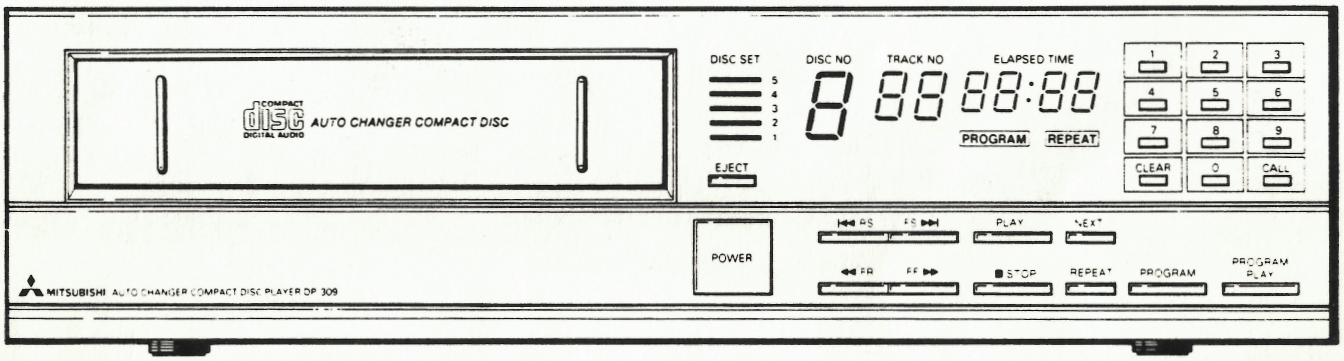
MITSUBISHI AUDIO SYSTEMS

SERVICE MANUAL

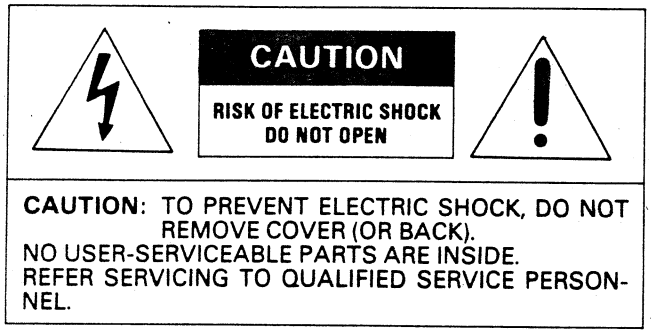
AUTO-CHANGER COMPACT DISC PLAYER

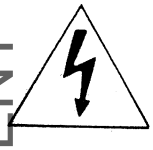
MODEL DP-309/DP-409R



CONTENTS

MITSUBISHI ELECTRIC SALES AMERICA, INC.
5757 Plaza Drive, P.O. Box 6007, Cypress, CA 90630-0007 U.S.A.





The lightning flash with an arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operation and maintenance (servicing) instruction in the literature accompanying the appliance.

SPECIFICATIONS

Format	Compact disc digital audio system
Audio section	
Frequency response	5Hz - 20kHz ±0.5dB
Harmonic distortion	0.003% (1kHz)
SN ratio	98dB
Dynamic range	94dB
Wow & flatter	Unmeasurable
Channel separation	98dB (1kHz)
Output voltage/ Impedance	2V/1k ohm (at full scale)
Internal systems	
Optical pickup	3-beam laser
Error correction system	CIRC dual error correction system
D/A conversion	16 bit linear
Filter	Seventh order passive filter
Functions	
Music search	FS ▶▶| and |◀◀ RS buttons ordered program search
Fast forward/reverse	FF ▶▶ and ◀◀ FR buttons Dual speed automatic switching
Program function	30 selections, random
Repeat	Repeat of all selections or all program selections
Disc loading	Disc magazine, 5 discs

SPECIAL NOTICE TO SERVICE PERSONNEL

1. In order to insure safe operation of this product after servicing, at least one of the following measurements should be made to determine that exposed parts are acceptably insulated from the supply circuit:
   - **a) Leakage Current**
     The leakage current shall not be more than 0.5mA at any accessible part.
   - **b) Grounding Impedance**
     The impedance of the grounding path at 60Hz shall not exceed 0.1 ohm when measured from the grounding means of the product to the accessible conductive part.
   - **c) Dielectric Voltage Test**
     There shall be no evidence of dielectric breakdown as a result of the application of:

   1) 1080V, 50 or 60 Hz, or 1530V DC for a period of 1 second or.
   2) 900V, 50 or 60 Hz for a periodof 1 minute, between parts involving electric shock and accessible conductive parts.

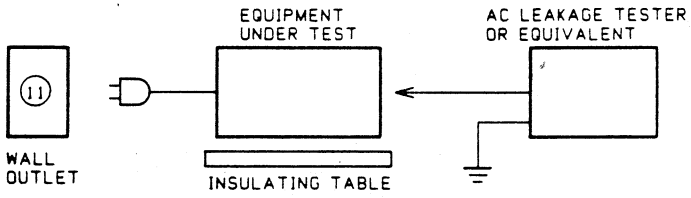
Disc magazine	
Disc numbers	5 discs
Loading	Slot-in
Dimensions (W x H x D)	187 x 133 x 36mm (7-3/8 x 5-1/4 x 1-7/16")
General	
Power supply	AC 120V, 60Hz
Power consumption	17W
Dimensions (W x H x D)	424 x 105 x 340mm (16-3/4 x 1/8-4 x 13-3/8")
Weight	7.5kg (16lbs. 9oz.)
Accessories	Pin plug cord Remote commander (DP-409R only) Instruction book

Specification subject to change without notice.

TO SERVICE PERSONNEL

1. Critical Components Information
   Components having special characteristics are marked ⚠ and must be replaced with parts having specifications equal to those originally installed.
2. Leakage Current Measurement (For 120V Model Only).
   When service has been completed, it is imperative that you verify that all exposed conductive surfaces are properly insulated from supply circuits.

- Meter impedance should be equivalant to 1500 ohm, shunted by 0.15μF.
- Leakage current must not exceed 0.5mA.
- Be sure to test for leakage with the AC pulag in both polarities.

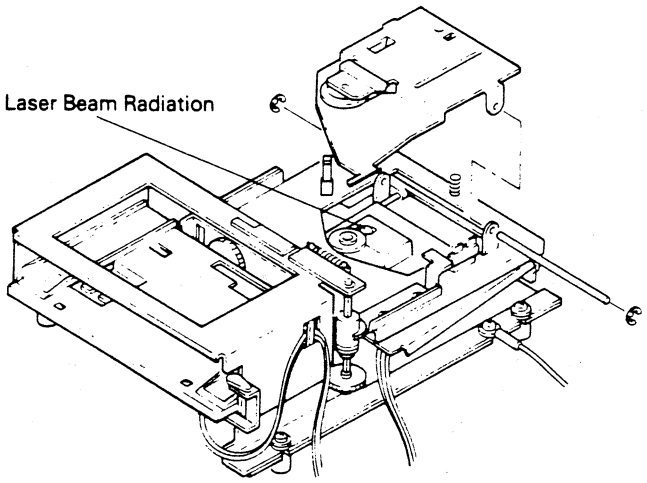


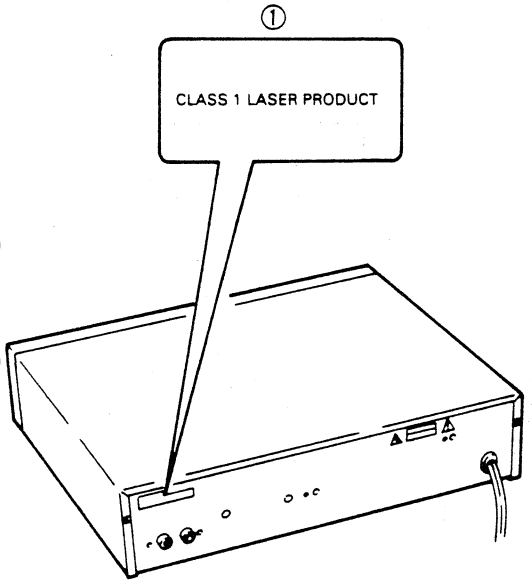
CAUTION — USE OF CONTROLS, ADJUSTMENTS, OR PERFORMANCE OF PROCEDURES OTHER THAN THOSE SPECIFIED HEREIN, MAY RESULT IN HAZARDOUS RADIATION EXPOSURE.

THE COMPACT DISC PLAYER SHOULD NOT BE ADJUSTED OR REPAIRED BY ANYONE EXCEPT PROPERLY QUALIFIED SERVICE PERSONNEL.

LASER BEAM RADIATION SPOT

Laser Diode Properties
Material: Ga-Al-As
Wavelength: 765nm - 795nm (25 °C)
Laser Output: Continuous Wave max. 0.4mW

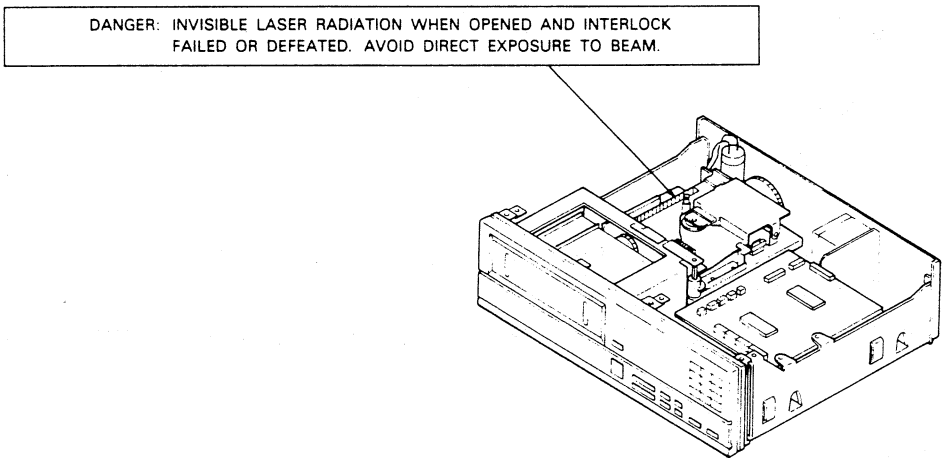




① THIS NOTICE IS PRINTED AS ILLUSTRATED TO INFORM THAT APPARATUS CONTAINS A LASER COMPONENT.

② THIS LABEL IS ATTACHED IN THE POSITION SHOWN IN THE ILLUSTRATION TO ALERT THE USER OF POSSIBLE EXPOSURE TO THE LASER BEAM.

CAUTION

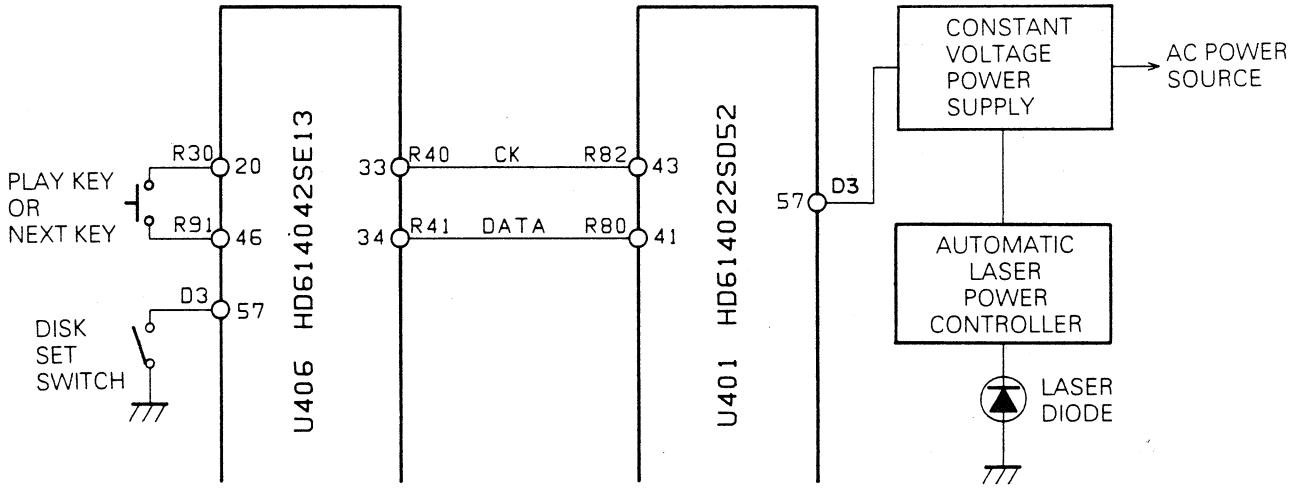


INTERLOCK OPERATION

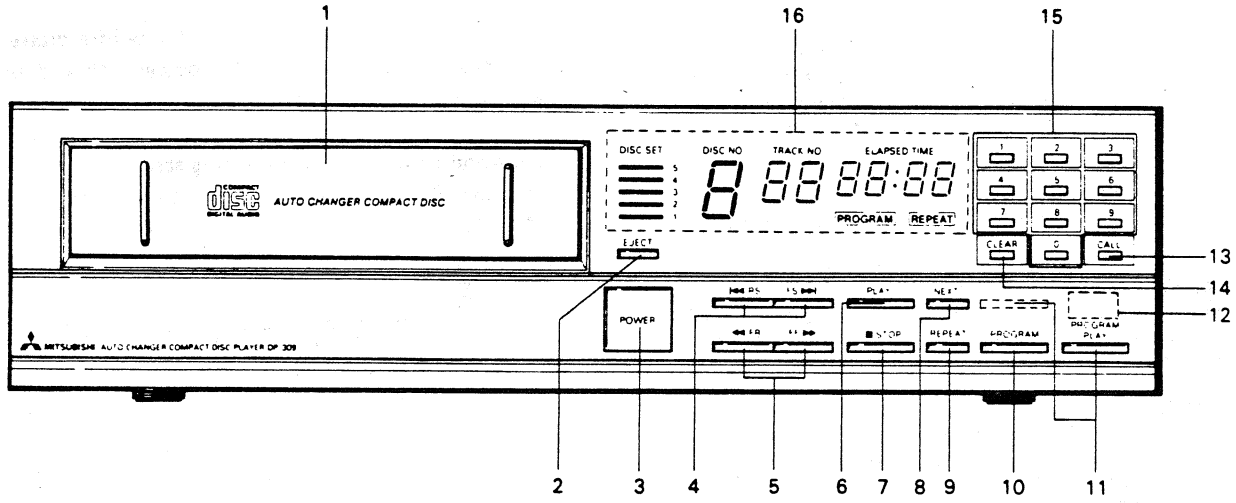
The Digital Compact Disc player reads the disc signals by laser beam detection. Laser beam contact with the human body must be avoided. Human eyes are especially affected by the laser beam. This unit is therefore equipped with an interlock to prevent unnescssary laser output.

The laser outputs are controlled by the injection or cutoff of the constant voltage source to the laser diode at pin 57 of U401 (HD614022SD52) and also by Automatic Laser Power Control Circuit. When pin 57 is in "H" (High) level, the laser diode emits a beam. When pin 57 is in "L" (Low) level, the laser diode does not emit a beam.
Pin 57 is set to an "H" level when it reads the index signals (lead-in area) or when the unit is set to the play mode.

After the disc magazine is inserted, the laser diode emits the beam when the PLAY key is pressed.



FRONT PANEL TERMINOLOGY AND FUNCTIONS



1. Disc magazine slot
Insert the disc magazine (with the arrow (⇨) mark up and forward) into this slot until it stops. The automatic mechanism will draw the magazine into the player.

2. EJECT button
Press to eject the disc magazine. When pressed during operation, the unit will switch to STOP and the magazine will be ejected.

3. POWER button
Depress to turn on the player. The unit is in standby for an initial one second until the internal power is stabilized.

4. FS ▶▶|/|◀◀ RS buttons
Press FS ▶▶| once to advance to the beginning of the next track. Press repeatedly to advance to the desired track as indicated on the display. When pressed, during playback of the last track, the unit will not advance.
Press |◀◀ RS to return to the beginning of the current track. Press repeatedly to return to the desired track as indicated on the display. When pressed during playback of track 1, the unit will return to the beginning of track 1.

5. FF ▶▶ / ◀◀ FR buttons
Press FF ▶▶ to advance to any forward position on the disc. Press and release to advance slightly. Press and hold to advance rapidly. Release at the desired point.
Press ◀◀ FR to return to any reverse position on the disc. Press and release to reverse slightly. Press and hold to reverse raplidly. Release at the desired point.

6. PLAY button
With the disc magazine inserted press to begin playback.
Note: PROGRAM-PLAY is used to begin programmed playback only.

7. STOP button
Press to stop playback.
Note: When pressed during programmed playback, the unit will stop and the programming instructions will remain in the program memory. Press PLAY to resume programmed playback from program 1.

8. NEXT button
Press once to select the next disc for playback. Press repeatedly to select the desired disc as indicated on the display.

9. REPEAT button
Press for repeat-playback. The REPEAT indicator is illuminated. Press again to cancel repeat-playback. The REPEAT indicator is turned off.

10. PROGRAM button
When in STOP mode, press to enter program mode. The PROGRAM indicator begins flashing. The disc and track number can be entered for up to 30 programs using the 10 key pad.

11. PROGRAM-PLAY button
When in the STOP or PLAY mode, press to begin programmed playback. The PROGRAM, DISC NO and TRACK NO indicator are illuminated and the contents of program 1 are displayed.
Note: If the prgrammed disc number(s) is not in the magazine, program play will not operate.

12. REMOTE SENSOR (DP-409R only)
Through this window the player receives infrared beam signals from the remote commander. Do not block this window or the remote commander function will not work.

13. CALL button
Press to check the contents of the program memory. The PROGRAM, DISC NO and TRACK NO indicators are illuminated and the contents of the first program are displayed. Press once to check the first program, press again for the second program and so forth. When in the stop mode, the program memory display turns off when pressed again after the last program has been displayed. During playback, the program memory display turns off automatically after 3 seconds.

14. CLEAR button
When in the STOP mode, press PROGRAM and then CLEAR to erase the contents of the program memory.

15. Key pad
During programming these keys (1-0) are used to select the disc and track number.
Note: Disc numbers greater than 5 and track numbers greater than 99 cannot be selected.

16. Display
- **DISC SET indicator**

This indicator displays the location and number of the disc in the magazine.
When a disc is loaded, the indicator for that disc number flashes.

- **DISC NO. indicator**

During playback, this indicator displays the number of the current disc. When programming, this indicator displays the disc number selected.

- **TRACK NO. indicator**

During playback, this indicator displays the number of the current track. When programming, this indicator displays the track number selected.

- **ELAPSED TIME indicator**

During playback, this indicator displays the elapsed time in minutes and seconds from the beginning of the current track. The indicator is reset to 0.00 at the beginning of the next track.
When programming, this indicator displays the program number from P-01 to P-30.

- **REPEAT indicator**

This indicator is illuminated when the repeat playback function is selected.

- **PROGRAM indicator**

This indicator is illuminated continuously during programmed playback. This indicator flashes during programming and when the CALL button is pressed.

- **Error display**

The "E" display under DISC NO. indicates an error in disc loading.
The "E" display in the upper position under TRACK NO. indicates an error in reading the data from the disc.
The "E" display in the lower position under TRACK NO. indicates a focusing error.

DISASSEMBLY PROCEDURES

Be sure to eject the loaded magazine before diassembling the mechanism ass'y. Turn the power off and pull the power plug from the outlet.

1. Removal of transportation fixing screws

1) Remove 4 red screws (1) from the bottom of the set. (Fig. 1)

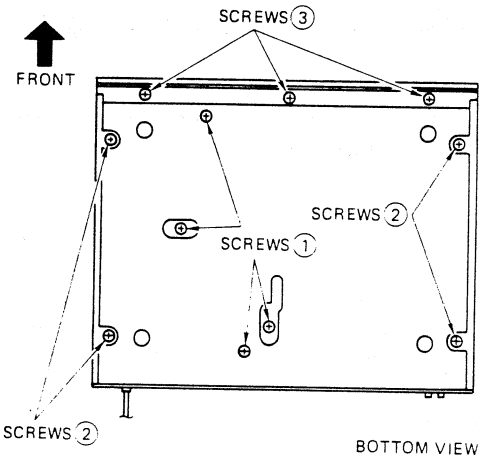


Fig. 1

2. Top cover removal

1) Remove 4 screws (2) from the bottom of the set. (Fig. 1)
2) Remove 3 screws (2) from the back panel. (Fig. 2)
3) Slide the top cover backward and remove it.

3. Front panel removal

1) Remove 3 screws (3) from the upper side of the front panel. (Fig. 2)
2) Remove 3 screws (3) from the lower side of the front panel. (Fig. 2)
3) Disconnect the connectors coming from the indicator P.C.B. and 10-key P.C.B.

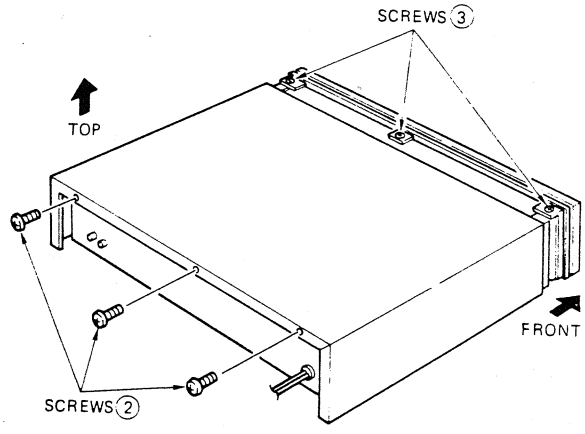


Fig. 2

4. Indicator P.C.B. and 10-key P.C.B. removal

1) Remove 3 screws (4) fixing the indicator P.C.B. and remove 2 screws (5) fixing the 10-key P.C.B. (Fig. 3)
2) The two P.C. Boards and the front panel are fixed together by claws. Bend the claws outward and remove the P.C. Boards.

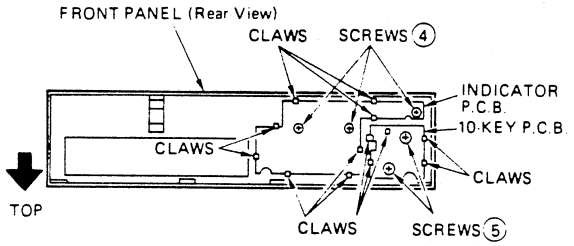


Fig. 3

5. Microprocessor P.C.B. removal

1) Remove screw (6) from the P.C.B. If the P.C.B. is raised up at the screw (6) side the main P.C.B just under the microprocessor P.C.B can be checked and adjusted .
2) Disconnect all connectors on the P.C.B.
3) Pull 2 P.C.B. holders and remove the P.C.B. (Fig. 4)

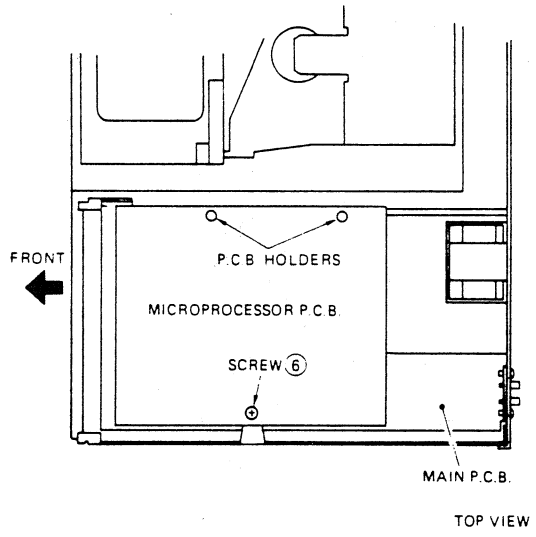


Fig. 4

6. Main P.C.B. removal

1) Remove the power switch fixing screw (7) and remove the power switch.
2) Disconnect all connectors and GND pins on the P.C.B.
3) Remove 2 plastic rivets of the output terminal.
4) Remove 5 P.C.B. fixing screws (8). (Fig. 5)

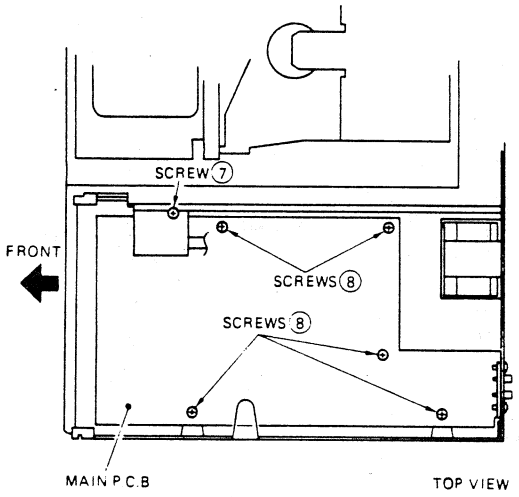


Fig. 5

7. Mechanism ass'y removal

1) Remove the microprocessor P.C.B. and main P.C.B. (Fig. 4, Fig. 5)
2) Remove 4 screws (9) and lift the mechanism ass'y up to remove it. (Fig. 6)

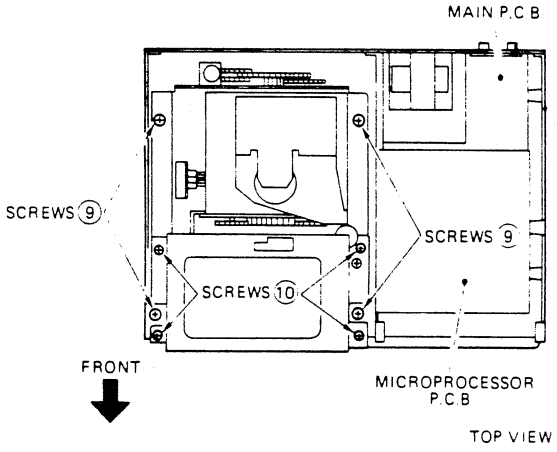


Fig. 6

8. Disc change ass'y removal

8-1. Disc change ass'y removal

Remove 4 screws (10) and remove the disc change ass'y. (Fig. 6)

8-2. Loading motor removal

1) Remove the belt from the pulley and remove the pulley from the motor shaft.
2) Remove 2 screws (11) and remove the motor from the bottom of the unit. (Fig. 7)

8-3. LED P.C.B. and leaf switch (A) removal

1) Remove screw (12) and remove leaf switch (A).
2) Remove screw (13) and remove the LED P.C.B. (Fig. 7)

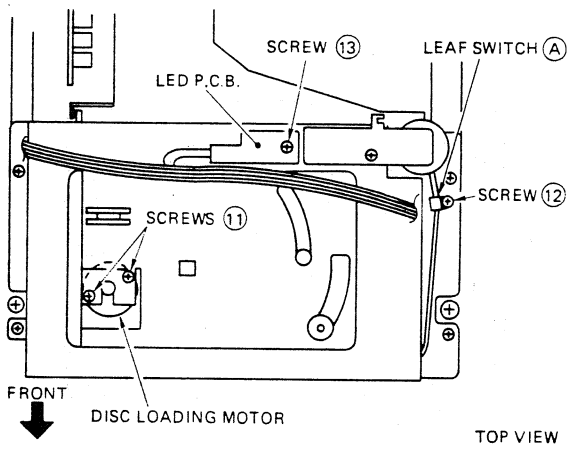


Fig. 7

8-4. Photocoupler P.C.B. and phototransistor P.C.B. removal

1) Remove the screw (14) and remove the phototransistor P.C.B.
2) Remove 2 plastic rivets and remove the photocoupler P.C.B. (Fig. 8)

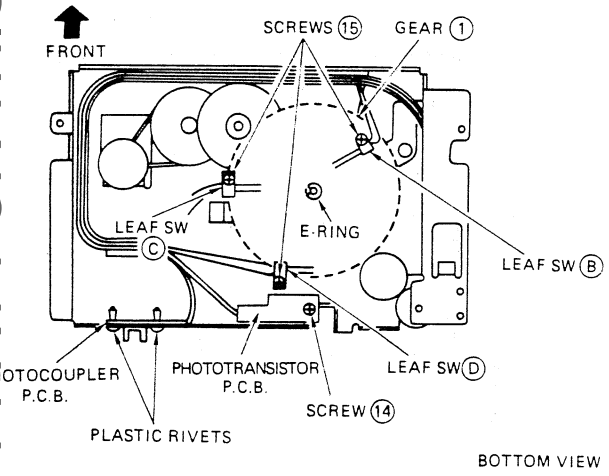


Fig. 8

8-5. Leaf switch P.C.B. and leaf switches (B), (C), (D) removal

1) Pull out the E-ring of gear (1) and remove gear (1)
2) Remove 3 screws (15) and remove leaf swtches (B) (C) and (D). (Fig. 8)
3) Remove 3 screws (16) and remove the leaf switch P.C.B. (Fig. 9)

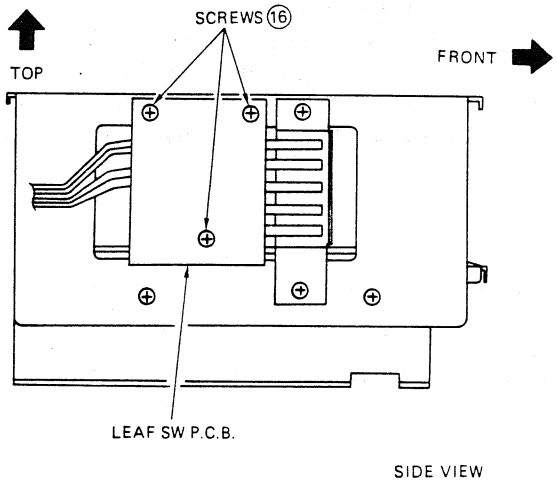


Fig. 9

8-6. Assemble gear (1) following the procedure below.

1) Face the crescent-shaped recess of gear (2) towards gear (1).
2) As shown in Fig. 9-1, insert gear (1) onto the shaft so that the boss of the disc tray's lock release lever can be seen through gear (1) 's matching hole (A) (gear (1) held by hand at this time.)
3) With the boss able to the seen from the matching holes at two places, insert gear (1) completely onto the shaft.
4) Fix gear (1) using the E ring. (Fig. 9-1)

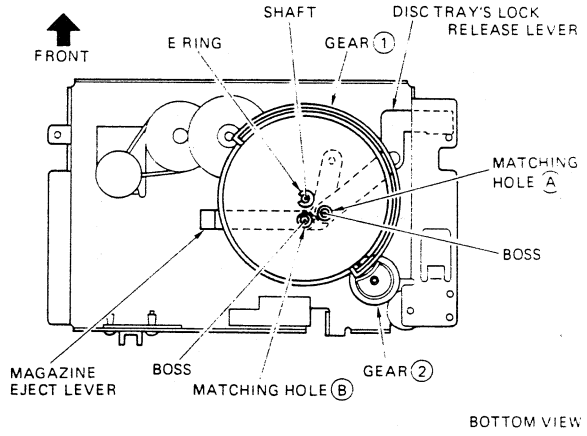


Fig. 9-1

9. Turntable ass'y removal

9-1. Turntable moving motor removal

Remove 2 screws (17) and remove the motor. (Fig. 10)

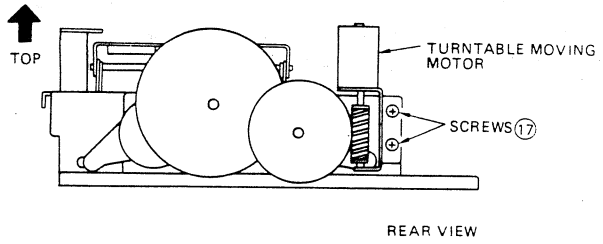


Fig. 10

9-2. Turntable ass'y removal

1) Lift the turntable ass'y fully up. (Disc loading position)
2) The turutable is attached by 4 elevationarm pins. Move the turntable ass'y to the left viewd from the back to release the pins and remove the assembly. (Fig. 11)

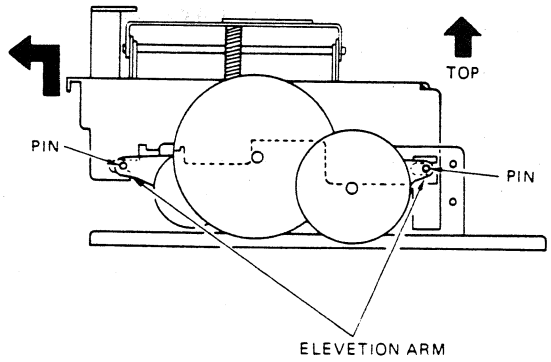


Fig. 11

9-3. Disc motor and track moving motor removal

1) Remove the E-ring, pull the shaft out and remove the disc holder. (Fig. 12)
2) Remove the turntable from the motor shaft and remove screws (18) .(Fig. 13)
3) Remove the disc drive motor from the lower side of the turntable ass'y.
4) Remove 2 screws (20) and track moving motor.
5) Remove screw (21) and remove the microswitch (A) . (Fig. 14)

10. Pick-up ass'y removal

1) Remove 3 screws (19) . (Fig. 13)
2) Disconnect 2 connectors on the pick-up P.C.B. and remove the pick-up ass'y.

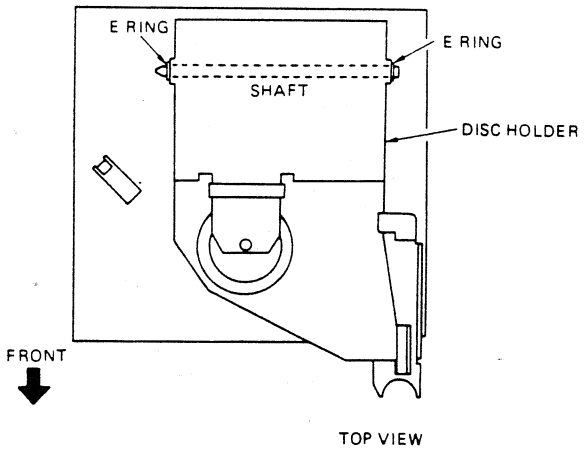


Fig. 12

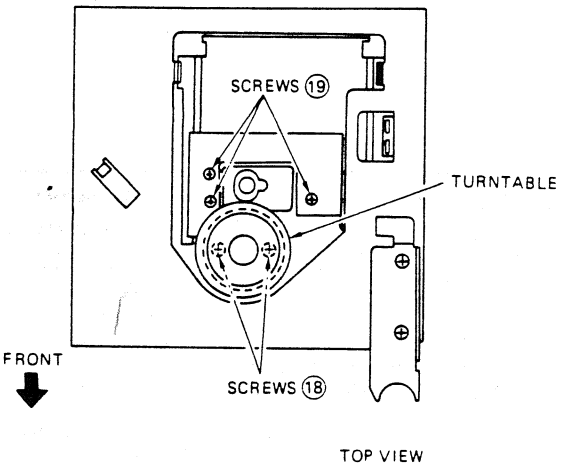


Fig. 13

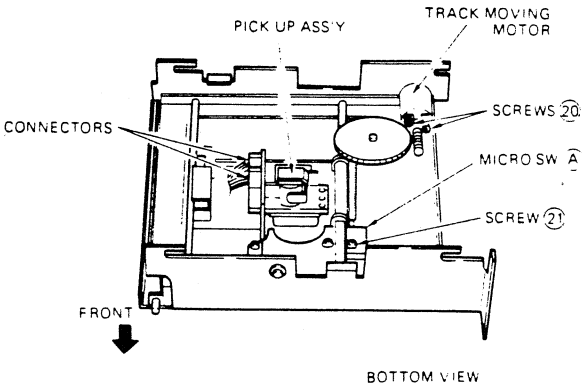
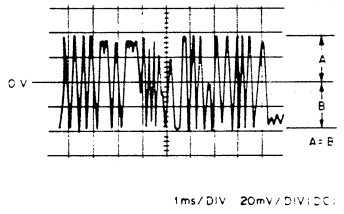


Fig. 14

ADJUSTMENTS

- On step 6, 7 connect a 400Hz BPF to the measuring instruments.
- Measure the output level at the output terminal of the oscillator.
- # = Code and connector numbers.

Step	Adjustment item	Disc	Mode	Connection terminal and instrument required	Adjustment method	Rating of standard
1	VCO offset voltage	NON-SET	STOP	Connect the oscilloscope to TP302. Short-circuit between TP102 and GND.	RV301	V = 0V DC
2	VCO PLL	NON-SET	STOP	Connect the frequency counter to TP303. Short-circuit between TP102 and GND.	L301	4.29 MHz ≦ Fvco ≦ 4.31 MHz
3	Tracking Offset	NON-SET	STOP	Connect the oscilloscope to TP104. Short-circuit pin1,pin2 and pin3 of *CN419.	RV104	X ≦ ± 20 mV DC *CN419 is on the OPERATION (1) P.C.B.
4	EF Balance	SET	PLAY	Connect the oscilloscope to TP106. Short-circuit between pin2 and pin3 of *CN419. ONCE DISC IS RUNNING IN PLAY MODE.	RV101	Adjust RV101 so that the signal has the symmetrical plus swing and minus swing on scope. 
5	Focus Offset	SET	PLAY ↓ STOP	Connect the oscilloscope to TP107. Open all pins of CN419.	RV102	1. Start playback. 2. Observe DC voltage at TP107. 3. Press the STOP key. 4. Adjust RV102 to obtain the same voltage in step 1. 5. Confirm the voltage doesn't change in both PLAY or STOP mode.
6	Tracking Gain	SET	PLAY	Connect the AC voltmeter toTP104 via 400Hz BPF. Apply a 400Hz, 600mVp-p signal from the audio signal generator to TP108 through the 200k OHM resistor.	RV103	1. Start playback. 2. Turn RV103 clockwise slowly to the point where tracking servo signal goes out. At this point, assume that 400 Hz signal level is 0 dB. 3. Turn RV103 until the 400 Hz signal level is – 16 dB ± 0.5 dB.

Step	Adjustment item	Disc	Mode	Connection terminal and instrument required	Adjustment method	Rating of standard
7	Focus Gain	SET	PLAY	Connect the AC voltmeter to via 400Hz BPF. Apply 400Hz, 600mVp-p signal the audio signal generator to the jumper wire (Shown in Fig. 15) through the 200k OHM resistor.	RV105	1. Start playback. 2. Turn RV105 clockwise slowly to the point where focus servo signal goes out. Assume that 400 Hz signal level is 0 dB at this point. 3. Turn RV105 until the 400 Hz signal level is – 3 dB ± 0.5 dB.

ADJUSTING POINTS

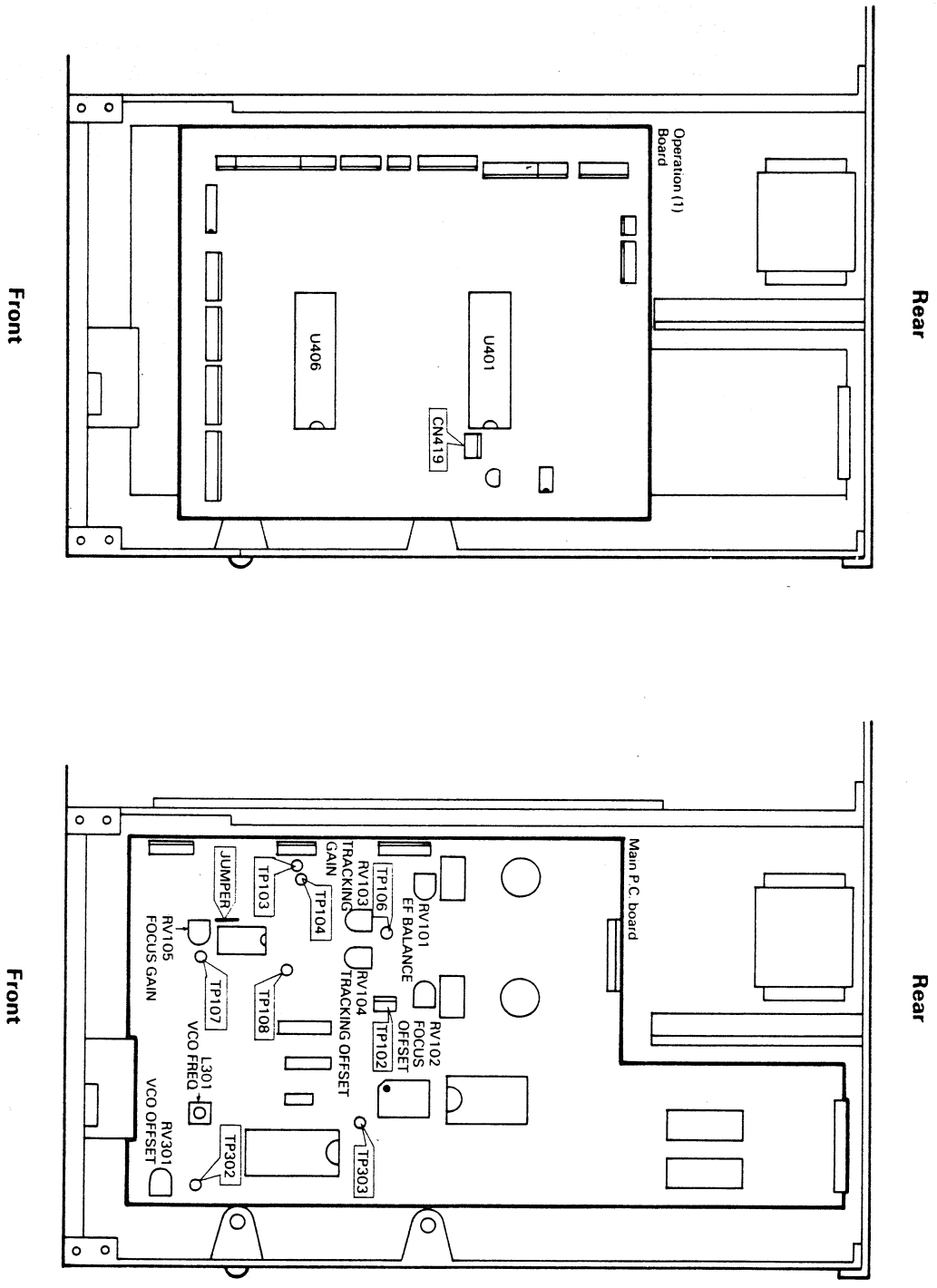
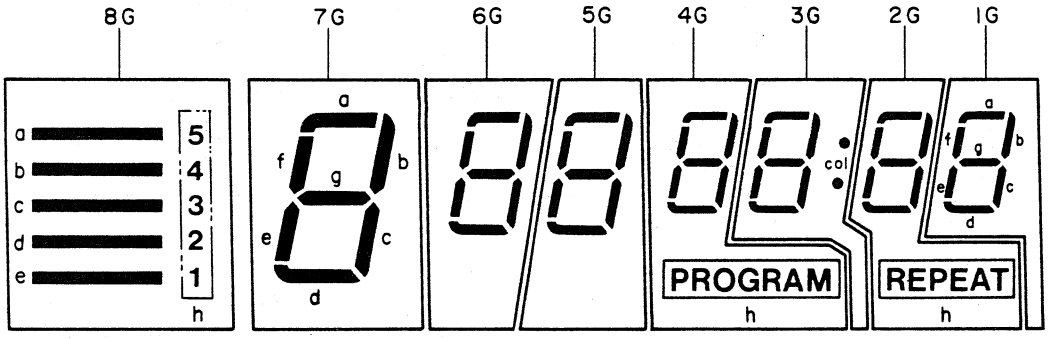
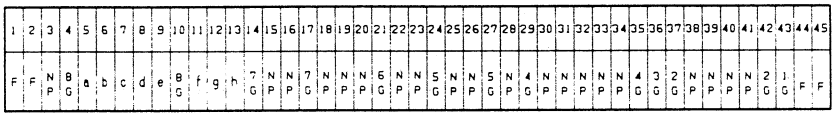


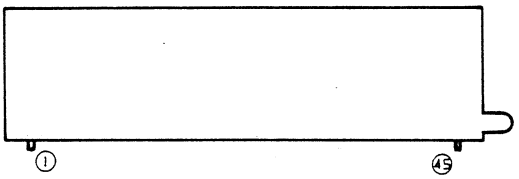
Fig. 15

INTERNAL DIAGRAMS AND PINOUT OF INTEGRATED CIRCUITS

FLS01 **Display unit**

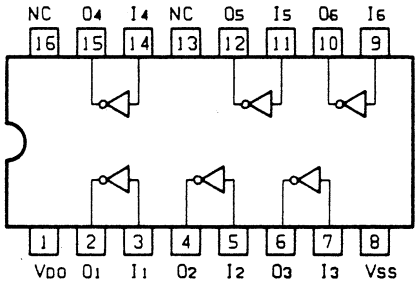




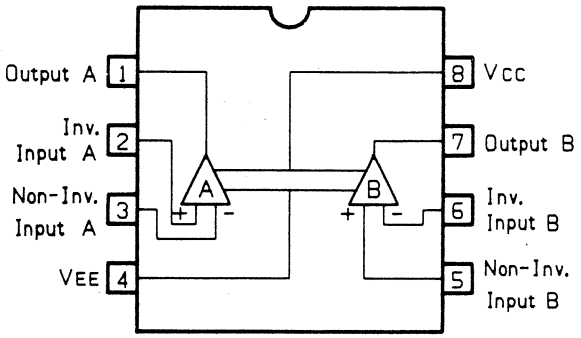


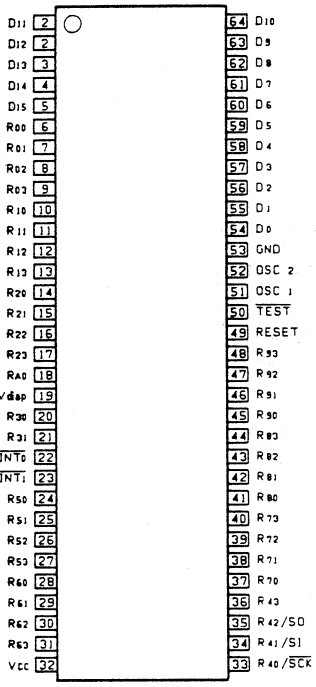
	8G	7G	6G	5G	4G	3G	2G	1G
a	▬	a	a	a	a	a	a	a
b	▬	b	b	b	b	b	b	b
c	▬	c	c	c	c	c	c	c
d	▬	d	d	d	d	d	d	d
e	▬	e	e	e	e	e	e	e
f	-	f	f	f	f	f	f	f
g	-	g	g	g	g	g	g	g
h	12345	-	-	-	PROGRAM	col	REPEAT	-

U405: M4049BP

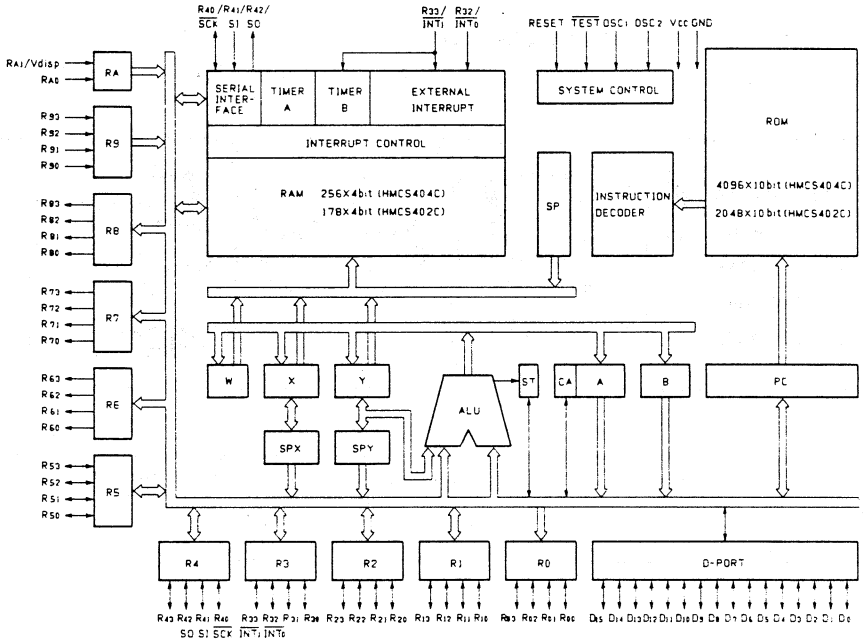


U302, 402: HA17558

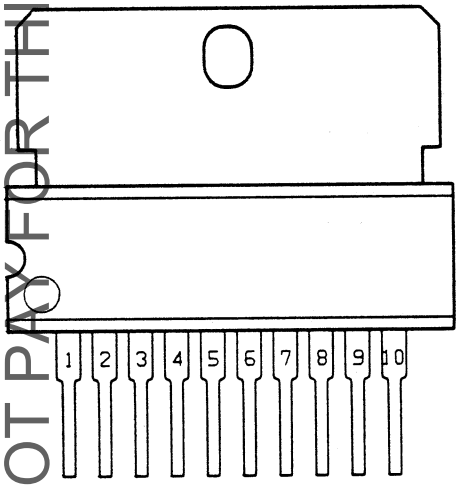


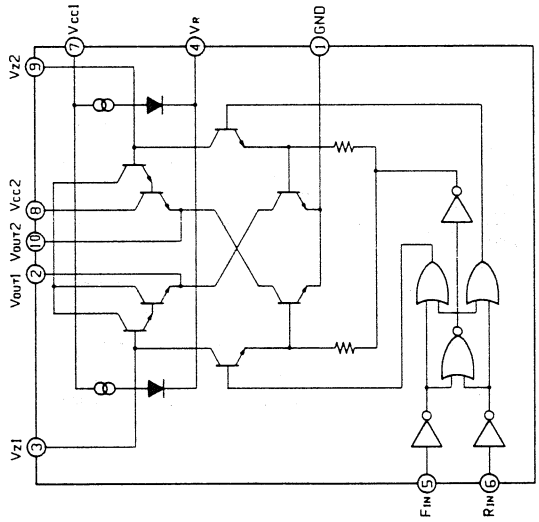


U401: HD6140225SD52
U406: HD614042SE13
System controller

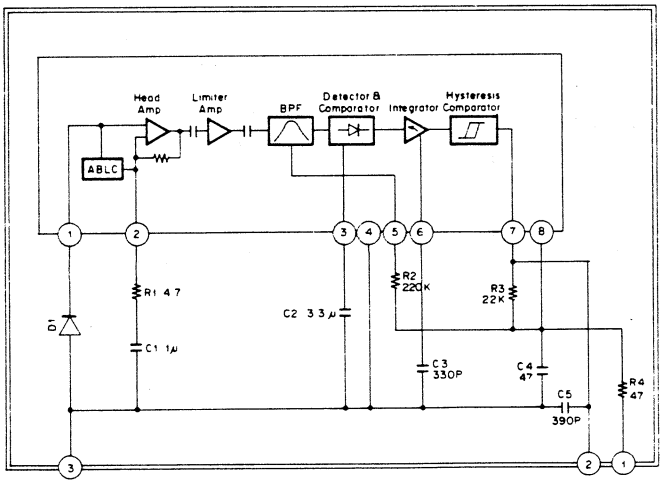


U403, 404: BA6109



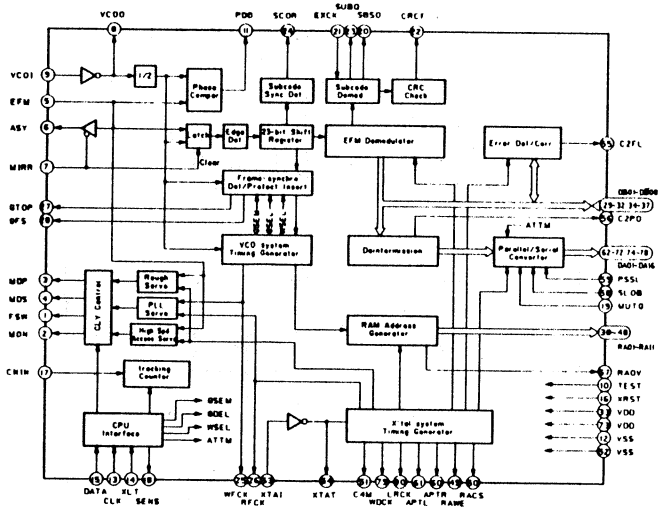


AKOI: BX1317 Remote control signal receiver unit (DP-409R ONLY)

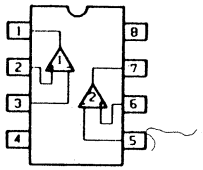


INTERNAL DIAGRAMS AND PINOUT OF INTEGRATED CIRCUITS

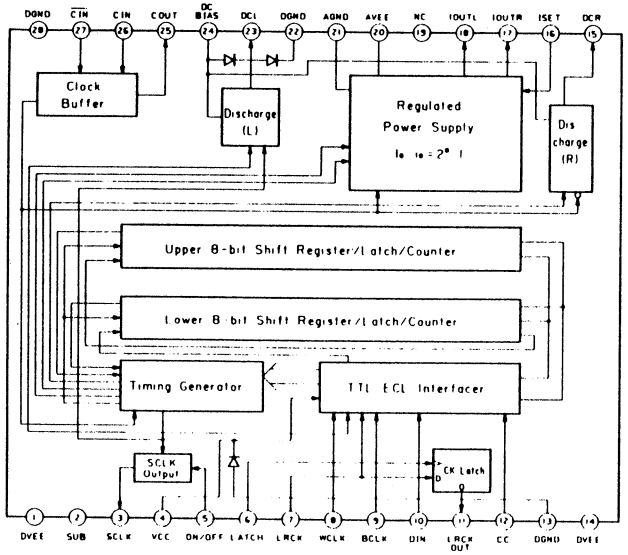
U301: CX23035
Digital signal processor



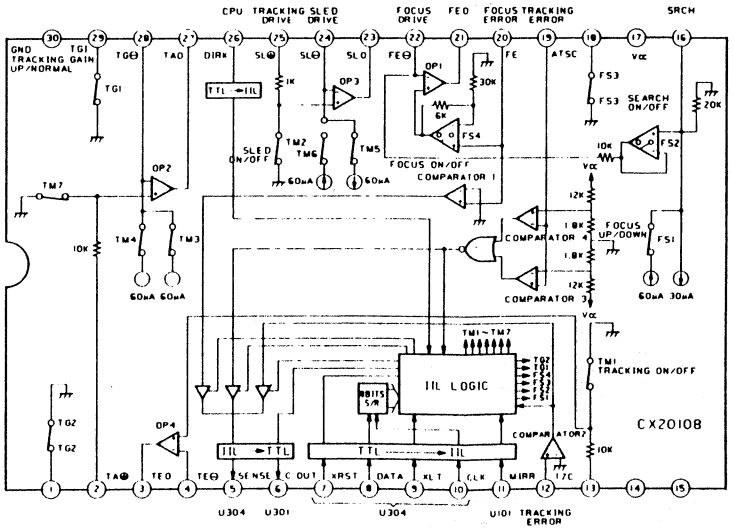
U302, 402: HA17558
U303, 503, 504: M5221
U505: M5218



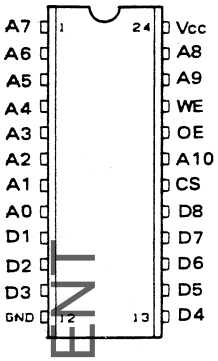
U501: CX20152
D/A convertor



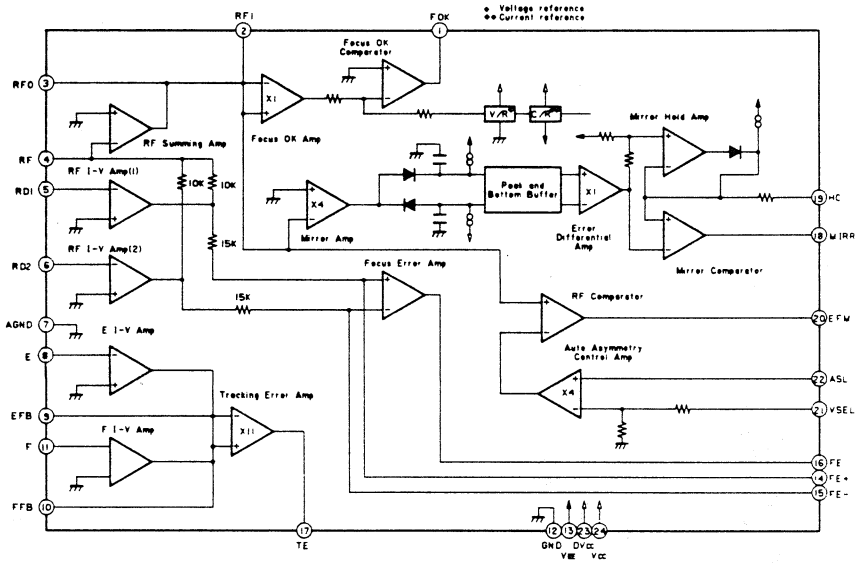
U102: CX20108
Servo controller



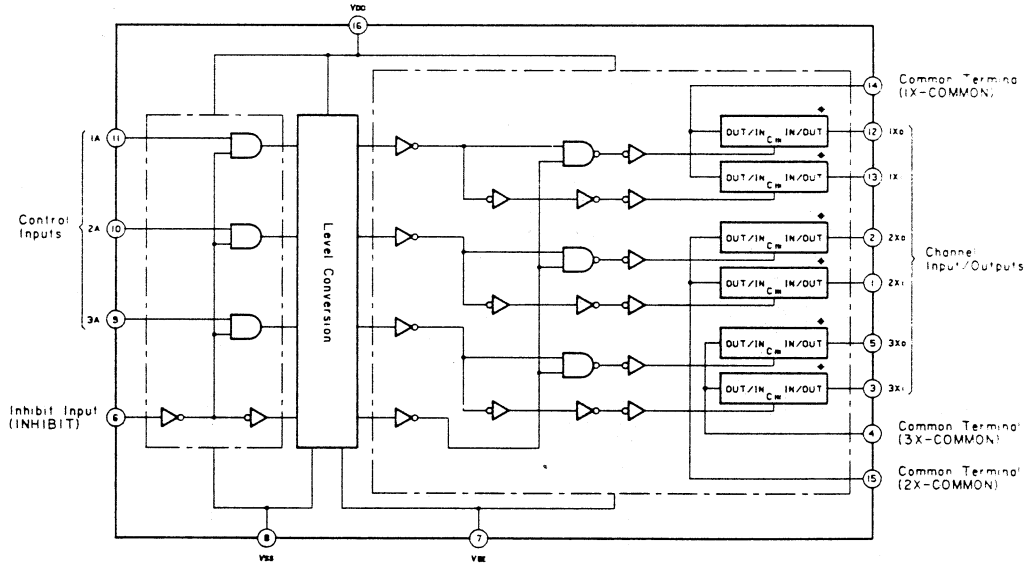
U304: HM6116LP-4
16 kbit S-RAM



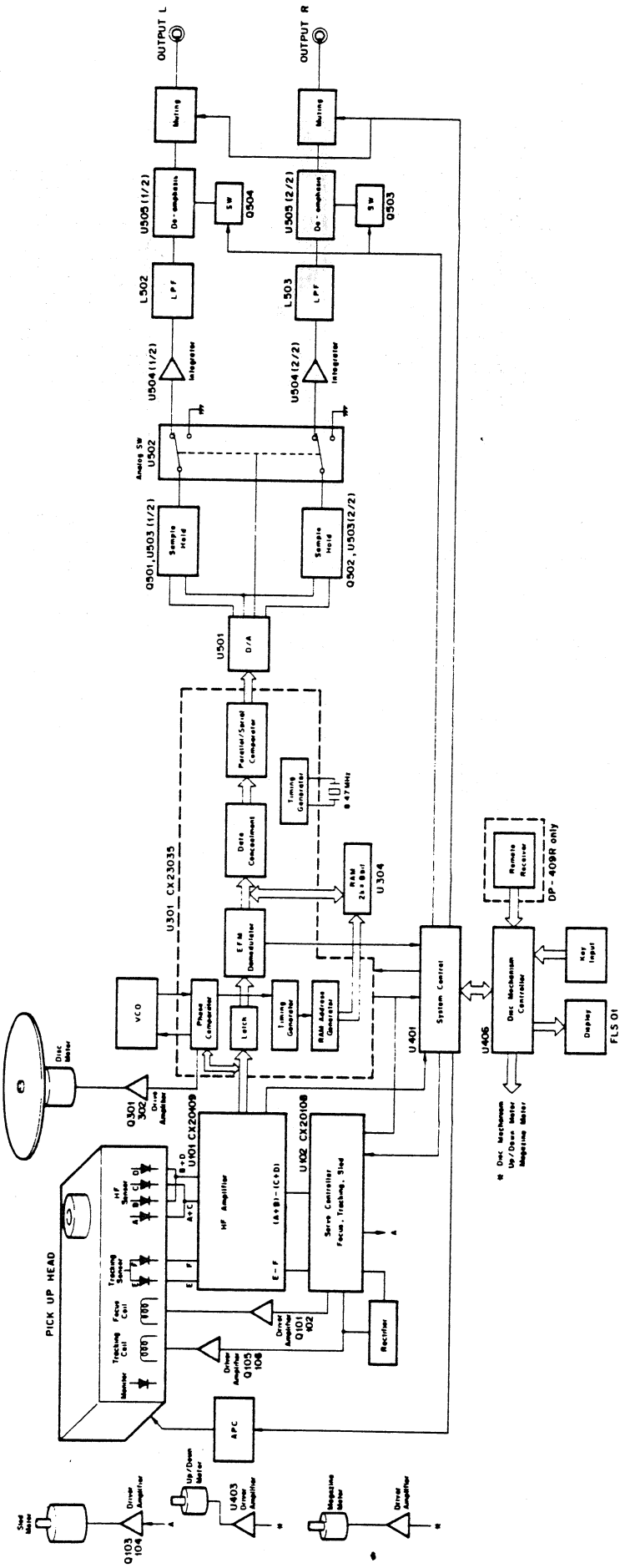
U101: CX20109
RF amplifier



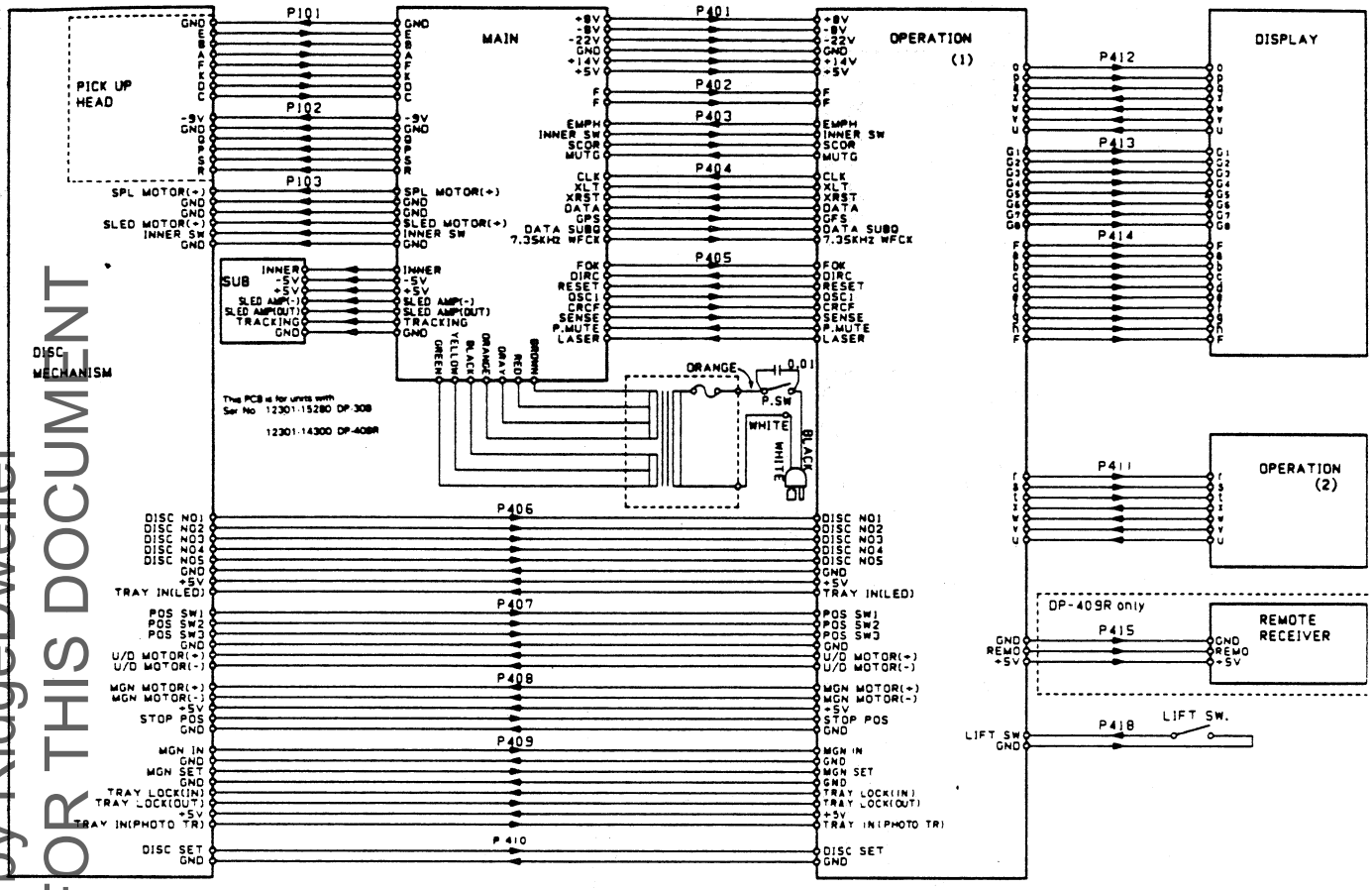
U502: 4053
Analog gate



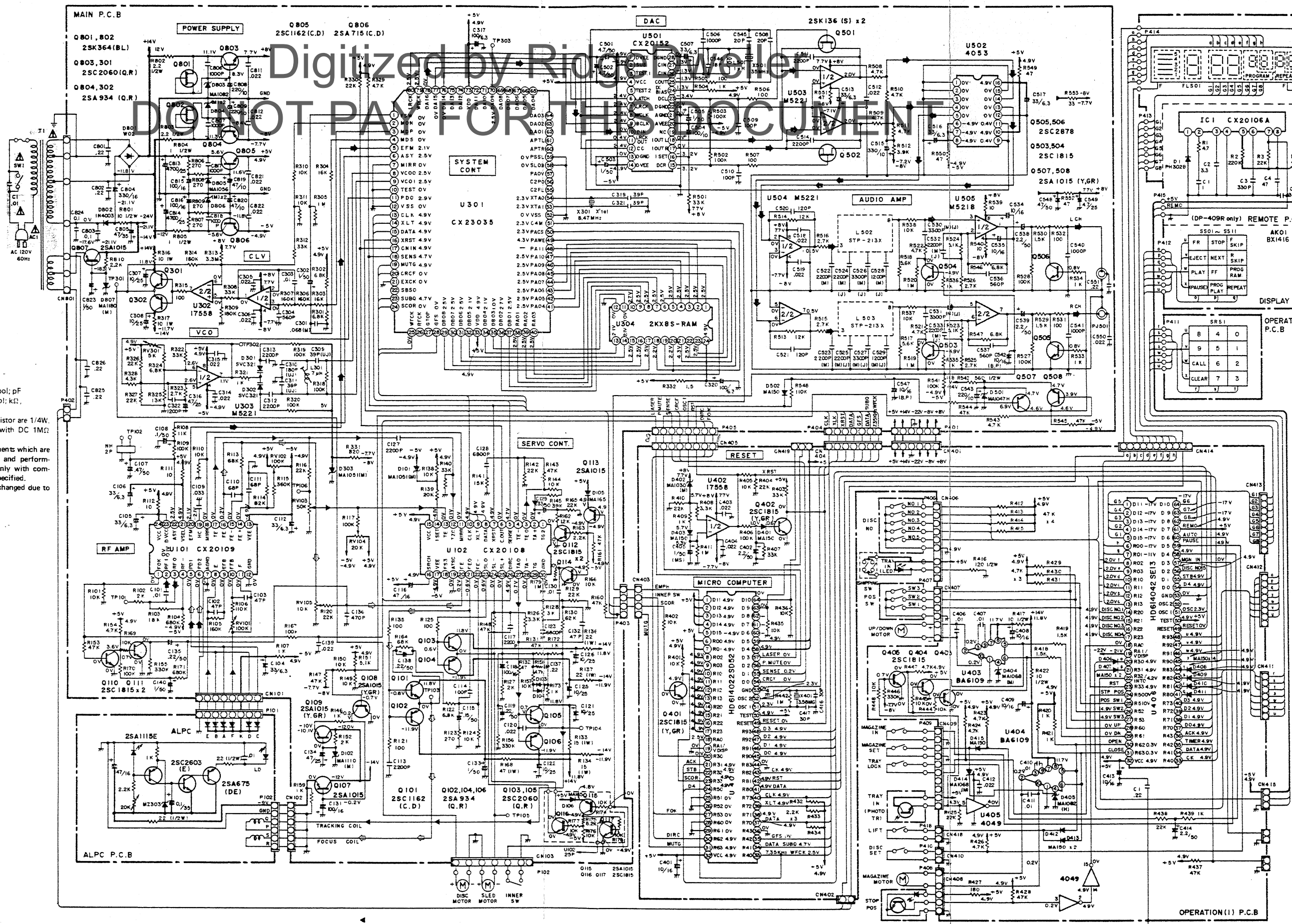
BLOCK DIAGRAM



WIRING DIAGRAM



SCHEMATIC DIAGRAM

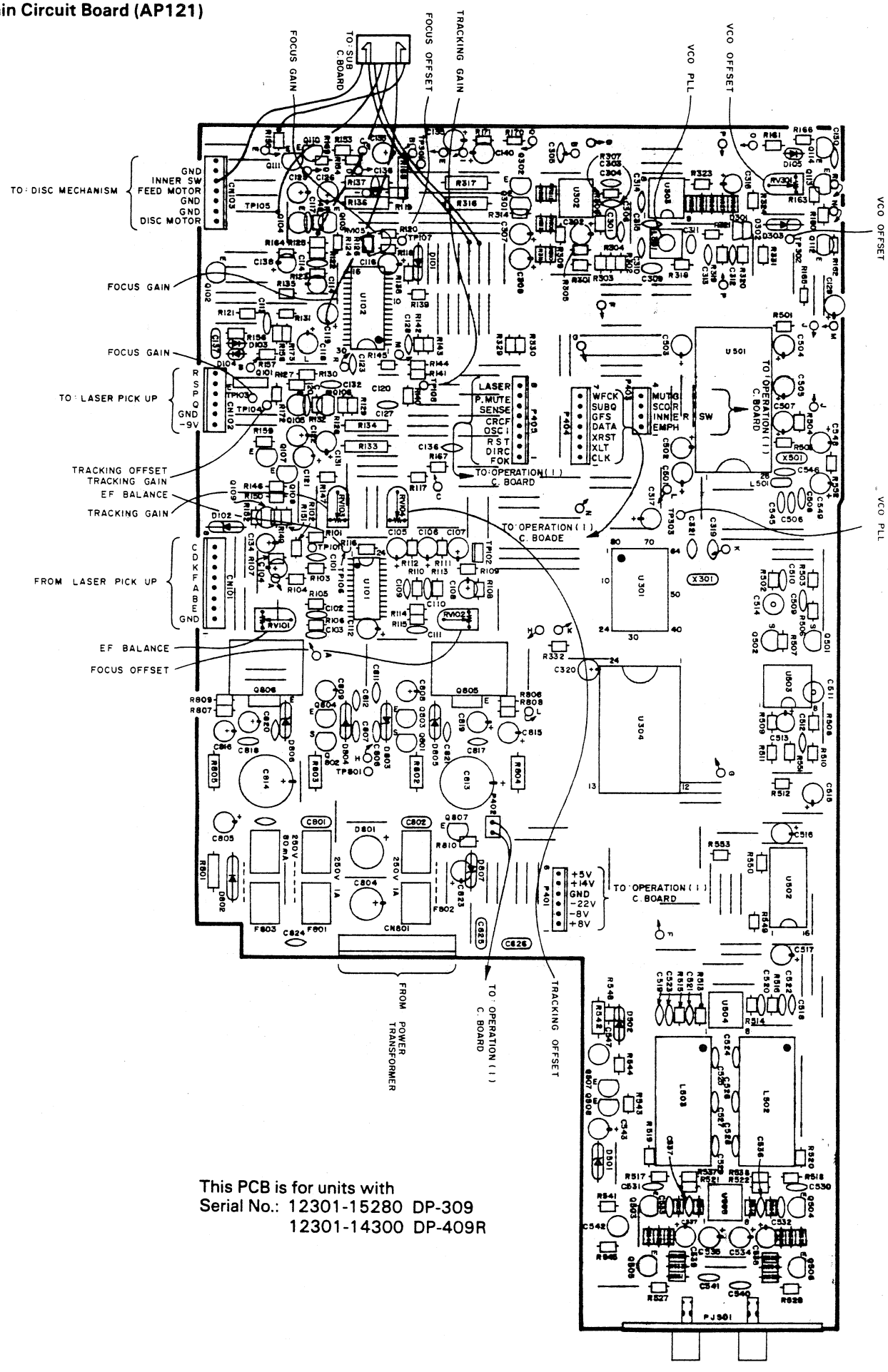


NOTES:

1. Unit of C and R
   C . . . .No-symbol; μF, P-symbol; pF
   R . . . .No-symbol; Ω, K-symbol; kΩ, M-symbol; MΩ
   Wattage for all unspecified resistor are 1/4W.
2. Voltage are those measured with DC 1MΩ digital voltmeter.
3. ⚠ and ⚠ indicates components which are critical for continued safety and performance of this unit. Replace only with components of the same type as specified.
4. This circuit diagram may be changed due to circuit improvement.

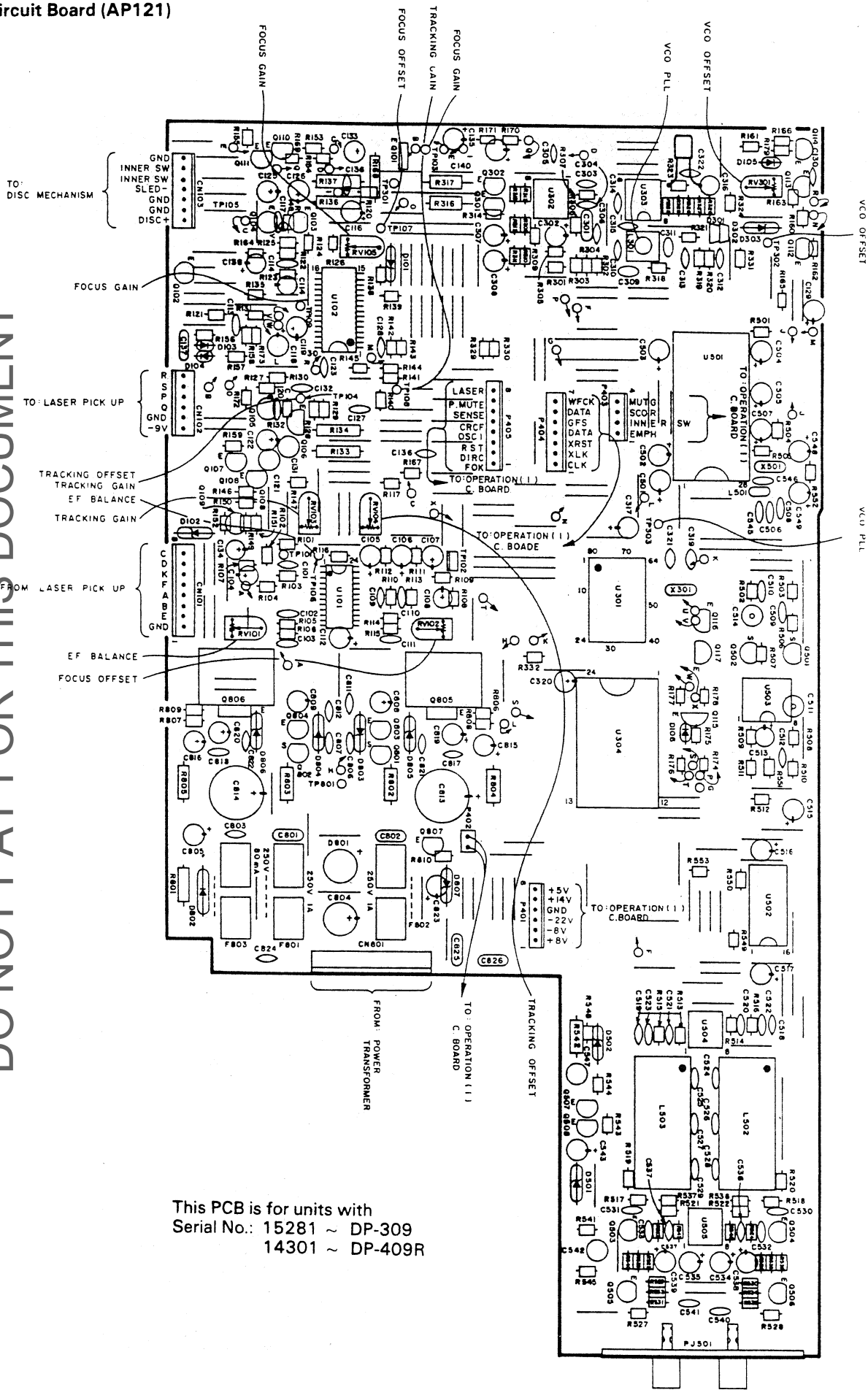
Signal Flow
- Audio signal
- Focus servo
- Tracking servo

Main Circuit Board (AP121)



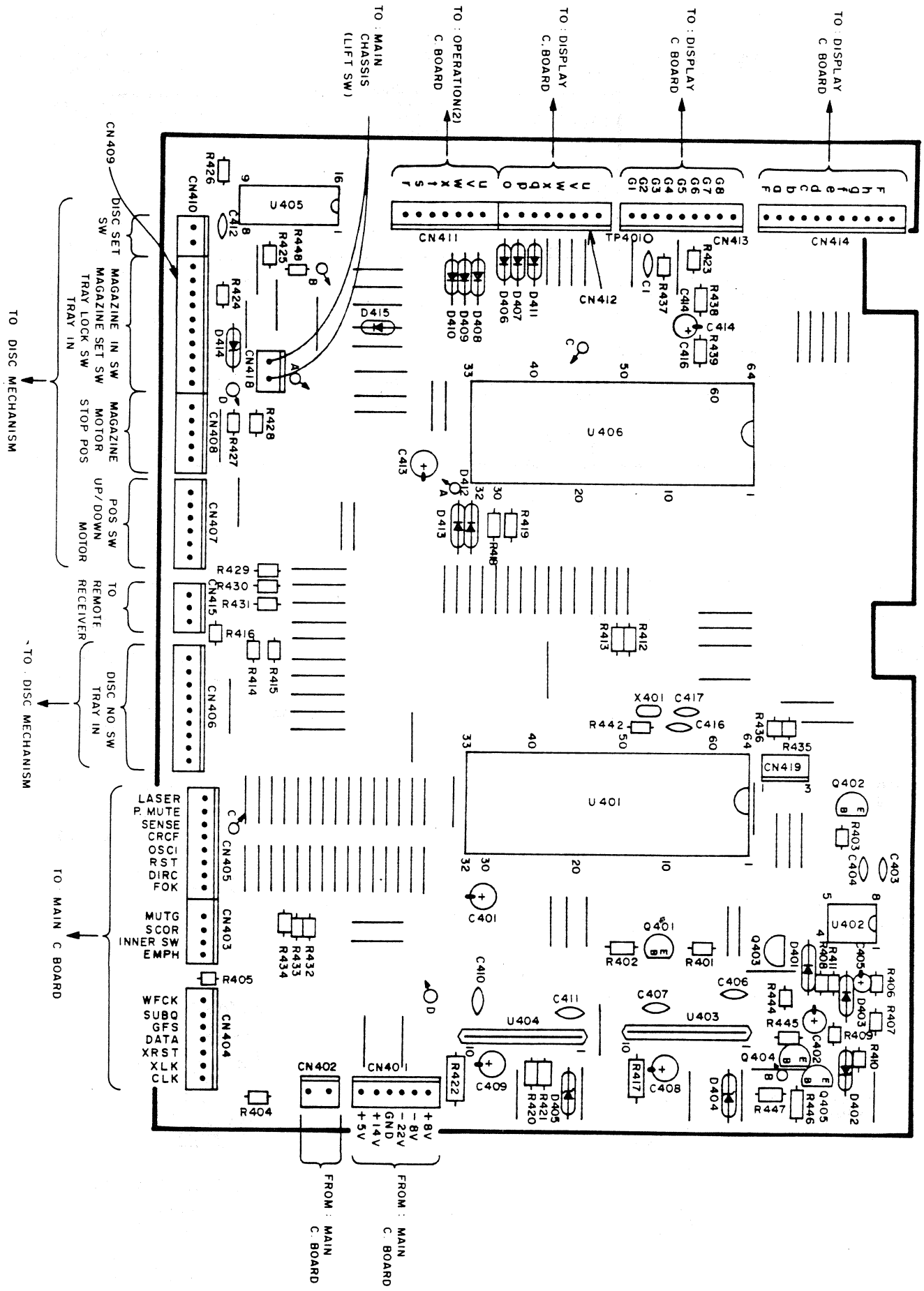
This PCB is for units with
Serial No.: 12301-15280 DP-309
12301-14300 DP-409R

Main Circuit Board (AP121)

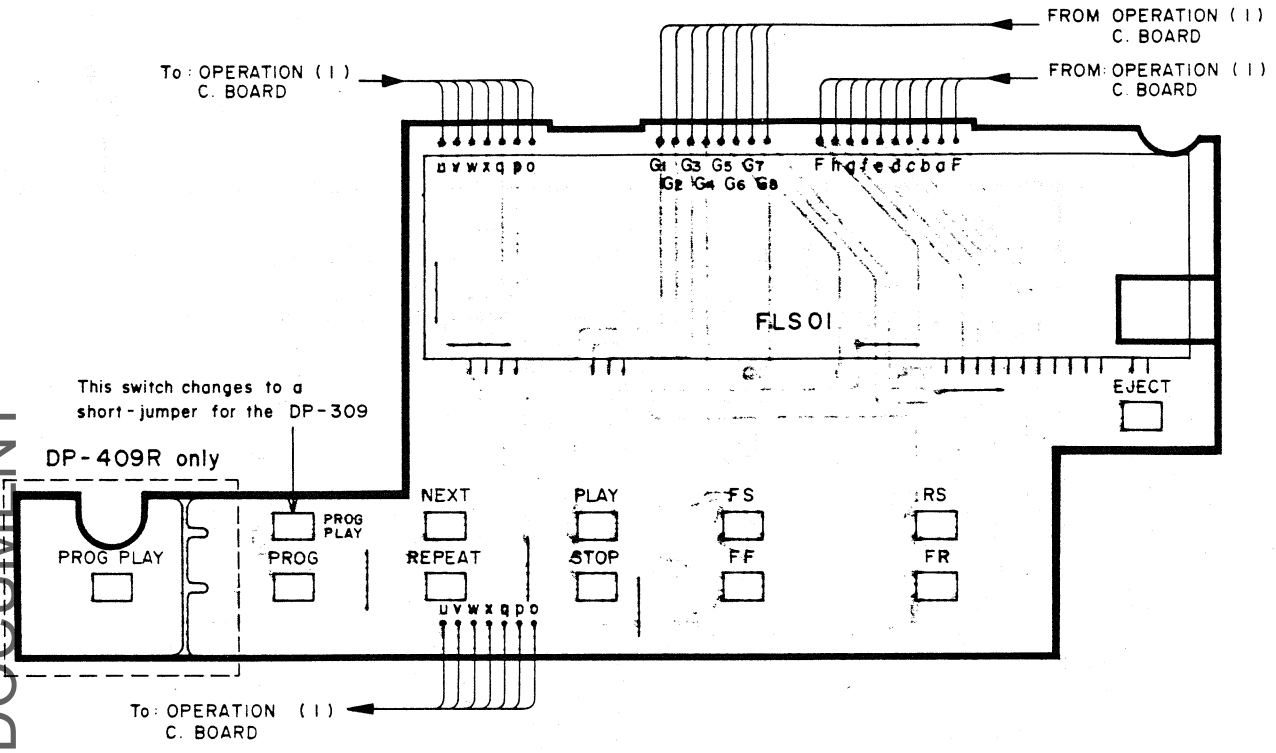


This PCB is for units with
Serial No.: 15281 ~ DP-309
14301 ~ DP-409R

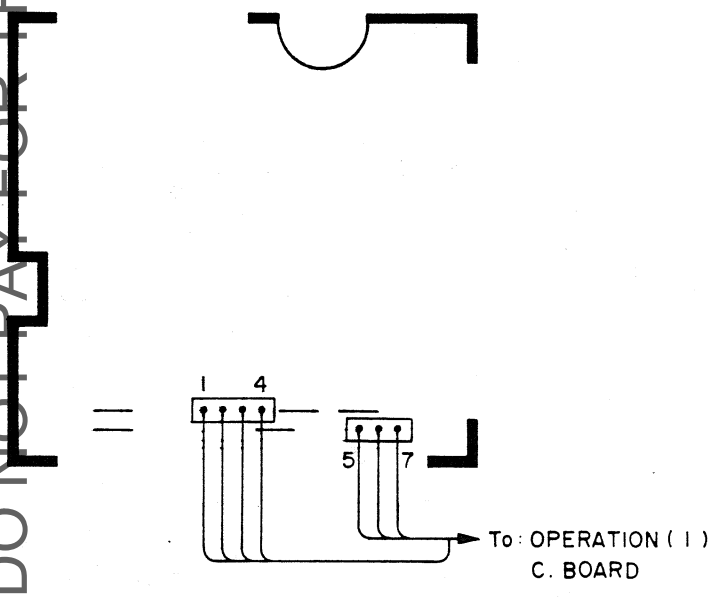
Operation (1) Circuit Board (AP122)



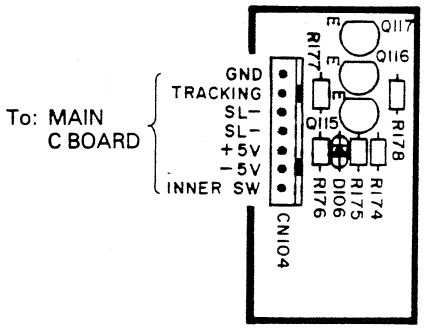
Display Circuit Board (AP112)



Operation (2) Circuit Board (AP111)

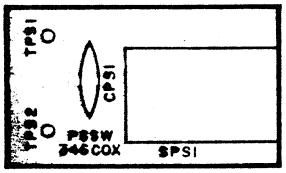


Sub Circuit Board

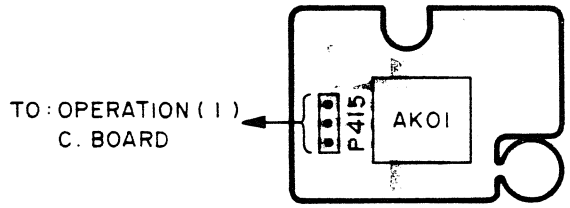


This PCB is for units with
Serial No.: 12301-15280 DP-309
12301-14300 DP-409R

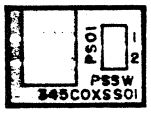
Power SW Circuit Board (AP2)



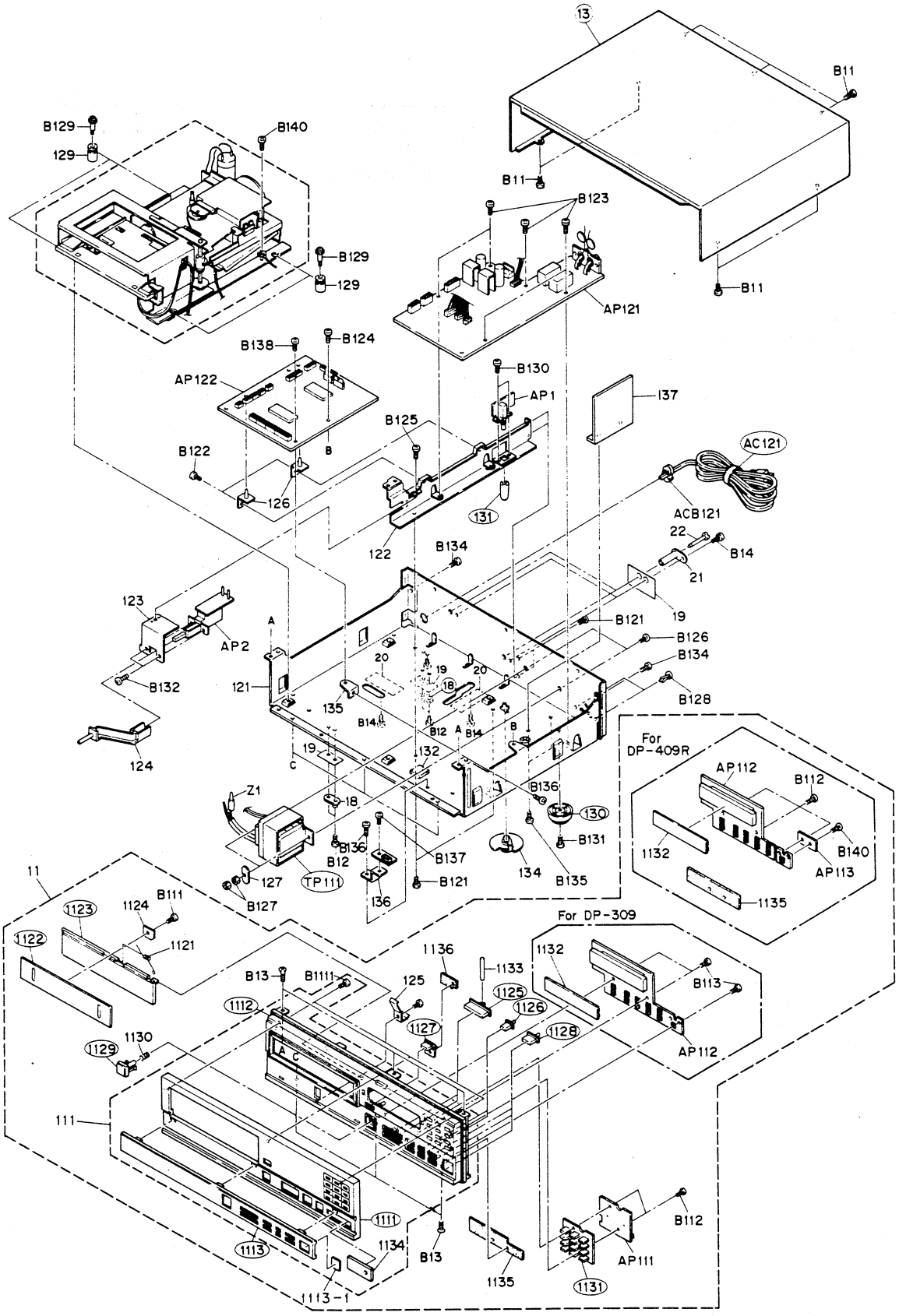
Remote Circuit Board (AP113) (DP-409R only)



Lift SW Circuit Board (AP1)



EXPLODED VIEW OF CABINET

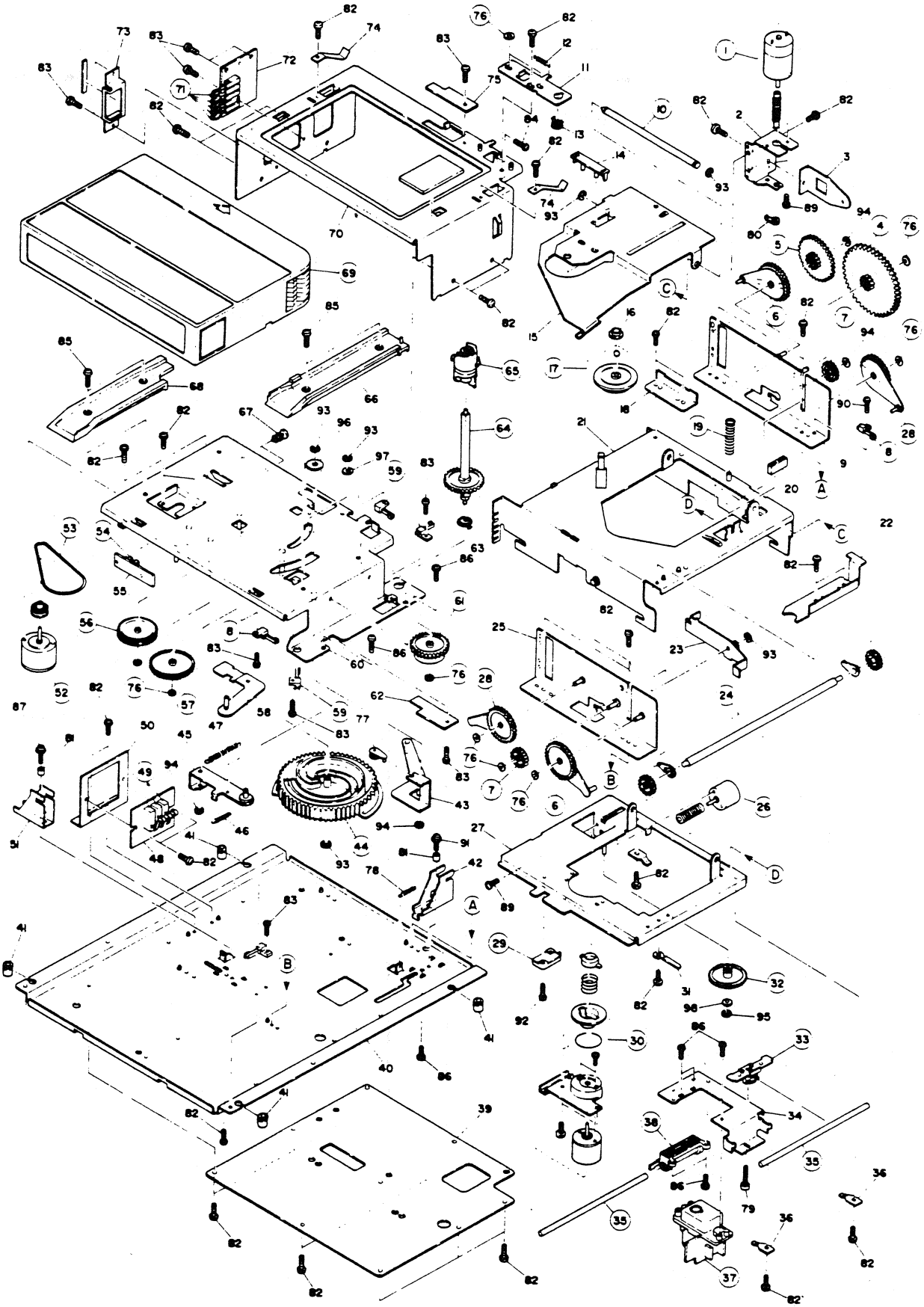


PARTS LIST (CABINET)

Symbol No.	Parts No.	Description
11		Front panel ass'y
12		
13	M07A20137	Top cover
14		
15		
16		
17		
18	M07A20661	Lock plate
19		Cushion label (2)
20		Cushion label (1)
21		Plate for transport
22		Lock screw for transport
111		Escutcheon ass'y
121		Main chassis (DP409R)
121		Main chassis (DP309)
122		PCB bracket
123		Bracket for power switch
124		Joint shaft
125		Spring plate
126		Hinge
127		Plate
128		Disc mechanism ass'y
129		Gum cushion
130	M07A20190	Foot
131	M07A20200	Lift button
132		Spacer
133		—
134		
135		PCB bracket
136		Bracket
137		Shield plate
138		Coating clip
139		—
140		—
141		—
142		—
143		—
144		—
145		—
1111	M07A20101	Escutcheon panel (DP409R, DP309)
1112	M07A20100	Front panel (DP309)
1112	M07A20100	Front panel (DP409R)
1113	M07A20225	Panel ornament (DP309)
1113	M07A21225	Panel ornament (DP409R)
11131		Filter (DP409R)
1121		Shutter spring
1122	M07A20136	Slot shutter panel
1123	M07A20660	Slot shutter base
1124		Support plate
1125	M07A20205	Button(FF)
1126	M07A20201	Button (NEXT)
1127	M07A20203	Button (EJECT)
1128	M07A20202	Button (PLAY)
1129	M07A20204	Power switch knob
1130		Spring for power switch
1131	M07A20395	Rubber switch
1132		Filter
1133		Shaft
1134		Spacer on front panel
1135		Switch spacer

Symbol No.	Parts No.	Description
AC121	M07A20495	Power cord ass'y ⚠
ACB121		Cramper
AP1		Lift SW P.C.B.
AP111		Key P.C.B.
AP112		Operation(2) P.C.B.
AP113		Remote P.C.B ass'y
AP121		Main P.C.B. ass'y
AP122		Operation(1) P.C.B.
AP2		Power SW P.C.B.
B11		T-screw (binding head) 3x6
B12		Screw for transport 3x8
B13		T-Screw (Flat head) 3x8
B14		Screw for transport 3x8
B111		Flat head tapping screw
B112		T-screw (binding head) 2.6x6
B113		T-screw (binding head) 2.6x6
B115		T-screw (binding head) 2.6x6
B121		T-screw (binding head) 3x6
B122		T-screw (binding head) 3x6
B123		T-screw (binding head) 3x6
B124		T-screw (binding head) 3x6
B125		T-screw (binding head) 3x6
B126		T-screw (binding ehad) 4x15
B127		Nut M4
B128		Rivet (pan head) 3x5.5
B129		Screw
B130		Screw (binding head) 2x5
B131		T-screw (binding head) 3x6
B132		Screw (binding head) 3x6
B133		Flat washer 3x6x0.5T
B134		T-screw (binding head) 3x6
B135		T-screw (binding head) 3x6
B136		T-screw (binding head) 3x6
B137		T-screw (binding head) 3x6
B138		T-screw (binding head) 3x6
B139		T-screw (binding head) 3x6
B140		T-screw (binding head) 3x6
B141		T-screw (binding head) 3x8
B1111		Bind top screw
TP111	M07A20500	Power transformer ⚠

EXPLODED VIEW OF MECHANISM



PARTS LIST (MECHANISM)

Symbol No.	Parts No.	Description
1	M17A20550	Motor ass'y (UP/DOWN)
2		Holder
3		Holder-L
4	M07A20731	Gear-U2
5	M07A20730	Gear-U1
6	M07A20655	Holder-F ass'y
7	M07A20732	Gear-U3
8	M07A20377	Leaf SW
9		Holder-L
10	M07A20676	Shaft
11		Slider
12		Spring
13		Bearing
14		Holder-U
15		Lever-C
16		Cup
17	M07A20657	Holder-L
18		Holder-L
19	M07A20760	Spring
20		Gum cushion
21		Chassis ass'y
22		Lever
23		Lever
24	M07A20739	Gear-U4 ass'y
25		Holder ass'y
26	M07A20552	Motor ass'y (slide)
27		Base ass'y
28	M07A20656	Holder-F ass'y
29	M07A20360	Slide SW
30	M07A20553	Motor ass'y (spindole)
31		Clamper
32	M07A20738	Gear
33	M07A20655	Adjuster
34		Holder
35	M07A20675	Shaft
36		Holder-Z
37	M07A19611	Laser Pick-up (MLP3)
38	M07A20679	Rack ass'y
39		Holder
40		Chassis ass'y
41		Gum cushion
42		Holder-U
43		Lever ass'y
44	M07A20736	Gear-4
45		Lever
46		Spring
47		Spring
48		PCB ass'y
49	M07A20380	Micro SW
50		Holder
51		Holder-U
52	M07A20551	Motor ass'y (Lording)
53	M07A20713	Belt
54	M07A20308	Interapter (ON1112)
55		PCB ass'y
56	M07A20632	Pulley ass'y
57	M07A20737	Gear-1
58		Lever
59	M07A20376	Leaf SW
60		Chassis ass'y

Symbol No.	Parts No.	Description
61	M07A20735	Gear-2
62		PCB ass'y
63		Bearing
64	M07A20733	Gear-3 ass'y
65	M07A20734	Gear-5
66		Holder
67		Rivet
68		Holder
69	M07A20162	Magazine ass'y
70		Chassis ass'y
71	M07A20375	Leaf SW
72		PCB ass'y
73		Holder-U
74		Spring
75	M07A20780	PS washer
76		PCB ass'y
77		Bearing
78		Spring
79		Bolt M3x14
80		Spacer
81		Coller
82		T-screw (binding head) 3x5
83		T-screw (binding head) 2.6x5
84		T-screw (pan head) 2x6
85		T-screw (binding head) BLACK 3x5
86		T-screw (binding head) 3x6
87		Washer head screw 2.6x5
89		T-screw (binding head) 3x3
90		T-screw (binding head) 2x5
91		T-screw (pan head) 3x6
92		T-screw (pan head) 2.6X10
93		E-Ring
94		E-Ring
95		E-Ring
96		PS washer
97		PS washer
98		Washer

PARTS LIST

NOTE: ⚠ and designates components on the Parts list that have special characteristics to maintain the safety performance of this unit. When replacing any of these parts, be sure to use only specified parts.

Symbol No.	Parts No.	Description
		Diodes
D1	M07A21320	PHOTO DIODE PH302B (DP-409R)
D101	M07A20329	MA1051M
D102	M07A20332	MA1110M
D103	M07A21321	MA165
D104	M07A21321	MA165
D105	M07A21321	MA165
D106	M07A21321	MA165
D301	M07A20325	SVC321SP
D302	M07A20325	SVC321SP
D303	M07A30329	MA1051M
D401	M07A20320	MA150
D402	M07A20321	MA1030M
D403	M07A20320	MA150
D404	M07A20336	MA1068L
D405	M07A20323	MA1082H
D406	M07A20320	MA150
D407	M07A20320	MA150
D408	M07A20320	MA150
D409	M07A20320	MA150
D410	M07A20320	MA150
D411	M07A20320	MA150
D412	M07A20320	MA150
D413	M07A20320	MA150
D414	M07A20336	MA1068L
D415	M07A20320	MA150
D501	M07A20328	MA1047H
D502	M07A20320	MA150
D801	M07A20327	W02RL
D802	M07A20326	1N4003
D803	M07A20331	MA1082M
D804	M07A20331	MA1082M
D805	M07A20330	MA1056M
D806	M07A20330	MA1056M
D807	M07A20333	MA1180M
		IC's
AK01		REMOTE SIGNAL RECEIVER (DP-409R)
IC1		CX20106A
U101	M07A20317	CX20109 (RF AMP)
U102	M07A20316	CX20108 (SERVO CONT)
U301	M07A20319	CX23035 (SYSTEM CONT)
U302	M07A20312	HA17558
U303	M07A20335	M5221
U304	M07A20315	HM6116LP-4
U401	M07A20310	HD614022SD52
U402	M07A20312	HA17558
U403	M07508343	BA6109 (MOTOR DRIVE)
U404	M07508343	BA6109 (MOTOR DRIVE)
U405	M07A20313	4049
U406	M07A21310	HD614042SE13
U501	M07A20318	CX20152 (D AC)
U502	M07A20314	4053 (HD 14053B)
U503	M07A20335	M5221
U504	M07A20335	M5221
U505	M07A20334	M5218P

Symbol No.	Parts No.	Description
		Transistors
Q101	M07A20301	2SC1162 (C,D)
Q102	M04207300	2SA934 (Q,R)
Q103	M04169300	2SC2060 (Q,R)
Q104	M04207300	2SA934 (Q,R)
Q105	M04169300	2SC2060 (Q,R)
Q106	M04207300	2SA934 (Q,R)
Q107	M05256300	2SA1015 (Y,GR)
Q108	M05256300	2SA1015 (Y,GR)
Q109	M05256300	2SA1015 (Y,GR)
Q110	M05237300	2SC1815 (Y,GR)
Q111	M05237300	2SC1815 (Y,GR)
Q112	M05237300	2SC1815 (Y,GR)
Q113	M05256300	2SA1015 (Y,GR)
Q114	M05237300	2SC1815 (Y,GR)
Q115	M05256300	2SA1015 (Y,GR)
Q116	M05237300	2SC1815 (Y,GR)
Q117	M05237300	2SC1815 (Y,GR)
Q301	M04169300	2SC2060 (Q,R)
Q302	M04207300	2SA934 (Q,R)
Q401	M05237300	2SC1815 (Y,GR)
Q402	M05237300	2SC1815 (Y,GR)
Q403	M05237300	2SC1815 (Y,GR)
Q404	M05237300	2SC1815 (Y,GR)
Q405	M05237300	2SC1815 (Y,GR)
Q501	M07A20302	2SK136(S)
Q502	M07A20302	2SK136(S)
Q503	M05237300	2SC1815 (Y,GR)
Q504	M05237300	2SC1815 (Y,GR)
Q505	M04207306	2SC2878 (B)
Q506	M04207306	2SC2878 (B)
Q507	M05256300	2SA1015 (Y, GR)
Q508	M05256300	2SA1015 (Y, GR)
Q801	M07A20303	2SK364 (BL)
Q802	M07A20303	2SK364 (BL)
Q803	M04169300	2SC2060 (Q,R)
Q804	M04207300	2SA934 (Q,R)
Q805	M07A20301	2SC1162 (C,D)
Q806	M07A20300	2SA715 (C,D)
Q807	M05256300	2SA1015 (Y,GR)
		Electrical Parts
C1	M07A20340	C-CERAMIC 0.01 400V ⚠
CX401	M07A21510	CERAMIC OSC 3.58 MHz
FLS01	M07A20340	FL DISPLAY TUBE
L301	M07A20512	VCO COIL 7μH
L501	M07A20510	RF COIL 1μH
L502	M07A20445	LOW PASS FILTER
L503	M07A20445	LOW PASS FILTER
PJ501	M07A20475	PIN JACK
RV101	M07A20425	VR-SEMI B-100K
RV102	M07A20425	VR-SEMI B-100K
RV103	M07A20426	VR-SEMI B-20K
RV104	M07A20426	VR-SEMI B-20K
RV105	M07A20410	VR-SEMI B-10K
RV301	M07A20427	VR-SEMI B-5K

Symbol No.	Parts No.	Description
SS01	M07A20355	SW (BOTTOM LIFT)
SS01	M07A20370	SW TACT (FR)
SS02	M07A20370	SW TACT (EJECT)
SS03	M07A20370	SW TACT (PLAY)
SS04	M07A20370	SW TACT (STOP)
SS05	M07A20370	SW TACT (NEXT)
SS06	M07A20370	SW TACT (FF)
SS07	M07A20370	SW TACT (PROGRAM-PLAY)
SS08	M07A20370	SW TACT (FS)
SS09	M07A20370	SW TACT (RS)
SS10	M07A20370	SW TACT (PROGRAM)
SS11	M07A20370	SW TACT (REPEAT)
SW1	M07A20356	SW PUSH (POWER) ⚠
X301	M07A20345	CRYSTAL OSC (8.4672MHz)
X501	M07A20346	CRYSTAL OSC (35.002MHz)
		Packing
100	M07A20900	Packing box (Inner)
101	M07A20910	Cushion set
102	M07A20920	Packing sheet
103	M07A20911	Cushion (Disc magazine)
104	M07A20496	Connection cable
105	M07A20162	Disc magazine
106	M07A21049	Remote controller (DP-409R)
107	M07A21901	Packing box (Outer) DP-409R
107	M07A20901	packing box (Outer) DP-309

PACKING INSTRUCTIONS