



Service Manual

Nakamichi

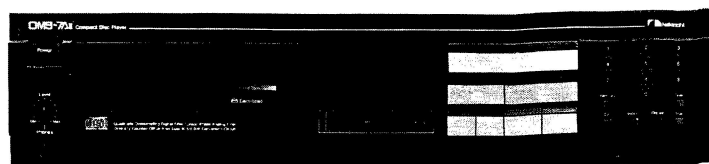
OMS-7_{II}

OMS-7A_{II}

OMS-7E_{II}

OMS-70_{II}

Compact Disc Player



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1. GENERAL

1.1 Voltage Selector

Voltage selector is installed on the rear panel of the Other version of the Nakamichi OMS-7II. This voltage selector can select either 110V, 120V or 220-240V at customer's disposal.

1.2 Packing Materials and Owner's Manual

Part No.	Description	Q'ty
OC82066A	Outer Carton OMS-7AII	1
OC82067A	Outer Carton OMS-7EII	1
OC82068A	Outer Carton OMS-7OII	1
OC82065A	Outer Carton OMS-7II	1
OC82074A	Inner Carton OMS-7AII	1
OC82075A	Inner Carton OMS-7EII	1
OC82076A	Inner Carton OMS-7OII	1
OC82073A	Inner Carton OMS-7II	1
OC82082A	Packing Cushion L	1
OC82083A	Packing Cushion R	1
OC82176A	Plastic Bag	1
ODO4643A	Owner's Manual OMS-7AII/7II & OMS-5AII/5II (English)	1
ODO4644A	Owner's Manual OMS-7II/7EII & OMS-5II/5EII (English/German/French)	1
ODO4642A	Owner's Manual OMS-7OII/5OII (Japanese)	1

2. PICKUP REPLACEMENT PROCEDURES

2.1 Notice in Handling Pickup

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

- (1) Repair or replace on a work stand on which the conducting rubber is spread.
- (2) Use ceramic soldering iron with GND.
- (3) Since the Pickup is supplied as a spare part in a conductive bag, take it out of the bag only when you need it.
- (4) **NEVER** turn the adjustment screws of the Pickup.

2.2 Pickup Replacement Procedures

- (1) Place the Compact Disc Player upside down on the work stand and remove the Bottom Cover by unfastening 10 screws and the shipping bracket.
- (2) Rotate the pulley of the Disc Mechanism Ass'y to move the Pickup in the direction of the arrow. See Fig. 2.1.
- (4) Remove L08 and two connectors. See Fig 2.2.

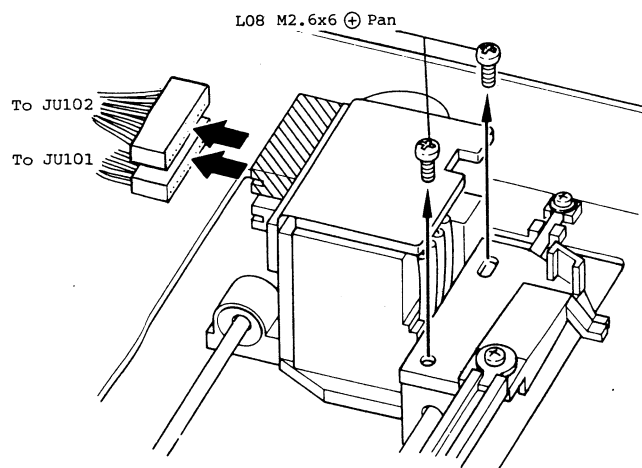


Fig. 2.2

CAUTION

Short the short-terminals on the Pickup during repair or replacement and open them after entire work is completed. Do not touch the Pickup while the short-terminals are open.

Important note for servicing

To avoid static breakdown of the laser diode, the APC connector (JU102) is not be disconnected when the power is on or off.

Before removing connector JU102 for servicing, be sure to solder on the shorting rounds on the laser pickup to short them out. While to assemble the pickup, first connect the JU102 to the Main P.C.B. then open the rounds on the pickup and turn the power on.

NOTE: Use a ceramic heater solder iron with little leak current.

To determine the failure of the laser pickup, sizing the voltage across the pickup can be a key. Connect a digital voltmeter across R601 and press the PLAY button. The current (I) can be calculated as:

$$(I) = \text{Voltage across R601} / 22 \text{ (ohm)}$$

The laser pickup is normal if (I) is obtained within 10% of the value specified on the individual pickup. But (I) shows tendency to increase when the laser pickup is used over 1000 hours.

15556
A 694

--- 69.4mA

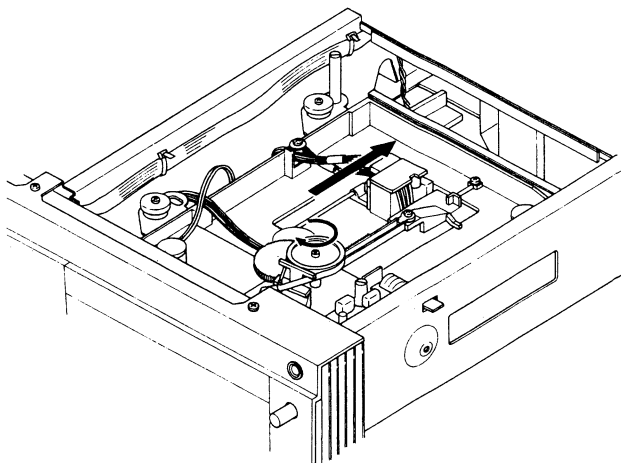


Fig. 2.1

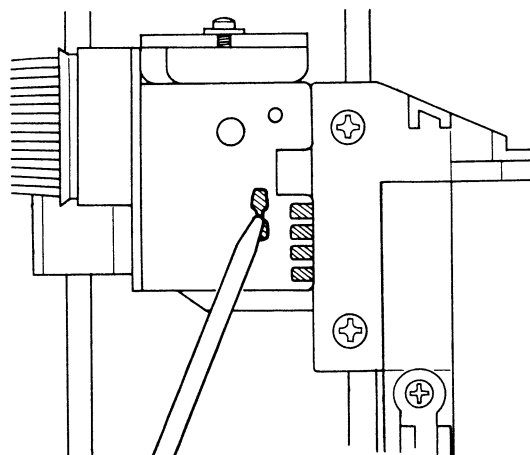


Fig. 2.3

WARNING:

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

Note: Laser Diode Properties

Material:	GaAlAs
Wavelength:	760nm-800nm
Emission Duration:	continuous
Laser Output:	0.4mW max.
Classification:	Class IIIB

- (5) Remove L09 and pull out O3. See Fig. 2.4.
- (6) Mount the new Pickup by reversing the disassembly procedure.
- (7) Open the short-terminals after connecting the connectors.
(See Fig. 2.3.)

2.3 Adjustment After Replacement of Pickup
Upon completion of replacement of the Pickup, perform the following adjustments in the flow chart shown in Fig. 2.5.

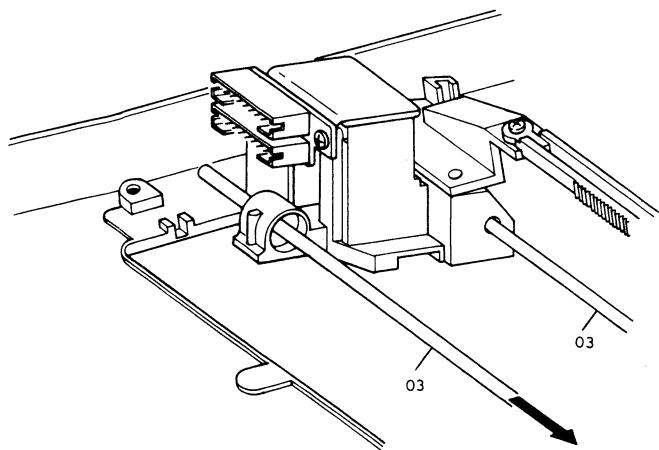
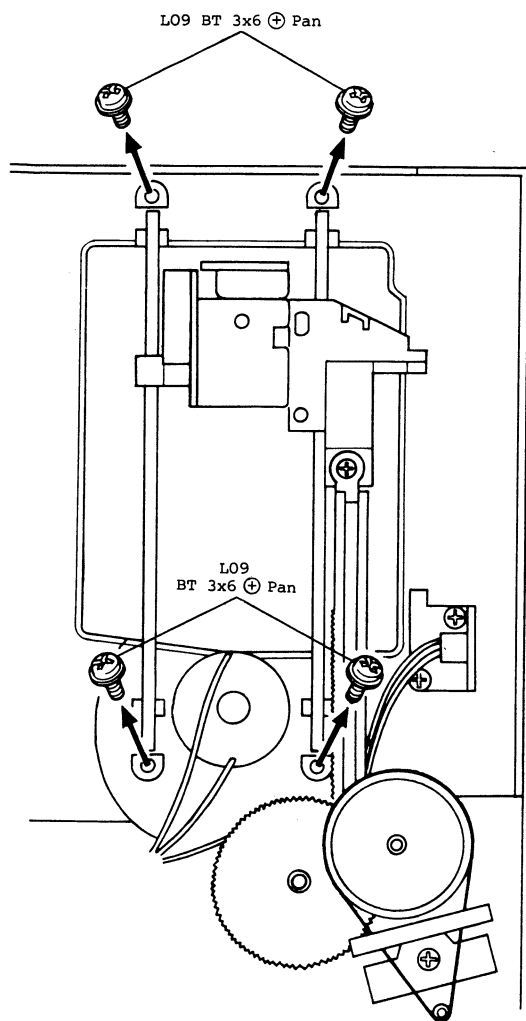


Fig. 2.4

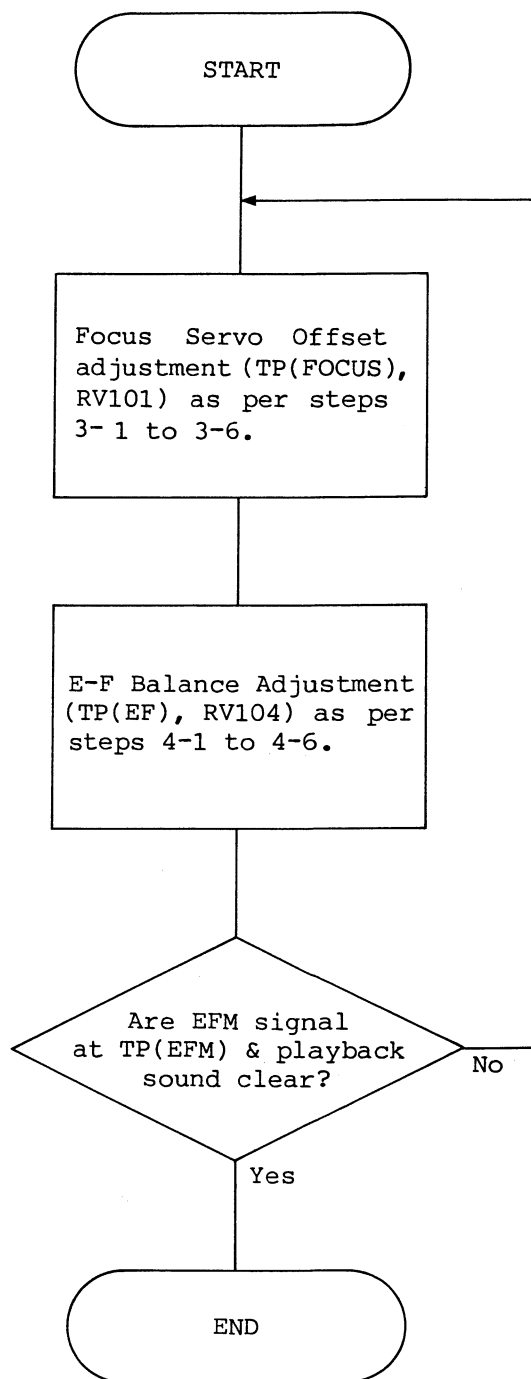


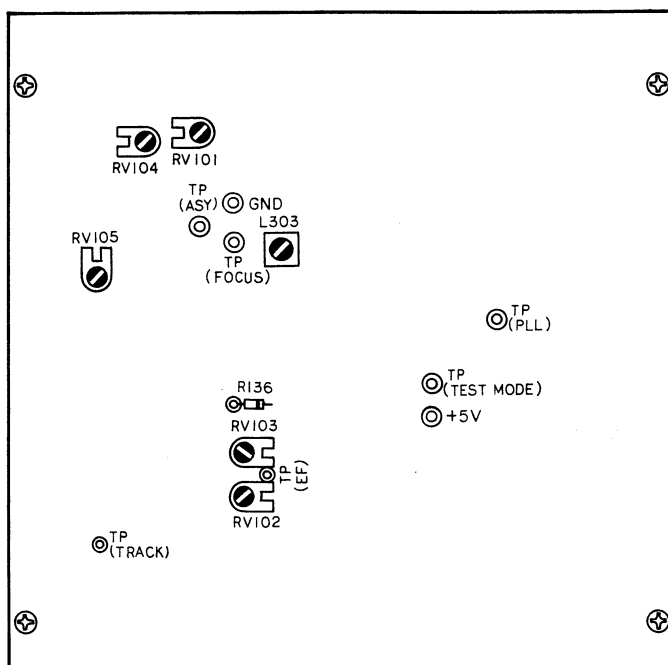
Fig. 2.5

3. MEASUREMENT INSTRUMENTS AND TEST DISCS

- (1) Oscilloscope (15MHz or more)
- (2) Frequency Counter (15MHz or more)
- (3) Audio Signal Generator
- (4) Distortion Meter
- (5) Sony Test C.D. YEDS-18 Type 3 and 4

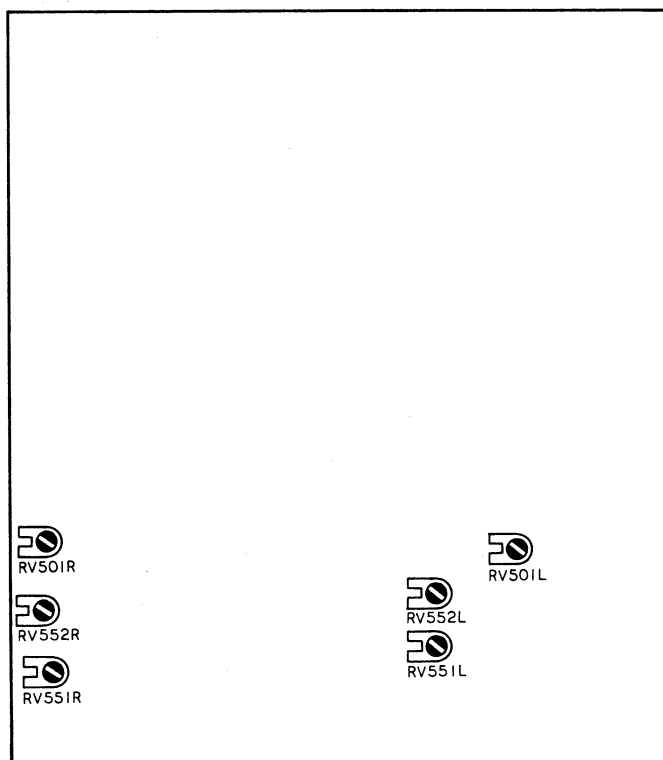
4. PARTS LOCATION FOR ADJUSTMENT

4.1. Parts on P.C.B. Ass'y



Main P.C.B.

Fig. 4.1



D/A Converter P.C.B.

Fig. 4.2

5. ADJUSTMENTS

5.1 Note

Pay attention to the following before adjustment.

- (1) Keep the Compact Disc Player horizontal during adjustment.
- (2) Before starting adjustment, allow three minutes after the power is turned ON. Offset voltage will stabilize in this period of time.
- (3) Potentiometers that are not stated in the adjustment instructions should be left to their original positions.

- (4) Keep the Pickup lens clean. Carefully clean it with lens cleaner or similar tools.
- (5) The Tracking Servo Gain adjustment has been factory-aligned using the special filter and the field adjustment is seldom required.

Danger: Invisible laser radiation when opened and interlock failed or defeated. Avoid direct exposure to beam.

5.2. Adjustment Instructions

STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	ADJUSTMENT	REMARKS
1	PLL Free-run Frequency Adjustment	None	Frequency counter to TP(PLL) on Main P.C.B.	Main P.C.B. L303	1. Connect the frequency counter to TP(PLL). 2. Connect TP(ASY) to GND. 3. Adjust L303 to obtain 4.3 ± 0.1 MHz on the frequency counter.
2	Tracking Offset Adjustment	None	Oscilloscope to TP(TRACK) on Main P.C.B.	Main P.C.B. RV102	1. Set a oscilloscope to DC input and 20mV/div., and connect it to TP(TRACK). 2. Short the TEST MODE pins on Main P.C.B. 3. Press the Repeat button. 4. Adjust RV102 to obtain 0 ± 10 mV on the scope.
3	Focus servo offset adjustment	Test disc Sony Type 4	Oscilloscope to TP(FOCUS) on Main P.C.B.	Main P.C.B. RV101	1. Set a oscilloscope to DC input and connect it to TP(FOCUS). 2. Press the Play button. 3. Observe and record DC average voltage at TP(FOCUS). 4. Press the Stop button. 5. Adjust RV101 to obtain same voltage in step 3 on the scope. 6. Repeat playback and stop a few times and check that the voltage does not change.
4	E-F Balance Adjustment	Test Disc Sony Type 4	Oscilloscope to TP(EF) on Main P.C.B.	Main P.C.B. RV104	1. Set a oscilloscope to DC input and connect it to TP(EF). 2. Press the Play button. 3. Short the TEST MODE pins on Main P.C.B. after pressing the Play button. 4. Press the Time button. 5. Adjust RV104 so that the signal has the symmetrical plus swing and minus swing on the scope. 6. Open the TEST MODE pins and check that playback and track search operates normally.
5	Tracking Servo Gain	Test Disc Sony Type 4	Oscilloscope to TP(TRACK) through a 1kHz BPF. Signal Generator to pin 4 of U102 on Main P.C.B.	Main P.C.B. RV103	1. Set a signal generator to 4 pins of U102. 2. Apply 1kHz, 300mV audio signal to TP(TRACK). Output impedance should be 220k ohms. 3. Turn RV103 slowly clockwise and top at the point where tracking servo signal goes out. At this point, assume that noise level is 0 dB. 4. Adjust RV103 to obtain a 1kHz signal level at -6dB.
6	THD Adjustment	Test Disc Sony Type 3	Distortion meter and Oscilloscope to OUTPUT terminal	D/A Converter P.C.B. RV551L/R RV552L/R RV501L/R	1. Play 10kHz(100%) track and adjust RV552L/R to obtain minimum distortion. 2. Play 1kHz(100%) track and adjust RV551L/R to obtain minimum distortion. 3. Perform steps 2 and 3 again. 4. Play 1kHz(-90dB) track and adjust RV501L/R to obtain equal waveforms on right and left channel.
7	Remote Control Sensitivity Adjustment	Remote Controller	Oscilloscope to UK01 #2pin on Remote P.C.B.	Remote P.C.B. CTK01	1. Connect a 470 or 510 ohm resistor in parallel to RK06. 2. Receive remote control signal and adjust CTK01 to obtain maximum output. 3. Remove the resistor.

6. MECHANISM ASS'Y AND PARTS LIST

6.1 Synthesis

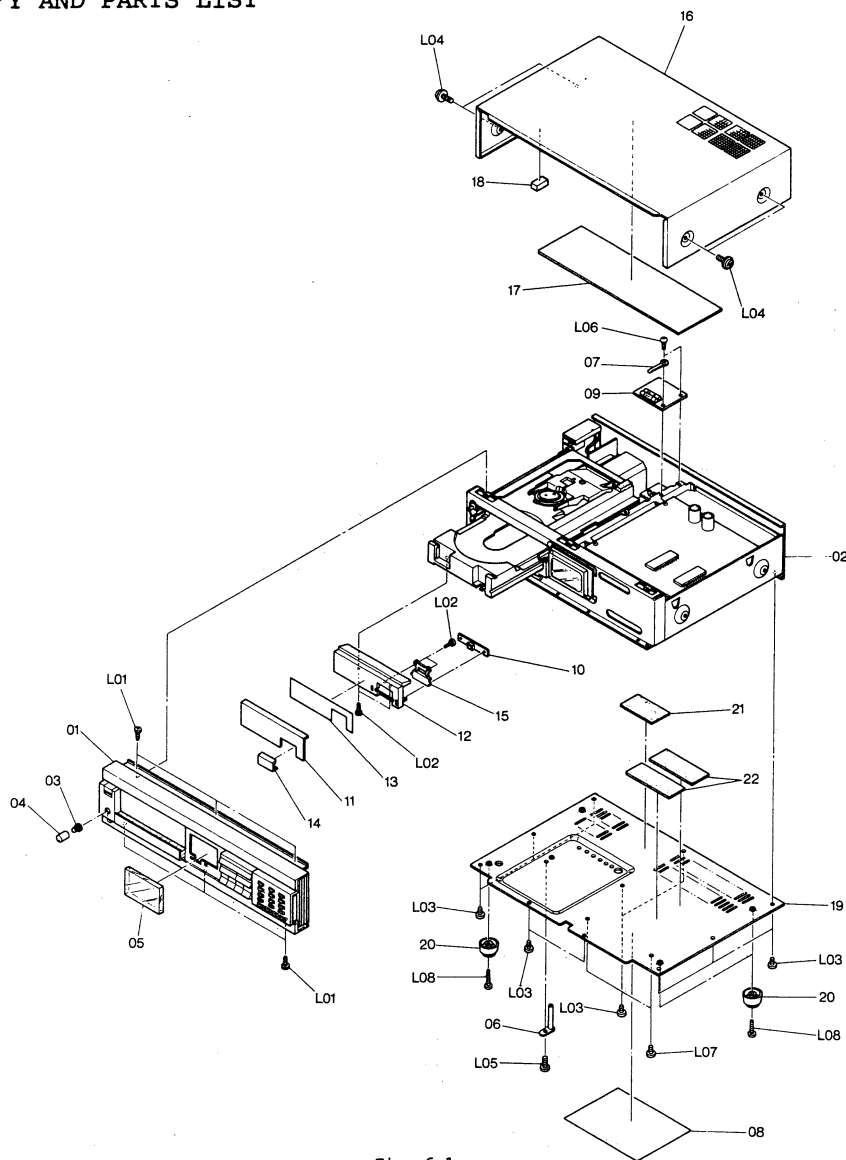


Fig. 6.1

Schematic Ref. No.	Part No.	Description	Q'ty	Schematic Ref. No.	Part No.	Description	Q'ty
01	CA80469A	Front Panel Ass'y (OMS-7I1)	1	15	OC80718A	Eject Button Base	1
	CA804669	Front Panel Ass'y (OMS-7AII)	1	16	OC80719A	Top Cover	1
	CA80467A	Front Panel Ass'y (OMS-7EII)	1	17	OC80720A	Vibration Isolation Sheet A (USA)	1
	CA80468A	Front Panel Ass'y (OMS-70II)	1		OC81089A	Vibration Isolation Sheet A (Except USA)	1
02	CA80470A	Chassis Ass'y (OMS-7AII)	1		OC81966A	Sponge	2
	CA80471A	Chassis Ass'y (OMS-7EII)	1	18	OC81967A	Bottom Cover	1
	CA80472A	Chassis Ass'y (OMS-70II)	1	19	OC80722A	Leg	4
	CA80473A	Chassis Ass'y (OMS-7II Others)	1	20	OC81063A	Vibration Isolating Sheet B (USA)	1
	CA80474A	Chassis Ass'y (OMS-7II Canada)	1	21	OC81062A	Vibration Isolating Sheet B (Except USA)	1
	CA80475A	Chassis Ass'y (OMS-7II Australia)	1		OC81969A	Vibration Isolating Sheet C (Except USA)	2
	OC80714A	Volume Knob	1		OC81968A	Vibration Isolating Sheet C (USA)	2
03	OC80713A	Volume Knob Cap	1	L01	OE00921A	BT 3x8 + Binding	6
04	OC80712A	Indicator Lens	1		OC82236A	BT 2x6 + Binding (Black Chromate)	4
05	OC82175A	Shipping Bracket	1		OE00970A	BT 3x4 + Binding	8
06	OC82240A	Cord Clamper	1		OC81064A	M 4x8 + Pan Washer-faced (Black Chromate)	4
07	OM04377A	Caution Label	1	L02	OC82239A	Shipping Screw (Red)	1
08	CA80478A	Fuse P.C.B. Ass'y(OMS-7EII)	1	L03	OC81033A	BT 3x8 + Round	2
09	CA80479A	Fuse P.C.B. Ass'y(except OMS-7EII)	1	L04	OC82237A	BT 3x8 + Binding (Black Chromate)	2
10	CA80476A	Eject/Load P.C.B. Ass'y	1	L05	OC82238A	BT 3x10 + Binding	4
11	OC80716A	Disc Tray Lid	1	L06			
12	OC80717A	Lid Frame	1	L07			
13	OC82153A	Sheet	1	L08			
14	OC80715A	Eject Button	1				

6.2 Front Panel Ass'y

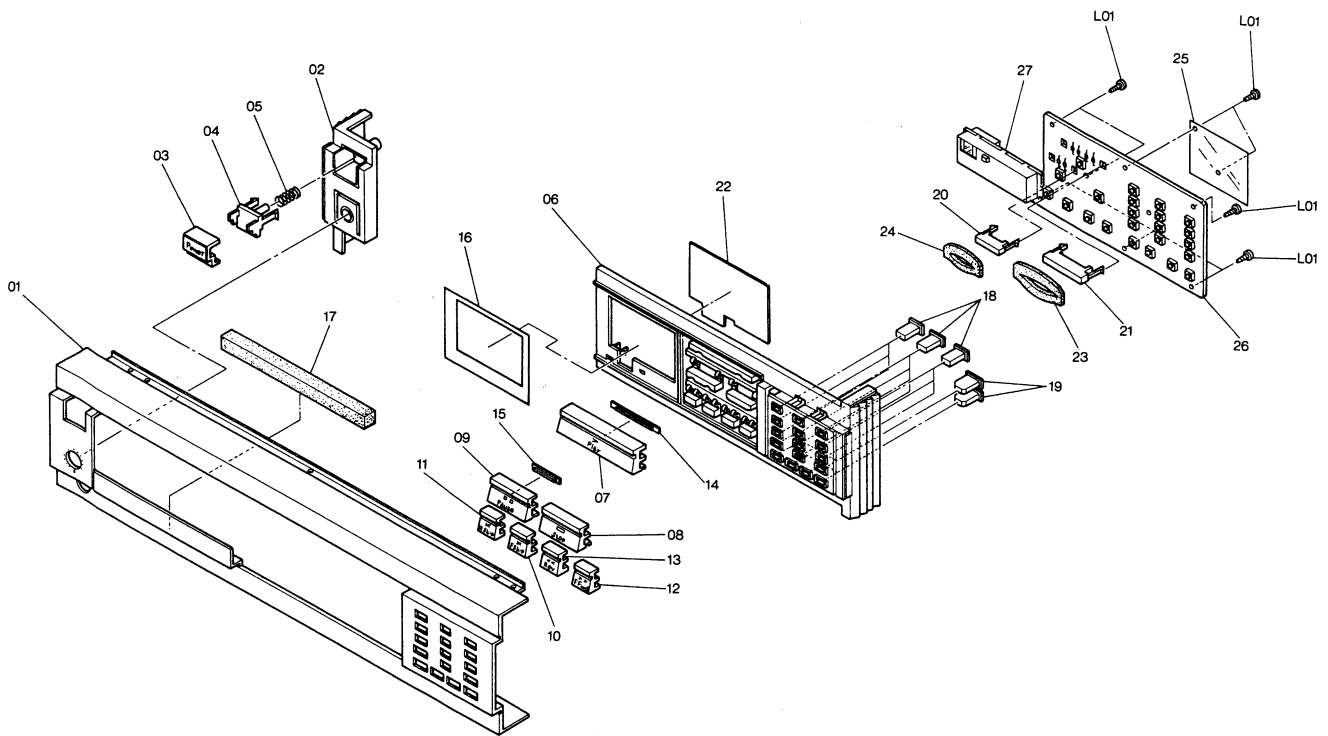


Fig. 6.2

Schematic Ref. No.	Part No.	Description	Q'ty
01	CA80469A	Front Panel Ass'y (OMS-7II)	1
	CA80466A	Front Panel Ass'y (OMS-7AII)	1
	CA80467A	Front Panel Ass'y (OMS-7EII)	1
	CA80468A	Front Panel Ass'y (OMS-70II)	1
02	OC82019A	Front Panel (OMS-7II)	1
03	OC82016A	Front Panel (OMS-7AII)	1
04	OC82017A	Front Panel (OMS-7EII)	1
05	OC82018A	Front Panel (OMS-70II)	1
06	OC80724A	Front Escutcheon L	1
07	OC81370A	Front Escutcheon R	1
08	OC81363A	Play Button	1
09	OC81364A	Stop Button	1
10	OC81365A	Pause Button	1
11	OC81366A	F. Skip Button	1
12	OC81367A	R. Skip Button	1
13	OC81368A	F.Fwd Button	1
14	OC81369A	Rev Button	1
15	OC81031A	Play Indicator	1
16	OC81030A	Pause Indicator	1
17	OC82162A	Indicator Sheet	1
18	OC80725A	Sponge A	1
19	OC80726A	Push Switch Button A	10
20	OC80705A	Push Switch Button B	6
21	OC82051A	LED Holder A	1
22	OC82052A	LED Holder B	1
23	OC80706A	FL Filter	1
24	OC81433A	Sponge C	1
25	OC81432A	Sponge B	1
26	OC82163A	Cable Protector	1
27	CA80480A	Control Switch P.C.B. Ass'y	1
L01	CA80492A	Remote Control P.C.B. Ass'y	1
	OE00792A	BT 2.6x6 + Pan	8

6.3 Chassis Ass'y

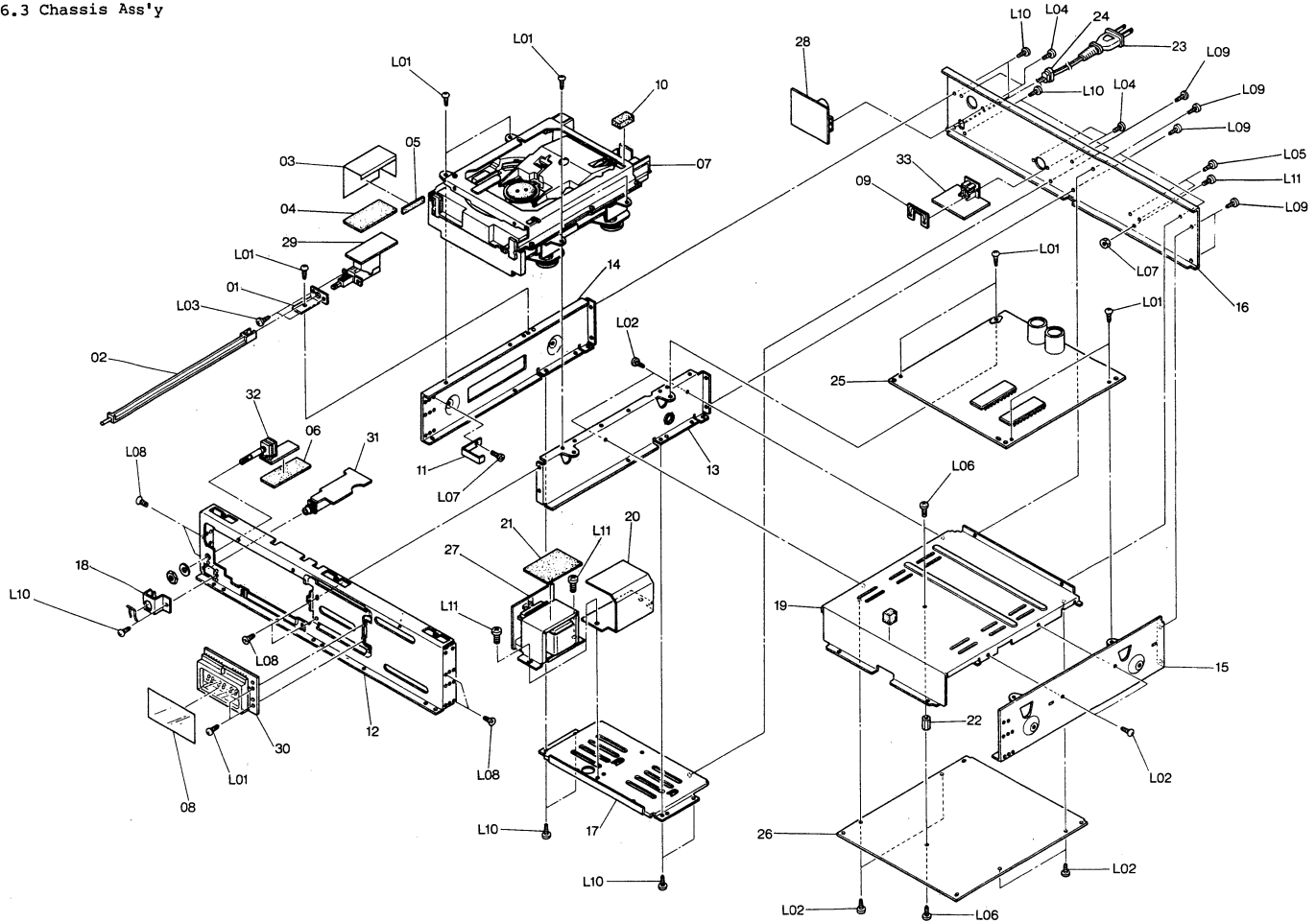


Fig. 6.3

Schematic Ref. No.	Part No.	Description	Q'ty	Schematic Ref. No.	Part No.	Description	Q'ty
	CA80470A	Chassis Ass'y (OMS-7AII)	1	23	OC81210A	Power Cord (OMS-7EII)	1
	CA80471A	Chassis Ass'y (OMS-7EII)	1		OC81208A	Power Cord (OMS-70II)	1
	CA80472A	Chassis Ass'y (OMS-70II)	1		OC81211A	Power Cord (OMS-7II Australia)	1
	CA80473A	Chassis Ass'y (OMS-7II Others)	1	24	OB08037U	Cord Bushing	1
	CA80474A	Chassis Ass'y (OMS-7II Canada)	1	25	CA80485A	Main P.C.B. Ass'y	1
	CA80475A	Chassis Ass'y (OMS-7II Australia)	1	26	CA80486A	D/A Converter P.C.B. Ass'y	1
				27	CA80494A	Power Trans. P.C.B. Ass'y (OMS-7AII & OMS-7II Canada)	1
01	OC80694A	Power Switch Bracket	1		CA80495A	Power Trans. P.C.B. Ass'y (OMS-7EII)	1
02	OC80693A	Joint Bar	1		CA80496A	Power Trans. P.C.B. Ass'y (OMS-70II)	1
03	OC80695A	Power Switch Insulator	1		OC80505A	Power Trans. P.C.B. Ass'y (OMS-7II)	1
04	OC80696A	Power Switch Sponge A	1		CA80497A	Power Trans. P.C.B. Ass'y (OMS-7II Australia)	1
05	OC80697A	Power Switch Sponge B	1	28	CA80498A	Voltage Selector P.C.B. Ass'y (OMS-7II Others)	1
06	OC80692A	Volume Insulator	1	29	CA80491A	Power Switch P.C.B. Ass'y (OMS-7EII)	1
07	CA80445A	Disc Mechanism Ass'y	1		CA80478A	Power Switch P.C.B. Ass'y (Except OMS-7EII)	1
08	OC80689A	FL Filter B	1	30	CA80490A	FL Indicator P.C.B. Ass'y	1
09	OC80710A	DIN Jack Plate	1	31	CA80488A	Headphone Amp. P.C.B. Ass'y	1
10	OC82151A	Damper	1	32	CA80489A	Volume P.C.B. Ass'y	1
11	OC82152A	U-shape Bracket	1	33	CA80493A	Wired Remote Control P.C.B. Ass'y	1
12	OC81953A	Front Chassis	1	L01	OC81033A	BT 3x8 + Round	11
13	OC81954A	Center Chassis	1	L02	OE00868A	BT 3x8 + Binding	8
14	OC81955A	Side Chassis L	1	L03	OE03369A	BT 3x4 + Binding	4
15	OC81956A	Side Chassis R	1	L04	OC80958A	M 3x8 + Binding (Black Chromate)	4
16	CA81957A	Rear Panel (OMS-7AII)	1	L05	OC81091A	BT 3x8 + Binding (Black Chromate)	2
	CA81958A	Rear Panel (OMS-7EII)	1	L06	OE00896A	BT 3x6 + Binding	1
	CA81959A	Rear Panel (OMS-70II)	1	L07	OE00824A	BT 2.6x6 + Pan	1
	CA81960A	Rear Panel (OMS-7II)	1	L08	OE00868A	BT 3x8 + Countersunk	6
17	OC81961A	Power Transformer Bracket	1	L09	OC81032A	M 3x8 + Nailtap Screw (Black)	10
18	OC80690A	Headphone Jack Bracket	1	L10	OC81033A	BT 3x8 + Binding	5
19	OC81962A	Power Transformer Spacer	1	L11	OC82143A	BT 4x6 + Binding	2
20	OC81963A	Shield Cover	1				
21	OC81964A	Power Transformer Sheet	1				
22	OC81965A	Shaft	1				
23	OC81209A	Power Cord (OMS-7AII, OMS-7II Canada & Others)	1				

6.4 Disc Mechanism Ass'y

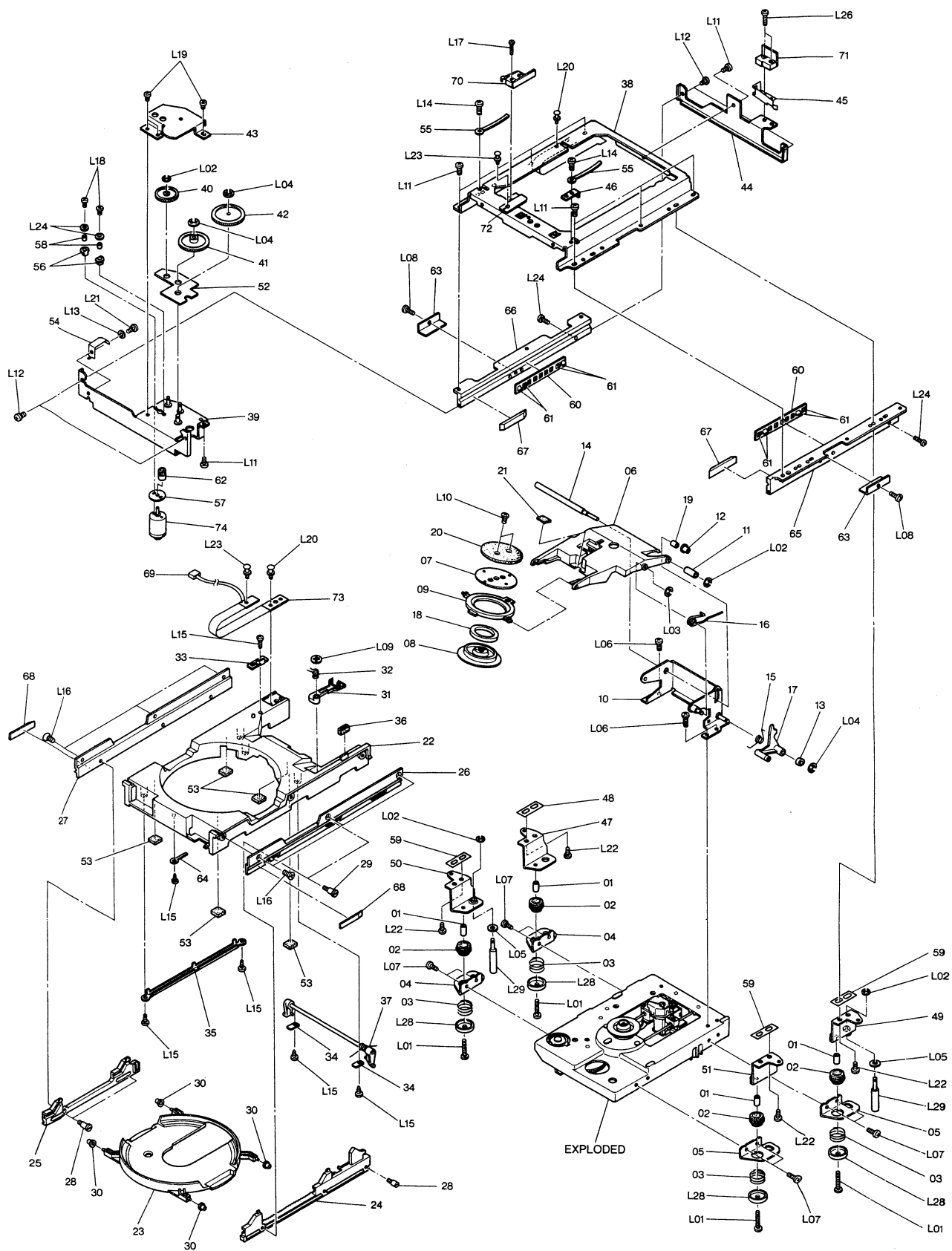


Fig. 6.4

Schematic Ref. No.	Part No.	Description	Q'ty	Schematic Ref. No.	Part No.	Description	Q'ty
	CA80445A	Disc Mechanism Ass'y	1	57	OC81006A	Sheet	1
				58	OC80984A	Spacer	2
01	OC81016A	Collar	4	59	OC81002A	Guide Sheet	6
02	OC81022A	Damper B	4	60	OC82009A	Roller Guide	2
03	OC81970A	Mechanism Spring	4	61	OC81000A	Roller	8
04	OC80773A	Mechanism Bracket L	2	62	OC81001A	Gear M	1
05	OC80774A	Mechanism Bracket R	2	63	OC81972A	Bracket Spacer	2
06	OC81971A	Chuck Arm	1	64	OC81171A	Wire Clamper	1
07	OC81991A	Chuck Cover	1	65	OC81973A	Guide Rail R	1
08	OC81992A	Chuck	1	66	OC81974A	Guide Rail L	1
09	OC81993A	Chuck Support	1	67	OC81975A	Guide Rail Sheet	2
10	CA80453A	Arm Bracket Ass'y	1	68	OC81976A	Disc Tray Spacer	2
11	OC80945A	Collar A	1	69	OC81977A	2P Connector Cord	1
12	OC80946A	Collar B	1	70	CA80499A	Open End Switch P.C.B. Ass'y	1
13	OC80947A	Collar C	1	71	CA80500A	Close End Switch P.C.B. Ass'y	1
14	OC81997A	Arm Shaft A	1	72	CA80503A	Photo Diode P.C.B. Ass'y	1
15	OC81998A	Timing Arm Spring	1	73	OC81058A	Flexible P.C.B.	1
16	OC81999A	Chuck Arm Spring	1	74	OC81978A	Loading Motor	1
17	CA80276A	Timing Arm Ass'y	1	L01	OC81014A	M 3x16 + Pan	4
18	OC82000A	Magnet	1	L02	OE00042A	E-Ring 1.5mm	4
19	OC82001A	Damper Tube	1	L03	OE00698A	E-Ring 2.5mm	1
20	OC82002A	Chuck Damper	1	L04	OE00222A	E-Ring 2mm	3
21	OC82003A	Sponge	1	L05	OC81015A	Washer 3x10x0.8 (Nickel)	2
22	OC82004A	Box	1	L06	OE00965A	BT 3x6 + Binding (Nickel)	3
23	OC82005A	Table	1	L07	OC82156A	BT 3x6 + Pan (Nickel)	8
24	OC82006A	Rack A	1	L08	OE00964A	M 3x5 + Binding	2
25	OC81009A	Rack B	1	L09	OC80952A	Stopper Ring 3mm (CS)	1
26	OC80981A	Box Rail R	1	L10	OE00955A	BT 2x4 + Binding	2
27	OC80982A	Box Rail L	1	L11	OC80957A	M 3x6 + Binding	8
28	OC80986A	Guide Screw A	2	L12	OC80962A	M 2.6x6 + Pan	4
29	OC80985A	Guide Screw B	2	L13	OC80967A	Washer 2.6x5.3x0.6	1
30	OC80970A	Table Roller	4	L14	OC80957A	M 3x6 + Binding	1
31	OC82007A	Lock Arm	1	L15	OC80965A	BT 2.6x6 + Pan (Black Chromate)	6
32	OC81007A	Lock Arm Spring	1	L16	OC80961A	M 2.6x4 + Countersunk (Black Chromate)	6
33	OC80971A	Switch Plate	1	L17	OC80955A	M 2.3x8 + Binding	1
34	OC80976A	Rack Arm Plate	2	L18	OE00124A	M 2x4 + Pan	2
35	OC81149A	Cord Cover	1	L19	OC80963A	M 2x1.8 + Pan (Black Chromate)	2
36	OC80999A	Cushion	1	L20	OC80953A	Plastic Rivet 3x4.5 (Black)	2
37	CA80354A	Rack Arm Ass'y	1	L21	OC80960A	M 2.6x3 + Pan (Black Chromate)	1
38	CA80446A	Box Guide Ass'y	1	L22	OC80958A	M 3x8 + Binding (Black Chromate)	4
39	CA80504A	Gear Bracket Ass'y	1	L23	OC80954A	Plastic Rivet 3x5.5 (Black)	2
40	OC81153A	Gear B	1	L24	OC80964A	BT 2x6 + Pan (Black Chromate)	2
41	OC81154A	Gear C	1	L25	OC80966A	Washer 2x6x4	2
42	OC81155A	Gear D	1	L26	OC80955A	M 2.3x8 Binding	2
43	OC81156A	Gear Cover	1	L28	OC81018A	Washer 7x0.6	4
44	OC80969A	Rear Bracket	1	L29	OC81017A	Shipping Screw	2
45	OC82008A	Actuator	1				
46	OC81160A	Stopper	1				
47	OC80992A	Front Bracket L	1				
48	OC80983A	Guide Screw C	1				
49	CA80281A	Front-Right Bracket Ass'y	1				
50	CA80282A	Rear-Left Bracket Ass'y	1				
51	OC80993A	Front Bracket R	1				
52	OC81005A	Damper A	1				
53	OC82155A	Damper Shaft	5				
54	OC80972A	Spring	1				
55	OC80991A	Wire Clamper	2				
56	OC81164A	Bushing	2				

6.5 Disc Mechanism Sub Ass'y

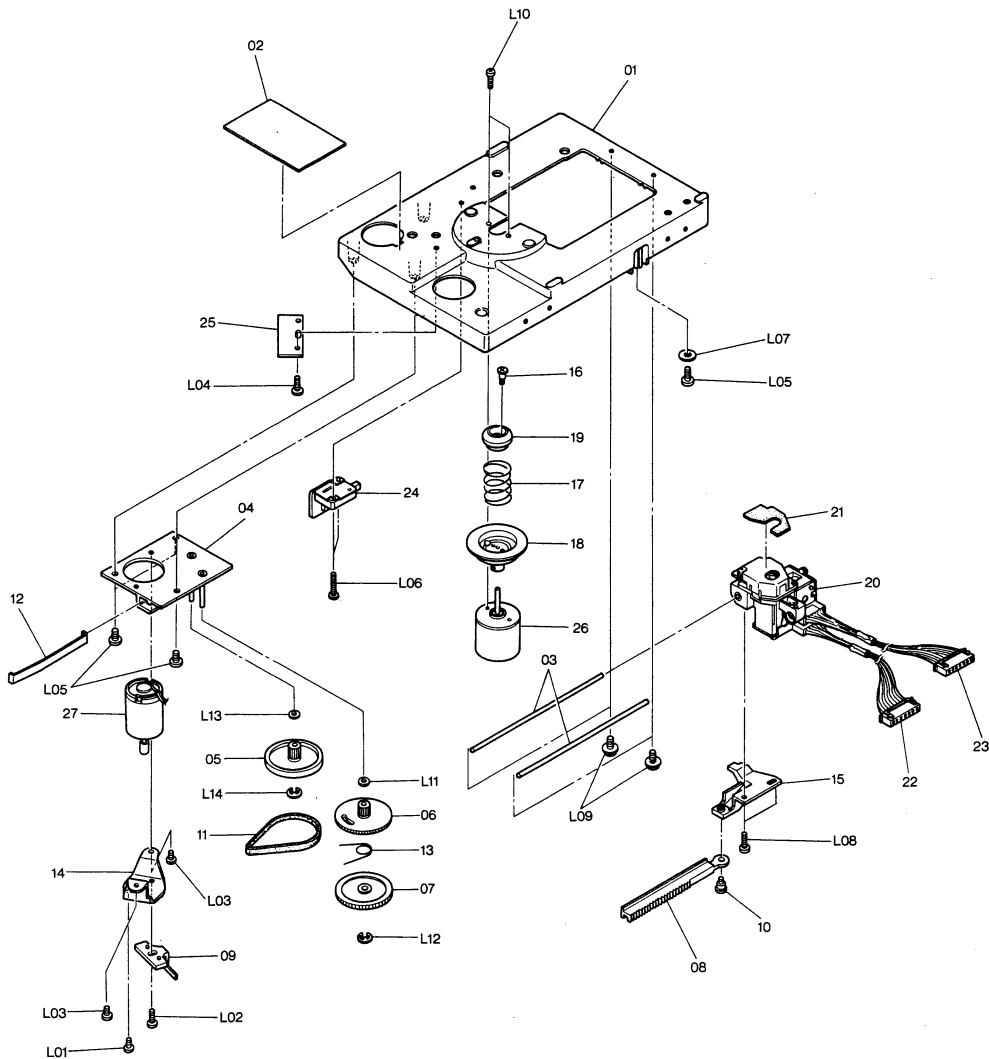


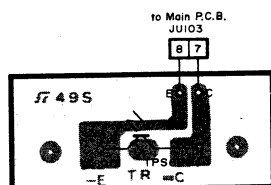
Fig. 6.5

Schematic Ref. No.	Part No.	Description	Q'ty	Schematic Ref. No.	Part No.	Description	Q'ty
01	OC81981A	Mechanism Chassis	1	22	OC82256A	8P Connector Cord	1
02	OC80794A	Sheet	1	23	OC82257A	9P Connector Cord	1
03	OC81982A	Pickup Shaft	2	24	CA80501A	Inner End Switch P.C.B. Ass'y	1
04	CA80261A	Gear Base Ass'y	1	25	CA80502A	Photo Transistor P.C.B. Ass'y	1
05	OC80790A	Gear A	1	26	OC81979A	Disc Motor	1
06	OC80788A	Gear B	1	27	OC81980A	Feed Motor	1
07	OC80789A	Gear C	1	L01	OE00804A	M 2x4 + Binding (Black Chromate)	1
08	OC80797A	Rack Gear	1	L02	OE00973A	M 2x6 + Binding	1
09	OC80792A	Belt Guide	1	L03	OE00869A	BT 2.6x4 + Binding	2
10	OC80777A	Pulley Support	1	L04	OC82229A	BT 2.6x6 + Binding (Nickel)	1
11	OC80793A	Belt	1	L05	OE00965A	BT 3x6 + Binding (Nickel)	4
12	OC80782A	Rack Spring	1	L06	OC82230A	BT 2.6x10 + Pan (Nickel)	2
13	OC80785A	Spring A	1	L07	OC82231A	Washer 3mm (3x12x5)	1
14	OC80770A	Motor Bracket	1	L08	OE00121A	M 2.6x6 + Pan	2
15	OC81983A	Rack Support	1	L09	OC82234A	BT 3x6 + Pan (Nickel)	4
16	OC81984A	Ring Set Screw	1	L10	OC82235A	BT 2x6 + Pan	2
17	OC81985A	Ring Spring	1	L11	OC82232A	Washer (Plastics)	1
18	OC81986A	Disc Table	1	L12	OE00222A	E-Ring 2mm	1
19	OC81987A	Slide Ring	1	L13	OC82233A	Washer (Plastics)	1
20	OC81988A	Laser Pickup	1	L14	OE00042A	E-Ring 1.5mm	1
21	OC81989A	Damper Plate	1				

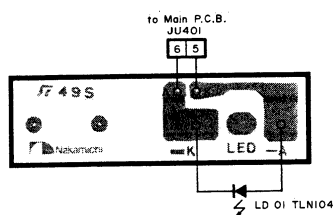
7. MOUNTING DIAGRAMS AND PARTS LIST

- Notes: 1. Mounting diagram shows a dip side view of the printed circuit board.
 2. Diode is MA150, 1SS53, 1SS1555, or 1SS176 unless otherwise specified.
 3. Abbreviation for part name:
 TR-Transistor, SiD-Silicon Diode, Varicap-Variable Capacitance Diode
 RK-Carbon Resistor, RM-Metal Film Resistor, RF-Fail Safe Type Resistor
 CE-Electrolytic Capacitor, CM-Mylar Capacitor, CC-Ceramic Capacitor
 CT-Tantalum Capacitor, C-Mica Capacitor
 CSP-Polystyrene Capacitor, CMM-Metallized Mylar Capacitor

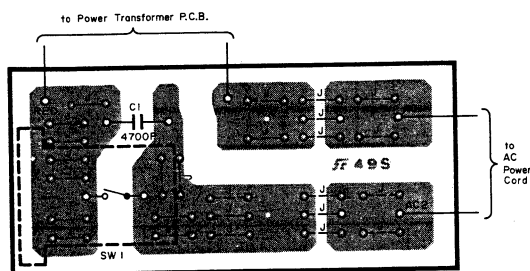
7.1. Photo Transistor P.C.B. Ass'y



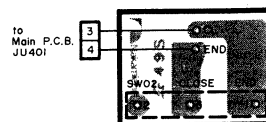
7.2. Photo Diode P.C.B. Ass'y



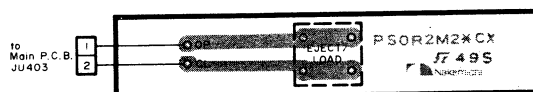
7.3. Power Switch P.C.B. Ass'y



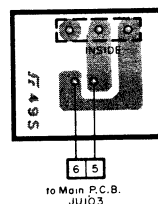
7.4. Close End Switch P.C.B. Ass'y



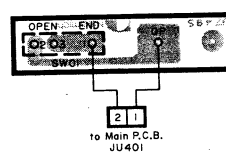
7.5. Eject/Load Switch P.C.B. Ass'y



7.6. Inner End Switch P.C.B. Ass'y

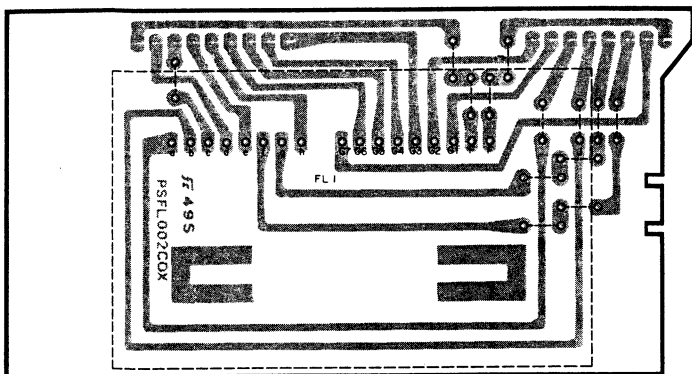


7.7. Open End Switch P.C.B. Ass'y

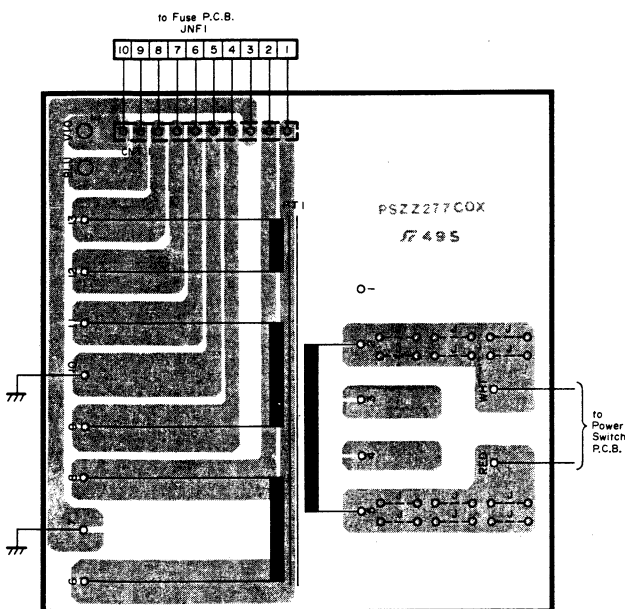


Schematic Ref No.	Part No.	Description	Schematic Ref No.	Part No.	Description
Q01	CA80502A	Photo Transistor P.C.B. Ass'y	SW02	CA80500A	Close End Switch P.C.B. Ass'y
	OC82039A	Photo Transistor P.C.B.		OC82037A	Close End Switch P.C.B.
	OC80758A	Photo Transistor TPS605		OC80912A	Microswitch SS-5D
LD01	CA80503A	Photo Diode P.C.B. Ass'y	KS01	CA80477A	Eject/Load P.C.B. Ass'y
	OC82040A	Photo Diode P.C.B.		OC82024A	Eject/Load P.C.B.
	OC80759A	Photo Diode TLN104		OC82062A	Key Switch B3F-1000
C1 CV1 SW1	CA80491A	Power Switch P.C.B. Ass'y (Except OMS-7EII)	AC1005 SW03	CA80501A	Inner End Switch P.C.B. Ass'y
	CA80487A	Power Switch P.C.B. Ass'y (OMS-7EII)		OC82038A	Inner End Switch P.C.B.
	OC82042A	Power Switch P.C.B.		OC82101A	9P Connector Cord
	OC82186A	CC 4700P 250V	AC2001 SW01	OC82177A	Slide Switch SCL101P
	OC82167A	Spark Killer Cover (OMS-7EII)		CA80499A	Open End Switch P.C.B. Ass'y
	OC80914A	Power Switch		OC82036A	Open End Switch P.C.B.
				OC82099A	8P Connector Cord
				OC80911A	Microswitch SS-5GL13

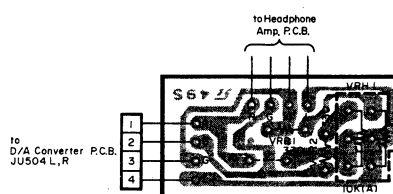
7.8. FL Indicator P.C.B. Ass'y



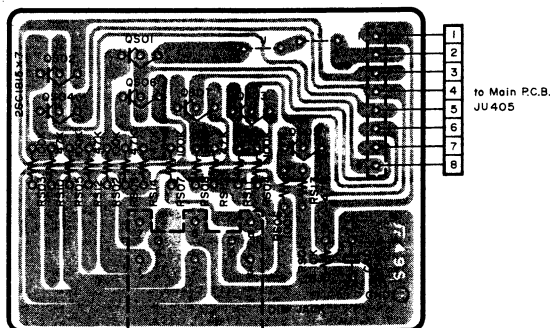
7.9. Power Transformer P.C.B. Ass'y



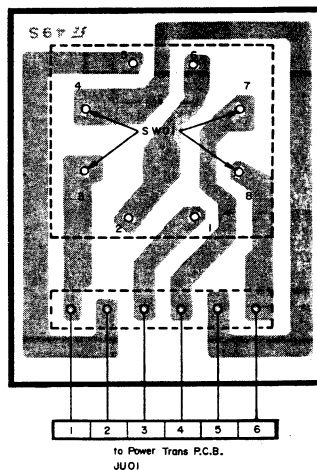
7.10. Volume P.C.B. Ass'y



7.11. Wired Remote Control P.C.B. Ass'y

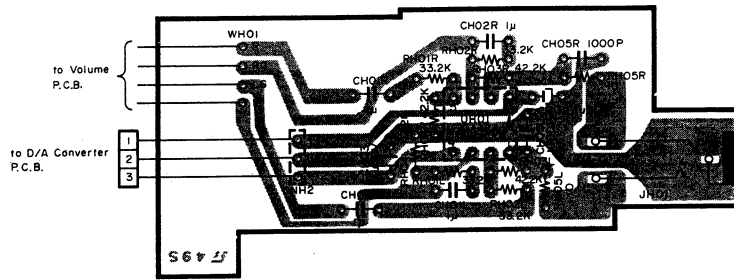


7.12. Voltage Selector P.C.B. Ass'y

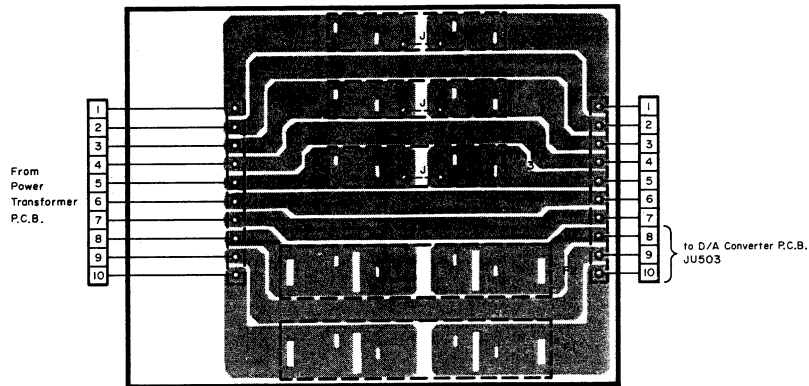


Schematic Ref No.	Part No.	Description	Schematic Ref No.	Part No.	Description
CN 1	CA80490A	FL Indicator P.C.B. Ass'y	CNH1	CA80489A	Volume P.C.B. Ass'y
CN 2	OC82030A	FL Indicator P.C.B.	JNH1	OC82029A	Volume P.C.B.
FL 1	OC82097A	8P Connector Cord	VRH1	OC81116A	VR 10K (A)x2
SP 1	OC82100A	9P Connector Cord	VRR1,2	OC82093A	3P Connector Cord
	OC82170A	FL Indicator		OC82088A	4P Connector Terminal
	OC82171A	FL Indicator Spacer		OB05577A	RK 330 1/4W J
CNT 1	CA80494A	Power Transformer P.C.B. Ass'y(OMS-7AII & OMS-7II Canada)	CNS01	CA80493A	Wired Remote Control P.C.B. Ass'y
JU 1	CA80495A	Power Transformer P.C.B. Ass'y(OMS-7EII & OMS-7II Australia)	CS01	OC82032A	Wired Remote Control P.C.B.
PT 1	CA80496A	Power Transformer P.C.B. Ass'y(OMS-70II)	EW01	OC82096A	8P Connector Cord
	OC82033A	Power Transformer P.C.B.	JS01	OB05811A	CM 0.047uF 50V K
	OC82104A	10P Connector Cord	QS01-07	OC82044A	Ground Wire
	OC82091A	Terminal (except Others)	RS01	OC80917A	8P Din Jack Socket
	OC82046A	Power Transformer (OMS-7AII & OMS-7II Canada)	RS02-8	OB10088A	TR 2SC1815(Y,GR)
	OC82047A	Power Transformer (OMS-7EII & OMS-7II Australia)	RS09-15	OB01888A	RK 10K 1/4W J
	OC82048A	Power Transformer (OMS-70II)		OB01889A	RK 100K 1/4W J
				OB05641A	RK 47K 1/4W J
			CNSW1	CA80498A	Voltage Selector P.C.B. Ass'y (Others)
			SP01	OC82034A	Voltage Selector P.C.B.
			SW01	OC82106A	11P Connector Cord
				OC82161A	Sponge
				OC82050A	Voltage Selector

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

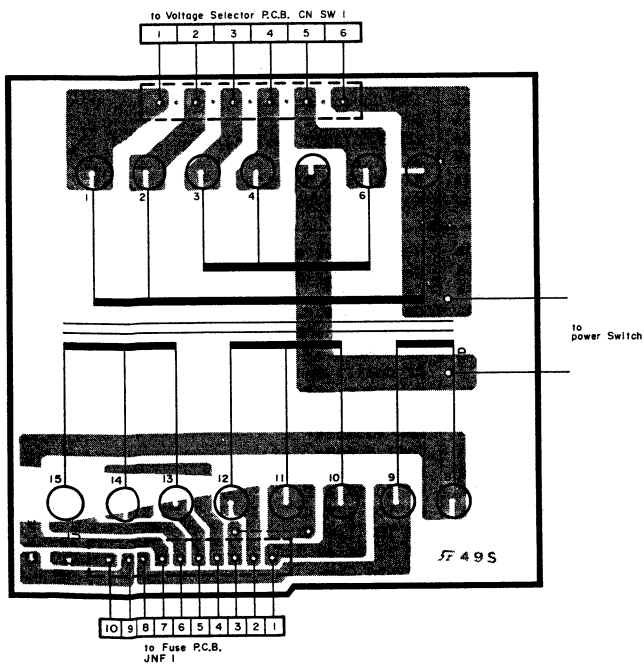


7.14. Fuse P.C.B. Ass'y



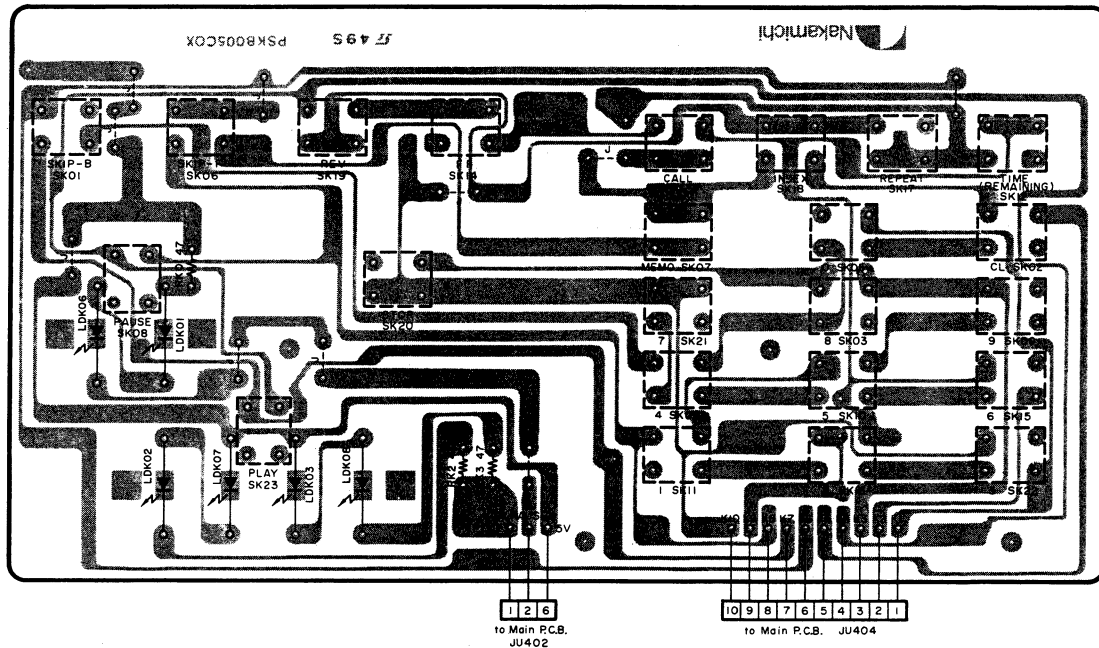
	220 V Class 2	Except for 220 V Class 2
F1	800mA 250V	800mA 250V
F2	800mA 250V	800mA 250V
F3	320mA 250V	Shorted
F4	800mA 250V	Shorted
F5	800mA 250V	Shorted

7.15. Power Transformer P.C.B. Ass'y (Others only)

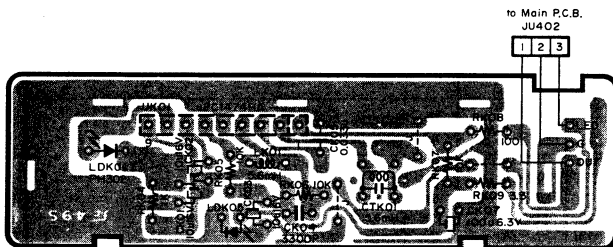


Schematic Ref No.	Part No.	Description
CH01L,R CH02L,R CH03 CH04 CH05L,05R CNH2 JH01 RH01L,01R RH02L,02R RH03L,03R RH04L,04R RH05L,05R RH06L,06R UH01 WH01	CA80488A OC82028A OB09868A OB09868A OB01405A OB01405A OB04059A OC82254A OC82168A OC82243A OC82243A OC82244A OC82244A OC82213A OB05936A OB06370A OC82169A	Headphone Amp. P.C.B. Ass'y Headphone Amp. P.C.B. CM 1u 50V J CM 1u 50V J CE 1u 50V CE 1u 50V CM 1000P 50V K 2P+3P Connector Cord Headphone Jack RK 33.2K 1/8W F RK 33.2K 1/8W F RK 42.2K 1/8W F RK 42.2K 1/8W F RK 10 1/8W F RK 10 1/4W J IC NJM4556D P.C.B. Joint
CNF1 F1,2 F1,2 F3 F4,5 JUF1	CA80479A CA80478A OC82025A OC82060A OC82059A OC82061A OC82103A OC82058A OC82056A OC82057A OC82056A OC82086A	Fuse P.C.B. Ass'y (Except OMS-7EII) Fuse P.C.B. Ass'y (OMS-7EII) Fuse P.C.B. Fuse Holder (Except OMS-7EII) Fuse Holder (OMS-7EII) Fuse Label 10P Connector Cord Fuse 250V 800mA (Except OMS-7EII) Fuse 250V 800mA (OMS-7EII) Fuse 250V 320mA (OMS-7EII) Fuse 250V 800mA (OMS-7EII) 10P Connector Terminal
CNT1 JU01 JU1 PT1	CA80497A OC82035A OC82242A OC82090A OC82091A OC82241A	Power Transformer P.C.B. Ass'y (Others) Power Transformer P.C.B. Ass'y 10P Connector Cord 11P Connector Terminal 2P Connector Terminal Power Transformer

7.16. Control Switch P.C.B. Ass'y

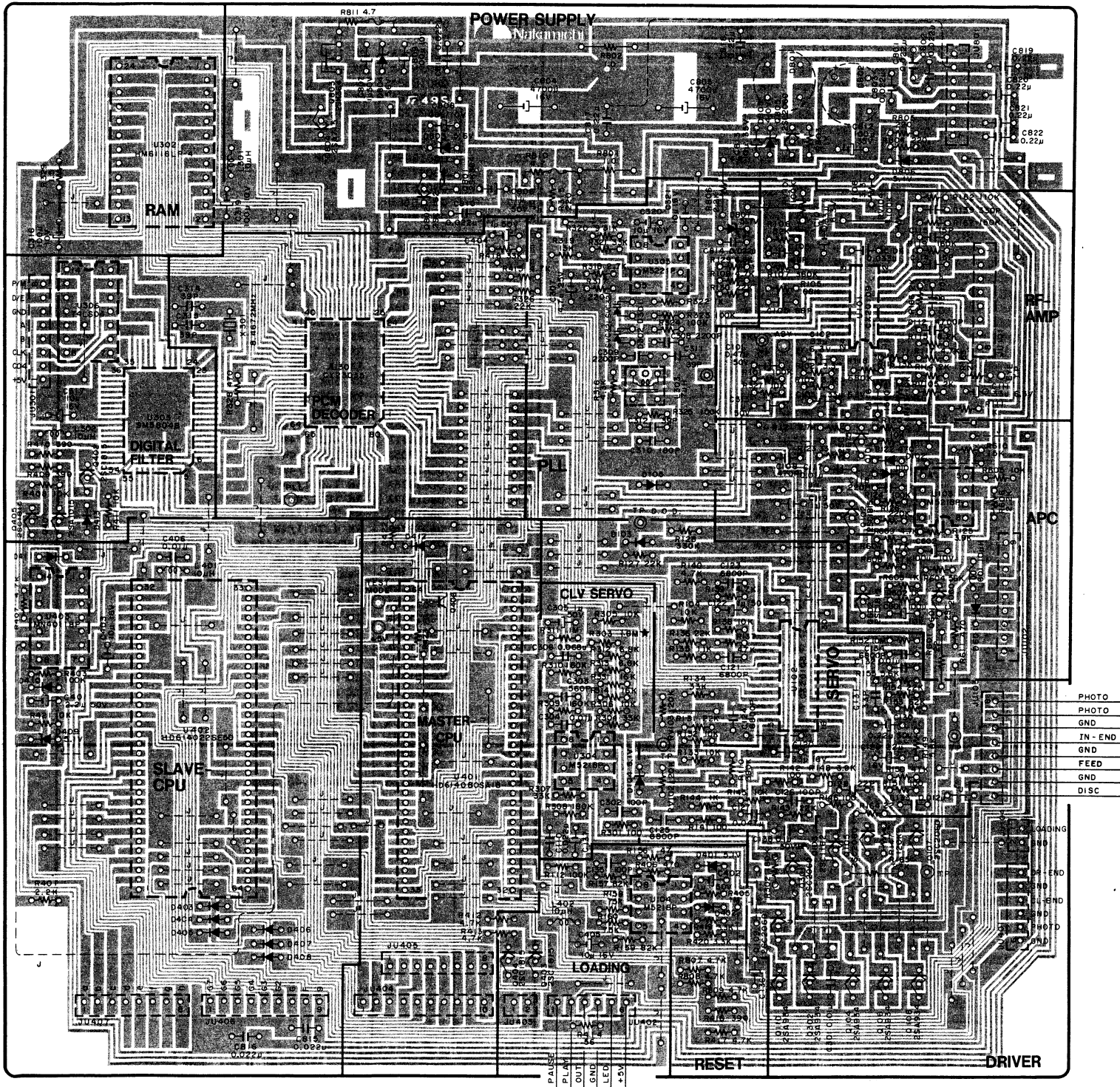


7.17. Remote Receiver P.C.B. Ass'y

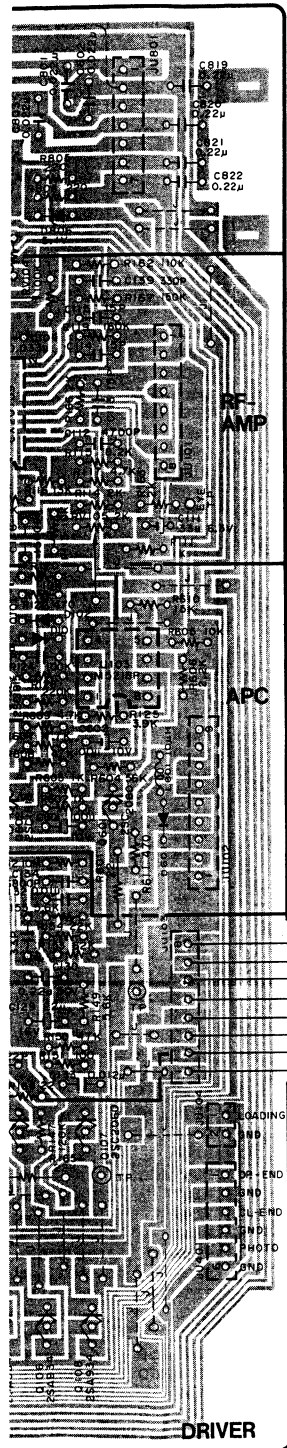


Schematic Ref No.	Part No.	Description
CNK01	CA80480A	Control Switch P.C.B. Ass'y
CNK02	OC82026A	Control Switch P.C.B.
LDK01-8	OC82102A	10P Connector Cord
RK01-3	OC82255A	6P Connector Cord
SK01-22	OC82136A	LED LN01301C (Green)
SK23	OC82227A	RK 47 1/2W
	OC82063A	Key Switch B3F-1020
	OC82064A	Key Switch B3F-1022
CK01-3	CA80492A	Remote Receiver P.C.B. Ass'y
CK04	OC82031A	Remote Receiver P.C.B.
CK05	OB09946A	CE 10u 16V
CK07	OB01914A	CM 3300p 50V J
CTK01	OB05583A	CM 0.033u 50V J
FK01	OB05885A	CE 100u 6.3V
LDK04	OC82043A	RF Coil 5.6mH
LDK05	OC82144A	Sensor Filter
LK01	OC80753A	Photo Diode PH302
RK04	OC80754A	LED PG5551KY
RK05	OC81151A	Coil 5.6mH
RK06,07	OB01857A	RK 1K 1/4W J
RK08	OB05936A	RK 10 1/4W J
RK09	OB01888A	RK 10K 1/4W J
SHK01	OB01679A	RK 100 1/4W J
SHK02	OB09304A	RK 3.3 1/4W J
SPK01	OC81207A	Shield Case
SPK02	OC82145A	Sensor Shield
UK01	OC82146A	LED Spacer
	OC82147A	Sensor Spacer
	OC80752A	IC uPC1474HA

7.18. Main P.C.B. Ass'y
(This P.C.B. is for the units with serial No. from 01037.)

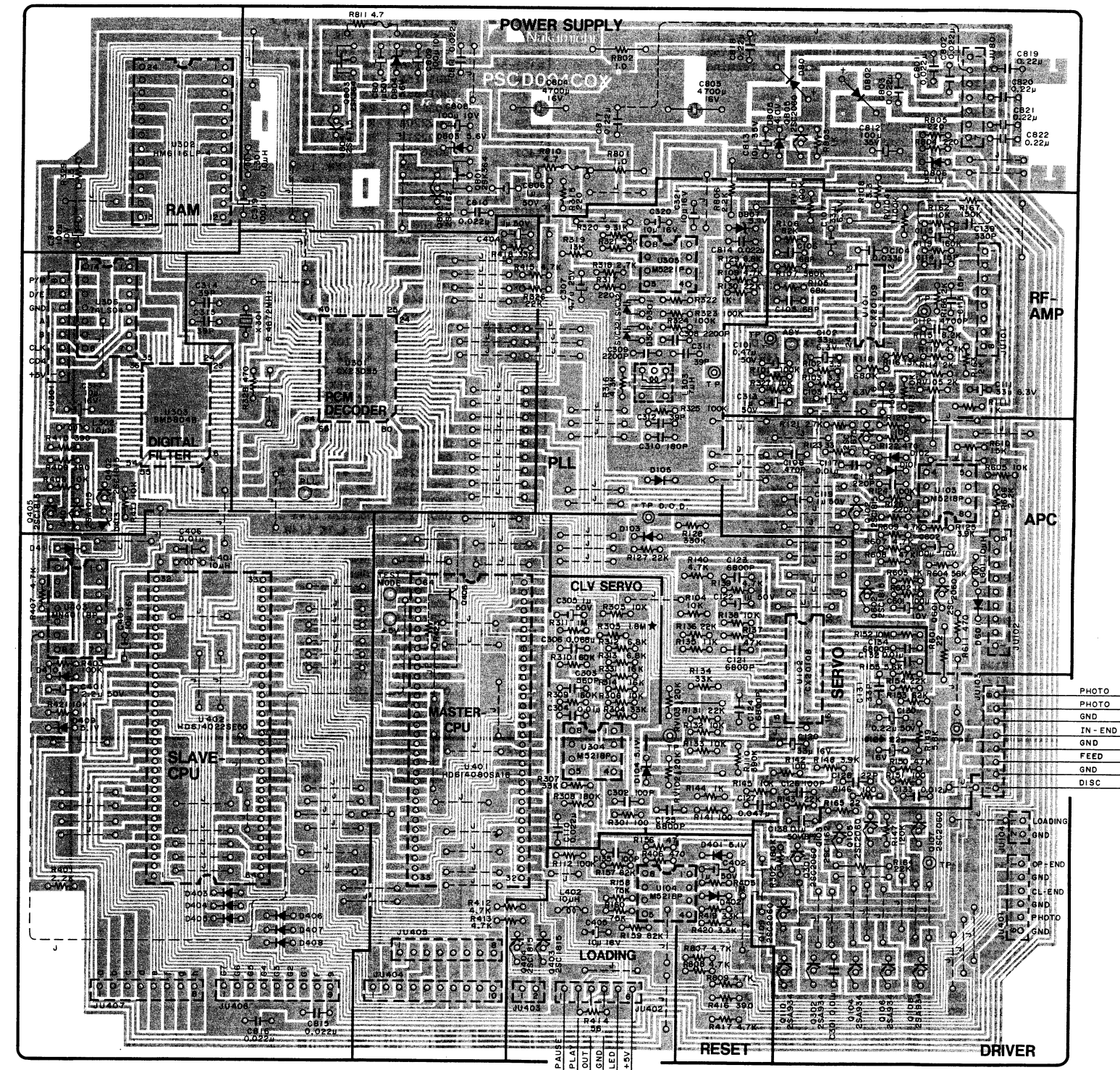


Schematic Ref No.	Part No.	Description	Schematic Ref No.	Part No.	
B1	CA80485B	Main P.C.B. Ass'y	JU103	OC82087A	8F
B2	OC82041A	Main P.C.B.	JU104	OC81161A	2P
C101	OC81033A	BT 3x8 + Binding	JU301	OC80837A	8P
C102,103	OE00857A	BT 3x6 + Binding	JU401,2	OC80836A	6P
C104	OC82189A	CE 0.47u 50V G	JU403	OC81161A	2P
C105,106	OB40047A	CE 33u 6.3V	JU404	OC82026A	10
C107	OB05531A	CM 0.033u 50V	JU405	OC82087A	8P
C108	OC82181A	C 68P 50V	JU406	OC81173A	9P
C109	OB40047A	CE 33u 6.3V	JU407	OC80837A	8P
C110	OC82196A	CM 470P 50V J	JU801	OC81172A	7P
C111	OB04062A	CM 0.022u 50V	L301,302	OC82202A	RF
C112	OB40047A	CE 33u 6.3V	L303	OC82203A	VC
C113-5	OB05652A	CM 4700P 50V	L401,402	OC82202A	RF
C116	OC82182A	C 15P 50V	L601	OC82202A	RF
C117	OC80808A	CM 1500P 50V	N0401	OC82166A	WI
C118	OB05681A	CM 0.01u 50V	Q101	OC80741A	TR
C119	OC82197A	CM 220P 50V J	Q102	OB10088A	TR
C120	OB01405A	CE 1u 50V	Q103	OC82131A	TR
C121	OC80801A	CE 33u 16V	Q104	OC82128A	TR
C122	OB05701A	CM 6800P 50V	Q105,107	OC82127A	TR
C123-5	OB01405A	CE 1u 50V	Q106,108	OC82128A	TR
C126	OB05701A	CM 6800P 50V	Q109,301	OC82127A	TR
C127	OC82198A	CM 100P 50V J	Q110,302	OC82128A	TR
C128	OB05811A	CM 0.047u 50V	Q401	OB10116A	TR
C129	OC82183A	C 22P 50V	Q402-6	OB10088A	TR
C130	OB01862A	CE 22u 16V	Q601,805	OC82127A	TR
C131	OB40252A	CE 0.22u 50V	Q801,803	OB10151A	FE
C132	OC82184A	C 33P 50V	Q802	OC82131A	TR
C133	OB05681A	CM 0.01u 50V	Q804	OC82129A	TR
C134	OB01605A	CM 0.012 50V	R101,112	OB01889A	RK
C135	OB05701A	CM 6800P 50V	R102,103	OB09304A	RK
C136	OC82198A	CM 100P 50V J	R104,113	OB01888A	RK
C137	OB40237A	CE 0.1u 50V (BP)	R105	OB05692A	RK
C138	OC82199A	CM 330P 50V	R106	OB05668A	RK
C139	OB05681A	CM 0.01u 50V	R107	OC82214A	RK
C301	OC82199A	CM 100P 50V J	R108	OB09304A	RK
C302	OC82200A	CM 560P 50V J	R109,117	OB01846A	RK
C303	OB05681A	CM 0.01u 50V	R110	OB05676A	RK
C304	OB01405A	CE 1u 50V	R111	OB01857A	RK
C305	OB05682A	CM 0.068u 50V	R114	OB09301A	RK
C306	OB01402A	CE 4.7u 25V	R115	OB01856A	RK
C307	OB04060A	CM 2200P 50V	R116	OB09135A	RK
C308,309	OC82187A	CC 180P 50V (UJ)	R118	OB05868A	RK
C310	OC82188A	CC 39P 50V (UJ)	R119	OC82215A	RK
C311,312	OB01405A	CE 1u 50V	R120	OB01888A	RK
C313	OC82185A	C 39P 50V	R121	OB05629A	RK
C314,315	OB05885A	CE 100u 10V	R122	OB05576A	RK
C316	OB01412A	CE 10u 16V	R123	OB01713A	RK
C317	OB05885A	CE 100u 10V	R124	OB01889A	RK
C318	OB01412A	CE 10u 16V	R125	OB05675A	RK
C319	OB09372A	CE 2.2u 50V	R126	OB05625A	RK
C320,321	OB09814A	CE 1u 50V (LN)	R127	OB05615A	RK
C401	OB01412A	CE 10u 16V	R128	OB05627A	RK
C402	OB01405A	CE 1u 50V	R129	OB01682A	RK
C403	OB01412A	CE 10u 16V	R130,131	OB05615A	RK
C404	OB01405A	CE 1u 50V	R132,133	OB01888A	RK
C405	OB05681A	CM 0.01u 50V	R134	OB05509A	RK
C406	OC82200A	CM 560P 50V J	R135	OB09334A	RK
C601,602	OC80799A	CE 100u 10V	R136,143	OB05615A	RK
C801-3	OB40062A	CM 0.022u 50V	R137,150	OB05641A	RK
C804,805	OB40085A	CE 4700u 16V	R138,145	OB01888A	RK
C806,807	OB01405A	CE 1u 50V	R139,140	OB01846A	RK
C808,809	OC80799A	CE 100u 10V	R141,142	OB01679A	RK
C810,811	OB40062A	CM 0.022u 50V	R144	OB01857A	RK
C812	OB09126A	CE 100u 35V	R146,151	OB01679A	RK
C813	OB40336A	CE 10u 35V	R147	OB05621A	RK
C814-6	OB40062A	CM 0.022u 50V	R148	OB05675A	RK
C817-22	OB09872A	CF 0.22u 50V J	R149	OB01887A	RK
D101,102	OB12363A	SiD MA700	R152	OB20002A	RK
D103	OC82107A	SiD MA165	R153	OB09369A	RK
D104	OC82112A	ZD 5.1V MA4051(M)	R154,164	OB05615A	RK
D105	OC82107A	SiD MA165	R155	OB01887A	RK
D301,302	OC80823A	Varicap SVC321	R156	OB01706A	RK
D401	OC82112A	ZD 5.1V MA4051(M)	R157,159	OB05668A	RK
D402-8	OC82107A	SiD MA165	R158,160	OB09517A	RK
D409	OC82112A	ZD 5.1V MA4051(M)	R162	OB09072A	RK
D410,11,13	OC82107A	SiD MA165	R163,166	OB09301A	RK
D601	OC82107A	SiD MA165	R164	OB05615A	RK
D801,802	OC82109A	SiD W02RL	R165	OC82204A	RM
D803,804	OC82110A	ZD 5.6V MA4056(M)	R167	OB05626A	RK
D805	OC82111A	ZD 4.0V MA4240(L)	R301	OB01679A	RK
D806,807	OC82112A	ZD 5.1V MA4051(M)	R302,308	OB05640A	RK
EP01	OC82164A	Earth Plate	R303*	OB05680A	RK
EW 1	OC82165A	Earth Wire	R304,307	OB05509A	RK
HS101	OC82053A	Heatsink for Q103	R305,306	OB01888A	RK
HS801,802	OC82054A	Heatsink for Q802,84	R309,310	OC82215A	RK
JU101	OC80837A	8P Connector Terminal	R311	OB05776A	RK
JU102	OC81173A	9P Connector Terminal			

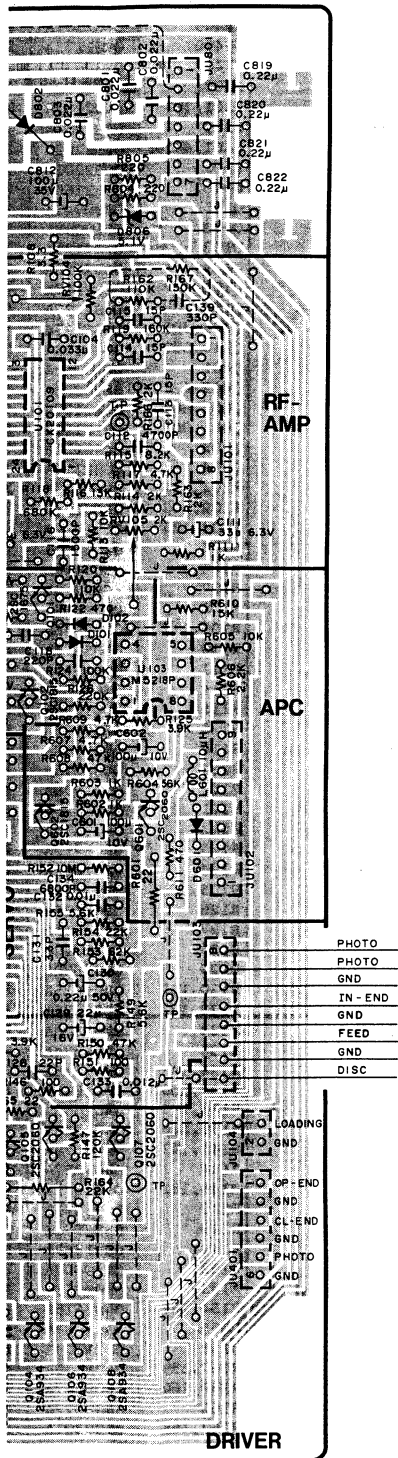


Schematic Ref No.	Part No.	Description	Schematic Ref No.	Part No.	Description	Schematic Ref No.	Part No.	Description
B1	CA80485B	Main P.C.B. Ass'y	JU103	OC82087A	8P Connector Terminal	R312,313	OB01682A	RK 6.8K 1/4W J
B2	OC82041A	Main P.C.B.	JU104	OC81161A	2P Connector Terminal	R314	OC82216A	RK 16K 1/4W J
C101	OC81033A	BT 3x8 + Binding	JU301	OC80837A	8P Connector Terminal	R315,317	OC82217A	RK 220 1/8W F
C102,103	OE00857A	BT 3x6 + Binding	JU401,2	OC80836A	6P Connector Terminal	R316	OB09307A	RK 4.3K 1/4W J
C104	OC82189A	CE 0.47u 50V G	JU403	OC81161A	2P Connector Terminal	R318	OB05629A	RK 2.7K 1/4W J
C105,106	OB40047A	CE 33u 6.3V	JU404	OC82026A	10P Connector Terminal	R319	OC82218A	RK 13K 1/8W F
C107	OB05531A	CM 0.033u 50V	JU405	OC82087A	8P Connector Terminal	R320	OC82219A	RK 9.31K 1/8W F
C108	OC82181A	C 68P 50V	JU406	OC81173A	9P Connector Terminal	R321	OB05509A	RK 33K 1/4W J
C109	OB40047A	CE 33u 6.3V	JU407	OC80837A	8P Connector Terminal	R322	OB01857A	RK 1K 1/4W J
C110	OC82196A	CM 470P 50V J	JU801	OC81172A	7P Connector Terminal	R323-5	OB01889A	RK 100K 1/4W J
C111	OB40047A	CE 33u 6.3V	L301,302	OC82202A	RF Coil 10uH	R326	OB05615A	RK 22K 1/4W J
C112	OB05652A	CM 4700P 50V	L303	OC82203A	VCO Coil 7uH	R327	OB01888A	RK 10K 1/4W J
C113-5	OC82182A	C 15P 50V	L401,402	OC82202A	RF Coil 10uH	R328	OB05576A	RK 470 1/4W J
C116	OC80808A	CM 1500P 50V	L601	OC82202A	RF Coil 10uH	R329	OC82220A	RK 1.5 1/4W J
C117	OB05681A	CM 0.01u 50V	N0401	OC82166A	Wire	R331	OC82221A	RK 16K 1/4W J
C118	OC82197A	CM 220P 50V J	Q101	OC80741A	TR 2SC1675(K)	R401	OB05622A	RK 2.2K 1/4W J
C119	OB01405A	CE 1u 50V	Q102	OB10088A	TR 2SC1815(Y,GR)	R403	OB01889A	RK 100K 1/4W J
C120	OC80801A	CE 33u 16V	Q103	OC82131A	TR 2SC1162(C,D)	R405	OB05776A	RK 1M 1/4W J
C121	OB05701A	CM 6800P 50V	Q104	OC82128A	TR 2SA934(Q,R)	R406,415	OB05576A	RK 470 1/4W J
C122	OB01405A	CE 1u 50V	Q105,107	OC82127A	TR 2SC2060(Q,R)	R407	OB01846A	RK 4.7K 1/4W J
C123-5	OB05701A	CM 6800P 50V	Q106,108	OC82128A	TR 2SA934(Q,R)	R408,411	OB01888A	RK 10K 1/4W J
C126	OC82198A	CM 100P 50V J	Q109,301	OC82127A	TR 2SC2060(Q,R)	R409,410	OB05691A	RK 390 1/4W J
C127	OB05811A	CM 0.047u 50V	Q110,302	OC82128A	TR 2SA934(Q,R)	R412,413	OB01846A	RK 4.7K 1/4W J
C128	OC82183A	C 22P 50V	Q401	OB10116A	TR 2SA1015(Y,GR)	R414	OB05890A	RK 56 1/4W J
C129	OB01862A	CE 22u 16V	Q402-6	OB10088A	TR 2SC1815(Y,GR)	R416	OB05691A	RK 390 1/4W J
C130	OB40252A	CE 0.22u 50V	Q601,805	OC82127A	TR 2SC2060(Q,R)	R417	OB01846A	RK 4.7K 1/4W J
C131	OC82184A	C 33P 50V	Q801,803	OB10151A	FET 2SK364(BL)	R418	OB05509A	RK 33K 1/4W J
C132	OB05681A	CM 0.01u 50V	Q802	OC82131A	TR 2SC1162(C,D)	R419,420	OB01681A	RK 3.3K 1/4W J
C133	OB01605A	CM 0.012 50V	Q804	OC82129A	TR 2SA715(C,D)	R421,423	OB01888A	RK 10K 1/4W J
C134	OB05701A	CM 6800P 50V	R101,112	OB01889A	RK 100K 1/4W J	R601	OC82222A	RK 22 1/4W F
C135	OC82198A	CM 100P 50V J	R102,103	OB09304A	RK 3.3 1/4W J	R602,603	OB01857A	RK 1K 1/4W J
C138	OB40237A	CE 0.1u 50V (BP)	R104,113	OB01888A	RK 10K 1/4W J	R604	OB05508A	RK 56K 1/4W J
C139	OC82199A	CM 330P 50V	R105	OB05692A	RK 68K 1/4W J	R605	OC82223A	RK 10K 1/4W F
C301	OB05681A	CM 0.01u 50V	R106	OB05668A	RK 82K 1/4W J	R606,806	OC82224A	RK 2.2K 1/4W F
C302	OC82199A	CM 100P 50V J	R107	OC82214A	RK 360K 1/4W J	R607,609	OB01846A	RK 4.7K 1/4W J
C303	OC82200A	CM 560P 50V J	R108	OB09304A	RK 3.3 1/4W J	R608	OB05641A	RK 47K 1/4W J
C304	OB05681A	CM 0.01u 50V	R109,117	OB01846A	RK 4.7K 1/4W J	R610	OB09705A	RK 15K 1/4W F
C305	OB01405A	CE 1u 50V	R110	OB05676A	RK 390K 1/4W J	R611	OC82225A	RK 470 1/4W F
C306	OB05682A	CM 0.068u 50V	R111	OB01857A	RK 1K 1/4W J	R801,802	OC82226A	RM 1.0 1/2W J
C307	OB01402A	CE 4.7u 25V	R114	OB09301A	RK 2K 1/4W J	R803	OB01857A	RK 1K 1/4W J
C308,309	OB04060A	CM 2200P 50V	R115	OB01856A	RK 8.2K 1/4W J	R804,805	OB01933A	RK 220 1/4W J
C310	OC82187A	CC 180P 50V (UJ)	R116	OB09135A	RK 13K 1/4W J	R807-9	OB01846A	RK 4.7K 1/4W J
C311,312	OC82188A	CC 39P 50V (UJ)	R118	OB05868A	RK 680K 1/4W J	R810,811	OB24125A	R-Fuse 4.7 1/4W J
C313	OB01405A	CE 1u 50V	R119	OC82215A	RK 160K 1/4W J	RV101,104	OC82137A	Semi VR 100K
C314,315	OC82185A	C 39P 50V	R120	OB01888A	RK 10K 1/4W J	RV102,103	OC82138A	Semi VR 20K
C316	OB05885A	CE 100u 10V	R121	OB05629A	RK 2.7K 1/4W J	RV105	OC80888A	Semi VR 2K
C317	OB01412A	CE 10u 16V	R122	OB05576A	RK 470 1/4W J	U101	OC82114A	IC CX20109
C319	OB05885A	CE 100u 10V	R123	OB01713A	RK 33 1/4W J	U102	OC82115A	IC CX20108
C320,321	OB01412A	CE 10u 16V	R124	OB01889A	RK 100K 1/4W J	U103,104	OC82117A	IC M5218P
C401	OB09372A	CE 2.2u 50V	R125	OB05675A	RK 3.9K 1/4W J	U301	OC82116A	IC CX23035
C402	OB09814A	CE 1u 50V (LN)	R126	OB05625A	RK 220K 1/4W J	U302	OC82124A	IC HM6116LP-4
C403	OB01412A	CE 10u 16V	R127	OB05615A	RK 22K 1/4W J	U303	OC82125A	IC SM5804B
C404	OB01405A	CE 1u 50V	R128	OB05627A	RK 330K 1/4W J	U304	OC82117A	IC M5218P
C405	OB01412A	CE 10u 16V	R129	OB01682A	RK 6.8K 1/4W J	U305	OC82118A	IC M5221P
C406	OB05681A	CM 0.01u 50V	R130,131	OB05615A	RK 22K 1/4W J	U306	OC80880A	IC 74LS04
C406	OC82200A	CM 560P 50V J	R132,133	OB01888A	RK 10K 1/4W J	U401	OC82119A	IC HD614080SA18
C601,602	OC80799A	CE 100u 10V	R134	OB05509A	RK 33K 1/4W J	U402	OC82120A	IC HD614022SE50
C801-3	OB40062A	CM 0.022u 50V	R135	OB09334A	RK 11K 1/4W J	U403	OC82121A	IC MN4011BP
C804,805	OB40085A	CE 4700u 16V	R136,143	OB05615A	RK 22K 1/4W J	X301	OC82212A	X'tal 8.4672MHz
C806,807	OB01405A	CE 1u 50V	R137,150	OB05641A	RK 47K 1/4W J			
C808,809	OC80799A	CE 100u 10V	R138,145	OB01888A	RK 10K 1/4W J			
C810,811	OB40062A	CM 0.022u 50V	R139,140	OB01846A	RK 4.7K 1/4W J			
C812	OB09126A	CE 100u 35V	R141,142	OB01679A	RK 100 1/4W J			
C813	OB40336A	CE 10u 35V	R144	OB01857A	RK 1K 1/4W J			
C814-6	OB40062A	CM 0.022u 50V	R146,151	OB01679A	RK 100 1/4W J			
C817-22	OB09872A	CF 0.22u 50V J	R147	OB05621A	RK 120K 1/4W J			
D101,102	OB12363A	SiD MA700	R148	OB05675A	RK 3.9K 1/4W J			
D103	OC82107A	SiD MA165	R149	OB01887A	RK 5.6K 1/4W J			
D104	OC82112A	ZD 5.1V MA4051(M)	R152	OB20002A	RK 10M 1/4W J			
D105	OC82107A	SiD MA165	R153	OB09369A	RK 62K 1/4W J			
D301,302	OC80823A	Varicap SVC321	R154,164	OB05615A	RK 22K 1/4W J			
D401	OC82112A	ZD 5.1V MA4051(M)	R155	OB01887A	RK 5.6K 1/4W J			
D402-8	OC82107A	SiD MA165	R156	OB01706A	RK 47 1/4W J			
D409	OC82112A	ZD 5.1V MA4051(M)	R157,159	OB05668A	RK 82K 1/4W J			
D410,11,13	OC82107A	SiD MA165	R158,160	OB09517A	RK 75K 1/4W J			
D601	OC82107A	SiD MA165	R162	OB09072A	RK 110K 1/4W J			
D801,802	OC82109A	SiD W02RL	R163,166	OB09301A	RK 2K 1/4W J			
D803,804	OC82110A	ZD 5.6V MA4056(M)	R164	OB05615A	RK 22K 1/4W J			
D805	OC82111A	ZD 4.0V MA4240(L)	R165	OC82204A	RM 22 1/2W J			
D806,807	OC82112A	ZD 5.1V MA4051(M)	R167	OB05626A	RK 150K 1/4W			
EP01	OC82164A	Earth Plate	R301	OB01679A	RK 100 1/4W J			
EW 1	OC82165A	Earth Wire	R302,308	OB05640A	RK 180K 1/4W J			
HS101	OC82053A	Heatsink for Q103	R303*	OB05690A	RK 1.8M 1/4W J			
HS801,802	OC82054A	Heatsink for Q802,84	R304,307	OB05509A	RK 33K 1/4W J			
JU101	OC80837A	8P Connector Terminal	R305,306	OB01888A	RK 10K 1/4W J			
JU102	OC81173A	9P Connector Terminal	R309,310	OC82215A	RK 160K 1/4W J			
			R311	OB05776A	RK 1M 1/4W J			

7.18. Main P.C.B. Ass'y
(This P.C.B. is for the units with serial No. up to 01037.)

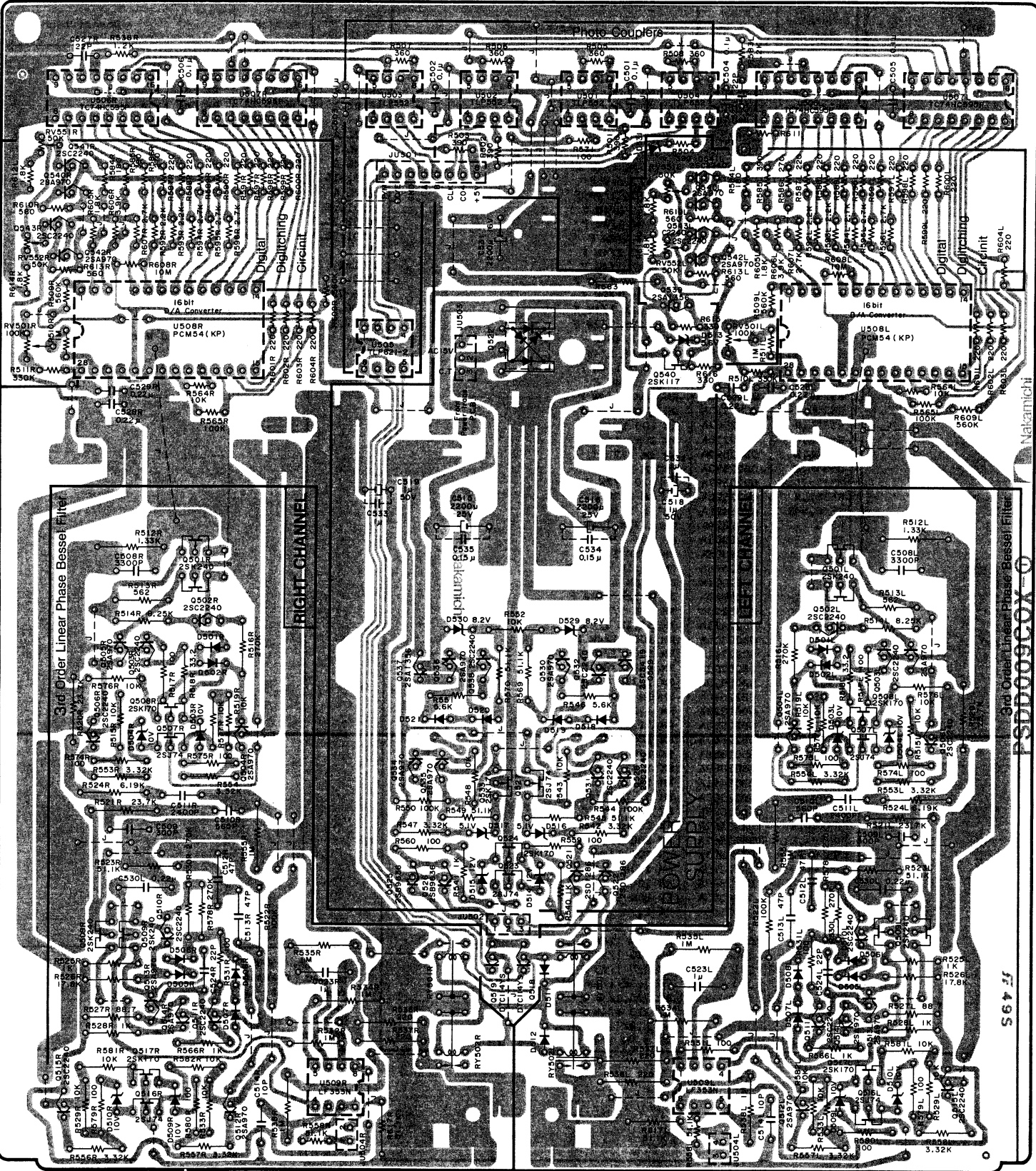


Schematic Ref No.	Part No.	Description	Schematic Ref No.	Part No.
B1	CA80485A	Main P.C.B. Ass'y	JU103	OC82087A
B2	OC82041A	Main P.C.B.	JU104	OC81161A
C101	OC81033A	BT 3x8 + Binding	JU301	OC80837A
C102,103	OE00857A	BT 3x6 + Binding	JU401,2	OC80836A
C104	OC82189A	CE 0.47u 50V G	JU403	OC81161A
C105,106	OB40047A	CE 33u 6.3V	JU404	OC82026A
C107	OB05531A	CM 0.033u 50V	JU405	OC82087A
C108	OC82181A	C 68P 50V	JU406	OC81173A
C110	OB40047A	CE 33u 6.3V	JU407	OC80837A
C111	OB40047A	CE 33u 6.3V	JU801	OC81172A
C112	OB05652A	CM 4700P 50V	L301,302	OC82202A
C113-5	OC82182A	C 15P 50V	L303	OC82203A
C116	OC80808A	CM 1500P 50V	L401,402	OC82202A
C117	OB05681A	CM 0.01u 50V	L601	OC82202A
C118	OC82197A	CM 220P 50V J	N0401	OC82166A
C119	OB01405A	CE 1u 50V	Q101	OC80741A
C120	OC80801A	CE 33u 16V	Q102	OB10088A
C121	OB05701A	CM 6800P 50V	Q103	OC82131A
C122	OB01405A	CE 1u 50V	Q104	OC82128A
C123-5	OB05701A	CM 6800P 50V	Q105,107	OC82127A
C126	OC82198A	CM 100P 50V J	Q106,108	OC82128A
C127	OB05811A	CM 0.047u 50V	Q109,301	OC82127A
C128	OC82183A	C 22P 50V	Q110,302	OC82128A
C129	OB01862A	CE 22u 16V	Q401	OB10116A
C130	OB40252A	CE 0.22u 50V	Q402-6	OB10088A
C131	OC82184A	C 33P 50V	Q601,805	OC82127A
C132	OB05681A	CM 0.01u 50V	Q801,803	OB10151A
C133	OB01605A	CM 0.012 50V	Q802	OC82131A
C134	OB05701A	CM 6800P 50V	Q804	OC82129A
C135	OC82198A	CM 100P 50V J	R101,112	OB1889A
C138	OB40237A	CE 0.1u 50V (BP)	R102,103	OB09304A
C139	OC82199A	CM 330P 50V	R104,113	OB1888A
C301	OB05681A	CM 0.01u 50V	R105	OB05692A
C302	OC82199A	CM 100P 50V J	R106	OB05668A
C303	OC82200A	CM 560P 50V J	R107	OC82214A
C304	OB05681A	CM 0.01u 50V	R108	OB09304A
C305	OB01405A	CE 1u 50V	R109,117	OB1846A
C306	OB05682A	CM 0.068u 50V	R110	OB05676A
C307	OB01402A	CE 4.7u 25V	R111	OB1857A
C308,309	OB40406A	CM 2200P 50V	R114	OB09301A
C310	OC82187A	CC 180P 50V (UJ)	R115	OB1856A
C311,312	OC82188A	CC 39P 50V (UJ)	R116	OB09135A
C313	OB01405A	CE 1u 50V	R118	OB05868A
C314,315	OC82185A	C 39P 50V	R119	OC82215A
C316	OB05685A	CE 100u 10V	R120	OB1888A
C317	OB01412A	CE 10u 16V	R121	OB05629A
C319	OB05885A	CE 100u 10V	R122	OB05576A
C320,321	OB01412A	CE 10u 16V	R123	OB01713A
C401	OB09372A	CE 2.2u 50V	R124	OB1889A
C402	OB09814A	CE 1u 50V (LN)	R125	OB05675A
C403	OB01412A	CE 10u 16V	R126	OB05625A
C404	OB01405A	CE 1u 50V	R127	OB05615A
C405	OB01412A	CE 10u 16V	R128	OB05627A
C406	OB05681A	CM 0.01u 50V	R129	OB1682A
C406	OC82200A	CM 560P 50V J	R130,131	OB05615A
C601,602	OC80799A	CE 100u 10V	R132,133	OB1888A
C801-3	OB40406A	CM 0.022u 50V	R134	OB05509A
C804,805	OB40085A	CE 4700u 16V	R135	OB09334A
C806,807	OB01405A	CE 1u 50V	R136,143	OB05615A
C808,809	OC80799A	CE 100u 10V	R137,150	OB05641A
C810,811	OB40406A	CM 0.022u 50V	R138,145	OB1888A
C812	OB09126A	CE 100u 35V	R139,140	OB1846A
C813	OB40336A	CE 10u 35V	R141,142	OB1679A
C814-6	OB40406A	CM 0.022u 50V	R144	OB1857A
C817-22	OB09872A	CF 0.22u 50V J	R146,151	OB1679A
D101,102	OB12363A	SiD MA700	R147	OB05621A
D103	OC82107A	SiD MA165	R148	OB05675A
D104	OC82112A	ZD 5.1V MA4051(M)	R149	OB1887A
D105	OC82107A	SiD MA165	R152	OB20002A
D301,302	OC80823A	Varicap SVC321	R153	OB09369A
D401	OC82112A	ZD 5.1V MA4051(M)	R154,164	OB05615A
D402-8	OC82107A	SiD MA165	R155	OB1887A
D409	OC82112A	ZD 5.1V MA4051(M)	R156	OB1706A
D410,11,13	OC82107A	SiD MA165	R157,159	OB05668A
D601	OC82107A	SiD MA165	R158,160	OB09517A
D801,802	OC82109A	SiD W02RL	R162	OB09072A
D803,804	OC82110A	ZD 5.6V MA4056(M)	R164	OB09301A
D805	OC82111A	ZD 4.0V MA4240(L)	R165	OB05615A
D806,807	OC82112A	ZD 5.1V MA4051(M)	R167	OB05626A
EP01	OC82164A	Earth Plate	R301	OB1679A
EW 1	OC82165A	Earth Wire	R302,308	OB05640A
HS101	OC82053A	Heatsink for Q103	R303*	OB05680A
HS801,802	OC82054A	Heatsink for Q802,84	R304,307	OB05509A
JU101	OC80837A	8P Connector Terminal	R305,306	OB1888A
JU102	OC81173A	9P Connector Terminal	R309,310	OC82215A
			R311	OB05776A

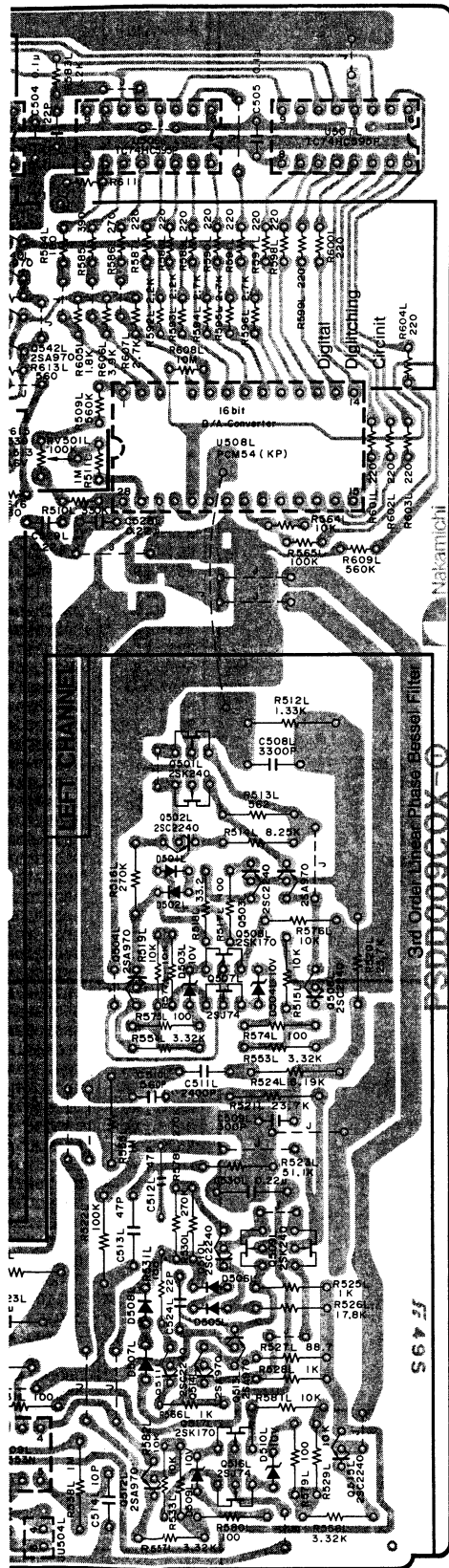


Schematic Ref No.	Part No.	Description	Schematic Ref No.	Part No.	Description	Schematic Ref No.	Part No.	Description
B1	CA80485A	Main P.C.B. Ass'y	JU103	OC82087A	8P Connector Terminal	R312,313	OB01682A	RK 6.8K 1/4W J
	OC82041A	Main P.C.B.	JU104	OC81161A	2P Connector Terminal	R314	OC82216A	RK 16K 1/4W J
B2	OC81033A	BT 3x8 + Binding	JU301	OC80837A	8P Connector Terminal	R315,317	OC82217A	RK 220 1/8W F
C101	OE00857A	BT 3x6 + Binding	JU401,2	OC80836A	6P Connector Terminal	R316	OB09307A	RK 4.3K 1/4W J
C102,103	OC82189A	CE 0.47u 50V G	JU403	OC81161A	2P Connector Terminal	R318	OB05629A	RK 2.7K 1/4W J
C104	OB40047A	CE 33u 6.3V	JU404	OC82026A	10P Connector Terminal	R319	OC82218A	RK 13K 1/8W F
C105,106	OB05531A	CM 0.033u 50V	JU405	OC82087A	8P Connector Terminal	R320	OC82219A	RK 9.31K 1/8W F
C107	OC82181A	C 68P 50V	JU406	OC81173A	9P Connector Terminal	R321	OB05509A	RK 33K 1/4W J
C108	OB40047A	CE 33u 6.3V	JU407	OC80837A	8P Connector Terminal	R322	OB01857A	RK 1K 1/4W J
C109	OC82196A	CM 470P 50V J	JU801	OC81172A	7P Connector Terminal	R323-5	OB01889A	RK 100K 1/4W J
C110	OB04062A	CM 0.022u 50V	L301,302	OC82202A	RF Coil 10uH	R326	OB05615A	RK 22K 1/4W J
C111	OB40047A	CE 33u 6.3V	L303	OC82203A	VCO Coil 7uH	R327	OB01888A	RK 10K 1/4W J
C112	OB05652A	CM 4700P 50V	L401,402	OC82202A	RF Coil 10uH	R328	OB05576A	RK 470 1/4W J
C113-5	OC82182A	C 15P 50V	L601	OC82202A	RF Coil 10uH	R329	OC82220A	RK 1.5 1/4W J
C116	OC80808A	CM 1500P 50V	N0401	OC82166A	Wire	R331	OC82221A	RK 16K 1/4W J
C117	OB05681A	CM 0.01u 50V	Q101	OC80741A	TR 2SC1675(K)	R401	OB05622A	RK 2.2K 1/4W J
C118	OC82197A	CM 220P 50V J	Q102	OB10088A	TR 2SC1815(Y,GR)	R403	OB01889A	RK 100K 1/4W J
C119	OB01405A	CE 1u 50V	Q103	OC82131A	TR 2SC1162(C,D)	R405	OB05776A	RK 1M 1/4W J
C120	OC80801A	CE 33u 16V	Q104	OC82128A	TR 2SA934(Q,R)	R406,415	OB05576A	RK 470 1/4W J
C121	OB05701A	CM 6800P 50V	Q105,107	OC82127A	TR 2SC2060(Q,R)	R407	OB01846A	RK 4.7K 1/4W J
C122	OB01405A	CE 1u 50V	Q106,108	OC82128A	TR 2SA934(Q,R)	R408,411	OB01888A	RK 10K 1/4W J
C123-5	OB05701A	CM 6800P 50V	Q109,301	OC82127A	TR 2SC2060(Q,R)	R409,410	OB05691A	RK 390 1/4W J
C126	OC82198A	CM 100P 50V J	Q110,302	OC82128A	TR 2SA934(Q,R)	R412,413	OB01846A	RK 4.7K 1/4W J
C127	OB05811A	CM 0.047u 50V	Q401	OB10116A	TR 2SA1015(Y,GR)	R414	OB05890A	RK 56 1/4W J
C128	OC82183A	C 22P 50V	Q402-6	OB10088A	TR 2SC1815(Y,GR)	R416	OB05691A	RK 390 1/4W J
C129	OB01862A	CE 22u 16V	Q601,805	OC82127A	TR 2SC2060(Q,R)	R417	OB01846A	RK 4.7K 1/4W J
C130	OB40252A	CE 0.22u 50V	Q801,803	OB10151A	FET 2SK364(BL)	R418	OB05509A	RK 33K 1/4W J
C131	OC82184A	C 33P 50V	Q802	OC82131A	TR 2SC1162(C,D)	R419,420	OB01681A	RK 3.3K 1/4W J
C132	OB05681A	CM 0.01u 50V	Q804	OC82129A	TR 2SA715(C,D)	R421,423	OB01888A	RK 10K 1/4W J
C133	OB01605A	CM 0.012 50V	R101,112	OB01889A	RK 100K 1/4W J	R601	OC82222A	RK 22 1/4W F
C134	OB05701A	CM 6800P 50V	R102,103	OB09304A	RK 3.3 1/4W J	R602,603	OB01857A	RK 1K 1/4W J
C135	OC82198A	CM 100P 50V J	R104,113	OB01888A	RK 10K 1/4W J	R604	OB05508A	RK 56K 1/4W J
C138	OB40237A	CE 0.1u 50V (BP)	R105	OB05692A	RK 68K 1/4W J	R605	OC82223A	RK 10K 1/4W F
C139	OC82199A	CM 330P 50V	R106	OB05668A	RK 82K 1/4W J	R606,806	OC82224A	RK 2.2K 1/4W F
C301	OB05681A	CM 0.01u 50V	R107	OC82214A	RK 360K 1/4W J	R607,609	OB01846A	RK 4.7K 1/4W J
C302	OC82199A	CM 100P 50V J	R108	OB09304A	RK 3.3 1/4W J	R608	OB05641A	RK 47K 1/4W J
C303	OC82200A	CM 560P 50V J	R109,117	OB01846A	RK 4.7K 1/4W J	R610	OB09705A	RK 15K 1/4W F
C304	OB05681A	CM 0.01u 50V	R110	OB05676A	RK 390K 1/4W J	R611	OC82225A	RK 470 1/4W F
C305	OB01405A	CE 1u 50V	R111	OB01857A	RK 1K 1/4W J	R801,802	OC82226A	RM 1.0 1/2W J
C306	OB05682A	CM 0.068u 50V	R114	OB09301A	RK 2K 1/4W J	R803	OB01857A	RK 1K 1/4W J
C307	OB01402A	CE 4.7u 25V	R115	OB01856A	RK 8.2K 1/4W J	R804,805	OB01933A	RK 220 1/4W J
C308,309	OB04060A	CM 2200P 50V	R116	OB09135A	RK 13K 1/4W J	R807-9	OB01846A	RK 4.7K 1/4W J
C310	OC82187A	CC 180P 50V (UJ)	R118	OB05868A	RK 680K 1/4W J	R810,811	OB24125A	R-Fuse 4.7 1/4W J
C311,312	OC82188A	CC 39P 50V (UJ)	R119	OC82215A	RK 160K 1/4W J	RV101,104	OC82137A	Semi VR 100K
C313	OB01405A	CE 1u 50V	R120	OB01888A	RK 10K 1/4W J	RV102,103	OC82138A	Semi VR 20K
C314,315	OC82185A	C 39P 50V	R121	OB05629A	RK 2.7K 1/4W J	RV105	OC80888A	Semi VR 2K
C316	OB05685A	CE 100u 10V	R122	OB05576A	RK 470 1/4W J	U101	OC82114A	IC CX20109
C317	OB01412A	CE 10u 16V	R123	OB01713A	RK 33 1/4W J	U102	OC82115A	IC CX20108
C319	OB05885A	CE 100u 10V	R124	OB01889A	RK 100K 1/4W J	U103,104	OC82117A	IC M5218P
C320,321	OB01412A	CE 10u 16V	R125	OB05675A	RK 3.9K 1/4W J	U301	OC82116A	IC CX23035
C401	OB09372A	CE 2.2u 50V	R126	OB05625A	RK 220K 1/4W J	U302	OC82124A	IC HM6116LP-4
C402	OB09814A	CE 1u 50V (LN)	R127	OB05615A	RK 22K 1/4W J	U303	OC82125A	IC SM5804B
C403	OB01412A	CE 10u 16V	R128	OB05627A	RK 330K 1/4W J	U304	OC82117A	IC M5218P
C404	OB01405A	CE 1u 50V	R129	OB01682A	RK 6.8K 1/4W J	U305	OC82118A	IC M5221P
C405	OB01412A	CE 10u 16V	R130,131	OB05615A	RK 22K 1/4W J	U306	OC80880A	IC 74LS04
C406	OB05681A	CM 0.01u 50V	R132,133	OB01888A	RK 10K 1/4W J	U401	OC82119A	IC HD614080SA18
C406	OC82200A	CM 560P 50V J	R134	OB05509A	RK 33K 1/4W J	U402	OC82120A	IC HD614022SE50
C601,602	OC80799A	CE 100u 10V	R135	OB09334A	RK 11K 1/4W J	U403	OC82121A	IC MN4011BP
C801-3	OB04062A	CM 0.022u 50V	R136,143	OB05615A	RK 22K 1/4W J	X301	OC82212A	X'tal 8.4672MHz
C804,805	OB40085A	CE 4700u 16V	R137,150	OB05641A	RK 47K 1/4W J			
C806,807	OB01405A	CE 1u 50V	R138,145	OB01888A	RK 10K 1/4W J			
C808,809	OC80799A	CE 100u 10V	R139,140	OB01846A	RK 4.7K 1/4W J			
C810,811	OB04062A	CM 0.022u 50V	R141,142	OB01679A	RK 100 1/4W J			
C812	OB09126A	CE 100u 35V	R144	OB01857A	RK 1K 1/4W J			
C813	OB40336A	CE 10u 35V	R146,151	OB01679A	RK 100 1/4W J			
C814-6	OB04062A	CM 0.022u 50V	R147	OB05621A	RK 120K 1/4W J			
C817-22	OB09872A	CF 0.22u 50V J	R148	OB05675A	RK 3.9K 1/4W J			
D101,102	OB12363A	SiD MA700	R149	OB01887A	RK 5.6K 1/4W J			
D103	OC82107A	SiD MA165	R152	OB20002A	RK 10M 1/4W J			
D104	OC82112A	ZD 5.1V MA4051(M)	R153	OB09369A	RK 62K 1/4W J			
D105	OC82107A	SiD MA165	R154,164	OB05615A	RK 22K 1/4W J			
D301,302	OC80823A	Varicap SVC321	R155	OB01887A	RK 5.6K 1/4W J			
D401	OC82112A	ZD 5.1V MA4051(M)	R156	OB01706A	RK 47 1/4W J			
D402-8	OC82107A	SiD MA165	R157,159	OB05668A	RK 82K 1/4W J			
D409	OC82112A	ZD 5.1V MA4051(M)	R158,160	OB09517A	RK 75K 1/4W J			
D410,11,13	OC82107A	SiD MA165	R162	OB09072A	RK 110K 1/4W J			
D601	OC82107A	SiD MA165	R163,166	OB09301A	RK 2K 1/4W J			
D801,802	OC82109A	SiD W02RL	R164	OB05615A	RK 22K 1/4W J			
D803,804	OC82110A	ZD 5.6V MA4056(M)	R165	OC82204A	RM 22 1/2W J			
D805	OC82111A	ZD 4.0V MA4240(L)	R167	OB05626A	RK 150K 1/4W			
D806,807	OC82112A	ZD 5.1V MA4051(M)	R301	OB01679A	RK 100 1/4W J			
EP01	OC82164A	Earth Plate	R302,308	OB05640A	RK 180K 1/4W J			
EW 1	OC82165A	Earth Wire	R303*	OB05680A	RK 1.8M 1/4W J			
HS101	OC82053A	Heatsink for Q103	R304,307	OB05509A	RK 33K 1/4W J			
HS801,802	OC82054A	Heatsink for Q802,84	R305,306	OB01888A	RK 10K 1/4W J			
JU101	OC80837A	8P Connector Terminal	R309,310	OC82215A	RK 160K 1/4W J			
JU102	OC81173A	9P Connector Terminal	R311	OB05776A	RK 1M 1/4W J			

7.19. D/A Converter P.C.B. Ass'y
(This P.C.B. is for the units with serial No. from 01037.)



Schematic Ref No.	Part No.	Description	Schematic Ref No.	Part No.	
	CA80486B	D/A Converter P.C.B. Ass'y	Q542L,R	OB06180A	T
B501	OC82027A	D/A Converter P.C.B.	Q543L,R	OB10078A	T
BP501	OB00521A	M3x8 + Pan	R501-504	OB05691A	R
C501-6	OC82172A	Bus-line Plate	R505-508	OB09326A	R
C508L,R	OB41635A	CMM 0.1u 63V J	R509L,R	OB05784A	R
C509L,R	OB41731A	CM 3300P 100V J	R510L,R	OB05627A	R
C510L,R	OC82247A	CSP 300P 160V J	R511L,R	OB05776A	R
C511L,R	OC82248A	CSP 560P 160V J	R512L,R	OB20396A	R
C512L,R	OC82249A	CSP 2400P 100V G	R513L,R	OB22706A	R
C513L,R	OC82178A	C 47P 500V J	R514L,R	OB09432A	R
C514L,R	OC82178A	C 47P 500V J	R515L,R*	OB09356A	R
C515,516	OC82179A	C 10P 500V J	R516L,R	OC82206A	R
C518,519	OB05654A	CE 2200u 25V	R517L,R	OB22567A	R
C523L,R	OB01405A	CE 1u 50V	R518L,R	OC82207A	R
C524L,R	OC82192A	CM 1u 160V K	R519L,R*	OB09356A	R
C527L,R	OC82180A	C 22P 500V J	R520-11L,R	OB22588A	R
C528L,R	OB41507A	C 22P 50V J	R522L,R	OB22589A	R
C529L,R	OB09872A	CF 0.22u 50V	R523L,R	OB22595A	R
C530L,R	OB09872A	CF 0.22u 50V	R524L,R	OC82208A	R
C531	OC02191A	CM 0.22u 100V K	R525L,R	OB09491A	R
C532,3	OB09880A	CE 2200u 16V B	R526L,R	OB09769A	R
C534,5	OB09870A	CF 1u 50V J	R527L,R	OC82209A	R
D501-2L,R	OB06397A	CF 0.15u 50V J	R528L,R	OB09491A	R
D503-4L,R	OB12168A	SiD 1SS176	R529L,R*	OB09356A	R
D505-8L,R	OB06397A	ZD 10V RD10JSB2	R530L,R	OC82210A	R
D509-10L,R	OB12168A	SiD 1SS176	R531L,R	OB22567A	R
D511,512	OB06397A	ZD 10V RD10JSB2	R533L,R*	OB09356A	R
D513	OB12150A	SiD 1SS176	R534L,R	OB22590A	R
D514,515	OB12175A	ZD 5.6V RD5.6JSB2	R535L,R	OB22590A	R
D516,517	OB12147A	ZD 12V RD122JSB3	R536-7L,R	OB20397A	R
D518-521	OB06397A	ZD 5.1V RD5.1SB2	R538L,R	OB22590A	R
D522	OB06397A	SiD 1SS176	R540,541	OB09491A	R
D529,530	OB82108A	SiD DBA10B	R542	OB09829A	R
D531	OB12162A	ZD 8.2V RD8.2JSB2	R543	OB09203A	R
HS501-3	OC80877A	SiD MA150	R544	OB09305A	R
JU501	OC82055A	Heatsink for Q529,537,520	R545	OB22595A	R
JU502	OC80837A	8P Connector Terminal	R546	OC82211A	R
JU503	OC82089A	3P Connector Terminal	R547	OB09829A	R
JU504L,R	OC80857A	3P Connector Terminal	R548	OB09203A	R
PJ501L	OC82173A	3P Connector Terminal	R549	OB22595A	R
PJ501R	OC82174A	Output Pin Jack (White)	R550	OB09305A	R
Q501L,R	OB06257A	Output Pin Jack (Red)	R551	OC82211A	R
Q502-3L,R	OB10078A	FET 2SK240(GR)	R552	OB09203A	R
Q504-5L,R	OB06180A	TR 2SC2240(GR)	R553-4L,R	OB09829A	R
Q506L,R	OB10078A	TR 2SA970(GR)	R555L,R	OB22590A	R
Q507L,R	OB10169A	TR 2SC2240(GR)	R556-7L,R	OB09829A	R
Q508L,R	OB10122A	FET 2SJ74(BL,V)	R558L,R	OB22595A	R
Q509L,R	OB06257A	FET 2SK170(BL,V)	R559,560	OB22567A	R
Q510-11L,R	OB10078A	FET 2SK240(GR)	R564L,R	OB01888A	R
Q512-14L,R	OB06180A	TR 2SC2240(GR)	R565L,R	OB01889A	R
Q515L,R	OB10078A	TR 2SA970(GR)	R566L,R	OB09491A	R
Q516L,R	OB10169A	TR 2SC2240(GR)	R569,570	OB22595A	R
Q517L,R	OB10122A	FET 2SJ74(BL,V)	R571	OB01679A	R
Q518,519	OB10063A	FET 2SK170(BL,V)	R574L,R	OB22567A	R
Q521,522	OB06371A	TR DTC114VS	R575L,R	OB22567A	R
Q523,527	OB10169A	TR 2SD1286(L,K)	R576-7L,R	OB09203A	R
Q524,533	OB10122A	FET 2SJ74(BL,V)	R578L,R	OC82210A	R
Q525,526	OB10144A	FET 2SK170(BL,V)	R579-80L,R	OB22567A	R
Q528	OB10078A	TR 2SB963(L,K)	R581-2L,R	OB09203A	R
Q529	OC82126A	TR 2SC2240(GR)	R583L,R	OB05623A	R
Q530,531	OB10078A	TR 2SC3419(O,Y)	R584L,R	OB05578A	R
Q532	OB06180A	TR 2SC2240(GR)	R585L,R	OB05691A	R
Q534-6	OB06180A	TR 2SA970(GR)	R586L,R	OB05645A	R
Q537,539	OC82130A	TR 2SA1356(O,Y)	R587-91L,R	OB11032A	R
Q538	OB10078A	TR 2SA970(GR)	R592-96L,R	OB05622A	R
Q540	OB10181A	TR 2SC2240(GR)	R597-99L,R	OB01933A	R
Q540L,R	OB06180A	FET 2SK117	R600-04L,R	OB01933A	R
Q541L,R	OB10078A	TR 2SA970(GR)	R605L,R	OB05614A	R
		TR 2SC2240(GR)	R606L,R	OB05675A	R

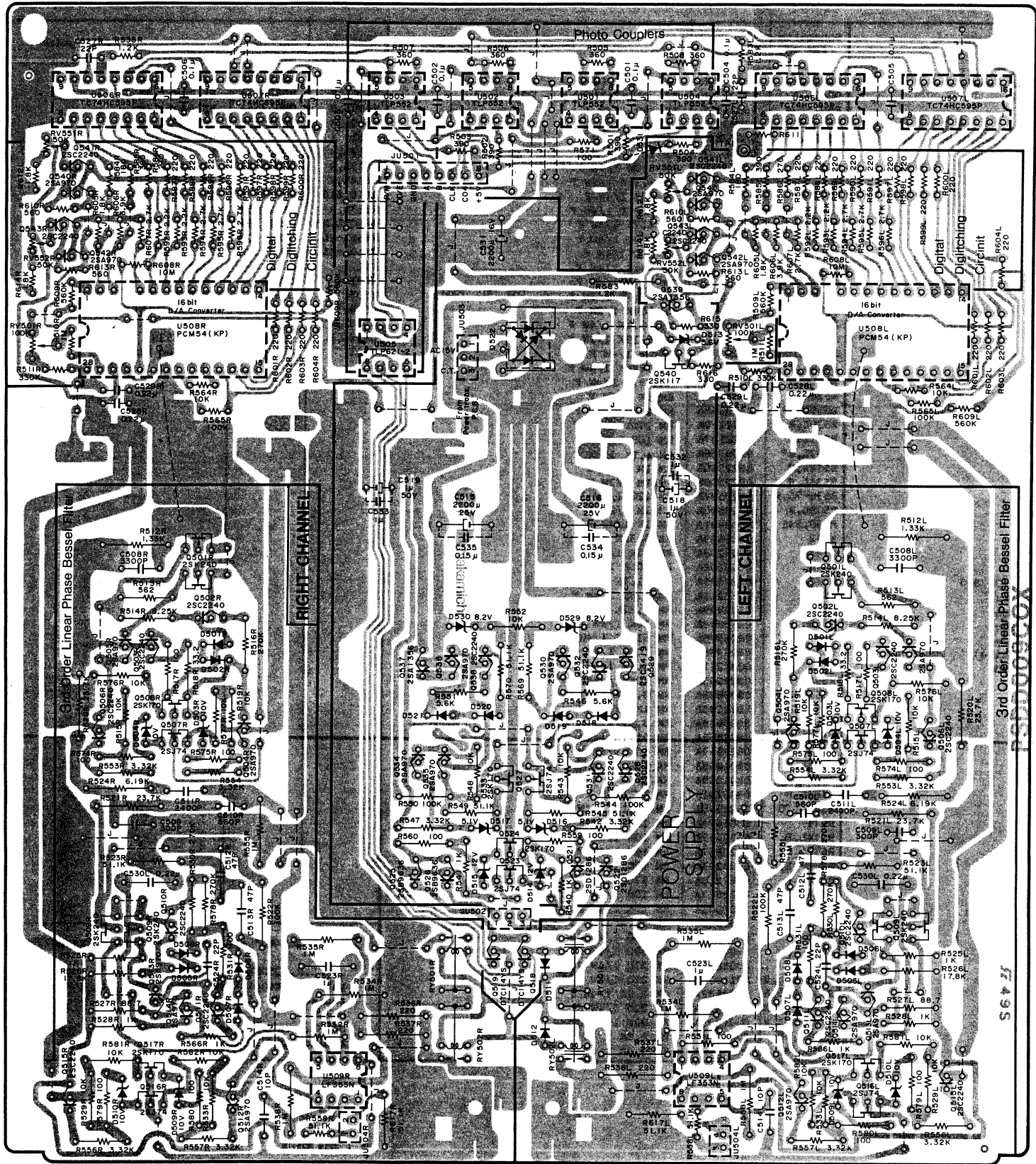


Schematic Ref No.	Part No.	Description	Schematic Ref No.	Part No.	Description	Schematic Ref No.	Part No.	Description
B501	CA80486B	D/A Converter P.C.B. Ass'y	Q542L,R	OB06180A	TR 2SA970(GR)	R607L,R	OB05629A	RK 2.7K 1/4W J
BP501	OC92027A	D/A Converter P.C.B.	Q543L,R	OB10078A	TR 2SC2240(GR)	R608L,R	OB20002A	RK 10M 1/4W J
C501-6	OE00521A	M3x8 + Pan	R501-504	OB05691A	RK 390 1/4W J	R609L,R	OB05784A	RK 560K 1/4W J
C508L,R	OC82172A	Bus-line Plate	R505-508	OB09326A	RK 360 1/4W J	R610L,R	OB05575A	RK 560 1/4W J
C509L,R	OB41635A	CMM 0.1u 63V J	R509L,R	OB05784A	RK 560K 1/4W J	R611	OB01888A	RK 10K 1/4W J
C510L,R	OB41731A	CM 3300P 100V J	R510L,R	OB05627A	RK 1M 1/4W J	R612L,R	OB05614A	RK 1.8K 1/4W J
C511L,R	OC82247A	CSP 300P 160V J	R511L,R	OB05776A	RK 330K 1/4W J	R613L,R	OB05575A	RK 560 1/4W J
C512L,R	OC82248A	CSP 560P 160V J	R512L,R	OB20396A	RM 1.33K 1/2W F	R614L,R	OB05614A	RK 1.8K 1/4W J
C513L,R	OC82249A	CSP 2400P 100V G	R513L,R	OB22706A	RM 562 1/4W F	R615,616	OB05577A	RK 330 1/4W J
C514L,R	OC82178A	C 47P 500V J	R514L,R	OB09432A	RM 8.25K 1/4W F	R617L,R	OB22595A	RM 51.1K 1/4W F
C515,516	OC82178A	C 47P 500V J	R515L,R*	OB09356A	RM 4.7K 1/4W F	RV501L,R	OC82139A	Semi VR 100K
C518,519	OC82179A	C 10P 500V J	R516L,R	OC82206A	RM 270K 1/4W F	RV551-2L,R	OC82140A	Semi VR 50K
C523L,R	OB05654A	CE 2200u 25V	R517L,R	OB22567A	RM 100 1/4W F	RY501-2L,R	OC82135A	Relay HD1-M-DC24V
C524L,R	OB01405A	CE 1u 50V	R518L,R	OC82207A	RM 33.2 1/4W F	TP1	OC82263A	Test Terminal
C527L,R	OC82192A	CM 1u 160V K	R519L,R*	OB09356A	RM 4.7K 1/4W F	U501-4	OC82133A	IC TLP552
C528L,R	OC82180A	C 22P 500V J	R520-1L,R	OB22588A	RM 23.7K 1/2W F	U505	OC82134A	IC TLP621-2
C529L,R	OB41507A	C 22P 50V J	R522L,R	OB22589A	RM 100K 1/2W F	U506-7L,R	OC82132A	IC TC74HC595P
C530L,R	OB09872A	CF 0.22u 50V	R523L,R	OB22595A	RM 51.1K 1/4W F	U508L,R	OC82123A	IC PCN54 (KP)
C531	OB09872A	CF 0.22u 50V	R524L,R	OC82208A	RM 6.19K 1/2W F	U509L,R	OB11032A	IC LF353N
C532,3	OC82194A	CM 0.22u 100V K	R525L,R	OB09491A	RM 1K 1/4W F	W501	OC82253A	Shielded Wire
C534,5	OC02191A	CE 2200u 16V B	R526L,R	OB09769A	RM 17.8K 1/4W F			
D501-2L,R	OB09880A	CF 1u 50V J	R527L,R	OC82209A	RM 88.7 1/4W F			
D503-4L,R	OB09870A	CF 0.15u 50V J	R528L,R	OB09491A	RM 1K 1/4W F			
D505-8L,R	OB06397A	SiD 1SS176	R529L,R*	OB09356A	RM 4.7K 1/4W F			
D509-10L,R	OB12168A	ZD 10V RD10JSB2	R530L,R	OC82210A	RM 270K 1/4W F			
D511,512	OB06397A	SiD 1SS176	R531L,R	OB22567A	RM 100 1/4W F			
D513	OB12168A	ZD 10V RD10JSB2	R533L,R*	OB09356A	RM 4.7K 1/4W F			
D514,515	OB06397A	SiD 1SS176	R534L,R	OB22590A	RM 1M 1/2W G			
D516,517	OB12150A	ZD 5.6V RD5.6JSB2	R535L,R	OB22590A	RM 1M 1/2W G			
D518-521	OB12175A	ZD 12V RD12JSB3	R536-7L,R	OB20397A	RM 220 1/2W J			
D522	OB12147A	ZD 5.1V RD5.1SB2	R538L,R	OB22590A	RM 1M 1/2W G			
D529,530	OB06397A	SiD 1SS176	R540,541	OB09491A	RM 1K 1/4W F			
D531	OB82108A	SiD DBA10B	R542	OB09829A	RM 3.32K 1/4W F			
HS501-3	OB12162A	ZD 8.2V RD8.2JSB2	R543	OB09203A	RM 10K 1/4W F			
JU501	OC80877A	SiD MA150	R544	OB09305A	RM 100K 1/4W F			
JU502	OC82055A	Heatsink for Q529,537,520	R545	OB22595A	RM 51.1K 1/4W F			
JU503	OC80837A	8P Connector Terminal	R546	OC82211A	RM 5.6K 1/4W F			
JU504L,R	OC82089A	3P Connector Terminal	R547	OB09829A	RM 3.32K 1/4W F			
PJ501L	OC80857A	3P Connector Terminal	R548	OB09203A	RM 10K 1/4W F			
PJ501R	OC80857A	3P Connector Terminal	R549	OB22595A	RM 51.1K 1/4W F			
Q501L,R	OC82173A	Output Pin Jack (White)	R550	OB09305A	RM 100K 1/4W F			
Q502-3L,R	OC82174A	Output Pin Jack (Red)	R551	OC82211A	RM 5.6K 1/4W F			
Q504-5L,R	OB06257A	FET 2SK240 (GR)	R552	OB09203A	RM 10K 1/4W F			
Q506L,R	OB10078A	TR 2SC2240 (GR)	R553-4L,R	OB09829A	RM 3.32K 1/4W F			
Q507L,R	OB06180A	TR 2SA970 (GR)	R555L,R	OB22590A	RM 1M 1/2W G			
Q508L,R	OB10078A	TR 2SC2240 (GR)	R556-7L,R	OB09829A	RM 3.32K 1/4W F			
Q509L,R	OB10169A	FET 2SJ74 (BL,V)	R558L,R	OB22595A	RM 51.1K 1/4W F			
Q510-11L,R	OB10122A	FET 2SK170 (BL,V)	R559,560	OB22567A	RM 100 1/4W F			
Q512-14L,R	OB06257A	FET 2SK240 (GR)	R564L,R	OB01888A	RK 10K 1/4W J			
Q515L,R	OB10078A	TR 2SC2240 (GR)	R565L,R	OB01889A	RK 100K 1/4W J			
Q516L,R	OB06180A	TR 2SA970 (GR)	R566L,R	OB09491A	RM 1K 1/4W F			
Q517L,R	OB10078A	TR 2SC2240 (GR)	R569,570	OB22595A	RM 51.1K 1/4W F			
Q518,519	OB10169A	FET 2SJ74 (BL,V)	R571	OB01679A	RK 100 1/4W J			
Q521,522	OB10122A	FET 2SK170 (BL,V)	R574L,R	OB22567A	RM 100 1/4W F			
Q523,527	OB10063A	TR DTC114YS	R575L,R	OB22567A	RM 100 1/4W F			
Q524,533	OB06371A	TR 2SD1286 (L,K)	R576-7L,R	OB09203A	RM 10K 1/4W F			
Q525,526	OB10169A	FET 2SJ74 (BL,V)	R578L,R	OC82210A	RM 270K 1/4W F			
Q528	OB10122A	FET 2SK170 (BL,V)	R579-80L,R	OB22567A	RM 100 1/4W F			
Q529	OB10144A	TR 2SB963 (L,K)	R581-2L,R	OB09203A	RM 10K 1/4W F			
Q530,531	OB10078A	TR 2SC2240 (GR)	R583L,R	OB05623A	RK 1.2K 1/4W J			
Q532	OC82126A	TR 2SC3419 (O,Y)	R584L,R	OB05578A	RK 180 1/4W J			
Q534-6	OB10078A	TR 2SC2240 (GR)	R585L,R	OB05691A	RK 390 1/4W J			
Q537,539	OB06180A	TR 2SA970 (GR)	R586L,R	OB05645A	RK 270 1/4W J			
Q538	OB06180A	TR 2SA970 (GR)	R587-91L,R	OB11032A	RK 220 1/4W J			
Q540	OC82130A	TR 2SA1356 (O,Y)	R592-96L,R	OB05622A	RK 2.2K 1/4W J			
Q540L,R	OB10078A	TR 2SC2240 (GR)	R597-99L,R	OB01933A	RK 220 1/4W J			
Q541L,R	OB10181A	FET 2SK117	R600-04L,R	OB01933A	RK 220 1/4W J			
	OB06180A	TR 2SA970 (GR)	R605L,R	OB05614A	RK 1.8K 1/4W J			
	OB10078A	TR 2SC2240 (GR)	R606L,R	OB05675A	RK 3.9K 1/4W J			

Parts marked* are 10k ohm for the units 1-2250.

Q507L,R, Q508L,R, Q517L,R, Q523/Q524, and Q527/Q533 are paired transistors. When one of them is damaged, replace it in the same rank (BL or V) as the paired one.
U508L,R are paired ICs. If only one of them is damaged, replace the IC pair.

7.19. D/A Converter P.C.B. Ass'y
(This P.C.B. is for the units with serial No. up to 01037.)



Schematic Ref No.	Part No.	Description	Schematic Ref No.	Part No.
B501	CA80486A	D/A Converter P.C.B. Ass'y	Q542L,R	OB06180A
BP501	OC82027A	D/A Converter P.C.B.	Q543L,R	OB10078A
C501-6	OB00521A	M3x8 + Pan	R501-504	OB05691A
C508L,R	OC82172A	Bus-line Plate	R505-508	OB09326A
C509L,R	OB41635A	CMM 0.1u 63V J	R509L,R	OB05784A
C510L,R	OB41731A	CM 3300P 100V J	R510L,R	OB05627A
C511L,R	OC82247A	CSP 300P 160V J	R511L,R	OB05776A
C512L,R	OC82248A	CSP 560P 160V J	R512L,R	OB20396A
C513L,R	OC82249A	CSP 2400P 100V G	R513L,R	OB22706A
C514L,R	OC82178A	C 47P 500V J	R514L,R	OB09432A
C515,516	OC82179A	C 47P 500V J	R515L,R	OB09356A
C518,519	OC82179A	C 10P 500V J	R516L,R	OC82206A
C523L,R	OB05654A	CE 2200u 25V	R517L,R	OB22567A
C524L,R	OB01405A	CE 1u 50V	R518L,R	OC82207A
C527L,R	OC82192A	CM 1u 160V K	R519L,R	OB09356A
C528L,R	OC82180A	C 22P 50V J	R520-1L,R	OB22588A
C529L,R	OB41507A	C 22P 50V J	R522L,R	OB22589A
C530L,R	OB09872A	CF 0.22u 50V	R523L,R	OB22595A
C531	OB09872A	CF 0.22u 50V	R524L,R	OC82208A
C532,3	OC82194A	CM 0.22u 100V K	R525L,R	OB09491A
C534,5	OC02191A	CE 2200u 16V B	R526L,R	OB09769A
D501-2L,R	OB09880A	CF 1u 50V J	R527L,R	OC82209A
D503-4L,R	OB09870A	CF 0.15u 50V J	R528L,R	OB09491A
D505-8L,R	OB06397A	SiD 1SS176	R529L,R	OB09356A
D509-10L,R	OB12168A	ZD 10V RD10JSB2	R530L,R	OC82210A
D511,512	OB06397A	SiD 1SS176	R531L,R	OB22567A
D513	OB12150A	ZD 5.6V RD5.6JSB2	R533L,R	OB09356A
D514,515	OB12175A	ZD 12V RD12JSB3	R534L,R	OB22590A
D516,517	OB12147A	ZD 5.1V RD5.1SB2	R535L,R	OB22590A
D518-521	OB06397A	SiD 1SS176	R536-7L,R	OB20397A
D522	OB82108A	SiD DBA10B	R538L,R	OB22590A
D529,530	OB12162A	ZD 8.2V RD8.2JSB2	R540,541	OB09491A
D531	OC80877A	SiD MA150	R542	OB09829A
HS501-3	OC82055A	Heatsink for Q529,537,520	R543	OB09203A
JU501	OC80837A	8P Connector Terminal	R544	OB09305A
JU502	OC82089A	3P Connector Terminal	R545	OB22595A
JU503	OC80857A	3P Connector Terminal	R546	OC82211A
JU504L,R	OC80857A	3P Connector Terminal	R548	OB09829A
PJ501L	OC82173A	Output Pin Jack (White)	R549	OB09203A
PJ501R	OC82174A	Output Pin Jack (Red)	R550	OB22595A
Q501L,R	OB06257A	FET 2SK240(GR)	R551	OB09305A
Q502-3L,R	OB10078A	TR 2SC2240(GR)	R552	OB09203A
Q504-5L,R	OB06180A	TR 2SA970(GR)	R553-4L,R	OB09829A
Q506L,R	OB10078A	TR 2SC2240(GR)	R555L,R	OB22590A
Q507L,R	OB10169A	FET 2SJ74(BL,V)	R556-7L,R	OB09829A
Q508L,R	OB10122A	FET 2SK170(BL,V)	R558L,R	OB22595A
Q509L,R	OB06257A	FET 2SK240(GR)	R559,560	OB22567A
Q510-11L,R	OB10078A	TR 2SC2240(GR)	R564L,R	OB01888A
Q512-14L,R	OB06180A	TR 2SA970(GR)	R565L,R	OB01889A
Q515L,R	OB10078A	TR 2SC2240(GR)	R566L,R	OB09491A
Q516L,R	OB10169A	FET 2SJ74(BL,V)	R569,570	OB22595A
Q517L,R	OB10122A	FET 2SK170(BL,V)	R571	OB01679A
Q518,519	OB10063A	TR DTC114YS	R574L,R	OB22567A
Q521,522	OB06371A	TR 2SD1286(L,K)	R575L,R	OB22567A
Q523,527	OB10169A	FET 2SJ74(BL,V)	R576-7L,R	OB09203A
Q524,533	OB10122A	FET 2SK170(BL,V)	R578L,R	OC82210A
Q525,526	OB10144A	TR 2SB963(L,K)	R579-80L,R	OB22567A
Q528	OB10078A	TR 2SC2240(GR)	R581-2L,R	OB09203A
Q529	OC82126A	TR 2SC3419(O,Y)	R583L,R	OB05623A
Q530,531	OB10078A	TR 2SC2240(GR)	R584L,R	OB05578A
Q532	OB06180A	TR 2SA970(GR)	R585L,R	OB05691A
Q534-6	OB06180A	TR 2SA970(GR)	R586L,R	OB05645A
Q537,539	OC82130A	TR 2SA1356(O,Y)	R587-91L,R	OB11032A
Q538	OB10078A	TR 2SC2240(GR)	R592-96L,R	OB05622A
Q540	OB10181A	FET 2SK117	R597-99L,R	OB01933A
Q540L,R	OB06180A	TR 2SA970(GR)	R600-04L,R	OB01933A
Q541L,R	OB10078A	TR 2SC2240(GR)	R605L,R	OB05614A
			R606L,R	OB05675A

8. SCHEMATIC DIAGRAM

8.1 IC Block Diagrams and Descriptions

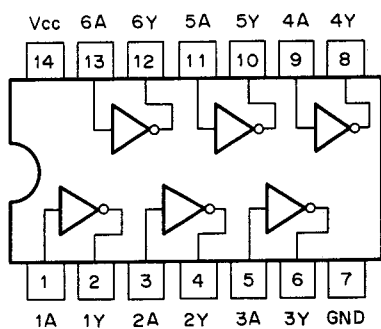


Fig. 8.1.1. Inverter TTL IC 74LS04

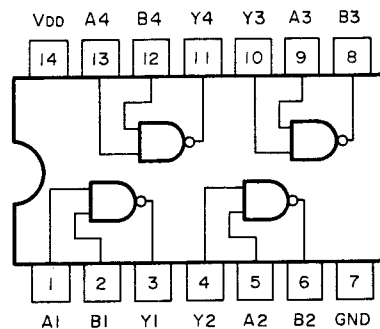


Fig. 8.1.2. NAND Gate C-MOS IC MN4011BP

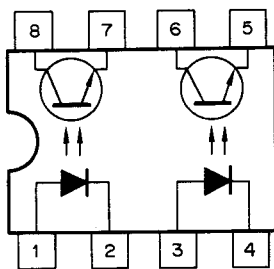


Fig. 8.1.3. Photo Coupler IC TLP621-2

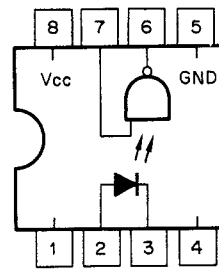


Fig. 8.1.4. Photo Coupler IC TLP552

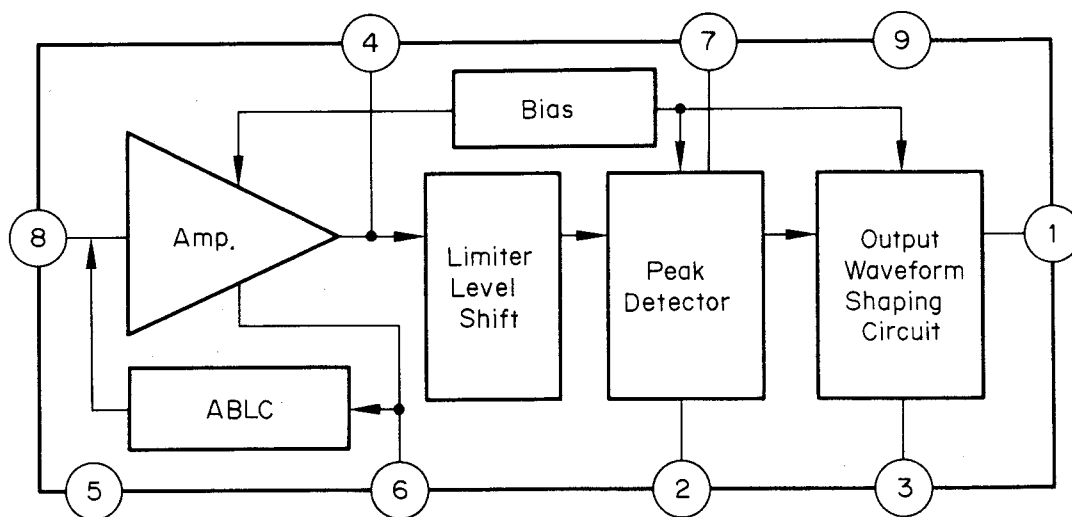


Fig. 8.1.5. Pre-Amp. IC uPC1474HA

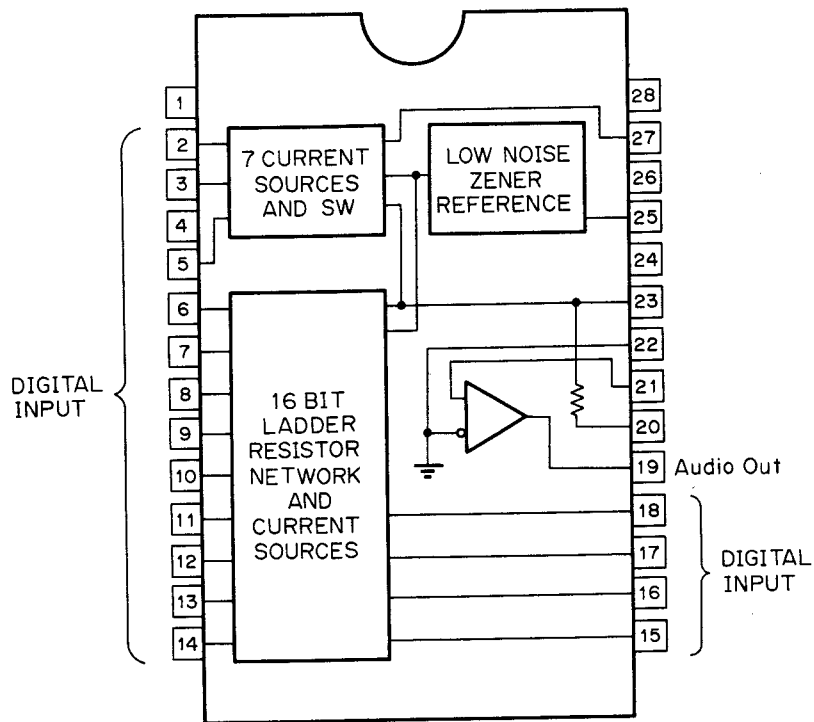


Fig. 8.1.6. D/A Converter IC PCM54KP

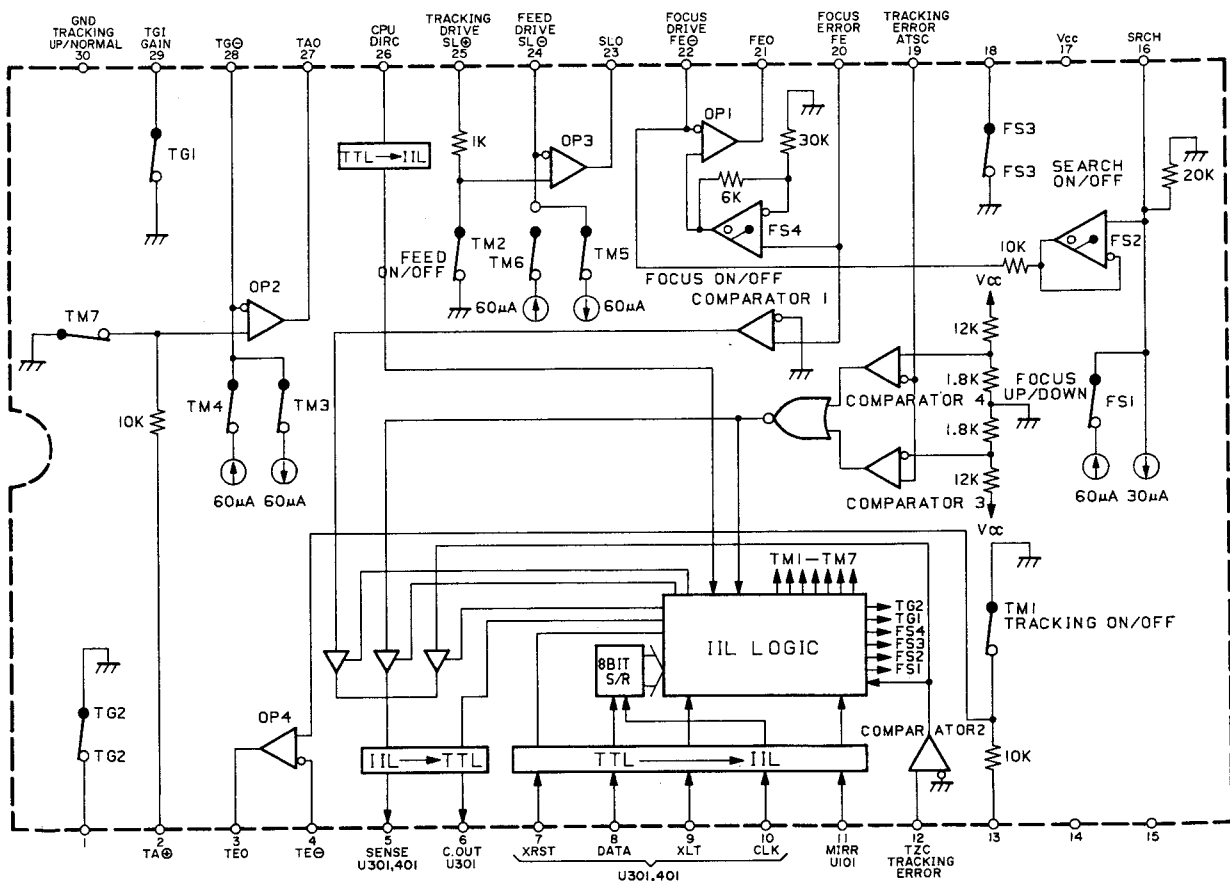


Fig. 8.1.7. Servo IC CX20108

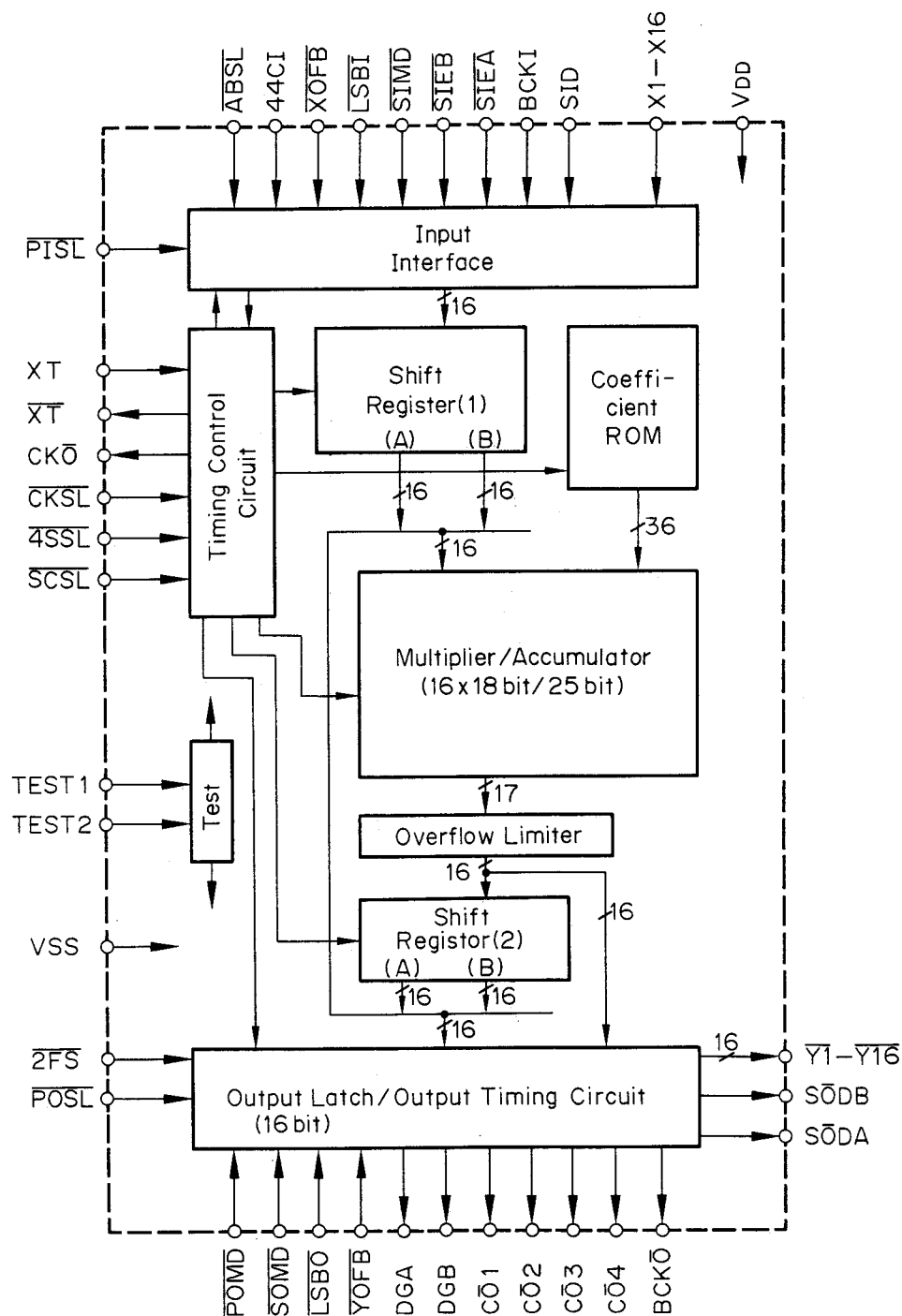


Fig. 8.1.8. Digital Filter IC SM5804B

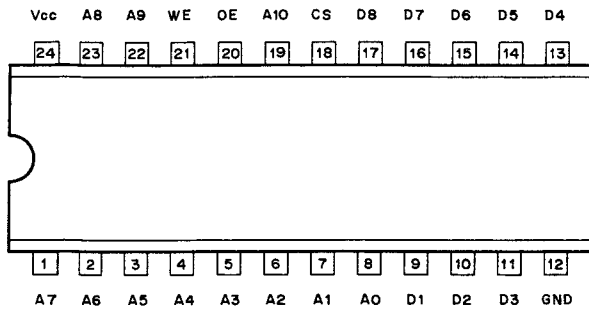


Fig. 8.1.9. 16k bit Static RAM LP6116

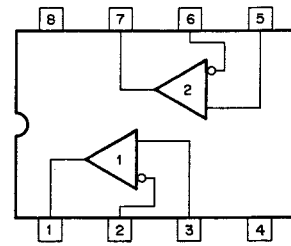


Fig. 8.1.10. Operational Amp. IC M5218P, M5221P, LF353N, NJM4556D

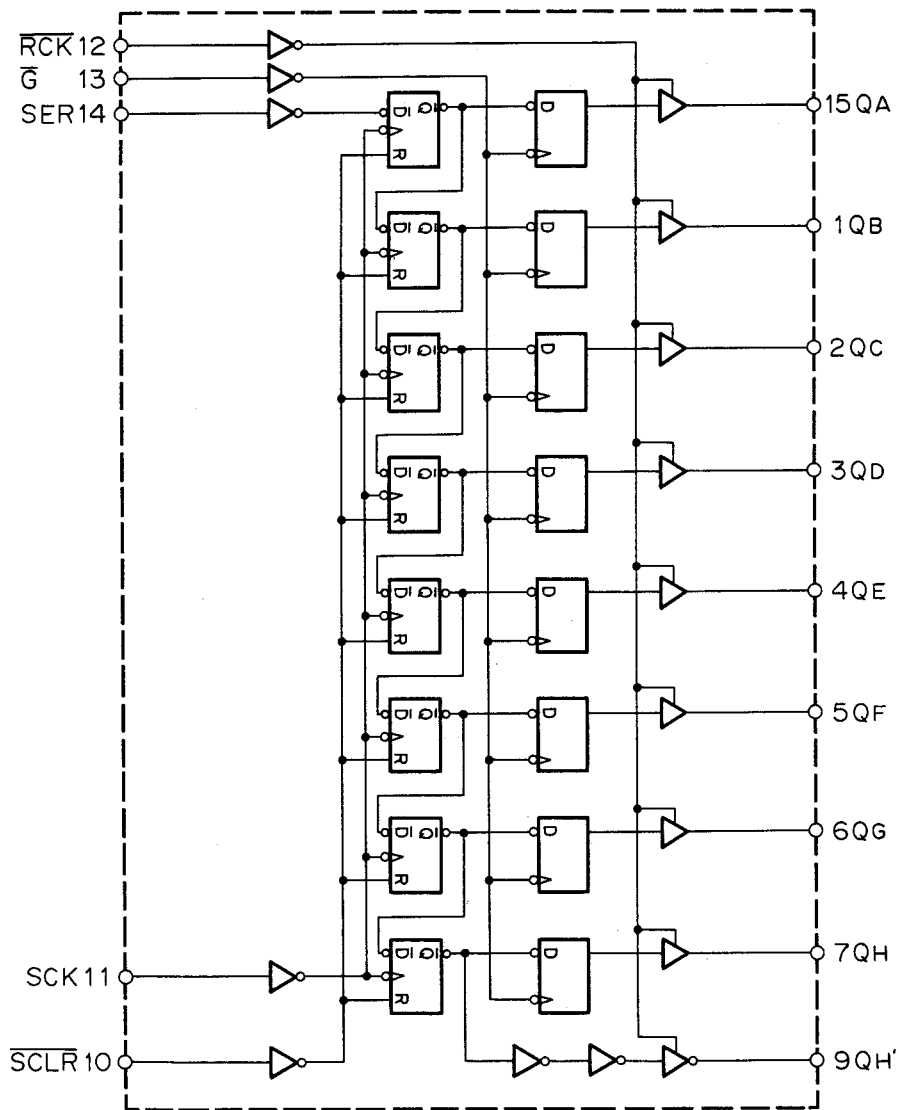


Fig. 8.1.11. Shift Register/Latch C-MOS IC TC74HC595P

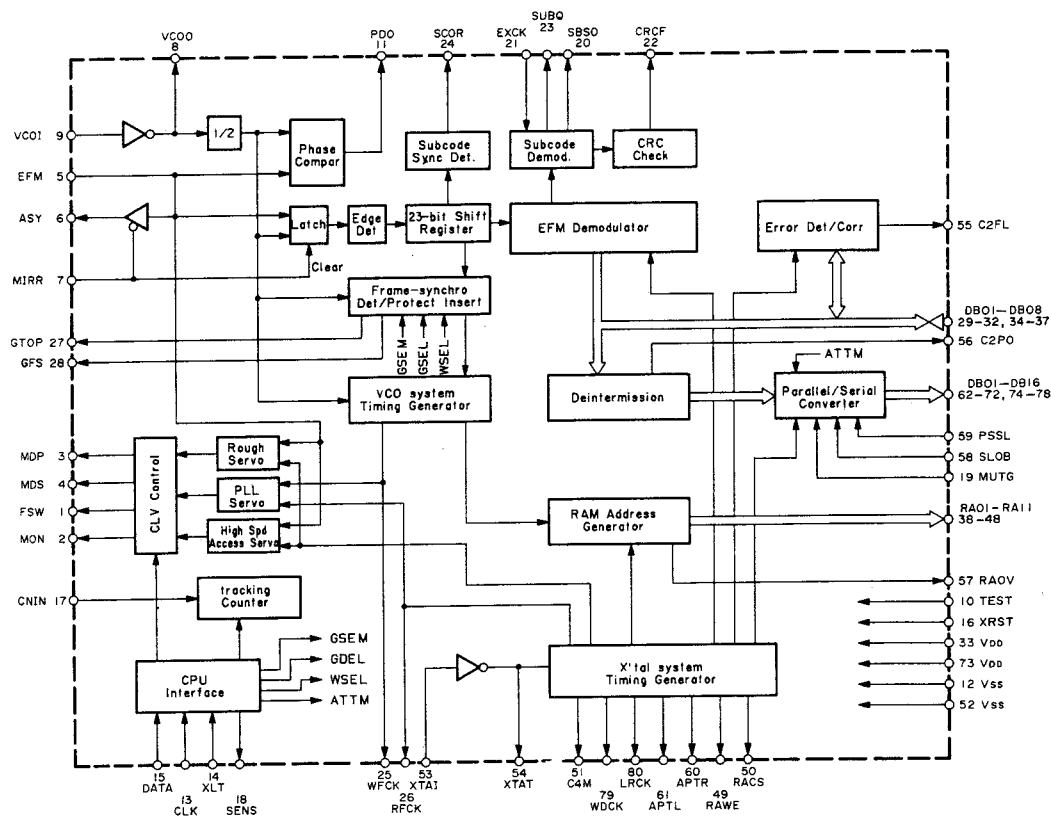


Fig. 8.1.12. Digital Signal IC CX23035

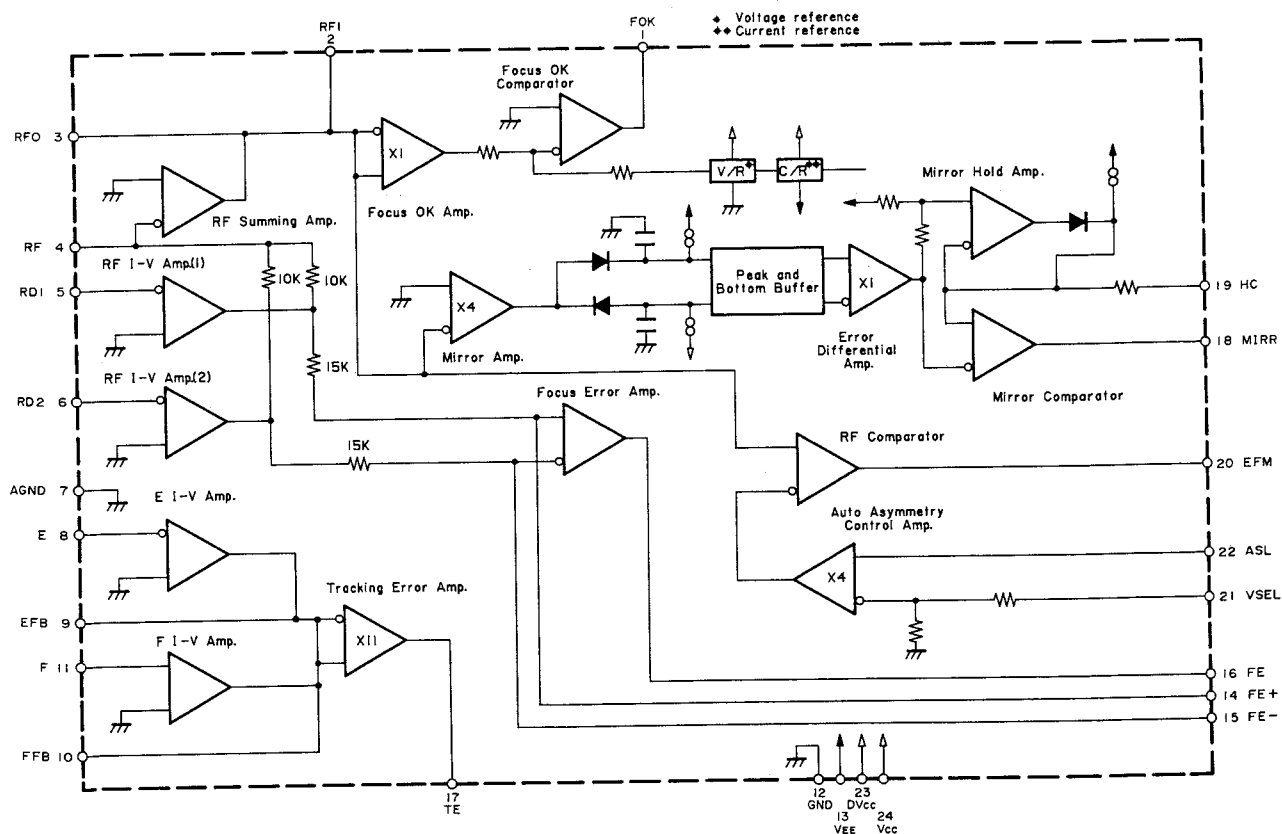


Fig. 8.1.13. RF Amp. IC CX20109

CPU (U401) function table

Pin No.	Signal Name	I/O	Description
1	SCRC	I	When disc is scratched this turns to high.
2	GFS	I	When disc rotation stabilizes this turns to high.
3	LASER	O	Turns to low to emit laser.
4	DISCSET	I	Turns to low when a disc is set.
5	EMPH	O	When disc data is emphasized, this signal turns to high automatically.
6	PLAY	O	To light Play indicator this turns to high while playing.
7	PAUSE	O	To light Pause indicator this turns to high while pause engaged.
8-17	----	-	Not used.
18	WFCK	I	7.35kHz clock
19	VDISP	-	Connected to GND.
20	INSIDE	I	When the pickup goes to the inner limit SW, this signal turns to low.
21	ACK	O	When U402 sends data to U401 completely, this turns to low.
22	SENSE	I	SENSE signal from U101, 301.
23	SCOR	I	75Hz clock
24	DATA4	I	Communication data from U402.
25	OPENEND	I	When the disc tray fully opens, this signal turns to low.
26	DATA5	I	Communication data from U402.
27	FOK	I	When focus is in, this signal turns to high.
28	OPEN	O	Turns to low when opening the tray.
29	CLOSE	O	Turns to low when closing the tray.
30-31	----	-	Not used.
32	Vcc	-	+5V
33	WFCK	I	7.35kHz clock
34	SUBQ	I	Subcode data input
35	----	-	Not used.
36	CLSEND	I	When the tray closes completely, this turns to low.
37	DATA	O	Servo control signal for U101, U301.
38	----	-	Not used.
39	XLT	O	Servo control signal for U101, U301.
40	CLK	O	Servo control clock for U101, U301.
41	SDATA	O	Communication serial data to U402.
42	SIRST	O	Communication data start signal to U402.
43	SCK	O	Communication data clock to U402.
44	----	-	Not used
45	DATA0	I	Communication data from U402.
46	DATA1	I	Communication data from U402.
47	DATA2	I	Communication data from U402.
48	DATA3	I	Communication data from U402.
49	RESET	I	Reset input signal. High for reset.
50	TEST	I	Connected to +5V.
51	OSC1	I	CPU clock, 4.235MHz.
52	OSC2	I	Not used.
53	GND	-	Ground terminal
54	CRCF	I	Turns to high when the CRC check is good.
55	MUTE	I	Control signal to U301. Low to mute output signal.
56	DIRC	O	Track search control signal.
57	H MUTE	O	Low while half-mute
58	----	-	Not used.
59	SENSE	I	SENSE signal from U101, U301.
60	----	-	Not used.
61	----	-	Not used.
62	PMUTE	O	Turns to low to mute output signal when power turns on.
63	TEST	I	Low for test mode.
64	STB	I	Strobe signal. When received data is good, turns to low.

CPU (U402) function table

Pin No.	Signal Name	I/O	Description
1	DIG4	O	Display digit data.
2	DIG5	O	Display digit data.
3	DIG6	O	Display digit data.
4	DIG7	O	Display digit data.
5	----	-	Not used.
6	SEGD	O	Display segment data.
7	SEGC	O	Display segment data.
8	SEGB	O	Display segment data.
9	SEGA	O	Display segment data.
10	SEGH	O	Display segment data.
11	SEGG	O	Display segment data.
12	SEGF	O	Display segment data.
13	SEGE	O	Display segment data.
14-17	UCODE	I	Selection of user code of remote signal.
18	REMO1	I	Remote control data.
19	VDISP	-	-22V
20	SCAN6	O	Keyboard scan signal.
21	SCAN5	O	Keyboard scan signal.
22	REMO2	I	Remote control data.
23	SIRST	I	Communication data start detection. Turns to low when data comes from U401.
24-28	UCODE	I	Selection of user code of remote signal.
29	MRESET	O	Reset signal for U401.
30-31	----	-	Not used.
32	Vcc	-	+5V.
33	SCK	I	Communication data clock from U401.
34	SDATA	I	Communication data from U401.
35	----	-	Not used.
36	ACK	I	When U401 sends data to U402 completely, this turns to low.
37	DATA0	O	Communication data to U401.
38	DATA1	O	Communication data to U401.
39	DATA2	O	Communication data to U401.
40	DATA3	O	Communication data to U401.
41	SCAN4	O	Keyboard scan signal.
42	SCAN3	O	Keyboard scan signal.
43	SCAN2	O	Keyboard scan signal.
44	SCAN1	O	Keyboard scan signal.
45	RET1	I	Keyboard return signal.
46	RET2	I	Keyboard return signal.
47	RET3	I	Keyboard return signal.
48	RET4	I	Keyboard return signal.
49	RESET	I	Reset input signal. High for reset.
50	TEST	I	Connected to +5V.
51	OSC1	-	Clock terminal, 4MHz.
52	OSC2	-	Not used.
53	GND	-	Ground terminal.
54	DATA4	O	Communication data to U401.
55	STB	O	Turn to low when DATA0-DATA4 is valid.
56	DATA5	O	Communication data to U401.
57	----	-	Not used.
58	REMLD	O	High to light Remote Control Sensor LED.
59-60	----	-	Not used.
61	----	-	Connected to GND.
62	DIG1	O	Display digit data.
63	DIG2	O	Display digit data.
64	DIG3	O	Display digit data.

8.2. Circuit Description

A. Laser Pickup

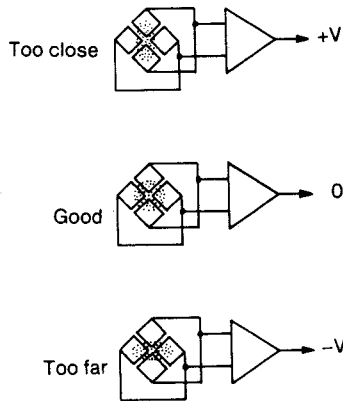
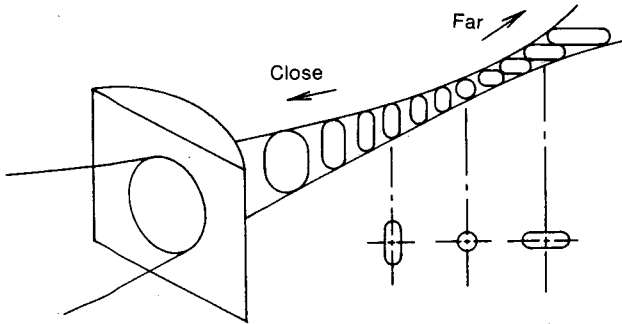
The laser pickup used for the OMS-7II comprises six photo diodes A to F; diodes A to D, which are located vertically and horizontally, for signal detection and diodes E and F for tracking servo. Since the laser light scintillated onto the surface of compact disc is turbulently reflected by pit area and entirely reflected by no pit area, the digital signals in disc can be read out by detecting the reflected laser light. The signals detected by photo diodes A to D is sent to U101(CX20109); signals from A+C are to #6 (PD2) pin and B+D to #5 (PD1) of U101 to be summed and generate an EFM signal at #3(RFO) pin. The test point marked EYE PATTERN TP is the check point for the EFM signal. The EFM signal input to #2(RFI) pin is shaped out by the comparator in U101 to be binary signals. The reference voltage of the comparator, at #22(ASY) pin of U101, drifts up and down in accordance with the shape of CD pits. The binary EFM signal is sent from #20(EFM) pin of U101 to #5(EFM) pin of U301 (CX23035).

B. Servo System

The model OMS-7II utilizes four servo circuits -- the focus servo, tracking servo, feed servo, and CLV servo -- which are controlled by U102 (CX20108) AND U301 (CX23035).

B-1 Focus Servo

The astigmatic method is employed for the focus control which utilizes the fact that routing the reflected laser light through a semi-cylindrical lens changes the shape of the beam in accordance with the distance.



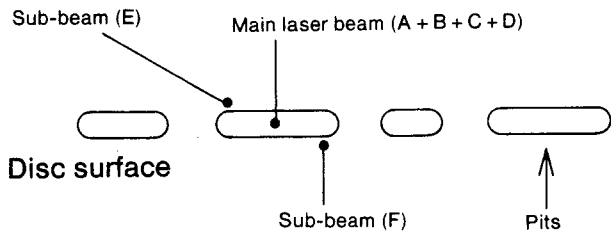
The theory of the astigmatic method

Providing a focalization is made at the point which the beam becomes a true circle, an out-focus condition due to too far or too close situation can be detected since it varies the shape of the beam.

The focus servo circuit of the model OMS-7II generates the difference $(A+C)-(B+D)$ from the laser pickup output signals $(A+C)$ and $(B+D)$. The focalization is perfect when this difference, the focus error signal, equals zero. U102 delivers the focus drive signal from the focus error signal which is in turn applied to the focusing coil of the laser pickup to focalize. U102 sends this focus drive signal to the laser pickup from #21 pin(FEO). Q103 and Q104 current-amplify this signal and apply this signal to the laser pickup.

B-2 Tracking Servo

Tracking servo is required to chase disc pit rows since CD systems do not have a guide to lead laser beam to the pit. The model OMS-7II employs 3-beam tracking servo system.



The 3-beam tracking servo

Three laser beams are irradiated towards the pits in slightly offset intervals to each other as shown. Servo is achieved by the following fact that: where the main beam (indicated by point [A+B+C+D] above, is precisely on the pit, (E-F) is zero; otherwise not). The E and F signals, input from #8(E) and #11(F) pins of U101, generate (E-F) signal inside and delivered at #17(TE) pin. RV102(Radial Offset) is for the offset adjustment; RV103(Radial Gain) is for the servo gain adjustment. The TE(tracking error) signal from U101 enters into #13 pin(TE) of U102 again and U102 makes tracking servo control signal according to the tracking error signal. The tracking servo control signal goes out of U102 from #27 pin (TAO) and Q107 and Q108 current-amplify to drive the tracking coil of the laser pickup.

In searching for a track the laser pickup should be moved quickly. U401(CPU) transmits data to pins #8(DATA) to #10(CLK) of U102 which in turn delivers the pulse from pin #27 in accordance with the corresponding pulse width.

B-3 Feed Servo

The feed servo serves for dual purpose -- to gradually move back and forth the entire of the laser pickup in accordance with the procession of disc playing; and to move the pickup quickly for searching tracks.

The lens of the laser pickup is able to travel at a small distance to follow the pits when playing with the entire pickup stopped. As the lens approaches the limit of the travelable range, DC components come to be contained in the tracking servo signals. The feed servo acts to detect the DC components and maintains the lens to be in the middle of the moveable range, namely to maintain the DC component to be zero.

The fraction of tracking servo signal from pin #27(TAO) of U102 through Q107 and Q108, only the DC component is extracted by R149, R150, C129, and C130 and applied to pin #25(SL+) of U102. This DC component is amplified in U102 and current-amplified by Q105 and Q106 and finally drives the feed motor. In regular operation, 0 to 0.4V DC is applied to rotate the feed motor every several seconds.

The feed motor is energized by the plus or minus DC at pin #23(SLO) corresponding to data from the CPU during searching the tracks.

B-4 CLV (Constant Linear Velocity) Servo Circuit

Unlike analog records, the rotation of compact disc is 500rpm in inner area and 200rpm in outer area. The CLV servo acts to maintain the proper rotation of the disc motor. The reference to determine if the rotation is too fast or too slow depends upon the coincidence of the phase of the RF signal to U301 and the reference clock signal. The correct motor rotation causes a 50% duty signal delivered at pin #3(MDP) of U301; while a faster rotation causes a longer duty signal (a signal with the long "high" period of time); a slower rotation causes a shorter duty signal to be delivered. This signal is amplified by U304(1/2, 2/2), Q301, and Q302 and finally drives the disc motor.

C. APC(Auto Power Controller) Circuit

The APC circuit is provided to maintain the constant laser output level in spite of the variation in temperature etc. The monitor diode located in the close proximity of the lens feeds back the variation to keep the current flowing through the diode constant. The feed back voltage from the monitor diode is compared to reference voltage by U103. Q601 amplifies its output and applies to laser emission diode to control laser output. When no disc is inside or the unit is in stop mode, "high" status of pin #3(LASER) of U401 turns Q602 off and in turn Q601 on so that the output of U103 connected to -5V. Therefore the laser diode turns off.

D. Signal System

The signals detected by the laser pickup are applied to U101 -- (A+C) to #5 pin(PD1); (B+D) to #6 pin(PD2) -- and generated as EFM signal of (A+B+C+D) and output at #3 pin (RFO). The EFM signal is input to #2 pin and to the comparator inside U101 which rejects DC components from the EFM signal to an asymmetrical configuration to convert it to the binary signal.

The EFM signal then input to pin #5(EFM) of U301 which serves to demodulate EFM data, reproduction of bit clock, error detection/correction, data interpolation, and sub-code demodulation, etc. Since to read out the data input to pin #5(EFM) of U301, the clock should be reproduced by the discrete VCO(Voltage Controlled Oscillator) is used. The VCO clock frequency and EFM waveform are compared with each other in the phase comparator of U301 and the difference, if found, is delivered to pin #11(PDO). The difference is filtered to smooth DC inside U301 finally controlling the VCO frequency determined by L303, D301 and D302. This PLL (Phase Locked Loop) circuit reproduces the bit clock, 4.3218MHz.

The reproduction of the bit clock causes the demodulation of the EFM signal into digital data inside U301, and sending the demodulated data to store it in the RAM(U302). Should an error be found in the demodulated data, the stored data is recalled from the RAM for correction and interpolation and the corrected data is sent pins #76(DA14) to #80(LRCK) of U301.

Reproduced sub-code is sent to CPU(U401) and used to display the track number, playing time, remaining time, index, etc. U303 is a quadruple oversampling digital filter. It removes unnecessary components above 20kHz from U301 output. The frequency of these unnecessary components are multiply of sampling frequency (44.1kHz) for digitizing music signal. These unnecessary components must be removed because it may damage an amplifier or speakers. However, removing these components by an analog filter is very difficult since unnecessary components and signals are close in frequency. For this reason the OMS-7II employs the digital filter to multiply the data which was sampled at 44.1 kHz sampling frequency to the quadruple frequency of 176.4 kHz. Then the unnecessary components over 20 kHz can be removed by a filter easily.

U501 - 505 are opt-isolators (photo couplers) which isolates the digital circuitry and the analog circuitry. The music information which comes to U501-504 as digital data carries high frequency noise which may stain analog output signal. The opt-isolators convert the digital data into light, then re-convert it into digital signals again, not electricity. Thus these isolators isolate the digital circuitry and the analog circuitry so that high-frequency digital noise is prevented from going to analog circuitry.

Since re-converted digital signal is serial data, U506 and U507 convert the serial data to parallel data. U508L/R (PCM54KP) are resistor-radder type DAC (Digital to Analog Converter) which converts and digital data input from pins #2 to #16 into analog signals. U508 has a reference current source. Its current is divided by resistor array, and switch the divided current according to the bit significance of input signal.

Finally analog music signal is reproduced, but it still has unnecessary components above 20kHz. Two differential amplifiers (Q501, 502, 503, 505, 511, 509, 510, 513, and 514) filter the analog signal to remove unnecessary components.

RY501 is controlled by the CPU(U401) and switch to vary the response of the CR filter(C510, C511, R520, and R524) when the high frequency range of disc is emphasized. RY502 is muting relay which is controlled by the CPU(U401). It cuts off audio output noise when the power is turned on or off.

E. Control System

U401 mainly serves as the system controller and U402 mainly serves as the keyboard and display controller. U401 exchanges data with the servo IC(U102) and digital control IC(U301) to control the other stages and sends necessary information to U402. U402 receives data from the keyboard, remote control receiver and U401. For basing information and block diagram, see separate IC block diagrams. The laser pickup moves widely when performing track search or when the F.Pwd button or Rev button is pressed. U401 sends data and clock (CLK, XLT, DATA) to U102 to move the laser pickup necessarily. U102 demodulates the data and controls the tracking servo or feed servo.

F. Power Supply Circuit

The model OMS-7II has four sorts of power supplies, one is for digital circuit($\pm 5V$), another is mainly for servo driving transistors ($\pm 11V$), another is for the output amplifier and the headphone amplifier($\pm 15V$), the other is for FL display tube. $\pm 5V$ are obtained at the output of Q802 and Q804, the buffers, with reference to the zener diodes D803 and D804 voltage. The FETs Q801 and Q803 feed a constant current through D803 and D804 to avoid the draft in $\pm 11V$ line affect $\pm 5V$. The D/A converter board mounts the power supplies of $\pm 15V$ for feeding the audio stages (the output amp, headphone amp, and the relay) and $+6V$ for the digital circuit.

An error-amplification type is used for the $\pm 15V$ supply. Q527 and Q528 stabilize the reference voltage obtained by the zener diodes D516. Using this reference voltage Q532, D518, R545, Q532, D518 and D519 error-amplify to make $\pm 15V$ DC. Q532, D518 and D519 are constant current circuit to raise error-amplifier gain.

To avoid interference at each other, $\pm 9V$ for output amplifier, $\pm 12V$ for output amplifier, and $\pm 12V$ for muting relay are obtained from $\pm 15V$ reference voltage.

8.3. Waveform at Major Points

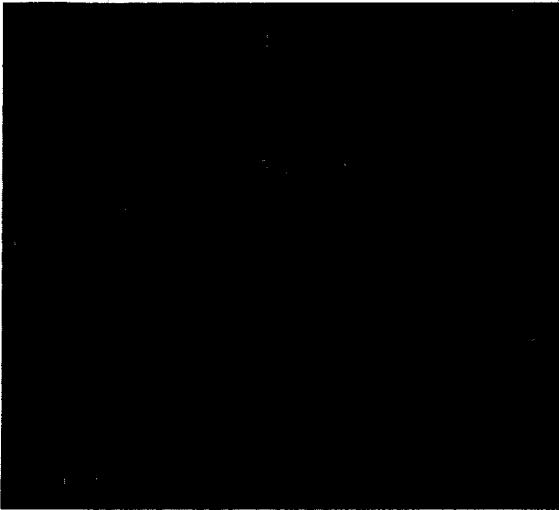


Fig. 8.2.1. Focus Servo Signal at TP(FOCUS) in PLAY mode

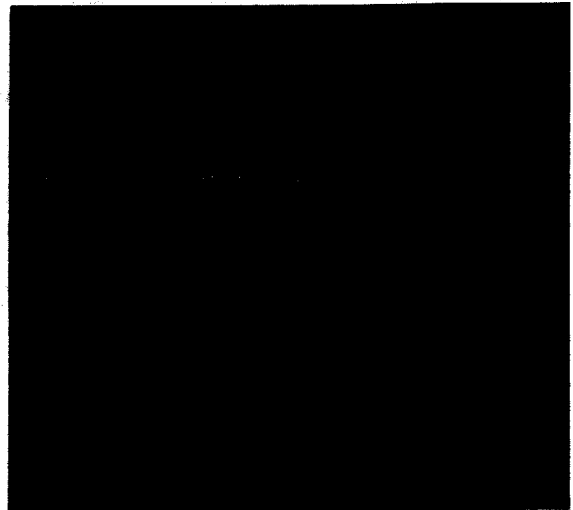


Fig. 8.2.2. Focus Servo Signal at TP(FOCUS) in STOP mode



Fig. 8.2.3. E-F Balance Signal at TP(EF)

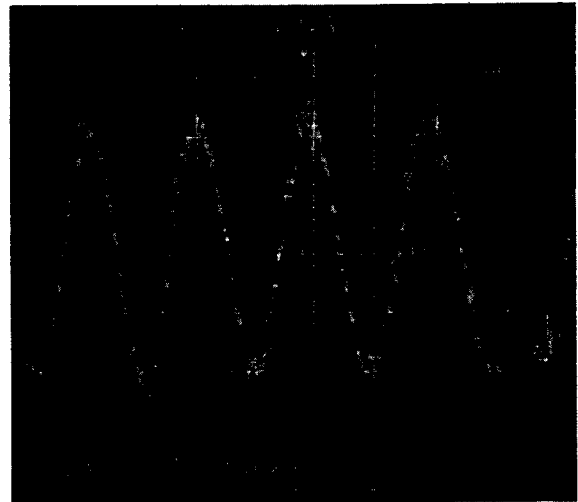


Fig. 8.2.4. E-F Balance Signal at TP(EF) (Oscilloscope in storage mode)

Warning:

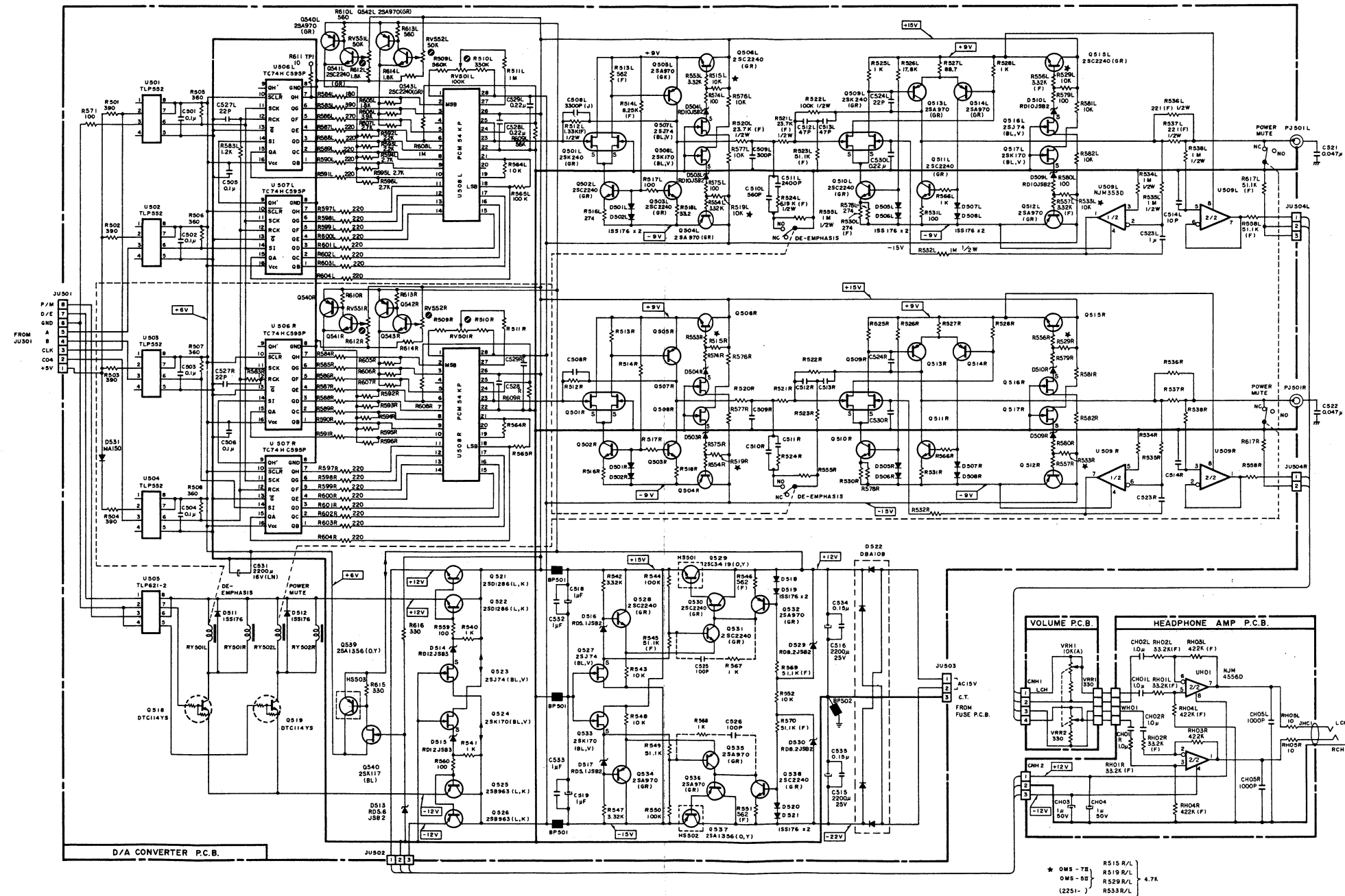
Parts marked with the symbol $\triangle$ have critical characteristics.

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 procedure.

Caution:

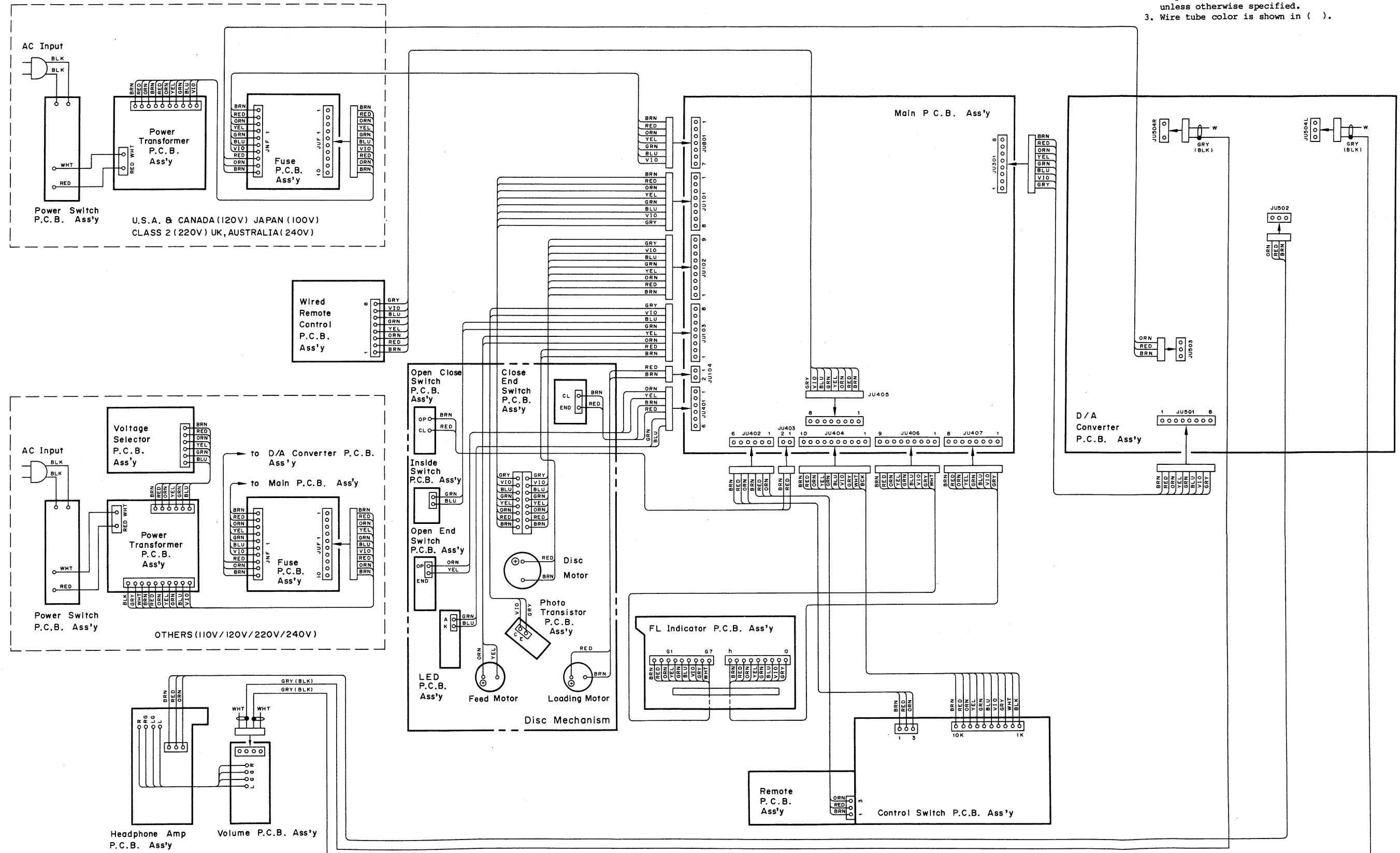
Before returning the unit to the customer, make sure you make either (1) a leakage current check or (2) a line to chassis resistance check. If the leakage current exceeds 0.5 milliamp, or if the resistance from chassis to either side of the power cord is less than 240k ohms, the unit is defective.

WARNING -- DO NOT return the unit to the customer until the problem is isolated and corrected.

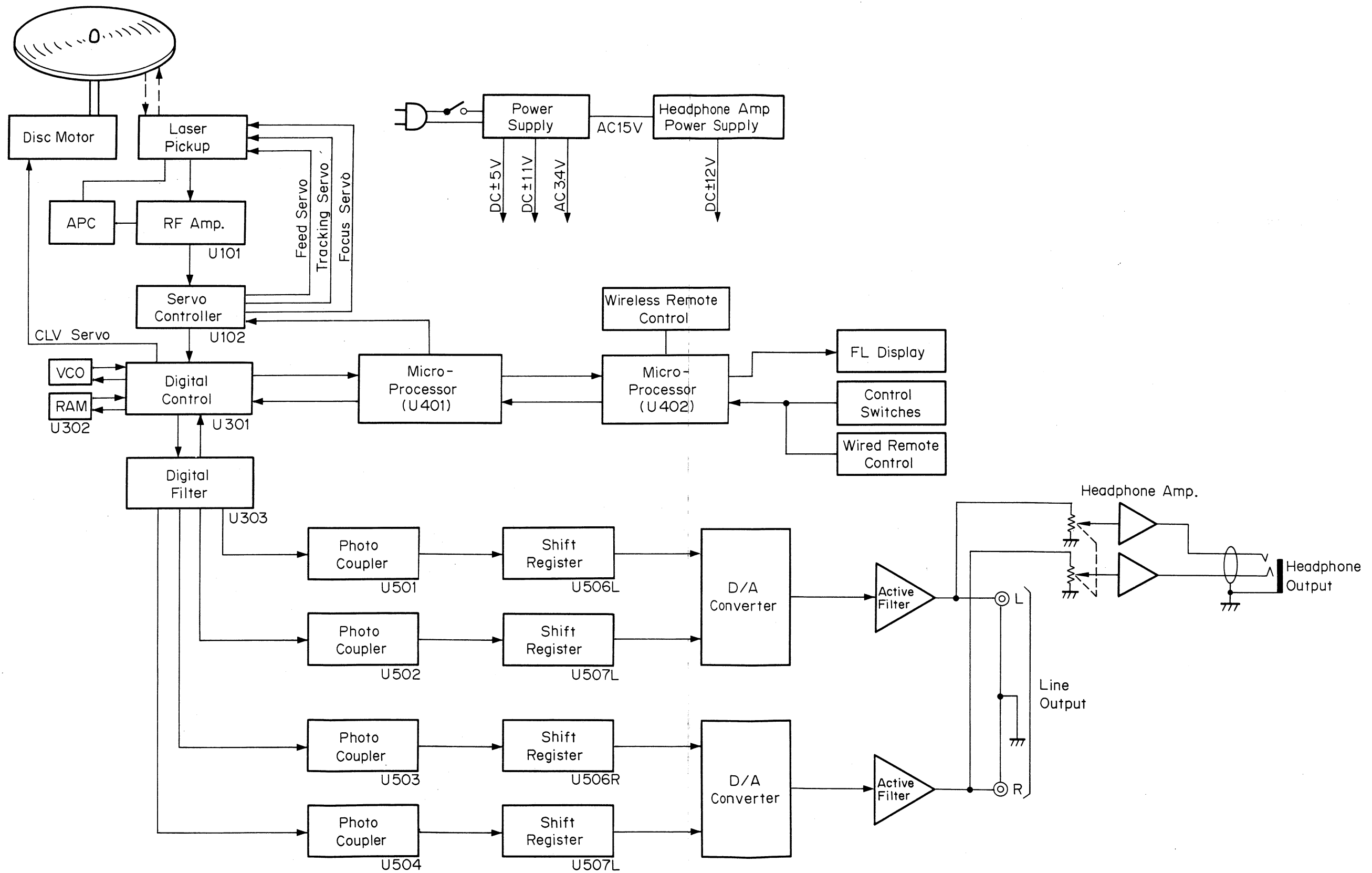


9. WIRING DIAGRAM

- Notes: 1. Table of wire colors
 BRN -- Brown BLU -- Blue
 RED -- Red VIO -- Violet
 ORN -- Orange GRN -- Gray
 YEL -- Yellow WHT -- White
 GRN -- Green BLK -- Black
2. Component side view of the P.C.B. is illustrated unless otherwise specified.
3. Wire tube color is shown in ().



10. BLOCK DIAGRAM



11. SPECIFICATIONS

[Main Unit]

SystemCompact Disc Digital Audio
Signal ReadoutOptical (semiconductor laser)
Error CorrectionCIRC principle
Number of Channels2 channels, stereo
Sampling Frequency44.1 kHz
Quantization.....16 bit linear
Disc Rotational VelocityApprox. 200 to 500 rpm (constant linear velocity)
Wow-and-FlutterBelow measurement limit
Frequency Response5 - 20,000Hz ± 0.5 dB
Signal-to-Noise RatioBetter than 102 dB
Dynamic Range96 dB
Total Harmonic Distortion0.003% (1 kHz)
Channel SeparationBetter than 100 dB
Output (Line)2 V (1 kHz, 0 dB, level control at maximum) into 100 ohms
 (Headphones)20 mW (1 kHz, 0 dB, level control at maximum) into 8 ohms (OMS-7II)
Power Requirements120, 220, 240, or 110-120/220-240 V AC, 50/60 Hz
 (According to country of sale)
Power Consumption25W max. (Models with voltage selector: 33W max.)
Dimensions435 (W) x 100 (H) x 308 (D) mm
 17-1/8 (W) x 3-15/16 (H) x 12-1/8 (D) inches.
Approximate Weight7.2 Kg, 15 lbs. 13 oz.

[Remote Control Unit RM-7CD]

PrincipleInfrared pulse system
Power Supply3 V DC (1.5V x 2)
Dimensions63 (W) x 18 (H) x 135 (D) mm
 2-1/2 (W) x 3-15/16 (H) x 5-6/16 (D) inches.
Approximate Weight100g, 3-1/2 oz. (including batteries)
Supplied AccessoriesShielded cable with RCA-type plugs x 1
 IEC R6 batteries (size AA) x 2

* Specifications and design are subject to change for further improvement without notice.