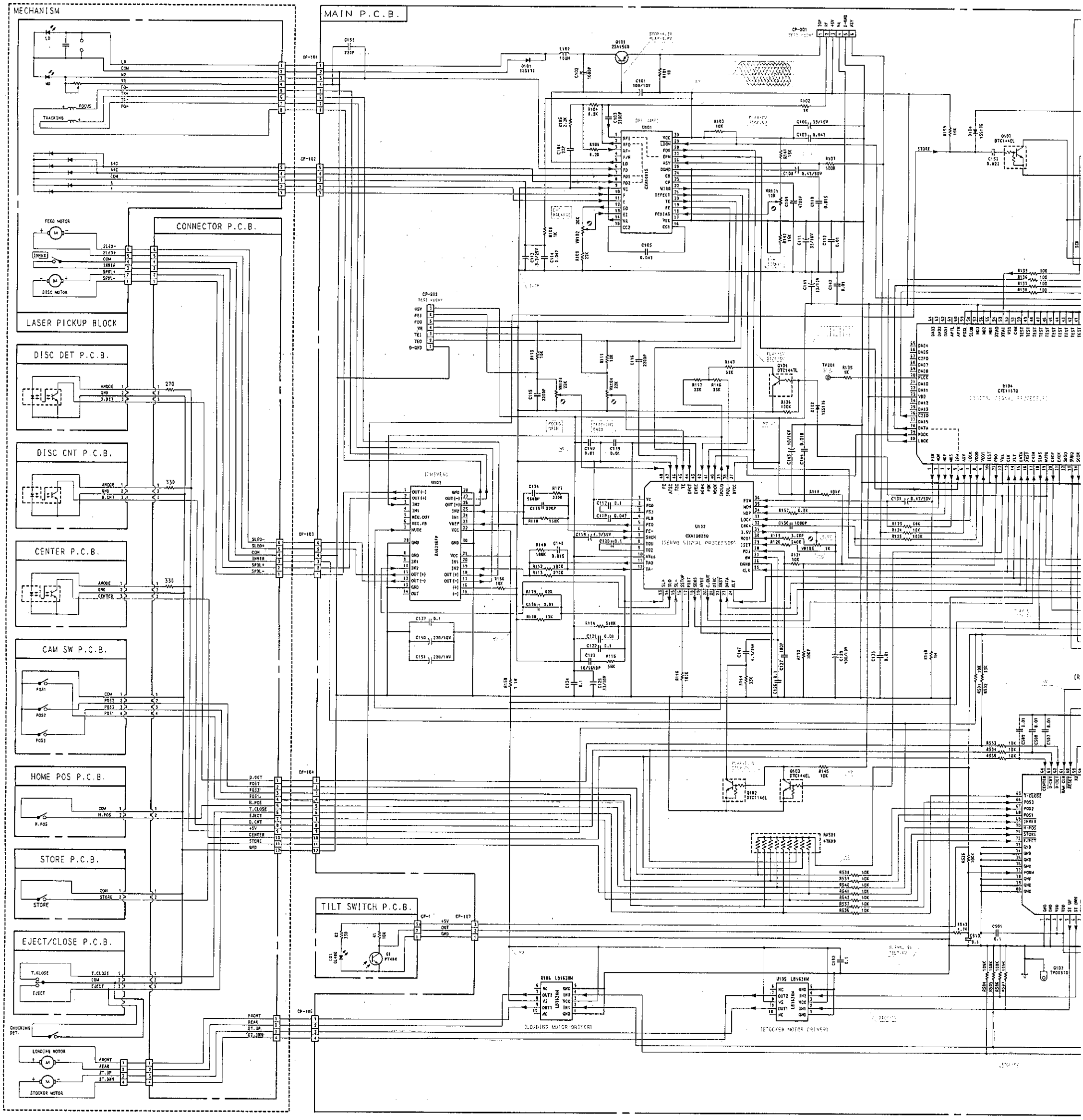
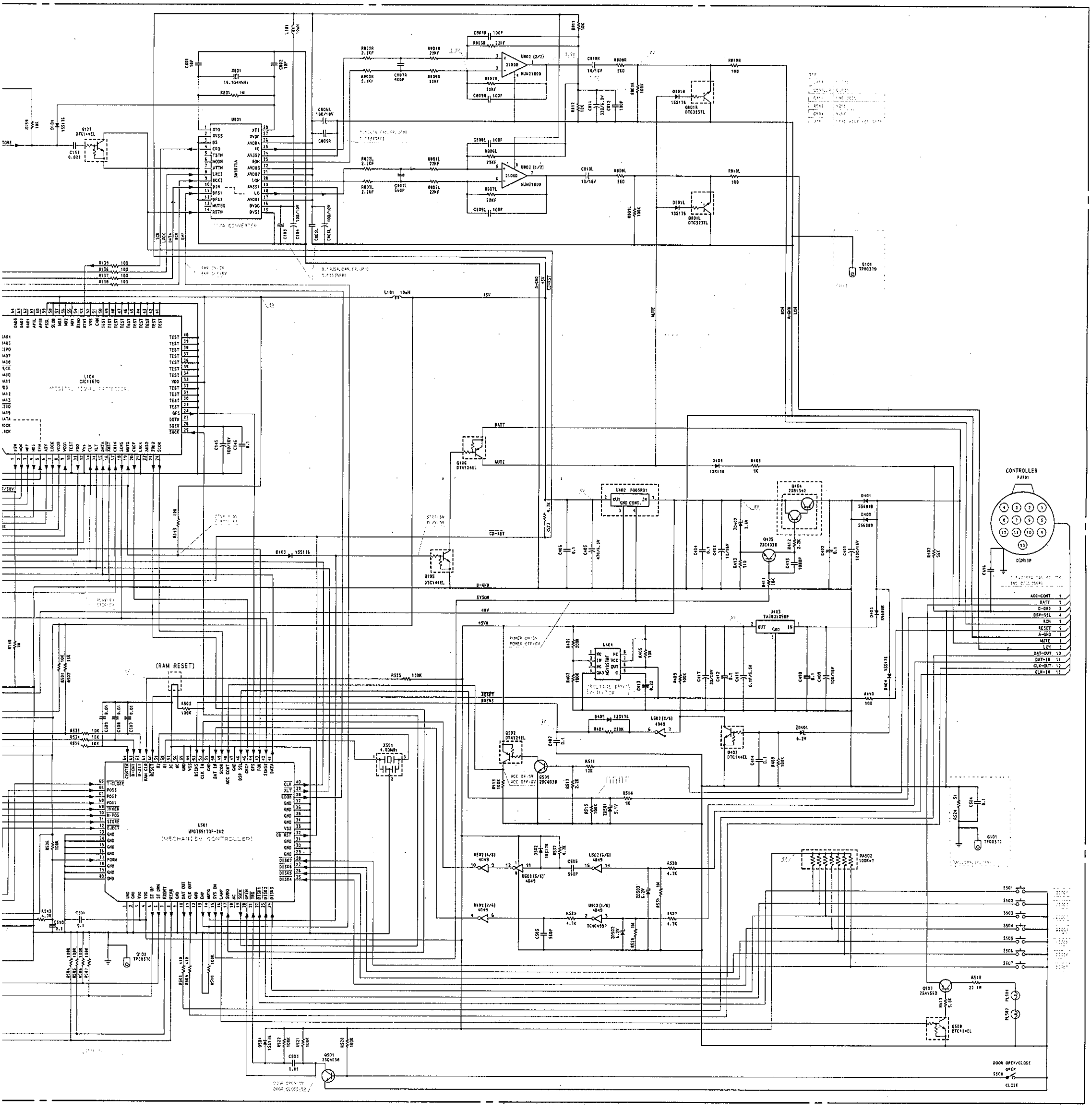
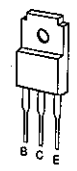
'95 FI. 08

SCHEMATIC DIAGRAM (MB-7)





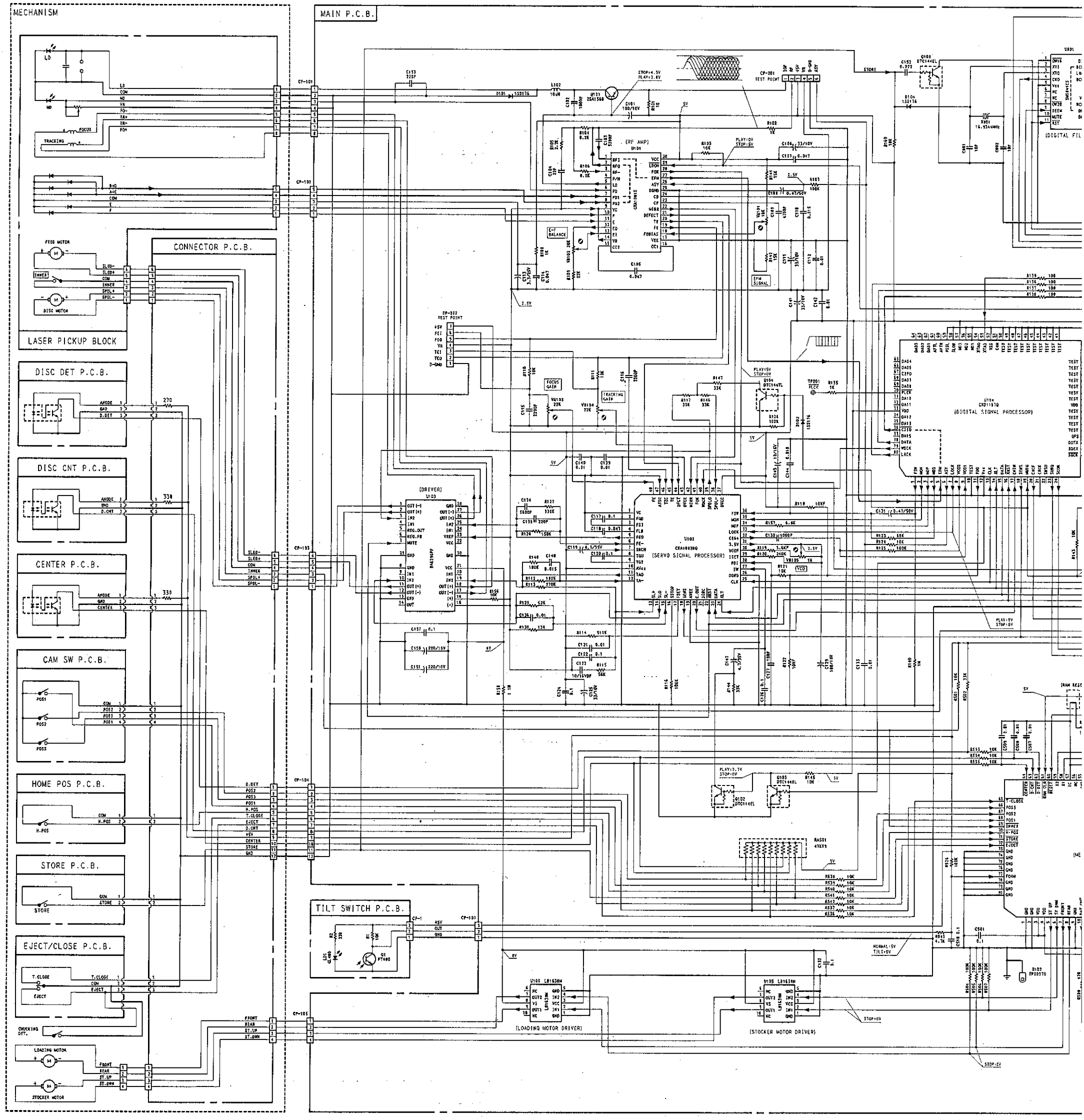
2SA1560
2SC4038
DTA124EL
DTC114EL
DTC144EL
DTC144TL
DTC323TL

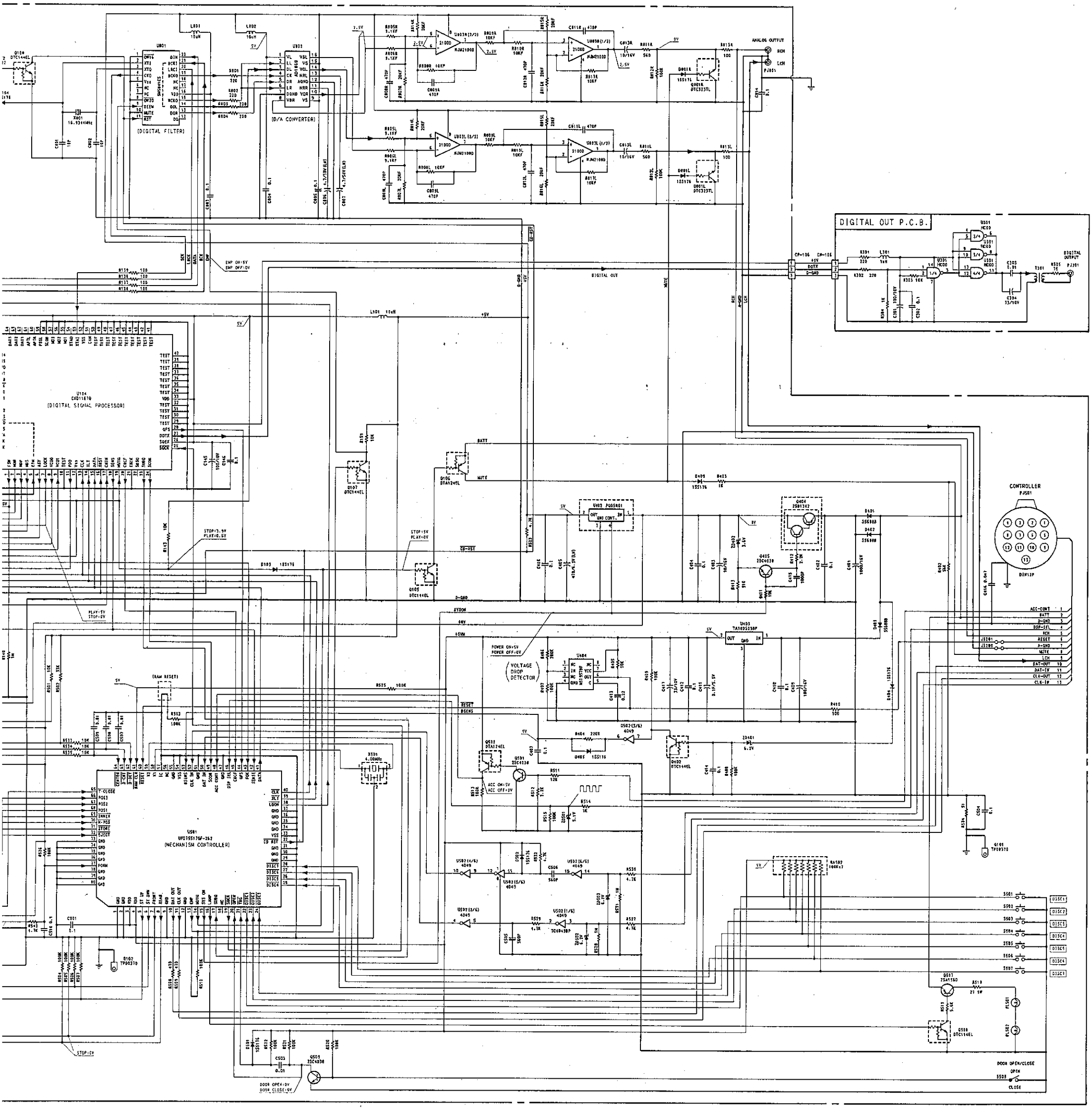


2SB1342

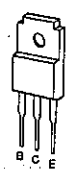
NOTES: 1. Diode is 1SS176, 1SS53, or 1S1555 unless otherwise specified.
2. Description of electrolytic capacitor: 100/16V = 100µ 16V

SCHEMATIC DIAGRAM (MB-9)





2SA1560
2SC4038
DTA124EL
DTC114EL
DTC144EL
DTC144TL
DTC323TL



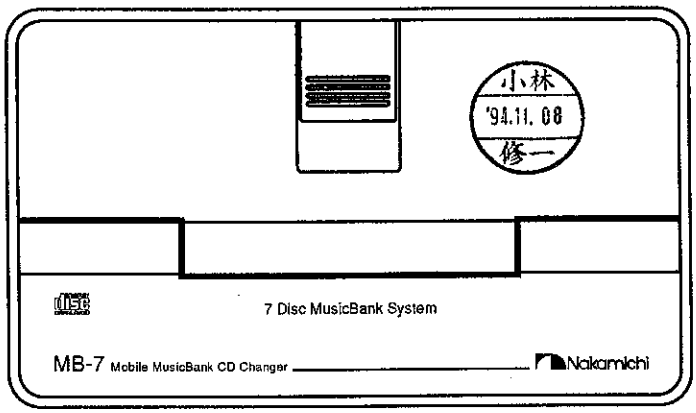
2SB1342

NOTES: 1. Diode is 1SS176, 1SS53, or 1S1555 unless otherwise specified.
2. Description of electrolytic capacitor: 100/16V = 100μ 16V

Service Manual

MB-7
MB-9

Mobile MusicBank CD Changer



Nakamichi

CONTENTS

1. GENERAL

1.1. Product Codes

N730 (MB-7)
N731 (MB-9)

1.2. Destinations

USA, CAN, EP, GER, JPN

Abbreviations

USA — U.S.A.
CAN — Canada
EP — Europe
GER — Germany
JPN — Japan

1.3. Cautions/Warnings

(1) Before Returning the Unit

Before returning the unit, eject all CDs and then secure the mechanism by fastening all four Shipping Lock Screws together with four Washers. See Fig. 1.1.

For the Shipping Lock Screws and Washers, see Ref. Nos. 32 and 31 in Fig. 7.1.

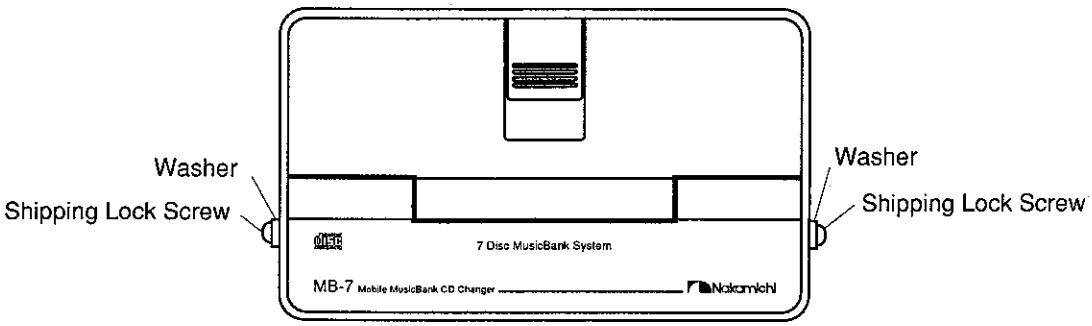


Fig. 1.1

(2) 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

(3) 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 beskriva i bruksanvisningen kan resultera i farlig laserutstrålning. Justering eller reparation av denna kompaktskivspelare skall endast utföras av kvalificerad servicepersonal.

OBS!

Indstilling af knapper, cmskiftere og øvrige kontrolknapper, som ikke følger den i brugsanvisningen beskrevne måde, kan resultere i farlig laserudstråling. Justering eller reparation af denno 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 ma 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 UDSAETTELSE 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. 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. 1.2.

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.

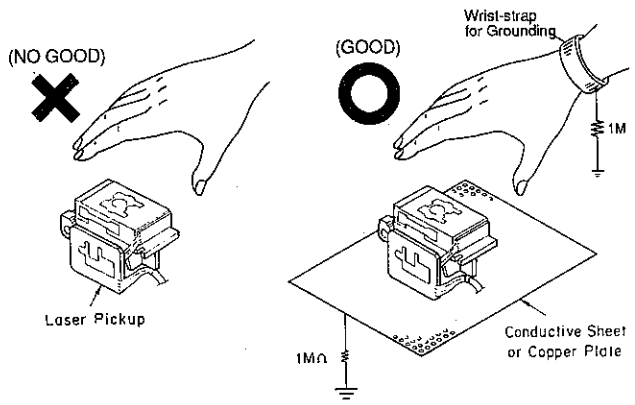


Fig. 1.2 Handling the Laser Pickup

1.5. Stocker Operation Check Function

A series of stocker operation can be checked by shortcircuiting the RAM Reset lands on the Main P.C.B. Ass'y. This function is useful to check whether any CD is left in the stocker before returning the unit to the customer.

(1) Remove the Bonnet (Upper).
(2) Turn ON the power.
(3) Short the RAM Reset lands. See Fig. 1.3.
(4) The stocker raises to the uppermost position, and then starts a series of CD unload operation as follows:

Disc No.: 7 (uppermost) → 6 → 5 → 4 → 3 → 2 → 1

(5) After completion of the stocker operation, the unit returns to standby condition.

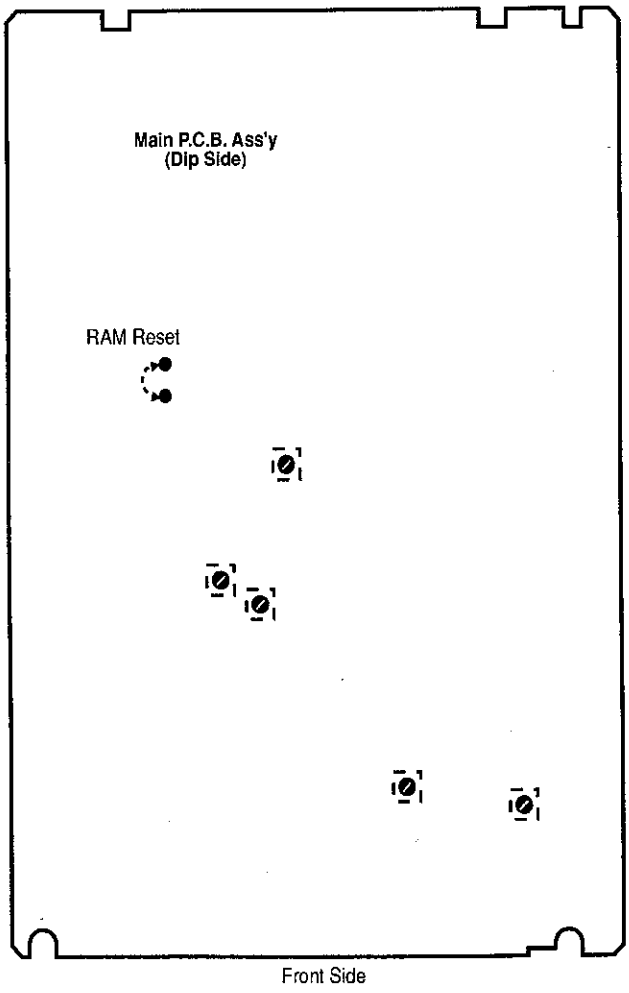


Fig. 1.3 Stocker Operation Check

1.6. Package Ass'y and Accessary Ass'y

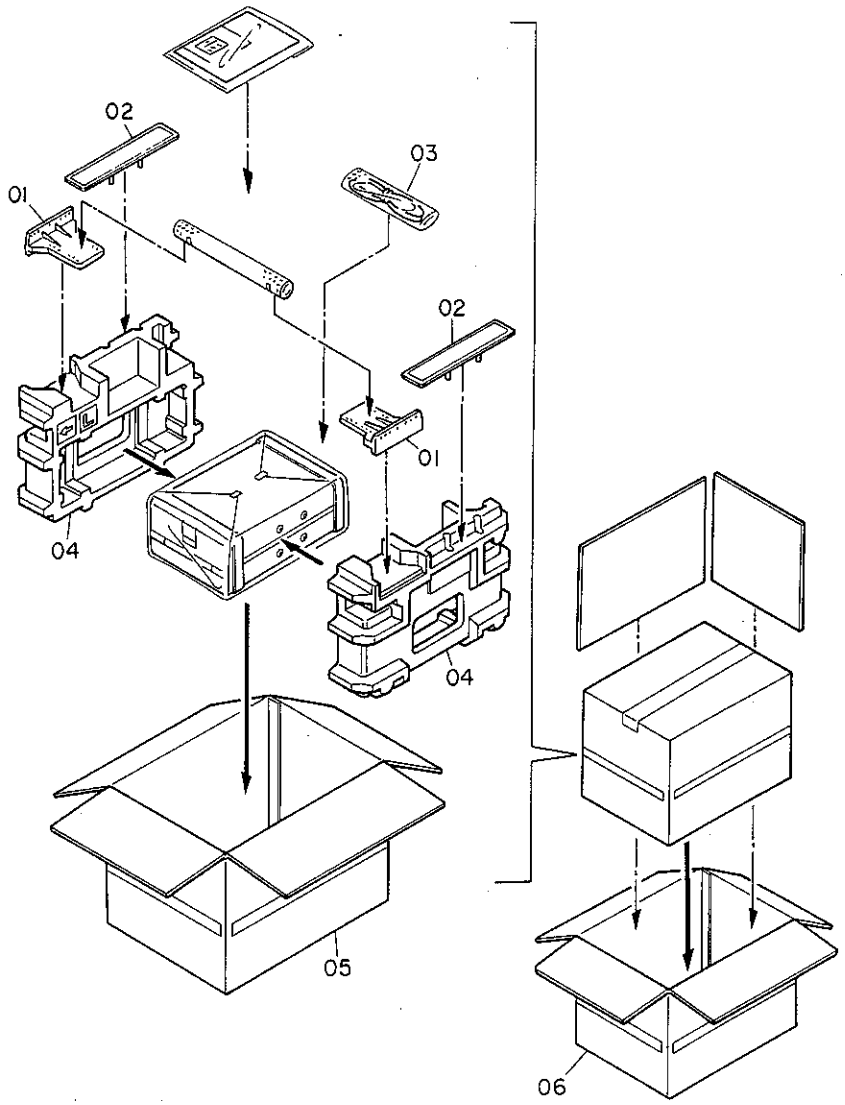


Fig. 1.4

Schematic Ref. No.	Part No.	Description	Q'ty
	—	**Package Ass'y**	
01	0H06760C	Angle A	2
02	HG06893A	Angle B Ass'y	2
03	0D06545A	DIN Wire	1
04	0F04834A	Packing L,R	1
05	0F04875A	Inner Carton (USA, CAN, EP) [MB-7]	1
	0F04832A	Inner Carton (JPN) [MB-7]	1
	0F04849A	Inner Carton [MB-9]	1
06	0F04876A	Outer Carton (USA, CAN, EP) [MB-7]	1
	0F04833A	Outer Carton (JPN) [MB-7]	1
	0F04850A	Outer Carton [MB-9]	
—	0F04874A	Sheet	1

Schematic Ref. No.	Part No.	Description	Q'ty
	DA04803A	**Accessory Ass'y (USA, CAN) [MB-7]**	**1**
	DA04804A	**Accessory Ass'y (EP) [MB-7]**	**1**
	DA04802A	**Accessory Ass'y (JPN) [MB-7]**	**1**
	DA04808A	**Accessory Ass'y (USA, CAN) [MB-9]**	**1**
	DA04809A	**Accessory Ass'y (EP) [MB-9]**	**1**
	DA04807A	**Accessory Ass'y (JPN) [MB-9]**	**1**
	0D06546C	Owner's Manual (English) [MB-7]	1
	0D06568B	Owner's Manual (English) [MB-9]	1
	0D06549C	Owner's Manual (Japanese) [MB-7]	1
	0D06571B	Owner's Manual (Japanese) [MB-9]	1
	DA04806A	Screw Ass'y	1

2. REMOVAL PROCEDURES

2.1. Bonnet (Upper) and Front Panel Ass'y

Refer to Figs. 2.1.1 and 2.1.2.

(1) Remove F01 (Protector Front). See Fig. 2.1.1.
(2) Pull out F02 (Push Rivet, 5 pcs.) and remove F03 (Protector Rear).
(3) Remove screws F04 (2 pcs.) and F05 (2 pcs.).
(4) Remove screws F06 (3 pcs.). See Fig. 2.1.2.
(5) Remove screws F07 (5 pcs.) and F08 (Bonnet (Upper)).
(6) Remove screws F09 (2 pcs.) and detach F10 (Front Panel Ass'y).

NOTE: Installing direction of the Bonnet (Upper):
Install the Bonnet (Upper) so that the bent lower edge comes to the right side and the straight lower edge comes to the left side as shown in Fig. 2.1.2.

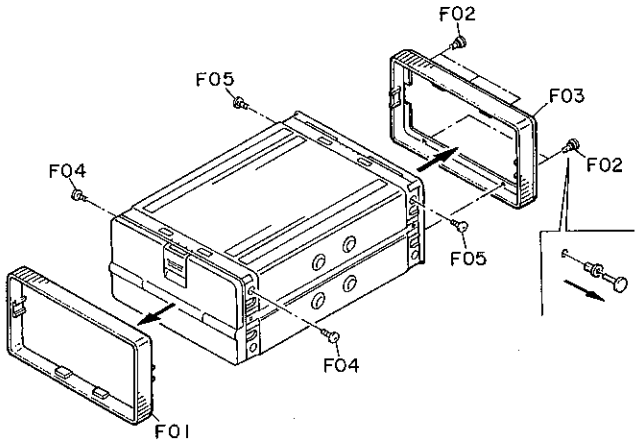


Fig. 2.1.1

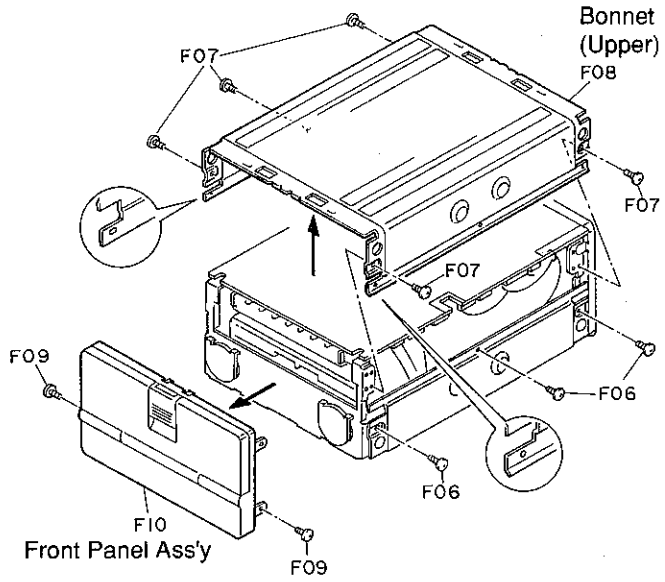


Fig. 2.1.2

2.2. Rear Panel, Main P.C.B. Ass'y and Bonnet (Lower)

Refer to Fig. 2.2.

(1) Remove the Bonnet (Upper) and Frant Panel Ass'y. Refer to item 2.1.
(2) Remove screws F01 (3 pcs.), F02 (1 pce., MB-9 only) and F03 (2 pcs.), disconnect a connector F04 (MB-9 only), and detach F05 (Rear Panel).
(3) Remove screws F06 (2 pcs.) and detach F07 (Insulating Sheet).
(4) Remove screws F08 (2 pcs.) and pull out F09 (3P Connector).
NOTE: Do not pull out other connectors yet to avoid damage to the laser pickup.
(5) Turn over F10 (Main P.C.B. Ass'y) in the direction of the arrow.
(6) Remove screws F11 (2 pcs.) and detach F12 (Bonnet (Lower)) downward.

NOTES: 1. Installing direction of the Bonnet (Lower)
Install the Bonnet (Lower) so that the straight lower edge comes to the right side and the bent lower edge comes to the left side as shown in the figure.
2. Installing the Bonnet (Lower)
Install the Bonnet (Lower) on the Mechanism Deck Ass'y so that the four screws "a" on both sides are fastened to the screwed hole "b" (not "c").

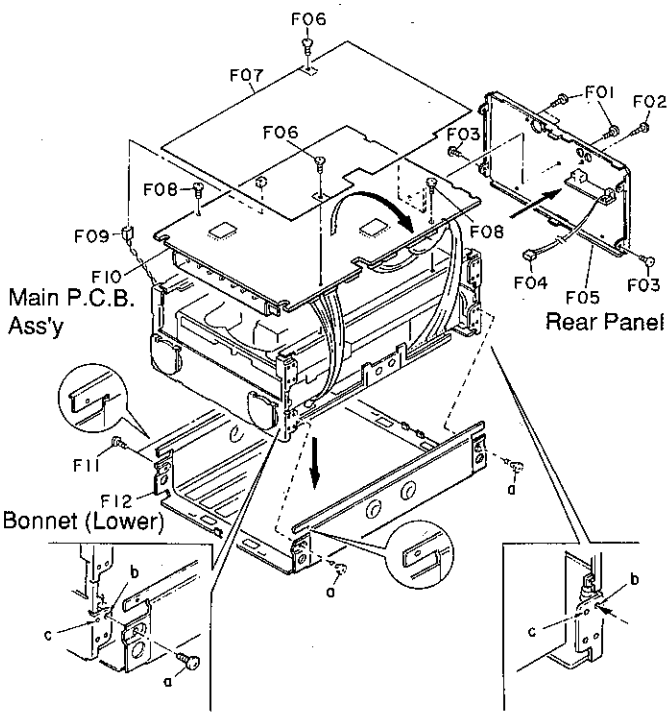


Fig. 2.2

Mounting the Dampers

When mounting four Dampers which act to absorb mechanical shock or vibration, pay attention so that they are mounted correctly. Incorrect mounting causes the playback sound to be skipped.
Mount the Dampers as follows:

(1) Insert the Damper into the damper holding shaft.

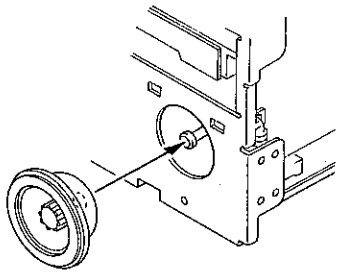


Fig. A

(2) Press the Damper so that it is securely inserted into the damper holding shaft. See Fig. B.

(3) Push the damper edge along with the circumference of the damper mounting hole to make a circle. See Fig. C.

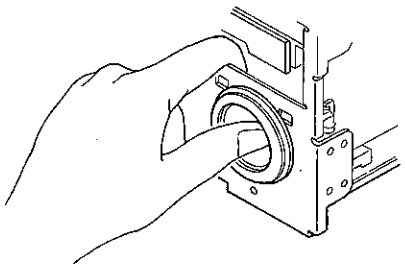


Fig. B

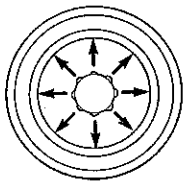


Fig. C

(4) Slide the Damper Holder over the Damper as shown in Fig. D and insert two claws of the Damper Holder into the Chassis Ass'y. See Fig. E.

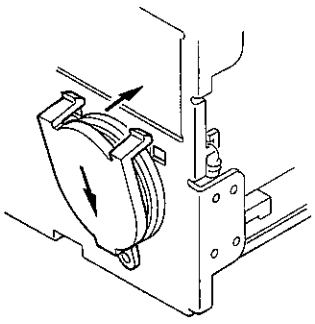


Fig. D

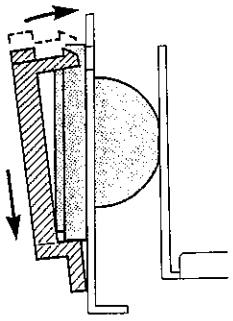


Fig. E

Fig. F shows the condition that the Damper is securely inserted into the Damper Holder. While, Fig. G shows the unsuccessful case.

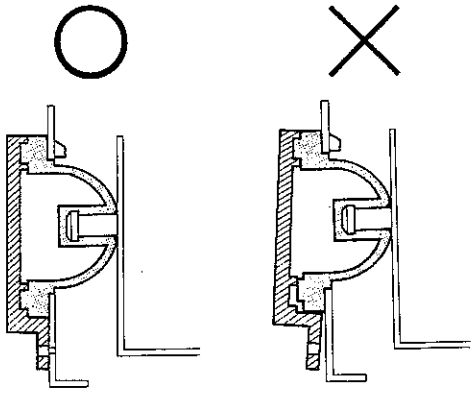


Fig. F

Fig. G

(5) With pushing the Damper Holder with your finger tip as it is not fastened with a screw yet, move the Mechanism Deck Ass'y back and forth to securely engage the Damper with the Damper Holder.

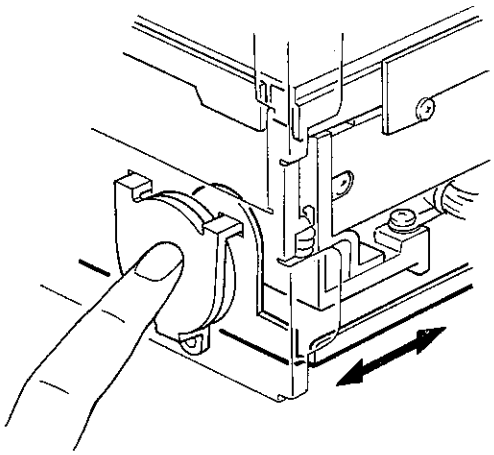


Fig. H

(to be continued.)

(6) Pull the lower part of the Damper Holder a little and check that the Damper is stuck to the Damper Holder as shown in Fig. I. If the Damper is not securely engaged with the Damper Holder, it will be detached from the Damper Holder as shown in Fig. J. In this case, repeat above damper mounting steps.

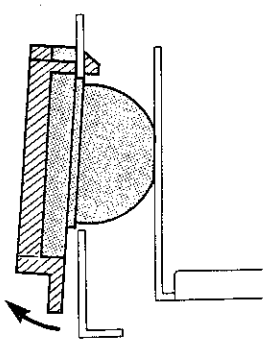


Fig. I

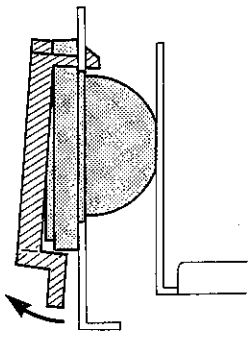


Fig. J

(7) Fix the Damper Holder to the Chassis with a screw.

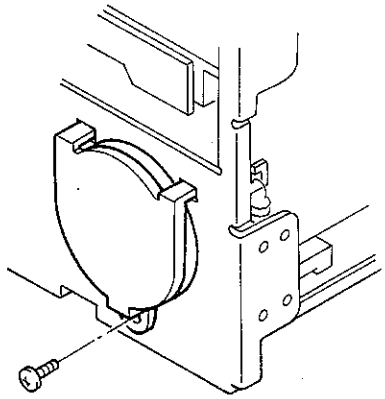


Fig. K

2.3. Mechanism Deck Ass'y

Refer to Fig. 2.3.

(1) Remove the Rear Panel Ass'y, Main P.C.B. Ass'y and Bonnet (Lower). Refer to item 2.2.

(2) Shortcircuit the lands "A" of the Laser Pickup.

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.

(3) Disconnect all connectors on the Main P.C.B. Ass'y.

(4) Remove screws F01 (4 pcs.) and detach F02 (Channels (R and L).

(5) Remove screws F03 (6 pcs.) and F04 (1 pce.) and disassemble F05 (Mechanism Deck Ass'y)

NOTE: Installing direction of F02 (Channels (R and L)): Install the Channel so that the cushion of the Channel comes to the rear as shown in the figure.

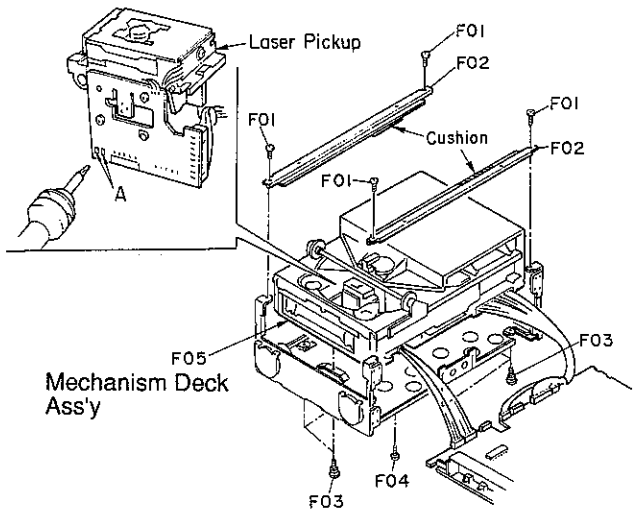


Fig. 2.3

2.4. Mechanism Top Cover

Refer to Figs. 2.4.1 and 2.4.2.

(1) Remove the Mechanism Deck Ass'y. Refer to item 2.3.
(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. 2.4.2 so that the carriages are in horizontal position. (Refer to "Leveling the carriages at the left side" in item 2.9.3.)

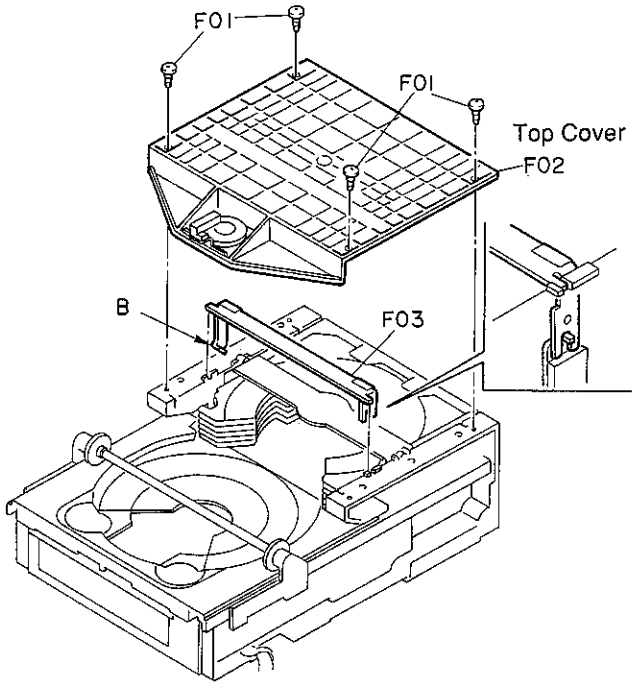


Fig. 2.4.1

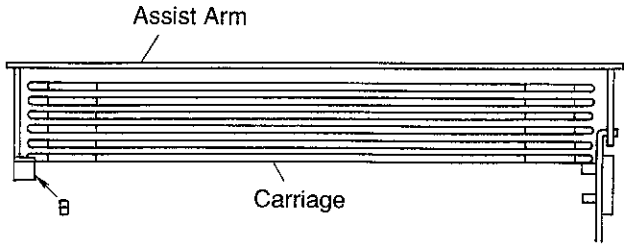


Fig. 2.4.2 Leveling the carriages at the left side

2.5. Drawing the Tray Ass'y

Refer to Fig. 2.5.

(1) Remove the Mechanism Deck Ass'y. Refer to item 2.3.
(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.

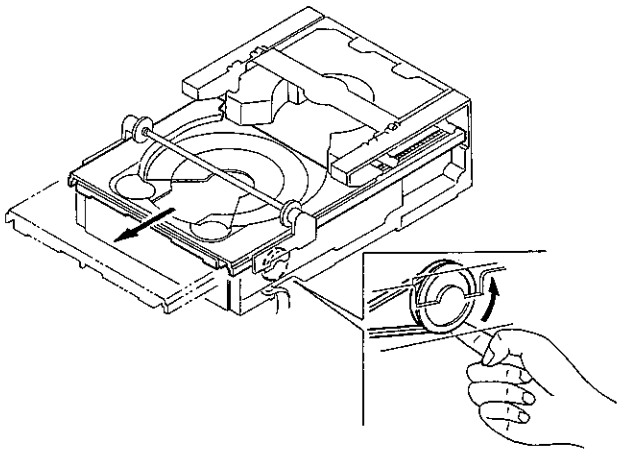


Fig. 2.5

2.6. Laser Pickup

2.6.1. Removing the Laser Pickup

Refer to Fig. 2.6.1.

(1) Draw the Tray Ass'y. Refer to item 2.5.
(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.

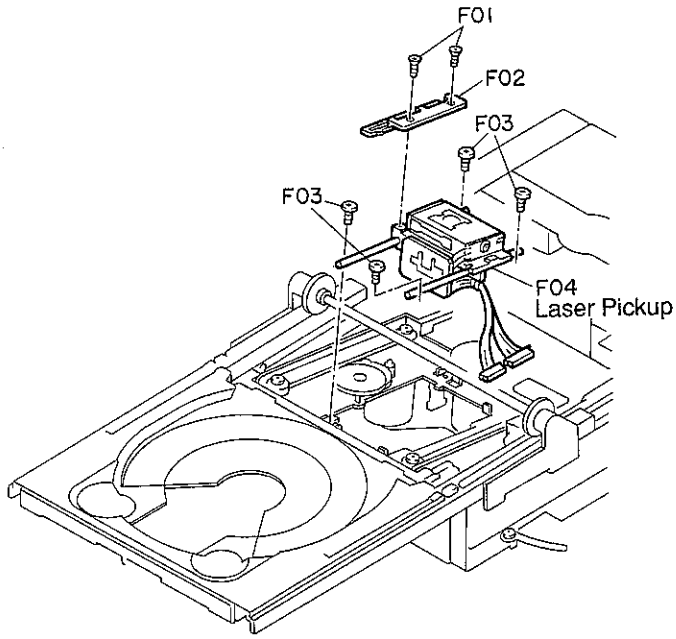


Fig. 2.6.1

2.6.2. Installing a New Laser Pickup

Refer to Fig. 2.6.2.

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) 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.

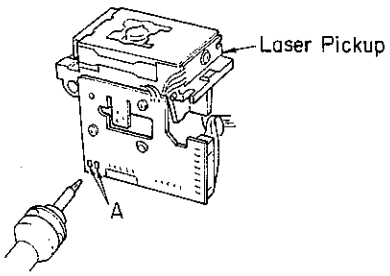


Fig. 2.6.2

2.7. Tray Ass'y

2.7.1. Removing the Tray Ass'y

Refer to Fig. 2.7.1.

(1) Draw the Tray Ass'y. Refer to item 2.5.
(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).

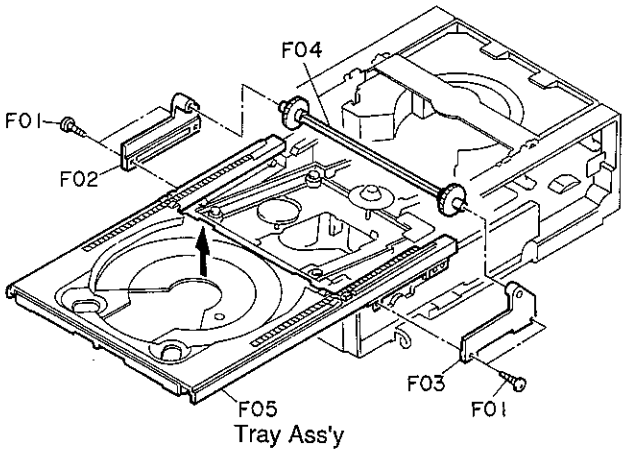


Fig. 2.7.1

2.7.2. 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. 2.7.2.
(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. 2.7.2.
(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. 2.7.3.
(4) Reverse the removal procedure in item 2.7.1.

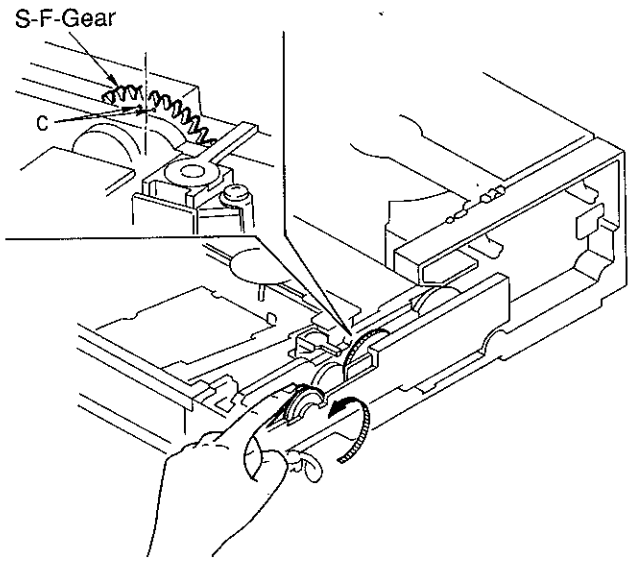


Fig. 2.7.2

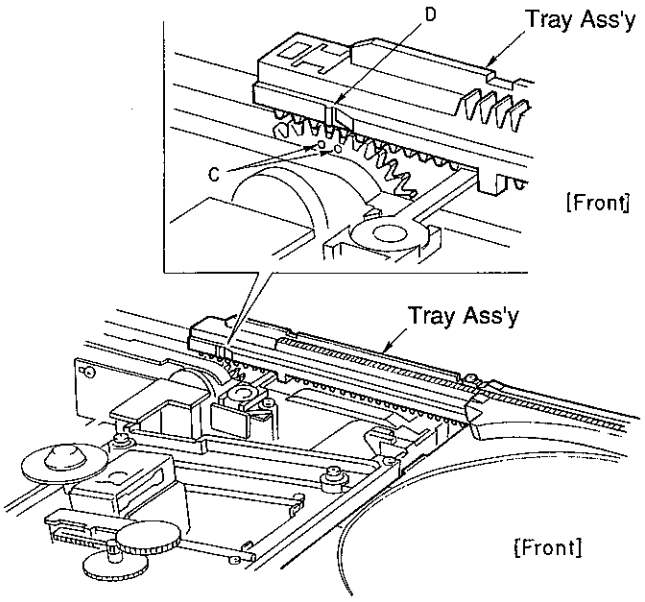


Fig. 2.7.3

2.8. Drive Unit Section

Refer to Fig. 2.8.

(1) Remove the Laser Pickup. Refer to item 2.6.
(2) Remove the Tray Ass'y. Refer to item 2.7.
(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.

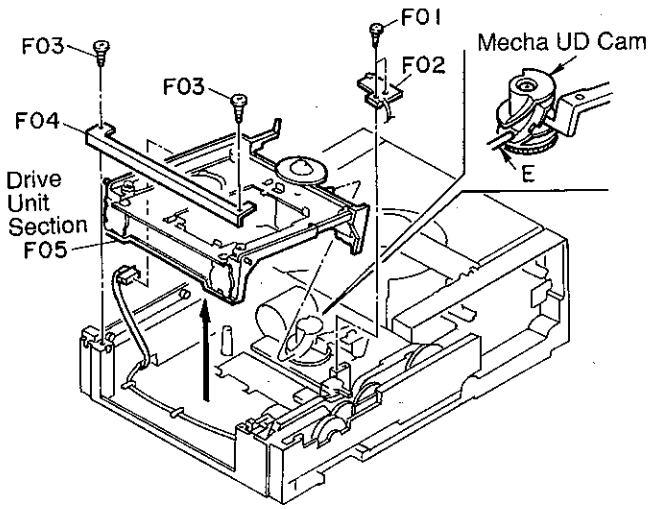


Fig. 2.8

2.9. Side Chassis R Section

2.9.1. Removing the Side Chassis R Section

Refer to Fig. 2.9.1.

(1) Remove the Drive Unit Section. Refer to item 2.8.
(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.

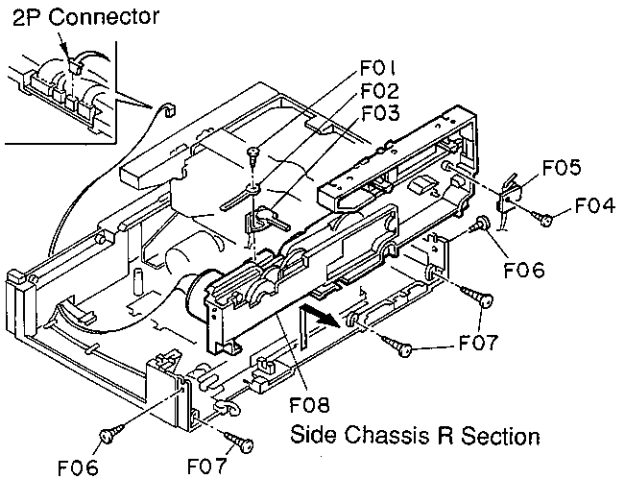


Fig. 2.9.1

2.9.2. Accessing to the Gears and Loading Motor Belt

Refer to Fig. 2.9.2.

(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".

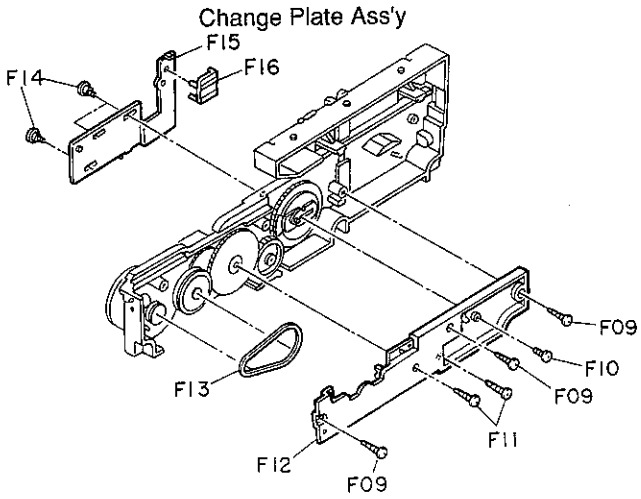


Fig. 2.9.2

2.9.3. 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. 2.9.3.
(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. 2.9.3.

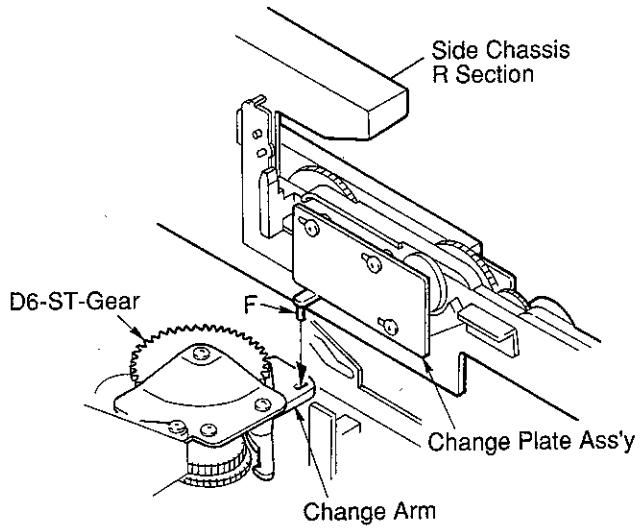


Fig. 2.9.3

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

• Leveling carriages at the right side
Lift the right end of the carriages (6 pcs.) with your finger tip as shown in Fig. 2.9.4, and place the lowest carriage onto the pin "G" (white one).

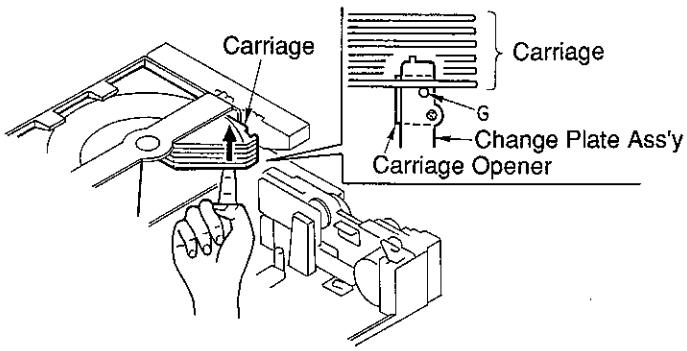


Fig. 2.9.4 Leveling the carriages at the right side

• 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. 2.9.5.

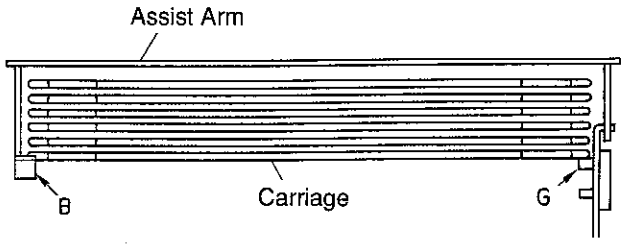


Fig. 2.9.5 Leveling the carriages

2.10. Side Chassis L
Refer to Fig. 2.10.
(1) Remove the Drive Unit Section. Refer to item 2.8.
(2) Remove screws F01 (3 pcs.) and F02 (2 pcs.), and disassemble F03 (Side Chassis L).

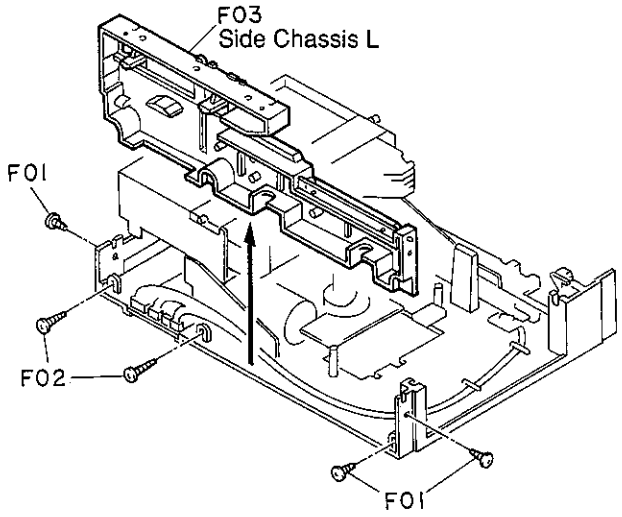


Fig. 2.10

2.11. Stocker Ass'y and Main Chassis Section
Refer to Fig. 2.11.
(1) Remove the Side Chassis R Section and Side Chassis L. Refer to items 2.9 and 2.10.
(2) Remove F01 (Stocker Ass'y including the carriages) from F02 (Main Chassis Section) as shown in the figure.

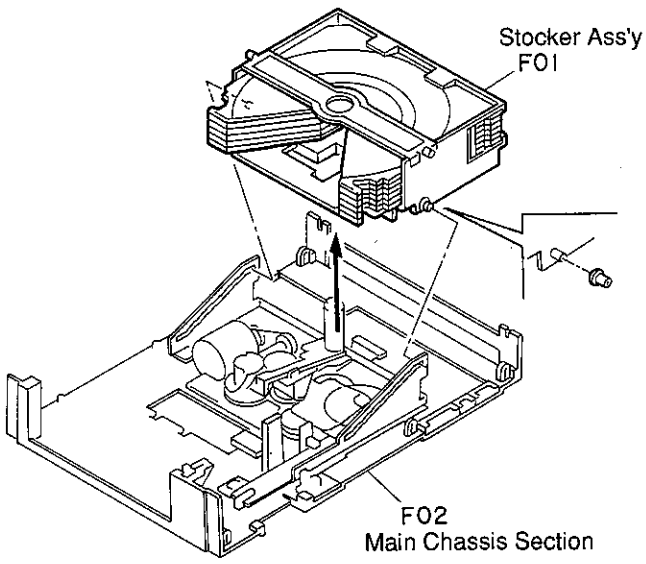


Fig. 2.11

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 2.9 "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.

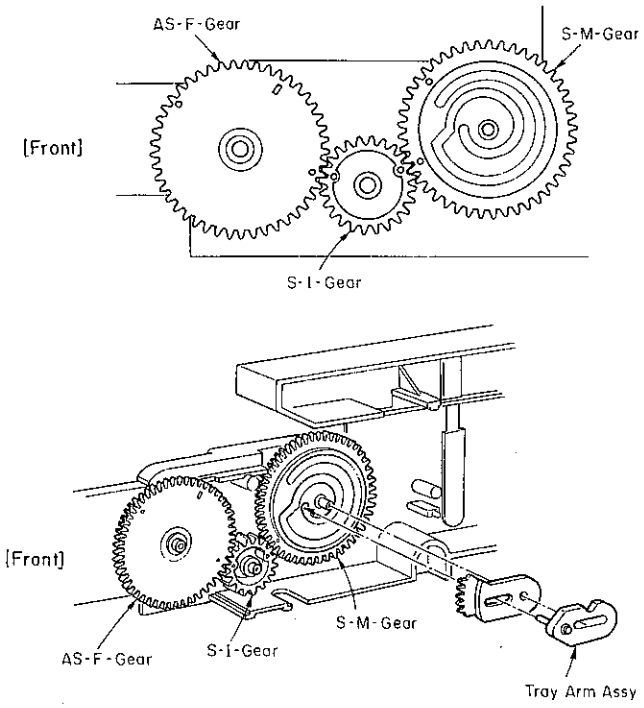


Fig. 3.1.1 Positioning of Three Gears

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.

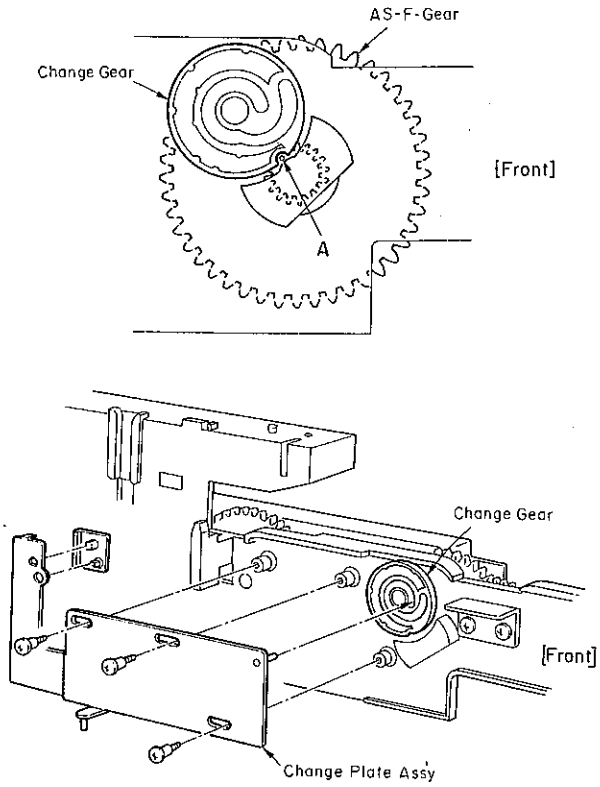


Fig. 3.1.2 Positioning of the Change Gear

3.2. Positioning the Tray Ass'y

When installing the Tray Ass'y on the mechanism unit, perform the following positioning. (Refer to 2.7.2 "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.

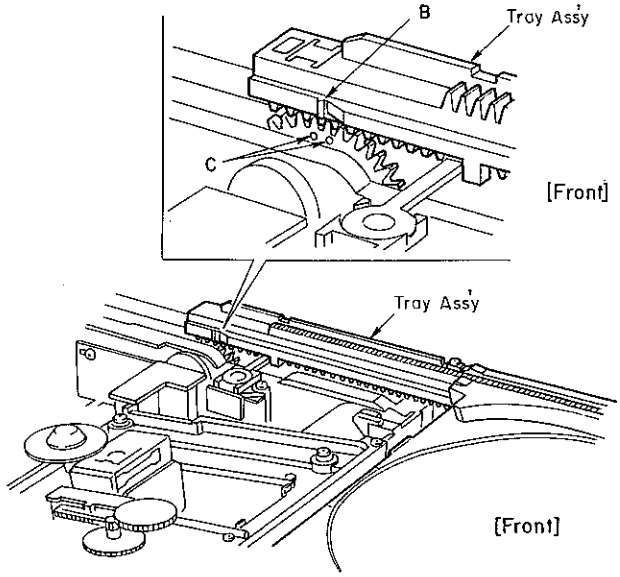


Fig. 3.2 Positioning of the Tray Ass'y

3.3. Lubrication

Apply the specified lubricant (grease) to the following places when parts are replaced. (Refer to Figs. 7.2 to 7.5.)

Fig.	Ref. No.	Location	Lubricant
(Mechanism Deck Ass'y)			
7.2	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 R Section	FLOIL G425, FL777
(Tray Ass'y)			
7.3	01	Tray Top	
		• Carriage contacting surface	FLOIL FL777
	05	Tray R	
		• Carriage contacting surface	FLOIL FL777
	06	Tray L	
		• Carriage contacting surface	FLOIL FL777
	07	TR Guide Shaft	
		• Right Side	FLOIL G425
		• Left Side	FLOIL FL777
(Side Chassis R Section)			
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
(Main Chassis Section)			
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 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) Philips Test Disc 5/5A or 444/444A
(6) SONY Test Disc YEDS-7 (Type 3)
(7) CD Player Test Unit Set (DA09157A)
Consisting of the following items:

• CD Player Test Unit	1 pce.
• MB-7/9Test Unit Cable (DA09186A)	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: The CD Player Test Unit (Test Unit Cable is excluded) for MB-7/9 can be used in the following Models:

- MB-1s/2s/3s/4s
- Sound Space 7
- 1000Mb/i, 1000Mb
- CD Player 1/2/3
- CD Cassette Player 1
- CD Player 4

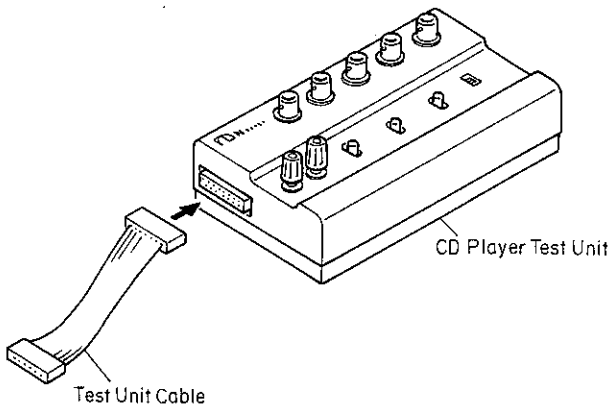


Fig. 4.1 Test Unit

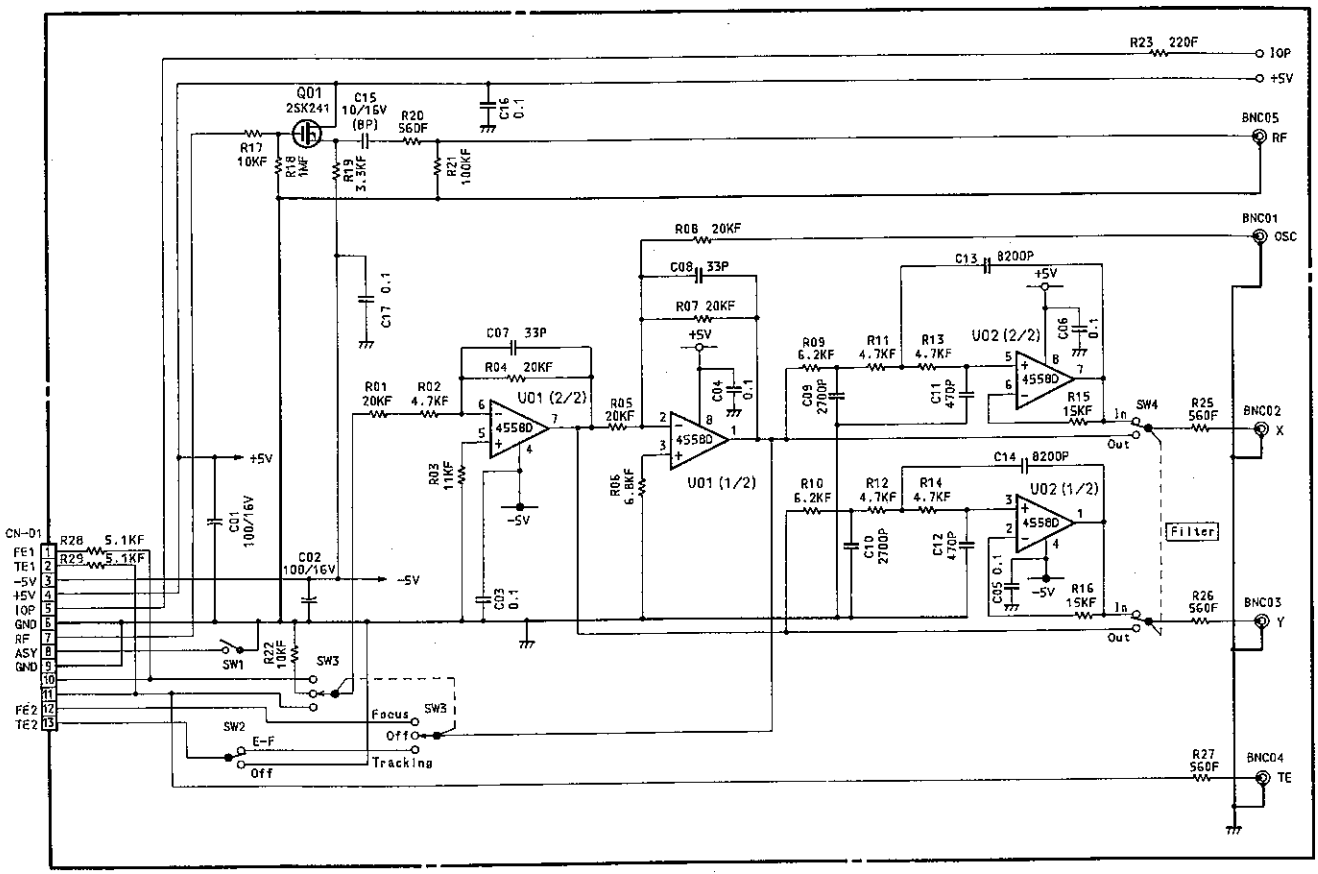
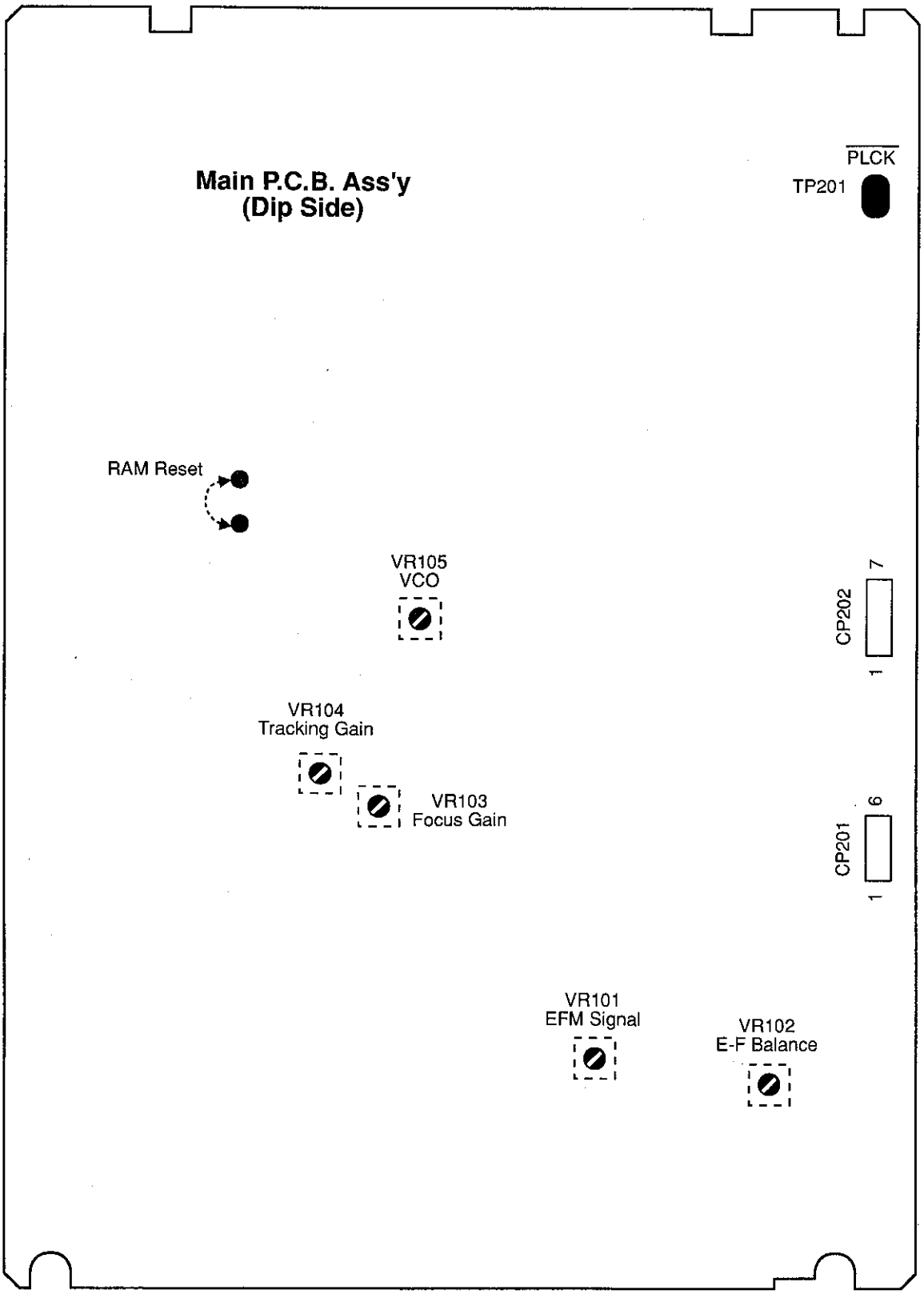


Fig. 4.2 Circuit of the Test Unit

5. PARTS LOCATION FOR ELECTRICAL ADJUSTMENT



Front Side

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 CP202 on the Main P.C.B. Ass'y.

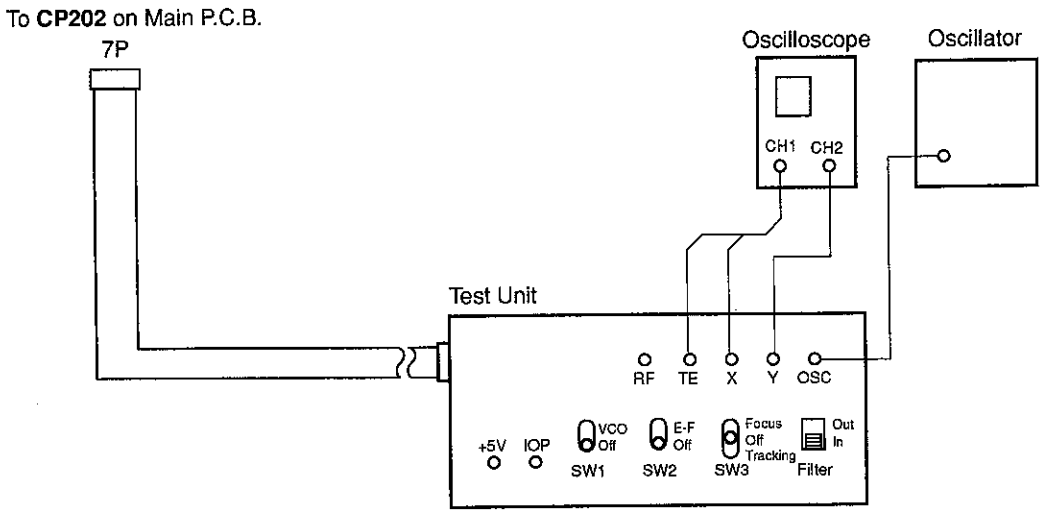
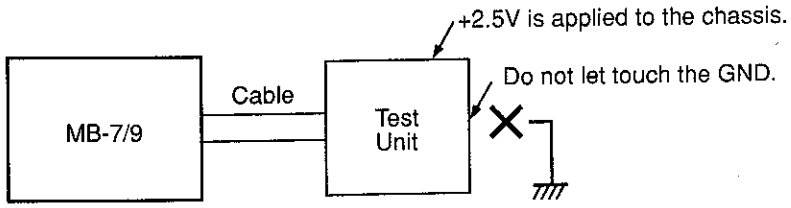
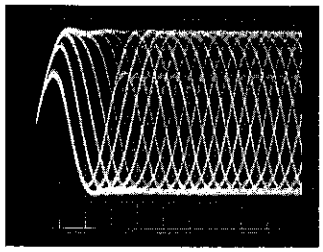
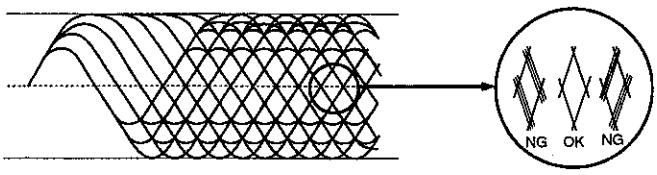
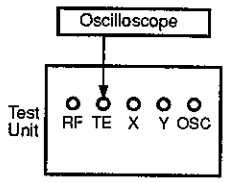
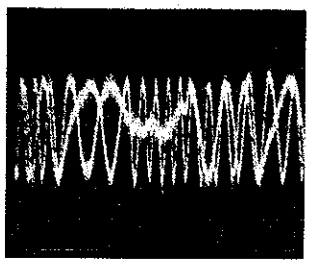
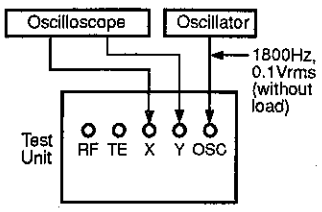
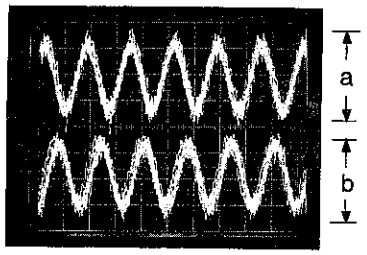
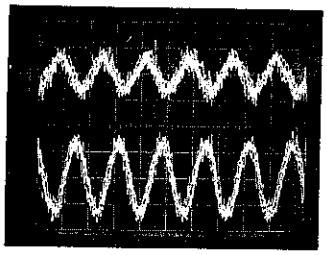


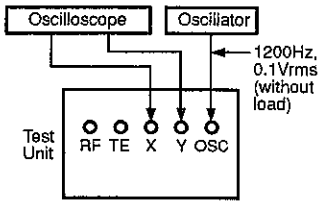
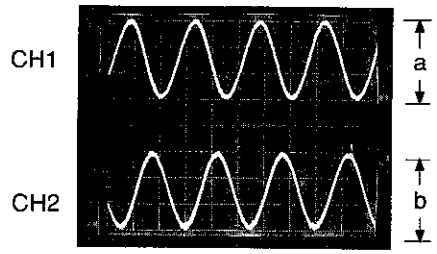
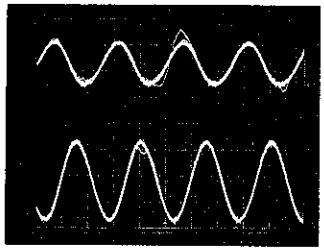
Fig. 6 Test Unit Connecting Diagram

CAUTION:
DO NOT let touch the chassis of the Test Unit to the measurement instrument as well as the MB-7/9 since +2.5V is applied to the chassis of the Test Unit when the test unit cable is connected to the MB-7/9.



STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	ADJUST-MENT	REMARKS
1	Laser Current Check	Philips Test Sample 5 or 444	DC Voltmeter between pins 1 (IOP) and 3 (+5V) of CP201 on Main P.C.B. DC Voltmeter Common: Pin 3 (+5V)		1. Turn the power ON and load the test disc. 2. Play back the test disc and calculate the current flowing into R101 on the Main P.C.B. Ass'y from the following formula. $I = \frac{\text{Voltmeter Value}}{\text{R101 (10 Ohms)}} = \text{oo.o mA}$ 3. Check that the calculated current is in a range of 50 to 60 mA. **Note**: If the current doubles, pickup will be defective.
2	VCO Frequency Adjustment	None	Frequency Counter (10/1 probe) to TP201 ($\overline{\text{PLCK}}$) and GND on Main P.C.B.	Main P.C.B. VR105	1. Set the shorting pin between pins 5 (GND) and 6 (ASY) of CP201 on Main P.C.B. 2. Adjust VR105 to obtain 4.322 ±0.005 MHz on the frequency counter. 3. Remove the shorting pin.
3	EFM Signal Adjustment	Philips Test Sample 5 or 444	Oscilloscope between pins 2 (RF) and 4 (VR) of CP201 on Main P.C.B. Oscilloscope Common: Pin 4 (VR)	Main P.C.B. VR101	1. Play back the first track of the test disc. 2. Adjust VR101 until waveform amplitude becomes maximum and the waveform becomes clear (not thick) as shown below:   Oscilloscope Setting: AC Mode, 0.2 V/div, 0.5 µs/div
4	E-F Balance Adjustment (Supple-mentary Beam Balance Adjustment)	Philips Test Sample 5 or 444	Oscilloscope to TE Connector of Test Unit	Main P.C.B. VR102	1. Connect the 7P cable of the Test Unit to CP202 on the Main P.C.B. Ass'y. 2. Play back the first track of the test disc. 3. Set SW2 of the Test Unit to E-F position. 4. Adjust VR102 so that the center level of the waveform is within the range of 0 V ±0.1 V DC as shown below: (To be continued.)

STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	ADJUST-MENT	REMARKS
	SW1: OFF SW3: OFF SW2: E-F Filter: OUT  Connecting Diagram				 --- Center Level Oscilloscope Setting: DC Mode, 1 V/div, 1 ms/div 5. Set SW2 to OFF position. 6. Remove the 7P cable from CP202.
5	Tracking Gain Adjustment	Philips Test Sample 5 or 444	Oscillator to OSC Connector of Test Unit Oscilloscope to Test Unit • CH1 to X • CH2 to Y	Main P.C.B. VR104	1. Connect the 7P cable of the Test Unit to CP202 on the Main P.C.B. Ass'y. 2. Set the output of oscillator to 1800 Hz, 0.1 Vrms without connecting it to the Test Unit. 3. Note the position of the output control of the oscillator. 4. Connect the oscillator output to OSC connector of the Test Unit and set its output to 0 V. 5. Set the Filter switch of the Test Unit to IN position. 6. Play back the first track of the test disc. 7. Set the output control of the oscillator to the position noted in 3. 8. Set SW3 of the Test Unit to TRACKING position. 9. Adjust VR104 so that the amplitude of both waveforms on the oscilloscope are equal. (a=b) 10. Set SW3 to OFF position. 11. Remove the 7P cable from CP202.
	SW1: OFF SW3: TRACKING SW2: OFF Filter: IN  Connecting Diagram				Good waveforms  a = b NG waveforms  Oscilloscope Setting: CH1, CH2: 0.2 V/div, DC Mode Time: 0.5 ms/div Mode: Auto, ALT Trigger: CH1

STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	ADJUST-MENT	REMARKS
6	Focus Gain Adjustment	Philips Test Sample 5 or 444	Oscillator to OSC connector of Test Unit Oscilloscope to Test Unit • CH1 to X • CH2 to Y	Main P.C.B. VR103	1. Connect the 7P cable of the Test Unit to CP202 on the Main P.C.B. Ass'y. 2. Set the output of oscillator to 1200 Hz, 0.1 Vrms without connecting it to the Test Unit. 3. Note the position of the output control of the oscillator. 4. Connect the oscillator output to OSC connector of the Test Unit and set its output to 0 V. 5. Set the Filter switch of the Test Unit to IN position. 6. Play back the first track of the test disc. 7. Set the output control of the oscillator to the position noted in 3. 8. Set SW3 of the Test Unit to FOCUS position. 9. Adjust VR103 so that the amplitude of both waveforms on the oscilloscope are equal. (a=b) 10. Set SW3 to OFF position. 11. Set the Filter switch to OUT position. 12. Remove the 7P cable from CP202. 13. After adjustment, perform "EFM Signal Adjustment" in Step 3.
					SW1: OFF SW3: FOCUS SW2: OFF Filter: IN  Connecting Diagram Good waveforms  a = b NG waveforms  Oscilloscope Setting: CH1, CH2: 0.2 V/div, DC Mode Time: 0.5 ms/div Mode: Auto, ALT Trigger: CH1
7	Operation Check	Philips Test Sample 5A or 444A			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. • Interruption 500 µm: 6th program • Black Dot 800 µm: 17th program • Simulated fingerprint: 19th program

7. MECHANISM ASS'Y AND PARTS LIST

7.1. Synthesis

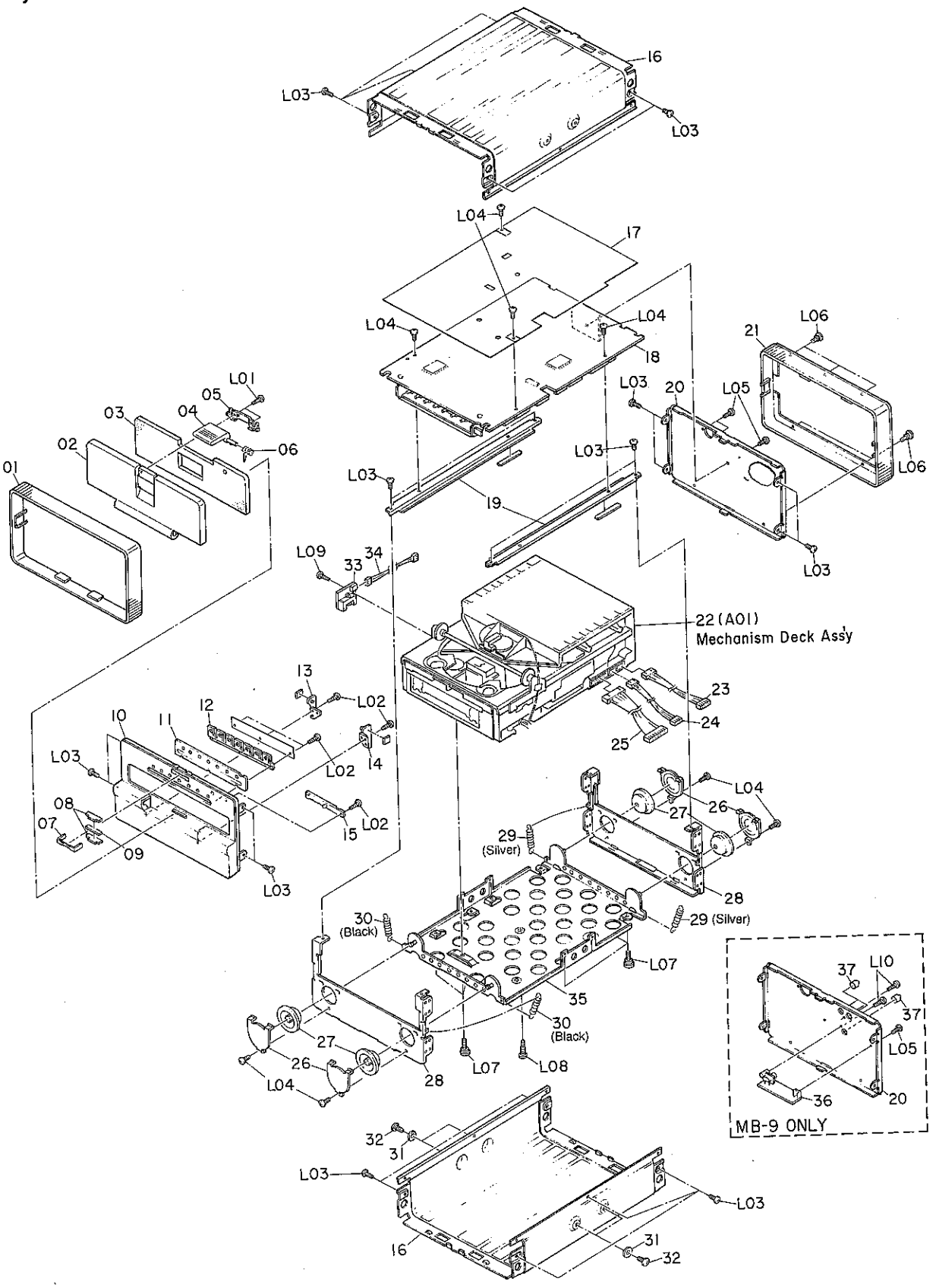
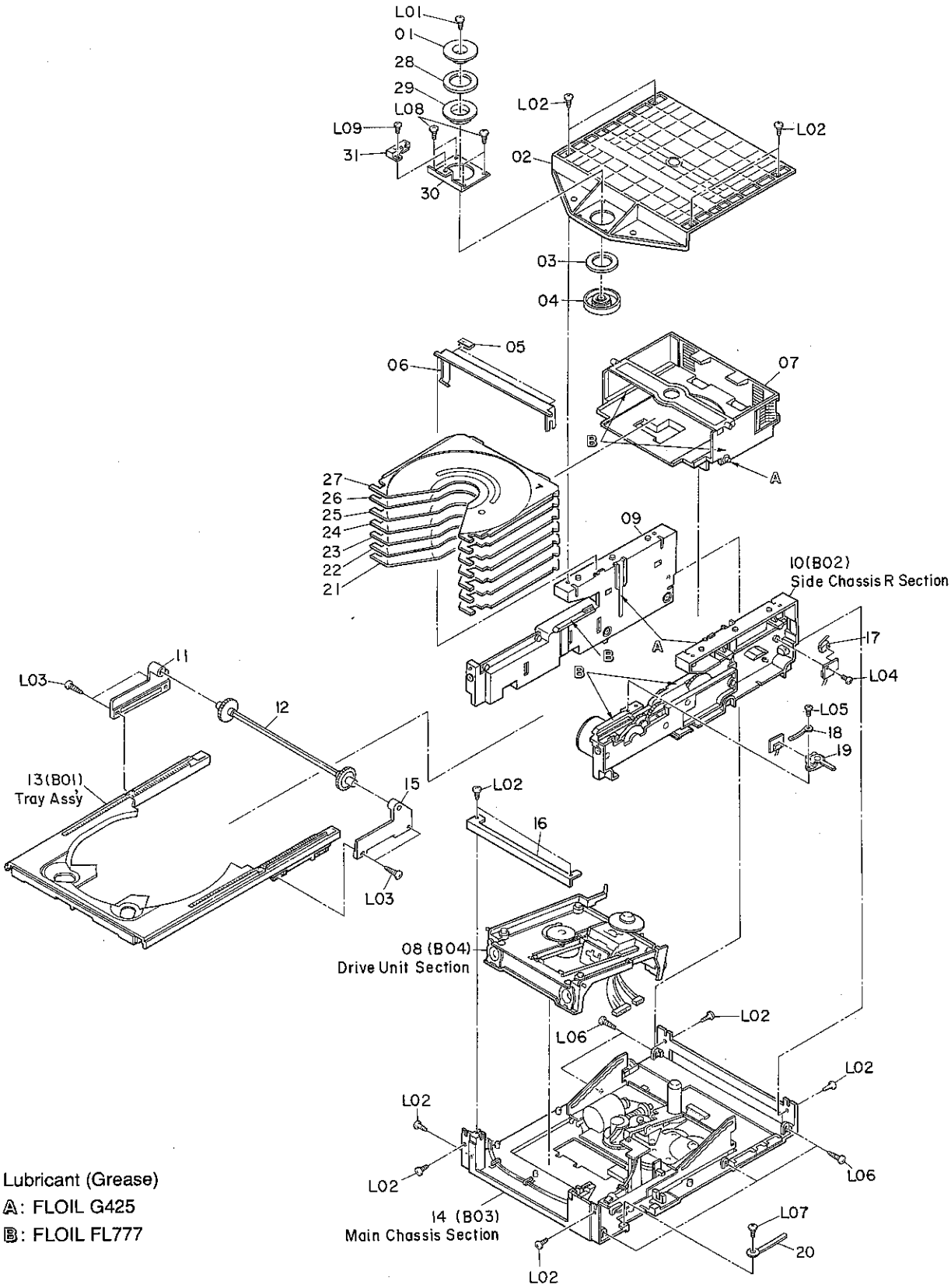


Fig. 7.1

7.1. Synthesis

Schematic Ref. No.	Part No.	Description	Q'ty
	—	**Synthesis**	
01	0H06765D	Protector Front	1
02	0H06763C	Front Door	1
03	0H06774B	Door Sponge	1
04	0H06771C	Door Handle	1
05	0J07270A	Magnet Plate	1
06	0J07276B	Door Spring	1
07	0J07275A	Magnet Holder	1
08	0J07274A	York	2
09	0J07269A	Magnet	1
10	0H06764D	Front Panel [MB-7]	1
	0H06799A	Front Panel [MB-9]	1
11	HG06892A	Indicator Ass'y	1
12	0H06770C	Button Disc	1
13	0H06773C	Door Pin L	1
14	0H06772C	Door Pin R	1
15	0H06801E	Button Door Switch	1
16	0H06767C	Bonnet	2
17	0J07271B	Insulating Sheet	1
18	BA09182A	Main P.C.B. Ass'y [MB-7] (USA, CAN , EP, JPN)	1
	BA09183A	Main P.C.B. Ass'y [MB-7] (GER)	1
	BA09192A	Main P.C.B. Ass'y [MB-9] (USA, CAN , EP, JPN)	1
	BA09193A	Main P.C.B. Ass'y [MB-9] (GER)	1
19	0J07264C	Channel	2
20	0H06768B	Rear Panel [MB-7]	1
	0H06800A	Rear Panel [MB-9]	1
21	0H06766C	Protector Rear	1
22	CG09212B	Mechanism Deck Ass'y	1
23	0B80670B	6P Connector Ass'y CN103	1
24	0B80672A	4P Connector Ass'y CN105	1
25	0B80671A	12P Connector Ass'y CN104	1
26	0J07263B	Damper Holder	4
27	0J07261A	Damper	4
28	0J07258A	Chassis Sub	2
29	0J07260A	Spring Sus R (Silver)	2
30	0J07352A	Spring Sus F (Black)	2
31	0J04310A	Poly Washer	4
32	0J07268A	Shipping Lock Screw	4
33	0B80685A	3P Connector Ass'y CN107	1
34	BA09210A	Tilt Switch P.C.B. Ass'y	1
35	JG04890B	Chassis Ass'y	1
36	BA09194A	Digital Out P.C.B. Ass'y [MB-9] (USA, CAN, EP, JPN)	1
	BA09195A	Digital Out P.C.B. Ass'y [MB-9] (GER)	1
37	0B84524A	RCA Cap [MB-9]	3
L01	0E03809A	PT2x4 + Binding (Black Chromate)	
L02	0E03638A	PT2x6 + Binding	
L03	0E03816A	ST3x4 + Binding (Black Chromate)	
L04	0E00800A	ST3x6 + Binding	
L05	0E00985A	M3x6 + Binding (Black Chromate)	
L06	0E03810A	Push Rivet	
L07	0E03805A	PT Special Screw 3x9.5	
L08	0E03815A	PT3x12 Flat Head	
L09	0E03769A	PT2.6x8 + Binding	
L10	0E03749A	PT3x8 + Binding (Black Chromate) [MB-9]	

7.2. Mechanism Deck Ass'y (A01)



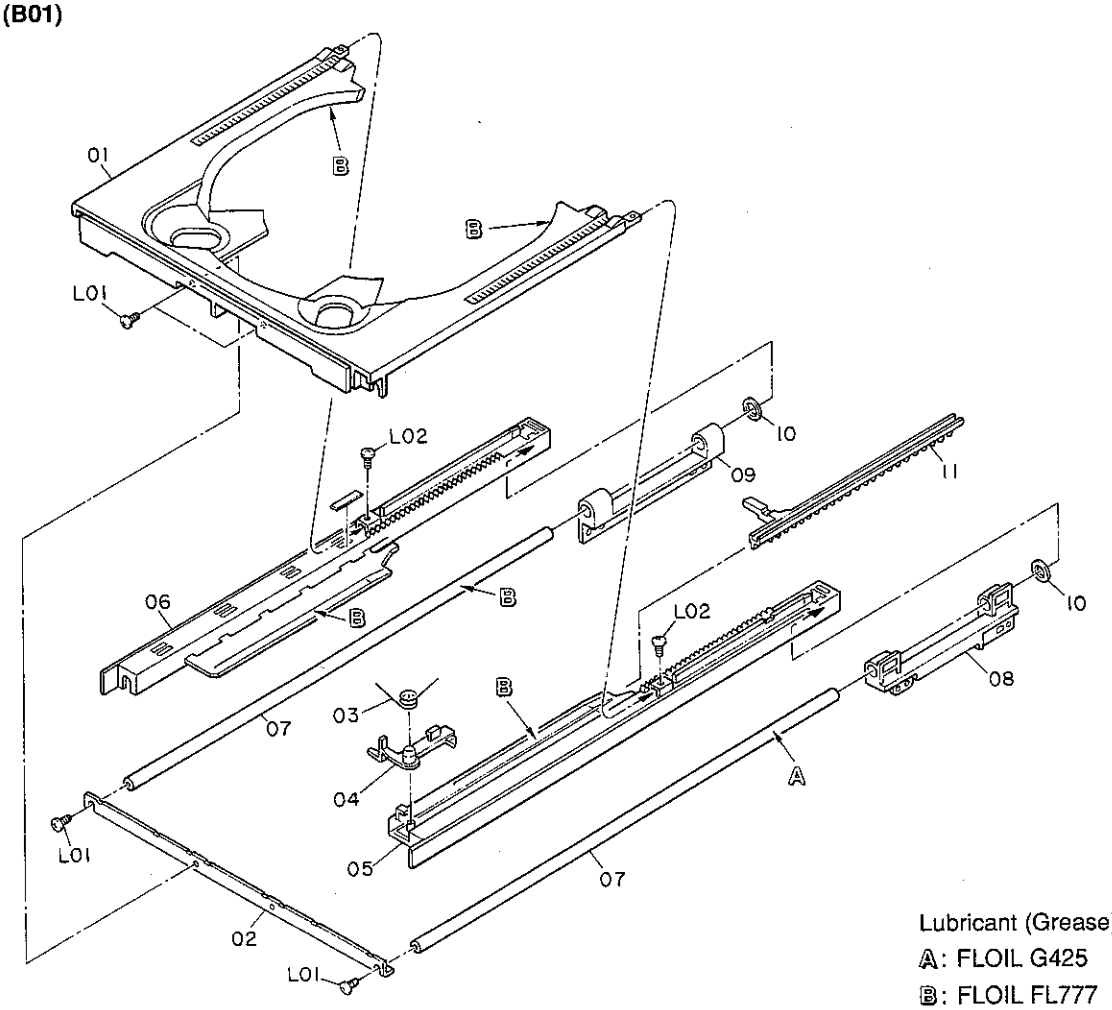
Lubricant (Grease)
Ⓐ: FLOIL G425
Ⓑ: FLOIL FL777

Fig. 7.2

7.2. Mechanism Deck Ass'y (A01)

Schematic Ref. No.	Part No.	Description	Q'ty
A01	**CG09212B**	**Mechanism Deck Ass'y**	**1**
01	2C00128A	Clamper Top MSS	1
02	2C00094A	Top Cover	1
03	2C00016A	Magnet 17x27x5	1
04	2C00015A	Clamper LO	1
05	2C00101A	A Arm Cushion	1
06	2C00116A	Assist Arm	1
07	CB00245A	Stocker Ass'y	1
08	—	Drive Unit Section	1
09	2C00090A	Side Chassis L	1
10	—	Side Chassis R Section	1
11	2C00098A	Tray Holder L	1
12	CB00230A	Timing Ass'y	1
13	CB00246A	Tray Ass'y	1
14	—	Main Chassis Section	1
15	2C00097A	Tray Holder R	1
16	2C00086A	Mecha B Stopper	1
17	2B70009A	Store SW MSS-10L2-1	1
18	2C00107A	Wire Clamper 3B4	1
19	2B70007A	Eject/T-Close SW SSS13	1
20	2C00106A	Wire Clamper 3A6	1
21	0C09830A	Carriage-S-1	1
22	0C09831A	Carriage-S-2	1
23	0C09832A	Carriage-S-3	1
24	0C09833A	Carriage-S-4	1
25	0C09834A	Carriage-S-5	1
26	0C09835A	Carriage-S-6	1
27	0C09836A	Carriage-S-7	1
28	2C00129A	Magnet 17x28.5x2	1
29	2C00130A	Clamper HI MSS	1
30	2C00127A	Clamper Plate	1
31	2B70013A	Chacking Detecting Switch	1
L01	0E00976A	M2x5 + Binding	
L02	0E00825A	BT2.6x8 + Binding (Black Chromate)	
L03	2E00005A	BT2.6x12 + Binding	
L04	0E00961A	BT2x5 + Binding	
L05	0E03442A	ST2.6x5 + Pan	
L06	0E03612A	BT2.6x10 + Binding	
L07	0E00873A	BT2.6x5 + Binding	
L08	0E00859A	BT2.6x6 + Binding	
L09	0E00954A	BT2.6x8 + Binding	

7.3. Tray Ass'y (B01)



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

Fig. 7.3

7.3. Tray Ass'y (B01)

Schematic Ref. No.	Part No.	Description	Q'ty
B01	**CB00246A**	**Tray Ass'y**	1
01	2C00067A	Tray Top	1
02	2C00066A	Tray Plate	1
03	2C00068A	Shuttle Lock Spring	1
04	2C00061A	Shuttle Lock	1
05	2C00064A	Tray R	1
06	2C00065A	Tray L	1
07	2C00069A	Tray Guide shaft	2
08	2C00063A	Tray Guide R	1
09	2C00062A	Tray Guide L	1
10	2C00070A	Stopper Rubber	2
11	2C00060A	Shuttle	1
L01	0E00945A	M2.6x4 + Binding (Black Chromate)	
L02	0E03022A	BT2x4 + Binding (Black Chromate)	

7.4. Side Chassis R Section (B02)

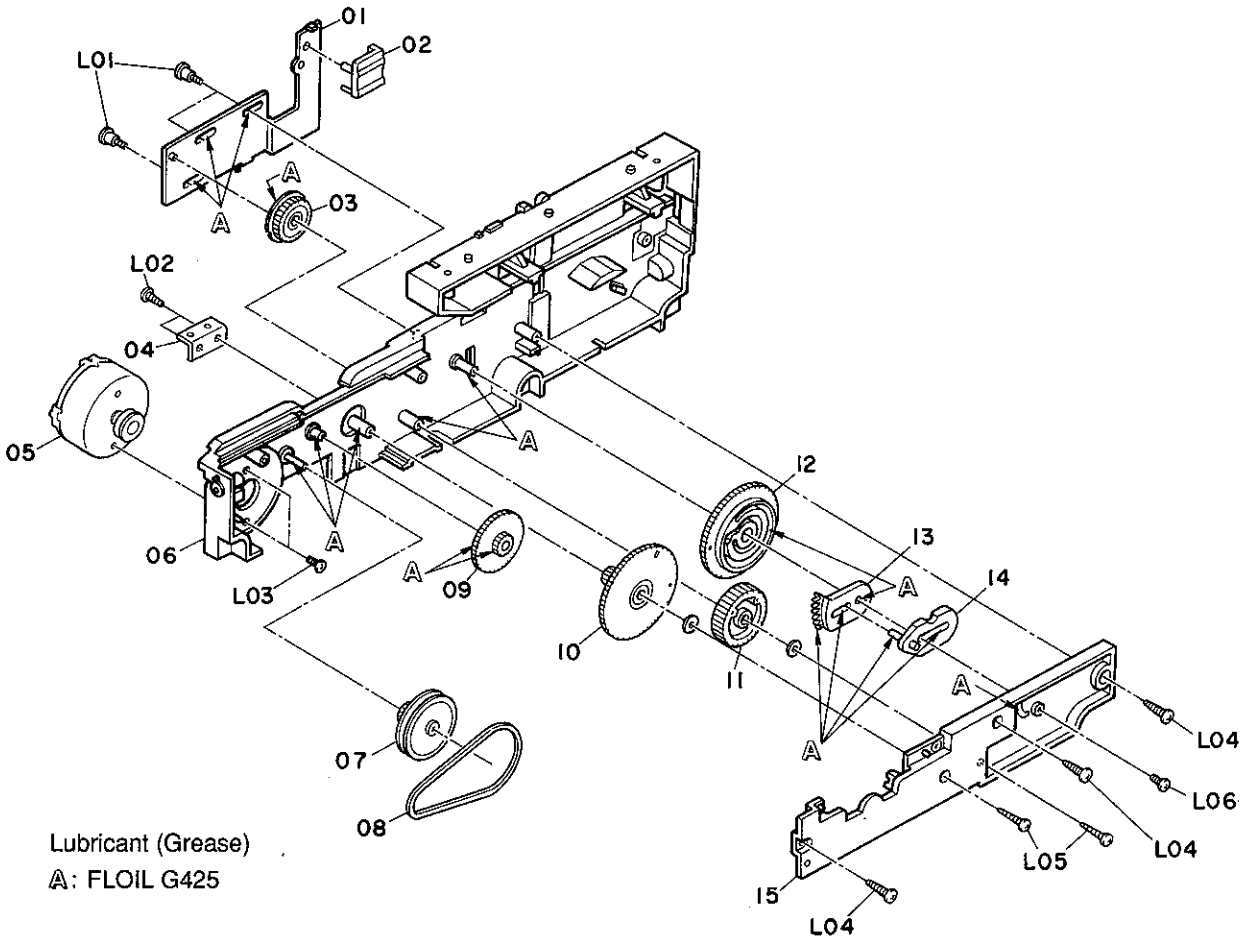
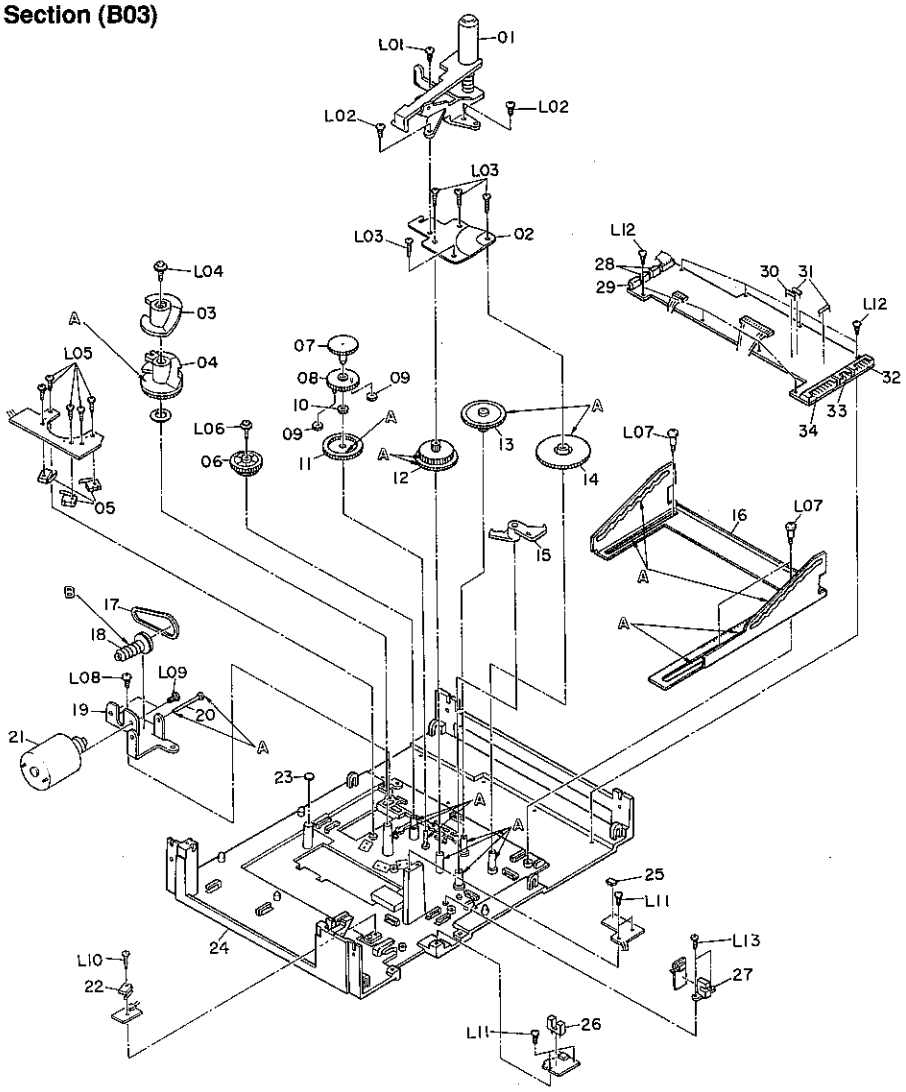


Fig. 7.4

7.4. Side Chassis R Section (B02)

Schematic Ref. No.	Part No.	Description	Q'ty
B02	—	**Side Chassis R Section**	**1**
01	CB00223A	Change Plate Ass'y	1
02	2C00072A	Carriage Opener	1
03	2C00039A	Change Gear	1
04	2C00093A	Switch-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 Stoper	1
14	CB00225A	Trace Arm Ass'y	1
15	2C00040A	Gear Holder	1
L04	0E00825A	BT2.6x8 + Binding (Black Chromate)	
L03	0E00945A	M2.6x4 + Binding (Black Chromate)	
L02	0E03610A	BT2.6x6 + Binding	
L05	0E03756A	BT2x10 + Binding (Black Chromoate)	
L01	2E00002A	BT2.0x1.4x5.9	
L06	2E00013A	M2x4 Binding (Black Chromate)	

7.5. Main Chassis Section (B03)



Lubricant (Grease)

Ⓐ: FLOIL G425

Ⓑ: FLOIL FL777

Fig. 7.5

7.5. Main Chassis Section (B03)

Schematic Ref. No.	Part No.	Description	Q'ty
B03	—	**Main Chassis Section**	**1**
01	CB00224A	Disc Lock Arm Ass'y	1
02	2C00081A	Gear Plate	1
03	2C00117A	ME UD Cam Top	1
04	2C00118A	Mecha UD Cam	1
05	2B70008A	Cam Switch MSS-10R2-16	3
06	2C00082A	ID-ST-Gear	1
07	2C00074A	D1-ST-Gear	1
08	CB00226A	D2-ST-Gear Ass'y	1
09	2C00075A	D3-ST-Gear	2
10	2C00076A	D4-ST-Gear	1
11	2C00077A	D5-ST-Gear	1
12	2C00083A	Lock Idler	1
13	2C00079A	D7M-ST-Gear	1
14	2C00078A	D6P-ST-Gear	1
15	2C00073A	Change Arm	1
16	2C00091A	Stocker Cam	1
17	2C00018A	Belt-T-C	1
18	2C00092A	ST-Worm-Gear	1
19	2C00088A	Motor Bracket	1
20	2C00100A	Worm Shaft	1
21	CB00213A	Stocker Motor Ass'y	1
22	2B70012A	Home Position MSS-10R2-17	1
23	2C00099A	Mecha Cushion	2
24	CB00221A	Main Chassis Ass'y	1
25	2B10019A	Photo Refrector GP2S40	1
26	2B10021A	Photo Interrupter GP1S 52V	1

Schematic Ref. No.	Part No.	Description	Q'ty
27	2B10020A	Photo Interrupter GP1S 51V	1
28	0B81459A	B2B-PH-K-S	2
29	0B81460A	B3B-PH-K-S	1
30	0B09663A	RK 270 1/6W J	1
31	0B09665A	RK 330 1/6W J	2
32	0B81470A	S6B-PH-K-S	1
33	0B81468A	S4B-PH-K-S	1
34	0B84475A	S12B-PH-K-S	1
L01	0E03610A	BT2.6x6 + Binding (Black Chromoate	
L02	0E00945A	M2.6x4 + Binding (Black Chromate)	
L03	0E00969A	BT2x8 + Binding	
L04	2E00010A	BT3x10 + Binding Washer Faced	
L05	2E00008A	BT1.7x5.5 + Binding	
L06	2E00009A	BT2x8 + Binding Washer Faced	
L07	2E00001A	BT2.6x1.4x7.4	
L08	0E00873A	BT2.6x5 + Binding	
L09	0E00501A	M3x3 + Pan	
L10	2E00007A	BT1.7x8 + Binding	
L11	0E00961A	BT2x5 + Binding	
L12	2E00006A	BT1.7x4 + Binding	
L13	0E00869A	BT2.6x4 + Binding	
—	2B80006A	Wire CNW-W6P	1
—	2B80007A	Wire CNW-2P175	1
—	2B80008A	Wire CNW-2P330	1
—	2B80009A	Wire CNW-W4P	1
—	2B80010A	Wire CNW-W2P50	1
—	2B80011A	Wire CNW-W11P	1
—	2B80012A	Wire CNW-3P	1

7.6. Drive Unit Section (B04)

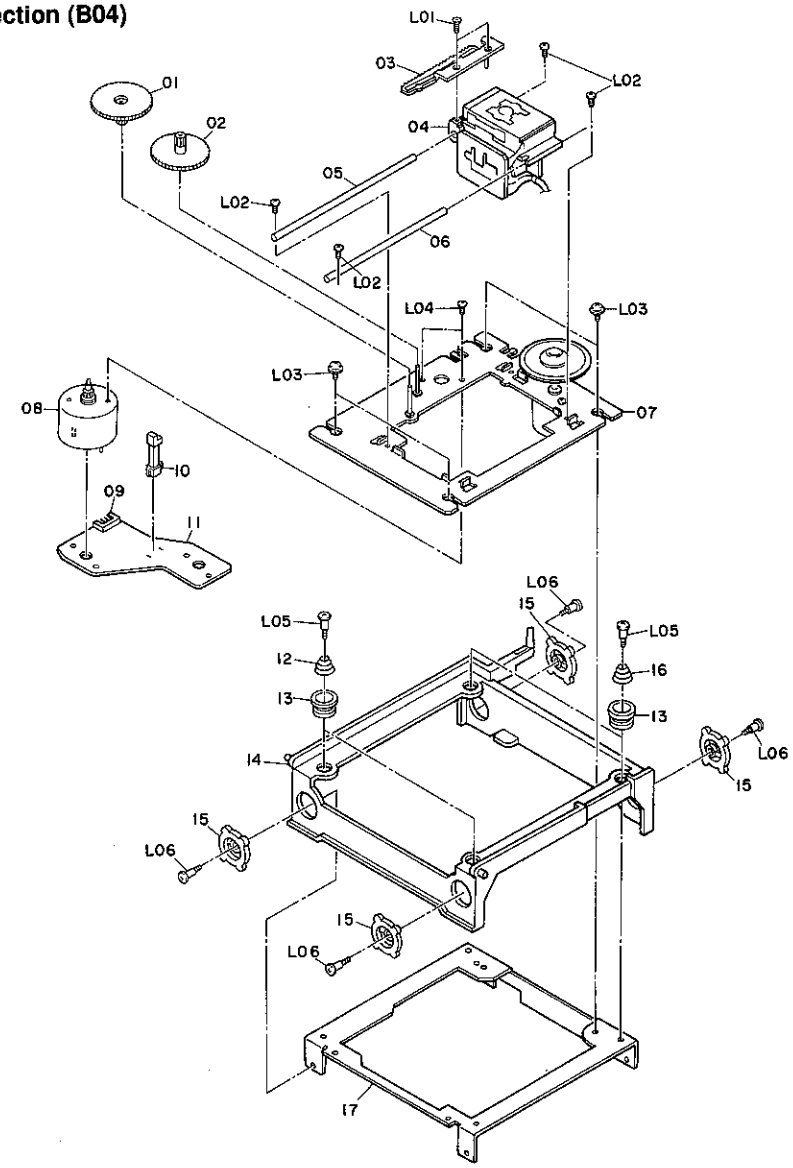


Fig. 7.6

7.6. Drive Unit Section (B04)

Schematic Ref. No.	Part No.	Description	Q'ty
B04	—	**Drive Unit Section**	1
01	2C00023A	Gear Power	1
02	2C00022A	Gear Middle	1
03	2C00105A	Plate Rack	1
04	2C00140A	Pick-Up SF91PQ	1
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	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	

Schematic Ref. No.	Part No.	Description	Q'ty
L02	2E00011A	ST2.6x6 + Binding	
L03	2E00012A	ST2.6x6 Cup Screw	
L04	0E03439A	M2x2.5 + Pan (Black Chromate)	
L05	2E00004A	ST2.0x10x15	
L06	2E00003A	ST2.0x3.0x8.0	

8. MOUNTING DIAGRAMS AND PARTS LIST

NOTE: 1. Component side is illustrated unless otherwise specified.
2. Polarity of electrolytic capacitor.

8.1. Tilt Switch P.C.B. Ass'y

Diagram is omitted.

8.2. Digital Out P.C.B. Ass'y (MB-9 only)

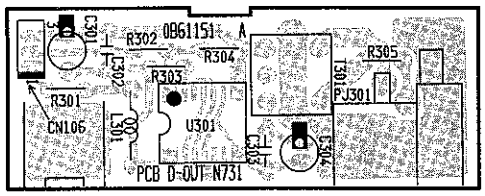


Fig. 8.1 (MB-9 only)

8.3. Main P.C.B. Ass'y
(1) MB-7

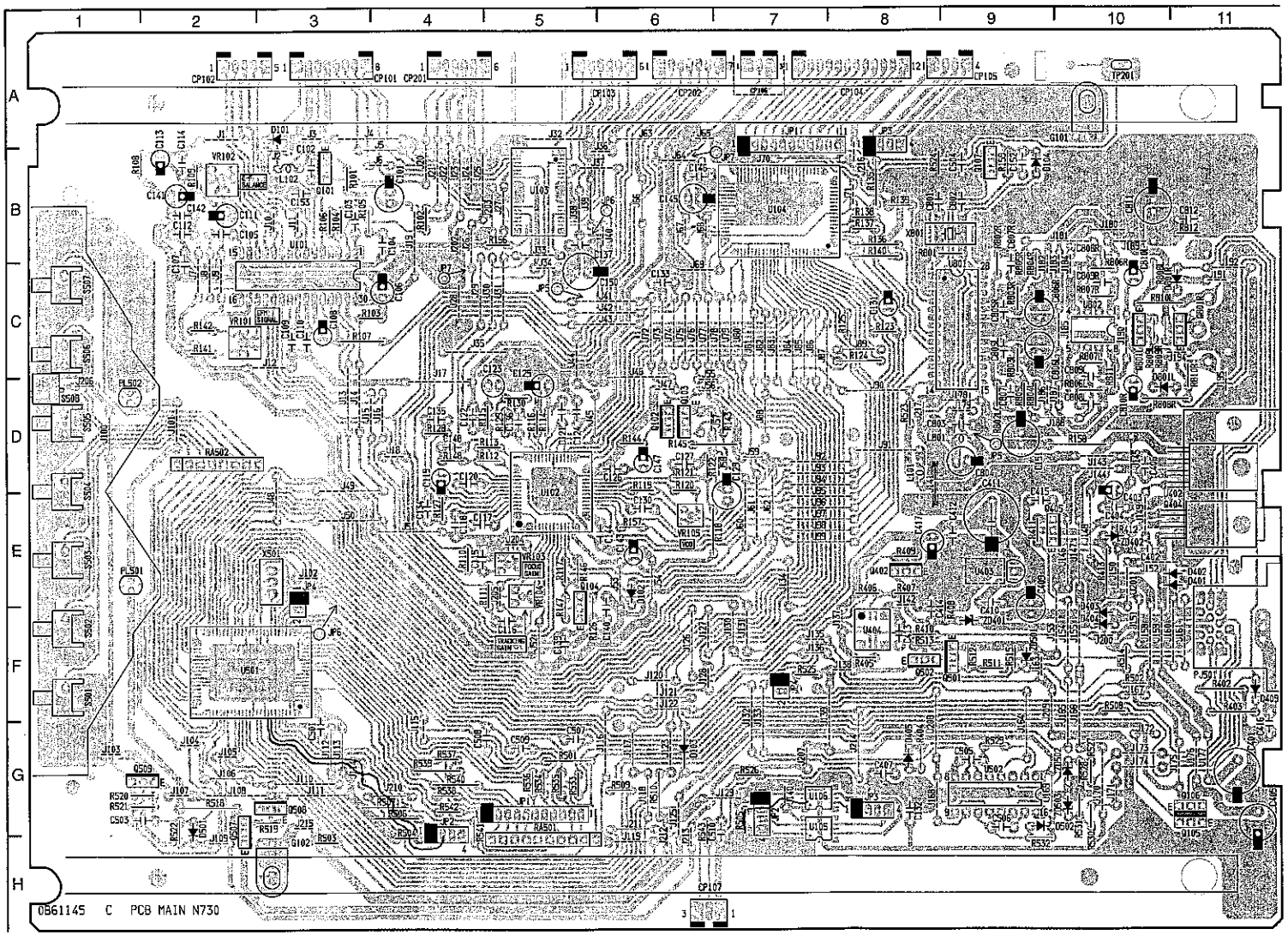


Fig. 8.2.1 MB-7

•Semiconductor Location

Ref. No.	Location
U101	B-3
U102	D-5
U103	B-5
U104	B-7
U105	G-7
U106	G-7
U402	D-11
U403	E-9
U404	F-8
U501	F-2
U502	G-9
U801	C-9
U802	C-10
Q101	B-3
Q102	D-6
Q103	D-6
Q104	E-5
Q105	G-11
Q106	G-11
Q107	B-9
Q402	E-8
Q404	E-11
Q405	E-9
Q501	F-9
Q502	F-8
Q507	G-2
Q508	G-3
Q509	G-1
Q801L	C-10
Q801R	C-11
ZD401	F-9
ZD402	E-10
ZD501	F-9
ZD502	G-10
ZD503	G-10
D101	B-3
D102	E-6
D103	G-6
D104	B-9
D401	E-11
D402	E-11
D403	E-10
D404	F-10
D405	G-8
D409	F-11
D501	G-2
D502	G-9
D801L	D-11
D801R	C-11

(2) MB-9

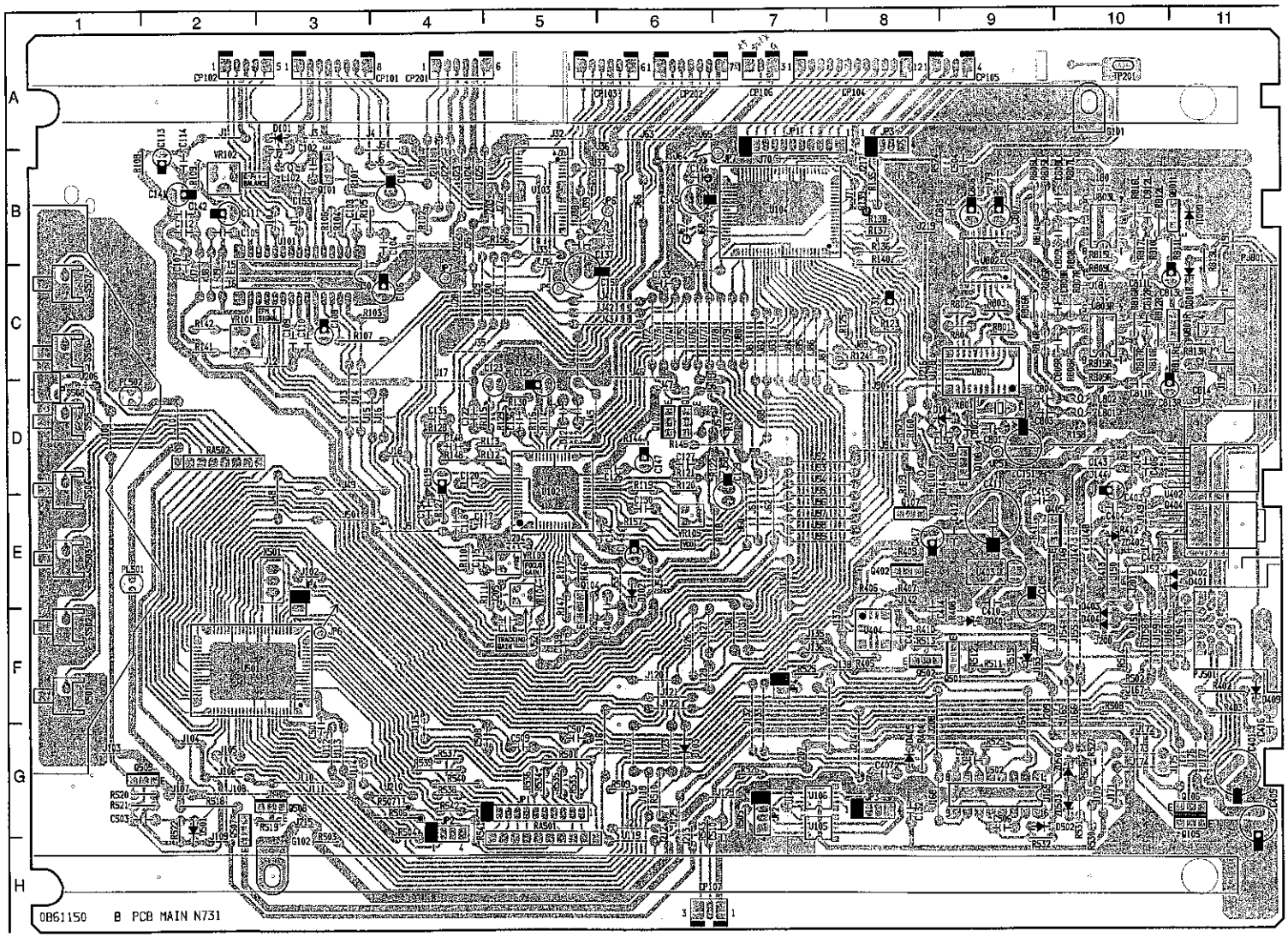


Fig. 8.2.2 MB-9

•Semiconductor Location

Ref. No.	Location
U101	B-3
U102	D-5
U103	B-5
U104	B-7
U105	G-7
U106	G-7
U402	D-11
U403	E-9
U404	F-8
U501	F-2
U502	G-9
U801	C-9
U802	B-9
U803L	B-10
U803R	C-10
Q101	B-3
Q102	D-6
Q103	D-6
Q104	E-5
Q105	G-11
Q106	G-11
Q107	E-8
Q108	D-9
Q402	E-8
Q404	E-11
Q405	E-9
Q501	F-9
Q502	F-8
Q507	G-2
Q508	G-3
Q509	G-1
Q801L	B-11
Q801R	C-11
ZD401	F-9
ZD402	E-10
ZD501	F-9
ZD502	G-10
ZD503	G-10
D101	B-3
D102	E-6
D103	G-6
D104	D-8
D401	E-11
D402	E-11
D403	E-10
D404	F-10
D405	G-8
D409	F-11
D501	G-2
D502	G-9
D801L	B-11
D801R	C-11

NOT

8.1. 1

Schen
Ref. N

Q1
LD1
R1
R2
CP1

8.3. M
(1) Fi

Schem
Ref. Nc

U101
U102
U103
U104
U105,1
U402
U403
U404
U501
U502
U801
U802
Q101
Q102
Q103
Q104
Q105
Q106
Q107
Q402
Q404
Q405
Q501
Q502
Q507
Q508
Q509
Q801L,
ZD401
ZD402
ZD501
ZD502,
D101,1
D103,1
D401,4
D403
D404,4
D409
D501,5

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. Tilt Switch P.C.B. Ass'y (MB-7)

Schematic Ref. No.	Part No.	Description
	BA09210A	**Tilt Switch P.C.B. Ass'y**
	0B61154A	Tilt Switch P.C.B.
Q1	3B10604A	TR PT480
LD1	3B10605A	LED GL480
R1	0B09701A	RK 10K 1/6W J
R2	0B09665A	RK 330 1/6W J
CP1	3B81467A	3P S-Post
	0H06837B	Switch Body N730 (1)
	0J07337A	Ball 3.0 (1)
	0E03769A	PT2.6x8 Binding (2)

8.3. Main P.C.B. Ass'y (MB-7)
(1) For USA, CAN, EP, JPN

Schematic Ref. No.	Part No.	Description
	BA09182A	**Main P.C.B. Ass'y (USA, CAN, EP, JPN)**
	0B61145C	Main P.C.B.
U101	0B11818A	IC CXA1081S
U102	0B10580A	IC CXA1082BQ
U103	0B10558A	IC BA6296FP
U104	0B11946A	IC CXD1167Q
U105,106	0B10465A	IC LB1638M
U402	0B10567A	IC PQ05RG1
U403	0B10462A	IC TA78DS05BP
U404	0B10466A	IC M51957BF
U501	0B10612A	IC uPD75517GF
U502	0B06215A	IC TC4049BP
U801	0B10589A	IC SM5871AN
U802	0B10588A	IC NJM2100D
Q101	0B10585A	TR 2SA1560
Q102	0B10322A	TR DTC114EL
Q103	0B10324A	TR DTC144EL
Q104	0B10330A	TR DTC144TL
Q105	0B10324A	TR DTC144EL
Q106	0B10584A	TR DTA124EL
Q107	0B10324A	TR DTC144EL
Q402	0B10324A	TR DTC144EL
Q404	0B10578A	TR 2SB1342
Q405	0B10398A	TR 2SC4038
Q501	0B10398A	TR 2SC4038
Q502	0B10584A	TR DTA124EL
Q507	0B10585A	TR 2SA1560
Q508	0B10322A	TR DTC114EL
Q509	0B10398A	TR 2SC4038
Q801L,R	0B10583A	TR DTC323TL
ZD401	0B12154A	ZD RD6.2V JS B3
ZD402	0B10579A	ZD RD3.6ESB1
ZD501	0B12147A	ZD RD5.1V JS B2
ZD502,503	0B12154A	ZD RD6.2V JS B3
D101,102	0B06398A	SID 1SS176
D103,104	0B06398A	SID 1SS176
D401,402	0B12693A	SID S5688B
D403	0B12693A	SID S5688B
D404,405	0B06398A	SID 1SS176
D409	0B06398A	SID 1SS176
D501,502	0B06398A	SID 1SS176

Schematic Ref. No.	Part No.	Description
D801L,R	0B06398A	SID 1SS176
L101,102	0B51300A	Inductor 10uH
L801	0B51300A	Inductor 10uH
X501	0B92033A	Resonator 4.0MHz
X801	0B92063A	X'tal 16.9344MHz
VR101	0B32193A	Semi VR 10K (B)
VR102	0B32194A	Semi VR 20K (B)
VR103,104	0B32186A	Semi VR 22K (B)
VR105	0B30174A	Semi VR 1K (B)
RA501	0B20667A	R-Array 47Kx9
RA502	0B20668A	R-Array 100Kx7
R101	0B09629A	RK 10 1/6W J
R102	0B09677A	RK 1K 1/6W J
R103	0B09701A	RK 10K 1/6W J
R104	0B09699A	RK 8.2K 1/6W J
R105	0B09685A	RK 2.2K 1/6W J
R106	0B09699A	RK 8.2K 1/6W J
R107	0B09725A	RK 100K 1/6W J
R108	0B09677A	RK 1K 1/6W J
R109	0B09709A	RK 22K 1/6W J
R110,111	0B09701A	RK 10K 1/6W J
R112	0B09731A	RK 180K 1/6W J
R113	0B09735A	RK 270K 1/6W J
R114	0B09742A	RK 510K 1/6W J
R115	0B09719A	RK 56K 1/6W J
R116	0B09725A	RK 100K 1/6W J
R117	0B09713A	RK 33K 1/6W J
R118	0B25291A	RM 10K 1/4W F
R119	0B25666A	RM 3.6K 1/4W F
R120	0B09734A	RK 240K 1/6W J
R121	0B09701A	RK 10K 1/6W J
R122	0B25291A	RM 10K 1/4W F
R123	0B09721A	RK 68K 1/6W J
R124	0B09701A	RK 10K 1/6W J
R125,126	0B09725A	RK 100K 1/6W J
R127	0B09737A	RK 330K 1/6W J
R128	0B09729A	RK 150K 1/6W J
R129	0B09720A	RK 62K 1/6W J
R130	0B09704A	RK 13K 1/6W J
R135	0B09677A	RK 1K 1/6W J
R136,137	0B09653A	RK 100 1/6W J
R138,139	0B09653A	RK 100 1/6W J
R140	0B09749A	RK 1M 1/6W J
R141,142	0B09705A	RK 15K 1/6W J
R143	0B09701A	RK 10K 1/6W J
R144	0B09713A	RK 33K 1/6W J
R145	0B09701A	RK 10K 1/6W J
R146,147	0B09713A	RK 33K 1/6W J
R148	0B09731A	RK 180K 1/6W J
R156	0B09701A	RK 10K 1/6W J
R157	0B09697A	RK 6.8K 1/6W J
R158	0B24235A	RF 1 1W
R159	0B09701A	RK 10K 1/6W J
R402	0B09719A	RK 56K 1/6W J
R403	0B09677A	RK 1K 1/6W J
R404	0B09733A	RK 220K 1/6W J
R405	0B09701A	RK 10K 1/6W J
R406	0B09732A	RK 200K 1/6W J
R407,408	0B09725A	RK 100K 1/6W J
R409	0B09725A	RK 100K 1/6W J
R410	0B09653A	RK 100 1/6W J

Schematic Ref. No.	Part No.	Description
R411	0B09701A	RK 10K 1/6W J
R412	0B09685A	RK 2.2K 1/6W J
R413	0B09676A	RK 910 1/6W J
R501	0B09701A	RK 10K 1/6W J
R502	0B09713A	RK 33K 1/6W J
R503,504	0B09725A	RK 100K 1/6W J
R505,506	0B09725A	RK 100K 1/6W J
R507	0B09725A	RK 100K 1/6W J
R508,509	0B09669A	RK 470 1/6W J
R510	0B09725A	RK 100K 1/6W J
R511	0B09703A	RK 12K 1/6W J
R512	0B09685A	RK 2.2K 1/6W J
R513	0B09725A	RK 100K 1/6W J
R514	0B09677A	RK 1K 1/6W J
R515	0B09725A	RK 100K 1/6W J
R518	0B24443A	RF 27 1W
R519	0B09695A	RK 5.6K 1/6W J
R520,521	0B09725A	RK 100K 1/6W J
R522	0B09725A	RK 100K 1/6W J
R523	0B09693A	RK 4.7K 1/6W J
R524	0B09646A	RK 51 1/6W J
R525,526	0B09725A	RK 100K 1/6W J
R527	0B09693A	RK 4.7K 1/6W J
R528	0B09749A	RK 1M 1/6W J
R529,530	0B09693A	RK 4.7K 1/6W J
R531	0B09749A	RK 1M 1/6W J
R532	0B09693A	RK 4.7K 1/6W J
R533,534	0B09701A	RK 10K 1/6W J
R535,536	0B09701A	RK 10K 1/6W J
R537,538	0B09701A	RK 10K 1/6W J
R539,540	0B09701A	RK 10K 1/6W J
R541,542	0B09701A	RK 10K 1/6W J
R543	0B09693A	RK 4.7K 1/6W J
R801	0B09749A	RK 1M 1/6W J
R802L,R	0B25661A	RM 2.2K 1/4W F
R803L,R	0B25661A	RM 2.2K 1/4W F
R804L,R	0B25679A	RM 22K 1/4W F
R805L,R	0B25679A	RM 22K 1/4W F
R806L,R	0B25679A	RM 22K 1/4W F
R807L,R	0B25679A	RM 22K 1/4W F
R808L,R	0B09671A	RK 560 1/6W J
R809L,R	0B09725A	RK 100K 1/6W J
R810L,R	0B09653A	RK 100 1/6W J
R811,812	0B09701A	RK 10K 1/6W J
C101	0B48040A	CE 100 10V
C102	0B41944A	CC 1000P 50V K
C103	0B42237A	CML 3300P 50V J
C104	0B41708A	CC 22P 50V J
C105	0B42095A	CML 0.047 50V J
C106	0B40160A	CE 33 10V
C107	0B42095A	CML 0.047 50V J
C108	0B40268A	CE 0.47 50V
C109	0B42239A	CML 4700P 50V J
C110	0B42089A	CML 0.015 50V J
C111	0B40160A	CE 33 10V
C112	0B41553A	CC 0.01 25V Z
C113	0B40271A	CE 3.3 25V
C114	0B42095A	CML 0.047 50V J
C115,116	0B42235A	CML 2200P 50V J
C117	0B42099A	CML 0.1 50V J
C118	0B42095A	CML 0.047 50V J

MB-7 Electrical Parts list (2/2)

Schematic Ref. No.	Part No.	Description
C119	0B40170A	CE 4.7 35V
C120	0B42099A	CML 0.1 50V J
C121	0B42087A	CML 0.01 50V J
C122	0B42099A	CML 0.1 50V J
C123	0B42025A	CE 10 16V (BP)
C124	0B42099A	CML 0.1 50V J
C125	0B40160A	CE 33 10V
C126	0B42099A	CML 0.1 50V J
C127	0B47122A	CC 100P 50V K
C129	0B48040A	CE 100 10V
C130	0B42231A	CML 1000P 50V J
C131	0B40268A	CE 0.47 50V
C132	0B42099A	CML 0.1 50V J
C133	0B42087A	CML 0.01 50V J
C134	0B42240A	CML 5600P 50V J
C135	0B42223A	CML 220P 50V J
C136	0B42087A	CML 0.01 50V J
C137	0B42099A	CML 0.1 50V J
C139,140	0B41553A	CC 0.01 25V Z
C141	0B40160A	CE 33 10V
C142	0B41553A	CC 0.01 25V Z
C143	0B40162A	CE 10 16V
C144	0B42090A	CML 0.018 50V J
C145	0B48040A	CE 100 10V
C146	0B42099A	CML 0.1 50V J
C147	0B40170A	CE 4.7 35V
C148	0B42089A	CML 0.015 50V J
C150,151	0B40789A	CE 220 10V
C152	0B42091A	CML 0.022 50V J
C153	0B47126A	CC 220P 50V K
C401	0B40082R	CE 1000 16V
C402	0B42099A	CML 0.1 50V J
C403	0B40162A	CE 10 16V
C404	0B42099A	CML 0.1 50V J
C405	0B40052A	CE 470 6.3V
C406,407	0B42099A	CML 0.1 50V J
C409	0B40698A	CE 100 16V
C410	0B42099A	CML 0.1 50V J
C411	0B42247A	CE 0.1F 5.5V
C412	0B42099A	CML 0.1 50V J
C413	0B42103A	CML 0.22 50V J
C414	0B42099A	CML 0.1 50V J
C415	0B42231A	CML 1000P 50V J
C416	0B41555A	CC 0.047 25V Z
C417	0B40160A	CE 33 10V
C501	0B42099A	CML 0.1 50V J
C503	0B41553A	CC 0.01 25V Z
C504	0B42099A	CML 0.1 50V J
C505,506	0B42228A	CML 560P 50V J
C507,508	0B41553A	CC 0.01 25V Z
C509	0B41553A	CC 0.01 25V Z
C510	0B42099A	CML 0.1 50V J
C801	0B41872A	CC 18P 50V J
C802	0B41975A	CC 10P 50V C
C803	0B42099A	CML 0.1 50V J
C804	0B48040A	CE 100 10V
C805L	0B42099A	CML 0.1 50V J
C805R	0B42099A	CML 0.1 50V J
C806L,R	0B48040A	CE 100 10V
C807L,R	0B42228A	CML 560P 50V J
C808L,R	0B42219A	CML 100P 50V J
C809L,R	0B42219A	CML 100P 50V J
C810L,R	0B40162A	CE 10 16V
C811	0B40837A	CE 330 6.3V
C812	0B42219A	CML 100P 50V J
CP101	0B81465A	8P T-Post
CP102	0B81462A	5P T-Post
CP103	0B81463A	6P T-Post
CP104	0B84087A	12P T-Post
CP105	0B81461A	4P T-Post
CP107	0B81460A	3P T-Post
CP201	0B84288A	6P T-Post RED
CP202	0B84291A	7P T-Post RED
G101,102	0B80673A	Earth Plate

Schematic Ref. No.	Part No.	Description
JP1	0B80675C	11P Connector Ass'y JP1
JP2	0B80676A	4P Connector Ass'y JP2
JP3	0B80677C	11P Connector Ass'y JP3
JP4	0B80678B	2P Flat Cable JP4
JP5	0B80679C	Lead Wire JP5
JP6	0B80680A	Lead Wire JP6
JP7	0B80681B	Lead Wire JP7
PJ501	0B80668A	DIN Socket 13P
PL501,502	0B90644A	Lamp 115mA 5V
S501,502	0B70230A	Tact Switch
S503,504	0B70230A	Tact Switch
S505,506	0B70230A	Tact Switch
S507	0B70230A	Tact Switch
S508	0B70233A	Detect Switch
TP201	0B80674A	Check Terminal 1P
	0E00818A	M3x8 + Binding (Black Chromate) (3)
	0E03749A	PT3x8 + Binding (Black Chromate) (2)
	0H06769B	Reflector (1)
	0J06212B	Lamp Holder (2)
	0J07267A	Heat Sink (1)
	0J07284B	Light Shield (1)

(2) For GER

Schematic Ref. No.	Part No.	Description
BA09183A	**Main P.C.B. Ass'y (GER)**	
	The following parts are different from those for USA, CAN, EP, JPN	
R524	—	None
C504	—	None
C416	0B50265A	EMI Coil
C803	0B41529A	CML 0.033 50V J
C805L,R	0B41529A	CML 0.033 50V J
JP8	0B80720A	Lead Wire (for Earth Plate G101)

8.1. Tilt Switch P.C.B. Ass'y (MB-9)

Schematic Ref. No.	Part No.	Description
	BA39210A	**Tilt Switch P.C.B. Ass'y**
	3B61154A	Tilt Switch P.C.B.
Q1	3B10604A	TR PT480
LD1	3B10605A	LED GL480
R1	3B20933A	RK 12K 1/6W J
R2	3B20897A	RK 470 1/6W J
CP1	3B81467A	3P S-Post
	3E03769A	PT2.6x8 + Binding (2)
	3H06837B	Switch Body (1)
	3J07337A	Ball 3.0 (1)

8.2. Digital Out P.C.B. Ass'y (MB-9)

(1) For USA, CAN, EP, JPN

Schematic Ref. No.	Part No.	Description
	BA09194A	**Digital Out P.C.B. Ass'y (JPN, USA, EP)**
	0B61151A	Digital Out P.C.B.
U301	0B11613A	IC TC74HC00AF
L301	0B51138A	Coil 1MH
R301,302	0B09661A	RK 220 1/6W J
R303	0B09701A	RK 10K 1/6W J
R304	0B09677A	RK 1K 1/6W J
R305	0B09650A	RK 75 1/6W J
C301	0B40063A	CE 100 10V
C302	0B42099A	CML 0.1 50V J
C303	0B42087A	CML 0.01 50V J
C304	0B40160A	CE 33 10V
CN106	0B80684A	Connector Ass'y CN601
PJ301	0B80692A	1P Pin Jack
T301	0B51351A	Pulse Trans
	0B84388A	Terminal P-424 (1)

(2) For GER

Schematic Ref. No.	Part No.	Description
	BA09195A	**Digital Out P.C.B. Ass'y (GER)**

Note: Parts which are different from those for USA, CAN, EP & JPN will be informed by Service Information later on.

8.3. Main P.C.B. Ass'y (MB-9)

(1) For USA, CAN, EP, JPN

Schematic Ref. No.	Part No.	Description
	BA09192A	**Main P.C.B. Ass'y (USA, CAN, EP, JPN)**
	0B61150B	Main P.C.B.
U101	0B11818A	IC CXA1081S
U102	0B10580A	IC CXA1082BQ
U103	0B10558A	IC BA6296FP
U104	0B11946A	IC CXD1167Q
U105,106	0B10465A	IC LB1638M
U402	0B10567A	IC PQ05RG1
U403	0B10462A	IC TA78DS05BP
U404	0B10466A	IC M51957BF
U501	0B10612A	IC uPD75517GF
U502	0B06215A	IC TC4049BP
U801	0B10593A	IC SM5841CS

Schematic Ref. No.	Part No.	Description
U802	0B17010A	IC AD1868R-J
U803L,R	0B10588A	IC NJM2100D
Q101	0B10585A	TR 2SA1560
Q102	0B10322A	TR DTC114EL
Q103	0B10324A	TR DTC144EL
Q104	0B10330A	TR DTC144TL
Q105	0B10324A	TR DTC144EL
Q106	0B10584A	TR DTA124EL
Q107,108	0B10324A	TR DTC144EL
Q402	0B10324A	TR DTC144EL
Q404	0B10578A	TR 2SB1342
Q405	0B10398A	TR 2SC4038
Q501	0B10398A	TR 2SC4038
Q502	0B10584A	TR DTA124EL
Q507	0B10585A	TR 2SA1560
Q508	0B10322A	TR DTC114EL
Q509	0B10398A	TR 2SC4038
Q801L,R	0B10583A	TR DTC323TL
ZD401	0B12154A	ZD RD6.2JSB3
ZD402	0B10579A	ZD RD3.6ESB1
ZD501	0B12147A	ZD RD5.1JSB2
ZD502,503	0B12154A	ZD RD6.2JSB3
D101,102	0B06398A	SID 1SS176
D103,104	0B06398A	SID 1SS176
D401,402	0B12693A	SID S5688B
D403	0B12693A	SID S5688B
D404,405	0B06398A	SID 1SS176
D409	0B06398A	SID 1SS176
D501,502	0B06398A	SID 1SS176
D801L,R	0B06398A	SID 1SS176
L101,102	0B51300A	Coil 10uH
L801,802	0B51300A	Coil 10uH
X501	0B92033A	Resonator 4.0MHz
X801	0B92063A	X'tal 16.9344MHz
VR101	0B32193A	Semi VR 10K
VR102	0B32194A	Semi VR 20K
VR103,104	0B32186A	Semi VR 22K
VR105	0B30174A	Semi VR 1K
RA501	0B20667A	R-Array 47Kx9
RA502	0B20668A	R-Array 100Kx7
R101	0B09629A	RK 10 1/6W J
R102	0B09677A	RK 1K 1/6W J
R103	0B09701A	RK 10K 1/6W J
R104	0B09699A	RK 8.2K 1/6W J
R105	0B09685A	RK 2.2K 1/6W J
R106	0B09699A	RK 8.2K 1/6W J
R107	0B09725A	RK 100K 1/6W J
R108	0B09677A	RK 1K 1/6W J
R109	0B09709A	RK 22K 1/6W J
R110,111	0B09701A	RK 10K 1/6W J
R112	0B09731A	RK 180K 1/6W J
R113	0B09735A	RK 270K 1/6W J
R114	0B09742A	RK 510K 1/6W J
R115	0B09719A	RK 56K 1/6W J
R116	0B09725A	RK 100K 1/6W J
R117	0B09713A	RK 33K 1/6W J
R118	0B25291A	RM 10K 1/4WF
R119	0B25666A	RM 3.6K 1/4WF
R120	0B09734A	RK 240K 1/6W J
R121	0B09701A	RK 10K 1/6W J
R122	0B25291A	RM 10K 1/4WF
R123	0B09721A	RK 68K 1/6W J
R124	0B09701A	RK 10K 1/6W J
R125,126	0B09725A	RK 100K 1/6W J
R127	0B09737A	RK 330K 1/6W J
R128	0B09729A	RK 150K 1/6W J
R129	0B09720A	RK 62K 1/6W J
R130	0B09704A	RK 13K 1/6W J
R135	0B09677A	RK 1K 1/6W J
R136,137	0B09653A	RK 100 1/6W J
R138,139	0B09653A	RK 100 1/6W J
R140	0B09749A	RK 1M 1/6W J

Schematic Ref. No.	Part No.	Description
R141,142	0B09705A	RK 15K 1/6W J
R143	0B09701A	RK 10K 1/6W J
R144	0B09713A	RK 33K 1/6W J
R145	0B09701A	RK 10K 1/6W J
R146,147	0B09713A	RK 33K 1/6W J
R148	0B09731A	RK 180K 1/6W J
R156	0B09701A	RK 10K 1/6W J
R157	0B09697A	RK 6.8K 1/6W J
R158	0B24235A	RF 1 1W
R159,160	0B09701A	RK 10K 1/6W J
R402	0B09719A	RK 56K 1/6W J
R403	0B09677A	RK 1K 1/6W J
R404	0B09733A	RK 220K 1/6W J
R405	0B09701A	RK 10K 1/6W J
R406	0B09732A	RK 200K 1/6W J
R407,408	0B09725A	RK 100K 1/6W J
R409	0B09725A	RK 100K 1/6W J
R410	0B09653A	RK 100 1/6W J
R411	0B09701A	RK 10K 1/6W J
R412	0B09685A	RK 2.2K 1/6W J
R413	0B09676A	RK 910 1/6W J
R501	0B09701A	RK 10K 1/6W J
R502	0B09713A	RK 33K 1/6W J
R503,504	0B09725A	RK 100K 1/6W J
R505,506	0B09725A	RK 100K 1/6W J
R507	0B09725A	RK 100K 1/6W J
R508,509	0B09669A	RK 470 1/6W J
R510	0B09725A	RK 100K 1/6W J
R511	0B09703A	RK 12K 1/6W J
R512	0B09685A	RK 2.2K 1/6W J
R513	0B09725A	RK 100K 1/6W J
R514	0B09677A	RK 1K 1/6W J
R515	0B09725A	RK 100K 1/6W J
R518	0B24443A	RF 27 1W
R519	0B09695A	RK 5.6K 1/6W J
R520,521	0B09725A	RK 100K 1/6W J
R522	0B09725A	RK 100K 1/6W J
R523	0B09693A	RK 4.7K 1/6W J
R524	0B09646A	RK 51 1/6W J
R525,526	0B09725A	RK 100K 1/6W J
R527	0B09693A	RK 4.7K 1/6W J
R528	0B09749A	RK 1M 1/6W J
R529,530	0B09693A	RK 4.7K 1/6W J
R531	0B09749A	RK 1M 1/6W J
R532	0B09693A	RK 4.7K 1/6W J
R533,534	0B09701A	RK 10K 1/6W J
R535,536	0B09701A	RK 10K 1/6W J
R537,538	0B09701A	RK 10K 1/6W J
R539,540	0B09701A	RK 10K 1/6W J
R541,542	0B09701A	RK 10K 1/6W J
R543	0B09693A	RK 4.7K 1/6W J
R801,802	0B09661A	RK 220 1/6W J
R803,804	0B09661A	RK 220 1/6W J
R805L,R	0B25675A	RM 9.1K 1/4W F
R806L,R	0B25675A	RM 9.1K 1/4W F
R807L,R	0B25320A	RM 20K 1/4W F
R808L,R	0B25291A	RM 10K 1/4W F
R809L,R	0B25291A	RM 10K 1/4W F
R810L,R	0B25291A	RM 10K 1/4W F
R811L,R	0B09671A	RK 560 1/4W J
R812L,R	0B09725A	RK 100K 1/4W J
R813L,R	0B09653A	RK 100 1/4W J
R814L,R	0B25320A	RM 20K 1/4W F
R815L,R	0B25320A	RM 20K 1/4W F
R816L,R	0B25320A	RM 20K 1/4W F
R817L,R	0B25291A	RM 10K 1/4W F
C101	0B48040A	CE 100 10V
C102	0B41944A	CC 1000P 50V K
C103	0B42237A	CML 3300P 50V J
C104	0B41708A	CC 22P 50V J
C105	0B42095A	CML 0.047 50V J
C106	0B40160A	CE 33 10V

MB-9 Electrical Parts list (2/2)

Schematic Ref. No.	Part No.	Description
C107	0B42095A	CML 0.047 50V J
C108	0B40268A	CE 0.47 50V
C109	0B42239A	CML 4700P 50V J
C110	0B42089A	CML 0.015 50V J
C111	0B40160A	CE 33 10V
C112	0B41553A	CC 0.01 25V Z
C113	0B40271A	CE 3.3 25V
C114	0B42095A	CML 0.047 50V J
C115,116	0B42235A	CML 2200P 50V J
C117	0B42099A	CML 0.1 50V J
C118	0B42095A	CML 0.047 50V J
C119	0B40170A	CE 4.7 35V
C120	0B42099A	CML 0.1 50V J
C121	0B42087A	CML 0.01 50V J
C122	0B42099A	CML 0.1 50V J
C123	0B42025A	CE 10 16V (BP)
C124	0B42099A	CML 0.1 50V J
C125	0B40160A	CE 33 10V
C126	0B42099A	CML 0.1 50V J
C127	0B47122A	CC 100P 50V K
C129	0B48040A	CE 100 10V
C130	0B42231A	CML 1000P 50V J
C131	0B40268A	CE 0.47 50V
C132	0B42099A	CML 0.1 50V J
C133	0B42087A	CML 0.01 50V J
C134	0B42240A	CML 5600P 50V J
C135	0B42223A	CML 220P 50V K
C136	0B42087A	CML 0.01 50V J
C137	0B42099A	CML 0.1 50V J
C139,140	0B41553A	CC 0.01 25V Z
C141	0B40160A	CE 33 10V
C142	0B41553A	CC 0.01 25V Z
C143	0B40162A	CE 10 16V
C144	0B42090A	CML 0.018 50V J
C145	0B48040A	CE 100 10V
C146	0B42099A	CML 0.1 50V J
C147	0B40170A	CE 4.7 35V
C148	0B42089A	CML 0.015 50V J
C150,151	0B40789A	CE 220 10V
C152	0B42091A	CML 0.022 50V J
C153	0B47126A	CC 220P 50V K
C401	0B40082A	CE 1000 16V
C402	0B42099A	CML 0.1 50V J
C403	0B40162A	CE 10 16V
C404	0B42099A	CML 0.1 50V J
C405	0B42145A	CE 470 6.3V (LN)
C406,407	0B42099A	CML 0.1 50V J
C409	0B40698A	CE 100 16V
C410	0B42099A	CML 0.1 50V J
C411	0B42247A	CE 0.1F 5.5V
C412	0B42099A	CML 0.1 50V J
C413	0B42103A	CML 0.22 50V J
C414	0B42099A	CML 0.1 50V J
C415	0B42231A	CML 1000P 50V J
C416	0B41555A	CC 0.047 25V Z
C417	0B40160A	CE 33 10V
C501	0B42099A	CML 0.1 50V J
C503	0B41553A	CC 0.01 25V Z
C504	0B42099A	CML 0.1 50V J
C505,506	0B42228A	CML 560P 50V J
C507,508	0B41553A	CC 0.01 25V Z
C509	0B41553A	CC 0.01 25V Z
C510	0B42099A	CML 0.1 50V J
C801,802	0B41975A	CC 10P 50V D
C803,804	0B42099A	CML 0.1 50V J
C805	0B42099A	CML 0.1 50V J
C806,807	0B42195A	CE 4.7 50V (LN)
C808L,R	0B42227A	CML 470P 50V J
C809L,R	0B42227A	CML 470P 50V J
C811L,R	0B42227A	CML 470P 50V J
C812L,R	0B42227A	CML 470P 50V J
C813L,R	0B40162A	CE 10 16V
C814	0B42099A	CML 0.1 50V J
CP101	0B81465A	8P T-Post

Schematic Ref. No.	Part No.	Description
CP102	0B81462A	5P T-Post
CP103	0B81463A	6P T-Post
CP104	0B84087A	12P T-Post
CP105	0B81461A	4P T-Post
CP106	0B84281A	3P T-post
CP107	0B81460A	3P T-Post
CP201	0B84288A	6P T-Post Red
CP202	0B84291A	7P T-Post Red
G101,102	0B80673A	Earth Plate
JP1	0B80675C	11P Connector Ass'y JP1
JP2	0B80676A	4P Connector Ass'y JP2
JP3	0B80677C	4P Connector Ass'y JP3
JP4	0B80678B	2P Flat Cable JP4
JP5	0B80679C	Lead Wire JP5
JP6	0B80680A	Lead Wire JP6
JP7	0B80681B	Lead Wire JP7
PJ501	0B80668A	DIN Jack 13P
PJ801	0B81630A	2P Pin Jack (Gold)
PL501,502	0B90644A	Lamp 115mA 5V
S501,502	0B70230A	Tact Switch
S503,504	0B70230A	Tact Switch
S505,506	0B70230A	Tact Switch
S507	0B70230A	Tact Switch
S508	0B70233A	Detect Switch
TP201	0B80674A	Check Terminal 1P
	0E00818A	M3x8 + Binding (Black Chromate) (3)
	0E03749A	PT3x8 + Binding (Black Chromate) (2)
	0H06769B	Reflector (1)
	0J06212B	Lamp Holder (2)
	0J07267A	Heat Sink (1)
	0J07284B	Light Shield (1)

(2) For GER

Schematic Ref. No.	Part No.	Description
	BA09193A	**Main P.C.B. Ass'y (GER)**

Note: Parts which are different from those for USA, CAN, EP & JPN will be informed by Service Information later on.

9. IC BLOCK DIAGRAMS

U501 μPD75517GF (Mechanism Controller)

Pin No.	Signal Name	I/O	Function
1	GND	–	GND
2	GND	–	GND
3 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	GND	–	GND
10	DAT OUT	O	Serial data output to the remote controller.
11	CLK OUT	O	Clock output to the remote controller.
12	GND	–	GND
13	EMP	O	De-emphasis control signal. L: De-emphasis ON.
14	MUTG	O	Mute control signal. H: Mute ON.
15	SYS ON	O	System ON signal.
16	LAMP	O	Lamp ON signal.
17	SUBQ	I	Subcode Q data.
18	NC	–	–
19	$\overline{\text{SQCK}}$	O	Clock for reading subcode Q data.
20	$\overline{\text{OPEN}}$	I	Door open/close switch signal. L: Open
21	$\overline{\text{TRG}}$	I	Trigger L pulse is generated when door is open.
22	$\overline{\text{DISC1}}$	I	Disc 1 eject/load button input signal. Becomes L when button is pressed.
23	$\overline{\text{DISC2}}$	I	Disc 2 eject/load button input signal. Becomes L when button is pressed.
24	$\overline{\text{DISC3}}$	I	Disc 3 eject/load button input signal. Becomes L when button is pressed.
25	$\overline{\text{DISC4}}$	I	Disc 4 eject/load button input signal. Becomes L when button is pressed.
26	$\overline{\text{DISC5}}$	I	Disc 5 eject/load button input signal. Becomes L when button is pressed.
27	$\overline{\text{DISC6}}$	I	Disc 6 eject/load button input signal. Becomes L when button is pressed.
28	$\overline{\text{DISC7}}$	I	Disc 7 eject/load button input signal. Becomes L when button is pressed.
29 to 31	GND	–	GND
32	$\overline{\text{CD RST}}$	O	Reset signal output. L: Reset
33	VSS	–	GND
34 to 37	GND	–	GND
38	$\overline{\text{LDON}}$	O	Laser ON signal.

Pin No.	Signal Name	I/O	Function
39	$\overline{XLT}$	O	Latch pulse for data at pin 41.
40	$\overline{CLK}$	O	Clock for data at pin 41.
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	DSP SEL	I	DSPSEL signal input from the remote controller.
47	GND	–	GND
48	ACC CONT	I	Remote signal input from the remote controller.
49	SCOR	I	Subcode input trigger signal.
50	DAT IN	I	Signal input from the remote controller.
51	GND	–	GND
52	CLK IN	I	Clock for reading DAT IN at pin 50.
53	BSENS	I	Battery voltage sensing input.
54	VSS	–	GND
55	GND	–	GND
56	NC	–	–
57	IC	–	Connected to GND.
58 59	X1 X2	–	4MHz crystal is connected.
60	$\overline{RESET}$	I	System reset signal.
61	$\overline{RAM\ CLR}$	I	RAM reset input for stocker operation check.
62	$\overline{D.\ DET}$	I	Disc presence detecting input.
63	$\overline{D.\ CNT}$	I	Stocker position counting input.
64	$\overline{CENTER}$	I	Disc tray center detecting input.
65	$\overline{T.\ CLOSE}$	I	Disc tray close detecting input.
66 67 68	POS3 POS2 POS1	I	Pickup position detecting inputs.
69	$\overline{INNER}$	I	Inner switch signal. Become "L" when the laser pickup reaches the innermost position.
70	$\overline{H.\ POS}$	I	Stocker home position detecting input.
71	$\overline{STORE}$	I	Disc tray stock position detecting input.
72	$\overline{EJECT}$	I	Disc tray ejection detecting input.
73 to 76	GND	–	GND
77	FORM	I	Unit tilting detecting input. L: Unit is tilting over predetermined value.
78 to 80	GND	–	GND

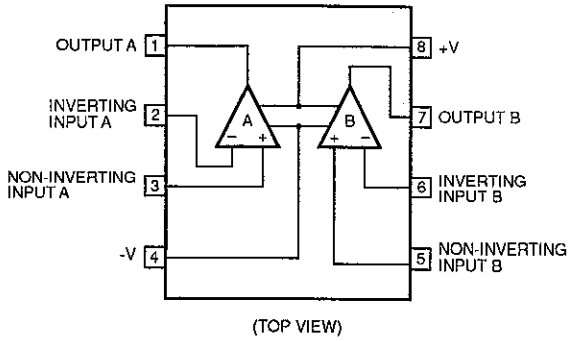


Fig. 9.1 Operational Amp. 2100D

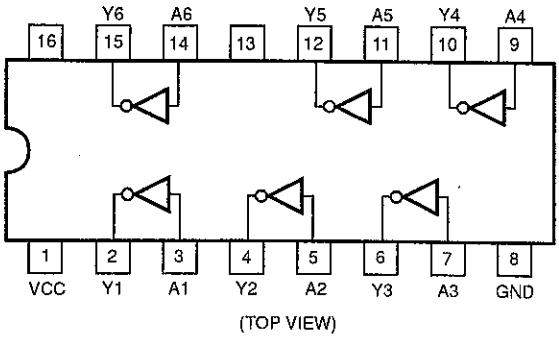
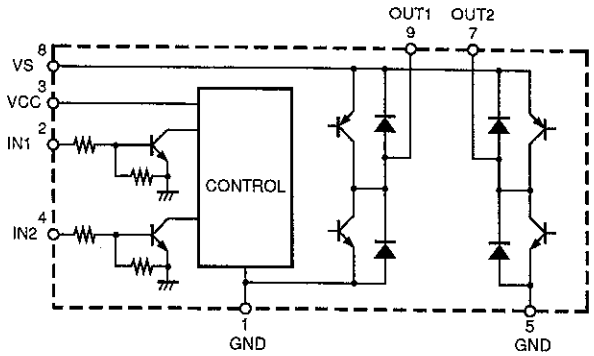


Fig. 9.2 Inverter TC4049BP



MODE	IN1	IN2	OUT1	OUT2
FWD	H	L	H	L
REV	L	H	L	H
BRAKE	H	H	L	L
STANDBY	L	L	OFF	OFF

Fig. 9.3 Motor Driver LB1638M

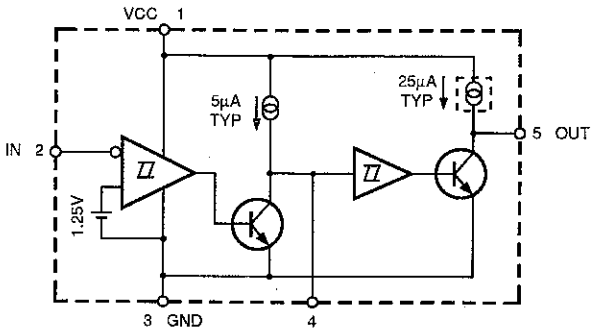


Fig. 9.4 Voltage Drop Detector M51957BF

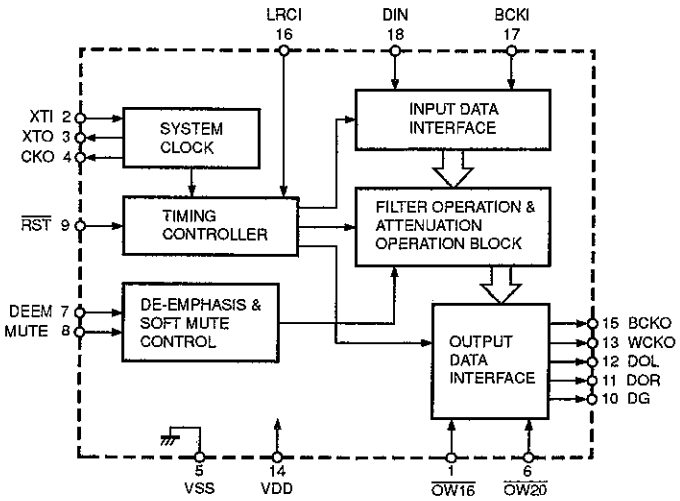


Fig. 9.5 8-Times Oversampling Digital Filter SM5841CS (MB-9)

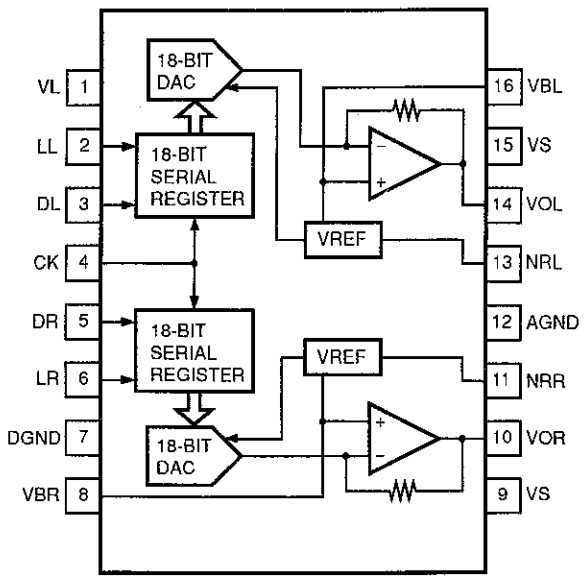


Fig. 9.6 Digital-to-Analog Converter AD1868R (MB-9)

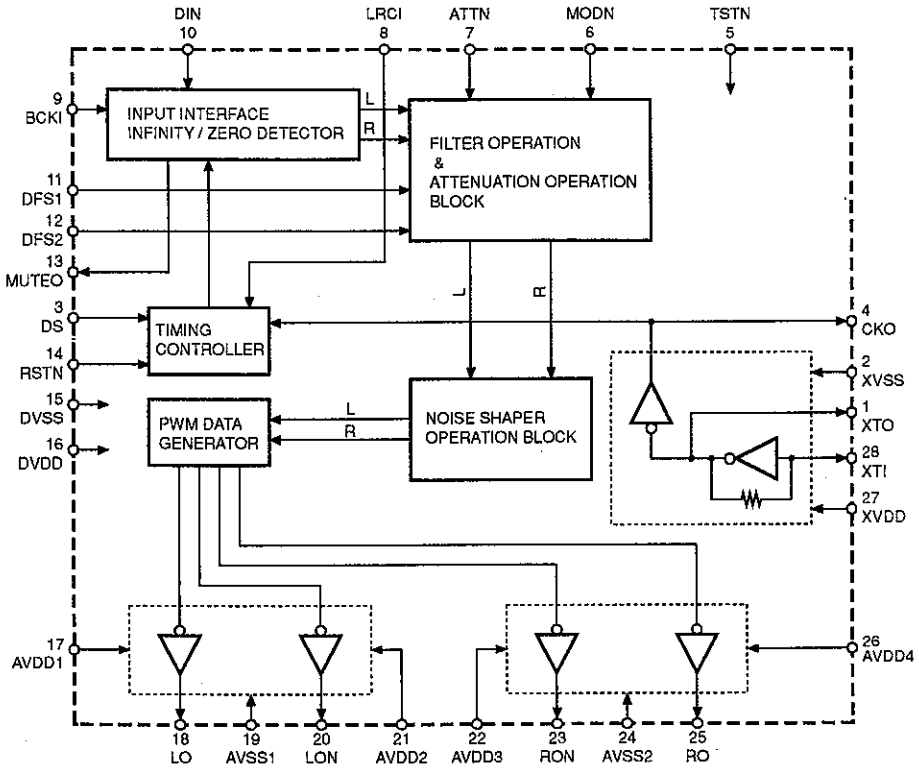


Fig. 9.7 Digital-to-Analog Converter SM5871AN (MB-7)

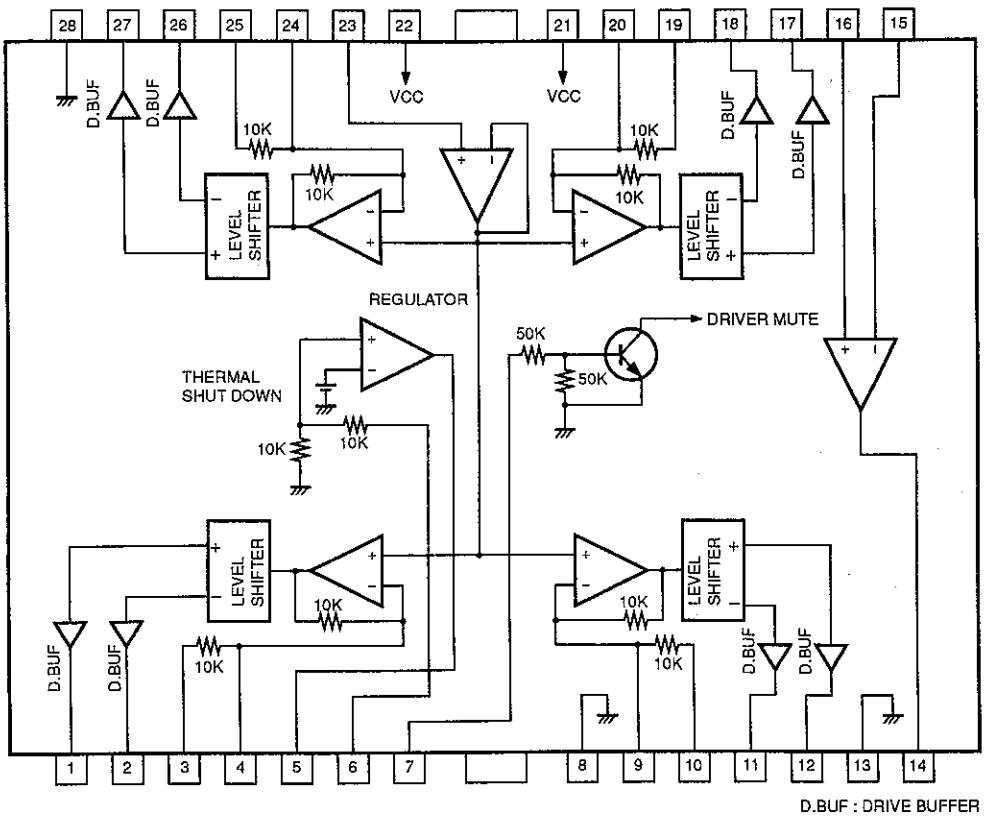


Fig. 9.8 Dirver BA6296FP

10. BLOCK DIAGRAM

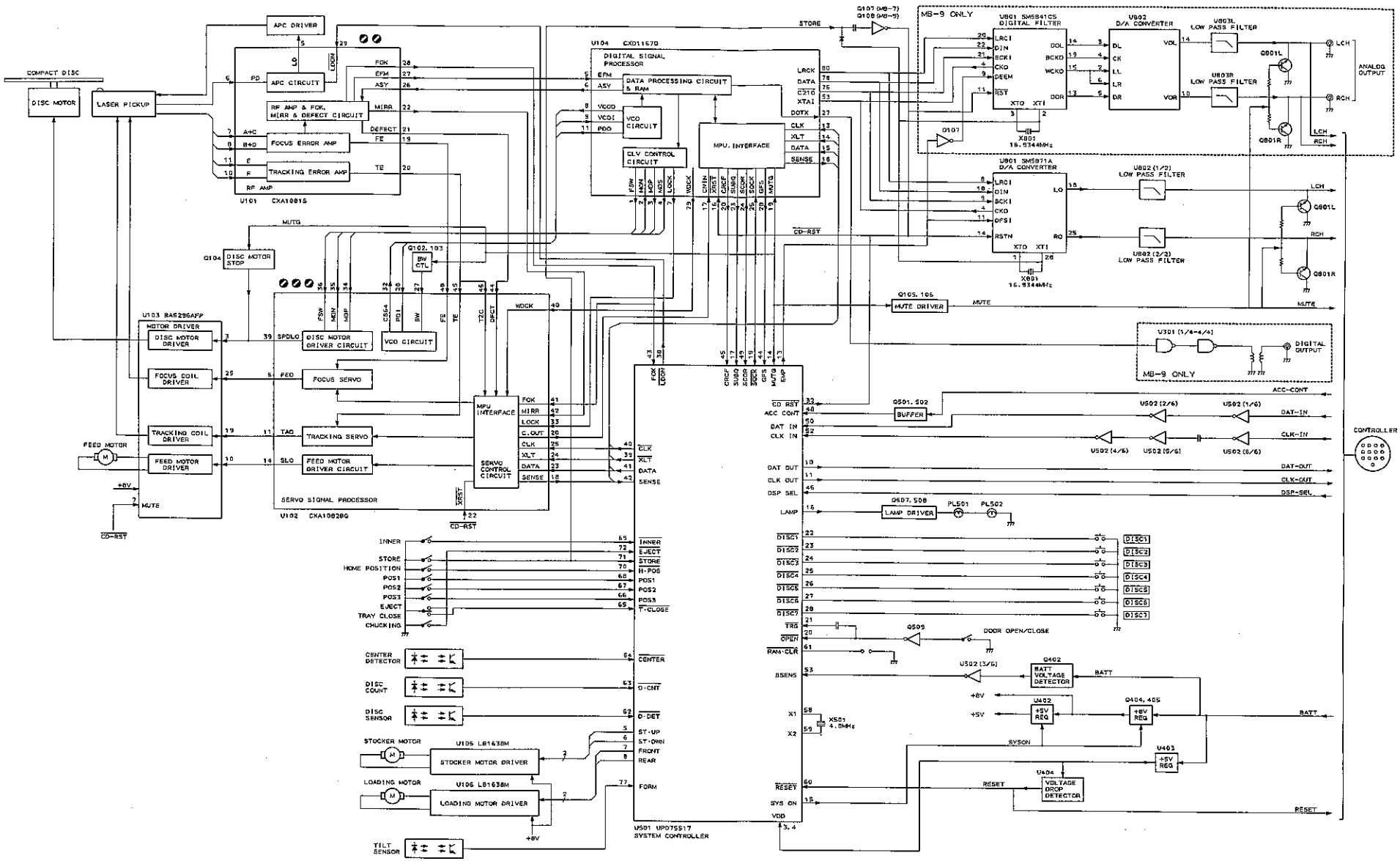


Fig. 10

11. WIRING DIAGRAM

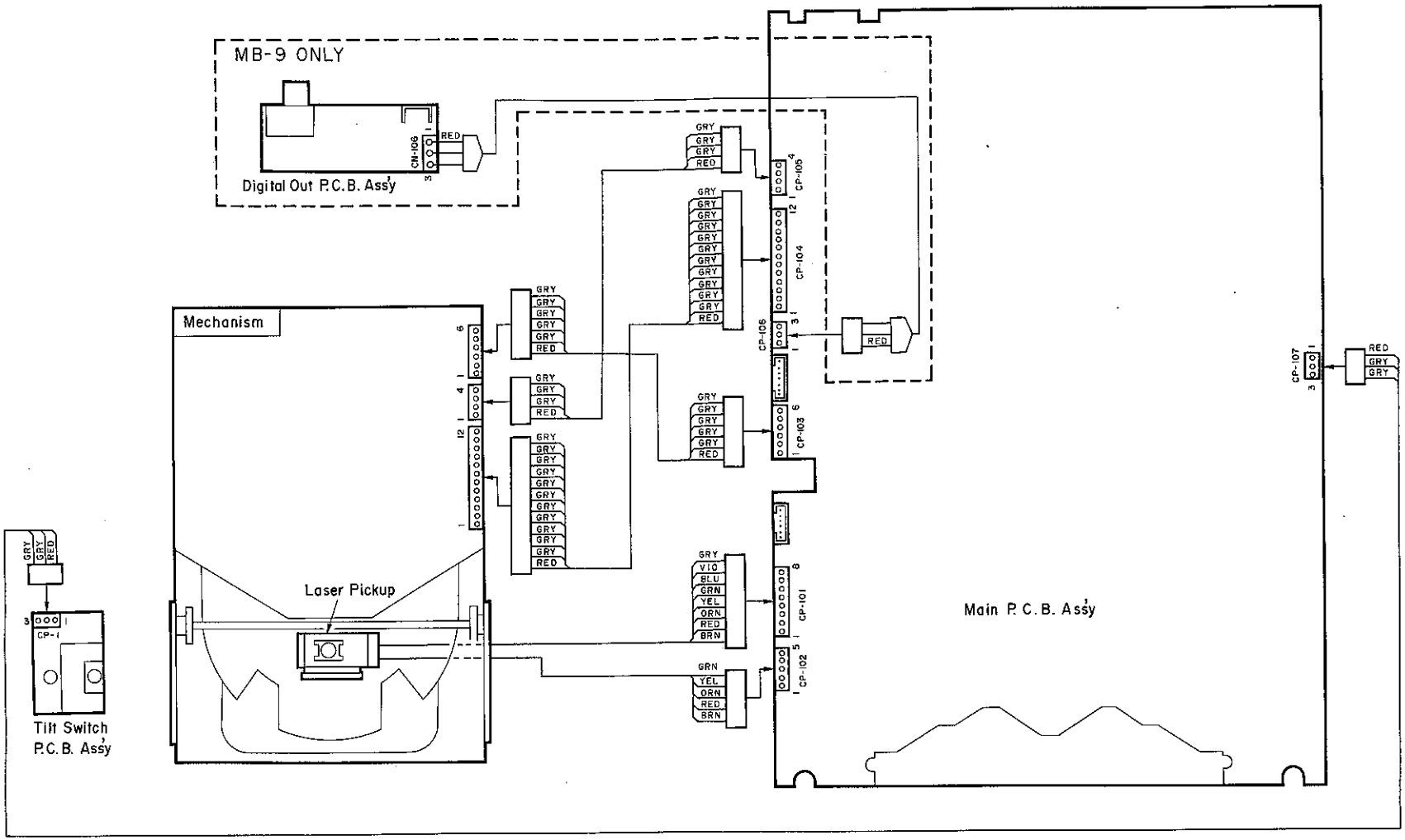


Fig. 11.1

NOTES: 1. Table of wire colors

BRN	— Brown	BLU	— Blue
RED	— Red	VIO	— Violet
ORN	— Orange	GRY	— Gray
YEL	— Yellow	WHT	— White
GRN	— Green	BLK	— Black

2. Component side view of the P.C.B. is illustrated unless otherwise specified.

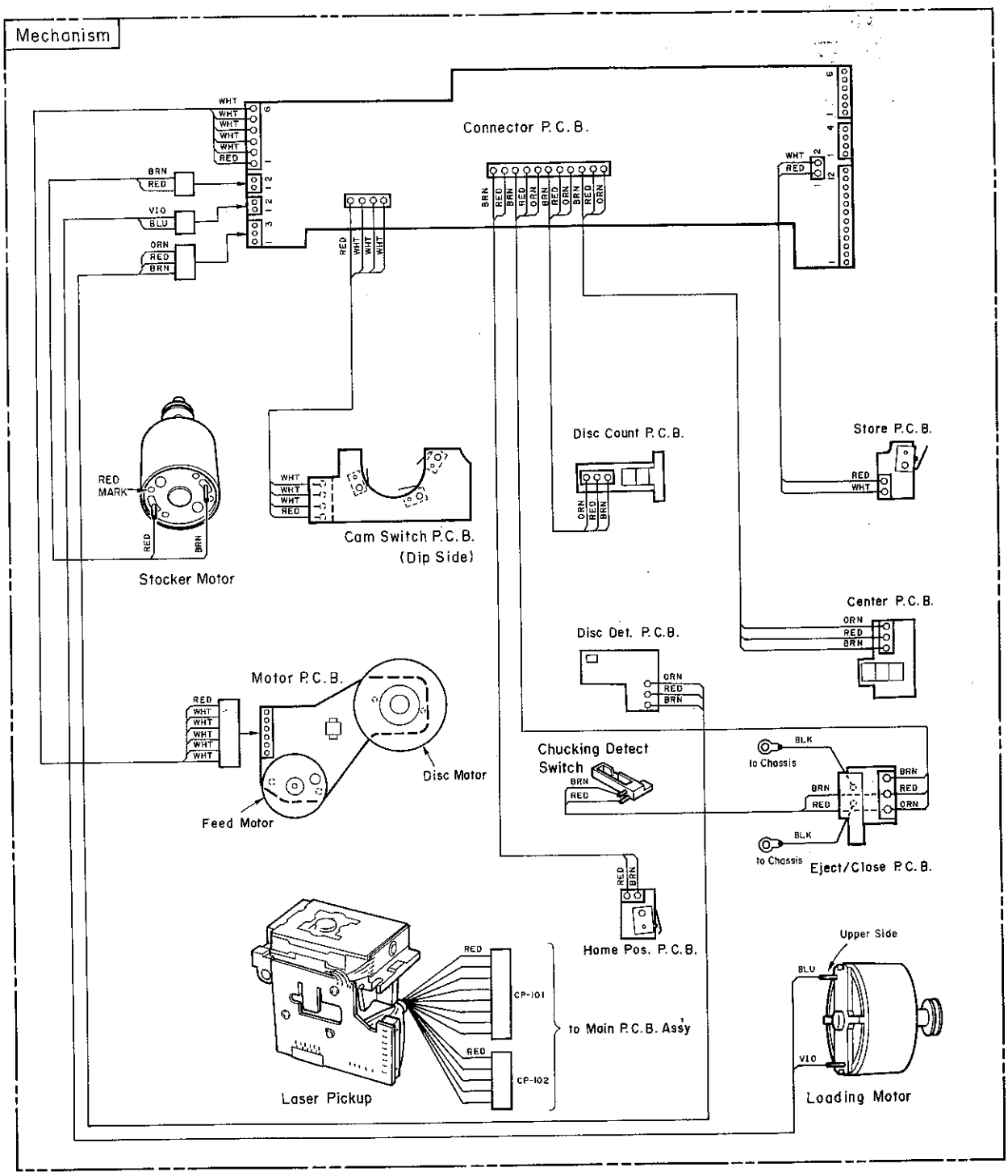

Mechanism
Connector P.C.B.
Stocker Motor
RED MARK
Cam Switch P.C.B.
(Dip Side)
Disc Count P.C.B.
Store P.C.B.
Center P.C.B.
Disc Det. P.C.B.
Motor P.C.B.
Disc Motor
Feed Motor
Chucking Detect Switch
to Chassis
Eject/Close P.C.B.
Home Pos. P.C.B.
Laser Pickup
CP-101
CP-102
to Main P.C.B. Assy
Upper Side
Loading Motor

Fig. 11.2

SPECIFICATIONS

System	Compact Disc digital audio
Signal Readout	Optical (semiconductor laser)
Error Correction	CIRC principle
Number of Channels	2 channels, stereo
D/A Converter Type	1-bit dual D/A converters with 3rd-order noise shaper and 8-times oversampling digital filter **[MB-7]**
	18-bit dual D/A converters with 8-times oversampling digital filter **[MB-9]**
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	10-20,000 Hz +0.5dB, –1.5 dB **[MB-7]**
	10-20,000 Hz +0.5dB, –0.5 dB **[MB-9]**
Signal to Noise Ratio	Better than 88 dB (IHF A-WTD) **[MB-7]**
	Better than 92 dB (IHF A-WTD) **[MB-9]**
Dynamic Range	Better than 86 dB **[MB-7]**
	Better than 90 dB **[MB-9]**
Total Harmonic Distortion	0.015% or less (1 kHz) **[MB-7]**
	0.008% or less (1 kHz) **[MB-9]**
Channel Separation	Better than 80 dB **[MB-7]**
	Better than 88 dB **[MB-9]**
Output Level/Impedance	1.2 V/600 ohms (1 kHz, 0 dB) **[MB-7]**
	1.5 V/600 ohms (1 kHz, 0 dB) **[MB-9]**
Power Source	14.4 VDC negative ground (10.8–15.6 V allowable)
Power Consumption	1 A max.
Dimensions*	196 (W) × 113 (H) × 298 (D) mm
	7-11/16 (W) × 4-7/16 (H) × 11-3/4 (D) inches
Approximate Weight	3.6 kg/7 lbs. 15 oz.

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

- MusicBank is a trademark of Nakamichi Corporation.
- Specifications and design are subject to change for further improvement without notice.

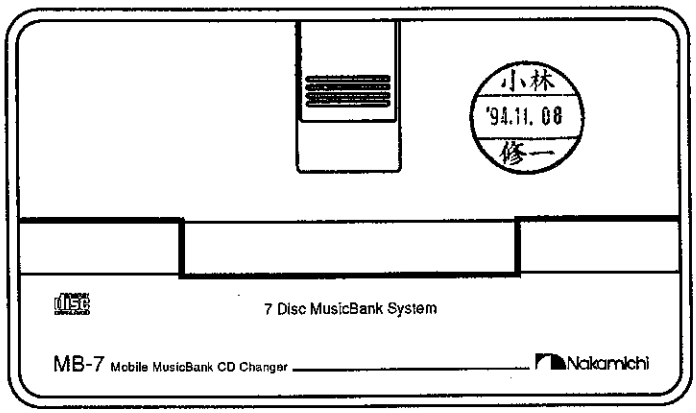
Nakamichi Corporation 1-153 Suzukicho, Kodaira, Tokyo 187 Phone: (0423) 42-1115
Nakamichi America Corporation 955 Francisco St., Torrance, CA 90502 Phone: (310) 538-8150
Nakamichi Canada 276 South West, Marine Drive, Vancouver, B.C. V5X 2R4 Phone: (604) 324-7535
Nakamichi Australia Unit 12 620-632 Botany Road, Alexandria, N.S.W. 2015 Phone: (02) 667-0811
Nakamichi GmbH Praunheimer Landstraße 32 D-60488 Frankfurt/Main Phone: (069) 7682021 (Office), 7682025 (Service)

0Q06176A G-940610A Printed in Japan

Service Manual

MB-7
MB-9

Mobile MusicBank CD Changer



Nakamichi

CONTENTS

1. GENERAL

1.1. Product Codes

N730 (MB-7)
N731 (MB-9)

1.2. Destinations

USA, CAN, EP, GER, JPN

Abbreviations

USA — U.S.A.
CAN — Canada
EP — Europe
GER — Germany
JPN — Japan

1.3. Cautions/Warnings

(1) Before Returning the Unit

Before returning the unit, eject all CDs and then secure the mechanism by fastening all four Shipping Lock Screws together with four Washers. See Fig. 1.1.

For the Shipping Lock Screws and Washers, see Ref. Nos. 32 and 31 in Fig. 7.1.

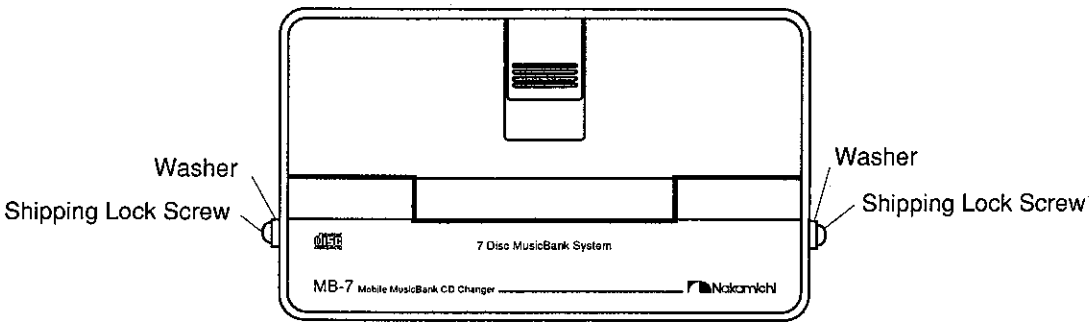


Fig. 1.1

(2) 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

(3) 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 beskriva i bruksanvisningen kan resultera i farlig laserutstrålning. Justering eller reparation av denna kompaktskivspelare skall endast utföras av kvalificerad servicepersonal.

OBS!

Indstilling af knapper, cmskiftere og øvrige kontrolknapper, som ikke følger den i brugsanvisningen beskrevne måde, kan resultere i farlig laserudstråling. Justering eller reparation af denno 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 ma 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 UDSAETTELSE 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. 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. 1.2.

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.

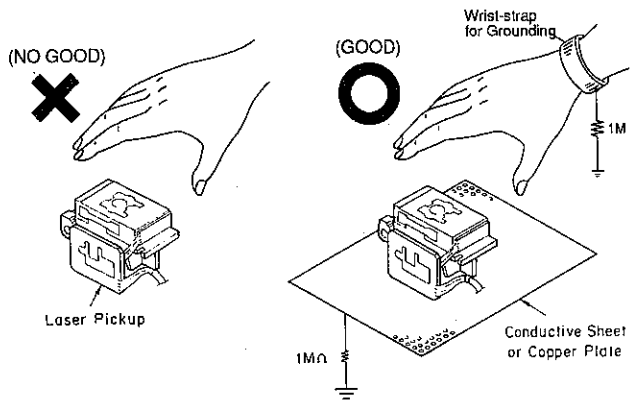


Fig. 1.2 Handling the Laser Pickup

1.5. Stocker Operation Check Function

A series of stocker operation can be checked by shortcircuiting the RAM Reset lands on the Main P.C.B. Ass'y. This function is useful to check whether any CD is left in the stocker before returning the unit to the customer.

(1) Remove the Bonnet (Upper).
(2) Turn ON the power.
(3) Short the RAM Reset lands. See Fig. 1.3.
(4) The stocker raises to the uppermost position, and then starts a series of CD unload operation as follows:

Disc No.: 7 (uppermost) → 6 → 5 → 4 → 3 → 2 → 1

(5) After completion of the stocker operation, the unit returns to standby condition.

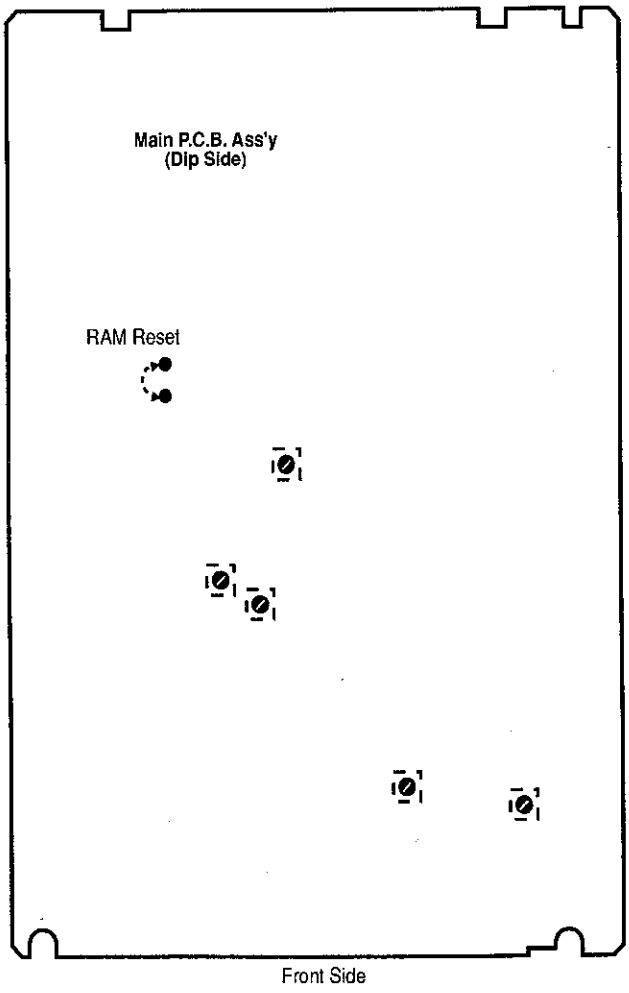


Fig. 1.3 Stocker Operation Check

1.6. Package Ass'y and Accessary Ass'y

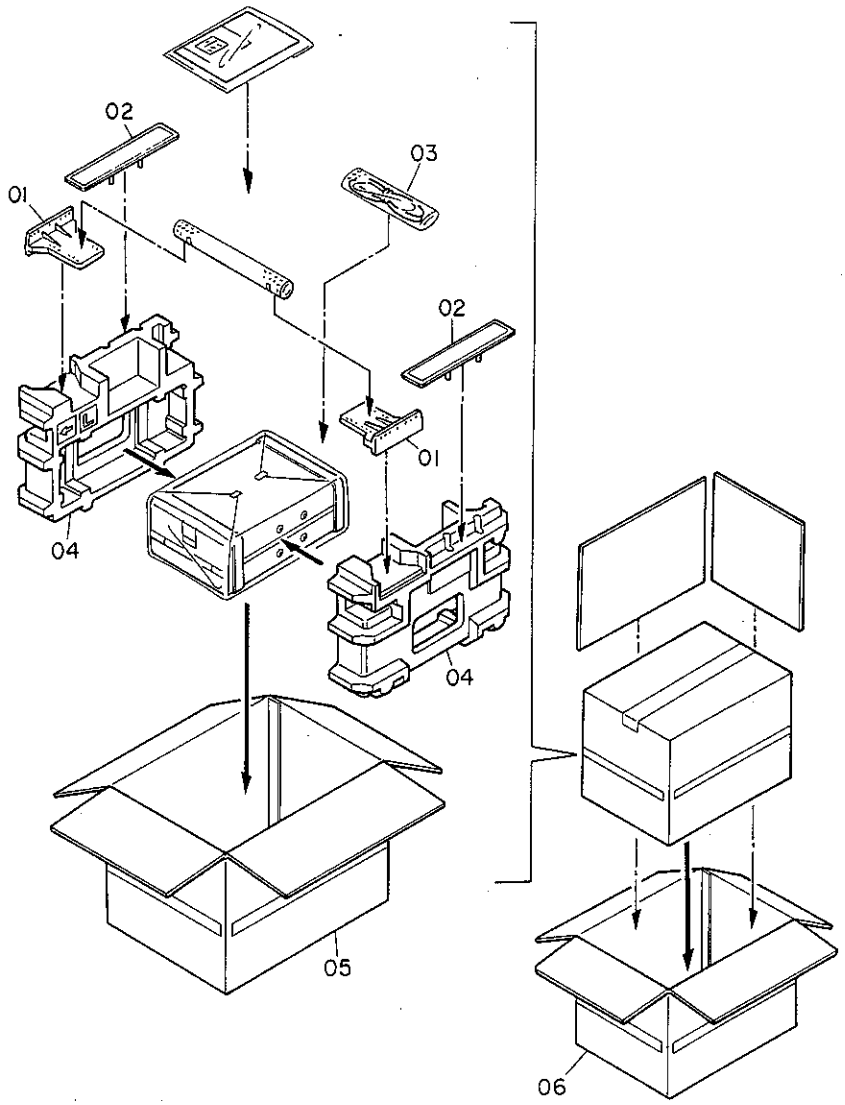


Fig. 1.4

Schematic Ref. No.	Part No.	Description	Q'ty
	—	**Package Ass'y**	
01	0H06760C	Angle A	2
02	HG06893A	Angle B Ass'y	2
03	0D06545A	DIN Wire	1
04	0F04834A	Packing L,R	1
05	0F04875A	Inner Carton (USA, CAN, EP) [MB-7]	1
	0F04832A	Inner Carton (JPN) [MB-7]	1
	0F04849A	Inner Carton [MB-9]	1
06	0F04876A	Outer Carton (USA, CAN, EP) [MB-7]	1
	0F04833A	Outer Carton (JPN) [MB-7]	1
	0F04850A	Outer Carton [MB-9]	
—	0F04874A	Sheet	1

Schematic Ref. No.	Part No.	Description	Q'ty
	DA04803A	**Accessory Ass'y (USA, CAN) [MB-7]**	**1**
	DA04804A	**Accessory Ass'y (EP) [MB-7]**	**1**
	DA04802A	**Accessory Ass'y (JPN) [MB-7]**	**1**
	DA04808A	**Accessory Ass'y (USA, CAN) [MB-9]**	**1**
	DA04809A	**Accessory Ass'y (EP) [MB-9]**	**1**
	DA04807A	**Accessory Ass'y (JPN) [MB-9]**	**1**
	0D06546C	Owner's Manual (English) [MB-7]	1
	0D06568B	Owner's Manual (English) [MB-9]	1
	0D06549C	Owner's Manual (Japanese) [MB-7]	1
	0D06571B	Owner's Manual (Japanese) [MB-9]	1
	DA04806A	Screw Ass'y	1

2. REMOVAL PROCEDURES

2.1. Bonnet (Upper) and Front Panel Ass'y

Refer to Figs. 2.1.1 and 2.1.2.

(1) Remove F01 (Protector Front). See Fig. 2.1.1.
(2) Pull out F02 (Push Rivet, 5 pcs.) and remove F03 (Protector Rear).
(3) Remove screws F04 (2 pcs.) and F05 (2 pcs.).
(4) Remove screws F06 (3 pcs.). See Fig. 2.1.2.
(5) Remove screws F07 (5 pcs.) and F08 (Bonnet (Upper)).
(6) Remove screws F09 (2 pcs.) and detach F10 (Front Panel Ass'y).

NOTE: Installing direction of the Bonnet (Upper):
Install the Bonnet (Upper) so that the bent lower edge comes to the right side and the straight lower edge comes to the left side as shown in Fig. 2.1.2.

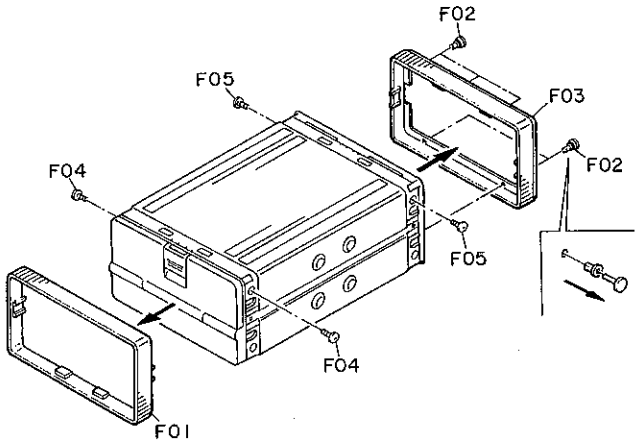


Fig. 2.1.1

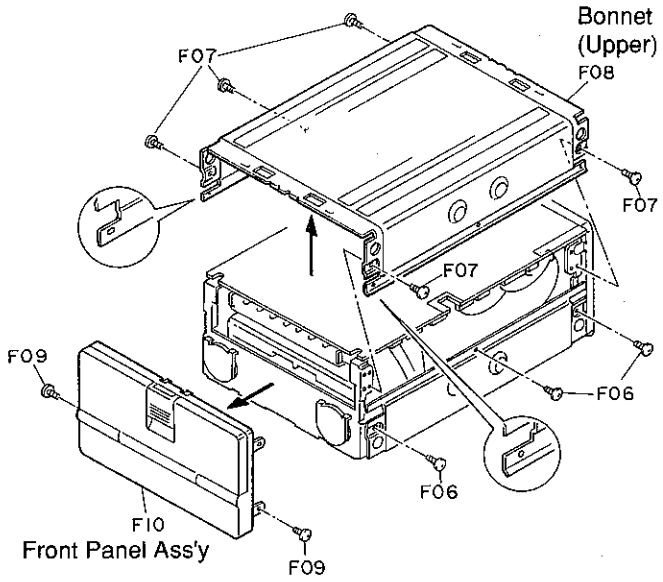


Fig. 2.1.2

2.2. Rear Panel, Main P.C.B. Ass'y and Bonnet (Lower)

Refer to Fig. 2.2.

(1) Remove the Bonnet (Upper) and Frant Panel Ass'y. Refer to item 2.1.
(2) Remove screws F01 (3 pcs.), F02 (1 pce., MB-9 only) and F03 (2 pcs.), disconnect a connector F04 (MB-9 only), and detach F05 (Rear Panel).
(3) Remove screws F06 (2 pcs.) and detach F07 (Insulating Sheet).
(4) Remove screws F08 (2 pcs.) and pull out F09 (3P Connector).
NOTE: Do not pull out other connectors yet to avoid damage to the laser pickup.
(5) Turn over F10 (Main P.C.B. Ass'y) in the direction of the arrow.
(6) Remove screws F11 (2 pcs.) and detach F12 (Bonnet (Lower)) downward.

NOTES: 1. Installing direction of the Bonnet (Lower)
Install the Bonnet (Lower) so that the straight lower edge comes to the right side and the bent lower edge comes to the left side as shown in the figure.
2. Installing the Bonnet (Lower)
Install the Bonnet (Lower) on the Mechanism Deck Ass'y so that the four screws "a" on both sides are fastened to the screwed hole "b" (not "c").

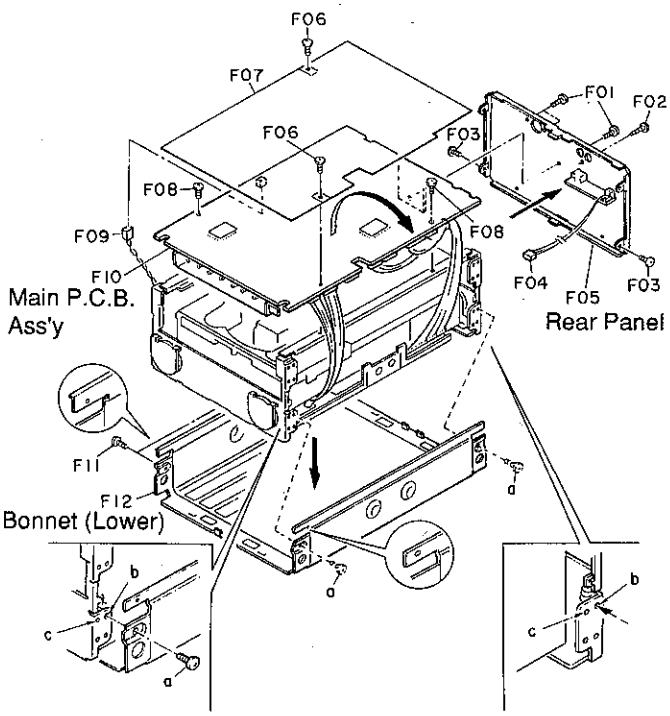


Fig. 2.2

Mounting the Dampers

When mounting four Dampers which act to absorb mechanical shock or vibration, pay attention so that they are mounted correctly. Incorrect mounting causes the playback sound to be skipped.
Mount the Dampers as follows:

(1) Insert the Damper into the damper holding shaft.

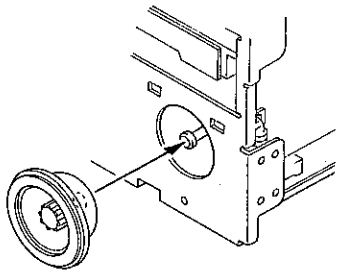


Fig. A

(2) Press the Damper so that it is securely inserted into the damper holding shaft. See Fig. B.
(3) Push the damper edge along with the circumference of the damper mounting hole to make a circle. See Fig. C.

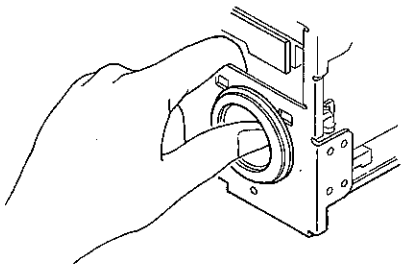


Fig. B

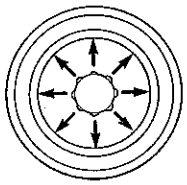


Fig. C

(4) Slide the Damper Holder over the Damper as shown in Fig. D and insert two claws of the Damper Holder into the Chassis Ass'y. See Fig. E.

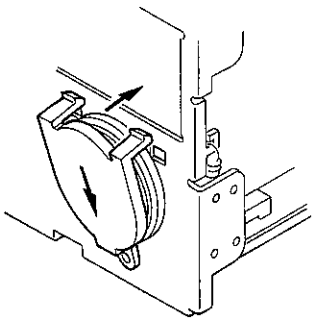


Fig. D

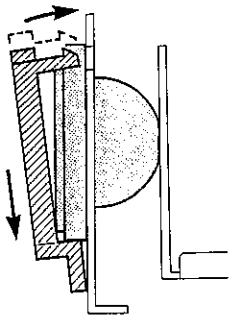


Fig. E

Fig. F shows the condition that the Damper is securely inserted into the Damper Holder. While, Fig. G shows the unsuccessful case.

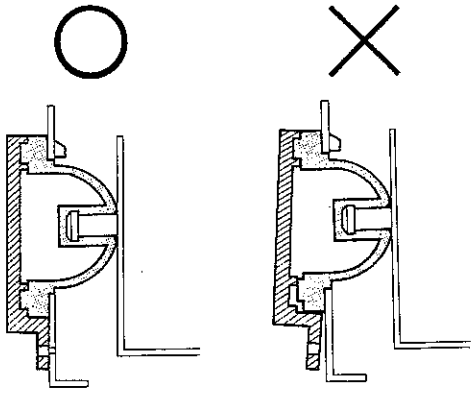


Fig. F

Fig. G

(5) With pushing the Damper Holder with your finger tip as it is not fastened with a screw yet, move the Mechanism Deck Ass'y back and forth to securely engage the Damper with the Damper Holder.

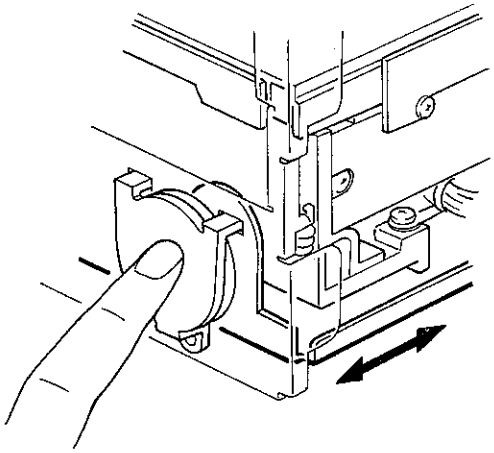


Fig. H

(to be continued.)

(6) Pull the lower part of the Damper Holder a little and check that the Damper is stuck to the Damper Holder as shown in Fig. I. If the Damper is not securely engaged with the Damper Holder, it will be detached from the Damper Holder as shown in Fig. J. In this case, repeat above damper mounting steps.

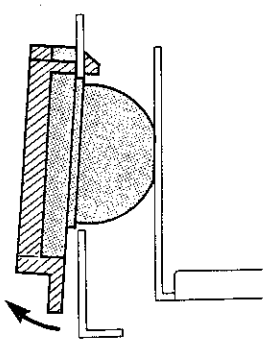


Fig. I

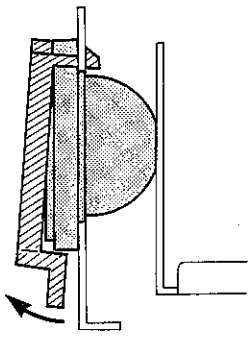


Fig. J

(7) Fix the Damper Holder to the Chassis with a screw.

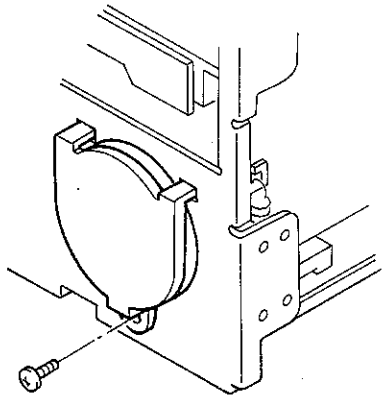


Fig. K

2.3. Mechanism Deck Ass'y

Refer to Fig. 2.3.

(1) Remove the Rear Panel Ass'y, Main P.C.B. Ass'y and Bonnet (Lower). Refer to item 2.2.

(2) Shortcircuit the lands "A" of the Laser Pickup.

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.

(3) Disconnect all connectors on the Main P.C.B. Ass'y.

(4) Remove screws F01 (4 pcs.) and detach F02 (Channels (R and L).

(5) Remove screws F03 (6 pcs.) and F04 (1 pce.) and disassemble F05 (Mechanism Deck Ass'y)

NOTE: Installing direction of F02 (Channels (R and L)): Install the Channel so that the cushion of the Channel comes to the rear as shown in the figure.

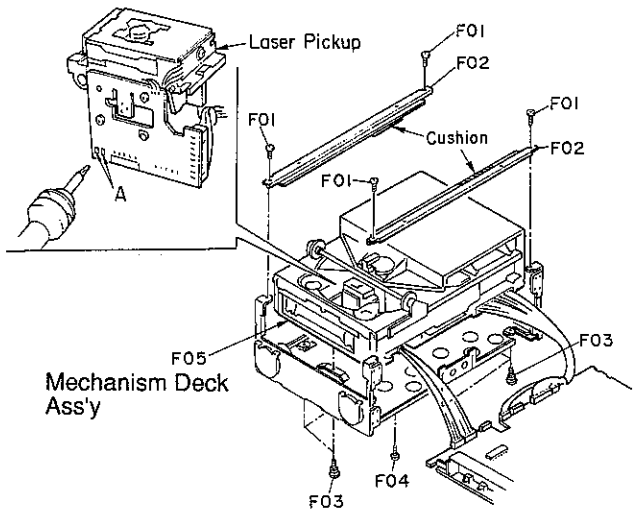


Fig. 2.3

2.4. Mechanism Top Cover

Refer to Figs. 2.4.1 and 2.4.2.

(1) Remove the Mechanism Deck Ass'y. Refer to item 2.3.
(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. 2.4.2 so that the carriages are in horizontal position. (Refer to "Leveling the carriages at the left side" in item 2.9.3.)

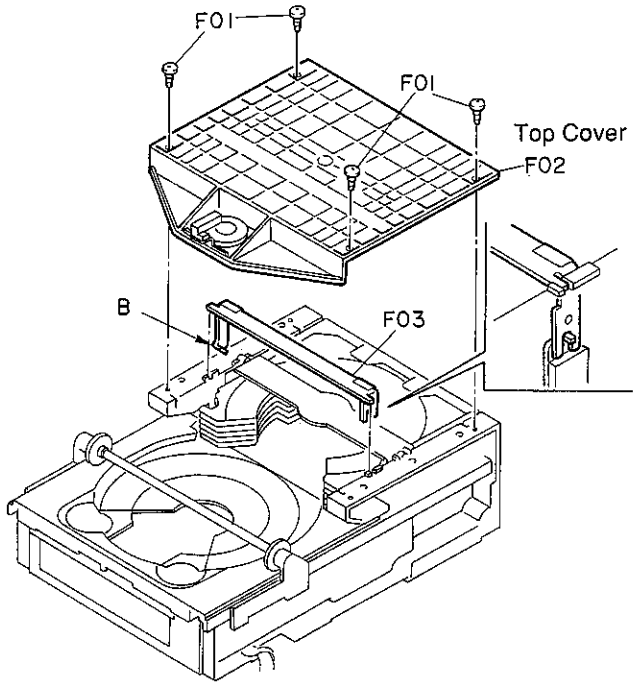


Fig. 2.4.1

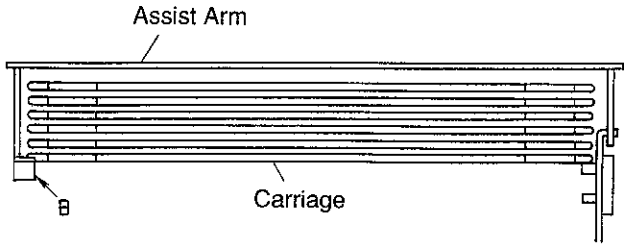


Fig. 2.4.2 Leveling the carriages at the left side

2.5. Drawing the Tray Ass'y

Refer to Fig. 2.5.

(1) Remove the Mechanism Deck Ass'y. Refer to item 2.3.
(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.

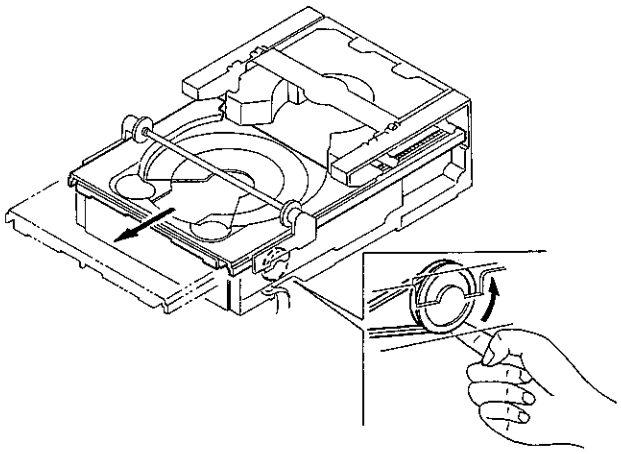


Fig. 2.5

2.6. Laser Pickup

2.6.1. Removing the Laser Pickup

Refer to Fig. 2.6.1.

(1) Draw the Tray Ass'y. Refer to item 2.5.
(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.

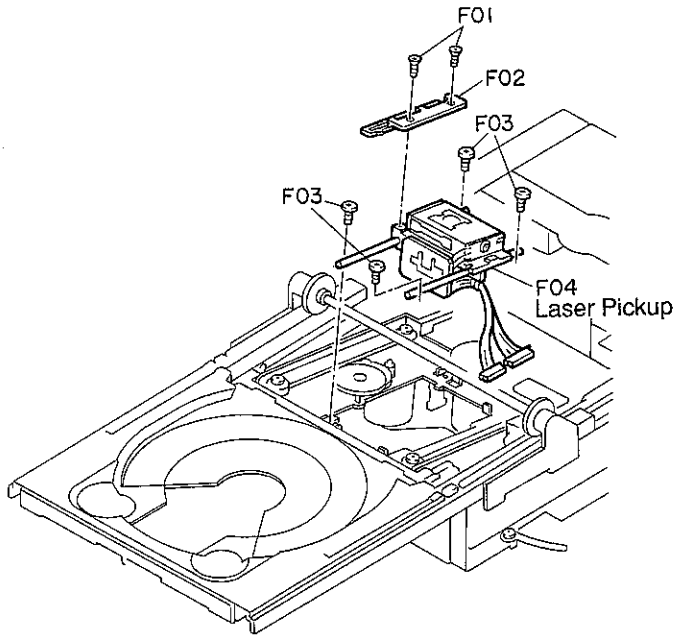


Fig. 2.6.1

2.6.2. Installing a New Laser Pickup

Refer to Fig. 2.6.2.

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) 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.

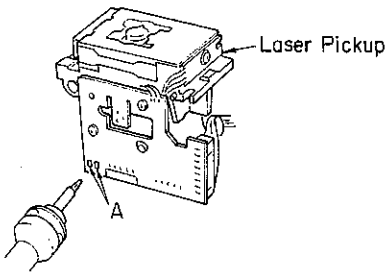


Fig. 2.6.2

2.7. Tray Ass'y

2.7.1. Removing the Tray Ass'y

Refer to Fig. 2.7.1.

(1) Draw the Tray Ass'y. Refer to item 2.5.
(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).

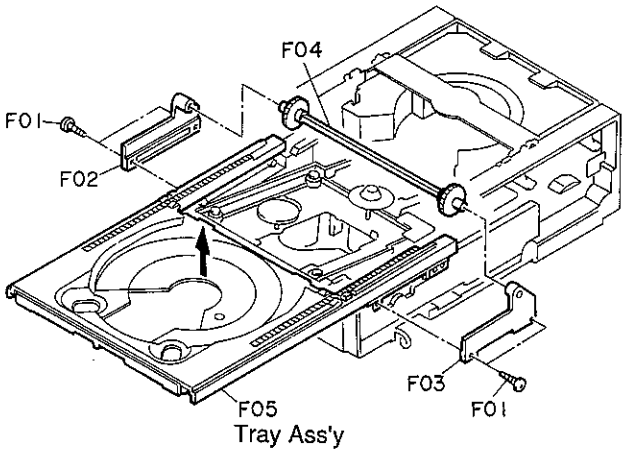


Fig. 2.7.1

2.7.2. 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. 2.7.2.
(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. 2.7.2.
(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. 2.7.3.
(4) Reverse the removal procedure in item 2.7.1.

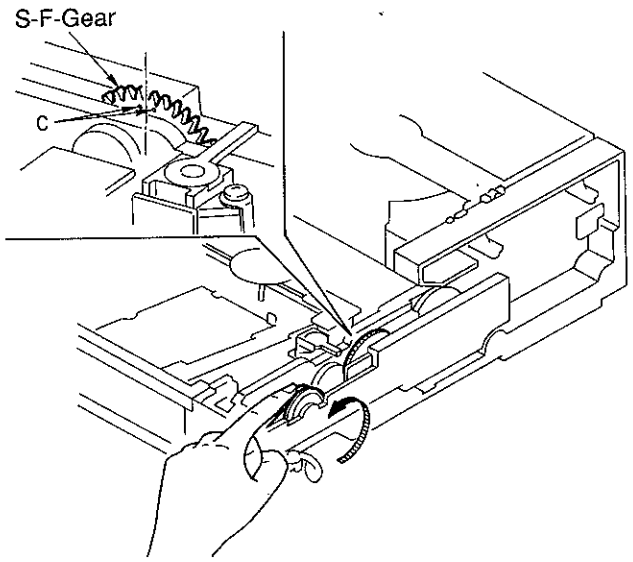


Fig. 2.7.2

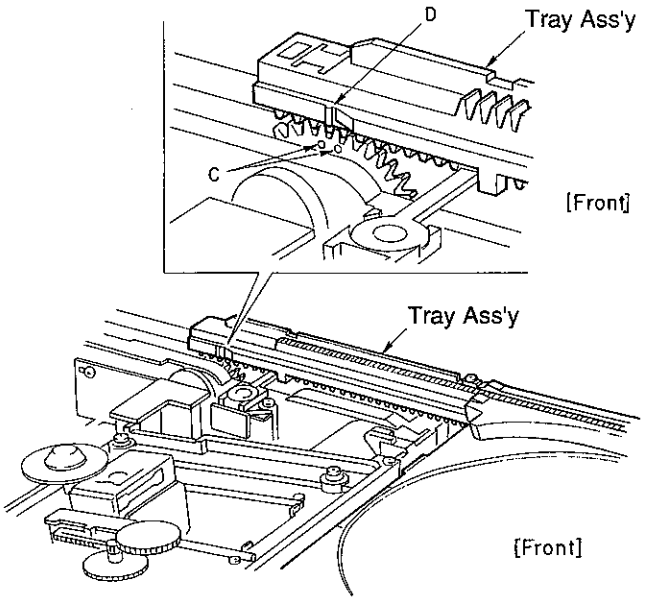


Fig. 2.7.3

2.8. Drive Unit Section

Refer to Fig. 2.8.

(1) Remove the Laser Pickup. Refer to item 2.6.
(2) Remove the Tray Ass'y. Refer to item 2.7.
(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.

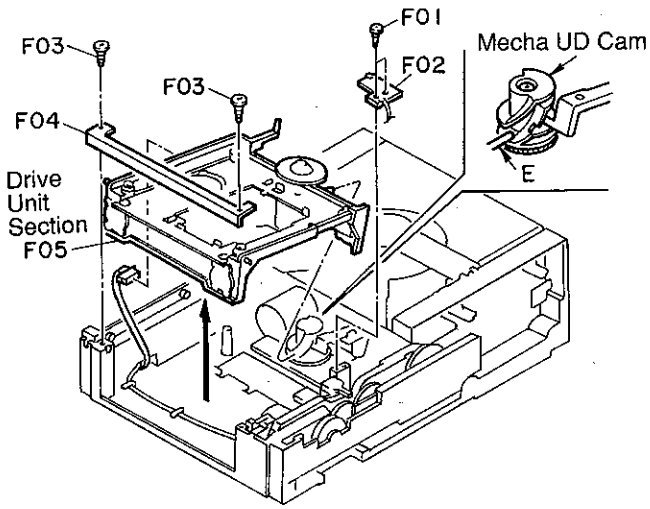


Fig. 2.8

2.9. Side Chassis R Section

2.9.1. Removing the Side Chassis R Section

Refer to Fig. 2.9.1.

(1) Remove the Drive Unit Section. Refer to item 2.8.
(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.

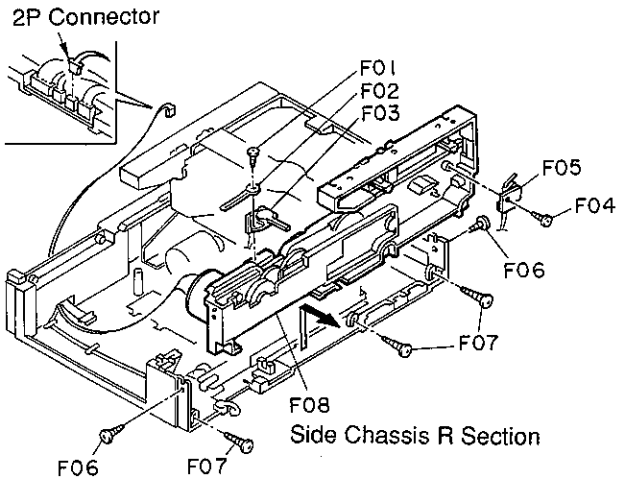


Fig. 2.9.1

2.9.2. Accessing to the Gears and Loading Motor Belt

Refer to Fig. 2.9.2.

(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".

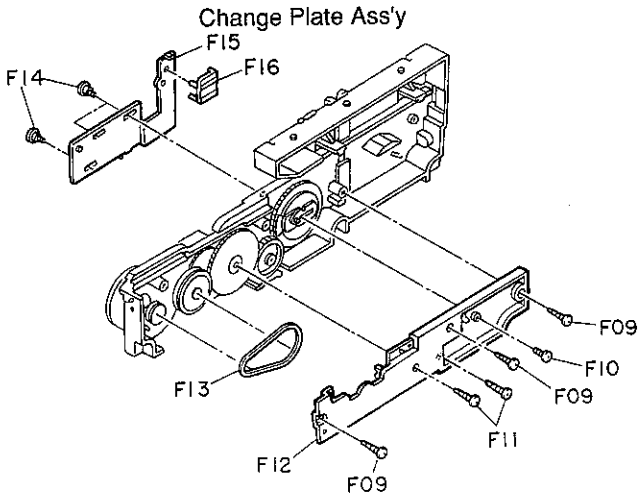


Fig. 2.9.2

2.9.3. 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. 2.9.3.
(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. 2.9.3.

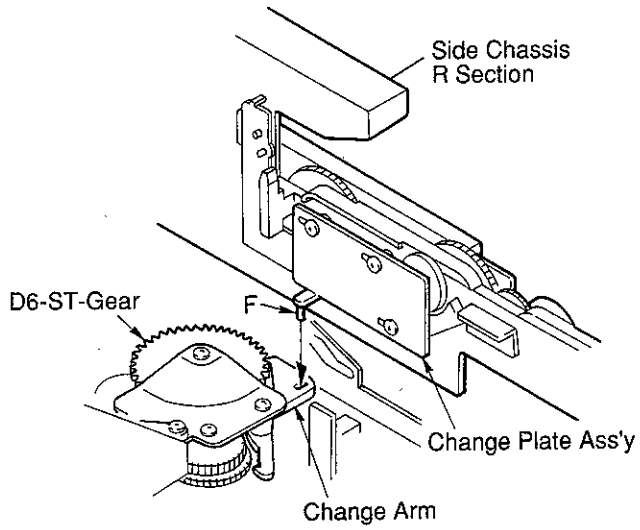


Fig. 2.9.3

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

• Leveling carriages at the right side
Lift the right end of the carriages (6 pcs.) with your finger tip as shown in Fig. 2.9.4, and place the lowest carriage onto the pin "G" (white one).

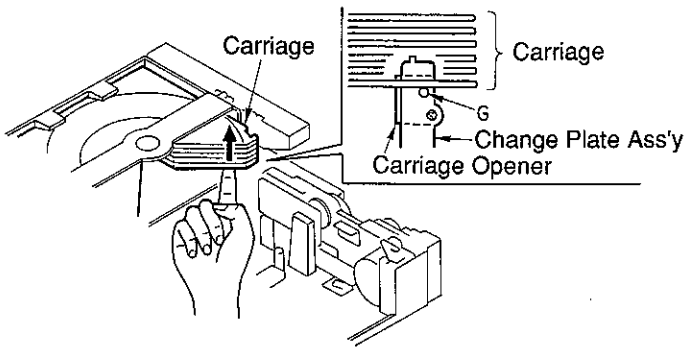


Fig. 2.9.4 Leveling the carriages at the right side

• 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. 2.9.5.

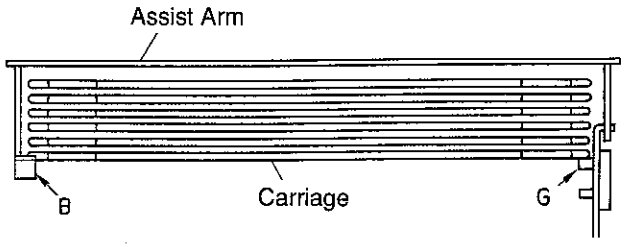


Fig. 2.9.5 Leveling the carriages

2.10. Side Chassis L

Refer to Fig. 2.10.
(1) Remove the Drive Unit Section. Refer to item 2.8.
(2) Remove screws F01 (3 pcs.) and F02 (2 pcs.), and disassemble F03 (Side Chassis L).

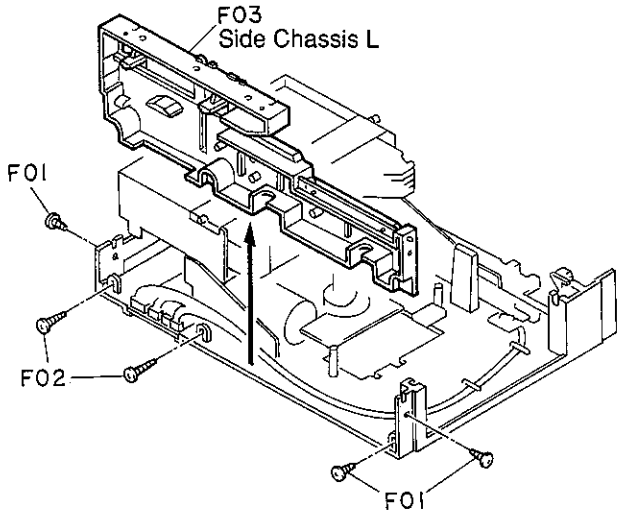


Fig. 2.10

2.11. Stocker Ass'y and Main Chassis Section

Refer to Fig. 2.11.
(1) Remove the Side Chassis R Section and Side Chassis L. Refer to items 2.9 and 2.10.
(2) Remove F01 (Stocker Ass'y including the carriages) from F02 (Main Chassis Section) as shown in the figure.

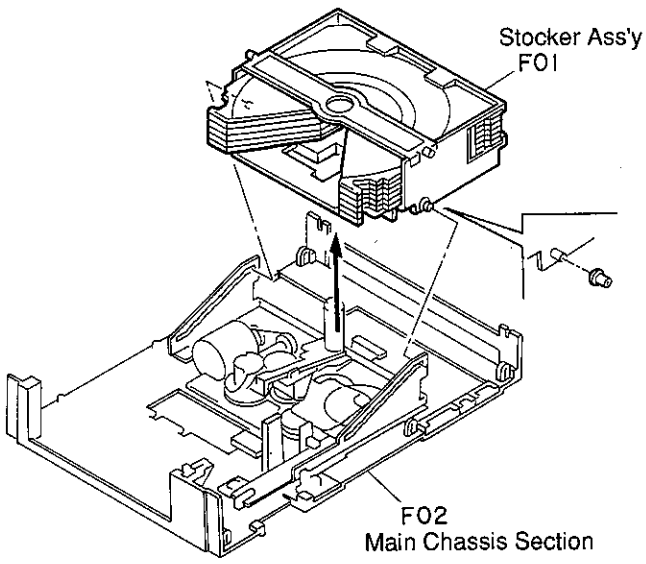


Fig. 2.11

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 2.9 "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.

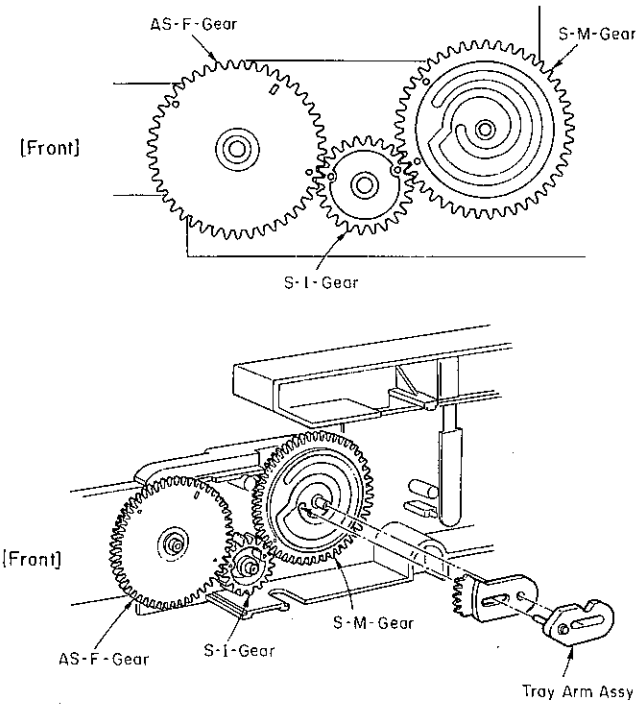


Fig. 3.1.1 Positioning of Three Gears

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.

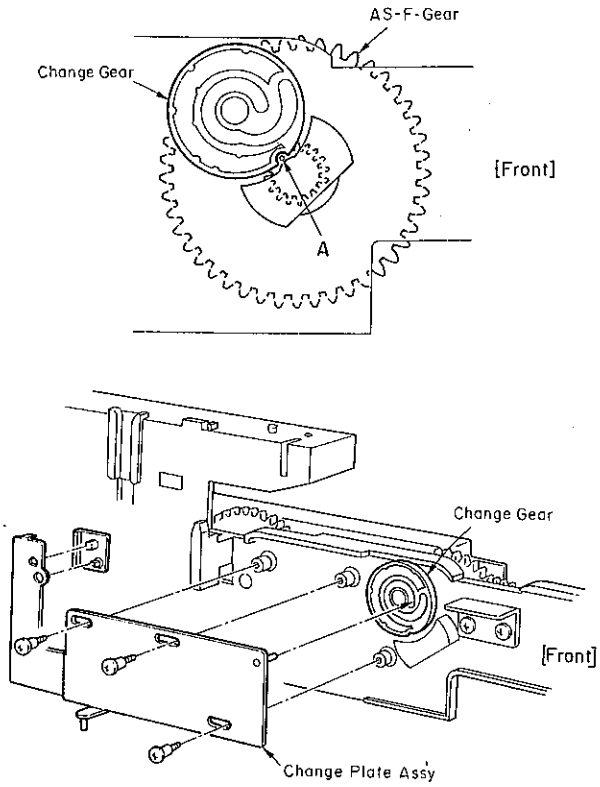


Fig. 3.1.2 Positioning of the Change Gear

3.2. Positioning the Tray Ass'y

When installing the Tray Ass'y on the mechanism unit, perform the following positioning. (Refer to 2.7.2 "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.

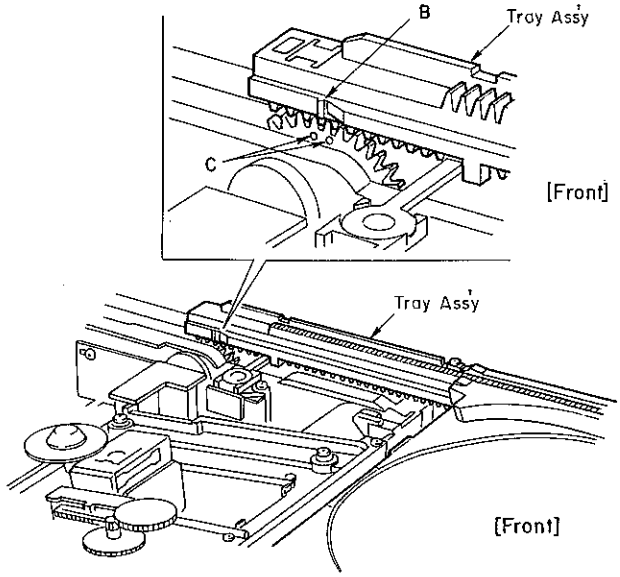


Fig. 3.2 Positioning of the Tray Ass'y

3.3. Lubrication

Apply the specified lubricant (grease) to the following places when parts are replaced. (Refer to Figs. 7.2 to 7.5.)

Fig.	Ref. No.	Location	Lubricant
(Mechanism Deck Ass'y)			
7.2	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 R Section	FLOIL G425, FL777
(Tray Ass'y)			
7.3	01	Tray Top	
		• Carriage contacting surface	FLOIL FL777
	05	Tray R	
		• Carriage contacting surface	FLOIL FL777
	06	Tray L	
		• Carriage contacting surface	FLOIL FL777
	07	TR Guide Shaft	
		• Right Side	FLOIL G425
		• Left Side	FLOIL FL777
(Side Chassis R Section)			
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
(Main Chassis Section)			
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 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) Philips Test Disc 5/5A or 444/444A
(6) SONY Test Disc YEDS-7 (Type 3)
(7) CD Player Test Unit Set (DA09157A)
Consisting of the following items:

• CD Player Test Unit	1 pce.
• MB-7/9Test Unit Cable (DA09186A)	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: The CD Player Test Unit (Test Unit Cable is excluded) for MB-7/9 can be used in the following Models:
- MB-1s/2s/3s/4s
- Sound Space 7
- 1000Mb/i, 1000Mb
- CD Player 1/2/3
- CD Cassette Player 1
- CD Player 4

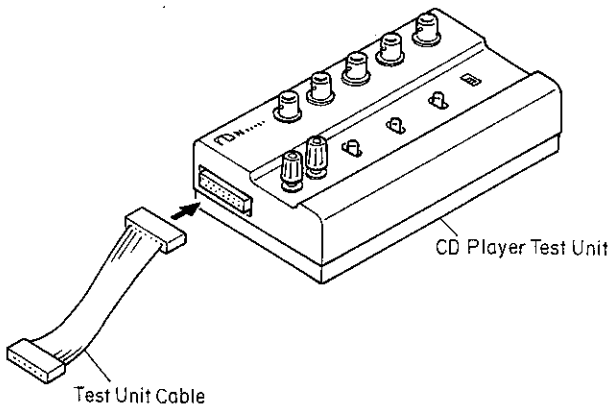


Fig. 4.1 Test Unit

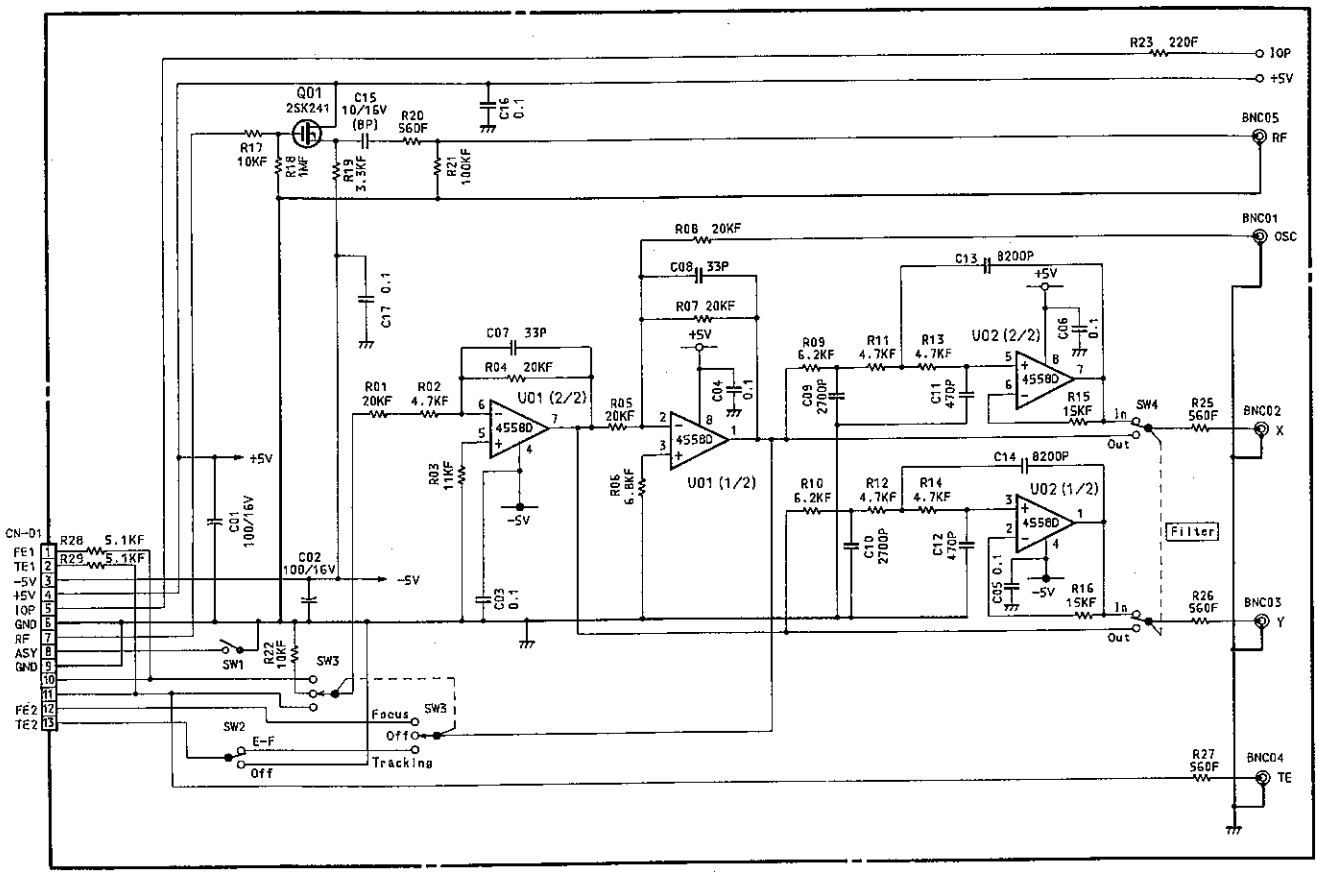
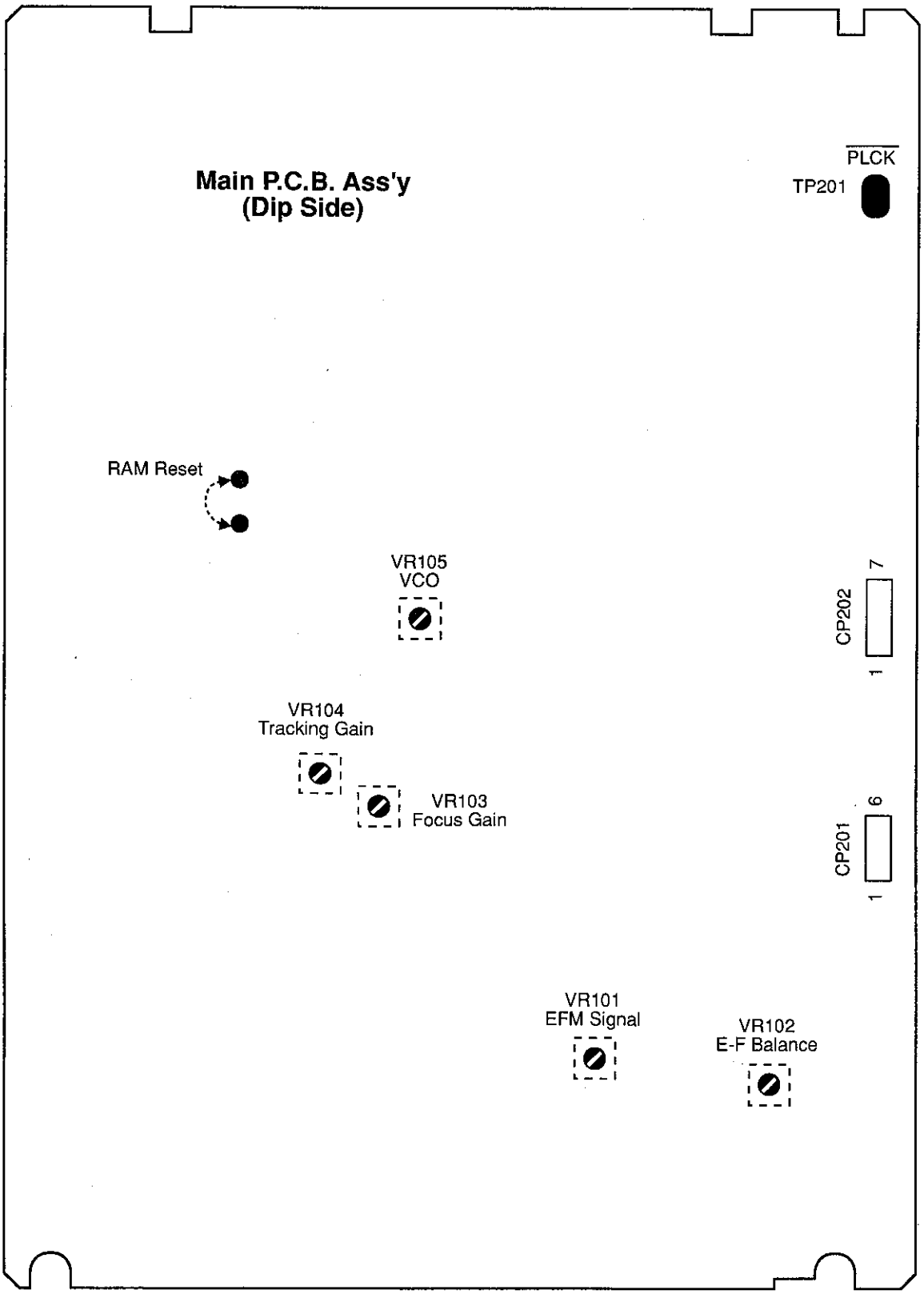


Fig. 4.2 Circuit of the Test Unit

5. PARTS LOCATION FOR ELECTRICAL ADJUSTMENT



Front Side

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 CP202 on the Main P.C.B. Ass'y.

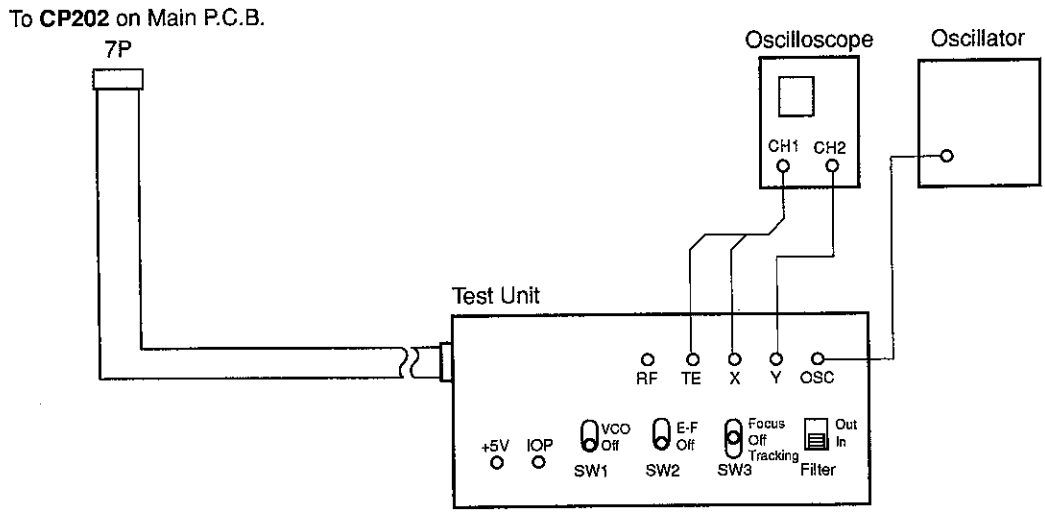
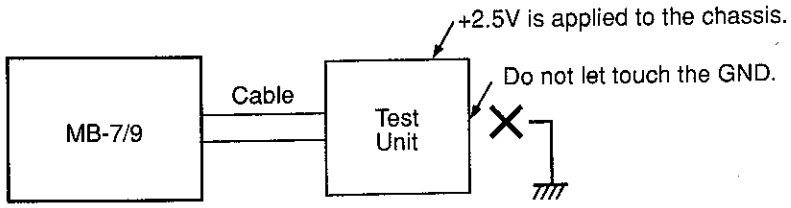
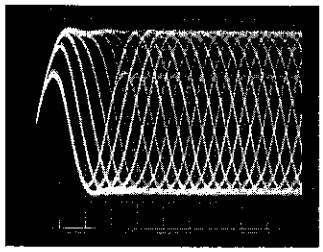
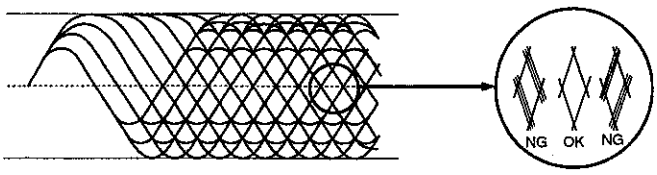
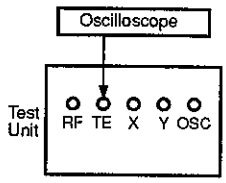
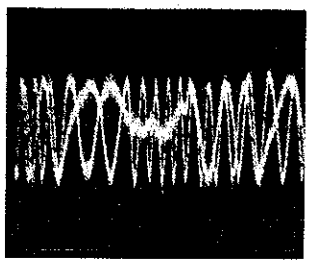
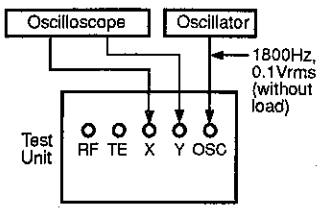
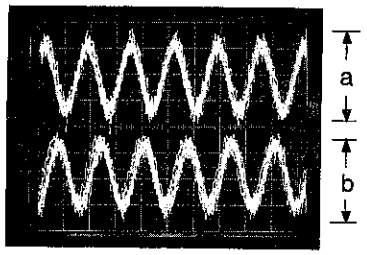
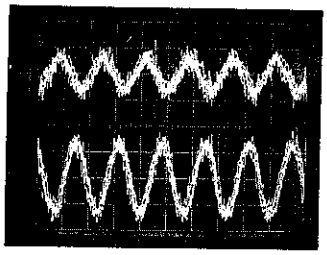


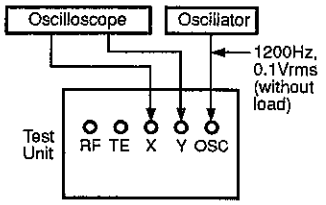
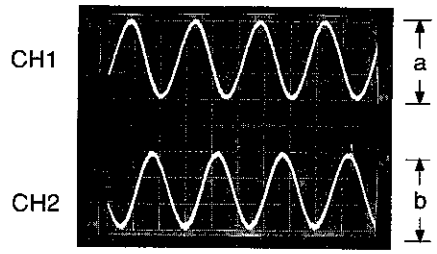
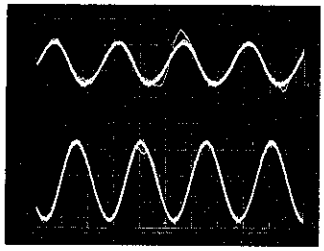
Fig. 6 Test Unit Connecting Diagram

CAUTION:
DO NOT let touch the chassis of the Test Unit to the measurement instrument as well as the MB-7/9 since +2.5V is applied to the chassis of the Test Unit when the test unit cable is connected to the MB-7/9.



STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	ADJUST-MENT	REMARKS
1	Laser Current Check	Philips Test Sample 5 or 444	DC Voltmeter between pins 1 (IOP) and 3 (+5V) of CP201 on Main P.C.B. DC Voltmeter Common: Pin 3 (+5V)		1. Turn the power ON and load the test disc. 2. Play back the test disc and calculate the current flowing into R101 on the Main P.C.B. Ass'y from the following formula. $I = \frac{\text{Voltmeter Value}}{\text{R101 (10 Ohms)}} = \text{oo.o mA}$ 3. Check that the calculated current is in a range of 50 to 60 mA. **Note**: If the current doubles, pickup will be defective.
2	VCO Frequency Adjustment	None	Frequency Counter (10/1 probe) to TP201 ($\overline{\text{PLCK}}$) and GND on Main P.C.B.	Main P.C.B. VR105	1. Set the shorting pin between pins 5 (GND) and 6 (ASY) of CP201 on Main P.C.B. 2. Adjust VR105 to obtain 4.322 ±0.005 MHz on the frequency counter. 3. Remove the shorting pin.
3	EFM Signal Adjustment	Philips Test Sample 5 or 444	Oscilloscope between pins 2 (RF) and 4 (VR) of CP201 on Main P.C.B. Oscilloscope Common: Pin 4 (VR)	Main P.C.B. VR101	1. Play back the first track of the test disc. 2. Adjust VR101 until waveform amplitude becomes maximum and the waveform becomes clear (not thick) as shown below:   Oscilloscope Setting: AC Mode, 0.2 V/div, 0.5 µs/div
4	E-F Balance Adjustment (Supple-mentary Beam Balance Adjustment)	Philips Test Sample 5 or 444	Oscilloscope to TE Connector of Test Unit	Main P.C.B. VR102	1. Connect the 7P cable of the Test Unit to CP202 on the Main P.C.B. Ass'y. 2. Play back the first track of the test disc. 3. Set SW2 of the Test Unit to E-F position. 4. Adjust VR102 so that the center level of the waveform is within the range of 0 V ±0.1 V DC as shown below: (To be continued.)

STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	ADJUST-MENT	REMARKS
	SW1: OFF SW3: OFF SW2: E-F Filter: OUT  Connecting Diagram				 --- Center Level Oscilloscope Setting: DC Mode, 1 V/div, 1 ms/div 5. Set SW2 to OFF position. 6. Remove the 7P cable from CP202.
5	Tracking Gain Adjustment	Philips Test Sample 5 or 444	Oscillator to OSC Connector of Test Unit Oscilloscope to Test Unit • CH1 to X • CH2 to Y	Main P.C.B. VR104	1. Connect the 7P cable of the Test Unit to CP202 on the Main P.C.B. Ass'y. 2. Set the output of oscillator to 1800 Hz, 0.1 Vrms without connecting it to the Test Unit. 3. Note the position of the output control of the oscillator. 4. Connect the oscillator output to OSC connector of the Test Unit and set its output to 0 V. 5. Set the Filter switch of the Test Unit to IN position. 6. Play back the first track of the test disc. 7. Set the output control of the oscillator to the position noted in 3. 8. Set SW3 of the Test Unit to TRACKING position. 9. Adjust VR104 so that the amplitude of both waveforms on the oscilloscope are equal. (a=b) 10. Set SW3 to OFF position. 11. Remove the 7P cable from CP202.
	SW1: OFF SW3: TRACKING SW2: OFF Filter: IN  Connecting Diagram				Good waveforms  a = b NG waveforms  Oscilloscope Setting: CH1, CH2: 0.2 V/div, DC Mode Time: 0.5 ms/div Mode: Auto, ALT Trigger: CH1

STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	ADJUST-MENT	REMARKS
6	Focus Gain Adjustment	Philips Test Sample 5 or 444	Oscillator to OSC connector of Test Unit Oscilloscope to Test Unit • CH1 to X • CH2 to Y	Main P.C.B. VR103	1. Connect the 7P cable of the Test Unit to CP202 on the Main P.C.B. Ass'y. 2. Set the output of oscillator to 1200 Hz, 0.1 Vrms without connecting it to the Test Unit. 3. Note the position of the output control of the oscillator. 4. Connect the oscillator output to OSC connector of the Test Unit and set its output to 0 V. 5. Set the Filter switch of the Test Unit to IN position. 6. Play back the first track of the test disc. 7. Set the output control of the oscillator to the position noted in 3. 8. Set SW3 of the Test Unit to FOCUS position. 9. Adjust VR103 so that the amplitude of both waveforms on the oscilloscope are equal. (a=b) 10. Set SW3 to OFF position. 11. Set the Filter switch to OUT position. 12. Remove the 7P cable from CP202. 13. After adjustment, perform "EFM Signal Adjustment" in Step 3.
					SW1: OFF SW3: FOCUS SW2: OFF Filter: IN  Connecting Diagram Good waveforms  a = b NG waveforms  Oscilloscope Setting: CH1, CH2: 0.2 V/div, DC Mode Time: 0.5 ms/div Mode: Auto, ALT Trigger: CH1
7	Operation Check	Philips Test Sample 5A or 444A			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. • Interruption 500 µm: 6th program • Black Dot 800 µm: 17th program • Simulated fingerprint: 19th program

7. MECHANISM ASS'Y AND PARTS LIST

7.1. Synthesis

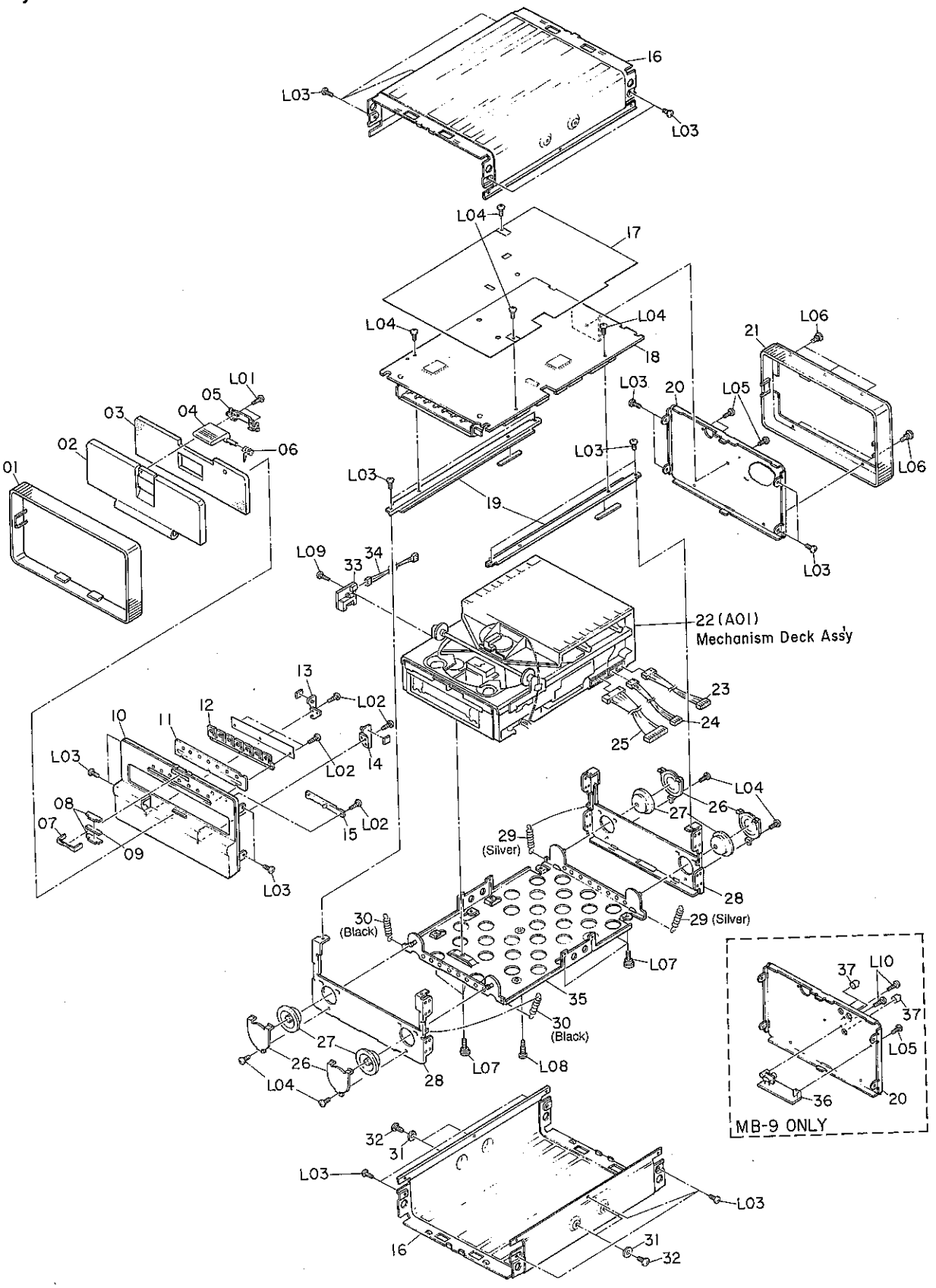
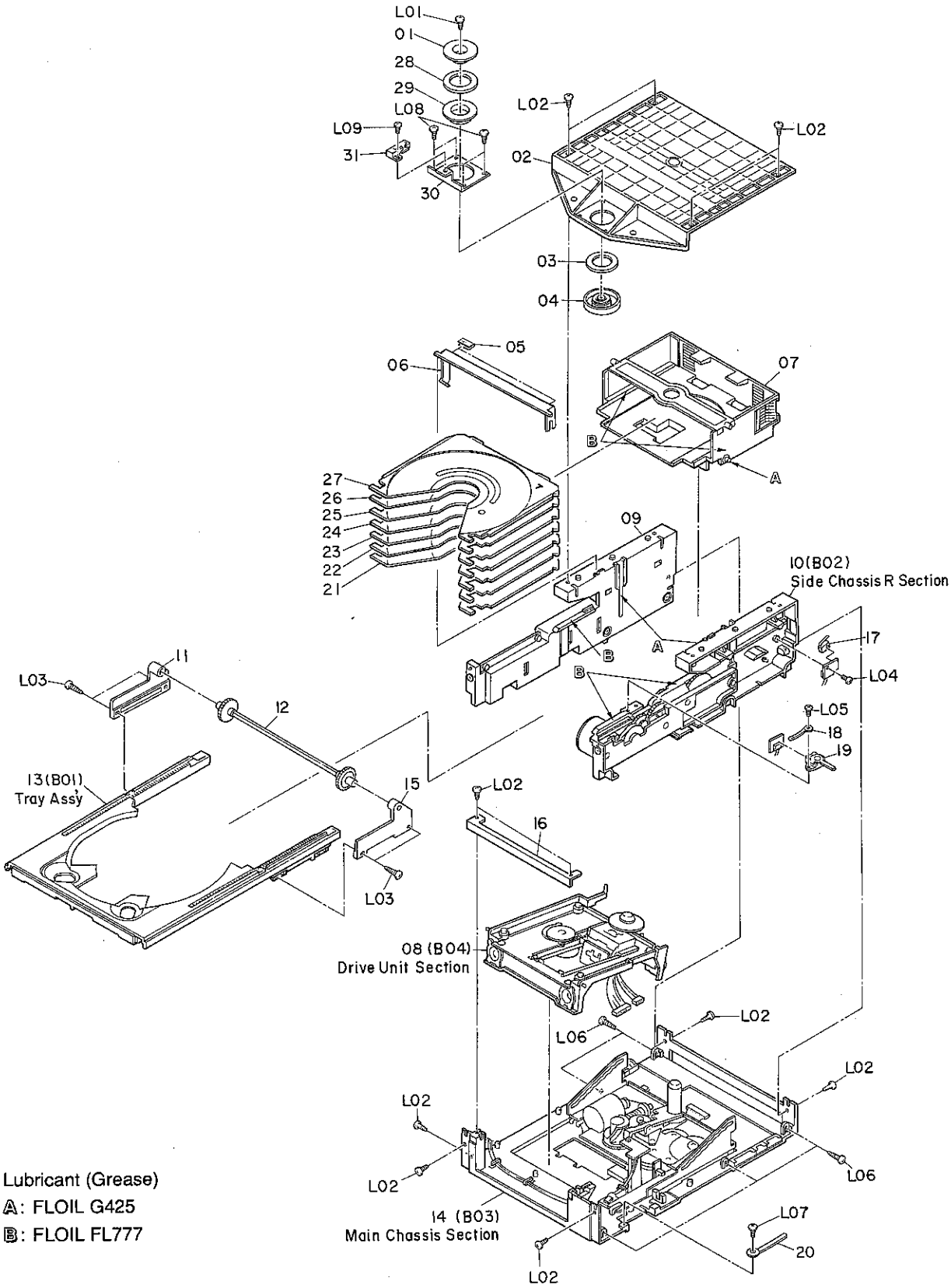


Fig. 7.1

7.1. Synthesis

Schematic Ref. No.	Part No.	Description	Q'ty
	—	**Synthesis**	
01	0H06765D	Protector Front	1
02	0H06763C	Front Door	1
03	0H06774B	Door Sponge	1
04	0H06771C	Door Handle	1
05	0J07270A	Magnet Plate	1
06	0J07276B	Door Spring	1
07	0J07275A	Magnet Holder	1
08	0J07274A	York	2
09	0J07269A	Magnet	1
10	0H06764D	Front Panel [MB-7]	1
	0H06799A	Front Panel [MB-9]	1
11	HG06892A	Indicator Ass'y	1
12	0H06770C	Button Disc	1
13	0H06773C	Door Pin L	1
14	0H06772C	Door Pin R	1
15	0H06801E	Button Door Switch	1
16	0H06767C	Bonnet	2
17	0J07271B	Insulating Sheet	1
18	BA09182A	Main P.C.B. Ass'y [MB-7] (USA, CAN , EP, JPN)	1
	BA09183A	Main P.C.B. Ass'y [MB-7] (GER)	1
	BA09192A	Main P.C.B. Ass'y [MB-9] (USA, CAN , EP, JPN)	1
	BA09193A	Main P.C.B. Ass'y [MB-9] (GER)	1
19	0J07264C	Channel	2
20	0H06768B	Rear Panel [MB-7]	1
	0H06800A	Rear Panel [MB-9]	1
21	0H06766C	Protector Rear	1
22	CG09212B	Mechanism Deck Ass'y	1
23	0B80670B	6P Connector Ass'y CN103	1
24	0B80672A	4P Connector Ass'y CN105	1
25	0B80671A	12P Connector Ass'y CN104	1
26	0J07263B	Damper Holder	4
27	0J07261A	Damper	4
28	0J07258A	Chassis Sub	2
29	0J07260A	Spring Sus R (Silver)	2
30	0J07352A	Spring Sus F (Black)	2
31	0J04310A	Poly Washer	4
32	0J07268A	Shipping Lock Screw	4
33	0B80685A	3P Connector Ass'y CN107	1
34	BA09210A	Tilt Switch P.C.B. Ass'y	1
35	JG04890B	Chassis Ass'y	1
36	BA09194A	Digital Out P.C.B. Ass'y [MB-9] (USA, CAN, EP, JPN)	1
	BA09195A	Digital Out P.C.B. Ass'y [MB-9] (GER)	1
37	0B84524A	RCA Cap [MB-9]	3
L01	0E03809A	PT2x4 + Binding (Black Chromate)	
L02	0E03638A	PT2x6 + Binding	
L03	0E03816A	ST3x4 + Binding (Black Chromate)	
L04	0E00800A	ST3x6 + Binding	
L05	0E00985A	M3x6 + Binding (Black Chromate)	
L06	0E03810A	Push Rivet	
L07	0E03805A	PT Special Screw 3x9.5	
L08	0E03815A	PT3x12 Flat Head	
L09	0E03769A	PT2.6x8 + Binding	
L10	0E03749A	PT3x8 + Binding (Black Chromate) [MB-9]	

7.2. Mechanism Deck Ass'y (A01)



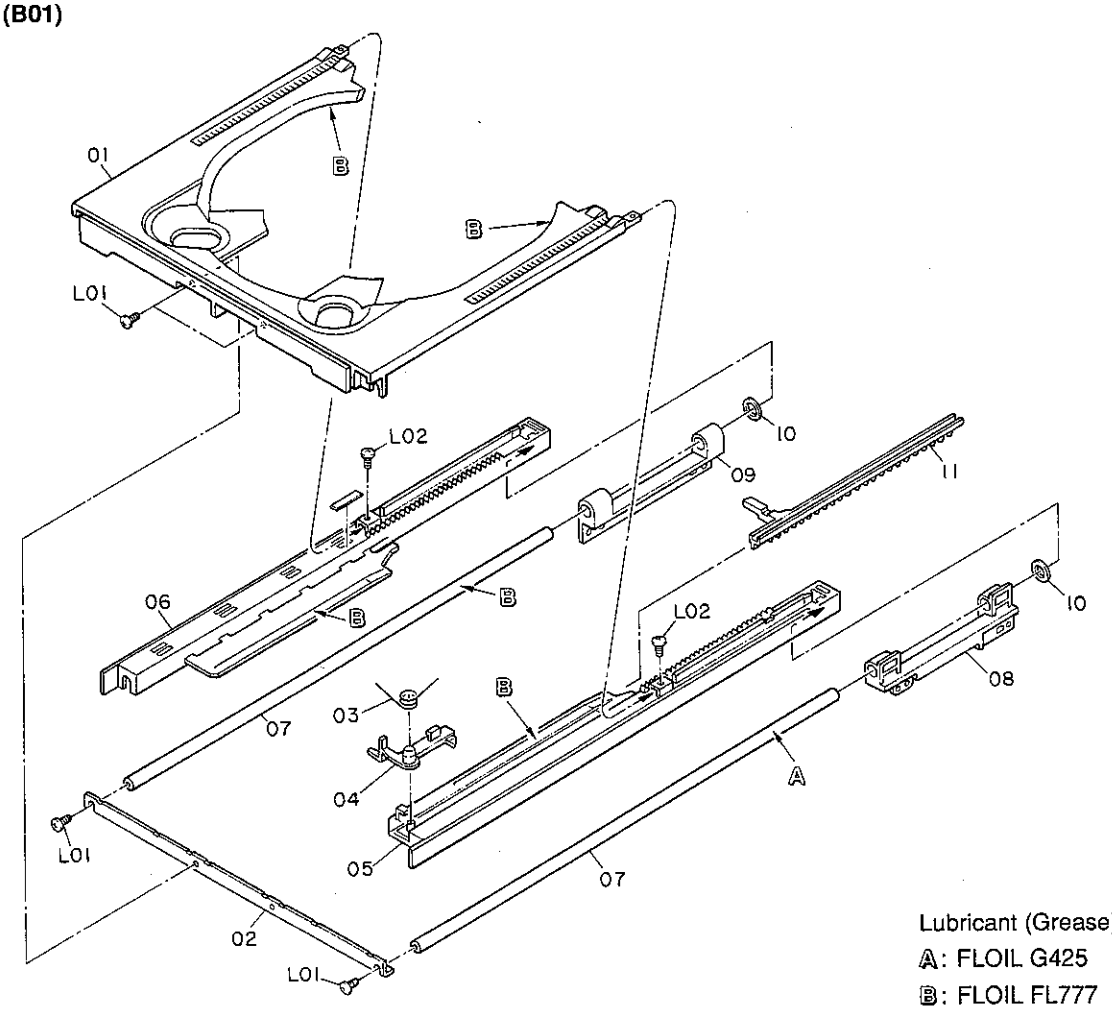
Lubricant (Grease)
Ⓐ: FLOIL G425
Ⓑ: FLOIL FL777

Fig. 7.2

7.2. Mechanism Deck Ass'y (A01)

Schematic Ref. No.	Part No.	Description	Q'ty
A01	**CG09212B**	**Mechanism Deck Ass'y**	**1**
01	2C00128A	Clamper Top MSS	1
02	2C00094A	Top Cover	1
03	2C00016A	Magnet 17x27x5	1
04	2C00015A	Clamper LO	1
05	2C00101A	A Arm Cushion	1
06	2C00116A	Assist Arm	1
07	CB00245A	Stocker Ass'y	1
08	—	Drive Unit Section	1
09	2C00090A	Side Chassis L	1
10	—	Side Chassis R Section	1
11	2C00098A	Tray Holder L	1
12	CB00230A	Timing Ass'y	1
13	CB00246A	Tray Ass'y	1
14	—	Main Chassis Section	1
15	2C00097A	Tray Holder R	1
16	2C00086A	Mecha B Stopper	1
17	2B70009A	Store SW MSS-10L2-1	1
18	2C00107A	Wire Clamper 3B4	1
19	2B70007A	Eject/T-Close SW SSS13	1
20	2C00106A	Wire Clamper 3A6	1
21	0C09830A	Carriage-S-1	1
22	0C09831A	Carriage-S-2	1
23	0C09832A	Carriage-S-3	1
24	0C09833A	Carriage-S-4	1
25	0C09834A	Carriage-S-5	1
26	0C09835A	Carriage-S-6	1
27	0C09836A	Carriage-S-7	1
28	2C00129A	Magnet 17x28.5x2	1
29	2C00130A	Clamper HI MSS	1
30	2C00127A	Clamper Plate	1
31	2B70013A	Chacking Detecting Switch	1
L01	0E00976A	M2x5 + Binding	
L02	0E00825A	BT2.6x8 + Binding (Black Chromate)	
L03	2E00005A	BT2.6x12 + Binding	
L04	0E00961A	BT2x5 + Binding	
L05	0E03442A	ST2.6x5 + Pan	
L06	0E03612A	BT2.6x10 + Binding	
L07	0E00873A	BT2.6x5 + Binding	
L08	0E00859A	BT2.6x6 + Binding	
L09	0E00954A	BT2.6x8 + Binding	

7.3. Tray Ass'y (B01)



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

Fig. 7.3

7.3. Tray Ass'y (B01)

Schematic Ref. No.	Part No.	Description	Q'ty
B01	**CB00246A**	**Tray Ass'y**	1
01	2C00067A	Tray Top	1
02	2C00066A	Tray Plate	1
03	2C00068A	Shuttle Lock Spring	1
04	2C00061A	Shuttle Lock	1
05	2C00064A	Tray R	1
06	2C00065A	Tray L	1
07	2C00069A	Tray Guide shaft	2
08	2C00063A	Tray Guide R	1
09	2C00062A	Tray Guide L	1
10	2C00070A	Stopper Rubber	2
11	2C00060A	Shuttle	1
L01	0E00945A	M2.6x4 + Binding (Black Chromate)	
L02	0E03022A	BT2x4 + Binding (Black Chromate)	

7.4. Side Chassis R Section (B02)

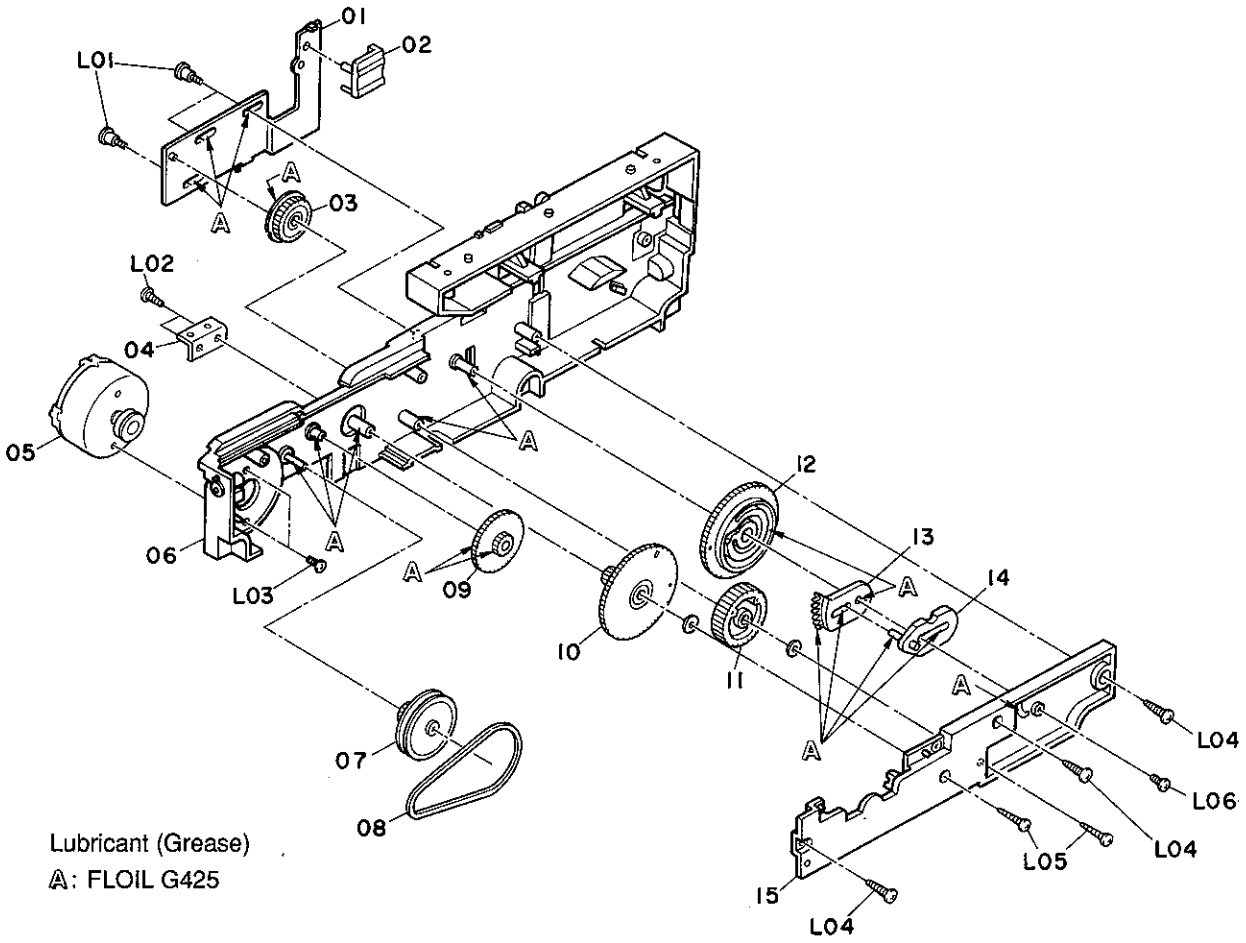


Fig. 7.4

7.4. Side Chassis R Section (B02)

Schematic Ref. No.	Part No.	Description	Q'ty
B02	—	**Side Chassis R Section**	**1**
01	CB00223A	Change Plate Ass'y	1
02	2C00072A	Carriage Opener	1
03	2C00039A	Change Gear	1
04	2C00093A	Switch-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 Stoper	1
14	CB00225A	Trace Arm Ass'y	1
15	2C00040A	Gear Holder	1
L04	0E00825A	BT2.6x8 + Binding (Black Chromate)	
L03	0E00945A	M2.6x4 + Binding (Black Chromate)	
L02	0E03610A	BT2.6x6 + Binding	
L05	0E03756A	BT2x10 + Binding (Black Chromoate)	
L01	2E00002A	BT2.0x1.4x5.9	
L06	2E00013A	M2x4 Binding (Black Chromate)	

7.5. Main Chassis Section (B03)

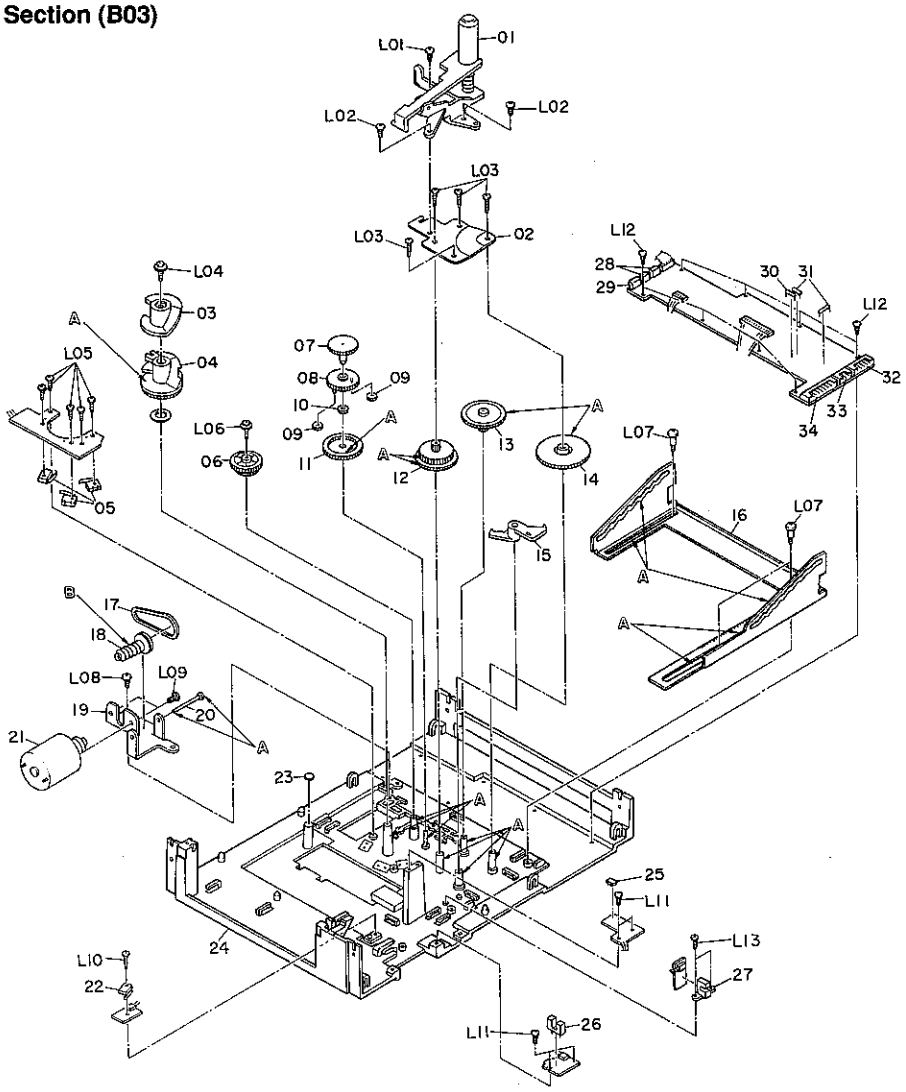


Fig. 7.5

7.5. Main Chassis Section (B03)

Schematic Ref. No.	Part No.	Description	Q'ty
B03	—	**Main Chassis Section**	**1**
01	CB00224A	Disc Lock Arm Ass'y	1
02	2C00081A	Gear Plate	1
03	2C00117A	ME UD Cam Top	1
04	2C00118A	Mecha UD Cam	1
05	2B70008A	Cam Switch MSS-10R2-16	3
06	2C00082A	ID-ST-Gear	1
07	2C00074A	D1-ST-Gear	1
08	CB00226A	D2-ST-Gear Ass'y	1
09	2C00075A	D3-ST-Gear	2
10	2C00076A	D4-ST-Gear	1
11	2C00077A	D5-ST-Gear	1
12	2C00083A	Lock Idler	1
13	2C00079A	D7M-ST-Gear	1
14	2C00078A	D6P-ST-Gear	1
15	2C00073A	Change Arm	1
16	2C00091A	Stocker Cam	1
17	2C00018A	Belt-T-C	1
18	2C00092A	ST-Worm-Gear	1
19	2C00088A	Motor Bracket	1
20	2C00100A	Worm Shaft	1
21	CB00213A	Stocker Motor Ass'y	1
22	2B70012A	Home Position MSS-10R2-17	1
23	2C00099A	Mecha Cushion	2
24	CB00221A	Main Chassis Ass'y	1
25	2B10019A	Photo Refrector GP2S40	1
26	2B10021A	Photo Interrupter GP1S 52V	1
27	2B10020A	Photo Interrupter GP1S 51V	1
28	0B81459A	B2B-PH-K-S	2
29	0B81460A	B3B-PH-K-S	1
30	0B09663A	RK 270 1/6W J	1
31	0B09665A	RK 330 1/6W J	2
32	0B81470A	S6B-PH-K-S	1
33	0B81468A	S4B-PH-K-S	1
34	0B84475A	S12B-PH-K-S	1
L01	0E03610A	BT2.6x6 + Binding (Black Chromoate	
L02	0E00945A	M2.6x4 + Binding (Black Chromate)	
L03	0E00969A	BT2x8 + Binding	
L04	2E00010A	BT3x10 + Binding Washer Faced	
L05	2E00008A	BT1.7x5.5 + Binding	
L06	2E00009A	BT2x8 + Binding Washer Faced	
L07	2E00001A	BT2.6x1.4x7.4	
L08	0E00873A	BT2.6x5 + Binding	
L09	0E00501A	M3x3 + Pan	
L10	2E00007A	BT1.7x8 + Binding	
L11	0E00961A	BT2x5 + Binding	
L12	2E00006A	BT1.7x4 + Binding	
L13	0E00869A	BT2.6x4 + Binding	
—	2B80006A	Wire CNW-W6P	1
—	2B80007A	Wire CNW-2P175	1
—	2B80008A	Wire CNW-2P330	1
—	2B80009A	Wire CNW-W4P	1
—	2B80010A	Wire CNW-W2P50	1
—	2B80011A	Wire CNW-W11P	1
—	2B80012A	Wire CNW-3P	1

7.6. Drive Unit Section (B04)

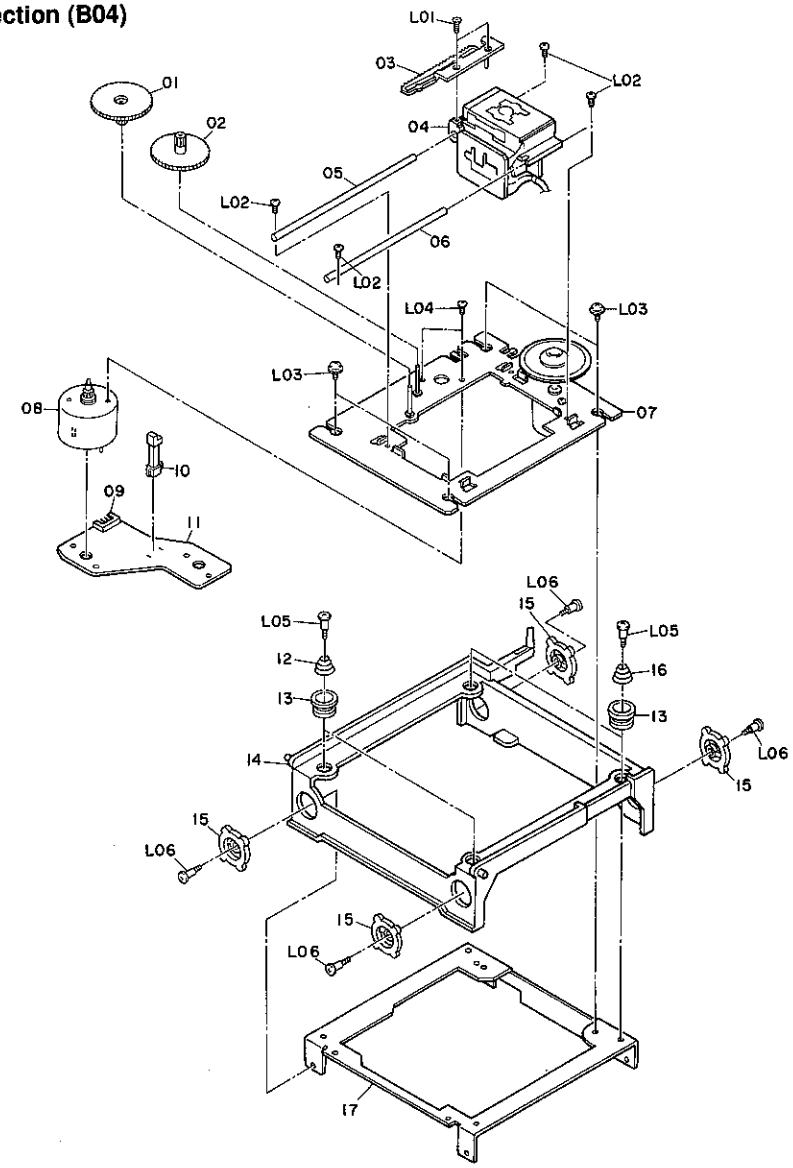


Fig. 7.6

7.6. Drive Unit Section (B04)

Schematic Ref. No.	Part No.	Description	Q'ty
B04	—	**Drive Unit Section**	1
01	2C00023A	Gear Power	1
02	2C00022A	Gear Middle	1
03	2C00105A	Plate Rack	1
04	2C00140A	Pick-Up SF91PQ	1
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	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	

Schematic Ref. No.	Part No.	Description	Q'ty
L02	2E00011A	ST2.6x6 + Binding	
L03	2E00012A	ST2.6x6 Cup Screw	
L04	0E03439A	M2x2.5 + Pan (Black Chromate)	
L05	2E00004A	ST2.0x10x15	
L06	2E00003A	ST2.0x3.0x8.0	

8. MOUNTING DIAGRAMS AND PARTS LIST

NOTE: 1. Component side is illustrated unless otherwise specified.
2. Polarity of electrolytic capacitor.

8.1. Tilt Switch P.C.B. Ass'y

Diagram is omitted.

8.2. Digital Out P.C.B. Ass'y (MB-9 only)

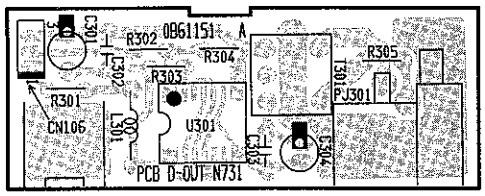


Fig. 8.1 (MB-9 only)

8.3. Main P.C.B. Ass'y
(1) MB-7

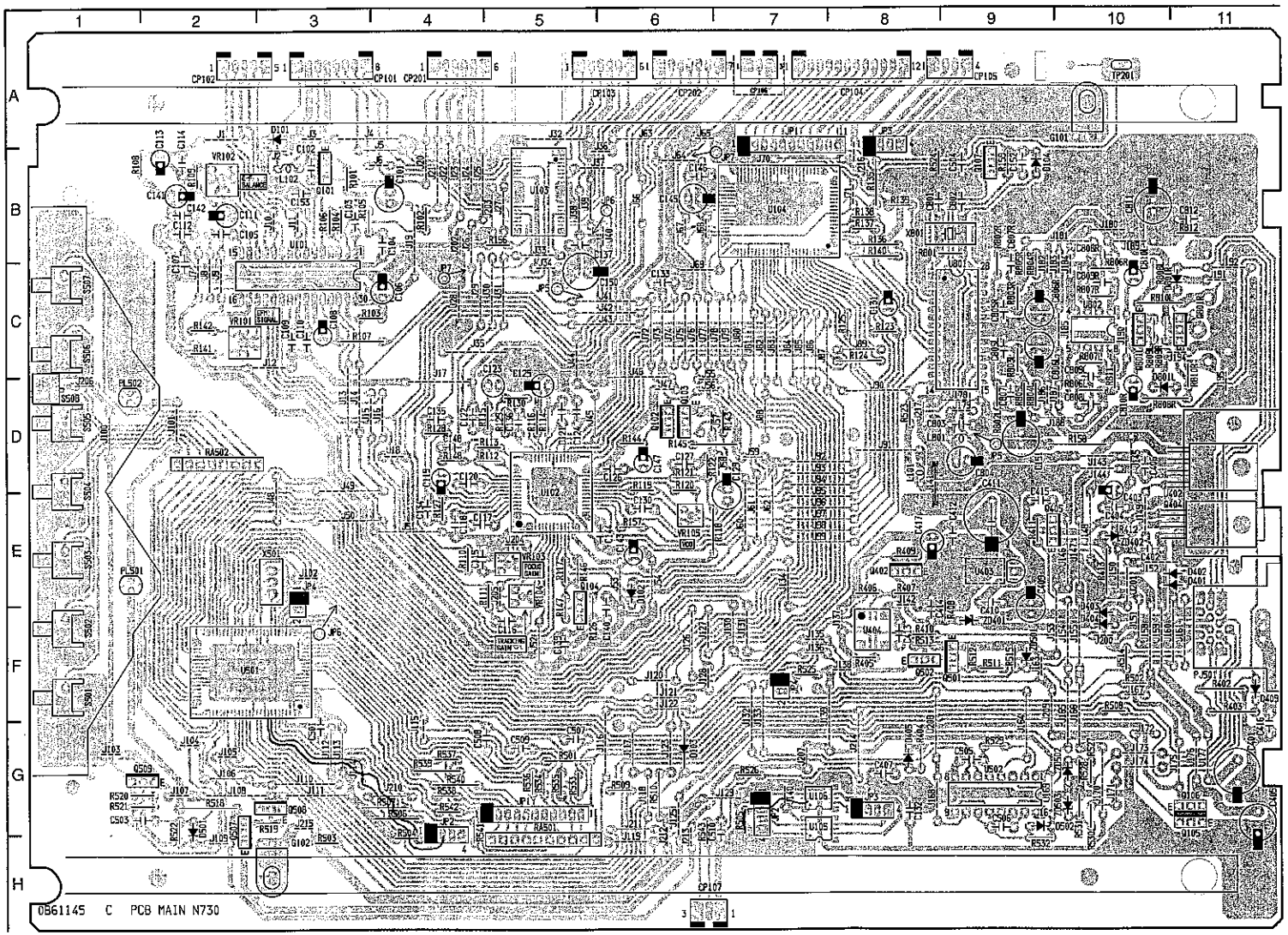


Fig. 8.2.1 MB-7

•Semiconductor Location

Ref. No.	Location
U101	B-3
U102	D-5
U103	B-5
U104	B-7
U105	G-7
U106	G-7
U402	D-11
U403	E-9
U404	F-8
U501	F-2
U502	G-9
U801	C-9
U802	C-10
Q101	B-3
Q102	D-6
Q103	D-6
Q104	E-5
Q105	G-11
Q106	G-11
Q107	B-9
Q402	E-8
Q404	E-11
Q405	E-9
Q501	F-9
Q502	F-8
Q507	G-2
Q508	G-3
Q509	G-1
Q801L	C-10
Q801R	C-11
ZD401	F-9
ZD402	E-10
ZD501	F-9
ZD502	G-10
ZD503	G-10
D101	B-3
D102	E-6
D103	G-6
D104	B-9
D401	E-11
D402	E-11
D403	E-10
D404	F-10
D405	G-8
D409	F-11
D501	G-2
D502	G-9
D801L	D-11
D801R	C-11

(2) MB-9

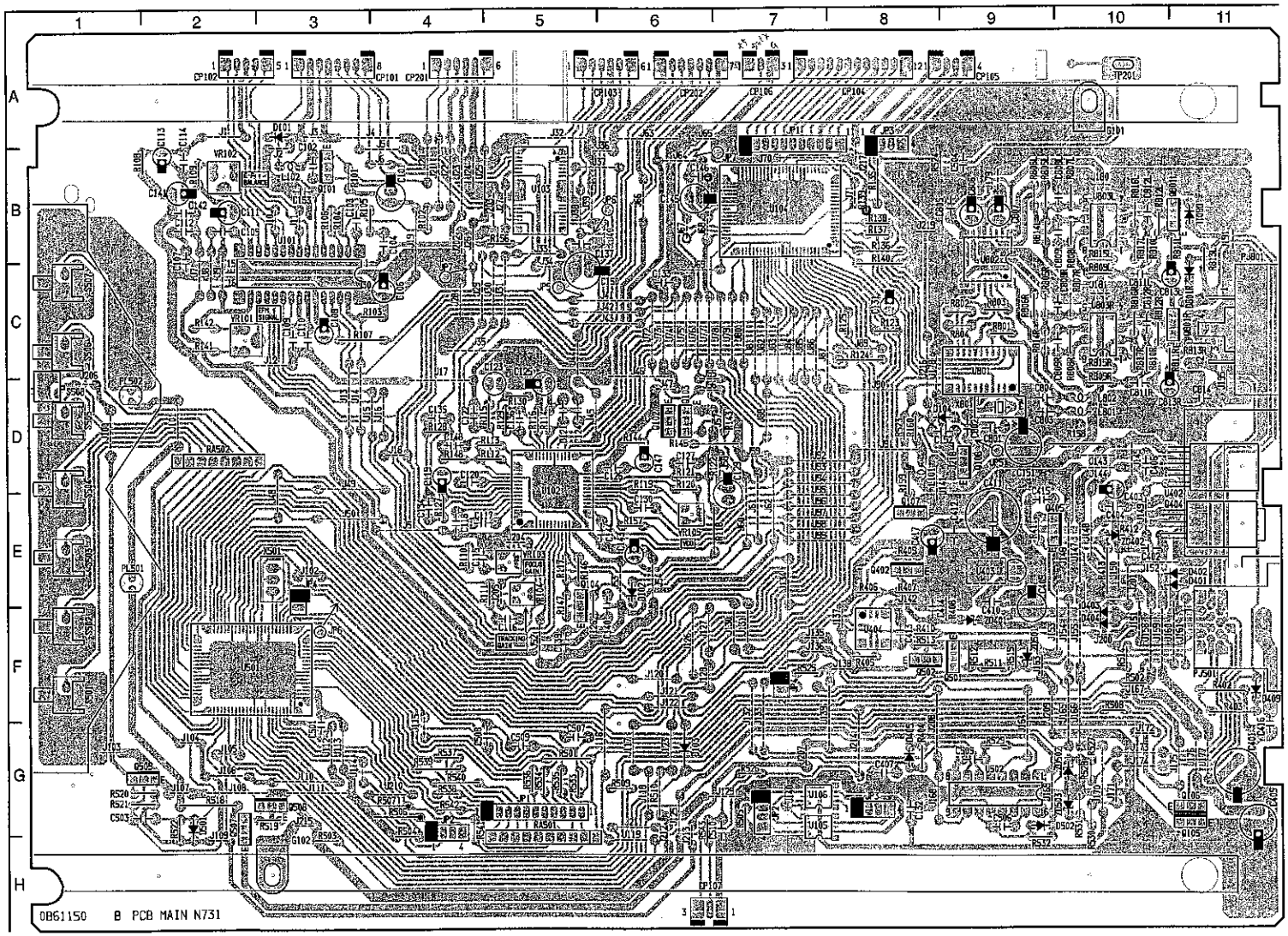


Fig. 8.2.2 MB-9

•Semiconductor Location

Ref. No.	Location
U101	B-3
U102	D-5
U103	B-5
U104	B-7
U105	G-7
U106	G-7
U402	D-11
U403	E-9
U404	F-8
U501	F-2
U502	G-9
U801	C-9
U802	B-9
U803L	B-10
U803R	C-10
Q101	B-3
Q102	D-6
Q103	D-6
Q104	E-5
Q105	G-11
Q106	G-11
Q107	E-8
Q108	D-9
Q402	E-8
Q404	E-11
Q405	E-9
Q501	F-9
Q502	F-8
Q507	G-2
Q508	G-3
Q509	G-1
Q801L	B-11
Q801R	C-11
ZD401	F-9
ZD402	E-10
ZD501	F-9
ZD502	G-10
ZD503	G-10
D101	B-3
D102	E-6
D103	G-6
D104	D-8
D401	E-11
D402	E-11
D403	E-10
D404	F-10
D405	G-8
D409	F-11
D501	G-2
D502	G-9
D801L	B-11
D801R	C-11

NOT

8.1. 1

Schen
Ref. N

Q1
LD1
R1
R2
CP1

8.3. M
(1) Fi

Schem
Ref. Nc

U101
U102
U103
U104
U105,1
U402
U403
U404
U501
U502
U801
U802
Q101
Q102
Q103
Q104
Q105
Q106
Q107
Q402
Q404
Q405
Q501
Q502
Q507
Q508
Q509
Q801L,
ZD401
ZD402
ZD501
ZD502,
D101,1
D103,1
D401,4
D403
D404,4
D409
D501,5

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. Tilt Switch P.C.B. Ass'y (MB-7)

Schematic Ref. No.	Part No.	Description
	BA09210A	**Tilt Switch P.C.B. Ass'y**
	0B61154A	Tilt Switch P.C.B.
Q1	3B10604A	TR PT480
LD1	3B10605A	LED GL480
R1	0B09701A	RK 10K 1/6W J
R2	0B09665A	RK 330 1/6W J
CP1	3B81467A	3P S-Post
	0H06837B	Switch Body N730 (1)
	0J07337A	Ball 3.0 (1)
	0E03769A	PT2.6x8 Binding (2)

8.3. Main P.C.B. Ass'y (MB-7)
(1) For USA, CAN, EP, JPN

Schematic Ref. No.	Part No.	Description
	BA09182A	**Main P.C.B. Ass'y (USA, CAN, EP, JPN)**
	0B61145C	Main P.C.B.
U101	0B11818A	IC CXA1081S
U102	0B10580A	IC CXA1082BQ
U103	0B10558A	IC BA6296FP
U104	0B11946A	IC CXD1167Q
U105,106	0B10465A	IC LB1638M
U402	0B10567A	IC PQ05RG1
U403	0B10462A	IC TA78DS05BP
U404	0B10466A	IC M51957BF
U501	0B10612A	IC uPD75517GF
U502	0B06215A	IC TC4049BP
U801	0B10589A	IC SM5871AN
U802	0B10588A	IC NJM2100D
Q101	0B10585A	TR 2SA1560
Q102	0B10322A	TR DTC114EL
Q103	0B10324A	TR DTC144EL
Q104	0B10330A	TR DTC144TL
Q105	0B10324A	TR DTC144EL
Q106	0B10584A	TR DTA124EL
Q107	0B10324A	TR DTC144EL
Q402	0B10324A	TR DTC144EL
Q404	0B10578A	TR 2SB1342
Q405	0B10398A	TR 2SC4038
Q501	0B10398A	TR 2SC4038
Q502	0B10584A	TR DTA124EL
Q507	0B10585A	TR 2SA1560
Q508	0B10322A	TR DTC114EL
Q509	0B10398A	TR 2SC4038
Q801L,R	0B10583A	TR DTC323TL
ZD401	0B12154A	ZD RD6.2V JS B3
ZD402	0B10579A	ZD RD3.6ESB1
ZD501	0B12147A	ZD RD5.1V JS B2
ZD502,503	0B12154A	ZD RD6.2V JS B3
D101,102	0B06398A	SID 1SS176
D103,104	0B06398A	SID 1SS176
D401,402	0B12693A	SID S5688B
D403	0B12693A	SID S5688B
D404,405	0B06398A	SID 1SS176
D409	0B06398A	SID 1SS176
D501,502	0B06398A	SID 1SS176

Schematic Ref. No.	Part No.	Description
D801L,R	0B06398A	SID 1SS176
L101,102	0B51300A	Inductor 10uH
L801	0B51300A	Inductor 10uH
X501	0B92033A	Resonator 4.0MHz
X801	0B92063A	X'tal 16.9344MHz
VR101	0B32193A	Semi VR 10K (B)
VR102	0B32194A	Semi VR 20K (B)
VR103,104	0B32186A	Semi VR 22K (B)
VR105	0B30174A	Semi VR 1K (B)
RA501	0B20667A	R-Array 47Kx9
RA502	0B20668A	R-Array 100Kx7
R101	0B09629A	RK 10 1/6W J
R102	0B09677A	RK 1K 1/6W J
R103	0B09701A	RK 10K 1/6W J
R104	0B09699A	RK 8.2K 1/6W J
R105	0B09685A	RK 2.2K 1/6W J
R106	0B09699A	RK 8.2K 1/6W J
R107	0B09725A	RK 100K 1/6W J
R108	0B09677A	RK 1K 1/6W J
R109	0B09709A	RK 22K 1/6W J
R110,111	0B09701A	RK 10K 1/6W J
R112	0B09731A	RK 180K 1/6W J
R113	0B09735A	RK 270K 1/6W J
R114	0B09742A	RK 510K 1/6W J
R115	0B09719A	RK 56K 1/6W J
R116	0B09725A	RK 100K 1/6W J
R117	0B09713A	RK 33K 1/6W J
R118	0B25291A	RM 10K 1/4W F
R119	0B25666A	RM 3.6K 1/4W F
R120	0B09734A	RK 240K 1/6W J
R121	0B09701A	RK 10K 1/6W J
R122	0B25291A	RM 10K 1/4W F
R123	0B09721A	RK 68K 1/6W J
R124	0B09701A	RK 10K 1/6W J
R125,126	0B09725A	RK 100K 1/6W J
R127	0B09737A	RK 330K 1/6W J
R128	0B09729A	RK 150K 1/6W J
R129	0B09720A	RK 62K 1/6W J
R130	0B09704A	RK 13K 1/6W J
R135	0B09677A	RK 1K 1/6W J
R136,137	0B09653A	RK 100 1/6W J
R138,139	0B09653A	RK 100 1/6W J
R140	0B09749A	RK 1M 1/6W J
R141,142	0B09705A	RK 15K 1/6W J
R143	0B09701A	RK 10K 1/6W J
R144	0B09713A	RK 33K 1/6W J
R145	0B09701A	RK 10K 1/6W J
R146,147	0B09713A	RK 33K 1/6W J
R148	0B09731A	RK 180K 1/6W J
R156	0B09701A	RK 10K 1/6W J
R157	0B09697A	RK 6.8K 1/6W J
R158	0B24235A	RF 1 1W
R159	0B09701A	RK 10K 1/6W J
R402	0B09719A	RK 56K 1/6W J
R403	0B09677A	RK 1K 1/6W J
R404	0B09733A	RK 220K 1/6W J
R405	0B09701A	RK 10K 1/6W J
R406	0B09732A	RK 200K 1/6W J
R407,408	0B09725A	RK 100K 1/6W J
R409	0B09725A	RK 100K 1/6W J
R410	0B09653A	RK 100 1/6W J

Schematic Ref. No.	Part No.	Description
R411	0B09701A	RK 10K 1/6W J
R412	0B09685A	RK 2.2K 1/6W J
R413	0B09676A	RK 910 1/6W J
R501	0B09701A	RK 10K 1/6W J
R502	0B09713A	RK 33K 1/6W J
R503,504	0B09725A	RK 100K 1/6W J
R505,506	0B09725A	RK 100K 1/6W J
R507	0B09725A	RK 100K 1/6W J
R508,509	0B09669A	RK 470 1/6W J
R510	0B09725A	RK 100K 1/6W J
R511	0B09703A	RK 12K 1/6W J
R512	0B09685A	RK 2.2K 1/6W J
R513	0B09725A	RK 100K 1/6W J
R514	0B09677A	RK 1K 1/6W J
R515	0B09725A	RK 100K 1/6W J
R518	0B24443A	RF 27 1W
R519	0B09695A	RK 5.6K 1/6W J
R520,521	0B09725A	RK 100K 1/6W J
R522	0B09725A	RK 100K 1/6W J
R523	0B09693A	RK 4.7K 1/6W J
R524	0B09646A	RK 51 1/6W J
R525,526	0B09725A	RK 100K 1/6W J
R527	0B09693A	RK 4.7K 1/6W J
R528	0B09749A	RK 1M 1/6W J
R529,530	0B09693A	RK 4.7K 1/6W J
R531	0B09749A	RK 1M 1/6W J
R532	0B09693A	RK 4.7K 1/6W J
R533,534	0B09701A	RK 10K 1/6W J
R535,536	0B09701A	RK 10K 1/6W J
R537,538	0B09701A	RK 10K 1/6W J
R539,540	0B09701A	RK 10K 1/6W J
R541,542	0B09701A	RK 10K 1/6W J
R543	0B09693A	RK 4.7K 1/6W J
R801	0B09749A	RK 1M 1/6W J
R802L,R	0B25661A	RM 2.2K 1/4W F
R803L,R	0B25661A	RM 2.2K 1/4W F
R804L,R	0B25679A	RM 22K 1/4W F
R805L,R	0B25679A	RM 22K 1/4W F
R806L,R	0B25679A	RM 22K 1/4W F
R807L,R	0B25679A	RM 22K 1/4W F
R808L,R	0B09671A	RK 560 1/6W J
R809L,R	0B09725A	RK 100K 1/6W J
R810L,R	0B09653A	RK 100 1/6W J
R811,812	0B09701A	RK 10K 1/6W J
C101	0B48040A	CE 100 10V
C102	0B41944A	CC 1000P 50V K
C103	0B42237A	CML 3300P 50V J
C104	0B41708A	CC 22P 50V J
C105	0B42095A	CML 0.047 50V J
C106	0B40160A	CE 33 10V
C107	0B42095A	CML 0.047 50V J
C108	0B40268A	CE 0.47 50V
C109	0B42239A	CML 4700P 50V J
C110	0B42089A	CML 0.015 50V J
C111	0B40160A	CE 33 10V
C112	0B41553A	CC 0.01 25V Z
C113	0B40271A	CE 3.3 25V
C114	0B42095A	CML 0.047 50V J
C115,116	0B42235A	CML 2200P 50V J
C117	0B42099A	CML 0.1 50V J
C118	0B42095A	CML 0.047 50V J

MB-7 Electrical Parts list (2/2)

Schematic Ref. No.	Part No.	Description
C119	0B40170A	CE 4.7 35V
C120	0B42099A	CML 0.1 50V J
C121	0B42087A	CML 0.01 50V J
C122	0B42099A	CML 0.1 50V J
C123	0B42025A	CE 10 16V (BP)
C124	0B42099A	CML 0.1 50V J
C125	0B40160A	CE 33 10V
C126	0B42099A	CML 0.1 50V J
C127	0B47122A	CC 100P 50V K
C129	0B48040A	CE 100 10V
C130	0B42231A	CML 1000P 50V J
C131	0B40268A	CE 0.47 50V
C132	0B42099A	CML 0.1 50V J
C133	0B42087A	CML 0.01 50V J
C134	0B42240A	CML 5600P 50V J
C135	0B42223A	CML 220P 50V J
C136	0B42087A	CML 0.01 50V J
C137	0B42099A	CML 0.1 50V J
C139,140	0B41553A	CC 0.01 25V Z
C141	0B40160A	CE 33 10V
C142	0B41553A	CC 0.01 25V Z
C143	0B40162A	CE 10 16V
C144	0B42090A	CML 0.018 50V J
C145	0B48040A	CE 100 10V
C146	0B42099A	CML 0.1 50V J
C147	0B40170A	CE 4.7 35V
C148	0B42089A	CML 0.015 50V J
C150,151	0B40789A	CE 220 10V
C152	0B42091A	CML 0.022 50V J
C153	0B47126A	CC 220P 50V K
C401	0B40082R	CE 1000 16V
C402	0B42099A	CML 0.1 50V J
C403	0B40162A	CE 10 16V
C404	0B42099A	CML 0.1 50V J
C405	0B40052A	CE 470 6.3V
C406,407	0B42099A	CML 0.1 50V J
C409	0B40698A	CE 100 16V
C410	0B42099A	CML 0.1 50V J
C411	0B42247A	CE 0.1F 5.5V
C412	0B42099A	CML 0.1 50V J
C413	0B42103A	CML 0.22 50V J
C414	0B42099A	CML 0.1 50V J
C415	0B42231A	CML 1000P 50V J
C416	0B41555A	CC 0.047 25V Z
C417	0B40160A	CE 33 10V
C501	0B42099A	CML 0.1 50V J
C503	0B41553A	CC 0.01 25V Z
C504	0B42099A	CML 0.1 50V J
C505,506	0B42228A	CML 560P 50V J
C507,508	0B41553A	CC 0.01 25V Z
C509	0B41553A	CC 0.01 25V Z
C510	0B42099A	CML 0.1 50V J
C801	0B41872A	CC 18P 50V J
C802	0B41975A	CC 10P 50V C
C803	0B42099A	CML 0.1 50V J
C804	0B48040A	CE 100 10V
C805L	0B42099A	CML 0.1 50V J
C805R	0B42099A	CML 0.1 50V J
C806L,R	0B48040A	CE 100 10V
C807L,R	0B42228A	CML 560P 50V J
C808L,R	0B42219A	CML 100P 50V J
C809L,R	0B42219A	CML 100P 50V J
C810L,R	0B40162A	CE 10 16V
C811	0B40837A	CE 330 6.3V
C812	0B42219A	CML 100P 50V J
CP101	0B81465A	8P T-Post
CP102	0B81462A	5P T-Post
CP103	0B81463A	6P T-Post
CP104	0B84087A	12P T-Post
CP105	0B81461A	4P T-Post
CP107	0B81460A	3P T-Post
CP201	0B84288A	6P T-Post RED
CP202	0B84291A	7P T-Post RED
G101,102	0B80673A	Earth Plate

Schematic Ref. No.	Part No.	Description
JP1	0B80675C	11P Connector Ass'y JP1
JP2	0B80676A	4P Connector Ass'y JP2
JP3	0B80677C	11P Connector Ass'y JP3
JP4	0B80678B	2P Flat Cable JP4
JP5	0B80679C	Lead Wire JP5
JP6	0B80680A	Lead Wire JP6
JP7	0B80681B	Lead Wire JP7
PJ501	0B80668A	DIN Socket 13P
PL501,502	0B90644A	Lamp 115mA 5V
S501,502	0B70230A	Tact Switch
S503,504	0B70230A	Tact Switch
S505,506	0B70230A	Tact Switch
S507	0B70230A	Tact Switch
S508	0B70233A	Detect Switch
TP201	0B80674A	Check Terminal 1P
	0E00818A	M3x8 + Binding (Black Chromate) (3)
	0E03749A	PT3x8 + Binding (Black Chromate) (2)
	0H06769B	Reflector (1)
	0J06212B	Lamp Holder (2)
	0J07267A	Heat Sink (1)
	0J07284B	Light Shield (1)

(2) For GER

Schematic Ref. No.	Part No.	Description
BA09183A	**Main P.C.B. Ass'y (GER)**	
	The following parts are different from those for USA, CAN, EP, JPN	
R524	—	None
C504	—	None
C416	0B50265A	EMI Coil
C803	0B41529A	CML 0.033 50V J
C805L,R	0B41529A	CML 0.033 50V J
JP8	0B80720A	Lead Wire (for Earth Plate G101)

8.1. Tilt Switch P.C.B. Ass'y (MB-9)

Schematic Ref. No.	Part No.	Description
	BA39210A	**Tilt Switch P.C.B. Ass'y**
	3B61154A	Tilt Switch P.C.B.
Q1	3B10604A	TR PT480
LD1	3B10605A	LED GL480
R1	3B20933A	RK 12K 1/6W J
R2	3B20897A	RK 470 1/6W J
CP1	3B81467A	3P S-Post
	3E03769A	PT2.6x8 + Binding (2)
	3H06837B	Switch Body (1)
	3J07337A	Ball 3.0 (1)

8.2. Digital Out P.C.B. Ass'y (MB-9)

(1) For USA, CAN, EP, JPN

Schematic Ref. No.	Part No.	Description
	BA09194A	**Digital Out P.C.B. Ass'y (JPN, USA, EP)**
	0B61151A	Digital Out P.C.B.
U301	0B11613A	IC TC74HC00AF
L301	0B51138A	Coil 1MH
R301,302	0B09661A	RK 220 1/6W J
R303	0B09701A	RK 10K 1/6W J
R304	0B09677A	RK 1K 1/6W J
R305	0B09650A	RK 75 1/6W J
C301	0B40063A	CE 100 10V
C302	0B42099A	CML 0.1 50V J
C303	0B42087A	CML 0.01 50V J
C304	0B40160A	CE 33 10V
CN106	0B80684A	Connector Ass'y CN601
PJ301	0B80692A	1P Pin Jack
T301	0B51351A	Pulse Trans
	0B84388A	Terminal P-424 (1)

(2) For GER

Schematic Ref. No.	Part No.	Description
	BA09195A	**Digital Out P.C.B. Ass'y (GER)**

Note: Parts which are different from those for USA, CAN, EP & JPN will be informed by Service Information later on.

8.3. Main P.C.B. Ass'y (MB-9)

(1) For USA, CAN, EP, JPN

Schematic Ref. No.	Part No.	Description
	BA09192A	**Main P.C.B. Ass'y (USA, CAN, EP, JPN)**
	0B61150B	Main P.C.B.
U101	0B11818A	IC CXA1081S
U102	0B10580A	IC CXA1082BQ
U103	0B10558A	IC BA6296FP
U104	0B11946A	IC CXD1167Q
U105,106	0B10465A	IC LB1638M
U402	0B10567A	IC PQ05RG1
U403	0B10462A	IC TA78DS05BP
U404	0B10466A	IC M51957BF
U501	0B10612A	IC uPD75517GF
U502	0B06215A	IC TC4049BP
U801	0B10593A	IC SM5841CS

Schematic Ref. No.	Part No.	Description
U802	0B17010A	IC AD1868R-J
U803L,R	0B10588A	IC NJM2100D
Q101	0B10585A	TR 2SA1560
Q102	0B10322A	TR DTC114EL
Q103	0B10324A	TR DTC144EL
Q104	0B10330A	TR DTC144TL
Q105	0B10324A	TR DTC144EL
Q106	0B10584A	TR DTA124EL
Q107,108	0B10324A	TR DTC144EL
Q402	0B10324A	TR DTC144EL
Q404	0B10578A	TR 2SB1342
Q405	0B10398A	TR 2SC4038
Q501	0B10398A	TR 2SC4038
Q502	0B10584A	TR DTA124EL
Q507	0B10585A	TR 2SA1560
Q508	0B10322A	TR DTC114EL
Q509	0B10398A	TR 2SC4038
Q801L,R	0B10583A	TR DTC323TL
ZD401	0B12154A	ZD RD6.2JSB3
ZD402	0B10579A	ZD RD3.6ESB1
ZD501	0B12147A	ZD RD5.1JSB2
ZD502,503	0B12154A	ZD RD6.2JSB3
D101,102	0B06398A	SID 1SS176
D103,104	0B06398A	SID 1SS176
D401,402	0B12693A	SID S5688B
D403	0B12693A	SID S5688B
D404,405	0B06398A	SID 1SS176
D409	0B06398A	SID 1SS176
D501,502	0B06398A	SID 1SS176
D801L,R	0B06398A	SID 1SS176
L101,102	0B51300A	Coil 10uH
L801,802	0B51300A	Coil 10uH
X501	0B92033A	Resonator 4.0MHz
X801	0B92063A	X'tal 16.9344MHz
VR101	0B32193A	Semi VR 10K
VR102	0B32194A	Semi VR 20K
VR103,104	0B32186A	Semi VR 22K
VR105	0B30174A	Semi VR 1K
RA501	0B20667A	R-Array 47Kx9
RA502	0B20668A	R-Array 100Kx7
R101	0B09629A	RK 10 1/6W J
R102	0B09677A	RK 1K 1/6W J
R103	0B09701A	RK 10K 1/6W J
R104	0B09699A	RK 8.2K 1/6W J
R105	0B09685A	RK 2.2K 1/6W J
R106	0B09699A	RK 8.2K 1/6W J
R107	0B09725A	RK 100K 1/6W J
R108	0B09677A	RK 1K 1/6W J
R109	0B09709A	RK 22K 1/6W J
R110,111	0B09701A	RK 10K 1/6W J
R112	0B09731A	RK 180K 1/6W J
R113	0B09735A	RK 270K 1/6W J
R114	0B09742A	RK 510K 1/6W J
R115	0B09719A	RK 56K 1/6W J
R116	0B09725A	RK 100K 1/6W J
R117	0B09713A	RK 33K 1/6W J
R118	0B25291A	RM 10K 1/4WF
R119	0B25666A	RM 3.6K 1/4WF
R120	0B09734A	RK 240K 1/6W J
R121	0B09701A	RK 10K 1/6W J
R122	0B25291A	RM 10K 1/4WF
R123	0B09721A	RK 68K 1/6W J
R124	0B09701A	RK 10K 1/6W J
R125,126	0B09725A	RK 100K 1/6W J
R127	0B09737A	RK 330K 1/6W J
R128	0B09729A	RK 150K 1/6W J
R129	0B09720A	RK 62K 1/6W J
R130	0B09704A	RK 13K 1/6W J
R135	0B09677A	RK 1K 1/6W J
R136,137	0B09653A	RK 100 1/6W J
R138,139	0B09653A	RK 100 1/6W J
R140	0B09749A	RK 1M 1/6W J

Schematic Ref. No.	Part No.	Description
R141,142	0B09705A	RK 15K 1/6W J
R143	0B09701A	RK 10K 1/6W J
R144	0B09713A	RK 33K 1/6W J
R145	0B09701A	RK 10K 1/6W J
R146,147	0B09713A	RK 33K 1/6W J
R148	0B09731A	RK 180K 1/6W J
R156	0B09701A	RK 10K 1/6W J
R157	0B09697A	RK 6.8K 1/6W J
R158	0B24235A	RF 1 1W
R159,160	0B09701A	RK 10K 1/6W J
R402	0B09719A	RK 56K 1/6W J
R403	0B09677A	RK 1K 1/6W J
R404	0B09733A	RK 220K 1/6W J
R405	0B09701A	RK 10K 1/6W J
R406	0B09732A	RK 200K 1/6W J
R407,408	0B09725A	RK 100K 1/6W J
R409	0B09725A	RK 100K 1/6W J
R410	0B09653A	RK 100 1/6W J
R411	0B09701A	RK 10K 1/6W J
R412	0B09685A	RK 2.2K 1/6W J
R413	0B09676A	RK 910 1/6W J
R501	0B09701A	RK 10K 1/6W J
R502	0B09713A	RK 33K 1/6W J
R503,504	0B09725A	RK 100K 1/6W J
R505,506	0B09725A	RK 100K 1/6W J
R507	0B09725A	RK 100K 1/6W J
R508,509	0B09669A	RK 470 1/6W J
R510	0B09725A	RK 100K 1/6W J
R511	0B09703A	RK 12K 1/6W J
R512	0B09685A	RK 2.2K 1/6W J
R513	0B09725A	RK 100K 1/6W J
R514	0B09677A	RK 1K 1/6W J
R515	0B09725A	RK 100K 1/6W J
R518	0B24443A	RF 27 1W
R519	0B09695A	RK 5.6K 1/6W J
R520,521	0B09725A	RK 100K 1/6W J
R522	0B09725A	RK 100K 1/6W J
R523	0B09693A	RK 4.7K 1/6W J
R524	0B09646A	RK 51 1/6W J
R525,526	0B09725A	RK 100K 1/6W J
R527	0B09693A	RK 4.7K 1/6W J
R528	0B09749A	RK 1M 1/6W J
R529,530	0B09693A	RK 4.7K 1/6W J
R531	0B09749A	RK 1M 1/6W J
R532	0B09693A	RK 4.7K 1/6W J
R533,534	0B09701A	RK 10K 1/6W J
R535,536	0B09701A	RK 10K 1/6W J
R537,538	0B09701A	RK 10K 1/6W J
R539,540	0B09701A	RK 10K 1/6W J
R541,542	0B09701A	RK 10K 1/6W J
R543	0B09693A	RK 4.7K 1/6W J
R801,802	0B09661A	RK 220 1/6W J
R803,804	0B09661A	RK 220 1/6W J
R805L,R	0B25675A	RM 9.1K 1/4W F
R806L,R	0B25675A	RM 9.1K 1/4W F
R807L,R	0B25320A	RM 20K 1/4W F
R808L,R	0B25291A	RM 10K 1/4W F
R809L,R	0B25291A	RM 10K 1/4W F
R810L,R	0B25291A	RM 10K 1/4W F
R811L,R	0B09671A	RK 560 1/4W J
R812L,R	0B09725A	RK 100K 1/4W J
R813L,R	0B09653A	RK 100 1/4W J
R814L,R	0B25320A	RM 20K 1/4W F
R815L,R	0B25320A	RM 20K 1/4W F
R816L,R	0B25320A	RM 20K 1/4W F
R817L,R	0B25291A	RM 10K 1/4W F
C101	0B48040A	CE 100 10V
C102	0B41944A	CC 1000P 50V K
C103	0B42237A	CML 3300P 50V J
C104	0B41708A	CC 22P 50V J
C105	0B42095A	CML 0.047 50V J
C106	0B40160A	CE 33 10V

MB-9 Electrical Parts list (2/2)

Schematic Ref. No.	Part No.	Description
C107	0B42095A	CML 0.047 50V J
C108	0B40268A	CE 0.47 50V
C109	0B42239A	CML 4700P 50V J
C110	0B42089A	CML 0.015 50V J
C111	0B40160A	CE 33 10V
C112	0B41553A	CC 0.01 25V Z
C113	0B40271A	CE 3.3 25V
C114	0B42095A	CML 0.047 50V J
C115,116	0B42235A	CML 2200P 50V J
C117	0B42099A	CML 0.1 50V J
C118	0B42095A	CML 0.047 50V J
C119	0B40170A	CE 4.7 35V
C120	0B42099A	CML 0.1 50V J
C121	0B42087A	CML 0.01 50V J
C122	0B42099A	CML 0.1 50V J
C123	0B42025A	CE 10 16V (BP)
C124	0B42099A	CML 0.1 50V J
C125	0B40160A	CE 33 10V
C126	0B42099A	CML 0.1 50V J
C127	0B47122A	CC 100P 50V K
C129	0B48040A	CE 100 10V
C130	0B42231A	CML 1000P 50V J
C131	0B40268A	CE 0.47 50V
C132	0B42099A	CML 0.1 50V J
C133	0B42087A	CML 0.01 50V J
C134	0B42240A	CML 5600P 50V J
C135	0B42223A	CML 220P 50V K
C136	0B42087A	CML 0.01 50V J
C137	0B42099A	CML 0.1 50V J
C139,140	0B41553A	CC 0.01 25V Z
C141	0B40160A	CE 33 10V
C142	0B41553A	CC 0.01 25V Z
C143	0B40162A	CE 10 16V
C144	0B42090A	CML 0.018 50V J
C145	0B48040A	CE 100 10V
C146	0B42099A	CML 0.1 50V J
C147	0B40170A	CE 4.7 35V
C148	0B42089A	CML 0.015 50V J
C150,151	0B40789A	CE 220 10V
C152	0B42091A	CML 0.022 50V J
C153	0B47126A	CC 220P 50V K
C401	0B40082A	CE 1000 16V
C402	0B42099A	CML 0.1 50V J
C403	0B40162A	CE 10 16V
C404	0B42099A	CML 0.1 50V J
C405	0B42145A	CE 470 6.3V (LN)
C406,407	0B42099A	CML 0.1 50V J
C409	0B40698A	CE 100 16V
C410	0B42099A	CML 0.1 50V J
C411	0B42247A	CE 0.1F 5.5V
C412	0B42099A	CML 0.1 50V J
C413	0B42103A	CML 0.22 50V J
C414	0B42099A	CML 0.1 50V J
C415	0B42231A	CML 1000P 50V J
C416	0B41555A	CC 0.047 25V Z
C417	0B40160A	CE 33 10V
C501	0B42099A	CML 0.1 50V J
C503	0B41553A	CC 0.01 25V Z
C504	0B42099A	CML 0.1 50V J
C505,506	0B42228A	CML 560P 50V J
C507,508	0B41553A	CC 0.01 25V Z
C509	0B41553A	CC 0.01 25V Z
C510	0B42099A	CML 0.1 50V J
C801,802	0B41975A	CC 10P 50V D
C803,804	0B42099A	CML 0.1 50V J
C805	0B42099A	CML 0.1 50V J
C806,807	0B42195A	CE 4.7 50V (LN)
C808L,R	0B42227A	CML 470P 50V J
C809L,R	0B42227A	CML 470P 50V J
C811L,R	0B42227A	CML 470P 50V J
C812L,R	0B42227A	CML 470P 50V J
C813L,R	0B40162A	CE 10 16V
C814	0B42099A	CML 0.1 50V J
CP101	0B81465A	8P T-Post

Schematic Ref. No.	Part No.	Description
CP102	0B81462A	5P T-Post
CP103	0B81463A	6P T-Post
CP104	0B84087A	12P T-Post
CP105	0B81461A	4P T-Post
CP106	0B84281A	3P T-post
CP107	0B81460A	3P T-Post
CP201	0B84288A	6P T-Post Red
CP202	0B84291A	7P T-Post Red
G101,102	0B80673A	Earth Plate
JP1	0B80675C	11P Connector Ass'y JP1
JP2	0B80676A	4P Connector Ass'y JP2
JP3	0B80677C	4P Connector Ass'y JP3
JP4	0B80678B	2P Flat Cable JP4
JP5	0B80679C	Lead Wire JP5
JP6	0B80680A	Lead Wire JP6
JP7	0B80681B	Lead Wire JP7
PJ501	0B80668A	DIN Jack 13P
PJ801	0B81630A	2P Pin Jack (Gold)
PL501,502	0B90644A	Lamp 115mA 5V
S501,502	0B70230A	Tact Switch
S503,504	0B70230A	Tact Switch
S505,506	0B70230A	Tact Switch
S507	0B70230A	Tact Switch
S508	0B70233A	Detect Switch
TP201	0B80674A	Check Terminal 1P
	0E00818A	M3x8 + Binding (Black Chromate) (3)
	0E03749A	PT3x8 + Binding (Black Chromate) (2)
	0H06769B	Reflector (1)
	0J06212B	Lamp Holder (2)
	0J07267A	Heat Sink (1)
	0J07284B	Light Shield (1)

(2) For GER

Schematic Ref. No.	Part No.	Description
	BA09193A	**Main P.C.B. Ass'y (GER)**

Note: Parts which are different from those for USA, CAN, EP & JPN will be informed by Service Information later on.

9. IC BLOCK DIAGRAMS

U501 μPD75517GF (Mechanism Controller)

Pin No.	Signal Name	I/O	Function
1	GND	–	GND
2	GND	–	GND
3 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	GND	–	GND
10	DAT OUT	O	Serial data output to the remote controller.
11	CLK OUT	O	Clock output to the remote controller.
12	GND	–	GND
13	EMP	O	De-emphasis control signal. L: De-emphasis ON.
14	MUTG	O	Mute control signal. H: Mute ON.
15	SYS ON	O	System ON signal.
16	LAMP	O	Lamp ON signal.
17	SUBQ	I	Subcode Q data.
18	NC	–	–
19	$\overline{\text{SQCK}}$	O	Clock for reading subcode Q data.
20	$\overline{\text{OPEN}}$	I	Door open/close switch signal. L: Open
21	$\overline{\text{TRG}}$	I	Trigger L pulse is generated when door is open.
22	$\overline{\text{DISC1}}$	I	Disc 1 eject/load button input signal. Becomes L when button is pressed.
23	$\overline{\text{DISC2}}$	I	Disc 2 eject/load button input signal. Becomes L when button is pressed.
24	$\overline{\text{DISC3}}$	I	Disc 3 eject/load button input signal. Becomes L when button is pressed.
25	$\overline{\text{DISC4}}$	I	Disc 4 eject/load button input signal. Becomes L when button is pressed.
26	$\overline{\text{DISC5}}$	I	Disc 5 eject/load button input signal. Becomes L when button is pressed.
27	$\overline{\text{DISC6}}$	I	Disc 6 eject/load button input signal. Becomes L when button is pressed.
28	$\overline{\text{DISC7}}$	I	Disc 7 eject/load button input signal. Becomes L when button is pressed.
29 to 31	GND	–	GND
32	$\overline{\text{CD RST}}$	O	Reset signal output. L: Reset
33	VSS	–	GND
34 to 37	GND	–	GND
38	$\overline{\text{LDON}}$	O	Laser ON signal.

Pin No.	Signal Name	I/O	Function
39	$\overline{XLT}$	O	Latch pulse for data at pin 41.
40	$\overline{CLK}$	O	Clock for data at pin 41.
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	DSP SEL	I	DSPSEL signal input from the remote controller.
47	GND	–	GND
48	ACC CONT	I	Remote signal input from the remote controller.
49	SCOR	I	Subcode input trigger signal.
50	DAT IN	I	Signal input from the remote controller.
51	GND	–	GND
52	CLK IN	I	Clock for reading DAT IN at pin 50.
53	BSENS	I	Battery voltage sensing input.
54	VSS	–	GND
55	GND	–	GND
56	NC	–	–
57	IC	–	Connected to GND.
58 59	X1 X2	–	4MHz crystal is connected.
60	$\overline{RESET}$	I	System reset signal.
61	$\overline{RAM\ CLR}$	I	RAM reset input for stocker operation check.
62	$\overline{D.\ DET}$	I	Disc presence detecting input.
63	$\overline{D.\ CNT}$	I	Stocker position counting input.
64	$\overline{CENTER}$	I	Disc tray center detecting input.
65	$\overline{T.\ CLOSE}$	I	Disc tray close detecting input.
66 67 68	POS3 POS2 POS1	I	Pickup position detecting inputs.
69	$\overline{INNER}$	I	Inner switch signal. Become "L" when the laser pickup reaches the innermost position.
70	$\overline{H.\ POS}$	I	Stocker home position detecting input.
71	$\overline{STORE}$	I	Disc tray stock position detecting input.
72	$\overline{EJECT}$	I	Disc tray ejection detecting input.
73 to 76	GND	–	GND
77	FORM	I	Unit tilting detecting input. L: Unit is tilting over predetermined value.
78 to 80	GND	–	GND

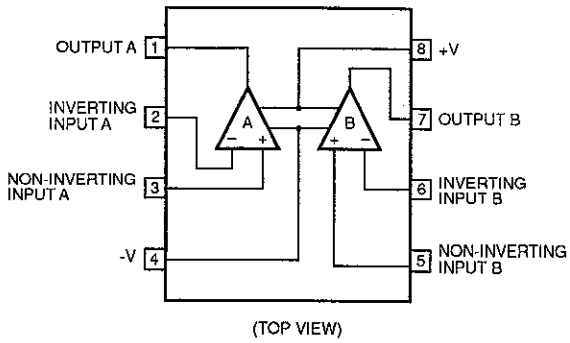


Fig. 9.1 Operational Amp. 2100D

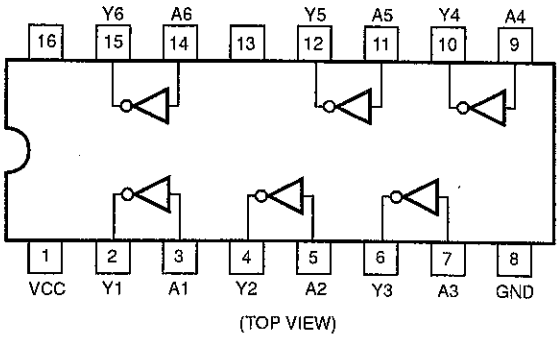
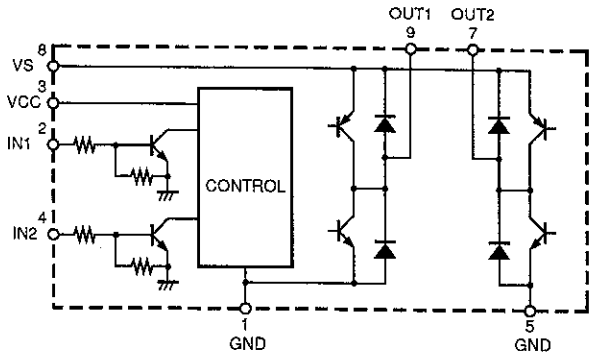


Fig. 9.2 Inverter TC4049BP



MODE	IN1	IN2	OUT1	OUT2
FWD	H	L	H	L
REV	L	H	L	H
BRAKE	H	H	L	L
STANDBY	L	L	OFF	OFF

Fig. 9.3 Motor Driver LB1638M

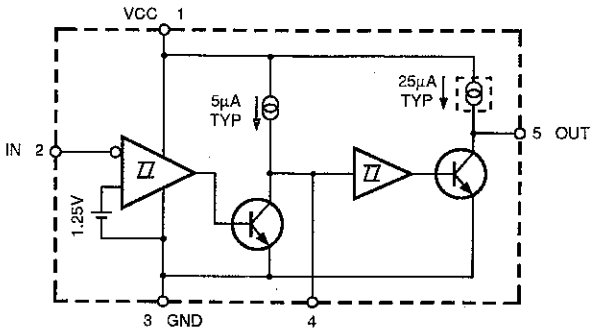


Fig. 9.4 Voltage Drop Detector M51957BF

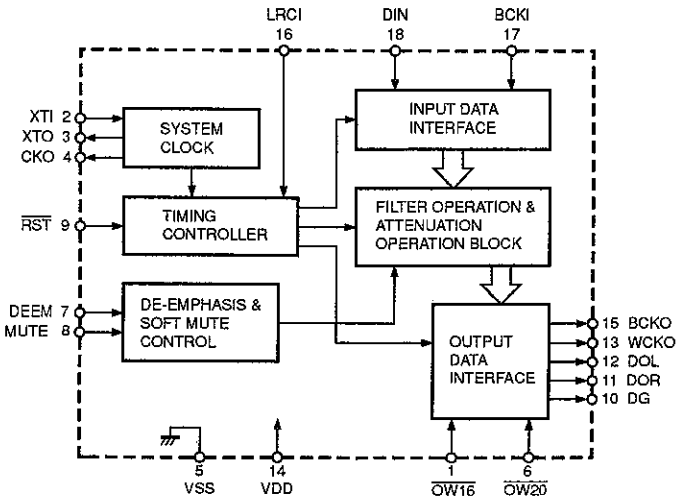


Fig. 9.5 8-Times Oversampling Digital Filter SM5841CS (MB-9)

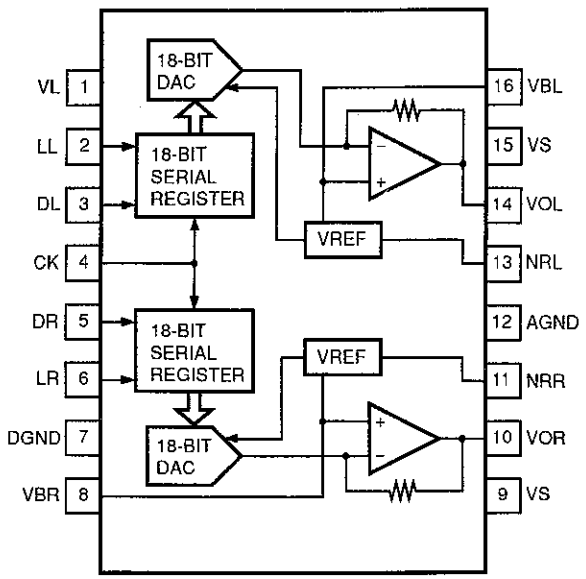


Fig. 9.6 Digital-to-Analog Converter AD1868R (MB-9)

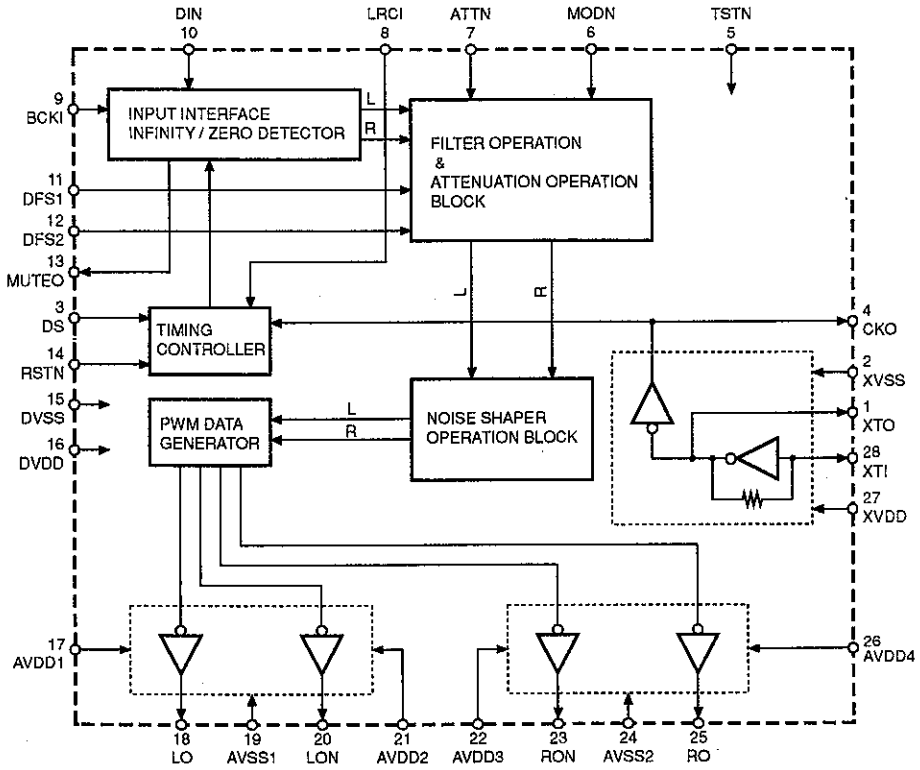


Fig. 9.7 Digital-to-Analog Converter SM5871AN (MB-7)

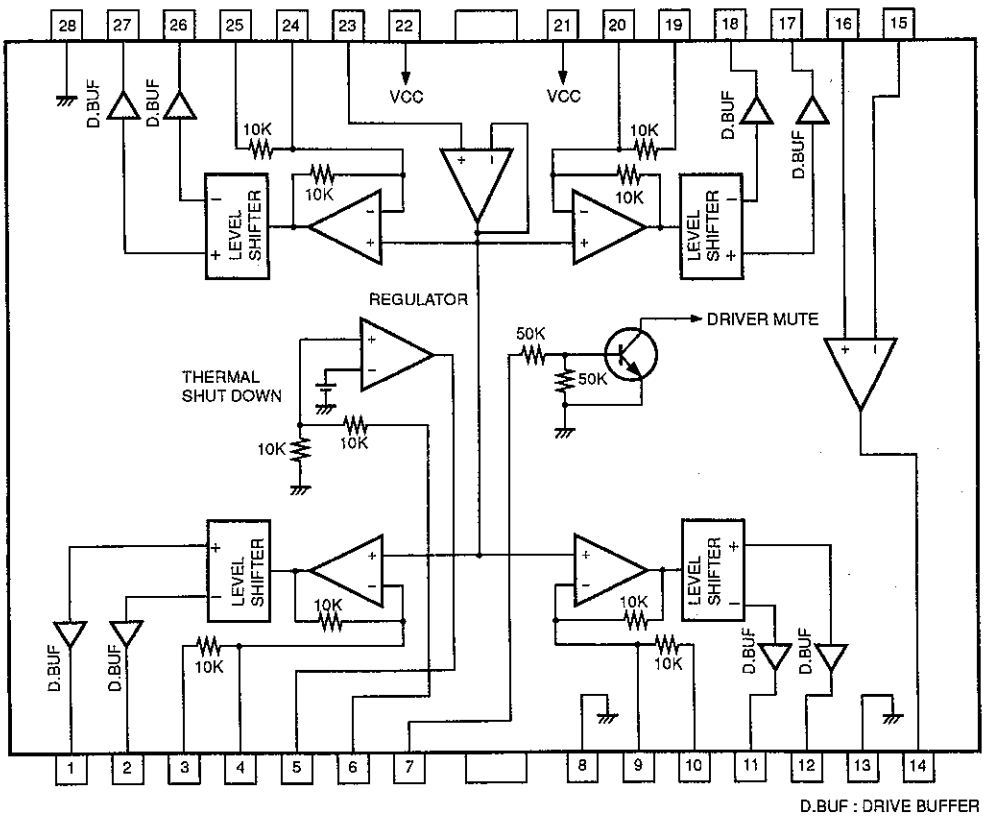


Fig. 9.8 Dirver BA6296FP

10. BLOCK DIAGRAM

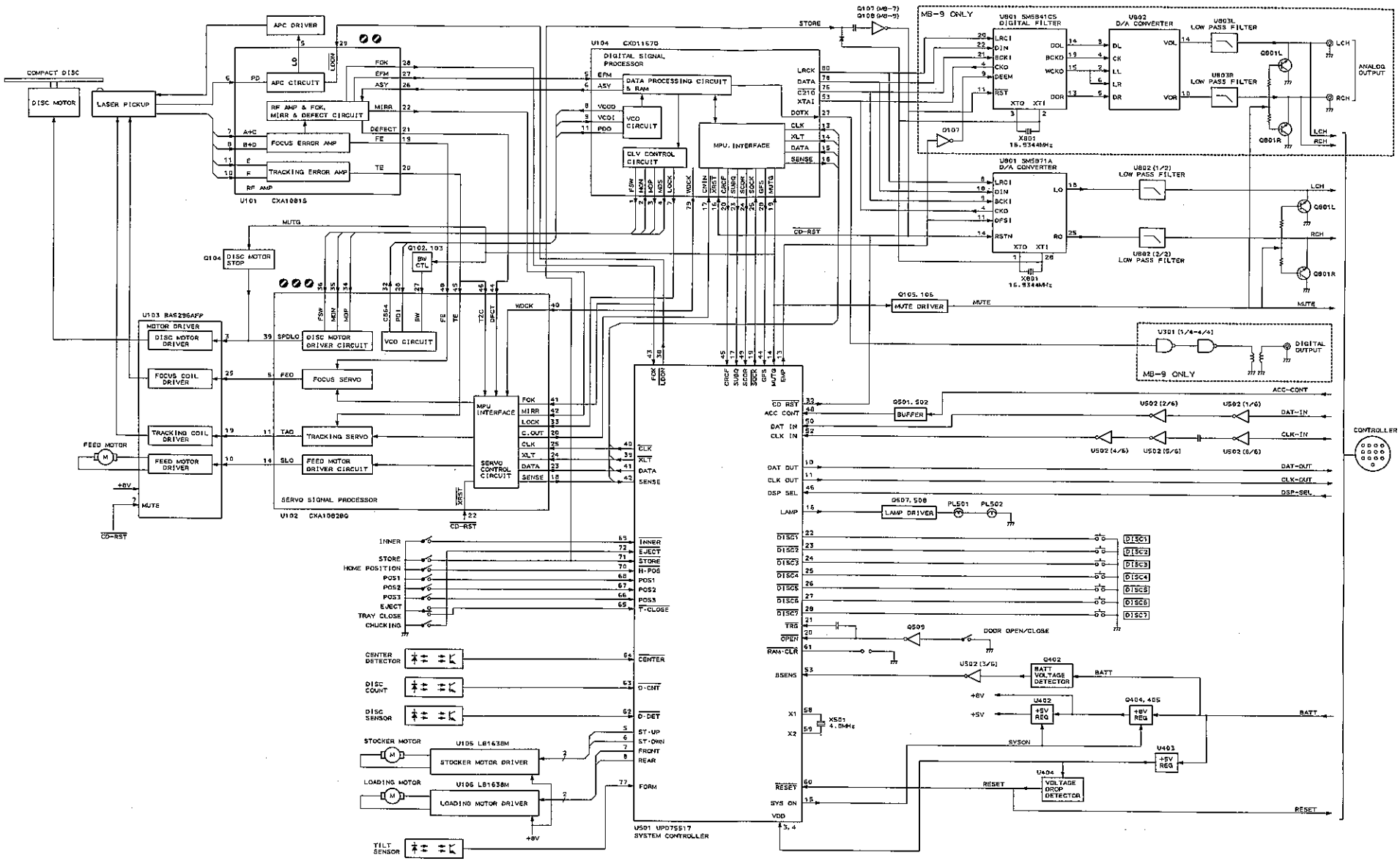


Fig. 10

11. WIRING DIAGRAM

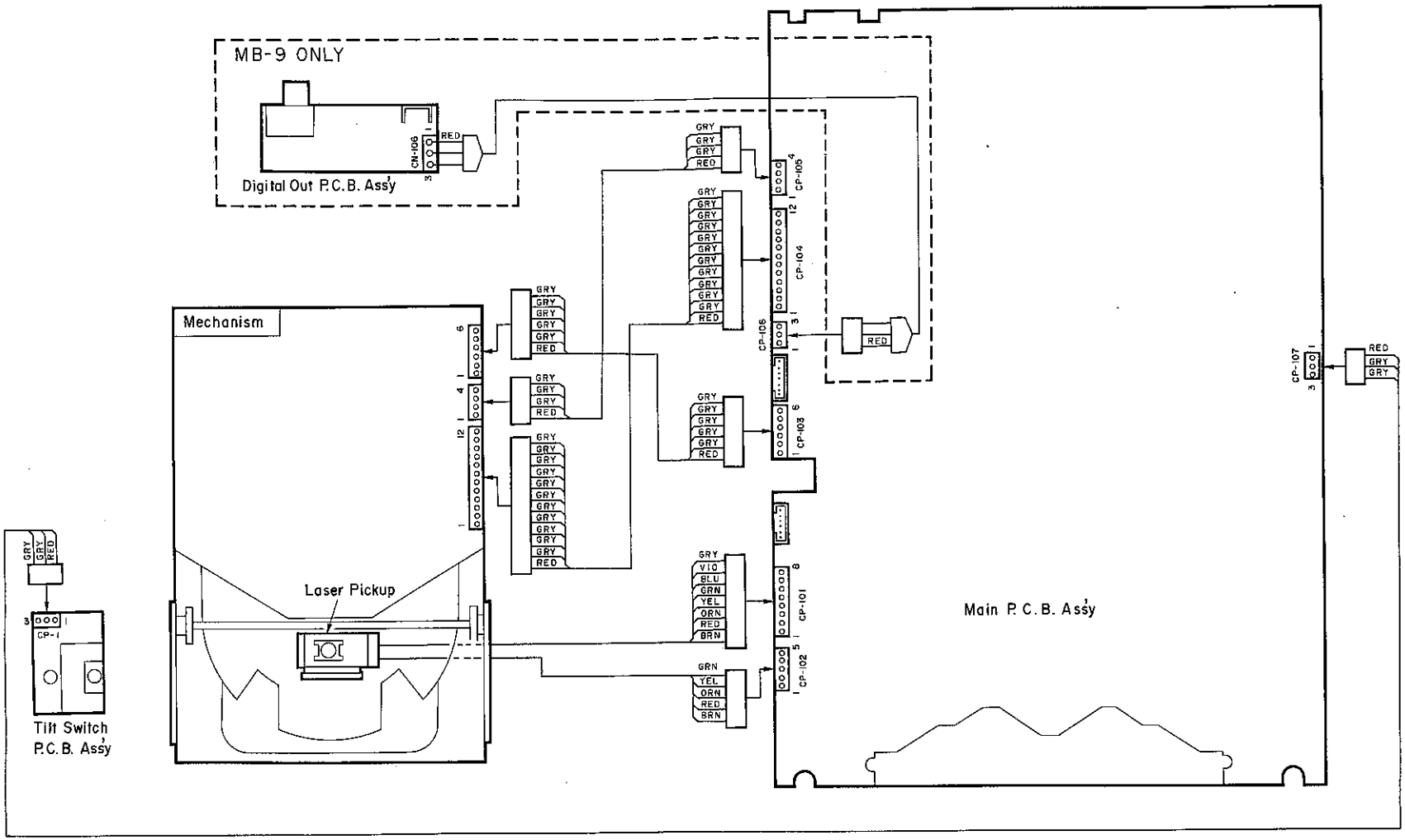


Fig. 11.1

NOTES: 1. Table of wire colors

BRN	— Brown	BLU	— Blue
RED	— Red	VIO	— Violet
ORN	— Orange	GRY	— Gray
YEL	— Yellow	WHT	— White
GRN	— Green	BLK	— Black

2. Component side view of the P.C.B. is illustrated unless otherwise specified.

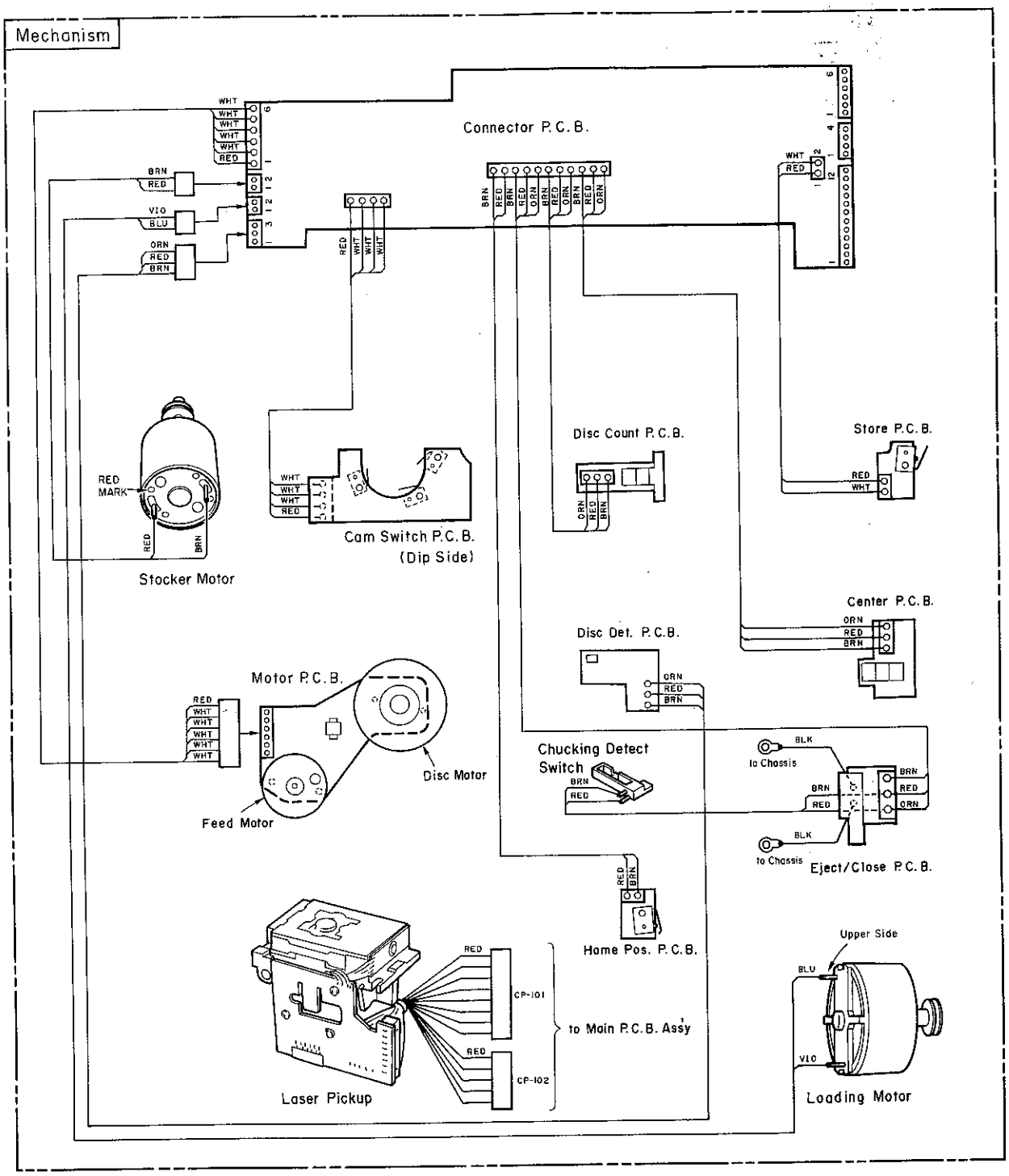

Mechanism
Connector P.C.B.
Stocker Motor
RED MARK
Cam Switch P.C.B.
(Dip Side)
Disc Count P.C.B.
Store P.C.B.
Center P.C.B.
Disc Det. P.C.B.
Motor P.C.B.
Disc Motor
Feed Motor
Chucking Detect Switch
to Chassis
Eject/Close P.C.B.
Home Pos. P.C.B.
Laser Pickup
CP-101
CP-102
to Main P.C.B. Assy
Upper Side
Loading Motor

Fig. 11.2

SPECIFICATIONS

System	Compact Disc digital audio
Signal Readout	Optical (semiconductor laser)
Error Correction	CIRC principle
Number of Channels	2 channels, stereo
D/A Converter Type	1-bit dual D/A converters with 3rd-order noise shaper and 8-times oversampling digital filter **[MB-7]**
	18-bit dual D/A converters with 8-times oversampling digital filter **[MB-9]**
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	10-20,000 Hz +0.5dB, –1.5 dB **[MB-7]**
	10-20,000 Hz +0.5dB, –0.5 dB **[MB-9]**
Signal to Noise Ratio	Better than 88 dB (IHF A-WTD) **[MB-7]**
	Better than 92 dB (IHF A-WTD) **[MB-9]**
Dynamic Range	Better than 86 dB **[MB-7]**
	Better than 90 dB **[MB-9]**
Total Harmonic Distortion	0.015% or less (1 kHz) **[MB-7]**
	0.008% or less (1 kHz) **[MB-9]**
Channel Separation	Better than 80 dB **[MB-7]**
	Better than 88 dB **[MB-9]**
Output Level/Impedance	1.2 V/600 ohms (1 kHz, 0 dB) **[MB-7]**
	1.5 V/600 ohms (1 kHz, 0 dB) **[MB-9]**
Power Source	14.4 VDC negative ground (10.8–15.6 V allowable)
Power Consumption	1 A max.
Dimensions*	196 (W) × 113 (H) × 298 (D) mm
	7-11/16 (W) × 4-7/16 (H) × 11-3/4 (D) inches
Approximate Weight	3.6 kg/7 lbs. 15 oz.

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

- MusicBank is a trademark of Nakamichi Corporation.
- Specifications and design are subject to change for further improvement without notice.

Nakamichi Corporation 1-153 Suzukicho, Kodaira, Tokyo 187 Phone: (0423) 42-1115
Nakamichi America Corporation 955 Francisco St., Torrance, CA 90502 Phone: (310) 538-8150
Nakamichi Canada 276 South West, Marine Drive, Vancouver, B.C. V5X 2R4 Phone: (604) 324-7535
Nakamichi Australia Unit 12 620-632 Botany Road, Alexandria, N.S.W. 2015 Phone: (02) 667-0811
Nakamichi GmbH Praunheimer Landstraße 32 D-60488 Frankfurt/Main Phone: (069) 7682021 (Office), 7682025 (Service)

0Q06176A G-940610A Printed in Japan