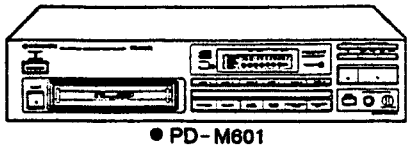
PIONEER®
The Art of Entertainment

Service Manual



● PD-M601

ORDER NO.
ARP2434

MULTI-PLAY COMPACT DISC PLAYER

PD-M601
PD-M551
PD-M501

PD-M601, PD-M551 AND PD-M501 HAVE THE FOLLOWING :

Type	Model			Power Requirement	Remarks
			PD-M501		
KU	○	○	○	AC120V only	
KUXJS	○	○	○	AC120V only	
KC	○	–	○	AC120V only	
KCXJS	○	–	○	AC120V only	
WEMXJS	○	–	○	AC220V-240V	
WBXJS	○	–	–	AC220V-240V	
RD	–	–	○	AC110-127V, 220-240V (switchable)	
WPW	–	–	○	AC220V-240V	

- **This manual is applicable to the following : PD-M601/KU, KUXJS, KC and KCXJS ; PD-M551/KU and KUXJS ; PD-M501/KU, KUXJS, KC and KCXJS.**
- **For the following : PD-M601/KUXJS, KC and KCXJS ; PD-M551/KU and KUXJS ; PD-M501/KU, KUXJS, KC and KCXJS, refer to page 39.**
- **For the other types, refer to applicable service manuals.**

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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
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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.

1. SAFETY INFORMATION

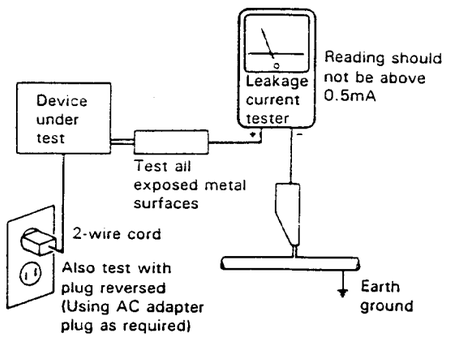
(FOR USA MODEL ONLY)

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.

(FOR EUROPEAN MODEL ONLY)

VARO!
AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTTIINA NÄKYMÄTTÖMÄLLE LASERSÄTEILYLLE. ÄLÄ KATSO SÄTEESEEN.

ADVERSEL:
USYNLIG LASERSTRÅLING VED ÅBNING NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION UNDGÅ UDSAETTELSE FOR STRÅLING.

VARNING!
OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD OCH SPÄRREN ÄR URKOPPLAD. BETRAKTA EJ STRÅLEN.

LASER
Kuva 1
Lasersateilyn varoitusmerkki

WARNING!
DEVICE INCLUDES LASER DIODE WHICH EMITS INVISIBLE INFRARED RADIATION WHICH IS DANGEROUS TO EYES. THERE IS A WARNING SIGN ACCORDING TO PICTURE 1 INSIDE THE DEVICE CLOSE TO THE LASER DIODE.

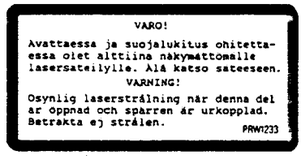
IMPORTANT
THIS PIONEER APPARATUS CONTAINS LASER OF CLASS 1.
SERVICING OPERATION OF THE APPARATUS SHOULD BE DONE BY A SPECIALLY INSTRUCTED PERSON.

LASER DIODE CHARACTERISTICS
MAXIMUM OUTPUT POWER: 5 mw
WAVELENGTH: 780-785 nm

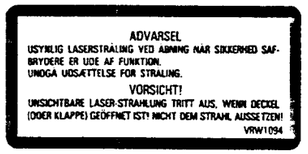
LASER
Picture 1
Warning sign for laser radiation

LABEL CHECK (MULTI MAGAZINE type)

WEMXJS type

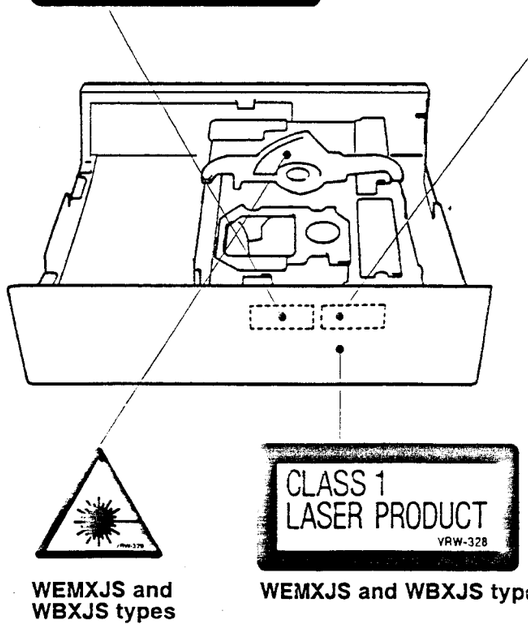

VARO!
Avattaessa ja suojalukitus ohitettaessa olet alttiina näkymättömälle lasersäteilylle. Älä katso säteeseen.
VARNING!
Osynlig laserstrålning när denna del är öppnad och spärren är urkopplad. Betrakta ej strålen.
PRW1233

WEMXJS type


ADVARSEL
USYNLIG LASERSTRÅLING VED ÅBNING NÅR SIKKERHED SAFBRYDERE ER UDE AF FUNKTION.
UNDGA UDSÆTTELSE FOR STRALING.
VORSICHT!
UNSICHTBARE LASER-STRAHLUNG TRITT AUS, WENN DECKEL (ODER KLAPPE) GEÖFFNET IST! NICHT DEM STRAHL AUSSETZEN!
VRW1094

WBXJS type

CAUTION
INVISIBLE LASER RADIATION WHEN OPEN, AVOID EXPOSURE TO BEAM
PRW1018



CLASS 1
LASER PRODUCT
VRW-328

WEMXJS and WBXJS types

WEMXJS and WBXJS types

Additional Laser Caution

1. Laser Interlock Mechanism
   The ON/OFF (ON : low level,OFF : high level) status of the LPS1 (S601) and LPS2 (S602) switches for detecting the loading state is detected by the system microprocessor, and the design prevents laser diode oscillation when both switches LPS1 and LPS2 are not ON (low level) (clamped state).
   Thus, interlock will no longer function if switches LPS1 (S601) and LPS2 (S602) are deliberately shorted.
   The interlock also does not operate in the test mode ＊.
   Laser diode oscillation will continue, if pins 1 and 2 of M51593FP (IC101) on the preamplifier board loaded on pick up assembly are connected to GND, or pin 19 is connected to low level (ON), or else the terminals of Q101 are shorted to each other (fault condition).

2. When the cover is opened with the servo mechanism block removed to be turned over, close viewing of the objective lens with the naked eye will cause exposure to a Class 1 laser beam.

'92 M1

＊ : Refer to page 28.

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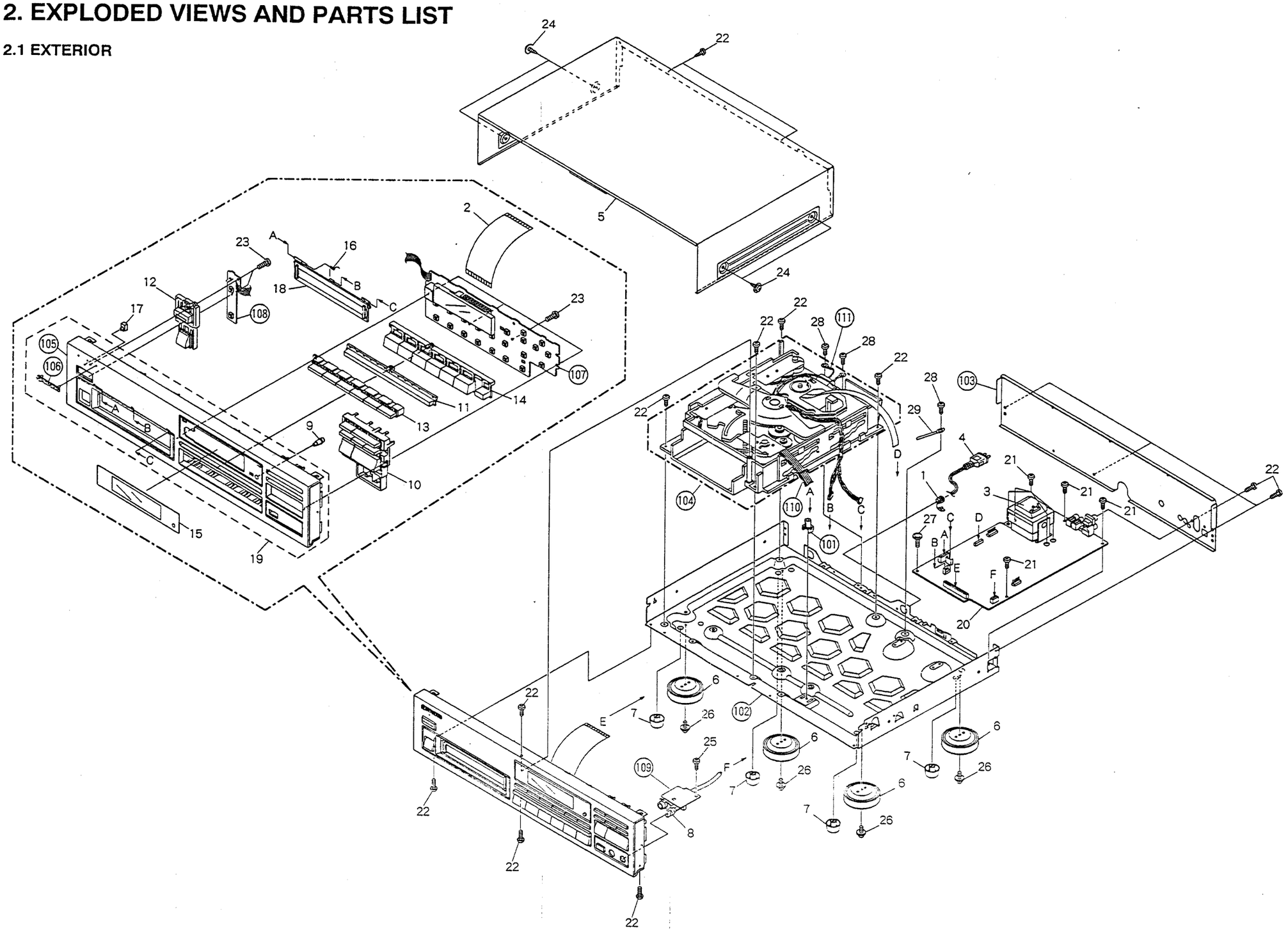
2. EXPLODED VIEWS AND PARTS LIST

2.1 EXTERIOR



NOTES:

- *The parts with an encircled number are generally unavaliable 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	Strain relief	CM-22
	2	32P F.F.C /30V	PDD1125
⚠	3	Power transformer	PTT1235
⚠	4	Power cord with plug	RDG1010
	5	Bonnet	PYY1149
	6	Insulator (For PD-M601,M551)	PNW1912
	7	Leg assembly (For PD-M501)	PXA1201
	8	Knob (Headphone)	PAC1370
	9	Time button B	PAC1549
	10	Play button A	PAC1633
	11	Fix button	PAC1639
	12	Power button A	PAC1642
	13	Disc button	PAC1643
	14	Program button	PAC1646
	15	Display window	PAM1550
	16	Spring(Door)	PBH1022
	17	LED lens	PNW2019
	18	Door	PNW2138
	19	Function panel assembly	PEA1195
◉	20	Mother board assembly	PWM1583
	21	Screw	BBZ30P060FMC
	22	Screw	BBZ30P080FZK
	23	Screw	PPZ30P120FMC
	24	Screw	FBT40P080FZK
	25	Screw	IBZ30P060FCC
	26	Screw	IBZ30P100FCC
	27	Screw	IBZ30P180FMC
	28	Screw	PDZ30P050FMC
	29	Cord clamper	RNH-184

Mark	No.	Description	Part No.
	101	PCB mould	AMR1525
	102	Under base	PNA1751
	103	Rear base	PNA1752
	104	Multi mechanism assembly	PXA1429
	105	Function panel	PNW2139
	106	Name plate	PAM1407
	107	Function board assembly	PWZ2291
	108	Switch board assembly	PWZ2296
	109	Headphone board assembly	PWZ2300
	110	Flat cable (6P)	D20PYY0615E
	111	Earth lead unit	XDF-502

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2.2 MULTI MECHANISM ASSEMBLY

Parts List

Mark	No.	Description	Part No.
	1	Motor pulley	PNW1634
	2	Gear holder	PNW1929
	3	• • • • •	
	4	Cam gear	PNW1923
	5	Belt	PEB1138
	6	Top guide	PNW1914
	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	PBA1055
	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 L	PNW1915
	34	Stair R	PNW1916
	35	Synchronize lever	PNW1926
	36	Motor assembly (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	PEB1178
	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 DC motor / 0.3W	PXM1027
	57	D.C. motor assembly (spindle with oil)	PEA1207
	58	Pickup assembly	PEA1179
	59	Disc table assembly	PEA1035
	60	Screw	BBZ26P060FMC
	61	Screw	BPZ20P060FMC
	62	Screw	BPZ26P100FMC
	63	Screw	JFZ17P025FZK
	64	Screw	JFZ20P040FMC
	65	Washer	WT12D032D025
	101	Motor	VXM1033
	102	Eject lever	PNB1306
	103	Upper chassis	PNB1267
	104	Servo mechanism assembly M	PXA1417
	105	Loading board assembly	PWZ2038
	106	Sub chassis	PNW2027
	107	Rubber tube	PEB1171
	108	Main chassis	PNW2026
	109	Select board assembly	PWZ2039
	110	Motor board assembly	PWZ2040
	111	Mechanism board assembly	PWX1192
	112	Earth lead unit	PDF1118
	113	Clamp magnet	PMF1014
	114	Gear stopper	PNB1303
	115	Yoke M	PNB1312
	116	AV angle	PNB1405
	117	Carriage base	PNW2058

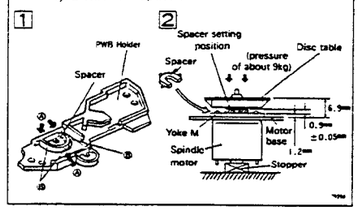
*1: Fix the motor (101) on the loading board assembly (105) so that the label attached on the motor faces the direction illustrated.

*2: Fix the motor (101) on the motor board assembly (110) so that the label attached on the motor faces the direction illustrated.

• **How to install the disc table**

1 Use nippers or other tool to cut the three sections marked Ⓐ and the three sections marked Ⓑ in figure. Then remove the spacer.

2 While supporting the spindle motor shaft with the stopper, put spacer on top of yoke M, and stick the disc table on top (takes about 9kg pressure). Detach the spacer.



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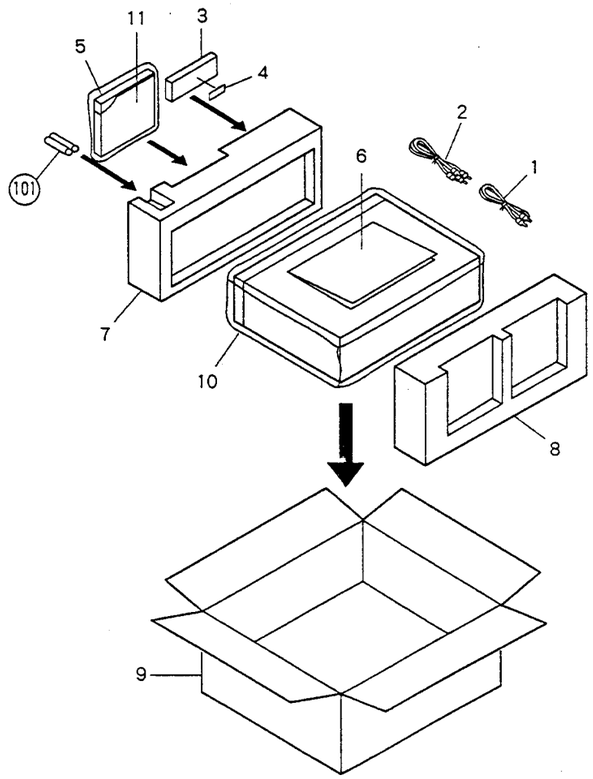
3. PACKING

Parts List

Mark	No.	Description	Part No.
	1	Connection cord with mini plug	PDE-319
	2	Connection cord with pin plug	PDE1109
	3	Remote control unit	PWW1068
	4	Battery cover	PZN1010
	5	Magazine assembly	PXA1308
	6	Operating instructions (English)	PRB1166
	7	Styrol protector (F)	PHA1198
	8	Styrol protector (R)	PHA1199
	9	CD packing case	PHG1753
	10	Mirror mat sheet	Z23-007
	11	PP case	PYY1141
	101	Dry cell battery(R03, AAA)	VEM-022



4. IC INFORMATION

■ PD4396B (IC351)

System control

● Pin Function

No.	Mark	Pin Name	I/O	Function	No.	Mark	Pin Name	I/O	Function
1	RESET	$\overline{REST}$		CPU reset (L : reset)	33	P02/S0	DATA	O	Serial output of LSI control data
2	T0	DG1	O*	DIGIT output for FL drive	34	P03/S1	SQSO	I	Serial input of subcode Q data
3	T1	DG2			35	P10/INT	RMDT	I	Remote control data input
4	T2	DG3			36	P11	SCOR	I	Subcode synch. S0 + S1 input
5	T3	DG4			37	P12	$\overline{INSD}$	I	Slider inside SW input (L : INSIDE)
6	T4	DG5			38	P13	FCOK	I	Focus OK input (H : OK , L : NG)
7	T5	DG6			39	P20	L IN	O	Disc tray IN / OUT *1
8	T6	DG7			40	P21	L OUT		
9	T7	DG8			41	P22	DSDW	O	Disc selector UP/DOWN *2
10	T8	DG9			42	P23	DSUP		
11	T9	DG10			43	P30	LPS2	I	Load position SW input *3
12	PH3	$\overline{MUTE}$	O	Muting output (L : Mute , H : OFF)	44	P31	LPS1		
13	PH2	SYC3	O	Synchro output	45	P32	DCNT	I	Disc selector count pulse *4
14	PH1	——		NC (Not used.)	46	P33	DCHM		Disc selector home *4
15	PH0	STBL	O	Standby LED output (L : Goes off, H :Light),	47	P60	MZS2	I	Magazine discrimination *5 SW input
16	S11	SL	O*	SEGMENT output for FL drive	48	P61	MZS1		
17	S10	SK			49	P62	SENS	I	Multi mode input of LSI operation state
18	VLOAD			– 26V	50	P63	GFS	I	Frame sync. lock input (H : OK , L : NG)
19	VPRE			– 5V	51	P40	MUTE	O	Muting output (H : Mute , L : OFF)
20	S9	SJ	O*	SEGMENT output for FL drive	52	P41	DLAT		Latch pulse for D/A converter IC
21	S8	SI			53	P42	XLAT		Latch pulse of LSI control data
22	S7	SD			54	P43	$\overline{XRST}$		LSI reset (L : Reset , H : Release)
23	S6	SC			55	PP0	$\overline{LDON}$		Laser diode output (H : OFF , L : ON)
24	S5	SB			56	X1	X1		Main system clock oscillation
25	S4	SA			57	X2	X2		
26	VDD	VDD		+5V	58	VSS	VSS		GND
27	S3	SH	O*	SEGMENT output for FL drive	59	XT1	——		GND (Not used.)
28	S2	SG			60	XT2	——		NC (Not used.)
29	S1	SF			61	P50	KD0/TEST	I	Key scan input and TEST mode required input
30	S0	SE			62	P51	KD1		Key scan input
31	P00	SYNC1	I	Synchro input	63	P52	KD2		
32	SCK	CLOK	O	Serial clock	64	P53	KD3		

O* : Output terminals with pull-down resistor.

*1 : Loading selector

Tray	L OUT	L IN
IN	L	H
OUT	H	L
STOP	L	L

*3 : Loading position SW

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

*4 : DISC select

	DCNT	DCHM
2 – 6 DISC	L	H
HOME	L	L
During select	H	*

*2 : Disc selector UP / DOWN

Selector	DSDW	DSUP
UP	L	H
DOWN	H	L
STOP	L	L

*5 : Magazine discrimination

	MZS1	MZS2
Magazine OUT	H	*
IN MULTI	L	H
IN SINGLE	L	L

5. SCHEMATIC DIAGRAM

5.1 Waveforms

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

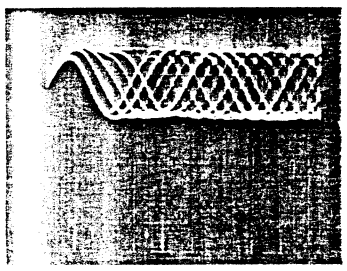
*1 50T-JUMP: After switching to the pause mode, press the manual search key.

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

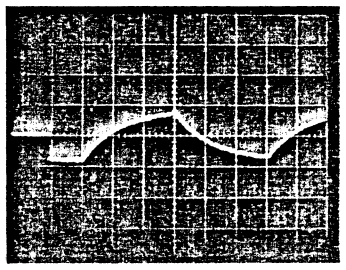
*3 POWER ON: Plug AC cord into AC wall socket.

*4 POWER OFF: Unplug AC cord form AC wall socket.

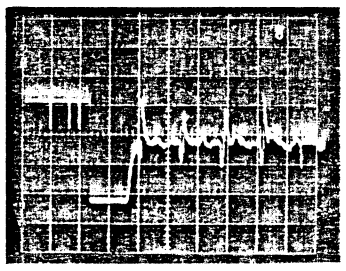
(2) TP1 - Pin 1:PLAY MODE
(RF)
500mV/div 500nsec/div



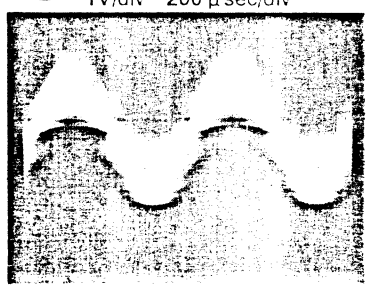
(5) IC202 - Pin 3 :FOCUS-IN (*2) MODE
(FODR)
1V/div 200msec/div



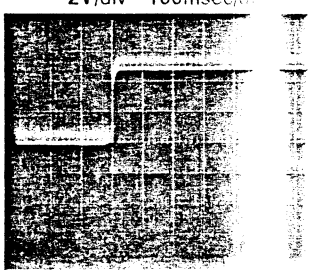
(7) IC201 - Pin 9:TRACK SEARCH MODE
(SPDR)
2V/div 50msec/div



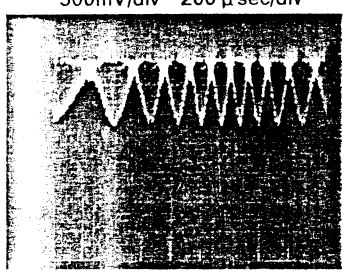
(11) IC401 - Pin 10:PLAY MODE (1kHz)
(LO) (D/A DATA OUT)
1V/div 200 μ sec/div



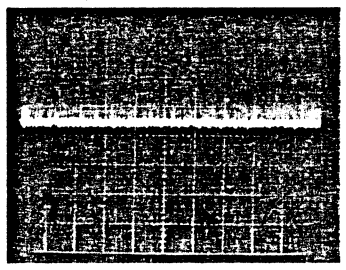
(22) IC20 - Pin 9:POWE
(RST)
2V/div 100msec/d



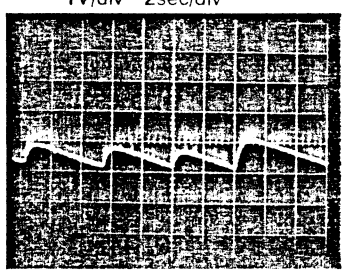
(2) TP1 - Pin 1:TRACK SEARCH MODE
(RF)
500mV/div 200 μ sec/div



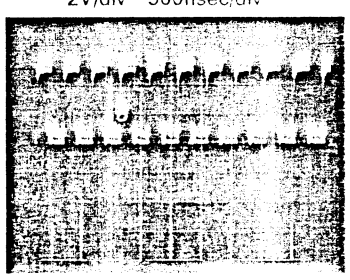
(5) IC202 - Pin 3 :PLAY MODE
(FODR)
1V/div 1msec/div



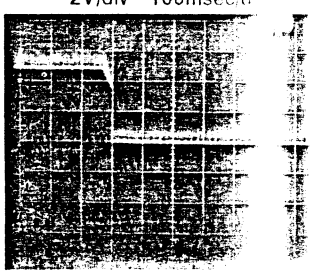
(8) IC202 - Pin 9 :PLAY MODE
(CADR)
1V/div 2sec/div



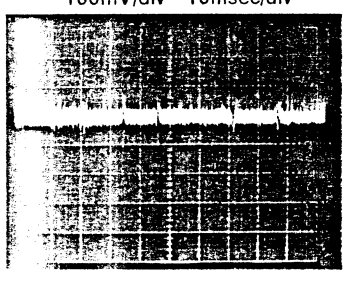
(16) IC301 - Pin 35:PLAY MODE (1kHz)
(BCLK)
2V/div 500nsec/div



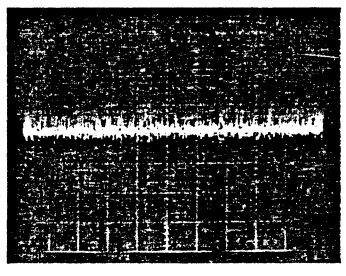
(22) IC20 - Pin 9:POWE
(RST)
2V/div 100msec/d



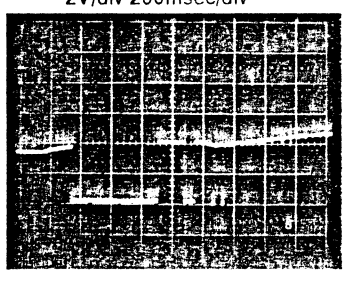
(3) TP1 - Pin 6:PLAY MODE
(FOER)
100mV/div 10msec/div



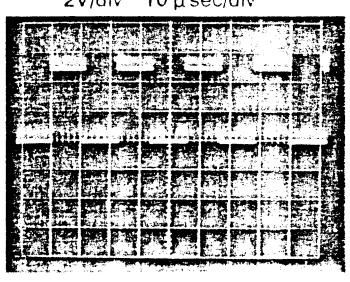
(6) IC202 - Pin 4:PLAY MODE
(TRDR)
500mV/div 1msec/div



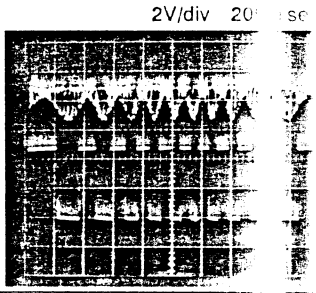
(8) IC202 - Pin 9 :TRACK SEARCH MODE
(CADR)
2V/div 200msec/div



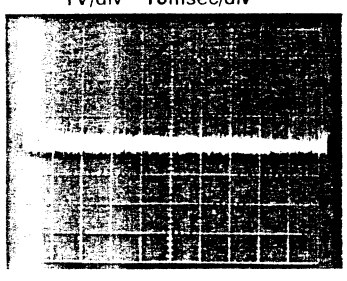
(18) IC301 - Pin 32:PLAY MODE (1kHz)
(LRCK)
2V/div 10 μ sec/div



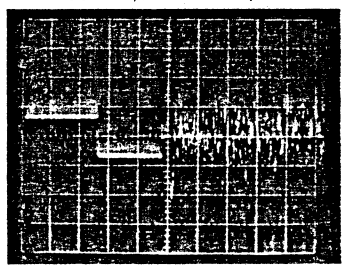
(23) :TRACK SEAR
Upper: TP1 - Pin 1 (
Lower: IC151 - Pin 2
2V/div 20



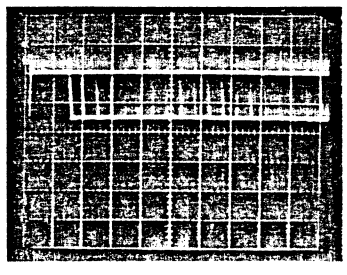
(4) TP1 - Pin 2:PLAY MODE
(TRER)
1V/div 10msec/div



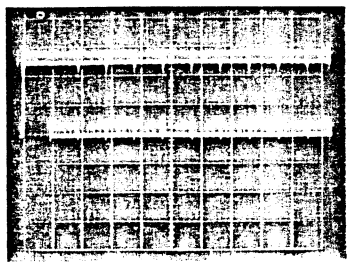
(6) IC202 - Pin 4:50T-JUMP (*1) MODE
(TRDR)
500mV/div 1msec/div



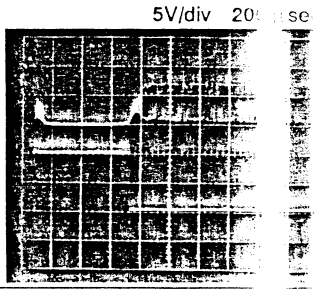
(9) IC151 - Pin 32:PLAY MODE
(EFM)
2V/div 500nsec/div



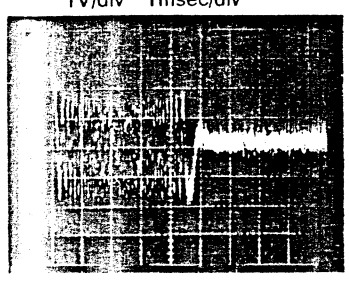
(19) IC301 - Pin 34:PLAY MODE (1kHz)
(DATA)
2V/div 500nsec/div



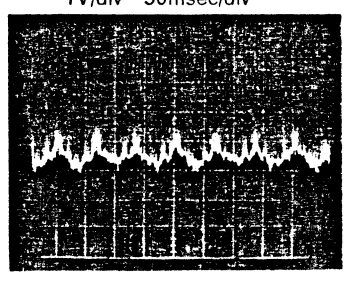
(24) :PLAY
Upper: TP1 - Pin 1 (
Lower: IC151 - Pin 3
5V/div 20



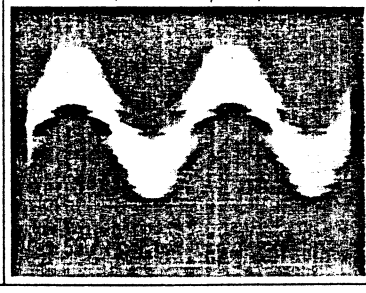
(4) TP1 - Pin 2:50T-JUMP (*1) MODE
(TRER)
1V/div 1msec/div



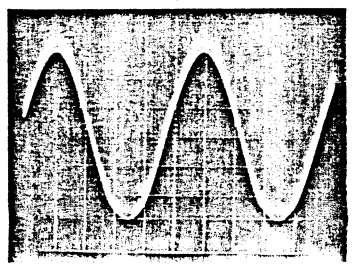
(7) IC201 - Pin 9:PLAY MODE
(SPDR)
1V/div 50msec/div



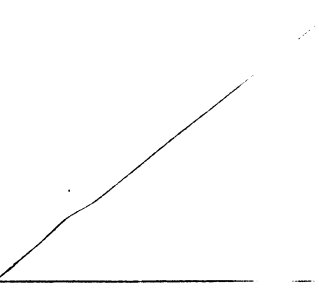
(10) IC401 - Pin 9:PLAY MODE (1kHz)
($\overline{LO}$) (D/A DATA OUT)
1V/div 200 μ sec/div



(21) Pin - OUTPUT:PLAY MODE(1kHz)
1V/div 200 μ sec/div

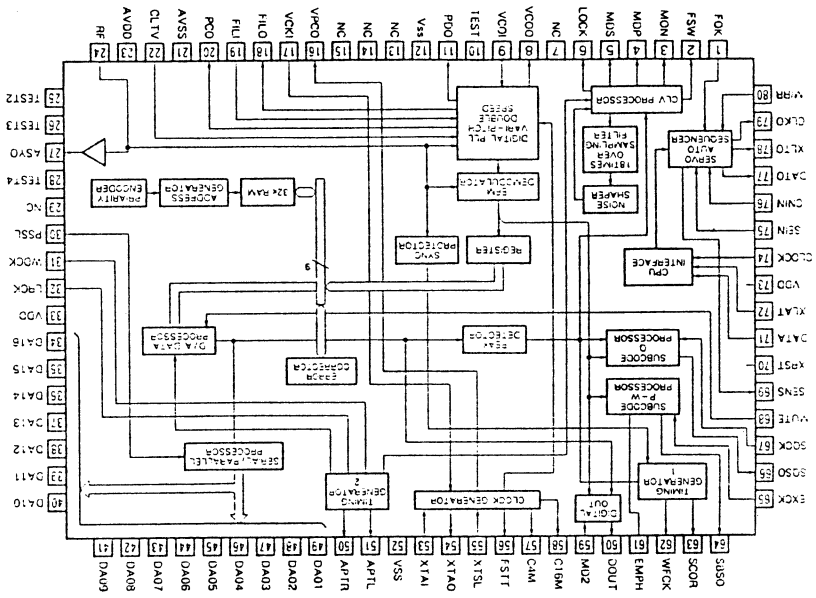


(25)

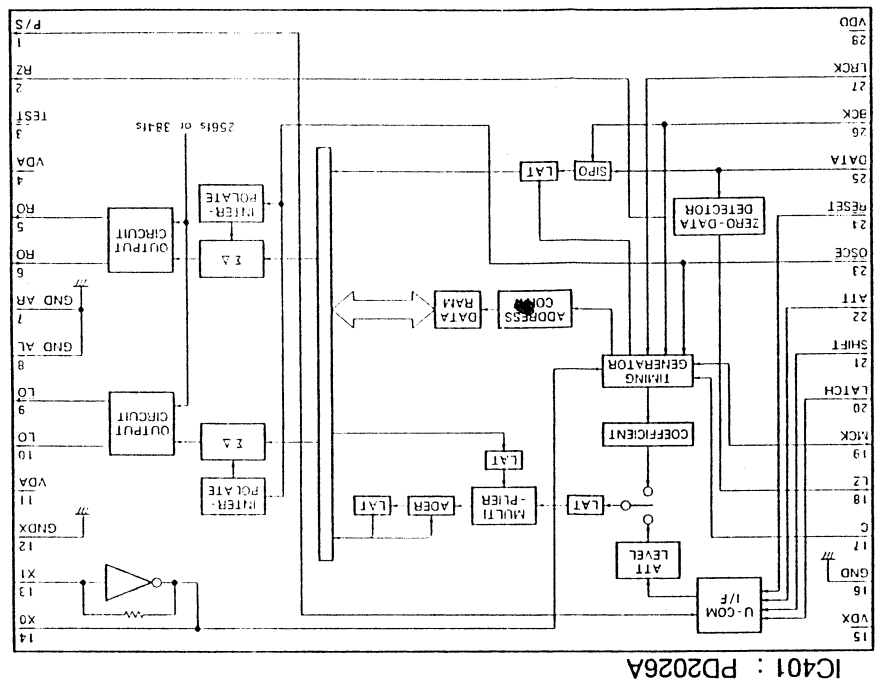


PD - M601

● IC BLOCK DIAGRAMS



IC301 : CXD2500AQ



IC401 : PD2026A

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1. RESISTORS :
Indicated in Ω , 1/4W, 1/6W and 1/8W, ± 5% tolerance unless otherwise noted k ; k Ω , M; M Ω , (F) ; ± 1%, (G) ; ± 2%, (K) ; ± 10%, (M) ; ± 20% tolerance.

2. CAPACITORS :
Indicated in capacity (μ F) / voltage(V)unless otherwise noted p ; pF. Indication without voltage is 50V except electrolytic capacitor.

3. VOLTAGE, CURRENT :
▭ ; DC voltage (V) at play state.
⇔ mA ; DC current at play state.
Value in ( ) is DC current at stop state.

4. OTHERS :
➡ ; Signal route.
◌ ; Adjusting point.
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.
※ marked capacitors and resistors have parts numbers.

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

5. SWITCHES : (The underlined indicates the switch position)
LOADING BOARD ASSEMBLY
S601 : LPS1
S602 : LPS2
SELECT BOARD ASSEMBLY
S603 : MZS1
S604 : MZS2
S605 : DCHM
S606 : DCNT
MECHANISM BOARD ASSEMBLY
S610 : INSIDE
FUNCTION BOARD ASSEMBLY
S701 : DISC2
S702 : DISC1
S703 : AUTO FADER
S704 : DELETE
S705 : PROGRAM
S717 : COMPU PGM EDIT
S718 : HI - LITE SCAN
S719 : DISC 3
S720 : DISC 4
S721 : ADLC
S722 : TIME FADE EDIT
S723 : DISC 5
S724 : DISC 6
S725 : ❙❙ (PAUSE)
S726 : REPEAT
S727 : ■ (STOP)
S728 : TIME
S729 : ▶ (PLAY)
S730 : RANDOM PLAY
S731 : ⏮ ◀◀ (TRACK/MANUAL SEARCH)
S732 : ▶▶ ▶▶⏭ (TRACK/MANUAL SEARCH)

Pi. POWER ON(*3)
1 msec/div
— GND
(26)

Pi POWER OFF(*4)
msec/div
— GND
(27)

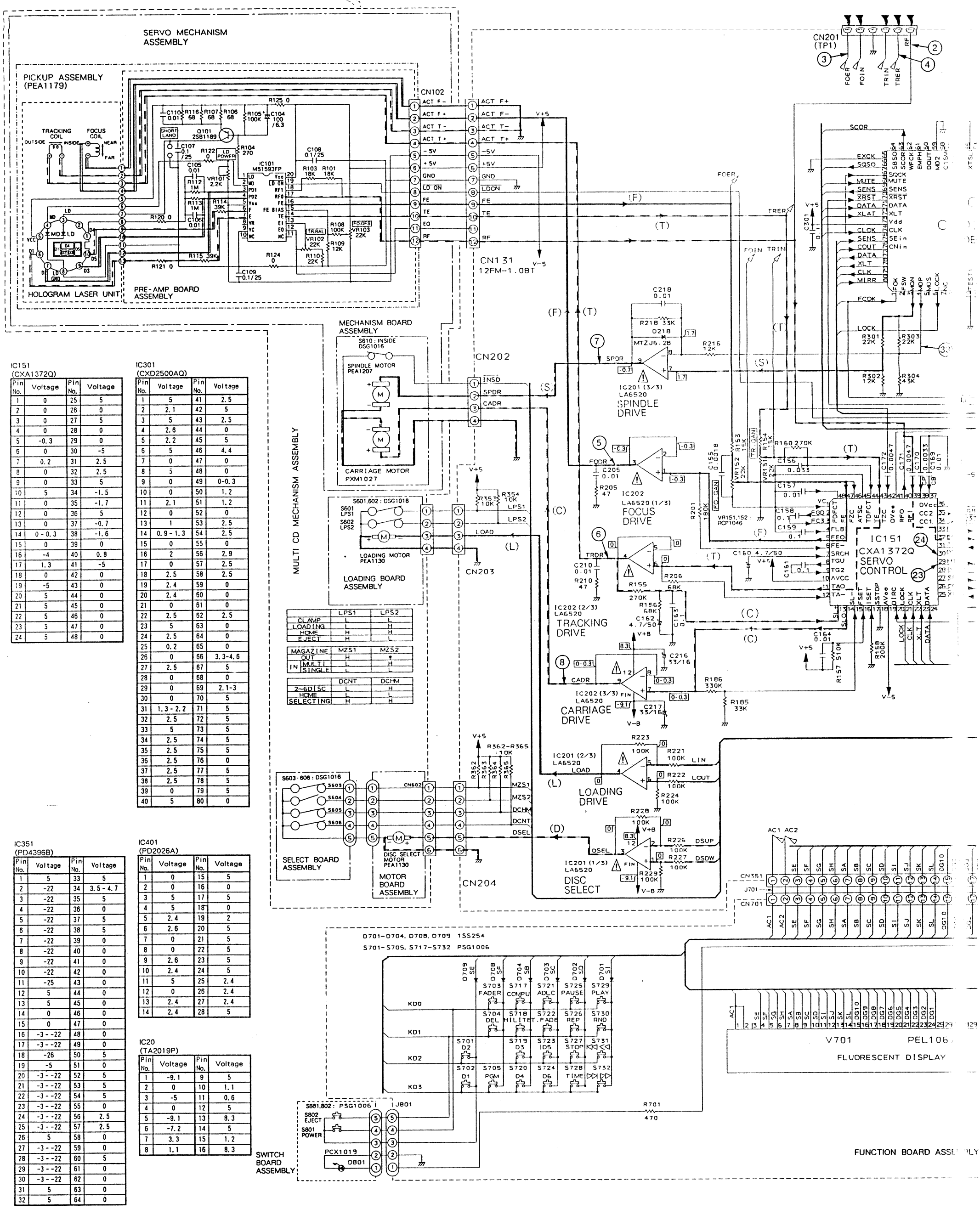
R SEARCH MODE
Tl Pin 1 (RF) 1V/div
IC - Pin 29 (MIRR)
div 200 μ sec/div
— GND
— GND
(28)

PLAY MODE
Tl Pin 1 (RF) 1V/div
IC - Pin 30 (DFCT)
div 200 μ sec/div
— GND
— GND

(33) IC301 - Pin 4:PLAY MODE
(MDP)
2V/div 2 μ sec/div
— GND

(53) IC301 - Pin 20:PLAY MODE
(PCO)
2V/div 10 μ sec/div
— GND

5.2 SCHEMATIC DIAGRAM



IC151 (CXA1372Q)

Pin No.	Voltage	Pin No.	Voltage
1	0	25	5
2	0	26	0
3	0	27	5
4	0	28	0
5	-0.3	29	0
6	0	30	-5
7	0.2	31	2.5
8	0	32	2.5
9	0	33	5
10	5	34	-1.5
11	0	35	-1.7
12	0	36	5
13	0	37	-0.7
14	0 - 0.3	38	-1.6
15	0	39	0
16	-4	40	0.8
17	1.3	41	-5
18	0	42	0
19	-5	43	0
20	5	44	0
21	5	45	0
22	5	46	0
23	5	47	0
24	5	48	0

IC301 (CXD2500AQ)

Pin No.	Voltage	Pin No.	Voltage
1	5	41	2.5
2	2.1	42	5
3	5	43	2.5
4	2.6	44	0
5	2.2	45	5
6	5	46	4.4
7	0	47	0
8	5	48	0
9	0	49	0-0.3
10	0	50	1.2
11	2.1	51	1.2
12	0	52	0
13	1	53	2.5
14	0.9 - 1.3	54	2.5
15	0	55	0
16	2	56	2.9
17	0	57	2.5
18	2.5	58	2.5
19	2.4	59	0
20	2.4	60	0
21	0	61	0
22	2.5	62	2.5
23	5	63	0
24	2.5	64	0
25	0.2	65	0
26	0	66	3.3-4.6
27	2.5	67	5
28	0	68	0
29	0	69	2.1-3
30	0	70	5
31	1.3 - 2.2	71	5
32	2.5	72	5
33	5	73	5
34	2.5	74	5
35	2.5	75	5
36	2.5	76	0
37	2.5	77	5
38	2.5	78	5
39	0	79	5
40	5	80	0

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

		MZS1	MZS2
MAGAZINE	OUT	H	*
IN	MULTI	L	H
	SINGLE	L	L

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

IC351 (PD4396B)

Pin No.	Voltage	Pin No.	Voltage
1	5	33	5
2	-22	34	3.5 - 4.7
3	-22	35	5
4	-22	36	0
5	-22	37	5
6	-22	38	5
7	-22	39	0
8	-22	40	0
9	-22	41	0
10	-22	42	0
11	-25	43	0
12	5	44	0
13	5	45	0
14	0	46	0
15	0	47	0
16	-3 - -22	48	0
17	-3 - -22	49	0
18	-26	50	5
19	-5	51	0
20	-3 - -22	52	5
21	-3 - -22	53	5
22	-3 - -22	54	5
23	-3 - -22	55	0
24	-3 - -22	56	2.5
25	-3 - -22	57	2.5
26	5	58	0
27	-3 - -22	59	0
28	-3 - -22	60	5
29	-3 - -22	61	0
30	-3 - -22	62	0
31	5	63	0
32	5	64	0

IC401 (PD2026A)

Pin No.	Voltage	Pin No.	Voltage
1	0	15	5
2	0	16	0
3	5	17	5
4	5	18	0
5	2.4	19	2
6	2.6	20	5
7	0	21	5
8	0	22	5
9	2.6	23	5
10	2.4	24	5
11	5	25	2.4
12	0	26	2.4
13	2.4	27	2.4
14	2.4	28	5

IC20 (TA2019P)

Pin No.	Voltage	Pin No.	Voltage
1	-9.1	9	5
2	0	10	1.1
3	-5	11	0.6
4	0	12	5
5	-9.1	13	8.3
6	-7.2	14	5
7	3.3	15	1.2
8	1.1	16	8.3

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MOTHER BOARD ASSEMBLY
(PWM1583 : PD-M601)
(PWM1582 : PD-M551)
(PWM1579 : PD-M501)

	R445.R446	R
PD-M501 PD-M551	680 Ω	
PD-M601	270 Ω	

Q452 : ZERO DETECTING ATTENUATOR DRIVER

Q451 : ZERO DETECTING ATTENUATOR DRIVER

Q405 : MUTE DRIVER

Q322 : INVERTER BUFFER

Q391 : INVERTER BUFFER

Q453 : ZERO ATTEN

IC301 CXD2500AQ DECODER

IC401 PD2026A D/A CONVERTER

IC151 CXA1372Q SERVO CONTROL

IC351 PD4396B SYSTEM CONTROL

IC21 : +5V REGULATOR

IC20 TA2019P
IC20 : SYSTEM RESET & ±5V REGULATOR

IC405 (1/2) BA15218
IC405 (2/2) BA15218

PD-M501 ONLY

	D391	JP
PD-M601 PD-M551	USED	SHORT (JUMPER)
PD-M501	SHORT (JUMPER)	OPEN

V701 PEL1067
FLUORESCENT DISPLAY

REMOTE SENSOR SBX1610-51
PD-M601, PD-M551

	CN351	CN701	J701
PD-M601 PD-M551	HLEM32S-1	HLEM32R-1	PDD1125
PD-M501	HLEM30S-1	HLEM30R-1	PDD1126

FUNCTION BOARD ASSEMBLY

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: Signal Route
(F) : Focus Servo Loop Line
(L) : Loading Motor Route
(T) : Tracking Servo Loop Line
(S) : Spindle Motor Route
(C) : Carriage Motor Route
(D) : Disc Select Motor Route
➤ : Measurement Point

MOTHER BOARD ASSEMBLY
(PWM1583 : PD-M601)
(PWM1582 : PD-M551)
(PWM1579 : PD-M501)

	R445,R446	R447,R448
PD-M501 PD-M551	680 Ω	SHORT (JUMPER)
PD-M601	270 Ω	470 Ω

	C433,C434	IC405
PD-M601	PCH1107	NJM4565D-D
PD-M501 PD-M551	CEAS220M25	NJM4558D-D

Q452 : ZERO DETECTING ATTENUATOR DRIVER

Q454 : ZERO DETECTING ATTENUATOR

Q403,404 : MUTE

IC405 (1/2),(2/2) : LOW-PASS FILTER

JA401 (1/2) PKB1009 LINEOUT JACK

JA401 (2/2) PKB1009

Q451 : ZERO DETECTING ATTENUATOR DRIVER

Q453 : ZERO DETECTING ATTENUATOR

Q405 : MUTE DRIVER

Q322 : INVERTER BUFFER

D/A CONVERTER C4026A PD2026A PSS100B

PD-M601 ONLY

HEADPHONE AMP

HEADPHONE BOARD ASSEMBLY

Q391 : INVERTER BUFFER

JA393 PKN1005 CD DECK SYNCHRO

JA392 PKN1004 OUT CONTROL IN

JA391 PKN1004

IC351 PD4396B SYSTEM CONTROL

IC21 : +5V REGULATOR

IC20 TA2019P

IC20 : SYSTEM RESET & ±5V REGULATOR

	D391	JP
PD-M601 PD-M551	USED	SHORT (JUMPER)
PD-M501	SHORT (JUMPER)	OPEN

REMOTE SENSOR SBX1610-51

PD-M601, PD-M551

	CN351	CN701	J701
PD-M601 PD-M551	HLEM32S-1	HLEM32R-1	PDD1125
PD-M501	HLEM30S-1	HLEM30R-1	PDD1126

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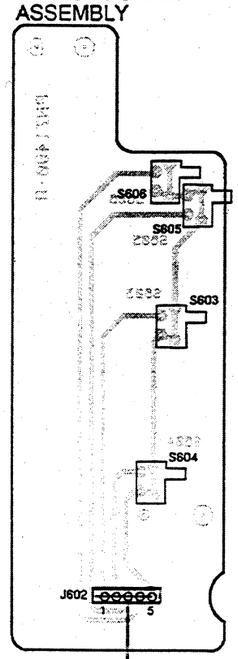
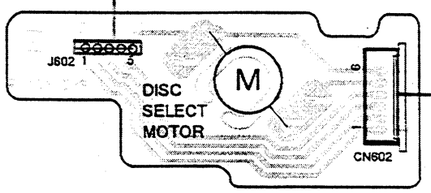
- - - - - : Signal Route
(F) : Focus Servo Loop Line
(L) : Loading Motor Route
(T) : Tracking Servo Loop Line
(S) : Spindle Motor Route
(C) : Carriage Motor Route
(D) : Disc Select Motor Route
> : Measurement Point

6. P.C.BOARDS CONNECTION DIAGRAM

SELECT BOARD ASSEMBLY

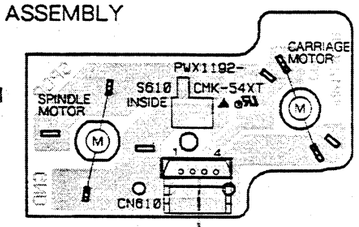


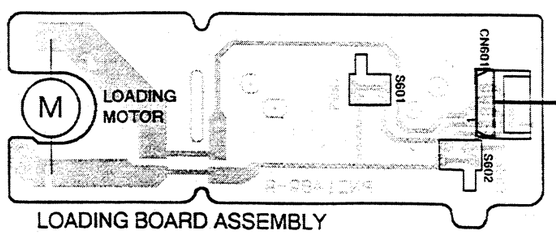
DISC SELECT MOTOR



MOTOR BOARD ASSEMBLY

MECHANISM BOARD ASSEMBLY





LOADING BOARD ASSEMBLY

PICKUP ASSEMBLY (PEA1179)

MOTHER BOARD ASSEMBLY
(PWM1583 : PD-M601)
(PWM1582 : PD-M551)
(PWM1579 : PD-M501)

IC151 (CXA1372Q)

Pin No.	Voltage	Pin No.	Voltage
1	0	25	5
2	0	26	0
3	0	27	5
4	0	28	0
5	-0.3	29	0
6	0	30	-5
7	0.2	31	2.5
8	0	32	2.5
9	0	33	5
10	5	34	-1.5
11	0	35	-1.7
12	0	36	5
13	0	37	-0.7
14	0 - 0.3	38	-1.6
15	0	39	0
16	-4	40	0.8
17	1.3	41	-5
18	0	42	0
19	-5	43	0
20	5	44	0
21	5	45	0
22	5	46	0
23	5	47	0
24	5	48	0

IC20 (TA2019P)

Pin No.	Voltage	Pin No.	Voltage
1	-6.1	9	5
2	0	10	1.1
3	-5	11	0.5
4	0	12	5
5	-6.1	13	8.3
6	-7.2	14	5
7	8.3	15	1.2
8	1.1	16	8.3

IC401 (PD2026A)

Pin No.	Voltage	Pin No.	Voltage
1	0	15	5
2	0	16	0
3	5	17	5
4	5	18	0
5	2.4	19	2
6	2.5	20	5
7	0	21	5
8	0	22	5
9	2.5	23	5
10	2.4	24	5
11	5	25	2.4
12	0	28	2.4
13	2.4	27	2.4
14	2.4	28	5

IC351 (PD4396B)

Pin No.	Voltage	Pin No.	Volt
1	5	33	5
2	-22	34	3.5 -
3	-22	35	5
4	-22	36	0
5	-22	37	5
6	-22	38	5
7	-22	39	0
8	-22	40	0
9	-22	41	0
10	-22	42	0
11	-25	43	0
12	5	44	0
13	5	45	0
14	0	46	0
15	0	47	0
16	-3 - -22	48	0
17	-3 - -22	49	0
18	-26	50	5
19	-5	51	0
20	-3 - -22	52	5
21	-3 - -22	53	5
22	-3 - -22	54	5
23	-3 - -22	55	0
24	-3 - -22	56	2.
25	-3 - -22	57	2.
26	5	58	0
27	-3 - -22	59	0
28	-3 - -22	60	5
29	-3 - -22	61	0
30	-3 - -22	62	0
31	5	63	0
32	5	64	0

HEADPHONE BOARD ASSEMBLY

SWITCH BOARD ASSEMBLY

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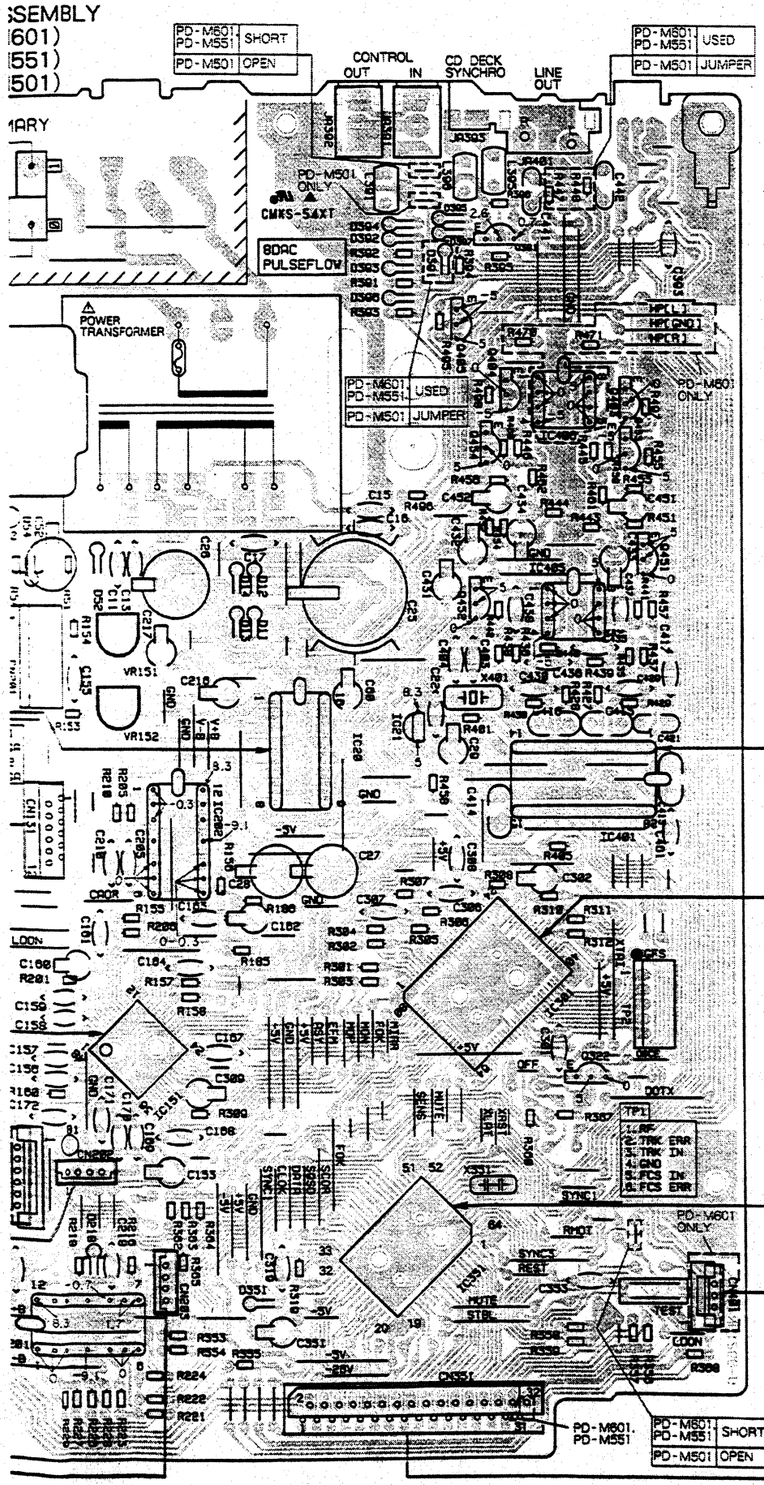
SEMBLY
(601)
(551)
(501)



IC401 (PD2026A)

Pin No.	Voltage	Pin No.	Voltage
1	0	15	5
2	0	16	0
3	5	17	5
4	5	18	0
5	2.14	19	2
6	2.6	20	5
7	0	21	5
8	0	22	5
9	2.6	23	5
10	2.14	24	5
11	5	25	2.4
12	0	26	2.4
13	2.4	27	2.4
14	2.4	28	5

IC351 (PD4396B)

Pin No.	Voltage	Pin No.	Voltage
1	5	33	5
2	-22	34	3.5 - 4.7
3	-27	35	5
4	-22	36	0
5	-22	37	5
6	-22	38	5
7	-22	39	0
8	-22	40	0
9	-22	41	0
10	-22	42	0
11	-25	43	0
12	5	44	0
13	5	45	0
14	0	46	0
15	0	47	0
16	-3 - -22	48	0
17	-3 - -22	49	0
18	-26	50	5
19	-5	51	0
20	-3 - -22	52	5
21	-3 - -22	53	5
22	-3 - -22	54	5
23	-3 - -22	55	0
24	-3 - -22	56	2.5
25	-3 - -22	57	2.5
26	5	58	0
27	-3 - -22	59	0
28	-3 - -22	60	5
29	-3 - -22	61	0
30	-3 - -22	62	0
31	5	63	0
32	5	64	0

IC301 (CXD2500AQ)

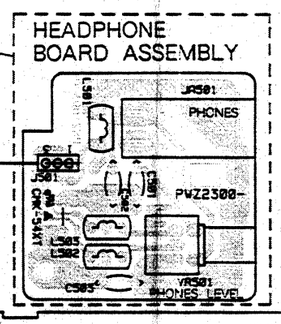
Pin No.	Voltage	Pin No.	Voltage
1	5	41	2.5
2	2.1	42	5
3	5	43	2.5
4	2.5	44	0
5	2.2	45	5
6	5	46	4.4
7	0	47	0
8	5	48	0
9	0	49	0-0.3
10	0	50	1.2
11	2.1	51	1.2
12	0	52	0
13	1	53	2.5
14	0.9 - 1.3	54	2.5
15	0	55	0
16	2	56	2.9
17	0	57	2.5
18	2.5	58	2.5
19	2.4	59	0
20	2.4	60	0
21	0	61	0
22	2.5	62	2.5
23	5	63	0
24	2.5	64	0
25	0.2	65	0
26	0	66	3.3-4.6
27	2.5	67	5
28	0	68	0
29	0	69	2.1-3
30	0	70	5
31	1.3 - 2.2	71	5
32	2.5	72	5
33	5	73	5
34	2.5	74	5
35	2.5	75	5
36	2.5	76	0
37	2.5	77	5
38	2.5	78	5
39	0	79	5
40	5	80	0

P.C.B. pattern diagram indication	Corresponding part symbol	Part name	P.C.B. pattern diagram indication	Corresponding part symbol	Part name
		Transistor			Ceramic capacitor
		FET			Mylar capacitor
					Styrol capacitor
		Diode			Electrolytic capacitor (Non polarized)
					Electrolytic capacitor (Noiseless)
		Zenner diode			Electrolytic capacitor (Polarized)
					Electrolytic capacitor (Polarized)
		LED			Power capacitor
		Varactor			Semi-fixed resistor
		Tact switch			Resistor array
					Resistor
		Inductor			
		Coil			Resonator
		Transformer			Thermistor
		Filter			

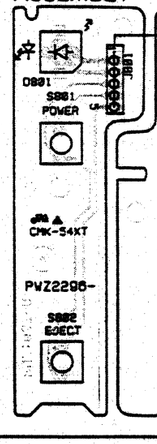
1. This P.C.B. connection diagram is viewed from the parts mounted side.
2. The parts which have been mounted on the board can be replaced with those shown with the corresponding wiring symbols listed in the above Table.
3. The capacitor terminal marked with ▭ shows negative terminal.
4. The diode marked with ○ shows cathode side.
5. The transistor terminal marked with ▭ shows emitter.

PD-M601 ONLY

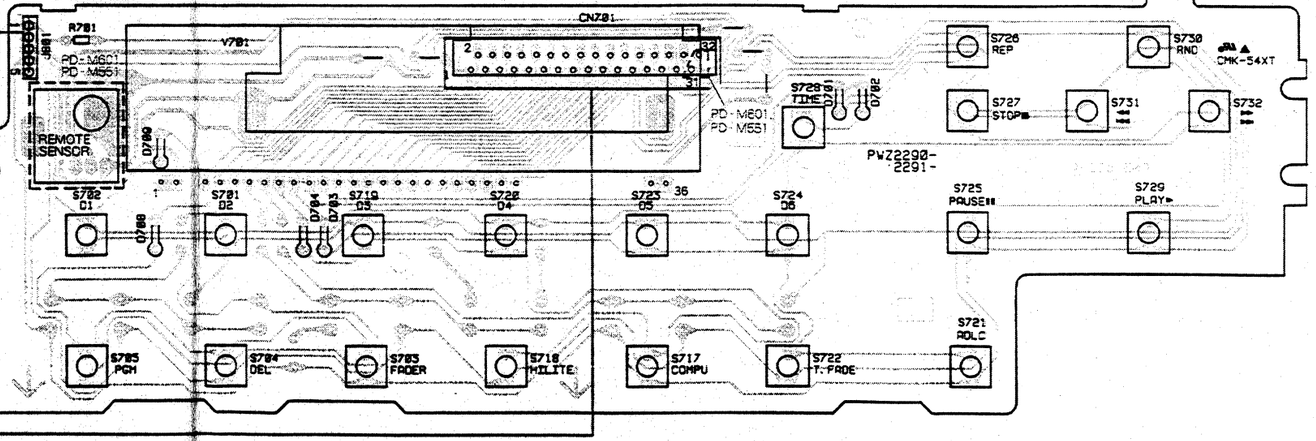
HEADPHONE BOARD ASSEMBLY



SWITCH BOARD ASSEMBLY



FUNCTION BOARD ASSEMBLY



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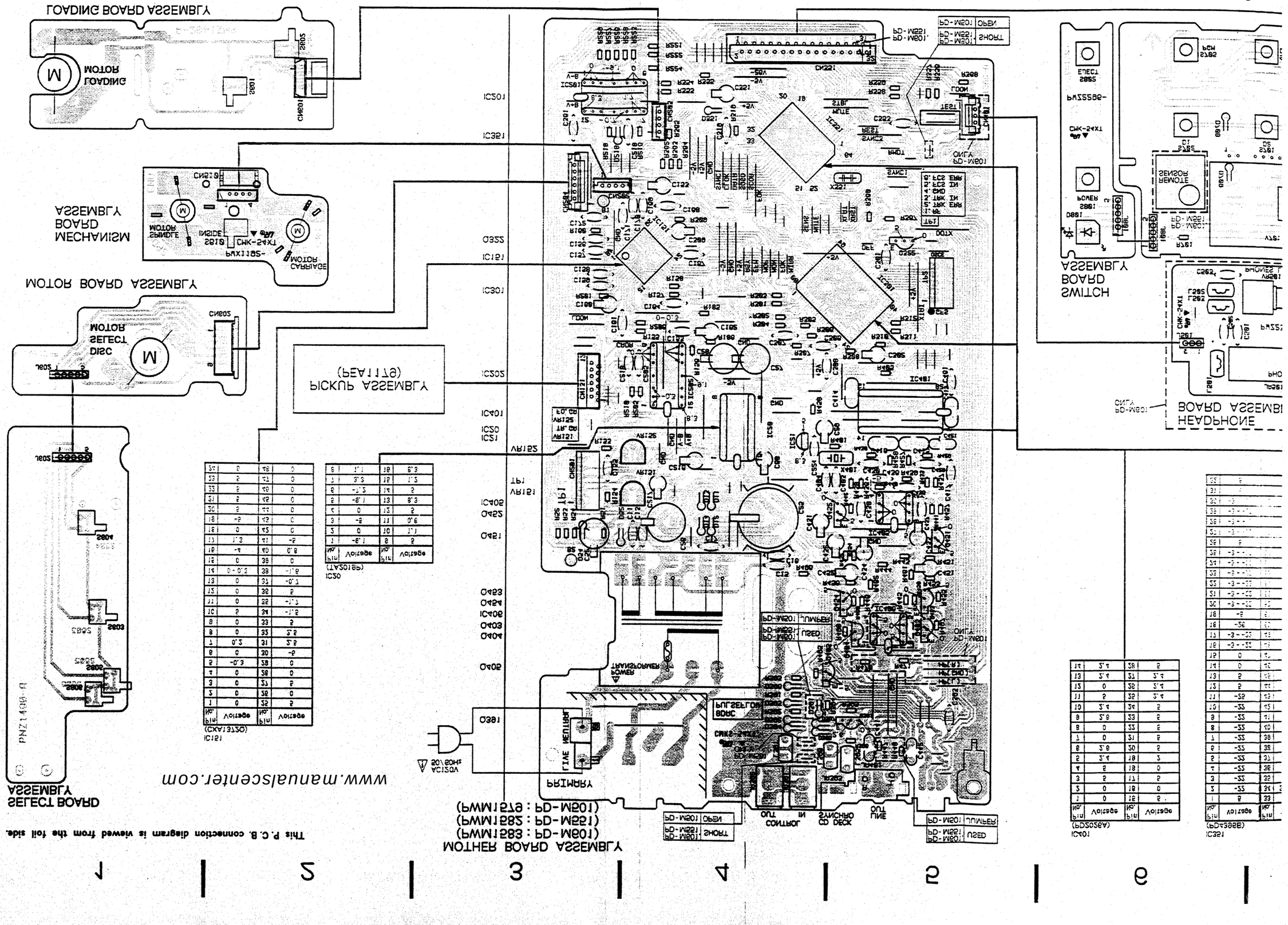
LOADING BOARD ASSEMBLY
MOTOR LOADING
CN801
CN802
MECHANISM BOARD ASSEMBLY
MOTOR SPINDLE
MOTOR CARRIAGE
INSIDE
CN804
CN803
MOTOR BOARD ASSEMBLY
MOTOR DISC SELECT
CN805
CN806
SELECT BOARD ASSEMBLY
PICKUP ASSEMBLY (HEAD)
CN101
CN102
CN103
CN104
CN105
CN106
CN107
CN108
CN109
CN110
CN111
CN112
CN113
CN114
CN115
CN116
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CN140

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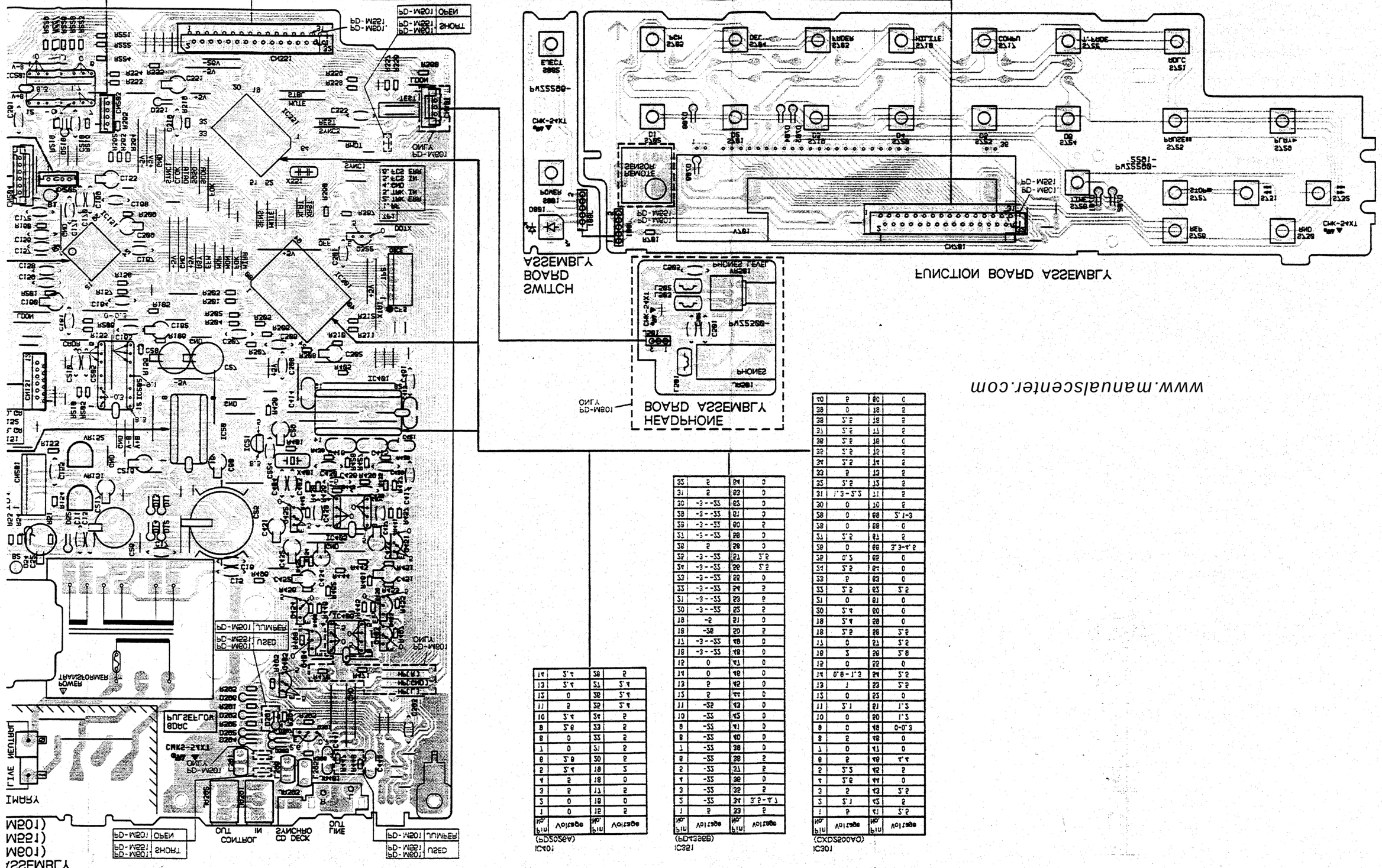

7. PCB PARTS LIST

NOTES:

- *Part without part number cannot be supplied.*
- *Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*
- *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.*
- *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 × 10¹*	*561*	*RD1/8PM 5 6 1 J*
47k Ω	*47 × 10³*	*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 × 10¹*	*5621*	*RN1/4SR 5 6 2 1 F*

LIST OF ASSEMBLIES

Mark	No.	Description	Part No.
◉		Mother board assembly	PWM1583
		Motor board assembly	
		Mechanism board assembly	
		Loading board assembly	
		Select board assembly	
◉		Sub board assembly	PWX1224
		├ Function board assembly	
		├ Switch board assembly	
		└ Headphone board assembly	

◉ MOTHER BOARD ASSEMBLY (PWM1583)

SEMICONDUCTORS

Mark	No.	Description	Part No.
	IC151	SERVO IC	CXA1372Q
⚠	IC20	REGULATOR IC	TA2019P
⚠	IC201, 202	POWER OP-AMP, IC	LA6520
	IC21	REGULATOR, IC	NJM2930L05
	IC301	EFM DEMODULATION IC	CXD2500AQ
	IC351	MICROCOMPUTER, IC	PD4396B
	IC401	D/A CONVERTER, IC	PD2026A
	IC405	OP-AMP IC	NJM4565D-D
	IC406	OP-AMP IC	BA15218
	Q322	TRANSISTOR	DTC124ES
	Q391	TRANSISTOR	2SC1740S
	Q403, 404	TRANSISTOR	2SD2144S
	Q405	TRANSISTOR	DTC124ES
	Q451, 452	TRANSISTOR	DTA124ES
	Q453, 454	TRANSISTOR	2SB1296
⚠	D11-14	DIODE	11ES2
	D218	ZENNER DIODE	MTZJ6.2B
	D351	DIODE	1SS254
	D391-397	DIODE	1SS254
⚠	D52	DIODE	11ES2
	D54	ZENNER DIODE	MTZJ18B

COILS

Mark	No.	Description	Part No.
	L391	AXIAL INDUCTOR	LAU010K
	L395, 396	AXIAL INDUCTOR	LAU010K

CAPACITORS

Mark	No.	Description	Part No.
	C11, 13	CERAMIC CAPACITOR	CKCYF103Z50
	C15	CERAMIC CAPACITOR	CKCYF103Z50
	C153	ELECTR. CAPACITOR	CEAS101M10
	C155	CERAMIC CAPACITOR	CKCYB182K50
	C156	CERAMIC CAPACITOR	CGCYX333K25
	C157	CERAMIC CAPACITOR	CGCYX103K25
	C158, 159	CERAMIC CAPACITOR	CGCYX104K25
	C16	CERAMIC CAPACITOR	CKCYF103Z50
	C160	ELECTR. CAPACITOR	CEAS4R7M50
	C161	CERAMIC CAPACITOR	CGCYX104K25
	C162	ELECTR. 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, 172	CERAMIC CAPACITOR	CKCYB472K50
	C205, 210	CERAMIC CAPACITOR	CKCYF103Z50
	C216, 217	ELECTR. CAPACITOR	CEAS330M16
	C218	CERAMIC CAPACITOR	CGCYX103K25
	C22	CERAMIC CAPACITOR	CKCYF103Z50
	C25	ELECTR. CAPACITOR	CEAS332M16
	C26	ELECTR. CAPACITOR	CEAS102M16
	C27	ELECTROLYTIC CAPACIT	CEAS471M6R3
	C28	ELECTR. CAPACITOR	CEAS101M10
	C29	ELECTROLYTIC CAPACIT	CEAS471M6R3
	C301	CERAMIC CAPACITOR	CGCYX104K25
	C302	ELECTROLYTIC CAPACIT	CEAS471M6R3
	C306	CERAMIC CAPACITOR	CKCYB152K50
	C307	CERAMIC CAPACITOR	CGCYX473K25
	C308	CERAMIC CAPACITOR	CGCYX103K25
	C309	ELECTR. CAPACITOR	CEASR47M50
	C351	ELECTROLYTIC CAPACIT	CEAS471M6R3
	C353, 361	CERAMIC CAPACITOR	CKCYF103Z50
	C393	CERAMIC CAPACITOR	CCCSL101J50
	C403	CERAMIC CAPACITOR	CCCCH120J50
	C404	CERAMIC CAPACITOR	CCCCH220J50
	C413-416	FILM CAPACITOR (0.1μ)	PCI10332

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Mark	No.	Description	Part No.
	C417	CERAMIC CAPACITOR	CKCYF103Z50
	C421	FILM CAPACITOR (0.1μ)	PCL1032
	C429, 430	CERAMIC CAPACITOR	CCCCH390J50
	C431, 432	ELECTR. CAPACITOR	CEAS330M16
	C433, 434	ALUMINUM (22μ/25V)	PCH1107
	C435-438	CERAMIC CAPACITOR	CCCCH390J50
	C441, 442	FILM CAPACITOR (0.0015μ)	PCL1030
	C451, 452	ELECTR. CAPACITOR	CEAS4R7M50
	C461	CERAMIC CAPACITOR	CKCYF103Z50
	C52	ELECTR. CAPACITOR	CEAS101M35
	C60	ELECTR. CAPACITOR	CEAS010M50
RESISTORS			
	VR151, 152	VR(22kΩ)	RCP1046
	OTHER RESISTORS		RD1/6PM□□□J
OTHERS			
	X351	CERAMIC RESONATOR (4.19MHz)	VSS1014
	X401	XTAL RES (OSC) (16.9344MHz)	PSS1008
	CN131	CONNECTOR FOR FFC (12P)	12FM-1.0BT
	CN351	32P FFC CONNECTOR	HLEM32S-1
	JA391, 392	JACK/12V (CONTROL IN, OUT)	PKN1004
	JA393	MINI JACK(CD DECK SYNCHRO)	PKN1005
	JA401	2P PIN JACK (LINE OUT)	PKB1009

MOTOR BOARD ASSEMBLY

Motor board assembly has not service parts.

MECHANISM BOARD ASSEMBLY

SWITCH

	S610	PUSH SWITCH (INSIDE)	DSG1016

LOADING BOARD ASSEMBLY

SWITCHES

	S601, 602	PUSH SWITCH (LPS1, LPS2)	DSG1016

SELECT BOARD ASSEMBLY

SWITCHES

	S603-606	PUSH SWITCH (MZS1, MZS2, DCHM, DCNT)	DSG1016

Mark	No.	Description	Part No.

FUNCTION BOARD ASSEMBLY

SEMICONDUCTORS

	D701-704	DIODE	1SS254
	D708, 709	DIODE	1SS254

SWITCHES

	S701-705	TACT SWITCH (DISC 2, 1, AUTO FADER, DELETE, PROGRAM)	PSG1006
	S717-732	TACT SWITCH (COMPU PGM EDIT, HI-LITE SCAN, DISC 3, 4, ADLC, TIME FADE EDIT, DISC 5, 6, ❙❙, REPEAT, ■, TIME, ▶, RANDOM PLAY, ⏮ ◀◀, ▶▶ ⏭)	PSG1006

RESISTOR

	R701	CARBON FILM RESISTOR	RD1/6PM471J

OTHERS

	REMOTE SENSOR		SBX1610-51
	CN701	32P FFC CONNECTOR	HLEM32R-1
	V701	FL INDICATOR TUBE	PEL1067

SWITCH BOARD ASSEMBLY

SEMICONDUCTOR

	D801	LED	PCX1019

SWITCHES

	S801, 802	TACT SWITCH (POWER, EJECT)	PSG1006

HEADPHONE BOARD ASSEMBLY

COILS

	L501-503	AXIAL INDUCTOR	LAU010K

CAPACITORS

	C501, 502	CERAMIC CAPACITOR	CKCYF103Z50
	C503	CERAMIC CAPACITOR	CKCYF473Z50

RESISTORS

	VR501	VARIABLE RESISTOR (PHONES LEVEL)	PCS1003

OTHERS

	JA501	HEADPHONE JACK (PHONES)	RKN1002

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

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● Test Point and Adjustment Variable Resistor Positions

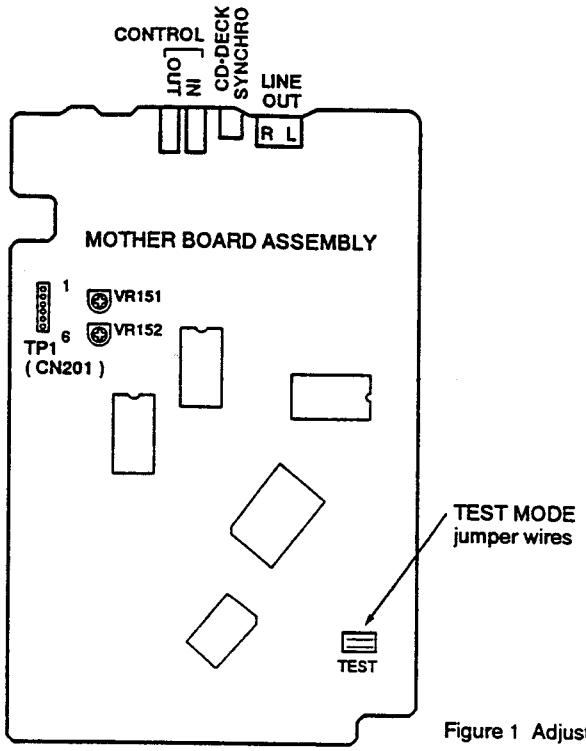

Figure 1 Adjustment Locations

● 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	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.
□□	PAUSE	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.

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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.
⇩	
PLAY ▷	Starts the spindle motor and closes the spindle servo.
⇩	
PAUSE ▯▯	Closes the tracking servo.

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

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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

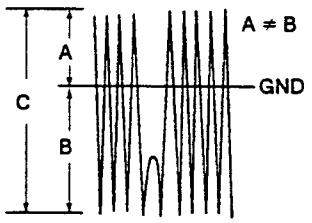
● Objective ● Symptom when out of adjustment	To verify that there is no variation in the sensitivity of the tracking photo diode. Play does not start or track search is impossible.		
● Measurement instrument connections	Connect the oscilloscope to TP1, Pin 2 (TRK. ERR). This connection may be via a low 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]

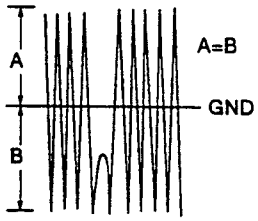
1. Move the pickup to midway across the disc (R=35 mm) with the TRACK/MANUAL SEARCH FWD ▷▷ • ▷▷| or REV |◁◁ • ◁◁ key.
2. Press the PGM (PROGRAM) key, then the PLAY ▷ key in that order to close the focus servo then the spindle servo.
3. Line up the bright line (ground) at the center of the oscilloscope 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.

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

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



When there is a DC component



When there is no DC component

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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 ▷ key, then the PAUSE ▯▯ key 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.

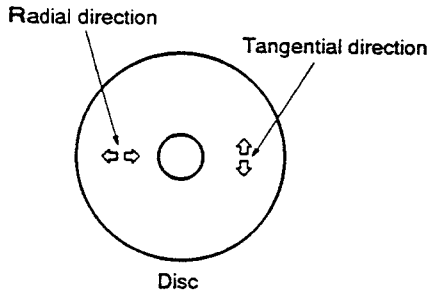
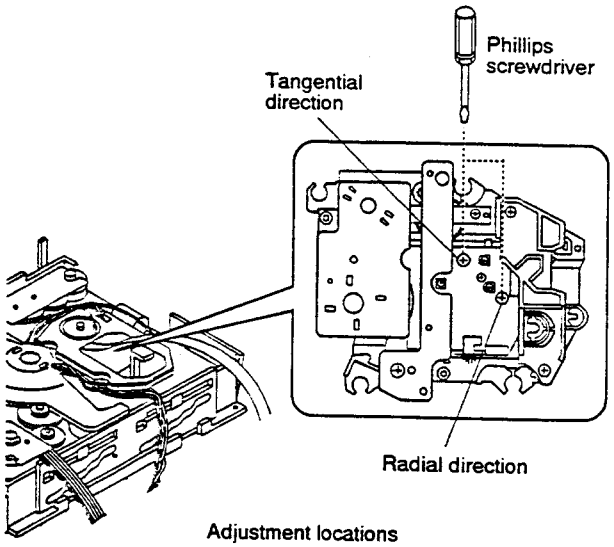


Figure 2



Adjustment locations

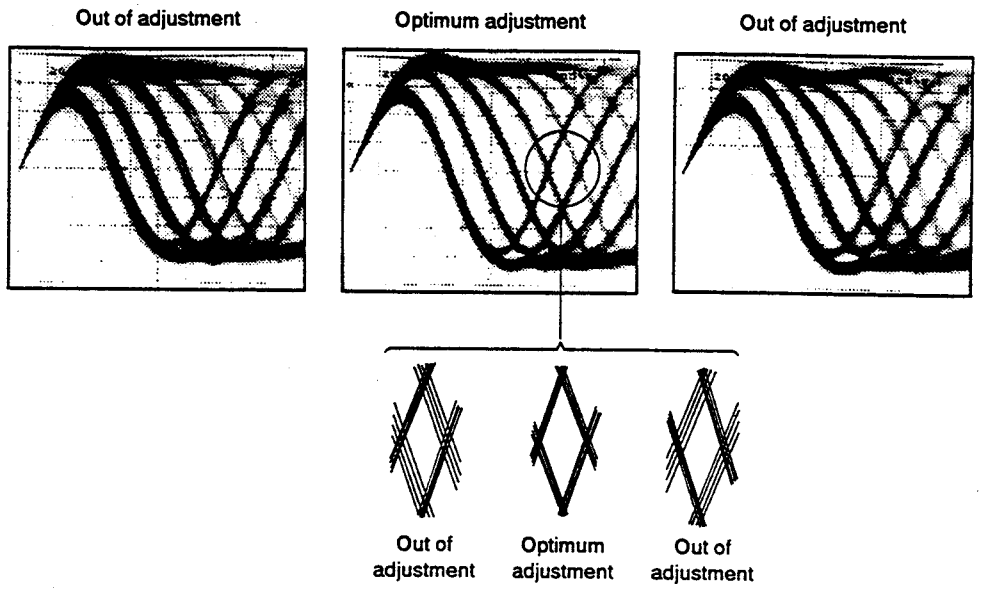


Figure 3 Eye pattern

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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 ▷ key, then the PAUSE ▯▯ key 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 ▷ key, then the PAUSE ▯▯ key 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.

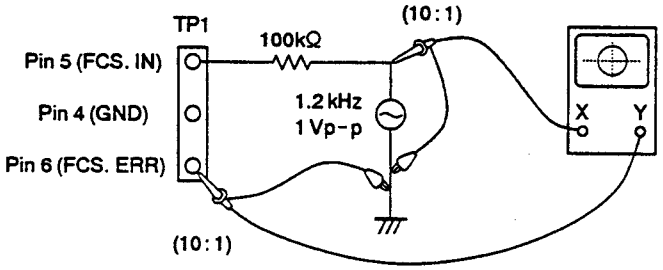
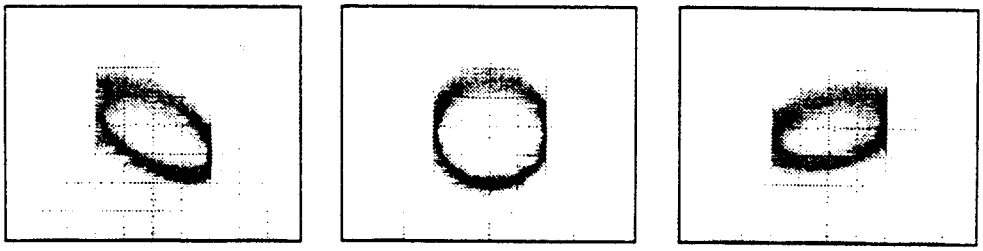


Figure 4

Focus Gain Adjustment



Higher gain | Optimum gain | Lower gain

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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 ▷ key, then the PAUSE ▯▯ key 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.

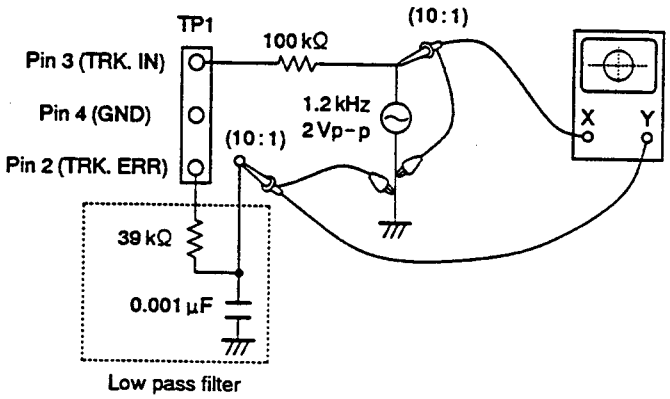
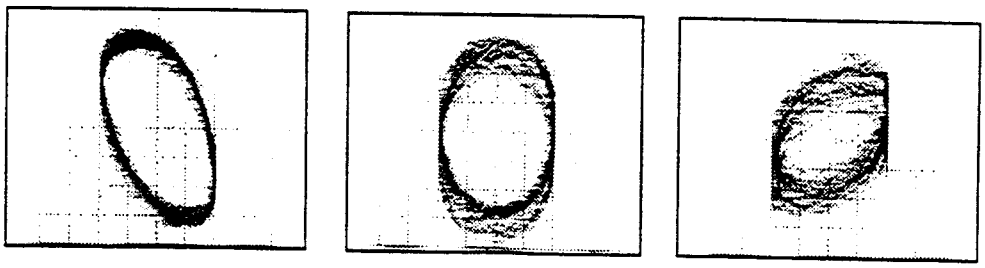


Figure 5

Tracking Gain Adjustment



Higher gain | Optimum gain | Lower gain

◉ MOTHER BOARD ASSEMBLY (PWM1582 and PWM1579)

PWM1582 , PWM1579 and PWM1583 have the same construction except for the following :

Mark	Symbol & Description	Part No.			Remarks
		PWM1583	PWM1582	PWM1579	
	IC405	NJM4565D-D	NJM4558D-D	NJM4558D-D	
	IC406	BA15218	•••••	•••••	
	D391	1SS254	1SS254	•••••	
	C433, 434 (22 μ /25V)	PCH1107	•••••	•••••	
	C433, 434	•••••	CEAS220M25	CEAS220M25	
	R445, 446	RD1/6PM271J	RD1/6PM681J	RD1/6PM681J	
	R447, 448	RD1/6PM471J	•••••	•••••	
	R470, 471	RD1/6PM470J	•••••	•••••	
	CN351 (32P FFC connector)	HLEM32S-1	HLEM32S-1	•••••	
	CN351 (30P FFC connector)	•••••	•••••	HLEM30S-1	

FUNCTION BOARD ASSEMBLY

Function board assembly of PD - M551 and PD - M501 and Function board assembly of PD - M601 have the same construction except for the following :

Mark	Symbol & Description	Part No.			Remarks
		PD-M601	PD-M551	PD-M501	
	CN701 (32P FFC connector)	HLEM32R-1	HLEM32R-1	•••••	
	CN701 (30P FFC connector)	•••••	•••••	HLEM30R-1	
	Remote sensor	SBX1610-51	SBX1610-51	•••••	

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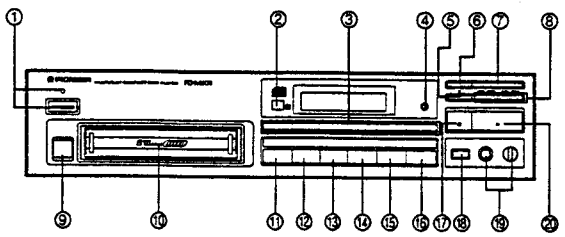
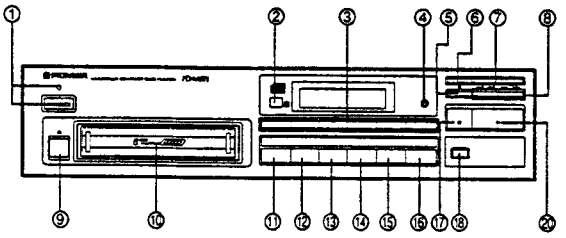
10. PANEL FACILITIES

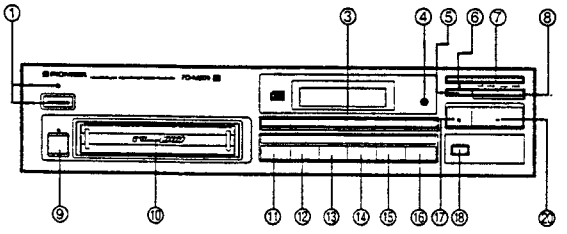
PD-M601



PD-M551



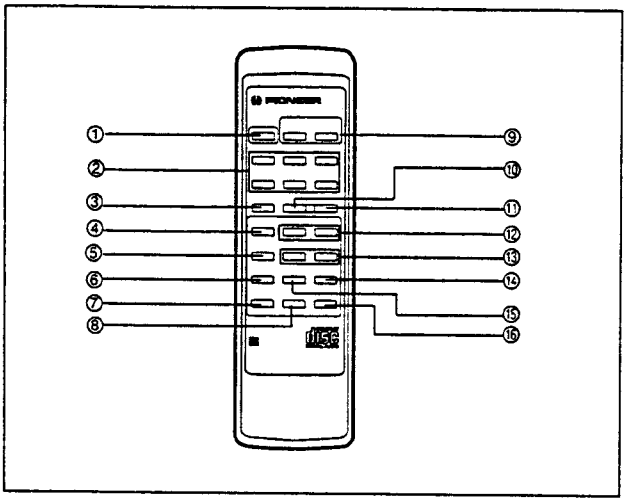
PD-M501



FRONT PANEL

① **POWER STANDBY/ON switch and STANDBY indicator**
② **Remote sensor (PD-M601/PD-M551 only)**
Receives the signal from the remote control unit.
- The PD-M501 is not equipped with the remote sensor.

③ **Disc number buttons (DISC 1 - DISC 6)**
④ **TIME button**
⑤ **Stop button (■)**
⑥ **REPEAT button**
⑦ **RANDOM PLAY button**
⑧ **Track/Manual search buttons (⏮ ◀◀/▶▶ ⏭)**
⑨ **EJECT button (⏏)**
⑩ **Magazine insertion slot**
⑪ **PROGRAM button**
⑫ **DELETE button**
⑬ **AUTO FADER button**
⑭ **HI-LITE SCAN button**
⑮ **COMPU PGM EDIT button**
⑯ **TIME FADE EDIT button**
⑰ **Pause button (❚❚)**
⑱ **ADLC (Automatic Digital Level Controller) button**
⑲ **Headphones jack (PHONES) and headphones volume control (PHONES LEVEL) (PD-M601 only)**
⑳ **Play button (▶)**



REMOTE CONTROL UNIT (PD-M601/PD-M551 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 (1 - 6)**
③ **STOP button (■)**
④ **RANDOM PLAY button**
⑤ **HI-LITE SCAN button**
⑥ **FADER button**
⑦ **ADLC (Automatic Digital Level Controller) button**
⑧ **CHECK button**
⑨ **OUTPUT LEVEL buttons (+/–)**
⑩ **PAUSE button (❚❚)**
⑪ **PLAY button (▶)**
⑫ **MANUAL search buttons (◀◀ / ▶▶)**
⑬ **TRACK search buttons (⏮ / ⏭)**
⑭ **DELETE button**
⑮ **PGM (program) button**
⑯ **CLEAR button**

11. SPECIFICATIONS

1. General

Type ..... Compact disc digital audio system
Power requirements
U.K. and Australian models .....AC 220 - 240 V, 60 Hz
U.S. and Canadian models .....AC 120 V, 60 Hz
Other models .....AC 110 - 127V/220 - 240 V (switchable), 50/60 Hz
Power consumption
U.S. and Canadian models .....12 W
U.K., Australian and other models .....14 W
Operating temperature ..... +5°C - +35°C (+41°F - +95°F)
Weight ..... 3.8 kg (8 lb, 6 oz)
External dimensions
PD-M601/PD-551 .....420 (W) X 291(D) X 105 (H) mm 16-9/16 (W) X11-7/16 (D) X 4-1/8 (H) in
PD-M501 .....420 (W) X 291(D) X 100 (H) mm 16-9/16 (W) X 11-7/16 (D) X 3-15/16 (H) in

2. Audio section

Frequency response ..... 2 Hz - 20 kHz
S/N ratio ..... 102 dB or more (EIAJ)
Dynamic range ..... 96 dB or more (EIAJ)
Harmonic distortion ..... 0.003% or less (EIAJ)
Output voltage 2.0V
Wow and flutter ..... Limit of mesurement (±0.001% W.PEAK) or less (EIAJ)
Channels ..... 2-channel (stereo)

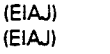
3. Output terminal

Audio line output
Headphone jack with volume control (PD-M601/PD-M551 only)
Control input/output jacks (available with the PD-M551/PD-M501 and U.S. and Canadian models of the PD-M601)
CD-DECK SYNCHRO jack

4. Accessories

- Remote control unit (PD-M601/PD-M551 only) 1
- Size AAA/R03/dry batteries (PD-M601/PD-M551 only) 2
- Six-compact-disc magazine 1
- Control cord (provided with PD-M551/PD-M501 and U.S. and Canadian models of PD-M601 only) 1
- Output cord 1
- Operating instructions 1

NOTE:
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 (12cm) discs.

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