Nakamichi

Service Manual

Nakamichi CD Player 4

MC-Service

CONTENTS

1. GENERAL

1.1. Model No.

Model No.: V313

1.2. Destinations

USA, CAN, EP, AUS, OTR, JPN

Abbreviation

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

1.3. CAUTIONS/WARNINGS

(1) Product Safety Notice

Parts marked with the symbol ⚠ in the schematic diagram have critical characteristics.

Use ONLY replacement parts recommended by the manufacturer.

It is recommended that the unit be operated from a suitable DC supply or batteries during initial check-out procedures.

(2) Leakage Current Check/Resistance Check

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

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

(3) Protection of Eyes from Laser Beam

To protect eyes from invisible laser beam during servicing, DO NOT LOOK AT THE LASER BEAM.

- Laser Diode Properties
  Laser Output: 44.6 μW Max.
  Measured at a distance of about 200 mm from the object lens surface on the Laser Pickup.
  Wavelength: 780 nm
  Emission Duration: Continuous

- Laser Caution Label and Class 1 Laser Product Label (for EP)

CAUTION– INVISIBLE LASER RADIATION WHEN OPEN AND INTERLOCKS DEFEATED. AVOID EXPOSURE TO BEAM.

VORSICHT! UNSICHTBARE LASERSTRAHLUNG TRITT AUS, WENN DECKEL GEÖFFNET UND WENN SICHERHEITSVERRIEGELUNG ÜBERBRÜCKT IST. NICHT DEM STRAHL AUSSETZEN!

VARNING– OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD OCH SPÄRR ÄR URKOPPLAD. STRÅLEN ÄR FARLIG.

ADVARSEL– USYNLIG LASERSTRÅLING VED ÅBNING, NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION. UNDGÅ UDSÆTTELSE FOR STRÅLING.

VAROITUS! LAITE SISÄLTÄÄ LASERDIODIN, JOKA LÄHETTÄÄ NÄKYMÄTÖNTÄ SILMILLE VAARALLISTA LASERSÄTEILYÄ.

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. 1.1.
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 Compact Disc Player's 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 shoud be: (1) a ceramic soldering iron, (2) a soldering iron with its metal part grounded, or (3) a soldering iron whose insulation resistance after five minutes of power application is 10 M-ohm or more at 500 VDC. Soldering should be completed promptly, at a soldering iron temperature of 320° max (39 W). A soldering iron heated above this temperature can break down the laser diode.

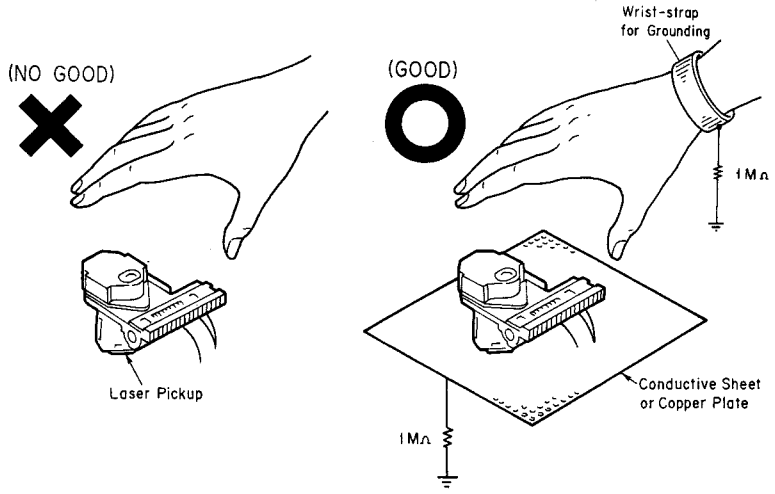


Fig. 1.1

1.5. Voltage Selector

Voltage Selector is installed on the Rear Panel of the Nakamichi CD Player 4 (Other). The voltage selector can select either 110V/127V or 220V/240V at customer's disposal.

1.6. Parts Supply

(1) **Unstocked Parts**
Parts marked with "★" at the head of part No. are not stocked. So, it takes time to supply the parts after we receive your order.

(2) **Unsupplied Parts**
Parts without part Nos. (indicated as "—" in the parts list) are not supplied.

1.7. Package Ass'y and Accessory Ass'y

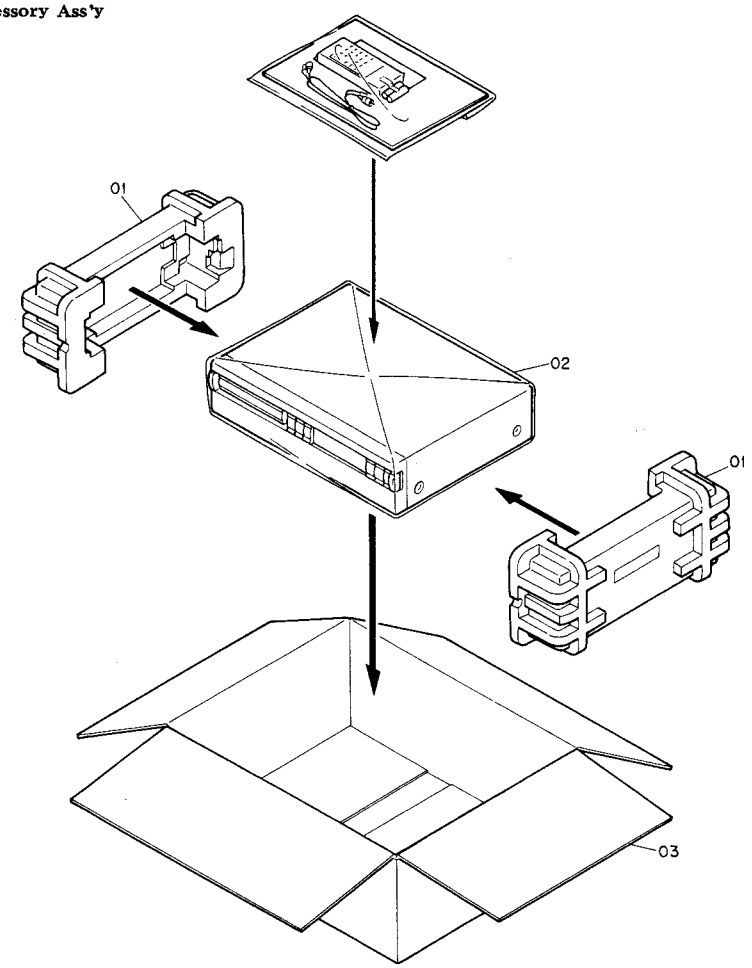


Fig. 1.2

Schematic Ref. No.	Part No.	Description	Q'ty	Schematic Ref. No.	Part No.	Description	Q'ty
	—	Package Ass'y			DA04340A	Accessory Ass'y (USA, CAN)	1
					DA04338A	Accessory Ass'y (EP)	1
01	0F04434A	Packing	2		DA04337A	Accessory Ass'y (AUS)	1
02	0F04458A	Poly Sheet	1		DA04334A	Accessory Ass'y (OTR)	1
03	0F04433A	Carton Box	1		DA04333A	Accessory Ass'y (JPN)	1
					0B90451A	Battery UM3	2
					0D03092B	Poly Bag for Accessory 320x340x0.08	1
					0D06097A	Owner's Manual(English/German/French)	1
					0D06098A	Owner's Manual(Japanese)	1
					DA04331A	Remote Control Unit (CD Player 4)	1
					DA04388A	Pin-Pin Cord Ass'y	1

2. REMOVAL PROCEDURES

2.1. Top Cover Ass'y
Refer to Fig. 2.1.
(1) Loosen screws F01 (2 pcs.) and F02 (4 pcs.), and remove F03 (Top Cover Ass'y) upward.

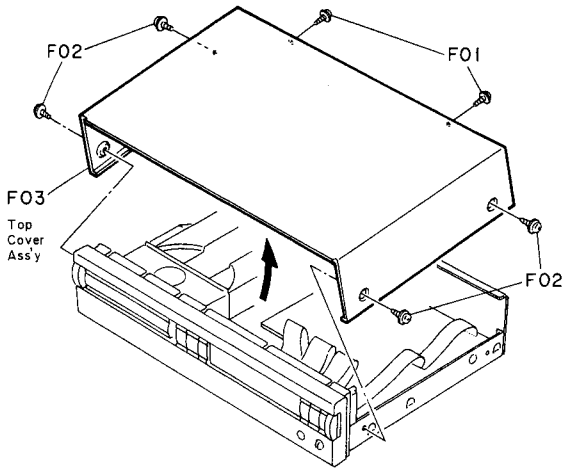


Fig. 2.1

2.2. Disc Tray Cover Ass'y
Refer to Fig. 2.2.
(1) Turn ON the Power switch.
(2) Press the Eject/Load button to eject the Disc Tray.
(3) Turn OFF the Power switch.
(4) Pull F01 (Disc Tray Cover Ass'y) upward to remove it.

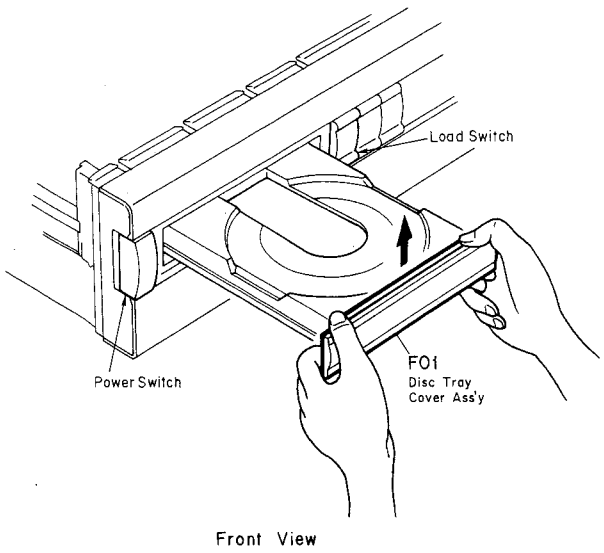


Fig. 2.2

2.3. Front Panel Ass'y
Refer to Fig. 2.3.
(1) Remove the Top Cover Ass'y referring to item 2.1.
(2) Remove the Disc Tray Cover Ass'y referring to item 2.2.
(3) Loosen screws F01 (2 pcs.) and F02 (3 pcs.), and remove F03 (Front Panel Ass'y).

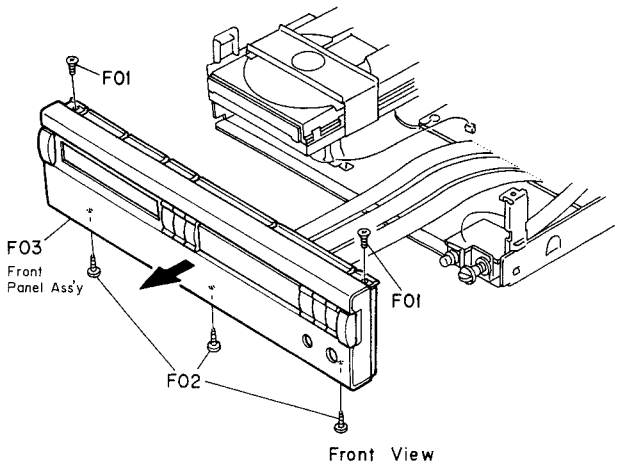


Fig. 2.3

2.4. Disc Mechanism Ass'y
Refer to Figs. 2.4.1 and 2.4.2.
(1) Remove the Top Cover Ass'y referring to item 2.1.
(2) Remove the Disc Tray Cover Ass'y referring to item 2.2.
(3) Short the lands "A" on the Sub P.C.B. Ass'y which is mounted at the back of the Disc Mechanism Ass'y. See Fig. 2.4.1.

Cautions: 1. Use a soldering iron whose metal part is grounded, or a ceramic soldering iron.
2. Do not forget shorting. Otherwise, the Laser Pickup will be damaged when connectors of the Disc Mechanism Ass'y are disconnected from the Main P.C.B. Ass'y.

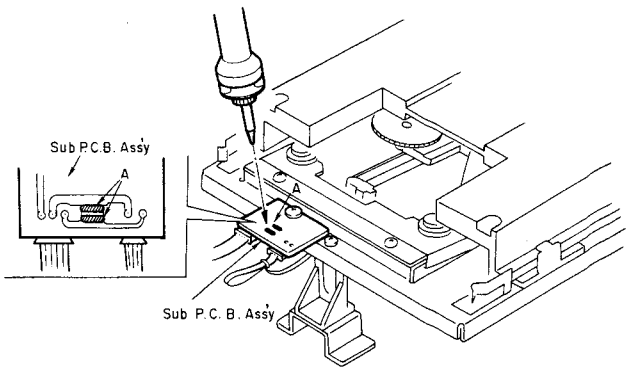


Fig. 2.4.1

(4) Loosen screws F01 (3 pcs.), disconnect connectors from the Main P.C.B. Ass'y, and remove F02 (Disc Mechanism Ass'y). See Fig. 2.4.2.

Note: On installing F02 (Disc Mechanism Ass'y), do not remove soldering of the lands "A" on the Sub P.C.B. Ass'y before connecting all connectors to the Main P.C.B. Ass'y.

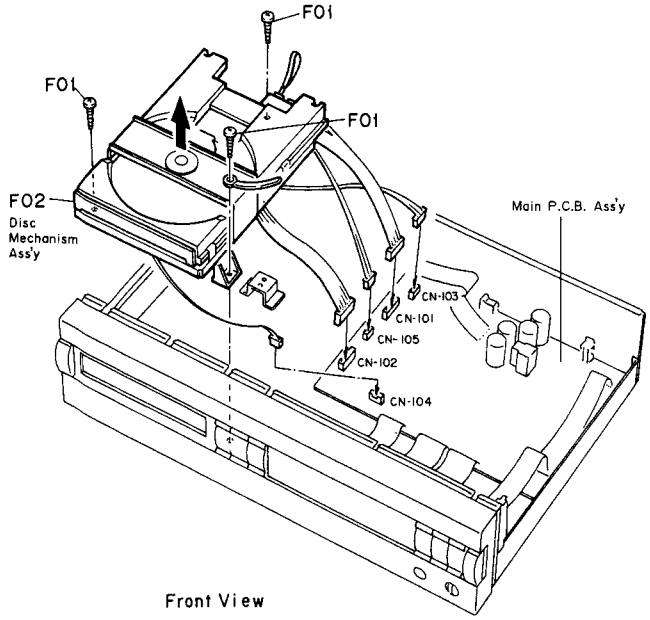


Fig. 2.4.2

2.5. Laser Pickup

Refer to Figs. 2.5.1 and 2.5.2.

2.5.1. Removing the Laser Pickup

(1) Remove the Disc Mechanism Ass'y referring to item 2.4. (Do not forget shorting the lands "A" on the Sub P.C.B. Ass'y.)

(2) Turn over the Disc Mechanism Ass'y and short the lands "B" on the P.C.B. of the Laser Pickup. See Fig. 2.5.1.

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

2. Do not forget shorting the land "B" as the Laser Pickup will be damaged when it is removed.

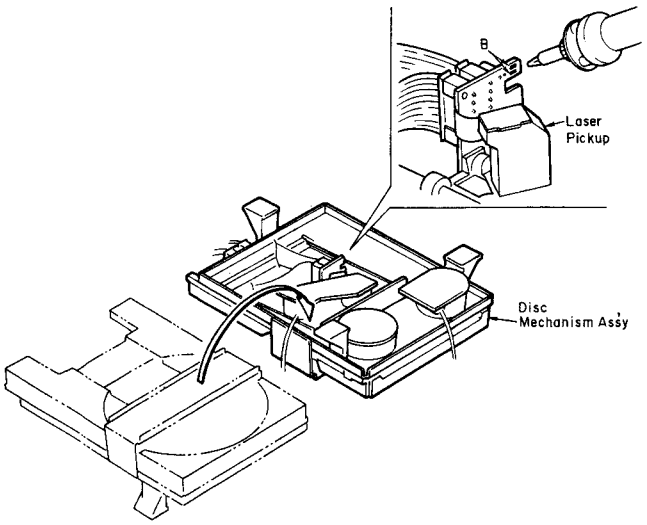


Fig. 2.5.1

(3) Slide the Disc Tray forward by hand.

(4) Loosen screws F01 (2 pcs.) and remove F02 (Chuck Chassis Ass'y). See Fig. 2.5.2.

(5) Loosen a screw F03 and remove F04 (Gear A).

(6) Loosen screws F05 (2 pcs.) and remove F06 (Shaft Clamp, 2 pcs.).

(7) Pull out F07 (Slide Shaft) from F08 (Laser Pickup).

2.5.2. Installing a New Laser Pickup

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 a new Laser Pickup by reversing procedures in item 2.5.1. See Fig. 2.5.2.

(2) Turn over the Disc Mechanism Ass'y and remove soldering of the lands B on the P.C.B. of the Laser Pickup. See Fig. 2.5.1.

(3) Install the Disc Mechanism Ass'y with three screws and connect all connectors to the Main P.C.B. Ass'y. See Fig. 2.4.2.

(4) Remove soldering of the lands A on the Sub P.C.B. Ass'y at the back of the Disc Mechanism Ass'y. See Fig. 2.4.1.

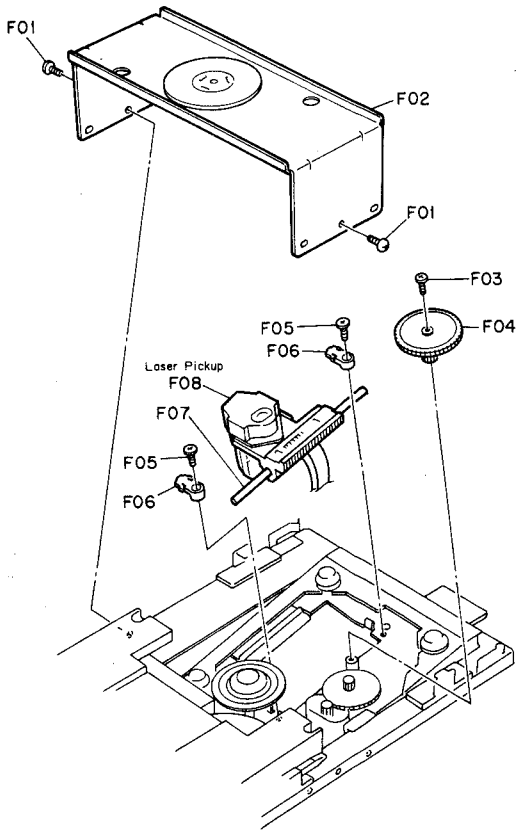


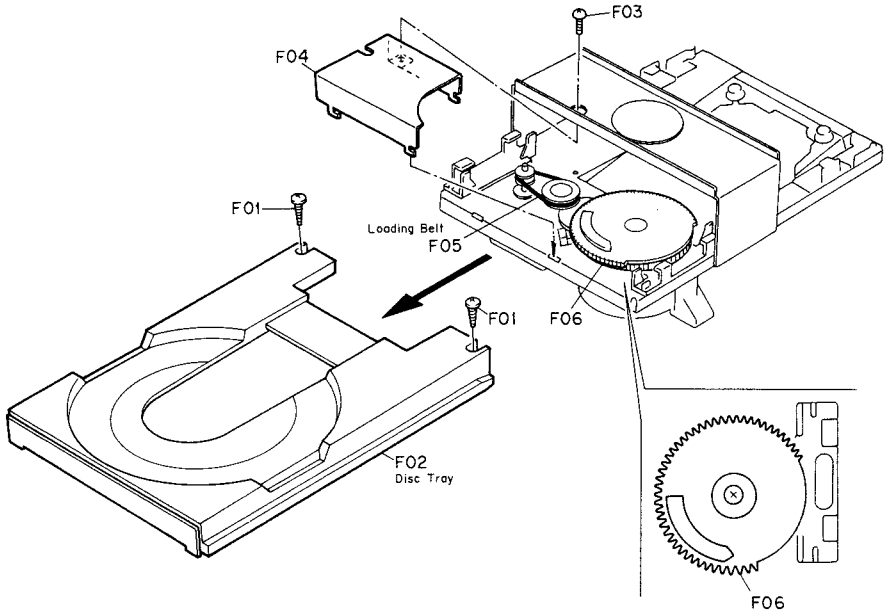
Fig. 2.5.2

2.6. Disc Tray and Loading Belt

Refer to Fig. 2.6.

(1) Remove the Top Cover Ass'y referring to item 2.1.
(2) Remove the Disc Tray Cover Ass'y referring to item 2.2.
(3) To set F02 (Disc Tray) free, push it until it reaches the end.
(4) Loosen screws F01 (2 pcs.) and pull out F02 (Disc Tray) forward.
(5) Loosen a screw F03, remove F04 (Gear Cover), and disengage F05 (Loading Belt).

Note: When installing F02 (Disc Tray), turn F06 (Drive Gear) so that it is positioned as shown in Fig. 2.6 before inserting F02 (Disc Tray).



Front View

Fig. 2.6

3. MEASUREMENT INSTRUMENTS AND JIGS

(1) Oscilloscope (15 MHz or more)
(2) DC Voltmeter
(3) Oscillator
(4) Frequency Counter
(5) Distortion Meter
(6) Philips Test Disc 5/5A
(7) SONY Test Disc YEDS-7 (Type 3)
(8) • CD Player Test Unit (DA09155A)
    • Test Unit Cable for CD Player 4 (DA09156A)

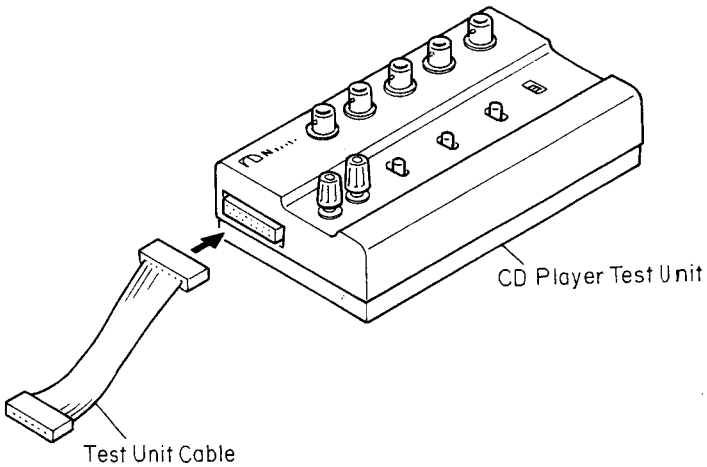


Fig. 3.1 Test Unit

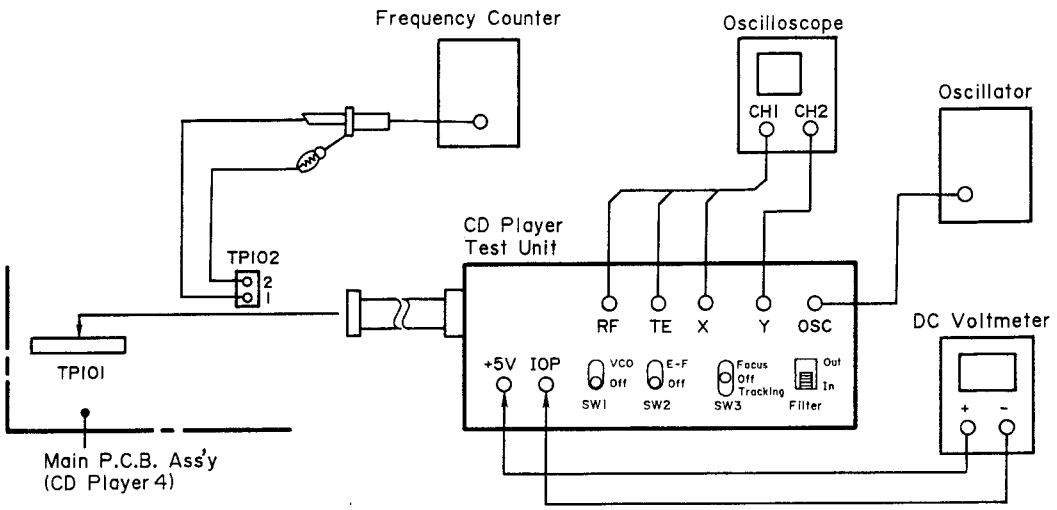


Fig. 3.2 Test Unit Connecting Diagram

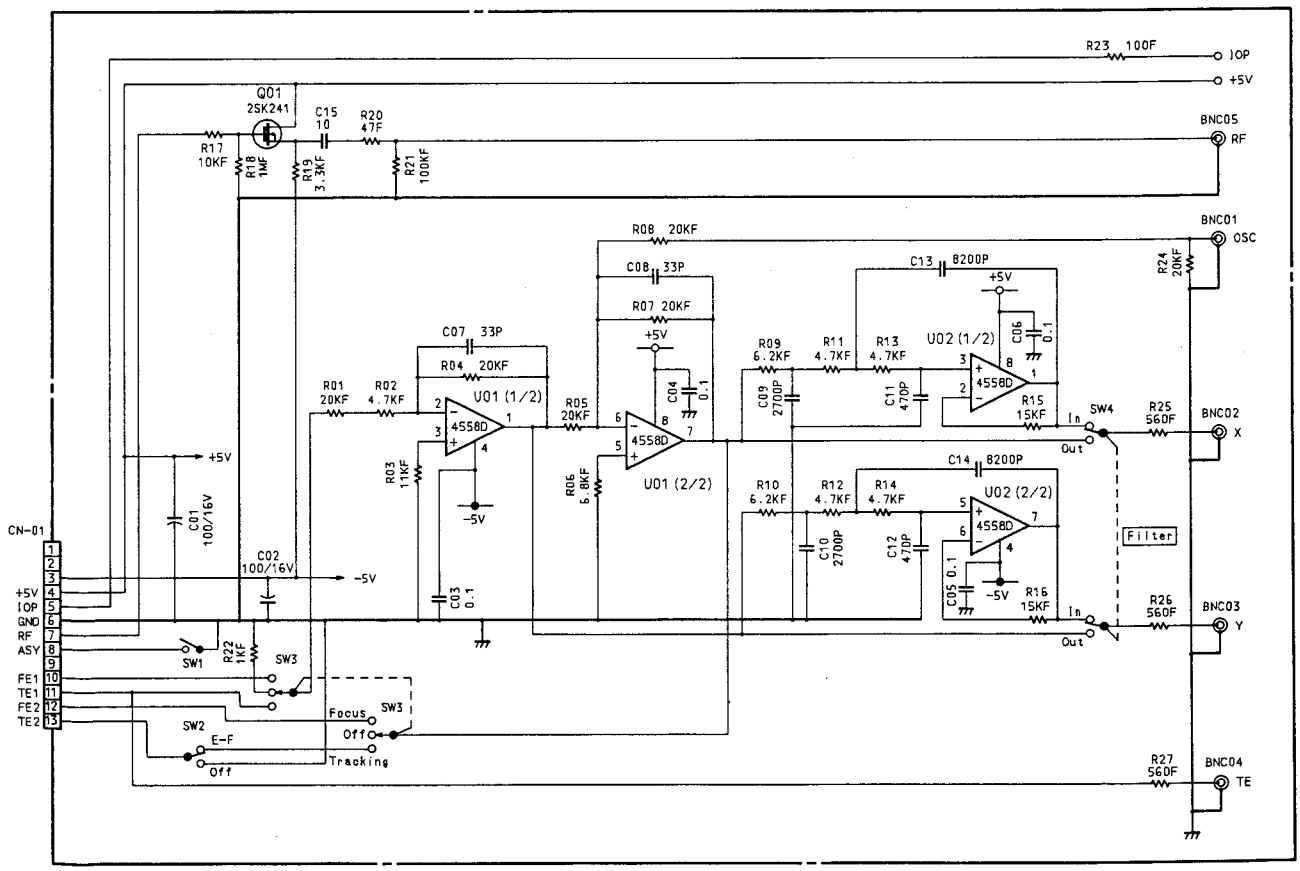


Fig. 3.3 Test Unit Circuit Diagram

4. PARTS LOCATION FOR ELECTRICAL ADJUSTMENT

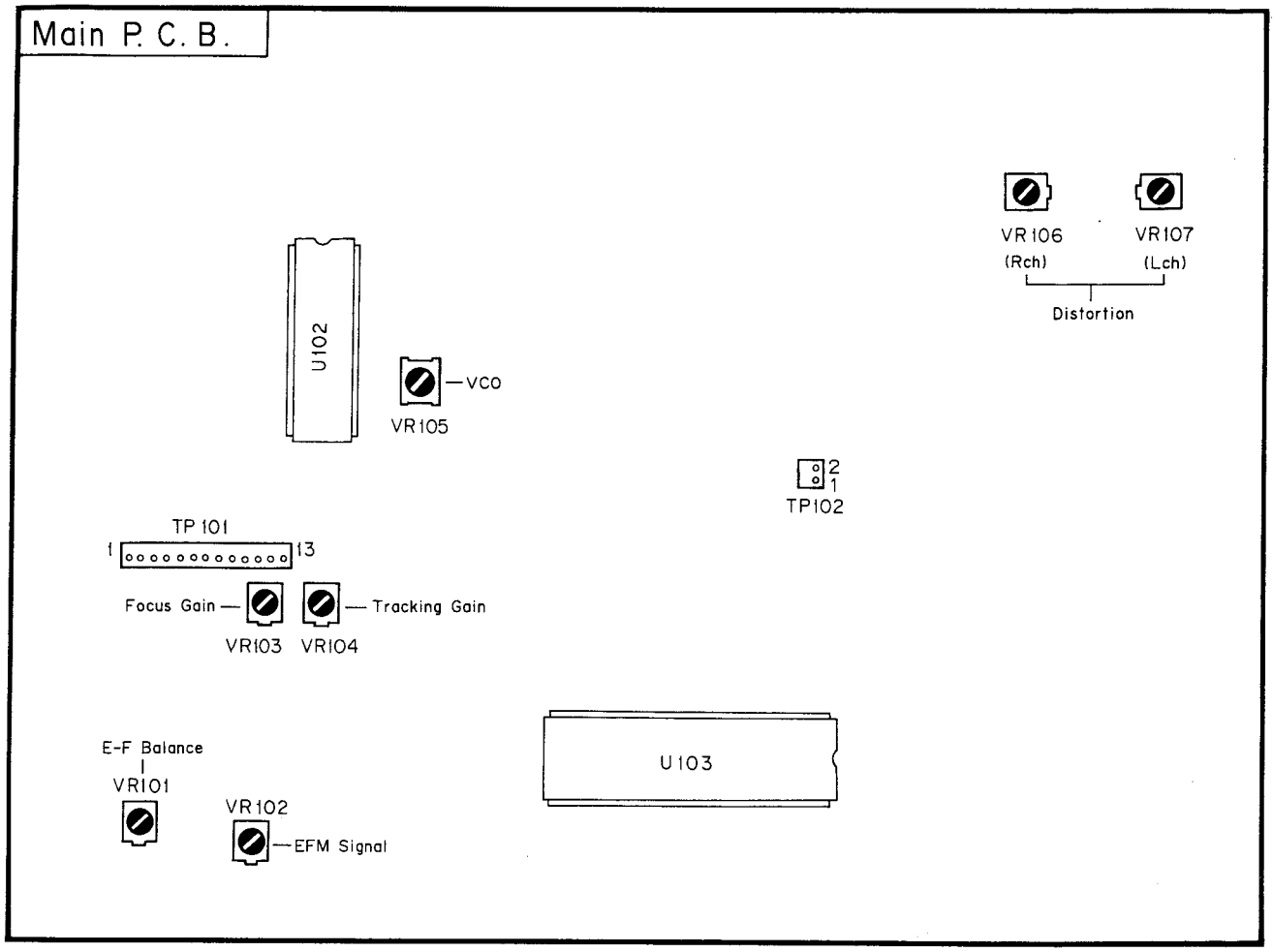
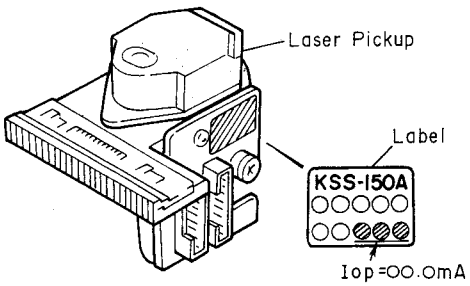
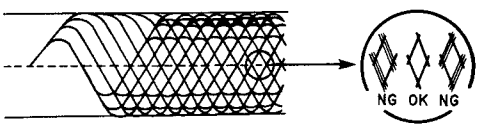
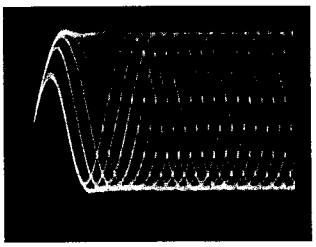
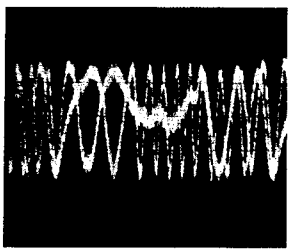
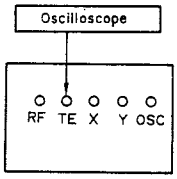
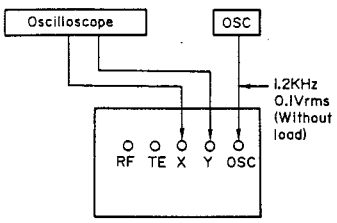
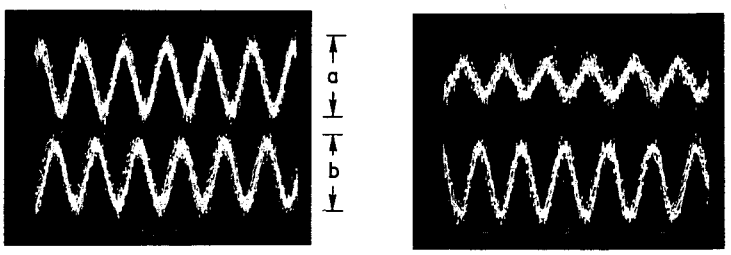


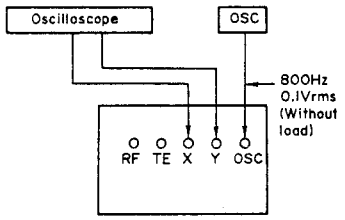
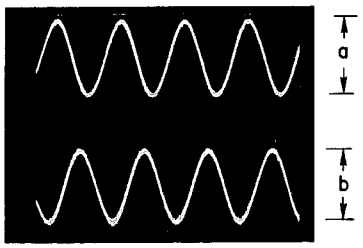
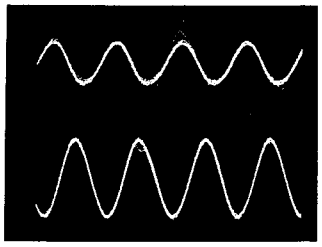
Fig. 4

5. ADJUSTMENTS

<table>
<tr><th>STEP</th><th>ITEM</th><th>SIGNAL SOURCE</th><th>OUTPUT CONNECTION</th><th>ADJUST-MENT</th><th>REMARKS</th></tr>
<tr><td>1</td><td>Preliminary Step</td><td></td><td></td><td></td><td>Connect the Test Unit to TP101 on the Main P.C.B. Ass'y via the Test Unit Cable. (See Fig. 3.2.)
Note: In the following cases, preset the following semi-fixed volumes to their mechanical center positions before starting adjustment.
VR101, VR102, VR103, VR104
o When Main P.C.B. Ass'y is replaced with new one.
o When VR101, VR102, VR103, or VR104 is replaced with new one.</td></tr>
<tr><td>2</td><td>Laser Current Check</td><td>Philips Test Sample 5</td><td>DC Voltmeter between Iop and +5V Terminals of Test Unit</td><td></td><td>1. Turn the power ON and load the test disc.
2. Play back the test disc and calculate the current flowing into R102 from the following formula.
$I = \frac{\text{Voltmeter Value}}{\text{R102 (22 Ohms)}}$ = oo.o mA (Measured Value)
Note: The voltmeter value should be read to 3 digits after the decimal point.
3. Press the Eject/Load button to open the Disc Tray and check that the difference between the measured value and the current value (Iop) indicated on the label on the Laser Pickup is within ±10%.
Iop - (Measured Value) = Iop ±10%.
 
</td></tr>
<tr><td>3</td><td>VCO Frequency Adjustment</td><td>None</td><td>Frequency Counter (10/1 probe) between Pins 1 (PLCK) and 2 (GND) of TP102 on Main P.C.B.</td><td>VR105</td><td>1. Set SW1 of the Test Unit to VCO.
2. Adjust VR105 to obtain 4.318 ±0.005 MHz on the frequency counter.
3. Set SW1 to OFF position.</td></tr>
<tr><td>4</td><td>EFM Signal Adjustment</td><td>Philips Test Sample 5</td><td>Oscilloscope to RF Connector of Test Unit</td><td>VR102</td><td>1. Play back the first track of the test disc.
2. Adjust VR102 until waveform amplitude becomes maximum and the waveform becomes clear (not thick) as shown below:
 

 
Oscilloscope Setting:
AC Mode, 0.2 V/div, 0.5 µs/div</td></tr>
</table>

STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	ADJUST-MENT	REMARKS
5	E-F Balance Adjustment (Supple-mentary Beam Balance Adjustment)	Philips Test Sample 5	Oscilloscope to TE Connector of Test Unit	VR101	1. Play back the first track of the test disc. 2. Set SW2 of the Test Unit to E-F position. 3. Adjust VR101 so that the center level of the waveform is within the range of 0 V ±0.1 V DC as shown below:  Center Level Oscilloscope Setting: DC Mode, 1 V/div, 1 ms/div 4. Set SW2 to OFF position.
	SW1: OFF SW3: OFF SW2: E-F Filter: OUT  Connecting Diagram				
6	Tracking Gain Adjustment	Philips Test Sample 5	Oscillator to OSC Connector of Test Unit Oscilloscope to Test Unit o CH1 to X o CH2 to Y	VR104	1. Set the output of oscillator to 1.2kHz, 0.1Vrms without connecting any load. 2. Connect the oscillator output to OSC connector of the Test Unit. 3. Set the Filter switch of the Test Unit to IN position. 4. Play back the first track of the test disc. 5. Set SW3 of the Test Unit to TRACKING position. 6. Adjust VR104 so that the amplitude of both waveforms on the oscilloscope are equal. (a=b)
	SW1: OFF SW3: TRACKING SW2: OFF Filter: IN  Connecting Diagram				7. Set SW3 to OFF position. Good waveforms NG waveforms  a=b 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
7	Focus Gain Adjustment	Philips Test Sample 5	Oscillator to OSC connector of Test Unit Oscilloscope to Test Unit o CH1 to X o CH2 to Y	VR103	1. Set the output of oscillator to 800Hz, 0.1Vrms without connecting any load. 2. Connect the oscillator output to OSC connector of the Test Unit. 3. Set the Filter switch of the Test Unit to IN position. 4. Play back the first track of the test disc. 5. Set SW3 of the Test Unit to FOCUS position. 6. Adjust VR103 so that the amplitude of both waveforms on the oscilloscope are equal. (a=b) 7. Set SW3 to OFF position. 8. Set the Filter switch to OUT position. 9. After adjustment, perform "EFM Signal Adjustment" in Step 4.
	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	
8	Distortion Adjustment	Sony YEDS-7 (Type 3)	Distortion Meter to Output Jack	VR107(Lch) VR106(Rch)	1. Play back the 19th program (1kHz, -20dB) of the test disc. 2. Adjust VR107 (Lch) and VR106 (Rch) to obtain minimum distortion.
9	Operation Check	Philips Test Sample 5A			Play back the following test programs on the test disc (Philips Test Sample 5A) and make sure that there is no noise and track-jumping. o Interruption 700 µm 8th program 0'00" - 0'20" o Black Dot 600 µm 14th program 0'00" - 0'20" o Simulated fingerprint 20th program 0'00" - 0'20"

6. MECHANISM ASS'Y AND PARTS LIST

6.1. Synthesis

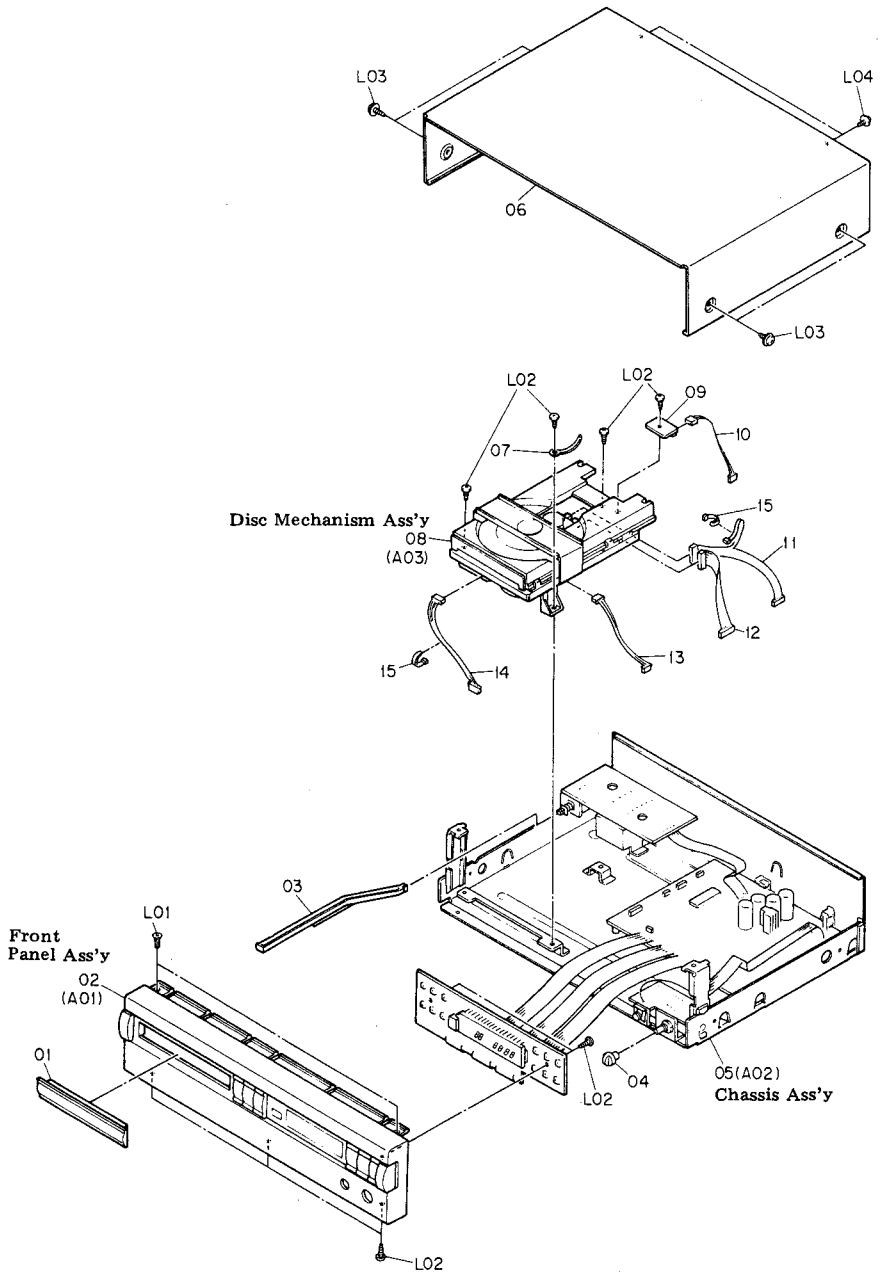


Fig. 6.1

★: Unstocked parts.

Schematic Ref. No.		Part No.	Description	Q'ty
6.1. Synthesis				
			Synthesis	
01		HA05820A	Disc Tray Cover Ass'y	1
02		HA05821A	Front Panel Ass'y	1
03		0J06148A	Power Switch Joint	1
04		0H05711A	Headphone Volume Knob	1
05		—	Chassis Ass'y	1
06		HA05819A	Top Cover Ass'y	1
07		0J06068A	Wire Clamper	1
08	★	CA08991A	Disc Mechanism Ass'y	1
09	★	BA07842A	Sub P.C.B. Ass'y	1
10		0B83864A	3P-H Connector Ass'y 150	1
11		0B83838A	Ribbon Cable Ass'y 8P 200	1
12		0B83839A	Ribbon Cable Ass'y 8P 150	1
13		0B83847A	4P-H Connector Ass'y 270	1
14		0B83840A	5P-H Connector Ass'y 300	1
15		0B90019A	Insu-Lock	2
L01		0E03025A	BT3x6 ⊕ Countersunk	
L02		0E00921A	BT3x8 ⊕ Binding (Black Chromate)	
L03		0E03032A	BT4x8 ⊕ Pan Washer-Faced (Black Chromate)	
L04		0E03632A	BT3x8 ⊕ Binding with Washer (Black Chromate)	

6.2. Front Panel Ass'y (A01)

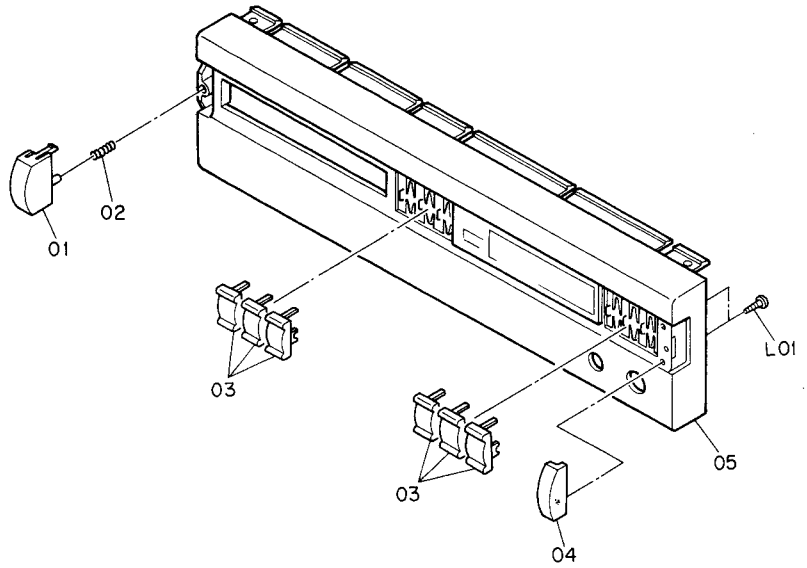


Fig. 6.2

★: Unstocked parts.

Schematic Ref. No.		Part No.	Description	Q'ty
6.2. Front Panel Ass'y (A01)				
A01		HA05821A	Front Panel Ass'y	1
01		0H05723A	Power Switch Button	1
02		0C09392A	Power Switch Spring	1
03		0H05716A	Control Knob A	6
04		0H05714A	Dummy Cap	1
05		—	Front Panel Sub Ass'y	1
L01		0E00855A	BT2x6 ⊕ Binding	
6.3. Chassis Ass'y (A02)				
A02		—	Chassis Ass'y	1
01	★	BA08005A	Main P.C.B. Ass'y (USA, EP, AUS, OTR, JPN) Serial No.: V31307634 -	1
	★	BA07805A	Main P.C.B. Ass'y (USA) Serial Nos.: V31301034 - 07633	1
	★	BA07805A	Main P.C.B. Ass'y (CAN)	1
02		0B90019A	Insu-Lock	
03	★	BA07808A	Power Switch P.C.B. Ass'y (USA, CAN)	1
	★	BA07942A	Power Switch P.C.B. Ass'y (AUS, EP)	1
	★	BA07975A	Power Switch P.C.B. Ass'y (OTR)	1
	★	BA07939A	Power Switch P.C.B. Ass'y (JPN)	1
04		0B50166A	Power Transformer (USA, CAN)	1
		0B50168A	Power Transformer (EP)	1
		0B50169A	Power Transformer (AUS)	1
		0B50167A	Power Transformer (OTR)	1
		0B50165A	Power Transformer (JPN)	1
05		0B71012A	Power Switch [S001]	1
06		0J06147A	Power Switch Angle	1
07		—	Chassis Base Ass'y	1
08		HA05833A	Leg Ass'y	4
09	★	BA07807A	Control & Display P.C.B.Ass'y	1
10		0J05092A	Snap Plate	1
11	★	BA07806A	Headphone Amp. P.C.B. Ass'y	1
12		0B80314A	Power Cord SPT-2 (USA, CAN)	1
		0B08093U	Power Cord (EP)	1
		0B05241A	Power Cord (AUS)	1
		0B08533A	Power Cord (OTR)	1
		0B08219B	Power Cord (JPN)	1
13		0B90280A	Cord Bushing (USA, CAN, EP, AUS)	1
		0B90283A	Cord Bushing (OTR, JPN)	1
14		0H05764A	Rear Plate (USA, CAN, EP, AUS, JPN)	1
		0H05722A	Rear Plate (OTR)	1
15		0M05611A	Voltage Lock Plate (OTR)	1
L01		0E03157A	BT3x8 ⊕ Binding With Washer	
L02		0E03592A	BT4x6 ⊕ Binding Washer-Faced	
L03		0E00921A	BT3x8 ⊕ Binding (Black Chromate)	
L04		0E00612A	M3x6 ⊕ Pan (2A)	
L05		0E00888A	BT3x12 ⊕ Binding	
L06		0E03365A	BT3x8 ⊕ Binding Projected	
L07		0E00985A	M3x6 ⊕ Binding (Black Chromate) (OTR)	

6.3. Chassis Ass'y (A02)

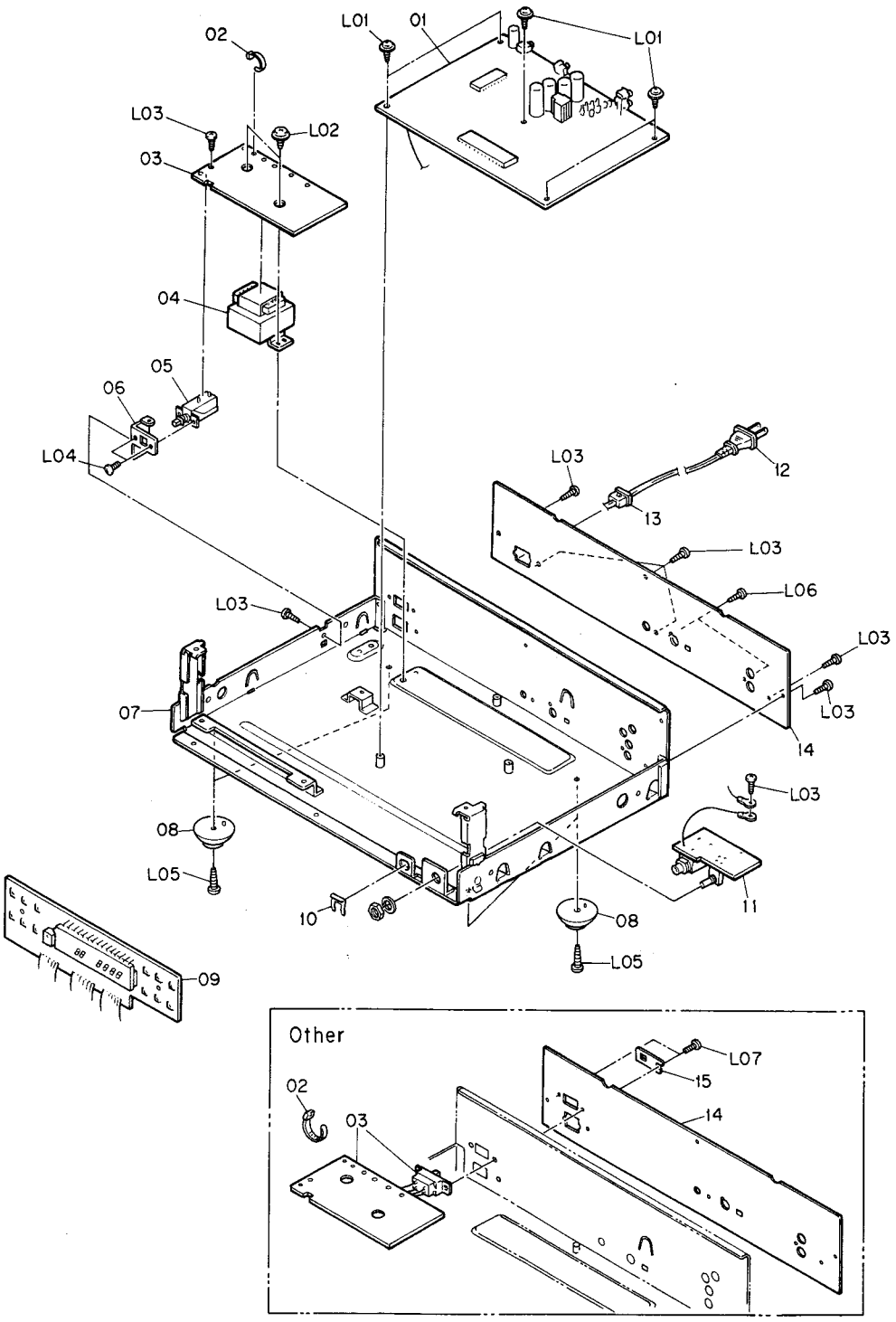


Fig. 6.3

6.4. Disc Mechanism Ass'y (A03)

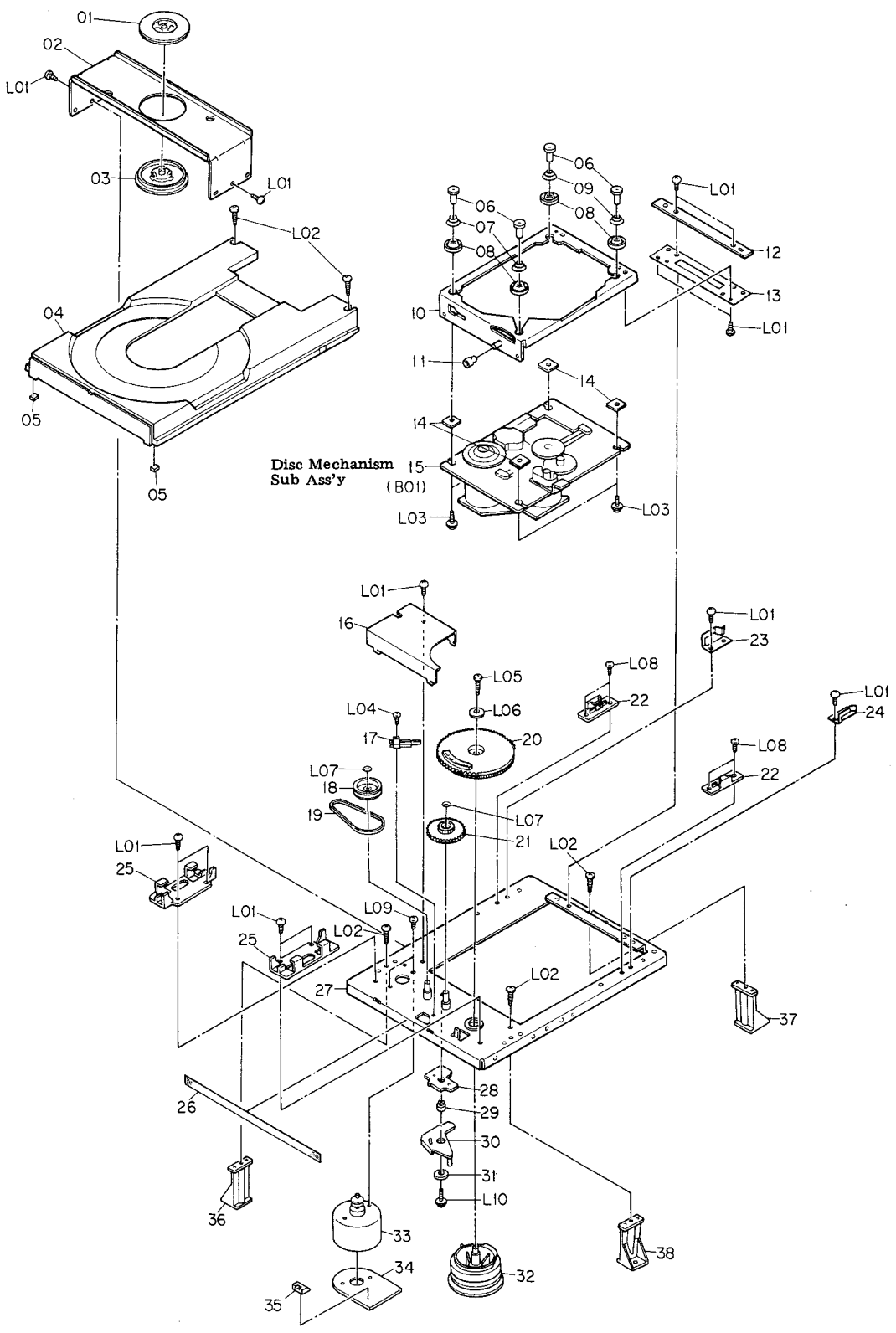


Fig. 6.4

6.5. Disc Mechanism Sub Ass'y (B01)

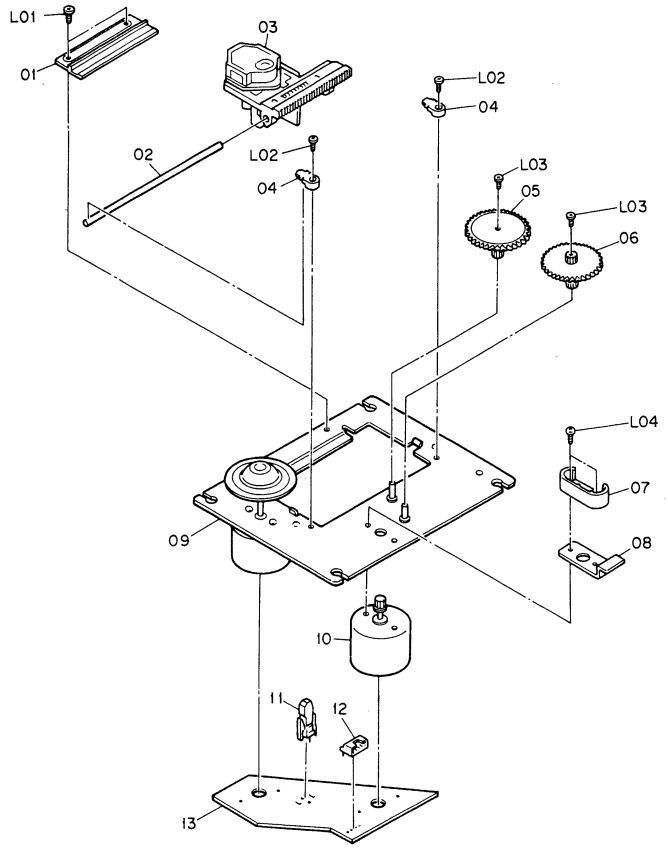


Fig. 6.5

★: Unstocked parts.

Schematic Ref. No.		Part No.	Description	Q'ty
6.4. Disc Mechanism Ass'y (A03)				
A03	★	CA08991A	Disc Mechanism Ass'y	1
01		0C85220A	Magnet Ass'y	1
02		0C85221A	Chuck Chassis	1
03		0C85222A	Chucking Pulley	1
04		0C85223A	Disc Tray	1
05		0C85247A	Damper	2
06		0C85213A	Shaft SP	4
07		0C85215A	Spring A	2
08		0C85216A	Insulator	4
09		0C85214A	Spring B	2
10		0C85249A	Sub Chassis Ass'y	1
11		0C85217A	Roller	1
12		0C85211A	Hinge Support	1
13		0C85212A	Hinge	1
14		0C85218A	Plate Spring	4
15		—	Disc Mechanism Sub Ass'y	1
16		0C85224A	Gear Cover	1
17		0C85228A	Leaf Switch	1
18		0C85232A	Loading Pulley	1
19		0C85231A	Loading Belt	1
20		0C85226A	Drive Gear	1
21		0C85230A	Center Gear	1
22		0C85236A	Tray Holder Rear	2
23		0C85238A	Tray Guide Left	1
24		0C85237A	Tray Guide Right	1
25		0C85235A	Tray Holder Front	2
26		0C85250A	Himelon	1
27		0C85248A	Main Chassis Ass'y	1
28		0C85242A	Link Plate	1
29		0C85243A	Boss	1
30		0C85244A	Stopper Link Ass'y	1
31		0C85245A	Spacer	1
32		0C85227A	Control Cam	1
33		0C85233A	Loading Motor Ass'y	1
34		0C85234A	Loading Motor P.C.B.	1
35		0C85246A	5P Connector	1
36		0C85241A	MD Holder Left	1
37		0C85240A	MD Holder Rear	1
38		0C85239A	MD Holder Right	1
L01		0E03594A	ST2.6x6 ⊕ Brazier	
L02		0E03596A	ST3x10 ⊕ Binding (Black Chromate)	
L03		0C85219A	Screw Washer Head	
L04		0E03566A	ST2x4 ⊕ Brazier	
L05		0E03595A	ST2.6x10 ⊕ Binding	
L06		0C85225A	Washer A	
L07		0C85229A	Washer B	
L08		0E03205A	ST2x4 ⊕ Pan	
L09		0E03202A	M2.6x3 ⊕ Binding (Black Chromate)	
L10		0E03597A	ST2.6x8 ⊕ Pan Washer-faced	
6.5. Disc Mechanism Sub Ass'y (B01)				
B01		—	Disc Mechanism Sub Ass'y	1
01		0C85253A	Slide Holder	1
02		0C85251A	Slide Shaft	1
03	★	0C85252A	Laser Pickup KSS-150A	1
04		0C85258A	Shaft Clamp	2
05		0C85256A	Gear A	1
06		0C85257A	Gear B	1
07		0C85254A	Gear Cover	1
08		0C85263A	Stopper	1
09	★	0C85259A	Disc Motor Ass'y	1
10	★	0C85255A	Feed Motor N Ass'y	1
11		0C85260A	Leaf Switch	1
12		0C85262A	4P Connector	1
13		0C85261A	Motor P.C.B.	1
L01		0C85264A	Screw 2x5 Tapping	
L02		0C85267A	Screw 2.6x8	
L03		0C85266A	Screw M1.7x3	
L04		0C85265A	Screw 2x5 ⊕ Pan	

7. MOUNTING DIAGRAMS AND PARTS LIST

Notes: 1. Mounting diagram shows a dip side view of the printed circuit board.
2. Diode is 1SS53, 1S1555, or 1SS176 unless otherwise specified.
3. Abbreviation for part name:
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

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

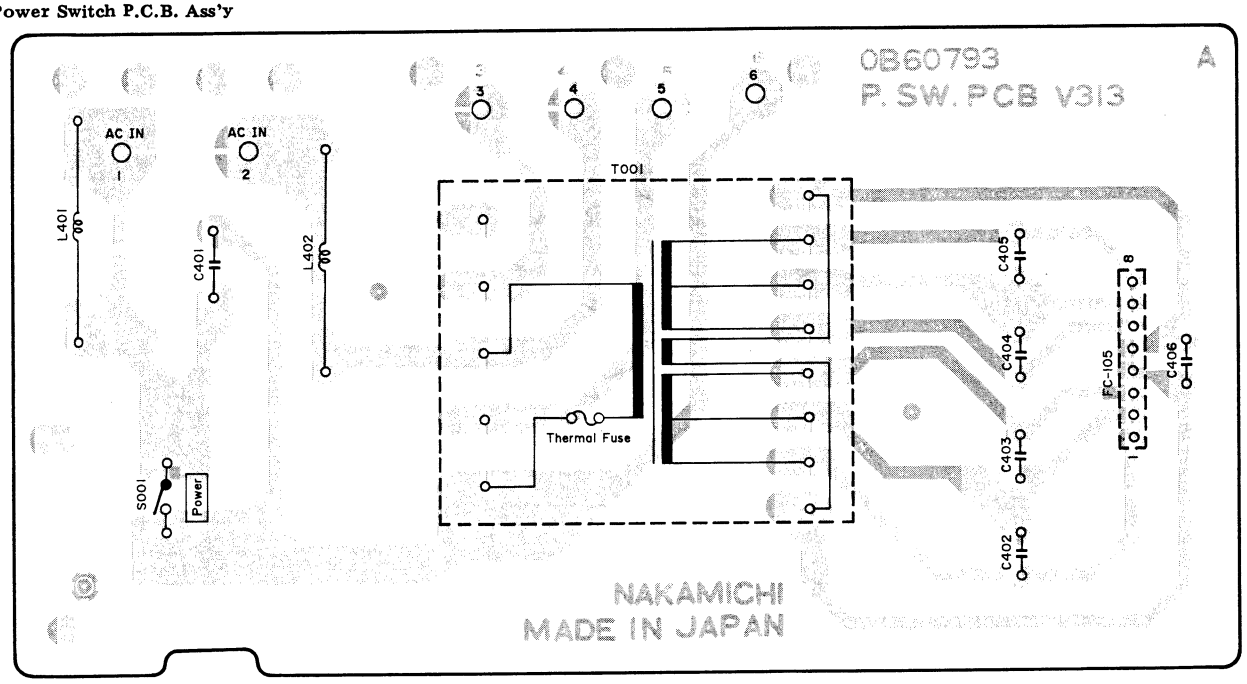


Fig. 7.1

7.2. Headphone Amp. P.C.B. Ass'y

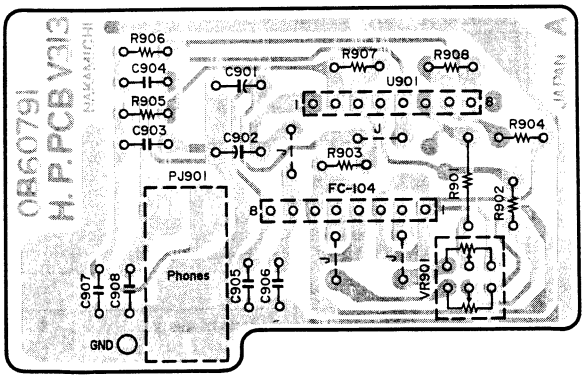


Fig. 7.2.1 2nd Version

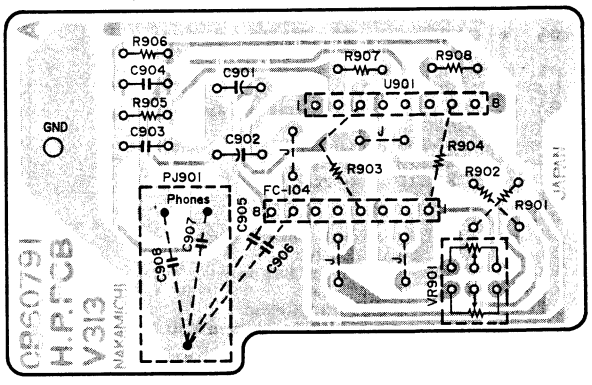


Fig. 7.2.2 1st Version

7.3. Sub P.C.B. Ass'y

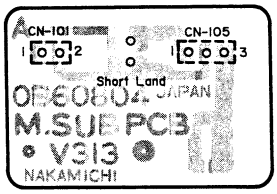


Fig. 7.3

★: Unstocked parts.

Schematic Ref. No.	Part No.	Description
7.1. Power Switch P.C.B. Ass'y		
★	BA07808A	Power Switch P.C.B. Ass'y (USA, CAN)
★	BA07942A	Power Switch P.C.B. Ass'y (EP, AUS)
★	BA07975A	Power Switch P.C.B. Ass'y (OTR)
★	BA07939A	Power Switch P.C.B. Ass'y (JPN)
L401,402	0B51352A	Inductor 68μH
C401	0B41825A	CC 4700P (USA, CAN, EP, AUS, OTR)
	0B41826A	CC 4700P 250V (JPN)
C402,403	0B47117A	CC 0.1μ 50V
C404,405	0B47117A	CC 0.1μ 50V
C406	0B47117A	CC 0.1μ 50V
	0E00752A	Eyelet 2x3 (EP, AUS) (2)
	0B07092U	Voltage Selector (1) (OTR)
7.2. Headphone Amp. P.C.B. Ass'y		
★	BA07806A	Headphone Amp. P.C.B. Ass'y
	0B60791A	Headphone Amp. P.C.B.
U901	0B11815A	IC NJM4556S
VR901	0B30120A	Volume 50K(A)x2
R901,902	0B09707A	RK 18K 1/6W J
R903,904	0B09709A	RK 22K 1/6W J
R905,906	0B09650A	RK 75 1/6W J
R907,908	0B09725A	RK 100K 1/6W J
C901,902	0B40078A	CE 100μ 16V
C903,904	0B41278A	CML 2200P 50V J
C905,906	0B41971A	CC 0.1μ 50V
C907,908	0B47139A	CC 4700P 50V
PJ901	0B81478A	Headphone Jack
7.3. Sub P.C.B. Ass'y		
★	BA07842A	Sub P.C.B. Ass'y
	0B60804A	Sub P.C.B.
CN101	0B81466A	2P-S Post
CN105	0B81467A	3P-S Post
	0E03355A	Earth Lug (1)
7.4. Control & Display P.C.B. Ass'y		
★	BA07807A	Control & Display P.C.B. Ass'y
	0B60792A	Control & Displasy P.C.B.
U601,602	0B11817A	IC TC5066BP
U603	0B11817A	IC TC5066BP
D601,602	0B06398A	SID 1SS176
D603,604	0B06398A	SID 1SS176
R601,602	0B09717A	RK 47K 1/6W J
R603,604	0B09717A	RK 47K 1/6W J
R605,606	0B09717A	RK 47K 1/6W J
R607,608	0B09717A	RK 47K 1/6W J
R609,610	0B09717A	RK 47K 1/6W J
R611,612	0B09717A	RK 47K 1/6W J
R613,614	0B09717A	RK 47K 1/6W J
R615,616	0B09717A	RK 47K 1/6W J
R617,618	0B09717A	RK 47K 1/6W J
R619,620	0B09717A	RK 47K 1/6W J
R621	0B09717A	RK 47K 1/6W J
R622	0B09677A	RK 1K 1/6W J
C601	0B40158A	CE 100μ 6.3V
RS601	0B19016A	Remote Control Receiver
S601,602	0B70161A	Tact Switch
S603,604	0B70161A	Tact Switch
S605,606	0B70161A	Tact Switch
S607,608	0B70161A	Tact Switch
S609,610	0B70161A	Tact Switch
S611,612	0B70161A	Tact Switch
FL601	0B90440A	FL Tube
	0J06219B	FL Cushion (2)
	0J06238A	FL Stopper (2)

7.4. Control & Display P.C.B. Ass'y

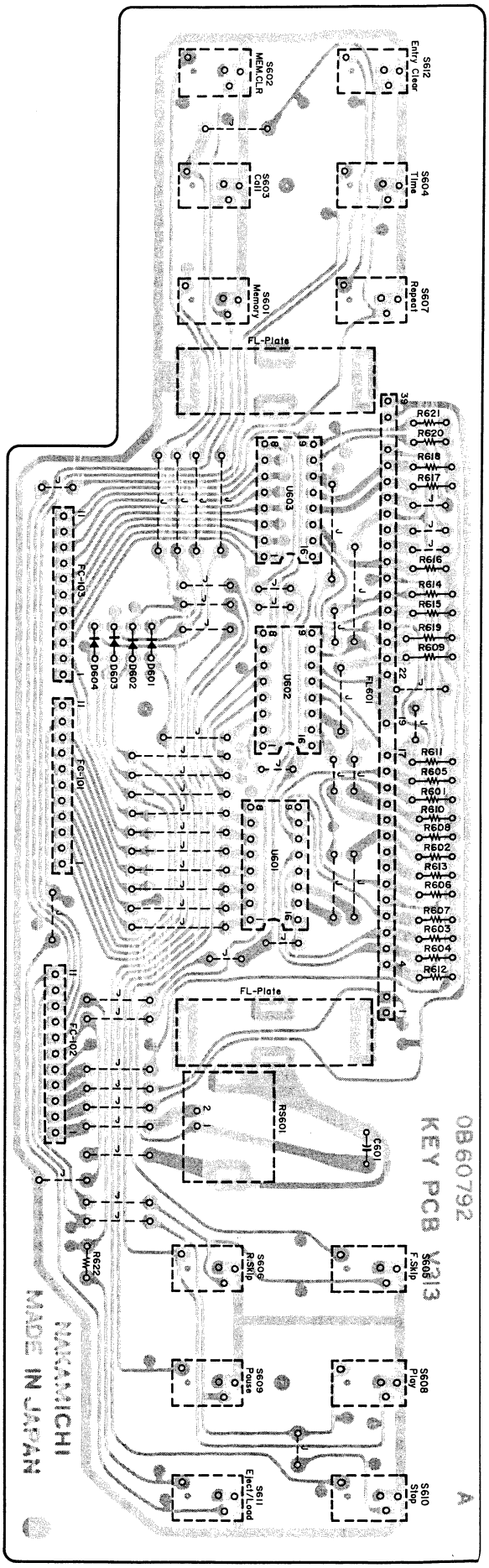


Fig. 7.4

★: Unstocked parts.

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

Schematic Ref. No.	Part No.	Description
★	BA08005A	Main P.C.B. Ass'y (USA, EP, AUS, OTR, JPN) Serial No.: V31307634 -
★	BA07805A	Main P.C.B. Ass'y (USA) Serial Nos.: V31301034 - 07633
★	BA07805A	Main P.C.B. Ass'y (CAN)
	0B60790A	Main P.C.B.
U101	0B11818A	IC CXA1081S
U102	0B11819A	IC CXA1082BS
U103	0B11823A	IC μPD75108CW239
U104	0B11820A	IC CXD1167QZ
U105	0B11822A	IC μPD7564CS092
U106	0B11538A	IC TC74HC164P
U107	0B11821A	IC M51951ASL
U108	0B11564A	IC TC74HC00AP
U109	0B11558A	IC TC74HC08AP
U110	0B11814A	IC SM5840BP
U111	0B11813A	IC AD1864N
U112	0B11816A	IC NJM5532S
U113	0B11753A	IC NJM7805FA
U114	0B11522A	IC NJM79L05A
U115	0B06124B	IC NJM4558D
U116	0B11557A	IC TC74HC04AP
Q101	0B10097A	TR 2SA952
Q102	0B10107A	TR 2SD1585
Q103	0B10106A	TR 2SB1094
Q104	0B06066A	TR 2SD471
Q105	0B06069A	TR 2SB564
Q106	0B06066A	TR 2SD471
Q107	0B06069A	TR 2SB564
Q108	0B06066A	TR 2SD471
Q109	0B06069A	TR 2SB564
Q110	0B06066A	TR 2SD471
Q111	0B06069A	TR 2SB564
Q112	0B10058A	TR DTA114ES
Q113	0B10062A	TR DTC144ES
Q114	0B10068A	TR DTC114ES
Q115,116	0B10062A	TR DTC144ES
Q117	0B10064A	TR DTC124ES
Q118	0B10068A	TR DTC114ES
Q119	0B10058A	TR DTA114ES
Q120,121	0B06299A	TR 2SC2878
Q122,123	0B06299A	TR 2SC2878
Q124	0B06429A	TR 2SC2655
Q125	0B10015A	TR 2SA1020
Q126	0B06429A	TR 2SC2655
Q127	0B10015A	TR 2SA1020
Q128	0B06303A	TR 2SB772
Q129	0B10055A	TR DTA124ES
Q130	0B06100A	TR 2SC945
Q131	0B10064A	TR DTC124ES
Q132,133	0B06299A	TR 2SC2878
IP101,102	0B11371A	IC Protector ICP-N5
IP103	0B11371A	IC Protector ICP-N5
IP104	0B11335A	IC Protector ICP-N15-T104
IP105,106	0B11371A	IC Protector ICP-N5 (USA, EP, AUS, OTR, JPN) Serial No.: V31307634 -
ZD101	0B12696A	ZD 11V LNMA4110(N)
ZD102	0B12694A	ZD 6.2V LNMA4062(N)
ZD103,104	0B12695A	ZD 10V LNMA4100(N)
ZD105,106	0B12697A	ZD RD5.6V LNMA4056(N)-M
ZD107	0B12198A	ZD 27V LNMA4270(N)
D101	0B12264A	SID 1SS132
D102,103	0B06398A	SID 1SS176
D104,105	0B06398A	SID 1SS176
D106,107	0B06398A	SID 1SS176
D108,109	0B06398A	SID 1SS176
D110	0B06398A	SID 1SS176
D111,112	0B12362A	SID S5566B
D113,114	0B12362A	SID S5566B
D115,116	0B12362A	SID S5566B
D117,118	0B12362A	SID S5566B
D119,120	0B12362A	SID S5566B
D121,122	0B06398A	SID 1SS176
D123,124	0B06398A	SID 1SS176
D125	0B06398A	SID 1SS176
X101	0B92039A	X'tal 16.9344M
CF101	0B92045A	Crystal 4MHz
CF102	0B92040A	Crystal 400K
T101	0B51351A	Pulse Transformer
L101,102	0B51114A	Micro Coil 10μH (K)
L103,104	0B51114A	Micro Coil 10μH (K)
L105	0B51114A	Micro Coil 10μH (K)
L107	0B51122A	Micro Coil 47μH
L108,109	0B51187A	Micro Coil 220μH (K)
L110,111	0B51187A	Micro Coil 220μH (K)
L112	0B51114A	Micro Coil 10μH (K)
VR101	0B32194A	Semi VR 20K
VR102	0B32193A	Semi VR 10K
VR103,104	0B32194A	Semi VR 20K
VR105	0B32179A	Swmi VR 1K
VR106,107	0B32196A	Semi VR 100K
R101	0B09652A	RK 91 1/6W J
R102	0B09637A	RK 22 1/6W J
R103	0B09706A	RK 16K 1/6W J
R104	0B09677A	RK 1K 1/6W J
R105	0B09709A	RK 22K 1/6W J
R106	0B09701A	RK 10K 1/6W J
R107	0B09725A	RK 100K 1/6W J
R108	0B09701A	RK 10K 1/6W J
R109	0B09693A	RK 4.7K 1/6W J
R110	0B09713A	RK 33K 1/6W J
R111	0B09725A	RK 100K 1/6W J
R112	0B09742A	RK 510K 1/6W J
R113	0B09725A	RK 100K 1/6W J
R114,115	0B09613A	RK 2.2 1/6W J
R116	0B09613A	RK 2.2 1/6W J
R117	0B09725A	RK 100K 1/6W J
R118	0B09735A	RK 270K 1/6W J
R119	0B09717A	RK 47K 1/6W J
R120	0B09660A	RK 200 1/6W J
R121	0B09725A	RK 100K 1/6W J
R122,123	0B09701A	RK 10K 1/6W J
R124	0B09701A	RK 10K 1/6W J
R125	0B22291A	RM 3.6K 1/4W F
R126	0B09727A	RK 120K 1/6W J
R127	0B09701A	RK 10K 1/6W J
R128	0B09725A	RK 100K 1/6W J
R129	0B09749A	RK 1M 1/6W J
R130	0B09708A	RK 20K 1/6W J
R131	0B09677A	RK 1K 1/6W J
R132	0B09725A	RK 100K 1/6W J
R133,134	0B09717A	RK 47K 1/6W J
R135	0B09717A	RK 47K 1/6W J
R136	0B09725A	RK 100K 1/6W J
R137	0B09657A	RK 150 1/6W J
R138	0B09683A	RK 1.8K 1/6W J
R139	0B09653A	RK 100 1/6W J
R140	0B09693A	RK 4.7K 1/6W J
R141	0B09725A	RK 100K 1/6W J
R142	0B09689A	RK 3.3K 1/6W J
R143	0B09697A	RK 6.8K 1/6W J
R144,145	0B09717A	RK 47K 1/6W J
R146,147	0B09717A	RK 47K 1/6W J
R148,149	0B09717A	RK 47K 1/6W J
R150,151	0B09717A	RK 47K 1/6W J
R152,153	0B09717A	RK 47K 1/6W J
R155	0B09717A	RK 47K 1/6W J
R156,157	0B09717A	RK 47K 1/6W J
R158,159	0B09717A	RK 47K 1/6W J
R160	0B09709A	RK 22K 1/6W J
R161	0B09693A	RK 4.7K 1/6W J
R162	0B09701A	RK 10K 1/6W J
R163	0B09677A	RK 1K 1/6W J
R164	0B09669A	RK 470 1/6W J
R165,166	0B09677A	RK 1K 1/6W J
R167,168	0B09677A	RK 1K 1/6W J
R169	0B09669A	RK 470 1/6W J
R170	0B09677A	RK 1K 1/6W J
R171,172	0B22533A	RM 470K 1/4W F
R173,174	0B09701A	RK 10K 1/6W J
R175	0B09697A	RK 6.8K 1/6W J
R176	0B09709A	RK 22K 1/6W J
R177	0B09685A	RK 2.2K 1/6W J
R178	0B09693A	RK 4.7K 1/6W J
R179,180	0B09701A	RK 10K 1/6W J
R181,182	0B09741A	RK 470K 1/6W J
R183,184	0B22809A	RM 560F 1/4W F
R185,186	0B22806A	RM 1.3K 1/4W F
R187,188	0B22808A	RM 4.7K 1/4W F
R189,190	0B22808A	RM 4.7K 1/4W F
R191,192	0B22808A	RM 4.7K 1/4W F
R193,194	0B22807A	RM 15K 1/4W F
R195,196	0B22809A	RM 560 1/4W F
R197,198	0B09691A	RK 3.9K 1/6W J
R199,200	0B09733A	RK 220K 1/6W J
R201	0B09699A	RK 8.2K 1/6W J
R202	0B09685A	RK 2.2K 1/6W J
R203	0B09701A	RK 10K 1/6W J
R204,205	0B24262A	RF 2.2 1/4W J
R206,207	0B09683A	RK 1.8K 1/6W J
R208,209	0B09685A	RK 2.2K 1/6W J
R210	0B22493A	RM 220K 1/4W F
R211	0B05575A	RK 560 1/4W J
R212	0B09701A	RK 10K 1/6W J
R213	0B22493A	RM 220K 1/4W F
R214,215	0B01679A	RK 100 1/4W J
R216	0B09682A	RK 1.6K 1/6W J
R219	0B09693A	RK 4.7K 1/6W J
R220	0B09737A	RK 330K 1/6W J
R222	0B09725A	RK 100K 1/6W J
R223	0B09677A	RK 1K 1/6W J
R224,225	0B09705A	RK 15K 1/6W J
R226	0B09715A	RK 39K 1/6W J
R227	0B09671A	RK 560 1/6W J
R228,229	0B09725A	RK 100K 1/6W J
R230,231	0B09725A	RK 100K 1/6W J
R232	0B09677A	RK 1K 1/6W J
R233	0B09650A	RK 75 1/6W J
R234	0B09655A	RK 120 1/6W J
R235	0B09687A	RK 2.7K 1/6W J
R236,237	0B22809A	RM 560 1/4W F
R238	0B09701A	RK 10K 1/6W J
R239	0B24267A	RF 4.7 1/4W J
C101	0B40078A	CE 100μ 16V
C102	0B41944A	CC 1000P 50V K
C103	0B41278A	CML 2200P 50V J
C104	0B40076A	CE 33μ 16V
C105	0B41555A	CC 0.047μ 25V Z
C106	0B41971A	CC 0.1μ 50V Z
C107	0B40076A	CE 33μ16V
C108	0B41971A	CC 0.1μ 50V Z
C109	0B40707A	CE 330μ 10V
C110	0B41292A	CML 0.033μ 50V J
C111	0B41823A	CML 0.01μ 50V J
C112	0B41292A	CML 0.033μ 50V J
C113	0B41823A	CML 0.01μ 50V J
C114	0B41278A	CML 2200P 50V J
C115	0B41282A	CML 4700P 50V J
C116	0B40116A	CE 10μ 50V
C117	0B40116A	CE 10μ 50V
C118	0B40078A	CE 100μ 16V
C119	0B41298A	CML 0.1μ 50V J
C120	0B41294A	CML 0.047μ 50V J
C121	0B41298A	CML 0.1μ 50V J
C122	0B40697A	CE 15μ 16V
C123	0B40678A	CE 220μ 10V (LN)
C124	0B41823A	CML 0.01μ 50V J
C125	0B41974A	CC 100P 50V J
C126	0B41298A	CML 0.1μ 50V J
C127	0B40116A	CE 10μ 50V
C128	0B41292A	CML 0.033μ 50V J
C129	0B40111A	CE 0.47μ 50V
C130	0B40678A	CE 220μ 10V (LN)
C131	0B41289A	CML 0.018μ 50V J
C132	0B41974A	CC 100P 50V J
C133,134	0B41885A	CC 220P 50V J
C135,136	0B41555A	CC 0.047μ 25V Z
C137,138	0B41555A	CC 0.047μ 25V Z
C139	0B41292A	CML 0.033μ 50V J
C140	0B47117A	CC 0.1μ 50V Z
C141,142	0B41992A	CSP 30P 160V J
C143,144	0B41971A	CC 0.1μ 50V J
C145	0B40548A	CE 470μ 16V
C146	0B41823A	CML 0.01μ 50V J
C147	0B40707A	CE 330μ 10V
C148	0B40115A	CE 4.7μ 50V
C149	0B41278A	CML 2200P 50V J
C150	0B40112A	CE 1μ 50V
C151	0B40092A	CE 220μ 25V
C152,153	0B40678A	CE 220μ 10V (LN)
C154,155	0B41971A	CC 0.1μ 50V Z

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

Schematic Ref. No.	Part No.	Description
C156,157	0B40678A	CE 220μ 10V (LN)
C158,159	0B41294A	CML 0.047μ 50V J
C160,161	0B47114A	CPP 0.027μ 100V G
C162,163	0B09820A	CPP 1200P 100V G
C164,165	0B41816A	CSP 220P 160V J
C166,167	0B41653A	CPP 3900P 100V J
C168,169	0B40474A	CE 47μ 16V (BP)
C170,171	0B41772A	CSP 1000P 160V J
C172,173	0B41975A	CC 10P 50V J
C174	0B47117A	CC 0.1μ 50V Z
C175	0B41274A	CML 1000P 50V J
C176,177	0B40675A	CE 3300μ 25V
C178,179	0B40679A	CE 100μ 25V
C180,181	0B40679A	CE 100μ 25V
C182,183	0B41823A	CML 0.01μ 50V J
C184,185	0B47117A	CC 0.1μ 50V Z
C186,187	0B47117A	CC 0.1μ 50V Z
C188	0B40116A	CE 10μ 50V
C189	0B41555A	CC 0.047μ 25V Z
C190,191	0B41823A	CML 0.01μ 50V J
C192,193	0B40675A	CE 3300μ 25V
C194,195	0B40545A	CE 100μ 16V
C196,197	0B40545A	CE 100μ 16V
C198,199	0B40678A	CE 220μ 10V (LN)
C200,201	0B40678A	CE 220μ 10V (LN)
C202	0B40108A	CE 1000μ 35V
C203	0B40120A	CE 100μ 50V
C204	0B40108A	CE 1000μ 35V
C205,206	0B41823A	CML 0.01μ 50V J
C207,208	0B41823A	CML 0.01μ 50V J
C209	0B41933A	CC 15P
C211	0B41971A	CC 0.1μ 50V Z
C212	0B40707A	CE 330μ 10V
C213,214	0B41971A	CC 0.1μ 50V Z
C215,216	0B40077A	CE 47μ 16V
C217	0B41553A	CC 0.01μ 25Z
C218	0B41709A	CC 47P 50V J
C220,221	0B40116A	CE 10μ50V
S101	0B70165A	Slide Switch
TF101,102	0B90322A	Thermal Fuse 126
TF103-107	0B90322A	Thermal Fuse 126 (CAN)
	0B90332A	Thermal Fuse 126 (USA) Serial Nos.: V31301034 - 07633
TP101	0B84224A	13P-T Post
TP102	0B02233A	2P-T Post
PJ101	0B84028A	Stereo Jack HSJ0912-01-020
PJ102	0B84226A	2P Mount Pin Jack
PJ103	0B84227A	1P Mount Pin Jack
CN101	0B81463A	6P-T Post
CN102	0B81465A	8P-T Post
CN103	0B81461A	4P-T Post
CN104	0B81462A	5P-T Post
CN105	0B81460A	3P-T Post
FC101,102	0B83835B	Flat Cable 11P 260
FC103	0B83835B	Flat Cable 11P 260
FC104	0B83837B	Flat Cable 8P 350
FC105	0B83834B	F. Cable 8P 260
	0B83923A	GND Wire Ass'y D (1)
	0B90448A	Heat Sink (1)

● Semiconductor Location

Ref. No.	Location
U101	G-9
U102	C-6
U103	G-4
U104	D-4
U105	H-2
U106	H-1
U107	E-7
U108	E-2
U109	G-2
U110	D-2
U111	C-2
U112	B-2
U113	C-5
U114	B-4
U115	H-7
U116	A-7
Q101	E-10
Q102	C-9
Q103	C-9
Q104	C-9
Q105	C-9
Q106	D-9
Q107	D-9
Q108	B-9
Q109	B-9
Q110	G-7
Q111	G-7
Q112	G-3
Q113	A-10
Q114	D-7
Q115	E-2
Q116	E-2
Q117	D-1
Q118	E-1
Q119	D-1
Q120	C-2
Q121	C-1
Q122	A-2
Q123	A-1
Q124	A-4
Q125	A-4
Q126	B-4
Q127	B-4
Q128	A-7
Q129	H-3
Q130	H-3
Q131	D-6
Q132	A-2
Q133	A-1
IP101	E-3
IP102	D-5
IP103	C-6
IP104	A-9
IP105	A-5
IP106	B-5
ZD101	D-1
ZD102	A-9
ZD103	A-4
ZD104	A-4
ZD105	B-4
ZD106	B-4
ZD107	A-9
D101	D-9
D102	G-2
D103	G-2
D104	G-2
D105	G-1
D106	D-3
D107	D-1
D108	A-2
D109	A-1
D110	C-1
D111	B-6
D112	B-6
D113	B-6
D114	B-6
D115	A-6
D116	A-6
D117	B-6
D118	B-6
D119	A-8
D120	A-8
D121	H-3
D122	H-3
D123	H-3
D124	H-3
D125	E-1

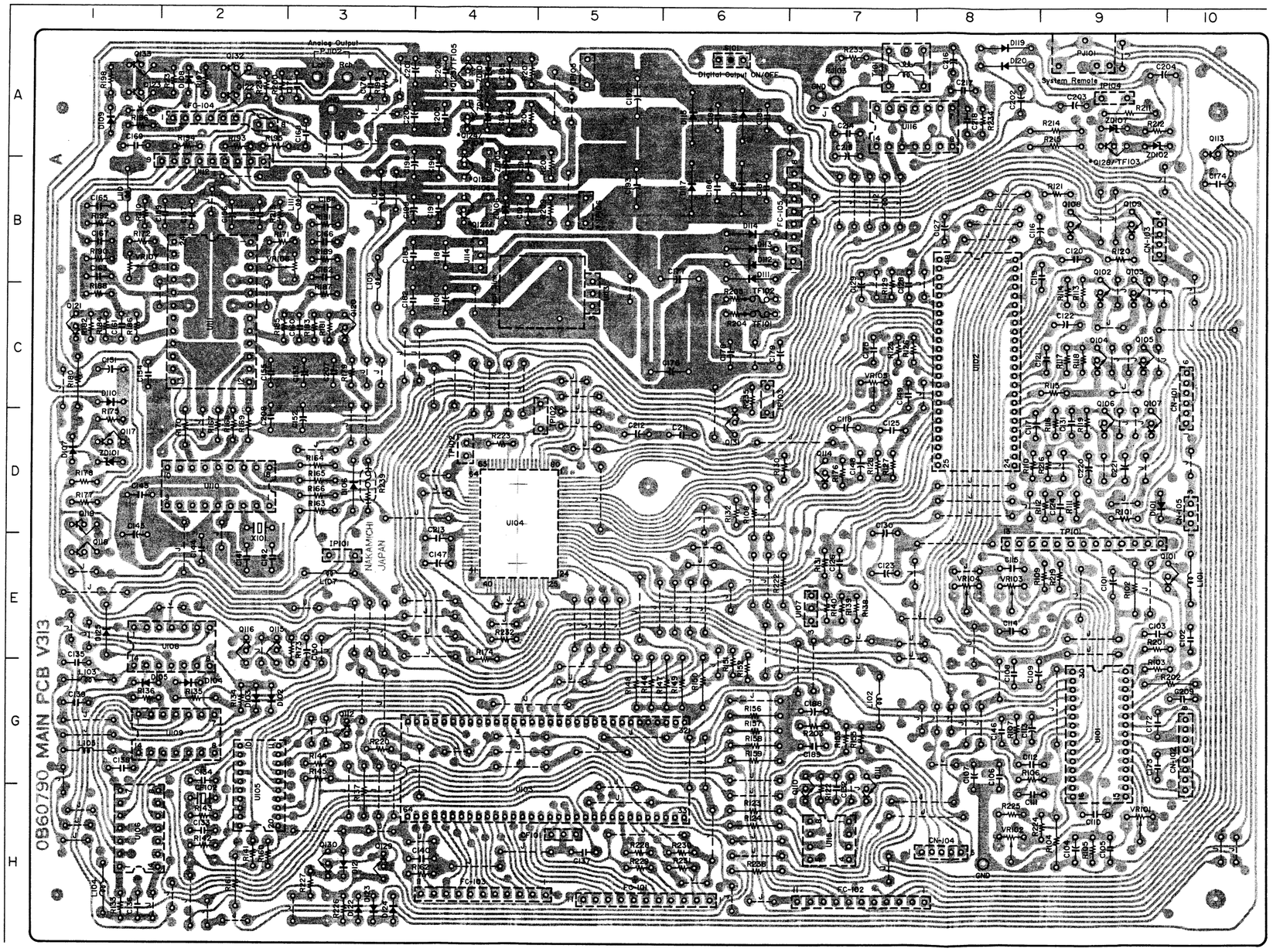
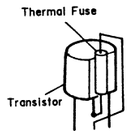


Fig. 7.5.1 For Serial No.: V31307634 -

Thermal fuses (TF103-TF107) are mounted on the transistors as shown below:



NOTE: Parts marked with * (TF103—TF107, IP105, IP106) are mounted as follows.

Destination	TF103—TF107	IP105, IP106
CAN	Mounted.	Not mounted.
USA, EP AUS, OTR JPN	Not mounted.	Mounted.

● **Semiconductor Location**

Ref. No.	Location
U101	G-9
U102	C-6
U103	G-4
U104	D-4
U105	H-2
U106	H-1
U107	E-7
U108	E-2
U109	G-2
U110	D-2
U111	C-2
U112	B-2
U113	C-5
U114	B-4
U115	H-7
U116	A-7
Q101	E-10
Q102	C-9
Q103	C-9
Q104	C-9
Q105	C-9
Q106	D-9
Q107	D-9
Q108	B-9
Q109	B-9
Q110	G-7
Q111	G-7
Q112	G-3
Q113	A-10
Q114	D-7
Q115	E-2
Q116	E-2
Q117	D-1
Q118	E-1
Q119	D-1
Q120	C-2
Q121	C-1
Q122	A-2
Q123	A-1
Q124	A-4
Q125	A-4
Q126	B-4
Q127	B-4
Q128	A-7
Q129	H-3
Q130	H-3
Q131	D-6
Q132	A-2
Q133	A-1
IP101	E-3
IP102	D-5
IP103	C-6
IP104	A-9
ZD101	D-1
ZD102	A-9
ZD103	A-4
ZD104	A-4
ZD105	B-4
ZD106	B-4
ZD107	A-9
D101	D-9
D102	G-2
D103	G-2
D104	G-2
D105	G-1
D106	D-3
D107	D-1
D108	A-2
D109	A-1
D110	C-1
D111	B-6
D112	B-6
D113	B-6
D114	B-6
D115	A-6
D116	A-6
D117	B-6
D118	B-6
D119	A-8
D120	A-8
D121	H-3
D122	H-3
D123	H-3
D124	H-3
D125	E-1

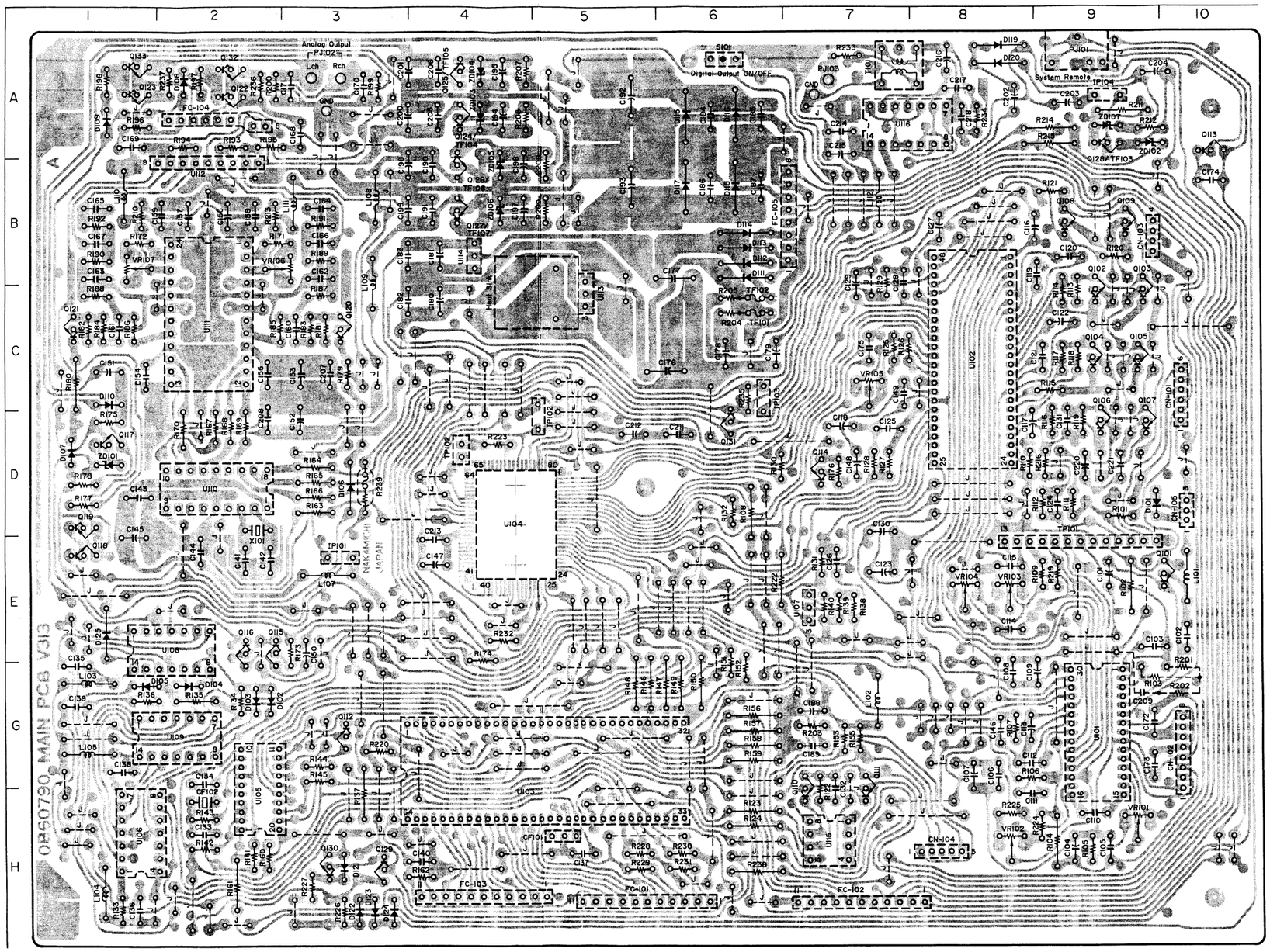
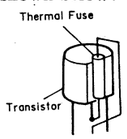


Fig. 7.5.2 For Serial Nos.: V31301034 - 07633

Thermal fuses (TF103-TF107) are mounted on the transistors as shown below:



8. SCHEMATIC DIAGRAM

8.1. IC Block Diagrams

U101 CXA1081S (RF Amp.)

Pin No.	Signal Name	I/O	Function
1	RFI	I	EFM signal is input from the RF summing amp. through a capacitor.
2	RFO	O	EFM signal (eye pattern) output. It is output from the RF summing amp.
3	RF—	I	Feedback input to the RF summing amp.
4	P/N	I	Open. Input condition depends on the kind of laser diode to be used.
5	LD	O	Output from the APC LD (Auto Power Control for Laser Diode) amp.
6	PD	I	Input to the APC PD (Photodiode) amp.
7	PD1	I	Current input (A + C) from the photodiodes A and C of the laser pickup.
8	PD2	I	Current input (B + D) from the photodiodes B and D of the laser pickup.
9	VC	—	Grounded.
10	F	I	Current input (F) from the photodiode F of the laser pickup.
11	E	I	Current input (E) from the photodiode E of the laser pickup.
12	EO	O	E I-V amp. output.
13	EI	I	Feedback input to E I-V amp.
14	VR	O	Output voltage = (VCC + VEE)/2 (Not used.)
15	CC2	I	Defect bottom hold signal input through a capacitor.
16	CC1	O	Defect bottom hold signal output.
17	VEE	I	—5 V is supplied.
18	FE Bias	I	Offset adjusting input of the focus error amp.
19	FE	O	Focus error amp. output.
20	TE	O	Tracking error amp. output.
21	DEFECT	O	Defect comparator output.
22	MIRR	O	Mirror comparator output.
23	CP	I	Mirror hold capacitor connecting pin.
24	CB	I	Defect bottom hold capacitor connecting pin.
25	DGND	—	Grounded.
26	ASY	I	EFM signal slice level control input from U104 (Digital Signal Processor).
27	EFM	O	Binary-coded EFM signal output.
28	FOK	O	Focus OK signal output.
29	$\overline{\text{LD ON}}$	I	Laser diode ON/OFF input. Active "L".
30	VCC	I	+5 V is supplied.

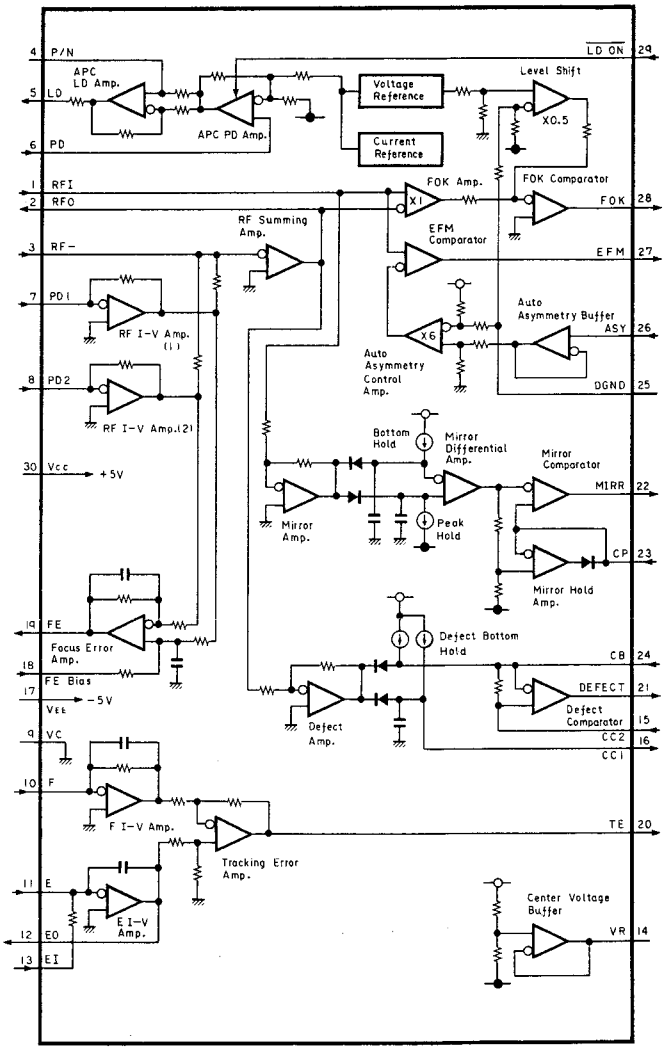


Fig. 8.1.1 RF Amp. CXA1081S (U101)

U103 μPD75108CW-239 (MPU)

Pin No.	Signal Name	I/O	Function
1	D-STA	I	Inner switch is connected. Becomes "L" when Inner switch is ON, ie., when the laser pickup reached the inner position.
2	D-Open	I	Disc Tray Open switch is connected.
3	DCLS	I	Disc Tray Close switch is connected.
4	Eject	I	Eject/Load switch is connected. Becomes "H" when the Eject/Load switch is pressed.
5 to 9	RD0 to RD4	I	Instruction input from the Remote Control Unit via U105 (Remote Control Instruction Decoder).
10	Sense	I	Sense input form U102 (Servo Signal Processor) or U104 (Digital Signal Processor). Signal meaning varies with the command sent from this IC (MPU). However, it is the answer to the command issued.
11	IR	I	Input from U105 (Remote Control Instruction Decoder).
12	FOK	I	Focus OK signal from U101 (RF Amp.)
13	RD6	I	Input from U105 (Remote Control Instruction Decoder).
14	CRCF	I	Input from U104 (Digital Signal Processor). This signal shows the cyclic redundancy code (CRC) check result of subcode Q in U104. Check result OK: "H", NG: "L"
15	SUBQ	I	Subcode Q data input from U104.
16	—	—	Not used.
17	SQCK	I	Clock for reading the subcode Q data.
18	SCOR	I	Subcode sync (S0 + S1) input. This IC (MPU) starts to read subcode Q information (SUBQ & CRCF) synchronizing with SQCK.
19	Data	O	An 8-bit serial output to U102 (Servo Signal Processor) and U104 (Digital Signal Processor). Command is output from this pin.
20	CLK	O	Clock for Data at pin 19.
21	XLT	O	"L" pulse is output when 8-bit data is sent. This pulse is used to latch the 8-bit data.
22	—	—	Not used.
23 to 26	KIB0 to KIB3	I	Input from the key matrix (switches on the Front Panel).
27 to 30	KIA0 to KIA3	—	Not used.
31	—	—	Not used.
32	VDD	I	+5 V is suplied.
33 34	Play Pause	—	Not used.
35	$\overline{\text{LD ON}}$	O	Laser diode ON signal. Becomes "L" while reading read-in area of the compact disc after loading or when the unit is set in Play or Pause mode.
36	IROK	O	System remote enable signal output.
37 to 40	T0 to T3	O	Output to the key matrix (switches on the Front Panel) and indicator control transistors.
41	$\overline{\text{MUTG}}$	O	Mute control output. Active "L".
42	EMPH	O	De-emphasis control output. This IC (MPU) knows emphasis ON/OFF condition of the compact disc through subcode Q information and controls de-emphasis control circuit in the output stage accordingly.
43 44	D-OSG D-CSG	O	Loading motor control output.
45	$\overline{\text{Reset}}$	I	Reset input. Active "L".
46 47	X2 X1	—	4 MHz oscillator is connected.
48 to 55	AA to AH	O	Indication control output for the track number indicator, mode indicators and button LEDs.
56 to 63	BA to BH	O	Indication control output for the time counter.
64	GND	—	Grounded.

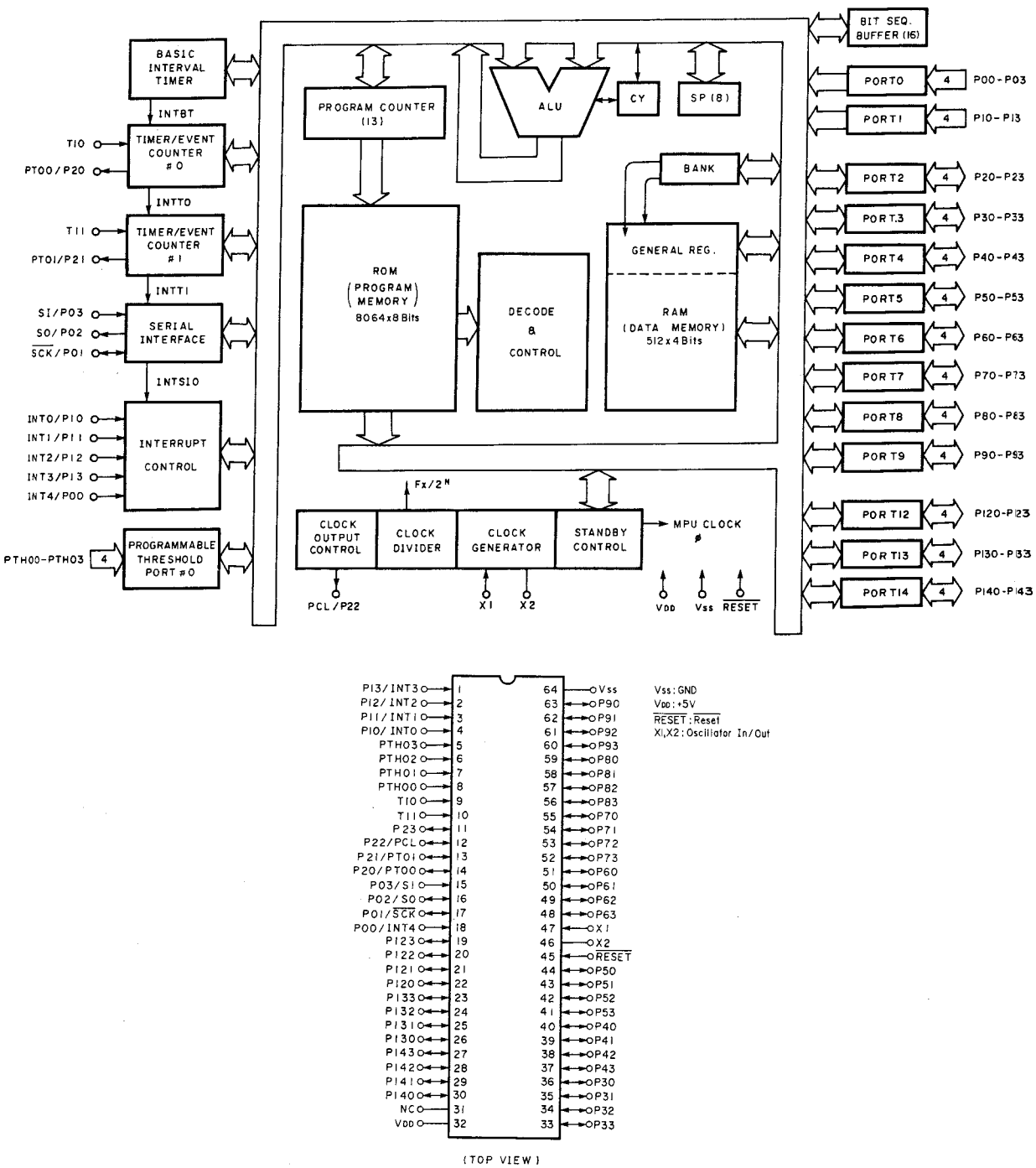


Fig. 8.1.2 MPU μPD75108CW-239 (U103)

U102 CXA1082BS (Servo Signal Processor)

Pin No.	Signal Name	I/O	Function
1	DVEE	I	—5 V is supplied.
2	DFCT	I	Input from defect comparator in U101 (RF amp.).
3	TE	I	Tracking error signal input.
4	TZC	I	Input to the tracking zero cross comparator.
5	ATSC	—	Grounded. (Not used.)
6	FE	I	Focus error signal input.
7	VC	—	Grounded.
8	FGD	I	Reduces focus servo gain at high frequency. Capacitor is connected between this pin and pin 9.
9	FS3	O	Selects focus servo gain at high frequency by turning ON or OFF this pin.
10	FLB	I	Capacitor connecting pin for increasing the focus servo gain at low frequency.
11	FEO	O	Focus amp. output.
12	FE—	I	Feedback input to the focus amp.
13	SRCH	I	Capacitor connecting pin for producing focus search waveform.
14 15	TGU TG2	I O	Capacitor connecting pins for changing over the tracking gain at high frequency.
16	AVCC	I	+5 V is supplied.
17	TAO	O	Tracking amp. output.
18	TA—	I	Feedback input to the tracking amp.
19	SL+	I	Non-inverting input of the feed motor amp.
20	SLO	O	Feed motor amp. output.
21	SL—	I	Inverting input of the feed motor amp.
22	SSTOP	I	(Not used.)
23	FSET	I	Input to determine the peak value for tracking/focus phase compensation, and fc of CLV LPF (Constant Linear Velocity Low Pass Filter).
24	Sense	O	Sense output to U103 (MPU). Signal meaning varies with the command sent from U103 (MPU). However, it is the answer to the command received. Example: Outputs FZC (Focus Zero Cross: in focus condition) for focus search command.
25	AVEE	I	—5 V is supplied.
26	C.OUT	O	Tracking pulse output.
27	DIRC	I	One-track jump direct control input. (Not used.)
28	$\overline{\text{XRST}}$	I	Reset input. Active "L".
29	Data	I	8-bit serial data is input from U103 (MPU).
30	XLT	I	"L" pulse is input from U103 (MPU). This pulse is used to latch the 8-bit data at pin 29 (Data).
31	CLK	I	Clocks for reading Data (pin 29).
32	DGND	—	Grounded.
33	BW	I	Input to determine the time-constant of the loop filter.
34	PDI	I	Phase difference compensation signal is input in order to match the VCO frequency with the EFM signal frequency.
35	ISET	I	Input to determine the amount of current on focus search, track jump and feed kick.
36	VCOF	I	VCO frequency adjusting input.
37	3.5V	O	Regulated +3.5 V is output.
38	C864	O	VCO frequency (8.64 MHz) is output.
39	LOCK	I	Input to prevent reckless run of the feed motor.
40	MDP	I	Disc motor drive input. Speed control pulse is input while in rough serve or PLL servo mode.
41	MON	I	Disc motor ON/OFF control input.
42	FSW	I	Input to determine the time-constant of the CLV LPF.
43	DVCC	I	+5 V is supplied.
44	SPDL—	I	Non-inverting input to the disc motor amp.
45	SPDLO	O	Disc motor amp. output.
46	WDCK	I	Strobe signal input from U104 (Digital Signal Processor). (88.2 kHz)
47	FOK	I	Focus OK signal input.
48	MIRR	I	Input from the mirror comparator in U101 (RF amp.)

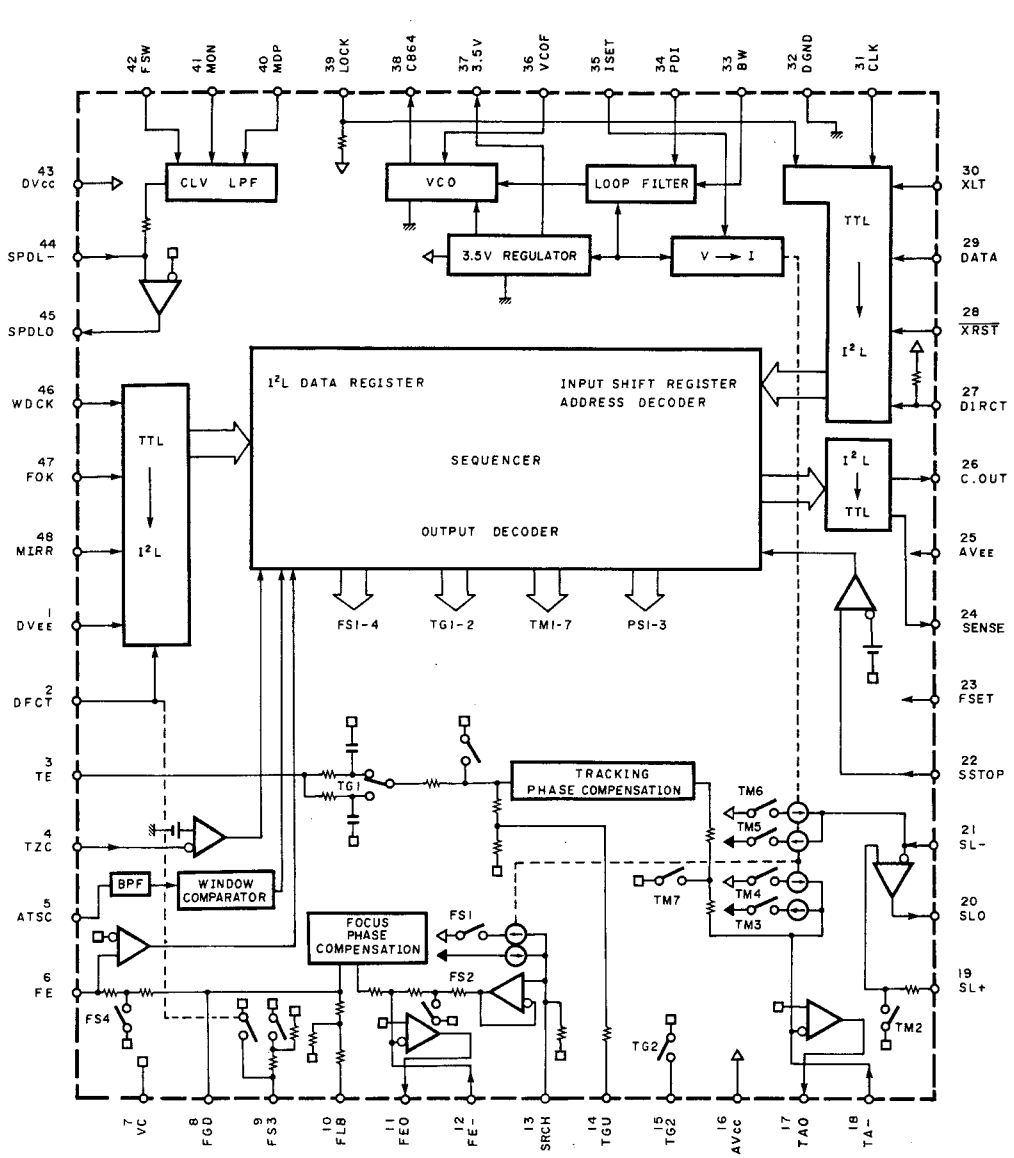


Fig. 8.1.3 Servo Signal Processor CXA1082BS (U102)

U104 CXD1167QZ (Digital Signal Processor)

Pin No.	Signal Name	I/O	Function
1	FSW	O	Output to change over the time-constant of the CLV LPF in U102 (Servo Signal Processor.
2	MON	O	Disc motor ON/OFF control output.
3	MDP	O	Disc motor drive output. Outputs a speed control pulse while in rough servo or PLL servo mode.
4	MDS	O	Disc motor drive output. Outputs a speed control pulse while in PLL servo mode.
5	EFM	I	Binary-coded EFM signal input from U101 (RF Amp.).
6	ASY	O	Output to control the slice level of the EFM signal.
7	LOCK	O	Output to prevent reckless run of the feed motor.
8	VCOO	O	VCO output. Frequency is 8.6436 MHz when locked to the clock extracted from the EFM signal.
9	VCOI	I	VCO input.
10	Test	I	Grounded. (Not used.)
11	PDO	O	Phase difference compensation signal between the clock extracted from the EFM signal and VCO/2.
12	VSS	—	Grounded.
13	CLK	I	Clocks for reading Data (pin 15).
14	XLT	I	"L" pulse is input from U103 (MPU). This pulse is used to latch the 8-bit data at pin 15 (Data).
15	Data	I	8-bit serial data is input from U103 (MPU).
16	$\overline{\text{XRST}}$	I	Reset input. Active "L".
17	CNIN	I	Tracking pulse is input from U102 (Servo Signal Processor).
18	Sense	O	Sense output to U103 (MPU). Signal meaning varies with the command sent from U103 (MPU). However, it is the answer to the command received. Example: Informs of track-jump completion by the specified amount.
19	MUTG	I	Muting input. By combining MUTG signal with the attenuation command sent from U103 (MPU), muting is performed.
20	CRCF	O	Output of CRC check result of subcode Q data.
21	EXCK	I	Clock input to read SBSO. (Not used.)
22	SBSO	O	Subcode data serial output. (Not used.)
23	SUBQ	O	Subcode Q data output.
24	SCOR	O	Subcode sync (S0 + S1) output.
25	SQCK	O	Clock for subcode Q data.
26	SQEX	I	Fixed to "H".
27	DOTX	O	Digital output.

Pin No.	Signal Name	I/O	Function
28	GFS	O	Indicates frame sync lock condition.
29 to 32	TEST	I	Not used. Fixed to "H" or "L".
33	VDD	I	+5 V is supplied.
34 to 50	TEST	I	Not used. Fixed to "H" or "L".
51	C4M	O	Frequency (4.2336 MHz) output. Produced by dividing X'tal frequency. (Not used.)
52	VSS	—	Grounded.
53	XTAI	I	X'tal oscillating frequency input. f=16.9344 MHz
54	XTAO	O	X'tal oscillating frequency output. (Not used.)
55 56 57	MD1 MD2 MD3	I	Mode select input. (MD1="L", MD2="L" or "H", MD3="H") • Digital output ON or OFF. • Internal digital filter is not used.
58	SLOB	I	Audio data code change-over input. Fixed to "L". 2's complement is selected.
59	PSSL	I	Audio data format change-over input. Fixed to "L". Serial output is selected.
60	APTR	O	Aparture compensation control output. "H" for R channel. (Not used.)
61	APTL	O	Aparture compensation control output. "H" for L channel. (Not used.)
62 to 66	DA01 to DA05	O	(Not used.)
67	C2PO	O	Not used.
68 69	DA07 DA08	O	(Not used.)
70	$\overline{\text{PLCK}}$	O	One-half frequency of VCO is output.
71 72	DA10 DA11	O	(Not used.)
73	VDD	I	+5 V is supplied.
74 75	DA12 DA13	O	(Not used.)
76	$\overline{\text{C21O}}$	O	Inversed output of the internal system clock (2.1168 MHz).
77	DA15	O	(Not used.)
78	Data	O	Demodulated serial audio data output.
79	WDCK	O	Strobe signal output to U102 (Servo Signal Processor). (88.2 kHz)
80	LRCK	O	Signal to distinguish L channel and R channel is output to U110 (Digital Filter). (44.1 kHz)

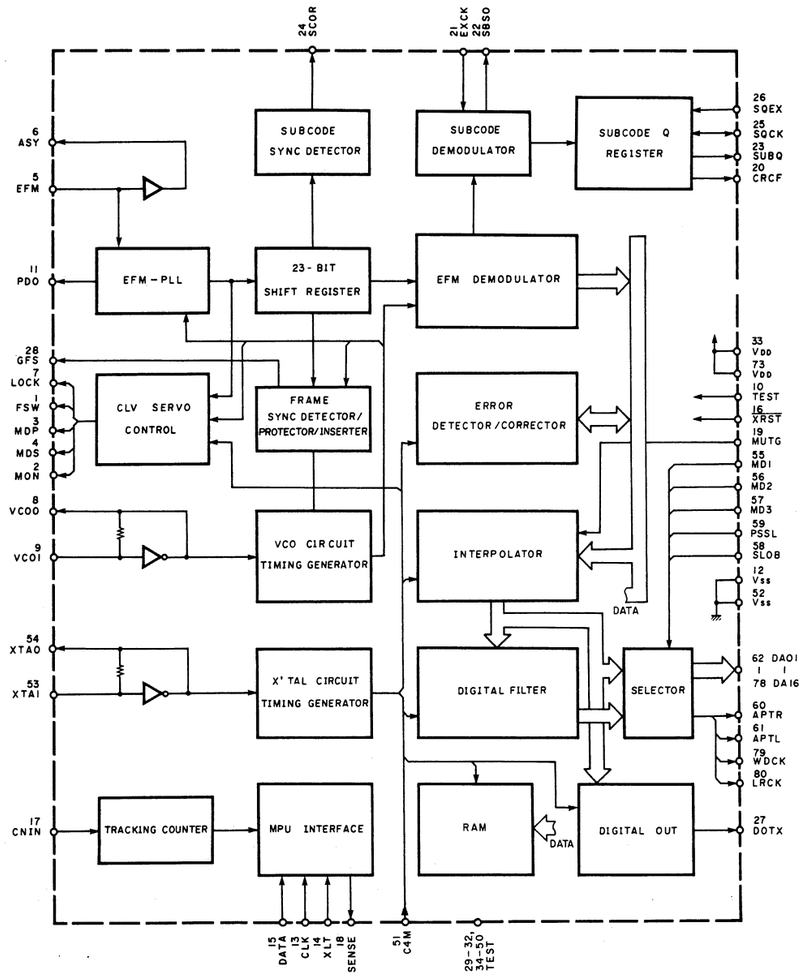


Fig. 8.1.4 Digital Signal Processor CXD1167QZ (U104)

U110 SM5840BP (Digital Filter)

Pin No.	Signal Name	I/O	Function
1	CKS	I	Frequency select input. Fixed to "H" for selecting 384 fs.
2 3	XTI XTO	I O	X'tal (16.9344 MHz) is connected.
4	CKO	O	System clock output. (16.9344 MHz)
5	VSS	—	Grounded.
6 7 8	MDT MCK MLE	I	Not used.
9	$\overline{RST}$	I	System reset input. Active "L".
10	DG	O	Deglitch output. Not used.
11	DOR	O	Rch audio data output.
12	DOL	O	Lch audio data output.
13	WCKO	O	Word clock for digitally-filtered output data.
14	VDD	I	+5 V is supplied.
15	BCKO	O	Bit clock for digitally-filtered output data.
16	LRCI	I	Sampling rate clock (fs) for input data.
17	BCKI	I	Bit clock for input data.
18	DIN	I	Serial audio data input.

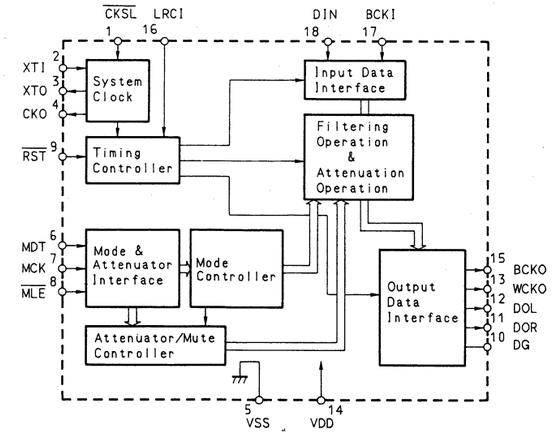


Fig. 8.1.5 Digital Filter SM5840BP (U110)

U111 AD1864N (18-Bit D/A Converter)

Pin No.	Signal Name	I/O	Function
1	—VS	I	—5 V for analog circuit.
2	Trim	I	Trim network connecting pin (Rch).
3	MSB	I	Trim potentiometer input for Rch MSB correction.
4	Iout	O	Output current (Rch).
5	AGND	—	Analog GND (Rch).
6	SJ	I	Amplifier summing junction (Rch).
7	Rf	I	Feedback input (Rch).
8	Vout	O	Output voltage (Rch).
9	VL	I	+5 V for digital circuit.
10	DR	I	Data input (Rch).
11	LR	I	Data latch input (Rch). Word clock input.
12	CK	I	Bit clock input.
13	DGND	—	Digital GND.
14	LL	I	Data latch input (Lch). Word clock input.
15	DL	I	Data input (Lch).
16	—VL	I	—5 V for digital circuit.
17	Vout	O	Output voltage (Lch).
18	RF	I	Feedback input (Lch).
19	SJ	I	Amplifier summing junction (Lch).
20	AGND	—	Analog GND (Lch).
21	Iout	O	Current output (Lch).
22	MSB	I	Trim potentiometer input for Lch MSB correction.
23	Trim	I	Trim network connecting pin (Lch).
24	Vs	I	+5 V for analog circuit.

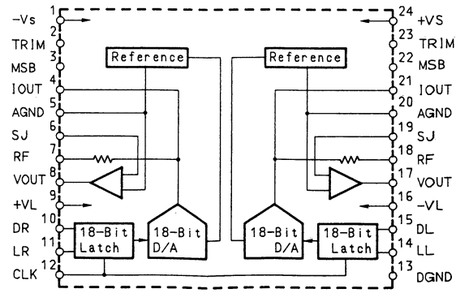


Fig. 8.1.6 18-Bit D/A Converter AD1864N (U111)

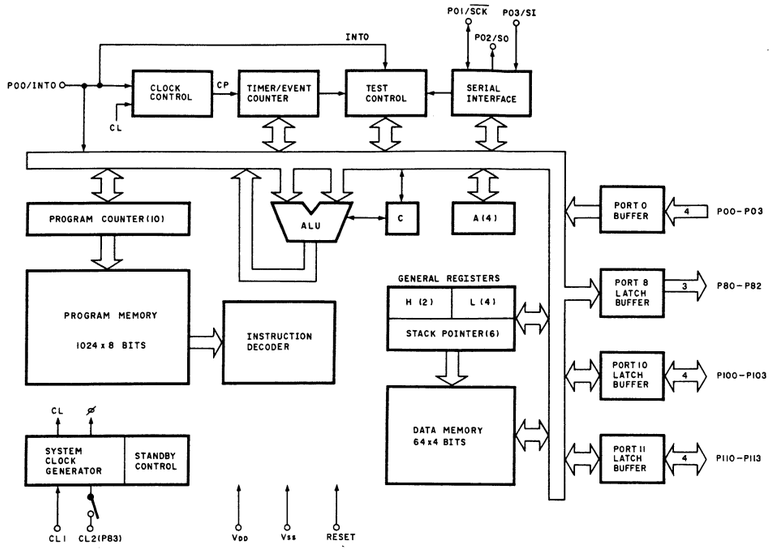


Fig. 8.1.7 Remote Control Instruction Decoder (MPU) μPD7564CS092 (U105)

Fig. 8.1.8 Display Driver TC5066BP

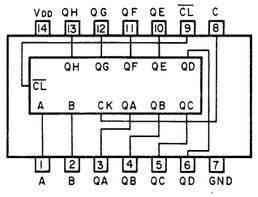
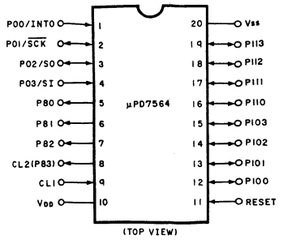


Fig. 8.1.9 3-to-8 Line Decoder TC74HC164P



RESET : Reset
CL1, CL2 : Crystal Input
INTO : Interrupt
SCK : Serial Data Clock
SO : Serial Data Output
SI : Serial Data Input
P00-03 : Input/Bidirectional Port
P80-83 : Output Port
P100-103, P110-113 : Bidirectional Ports

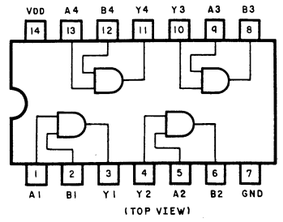


Fig. 8.1.10 AND Gate TC74HC08AP

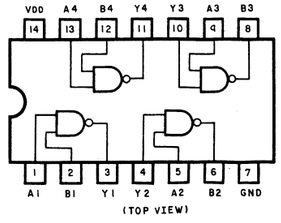


Fig. 8.1.11 NAND Gate TC74HC00AP

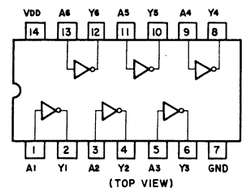


Fig. 8.1.12 Inverter IC TC74HC04AP

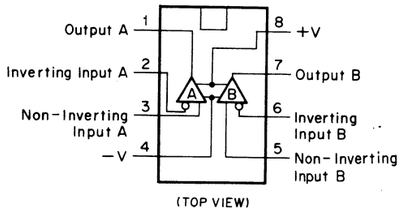


Fig. 8.1.13 Operational Amp. IC NJM4558D

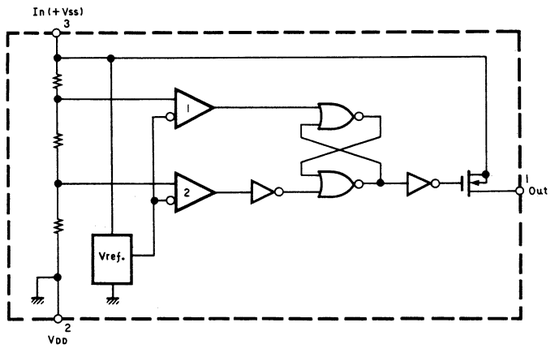


Fig. 8.1.14 Voltage Drop Detector M51951ASL

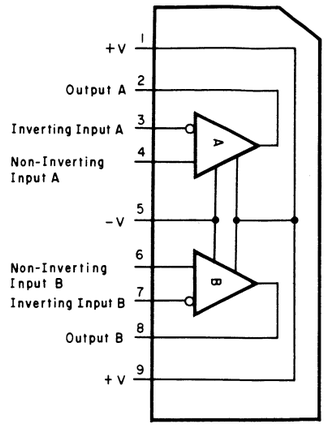
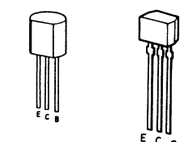


Fig. 8.1.15 Operational Amp. IC NJM5532S

8.2. Schematic Diagram



2SA952
2SC945
2SC2878

DTA114ES
DTA124ES
DTC114ES
DTC124ES
DTC144ES

2SA1020
2SC2655

2SB564
2SD471

2SB772

2SB1094
2SD1585

NJM7805FA

NJM79L05A

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

*: Shows typical value (VR102, R216, R224, R225, C117).

NOTE: Parts marked with * (TF103—TF107, IP105, IP106) are mounted as follows.

Serial No.	Destination	TF103—TF107	IP105, IP106
V31301034 —07633	USA, CAN	Mounted.	Not mounted.
	CAN	Mounted.	Not mounted.
V31307634—	USA, EP AUS, OTR JPN	Not mounted.	Mounted.

Fig. 8.2

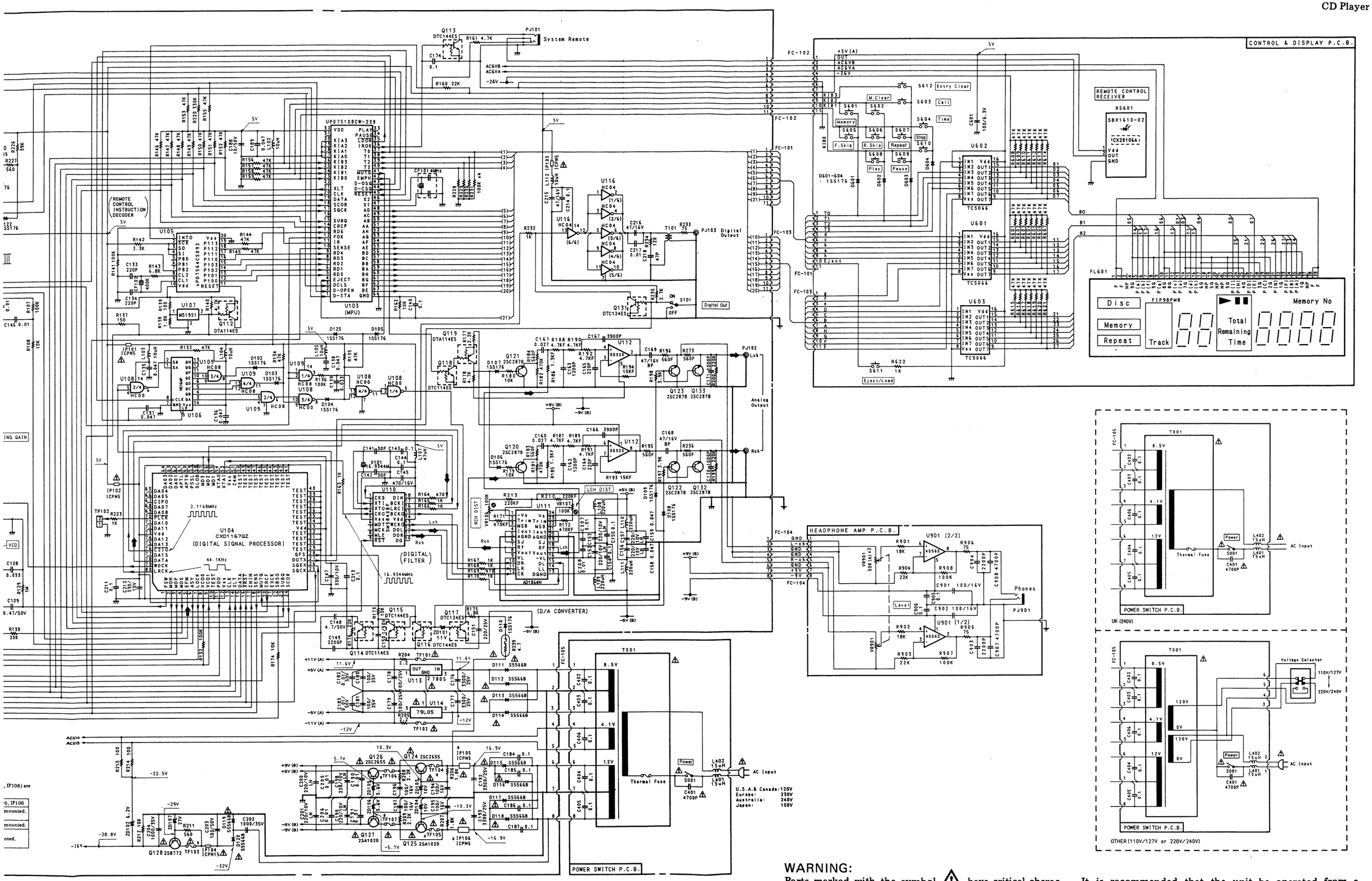
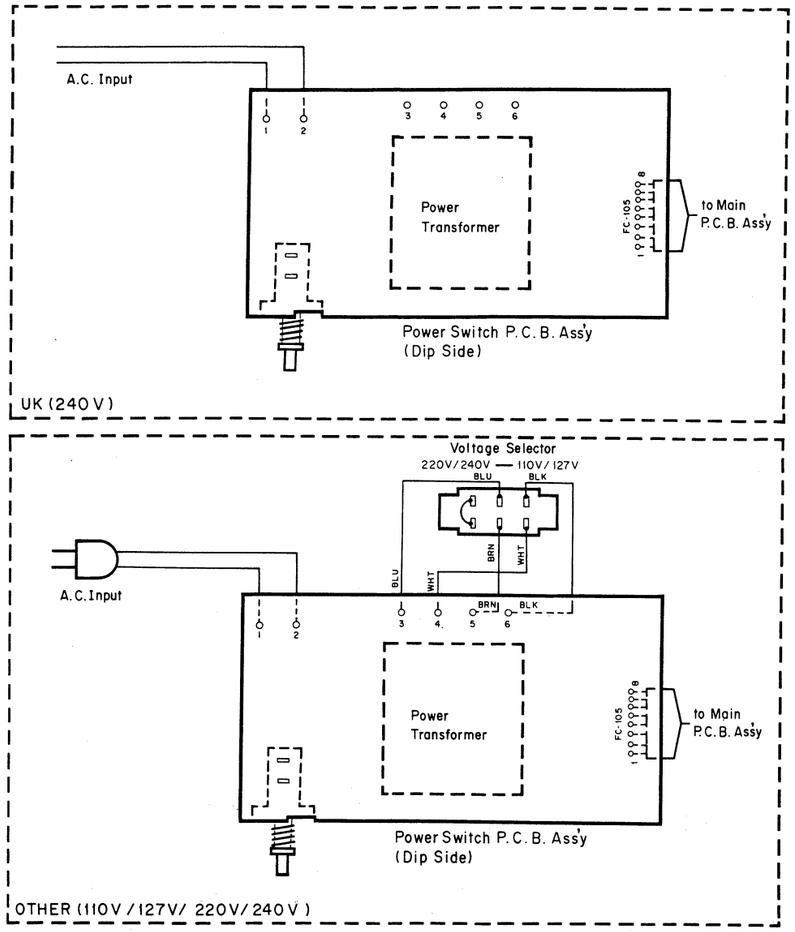


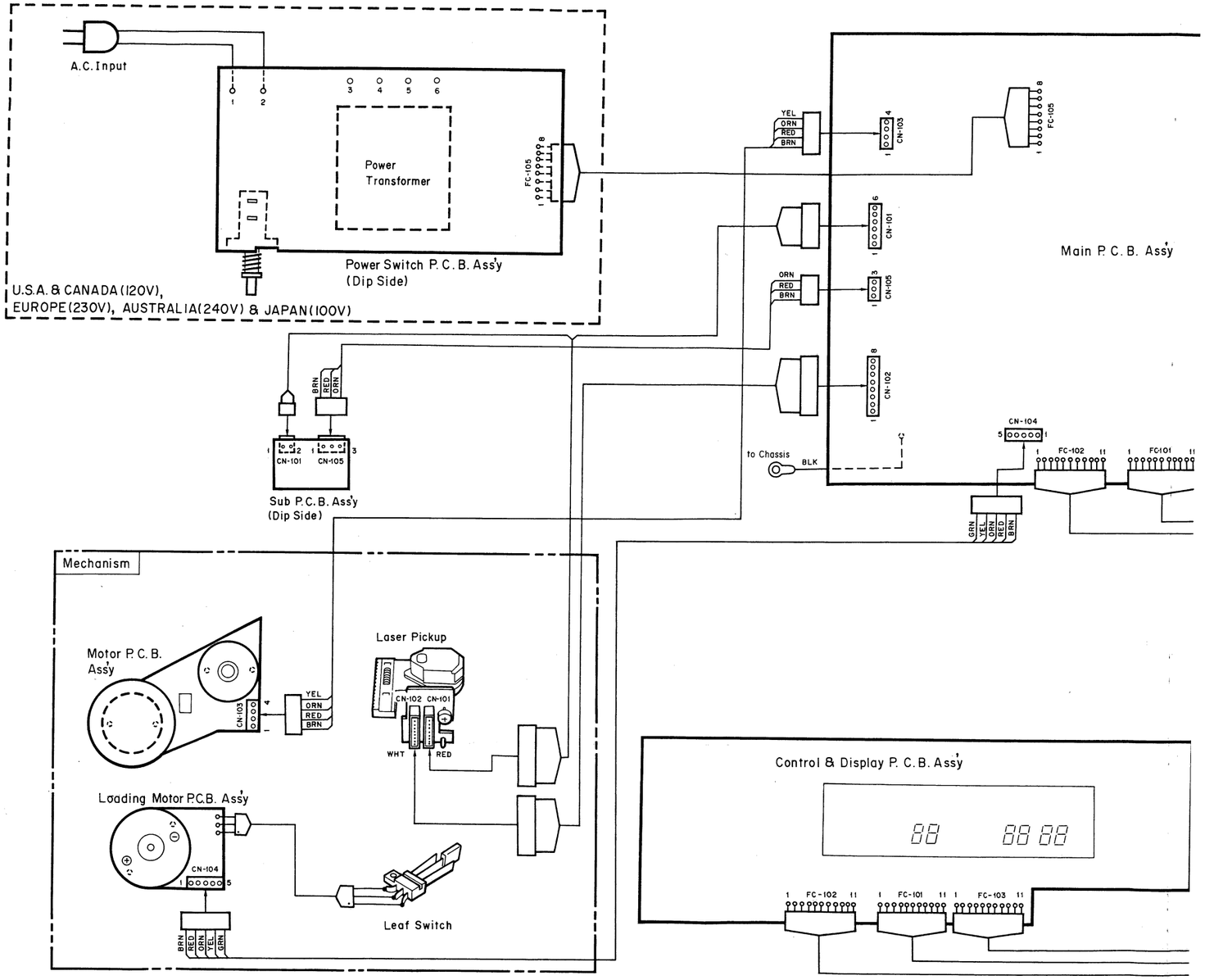
Fig. 8.2

WARNING:
Parts marked with the symbol ⚠ have critical characteristics.
Use ONLY replacement parts recommended by the manufacturer.

It is recommended that the unit be operated from a suitable DC supply or batteries during initial check-out procedures.

9. WIRING DIAGRAM





Notes: 1. Table of wire colors

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

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

Fig. 9

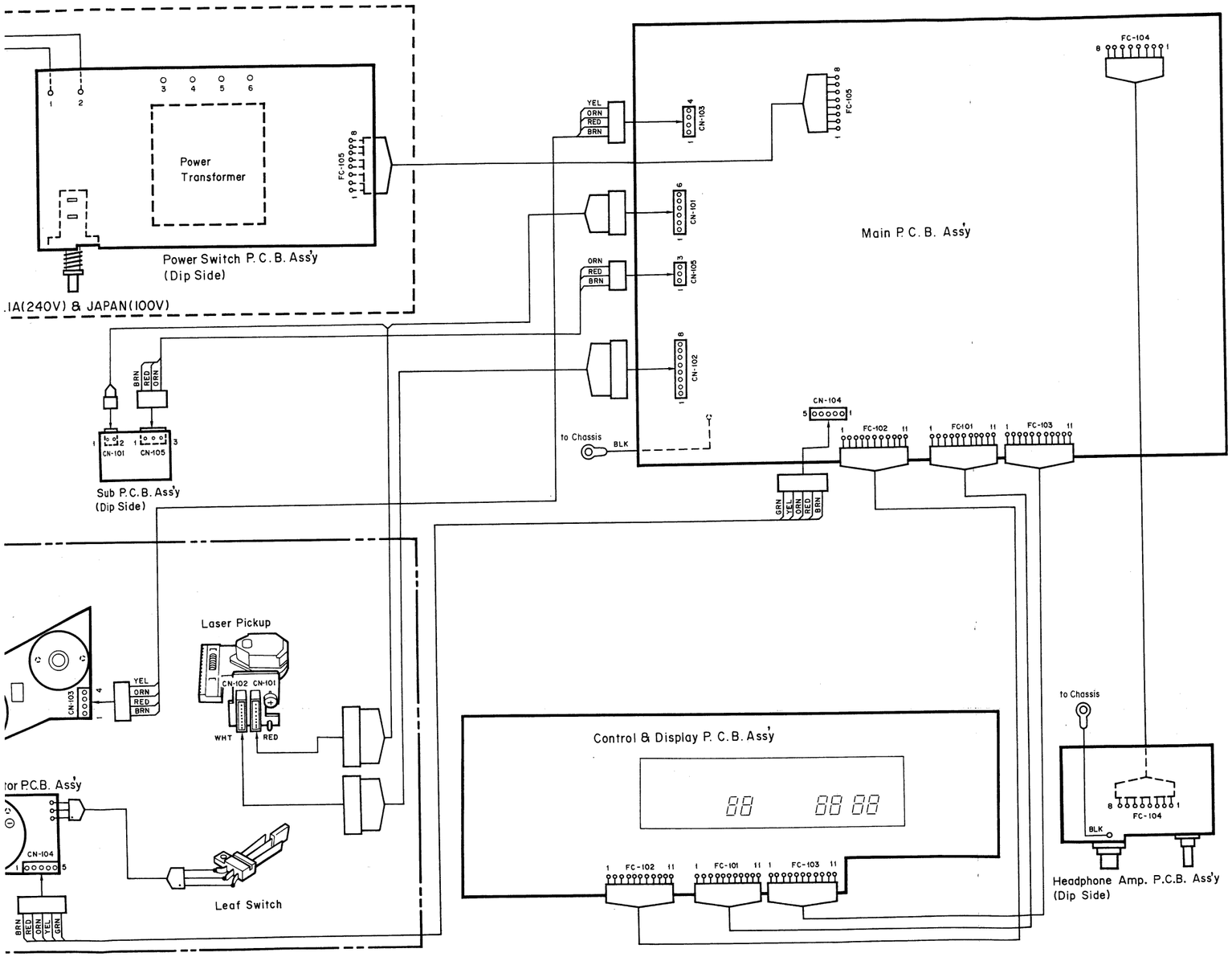

Power Transformer
Power Switch P.C.B. Ass'y
(Dip Side)
.IA(240V) & JAPAN(100V)
FC-105
Main P.C.B. Ass'y
YEL
ORN
RED
BRN
CN-103
CN-101
CN-105
CN-102
FC-104
FC-105
CN-104
FC-102
FC101
FC-103
to Chassis
BLK
GRN
Sub P.C.B. Ass'y
(Dip Side)
Laser Pickup
WHT
Control & Display P.C.B. Ass'y
Headphone Amp. P.C.B. Ass'y
(Dip Side)
Leaf Switch

Fig. 9

10. BLOCK DIAGRAM

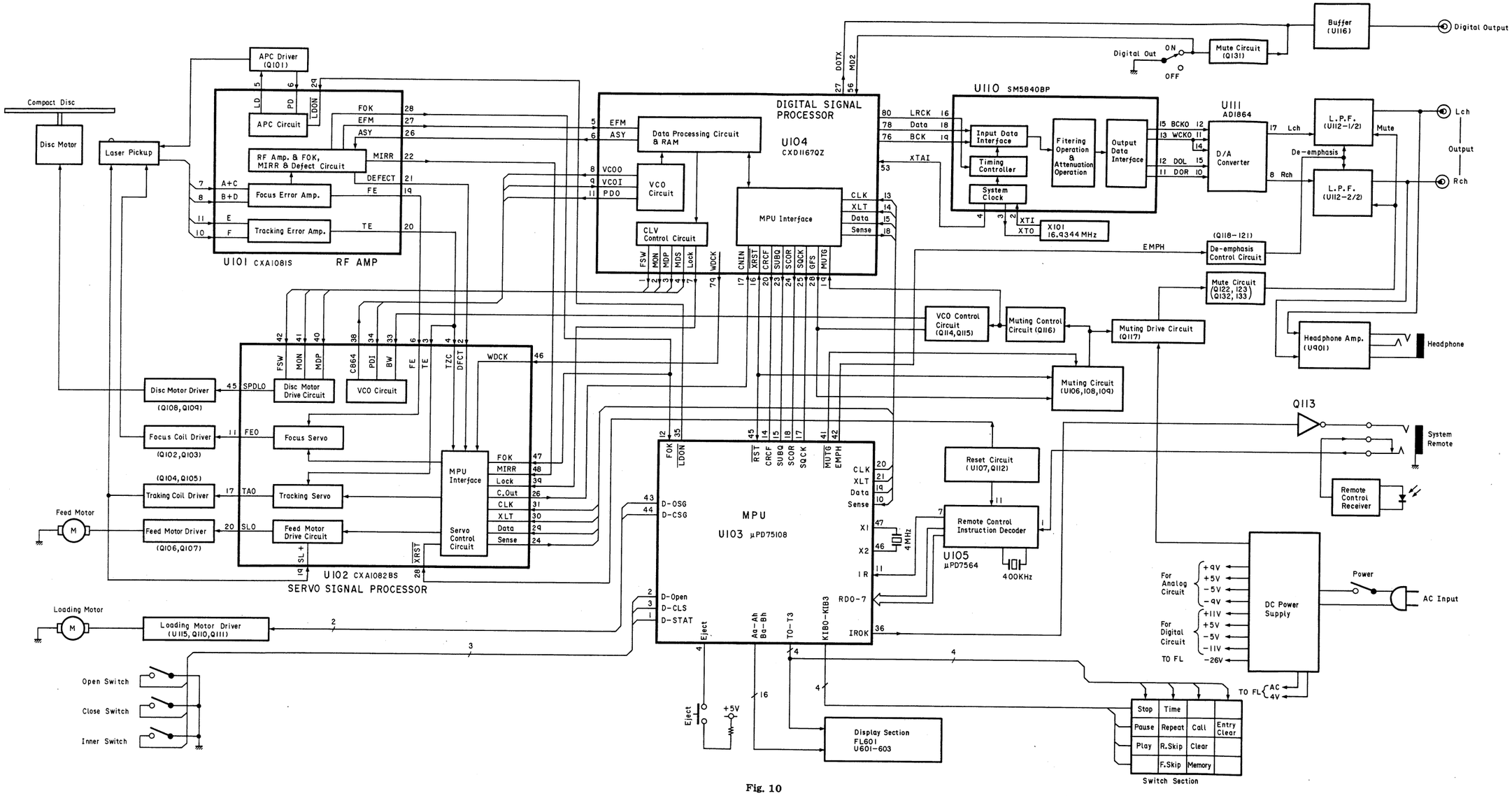


Fig. 10

11. TIMING CHART

(1) Operational Timing Chart

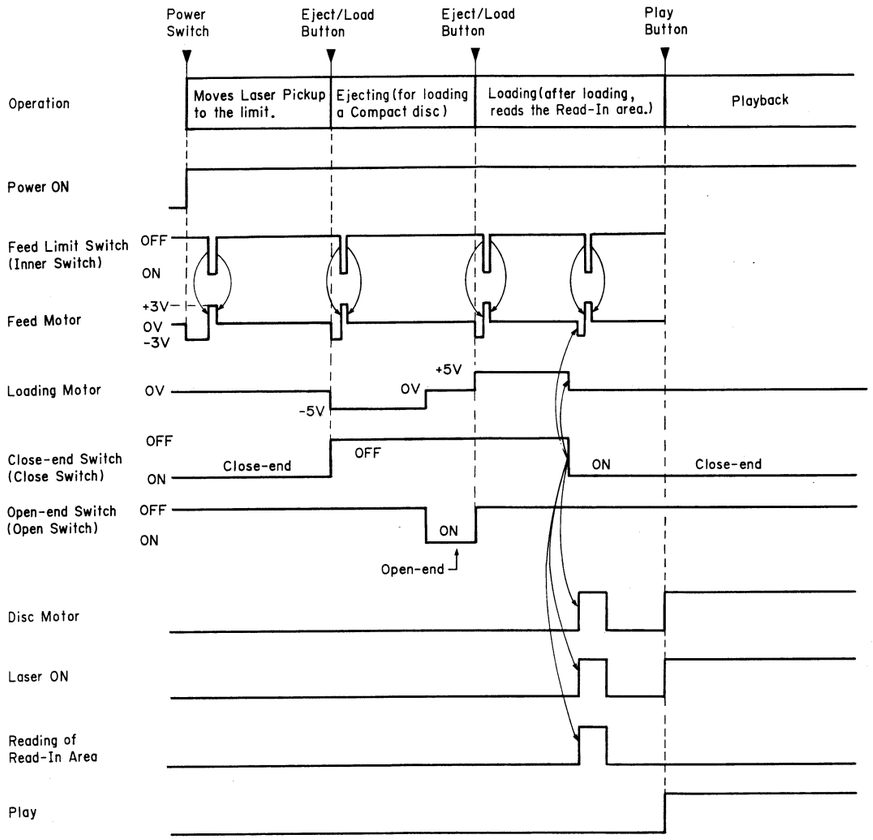


Fig. 11.1

(2) Operational Flowchart

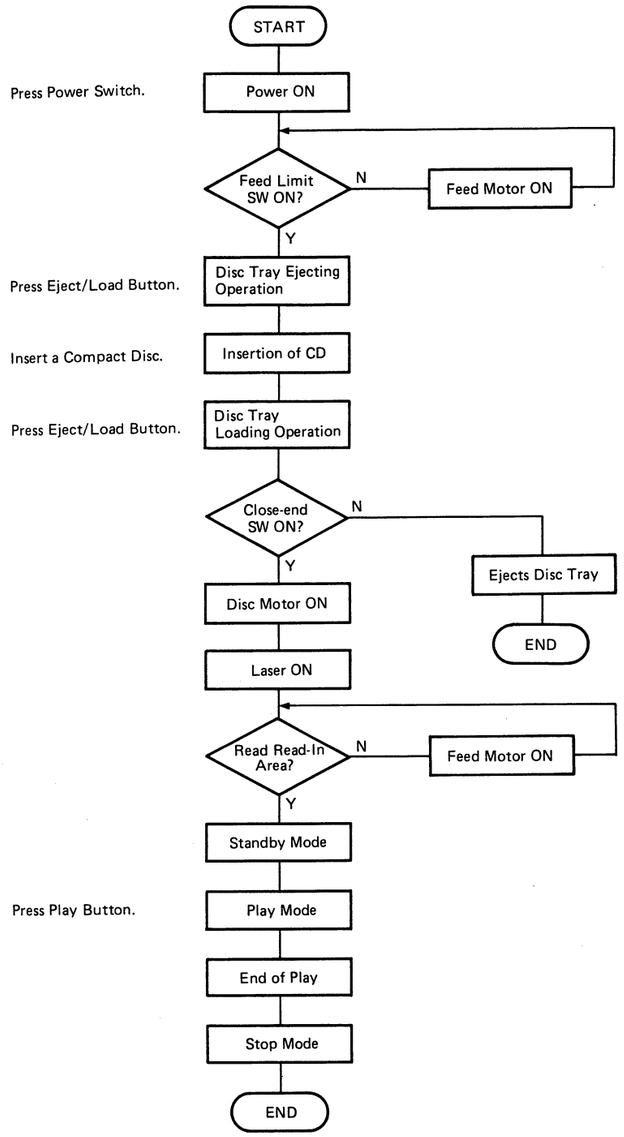


Fig. 11.2

12. SPECIFICATIONS

- **Main Unit**

System	Compact Disc digital audio
Signal Readout	Optical (semiconductor laser)
Error Correction	CIRC principle
Number of Channels	2 channels, stereo
D/A Converter Type	18-bit Dual D/A converters with 8-times oversampling digital filter
Sampling Frequency	44.1 kHz
Quantization	16 bit linear
Disc Rotational Velocity	Approx. 200 to 500 rpm (constant linear velocity)
Wow and Flutter	Below measurement limit
Frequency Response	5—20,000 Hz ±0.5, —1 dB
Signal to Noise Ratio (IHF A-WTD)	Better than 105 dB
Dynamic Range	Better than 97 dB
Total Harmonic Distortion (1 kHz)	0.0035%
Total Harmonic Distortion + Noise (1 kHz)	0.004%
Channel Separation	Better than 95 dB
Output Level/Impedance (1 kHz,0 dB)	
Line	2.0 V/600 ohms
Headphone	60 mW into 40 ohms
Power Requirements	120, 230, 240 or 110—127/220—240V 50/60 Hz (According to country of sale)
Power Consumption	20 W max.
Dimensions*	430 (W) x 100 (H) x 320 (D) mm 16-15/16 (W) x 3-15/16 (H) x 12-5/8 (D) inches
Approximate Weight	5.0 kg, 11 lbs.

- **Remote Control Unit**

Principle	Infrared pulse system
Power Supply	3 VDC (1.5 Vx2)
Dimensions*	63 (W) x 18 (H) x 135 (D) mm 2-1/2 (W) x 11/16 (H) x 5-5/16 (D) inches
Approximate Weight	100 g, 3-1/2 oz (including batteries)

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