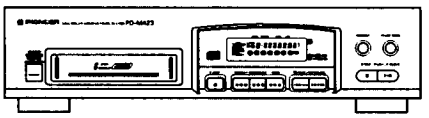
PIONEER
The Art of Entertainment

Service Manual



ORDER NO.
RRV1062

MULTI-PLAY COMPACT DISC PLAYER

PD-M423
PD-M403

THIS MANUAL IS APPLICABLE TO THE FOLLOWING MODEL(S) AND TYPE(S).

Type	Model		Power Requirement	Remarks
	PD-M423	PD-M403		
KUXJ	○	○	AC120V	
KCXJ	○	○	AC120V	

CONTENTS

1. SAFETY INFORMATION ····2
2. PACKING AND PARTS LIST ····3
3. EXPLODED VIEWS AND PARTS LIST ····4
4. BLOCK DIAGRAM ····10
5. SCHEMATIC DIAGRAM····11
6. PCB CONNECTION DIAGRAM····17
7. PCB PARTS LIST ····23
8. ADJUSTMENTS ····25
9. IC INFORMATION ····34
10. FL INFORMATION····39
11. FOR PD-M423/KCXJ, PD-M403/KUXJ AND KCXJ ····40
12. PANEL FACILITIES····41
13. SPECIFICATIONS ····42

PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan
PIONEER ELECTRONICS SERVICE INC. P.O. Box 1760, Long Beach, California 90801 U.S.A.
PIONEER ELECTRONICS OF CANADA, INC. 300 Allstate Parkway Markham, Ontario L3R 0P2 Canada
PIONEER ELECTRONIC [EUROPE] N.V. Haven 1087 Keetberglaan 1, 9120 Melsele, Belgium
PIONEER ELECTRONICS AUSTRALIA PTY. LTD. 178-184 Boundary Road, Braeside, Victoria 3195, Australia TEL: [03] 580-9911

© PIONEER ELECTRONIC CORPORATION 1994

T – SSF FEB. 1994 Printed in Japan

1. SAFETY INFORMATION

This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer. Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual.
Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty. If you are not qualified to perform the repair of this product properly and safely, you should not risk trying to do so and refer the repair to a qualified service technician.

WARNING

Lead in solder used in this product is listed by the California Health and Welfare agency as a known reproductive toxicant which may cause birth defects or other reproductive harm (California Health & Safety Code, Section 25249.5).
When servicing or handling circuit boards and other components which contain lead in solder, avoid unprotected skin contact with the solder. Also, when soldering do not inhale any smoke or fumes produced.

NOTICE
(FOR CANADIAN MODEL ONLY)
Fuse symbols (fast operating fuse) and/or (slow operating fuse) on PCB indicate that replacement parts must be of identical designation.

REMARQUE
(POUR MODÈLE CANADIEN SEULEMENT)
Les symboles de fusible (fusible de type rapide) et/ou (fusible de type lent) sur CCI indiquent que les pièces de remplacement doivent avoir la même désignation.

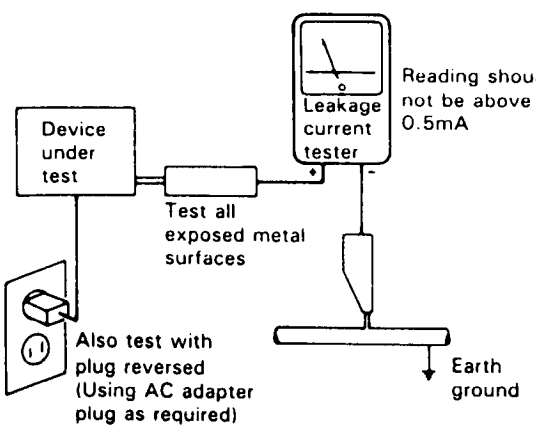
(FOR USA MODEL ONLY)

1. SAFETY PRECAUTIONS

The following check should be performed for the continued protection of the customer and service technician.

LEAKAGE CURRENT CHECK

Measure leakage current to a known earth ground (water pipe, conduit, etc.) by connecting a leakage current tester such as Simpson Model 229-2 or equivalent between the earth ground and all exposed metal parts of the appliance (input/output terminals, screwheads, metal overlays, control shaft, etc.). Plug the AC line cord of the appliance directly into a 120V AC 60Hz outlet and turn the AC power switch on. Any current measured must not exceed 0.5mA.



AC Leakage Test

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

2. PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in the appliance have special safety related characteristics. These are often not evident from visual inspection nor the protection afforded by them necessarily can be obtained by using replacement components rated for voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

Electrical components having such features are identified by marking with a ⚠ on the schematics and on the parts list in this Service Manual.
The use of a substitute replacement component which dose not have the same safety characteristics as the PIONEER recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards.

Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current PIONEER Service Manual. A subscription to, or additional copies of, PIONEER Service Manual may be obtained at a nominal charge from PIONEER.

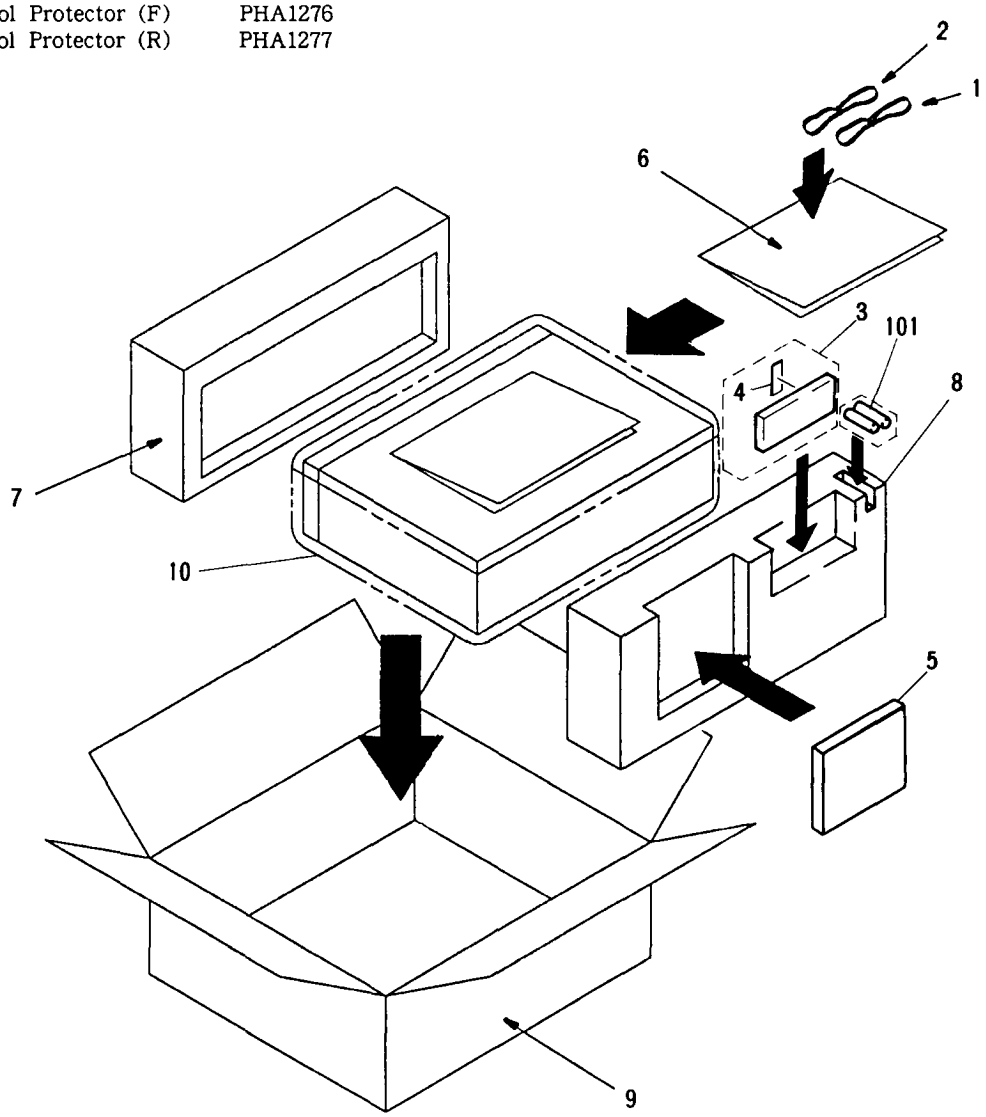
2. PACKING AND PARTS LIST

NOTES:

- Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "⊙" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.

Parts List

Mark	No.	Description	Part No.
	1	Connection Cord with Mini Plug (for SR cord)	PDE – 319
	2	Connection Cord with Pin Plug (for Audio)	PDE1109
	3	Remote Control Unit	PWW1089
	4	Battery Cover	PZN1010
	5	Magazine Assy	PXA1523
	6	Operating Instructions (English)	PRB1205
	7	Styrol Protector (F)	PHA1276
	8	Styrol Protector (R)	PHA1277
	9	CD Packing Case	PHG1999
	10	Mirror Mat Sheet	Z23 – 007
NSP	101	Dry Cell Battery (R03, AAA)	VEM – 022



3. EXPLODED VIEWS AND PARTS LIST

NOTES:

- Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "⊙" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.

3.1 EXTERIOR

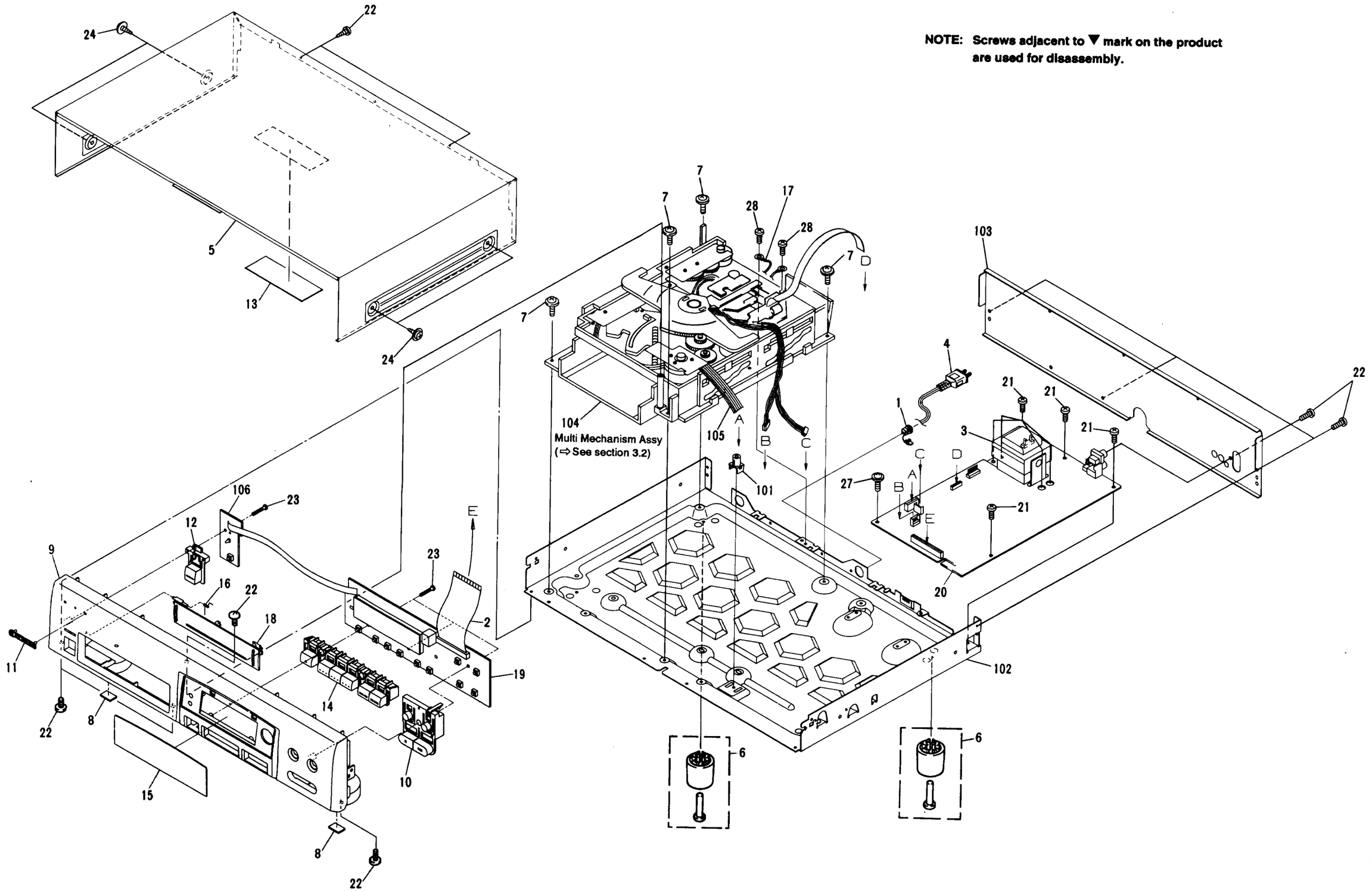
Parts List

Mark	No.	Description	Part No.
⚠	1	Strain Relief	CM – 22C
	2	32P F.F.C/30V	PDD1041
⚠	3	Power Transformer	PTT1237
⚠	4	Power Cord with Plug	PDG1015
	5	Bonnet	PYY1149
	6	Foot Assy	AEC1531
	7	Screw	IBZ30P080FCC
	8	Rubber Sheet	AEB1111
	9	Function Panel	PNW2387
	10	Play Button	PAC1766
	11	Name Plate	PAM1608
	12	Power Button	PAC1719
	13	65 Label	ORW1069
	14	Track Button	PAC1765
	15	Display Window	PAM1635
	16	Spring (Door)	PBH1022
	17	Earth Lead Unit	XDF – 502
	18	Door	PNW2264
	19	Function Board Assy	PWZ2769
⚠	20	Mother Board Assy	PWM1858
	21	Screw	BBZ30P060FMC
	22	Screw	BBZ30P080FZK
	23	Screw	PPZ30P120FMC
	24	Screw	FBT40P080FZK
	25	.....	
	26	.....	
	27	Screw	IBZ30P180FMC
	28	Screw	PDZ30P050FMC

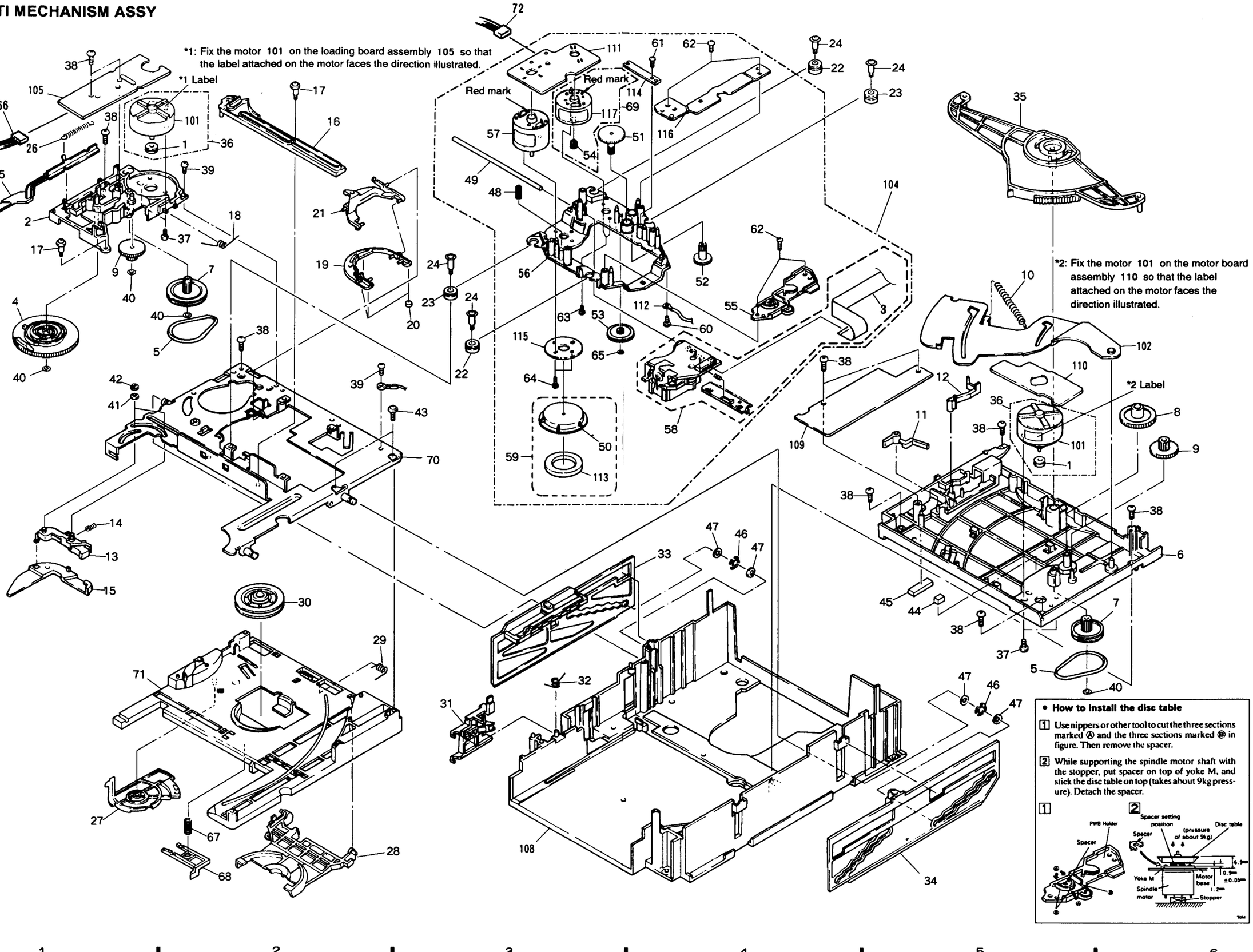
Mark	No.	Description	Part No.
NSP	101	PCB Mould	AMR1525
NSP	102	Under Base	PNA1751
NSP	103	Rear Base	PNA2068
NSP	104	Multi Mechanism Assy	PXA1532
NSP	105	Flat Cable (6P)	D20PYY0615E
NSP	106	Switch Board Assy	PWZ2804

Exterior

NOTE: Screws adjacent to ▼ mark on the product are used for disassembly.



3.2 MULTI MECHANISM ASSY

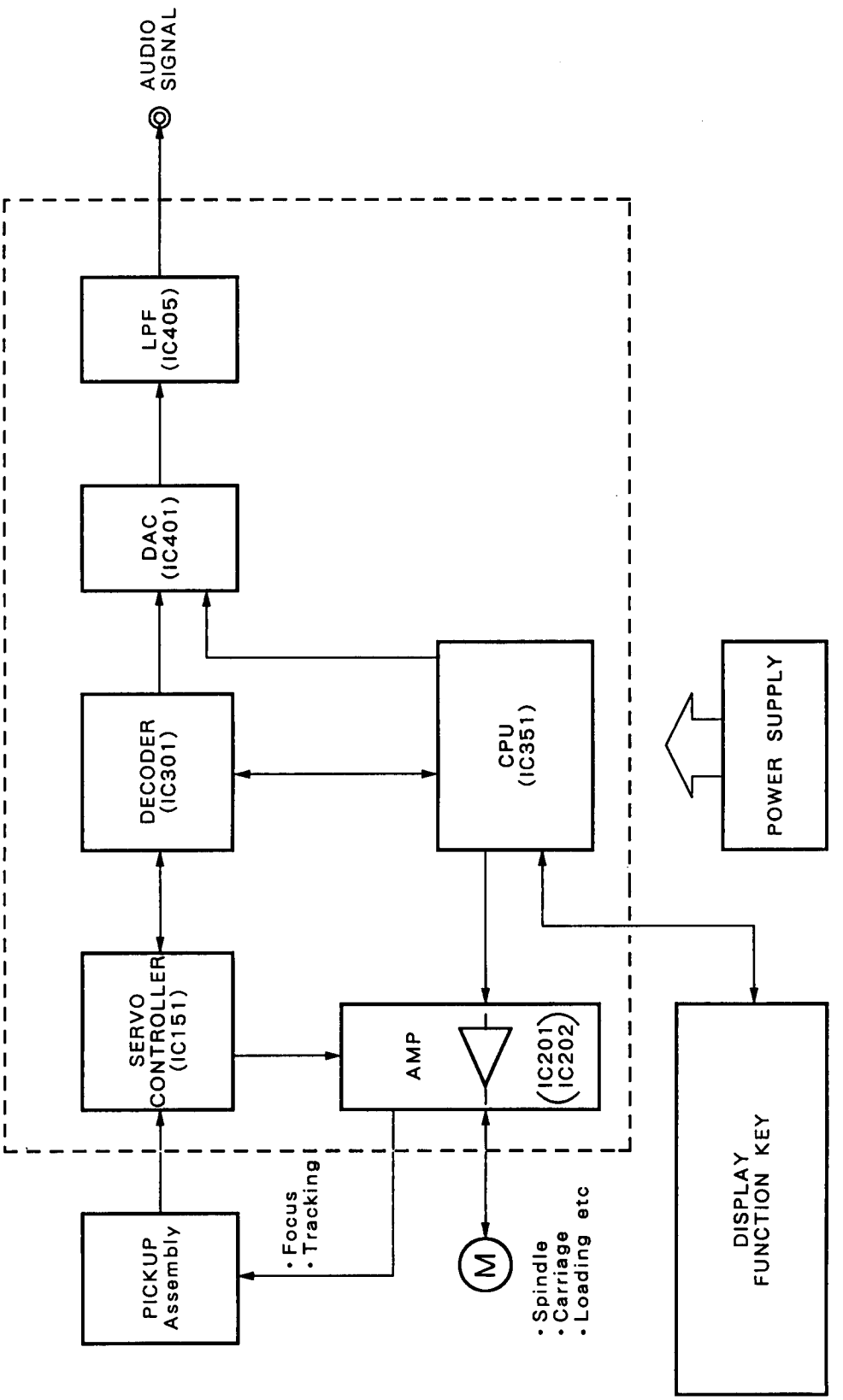


Parts List

Mark	No.	Description	Part No.
	1	Motor Pulley	PNW1634
	2	Gear Holder	PNW1929
	3	PU Frexible Cable	PNP1343
	4	Cam Gear	PNW1923
	5	Belt	PEB1138
	6	Top Guide N	PNW2441
	7	Gear Pulley	PNW1918
	8	Gear S	PNW1919
	9	Gear L	PNW1920
	10	Eject Spring	PBH1107
	11	Switch Lever	PNW1927
	12	Seven Bar	PNW1931
	13	Sub Rotary Lever	PNW1933
	14	Sub Rotary Lever Spring	PBH1111
	15	Rotary Lever	PNW1932
	16	Drive Plate	PNW1930
	17	Motor Screw	PBA-112
	18	Holder Lever Spring	PBH1110
	19	Disc Holder	PNW1924
	20	Cushion A	PED1001
	21	Holder Lever	PNW1925
	22	Float Rubber	PEB1014
	23	Float Rubber	PEB1132
	24	Float Screw	PBA1073
	25	Release Lever	PNW1934
	26	Release Spring	PBH1106
	27	Clamper Cam	PNW1922
	28	Clamper Holder	PNW1921
	29	Clamper Spring	PBH1109
	30	Clamper	PNW1857
	31	Lock Lever	PNW1917
	32	Lock Spring	PBH1108
	33	Stair NL	PNW2443
	34	Stair NR	PNW2444
	35	Synchronize Lever	PNW1926
	36	Motor Assy (LOADING, DISC SELECT)	PEA1130
	37	Screw	PMZ26P040FMC
	38	Screw	PPZ30P080FMC
	39	Screw	BBZ30P060FMC
	40	Washer	WT26D047D025
	41	Washer	WA31D054D025
	42	E Ring	Z39-010
	43	Screw	IPZ30P080FMC
	44	Rubber Spacer	PEB1238
	45	Rubber Spacer	PEB1179
	46	Silent Ring	PBK1093
	47	Washer	WA62D130D025
	48	Earth Spring	PBH1132

Mark	No.	Description	Part No.
	49	Guide Bar	PLA1094
	50	Disc Table	PNW1067
	51	Gear 1	PNW2052
	52	Gear 2	PNW2053
	53	Gear 3	PNW2054
	54	Pinion Gear	PNW2055
	55	PWB Holder	PNW2057
	56	Carriage Base	PNW2445
	57	D.C. Motor Assy (spindle with oil)	PEA1235
	58	Pickup Assy	PEA1291
	59	Disc Table Assy	PEA1035
	60	Screw	BBZ26P060FMC
	61	Screw	BPZ20P060FMC
	62	Screw	BPZ26P100FMC
	63	Screw	JFZ17P025FZK
	64	Screw	JFZ20P040FMC
	65	Washer	WT12D032D025
	66	Connector Assy	PDE1241
	67	Stopper Spring	PBH1131
	68	Stopper	PNW2069
	69	D.C. Motor Assy (CARRIAGE)	PEA1246
	70	Upper Chassis	PNB1267
	71	Sub Chassis	PNW2440
	72	Connector Assy	PDE1240
NSP	101	Motor	VXM1033
NSP	102	Eject Lever	PNB1306
	103	• • • • •	
NSP	104	Servo mechanism Assy M	PXA1512
NSP	105	Loading Board Assy	PWZ2038
	106	• • • • •	
	107	• • • • •	
NSP	108	Main Chassis	PNW2074
NSP	109	Select Board Assy	PWZ2533
NSP	110	Motor Board Assy	PWZ2040
NSP	111	Mechanism Board Assy	PWX1192
NSP	112	Earth Lead Unit	PDF1074
NSP	113	Clamp Magnet	PMF1014
NSP	114	Gear Stopper	PNB1303
NSP	115	Yoke M	PNB1312
NSP	116	AV Angle	PNB1405
NSP	117	Carriage DC Motor / 0.3W	PXM1027

4. BLOCK DIAGRAM



5. SCHEMATIC DIAGRAM

5.1 Waveforms

Note: The encircled numbers denote measuring points in the schematic diagram.

*1 50T – JUMP: After switching to the pause mode, press the manual search key.

*2 FOCUS – IN: Press the key without loading a disc.

② TP1 – Pin 1: PLAY MODE (RF)
500mV/div 500nsec/div
– VC

⑤ IC202 – Pin 3 : FOCUS – IN (*2) MODE (FODR)
1V/div 200msec/div
– GND

⑦ IC201 – Pin 9: TRACK SEARCH MODE (SPDR)
2V/div 50msec/div
– GND

② TP1 – Pin 1: TRACK SEARCH MODE (RF)
500mV/div 200 µsec/div
– VC

⑤ IC202 – Pin 3 : PLAY MODE (FODR)
1V/div 1msec/div
– GND

⑧ IC202 – Pin 9 : PLAY MODE (CADR)
0.5V/div 2sec/div
– GND

③ TP1 – Pin 6: PLAY MODE (FOER)
100mV/div 10msec/div
– VC

⑥ IC202 – Pin 4: PLAY MODE (TRDR)
500mV/div 1msec/div
– GND

⑧ IC202 – Pin 9 : TRACK SEARCH MODE (CADR)
2V/div 200msec/div
– GND

④ TP1 – Pin 2: PLAY MODE (TRER)
1V/div 10msec/div
– VC

⑥ IC202 – Pin 4: 50T – JUMP (*1) MODE (TRDR)
500mV/div 1msec/div
– GND

⑨ IC151 – Pin 32: PLAY MODE (EFM)
2V/div 500nsec/div
– GND

④ TP1 – Pin 2: 50T – JUMP (*1) MODE (TRER)
1V/div 1msec/div
– VC

⑦ IC201 – Pin 9: PLAY MODE (SPDR)
1V/div 50msec/div
– GND

⑩ IC401 – Pin 7 : PLAY MODE (1kHz) (LO) (D/A DATA OUT)
1V/div 200 µsec/div
– GND

⑪ IC401 – Pin 8 : PLAY MODE (1kHz) (LO) (D/A DATA OUT)
1V/div 200 µsec/div
– GND

⑯ IC301 – Pin 22 : PLAY MODE (1kHz) (BCLK)
2V/div 500nsec/div
– GND

⑱ IC301 – Pin 20 : PLAY MODE (1kHz) (LRCK)
2V/div 10 µsec/div
– GND

⑲ IC301 – Pin 21 : PLAY MODE (1kHz) (PCMD)
2V/div 500nsec/div
– GND

㉑ Pin – OUTPUT: PLAY MODE (1kHz)
1V/div 200 µsec/div
– GND

㉓ : TRACK SEARCH MODE
Upper: TP1 – Pin 1 (RF) 1V/div
Lower: IC151 – Pin 29 (MIRR)
2V/div 200 µsec/div
– VC
– GND

㉔ : PLAY MODE
Upper: TP1 – Pin 1 (RF) 1V/div
Lower: IC151 – Pin 30 (DFCT)
5V/div 200 µsec/div
(Upper)
– GND
– GND
(Lower)

㉕

㉖

㉗

㉘

㉝ IC301 – Pin 3 : PLAY MODE (MDP)
2V/div 2 µsec/div
– GND

㊸ IC301 – Pin 9 : PLAY MODE (PCO)
2V/div 10 µsec/div
– GND

NOTE FOR SCHEMATIC DIAGRAMS (Type 4A)

1. **When ordering service parts, be sure to refer to "PARTS LIST of EXPLODED VIEWS" or "PCB PARTS LIST".**
2. **Since these are basic circuits, some parts of them or the values of some components may be changed for improvement.**
3. **RESISTORS:**
   Unit: k:kΩ, M:MΩ, or Ω unless otherwise noted.
   Rated power: 1/4W, 1/6W, 1/8W, 1/10W unless otherwise noted.
   Tolerance: (F): ±1%, (G): ±2%, (K): ±10%, (M): ±20% or ±5% unless otherwise noted.
4. **CAPACITORS:**
   Unit: p:pF or µF unless otherwise noted.
   Ratings: capacitor (µF)/ voltage (V) unless otherwise noted.
   Rated voltage: 50V except for electrolytic capacitors.
5. **COILS:**
   Unit: m:mH or µH unless otherwise noted.
6. **VOLTAGE AND CURRENT:**
   ▭ or ⌐ V :
   DC voltage (V) in PLAY mode unless otherwise noted.
   ⇦ mA or ⌐ mA :
   DC current in PLAY mode unless otherwise noted.
   Value in ( ) is DC current in STOP mode.
7. **OTHERS:**
   - ⊘ or ⓿ : Adjusting point.
   - ◁ : Measurement point.
   - The ⚠ mark found on some component parts indicates the importance of the safety factor of the parts. Therefore, when replacing, be sure to use parts of identical designation.
8. **SCH–□ ON THE SCHEMATIC DIAGRAM:**
   - SCH–□ indicates the drawing number of the schematic diagram. (SCH stands for schematic diagram.)
9. **SWITCHES** (Underline indicates switch position):

FUNCTION	BOARD	ASSY
S701	:	EJECT
S702	:	REPEAT
S703	:	PROGRAM
S704	:	DISC
S705	:	⏮ • ◁◁
S706	:	▷▷ • ▷▷⏭
S707	:	STOP
S708	:	▷/⏸
S709	:	RANDOM
S710	:	HI – LITE SCAN

SWITCH	BOARD	ASSY
S801	:	POWER

SERVO MECHANISM ASSY

PICKUP ASSY (PEA12911)

PRE AMP BOARD ASSY

CN102

CN131 12FMZ-ABT

RKP-533 CN201

TP1 TP2

MOTHER BOARD ASSY (PWM1856 : PD-M403) (PWM1858 : PD-M423)

IC301 CXD2517Q (DECODER)

IC401 TC9268P D/A CONVERTER

IC405: LOW-PASS FILTER

Q405: MUTE DRIVER

JA401 (1/2) PKB1009 LINEOUT JACK

JA401 (2/2) PKB1009

IC201 (3/5) LA6520 (SPINDLE DRIVE)

IC202 (2/5) LA6520 (TRACKING DRIVE)

IC202 (3/5) LA6520 (CARRIAGE DRIVE)

IC201 (2/5) LA6520 (LOADING DRIVE)

IC201 (1/5) LA6520 (DISC SELECT)

IC151 CXA1372Q (SERVO CONTROL)

IC351 PD4520A (SYSTEM CONTROL)

IC21: SYSTEM RESET AND +5V REGULATOR

MULTI MECHANISM ASSY

MECHANISM BOARD ASSY

INSIDE SW DSG1016 S610

D.C MOTOR ASSY (SPINDLE) PEA1250

D.C MOTOR ASSY (CARRIAGE) PEA1246

CN202 VKN1051

CN223 2-173981-4

S601,S602:DSG1016 S601 LPS1 S602 LPS2

MOTOR ASSY (LOADING) PEA1130 CN601 4-173979-4

LOADING BOARD ASSY (PWZ2038)

	LPS1	LPS2
CLAMP	H	L
LOADING	L	H
HOME	H	L
EJECT	H	L

	MZS1	MZS2
OUT	H	*
MULTI	L	H
IN (SINGLE)	L	L

	DCNT	DCHM
2-6DISC	L	H
HOME	L	L
SELECTING	H	L

S603:PSG1010 S604 S605 S606 S52151-0610 CN603

MOTOR ASSY PEA1130 DISC SELECT

SELECT BOARD ASSY (PWZ2533)

MOTOR BOARD ASSY (PWZ2040)

CN204 52147-0610

SWITCH BOARD ASSY (PWZ2804)

S801 PSG1006 POWER J801

S701 PGM S702 RTP S703 HILITE S704 STOP S705 KEY S706 DCH S707 EJECT S708 DISC S709 RDM

V701 PEL 1084 FLUORESCENT DISPLAY

REMOTE SENSOR SBX1785-51 PD-M423 ONLY

FUNCTION BOARD ASSY (PWZ2768 : PD-M403) (PWZ2769 : PD-M423)

SUB BOARD ASSY (PWX1334 : PD-M403) (PWX1336 : PD-M423)

D701-D703 1SS133X X5 S701-S710 PSG1006 X10

CN351 CN701 J701

AC POWER CORD AC120V/60Hz

POWER TRANSFORMER PTT1237

SR JACK (CONTROL) JA391 IN RKN1004 JA392 OUT RKN1004

KUXJ:PDG1015 KCXJ:RDG1010

63 - 89mA (39mA) VH 130mA (78mA) V5 92 - 110mA (28mA) VL

	PD-M403	PD-M423
CN351	HLEM3BS-1	HLEM32S-1
CN701	HLEM3BR-1	HLEM32R-1
J701	PDD1849	PDD1841

: FOCUS SERVO LOOP LINE
: TRACKING SERVO LOOP LINE
: SIGNAL ROUTE
: LOADING MOTER ROUTE
: SPINDLE MOTER ROUTE
: CARRIAGE MOTER ROUTE
: DISC SELECT MOTER ROUTE

IC301 (CXD2517Q)

Pin No.	Voltage (V)	Pin No.	Voltage (V)	Pin No.	Voltage (V)	Pin No.	Voltage (V)
1	5.0	17	2.5	33	0to0.3	49	2.2to2.5
2	5.0	18	0	34	2.3	50	5.0
3	2.6to2.7	19	2.5	35	3.1	51	4.9
4	0.1	20	2.5	36	0	52	5.0
5	5.0	21	2.4	37	2.1	53	4.9
6	0	22	2.1	38	1.7	54	4.9
7	2.7	23	0	39	0	55	0.1
8	2.8	24	5.0	40	0	56	4.9to5.0
9	2.8	25	1.8	41	2.5	57	5.0
10	0	26	5.0	42	0	58	5.0
11	0	27	5.0	43	0.1	59	4.9
12	2.7	28	2.5	44	0.1	60	0
13	5.0	29	0	45	5.0	61	0
14	2.7	30	5.0	46	0.1	62	0
15	0	31	4.5	47	4.9	63	0
16	0	32	0	48	0	64	0

IC351 (PD4520A)

Pin No.	Voltage (V)	Pin No.	Voltage (V)	Pin No.	Voltage (V)	Pin No.	Voltage (V)
1	5.0	17	2Zto -3	33	4.9	49	2.0to2.5
2	-22.3	18	-25.3	34	0.1	50	5.0
3	-22.3	19	-5.0	35	5.0	51	0
4	-22.3	20	-22to -3	36	0.1	52	0
5	-22.3	21	22to -3	37	5.0	53	5.0
6	-22.3	22	-22to -3	38	5.0	54	5.0
7	-22.3	23	-22to -3	39	0	55	0
8	-22.3	24	-22to -3	40	0	56	2.5
9	-22.3	25	-22to -3	41	0	57	2.5
10	-22.3	26	5.0	42	0	58	0
11	-25.1	27	-22to -3	43	0	59	0
12	5.0	28	-22to -3	44	0	60	5.0
13	5.0	29	-22to -3	45	0	61	0
14	-4.5	30	-22to -3	46	0	62	0
15	0	31	5.0	47	0	63	0
16	-22to -3	32	4.9	48	0	64	0

IC401 (TC9268P)

Pin No	Voltage (V)	Pin No.	Voltage (V)
1	5.0	11	0
2	0	12	2.1
3	0	13	2.5
4	2.1	14	5.0
5	2.3	15	1.5
6	5.0	16	0
7	2.3	17	5.0
8	2.1	18	2.5
9	0	19	1.0
10	0	20	2.5

IC151 (CXA1372Q)

Pin No.	Voltage (V)	Pin No.	Voltage (V)	Pin No.	Voltage (V)	Pin No.	Voltage (V)
1	2.5	13	2.5	25	5.0	37	2.0
2	2.5	14	2.5to2.6	26	0.1	38	2.7to2.8
3	2.5	15	2.5	27	4.9	39	2.5
4	2.5	16	0.8	28	0	40	3.2
5	2.4	17	1.3	29	0	41	0
6	2.5	18	2.5	30	0	42	2.5
7	2.6	19	0	31	0	43	2.5
8	2.5	20	5.0	32	2.7	44	2.5
9	2.5	21	5.0	33	5.0	45	2.5
10	5.0	22	4.9	34	1.3	46	2.5
11	2.5	23	5.0	35	1.0	47	2.5
12	2.5	24	4.9to5.0	36	5.0	48	2.4

6. PCB CONNECTION DIAGRAM

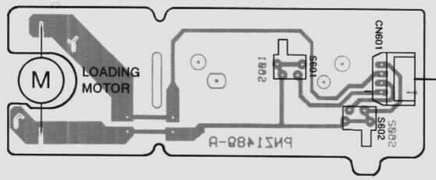
- **This diagram is viewed from the mounted parts side.**

NOTE FOR PCB DIAGRAMS:

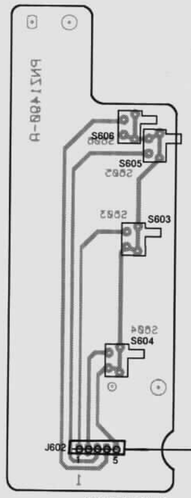
1. Part numbers in PCB diagrams match those in the schematic diagrams.
2. A comparison between the main parts of PCB and schematic diagrams is shown below.

Symbol in PCB Diagrams	Symbol in Schematic Diagrams	Part Name
B C E	B C E B C E	Transistor
B C E	B C E B C E	Transistor with resistor
D G S	D G S D G S	Field effect transistor
		Resistor array
I O	IN OUT	3- terminal regulator

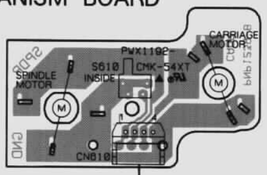
LOADING BOARD ASSY



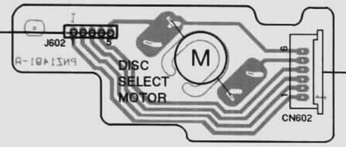
SELECT BOARD ASSY



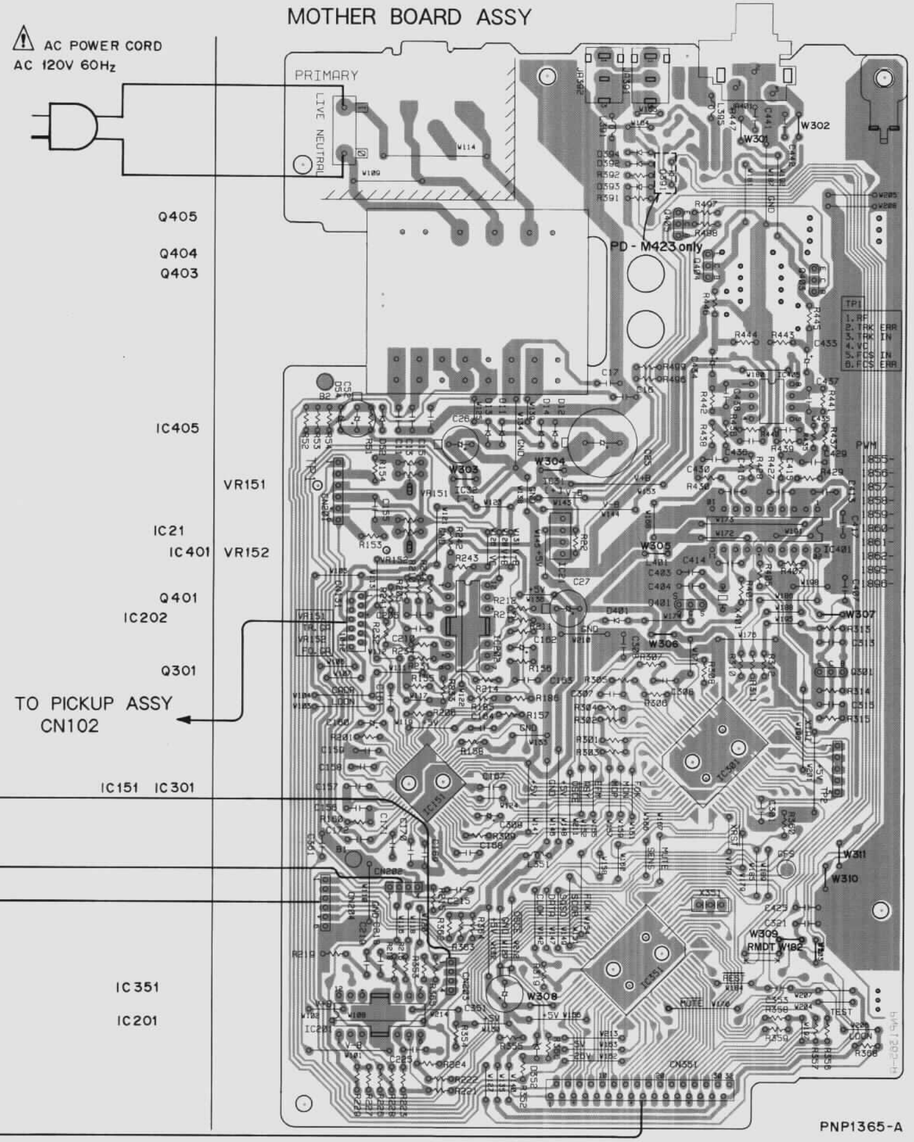
MECHANISM BOARD ASSY



MOTOR BOARD ASSY

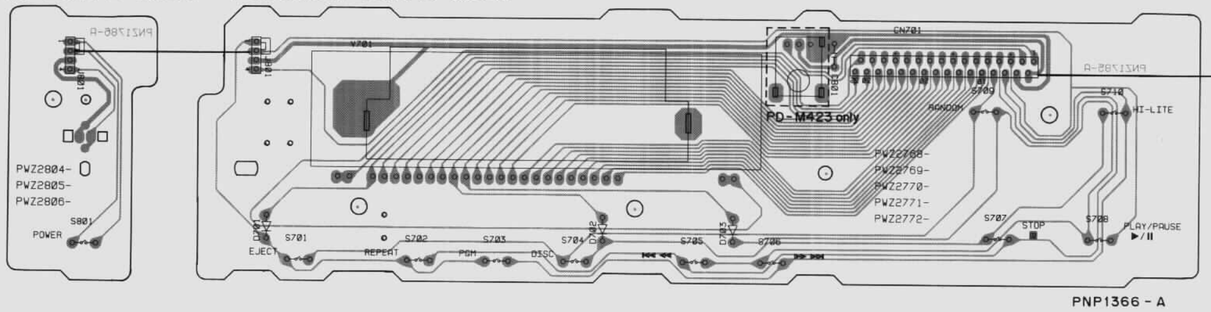


MOTHER BOARD ASSY



SWITCH BOARD ASSY

FUNCTION BOARD ASSY



6. PCB CONNECTION DIAGRAM

- This diagram is viewed from the foil side.

7. PCB PARTS LIST

NOTES:

- Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "⊙" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex.1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J=5%, and K=10%).

560 Ω → 56 × 10^1 → 561 ····· RD1/8PM 5 6 1 J
47k Ω → 47 × 10^3 → 473 ····· RD1/4PS 4 7 3 J
0.5 Ω → 0R5 ····· RN2H 0 R 5 K
1 Ω → 010 ····· RS1P 0 1 0 K

Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62k Ω → 562 × 10^1 → 5621 ····· RN1/4PC 5 6 2 1 F

Mark	No.	Description	Part No.
LIST OF ASSEMBLIES			
⚠		MOTHER BOARD ASSY	PWM1858
NSP		MECHANISM BOARD ASSY	PWX1279
NSP		├LOADING BOARD ASSY	PWZ2038
NSP		├MOTOR BOARD ASSY	PWZ2040
NSP		└SELECT BOARD ASSY	PWZ2533
NSP		SUB BOARD ASSY	PWX1336
		├FUNCTION BOARD ASSY	PWZ2769
NSP		└SWITCH BOARD ASSY	PWZ2804
NSP		MECHANISM BOARD ASSY	PWX1192
MOTHER BOARD ASSY			
SEMICONDUCTORS			
	IC151	SERVO IC	CXA1372Q
⚠	IC201, IC202	POWER OP-AMP IC	LA6520
⚠	IC21	REGULATOR, IC	PQ05RR12
	IC301	EFM DEMODULATION IC	CXD2517Q
	IC351	MICROCOMPUTER IC	PD4520A
	IC401	CONVERTER IC	TC9268P
	IC405	OP-AMP IC	NJM4558D-D
	Q301	TRANSISTOR	2SC3732
	Q401	N-FET	2SK246
	Q403, Q404	TRANSISTOR	2SD2144S
	Q405	TRANSISTOR	DTC124ES
⚠	D11-D14	DIODE	11ES2
	D352	ZENER DIODE	MTZJ5.1B
	D391-D394	DIODE	1SS254
	D401	DIODE	1SS254
⚠	D52	DIODE	11ES2
	D54	ZENNER DIODE	MTZJ18B
COILS			
	L351	AXIAL INDUCTOR	LAU100K
	L391	AXIAL INDUCTOR	LAU010K

Mark	No.	Description	Part No.
CAPACITORS			
	C11, C13	CERAMIC CAPACITOR	CKCYF103Z50
	C15	CERAMIC CAPACITOR	CKCYF103Z50
	C155	CERAMIC CAPACITOR	CKCYB561K50
	C156	CERAMIC CAPACITOR	CGCYX333K25
	C157	CERAMIC CAPACITOR	CGCYX103K25
	C158, C159	CERAMIC CAPACITOR	CGCYX104K25
	C16	CERAMIC CAPACITOR	CKCYF103Z50
	C160	ELECT. CAPACITOR	CEAS4R7M50
	C161	CERAMIC CAPACITOR	CGCYX104K25
	C162	ELECT. CAPACITOR	CEAS4R7M50
	C163	CERAMIC CAPACITOR	CGCYX104K25
	C164	CERAMIC CAPACITOR	CGCYX103K25
	C167	CERAMIC CAPACITOR	CKCYF103Z50
	C168	CERAMIC CAPACITOR	CGCYX333K25
	C169	CERAMIC CAPACITOR	CGCYX103K25
	C17	CERAMIC CAPACITOR	CKCYF103Z50
	C170	CERAMIC CAPACITOR	CKCYB332K50
	C171	CERAMIC CAPACITOR	CKCYB102K50
	C172	CERAMIC CAPACITOR	CKCYB472K50
	C205, C210	CERAMIC CAPACITOR	CKCYF103Z50
	C215	CERAMIC CAPACITOR	CKCYF103Z50
	C218	CERAMIC CAPACITOR	CGCYX103K25
	C219	CERAMIC CAPACITOR	CKCYF103Z50
	C25	ELECT. CAPACITOR	CEAS332M16
	C26	ELECT. CAPACITOR	CEAS331M16
	C27	ELECT. CAPACITOR	CEAS330M16
	C301	CERAMIC CAPACITOR	CGCYX104K25
	C306	CERAMIC CAPACITOR	CKCYB152K50
	C307	CERAMIC CAPACITOR	CGCYX473K25
	C308	CERAMIC CAPACITOR	CGCYX103K25
	C309	ELECT. CAPACITOR	CEASR47M50
	C313	CERAMIC CAPACITOR	CCCCH100D50
	C315	CERAMIC CAPACITOR	CKCYF103Z50
	C321	CERAMIC CAPACITOR	CCCSL101J50
	C351	ELECT. CAPACITOR	CEAS471M6R3
	C353, C361	CERAMIC CAPACITOR	CKCYF103Z50
	C403, C404	CERAMIC CAPACITOR	CCCCH150J50
	C407	CERAMIC CAPACITOR	CCCSL101J50

Mark	No.	Description	Part No.
	C413-C416	AUDIO FILM CAPACITOR	CFTYA104J50
	C417	CERAMIC CAPACITOR	CKCYF103Z50
	C425	CERAMIC CAPACITOR	CCCSL101J50
	C429, C430	CERAMIC CAPACITOR	CCCCH560J50
	C433, C434	ELECT. CAPACITOR	CEAS220M25
	C435-C438	CERAMIC CAPACITOR	CCCCH390J50
	C441, C442	FILM CAPACITOR (0.0015/50V)	PCL1030
	C52	ELECT. CAPACITOR	CEAS101M35
RESISTORS			
	VR151, VR152	VR(22K)	PCP1030
	OTHER RESISTORS		RD1/6PM□□□J
OTHERS			
	CN131	CONNECTOR	12FMZ-ABT
	CN202	CONNECTOR	VKN1051
	CN203	CONNECTOR 4P	4-173981-4
	CN204	6P JUMPER CONNECTOR	52147-0610
	CN351	CONNECTOR 32P	9604S-32C
	JA391	JACK(FOR CONTROL IN)	RKN1004
	JA392	JACK(FOR CONTROL OUT)	RKN1004
	JA401	JACK(FOR LINE OUT)	PKB1009
	X351	CERAMIC OSCILLATOR	VSS1028
	X401	CRYSTAL OSCILLATOR	PSS1008
⚠	RAPPING TERMINAL		RKC-061

LOADING BOARD ASSY

Mark	No.	Description	Part No.
SWITCHES			
	S601, S602	PUSH SWITCH	DSG1016
OTHERS			
	CN601	CONNECTOR 4P	4-173979-4

MOTOR BOARD ASSY

Mark	No.	Description	Part No.
OTHERS			
	CN602	6PJUMPER CONNECTOR	52151-0610

SELECT BOARD ASSY

Mark	No.	Description	Part No.
SWITCHES			
	S603	DETECTOR SWITCH	PSG1010
	S604-S606	PUSH SWITCH	DSG1016

FUNCTION BOARD ASSY

Mark	No.	Description	Part No.
SEMICONDUCTORS			
	D701-D703	DIODE	1SS133X
SWITCHES			
	S701-S710	SWITCH	PSG1006
OTHERS			
	V701	FL INDICATOR TUBE	PEL1084
	CN701	CONNECTOR 32P	9604S-32F
	REMOTE SENSOR		SBX1785

SWITCH BOARD ASSY

Mark	No.	Description	Part No.
SWITCHES			
	S801	SWITCH	PSG1006

MECHANISM BOARD ASSY

Mark	No.	Description	Part No.
OTHERS			
	CN610	CONNECTOR 4P	VKN1061
	S610	PUSH SWITCH	DSG1016

8. ADJUSTMENTS

8.1. Adjustment Methods

If a disc player is adjusted incorrectly or inadequately, it may malfunction or not work at all even though there is nothing at all wrong with the pickup or the circuitry. Adjust correctly following the adjustment procedure.

● Adjustment Items/Verification Items and Order

If the specified values cannot be obtained or no adjustment is possible by performing the verifications or adjustments described in steps 1 − 4, the pickup block may be defective.

Step	Item	Test Point	Adjustment Location
1	Focus offset verification	TP1, Pin 6 (FCS. ERR)	None
2	Tracking error balance verification	TP1, Pin 2 (TRK. ERR)	None
3	Pickup radial/tangential direction tilt adjustment	TP1, Pin 1 (RF)	Radial tilt adjustment screw, Tangential tilt adjustment screw
4	RF level verification	TP1, Pin 1 (RF)	None
5	Focus servo loop gain adjustment	TP1, Pin 5 (FCS. IN) TP1, Pin 6 (FCS. ERR)	VR152 (FCS. GAN)
6	Tracking servo loop gain adjustment	TP1, Pin 3 (TRK. IN) TP1, Pin 2 (TRK. ERR)	VR151 (TRK. GAN)

● **Abbreviation table**

FCS. ERR :Focus Error
TRK. ERR :Tracking Error
FCS GAN :Focus Gain
TRK GAN :Tracking Gain
FCS. IN :Focus In
TRK. IN :Tracking In

● Measuring Instruments and Tools

1. Dual trace oscilloscope (10:1 probe)
2. Low-frequency oscillator
3. Test disc (YEDS-7)
4. Low pass filter (39kΩ +0.001 μF)
5. Resistor (100 kΩ)
6. Standard tools

● Test Point and Adjustment Variable Resistor Positions

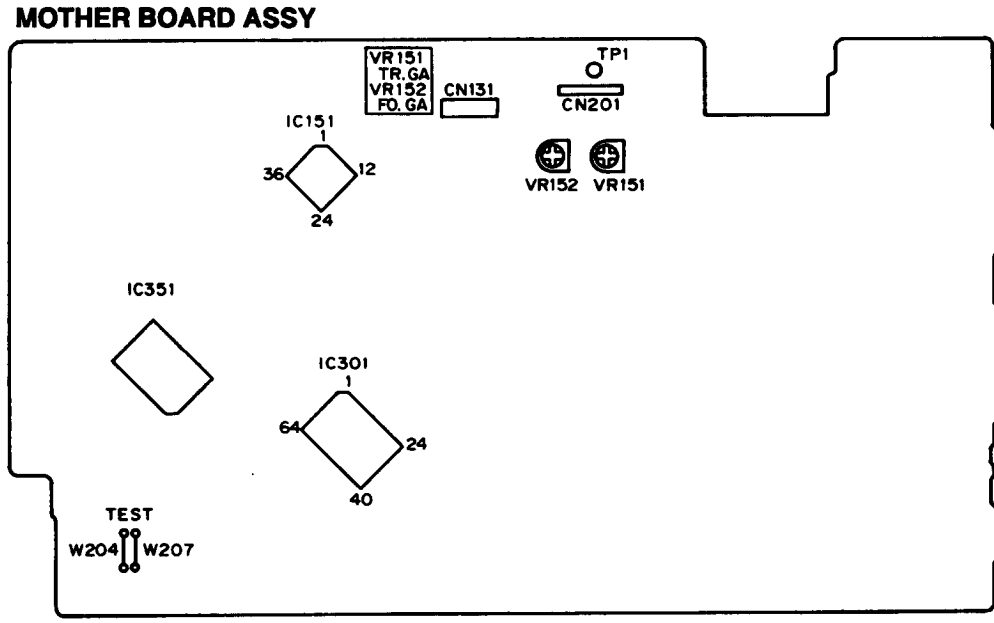


Figure 1. Adjustment Locations

● Notes

1. Use a 10:1 probe for the oscilloscope.
2. All the knob positions (settings) for the oscilloscope in the adjustment procedures are for when a 10:1 probe is used.

● Test Mode

These models have a test mode so that the adjustments and checks required for service can be carried out easily. When these models are in test mode, the keys on the front panel work differently from normal. Adjustments and checks can be carried out by operating these keys with the correct procedure. For these models, all adjustments are carried out in test mode.

[Setting these models to test mode]

How to set this model into test mode.
1. Unplug the power cord from the AC socket.
2. Short the test mode jumper wires. (See Figure 1.)
3. Plug the power cord back into the AC socket.

When the test mode is set correctly, the display is different from what it usually is when the power is turned on. If the display is still the same as usual, test mode has not been set correctly, so repeat Steps 1 – 3.

[Release from test mode]

Here is the procedure for releasing the test mode:

1. Press the STOP key and stop all operations.
2. Unplug the power cord from the AC socket.

[Operations of the keys in test mode]

Code	Key Name	Function in Test Mode	Explanation
	PGM (PROGRAM)	Focus servo close	The laser diode is lit up and the focus actuator is lifted up, then lowered slowly and the focus servo is closed at the point where the objective lens is focused on the disc. With the player in this state, if you lightly rotate the stopped disc by hand, you can hear the sound the focus servo. If you can hear this sound, the focus servo is operating correctly. If you press this key with no disc mounted, the laser diode lights up, the focus actuator is pulled up, then the actuator is lowered and raised three times and returned to its original position.
▷/▯▯	PLAY/PAUSE	Spindle servo ON	Starts the spindle motor in the clockwise direction and when the disc rotation reaches the prescribed speed (about 500 rpm at the inner periphery), sets the spindle servo in a closed loop. Be careful. Pressing this key when there is no disc mounted makes the spindle motor run at the maximum speed. If the focus servo does not go correctly into a closed loop or the laser light shines on the mirror section at the outermost periphery of the disc, the same symptom is occurred.
		Tracking servo close/open	Pressing this key when the focus servo and spindle servo are operating correctly in closed loops puts the tracking servo into a closed loop, displays the track number being played back and the elapsed time on the front panel, and outputs the playback signal. If the elapsed time is not displayed or not counted correctly or the audio is not played back correctly, it may be that the laser is shining on the section with no sound recorded at the outer edge of the disc, that something is out of adjustment, or that there is some other problem. This key is a toggle key and open/close the tracking servo alternately. This key has no effect if no disc is mounted.

Code	Key Name	Function in Test Mode	Explanation
⏮ / ◁◁	TRACK / MANUAL SEARCH REV	Carriage reverse (inwards)	Moves the pickup position toward the inner diameter of the disc. When this key is pressed with the tracking servo in a closed loop, the tracking servo automatically goes into an open loop. Since the motor does not automatically stop at the mechanical end point in test mode, be careful with this operation.
▷▷ / ⏭	TRACK / MANUAL SEARCH FWD	Carriage forward (outwards)	Moves the pickup position toward the outer diameter of the disc. When this key is pressed with the tracking servo in a closed loop, the tracking servo automatically goes into an open loop. Since the motor does not automatically stop at the mechanical end point in test mode, be careful with this operation.
□	STOP	Stop	Initializes and the disc rotation stops. The pickup and disc remain where they are when this key is pressed.
⏏	EJECT	CD magazine eject	Stores Disc 1 in the CD magazine, then ejects the CD magazine. However, even though the CD magazine is ejected, the pickup does not return to the park position. Even if the CD magazine is mounted again, the pickup remains where it is.

Note : When inserting the magazine, disc 1 of the magazine is loaded automatically.

[How to play back a disc in test mode]

In test mode, since the servos operate independently, playing back a disc requires that you operate the keys in the correct order to close the servos.
Here is the key operation sequence for playing back a disc in test mode.

PGM(PROGRAM)	Lights up the laser diode and closes the focus servo.
⇩	
▷/ ⏸	Starts the spindle motor and closes the spindle servo.
⇩	
▷/ ⏸	Closes the tracking servo.

Wait at least 2-3 seconds between each of these operations.

1. Focus Offset Verification

● Objective ● Symptom when out of adjustment	Verify the DC offset for the focus error amp. The model does not focus in and the RF signal is dirty.		
● Measurement instrument connections	Connect the oscilloscope to TP1, Pin 6 (FCS. ERR) [Settings] 5 mV/division 10 ms/division DC mode	● Player state ● Adjustment location ● Disc	Test mode, stopped (just the Power switch on) None None needed

[Procedure]

Verify the DC voltage at TP1, Pin 6 (FCS. ERR) is 0 ± 50 mV.

Note : If the specified values cannot be obtained or no adjustment is possible by performing the verifications or adjustments described in adjustment items 1 − 4, the pickup block may be defective.

2. Tracking Error Balance Verification

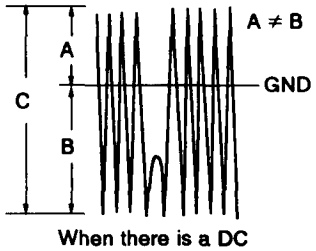
● Objective ● Symptom when out of adjustment	To verify that there is no variation in the sensitivity of the tracking photo diode. Play does not start or track search is impossible.		
● Measurement instrument connections	Connect the oscilloscope to TP1, Pin 2 (TRK. ERR). This connection may be via a low pass filter. [Settings] 50 mV/division 5 ms/division DC mode	● Player state ● Adjustment location ● Disc	Test mode, focus and spindle servos closed and tracking servo open None YEDS-7

[Procedure]

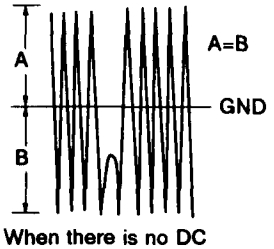
1. Move the pickup to midway across the disc (R=35 mm) with the TRACK/MANUAL SEARCH FWD ▷▷ • ▷▷| or REV |◁◁ • ◁◁ key.
2. Press the PGM (PROGRAM) key, then the PLAY/PAUSE ▷/ ▯▯ key in that order to close the focus servo then the spindle servo.
3. Line up the bright line (ground) at the center of the oscilloscope screen and put the oscilloscope into DC mode.
4. Supposing that the positive amplitude of the tracking error signal at TP1, pin 2 (TRK ERR) is (A) and the negative amplitude is (B), the following expression is satisfied.

When $A \geqq B$, $\frac{A-B}{C} \times \frac{1}{2} \leqq 0.1$

When $A < B$, $\frac{B-A}{C} \times \frac{1}{2} \leqq 0.1$



When there is a DC component



When there is no DC component

3. Pickup Radial/Tangential Tilt Adjustment

● Objective	To adjust the angle of the pickup relative to the disc so that the laser beams are shone straight down into the disc for the best read out of the RF signals.		
● Symptom when out of adjustment	Sound broken;some discs can be played but not others.		
● Measurement instrument connections	Connect the oscilloscope to TP1, Pin 1 (RF). [Settings] 20 mV/division 200 ns/division AC mode	● Player state ● Adjustment location ● Disc	Test mode, play Pickup radial tilt adjustment screw and tangential tilt adjustment screw YEDS-7

[Procedure]

1. Press the TRACK/MANUAL SEARCH FWD ▷▷ • ▷▷| or REV |◁◁ • ◁◁ key to move the pickup to halfway across the disc (R=35mm).
   Press the PGM (PROGRAM) key, the PLAY/PAUSE ▷ / ▯▯ key twice in that order to close the respective servos and put the player into play mode.
2. First, adjust the radial tilt adjustment screw with a Phillips screwdriver so that the eye pattern (the diamond shape at the center of the RF signal) can be seen the most clearly.
3. Next, adjust the tangential tilt adjustment screw with a Phillips screwdriver so that the eye pattern (the diamond shape at the center of the RF signal) can be seen the most clearly (Figure 3).
4. Adjust the radial tilt adjustment screw and the tangential tilt adjustment screw again so that the eye pattern can be seen the most clearly. As necessary, adjust the two screws alternately so that the eye pattern can be seen the most clearly.
5. When the adjustment is completed, lock the radial and tangential adjustment screw.
   Note:Radial and tangential mean the directions relative to the disc shown in Figure 2.

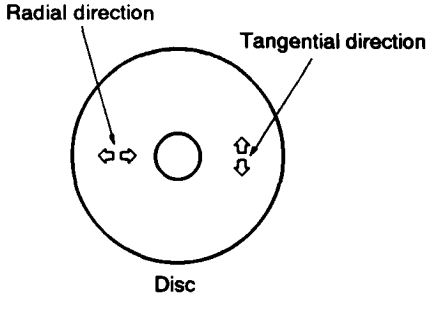
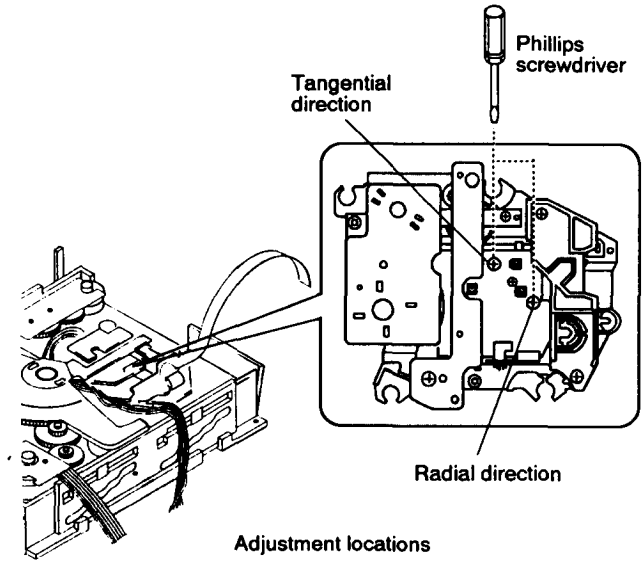


Figure 2



Adjustment locations

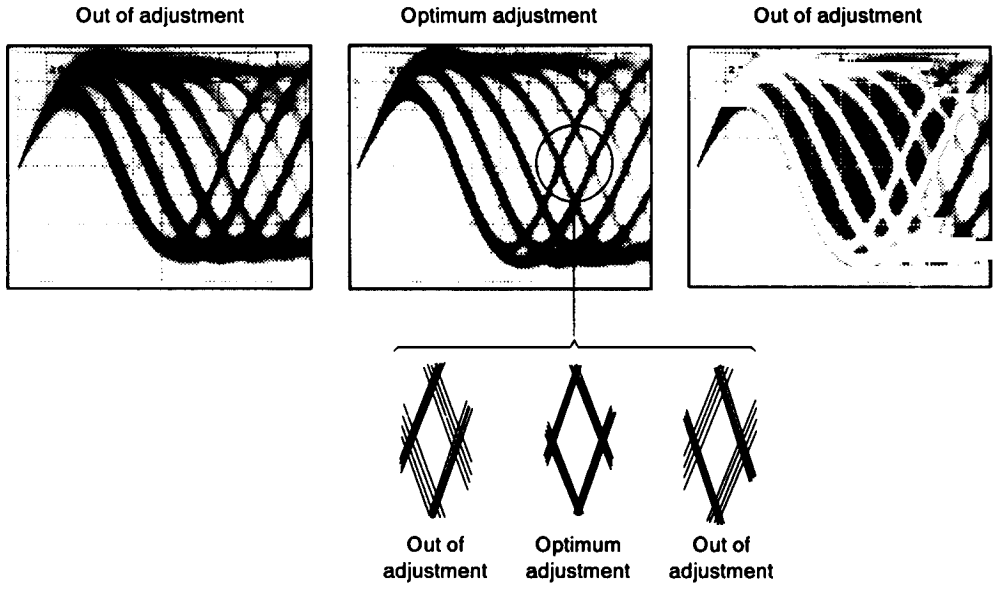


Figure 3. Eye pattern

4. RF Level Verification

● Objective ● Symptom when out of adjustment	To verify the playback RF signal amplitude No play or no search		
● Measurement instrument connections	Connect the oscilloscope to TP1, Pin 1 (RF). [Settings] 50 mV/division 10 ms/division AC mode	● Player state ● Adjustment location ● Disc	Test mode, play None YEDS-7

[Procedure]

1. Move the pickup to midway across the disc (R=35 mm) with the TRACK/MANUAL SEARCH FWD ▷▷ · ▷▷| or REV |◁◁ · ◁◁ key, then press the PGM (PROGRAM) key, the PLAY/PAUSE ▷ / ▯▯ key twice in that order to close the respective servos and put the player into play mode.
2. Verify the RF signal amplitude is 1.2 Vp-p ± 0.2 V.

5. Focus Servo Loop Gain Adjustment

● Objective	To optimize the focus servo loop gain.		
● Symptom when out of adjustment	Playback does not start or focus actuator noisy.		
● Measurement instrument connections	See figure 4. [Settings] CH1 CH2 20 mV/division 5 mV/division X-Y mode	● Player state ● Adjustment location ● Disc	Test mode, play VR152 (FCS. GAN) YEDS-7

[Procedure]

1. Set the AF generator output to 1.2 kHz and 1 Vp-p.
2. Press the TRACK/MANUAL SEARCH FWD ▷▷ • ▷▷| or REV |◁◁ • ◁◁ key to move the pickup to halfway across the disc (R=35 mm), then press the PGM (PROGRAM) key, the PLAY/PAUSE ▷ / ▯▯ key twice in that order to close the corresponding servos and put the player into play mode.
3. Adjust VR152 (FCS. GAN) so that the Lissajous waveform is symmetrical about the X axis and the Y axis.

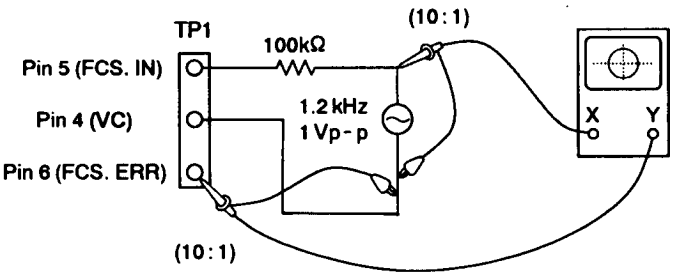
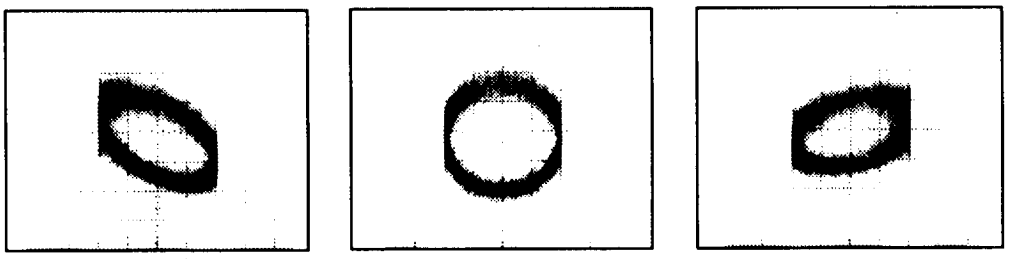


Figure 4

Focus Gain Adjustment



Higher gain | Optimum gain | Lower gain

6. Tracking Servo Loop Gain Adjustment

● Objective	To optimize the tracking servo loop gain.		
● Symptom when out of adjustment	Playback does not start, during searches the actuator is noisy, or tracks are skipped.		
● Measurement instrument connections	See Figure 5. [Settings] CH1 CH2 50 mV/division 20 mV/division X-Y mode	● Player state ● Adjustment location ● Disc	Test mode, play VR151 (TRK. GAN) YEDS-7

[Procedure]

1. Set the AF generator output to 1.2 kHz and 2 Vp-p.
2. Press the TRACK/MANUAL SEARCH FWD ▷▷ • ▷▷| or REV |◁◁ • ◁◁ key to move the pickup to halfway across the disc (R=35 mm), then press the PGM (PROGRAM) key, the PLAY/PAUSE ▷/ ▯▯ key twice in that order to close the corresponding servos and put the player into play mode.
3. Adjust VR151 (TRK. GAN) so that the Lissajous waveform is symmetrical about the X axis and the Y axis.

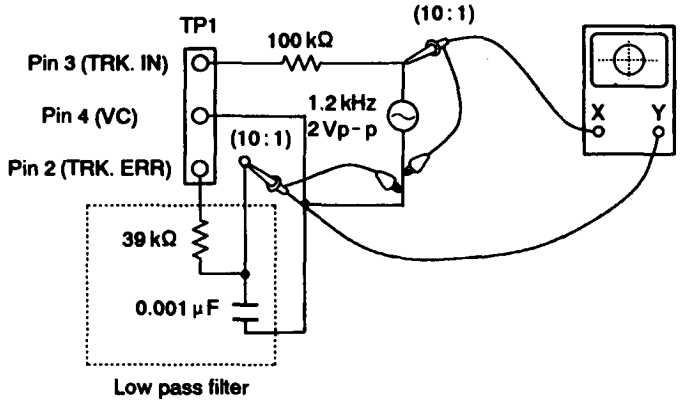
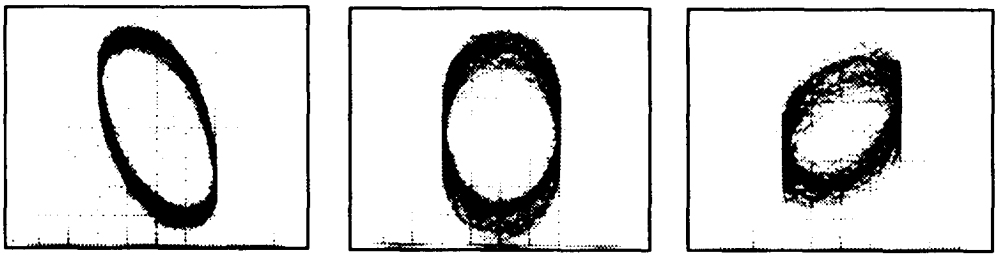


Figure 5

Tracking Gain Adjustment



Higher gain | Optimum gain | Lower gain

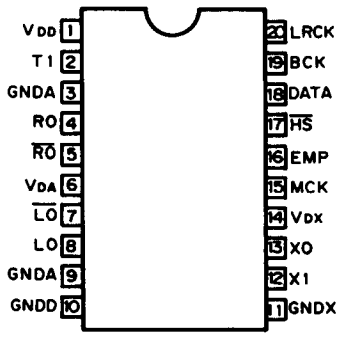
9. IC INFORMATION

- The information shown in the list is basic information and may not correspond exactly to that shown in the schematic diagrams.

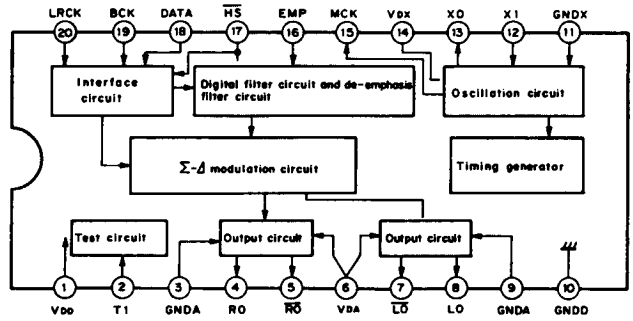
■ TC9268P (IC401)

D/A Convertor IC

● Pin Arrangement (Top view)



● Block Diagram



● Pin Functions

Pin No.	Symbol	I/O	Function
1	VDD	–	Power supply pin of digital section.
2	T1	I	Test pin. Normally "L".
3	GNDA	–	Ground pin of analog section for R channel.
4	RO	O	R channel data normal output pin.
5	$\overline{RO}$	O	R channel data inversion output pin.
6	VDA	–	Power supply pin of analog section.
7	$\overline{LO}$	O	L channel data inversion output pin.
8	LO	O	L channel data normal output pin.
9	GNDA	–	Ground pin of analog section for L channel.
10	GNDD	–	Ground pin of digital section.
11	GNDX	–	Ground pin of crystal oscillation section.
12	XI	I	Connected to crystal oscillator. Generates clock required for the system.
13	XO	O	
14	VDX	–	Power supply pin of crystal oscillation section.
15	MCK	O	System clock output pin.
16	EMP	I	De-emphasis filter control pin. De-emphasis filter on at "H". De-emphasis filter off at "L".
17	$\overline{HS}$	I	Normal speed/ ×2 speed selection pin. "H" : Normal speed, "L" : ×2 speed.
18	DATA	I	Data input pin.
19	BCK	I	Bit clock input pin.
20	LRCK	I	LR clock input pin.

■ PD4520A (IC351)
System Control

● Pin Functions

Pin No.	Symbol	Name	Function	I/O	Reset	Potential	
1	RESET	REST	CPU reset ("L" : Reset)	–	–	–	
2	T0	G1	DIGIT output for FL driving.	O	–26V	⎍	Built-in pull-down resistor
3	T1	G2					
4	T2	G3					
5	T3	G4					
6	T4	G5					
7	T5	G6					
8	T6	G7					
9	T7	G8					
10	T8	G9					
11	T9	Not used	NC (open)	O	–	–	
12	PH3	MUTE	Muting output. ("L" : Mute, "H" OFF)	O	–	L	
13	PH2	SYC3	Sync output.	O	–	L	
14	PH1	OSCE	OSCE output. ("L" : Oscillation, "H" : Stop)	O	–	L	
15	PH0	STBL	Standby LED output. ("L" : OFF, "H" : Light)	O	–	L	
16	S11	SEG l	SEGMENT output for FL driving.	O	–26V	–26V	
17	S10	SEG k					
18	Vload		–26V	–	–	–	
19	Vpre		–5V	–	–	–	
20	S9	SEG j	SEGMENT output for FL driving.	O	–26V	–26V	Built-in pull-down resistor
21	S8	SEG i					
22	S7	SEG d					
23	S6	SEG c					
24	S5	SEG b					
25	S4	SEG a					
26	VDD	VDD	+5V	–	–	–	
27	S3	SEG h	SEGMENT output for FL driving.	O	–26V	–26V	
28	S2	SEG g					
29	S1	SEG f					
30	S0	SEG e					
31	P00	SYC I	Sync input.	I	–	–	
32	SCK	CLOK	Serial clock.	O	–	H	

(Disc Selector UP/DOWN)

Selector	DSDW	DSUP
UP	L	H
DOWN	H	L
Stop	L	L

(Loading Selector)

Tray	LOUT	LIN
IN	L	H
OUT	H	L
Stop	L	L

Pin No.	Symbol	Name	Function	I/O	Reset	Potential
33	S0	DATA	LSI control data serial output.	O	–	H
34	S1	SQSO	Subcode Q data serial input.	I	–	–
35	INT 0	RMDT	Remote control data input.	I	–	–
36	INT 1	SCOR	Subcode sync S0+S1 input.	I	–	–
37	P12	INSD	Slider inside SW input. ("L" : INSIDE)	I	–	–
38	P13	FOCK	Focus OK input ("H" : OK, "L" : NG)	I	–	–
39	P20	LIN	Disk tray IN/OUT. (See page 35)	O	–	L
40	P21	LOUT		O	–	L
41	P22	DSDW	Disk selector UP/DOWN. (See page 35)	O	–	L
42	P23	DSUP		O	–	L
43	P30	LPS2	Load position SW input. (See the following)	I	–	–
44	P31	LPS1		I	–	–
45	P32	DCNT	DISC selector count pulse. (See the following)	I	–	–
46	P33	DCHM	DISC selector home. (See the following)	I	–	–
47	P60	MZS2	Magazine discrimination SW input. (See the following)	I	–	–
48	P61	MZS1		I	–	–
49	S62	SENS	LSI operation condition multi mode input.	I	–	–
50	S63	GFS	Frame sync lock input. ("H" : OK, "L" : NG)	I	–	–
51	P40	MUTE	Muting output. ("H" : Mute, "L" : OFF)	O	–	H
52	P41	DEMP	De-emphasis output. ("H" : ON)	O	–	L
53	P42	XLAT	LSI control data latch pulse.	O	–	H
54	P43	XRST	LSI reset. ("L" : RESET, "H" : Release)	O	–	L
55	PPO	LDON	Laser diode output. ("H" : OFF, "L" : ON)	O	–	H
56	X1	X1	Main system clock oscillation. (4.194304 MHz)	–	–	–
57	X2	X2				
58	VSS	VSS	GND	–	–	–
59	XT1	Not used	GND (Vss)	–	–	–
60	XT2	Not used	NC (open)	–	–	–
61	P50	KD 0/TEST	Key scan input and TEST mode request input.	I	–	–
62	P51	KD1	Key scan input.	I	–	–
63	P52	KD2				
64	P53	KD3				

(Magazine Discrimination)

	MZS 1	MZS 2
Magazine OUT	H	*
IN Multi	L	H
IN Single	L	L

(DISC Select)

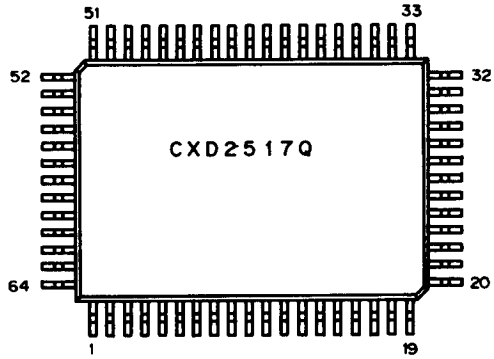
	DCNT	DCHM
2 to 6 DISCS	L	H
HOME	L	L
During selecting	H	*

(Load Position SW)

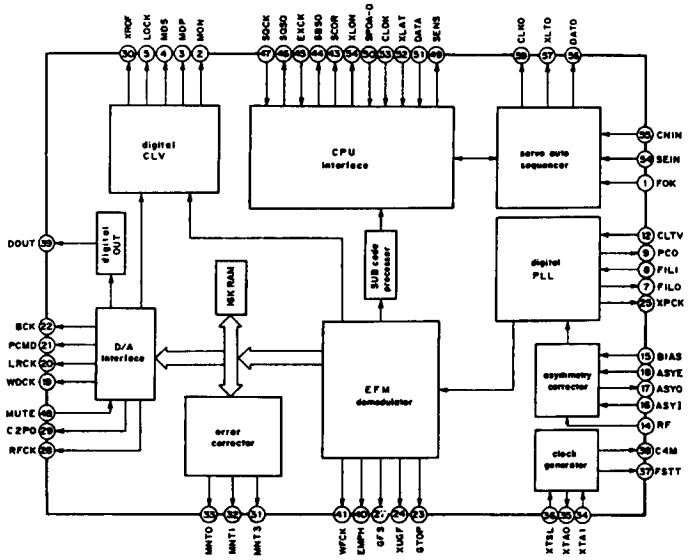
	LPS	LPS
CLAMP	L	L
LOADING	L	H
HOME	H	H
EJECT	H	L

■ CXD2517Q (IC301)
EFM Demodulator IC

● Pin Arrangement (Top view)



● Block Diagram



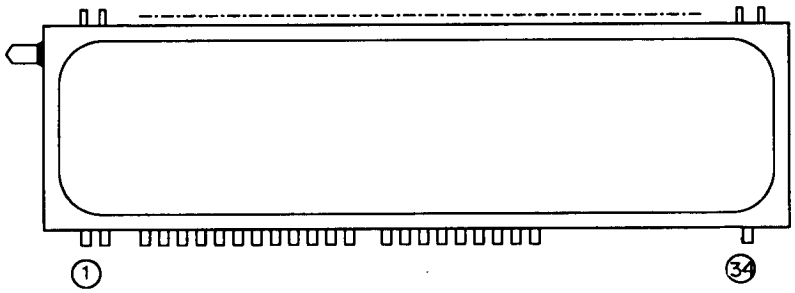
● Pin Functions

Pin No.	Symbol	I/O		Function
1	FOK	I	–	Focus OK input pin. Used for SENS output and servo auto sequence.
2	MON	O	1, 0	ON/OFF control output for spindle motor.
3	MDP	O	1, Z, 0	Spindle motor servo control.
4	MDS	O	1, Z, 0	Spindle motor servo control.
5	LOCK	O	1, 0	High output GFS is sampled at 460 Hz and that is High; Low output when GFS is sampled 8 times and that is Low.
6	TEST	I	–	Test pin, normally GND.
7	FILO	O	Analog	Filter output for master PLL .(slave=digital PLL)
8	FILI	I	–	Master PLL filter input.
9	PCO	O	1, Z, 0	Master PLL charge pump output.
10	Vss	–	–	GND
11	AVss	–	–	Analog GND
12	CLTV	I	–	Master VCO control voltage input.
13	AVDD	–	–	Analog power supply. (+5V)
14	RF	I	–	EFM signal input.
15	BIAS	I	–	Asymmetry circuit constant current input.
16	ASYI	I	–	Asymmetry comparator voltage input.
17	ASYO	O	1, 0	EFM full-swing output. (Low=Vss, High=VDD)
18	ASYE	I	–	"L": Asymmetry circuit OFF, "H": Asymmetry circuit ON.
19	WDCK	O	1, 0	D/A interface. Word clock f=2 Fs.
20	LRCK	O	1, 0	D/A interface. LR clock F=FS.
21	PCMD	O	1, 0	D/A interface. Serial data . (2's COMP, MSB fast)
22	BCK	O	1, 0	D/A interface. Bit clock.
23	GTOP	O	1, 0	GTOP output.
24	XUGF	O	1, 0	XUGF output.
25	XPCK	O	1, 0	XPLCK output.

Pin No.	Symbol	I/O		Function
26	V_{DD}	–	–	Power supply . (+5V)
27	GFS	O	1, 0	GFS output.
28	RFCK	O	1, 0	RFCK output.
29	C2PO	O	1, 0	C2PO output.
30	XROF	O	1, 0	XRAOF output.
31	MNT3	O	1, 0	MNT3 output.
32	MNT1	O	1, 0	MNT1 output.
33	MNT0	O	1, 0	MNT0 output.
34	XTAI	I	–	Crystal oscillator circuit input. 16.9344 MHz or 33.8688 MHz input.
35	XTAO	O	1, 0	16.9344 MHz crystal oscillation circuit output.
36	XTSL	I	–	Crystal selection input. Low for 16.9344 MHz crystal; High for 33.8688 MHz crystal.
37	FSTT	O	1, 0	2/3 frequency divider input of Pins 34 and 35.
38	C4M	O	1, 0	4.2336 MHz output.
39	DOUT	O	1, 0	Digital Out output.
40	EMPH	O	1, 0	Playback disc emphasis mode output. (Low for no emphasis applied; High for emphasis applied)
41	WFCK	O	1, 0	WFCK output.
42	Vss	–	–	GND
43	SCOR	O	1, 0	Subcode sync output. (High for subcode sync S0 or S1 detected)
44	SBSO	O	1, 0	Sub P to W serial output.
45	EXCK	I	–	SBSO readout clock input.
46	SQSO	O	1, 0	Sub Q 80-bit serial output.
47	SQCK	I	–	SQSO readout clock input.
48	MUTE	I	–	"H": Mute, "L": Release.
49	SENS	O	1, 0	SENS output .(Output to CPU)
50	XRST	I	–	System reset .(Low for reset)
51	DATA	I	–	Serial data input from CPU.
52	XLAT	I	–	Latch input from CPU. Latches serial data at falling edge.
53	CLOK	I	–	Serial data transfer clock input from CPU.
54	SEIN	I	–	Sense input from SSP.
55	CNIN	I	–	Track jump number count signal input.
56	DATO	O	1, 0	Serial data output to SSP.
57	XLTO	O	1, 0	Serial data latch output to SSP. Latches at falling edge.
58	V_{DD}	–	–	Power supply . (+5V)
59	CLKO	O	1, 0	Serial data transfer clock output to SSP.
60	SPOA	I	–	Microprocessor extension interface. (input A)
61	SPOB	I	–	Microprocessor extension interface. (input B)
62	SPOC	I	–	Microprocessor extension interface. (input C)
63	SPOD	I	–	Microprocessor extension interface. (input D)
64	XLON	O	1, 0	Microprocessor extension interface. (output)

10. FL INFORMATION

■ PEL1084 (V701)

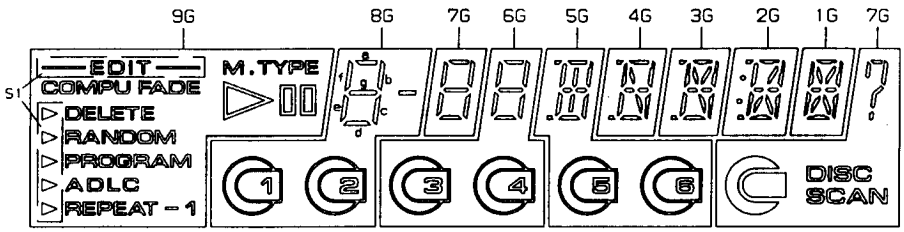


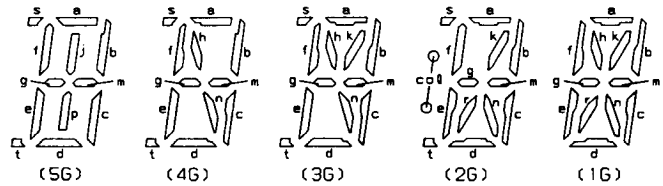
PIN CONNECTION

PIN NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
CONNECTION	F1	F1	NP	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	NX	9G	8G	7G	6G	5G	4G	3G	2G	1G	NX	NX	NX	NX	NX	NX	NP	NX	F2

NOTE 1) F1,F2 --- Filament
2) NP ------ No pin
3) NX ------ No extend pin
4) 1G~9G --- Grid

GRID ASSIGNMENT





ANODE CONNECTION

	9G	8G	7G	6G	5G	4G	3G	2G	1G
P1	RANDOM	e	e	e	e	e	e	e	e
P2	FADE	f	f	f	f	f	f	f	f
P3	COMPU	g	g	g	g,m	g	g,m	g,m	g
P4	□□	—	?	-	s,t	m	s,t	s,t	m
P5	M.TYPE	a	a	a	a	a	a	a	a
P6	S1	b	b	b	b	b	b	b	b

	9G	8G	7G	6G	5G	4G	3G	2G	1G
P7	DELETE	c	c	c	c	c	c	c	c
P8	PROGRAM	d	d	d	d	d	d	d	d
P9	▷	-	DISC	-	j,p	h	h	col	h
P10	ADLC	-	SCAN	-	-	s	k	k	k
P11	-1	①	C	③	⑤	n	n	n	n
P12	REPEAT	②	▭	④	⑥	t	-	r	r

11. FOR PD-M423/KCXJ, PD-M403/KUXJ AND KCXJ

CONTRAST OF MISCELLANEOUS PARTS

NOTES:

- Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "⊙" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.

PD-M423/KCXJ, PD-M403/KUXJ, KCXJ and PD-M423/KUXJ have the same construction except for the following:

Mark	Symbol and Description	Part No.				Remarks
		PD-M423/ KUXJ	PD-M423/ KCXJ	PD-M403/ KUXJ	PD-M403/ KCXJ	
⚠	Mother Board Assy	PWM1858	PWM1858	PWM1856	PWM1856	
NSP	Sub Board Assy	PWX1336	PWX1336	PWX1334	PWX1334	
	Function Board Assy	PWZ2769	PWZ2769	PWZ2768	PWZ2768	
⚠	Power Cord with Plug	PDG1015	RDG1010	PDG1015	RDG1010	
⚠	Strain Relief	CM – 22C	CM – 22	CM – 22C	CM – 22	
	32P F.F.C/30V (J701)	PDD1041	PDD1041	Not Used	Not Used	
	30P F.F.C/30V (J701)	Not Used	Not Used	PDD1049	PDD1049	
	Display Window	PAM1635	PAM1635	PAM1634	PAM1634	
	Function Panel	PNW2387	PNW2387	PNW2389	PNW2389	
NSP	Rear Base	PNA2068	PNA2069	PNA2071	PNA2072	
	65 Label	ORW1069	Not Used	ORW1069	Not Used	
	Remote Control Unit	PWW1089	PWW1089	Not Used	Not Used	
	Battery Cover	PZN1010	PZN1010	Not Used	Not Used	
NSP	Battery (R03, AAA)	VEM – 022	VEM – 022	Not Used	Not Used	
	Operating Instructions (English)	PRB1205	Not Used	PRB1205	Not Used	
	Operating Instructions (English/French)	Not Used	PRE1191	Not Used	PRE1191	
	Packing Case	PHG1999	PHG2000	PHG2002	PHG2003	

MOTHER BOARD ASSY

PWM1856 and PWM1858 have the same construction except for the following:

Mark	Symbol and Description	Part No.		Remarks
		PWM1858	PWM1856	
	D391	1SS254	Not Used	
	CN351 (Connector 32P)	9604S – 32C	Not Used	
	CN351 (Connector 30P)	Not Used	9604S – 30C	

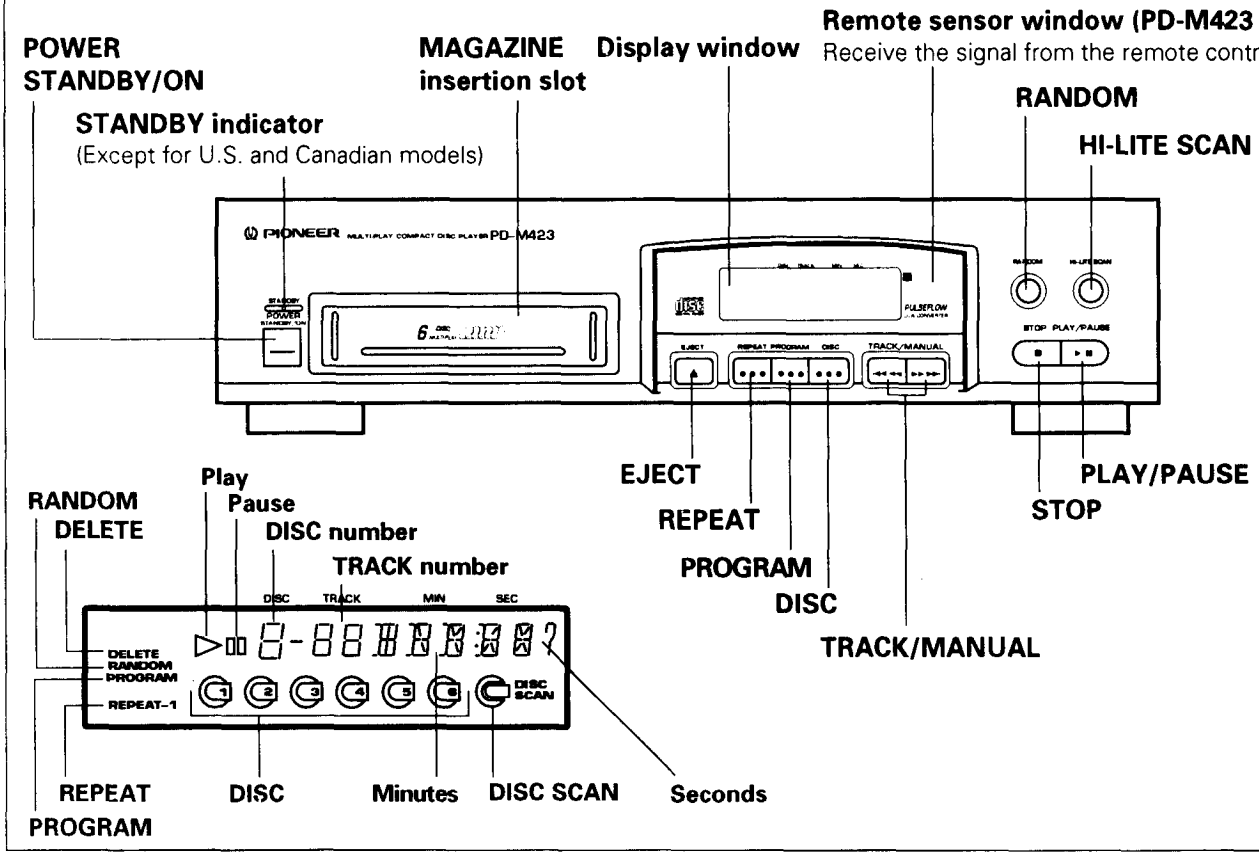
FUNCTION BOARD ASSY

PWZ2768 and PWZ2769 have the same construction except for the following:

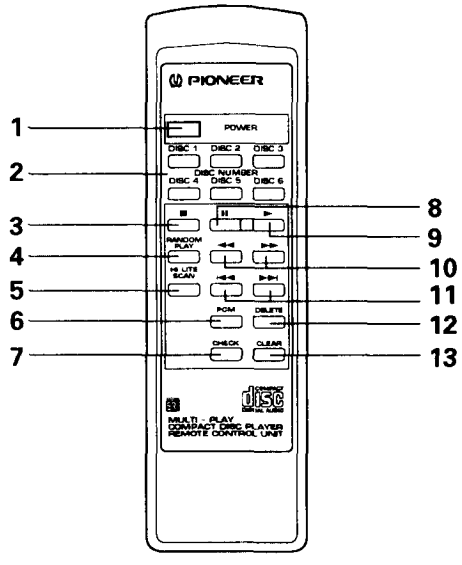
Mark	Symbol and Description	Part No.		Remarks
		PWZ2769	PWZ2768	
	Remote Sensor	SBX1785 – 51	Not Used	
	CN701 (Connector 32P)	9607S – 32F	Not Used	
	CN701 (Connector 30P)	Not Used	9607S – 30F	

12. PANEL FACILITIES

FRONT PANEL



REMOTE CONTROL UNIT (PD-M423 only)



Remote control buttons with the same names or marks as buttons on the front panel of the player control the same operations as the corresponding front panel buttons.

1 POWER button
2 DISC NUMBER buttons (DISC 1-DISC 6)
3 STOP button (■)
4 RANDOM PLAY button
5 HI-LITE SCAN button
6 PGM (program) button
7 CHECK button
8 PAUSE button
9 PLAY button (►)
10 MANUAL search buttons (◄◄, ►►)
11 TRACK search buttons (I◄◄ , ►►I)
12 DELETE button
13 CLEAR button

13. SPECIFICATIONS

General

Type ..... Compact disc digital audio system
Power requirements
U.S. model ..... AC 120 V, 60 Hz
U.K. and Australian models ..... AC 220-240 V, 50/60Hz
Power consumption
U.S.model ..... 10 W
U.K. and Australian models ..... 12 W
Operating temperature ..... +5°C-+35°C (+41°F– +95°F)
Weight (without package) ..... 3.7 kg (8 lb, 3 oz)
External dimensions ..... 420(W) x 294 (D) x 105 (H) mm 16-9/16 (W) x 11-9/16 (D) x 4-1/8 (H) in

Audio section

Frequency response ..... 2 Hz – 20 kHz
S/N ratio ..... 98dB or more (EIAJ)
Dynamic range ..... 95dB or more (EIAJ)
Harmonic distortion ..... 0.005% or less (EIAJ)
Output voltage ..... 2.0 V
Wow and flutter ..... Limit of measurement (0.001% W.PEAK) or less (EIAJ)
Channels ..... 2-channel (stereo)

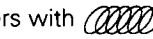
Output terminal

Audio line output
Control input/output jacks (Except for PD-M423 of Australian model.)

Accessories

- Remote control unit (PD-M423 only) 1
- Size AAA/R03 dry batteries (PD-M423 only) 2
- Six-compact-disc magazine 1
- Control cable (Except for PD-M423 of Australian model) 1
- Output cable 1
- Operating instructions 1

Specifications and design subject to possible modification without notice, due to improvements.

The Magazine Type Multi-Play CD Players with  mark and the Magazines with the same mark are compatible for 5 inch (12 cm) discs.