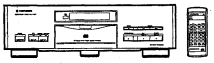
PIONEER®
The Art of Entertainment

Service Manual



ORDER NO.
ARP2298

COMPACT DISC PLAYER

PD-75

PD-75 HAS THE FOLLOWING :

Type	Power Requirement	Remarks
KU/CA	AC 120 V only	
HEM	AC 220 V-230 V, AC 230-240 V(switchable)*	
SD	AC 110 V, 120 V-127 V, 220 V, 240 V(switchable)	

* Change the connection of the power transformer's primary wiring.

- **This manual is applicable to PD-75/KU/CA, HEM and SD types.**
- **As to the HEM and SD types, refer to page 87.**
- **Ce manuel pour le service comprend les explications de réglage en français.**
- **Este manual de servicio trata del método ajuste escrito en español.**

CONTENTS

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FI JUNE 1991

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

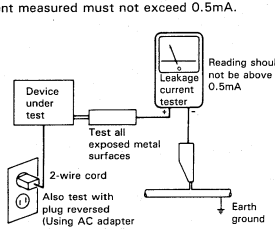
(FOR USA MODEL ONLY)

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.

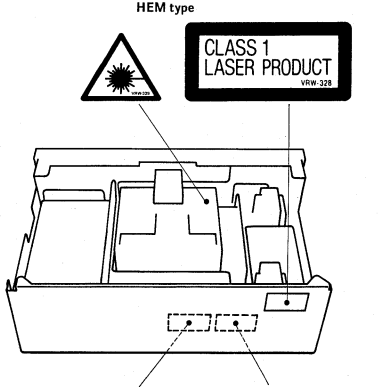
IMPORTANT
THIS PIONEER APPARATUS CONTAINS LASER OF HIGHER CLASS THAN 1. SERVICING OPERATION OF THE APPARATUS SHOULD BE DONE BY A SPECIALLY INSTRUCTED PERSON.

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

LASER
Picture 1
Warning sign for
laser radiation

LABEL CHECK

HEM type



HEM type

Additional Laser Caution

1. Laser Interlock mechanism
   The ON/OFF status of the clamp switch (S 102) for detecting loading completion is detected by the system microprocessor, and the design prevents laser diode oscillation when the clamp switch is OFF.
   Thus, the interlock will no longer function if the clamp switch (S 102) is deliberately shorted.
   In the test mode the interlock mechanism will not function (refer to page 39).
   Laser diode oscillation will continue if pin 4, 5, or 29 of CXA 1081 S(IC 1) is connected to ground or the terminals of Q 304 are shorted each other (fault condition).

2. If the fault condition described in 1 is induced with the cover removed and the objective lens extending past the outer circumference of the disc clamper diameter, close viewing of the objective lens with the naked eye will cause exposure to a Class 1 or higher laser beam.

2. EXPLODED VIEWS AND PARTS LIST

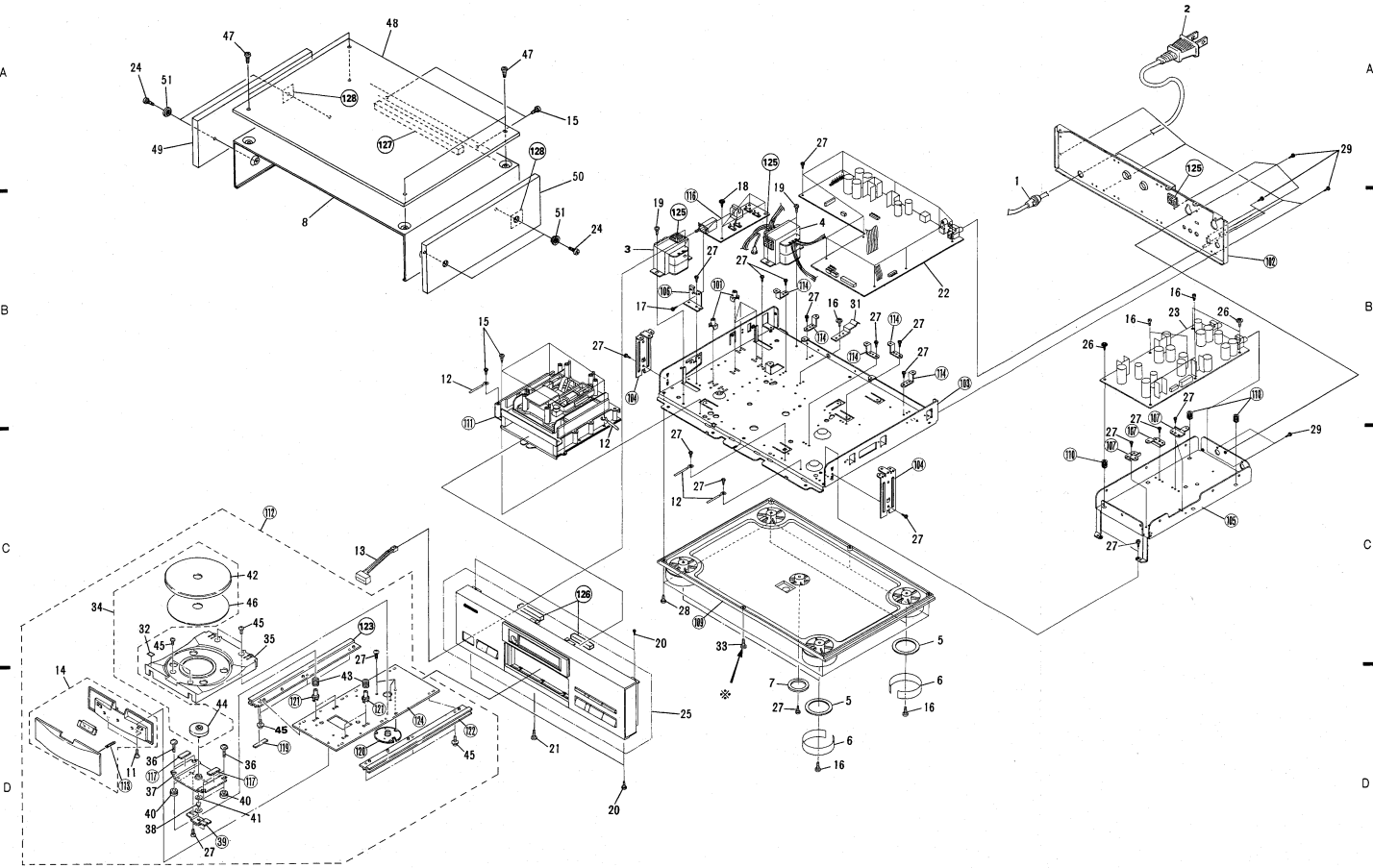
NOTES :

- *Parts 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.*

2.1 EXTERIOR

Parts List of Exterior

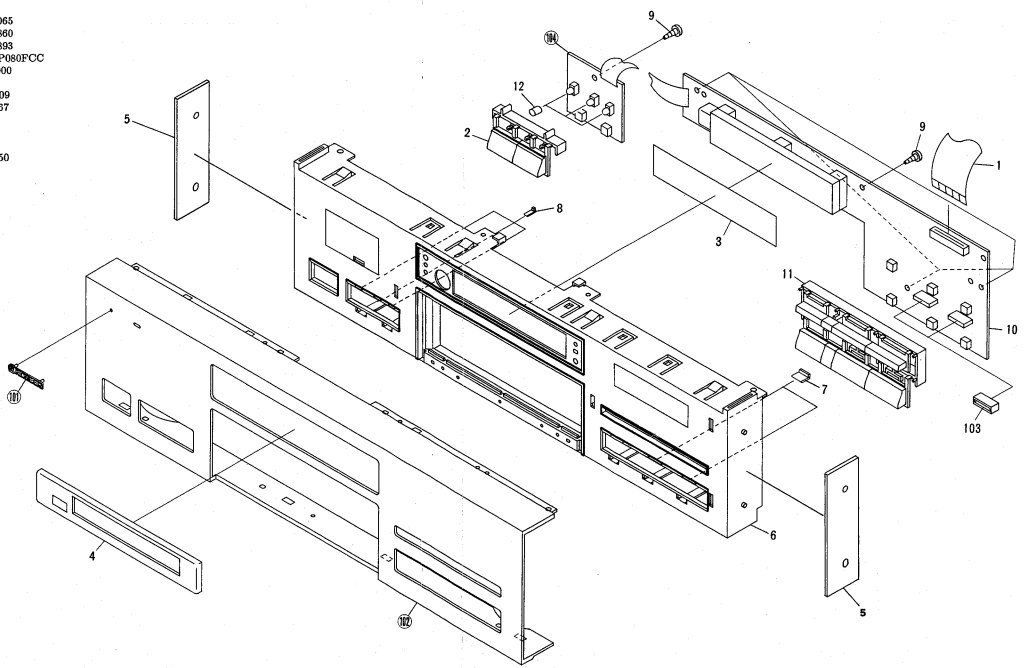
Mark	No.	Description	Parts No.
	1	Strain relief	CM-22C
⚠	2	AC power cord	PDG1015
⚠	3	Power transformer(16VA)	PTT1166
⚠	4	Power transformer(17VA)	PTT1162
	5	Stopper	PNM1095
	6	Tape	PNM1099
	7	Stopper	PNM1107
	8	Bonnet	PEA1168
	9	・・・・・	
	10	・・・・・	
	11	Screw	IBZ30P060FCC
	12	Cord clamper	RNH-184
	13	Power button	PAC1539
	14	Tray plate (A) assembly	PXA1395
	15	Screw	BBZ30P080FCC
	16	Screw	IBZ30P060FCC
	17	Screw	PMZ30P060FCU
	18	Screw	IBZ30P180FMC
	19	Screw	BBZ40P060FCC
	20	Screw	BBT30P080FCC
	21	Screw	PDZ30P050FCC
◉	22	MAIN BOARD assembly	PWZ1983
◉	23	ANALOG BOARD assembly	PWM1364
	24	Screw	PBA1038
	25	Front panel assembly	PEA1177
	26	Screw	IBZ30P150FCU
	27	Screw	IBZ30P060FCC
	28	Screw	BBZ30P140FCC
	29	Screw	BBZ30P080FCC
	30	・・・・・	
	31	Ground plate	PBK1090
	32	Caution label	PRW1244
	33	Screw	BBZ30P160FZK
	34	Turntable assembly	PEA1159
	35	Over tray	PNW1871
	36	Floating screw	PBA1064
	37	Spindle base assembly	PXA1405
	38	Receptacle	VNL-268
	39	Stopper	
	40	Damper rubber	PEB1146
	41	E-ring	YE30FUC
	42	Turntable	PAN1203
	43	Floating spring	PBH1092
	44	Rotor assembly	PXA1392
	45	Screw	BBZ30P060FCC
	46	TT sheet	PNM1125
	47	SH screw	PBA1033
	48	Top panel	PAN1123
	49	Side board (L)	PMM1039
	50	Side board (R)	PMM1040
	51	Wood collar	PNW1238
	101	PCB mould	
	102	Rear base	
	103	Under base	
	104	Side angle	
	105	Shield plate	
	106	Switch angle	
	107	Angle (B)	
	108	・・・・・	
	109	Base	
	110	PCB spacer	
	111	Single mechanism assembly	
	112	Tray assembly	
	113	Plate spring	
	114	Board angle	
	115	・・・・・	
	116	PRIMARY BOARD assembly	
	117	Stopper rubber	
	118	・・・・・	
	119	Stopper tape	
	120	Tray locker	
	121	Collar	
	122	Slide guide	
	123	Rack	
	124	Tray	
	125	Binder holder	
	126	Spacer	
	127	Bonnet spacer	
	128	Wood spacer	



2.2 FRONT PANEL SECTION

Parts List of Front Panel section

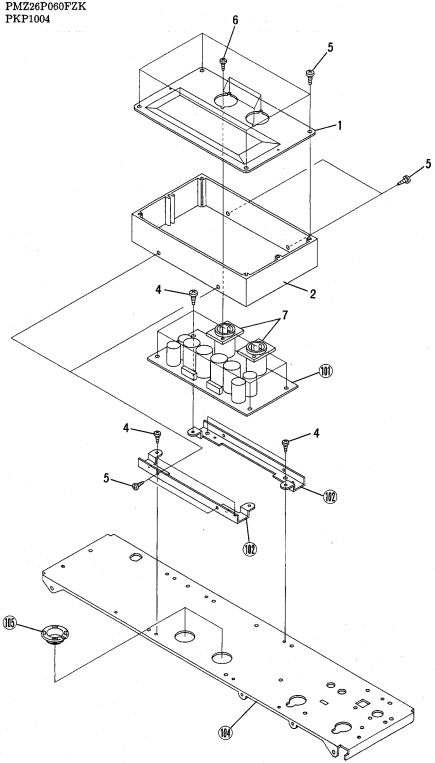
Mark	No.	Description	Parts No.
⚠	1	25P shield F.F.C	PDD1096
	2	Digital button	PAC1530
	3	FL sheet	PAM1290
	4	Display window(A)	PAM1515
	5	Side sash	PAN1220
	6	Function panel	PNW2065
	7	Lens(L)	PNW1860
	8	Lens(S)	PNW1893
	9	Screw	BBZ26P080FCC
◉	10	FUNCTION A BOARD assembly	PWZ2000
	11	Function button	PAC1609
	12	LED cover (S)	PEB1167
	101	Name plate	
	102	Front panel	
	103	LED cover	PEB1150
	104	FUNCTION B BOARD assembly	



2.3 REAR PANEL SECTION

Parts List of Rear Panel section

Mark	No.	Description	Parts No.
	1	Balance cover	PAT1004
	2	Balance case	PNS1019
	3	· · · · ·	
	4	Screw	BBZ30P080FCC
	5	Screw	BBT30P080FZK
	6	Screw	PMZ26P060FZK
	7	3P receptacle	PKP1004
	101	BALANCE BOARD assembly	
	102	Balance angle	
	103	· · · · ·	
	104	Rear base	
	105	Edge cover	



2.4 MECHANISM SECTION

Parts List of Mechanism section

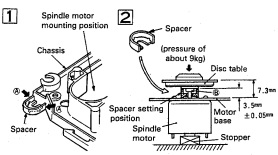
Mark No.	Description	Parts No.
1	Lever switch	DSK1003
2	Floating screw	PBA1064
3	Floating spring (A)	PBH1098
4	Floating spring (B)	PBH1099
5	Biss spring	PHB1112
6	Floating spring (C)	PBH1113
7	Floating spring (D)	PBH1114
8	Belt	PEB1138
9	Dumper rubber	PEB1146
10	Stopper rubber	PEB1085
11	Screw	PMZ30P350FCU
12	Roller	PNW2037
13	Blind sheet	
14	Gear	PNW1097
15	Motor pulley	PNW1643
16	Cam	PNW1816
17	Synchro gear	PNW1817
18	Gear pulley	PNW1870
19	Single gear	PNW1878
20	Lock plate	PNW2013
21	Loading base (L)	PNW2050
22	Loading base (R)	PNW2051
23	DC motor	PXM1010
24	Cord clamper	RNH-184
25	Screw	PBA1024
26	Adjustment screw	PBA1054
27	Lever spring	PBH1028
28	Axis spring	PBH1029
29	Adjustment spring	PBK1021
30	Rivet	PBM-015
31	Stopper rubber	PEB1035
32	Rubber	PEB1048
33	Guide bar	PLA1026
34	Axis	PLA1027
35	Disk table	PLA1088
36	Roller	PLM1001
37	Adjustment lever	PNB1048
38	Spindle motor	PXM1026
39	Pick up assembly	PWY1004
40	Screw	BBZ30P060FCC
41	Screw	IBZ30P080FCC
42	Screw	PMZ26P030FCU
43	Screw	PMZ26P060FCU
44	Screw	PMZ30P080FCU
45	Screw	PMZ30P160FCU
46	Washer	WS30FMC
47	Washer	WT26D047D025
48	Screw	ZMD30H040FBT
49	Drive unit	PYY1038
50	Speed detection unit	PYY1039

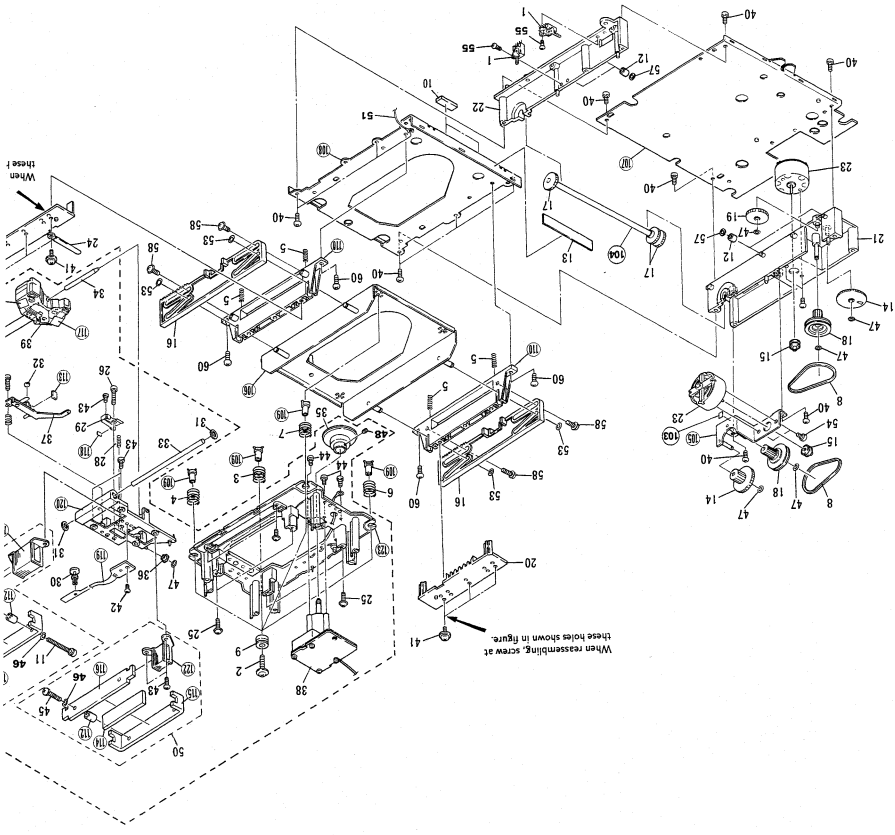
Mark No.	Description	Parts No.
51	Ground plate	PDF1087
52	· · · · ·	
53	Washer	WT32D080D050
54	Screw	PMA26P040FCU
55	Screw	BPZ26P060FCU
56	Screw	BPZ26P060FMC
57	Washer	WT31D054D013
58	Screw	IBZ30P060FCC
59	Screw	ZMD30H040FBT
60	Screw	PDZ30P060FCC
101	· · · · ·	
102	· · · · ·	
103	Felt	
104	Synchro gear axis	
105	Gear angle	
106	Mechanism deck	
107	Bottom plate	
108	Base plate	
109	Collar	
110	U guide	
111	Servo mechanism assembly	
112	Collar	
113	Cushion rubber (2.5)	
114	Magnet	
115	Side yoke	
116	Center yoke	
117	Vinyl Sheet	
118	Tape	
119	Flexible cable	
120	Carriage	
121	Bobbin (A)	
122	Bobbin (B)	
123	Mechanism base unit	
124	Binder	

• How to install the disc table

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

2 While supporting the spindle motor shaft with the stopper, put spacer on top of the motor base (angled so it doesn't touch section Ⓑ), and stick the disc table on top (takes about 9kg pressure). Take off the spacer.





PD3179B)

Voltage	Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage
0	17	0	33	5	49	0.2 ~0.3
1.5	18	5	34	5	50	5
2.1	19	5	35	0	51	0
5	20	0	36	5	52	0
5	21	0	37	5	53	0
5	22	5	38	5	54	0
5.4	23	4.9	39	0	55	0
0	24	5	40	0	56	0
5	25	0	41	0.3 ~0.4	57	0
5	26	0	42	0	58	0
5	27	0	43	0	59	0
1.3 ~1.9	28	0	44	0	60	0
5	29	4.9	45	0	61	0
5	30	4.9	46	0	62	0
0	31	0	47	0	63	0
5	32	0	48	5	64	2.5

IC401 (PDG036)

Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage
1	0.3 ~0.4	17	5	33	1.3	49	−20.9
2	0	18	5	34	4.9	50	−20.9
3	4.9	19	5	35	4.9	51	−20.9
4	4.9	20	5	36	1.3	52	−20.9
5	5.1	21	5	37	1.3	53	−20.9
6	0	22	5	38	5	54	−20.9
7	0.3 ~0.4	23	5	39	−24.4	55	−20.5
8	0	24	0	40	−21.3	56	−20.5
9	0	25	0	41	5.1	57	−26
10	0	26	0	42	0.6	58	0
11	0	27	0	43	5	59	0
12	0	28	5	44	−24.4	60	2.3
13	0	29	5	45	1.6	61	2.2
14	0	30	0	46	−23.6	62	5
15	0	31	0	47	−20.9	63	5
16	5	32	0	48	−20.9	64	5

●TERMINAL VOLTAGES

IC1 (CXA1081S)

Pin No.	Voltage	Pin No.	Voltage
1	0	16	-3
2	1.3	17	-5
3	0	18	0
4	2.4	19	0
5	2.8	20	0
6	-4.8	21	-4.9
7	0	22	0
8	0	23	-1
9	0	24	-2.1
10	0	25	0
11	0	26	2.5
12	-1.2	27	2.4
13	-0.1	28	5
14	0	29	0
15	-3.1	30	5

IC2 (CXA1082BS)

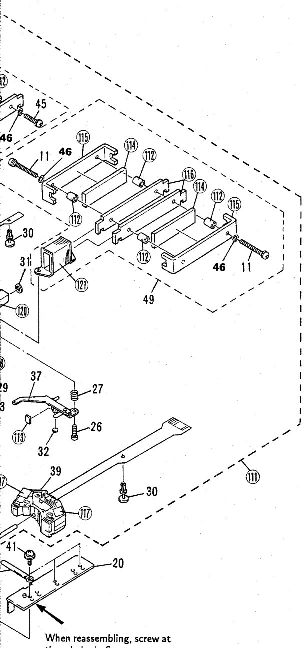
Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage
1	-5	17	0	33	2.5
2	0	18	0	34	2.5
3	0	19	0	35	2.3
4	0	20	0	36	2.3
5	0	21	0	37	3.5
6	0	22	0	38	2.4
7	0	23	-4.1	39	5
8	0	24	5	40	2.5
9	0	25	-5	41	5
10	0	26	0	42	2.5
11	0.2	27	5	43	5
12	0	28	5	44	0
13	0.2	29	5	45	0.23~0.28
14	0	30	5	46	2.5
15	0	31	5	47	5
16	5	32	0	48	0

IC3 (CXD1167Q)

Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage
1	2.5	21	0	41	0	61	1.3
2	5	22	0.12	42	0	62	0
3	2.5	23	0	43	0	63	0
4	2.8	24	0	44	0	64	0
5	2.4	25	5	45	0	65	0
6	2.5	26	5	46	0	66	0
7	5	27	2.5	47	0	67	0
8	2.4	28	5	48	0	68	2.5
9	2.4	29	1.9	49	0	69	2.5
10	0	30	1.9	50	0	70	2.3
11	1.8	31	0	51	2.3	71	5
12	0	32	0	52	0	72	0
13	5	33	5	53	2.2	73	5
14	5	34	0	54	2.2	74	0
15	5	35	0	55	0	75	2.4
16	5	36	0	56	0	76	2.3
17	0	37	0	57	5	77	2.3
18	5	38	0	58	0	78	2.5
19	0	39	0	59	0	79	2.5
20	5	40	0	60	1.3	80	2.5

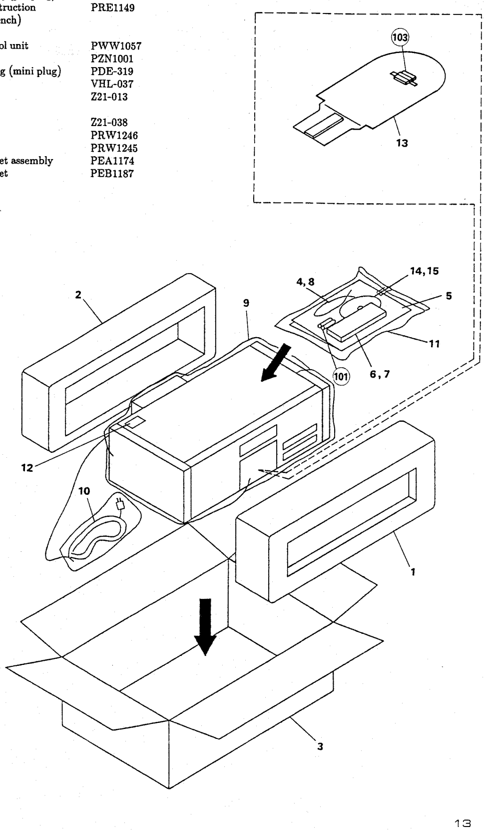
IC4 (PD3179B)

Pin No.	Voltage	Pin No.
1	0	17
2	1.5	18
3	2.1	19
4	5	20
5	5	21
6	5	22
7	5.4	23
8	0	24
9	5	25
10	5	26
11	5	27
12	1.3~1.9	28
13	5	29
14	5	30
15	0	31
16	5	32



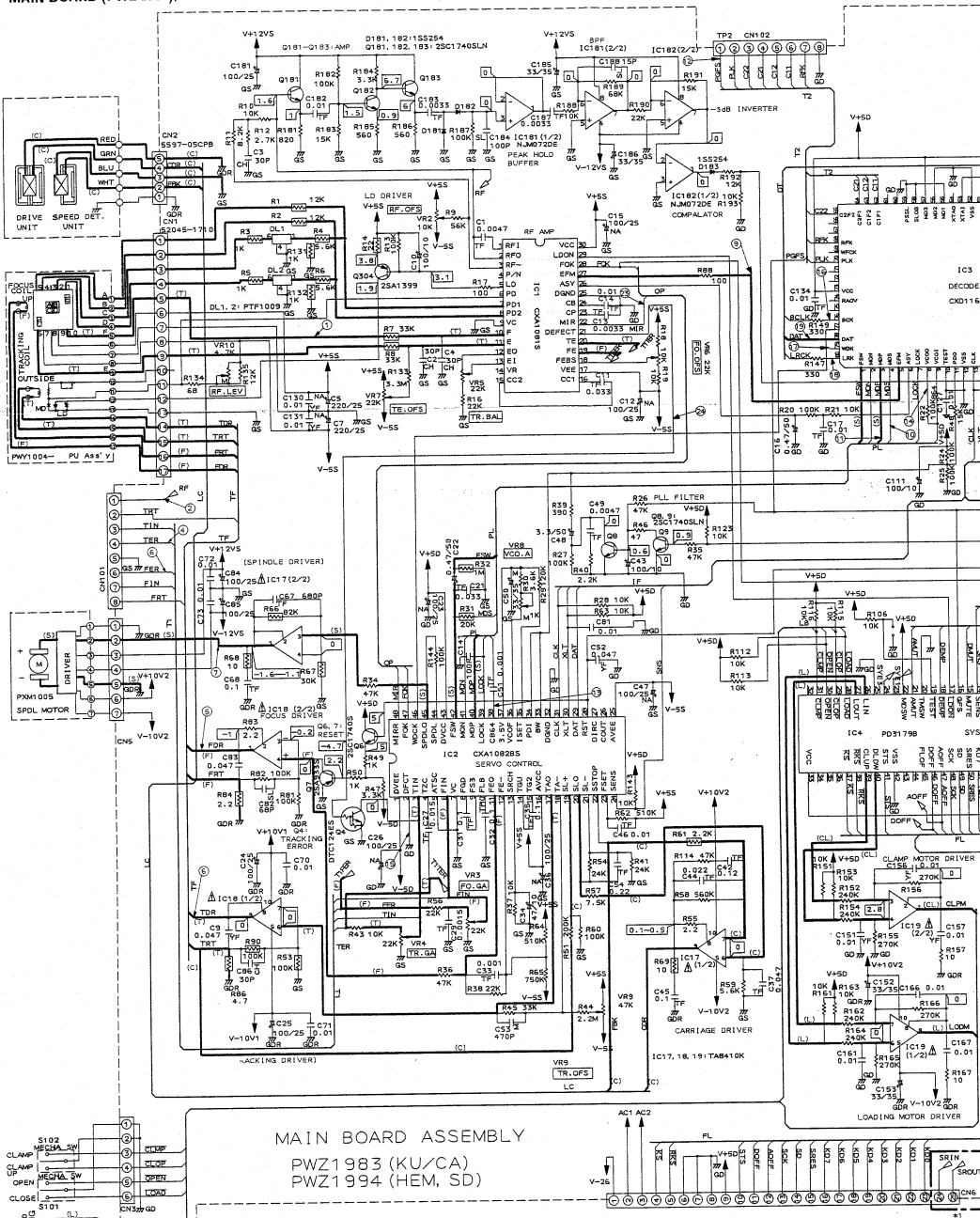
3. PACKING

Mark	No.	Description	Parts No.
	1	Protector (F)	PHA1171
	2	Protector (R)	PHA1172
	3	CD packing case	PHG1676
	4	Cord with plug (pin plug)	PDE1003
	5	Operating instruction (English, French)	PRE1149
	6	Remote control unit	PWW1057
	7	Battery cover	PZN1001
	8	Cord with plug (mini plug)	PDE-319
	9	Mirror mat	VHL-037
	10	Vinyl pouch	Z21-013
	11	Vinyl pouch	Z21-038
	12	Caution label	PRW1246
	13	Sheet	PRW1245
	14	Turntable sheet assembly	PEA1174
	15	Turntable sheet	PEB1187
	101	Battery	
	103	Rubber spacer	

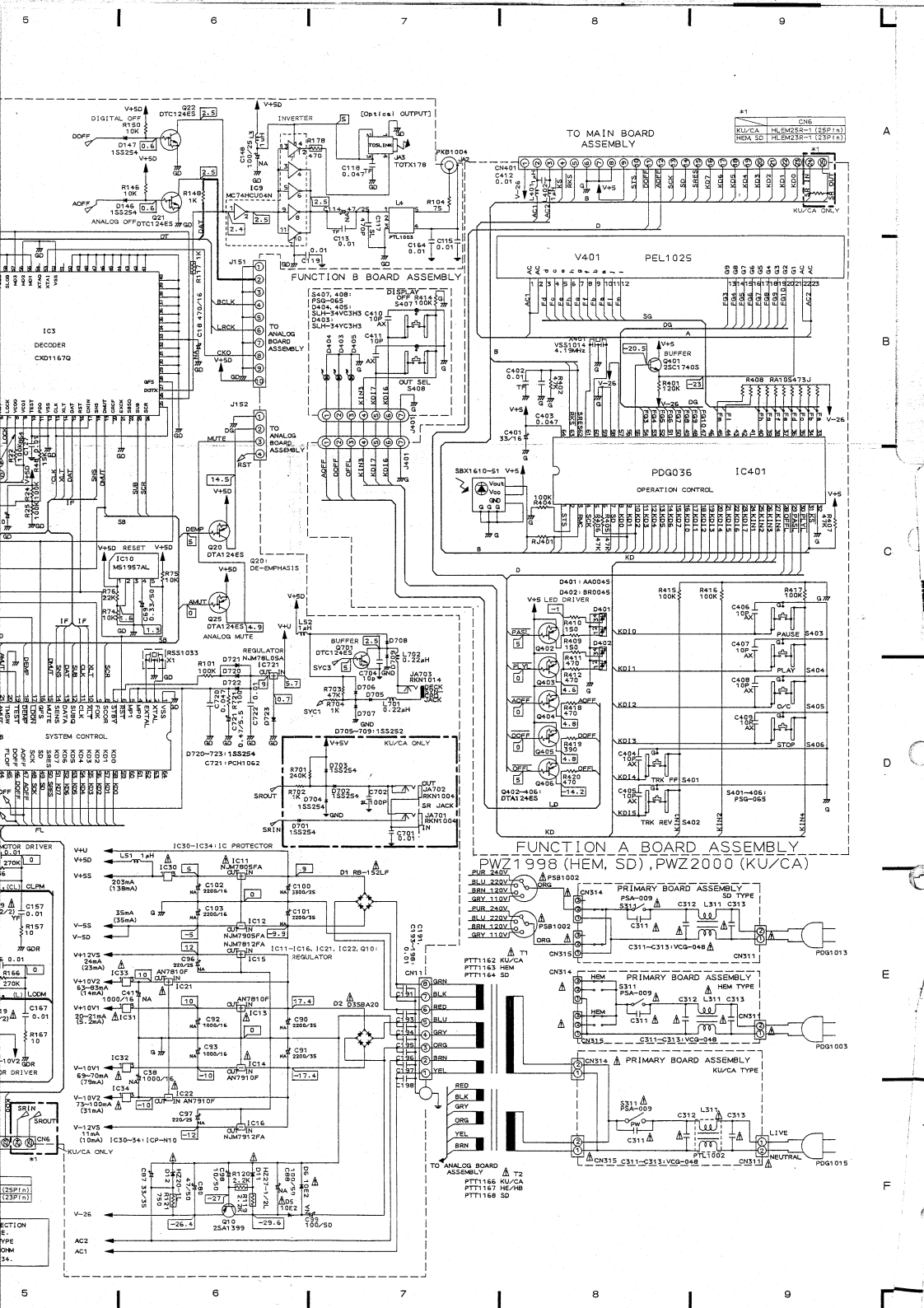


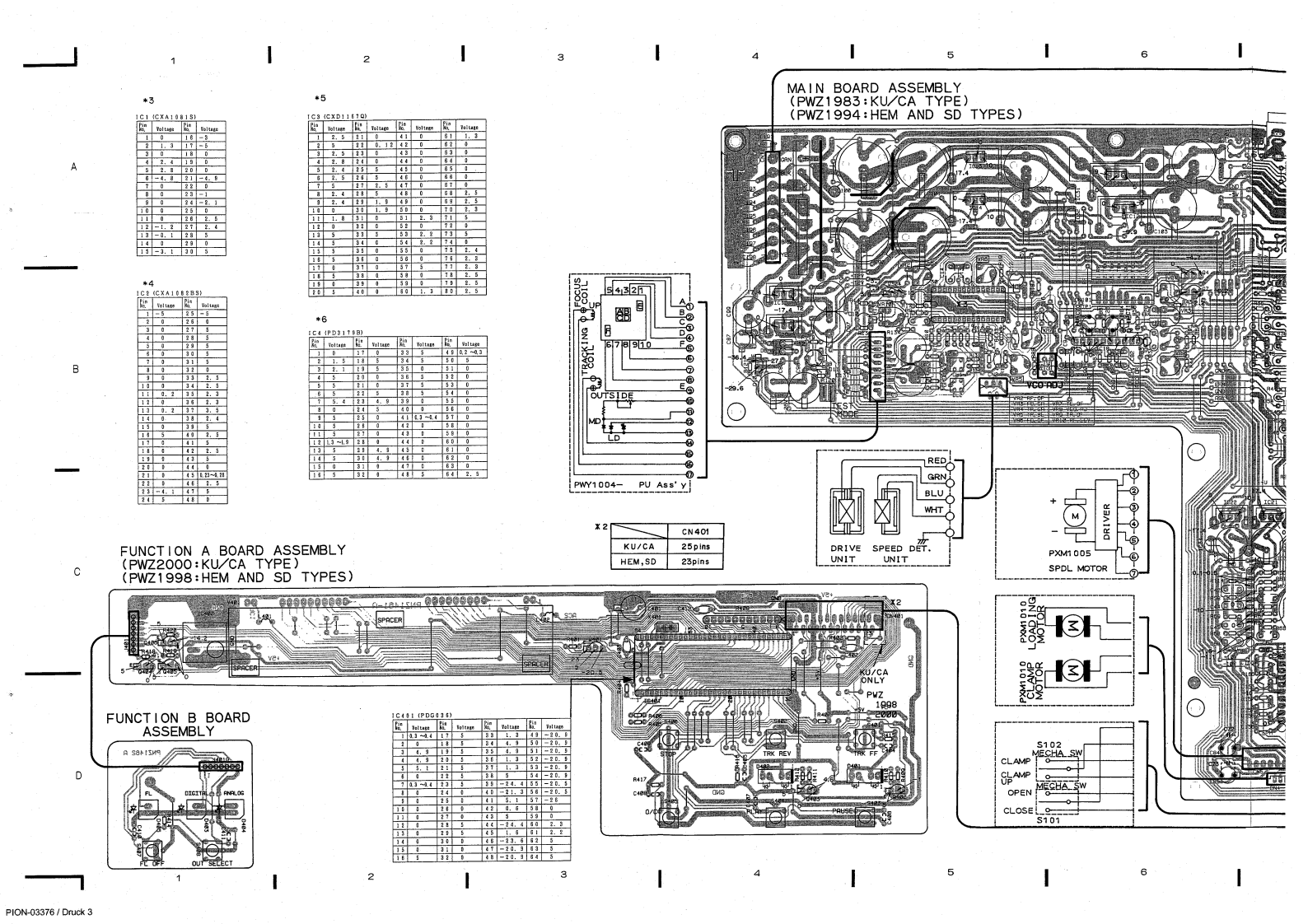
4. SCHEMATIC DIAGRAM AND P.C.BOARDS CONNECTION DIAGRAM

4.1 MAIN BOARD (PWZ 1983), PRIMARY BOARD, FUNCTION A BOARD(PWZ 2000), AND FUNCTION B BOARD ASSEMBLIES



*1	CN6
KU/CA	HLEM25R-1 (25Pin)
HEM, SD	HLEM23R-1 (23Pin)


TO MAIN BOARD ASSEMBLY
FUNCTION B BOARD ASSEMBLY
FUNCTION A BOARD ASSEMBLY
PWZ1998 (HEM, SD), PWZ2000 (KU/CA)
V401 PEL1025
IC401 PDG036
OPERATION CONTROL
IC3 DECODER CXD1167Q
SYSTEM CONTROL
IC30~IC34: IC PROTECTOR
REGULATOR
PRIMARY BOARD ASSEMBLY
SD TYPE
HEM TYPE
KU/CA TYPE
TO ANALOG BOARD ASSEMBLY
PTT1162 KU/CA
PTT1163 HEM
PTT1164 SD
PTT1166 KU/CA
PTT1167 HE/HB
PTT1168 SD
PDG1013
PDG1003
PDG1015
PTL1002
NEUTRAL
LIVE



*3

IC1 (CXA1081S)

Pin No.	Voltage	Pin No.	Voltage
1	0	16	−5
2	1.3	17	−5
3	0	18	0
4	2.4	19	0
5	2.8	20	0
6	−4.8	21	−4.8
7	0	22	0
8	0	23	−1
9	0	24	−2.1
10	0	25	0
11	0	26	2.5
12	−1.2	27	2.4
13	−0.1	28	5
14	0	29	0
15	−3.1	30	5

*4

IC8 (CXA1082BS)

Pin No.	Voltage	Pin No.	Voltage
1	−5	25	−5
2	0	26	0
3	0	27	5
4	0	28	5
5	0	29	5
6	0	30	5
7	0	31	5
8	0	32	0
9	0	33	2.5
10	0	34	2.5
11	0.2	35	2.3
12	0	36	2.3
13	0.2	37	3.5
14	0	38	2.4
15	0	39	5
16	5	40	2.5
17	0	41	5
18	0	42	2.5
19	5	43	3
20	0	44	0
21	0	45	0.23~0.28
22	0	46	2.5
23	−4.1	47	5
24	5	48	0

*5

IC3 (CXD1167Q)

Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage
1	2.5	31	0	61	0	91	1.3
2	5	32	0.12	62	0	92	0
3	2.5	33	0	63	0	93	0
4	2.8	34	0	64	0	94	0
5	2.4	35	5	65	0	95	0
6	2.5	36	5	66	0	96	0
7	5	37	2.5	67	0	97	0
8	2.4	38	5	68	0	98	2.5
9	2.4	39	1.9	69	0	99	2.5
10	0	40	1.9	70	0	100	2.3
11	1.8	41	0	71	2.3	101	5
12	0	42	0	72	0	102	0
13	5	43	5	73	2.2	103	5
14	5	44	0	74	2.2	104	5
15	5	45	0	75	5	105	2.4
16	5	46	0	76	2.8	106	2.8
17	0	47	0	77	5	107	2.3
18	5	48	0	78	2.5	108	2.5
19	0	49	0	79	2.5	109	2.5
20	5	50	0	80	1.3	110	2.5

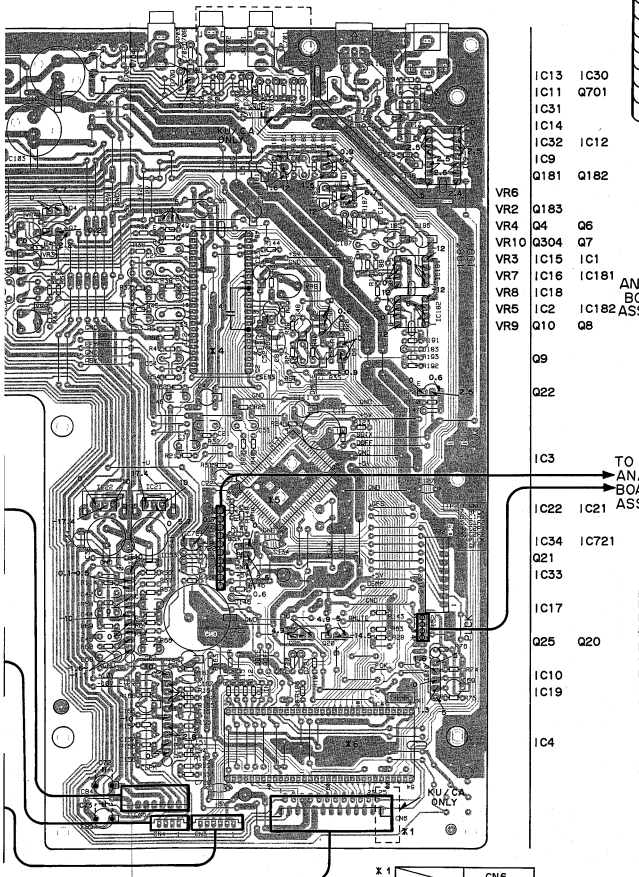
*6

IC4 (PD3179B)

Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage
1	0	17	0	33	5	49	0.2~0.3
2	1.5	18	5	34	5	50	5
3	2.1	19	5	35	0	51	0
4	5	20	0	36	5	52	0
5	5	21	0	37	5	53	0
6	5	22	5	38	5	54	0
7	5.4	23	4.9	39	0	55	0
8	0	24	5	40	0	56	0
9	5	25	0	41	1.3~1.4	57	0
10	3	26	0	42	0	58	0
11	3	27	0	43	0	59	0
12	1.3~1.9	28	0	44	0	60	0
13	3	29	4.3	45	0	61	0
14	3	30	4.9	46	0	62	0
15	0	31	0	47	0	63	0
16	5	32	0	48	5	64	2.5

IC401 (PDG036)

Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage
1	0.3~0.4	17	5	33	1.3	49	−20.8
2	0	18	5	34	4.9	50	−20.9
3	4.9	19	5	35	4.9	51	−20.9
4	4.9	20	5	36	1.3	52	−20.8
5	5.1	21	5	37	1.3	53	−20.9
6	0	22	5	38	5	54	−20.9
7	0.3~0.4	23	5	39	−24.4	55	−20.9
8	0	24	0	40	−21.3	56	−20.9
9	0	25	0	41	5.1	57	−26
10	0	26	0	42	0.6	58	0
11	0	27	0	43	5	59	0
12	0	28	5	44	−24.4	60	2.3
13	0	29	5	45	1.6	61	2.2
14	0	30	0	46	−23.6	62	5
15	0	31	0	47	−20.9	63	5
16	5	32	0	48	−20.9	64	5



IC13 IC30
IC11 Q701
IC31
IC14
IC32 IC12
IC9
Q181 Q182
VR6
VR2 Q183
VR4 Q4 Q6
VR10 Q304 Q7
VR3 IC15 IC1
VR7 IC16 IC181
VR8 IC18
VR5 IC2 IC182
VR9 Q10 Q8
Q9
Q22
IC3
IC22 IC21
IC34 IC721
Q21
IC33
IC17
Q25 Q20
IC10
IC19
IC4

TO ANALOG BOARD ASSEMBLY

TO ANALOG BOARD ASSEMBLY

KU/CA ONLY

X1

X1	CN6
KU/CA	25pins
HEM, SD	23pins

POWER SUPPLY SECTION FOR KU/CA TYPE

PRIMARY BOARD ASSEMBLY

GRN BLK RED BLU GRY ORG BRN YEL

T1 WHT BRN

T2 BRN WHT

GRY ORG YEL BRN RED BLK

AC POWER CORD AC 120V

POWER SUPPLY SECTION FOR HEM TYPE

PRIMARY BOARD ASSEMBLY

T1 WHT BLU

T2 BLU WHT

AC POWER CORD AC 220V

POWER SUPPLY SECTION FOR SD TYPE

PRIMARY BOARD ASSEMBLY

T1 WHT

VOLTAGE SELECTOR

GRY BRN BLU PUR ORG

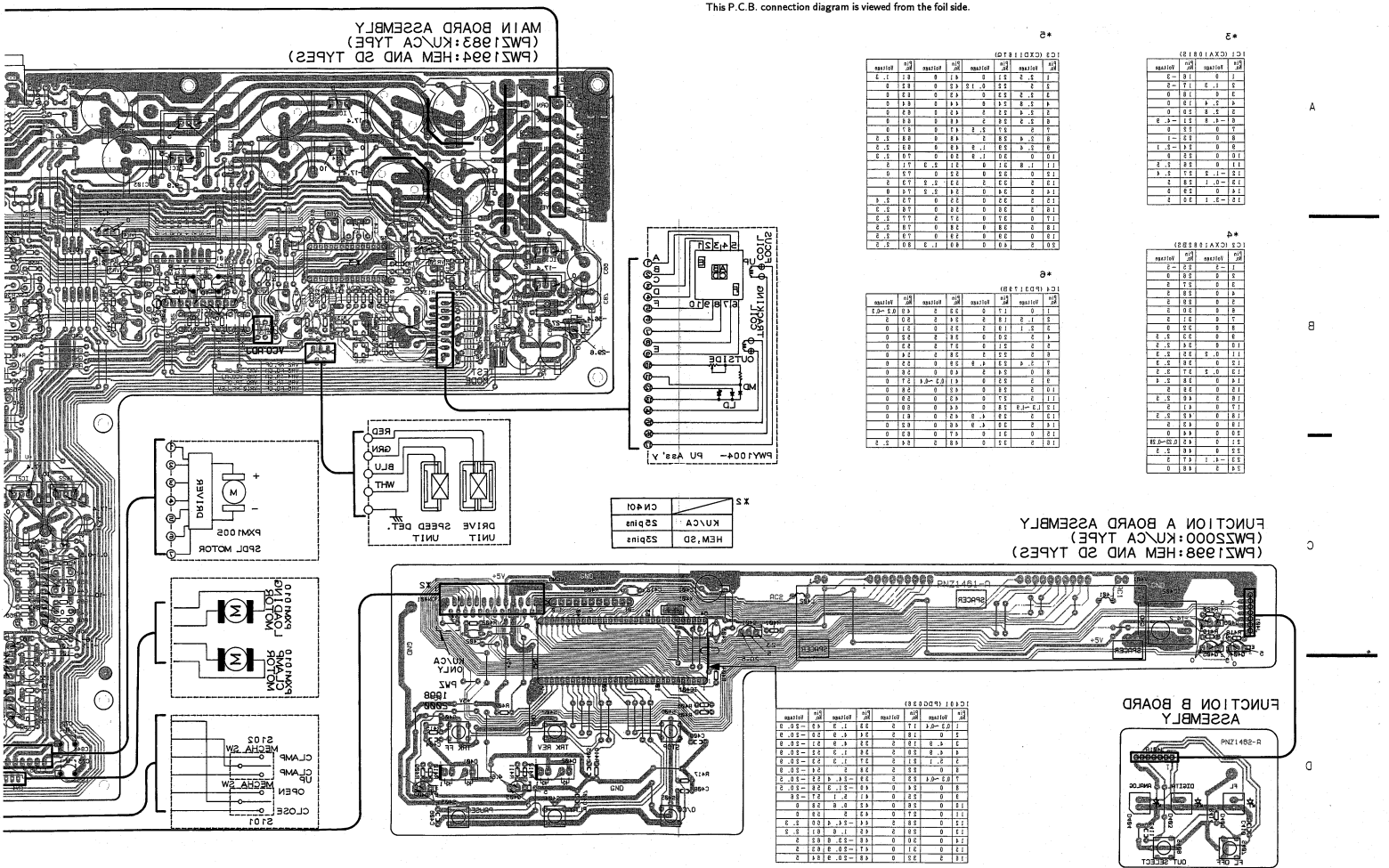
T2 PUR BLU BRN GRY WHT

VOLTAGE SELECTOR

AC POWER CORD AC 110/120-127/ 220/240V

POWER SUPPLY SECTION FOR KUXCA TYPE
PRIMARY BOARD ASSEMBLY
T1
T2
WHT
GRN
BLK
RED
BLU
GRY
ORG
BRN
YEL
AC POWER CORD
AC 120V
TO ANALOG BOARD ASSEMBLY
POWER SUPPLY SECTION FOR HEM TYPE
PRIMARY BOARD ASSEMBLY
AC POWER CORD
AC 220V
POWER SUPPLY SECTION FOR SD TYPE
PRIMARY BOARD ASSEMBLY
VOLTAGE SELECTOR
AC POWER CORD
AC 110/120-127/
220 /240V
TO ANALOG BOARD ASSEMBLY
KUXCA ONLY
X1
CN6
KUXCA
25pins
HEM, SD
25pins

This P.C.B. connection diagram is viewed from the foil side.



4.2 ANALOG BOARD(PWM 1364) AND BALANCE BOARD ASSEMBLIES

This P.C.B. connection diagram is viewed from the foil side.

*1

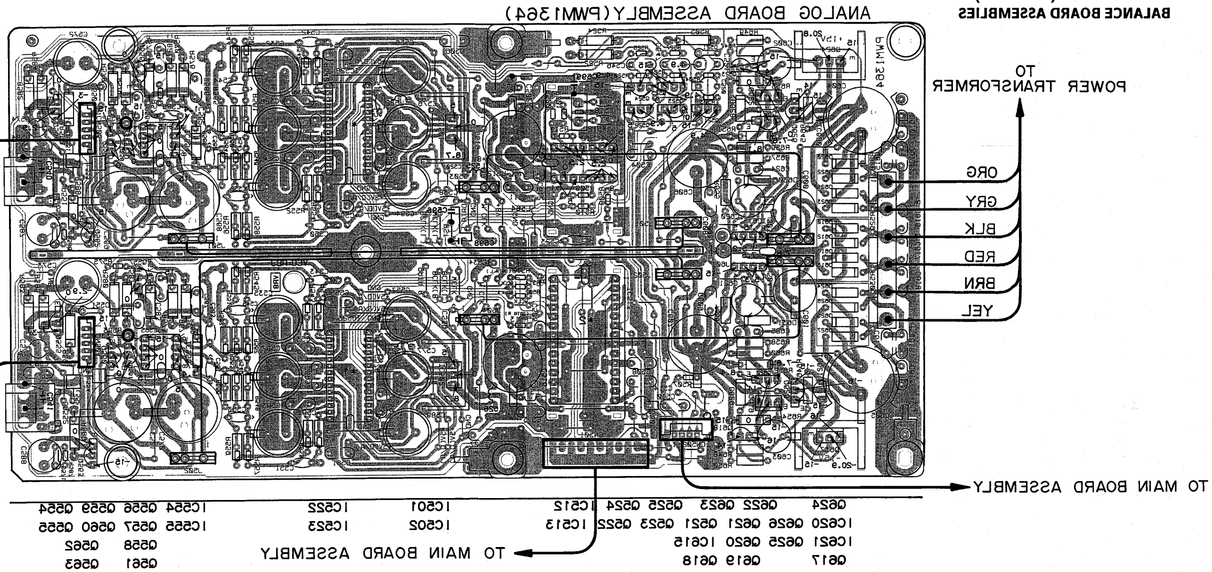
IC552, IC523 (PD2028A)

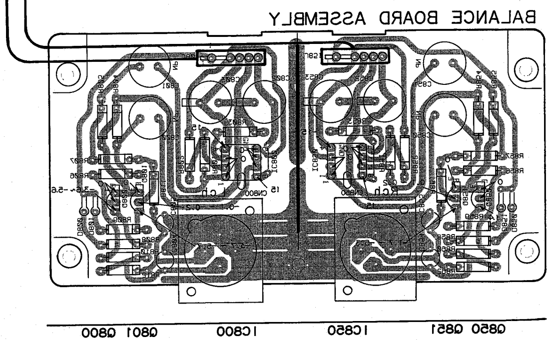
Pin No.	Voltage	Pin No.	Voltage
1	0	15	5
2	2.6	16	5
3	2	17	5
4	0	18	0
5	5	19	3.8
6	5	20	2.2
7	2.3	21	0
8	2.5	22	0
9	0	23	0
10	5	24	0
11	0	25	3.2
12	2	26	2.5
13	2.6	27	0
14	0	28	5

*2

IC513 (SM5813AP)

Pin No.	Voltage	Pin No.	Voltage
1	2.5	15	5
2	2.4	16	0
3	5	17	5
4	0	18	0
5	0	19	0
6	2.4	20	2.4
7	2.6	21	0
8	0	22	5
9	2.2	23	1.9
10	5	24	1.9
11	0	25	3.7
12	0	26	2.1
13	0	27	2.5
14	4.8	28	2.5





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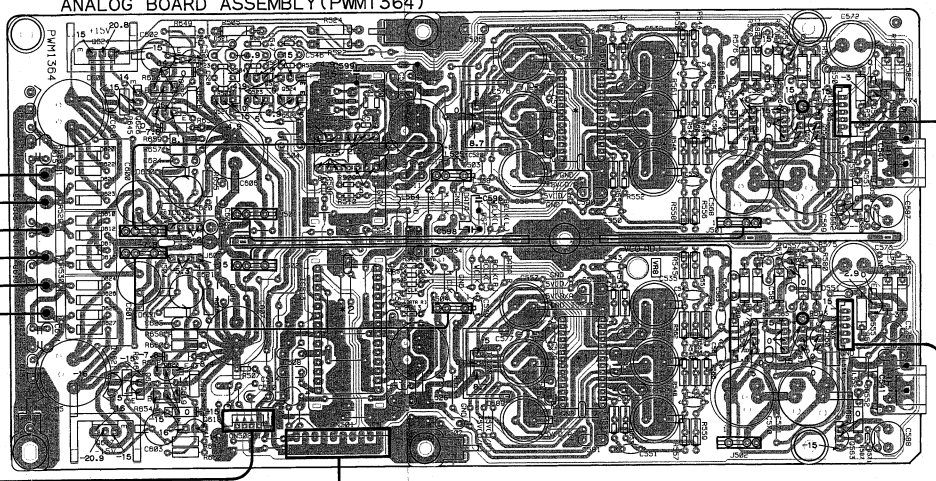
4.2 ANALOG BOARD(PWM 1364) AND BALANCE BOARD ASSEMBLIES

ANALOG BOARD ASSEMBLY(PWM1364)



TO POWER TRANSFORMER

ORG
GRY
BLK
RED
BRN
YEL

TO MAIN BOARD ASSEMBLY

Q624 Q622 Q623 Q525 Q524 IC512 IC501 IC522
IC620 Q626 Q621 Q521 Q523 Q522 IC513 IC502 IC523
IC621 Q625 Q620 IC615
Q617 Q619 Q618

TO MAIN BOARD ASSEMBLY

IC554 Q556 Q559 Q554
IC555 Q557 Q560 Q555
Q558 Q562
Q561 Q563

*1

IC522, IC523 (PD2028A)

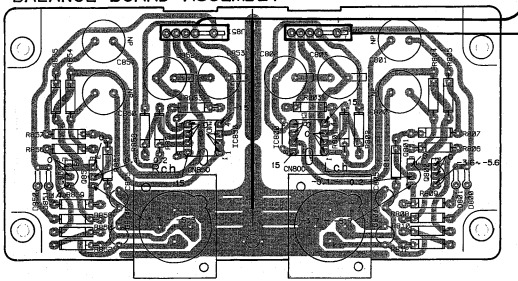
Pin No.	Voltage	Pin No.	Voltage
1	0	15	5
2	2.6	16	5
3	5	17	5
4	0	18	0
5	5	19	3.8
6	5	20	2.2
7	3.3	21	0
8	2.5	22	0
9	0	23	0
10	5	24	0
11	0	25	3.8
12	5	26	2.5
13	2.6	27	0
14	0	28	5

*2

IC513 (SM5813AP)

Pin No.	Voltage	Pin No.	Voltage
1	2.5	15	5
2	2.4	16	0
3	5	17	5
4	0	18	0
5	0	19	0
6	2.4	20	2.4
7	2.6	21	0
8	0	22	5
9	2.2	23	1.9
10	0	24	1.9
11	0	25	3.7
12	0	26	2.1
13	0	27	2.5
14	4.8	28	2.5

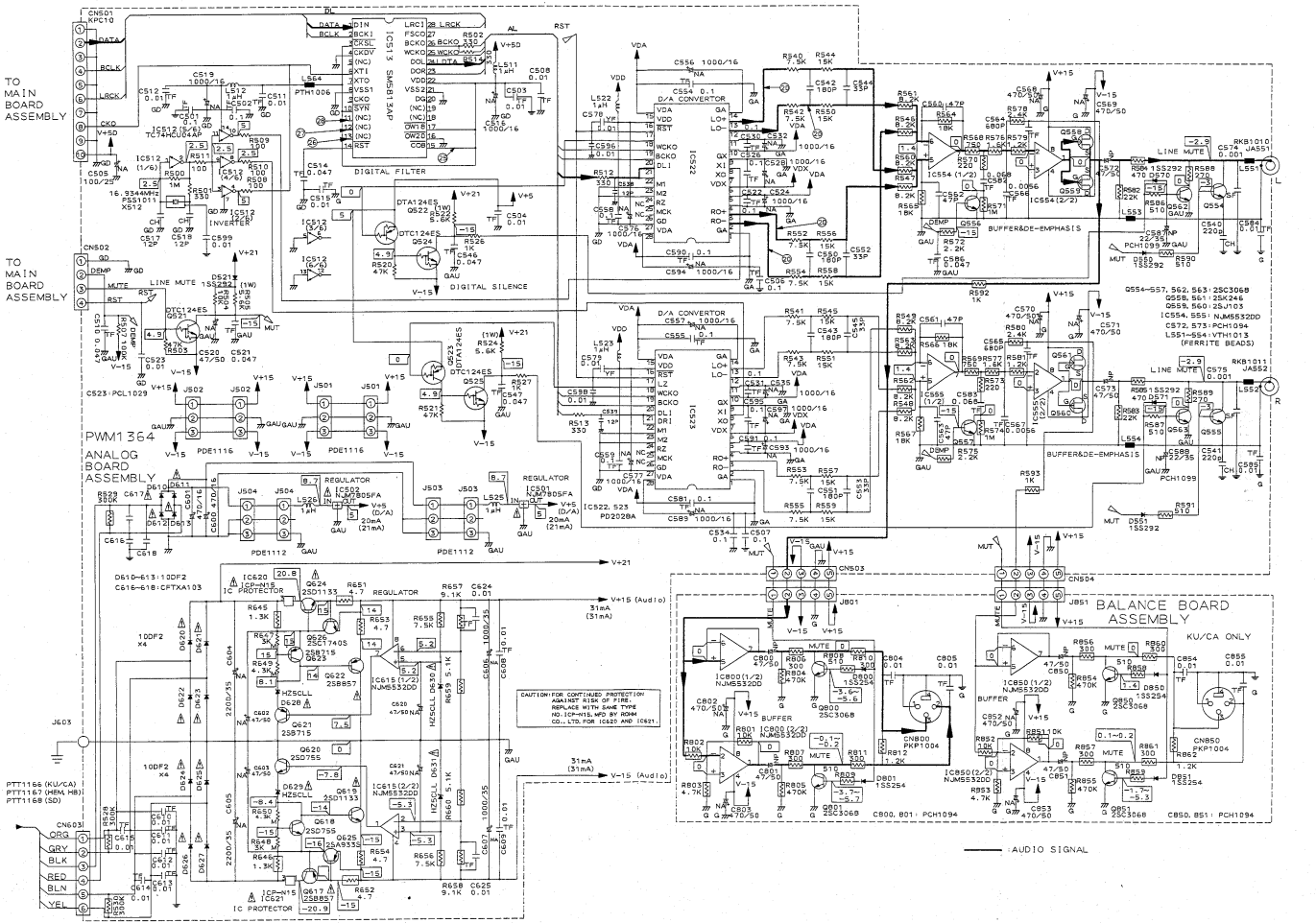
BALANCE BOARD ASSEMBLY

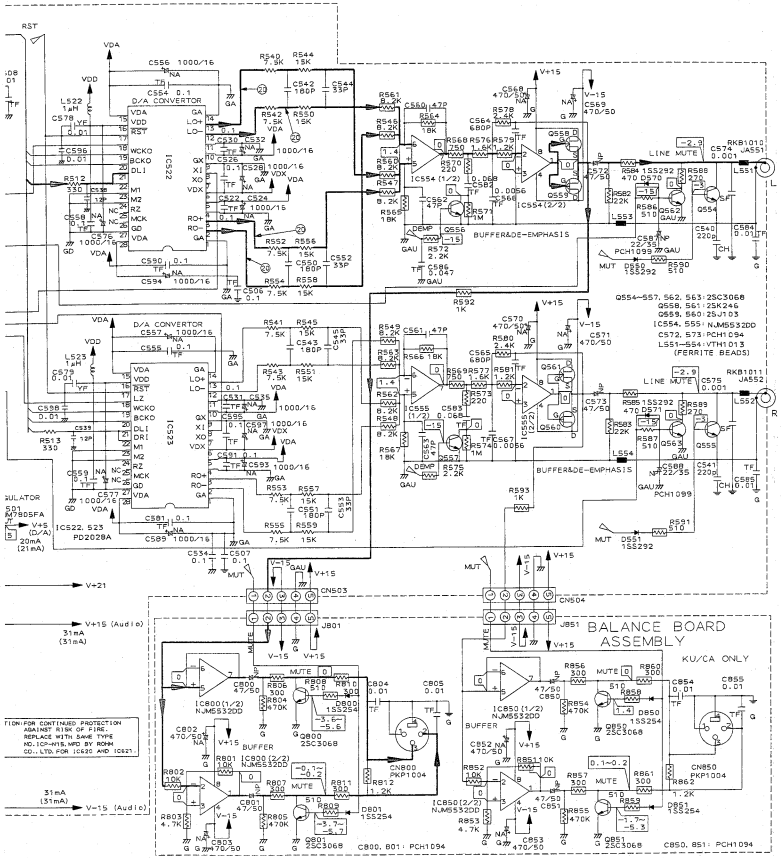


Q850 Q851 IC850 IC800 Q801 Q800

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
		Diode			Spiral capacitor
					Electrolytic capacitor (Non polarized)
		Zener diode			Electrolytic capacitor (Nonetess)
					Electrolytic capacitor (Polarized)
		LED			Electrolytic capacitor (Polarized)
		Varactor			Power capacitor
					Semi-fixed resistor
		Tact switch			Resistor array
		Inductor			Resistor
		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.


TO MAIN BOARD ASSEMBLY
TO MAIN BOARD ASSEMBLY
PWM1364 ANALOG BOARD ASSEMBLY
BALANCE BOARD ASSEMBLY
KU/CA ONLY
DIGITAL FILTER
SM5813AP
D/A CONVERTOR
BUFFER&DE-EMPHASIS
DIGITAL SILENCE
REGULATOR
IC PROTECTOR
INVERTER
LINE MUTE
CAUTION:FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE WITH SAME TYPE NO.ICP-N15, MFD BY ROHM CO., LTD. FOR IC620 AND IC621.
AUDIO SIGNAL



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

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

3.VOLTAGE, CURRENT :
; DC voltage (V) at play state.
; 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)
PRIMARY BOARD ASSEMBLY
S311 POWER

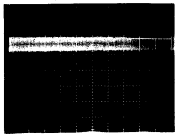
FUNCTION A BOARD ASSEMBLY
S401 ⏮
S402 ⏭ TRACK SEARCH
S403 PAUSE(⏸)
S404 PLAY(▷)
S405 OPEN/CLOSE(⏏)
S406 STOP(□)

FUNCTION B BOARD ASSEMBLY
S407 DISPLAY OFF
S408 OUTPUT

4.3 WAVEFORMS

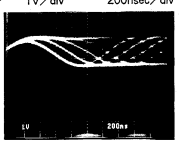
NOTE : The encircled numbers denote measuring points in the schematic diagram.

① CN1-5 Pin : PLAY MODE
50mV/div 5msec/div

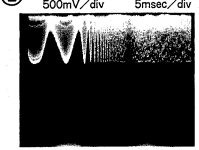


① CN1-5 Pin : SEARCH MODE
50mV/div 5msec/div

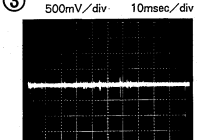
② TP1-1 Pin : PLAY MODE
1V/div 200nsec/div



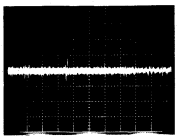
② TP1-1 Pin : SEARCH MODE
500mV/div 5msec/div



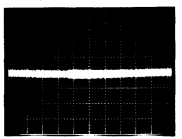
③ TP1-6 Pin : PLAY MODE
500mV/div 10msec/div



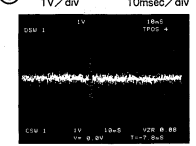
③ TP1-6 Pin : SEARCH MODE
500mV/div 10msec/div



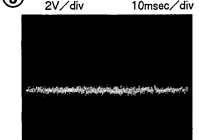
④ TP1-4 Pin : PLAY MODE
1V/div 10msec/div



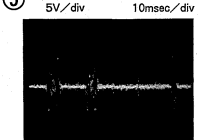
④ TP1-4 Pin : SEARCH MODE
1V/div 10msec/div



⑤ IC18-1 Pin : PLAY MODE
2V/div 10msec/div

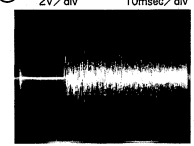


⑤ IC18-1 Pin : SEARCH MODE
5V/div 10msec/div

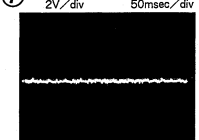


⑥ IC18-9 Pin : PLAY MODE
2V/div 10msec/div

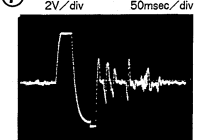
⑥ IC18-9 Pin : SEARCH MODE
2V/div 10msec/div



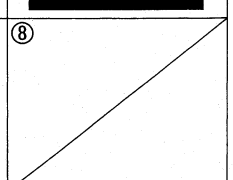
⑦ IC17-1 : PLAY MODE
2V/div 50msec/div



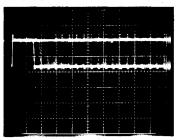
⑦ IC17-1 Pin : SEARCH MODE
2V/div 50msec/div



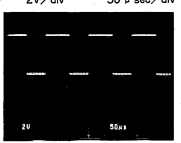
⑧



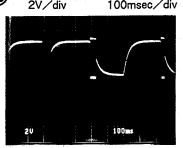
⑨ IC1-27 Pin : PLAY MODE
2V/div 500nsec/div



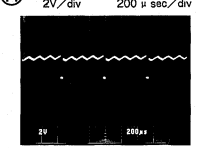
⑩ IC3-4 Pin : PLAY MODE
2V/div 50 μ sec/div



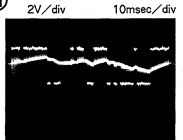
⑩ IC3-4 Pin : SEARCH MODE
2V/div 100msec/div



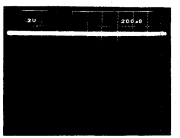
⑪ IC3-3 Pin : PLAY MODE
2V/div 200 μ sec/div



⑪ IC3-3 Pin : SEARCH MODE
2V/div 10msec/div

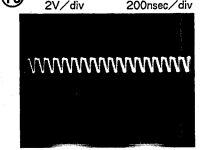


⑫ TP2-1 Pin : PLAY MODE
2V/div 200 μ sec/div

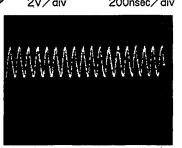


⑫ TP2-1 Pin : SEARCH MODE
2V/div 20msec/div

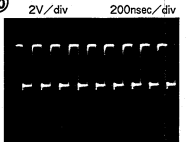
⑬ IC2-38 Pin : PLAY MODE
2V/div 200nsec/div



⑭ IC3-8 Pin : PLAY MODE
2V/div 200nsec/div



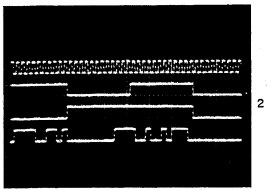
⑮ TP2-2 Pin : PLAY MODE
2V/div 200nsec/div



IC3 (CXD1167Q)

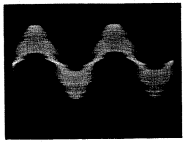
PLAY MODE

⑯ BCLK (Pin76)
⑰ WDCK (Pin79)
⑱ LRCK (Pin80)
⑲ DATA (Pin78)

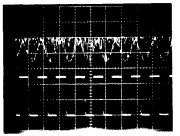


10V/div
2 μ sec/div

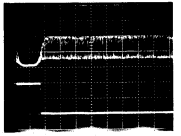
⑳ IC522, IC 523-13,12,2,3 Pin :
PLAY MODE (0dB, 1kHz)
2V/div 200 μ sec/div



㉓ IC1-22 Pin : TRACKING OPEN
0.1msec/div
Upper TP1-1 Pin : 1V/div
Lower IC1-22 Pin : 2V/div

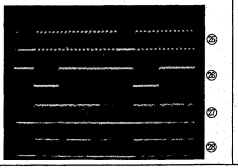


㉔ IC1-21 Pin : DFCT 0.5msec/div
Upper TP1-1 Pin : 1V/div
Lower IC1-21 Pin : 5V/div



IC513 SM 5813 AP
PLAY MODE
5 V/div.

㉕ BCKO (Pin 15)
㉖ WCKO (Pin 13)
㉗ DOL (Pin 12)
㉘ DOR (Pin 11)



5. P.C.B.'s PARTS LIST

NOTES :

- *Parts 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%).

560Ω	*56 × 10¹* *561*	*RD1/4PS[5][6][1]J*
47kΩ	*47 × 10³* *473*	*RD1/4PS[4][7][3]J*
0.5Ω	*0R5*	*RD2H[0][R][5]K*
1Ω	*010*	*RD1P[0][1][0]K*

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

5.62kΩ 562 × 10¹ 5621 ····· *RD1/4SR[5][6][2][1]F*

Mark	No.	Description	Parts No.
		◉ANALOG BOARD ASSEMBLY (PWM1364)	
		SEMICONDUCTORS	
	IC501,IC502	REGULATOR IC	NJM7805FA
	IC512	LOGIC IC	TC74HCU04AP
	IC513	IC	SM5813AP
	IC522,IC523	D/A CONVERTER,IC	PD2028A
	IC554,IC555	OP-AMP IC	NJM5532DD
	IC615	OP-AMP IC	NJM5532DD
⚠	IC620,IC621	IC PROTECTOR	ICP-N15
	Q521	TRANSISTOR	DTC124ES
	Q522,Q523	TRANSISTOR	DTA124ES
	Q524,Q525	TRANSISTOR	DTC124ES
	Q554-Q557	TRANSISTOR	2SC3068
	Q558	TRANSISTOR	2SK246
	Q559,Q560	FET	2SJ103
	Q561	TRANSISTOR	2SK246
	Q562,Q563	TRANSISTOR	2SC3068
⚠	Q617	TRANSISTOR	2SB857
	Q618	TRANSISTOR	2SD755
⚠	Q619	POWER TRANSISTOR	2SD1133
	Q620	TRANSISTOR	2SD755
	Q621	TRANSISTOR	2SB715
⚠	Q622	TRANSISTOR	2SB857
	Q623	TRANSISTOR	2SB715
⚠	Q624	POWER TRANSISTOR	2SD1133
	Q625	TRANSISTOR	2SA933S
	Q626	TRANSISTOR	2SC1740S
	D521	DIODE	1SS292
	D550,D551	DIODE	1SS292
	D570,D571	DIODE	1SS292
⚠	D610-D613	DIODE	10DF2
⚠	D620-D627	DIODE	10DF2
⚠	D628-D631	ZENER DIODE	HZ5CLL

Mark	No.	Description	Parts No.
		COILS AND FILTERS	
	L511,L512	AXIAL INDUCTOR	LAU010K
	L522,L523	AXIAL INDUCTOR	LAU010K
	L525-L527	AXIAL INDUCTOR	LAU010K
	L551-L554	FERRITE BEADS	VTH1013
	L564		PTH1006
		CAPACITORS	
	C501,C502	AUDIO FILM CAPACITOR	CFTXA104J50
	C503,C504	AUDIO FILM CAPACITOR	CFTXA103J50
	C505	ELECTROLYTIC CAPACIT	CENA161M25
	C506,C507	AUDIO FILM CAPACITOR	CFTXA104J50
	C508	AUDIO FILM CAPACITOR	CFTXA103J50
	C510	AUDIO FILM CAPACITOR	CFTXA473J50
	C511,C512	AUDIO FILM CAPACITOR	CFTXA103J50
	C514	AUDIO FILM CAPACITOR	CFTXA473J50
	C515	AUDIO FILM CAPACITOR	CFTXA103J50
	C516	ELECTROLYTIC CAPACIT	CENA102M16
	C517,C518	CERAMIC CAPACITOR	CCCCH120J50
	C519	ELECTROLYTIC CAPACIT	CENA102M16
	C520	ELECTROLYTIC CAPACIT	CENA470M50
	C521	AUDIO FILM CAPACITOR	CFTXA473J50
	C522	AUDIO FILM CAPACITOR	CFTXA104J50
	C523	CERAMIC CAPACITOR	PCL1029
	C524	ELECTROLYTIC CAPACIT	CENA102M16
	C526	AUDIO FILM CAPACITOR	CFTXA104J50
	C528	ELECTROLYTIC CAPACIT	CENA102M16
	C530,C531	AUDIO FILM CAPACITOR	CFTXA104J50
	C532	ELECTROLYTIC CAPACIT	CENA102M16
	C534	AUDIO FILM CAPACITOR	CFTXA104J50
	C535	ELECTROLYTIC CAPACIT	CENA102M16
	C538,C539	CERAMIC CAPACITOR	CCCCH120J50
	C540,C541	CERAMIC CAPACITOR	CCDCH221J50
	C542,C543	MICA CAPACITOR	CMA181J500
	C544,C545	MICA CAPACITOR	CMA330J500
	C546,C547	AUDIO FILM CAPACITOR	CFTXA473J50
	C550,C551	MICA CAPACITOR	CMA181J500
	C552,C553	MICA CAPACITOR	CMA330J500

Mark	No.	Description	Parts No.
	C554,C555	AUDIO FILM CAPACITOR	CFTXA104J50
	C556,C557	ELECTROLYTIC CAPACIT	CENA102M16
	C558,C559	AUDIO FILM CAPACITOR	CFTXA104J50
	C560-C563	MICA CAPACITOR	CMA470J500
	C564,C565		CFTXA681J50
	C566,C567		CFTXA562J50
	C568-C571	ELECTROLYTIC CAPACIT	CENA471M50
	C572,C573	ELECTROLYTIC CAPACIT	PCH1094
	C574,C575	PL STYRENE CAPACITOR	CQSP102J50
	C576,C577	ELECTROLYTIC CAPACIT	CENA102M16
	C578,C579	AUDIO FILM CAPACITOR	CFTXA103J50
	C581	AUDIO FILM CAPACITOR	CFTXA104J50
	C582,C583	AUDIO FILM CAPACITOR	CFTXA683J50
	C584,C585	AUDIO FILM CAPACITOR	CFTXA103J50
	C586	AUDIO FILM CAPACITOR	CFTXA473J50
	C587,C588	ELECTR. CAPACITOR	PCH1099
	C589	ELECTROLYTIC CAPACIT	CENA102M16
	C590,C591	AUDIO FILM CAPACITOR	CFTXA104J50
	C593,C594	ELECTROLYTIC CAPACIT	CENA102M16
	C595	AUDIO FILM CAPACITOR	CFTXA104J50
	C596	CERAMIC CAPACITOR	CKDYF103Z50
	C597	ELECTROLYTIC CAPACIT	CENA102M16
	C598	CERAMIC CAPACITOR	CKDYF103Z50
	C599	AUDIO FILM CAPACITOR	CFTXA103J50
	C600,C601	ELECTROLYTIC CAPACIT	CENA471M16
	C602,C603	ELECTROLYTIC CAPACIT	CENA470M50
	C604,C605	ELECTR. CAPACITOR	PCH1102
	C606,C607	ELECTROLYTIC CAPACIT	CENA102M35
	C608-C618	AUDIO FILM CAPACITOR	CFTXA103J50
	C620,C621	ELECTROLYTIC CAPACIT	CENA470M50
	C624,C625	AUDIO FILM CAPACITOR	CFTXA103J50

RESISTORS

	R505,R522	METAL OXIDE RESISTOR	RS1LMF562J
	R524	METAL OXIDE RESISTOR	RS1LMF562J
	R528-R530	CARBON FILM RESISTOR	RDR1/4PM304J
	R540-R567	CARBON FILM RESISTOR	RDR1/4PM□□□J
	R568-R571	CARBON FILM RESISTOR	RDM1/2P□□□J
	R573,R574	CARBON FILM RESISTOR	RDM1/2P□□□J
	R576-R585	CARBON FILM RESISTOR	RDM1/2P□□□J
	R588-R589	CARBON FILM RESISTOR	RDM1/2P271J
	R590-R593	CARBON FILM RESISTOR	RDM1/2P□□□J
	R645,R646	CARBON FILM RESISTOR	RDR1/4PM132J
	R647-R650	METALFILM RESISTER	RN1/4PQ□□□□F
	R651-R654	CARBON FILM RESISTOR	RDR1/2PM4R7J
	R655-R660	CARBON FILM RESISTOR	RDR1/4PM□□□J
	Other resistors		RD1/6PM□□□J

OTHERS

	CN501	CONNECTOR(10P)	KPC10
	JA551	1P PIN JACK(W)	RKB1010
	JA552	1P PIN JACK (R)	RKB1011
	X512	XTAL RES (OSC)	PSS1011
	SCREW		IBZ30P100FCC

Mark	No.	Description	Parts No.
	◉MAIN BOARD ASSEMBLY (PWZ1983)		

SEMICONDUCTORS

	IC1	PRE AMP IC	CXA1081S
	IC2	SERVO CONTROL IC	CXA1082BS
	IC3	EFM DEMODULATION IC	CXD1167Q
	IC4	MICROCOMPUTER,IC	PD3179B
	IC9	IC	MC74HCU04N
	IC10	SYSTEM RESET IC	M51957AL
⚠	IC11	REGULATOR IC	NJM7805FA
	IC12	REGULATOR IC	NJM7905FA
⚠	IC13	REGULATOR IC	AN7810F
⚠	IC14	REGULATOR IC	AN7910F
	IC15	REGULATOR IC	NJM7812FA
	IC16	REGULATOR IC	NJM7912FA
⚠	IC17-IC19	POWER OP-AMP	TA8410K
⚠	IC21	REGULATOR IC	AN7810F
⚠	IC22	REGULATOR IC	AN7910F
⚠	IC30-IC34	IC PROTECTOR	ICP-N10
	IC181,IC182	IC	NJM072DE
	IC721	REGULATOR IC	NJM78L05A
	Q4	TRANSISTOR	DTC124ES
	Q6	TRANSISTOR	2SC1740S
	Q7	TRANSISTOR	2SA933S
	Q8,Q9	TRANSISTOR	2SC1740SLN
	Q10	TRANSISTOR	2SA1399
	Q20	TRANSISTOR	DTA124ES
	Q21,Q22	TRANSISTOR	DTC124ES
	Q25	TRANSISTOR	DTA124ES
	Q181-Q183	TRANSISTOR	2SC1740SLN
	Q304	TRANSISTOR	2SA1399
	Q701	TRANSISTOR	DTC124ES
⚠	D1		RB-152L/F
⚠	D2		D3SBA20
⚠	D5,D6	DIODE	10E2
⚠	D11	ZENER DIODE	HZ27-1/2L
⚠	D12	ZENER DIODE	HZ20-1L
	D146,D147	DIODE	1SS254
	D181-D183	DIODE	1SS254
	D701-D709	DIODE	1SS254
	D720-D723	DIODE	1SS254

COILS AND FILTERS

	DL1,DL2	FILTER	PTF1009
	L3	RADIAL INDUCTOR	LRA010K
	L4	COIL	PTL1003
	L51,L52	AXIAL INDUCTOR	LAU010K
	L701,L702	AXIAL COIL	LAUR22K

CAPACITORS

	C1	AUDIO FILM CAPACITOR	CFTXA472J50
	C2-C4	CERAMIC CAPACITOR	CCCCH300J50
	C5,C7	ELECTROLYTIC CAPACIT	CENA221M25
	C9	CERAMIC CAPACITOR	CGCYF473Z25
	C10	ELECTR.CAPACITOR	CEAS101M10

Mark	No.	Description	Parts No.
	C11	AUDIO FILM CAPACITOR	CFTXA333J50
	C12	ELECTROLYTIC CAPACIT	CENA101M25
	C13	AUDIO FILM CAPACITOR	CFTXA332J50
	C14	AUDIO FILM CAPACITOR	CFTXA103J50
	C15	ELECTROLYTIC CAPACIT	CENA101M25
	C16	ELECTR.CAPACITOR	CEASR47M50
	C17	AUDIO FILM CAPACITOR	CFTXA103J50
	C18	ELECTROLYTIC CAPACIT	CENA471M16
	C21	AUDIO FILM CAPACITOR	CFTXA333J50
	C22	ELECTR.CAPACITOR	CEASR47M50
	C23	ELECTROLYTIC CAPACIT	CENA101M25
	C24,C25	ELECTR.CAPACITOR	CEAS101M25
	C26	ELECTROLYTIC CAPACIT	CENA101M25
	C27	AUDIO FILM CAPACITOR	CFTXA153J50
	C29		CFTXA152J50
	C31,C32	AUDIO FILM CAPACITOR	CFTXA104J50
	C33		CFTXA102J50
	C34	ELECTR.CAPACITOR	CEAS470M10
	C35	AUDIO FILM CAPACITOR	CFTXA104J50
	C36	ELECTROLYTIC CAPACIT	CENA101M25
	C37	AUDIO FILM CAPACITOR	CFTXA473J50
	C38,C41	ELECTROLYTIC CAPACIT	CENA102M16
	C42	AUDIO FILM CAPACITOR	CFTXA124J50
	C43	ELECTR.CAPACITOR	CEAS101M10
	C44	AUDIO FILM CAPACITOR	CFTXA223J50
	C45	AUDIO FILM CAPACITOR	CFTXA104J50
	C46	AUDIO FILM CAPACITOR	CFTXA103J50
	C47	ELECTROLYTIC CAPACIT	CENA101M25
	C48	ELECTR.CAPACITOR	CEAS3R3M50
	C49	AUDIO FILM CAPACITOR	CFTXA472J50
	C50	ELECTROLYTIC CAPACIT	CEAS330M35
	C51		CFTXA102J50
	C52	CERAMIC CAPACITOR	CGCYF473Z25
	C53	MYLOR FILM CAPACITOR	CQMA471J50
	C54	AUDIO FILM CAPACITOR	CFTXA224J50
	C67		CFTXA681J50
	C68	AUDIO FILM CAPACITOR	CFTXA104J50
	C69	ELECTR.CAPACITOR	CEASR33M50
	C70-C73	AUDIO FILM CAPACITOR	CFTXA103J50
	C80	ELECTR.CAPACITOR	CEAS470M50
	C81	CERAMIC CAPACITOR	CKCYF103Z50
	C82	CERAMIC CAPACITOR	CCCSL680J50
	C83	CERAMIC CAPACITOR	CGCYF473Z25
	C84,C85	ELECTR.CAPACITOR	CEAS101M25
	C86	CERAMIC CAPACITOR	CCCCH300J50
	C87	ELECTROLYTIC CAPACIT	CEAS330M35
	C88	ELECTR.CAPACITOR	CEAS101M50
	C90,C91	ELECTROLYTIC CAPACIT	CENA222M35
	C92,C93	ELECTROLYTIC CAPACIT	CENA102M16
	C96,C97	ELECTROLYTIC CAPACIT	CENA221M25
	C98	ELECTR.CAPACITOR	CEAS100M50
	C99	ELECTR.CAPACITOR	CEAS101M50
	C100	ELECTROLYTIC CAPACIT	CENA332M25
	C101	ELECTROLYTIC CAPACIT	CENA222M35
	C102,C103	ELECTROLYTIC CAPACIT	CENA222M16

Mark	No.	Description	Parts No.
	C111	ELECTR.CAPACITOR	CEAS101M10
	C113	AUDIO FILM CAPACITOR	CFTXA103J50
	C114	ELECTROLYTIC CAPACIT	CENA470M25
	C115	CERAMIC CAPACITOR	CKCYF103Z50
	C117	CERAMIC CAPACITOR	CCCSL471J50
	C118	AUDIO FILM CAPACITOR	CFTXA473J50
	C119,C127	CERAMIC CAPACITOR	CKCYF103Z50
	C130,C131	CERAMIC CAPACITOR	CKCYF103Z50
	C134	AUDIO FILM CAPACITOR	CFTXA103J50
	C141	CERAMIC CAPACITOR	CCDSL101J50
	C148	ELECTROLYTIC CAPACIT	CENA101M25
	C151	CERAMIC CAPACITOR	CKCYF103Z50
	C152,C153	ELECTROLYTIC CAPACIT	CEAS330M35
	C156,C157	CERAMIC CAPACITOR	CKCYF103Z50
	C161,C164	CERAMIC CAPACITOR	CKCYF103Z50
	C166,C167	CERAMIC CAPACITOR	CKCYF103Z50
	C181	ELECTR.CAPACITOR	CEAS101M25
	C182	AUDIO FILM CAPACITOR	CFTXA103J50
	C183	AUDIO FILM CAPACITOR	CFTXA332J50
	C184	CERAMIC CAPACITOR	CCCSL101J50
	C185,C186	ELECTROLYTIC CAPACIT	CEAS330M35
	C187	AUDIO FILM CAPACITOR	CFTXA332J50
	C188	CERAMIC CAPACITOR	CCCSL150J50
	C191	CERAMIC CAPACITOR	PCL1029
	C193-C198	CERAMIC CAPACITOR	PCL1029
	C701	CERAMIC CAPACITOR	CKCYF103Z50
	C702	CERAMIC CAPACITOR	CCCSL101J50
	C704	CERAMIC CAPACITOR	CCCSL100D50
	C720	CERAMIC CAPACITOR	CGCYF473Z25
	C721		PCH1062
	C722	CERAMIC CAPACITOR	CKCYF103Z50

RESISTORS

VR2	SEMI-FIXED RESISTOR	VRTB6VS103
VR3-VR7	VR	VRTB6VS223
VR8	VR	VRTS6VS102
VR9	VR	VRTB6VS473
VR10	VR	VRTS6VS472
R1-R8	CARBON FILM RESISTOR	RDR1/4PM□□□J
R14	CARBON FILM RESISTOR	RDR1/2PM220J
R30	METAL FILM RESISTOR	RN1/6PQ3601F
R31,R32	CARBON FILM RESISTOR	RDR1/4PM□□□J
R53	CARBON FILM RESISTOR	RDR1/4PM104J
R58,R59	CARBON FILM RESISTOR	RDR1/4PM□□□J
R61	CARBON FILM RESISTOR	RDR1/4PM222J
R66-R69	CARBON FILM RESISTOR	RDR1/4PM□□□J
R84,R86	CARBON FILM RESISTOR	RDR1/2PM□□□J
R90,R114	CARBON FILM RESISTOR	RDR1/4PM□□□J
R117	CARBON FILM RESISTOR	RDR1/4PM102J
R119-R121	CARBON FILM RESISTOR	RDR1/4PM□□□J
R131,R132	CARBON FILM RESISTOR	RDR1/4PM102J
R178	CARBON FILM RESISTOR	RDR1/4PM471J
	Other resistors	RD1/6PM□□□J

OTHERS

CN1	52045-1710
CN2	5597-05CPB

Mark	No.	Description	Parts No.
	CN6	CONNECTOR	HLEM25R
	JA2	JACK	PKB1004
	JA3	OPTICAL OUTPUT JACK	TOTX178
	JA701	JACK	RKN1004
	JA702	JACK	RKN1004
	JA703	JACK	RKN1014
	X1	CERAMIC RESONATOR	RSS1033

PRIMARY BOARD ASSEMBLY

SWITCH

⚠	S311	SWITCH (POWER)	PSA-009

FILTER

⚠	L311	FILTER	PTL1002

CAPACITORS

⚠	C311-C313	CAPACITOR (CERAMIC)	VCG-048

FUNCTION B BOARD ASSEMBLY

SEMICONDUCTORS

D403	LED	SLH-34YC3H3
D404,D405	LED	SLH-34VC3H3

SWITCHES

S407,S408	SWITCH (DISPLAY OFF, OUTPUT)	PSG-065

CAPACITORS

C410,C411	AXIAL CERAMIC C.	CCPUCH100J50

RESISTOR

R414	CARBON FILM RESISTOR	RD1/6PM104J

◉FUNCTION A BOARD ASSEMBLY (PWZ2000)

SEMICONDUCTORS

IC401	FL MCU	PDG036
Q401	TRANSISTOR	2SC1740S
Q402-Q406	TRANSISTOR	DTA124ES
D401	LED	AA0045
D402	LED	BR0045

SWITCHES

S401-S406	SWITCH (TRK FF, TRK REV, PAUSE / PLAY, OPEN/CLOSE, STOP)	PSG-065

COILS

L401	AXIAL INDUCTOR	LAU010K
L402	AXIAL INDUCTOR	LAU010K

Mark	No.	Description	Parts No.

CAPACITORS

C401	ELECTROLYTIC CAPACIT	CEJA330M16
C402	AUDIO FILM CAPACITOR	CFTXA103J50
C403	CERAMIC CAPACITOR	CGCYF473Z25
C404-C409	AXIAL CERAMIC C.	CCPUCH100J50
C412	CERAMIC CAPACITOR	CKCYF103Z50

RESISTORS

R408	RESISTOR ARRAY (47K)	RA10S473J
	Other resistors	RD1/6PM□□□J

OTHERS

CN401	CONNECTOR	HLEM25R
V401	FL TUBE	PEL1025
X401	CERAMIC RESONATOR	VSS1014
	REMOTE SENSOR	SBX1610

BALANCE BOARD ASSEMBLY

SEMICONDUCTORS

IC800,IC850	OP-AMP IC	NJM5532DD
Q800,Q801	TRANSISTOR	2SC3068
Q850,Q851	TRANSISTOR	2SC3068
D800,D801	DIODE	1SS254
D850,D851	DIODE	1SS254

CAPACITORS

C800,C801	ELECTROLYTIC CAPACIT	PCH1094
C802,C803	ELECTROLYTIC CAPACIT	CENA471M35
C804,C805	AUDIO FILM CAPACITOR	CFTXA103J50
C850,C851	ELECTROLYTIC CAPACIT	PCH1094
C852,C853	ELECTROLYTIC CAPACIT	CENA471M35
C854,C855	AUDIO FILM CAPACITOR	CFTXA103J50

RESISTORS

R801-R807	CARBON FILM RESISTOR	RDM1/2P□□□J
R808,R809	CARBON FILM RESISTOR	RDR1/4PM511J
R810-R812	CARBON FILM RESISTOR	RDM1/2P□□□J
R851-R857	CARBON FILM RESISTOR	RDM1/2P□□□J
R858,R859	CARBON FILM RESISTOR	RDR1/4PM511J
R860-R862	CARBON FILM RESISTOR	RDM1/2P□□□J

6. ADJUSTMENTS

Perform the following adjustments in the indicated order.

● Adjustments

1. Tracking error offset, focus error offset and RF offset adjustment.
2. Tracking return offset adjustment.
3. Focus lock and spindle lock check.
4. Grating adjustment.
5. Tracking balance adjustment.
6. Tangential adjustment
7. Radial adjustment
8. RF level check
9. Focus gain adjustment
10. Tracking gain adjustment
11. VCO free-running frequency adjustment
12. Method of focus error check

● Measuring Devices

1. Dual-trace oscilloscope
2. Light power meter
3. YEDS-7 test disc
4. Focus and tracking adjustment filter
5. Loop gain adjustment band-pass filter
6. Signal generator
7. Grating driver
8. General-use tools
9. Commercial available disc (8 cm and 12 cm)
10. Hex. wrenchdriver (GGK 1002, 1.5 mm)

● About the test mode

How to activate and release the test mode

① To activate the test mode, turn ON the power switch with the test mode jumper short-circuited.

② The test mode is released by turning the power switch OFF.

The functions of the keys in the test mode are outlined in Table 1.

● Adjustment Volume Name

VR2: RF offset (RF. OF)
VR3: Focus gain (FO. GA)
VR4: Tracking gain (TR. GA)
VR5: Tracking balance (TR. BL)
VR6: Focus error offset (FO. OF)
VR7: Tracking error offset (TE. OF)
VR8: VCO frequency counter (VCOA)
VR9: Tracking return offset (TR. OF)
VR10 : RF level (RF.LEV)

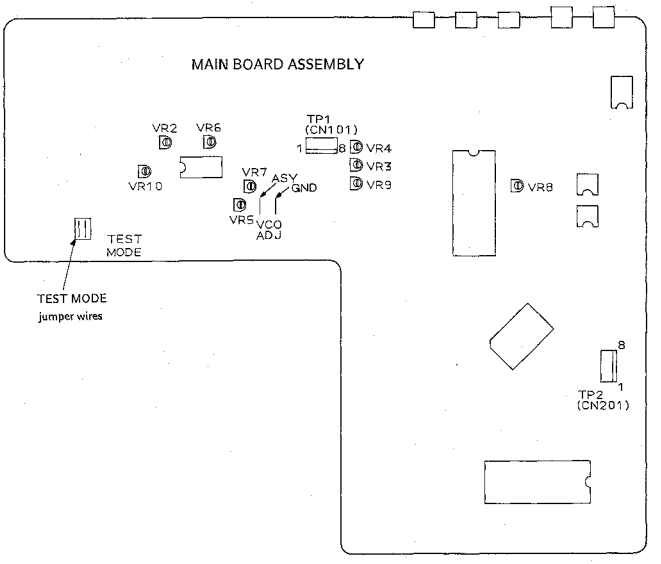
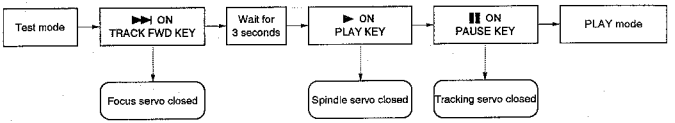


Fig.1 Adjusting point

In the test mode, closing and opening of servos is performed independently. Therefore, to set the play mode the servos have to be closed in (serial) sequence. Remember that in the test mode the play mode can't be set simply by pressing PAUSE (▮▮) key.

For example, to set the play mode from the stop mode, press the following keys in the indicated order.



* In the test mode, servos keep a serial sequence.

● **Function of Each Key in the Test Mode**

Symbol	Key name	Function during test mode	Description
▶▶|	TRACK FWD	Focus servo close	Lights the laser diode and sets the focus actuator UP/DOWN to close the focus servo.
▶	PLAY	Spindle servo close	After kicking the spindle motor, it closes the servo in the CLV–H mode.
▮▮	PAUSE	Tracking servo close/open	Performs a toggle operation. When pressed, the tracking servo is closed and the unit enters the play mode (the focus servo and spindle servo should be already closed). At this time the PAUSE indicator lights. If pressed again, the tracking servo opens.
	OUTPUT	Carriage reverse (inward)	Moves the carriage inwards at high (approx. 1 cm/s) speed. Since there is no safety device to stop the carriage, be sure to stop it manually in time.
	DISPLAY	Carriage forward (outward)	Moves the carriage outwards at high (approx. 1 cm/s) speed. Since there is no safety device to stop the carriage, be sure to stop it manually in time.
■	STOP	Stop	Stops all servos and returns the unit to the initial condition.
▲	OPEN/CLOSE	(Disc tray) open/close	Opens and closes the disc tray. However, the pickup does not return to the rest position when the tray is opened. It does not move either when the tray is closed.

Table 1.

Step No.	Oscilloscope setting V	Oscilloscope setting H	Test points	Adjusting points	Check items/ adjustment specifications	Adjustment procedure
1	**Tracking error offset, focus error offset and RF offset adjustment**					
		TP1	TP1 Pin 4 (TR. ER)	VR7 (TE. OF)	0V ± 50 mV	● Set the test mode. (*) ● Adjust VR7 (TE. OF: tracking error offset) so that the voltage at Pin 4 (TE: tracking error) of TP1 becomes 0V ± 50 mV.
		TP1	TP1 Pin 6 (FO. ER)	VR6 (FO.OF)	0V ± 50 mV	● Adjust VR6 (FO. OF: focus error offset) so that the voltage at Pin 6 (FO. ER: focus error) of TP1 becomes 0V ± 50 mV.
		TP301	TP 1 Pin 1 (RF)	VR2 (RF. OF)	100 mV ± 50 mV	● Adjust VR2 (RF. OF: RF offset) so that RF output voltage at Pin 1 of TP 1 becomes 100 mV ± 50 mV.
2	**Tracking return offset adjustment**					
		TP1	TP1 Pin 2 (TR. RT)	VR9 (TR. OF)	0V ± 10 mV	● Set the test mode. (*) ● Adjust VR9 (TR. OF: tracking return offset) so that the voltage at Pin 2 TR. RT (tracking return) of TP1 becomes 0V ± 10 mV.
3	**Focus lock and spindle lock check**					
	V 0.5V/div	H 100 msec /div	TP 1 Pin 1 (RF output)		RF output Clockwise rotation	● Load the disc. ● Set the test mode. (*) ● Move the pickup close to the center of the disc using DISPLAY Key. Be sure to perform this operation. ● Observe Pin 1 RF (RF output) of TP 1 with an oscilloscope and confirm that RF signal is output after pressing TRACK FWD key (▶▶|). ● Press PLAY key (▶) and confirm that the disc rotates clockwise at approx. normal speed (about 300 rpm around the center of the disc), without running wildly or in reverse direction.

* See page 39.

Step No.	Oscilloscope setting V	Oscilloscope setting H	Test points	Adjusting points	Check items/ adjustment specifications	Adjustment procedure
4–1	**Grating adjustment (1) (with an 8 cm disc)**					
	1V/div	5 ms/div	TP1 Pin 4 (TR. ER)	Grating	Null point	● This adjustment can be performed with an 8 cm disc having pits over a 75 mm in diameter. ● Load the disc. (8 cm) ● Set the test mode. (*) ● Press TRACK FWD (▶▶I) and PLAY (▶) keys in that order to close the focus and spindle servos (the tracking servo is open state.) ● Press DISPLAY key and move the pickup to the outer track of the 8 cm disc. When moving the pickup, it is possible to insert a slotted screwdriver in the grating adjustment plate slot from above the unit. (Fig. 3.) ● Observe the waveform at Pin 4 TR. ER (tracking error) of TP1 with an oscilloscope and at this time, insert cut off 4 kHz low-pass filter (Fig. 2). ● Insert the tracking driver in the adjustment slot and turn it so as to find out the null point (Photo–1).

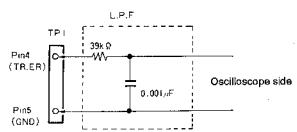


Fig. 2.

* See page 39.

Step No.	Oscilloscope setting V	Oscilloscope setting H	Test points	Adjusting points	Check items/ adjustment specifications	Adjustment procedure
4–2	**Grating adjustment (2) (with an 12 cm disc playing more than 60 minutes)**					
	1V/div	5 ms/div	TP1 Pin 4 (TR. ER)	Grating	Null point	● Load the disc (playing more than 60 minutes). ● Set the test mode. (*) ● Press TRACK FWD (▶▶|) and PLAY (▶) keys in that order to close the focus and spindle servos (the tracking servo is open state). ● Press DISPLAY key and move the pickup to the outer track of the disc. When moving the pickup, it is possible to insert a slotted screwdriver in the grating adjustment plate slot from above the unit. (Fig. 3.) ● Observe the waveform at Pin 4 TR. ER (tracking error) of TP1 with an oscilloscope and at this time, insert cut off 4 kHz low-pass filter. (Fig. 2.) ● Insert the tracking driver in the adjustment slot and turn it so as to find out the null point (Photo–1).
				Grating	Maximum amplitude	● Turn the grating driver slowly clockwise from the null point and set to at the first point where the waveform amplitude (tracking error signal) is maximum. (See photo–2)

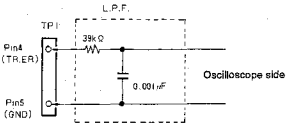


Fig. 2.

* See page 39.

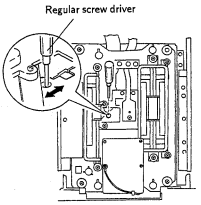
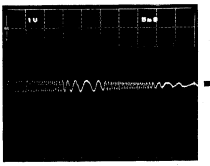
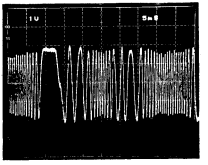


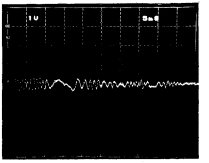
Fig. 3. Grating Adjustment



Photo–1 Null point

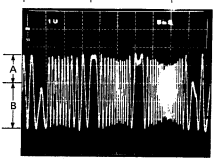


Photo–2 Maximum amplitude

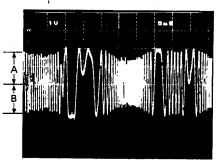


Photo–3 Out of null point

Step No.	Oscilloscope setting V	Oscilloscope setting H	Test points	Adjusting points	Check items/ adjustment specifications	Adjustment procedure
5	**Tracking balance adjustment**					
	0.5V/div	5 msec/div	TP1 Pin 4 (TR. ER)	VR5 (TR. BL)		● Load the disc. ● Set the test mode. (*) ● Press DISPLAY key and move carriage close to the center track of the disc. ● Press TRACK FWD (►►I) and PLAY (►) keys in that order to turn the disc. ● Observe Pin 4 TR. ER (tracking error) of TP1 with an oscilloscope. And adjust VR5 TR. BL (tracking balance) so as to remove DC elements from the tracking error waveform.



Photo–6



Photo–7

* See page 39.

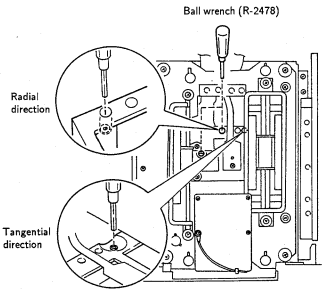
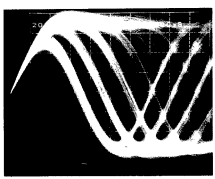
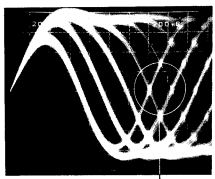


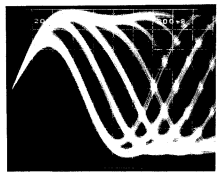
Fig. 4. Tangential Adjustment



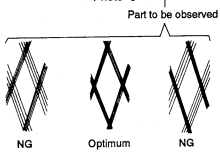
Photo–8



Photo–9



Photo–10



Step No.	Oscilloscope setting V	Oscilloscope setting H	Test points	Adjusting points	Check items/ adjustment specifications	Adjustment procedure
6	**Tangential adjustment**					
			TP 1 Pin 1 (RF output)	Tangential adjustment screw	Eye pattern optimum point	● Load the disc. ● Set the test mode. (*) ● Press DISPLAY key and move the pickup to the center track of the disc (set it to such a location that the tangential screw can be seen from above the servo mechanism. (See fig. 4.) ● Press TRACK FWD (▶▶I), PLAY (▶) and PAUSE (▮▮) keys in that order to close all servos. (Pause indicator lights.) ● Observe Pin 1 RF (RF output) of TP 1 with an oscilloscope and adjust the tangential screw so that the eye pattern becomes clear. (Fig. 4.) ● The adjustment point is located around the middle location between the point where the eye pattern becomes blurred when turning the tangential screw clockwise and the point where the eye pattern becomes blurred when turning the adjustment screw counterclockwise. Observe the overall clearness of the waveform and one of the diamond shapes in the eye pattern (photo-9). Optimum adjustment is attained at the point where diamond shape lines are relatively thin.

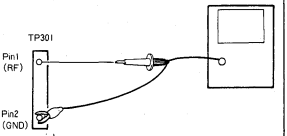


Fig. 5

* See page 39.

Step No.	Oscilloscope setting		Test points	Adjusting points	Check items/ adjustment specifications	Adjustment procedure
	V	H				
7	**Radial adjustment**					
			TP 1 Pin 1 (RF output)	Radial adjustment screw	Eye pattern optimum point	● Load the disc. ● Set the test mode. (*) ● Press DISPLAY key and move the pickup to the center track of the disc (set it to such a location that the tangential screw can be seen from above the servo mechanism. (See fig. 4.) ● Press TRACK FWD (▶▶|), PLAY (▶) and PAUSE (▮▮) keys in that order to close all servos. (Pause indicator lights.) ● Observe Pin 1 RF (RF output) of TP 1 with an oscilloscope and adjust the tangential screw so that the eye pattern becomes clear. (Fig. 4.) ● The adjustment point is located around the middle location between the point where the eye pattern becomes blurred when turning the tangential screw clockwise and the point where the eye pattern becomes blurred when turning the adjustment screw counterclockwise. Observe the overall clearness of the waveform and one of the diamond shapes in the eye pattern (photo-9). Optimum adjustment is attained at the point where diamond shape lines are relatively thin. ● Perform the tangential and radial adjustments alternately two or more times.

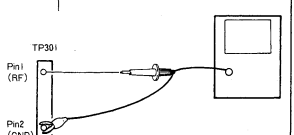


Fig. 5

* See page 39.

Step No.	Oscilloscope setting		Test points	Adjusting points	Check items/ adjustment specifications	Adjustment procedure
	V	H				
8	RF level check					
			TP 1 Pin 1 (RF)	Check	1.5V $^{+0.2V}_{-0V}$	● Set the test mode. (*) ● Connect the probe of the oscilloscope to Pin 1 RF (RF output) of TP 1 . ● Play back the disc, measure the RF waveform p–p voltage and confirm that it becomes 1.5V $^{+0.2V}_{-0V}$.
			TP 1 Pin 1 (RF)	VR 10	1.5V $^{+0.2V}_{-0V}$	● Adjust VR 10 if the voltage does not become 1.5V $^{+0.2V}_{-0V}$.

* See page 39.

Step No.	Oscilloscope setting V	Oscilloscope setting H	Test points	Adjusting points	Check items/ adjustment specifications	Adjustment procedure
9	**Focus gain adjustment**					
	CH1 (X) , CH2 (Y) 20 mV/div, 5 mV/div (probe 10:1)	X axis: TP1 Pin 5 (FO. IN) Y axis: TP1 Pin 6 (FO. ER)	VR3 (FO. GA)	Phase difference 90°	● With the power off, connect the oscilloscope and the oscillator as shown in Fig. 6. ● Set the normal playback mode. ● Turn the oscillators power on and set it to output a 1.2 kHz, 1 Vp–p signal. **Note:** (Some oscillators output DC when turned ON. In that case, connect the oscillator after turning it on.) ● Adjust VR3 FO. GA (focus gain) so that the resurge waveform on an oscilloscope becomes a horizontal circle (phase difference 90°).

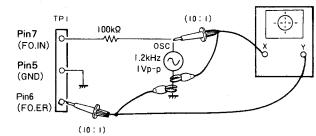
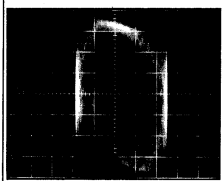
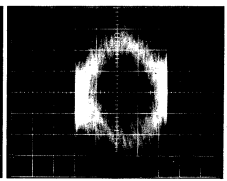


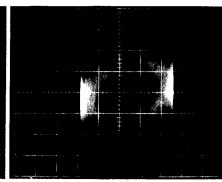
Fig. 6.



High gain
Photo–11



Optimum gain
Photo–12



Low gain
Photo–13

Step No.	Oscilloscope setting V	Oscilloscope setting H	Test points	Adjusting points	Check items/ adjustment specifications	Adjustment procedure
10	**Tracking gain adjustment**					
	CH1 (X), CH2 (Y) 50 mV/div, 5 mV/div (Probe 10:1)		X axis: TP1 Pin 3 (TR. IN) Y axis: TP1 Pin 2 (TR. ER)	VR4 (TR. GA)	Phase difference 90°	● With the power off, connect the oscilloscope and the oscillator as shown in Fig. 7. ● Set the normal playback mode. ● Turn the oscillators power on and set it to output a 1 kHz, 2 Vp–p signal. **Note:** (Some oscillators output DC when turned on. In that case, connect the oscillator after turning it on.) ● Adjust VR4 TR. GA (tracking gain) so that the resurge waveform on an oscilloscope becomes a horizontal circle (phase difference 90°).

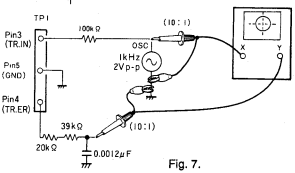
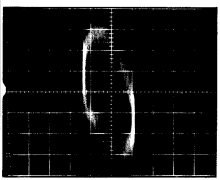
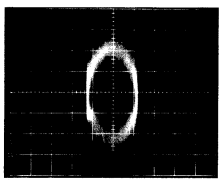


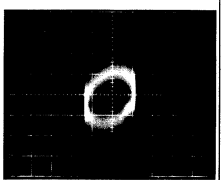
Fig. 7.



High gain
Photo–14



Optimum gain
Photo–15

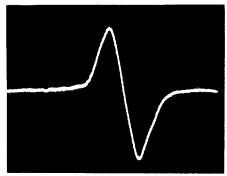


Low gain
Photo–16

11	**VCO free–running frequency adjustment**					
			TP 2 Pin 2		Frequency 4.275 MHz ± 0.025 MHz	● Set the test mode. (*) ● Short the ASY and GND jumpers by using a slotted screw driver or similar. ● Connect the frequency counter (10 MHz range) to Pin 2 of TP 2. ● Adjust VR8 (VCO. A) so that the frequency counter reads 4.275 MHz ± 0.025 MHz. **Note:** Adjust with the stop mode.

* See page 39.

Step No.	Oscilloscope setting V	Oscilloscope setting H	Test points	Adjusting points	Check items/ adjustment specifications	Adjustment procedure
12	**Focus error check**					
	1V/div	2 ms/div	TP1 Pin 6 (FO. ER)	Check	Waveform	● Set the test mode. (*) ● Connect Pin 7 FO. IN (focus in) of TP1 to GND. ● Press TRACK FWD key and check the waveform on Pin 6 FO. ER (focus error) of TP1 with the oscilloscope.



Focus error
Photo–17

* See page 39.

6. RÉGLAGES

Effectuer les réglages suivants dans l'ordre indiqué.

● Réglages

1. Réglage du décalage d'erreur d'alignement, du décalage d'erreur de mise au point et du décalage RF (fréquence radio).
2. Réglage du décalage de retour d'alignement.
3. Contrôle du verrouillage de mise au point et du verrouillage d'axe.
4. Réglage du filtre.
5. Réglage de l'équilibre d'alignement.
6. Réglage tangentiel.
7. Réglage radial.
8. Contrôle du niveau RF (fréquence radio)
9. Réglage du gain de mise au point
10. Réglage du gain d'alignement
11. Réglage de la fréquence de relaxation du VCO (oscillateur à fréquence réglée par variation de tension)
12. Méthode de contrôle d'erreur de mise au point

● Appareils de Mesure

1. Oscilloscope à double trace
2. Indicateur de puissance lumineuse
3. Disc d'essai YEDS-7
4. Filtre de réglage de mise au point et d'alignement
5. Filtre passe-bande de réglage de gain de boucle
6. Générateur de signal
7. Excitateur de filtre
8. Outils à usage général
9. Disc disponible dans le commerce (8 cm et 12 cm)
10. Clé hex. (GGK 1002, 1.5 mm)

● Apropos du mode d'essai

Mise en/hors service du mode d'essai

① Pour activer le mode d'essai, mettre l'interrupteur d'alimentation sous tension en court-circuitant le cavalier de mode d'essai.

② Le mode d'essai est annulé en ramenant l'interrupteur d'alimentation sur OFF.

Les fonctions des touches en mode d'essai sont décrites au Tableau 1.

● Nom des Résistances Variables de Réglage

VR2: Décalage RF (RF. OF)
VR3: Gain de mise au point (FO. GA)
VR4: Gain d'alignement (TR. GA)
VR5: Equilibre d'alignement (TR. BL)
VR6: Décalage d'erreur de mise au point (FO. OF)
VR7: Décalage d'erreur d'alignement (TE. OF)
VR8: Compteur de fréquence VCO (VCOA)
VR9: Décalage de retour d'alignement (TR. OF)
VR 10 : Niveau RF (RF.LEV)

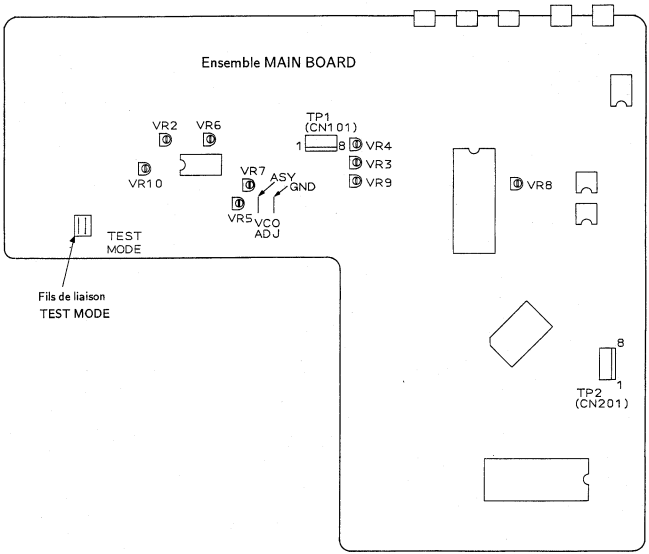
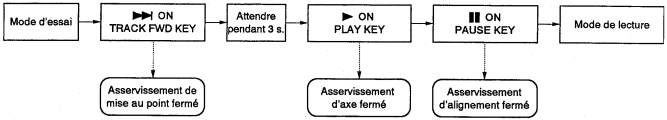


Fig.1 Points de réglage

Dans le mode d'essai, l'ouverture et la fermeture des circuits d'asservissement sont effectuées indépendamment. Par conséquent, pour régler le mode de lecture, les asservissements doivent être fermés l'un après l'autre (en série). Ne pas oublier que, dans le mode d'essai, le mode de lecture ne peut pas être réglé simplement en appuyant sur la touche PAUSE (▮▮).

Par exemple, pour régler le mode de lecture à partir du mode d'arrêt, appuyer sur les touches suivantes dans l'ordre indiqué.



* Dans le mode d'essai, les asservissements restent en séquence sérielle.

● Fonction de Chaque Touche dans le Mode D'essai

Symbole	Touche	Fonction en mode d'essai	Explication
▶▶|	TRACK FWD	Fermeture asservissement de mise au point	Fait s'allumer la diode laser et déplace le dispositif de commande de mise au point dans le sens vertical pour fermer l'asservissement de mise au point.
▶	PLAY	Fermeture asservissement d'axe	Après le démarrage du moteur d'axe, ferme l'asservissement dans le mode CLV–H.
▮▮	PAUSE	Fermeture/ouverture asservissement d'alignement	Exécute une opération de bascule. Quand elle est enfoncée, l'asservissement d'alignement est fermé et l'appareil passe dans le mode de lecture (les asservissements de mise au point et d'axe doivent déjà être fermés). A ce moment–là le témoin de PAUSE s'allume. Si elle est de nouveau enfoncée, l'asservissement d'alignement s'ouvre.
	OUTPUT	Retour du chariot (vers l'intérieur)	Déplace le chariot vers l'intérieur à grande vitesse (approx. 1 cm/s.). Comme il n'y a pas de dispositif de sécurité pour arrêter le chariot, il faut donc l'arrêter manuellement à temps.
	DISPLAY	Avance du chariot (vers l'extérieur)	Déplace le chariot vers l'extérieur à grande vitesse (approx. 1 cm/s.). Comme il n'y a pas de dispositif de sécurité pour arrêter le chariot, il faut donc l'arrêter manuellement à temps.
■	STOP	Arrêt	Arrête tous les asservissements et ramène l'appareil à sa condition initiale.
▲	OPEN/CLOSE	Ouverture/fermeture du plateau de disc	Ouvre et ferme le plateau de disc. Le capteur ne revient cependant pas à la position d'arrêt quand le plateau est ouvert. Il ne se déplace pas non plus quand le plateau est fermé.

Tableau 1.

Etape No.	Réglage de l'oscilloscope V	Réglage de l'oscilloscope H	Points d'essai	Points de réglage	Eléments contrôlés/ spécifications de réglage	Procédure de réglage
1	**Réglage du décalage d'erreur d'alignement, du décalage d'erreur de mise au point et du décalage RF (fréquence radio)**					
		TP1	TP1 Pin 4 (TR. ER)	VR7 (TE. OF)	0V ± 50 mV	● Régler le mode d'essai. (*) ● Ajuster VR7 (TE. OF: décalage d'erreur d'alignement) afin que la tension à la broche 4 (TE: erreur d'alignement) de TP1 devienne 0V ± 50 mV.
		TP1	TP1 Pin 6 (FO. ER)	VR6 (FO.OF)	0V ± 50 mV	● Ajuster VR6 (FO. OF: décalage d'erreur de mise au point) afin que la tension à la broche 6 (FO. ER: erreur de mise au point) de TP1 devienne 0V ± 50 mV.
		TP301	TP 1 Pin 1 (RF)	VR2 (RF. OF)	100 mV ± 50 mV	● Ajuster VR2 (RF. OF: décalage RF) afin que la tension à la broche 1 de TP 1 devienne 100 mV ± 50 mV.
2	**Réglage du décalage de retour d'alignement**					
		TP1	TP1 Pin 2 (TR. RT)	VR9 (TR. OF)	0V ± 10 mV	● Régler le mode d'essai. (*) ● Ajuster VR9 (TR. OF: décalage de retour d'alignement) afin que la tension à la broche 2 (TR. RT: retour d'alignement) de TP1 devienne 0V ± 10 mV.
3	**Contrôle du verrouillage de mise au point et du verrouillage d'axe**					
	V 0,5V/div	H 100 msec /div	TP 1 Pin 1 (Sortie RF)		Sortie RF Rotation dans le sens des aiguilles d'une montre	● Charger le disc. ● Régler le mode d'essai. (*) ● Amener le capteur près du centre du disc en utilisant la touche DISPLAY. Toujours effectuer cette opération. ● Observer la sortie RF à la broche 1 de TP 1 avec un oscilloscope et confirmer que le signal RF est sorti lorsque la touche TRACK FWD (▶▶I) est enfoncée. ● Appuyer sur la touche PLAY (▶) et confirmer que le disc tourne dans le sens des aiguilles d'une montre à approximativement la vitesse normale (environ 300 tr/mn près du centre du disc), sans qu'il tourne irrégulièrement ou en sens inverse.

* Voir page 54.

Etape No.	Réglage de l'oscilloscope V	Réglage de l'oscilloscope H	Points d'essai	Points de réglage	Eléments contrôlés/ spécifications de réglage	Procédure de réglage
4–1	**Réglage du filtre (1) (avec un disc de 8 cm)**					
	1V/div	5 ms/div	TP1 Pin 4 (TR. ER)	Filtre	Point nul	● Ce réglage peut être effectué avec un disc de 8 cm ayant des microcuvettes sur un rayon supérieur à 75 mm. ● Charger le disc. (8 cm) ● Régler le mode d'essai. (*) ● Appuyer sur les touches TRACK FWD (▶▶|) et PLAY (▶) dans cet ordre pour fermer les asservissements de mise au point et d'axe (l'asservissement d'alignement est en état ouvert). ● Appuyer sur la touche DISPLAY. et amener le capteur sur la piste extérieure du disc de 8 cm. Lors du déplacement du capteur, il est possible d'insérer un tournevis dans la fente de la plaque de réglage du filtre depuis le haut de l'appareil. (Fig. 3). ● Observer la forme d'onde à la broche 4 (TR. ER: erreur d'alignement) de TP1 avec un oscilloscope et à ce moment-là, insérer un filtre passe-bas de coupure 4 kHz (Fig. 2). ● Insérer le tournevis d'alignement dans la fente de réglage et le tourner afin de trouver le point nul (Photo–1).

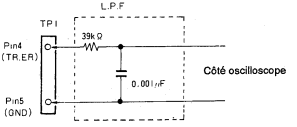


Fig. 2.

* Voir page 54.

Etape No.	Réglage de l'oscilloscope V	Réglage de l'oscilloscope H	Points d'essai	Points de réglage	Eléments contrôlés/ spécifications de réglage	Procédure de réglage
4–2	**Réglage du filtre (2) (avec un disc de 12 cm dont la durée de lecture est supérieure à 60 minutes)**					
	1V/div	5 ms/div	TP1 Pin 4 (TR. ER)	Filtre	Point nul	● Charger le disc. (durée de lecture supérieure à 60 minutes). ● Régler le mode d'essai. (*) ● Appuyer sur les touches TRACK FWD (▶▶|) et PLAY (▶) dans cet ordre pour fermer les asservissements de mise au point et d'axe (l'asservissement d'alignement est en état ouvert). ● Appuyer sur la touche DISPLAY et amener le capteur sur la piste extérieure du disc. Lors du déplacement du capteur, il est possible d'insérer un tournevis dans la fente de la plaque de réglage du filtre depuis le haut de l'appareil. (Fig. 3). ● Observer la forme d'onde à la broche 4 (TR. ER: erreur d'alignement) de TP1 avec un oscilloscope et à ce moment–à, insérer un filtre passe–bas de coupure 4 kHz (Fig. 2). ● Insérer le tournevis d'alignement dans la fente de réglage et le tourner afin de trouver le point nul (Photo–1).
				Filtre	Amplitude maximum	● Tourner lentement l'excitateur de filtre dans le sens des aiguilles d'une montre à partir du point nul et le régler au premier point où l'amplitude de la forme d'onde (signal d'erreur d'alignement) est maximum. (Voir photo–2).

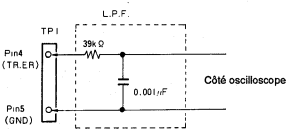


Fig. 2.

* Voir page 54.

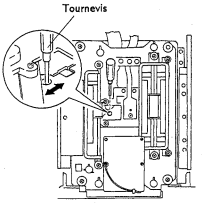
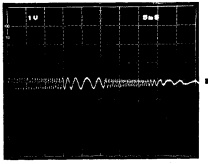
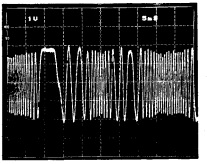


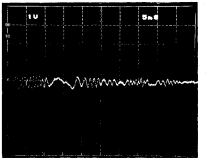
Fig. 3. Réglage du Filtre



Photo–1 Point nul

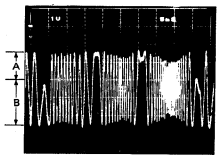


Photo–2 Amplitude maximum

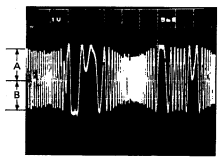


Photo–3 Hors du point nul

Etape No.	Réglage de l'oscilloscope V	Réglage de l'oscilloscope H	Points d'essai	Points de réglage	Eléments contrôlés/ spécifications de réglage	Procédure de réglage
5	**Réglage de l'équilibre d'alignement**					
	0.5V/div	5 msec/div	TP1 Pin 4 (TR. ER)	VR5 (TR. BL)		● Charger le disc. ● Régler le mode d'essai. (*) ● Appuyer sur la touche DISPLAY et amener le chariot près de la piste centrale du disc. ● Appuyer sur les touches TRACK FWD (▶▶|) et PLAY (▶) dans cet ordre pour faire tourner le disc. ● Observer la forme d'onde à la broche 4 (TR. ER: erreur d'alignement) de TP1 avec un oscilloscope. Et régler VR5 (TR. BL: équilibre d'alignement) afin d'éliminer les éléments CC de la forme d'onde d'erreur d'alignement.



Photo–6



Photo–7

* Voir page 54.

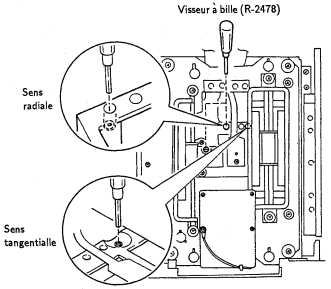
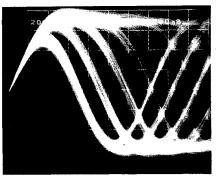
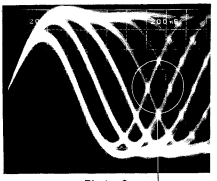


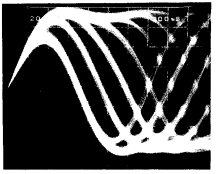
Fig. 4. Réglage Tangentiel



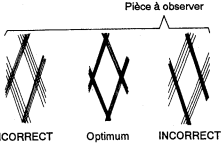
Photo–8



Photo–9



Photo–10



Etape No.	Réglage de l'oscilloscope		Points d'essai	Points de réglage	Eléments contrôlés/ spécifications de réglage	Procédure de réglage
	V	H				
6	**Réglage tangentiel**					
			TP 1 Pin 1 (Sortie RF)	Vis de réglage tangentiel	Point optimum de mire	● Charger le disc. ● Régler le mode d'essai. (*) ● Appuyer sur la touche DISPLAY et amener le capteur à la piste centrale du disc. (Le placer à un endroit où la vis tangentielle peut être vue depuis le haut du mécanisme d'asservissement. (Voir Fig. 4.). ● Appuyer sur les touches TRACK FWD (▶▶|), PLAY (▶) et PAUSE (❚❚) dans cet ordre pour fermer tous les asservissements. (Le témoin de pause s'allume). ● Observer la sortie RF broche 1 de TP 1 avec un oscilloscope et régler la vis tangentielle afin que la mire devienne claire. (Fig. 4.). ● Le point de réglage est situé vers la position médiane entre le point où la mire devient floue lorsque la vis tangentielle est tournée dans le sens des aiguilles d'une montre et le point où la mire devient floue lorsque la vis de réglage est tournée dans le sens inverse. Observer la netteté d'ensemble de la forme d'onde et une des formes en diamant dans la mire (Photo-9). Le réglage optimum est obtenu au point où les lignes de la forme en diamant sont relativement fines.

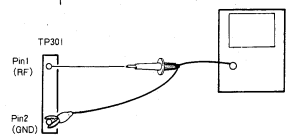


Fig. 5

* Voir page 54.

Etape No.	Réglage de l'oscilloscope V	Réglage de l'oscilloscope H	Points d'essai	Points de réglage	Eléments contrôlés/ spécifications de réglage	Procédure de réglage
7	**Réglage radial**					
			TP 1 Pin 1 (Sortie RF)	Vis de réglage radial	Point optimum de mire	● Charger le disc. ● Régler le mode d'essai. (*) ● Appuyer sur la touche DISPLAY et amener le capteur à la piste centrale du disc. (Le placer à un endroit où la vis radiale peut être vue depuis le haut du mécanisme d'asservissement. (Voir Fig. 5.). ● Appuyer sur les touches TRACK FWD (▶▶I), PLAY (▶) et PAUSE (▮▮) dans cet ordre pour fermer tous les asservissements. (Le témoin de pause s'allume). ● Observer la sortie RF broche 1 de TP 1 avec un oscilloscope et régler la vis radiale afin que la mire devienne claire. (Fig. 4.). ● Le point de réglage est situé vers la position médiane entre le point où la mire devient floue lorsque la vis radiale est tournée dans le sens des aiguilles d'une montre et le point où la mire devient floue lorsque la vis de réglage est tournée dans le sens inverse. Observer la netteté d'ensemble de la forme d'onde et une des formes en diamant dans la mire (Photo–9). Le réglage optimum est obtenu au point où les lignes de la forme en diamant sont relativement fines. ● Effectuer alternativement, deux fois ou plus, les réglages tangentiel et radial.

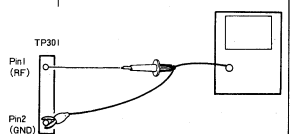


Fig. 5

* Voir page 54.

Etape No.	Réglage de l'oscilloscope		Points d'essai	Points de réglage	Eléments contrôlés/ spécifications de réglage	Procédure de réglage
	V	H				
8	**Contrôle du niveau RF (fréquence radio)**					
			TP 1 Pin 1 (RF)	Contrôle	1,5V $^{+0,2V}_{-0V}$	● Régler le mode d'essai. (*) ● Connecter la sonde de l'oscilloscope à la sortie RF broche 1 de TP 1 . ● Reproduire le disc, mesurer la tension c-c de la forme d'onde RF et confirmer qu'elle devient 1,5V $^{+0,2V}_{-0V}$.
			TP 1 Pin 1 (RF)	VR 10	1,5V $^{+0,2V}_{-0V}$	● Ajuster VR 10 si la tension ne devient pas 1,5V $^{+0,2V}_{-0V}$.

* Voir page 54.

Etape No.	Réglage de l'oscilloscope V	Réglage de l'oscilloscope H	Points d'essai	Points de réglage	Eléments contrôlés/ spécifications de réglage	Procédure de réglage
9	**Réglage du gain de mise au point**					
	CH1 (X) , CH2 (Y) 20 mV/div, 5 mV/div (Sonde 10:1)		Axe X: TP1 Pin 5 (FO. IN) Axe Y: TP1 Pin 6 (FO. ER)	VR3 (FO. GA)	Différence de phase 90°	● L'alimentation étant coupée, connecter l'oscilloscope et l'oscillateur comme indiqué sur la Fig. 6. ● Régler le mode de lecture normal. ● Mettre l'oscillateur sous tension et le régler pour sortir un signal 1 Vc–c, 1,2 kHz. **Remarque:** (Certains oscillateurs sortent CC lorsqu'ils sont mis sous tension. Dans ce cas, connecter l'oscillateur après l'avoir mis sous tension). ● Ajuster VR3 (FO. GA: gain de mise au point) afin que la forme d'onde de choc sur l'oscilloscope devienne un cercle horizontal (différence de phase 90°).

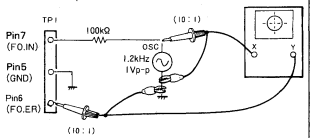
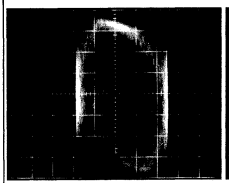
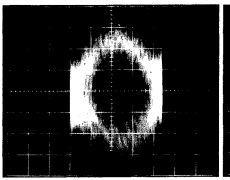


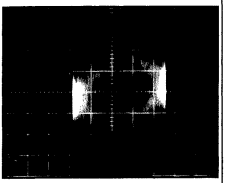
Fig. 6.



Gain élevé
Photo–11



Gain optimum
Photo–12



Gain faible
Photo–13

Etape No.	Réglage de l'oscilloscope V	Réglage de l'oscilloscope H	Points d'essai	Points de réglage	Eléments contrôlés/ spécifications de réglage	Procédure de réglage
10	**Réglage du gain d'alignement**					
	CH1 (X), CH2 (Y) 50 mV/div, 5 mV/div (Sonde 10:1)		Axe X: TP1 Pin 3 (TR. IN) Axe Y: TP1 Pin 2 (TR. ER)	VR4 (TR. GA)	Différence de phase 90°	● L'alimentation étant coupée, connecter l'oscilloscope et l'oscillateur comme indiqué sur la Fig. 7. ● Régler le mode de lecture normal. ● Mettre l'oscillateur sous tension et le régler pour sortir un signal 2 Vc-c, 1 kHz. **Remarque:** (Certains oscillateurs sortent CC lorsqu'ils sont mis sous tension. Dans ce cas, connecter l'oscillateur après l'avoir mis sous tension). ● Ajuster VR4 (TR. GA: gain d'alignement) afin que la forme d'onde de choc sur l'oscilloscope devienne un cercle horizontal (différence de phase 90°).

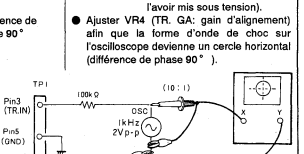
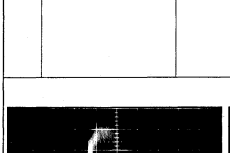
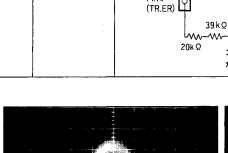


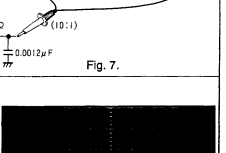
Fig. 7.



Gain élevé
Photo–14



Gain optimum
Photo–15

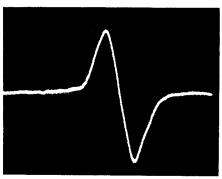


Gain faible
Photo–16

11	**Réglage de la fréquence de relaxation du VCO (oscillateur à fréquence réglée par variation de tension)**					
			TP 2 Pin 2		Fréquence 4,275 MHz ± 0,025 MHz	● Régler le mode d'essai. (*) ● Coupler ASY et les fils GND en utilisant un tournevis à fente ou objet similaire. ● Connecter le fréquencemètre (gamme 10 MHz) à la broche 2 de TP 2. ● Ajuster VR8 (VCO. A) afin que le fréquencemètre indique 4,275 MHz ± 0,025 MHz. **Remarque:** Ajuster dans le mode d'arrêt.

* Voir page 54.

Etape No.	Réglage de l'oscilloscope		Points d'essai	Points de réglage	Eléments contrôlés/ spécifications de réglage	Procédure de réglage
	V	H				
12	**Contrôle d'erreur de mise au point**					
	1V/div	2 ms/div	TP1 Pin 6 (FO. ER)	Contrôle	Forme d'onde	● Régler le mode d'essai. (*) ● Connecter la broche 7 FO. IN (entrée de mise au point) de TP1 à GND. ● Appuyer sur la touche TRACK FWD et contrôler la forme d'onde à la broche 6 FO. ER (erreur de mise au point) de TP1 avec l'oscilloscope.



Erreur de mise au point
Photo–17

* Voir page 54.

6. AJUSTES

Realice los siguientes ajustes en el orden indicado:

● Ajustes

1. Ajuste de compensación del error de seguimiento, del error de foco y de RF
2. Ajuste de compensación del retorno de seguimiento
3. Comprobación de la sincronización del foco y del eje
4. Ajuste de la rejilla
5. Ajuste del equilibrio del seguimiento
6. Ajuste tangencial
7. Ajuste radial
8. Comprobación del nivel de RF
9. Ajuste de la ganancia de foco
10. Ajuste de la ganancia de seguimiento
11. Ajuste de la frecuencia propia del VCO (oscilador controlado por tensión)
12. Método de comprobación del error de foco

● Dispositivos de Medición

1. Osciloscopio de doble trazo
2. Medidor de potencia lumínica
3. Disco de prueba YEDS-7
4 Filtro de ajuste de foco y seguimiento
5. Filtro de paso de banda para el ajuste de la ganancia de bucle.
6. Generador de señales
7. Destornillador de la rejilla
8. Herramientas de uso general
9. Disco disponible comercialmente (de 8 cm y de 12 cm)
10. Llave hex.(GGK 1002, 1.5 mm)

● Modo de prueba

Activación y desacivation del mode de prueba

① Para activar el mode de prueba, ponga en ON el interruptor de alimentación con el puente del mode de prueba cortocircuitado.

② El modo de pruebga se desactivará poniendo el interrupter de alimentación en OFF.

Las funciones de las teclas en el modo de prueba se describen en la tabla 1.

● Descripción de los Resistores Variables Empleados para el Ajuste

VR2: Compensación de RF (RF. OF)
VR3: Ganancia de foco (FO. GA)
VR4: Ganancia de seguimiento (TR. GA)
VR5: Equilibrio de seguimiento (TR. BL)
VR6: Compensación del error de foco (FO. OF)
VR7: Compensación del error de seguimiento (TE. OF)
VR8: Contador de frecuencias del oscilador controlado por tensión (VCOA)
VR9: Compensación del retorno de seguimiento (TR. OF)
VR10 : Nivel de RF (RF.LEV)

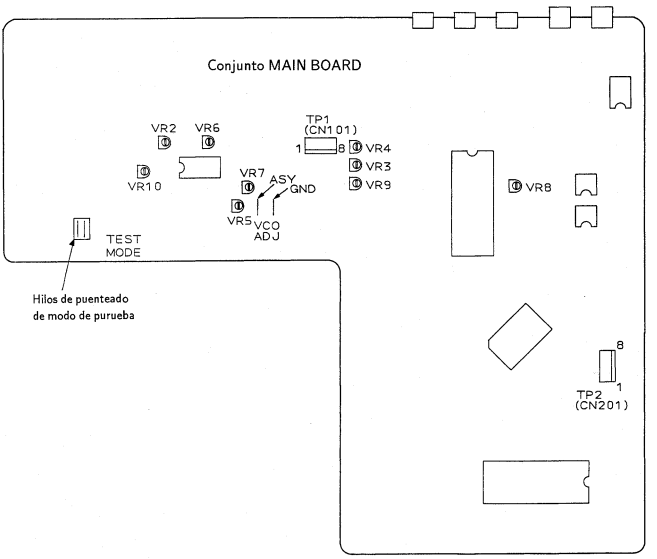
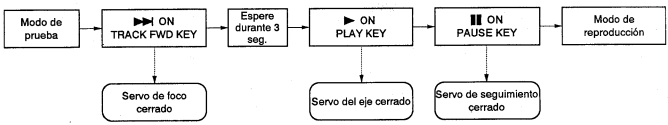


Fig.1 Punt de ajuste

En el modo de prueba, la apertura y cerrado de los servos se efectúa independientemente. Por lo tanto, para establecer el modo de reproduccion se deben cerrar los servos en orden serial. Recuerde que en el modo de prueba no se puede establecer el modo de reproducción pulsando simplemente la tecla PAUSE (▮▮).

Por ejemplo, para establecer el modo de reproducción partiendo del modo de parada pulse las teclas siguientes en el orden indicado.



* En el modo de prueba los servos siguen un orden serial.

● Función de Cada Tecla en el Modo de Prueba

Símbolo	Tecla	Función durante el modo de prueba	Explicación
▶▶|	TRACK FWD	Cerrar el servo del foco	Enciende el diodo laser y mueve el actuador del foco en dirección vertical para cerrar el servo del foco.
▶	PLAY	Cerrar el servo del eje	Después de arrancar el motor del eje, cierre el servo en el modo CLV–H.
▮▮	PAUSE	Abrir/cerrar el servo de seguimiento	Ejecuta una conmutación. Al pulsar esta tecla se cierra el servo de seguimiento y la unidad entra en el modo de reproducción (los servos del foco y del eje deben estar cerrados previamente). En ese momento se enciende el indicador PAUSE. Si se la pulsa nuevamente, se abre el servo de seguimiento.
	OUTPUT	Movimiento en retroceso (hacia dentro) del carro	Mueve el carro hacia dentro a alta velocidad (aprox. 1 cm/seg.). Dado que no existe un dispositivo de seguridad que detenga el carro, asegúrese de detenerlo manualmente a tiempo.
	DISPLAY	Movimiento en avance (hacia fuera) del carro	Mueve el carro hacia fuera a alta velocidad (aprox. 1 cm/seg). Dado que no existe un dispositivo de seguridad que detenga el carro, asegúrese de detenerlo manualmente a tiempo.
■	STOP	Parada	Detiene todos los servos y hace que la unidad vuelva a su estado inicial.
▲	OPEN/CLOSE	Abrir/cerrar la bandeja del disco	Abre y cierra la bandeja del disco. Sin embargo, el lector no vuelve a la posición de reposo cuando se abre la bandeja y tampoco se mueve al cerrarse la bandeja.

Tabla 1.

Paso	Margen del osciloscopio V	Margen del osciloscopio H	Puntos de prueba	Puntos de ajuste	Item a probar/Especif. de ajuste	Procedimiento de ajuste
1	**Ajuste de compensación del error de seguimiento, del error de foco y de RF**					
		TP1	TP1 Pin 4 (TR. ER)	VR7 (TE. OF)	0V ± 50 mV	● Establezca el modo de prueba (*) ● Ajuste VR7 (TE. OF: compensación del error de seguimiento) de forma que la tensión en el contacto 4 (TE: error de seguimiento) de TP1 sea 0V ± 50 mV.
		TP1	TP1 Pin 6 (FO. ER)	VR6 (FO.OF)	0V ± 50 mV	● Ajuste VR6 (FO. OF: compensación del error de foco) de forma que la tensión en el contacto 6 (FO. ER: error de foco) de TP1 sea 0V ± 50 mV.
		TP301	TP 1 Pin 1 (RF)	VR2 (RF. OF)	100 mV ± 50 mV	● Ajuste VR2 (RF. OF: compensación de RF) de forma que la tensión de salida de RF en el contacto 1 de TP 1 sea 100 mV ± 50 mV.
2	**Ajuste de compensación del retorno de seguimiento**					
		TP1	TP1 Pin 2 (TR. RT)	VR9 (TR. OF)	0V ± 10 mV	● Establezca el modo de prueba. (*) ● Ajuste VR9 (TR. OF: compensación del retorno de seguimiento) de forma que la tensión en el contacto 2 (TR. RT: retorno de seguimiento) de TP1 sea 0V ± 10 mV.
3	**Comprobación de la sincronización del foco y del eje**					
	V 0.5V/div	H 100 msec /div	TP 1 Pin 1 (Salida de RF)		Salida de RF Rotación en sentido horario	● Cargue el disco. ● Establezca el modo de prueba. (*) ● Aproxime el lector al centro del disco usando la tecla DISPLAY. Asegúrese de efectuar esta operación. ● Observe la salida de RF por el contacto 1 de TP 1 con un osciloscopio y confirme que la señal de RF sea emitida al pulsar la tecla TRACK FWD (▶▶|). ● Pulse la tecla PLAY (▶) y confirme que el disco gira en sentido horario a aproximadamente la velocidad normal (unos 300 rpm por estar el lector cerca del centro del disco) sin que corra descontroladamente o en dirección inversa.

* Vea la página 69.

Paso	Margen del osciloscopio		Puntos de prueba	Puntos de ajuste	Item a probar/Especif. de ajuste	Procedimiento de ajuste
	V	H				
4–1	**Ajuste de la rejilla (1) (con un disco de 8 cm)**					
	1V/div	5 ms/div	TP1 Pin 4 (TR. ER)	Rejilla	Punto nulo	● Este ajuste puede realizarse utilizando un disco de 8 cm con hoyos sobre un diámetro de 75 mm. ● Cargue el disco. (8 cm) ● Establezca el modo de prueba. (*) ● Pulse las teclas TRACK FWD (▶▶|) y PLAY (▶) en este orden para cerrar los servos del foco y del eje (el servo de seguimiento estará abierto). ● Pulse la tecla DISPLAY y mueva el lector a la pista externa del disco de 8 cm. Cuando mueva el lector, será posible introducir un destornillador en la ranura de la placa de ajuste de la rejilla desde la parte de arriba de la unidad. (Fig. 3) ● Observe la forma de la onda por el contacto 4 (TR. ER: error de seguimiento) de TP1 con un osciloscopio y, en ese momento, introduzca un filtro de corte pasabajos de 4 kHz. (Fig. 2) ● Introduzca el destornillador de seguimiento en la ranura de ajuste y gírelo de forma que encuentre el punto nulo (Foto–1).

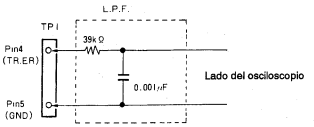


Fig. 2.

* Vea la página 69.

Paso	Margen del osciloscopio V	Margen del osciloscopio H	Puntos de prueba	Puntos de ajuste	Item a probar/Especif. de ajuste	Procedimiento de ajuste
4–2	**Ajuste de la rejilla (2) (con un disco de 12 cm reproduciendo durante más de 60 minutos)**					
	1V/div	5 ms/div	TP1 Pin 4 (TR. ER)	Rejilla	Punto nulo	● Cargue el disco (reproduciendo durante más de 60 minutos). ● Establezca el modo de prueba. (*) ● Pulse las teclas TRACK FWD (▶▶|) y PLAY (▶) en este orden para cerrar los servos del foco y del eje (el servo de seguimiento estará abierto). ● Pulse la tecla DISPLAY y mueva el lector a la pista externa del disco. Cuando mueva el lector, será posible introducir un destornillador en la ranura de la placa de ajuste de la rejilla desde la parte de arriba de la unidad. (Fig. 3) ● Observe la forma de la onda por el contacto 4 (TR. ER: error de seguimiento) de TP1 con un osciloscopio y, en ese momento, introduzca un filtro de corte pasabajos de 4 kHz. (Fig. 2) ● Introduzca el destornillador de seguimiento en la ranura de ajuste y gírelo de forma que encuentre el punto nulo. (Foto–1)
				Rejilla	Amplitud máxima	● Gire el destornillador de la rejilla lentamente en sentido antihorario a partir del punto nulo y deténgase en el primer punto donde la amplitud de la onda (señal de error de seguimiento) sea máxima. (Vea Foto–2)

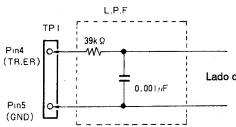


Fig. 2.

* Vea la página 69.

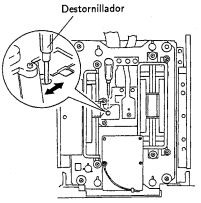
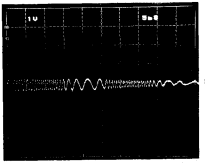
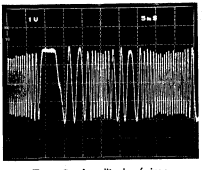


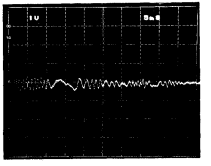
Fig. 3. Ajuste de la Rejilla



Foto–1 Punto nulo

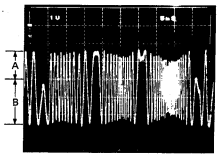


Foto–2 Amplitud máxima

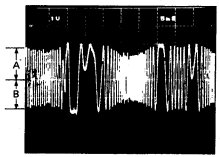


Foto–3 Fuera del punto nulo

Paso	Margen del osciloscopio		Puntos de prueba	Puntos de ajuste	Item a probar/Especif. de ajuste	Procedimiento de ajuste
	V	H				
5	**Ajuste del equilibrio del seguimiento**					
	0,5V/div	5 msec/div	TP1 Pin 4 (TR. ER)	VR5 (TR. BL)		● Cargue el disco ● Establezca el modo de prueba. (*) ● Pulse la tecla DISPLAY y mueva el carro hasta cerca de la pista central del disco. ● Pulse las teclas TRACK FWD (▶▶I) y PLAY (▶) en ese orden para hacer girar el disco. ● Observe la forma de la onda por el contacto 4 (TR. ER: error de seguimiento) de TP1 con un osciloscopio y ajuste el VR5 (TR. BL: equilibrio de seguimiento) de forma que desaparezcan los elementos de CC de la onda del error de seguimiento.



Foto–6



Foto–7

* Vea la página 69.

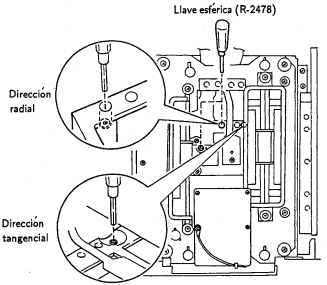
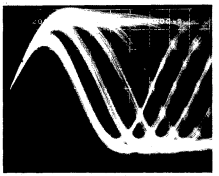
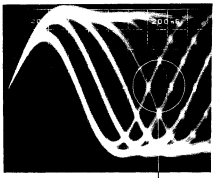


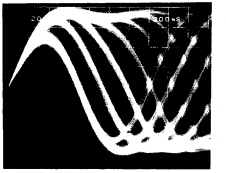
Fig. 4. Ajuste Tangencial



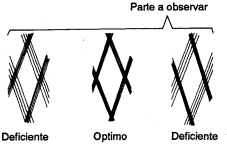
Foto–8



Foto–9



Foto–10



Paso	Margen del osciloscopio V	Margen del osciloscopio H	Puntos de prueba	Puntos de ajuste	Item a probar/Especif. de ajuste	Procedimiento de ajuste
6	**Ajuste tangencial**					
			TP 1 Pin 1 (Salida de RF)	Tornillo de ajuste tangencial	Punto óptimo de la figura del ojo	● Cargue el disco. ● Establezca el modo de prueba. (*) ● Pulse la tecla DISPLAY y mueva el lector a la pista central del disco (colóquelo en un lugar tal que el tornillo de ajuste tangencial pueda verse desde arriba del servomecanismo. (Vea la Fig. 4) ● Pulse las teclas TRACK FWD (▶▶|), PLAY (▶) y PAUSE (▮▮) en este orden para cerrar todos los servos. (Se enciende el indicador de pausa). ● Observe la salida de RF por el contacto 1 de TP 1 con un osciloscopio y ajuste el tornillo tangencial de forma que la figura del ojo se vea claramente. (Fig. 4) ● El punto de ajuste se encuentra cerca del punto medio entre el punto donde la figura del ojo se enturbia al girar el tornillo tangencial en sentido horario y el punto donde la figura del ojo se enturbia al girar el tornillo de ajuste en sentido antihorario. Observe la claridad general de la onda y una de las figuras del diamante en la figura del ojo (foto-9). El ajuste óptimo se obtiene donde las líneas de la figura del diamante son relativamente delgadas.

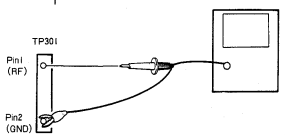


Fig. 5

* Vea la página 69.

Paso	Margen del osciloscopio		Puntos de prueba	Puntos de ajuste	Item a probar/Especif. de ajuste	Procedimiento de ajuste
	V	H				
7	**Ajuste radial**					
			TP 1 Pin 1 (Salia de RF)	Tornillo de ajuste radial	Punto óptimo de la figura del ojo	● Cargue el disco. ● Establezca el modo de prueba. (*) ● Pulse la tecla DISPLAY y mueva el lector a la pista central del disco (colóquelo en un lugar tal que el tornillo de ajuste tangencial pueda verse desde arriba del servomecanismo. (Vea la Fig. 5) ● Pulse las teclas TRACK FWD (▶▶|), PLAY (▶) y PAUSE (❚❚) en este orden para cerrar todos los servos. (Se enciende el indicador de pausa). ● Observe la salida de RF por el contacto 1 de TP 1 con un osciloscopio y ajuste el tornillo radial de forma que la figura del ojo se vea claramente. (Fig. 4) ● El punto de ajuste se encuentra cerca del punto medio entre el punto donde la figura del ojo se enturbia al girar el tornillo radial en sentido horario y el punto donde la figura del ojo se enturbia al girar el tornillo de ajuste en sentido antihorario. Observe la claridad general de la onda y una de las figuras del diamante en la figura del ojo (foto-9). El ajuste óptimo se obtiene donde las líneas de la figura del diamante son relativamente delgadas. ● Efectúe los ajustes tangencial y radial alternativamente dos o más veces.

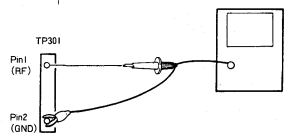


Fig. 5

* Vea la página 69.

Paso	Margen del osciloscopio		Puntos de prueba	Puntos de ajuste	Item a probar/Especif. de ajuste	Procedimiento de ajuste
	V	H				
8	**Comprobación del nivel de RF**					
			TP 1 Pin 1 (RF)	Comprobación	1.5V $^{+0.2V}_{-0V}$	● Establezca el modo de prueba. (*) ● Conecte la sonda del osciloscopio al contacto 1 (salida de RF) de TP 1. ● Reproduzca el disco, mida la tensión p-p de la onda de RF y confirme que sea 1.5V $^{+0.2V}_{-0V}$.
			TP 1 Pin 1 (RF)	VR 10	1.5V $^{+0.2V}_{-0V}$	● Ajuste VR 10 si la tensión no es 1.5V $^{+0.2V}_{-0V}$.

* Vea la página 69.

Paso	Margen del osciloscopio V	Margen del osciloscopio H	Puntos de prueba	Puntos de ajuste	Item a probar/Especif. de ajuste	Procedimiento de ajuste
9	**Ajuste de la ganancia de foco**					
	CH1 (X) , CH2 (Y) 20 mV/div, 5 mV/div (Sonda 10:1)	Eje X: TP1 Pin 5 (FO. IN) Eje Y: TP1 Pin 6 (FO. ER)	VR3 (FO. GA)	Diferencia de fase de 90 °		● Con la unidad apagada, conecte el osciloscopio y el oscilador como muestra la Fig. 6. ● Establezca el modo de reproducción normal. ● Encienda el oscilador y ajústelo para que emita una señal de 1,2 kHz, 1 Vp-p. **Nota:** Algunos osciladores emiten CC al ser encendidos. En este caso, encienda el oscilador antes de conectarlo. ● Ajuste VR3 (FO. GA: ganancia de foco) de forma que la onda de resurgimiento en el osciloscopio se convierta en un círculo horizontal (diferencia de fase de 90 °).

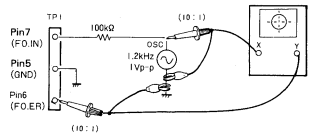
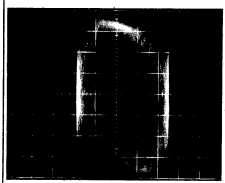
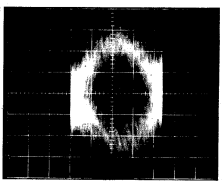


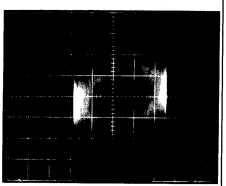
Fig. 6.



Alta ganancia
Foto–11



Ganancia óptima
Foto–12



Baja ganancia
Foto–13

Paso	Margen del osciloscopio V	Margen del osciloscopio H	Puntos de prueba	Puntos de ajuste	Item a probar/Especif. de ajuste	Procedimiento de ajuste
10	**Ajuste de la ganancia de seguimiento**					
	CH1 (X), CH2 (Y) 50 mV/div, 5 mV/div (Sonda 10:1)		Eje X: TP1 Pin 3 (TR. IN) Eje Y: TP1 Pin 2 (TR. ER)	VR4 (TR. GA)	Diferencia de fase de 90°	● Con la unidad apagada, conecte el osciloscopio y el oscilador como muestra la Fig. 7. ● Establezca el modo de reproducción normal. ● Encienda el oscilador y ajústelo para que emita una señal de 1 kHz, 2 Vp-p. **Nota:** Algunos osciladores emiten CC al ser encendidos. En este caso, encienda el oscilador antes de conectarlo. ● Ajuste VR4 (TR. GA: ganancia de seguimiento) de forma que la onda de resurgimiento en el osciloscopio se convierta en un círculo horizontal (diferencia de fase de 90°).

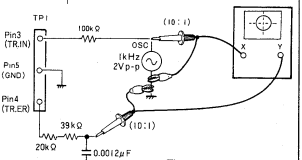
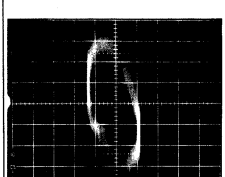
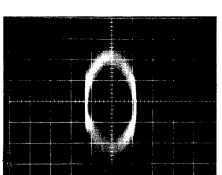


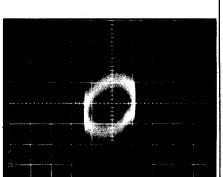
Fig. 7.



Alta ganancia
Foto–14



Ganancia óptima
Foto–15

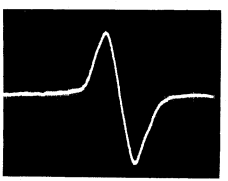


Baja ganancia
Foto–16

11	**Ajuste de la frecuencia propia del oscilador controlado por tensión**					
			TP 2 Pin 2		Frecuencia 4,275 MHz ± 0,025 MHz	● Establezca el modo de prueba. (*) ● Ponga en derivacion los puentes del ASY y GND empleando un destornillador de cabeza ranurada u otra herramienta similar. ● Conecte el contador de frecuencias (margen de 10 MHz) al contacto 2 de TP 2. ● Ajuste VR8 (VCO. A) de forma que en el contador de frecuencias se lea 4,275 MHz ± 0,025 MHz. **Nota:** Ajuste con la unidad en el modo de parada

* Vea la página 69.

Paso	Margen del osciloscopio		Puntos de prueba	Puntos de ajuste	Item a probar/Especif. de ajuste	Procedimiento de ajuste
	V	H				
12	**Comprobación del error de foco**					
	1V/div	2 ms/div	TP1 Pin 6 (FO. ER)	Comprobación	Forma de onda	● Establezca el modo de prueba. (*) ● Conecte a tierra el contacto 7 (FO. IN: entrada de foco) de TP1. ● Pulse la tecla TRACK FWD y compruebe la forma de la onda en el contacto 6 (FO. ER: error de foco) de TP1 con un osciloscopio.



Error de foco
Foto–17

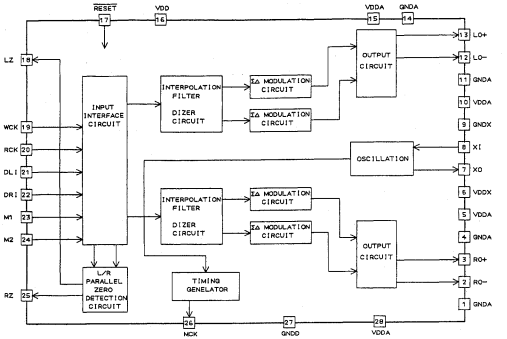
* Vea la página 69.

7. IC INFORMATION

■PD2028A

D/A Converter

- **Block Diagram**



- **Pin Function**

No.	Pin name	I/O	Function
1	GNDA	–	GND terminal of D/A converter (RO−).
2	RO−	O	Data output for R ch.
3	RO+		
4	GNDA	–	GND terminal of D/A converter (RO+).
5	VDDA	–	Power supply input of D/A converter (RO+).
6	VDDX	–	Power supply input of Oscillator.
7	XO	O	Terminals for crystal oscillator.
8	XI	I	Generate system clock.
9	GNDX	–	GND terminal of Oscillator.
10	VDDA	–	Power supply input of D/A converter (LO−).
11	GNDA	–	GND terminal of D/A converter (LO−).
12	LO−	O	Data output for L ch.
13	LO+		
14	GNDA	–	GND terminal of D/A converter (LO+).

No.	Pin name	I/O	Function
15	VDDA	–	Power supply input of D/A converter (LO+).
16	VDD	–	Power supply input of logic circuit.
17	$\overline{\text{RESET}}$	I	Reset terminal. When "L", reset the ΣΔ circuit.
18	LZ	O	Digital-Zero output for L ch.
19	WCK	I	Word clock input
20	BCK	I	Bit clock input
21	DLI	I	Data input for L ch.
22	DRI	I	Data input for R ch.
23	M1	I	Mode select input 1.(*1)
24	M2	I	Mode select input 2.(*1)
25	RZ	O	Digital-Zero output for R ch.
26	MCK	O	System clock output
27	GNDD	–	GND terminal of logic circuit.
28	VDDA	–	Power supply input of D/A converter (RO−).

*1 : Selection of input data.

M1(23pin)	M2(24pin)	MCK(26pin) output	OSR	Input bit rate	Applicable digital filter
0	0	384fs	384fs	20	NPC SM5803/13/40
0	1	256fs	512fs	20	NPC SM5803/13/40
1	0	256fs	256fs	20	NPC SM5803/13/40
1	1	384fs	384fs	18	SONY CXD1244/2550

■PD3179B

Microcomputer

• Pin Function

No.	Symbol	Pin name	I/O	Reset	Function
1	V_{SS}	—	—	—	GND
2	XTAL	—	—	—	Internal clock circuit input.
3	EXTAL	—	—	—	Internal clock circuit input.
4	MP0	—	I	—	+5V
5	MP1	—	I	—	+5V
6	$\overline{RES}$	—	I	—	Reset input for CPU (RESET / RUN)
7	$\overline{STBY}$	—	I	—	Standby input for CPU (STANDBY / RUN)
8	$\overline{NMI}$	SCOR	I	—	Sub code sync input (SYNC)
9	P20	FOK	I	—	Focus OK (NG / OK)
10	P21	$\overline{XLT}$	O	H	LSI data execute control pulse (EXEC)
11	SCLK	CLK	O	H	Serial transmit clock
12	Rx	SUBQ	I	—	Sub code Q data input
13	Tx	DATA	O	H	Serial data output (0 1 2 3 4 5 6 7)
14	P25	SENS	I	—	LSI running state. Multi mode input
15	P26	MUTE	O	H	Muting out (Digital block) (OFF / ON)
16	P27	GFS	I	—	Frame sync lock (NG / LOCK)
17	P50	$\overline{LDON}$	O	H	Laser diode On/Off (ON / OFF)
18	P51	$\overline{DEMP}$	O	H	De-emphasis On/Off (ON / OFF)
19	P52	$\overline{TEST}$	I	—	Test mode select input (TEST / NORMAL)
20	P53	TMSW	I	—	Timer play switch (YES / NO)
21	P54	AMUTE	O	H	Muting out (Analog block) (OFF / ON)
22	P55	MDSW	I	—	Model select switch (With FADE / No FADE)
23	P56	SYC1	I	—	Deck-Synchro input port(Pulled-up when not used)
24	P57	SYC3	O	L	Deck-Synchro output port(Open when not used)
25	P60	Not used	I	—	GND
26	P61	LIN	O	L	Disc tray loading IN/OUT output (Free / Brake / IN)
27	P62	LOUT	O	L	(OUT)
28	P63	$\overline{LOAD}$	I	—	Loading complete (LOAD-IN / NOT)
29	P64	$\overline{CLOP}$	I	—	Clamp up complete (CLAMP-UP / NOT)
30	P65	$\overline{OPEN}$	I	—	Open complete (OPEN / NOT)
31	P66	$\overline{CLMP}$	I	—	Clamp complete (CLAMP / NOT)
32	P67	Not used	O	L	(OPEN)

No.	Symbol	Pin name	I/O	Reset	Function
33	V_{cc}	–	–	–	+5V
34	P47	Not used	O	L	(Open)
35	P46	Not used	O	L	(Open)
36	P45	Not used	O	L	(Open)
37	P44	$\overline{KS}$	I	–	Key strobe input from front panel ON / OFF
38	P43	$\overline{RKS}$	I	–	Key strobe input from remote controller ON / OFF
39	P42	CLUP	O	L	Disc clamp Up/Down output Free / Brake / UP
40	P41	CLDW	O	L	Down
41	P40	STS	I	–	Input for display data transmit enable ENABLE / DISABLE
42	V_{ss}	–	–	–	GND
43	P17	Not used	O	L	(Open)
44	P16	Not used	O	L	(Open)
45	P15	FLOF	O	H	FL display on/off ON / OFF
46	P14	$\overline{DOFF}$	O	H	Digital output status ON / OFF
47	P13	$\overline{AOFF}$	O	H	Analog output status ON / OFF
48	P12	SCK	O	H	Serial transmit clock for display data
49	P11	SD	O	H	Serial display data output
50	P10	SRES	O	L	Reset output for key display microcomputer RESET / RUN
51	P37	KD7	I	–	Key code input from front panel and remote controller (MSB)
52	P36	KD6	I	–	
53	P35	KD5	I	–	
54	P34	KD4	I	–	
55	P33	KD3	I	–	
56	P32	KD2	I	–	
57	P31	KD1	I	–	
58	P30	KD0	I	–	Key code input from front panel and remote controller (LSB)
59	P74	Not used	O	L	(Open)
60	P73	Not used	O	L	(Open)
61	P72	$\overline{DLAT}$	O	H	ATT level data latch pulse *1
62	P71	DDAT	O	H	ATT level data serial output *1 0 1 2 3 4 5 6 7
63	P70	DCLK	O	H	ATT level data serial transmit clock *1 Continuous 8 pulses output.
64	E	–	O	–	(Open)

*1 : Pins 61 to 63 are connected to digital filter IC(SM5840) when it is used.

8. FOR HEM AND SD TYPES

• CONTRAST OF MISCELLANEOUS PARTS

NOTES :

- *Parts 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.*

The PD-75/HEM and SD types are the same as the PD-75/KU/CA type with the exception of the following sections.

Mark	Symbol & Description	Part No.			Remarks
		KU/CA	HEM	SD	
⚠◉	MAIN BOARD assembly	PWZ1983	PWZ1994	PWZ1994	
⚠	PRIMARY BOARD assembly	Non supply	Non supply	Non supply	
	BALANCE BOARD assembly	Non supply	.....	.....	
◉	FUNCTION A BOARD assembly	PWZ2000	PWZ1998	PWZ1998	
⚠	AC power cord	PDG1015	PDG1003	PDG1013	
⚠	Voltage selector	.....	.....	PSB1002	
⚠	Power transformer(17VA)	PTT1162	PTT1163	PTT1164	
⚠	Power transformer(8VA)	PTT1166	PTT1167	PTT1168	
⚠	Strain relief	CM-22C	CM-22B	CM-22B	
	25P F.F.C/30V	PDD1096	.....	.....	
	23P F.F.C/30V	.....	PDD1069	PDD1069	
	3P receptacle	PKP1004	.....	.....	
	Balance case	PNS1019	.....	.....	
	Balance cover	PAT1004	.....	.....	
	Bonnet	PEA1168	PYY1071	PYY1071	
	CD packing case	PHG1676	PHG1671	PHG1671	For Packing
	Cord with plug(mini plug)	PDE-319	.....	.....	
	FL sheet	PAM1290	PAM1251	PAM1290	
	Front panel assembly	PEA1177	PEA1178	PEA1178	
	Spacer	PNM1136	.....	.....	
	UL Caution	PRW1250	.....	.....	
	Operating instructions (German/Italian/Dutch/Swedish /Spanish/Portuguese)	.....	PRF1048	.....	

MAIN BOARD ASSEMBLY(PWZ1994)

The MAIN BOARD assembly (PWZ1994) is the same as the MAIN BOARD assembly (PWZ1983) with the exception of the following sections.

Mark	Symbol & Description	Part No.		Remarks
		PWZ1983	PWZ1994	
	D701-D704	1SS254	.....	
	C701	CKCYF103Z50	.....	
	C702	CCCSL101J50	.....	
	R701	RD1/6PM244J	.....	
	R702	RD1/6PM102J	.....	
	CN6	HLEM25R	HLEM23R	
	JA701, JA702	RKN1004	.....	

PRIMARY BOARD ASSEMBLY

The PRIMARY BOARD assemblies of PD-75/HEM and SD are the same as the PRIMARY BOARD assembly of PD-75/KU/CA with the exception of the following sections.

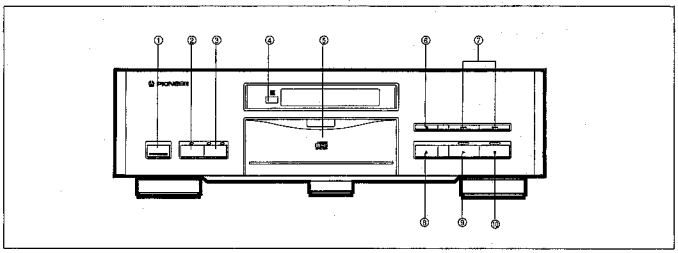
Mark	Symbol & Description	Part No.		Remarks
		KU/CA	HEM and SD	
	Capacitor sleeve	.....	REC-297	

FUNCTION A BOARD ASSEMBLY(PWZ1998)

The FUNCTION A BOARD assembly (PWZ1998) is the same as the FUNCTION A BOARD assembly (PWZ2000) with the exception of the following sections.

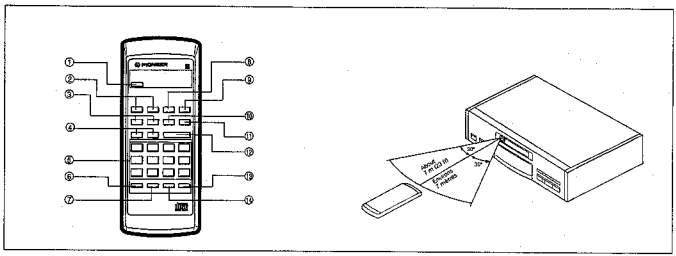
Mark	Symbol & Description	Part No.		Remarks
		PWZ2000	PWZ1998	
	R418, R420	RD1/6PM471J	RD1/6PM331J	
	R419	RD1/6PM391J	RD1/6PM331J	
	CN401	HLEM25R	HLEM23R	

9. PANEL FACILITIES



FRONT PANEL

① POWER switch
② DISPLAY button and OFF indicator
③ OUTPUT button and DIGITAL/ANALOG indicators
④ Remote sensor
Receives the signal from the remote control unit.
⑤ Disc tray
⑥ STOP button (■)
⑦ TRACK search buttons (|◄◄/►►|)
⑧ OPEN/CLOSE button (▲)
⑨ PLAY button (►) and indicator
⑩ PAUSE button (II) and indicator



REMOTE CONTROL UNIT

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 **OPEN/CLOSE button (⏏)**
② **INDEX buttons (← / →)**
③ **MANUAL search buttons (◀◀ / ▶▶)**
④ **TRACK search buttons (⏮ / ⏭)**
⑤ **Track number/Digit buttons (1-10, +10, ≧ 20)**
⑥ **PGM (Program) button**
⑦ **CHECK button**
⑧ **REPEAT button**
⑨ **RANDOM PLAY button**
⑩ **PAUSE button (⏸)**
⑪ **STOP button (■)**
⑫ **PLAY button (▶)**
⑬ **TIME button**
⑭ **CLEAR button**

REMOTE CONTROL OPERATIONS

When operating the remote control unit, point the unit's infrared signal transmitter at the remote control receiver (REMOTE SENSOR) on the front panel of the player. The remote control unit can be used within a range of about 7 meters (23 feet) from the remote sensor, and within angles of up to about 30 degrees.

NOTE:

If the remote control sensor window is in a position where it receives strong light such as sunlight or fluorescent light, control may not be possible.

10. SPECIFICATIONS

1. General

Type ..... Compact disc digital audio system
Power requirements
European model ..... AC 220 - 230 V, 50/60 Hz
U.K. and Australian models ..... AC 230 - 240 V, 60 Hz
U.S. and Canadian models ..... AC 120 V, 60Hz
Other models ..... AC 110/120 - 127/220/240 V (Switchable), 50/60 Hz
Power consumption ..... 30 W
Operating temperature ..... +5°C - +35°C
+41°F - +95°F
Weight ..... 12.0 kg (26 lb, 7 oz)
External dimensions ..... 459(W) X 330(D) X 130(H) mm
18-1/16(W) X 13(D) X 5-2/16(H) in
U.S. and Canadian models ... 459(W) X 360(D) X 130(H) mm
18-1/16(W) X 14-3/16(D) X 5-2/16(H) in

2. Audio section

Frequency response ..... 2 Hz - 20 kHz
S/N ratio ..... 112 dB or more (EIAJ)
Dynamic range ..... 98 dB or more (EIAJ)
Channel separation ..... 108 dB or more (EIAJ)
Harmonic distortion ..... 0.0018% or less (EIAJ)
Output voltage 2.0V
Wow and flutter ..... Limit of measurement (±0.001% W.PEAK) or less (EIAJ)
Channels ..... 2-channel (stereo)
Balanced type audio line out
(U.S. and Canadian models) ..... 2V (600 Ω)

3. Output terminal

Unbalanced type audio line output jacks
Balanced type audio line output jacks (U.S. and Canadian models only)
Optical and coaxial digital output jacks
Control input/output jacks (U.S. and Canadian models only)
CD-DECK SYNCHRO jack

4. Functions

Basic operation buttons
- PLAY, PAUSE, STOP

Search function
- Direct play
- Track search
- Manual search
- Index search
- Time location

Programming
- Maximum 24 steps
- Pause
- Program check/correction
- Program clear (single track or all tracks)

Repeat functions
- 1 track repeat
- All tracks repeat
- Program play repeat
- Random play repeat
- Program random play repeat

Random play (repeat also available)

Switching display
Time consumed, remaining time (track/disc), and total time

Timer start

5. Accessories

- Remote control unit 1
- Size AAA/R03/dry batteries 2
- Turntable sheet 1
- Control cord (U.S. and Canadian models only) 1
- Output cable 1
- Operating instructions 1

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