                 |                          | R412               | 0B09677A | RK 1K 1/6W J   | C147               | 0B40115A | CE 4.7 50V      |
|                    |                 |                          | R413               | 0B09718A | RK 51K 1/6W J  | C148               | 0B41525A | CML 0.015 50V J |
|                    |                 |                          | R414               | 0B09701A | RK 10K 1/6W J  | C149               | 0B47117A | CC 0.1 50V Z    |
|                    |                 |                          | R416               | 0B09693A | RK 4.7K 1/6W J | C150               | 0B40063A | CE 100 10V      |
|                    |                 |                          | R417               | 0B09717A | RK 47K 1/6W J  | C151               | 0B41298A | CML 0.1 50V J   |
|                    |                 |                          | R419               | 0B09717A | RK 47K 1/6W J  | C152               | 0B41294A | CML 0.047 50V J |
|                    |                 |                          | R420               | 0B09701A | RK 10K 1/6W J  | C153               | 0B41298A | CML 0.1 50V J   |
|                    |                 |                          | R422               | 0B09717A | RK 47K 1/6W J  | C154               | 0B41294A | CML 0.047 50V J |
|                    |                 |                          | R424               | 0B09653A | RK 100 1/6W J  | C155               | 0B41885A | CC 220P 50V J   |
|                    |                 |                          | R501,502           | 0B09701A | RK 10K 1/6W J  | C301               | 0B41823A | CML 0.01 50V J  |
|                    |                 |                          | R503               | 0B09701A | RK 10K 1/6W J  | C302               | 0B40076A | CE 33 16V       |
|                    |                 |                          | R506               | 0B09713A | RK 33K 1/6W J  | C303               | 0B41709A | CC 47P 50V J    |
|                    |                 |                          | R514,515           | 0B09725A | RK 100K 1/6W J | C304,305           | 0B47215A | CC 330P 50V J   |
|                    |                 |                          | R516,517           | 0B09725A | RK 100K 1/6W J | C306               | 0B47117A | CC 0.1 50V Z    |
|                    |                 |                          | R519               | 0B09725A | RK 100K 1/6W J | C307               | 0B40078A | CE 100 16V      |
|                    |                 |                          | R521               | 0B09725A | RK 100K 1/6W J | C308               | 0B47117A | CC 0.1 50V Z    |
|                    |                 |                          | R533               | 0B09725A | RK 100K 1/6W J | C401               | 0B40085A | CE 4700 16V     |

## MB-2s Electrical Parts list (2/2)

### Schematic

| Ref. No. | Part No. | Description           |
|----------|----------|-----------------------|
| C803,804 | 0B47117A | CC 0.1 50V Z          |
| C805     | 0B41298A | CML 0.1 50V J         |
| C806,807 | 0B40768A | CE 4.7 25V (LN)       |
| C808L,R  | 0B41201A | CPP 100P 100V J       |
| C809L,R  | 0B41298A | CML 0.1 50V J         |
| C810L,R  | 0B41201A | CPP 100P 100V J       |
| C811L,R  | 0B41215A | CPP 390P 100V J       |
| C812L,R  | 0B41298A | CML 0.1 50V J         |
| C813L,R  | 0B40776A | CE 47 16V (LN)        |
| CJ101    | 0B80638B | Ribbon Cable 10P      |
| CJ102    | 0B80639B | Ribbon Cable 2P       |
| CN103    | 0B80642A | Connector Ass'y CN103 |
| CN106    | 0B80643A | Connector Ass'y CN106 |
| CN107    | 0B80644A | Connector Ass'y CN107 |
| CN401    | 0B80634B | Connector Ass'y CN401 |
| CN601    | 0B80631B | Connector Ass'y CN601 |
| CN602    | 0B80632A | Connector Ass'y CN602 |
| CP101    | 0B81465A | 8P T-Post             |
| CP102    | 0B81462A | 5P T-Post             |
| CP103    | 0B81463A | 6P T-Post             |
| CP106    | 0B84087A | 12P T-Post            |
| CP107    | 0B81461A | 4P T-Post             |
| CP901    | 0B81463A | 6P T-Post             |
| S301     | 0B70165A | Slide Switch          |
| TP101    | 0B08182A | 6P T-Post             |
| TP102    | 0B02244A | 7P T-Post             |
| TP103    | 0B02233A | 2P T-Post             |
| PJ301    | 0B84544A | 1P Pin Jack           |
| PJ302    | 0B84028A | Stereo Mini           |
| PJ801    | 0B80645A | 2P Mount Pin Jack     |
| GND1     | 0B84388A | Screw Terminal        |
| GND2     | 0J05898C | Earth Plate           |
|          | 0B80657A | Lead Wire (1)         |
|          | 0B80659A | Lead Wire (1)         |
|          | 0B90019A | SK Binder SKB80 (6)   |
|          | 0B90464A | Heat Sink (1)         |

### 8.2. Transformer P.C.B. Ass'y

| Schematic Ref. No. | Part No. | Description                     |
|--------------------|----------|---------------------------------|
|                    | —        | <b>Transformer P.C.B. Ass'y</b> |
|                    | 0B61140A | Transformer P.C.B.              |
| LF1,2              | 0B51397A | Inductor 15uH VW1               |
| WP101              | 0B84275A | Wrapping Terminal 2P            |
|                    | 0B90366A | Fuse Clip (FP-217) (2)          |

### 8.3. Power Switch P.C.B. Ass'y

| Schematic Ref. No. | Part No.        | Description                      |
|--------------------|-----------------|----------------------------------|
|                    | <b>BA09071A</b> | <b>Power Switch P.C.B. Ass'y</b> |
|                    | 0B61132A        | Power Switch P.C.B.              |
| S401               | 0B70226A        | Push Switch                      |

### 8.4. Key P.C.B. Ass'y

| Schematic Ref. No. | Part No.        | Description             |
|--------------------|-----------------|-------------------------|
|                    | <b>BA09070A</b> | <b>Key P.C.B. Ass'y</b> |
|                    | 0B61131A        | Key P.C.B.              |
| R607,608           | 0B09717A        | RK 47K 1/6W J           |
| R609,610           | 0B09717A        | RK 47K 1/6W J           |
| S601,602           | 0B70227A        | Tact Switch LCP-S       |
| S603,604           | 0B70227A        | Tact Switch LCP-S       |
| S605,606           | 0B70227A        | Tact Switch LCP-S       |
| S607,608           | 0B70227A        | Tact Switch LCP-S       |
| S609,610           | 0B70227A        | Tact Switch LCP-S       |
| S611,612           | 0B70227A        | Tact Switch LCP-S       |
| S613               | 0B70227A        | Tact Switch LCP-S       |

### 8.5. Display P.C.B. Ass'y

| Schematic Ref. No. | Part No.        | Description                    |
|--------------------|-----------------|--------------------------------|
|                    | <b>BA09069A</b> | <b>Display P.C.B. Ass'y</b>    |
|                    | 0B61130A        | Display P.C.B.                 |
| U601               | 0B11891A        | IC LC7582A                     |
| U602               | 0B10555A        | Remote Control Sensor GP1U581Y |
| LCD1               | 0B90641A        | LCD GTD-12743AA                |
| R601               | 0B09717A        | RK 47K 1/6W J                  |
| R602,603           | 0B09725A        | RK 100K 1/6W J                 |
| R604,605           | 0B09725A        | RK 100K 1/6W J                 |
| C601               | 0B47117A        | CC 0.1 50V Z                   |
| C602               | 0B05571A        | CML 680P 50V J                 |
| CN603              | 0B80633B        | Connector Ass'y CN603          |
| LP601              | 0B90640A        | Lamp 200mA 5V                  |

### 8.6. Headphone P.C.B. Ass'y

| Schematic Ref. No. | Part No.        | Description                   |
|--------------------|-----------------|-------------------------------|
|                    | <b>BA09084A</b> | <b>Headphone P.C.B. Ass'y</b> |
|                    | 0B61133A        | Headphone P.C.B.              |
| U901               | 0B11857A        | IC NJM4556L                   |
| VR901              | 0B30120A        | VR 50K(A)x2                   |
| R901L,R            | 0B09677A        | RK 1K 1/6W J                  |
| R902L,R            | 0B09717A        | RK 47K 1/6W J                 |
| R905L,R            | 0B09650A        | RK 75 1/6W J                  |
| R906               | 0B09629A        | RK 10 1/6W J                  |
| R907               | 0B24305A        | RF 27 1/2W J                  |
| C901L,R            | 0B40074A        | CE 10 16V                     |
| C902L,R            | 0B41394A        | CPP 220P 50V J                |
| C904               | 0B40078A        | CE 100 16V                    |
| C905               | 0B40053A        | CE 1000 6.3V                  |
| CN901              | 0B80637A        | Connector Ass'y               |
| PJ901              | 0B84371A        | Headphone Jack                |



**8.1. Main P.C.B. Ass'y**

| Schematic Ref. No. | Part No.        | Description              | Schematic Ref. No. | Part No. | Description     | Schematic Ref. No. | Part No. | Description           |
|--------------------|-----------------|--------------------------|--------------------|----------|-----------------|--------------------|----------|-----------------------|
|                    | <b>BA09078A</b> | <b>Main P.C.B. Ass'y</b> | R125,126           | 0B09725A | RK 100K 1/6W J  | C106               | 0B40076A | CE 33 16V             |
|                    |                 |                          | R127               | 0B09737A | RK 330K 1/6W J  | C107               | 0B47137A | CC 0.047 25V J        |
|                    | 0B61129A        | Main P.C.B.              | R128               | 0B09729A | RK 150K 1/6W J  | C108               | 0B40111A | CE 0.47 50V           |
| U101               | 0B11818A        | IC CXA1081S              | R129               | 0B09720A | RK 62K 1/6W J   | C109               | 0B41522A | CML 4700P 50V J       |
| U102               | 0B11819A        | IC CXA1082BS             | R130               | 0B09704A | RK 13K 1/6W J   | C110               | 0B41525A | CML 0.015 50V J       |
| U103               | 0B10558A        | IC BA6296FP              | R131               | 0B09710A | RK 24K 1/6W J   | C111               | 0B40076A | CE 33 16V             |
| U104               | 0B11946A        | IC CXD1167Q              | R132               | 0B09701A | RK 10K 1/6W J   | C112               | 0B47133A | CC 0.01 50V Z         |
| U105,106           | 0B10465A        | IC LB1638M               | R133               | 0B09725A | RK 100K 1/6W J  | C113               | 0B40114A | CE 3.3 50V J          |
| U401               | 0B10554A        | IC PQ05RF1               | R134               | 0B09701A | RK 10K 1/6W J   | C114               | 0B47137A | CC 0.047 50V J        |
| U402               | 0B11611A        | IC TC4584BP              | R135               | 0B09677A | RK 1K 1/6W J    | C115,116           | 0B41278A | CML 2200P 50V J       |
| U501               | 0B10556A        | IC UPD75517-230          | R136,137           | 0B09653A | RK 100 1/6W J   | C117               | 0B41298A | CML 0.1 50V J         |
| U801               | 0B10551A        | IC SM5841CP              | R138,139           | 0B09653A | RK 100 1/6W J   | C118               | 0B41294A | CML 0.047 50V J       |
| U802               | 0B17010A        | IC AD1868R-J (DAC)       | R140               | 0B09749A | RK 1M 1/6W J    | C119               | 0B40115A | CE 4.7 50V            |
| U803L,R            | 0B08124B        | IC NJM4558D              | R141,142           | 0B09705A | RK 15K 1/6W J   | C120               | 0B41298A | CML 0.1 50V J         |
| Q101               | 0B12097A        | TR 2SA952                | R143               | 0B09701A | RK 10K 1/6W J   | C121               | 0B41823A | CML 0.01 50V J        |
| Q102               | 0B10068A        | TR DTC114ES              | R144               | 0B09713A | RK 33K 1/6W J   | C122               | 0B41298A | CML 0.1 50V J         |
| Q103,104           | 0B10368A        | TR DTC144TS              | R145               | 0B09701A | RK 10K 1/6W J   | C123               | 0B09163A | CE 10 16V (BP)        |
| Q105,106           | 0B10563A        | TR 2SB1482               | R146,147           | 0B09713A | RK 33K 1/6W J   | C124               | 0B47117A | CC 0.1 50V Z          |
| Q107               | 0B10368A        | TR DTC144TS              | R148               | 0B09731A | RK 180K 1/6W J  | C125               | 0B40076A | CE 33 16V             |
| Q111               | 0B10058A        | TR DTA114ES              | R156               | 0B09701A | RK 10K 1/6W J   | C126               | 0B41298A | CML 0.1 50V J         |
| Q401               | 0B06100A        | TR 2SC945                | R157               | 0B09697A | RK 6.8K 1/6W J  | C127               | 0B41974A | CC 100P 50V J         |
| Q402               | 0B06322A        | TR 2SC2002               | R158               | 0B09701A | RK 10K 1/6W J   | C129               | 0B40078A | CE 100 16V            |
| Q403               | 0B10094A        | TR 2SA1015 (Y)           | R401               | 0B09749A | RK 1M 1/6W J    | C130               | 0B41274A | CML 1000P 50V J       |
| Q404,405           | 0B06100A        | TR 2SC945                | R402               | 0B09701A | RK 10K 1/6W J   | C131               | 0B40111A | CE 0.47 50V           |
| Q801L,R            | 0B06299A        | TR 2SC2878               | R403               | 0B09749A | RK 1M 1/6W J    | C132               | 0B40063A | CE 100 10V            |
| D101,102           | 0B06398A        | SID 1SS176               | R404               | 0B09701A | RK 10K 1/6W J   | C133               | 0B41823A | CML 0.01 50V J        |
| D103,104           | 0B06398A        | SID 1SS176               | R405               | 0B09717A | RK 47K 1/6W J   | C134               | 0B41283A | CML 5600P 50V J       |
| D401,402           | 0B12693A        | SID S5688B               | R406               | 0B09693A | RK 4.7K 1/6W J  | C135               | 0B41885A | CC 220P 50V J         |
| D403,404           | 0B12693A        | SID S5688B               | R407               | 0B09637A | RK 22 1/6W J    | C136               | 0B41823A | CML 0.01 50V J        |
| D405,406           | 0B06398A        | SID 1SS176               | R408,409           | 0B09701A | RK 10K 1/6W J   | C137               | 0B47117A | CC 0.1 50V Z          |
| D407,408           | 0B06398A        | SID 1SS176               | R410               | 0B09749A | RK 1M 1/6W J    | C139,140           | 0B47133A | CC 0.01 50V Z         |
| D409,410           | 0B06398A        | SID 1SS176               | R411               | 0B09701A | RK 10K 1/6W J   | C141               | 0B40076A | CE 33 16V             |
| D411               | 0B12693A        | SID S5688B               | R412               | 0B09677A | RK 1K 1/6W J    | C142               | 0B47133A | CC 0.01 50V Z         |
| D412,413           | 0B06398A        | SID 1SS176               | R413               | 0B09718A | RK 51K 1/6W J   | C143               | 0B40074A | CE 10 16V             |
| D416,417           | 0B06398A        | SID 1SS176               | R414               | 0B09701A | RK 10K 1/6W J   | C144               | 0B41526A | CML 0.018 50V J       |
| D418               | 0B06398A        | SID 1SS176               | R415               | 0B09749A | RK 1M 1/6W J    | C145               | 0B40078A | CE 100 16V            |
| D419               | 0B12693A        | SID S5688B               | R416               | 0B09693A | RK 4.7K 1/6W J  | C146               | 0B47117A | CC 0.1 50V Z          |
| D420,421           | 0B06398A        | SID 1SS176               | R417               | 0B09717A | RK 47K 1/6W J   | C147               | 0B40115A | CE 4.7 50V            |
| D422               | 0B06398A        | SID 1SS176               | R418               | 0B09685A | RK 2.2K 1/6W J  | C148               | 0B41525A | CML 0.015 50V J       |
| L101,102           | 0B51369A        | Inductor 10uH            | R419               | 0B09717A | RK 47K 1/6W J   | C149               | 0B47117A | CC 0.1 50V Z          |
| L401               | 0B51132A        | Inductor 330uH           | R420               | 0B09701A | RK 10K 1/6W J   | C150               | 0B40063A | CE 100 10V            |
|                    |                 | LAL03TA331K              | R422               | 0B09717A | RK 47K 1/6W J   | C155               | 0B41885A | CC 220P 50V J         |
| L801,802           | 0B51369A        | Inductor 10uH            | R424               | 0B09653A | RK 100 1/6W J   | C401               | 0B40085A | CE 4700 16V           |
| X501               | 0B92033A        | Crystal 4.0MHz           | R501,502           | 0B09701A | RK 10K 1/6W J   | C402               | 0B41298A | CML 0.1 50V J         |
| X801               | 0B92039A        | X'tal 1.69344MHz         | R503               | 0B09701A | RK 10K 1/6W J   | C403               | 0B41300A | CML 0.15 50V J        |
| VR101              | 0B32145A        | Semi VR B10K             | R506               | 0B09713A | RK 33K 1/6W J   | C404,405           | 0B40078A | CE 100 16V            |
| VR102,103          | 0B32146A        | Semi VR 20K              | R514,515           | 0B09725A | RK 100K 1/6W J  | C406               | 0B41823A | CML 0.01 50V J        |
| VR104              | 0B32146A        | Semi VR 20K              | R516,517           | 0B09725A | RK 100K 1/6W J  | C407               | 0B40074A | CE 10 16V             |
| VR105              | 0B30170A        | Semi VR 1K               | R519,520           | 0B09725A | RK 100K 1/6W J  | C408               | 0B40082A | CE 1000 16V           |
| RA501              | 0B20656A        | R Array 47Kx9            | R521               | 0B09725A | RK 100K 1/6W J  | C409               | 0B40052A | CE 470 6.3V           |
| R101               | 0B09629A        | RK 10 1/6W J             | R533               | 0B09725A | RK 100K 1/6W J  | C411               | 0B42054A | Gold Cap 0.22F 5.5V   |
| R102               | 0B09677A        | RK 1K 1/6W J             | R534,535           | 0B09717A | RK 47K 1/6W J   | C501               | 0B47117A | CC 0.1 50V Z          |
| R103               | 0B09701A        | RK 10K 1/6W J            | R536               | 0B09717A | RK 47K 1/6W J   | C504,505           | 0B47133A | CC 0.01 50V Z         |
| R104               | 0B09699A        | RK 8.2K 1/6W J           | R539               | 0B09725A | RK 100K 1/6W J  | C506               | 0B47133A | CC 0.01 50V Z         |
| R105               | 0B09685A        | RK 2.2K 1/6W J           | R540,541           | 0B09701A | RK 10K 1/6W J   | C801,802           | 0B41975A | CC 10P 50 C           |
| R106               | 0B09699A        | RK 8.2K 1/6W J           | R801,802           | 0B09661A | RK 220 1/6W J   | C803,804           | 0B47117A | CC 0.1 50V Z          |
| R107               | 0B09725A        | RK 100K 1/6W J           | R803,804           | 0B09661A | RK 220 1/6W J   | C805               | 0B41298A | CML 0.1 50V J         |
| R108               | 0B09677A        | RK 1K 1/6W J             | R805L,R            | 0B25671A | RM 5.6K 1/4W F  | C806,807           | 0B40115A | CE 4.7 50V            |
| R109               | 0B09709A        | RK 22K 1/6W J            | R806L,R            | 0B25671A | RM 5.6K 1/4W F  | C808L,R            | 0B41201A | CPP 100P 100V J       |
| R110,111           | 0B09701A        | RK 10K 1/6W J            | R807L,R            | 0B25308A | RM 15K 1/4W F   | C809L,R            | 0B41298A | CML 0.1 50V J         |
| R112               | 0B09731A        | RK 180K 1/6W J           | R808L,R            | 0B09697A | RK 6.8K 1/6W J  | C810L,R            | 0B41201A | CPP 100P 100V J       |
| R113               | 0B09735A        | RK 270K 1/6W J           | R809L,R            | 0B09698A | RK 7.5K 1/6W J  | C811L,R            | 0B41215A | CPP 390P 100V J       |
| R114               | 0B09742A        | RK 510K 1/6W J           | R810L,R            | 0B09697A | RK 6.8K 1/6W J  | C812L,R            | 0B41298A | CML 0.1 50V J         |
| R115               | 0B09719A        | RK 56K 1/6W J            | R811L,R            | 0B09671A | RK 560 1/6W J   | C813L,R            | 0B40077A | CE 47 16V             |
| R116               | 0B09725A        | RK 100K 1/6W J           | R812L,R            | 0B09653A | RK 100 1/6W J   | CJ101              | 0B80638B | Ribbon Cable 10P      |
| R117               | 0B09713A        | RK 33K 1/6W J            | R813L,R            | 0B09725A | RK 100K 1/6W J  | CJ102              | 0B80639B | Ribbon Cable 2P       |
| R118               | 0B25291A        | RM 10K 1/4W F            | R814L,R            | 0B09691A | RK 3.9K 1/6W J  | CN103              | 0B80642A | Connector Ass'y CN103 |
| R119               | 0B25666A        | RM 3.6K 1/4W F           | R815L,R            | 0B25308A | RM 15K 1/4W F   | CN106              | 0B80643A | Connector Ass'y CN106 |
| R120               | 0B09734A        | RK 240K 1/6W J           | C101               | 0B40063A | CE 100 10V      | CN107              | 0B80644A | Connector Ass'y CN107 |
| R121               | 0B09701A        | RK 10K 1/6W J            | C102               | 0B41944A | CC 1000P 50 K   | CN401              | 0B80634B | Connector Ass'y CN401 |
| R122               | 0B25291A        | RM 10K 1/4W F            | C103               | 0B41521A | CML 3300P 50V J | CN601              | 0B80631B | Connector Ass'y CN601 |
| R123               | 0B09721A        | RK 68K 1/6W J            | C104               | 0B41708A | CC 22P 50V J    | CN602              | 0B80632A | Connector Ass'y CN602 |
| R124               | 0B09701A        | RK 10K 1/6W J            | C105               | 0B41294A | CML 0.047 50V J | CP101              | 0B81465A | 8P T-Post             |

## MB-3s Electrical Parts list (2/2)

| Schematic Ref. No. | Part No  | Description         |
|--------------------|----------|---------------------|
| CP102              | 0B81462A | 5P T-Post           |
| CP103              | 0B81463A | 6P T-Post           |
| CP106              | 0B84087A | 12P T-Post          |
| CP107              | 0B81461A | 4P T-Post           |
| PJ801              | 0B84226A | Pin Jack 2P         |
| TP101              | 0B08182A | 6P T-Post           |
| TP102              | 0B02244A | 7P T-Post           |
| TP103              | 0B02233A | 2P T-Post           |
| GND1               | 0B84388A | Screw Terminal      |
| GND2               | 0J05898C | Earth Plate         |
|                    | 0B80657A | Lead Wire (1)       |
|                    | 0B80659A | Lead Wire (1)       |
|                    | 0B90019A | SK Binder SKB80 (6) |
|                    | 0B90464A | Heat Sink (1)       |

### 8.2. Transformer P.C.B. Ass'y

| Schematic Ref. No. | Part No. | Description                     |
|--------------------|----------|---------------------------------|
|                    | --       | <b>Transformer P.C.B. Ass'y</b> |
|                    | 0B61140A | Transformer P.C.B.              |
| LF1,2              | 0B51397A | Inductor 15uH VW1               |
| WP101              | 0B84275A | Wrapping Terminal 2P            |
|                    | 0B90366A | Fuse Clip (FP-217) (2)          |

### 8.3. Power Switch P.C.B. Ass'y

| Schematic Ref. No. | Part No.        | Description                      |
|--------------------|-----------------|----------------------------------|
|                    | <b>BA09071A</b> | <b>Power Switch P.C.B. Ass'y</b> |
|                    | 0B61132A        | Power Switch P.C.B.              |
| S401               | 0B70226A        | Push Switch                      |

### 8.4. Key P.C.B. Ass'y

| Schematic Ref. No. | Part No.        | Description             |
|--------------------|-----------------|-------------------------|
|                    | <b>BA09070A</b> | <b>Key P.C.B. Ass'y</b> |
|                    | 0B61131A        | Key P.C.B.              |
| R607,608           | 0B09717A        | RK 47K 1/6W J           |
| R609,610           | 0B09717A        | RK 47K 1/6W J           |
| S601,602           | 0B70227A        | Tact Switch LCP-S       |
| S603,604           | 0B70227A        | Tact Switch LCP-S       |
| S605,606           | 0B70227A        | Tact Switch LCP-S       |
| S607,608           | 0B70227A        | Tact Switch LCP-S       |
| S609,610           | 0B70227A        | Tact Switch LCP-S       |
| S611,612           | 0B70227A        | Tact Switch LCP-S       |
| S613               | 0B70227A        | Tact Switch LCP-S       |

### 8.5. Display P.C.B. Ass'y

| Schematic Ref. No. | Part No.        | Description                    |
|--------------------|-----------------|--------------------------------|
|                    | <b>BA09069A</b> | <b>Display P.C.B. Ass'y</b>    |
|                    | 0B61130A        | Display P.C.B.                 |
| U601               | 0B11891A        | IC LC7582A                     |
| U602               | 0B10555A        | Remote Control Sensor GP1U581Y |
| LP601              | 0B90640A        | Lamp 200mA 5V                  |
| R601               | 0B09717A        | RK 47K 1/6W J                  |
| R602,603           | 0B09725A        | RK 100K 1/6W J                 |
| R604,605           | 0B09725A        | RK 100K 1/6W J                 |
| C601               | 0B47117A        | CC 0.1 50V Z                   |
| C602               | 0B05571A        | CML 680P 50V J                 |
| CN603              | 0B80633B        | Connector Ass'y                |
| LCD1               | 0B90841A        | LCD GTD-12743AA                |



## 9. IC BLOCK DIAGRAMS

### U501 $\mu$ PD75517-230 (Mechanism Controller)

| Pfn No.        | Signal Name        | I/O | Function   |
|----------------|--------------------|-----|--|
| 1              | –                  | –   | Connected to GND.  |
| 2              | AVREF              | –   | Connected to +5V (MB-1s).<br>Connected to GND (MB-2s/3s).  |
| 3<br>4         | VDD                | –   | +5V  |
| 5              | ST UP              | O   | Stocker motor drive signal. Stocker raises when "H".       |
| 6              | ST DWN             | O   | Stocker motor drive signal. Stocker lowers when "H".       |
| 7              | FRONT              | O   | Loading motor drive signal. Disc tray is ejected when "H". |
| 8              | REAR               | O   | Loading motor drive signal. Disc tray is loaded when "H".  |
| 9              | DSP. INH           | O   | Display inhibit signal.                                    |
| 10             | DSP. DT            | O   | Serial display data.                                       |
| 11             | DSP. CK            | O   | Clock for display data at pin 10.                          |
| 12             | DSP. EN            | O   | Latch pulse for display data at pin 10.                    |
| 13             | EMP                | O   | De-emphasis control signal. H: De-emphasis ON.             |
| 14             | MUTG               | O   | Mute control signal.                                       |
| 15             | REM. ACK           | O   | Acknowledge of remote control signal. (MB-1s/2s)           |
| 16             | NC                 | O   | Not used.  |
| 17             | K. DATA            | I   | Not used.  |
| 18             | –                  | I   | Connectd to GND.   |
| 19             | K. CLK             | I   | Not used.  |
| 20             | –                  | I   | Connected to GND.  |
| 21<br>to<br>24 | $\overline{T3-T0}$ | O   | Key matrix scanning signals.                               |
| 25<br>to<br>28 | $\overline{K3-K0}$ | I   | Key matrix input signals.                                  |
| 29             | MOD. SEL           | I   | Mode select signal. Fixed at "L".                          |
| 30             | RAM CLR            | I   | RAM reset input. Can use at power ON.                      |
| 31             | STBY               | I   | Not used.  |
| 32             | DSP. LCD           | I   | Fixed at "L".  |
| 33             | VSS                | –   | GND  |
| 34             | FGC                | O   | Focus gain control signal (MB-1s).                         |
| 35             | TGC2               | O   | Tracking gain control 2 signal (MB-1s).                    |
| 36             | TGC1               | O   | Tracking gain control 1 signal (MB-1s).                    |
| 37             | M. POFF            | O   | Not used.  |
| 38             | LDON               | O   | Laser ON signal.   |
| 39             | XLT                | O   | Latch pulse for data at pin 41.                            |
| 40             | CLK                | O   | Clock for data at pin 41.                                  |

| Pin No.        | Signal Name          | I/O | Function  |
|----------------|----------------------|-----|---|
| 41             | DATA                 | O   | 8-bit serial data to LSIs.  |
| 42             | SENSE                | I   | Sense signal from LSIs.   |
| 43             | FOK                  | I   | Focus OK signal.  |
| 44             | GFS                  | I   | Frame sync lock signal.   |
| 45             | CRCF                 | I   | CRC (cyclic redundancy code) check result signal for subcode Q.                       |
| 46             | REM                  | I   | Fixed at "H".   |
| 47             | -                    | I   | Connected to GND.   |
| 48             | SCOR                 | I   | Subcode input trigger signal.   |
| 49             | SG. IN               | I   | Remote controller input signal.   |
| 50             | SUBQ                 | I   | Subcode Q data.   |
| 51             | -                    | I   | Connected to GND.   |
| 52             | SQCK                 | O   | Clock for inputting subcode Q data.   |
| 53             | P. OFF               | I   | Power OFF signal.   |
| 54             | VSS                  | -   | GND   |
| 55             | -                    | I   | Connected to GND.   |
| 56             | -                    | O   | Not used.   |
| 57             | IC                   | -   | Connected to GND.   |
| 58<br>59       | X1<br>X2             | -   | Connected to 4MHz crystal.  |
| 60             | RESET                | I   | System reset signal.  |
| 61             | -                    | I   | Connected to GND.   |
| 62             | D. DET               | I   | Disc presence detecting input.  |
| 63             | D. CNT               | I   | Stocker position counting input.  |
| 64             | CENTER               | I   | Disc tray center detecting input.   |
| 65             | T. CLOSE             | I   | Disc tray close detecting input.  |
| 66<br>67<br>68 | POS3<br>POS2<br>POS1 | I   | Pickup position detecting inputs.   |
| 69             | INNER                | I   | Inner switch signal. Become "L" when the laser pickup reaches the innermost position. |
| 70             | H. POS               | I   | Stocker home position detecting input.  |
| 71             | STORE                | I   | Disc tray stock position detecting input.   |
| 72             | EJECT                | I   | Disc tray ejection detecting input.   |
| 73             | -                    | -   | Connected to GND.   |
| 74<br>to<br>78 | -                    | I   | Connected to GND.   |
| 79             | F. IN                | I   | Analog-to-digital converted focus input. (MB-1s)                                      |
| 80             | T. IN                | I   | Analog-to-digital converted tracking input. (MB-1s)                                   |

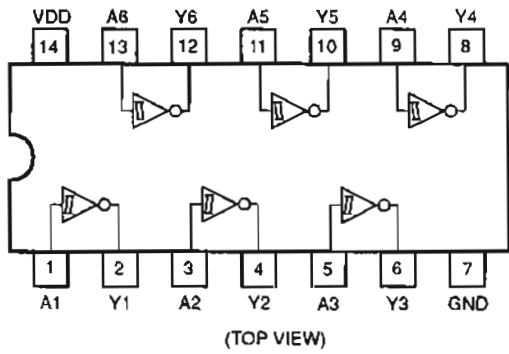


Fig. 9.1 Inverter TC4584BP

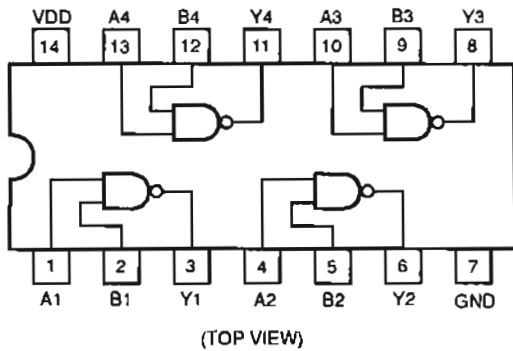


Fig. 9.2 NAND Gate TC74HC00AP

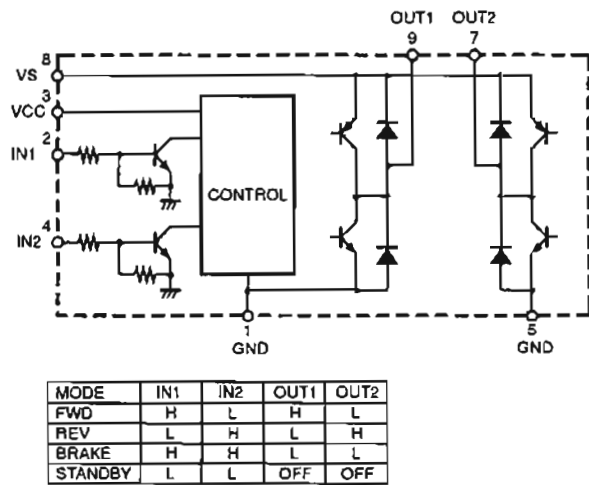


Fig. 9.3 Motor Driver LB1638M

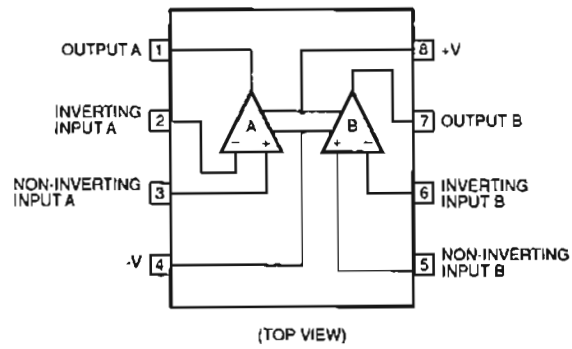


Fig. 9.4 Operational Amp. 4558D, 5532AN

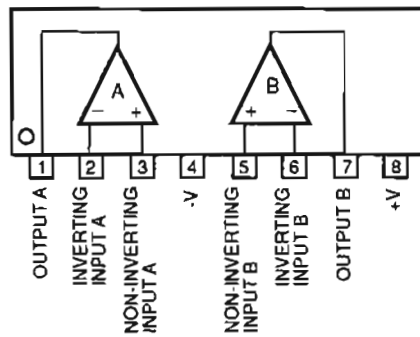


Fig. 9.5 Operational Amp. 4556L

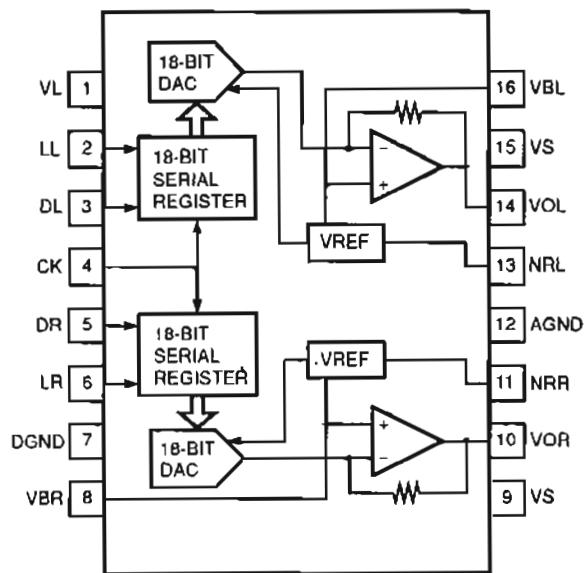


Fig. 9.6 Digital-to-Analog Converter AD1868R-J (MB-2s/3s)

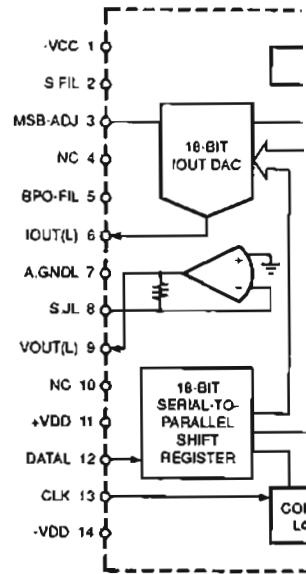


Fig. 9.7 Digital-to-Analog Converter AD1868R-J (MB-2s/3s)



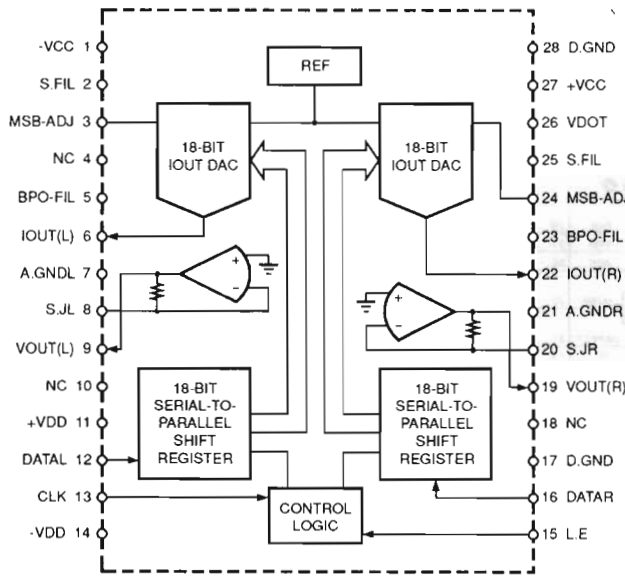


Fig. 9.7 Digital-to-Analog Converter PCM1700P (MB-1s)

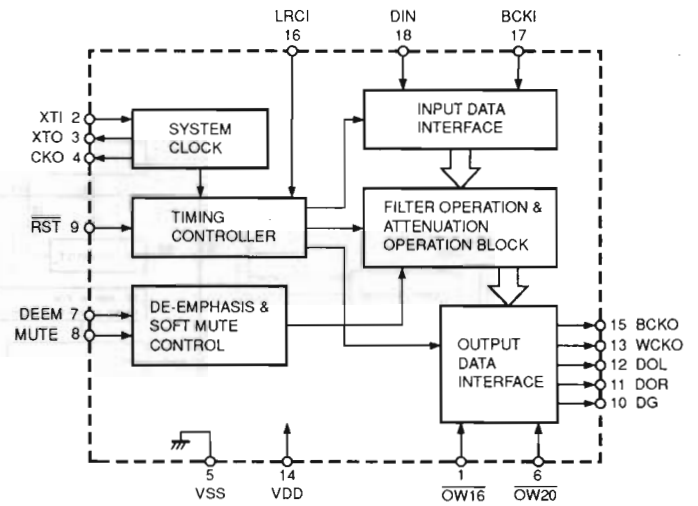


Fig. 9.8 8-Times Oversampling Digital Filter SM5841CP

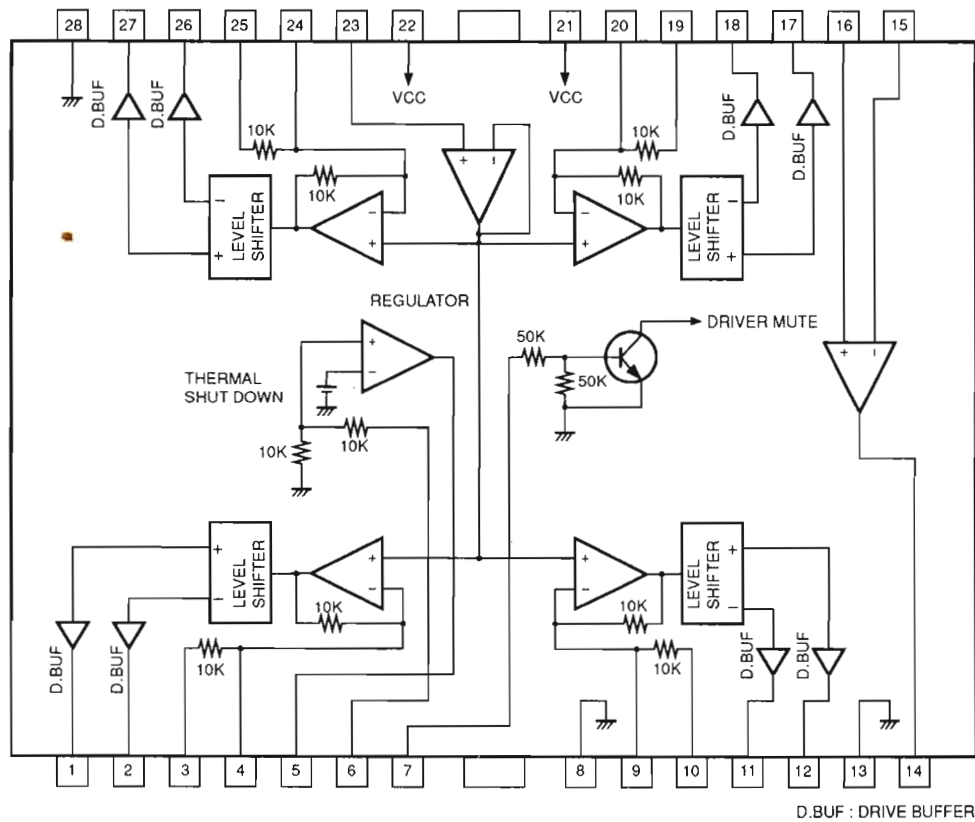


Fig. 9.9 Driver BA6296FP

# 10. BLOCK DIAGRAMS

## 10.1. For MB-1s

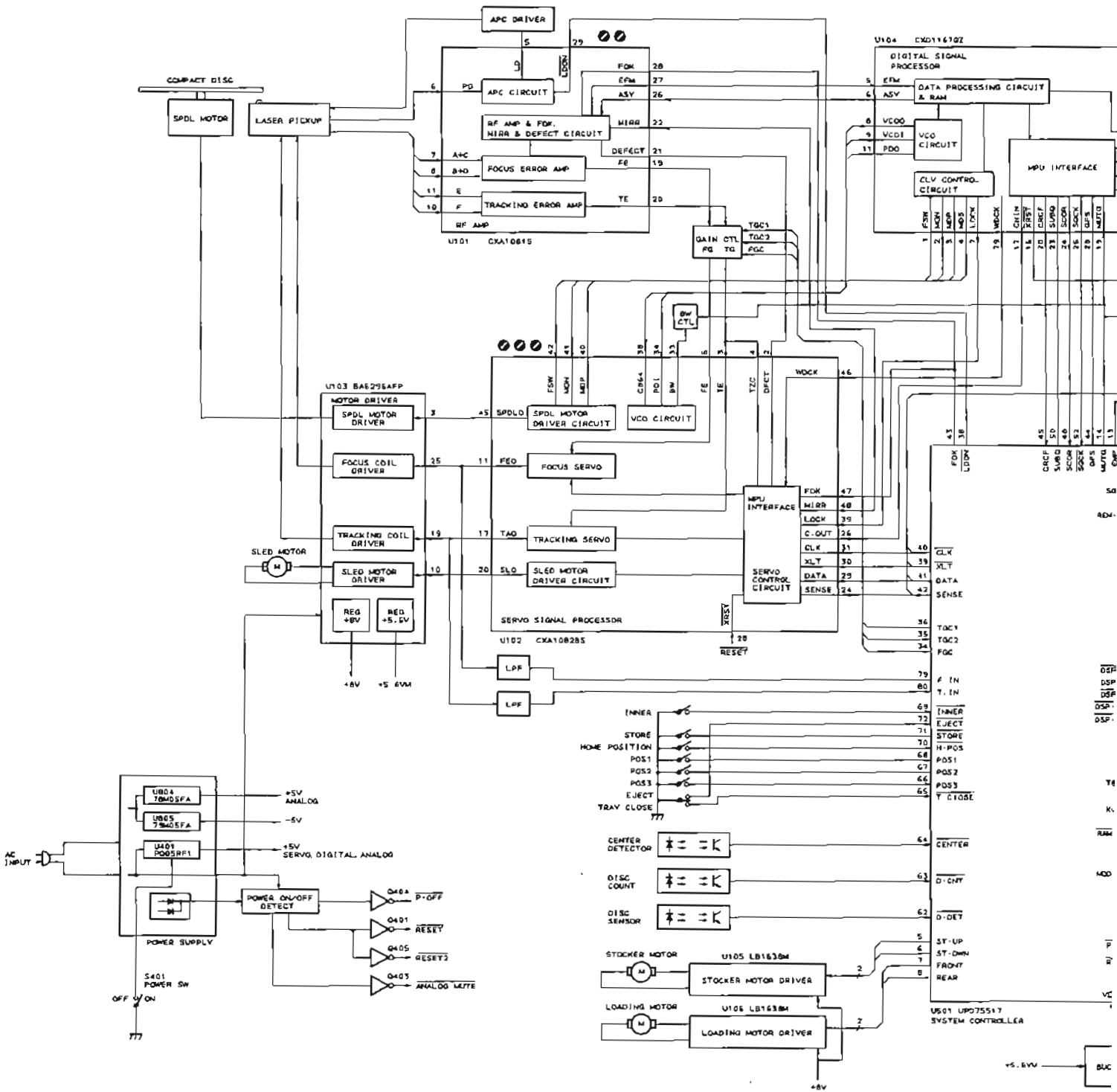
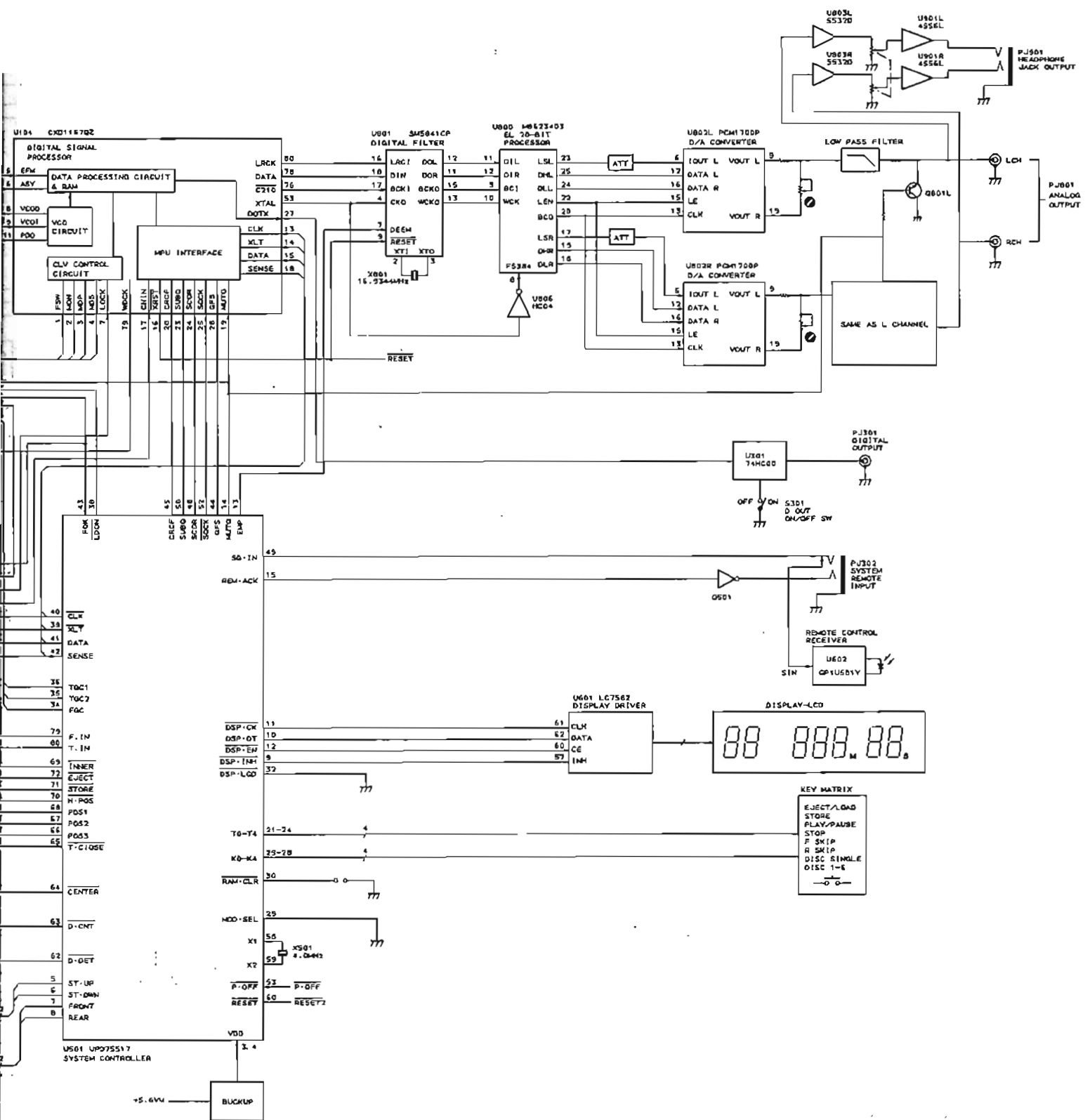


Fig. 10.1 (MB-1s)





10.1 (MB-1s)

10.2. For MB-2s and -3s

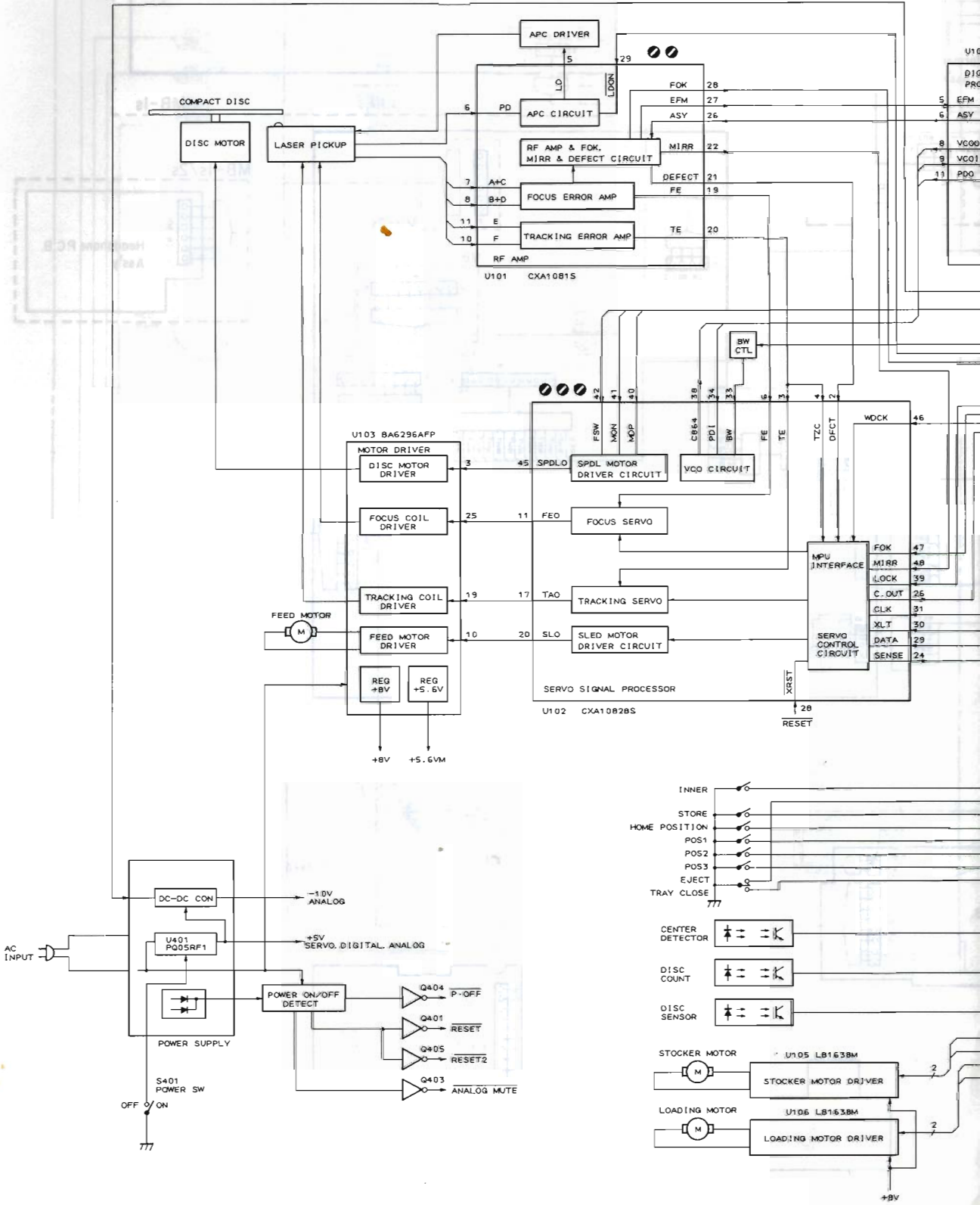


Fig. 10.2 (MB-2s and

2. For MB-2s and -3s

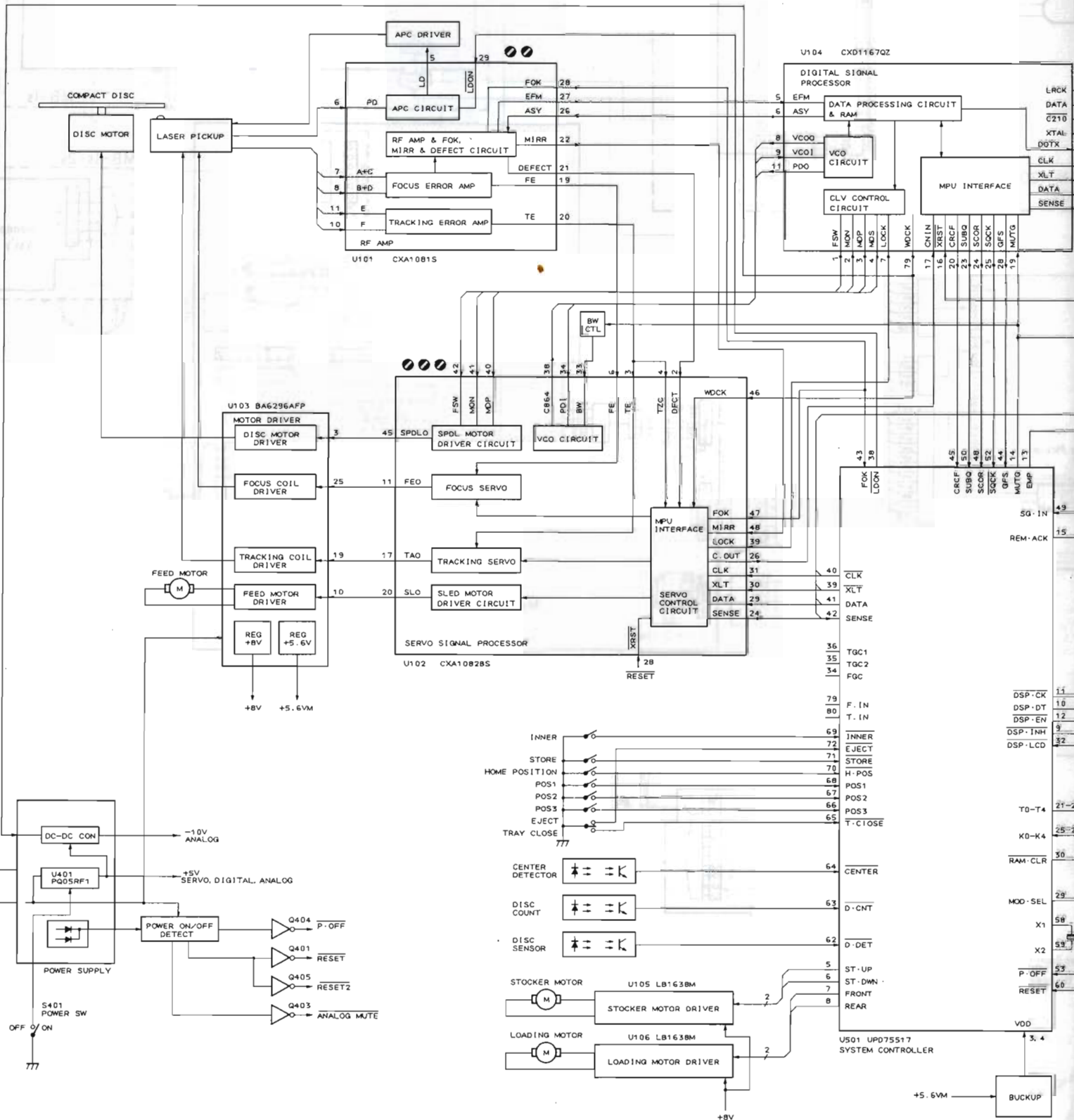
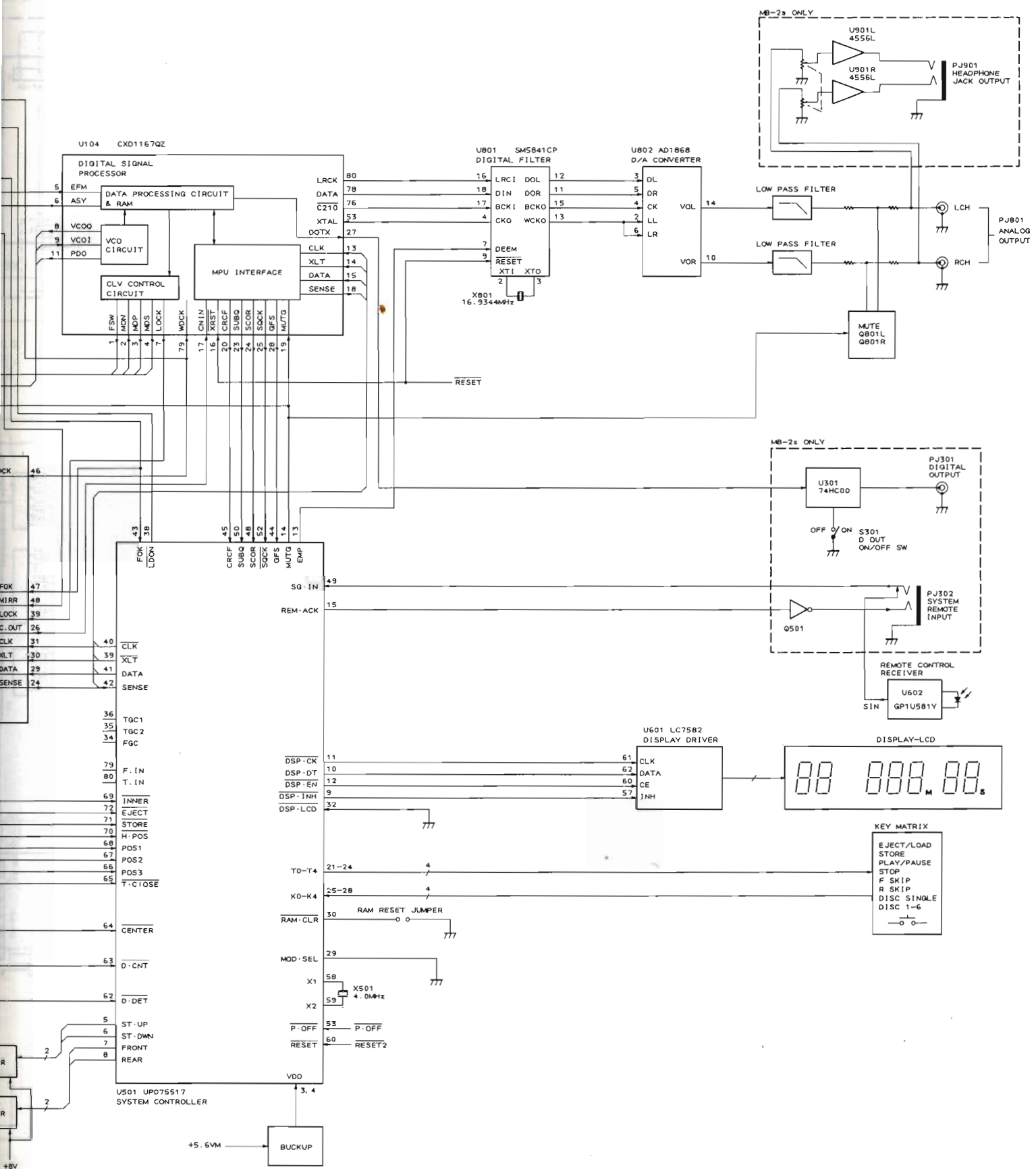


Fig. 10.2 (MB-2s and -3s)



(MB-2s and -3s)







Mechanism

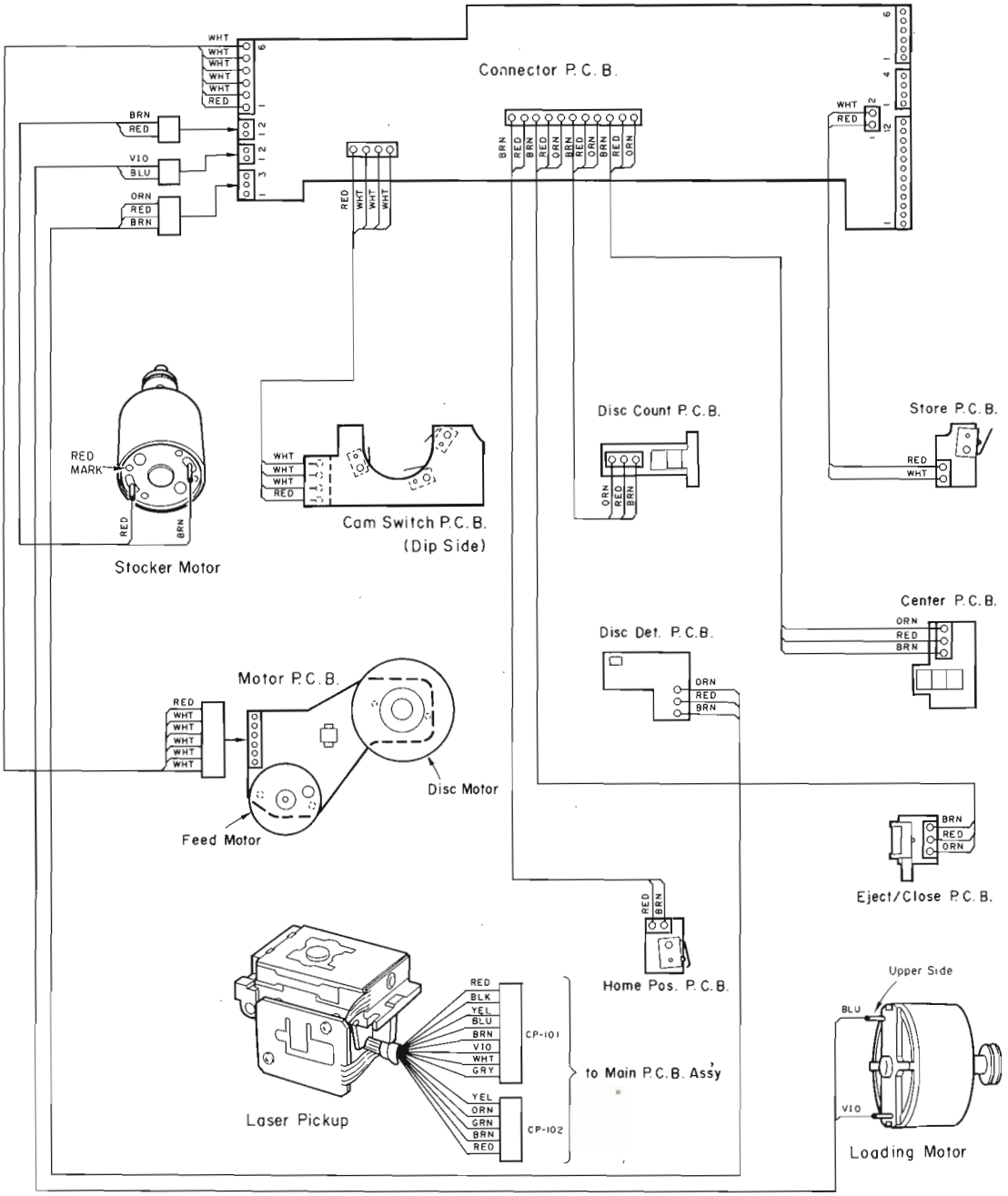


Fig. 11.2

## 12. SCHEMATIC DIAGRAM (DAC CIRCUIT [MB-1s])

**NOTE:** DAC circuit of MB-1s is shown below. For other circuits, see attached schematic diagrams.

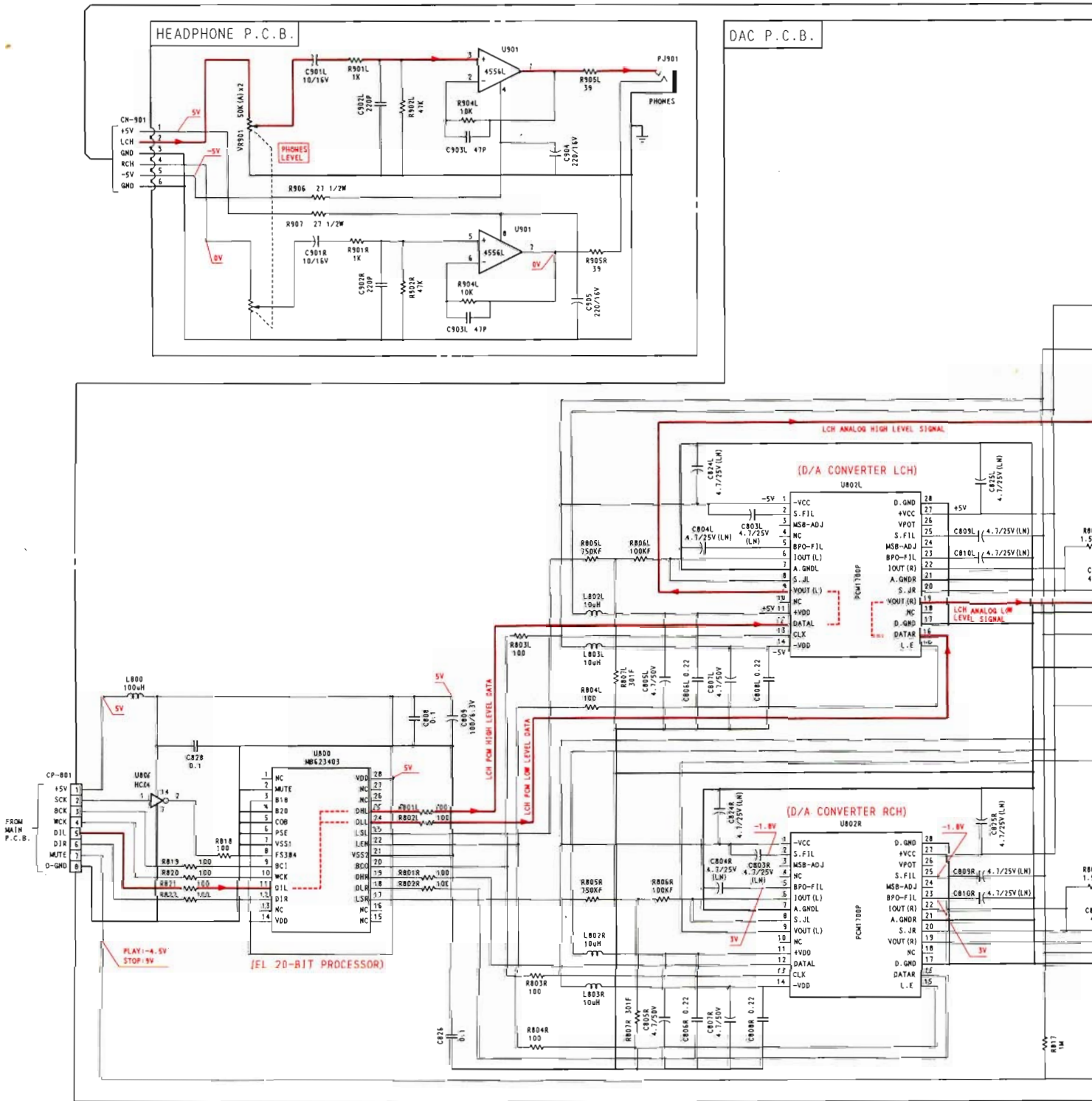
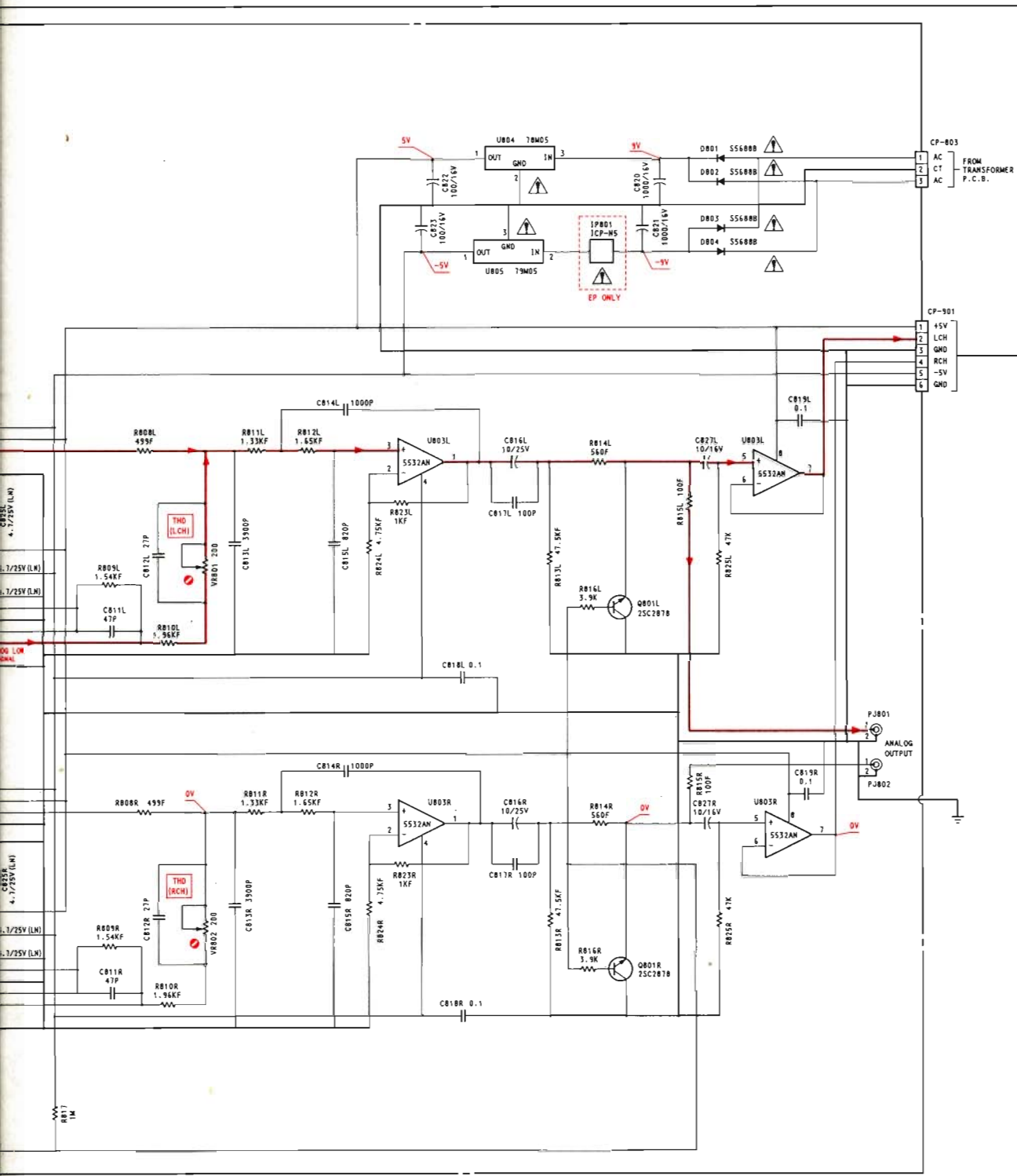


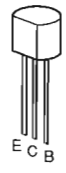
Fig. 12 DAC Circuit [MB-1s]

**NOTE:** Description of electrolytic capacitor: 100/16V = 100μ 16V

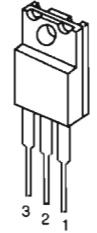




MB-1s]

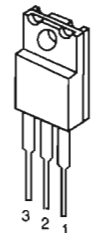


2SC2878



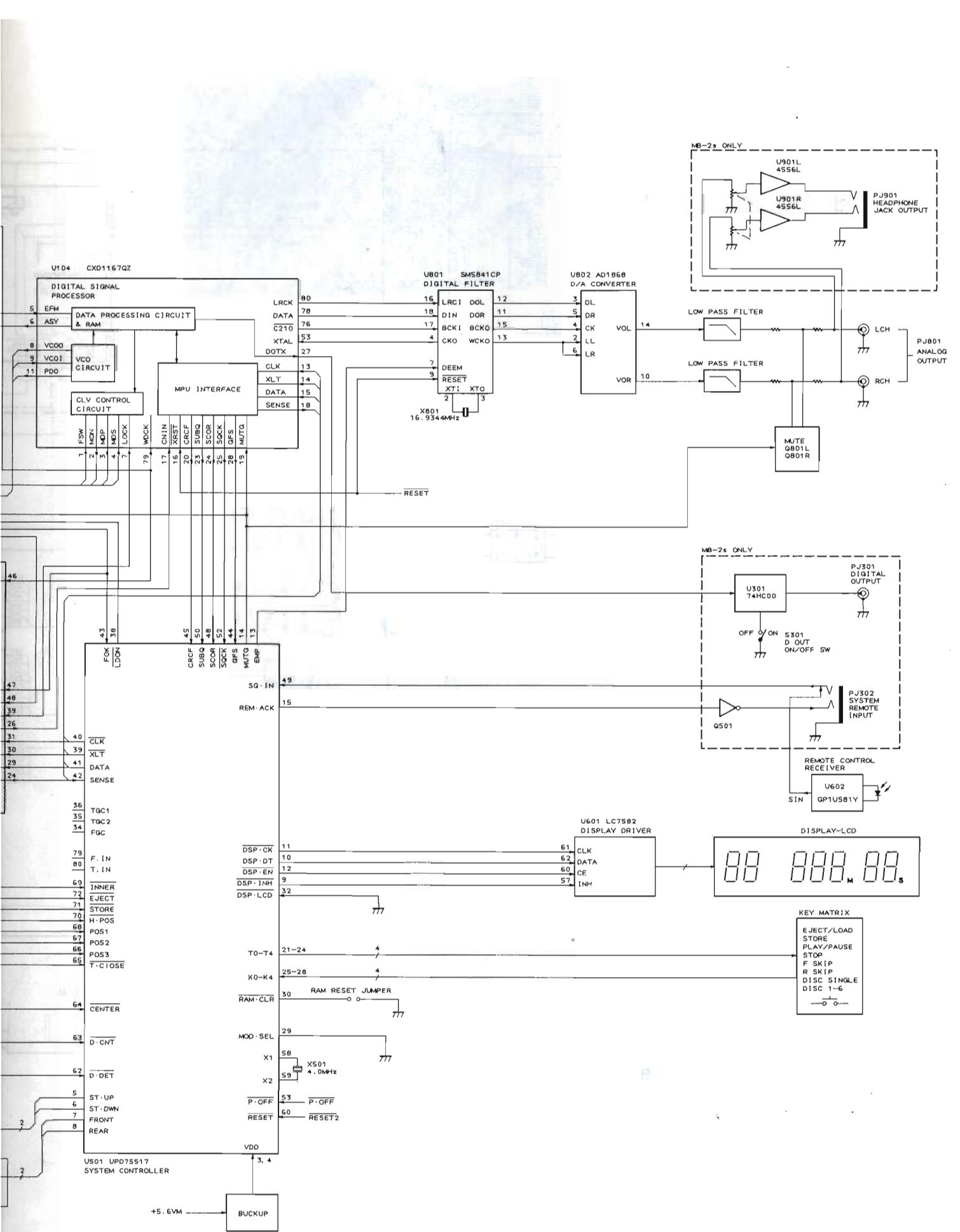
NJM78M05FA

- 1: OUT
- 2: GND
- 3: IN (+V)



NJM79M05FA

- 1: OUT
- 2: IN (-V)
- 3: GND



## 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 .....                         | EL 20-bit dual D/A converters with 8-times oversampling digital filter <b>[MB-1s]</b><br>18-bit dual D/A converters with 8-times oversampling digital filter <b>[MB-2s/3s]</b> |
| 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 .....                         | 20-20,000 Hz +0.5/-1.0 dB <b>[MB-1s]</b><br>20-20,000 Hz +0.8/-1.2 dB <b>[MB-2s/3s]</b>  |
| Total Harmonic Distortion (T.H.D. + Noise) ..... | 0.01% (1 kHz)  |
| Signal to Noise Ratio .....                      | Better than 95 dB (IHF A-WTD) <b>[MB-1s]</b><br>Better than 93 dB (IHF A-WTD) <b>[MB-2s/3s]</b>  |
| Dynamic Range .....                              | Better than 95 dB <b>[MB-1s]</b><br>Better than 88 dB <b>[MB-2s/3s]</b>  |
| Channel Separation .....                         | Better than 90 dB  |
| Output Level/Impedance                           |  |
| Line (Fixed) .....                               | 1.8 V/600 ohms (1 kHz, 0 dB)   |
| Headphone (Variable) .....                       | 75 mW/40 ohms (Phones Level Max.) <b>[MB-1s]</b><br>50 mW/40 ohms (Phones Level Max.) <b>[MB-2s]</b>   |
| Digital Output .....                             | 75 ohms coaxial <b>[MB-1s/2s]</b>  |
| Power Source .....                               | 120, 230, 240 or 110-127/220-240 VAC, 50/60 Hz (according to country of sale)  |
| Power Consumption .....                          | 12W max. <b>[MB-1s]</b> , 10W max. <b>[MB-2s/3s]</b>   |
| Dimensions* .....                                | 430 (W) × 99 (H) × 270 (D) mm, 16-15/16(W) × 3-7/8 (H) × 10-5/8 (D) inches   |
| Approximate Weight .....                         | 5.5 kg, 12 lbs. 2 oz. <b>[MB-1s]</b> , 5.3 kg, 11 lbs. 11 oz. <b>[MB-2s/3s]</b>  |

### •Remote Control Unit

|                          |  |
|--------------------------|--|
| Principle .....          | Infrared pulse system  |
| Power Supply .....       | 3 VDC (1.5 V × 2)  |
| Dimensions* .....        | 57 (W) × 16 (H) × 152 (D) mm, 2-1/4 (W) × 5/8 (H) × 6 (D) inches <b>[MB-1s/2s]</b><br>58 (W) × 17 (H) × 125 (D) mm, 2-5/16 (W) × 11/16 (H) × 4-15/16 (D) inches <b>[MB-3s]</b> |
| Approximate Weight ..... | 130 g, 5 oz. (including batteries) <b>[MB-1s/2s]</b> ,<br>120 g, 4 oz. (including batteries) <b>[MB-3s]</b>  |

|                             |   |
|-----------------------------|---|
| •Supplied Accessories ..... | Shielded cable with RCA-type plug × 1<br>IEC R03 batteries (size AAA) × 2 |
|-----------------------------|---|

\* Dimensions do not include protruding parts. Height is the panel height.

|                               |   |
|-------------------------------|---|
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| Nakamichi America Corporation | 955 Francisco St., Torrance, CA 90502 Phone: (310) 538-8150                                       |
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| Nakamichi Australia           | Unit 12 620-632 Botany Road, Alexandria, N.S.W. 2015 Phone: (02) 667-0811                         |
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