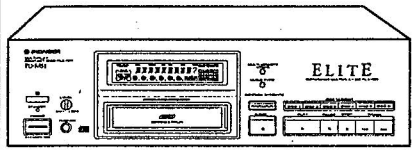
PIONEER®
The Art of Entertainment

Service Manual



ORDER NO.
ARP2204

MULTI-PLAY COMPACT DISC PLAYER

PD-M51
PD-M750

PD-M51 AND PD-M750 HAVE THE FOLLOWING:

Type	Model		Power Requirement	Remarks
	PD-M51	PD-M750		
KU	○	—	AC120V only	
KC	—	○	AC120V only	
HEM	—	○	AC220V-230V, 230V-240V (switchable) *	
SD	—	○	AC110/V, 120V-127V, 220V, 240V (switchable)	

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

- **This manual is applicable to the PD-M51/KU, PD-M750/KC, HEM and SD types.**
- **As to the PD-M750/KC, HEM and SD types, refer to page 83-84.**
- **Ce manuel pour le service comprend les explications de réglage en français.**
- **Este manual de servicio trata del método ajuste escrito en español.**

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SO MAY. 1991 Printed

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

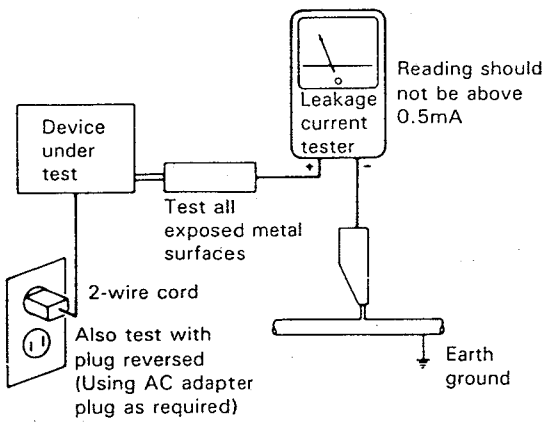
(FOR USA MODEL ONLY)

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.

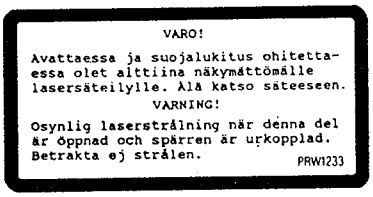
IMPORTANT
THIS PIONEER APPARATUS CONTAINS LASER OF HIGHER CLASS THAN 1. SERVICING OPFRATION OF THE APPARATUS SHOULD BE DONE BY A SPECIALLY INSTRUCTED PERSON.

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

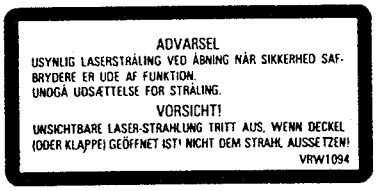
LASER
Picture 1
Warning sign for laser radiation

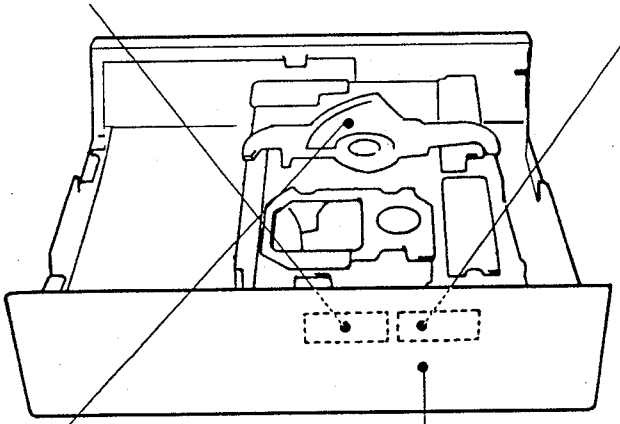
LABEL CHECK (MULTI MAGAZINE type)

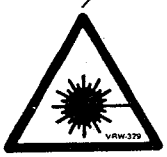
HEM type

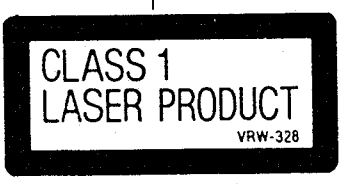


HEM type









HEM type

HEM type

Additional Laser Caution

1. Laser Interlock Mechanism
   The ON/OFF (ON : low level, OFF : high level) status of the LPS1 (S601) and LPS2 (S602) switches for detecting the loading state is detected by the system microprocessor, and the design prevents laser diode oscillation when both switches LPS1 and LPS2 are not ON (low level)(clamped state).
   Thus, interlock will no longer function if switches LPS1 (S601) and LPS2 (S602) are deliberately shorted.
   Also, in the test mode *, the interlock mechanism does not operate too.
   Laser diode oscillation will continue if pins 2 and 3 of CXA1471S (IC101) are connected to ground or pin 20 is connected to high level (ON) or the terminals of Q101 are shorted to each other (fault condition).

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

*: Refer to page 41.

2. EXPLODED VIEWS, PACKING AND PARTS LIST

2.1 EXTERIOR

NOTES:

- Parts without part number cannot be supplied.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "⊙" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.

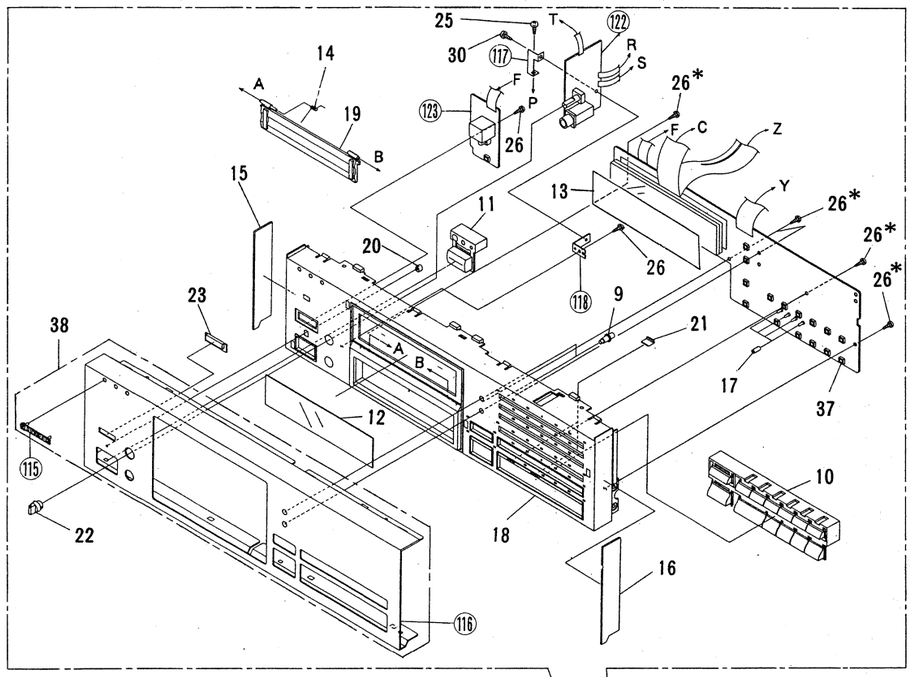
Parts List

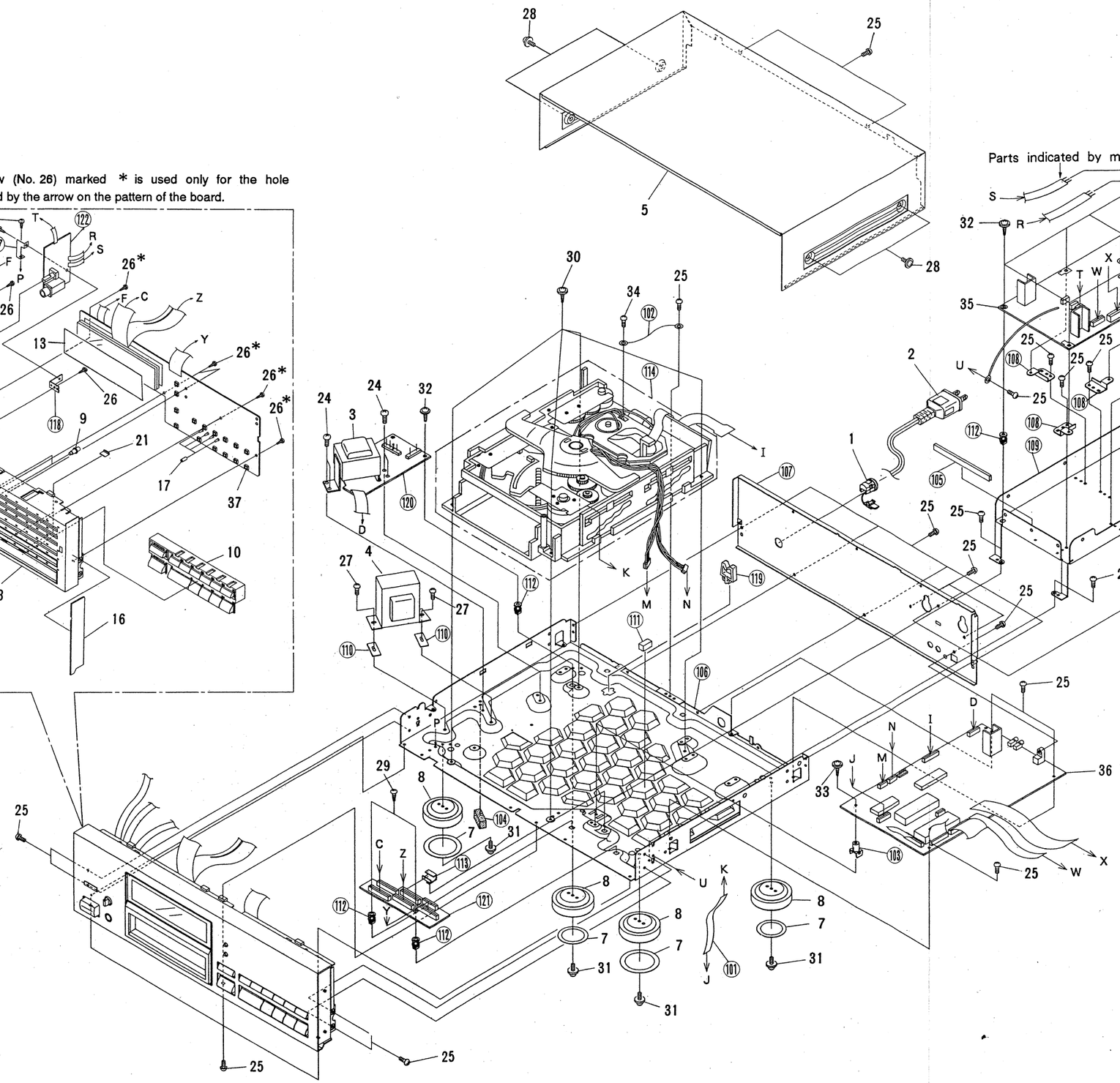
Mark	No.	Description	Part No.
⚠	1	Strain relief	CM – 22C
⚠	2	AC Power cord	PDG1015
⚠	3	Power transformer/W	PTT1175
⚠	4	Power transformer/VA	PTT1192
	5	Bonnet	PYY1153
	6	Cord clamper	RNH – 184
	7	Stopper	PNM1070
	8	Insulator	VNK1095
	9	Chip button	PAC1310
	10	Operation button	PAC1552
	11	Power button	PAC1569
	12	Display window	PAM1473
	13	Display screen	PAM1479
	14	Spring	PBH1022
	15	Side rubber L	PEB1156
	16	Side rubber R	PEB1157
	17	LED cover T	PEB1176
	18	Function panel	PNW1937
	19	Door	PNW1938
	20	LED lens	PNW2019
	21	Lens L	PNW2023
	22	Headphone knob	RAC1366
	23	Sensor acryl	VNK1566
	24	Screw	BBZ30P060FZK
	25	Screw	BBZ30P080FCC
	26	Screw	BBZ30P120FZK
	27	Screw	BBZ40P080FCC
	28	Screw	FBT40P080FZK
	29	Screw	BBZ30P160FMC
	30	Screw	IBZ30P080FCC
	31	Screw	IBZ30P100FCC
	32	Screw	IBZ30P150FCC
	33	Screw	IBZ30P180FMC
	34	Screw	PDZ30P050FMC
⊙	35	Audio board assembly	PWM1413
⊙	36	Main board assembly	PWZ2052
⊙	37	Function board assembly	PWZ2079
	38	Front panel assembly	PEA1163

Mark	No.	Description	Part No.
	101	Parallel wire	
	102	Earth lead unit	
	103	P.C.B mold	
	104	Spacer (sponge)	
	105	Edging G	
	106	Under base	
	107	Rear base	
	108	Angle B	
	109	Shield plate	
	110	Transformer sheet	
	111	Spacer	
	112	P.C.B spacer	
	113	P.C.B plate holder	
	114	Multi mechanism assembly	
	115	Name plate	
	116	Front panel	
	117	Earth plate M	
	118	HP angle	
	119	Clamper	
	120	Transformer board assembly	
	121	Adapter board assembly	
	122	Headphone board assembly	
	123	Power SW board assembly	

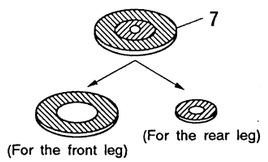
Exterior

Note: The screw (No. 26) marked * is used only for the hole designated by the arrow on the pattern of the board.

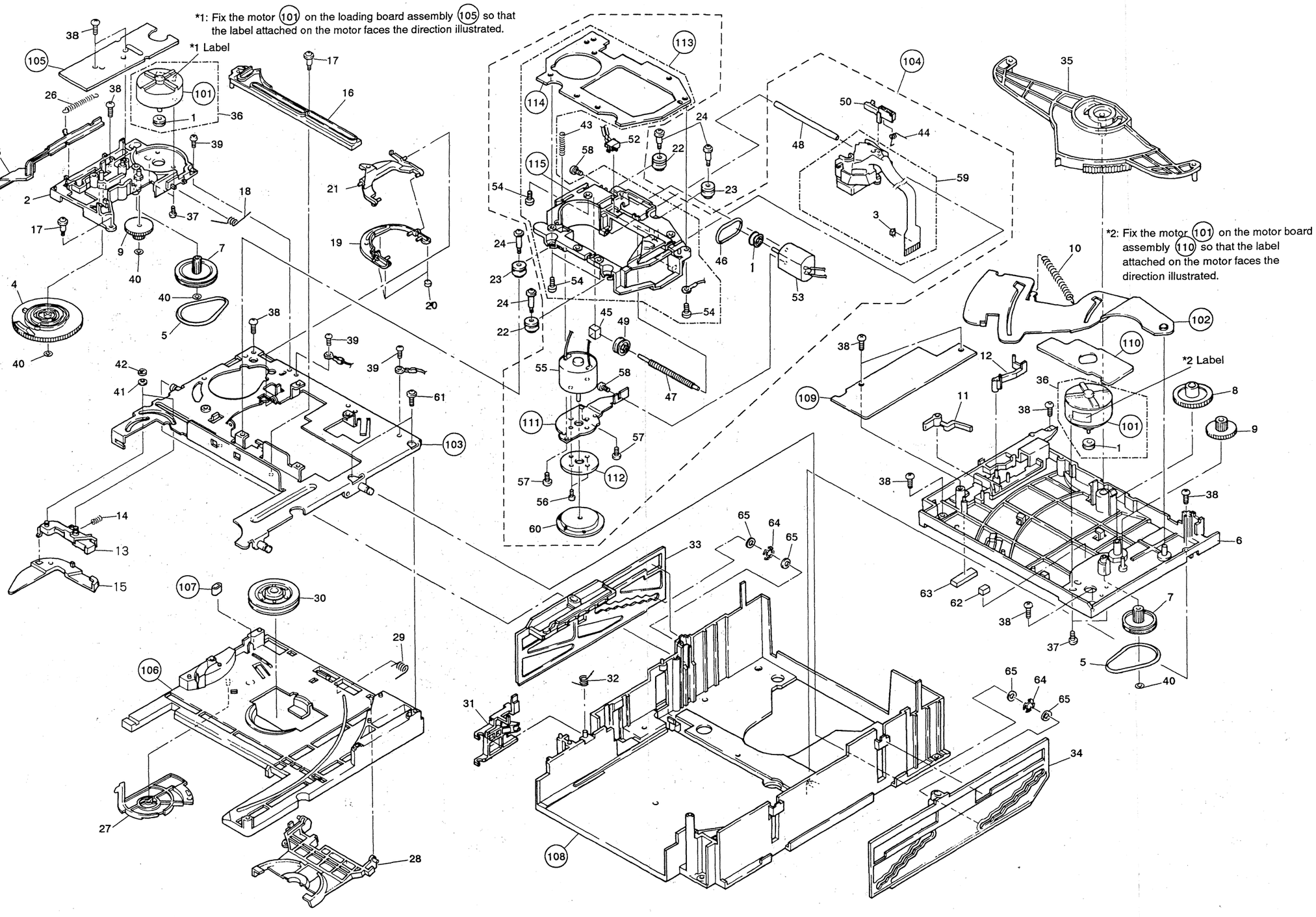




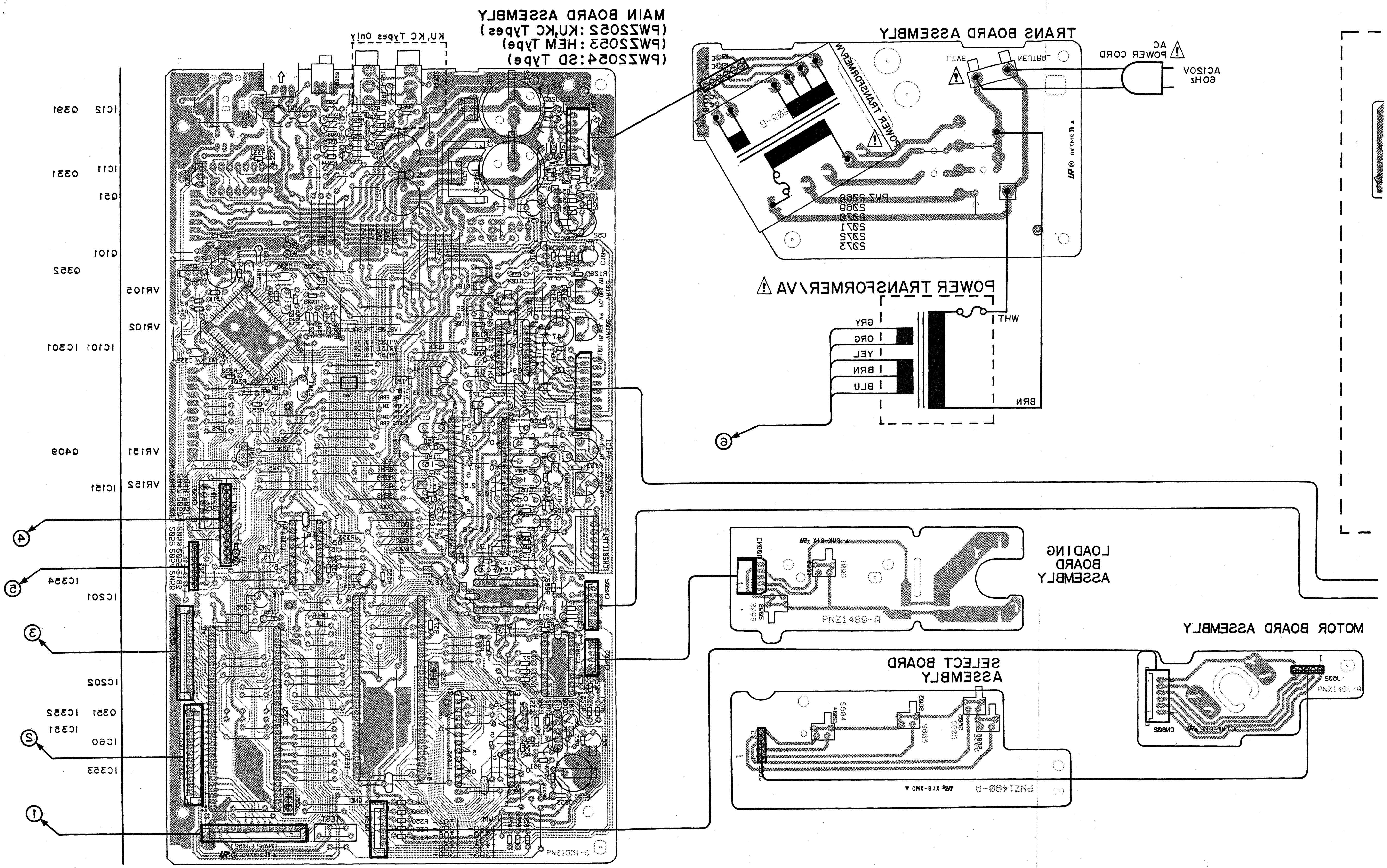
* The stopper consist of the big ring part and the small ring part.
If you stick the stopper to the leg, stick the big ring part to the front leg, and the small ring part to the rear leg.



2.2 MULTI MECHANISM ASSEMBLY



12 11 10 9 8 7



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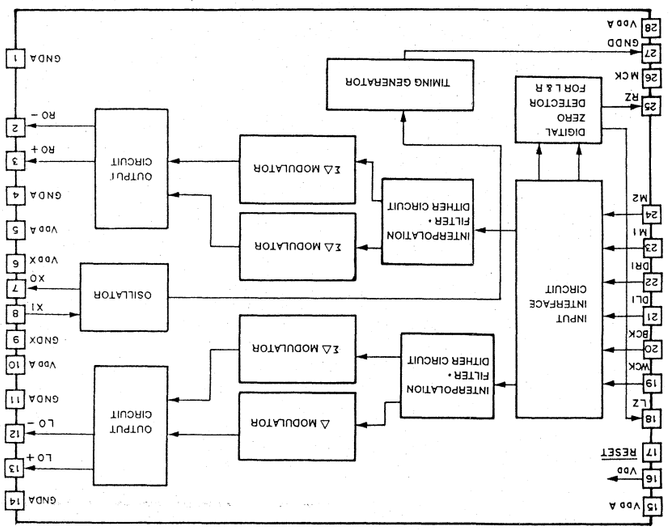

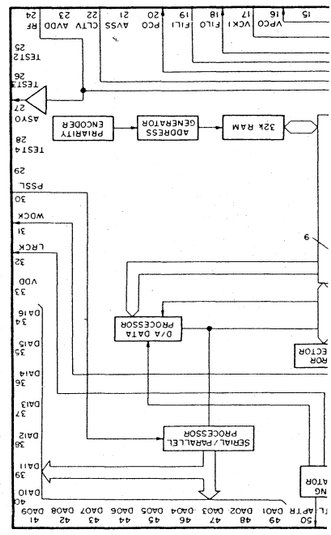

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1. RESISTORS :
Indicated in Ω, 1/6W, ± 5 % tolerance unless otherwise noted
k : kΩ, M : MΩ, (F) : ± 1 %, (G) : ± 2 %, (K) : ± 10 %, (M) : ± 20 % tolerance.

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

3. VOLTAGE CURRENT :
□ : DC voltage (V) at play state.
➡mA : DC current at play state.
Value in ( ) is DC current at stop state.

4. OTHERS :
➡ : Signal route.
⊘ : Adjusting point.
The Δ 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.

Parts List

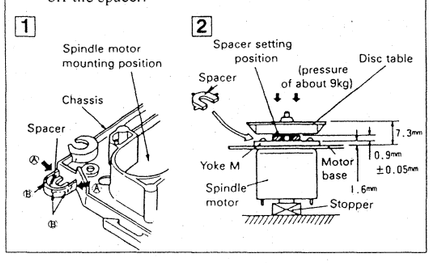
Mark	No.	Description	Part No.
	1	Motor pulley	PNW1634
	2	Gear holder	PNW1929
	3	Semi-fixed resistor (VR1)	PCP1008
	4	Cam gear	PNW1923
	5	Belt	PEB1138
	6	Top guide	PNW2061
	7	Gear pulley	PNW1918
	8	Gear S	PNW1919
	9	Gear L	PNW1920
	10	Eject spring	PBH1107
	11	Switch lever	PNW1927
	12	Seven bar	PNW1931
	13	Sub rotary lever	PNW1933
	14	Sub rotary lever spring	PBH1111
	15	Rotary lever	PNW1932
	16	Drive plate	PNW1930
	17	Motor screw	PBA-112
	18	Holder lever spring	PBH1110
	19	Disc holder	PNW1924
	20	Cushion A	PED1001
	21	Holder lever	PNW1925
	22	Float rubber	PEB1014
	23	Float rubber	PEB1132
	24	Float screw	PBA1055
	25	Release lever	PNW1934
	26	Release spring	PBH1106
	27	Clamper cam	PNW1922
	28	Clamper holder	PNW1921
	29	Clamper spring	PBH1109
	30	Clamper	PNW1857
	31	Lock lever	PNW1917
	32	Lock spring	PBH1108
	33	Stair L	PNW1915
	34	Stair R	PNW1916
	35	Synchronize lever	PNW1926
	36	Motor assembly (LOADING, DISC SELECT)	PEA1130
	37	Screw	PMZ26P040FMC
	38	Screw	PPZ30P080FMC
	39	Screw	BBZ30P060FMC
	40	Washer	WT26D047D025
	41	Washer	WA31D054D025
	42	E ring	Z39-010
	43	Earth spring	PBH1009
	44	Drive spring	PBH1084
	45	Plate spring	PBK1057

Mark	No.	Description	Part No.
	46	Belt	PEB1072
	47	Drive screw	PLA1003
	48	Guide bar	PLA1071
	49	Pulley	PNW1066
	50	Half nut	PNW1605
	51	• • • • •	
	52	Push switch (INSIDE)	DSG1014
	53	D.C.motor (CARRIAGE)	PXM1013
	54	Screw	PBZ30P080FMC
	55	D.C.motor assembly (with oil)(SPINDLE)	PEA1028
	56	Screw	JFZ20P040FMC
	57	Screw	BPZ20P080FZK
	58	Screw	PMZ20P030FMC
	59	Pickup assembly	PEA1030
	60	Disc table assembly	PEA1035
	61	Screw	IPZ30P080FMC
	62	Rubber spacer	PEB1178
	63	Rubber spacer	PEB1179
	64	Silent ring	PBK1093
	65	Washer	WA62D130D025
	101	Motor	
	102	Eject lever	
	103	Upper chassis	
	104	Servo mechanism assembly M	
	105	Loading board assembly	
	106	Sub chassis	
	107	Rubber tube	
	108	Main chassis	
	109	Select board assembly	
	110	Motor board assembly	
	111	Motor base	
	112	Yoke M	
	113	Mechanism base assembly T	
	114	Mechanism base	
	115	Mechanism chassis	

• How to install the disc table

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

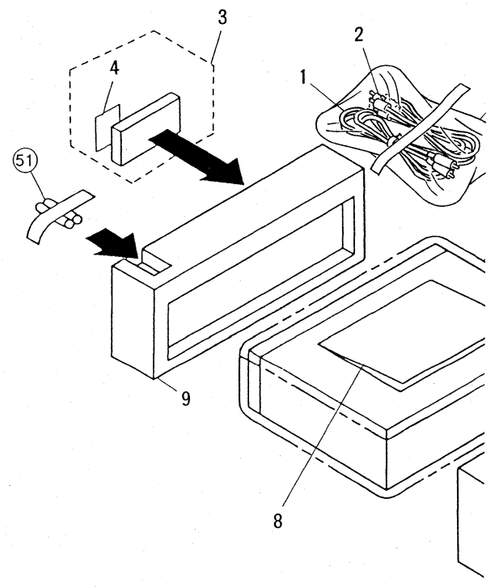
2 While supporting the spindle motor shaft with the stopper, put spacer on top of yoke M, and stick the disc table on top (takes about 9kg pressure). Take off the spacer.

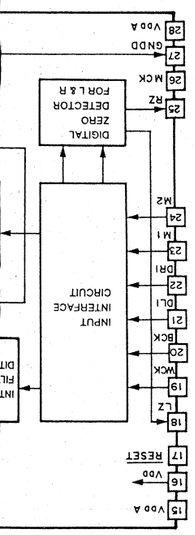


2.3 PACKING

Parts List

Mark	No.	Description	Part No.
	1	Cord with mini plug	PDE – 319
	2	Cord with plug	PDE1001
	3	Wireless remote controller	PWW1064
	4	Battery lid	PZN1001
	5	Single magazine assembly	PXA1043
	6	Magazine assembly	PXA1308
	7	Bag	Z21 – 039
	8	Operating instructions (English)	PRB1150
	9	Styrol protector F	PHA1155
	10	Styrol protector R	PHA1156
	11	Packing case	PHG1613
	12	Sheet	Z23 – 007
	13	PP case	PYY1141
	14	PP case S	PYY1157
	51	Battery (R03, AA)	





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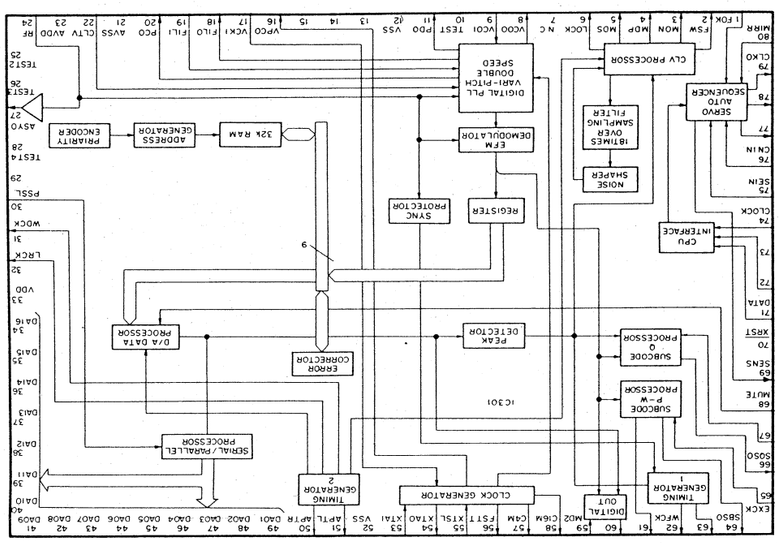

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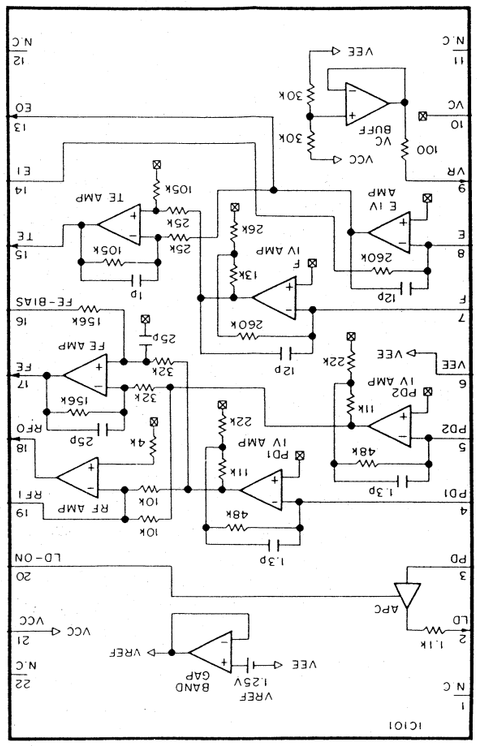

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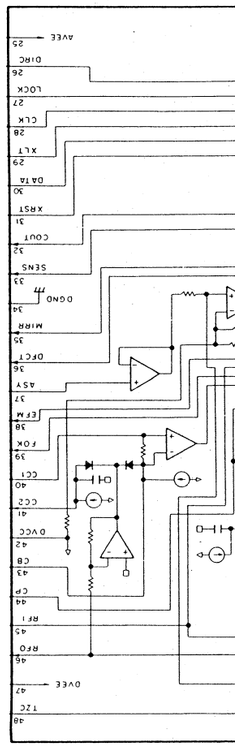

2.3 PACKING

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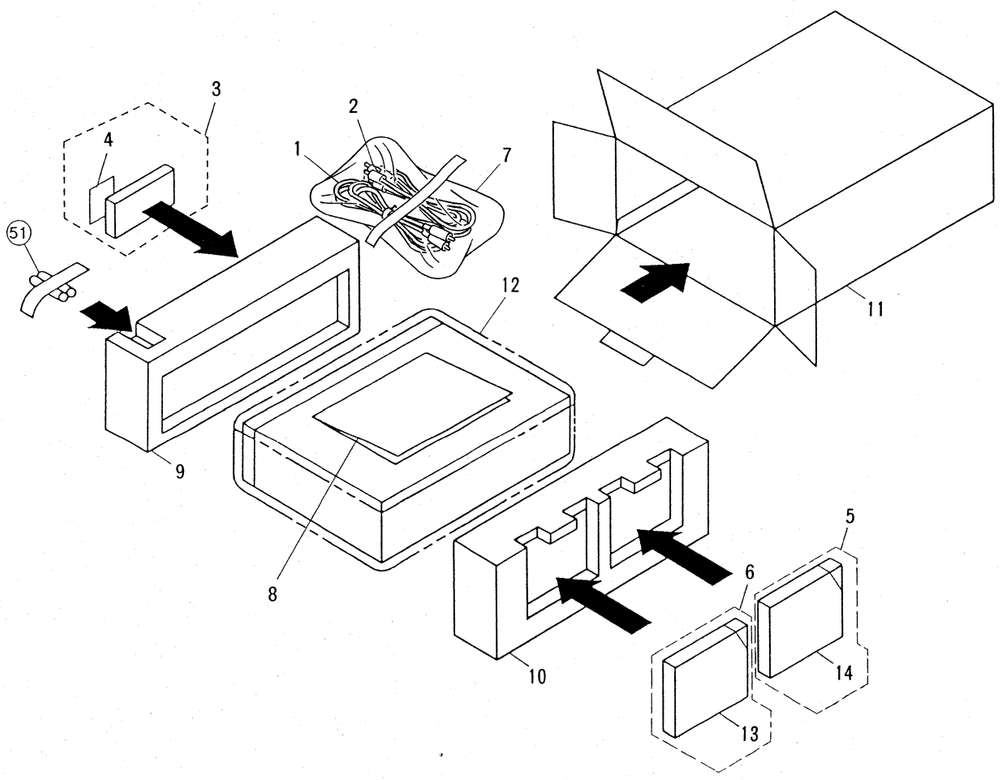
	9	Styrol protector F	PHA1155
	10	Styrol protector R	PHA1156
	11	Packing case	PHG1613
	12	Sheet	Z23 – 007
	13	PP case	PYY1141
	14	PP case S	PYY1157
	51	Battery (R03, AA)	



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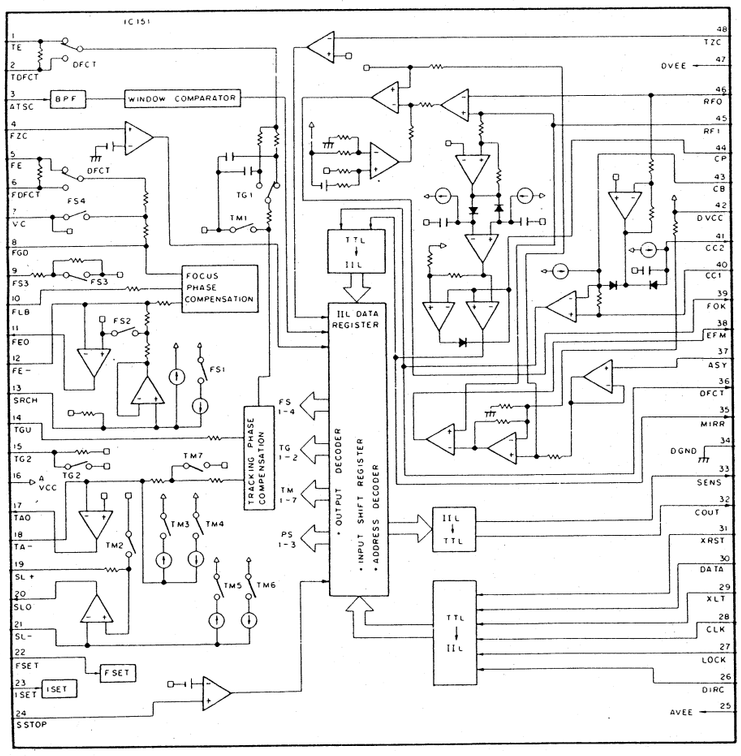

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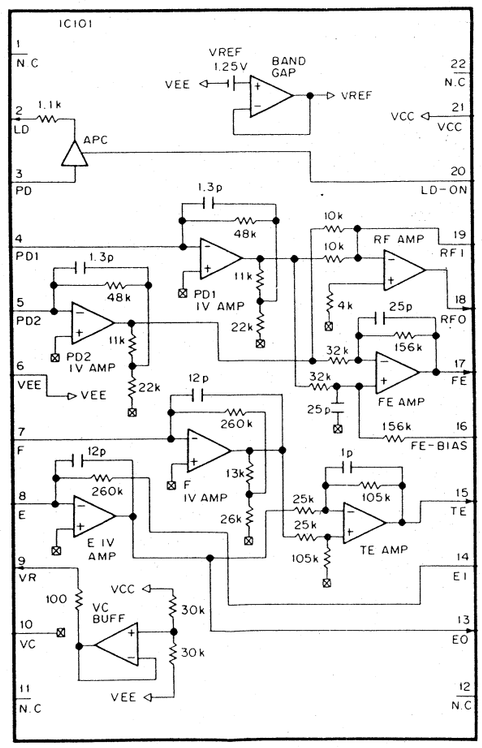

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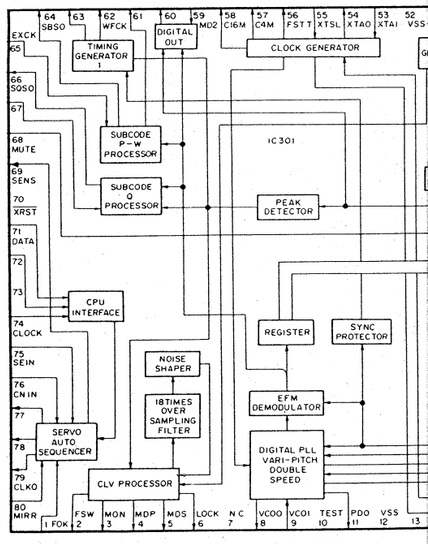


3. SCHEMATIC DIAGRAM

MAIN BOARD ASSEMBLY
(PWZ 2052 ; KU, KC Type)
(PWZ 2053 ; HEM Type)
(PWZ 2054 ; SD Type)

CN201 (TP1)

SERVO MECHANISM ASSEMBLY

PICK UP ASSEMBLY
PEA1030

CN101
52045-1610

IC101
CXA1471S
RF AMP

IC151
CXA1372S
SERVO CONTROL

IC301
CXD2500Q
DECODER

IC351
PD4324B
SYSTEM CONTROL

IC352
PD4325A
RAM CONTROL

IC354
BU4053B

IC202(1/3)
SPINDLE DRIVE

IC201(1/3)
FOUCUS DRIVE

IC201(2/3)
TRACKING DRIVE

IC201(3/3)
CARRIAGE DRIVE

IC202(2/3)
LOADING DRIVE

IC202(3/3)
DISC SELECT DRIVE

SPDL MTR ASSEMBLY PEA1028

CARRIAGE MTR
PXM1013

LOADING BOARD ASSEMBLY
S601, S602 : DSG1016

LOADING MOTOR ASSEMBLY PEA1130

MOTOR BOARD SELECT BOARD ASSEMBLY
S603-S606, DSG1016

DISC SELECT MOTOR ASSEMBLY PEA1130

ADAPTOR BOARD ASSEMBLY

S901
TEST SW

TO FUNCTION BOARD ASSEMBLY J701

TO FUNCTION BOARD ASSEMBLY J702

TO FUNCTION BOARD ASSEMBLY J703

MULTI MECHANISM ASSEMBLY

IC353 (LH5116-15)

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

IC60
M51957AL

Pin No.	Volts
1	5. 0
2	1. 5
3	0. 0
4	1. 2
5	5. 0

3. SCHEMATIC DIAGRAM

MAIN BOARD ASSEMBLY
(PWZ 2052 ; KU, KC Type)
(PWZ 2053 ; HEM Type)
(PWZ 2054 ; SD Type)

SERVO MECHANISM ASSEMBLY

PICK UP ASSEMBLY
PEA1030

MULTI MECHANISM ASSEMBLY

CN201 (TP1)

CN301 (TP2)

CN101
52045-1610

IC101
CXA1471S
RF AMP

IC151
CXA1372S
SERVO CONTROL

IC301
CXD2500Q
DECODER

IC351
PD4324B
SYSTEM CONTROL

IC352
PD4325A
RAM CONTROL

IC354
BU4053B

Q101
LD POWER

Q351
CHIP SELECT HOLD

X351
VSS1014
4.19MHz

X352
4.0MHz
FCR4.0MC

IC201(1/3)
FOUCUS DRIVE

IC201(2/3)
TRACKING DRIVE

IC201(3/3)
CARRIAGE DRIVE

IC202(1/3)
SPINDLE DRIVE

IC202(2/3)
LOADING DRIVE

IC202(3/3)
DISC SELECT DRIVE

SPDL MTR ASSEMBLY PEA1028

CARRIAGE MTR
PXM1013

LOADING BOARD ASSEMBLY
S601, S602 : DSG1016

LOADING MOTOR ASSEMBLY PEA1130

MOTOR BOARD SELECT BOARD ASSEMBLY
S603-S606 : DSG1016

DISC SELECT MOTOR ASSEMBLY PEA1130

ADAPTOR BOARD ASSEMBLY

S901
TEST SW

TO FUNCTION BOARD ASSEMBLY J701

TO FUNCTION BOARD ASSEMBLY J702

TO FUNCTION BOARD ASSEMBLY J703

IC353 (LH5116-15)

Pin No.	Volts
1	0.0
2	0.0
3	0.0
4	0.0
5	5.0
6	5.0
7	0.0
8	0.0
9	5.0
10	5.0
11	0.0
12	0.0
13	0.0
14	5.0
15	5.0
16	0.0
17	0.0
18	5.0
19	0.0
20	5.0
21	5.0
22	0.0
23	0.0
24	5.0

IC60 M51957AL

Pin No.	Volts
1	5.0
2	1.5
3	0.0
4	1.2
5	5.0

ASSEMBLY
, KC Type)
M Type)
) Type)

► : Measurement point
——— : Focus servo loop
— · — · — : Signal route
——— : Tracking servo loop
— — — — : Carriage servo loop
— — — — : Disc select motor route
——— : Loading motor route
— — — — : Spindle motor route

NOTE :
⏚ : CHASSIS GND

CN301 (TP2)
JP331
R331 470
C331 10P
JA331
R332 1K
C332 10P
Q331 MUTE
Q331 DTC124ES
JP301
IC301 CXD2500Q DECODER
C301 47/50
C302 47/50
C313 0.047
R312 470
R311 470
R310 470
J301
TO AUDIO BOARD ASSEMBLY CN501
R308 10K
C308 0.01
Q352 BUFFER
Q352 DTA124ES
D301 1SS254
C307 0.047
R307 10K
C306 0.001
C303 33/16
R301 22K
R303 22K
R302 12K
R304 45K
J302
TO AUDIO BOARD ASSEMBLY CN502
Q409 INVERTER
Q409 DTA124ES
C309 0.01
IC354 BU4053B
IC351 ANALOG MULTIPLEXER
R356 10K
R358 10K
R359 10K
R360 10K
R361 10K
R362 10K
R159 100K
C173 0.47/50
X351 VSS1014 4.19MHz
IC351 PD4324B SYSTEM CONTROL
RESET IC
IC60 M51957AL
R62 22K
R63 10K
R61 10K
C62 2.2
C61 0.33/50
Q391 INVERTER BUFFER
L391 1A
C341
D399 1SS254
L393 1uH
Q391 DTC124ES
PKN1005 DECK SYNCRO JACK
D398 1SS254
L394 1uH
JA393
R393 47K
R394 1K
D396 1SS254
D397 1SS254
D395 1SS254
TO AUDIO BOARD ASSEMBLY CN603
KU, KC TYPES ONLY.
R391 240K
R392 1K
D393 1SS254
D392 1SS254
D394 1SS254
JA392
RKN1004
OUT
SR JACK
RKN1004
IN
1SS254 D391
JA391
HEM, SD TYPES ONLY.
JP353
C352 33/16
IC352 PD4325A RAM CONTROL
IC353 RAM LH5116-15
R372 10K
R373 10K
X352 4.0MHz FCR4.0MC
Q351 CHIP SELECT HOLD
Q351 2SC1740S
R364 47K
R363 10K
JP354
J358
V+U 80mA (28mA)
VD+5
VA+5 217mA (113mA)
VD-5 22mA (24mA)
V-U 72mA (23mA)
IC11 LM2940CT-5.0
IC12 NJM79M05FA
C23 1000/16
C21 2200/16
C22 2200/16
C24 1000/16
11ES2
D21
D22
D23
D24
IC11, 12 REGULATOR
CN12 KPC6
AC1
AC2
R58 240
R59 240
R60 240
R57 5.6K
D54 MTZ6.2B/C
R52 470
C340 470/50
R53 4.7K
D53 MTZ39B/C
R54 2.2K
Q51 2SA933S
D52 11ES2
Q51 REGULATOR
J351
J352
J353
SEG A
SEG B
SEG C
SEG D
SEG E
SEG F
SEG G
SEG H
SEG I
SEG J
SEG K
SEG L
SEG M
SEG N
SEG O
SEG P
V-FL

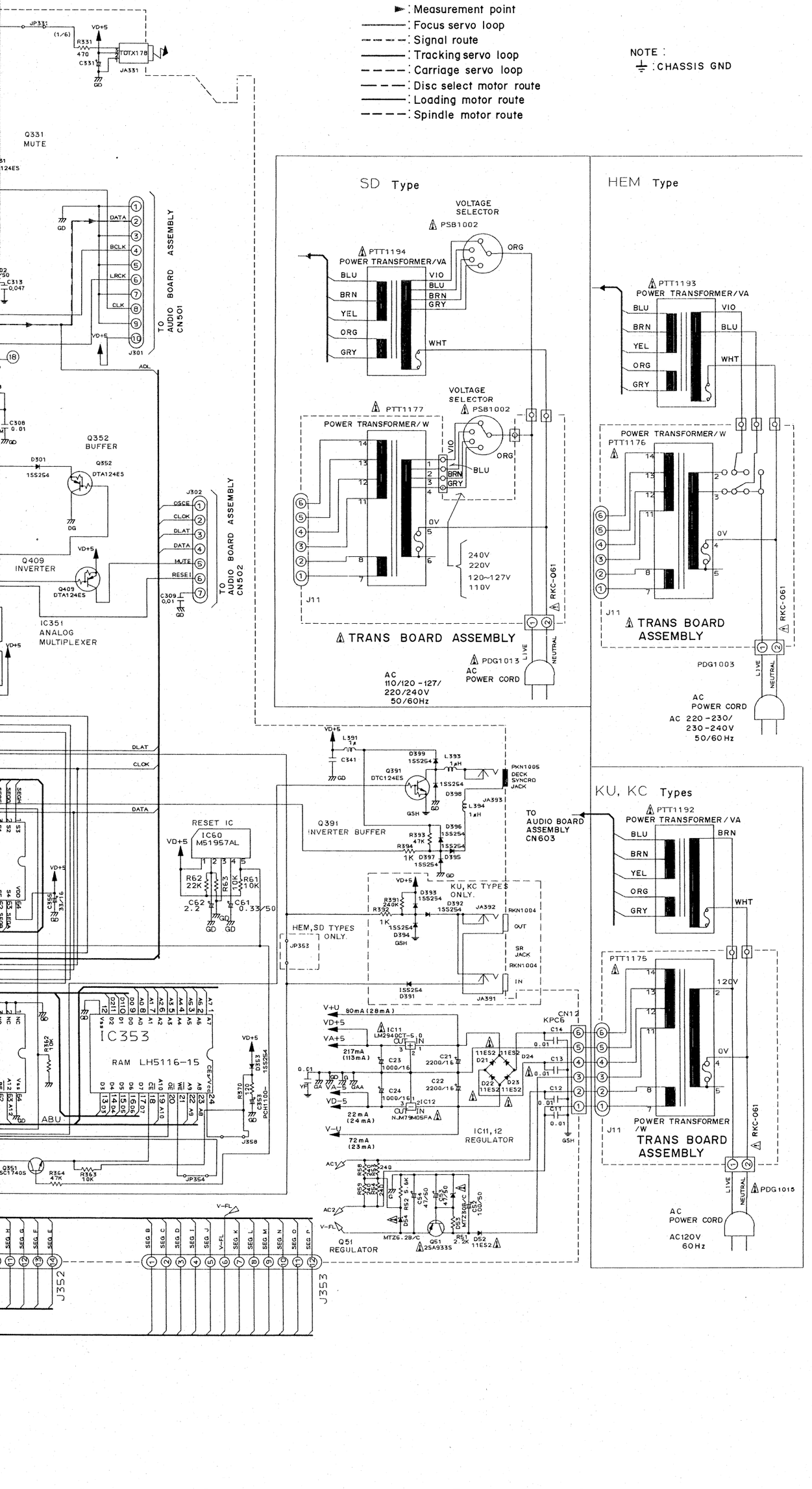
SD Type
VOLTAGE SELECTOR
PSB1002
PTT1194 POWER TRANSFORMER/VA
BLU
BRN
YEL
ORG
GRY
VIO
WHT
PTT1177 POWER TRANSFORMER/W
240V
220V
120~127V
110V
J11
TRANS BOARD ASSEMBLY
RKC-061
PDG1013 AC POWER CORD
AC 110/120-127/ 220/240V 50/60Hz

HEM Type
PTT1193 POWER TRANSFORMER/VA
PTT1176 POWER TRANSFORMER/W
J11
TRANS BOARD ASSEMBLY
PDG1003
AC POWER CORD
AC 220-230/ 230-240V 50/60Hz

KU, KC Types
PTT1192 POWER TRANSFORMER/VA
PTT1175 POWER TRANSFORMER/W
120V
0V
J11
TRANS BOARD ASSEMBLY
AC POWER CORD
AC120V 60Hz

►: Measurement point
———: Focus servo loop
– – – –: Signal route
———: Tracking servo loop
– – – –: Carriage servo loop
— — —: Disc select motor route
———: Loading motor route
– – – –: Spindle motor route

NOTE :
⏚ : CHASSIS GND



IC301
(CXD2500Q)

Pin No.	Volts	Pin No.	Volts	Pin No.	Volts	Pin No.	Volts
1	5.0	21	0.0	41	2.5	61	0.0
2	2.1	22	2.5	42	5.0	62	2.5
3	5.0	23	5.0	43	2.5	63	0.0
4	2.6	24	2.5	44	0.0	64	0.0
5	2.2	25	0.2	45	5.0	65	0.0
6	5.0	26	0.0	46	4.4	66	3.3~4.6
7	0.0	27	2.5	47	0.0	67	5.0
8	5.0	28	0.0	48	0.0	68	0.0
9	0.0	29	0.0	49	0~0.3	69	2.1~3.0
10	0.0	30	0.0	50	1.2	70	5.0
11	2.1	31	1.3~2.2	51	1.2	71	5.0
12	0.0	32	2.5	52	0.0	72	5.0
13	1.0	33	5.0	53	2.5	73	5.0
14	0.9~1.3	34	2.5	54	2.5	74	5.0
15	0.0	35	2.5	55	0.0	75	5.0
16	2.0	36	2.5	56	2.9	76	0.0
17	0.0	37	2.5	57	2.5	77	5.0
18	2.5	38	2.5	58	2.5	78	5.0
19	2.4	39	0.0	59	0.0	79	5.0
20	2.4	40	5.0	60	0.0	80	0.0

IC151
(CXA1372S)

Pin No.	Volts	Pin No.	Volts
1	0.0	25	-5.0
2	0.0	26	5.0
3	0.0	27	5.0
4	0.0	28	5.0
5	0.0	29	5.0
6	0.0	30	5.0
7	0.0	31	5.0
8	0.0	32	0.0
9	0.0	33	5.0
10	0.0	34	0.0
11	1.0	35	0.0
12	0.0	36	-5.0
13	0.2	37	2.5
14	0.0	38	2.5
15	0.0	39	5.0
16	5.0	40	-1.5
17	0.0	41	-1.7
18	0.0	42	5.0
19	0.0	43	-0.7
20	0.2~0.8	44	-1.6
21	0.0	45	0.0
22	-4.0	46	0.8
23	1.3	47	-5.0
24	0.0	48	0.0

IC101
(CXA1471S)

Pin No.	Volts
1	0.0
2	2.9
3	-4.7
4	0.0
5	0.0
6	-5.0
7	0.0
8	0.0
9	0.0
10	0.0
11	0.0
12	0.0
13	-0.9
14	-0.7
15	0.0
16	0.0
17	0.0
18	0.8
19	0.0
20	5.0
21	5.0
22	0.0

IC201
(LA6520)

Pin No.	Volts
1	-0.1
2	-0.1
3	-0.1
4	0.0
5	0.0
6	0.0
7	0.6
8	0.6
9	0.4~0.8
10	0.0
11	0.0
12	8.2
13	FIN

IC202
(LA6520)

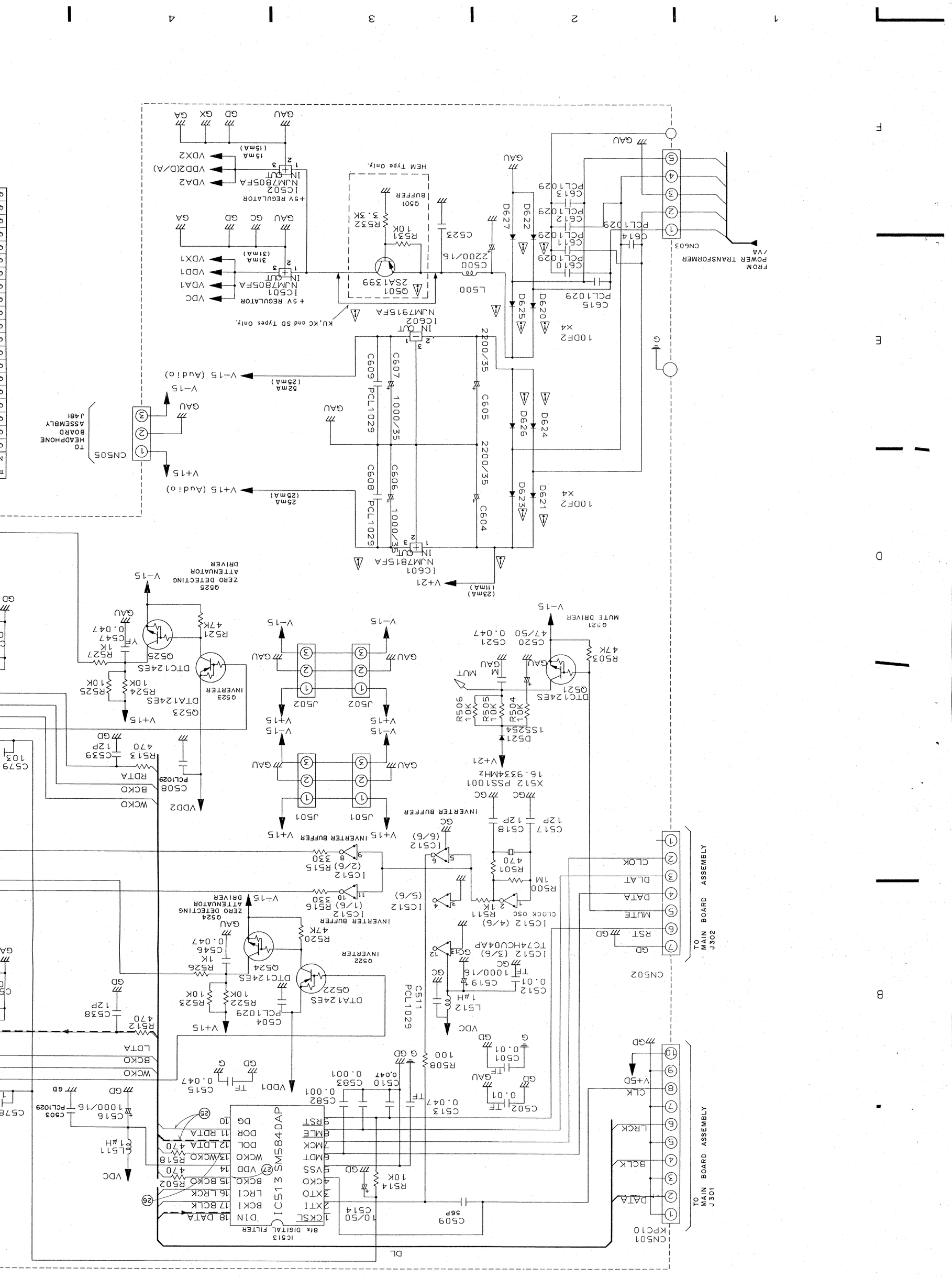
Pin No.	Volts
1	1.7
2	1.7
3	-0.7
4	0.0
5	0.0
6	0.0
7	0.0
8	0.0
9	0.0
10	0.0
11	0.0
12	8.2
13	FIN

IC11
(LM2940CT-5.0)

Pin No.	Volts
1	9.0
2	0.0
3	5.0

IC12
(NJM79M05FM)

Pin No.	Volts
1	0.0
2	-9.5
3	-5.0


FROM POWER TRANSFORMER /VA
CN603
PCL1029
C614
C611
C610
C612
C613
D622
D627
D620
D625
D624
D626
D621
D623
10DF2 x4
C615
L500
C500 2200/16
C523
Q501 2SA1399
R531 10K
R532 3.3K
Q501 BUFFER
HEM Type Only.
KU,KC and SD Types Only.
IC602 NJM7915FA
IC601 NJM7815FA
IC501 NJM78052FA
IC502 NJM78052FA
+5V REGULATOR
C609 PCL1029
C607 1000/35
C608 PCL1029
C606 1000/35
2200/35
C605
2200/35
C604
C603
CN505
TO HEADPHONE BOARD ASSEMBLY J481
V-15 (Audio)
52mA (25mA)
25mA (25mA)
V+15 (Audio)
V+21 (11mA)
(23mA)
GAU
GD
GA
GC
GX
V-15
V+15
V+21
VDC
VDA1
VDA2
VDC1
VDC2
VDD1
VDD2(D/A)
VDX1
VDX2
31mA (31mA)
15mA (15mA)
0525 ZERO DETECTING ATTENUATOR DRIVER
0523 INVERTER
0522 INVERTER
0524 ZERO DETECTING ATTENUATOR DRIVER
DTC124ES
DTA124ES
Q525
Q523
Q522
Q524
R527 1K
R525 10K
R524 10K
R521 47K
R520 47K
R526 1K
R523 10K
R522 10K
C547 0.047
C546 0.047
C504 PCL1029
C538 12P
R512 470
C539 12P
R513 470
C508 PCL1029
C579 103
C578
C516 1000/16
C503 PCL1029
L511 1μH
R518 470
R502 470
C515 0.047
C513 SM5840AP
IC513 8fs DIGITAL FILTER
C582 0.001
C583 0.001
C510 0.047
C514 10/50
C509 56P
R514 10K
R508 100
C513 0.047
C502 0.01
C501 0.01
C512 0.01
C519 1000/16
L512 1μH
C511 PCL1029
IC512 (1/6) R516 330
IC512 (2/6) R515 330
IC512 (3/6) TC74HCU04AP
IC512 (4/6) R511 1K
IC512 (5/6)
IC512 (6/6)
CLOCK OSC
R500 1M
R501 470
C517 12P
C518 12P
X512 PSS1001 16.9334MHz
D521 1SS254
Q521 DTC124ES
R503 47K
C520 47/50
C521 0.047
MUTE DRIVER
M MUT
R506 10K
R505 10K
R504 10K
J501
J502
INVERTER BUFFER
CN502
TO MAIN BOARD ASSEMBLY J302
CN501
TO MAIN BOARD ASSEMBLY J301
MUTE
RST
DLAT
CLOK
DATA
BCLK
LRCK
CLK
+5D
DATA
WCKO
BCKO
LDTA
DL

AUDIO BOARD ASSEMBLY
(PWM1413 ; KU, KC, SD Types.)
(PWM1414 ; HEM Type.)

IC513 SM5840AP
DIGITAL FILTER
DIN 18 DATA
BCKI 17 BCLK
LRCI 16 LRCK
BCKO 15 BCKO
VDD 14
WCKO 13 WCKO
DOL 12 LDTA
DOR 11 RDTA
DG 10

IC522 PD2028A
IC523 PD2028A
IC522, IC523
D/A CONVERTER

IC554
LOW-PASS FILTER
IC554(1/2)
IC554(2/2)

IC555
LOW-PASS FILTER
IC555(1/2)
IC555(2/2)

Q524
ZERO DETECTING
ATTENUATOR
DRIVER

Q523
INVERTER

Q525
ZERO DETECTING
ATTENUATOR
DRIVER

IC522, 523 : PD2028A
IC554, 555 : NJM5532DD
Q554, 555, 562, 563 : 2SC3068
Q558, 561 : 2SK364
Q559, 560 : 2SJ104
C572, 573 : PCH1094
C503,504,508,608-615 : PCL1029(0.01)

CN503
TO
HEADPHONE
BOARD
ASSEMBLY
J483

CN505
TO
HEADPHONE
BOARD
ASSEMBLY
J481

V REGULATOR
C501
JM7805FA
OUT
31mA
(31mA)
VDC
VDA1
VDD1
VDX1

V REGULATOR
C502
JM7805FA
OUT
15mA
(15mA)
VDA2
VDD2(D/A)
VDX2

SD Types Only.

TRNSISTOR No.	Volts EMITTER	COLLECTER	BASE
Q101	3.7	1.8	3.0
Q331	5.0	5.0	0.0
Q409	5.0	5.0	0.0
Q391	0.0	0.0	5.1
Q51	-28.9	-31.3	-29.6
Q701	-3.0	-3.3	-4.4
Q702	-3.0	-7.1	-3.0
Q706	-14.5	-3.0	-14.5
Q707	-16.5	0.0	-17.3
Q708	-16.0	-3.0	-16.0
Q801	5.0	0.0	5.0
Q521	-15.3	-15.3	5.0
Q522	5.0	5.0	0.0
Q523	5.0	5.0	0.0
Q524	-15.3	-15.3	5.0
Q525	-15.3	-15.3	5.0
Q554	0.0	0.0	-2.0
Q555	0.0	0.0	-2.0
Q562	0.0	0.0	-15.3
Q563	0.0	0.0	-15.3

IC354 (BU4053B)

Pin No.	Volts
1	5.0
2	0.3
3	5.0
4	5.0
5	1.0
6	0.0
7	0.0
8	0.0
9	4.8
10	5.0
11	5.0
12	0.0
13	4.0
14	4.6
15	5.0
16	5.0

IC513 (SM5840AP)

Pin No.	Volts
1	4.8
2	2.5
3	2.5
4	2.6
5	0.0
6	4.3
7	5.0
8	5.0
9	5.0
10	3.0
11	1.8
12	1.8
13	3.7
14	5.0
15	1.4
16	2.5
17	2.4
18	2.5

IC554 (NJM5532DD)

Pin No.	Volts
1	0.0
2	0.0
3	0.0
4	-15.3
5	1.3
6	0.0
7	0.0
8	14.8

IC555 (NJM5532DD)

Pin No.	VOLTS
1	0.0
2	0.0
3	0.0
4	-15.3
5	1.3
6	0.0
7	0.0
8	14.8

IC501 (NJM7805FA)

Pin No.	Volts
1	9.2
2	0.0
3	5.0

IC502 (NJM7905FA)

Pin No.	Volts
1	9.2
2	0.0
3	5.1

IC512 (TC74BCU04AP)

Pin No.	Volts
1	2.5
2	2.5
3	2.2
4	2.6
5	2.5
6	2.5
7	0.0
8	3.0
9	2.6
10	3.0
11	2.7
12	2.7
13	2.5
14	5.0

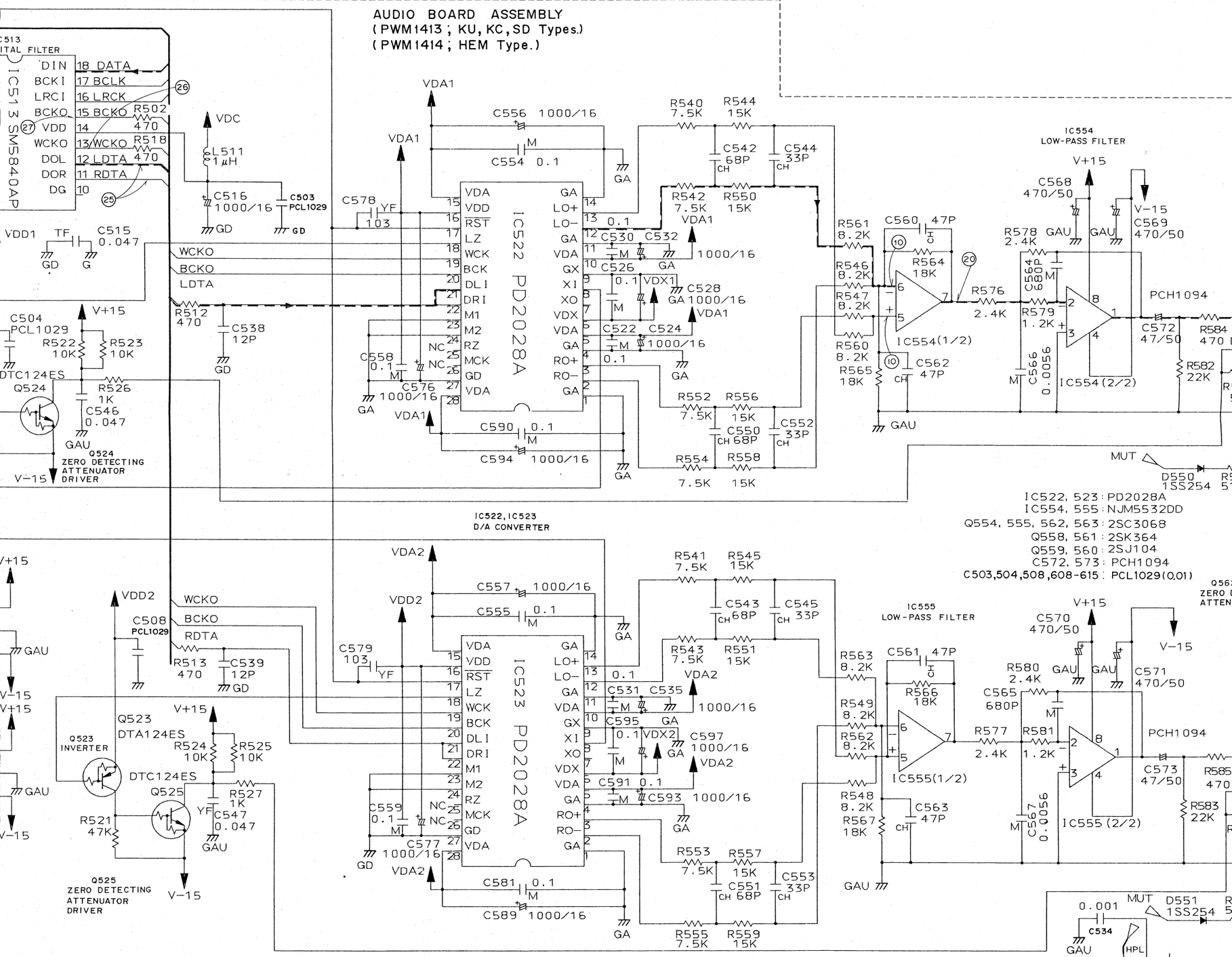
IC522 (PD2028A)

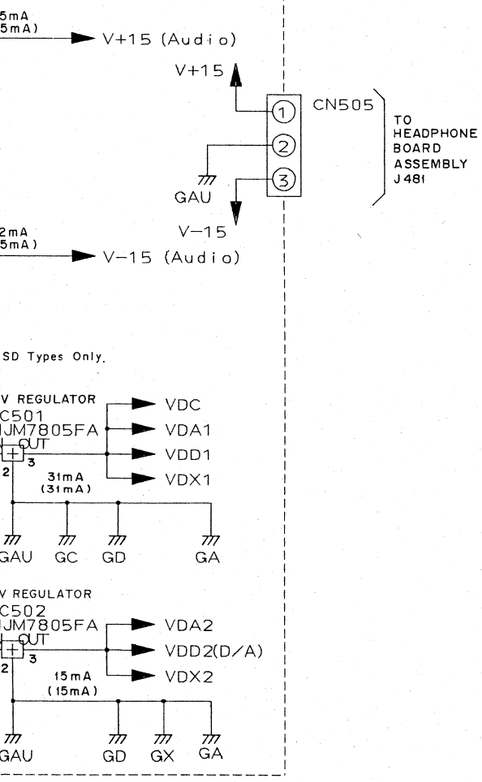
Pin No.	Volts	Pin No.	Volts
1	0.0	15	5.0
2	2.5	16	5.0
3	2.2	17	5.0
4	0.0	18	0.0
5	5.0	19	3.6
6	5.0	20	1.7
7	2.3	21	1.8
8	2.5	22	1.8
9	0.0	23	0.0
10	5.0	24	0.0
11	0.0	25	0.0
12	2.3	26	2.7
13	2.5	27	0.0
14	0.0	28	5.0

IC523 (PD2028A)

Pin No.	Volts	Pin No.	Volts
1	0.0	15	5.1
2	2.6	16	5.1
3	2.3	17	5.0
4	0.0	18	0.0
5	5.1	19	3.7
6	5.1	20	1.7
7	2.4	21	1.8
8	2.5	22	1.8
9	0.0	23	0.0
10	5.1	24	0.0
11	0.0	25	0.0
12	2.3	26	2.9
13	2.5	27	0.0
14	0.0	28	5.1

AUDIO BOARD ASSEMBLY
(PWM1413 ; KU, KC, SD Types.)
(PWM1414 ; HEM Type.)





TRNSISTOR No.	Volts EMITTER	COLLECTER	BASE
Q101	3.7	1.8	3.0
Q331	5.0	5.0	0.0
Q409	5.0	5.0	0.0
Q391	0.0	0.0	5.1
Q51	-28.9	-31.3	-29.6
Q701	-3.0	-3.3	-4.4
Q702	-3.0	-7.1	-3.0
Q706	-14.5	-3.0	-14.5
Q707	-16.5	0.0	-17.3
Q708	-16.0	-3.0	-16.0
Q801	5.0	0.0	5.0
Q521	-15.3	-15.3	5.0
Q522	5.0	5.0	0.0
Q523	5.0	5.0	0.0
Q524	-15.3	-15.3	5.0
Q525	-15.3	-15.3	5.0
Q554	0.0	0.0	-2.0
Q555	0.0	0.0	-2.0
Q562	0.0	0.0	-15.3
Q563	0.0	0.0	-15.3

IC354 (BU4053B)

Pin No.	Volts
1	5.0
2	0.3
3	5.0
4	5.0
5	1.0
6	0.0
7	0.0
8	0.0
9	4.8
10	5.0
11	5.0
12	0.0
13	4.0
14	4.6
15	5.0
16	5.0

IC513 (SM5840AP)

Pin No.	Volts
1	4.8
2	2.5
3	2.5
4	2.6
5	0.0
6	4.3
7	5.0
8	5.0
9	5.0
10	3.0
11	1.8
12	1.8
13	3.7
14	5.0
15	1.4
16	2.5
17	2.4
18	2.5

IC554 (NJM5532DD)

Pin No.	Volts
1	0.0
2	0.0
3	0.0
4	-15.3
5	1.3
6	0.0
7	0.0
8	14.8

IC555 (NJM5532DD)

Pin No.	VOLTS
1	0.0
2	0.0
3	0.0
4	-15.3
5	1.3
6	0.0
7	0.0
8	14.8

IC501 (NJM7805FA)

Pin No.	Volts
1	9.2
2	0.0
3	5.0

IC502 (NJM7905FA)

Pin No.	Volts
1	9.2
2	0.0
3	5.1

IC512 (TC74BCU04AP)

Pin No.	Volts
1	2.5
2	2.5
3	2.2
4	2.6
5	2.5
6	2.5
7	0.0
8	3.0
9	2.6
10	3.0
11	2.7
12	2.7
13	2.5
14	5.0

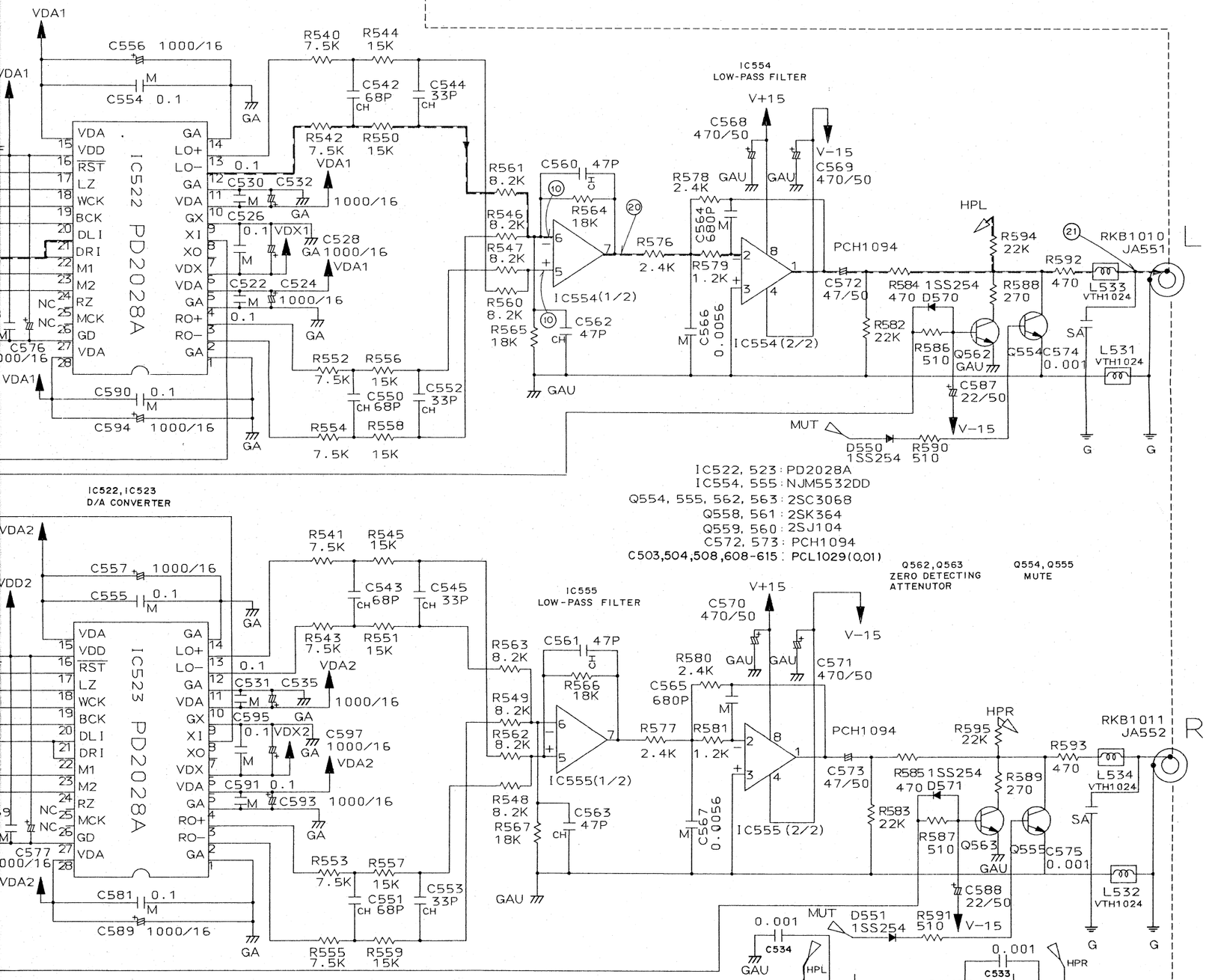
IC522 (PD2028A)

Pin No.	Volts	Pin No.	Volts
1	0.0	15	5.0
2	2.5	16	5.0
3	2.2	17	5.0
4	0.0	18	0.0
5	5.0	19	3.6
6	5.0	20	1.7
7	2.3	21	1.8
8	2.5	22	1.8
9	0.0	23	0.0
10	5.0	24	0.0
11	0.0	25	0.0
12	2.3	26	2.7
13	2.5	27	0.0
14	0.0	28	5.0

IC523 (PD2028A)

Pin No.	Volts	Pin No.	Volts
1	0.0	15	5.1
2	2.6	16	5.1
3	2.3	17	5.0
4	0.0	18	0.0
5	5.1	19	3.7
6	5.1	20	1.7
7	2.4	21	1.8
8	2.5	22	1.8
9	0.0	23	0.0
10	5.1	24	0.0
11	0.0	25	0.0
12	2.3	26	2.9
13	2.5	27	0.0
14	0.0	28	5.1

DIO BOARD ASSEMBLY
WM1413 ; KU, KC, SD Types.)
WM1414 ; HEM Type.)



IC522, 523 : PD2028A
IC554, 555 : NJM5532DD
Q554, 555, 562, 563 : 2SC3068
Q558, 561 : 2SK364
Q559, 560 : 2SJ104
C572, 573 : PCH1094
C503,504,508,608-615 : PCL1029(0.01)

TOR	Volts		
	EMITTER	COLLECTER	BASE
1	3.7	1.8	3.0
1	5.0	5.0	0.0
9	5.0	5.0	0.0
1	0.0	0.0	5.1
	-28.9	-31.3	-29.6
1	-3.0	-3.3	-4.4
2	-3.0	-7.1	-3.0
6	-14.5	-3.0	-14.5
7	-16.5	0.0	-17.3
8	-16.0	-3.0	-16.0
1	5.0	0.0	5.0
1	-15.3	-15.3	5.0
2	5.0	5.0	0.0
3	5.0	5.0	0.0
4	-15.3	-15.3	5.0
5	-15.3	-15.3	5.0
4	0.0	0.0	-2.0
5	0.0	0.0	-2.0
2	0.0	0.0	-15.3
3	0.0	0.0	-15.3

IC354 (BU4053B)

Pin No.	Volts
1	5.0
2	0.3
3	5.0
4	5.0
5	1.0
6	0.0
7	0.0
8	0.0
9	4.8
10	5.0
11	5.0
12	0.0
13	4.0
14	4.6
15	5.0
16	5.0

IC513 (SM5840AP)

Pin No.	Volts
1	4.8
2	2.5
3	2.5
4	2.6
5	0.0
6	4.3
7	5.0
8	5.0
9	5.0
10	3.0
11	1.8
12	1.8
13	3.7
14	5.0
15	1.4
16	2.5
17	2.4
18	2.5

IC554 (NJM5532DD)

Pin No.	Volts
1	0.0
2	0.0
3	0.0
4	-15.3
5	1.3
6	0.0
7	0.0
8	14.8

IC555 (NJM5532DD)

Pin No.	VOLTS
1	0.0
2	0.0
3	0.0
4	-15.3
5	1.3
6	0.0
7	0.0
8	14.8

IC501 (NJM7805FA)

Pin No.	Volts
1	9.2
2	0.0
3	5.0

IC502 (NJM7905FA)

Pin No.	Volts
1	9.2
2	0.0
3	5.1

IC512 (TC74HC004AP)

Pin No.	Volts
1	2.5
2	2.5
3	2.2
4	2.6
5	2.5
6	2.5
7	0.0
8	3.0
9	2.6
10	3.0
11	2.7
12	2.7
13	2.5
14	5.0

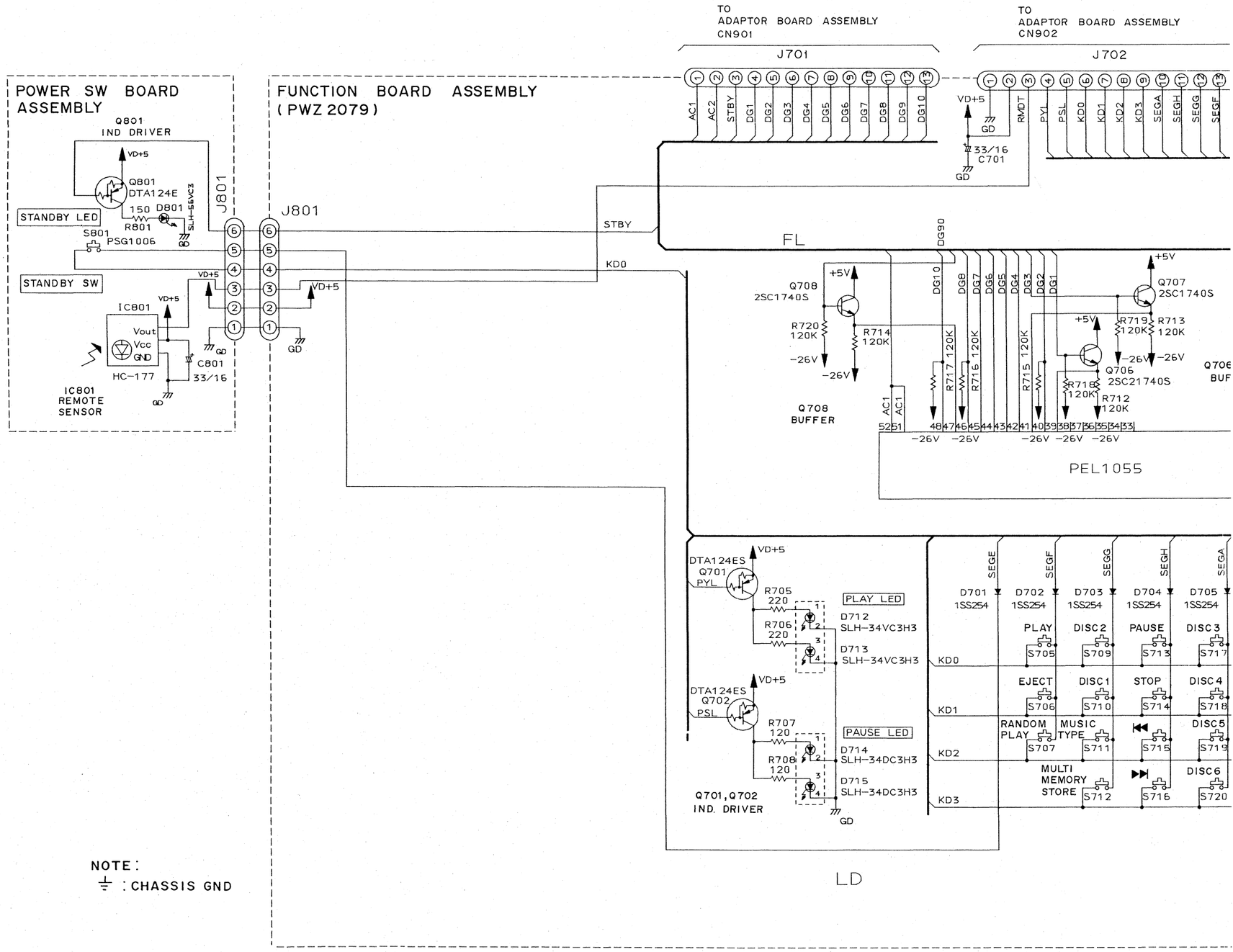
IC522 (PD2028A)

Pin No.	Volts	Pin No.	Volts
1	0.0	15	5.0
2	2.5	16	5.0
3	2.2	17	5.0
4	0.0	18	0.0
5	5.0	19	3.6
6	5.0	20	1.7
7	2.3	21	1.8
8	2.5	22	1.8
9	0.0	23	0.0
10	5.0	24	0.0
11	0.0	25	0.0
12	2.3	26	2.7
13	2.5	27	0.0
14	0.0	28	5.0

IC523 (PD2028A)

Pin No.	Volts	Pin No.	Volts
1	0.0	15	5.1
2	2.6	16	5.1
3	2.3	17	5.0
4	0.0	18	0.0
5	5.1	19	3.7
6	5.1	20	1.7
7	2.4	21	1.8
8	2.5	22	1.8
9	0.0	23	0.0
10	5.1	24	0.0
11	0.0	25	0.0
12	2.3	26	2.9
13	2.5	27	0.0
14	0.0	28	5.1

NOTE :
⏚ : CHASSIS GND



NOTE:
⏚ : CHASSIS GND

BOARD ASSEMBLY

TO
ADAPTOR BOARD ASSEMBLY
CN902

TO
ADAPTOR BOARD ASSEMBLY
CN903

TO
AUDIO BOARD ASSEMBLY
CN505

J701 J702 J703 J481

DG2 DG3 DG4 DG5 DG6 DG7 DG8 DG9 DG10

VD+5 GD 33/16 C701 GD RMDT PYL PSL KD0 KD1 KD2 KD3 SEGA SEGH SEGG SEGF SEGE

SEGB SEGC SEGD SEGI SEGJ −26V SEGK SEGL SEGM SEGN SEGO SEGP

L481 L482 L483 LAU010 X3

C484 33/16 C485 33/16

VR481 (1/2) R481 3.9K R484 1K PCS1002 GND

0.01 C481 C483 0.01 C482 0.01 GSH

R486 1K C487 M 0.1 GND

R485 3.9K VR481 (2/2)

IC48
HEADPHON

HEADPHOI

TO AUDIO BOARD ASSEMBLY CN503 J483 HPL

TO AUDIO BOARD ASSEMBLY CN504 J482 HRR

GSH

FL

DG90 DG10 DG8 DG7 DG6 DG5 DG4 DG3 DG2 DG1

+5V Q708 C1740S R720 120K R714 120K −26V −26V

Q708 BUFFER

AC1 AC1

R717 120K R716 120K R715 120K

+5V Q707 2SC1740S R719 120K R713 120K −26V −26V

+5V Q706 2SC21740S R718 120K R712 120K −26V −26V

Q706, Q707 BUFFER

P1 P2 P3 P4 P5 P6 P7 P8 P9 P10 P11 P12 P13 P14 P15 P16 AC2 AC2

52 51 48 47 46 45 44 43 42 41 40 39 38 37 36 35 34 33 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 2 1

−26V −26V −26V −26V −26V

PEL1055 V701

S701~S720 PSG1006

+5

705 220 706 220 PLAY LED D712 SLH-34VC3H3 D713 SLH-34VC3H3

+5

707 220 708 220 PAUSE LED D714 SLH-34DC3H3 D715 SLH-34DC3H3 GD

SEGE SEGF SEGG SEGH SEGA

D701 1SS254 D702 1SS254 D703 1SS254 D704 1SS254 D705 1SS254

KD0 PLAY S705 DISC2 S709 PAUSE S713 DISC3 S717

KD1 EJECT S706 DISC1 S710 STOP S714 DISC4 S718

KD2 RANDOM PLAY S707 MUSIC TYPE S711 ⏮ S715 DISC5 S719

KD3 MULTI MEMORY STORE S712 ⏭ S716 DISC6 S720

R701 10K R702 10K R703 10K R704 10K GD

LD

TO
ADAPTOR BOARD ASSEMBLY
CN903

J703

SEGB SEGC SEGD SEG1 SEGJ -26V SEGK SEGL SEGM SEGN SEGO SEGP

P1 P2 P3 P4 P5 P6 P7 P8 P9 P10 P11 P12 P13 P14 P15 P16

AC2 AC2

20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 2 1

V701

S701~S720 PSG1006

R701 10K
R702 10K
R703 10K
R704 10K
GD

TO
AUDIO BOARD ASSEMBLY
CN505

J481

HEADPHONE BOARD ASSEMBLY

L481 L482 L483 LAU010 X3

C484 33/16 C485 33/16

0.1 C486 M R482 68K
R483 6.8K

VR481 (1/2) R481 3.9K
R484 1K
PCS1002
IC481 (2/2) M5218AL
R490 120
L502 1μH
L503 0.22μH
C488 0.001
HEAD PHONE JACK
JA481 RKN1002
C489 0.047
C490 0.001
GSH

0.01 C481
C483 0.01
C482 0.01
GSH

R486 1K
C487 M 0.1
R488 68K
R487 6.8K
IC481 (1/2) M5218AL
R489 120
L501 1μH
R485 3.9K
VR481 (2/2)

IC481
HEADPHONE AMP

TO
AUDIO BOARD ASSEMBLY CN503
HPL
J483

TO
AUDIO BOARD ASSEMBLY CN504
HRR
J482

GSH

J485

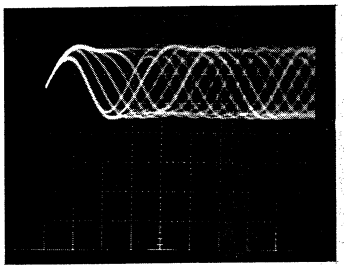
Waveforms

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

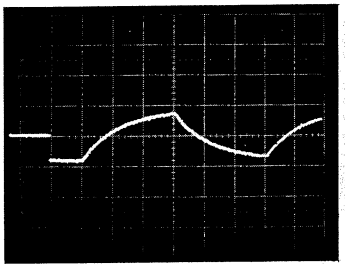
*1 50T-JUMP: After switching to the pause mode, press the manual search key.

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

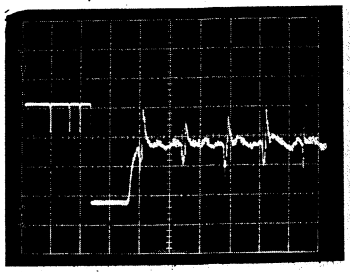
② TP1-Pin 1: PLAY MODE
(RF)
500mV/div 500nsec/div



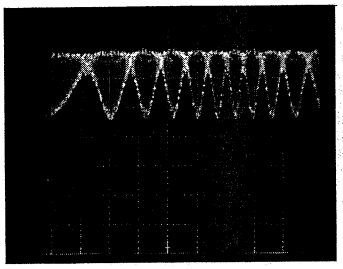
⑤ IC201-Pin 3: FOCUS-IN (*2) MODE
(FODR)
1V/div 200msec/div



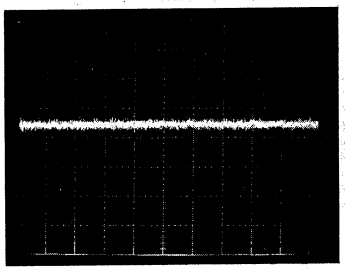
⑦ IC202-Pin 3: TRACK SEARCH MODE
(SPDR)
2V/div 50msec/div



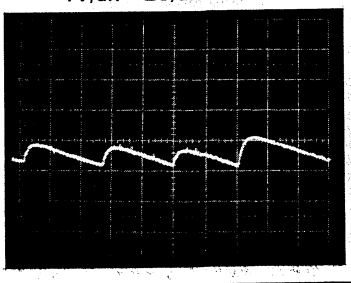
② TP1-Pin 1: TRACK SEARCH MODE
(RF)
500mV/div 200μsec/div



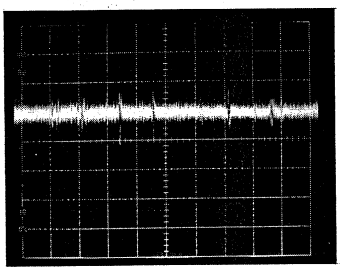
⑤ IC201-Pin 3: PLAY MODE
(FODR)
1V/div 1msec/div



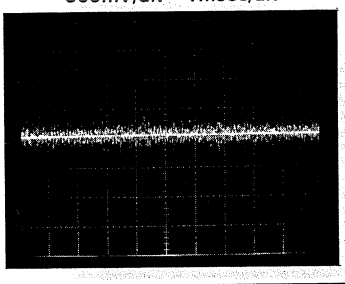
⑧ IC201-Pin 9: PLAY MODE
(CADR)
1V/div 2S/div



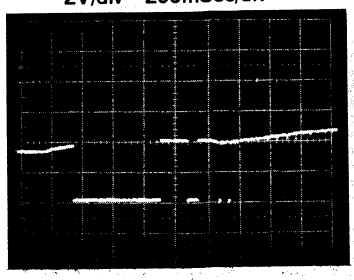
③ TP1-Pin 6: PLAY MODE
(FOER)
100mV/div 10msec/div



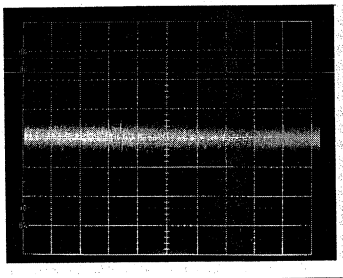
⑥ IC201-Pin 4: PLAY MODE
(TRDR)
500mV/div 1msec/div



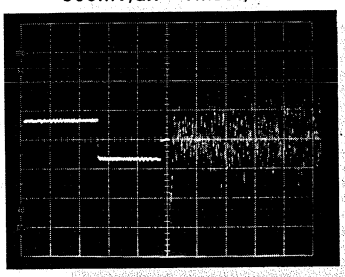
⑧ IC201-Pin 9: TRACK SEARCH MODE
(CADR)
2V/div 200msec/div



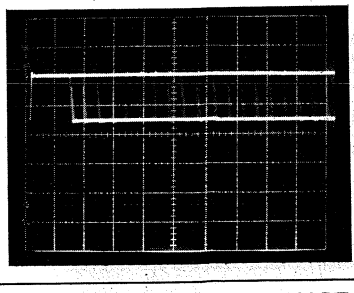
④ TP1-Pin 2: PLAY MODE
(TRER)
1V/div 10msec/div



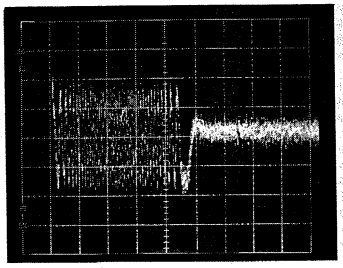
⑥ IC201-Pin 4: 50T-JUMP (*1) MODE
(TRDR)
500mV/div 1msec/div



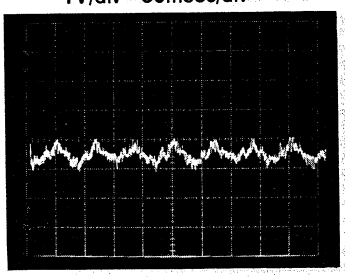
⑨ IC151-Pin 38: PLAY MODE
(EFM)
2V/div 500nsec/div



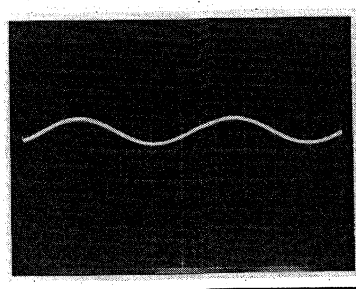
④ TP1-Pin 2: 50T-JUMP (*1) MODE
(TRER)
1V/div 1msec/div



⑦ IC202-Pin 3: PLAY MODE
(SPDR)
1V/div 50msec/div

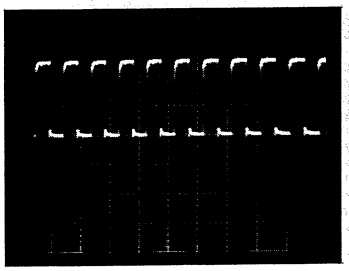


⑩ IC554-Pin 5, 6: PLAY MODE (1kHz)
2V/div 200 μ sec/div



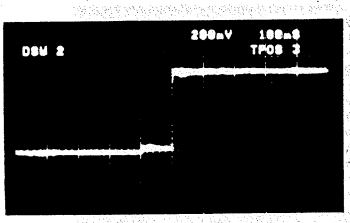
*3 POWER ON : Plug AC cord into AC wall socket.
*4 POWER OFF: Unplug AC cord from AC wall socket.

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



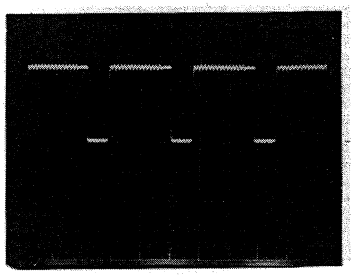
– GND

(22) IC60-Pin 5: POWER ON (*3)
(RST)
2V/div 100msec/div



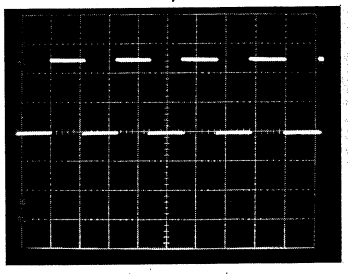
– GND

(26) IC513-Pin 13: PLAY MODE (1kHz)
(DIG.FIL.WCKO)
2V/div 1 μ sec/div



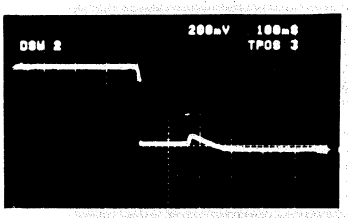
– GND

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



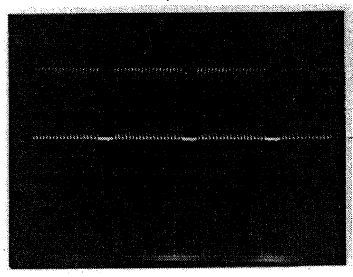
– GND

(22) IC60-Pin 5: POWER OFF (*4)
(RST)
2V/div 100msec/div



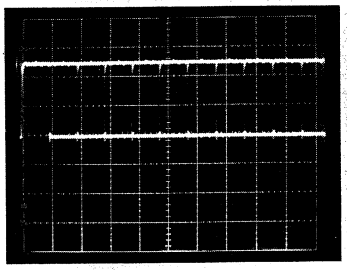
– GND

(27) IC513-Pin 15: PLAY MODE (1kHz)
(DIG.FIL.BCKO)
2V/div 1 μ sec/div



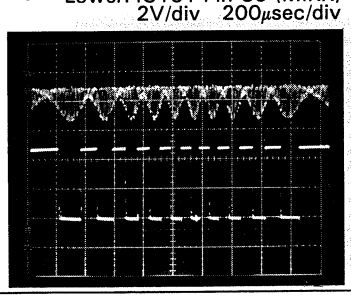
– GND

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



– GND

(23) : TRACK SEARCH MODE
Upper: TP1-Pin 1 (RF) 1V/div
Lower: IC151-Pin 35 (MIRR)
2V/div 200μsec/div

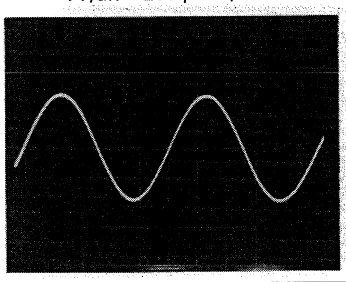


– GND

– GND

(28)

(20) IC554-Pin 7: PLAY MODE (1kHz)
(D/A OUT)
1V/div 200 μ sec/div



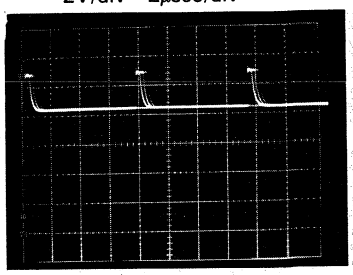
– GND

(24) : PLAY MODE
Upper: TP1-Pin 1 (RF) 1V/div
Lower: IC151-Pin 36 (DFCT)
5V/div 200μsec/div

– GND

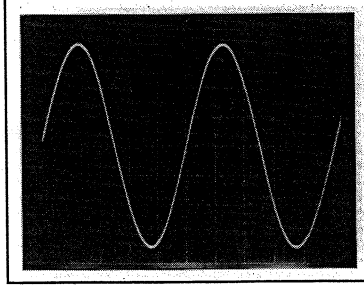
– GND

(33) IC301-Pin 4: PLAY MODE
(MDP)
2V/div 2μsec/div



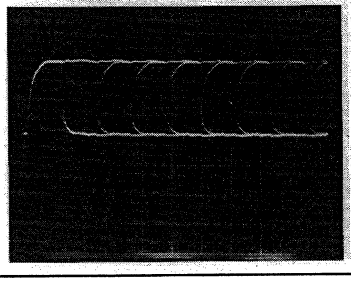
– GND

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



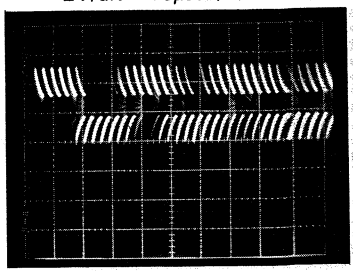
– GND

(25) IC513-Pin 11, 12: PLAY MODE (1kHz)
(DIG.FIL.RDATA, LDATA)
2V/div 100nsec/div



– GND

(53) IC301-Pin 20: PLAY MODE
(PCO)
2V/div 10μsec/div

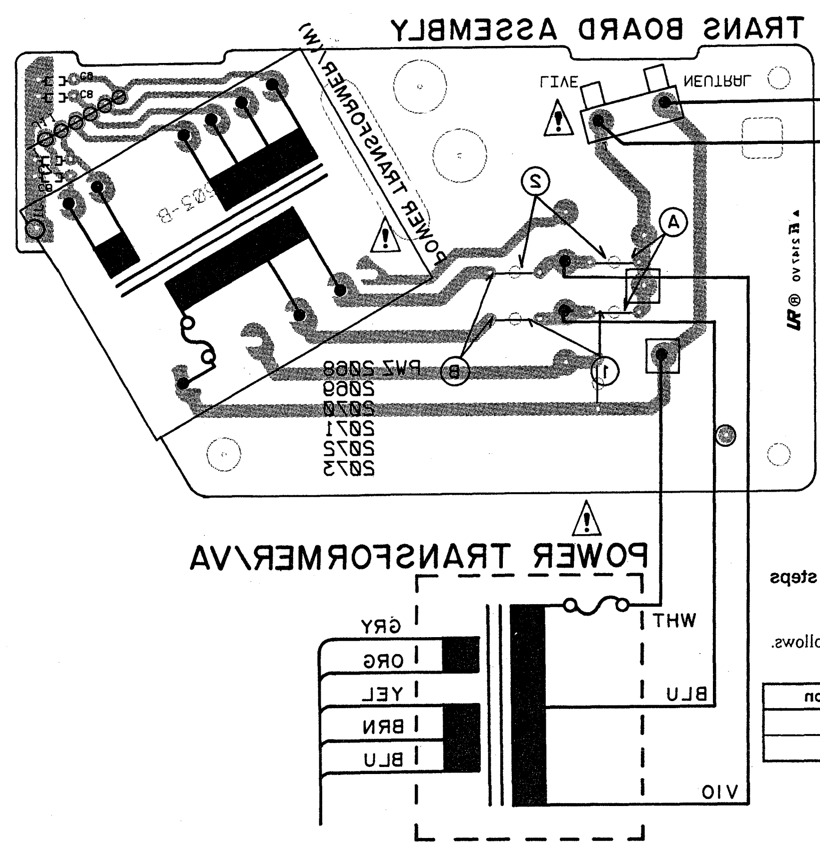


– GND

4. P.C. BOARDS CONNECTION DIAGRAM

- View from soldering side

POWER Supply Section for HEM Type Only.



Line voltage can be changed with following steps

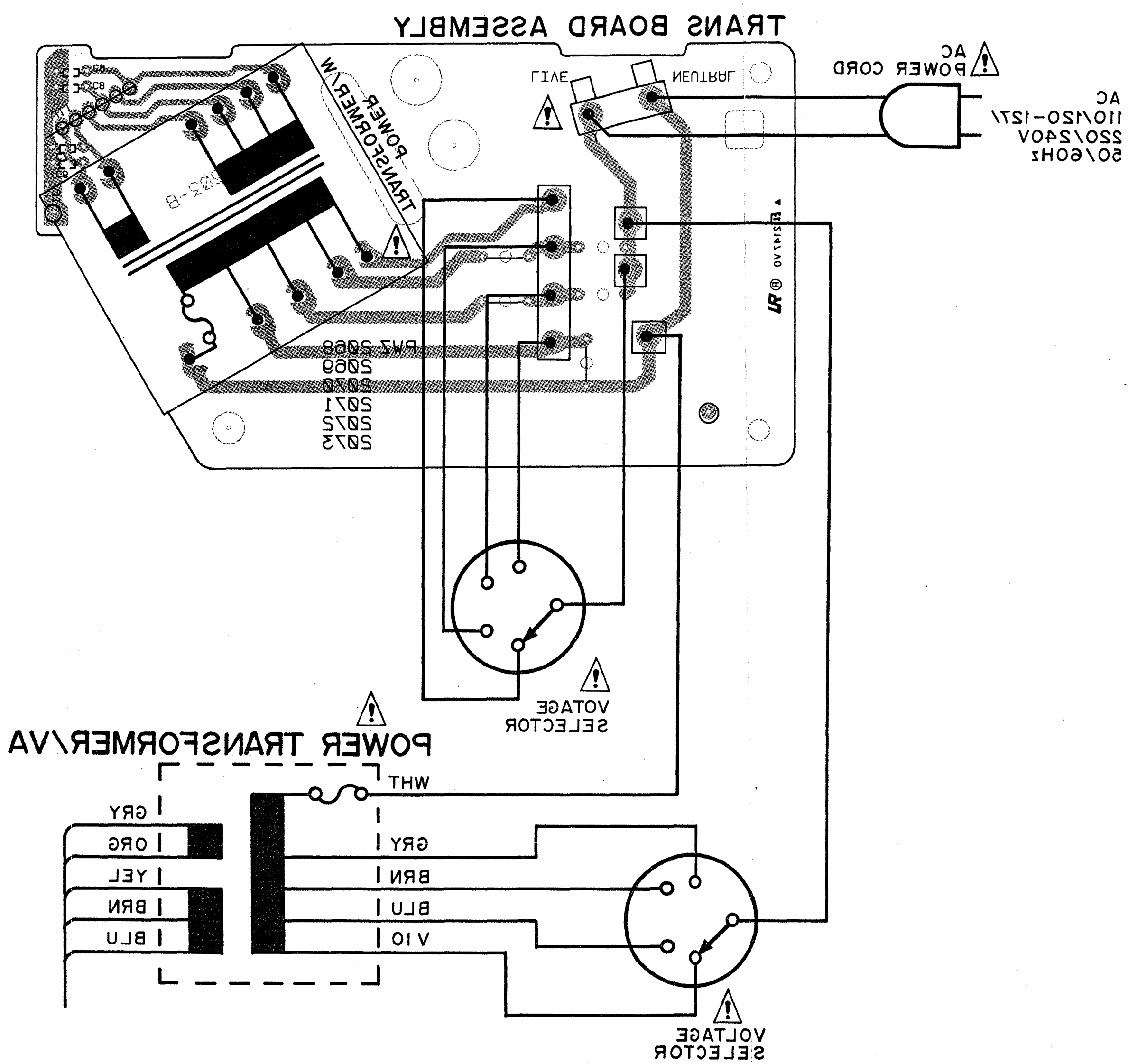
1. Disconnect the AC power cord.
2. Remove the bonnet.
3. Change the position of the jumper Ⓐ and Ⓑ as follows.

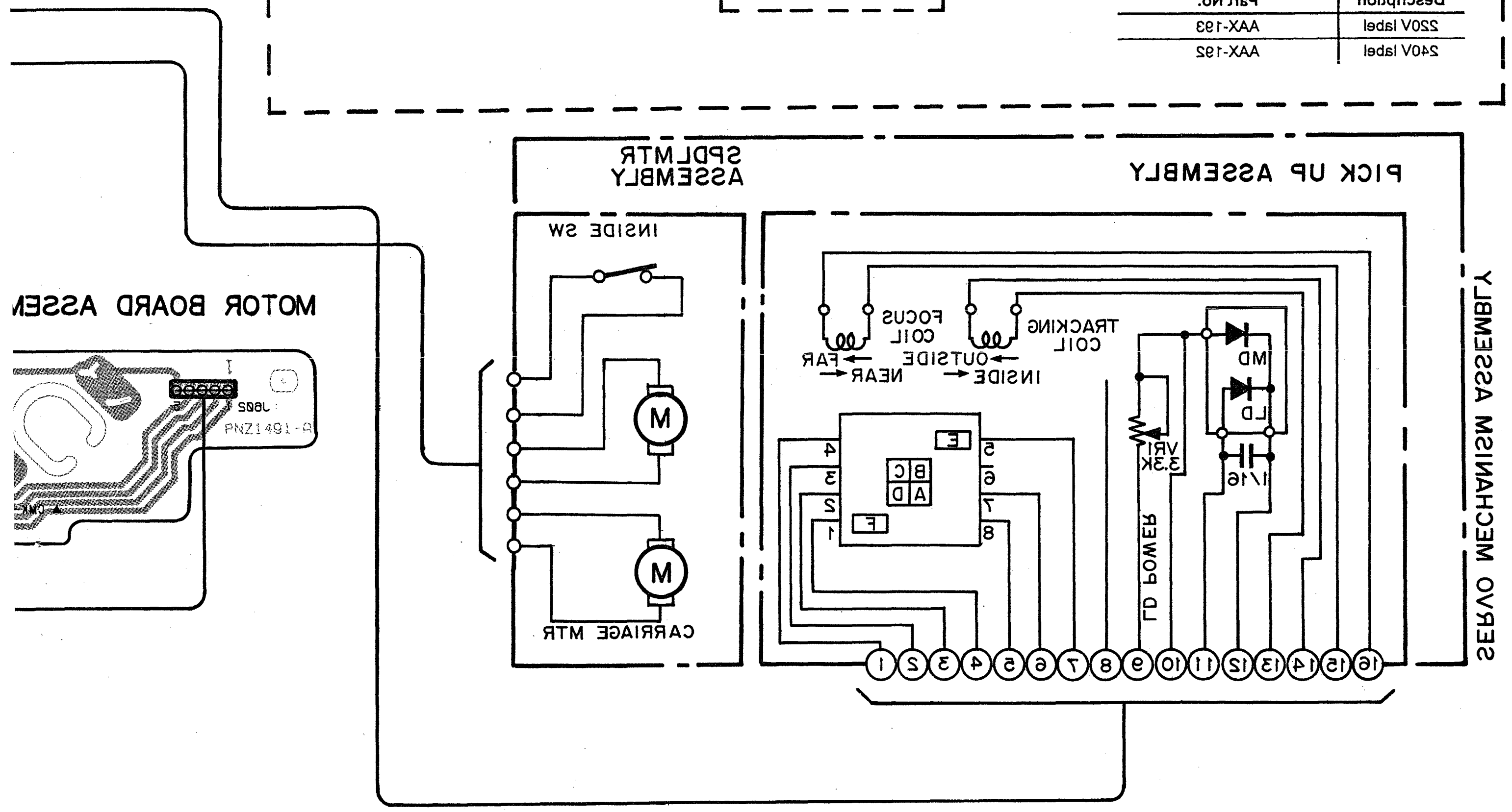
Voltage	Jumper Ⓐ and Ⓑ position
220V-230V	①
230V-240V	②

4. Stick the line voltage label on the rear panel.

Description	Part No.
220V label	AAX-193
240V label	AAX-192

POWER Supply Section for SD Type Only.



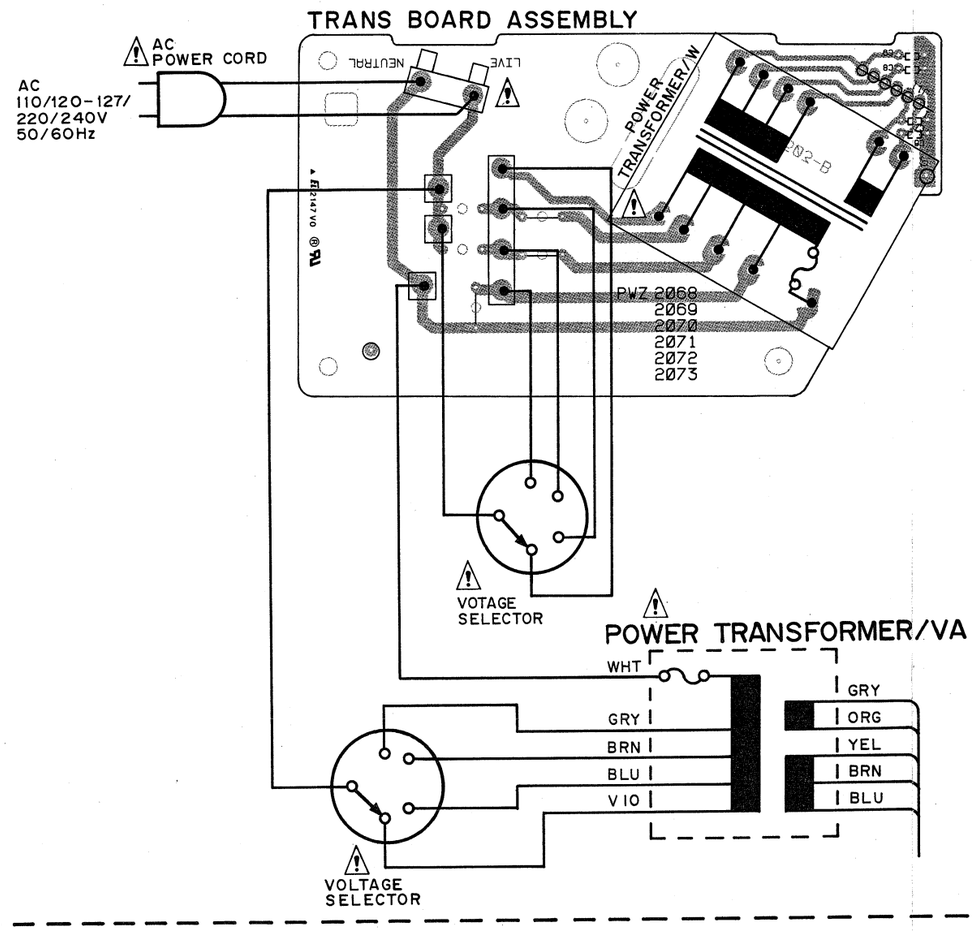


IC301
(CXD2500Q)

Pin No.	Volts	Pin No.	Volts	Pin No.	Volts	Pin No.	Volts	Pin No.	Volts	Pin No.	Volts	Pin No.	Volts	Pin No.	Volts
1	5.0	11	2.1	21	0.0	31	1.3~2.2	41	2.5	51	1.2	61	0.0	71	5.0
2	2.1	12	0.0	22	2.5	32	2.5	42	5.0	52	0.0	62	2.5	72	5.0
3	5.0	13	1.0	23	5.0	33	5.0	43	2.5	53	2.5	63	0.0	73	5.0
4	2.6	14	0.9~1.3	24	2.5	34	2.5	44	0.0	54	2.5	64	0.0	74	5.0
5	2.2	15	0.0	25	0.2	35	2.5	45	5.0	55	0.0	65	0.0	75	5.0
6	5.0	16	2.0	26	0.0	36	2.5	46	4.4	56	2.9	66	3.3~4.6	76	0.0
7	0.0	17	0.0	27	2.5	37	2.5	47	0.0	57	2.5	67	5.0	77	5.0
8	5.0	18	2.5	28	0.0	38	2.5	48	0.0	58	2.5	68	0.0	78	5.0
9	0.0	19	2.4	29	0.0	39	0.0	49	0~0.3	59	0.0	69	2.1~3.0	79	5.0
10	0.0	20	2.4	30	0.0	40	5.0	50	1.2	60	0.0	70	5.0	80	0.0

4. P.C. BOARDS CONNECTION DIAGRAM

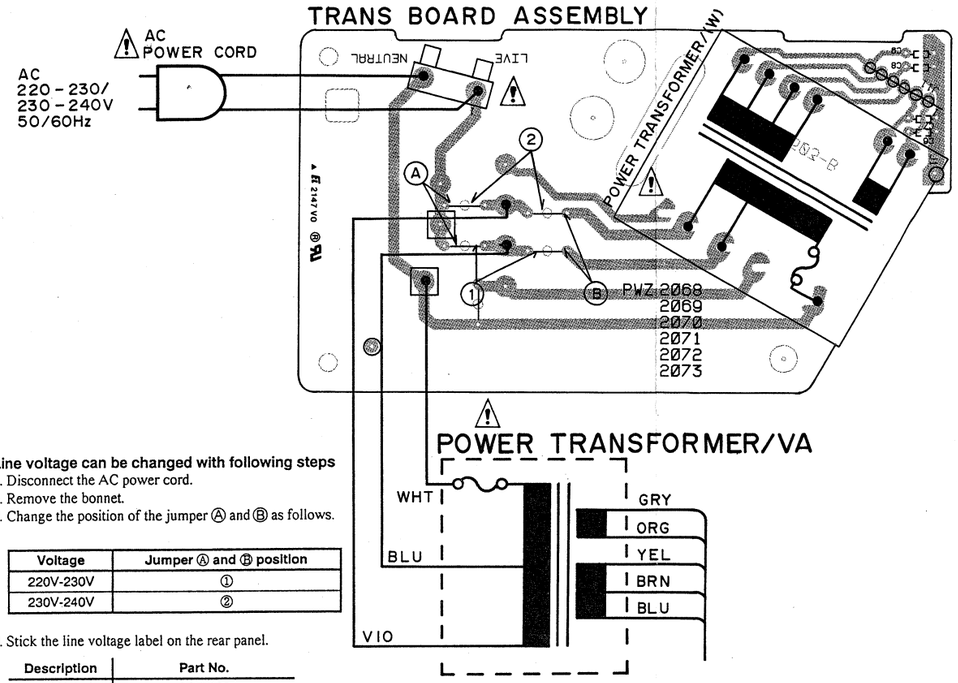
POWER Supply Section for SD Type Only.



IC301
(CXD2500Q)

Pin No.	Volts	Pin No.	Volts	Pin No.	Volts	Pin No.	Volts	Pin No.	Volts	Pin No.	Volts	Pin No.	Volts	Pin No.	Volts
1	5.0	11	2.1	21	0.0	31	1.3~2.2	41	2.5	51	1.2	61	0.0	71	5.0
2	2.1	12	0.0	22	2.5	32	2.5	42	5.0	52	0.0	62	2.5	72	5.0
3	5.0	13	1.0	23	5.0	33	5.0	43	2.5	53	2.5	63	0.0	73	5.0
4	2.6	14	0.9~1.3	24	2.5	34	2.5	44	0.0	54	2.5	64	0.0	74	5.0
5	2.2	15	0.0	25	0.2	35	2.5	45	5.0	55	0.0	65	0.0	75	5.0
6	5.0	16	2.0	26	0.0	36	2.5	46	4.4	56	2.9	66	3.3~4.6	76	0.0
7	0.0	17	0.0	27	2.5	37	2.5	47	0.0	57	2.5	67	5.0	77	5.0
8	5.0	18	2.5	28	0.0	38	2.5	48	0.0	58	2.5	68	0.0	78	5.0
9	0.0	19	2.4	29	0.0	39	0.0	49	0~0.3	59	0.0	69	2.1~3.0	79	5.0
10	0.0	20	2.4	30	0.0	40	5.0	50	1.2	60	0.0	70	5.0	80	0.0

POWER Supply Section for HEM Type Only.



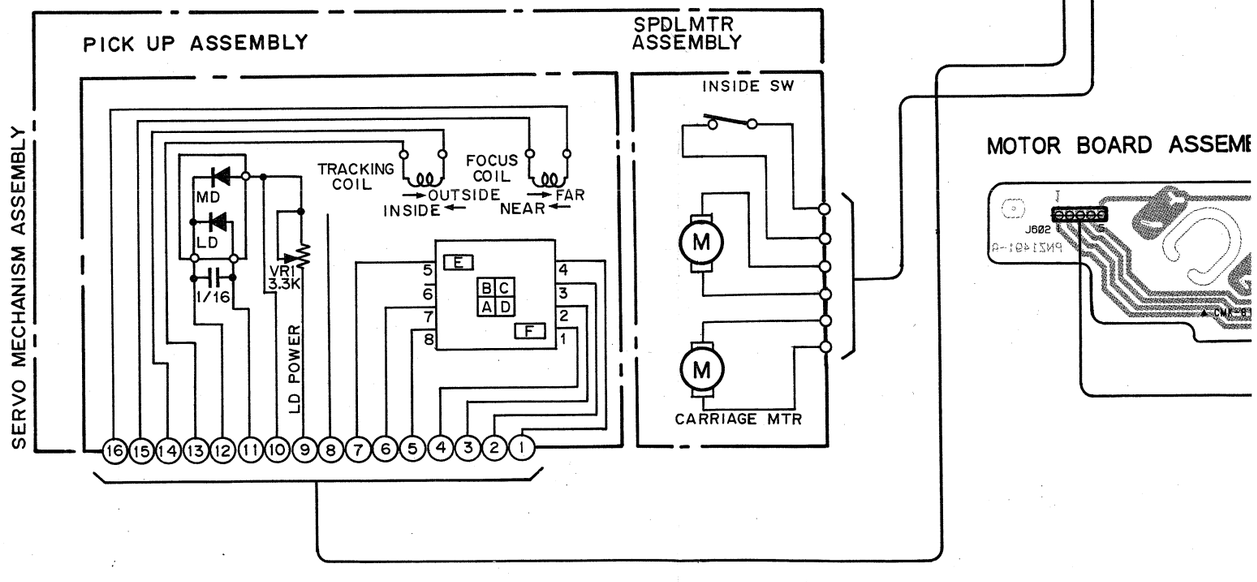
Line voltage can be changed with following steps

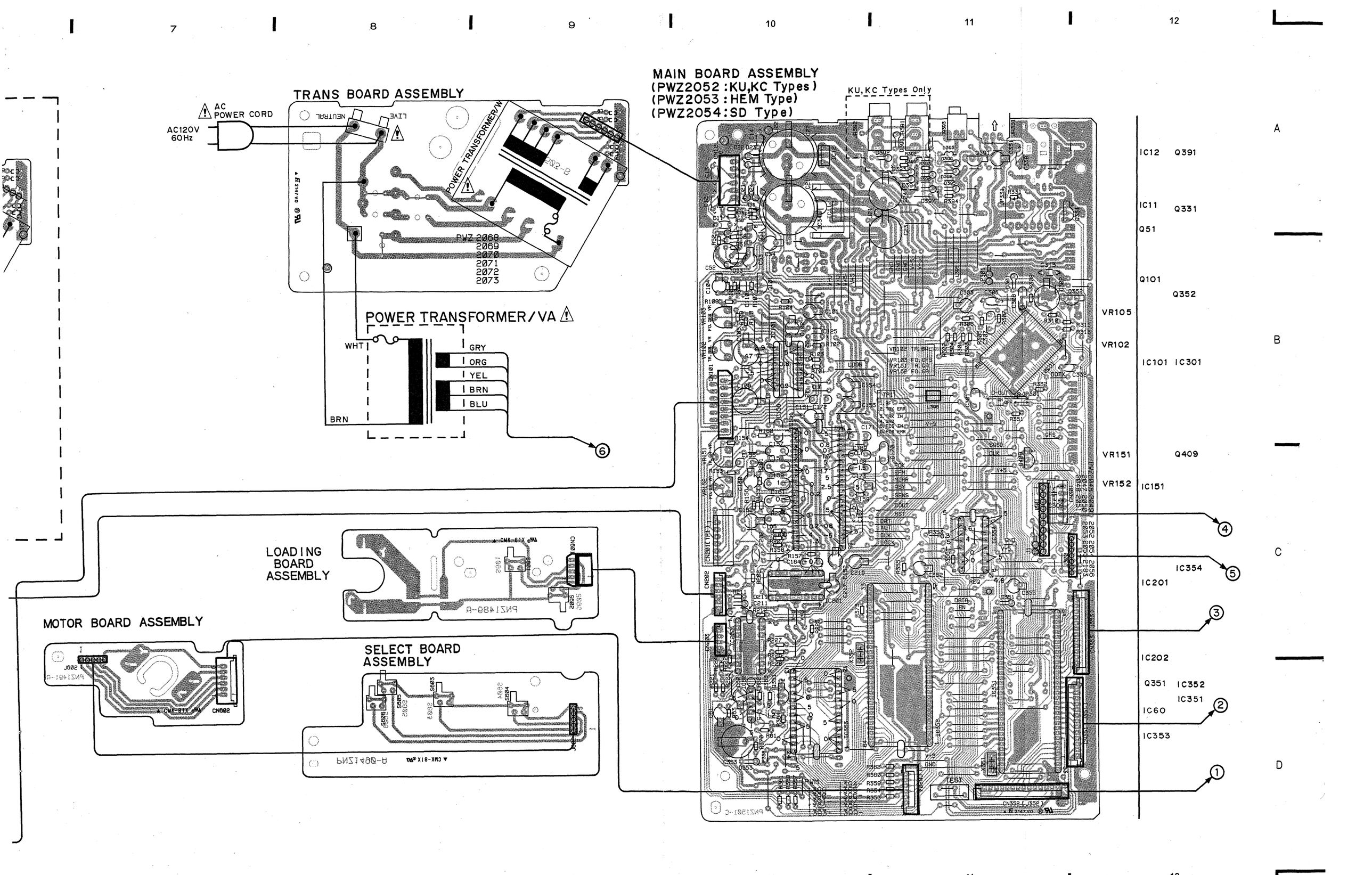
1. Disconnect the AC power cord.
2. Remove the bonnet.
3. Change the position of the jumper Ⓐ and Ⓑ as follows.

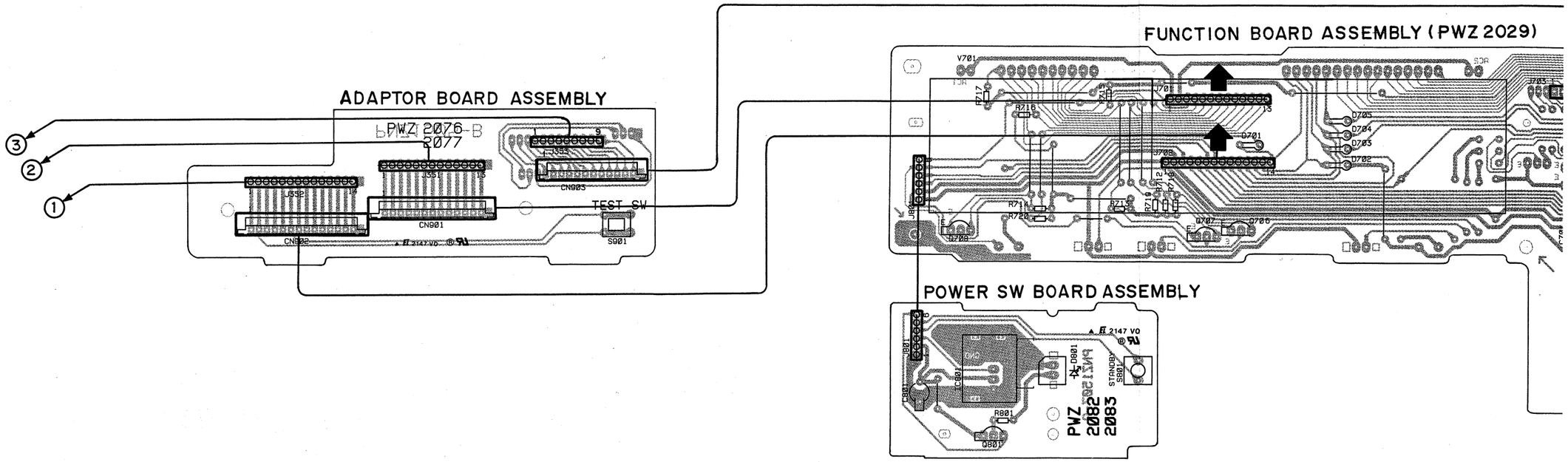
Voltage	Jumper Ⓐ and Ⓑ position
220V-230V	①
230V-240V	②

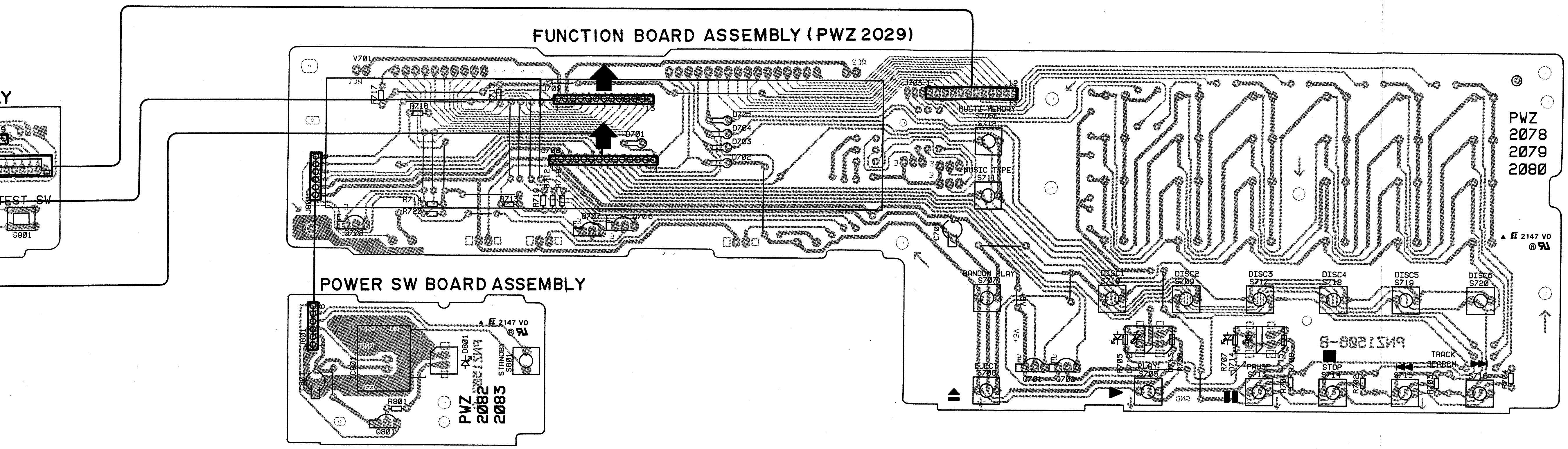
4. Stick the line voltage label on the rear panel.

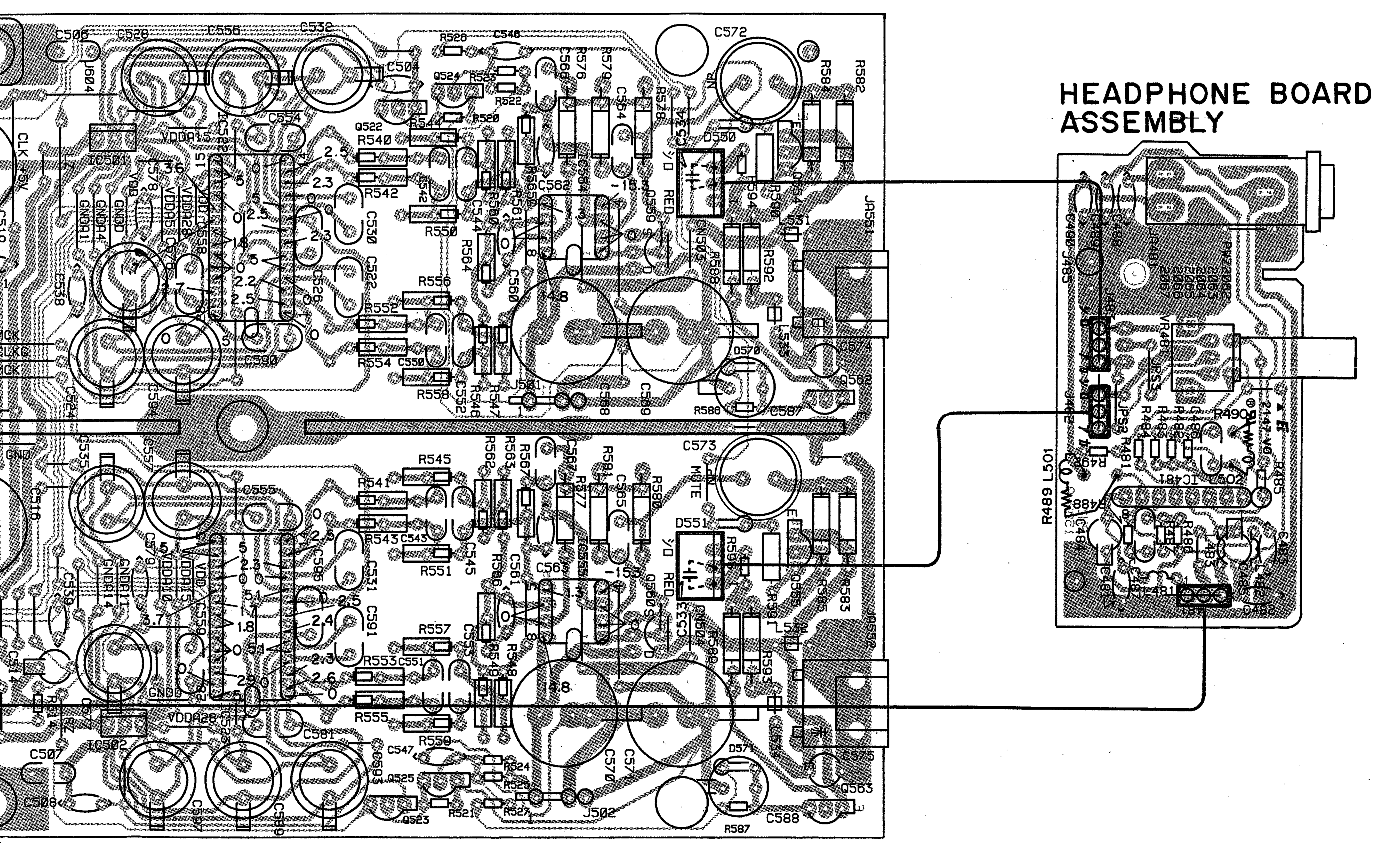
Description	Part No.
220V label	AAX-193
240V label	AAX-192




TRANS BOARD ASSEMBLY
AC POWER CORD
AC120V 60Hz
NEUTRAL
LIVE
POWER TRANSFORMER/W
PWZ 2068
2069
2070
2071
2072
2073
POWER TRANSFORMER/VA
WHT
BRN
GRY
ORG
YEL
BRN
BLU
MAIN BOARD ASSEMBLY
(PWZ2052 :KU,KC Types)
(PWZ2053 :HEM Type)
(PWZ2054:SD Type)
KU,KC Types Only
IC12 Q391
IC11 Q331
Q51
Q101
Q352
VR105
VR102
IC101 IC301
VR151
Q409
VR152
IC151
IC354
IC201
IC202
Q351 IC352
IC351
IC60
IC353
LOADING BOARD ASSEMBLY
MOTOR BOARD ASSEMBLY
SELECT BOARD ASSEMBLY

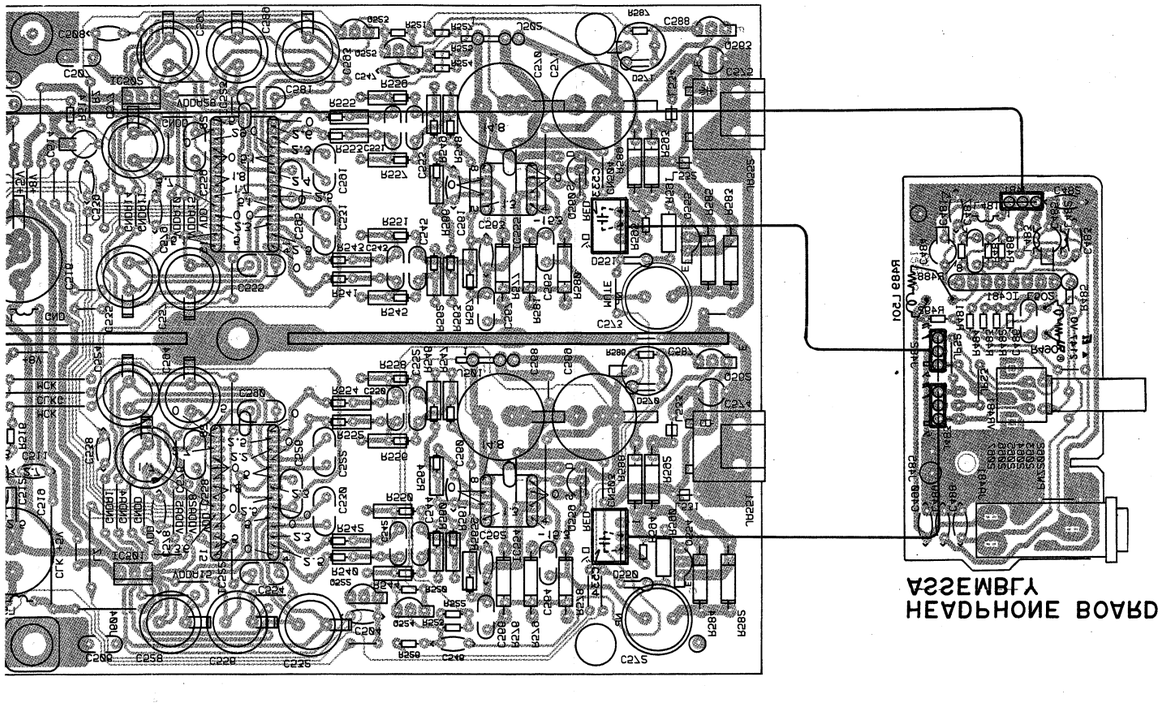

ADAPTOR BOARD ASSEMBLY
PWZ2076-B
2077
CN903
CN901
CN902
TEST SW
S901
FUNCTION BOARD ASSEMBLY (PWZ2029)
POWER SW BOARD ASSEMBLY
PWZ 2082 2083
AUDIO BOARD ASSEMBLY
(PWM1413: KU, KC, Sand SD Types)
(PWM1414: HEM Type)
PWM1413, 1414, 1415
HEM Type Only
KU, KC and SD Types Only
HEADPHONE BOARD ASSEMBLY



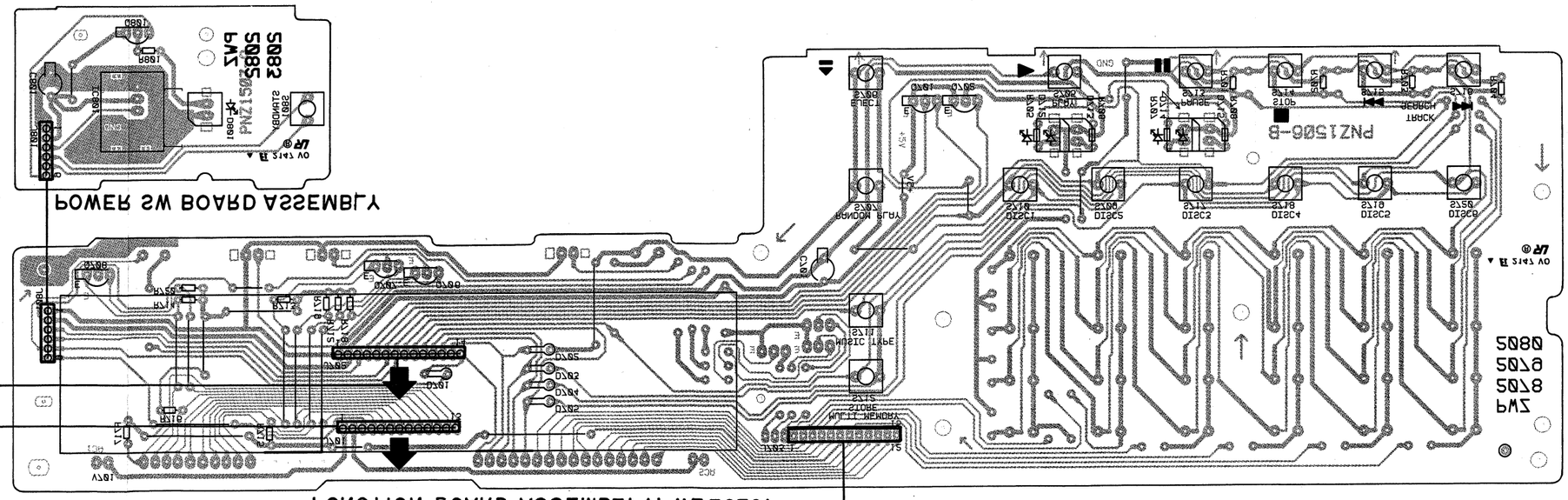


P.C.B. pattern diagram indication	Corresponding part symbol	Part name	P.C.B. pattern diagram indication	Corresponding part symbol	Part name
		Transistor			Ceramic capacitor
		FET			Mylar capacitor
			SA		Styrol capacitor
		Diode	NP		Electrolytic capacitor (Non polarized)
			NL		Electrolytic capacitor (Noiseless)
		Zenner diode			Electrolytic capacitor (Polarized)
					Electrolytic capacitor (Polarized)
		LED			Power capacitor
		Varactor			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 O shows cathode side.
5. The transistor terminal marked with ▭ shows emitter.



ASSEMBLY
HEADPHONE BOARD

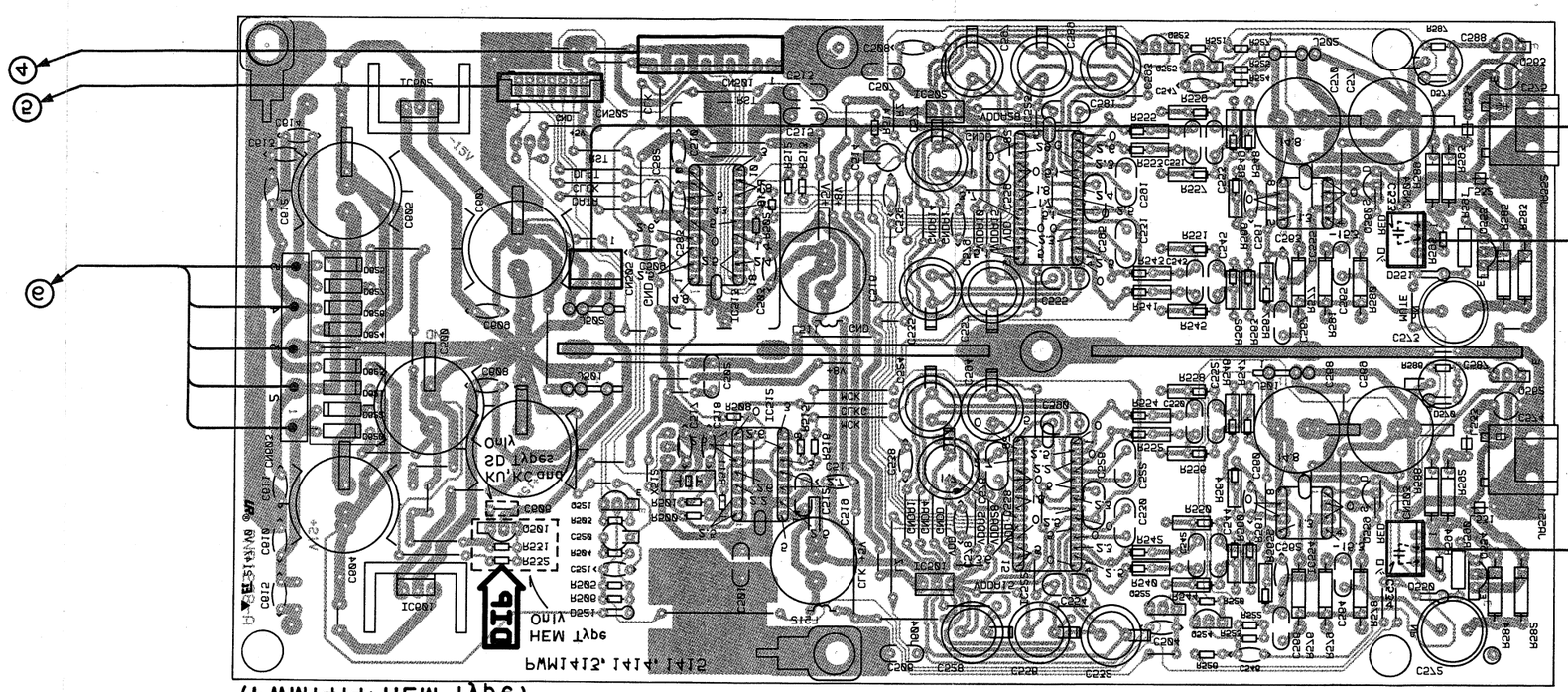


POWER SW BOARD ASSEMBLY

FUNCTION BOARD ASSEMBLY (PWZ5059)

• View from soldering side

PD-M91


(PWM1414: HEM Type)
(PWM1413: KU,KC,Saudi SD Types)
AUDIO BOARD ASSEMBLY
HEADPHONE BOARD ASSEMBLY
POWER SW BOARD ASSEMBLY
FUNCTION BOARD ASSEMBLY (P
ADAPTOR BOARD ASSEMBLY
TEST SW
DTb
HEM Type
Only
KU,KC,Saudi
SD Types
Only

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%)

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

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

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

Mark	No.	Description	Part No.
		⊙ AUDIO BOARD ASSEMBLY(PWM1413)	
		SEMICONDUCTORS	
⚠	IC501, 502	REGULATOR IC	NJM7805FA
	IC512	LOGIC IC	TC74HCU04AP
	IC513	DIGITAL FILTER, IC	SM5840AP
	IC522, 523	D/A CONVERTER, IC	PD2028A
	IC554, 555	OP-AMP IC	NJM5532DD
⚠	IC601	REGULATOR IC	NJM7815FA
⚠	IC602	REGULATOR IC	NJM7915FA
	Q521	TRANSISTOR	DTC124ES
	Q522, 523	TRANSISTOR	DTA124ES
	Q524, 525	TRANSISTOR	DTC124ES
	Q554, 555	TRANSISTOR	2SC3068
	Q562, 563	TRANSISTOR	2SC3068
	D521	DIODE	1SS254
	D550, 551	DIODE	1SS254
	D570, 571	DIODE	1SS254
⚠	D620-627	DIODE	10DF2
		COILS/TRANSFORMERS	
	L511, 512	AXIAL INDUCTOR	LAU010K
	L531-534	FERRITE BEAD	VTH1024
		CAPACITORS	
	C500	ELECTR. CAPACITOR	CEAS222M16
	C501, 502	AUDIO FILM CAPACITOR	CFTXA103J50
	C503, 504	CERAMIC CAPACITOR	PCL1029
	C506, 507	AUDIO FILM CAPACITOR	CFTXA103J50
	C508	CERAMIC CAPACITOR	PCL1029
	C509	CERAMIC CAPACITOR	CCCCH560J50
	C510	CERAMIC CAPACITOR	CGCYF473Z25
	C511	CERAMIC CAPACITOR	PCL1029
	C512	AUDIO FILM CAPACITOR	CFTXA103J50
	C513	AUDIO FILM CAPACITOR	CFTXA473J50
	C514	ELECTR. CAPACITOR	CEAS101M10
	C515	AUDIO FILM CAPACITOR	CFTXA473J50
	C516	ELECTR. CAPACITOR	CEAS102M16
	C517	CERAMIC CAPACITOR	CCCCH120J50
	C518	CERAMIC CAPACITOR	CCCCH270J50
	C519	ELECTR. CAPACITOR	CEAS102M16
	C520	ELECTR. CAPACITOR	CEAS470M50
	C521	MYLOR FILM CAPACITOR	CQMA473J50
	C522	MYLOR FILM CAPACITOR	CQMA104J50
	C524	ELECTR. CAPACITOR	CEAS102M16
	C526	MYLOR FILM CAPACITOR	CQMA104J50
	C528	ELECTR. CAPACITOR	CEAS102M16
	C530, 531	MYLOR FILM CAPACITOR	CQMA104J50
	C532	ELECTR. CAPACITOR	CEAS102M16
	C533, 534	CERAMIC CAPACITOR	CKDYF102Z50
	C535	ELECTR. CAPACITOR	CEAS102M16
	C538, 539	CERAMIC CAPACITOR	CCCCH120J50
	C542, 543	CERAMIC CAPACITOR	CCCCH680J50
	C544, 545	CERAMIC CAPACITOR	CCCCH330J50
	C546	CERAMIC CAPACITOR	CKCYF473Z50
	C547	CERAMIC CAPACITOR	CGCYF473Z25
	C550, 551	CERAMIC CAPACITOR	CCCCH680J50
	C552, 553	CERAMIC CAPACITOR	CCCCH330J50
	C554, 555	MYLOR FILM CAPACITOR	CQMA104J50
	C556, 557	ELECTR. CAPACITOR	CEAS102M16
	C558, 559	MYLOR FILM CAPACITOR	CQMA104J50
	C560-563	CERAMIC CAPACITOR	CCCCH470J50
	C564, 565	MYLOR FILM CAPACITOR	CQMA681J50
	C566, 567	MYLOR FILM CAPACITOR	CQMA562J50
	C568-571	ELECTR. CAPACITOR	CEAS471M50
	C572, 573	ELECTR. CAPACITOR	PCH1094
	C574, 575	PL. STYRENE CAPACITOR	CQSA102J50
	C576, 577	ELECTR. CAPACITOR	CEAS102M16
	C578, 579	CERAMIC CAPACITOR	CKCYF103Z50
	C581	MYLOR FILM CAPACITOR	CQMA104J50
	C582, 583	CERAMIC CAPACITOR	CKCYB102K50
	C587, 588	ELECTR. CAPACITOR	CEAS220M50
	C589	ELECTR. CAPACITOR	CEAS102M16
	C590, 591	MYLOR FILM CAPACITOR	CQMA104J50
	C593, 594	ELECTR. CAPACITOR	CEAS102M16
	C595	MYLOR FILM CAPACITOR	CQMA104J50
	C597	ELECTR. CAPACITOR	CEAS102M16
	C604, 605	ELECTR. CAPACITOR	CEAS222M35

Mark	No.	Description	Part No.
	C606, 607	ELECTR. CAPACITOR	CEAS102M35
	C608-615	CERAMIC CAPACITOR	PCL1029
RESISTORS			
	R500-506	CARBONFILM RESISTOR	RD1/6PM□□□J
	R508-514	CARBONFILM RESISTOR	RD1/6PM□□□J
	R518	CARBONFILM RESISTOR	RD1/6PM□□□J
	R520-527	CARBONFILM RESISTOR	RD1/6PM□□□J
	R540-567	CARBONFILM RESISTOR	RD1/4PM□□□J
	R576-581	CARBONFILM RESISTOR	RD1/4PM□□□J
	R582-585	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R586, 587	CARBONFILM RESISTOR	RD1/6PM□□□J
	R588, 589	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R590, 591	CARBONFILM RESISTOR	RD1/4PM□□□J
	R592, 593	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R594, 595	CARBONFILM RESISTOR	RD1/6PM□□□J
OTHERS			
	CN501	CONNECTOR(10P)	KPC10
	JA551	1P PIN JACK(W)	RKB1010
	JA552	1P PIN JACK (R)	RKB1011
	X512	XTAL RES (OSC)	PSS1001

LOADING BOARD ASSEMBLY

SWITCHES

	S601, 602	PUSH SWITCH	DSG1016

SELECT BOARD ASSEMBLY

SWITCHES

	S603-606	PUSH SWITCH	DSG1016

MOTOR BOARD ASSEMBLY

There is no supply part in this assembly.

⊙ MAIN BOARD ASSEMBLY(PWZ2052)

SEMICONDUCTORS

⚠	IC11	IC	LM2940CT-5.0
⚠	IC12	REGULATOR IC	NJM79M05FA
	IC60	SYSTEM RESET IC	M51957AL
	IC101	PRE AMP IC	CXA1471S
	IC151	SERVO IC	CXA1372S
	IC201, 202	POWER OP-AMP, IC	LA6520
	IC301	EFM DEMODULATION IC	CXD2500Q
	IC351	MICROCOMPUTER, IC	PD4324B
	IC352	MICROCOMPUTER, IC	PD4325A
	IC353	IC (RAM)	LH5116-15
	IC354	LOGIC IC	BU4053B
⚠	Q51	TRANSISTOR	2SA933S
	Q101	TRANSISTOR	2SA854S
	Q331	TRANSISTOR	DTC124ES
	Q351	TRANSISTOR	2SC1740S
	Q352	TRANSISTOR	DTA124ES
	Q391	TRANSISTOR	DTC124ES
	Q409	TRANSISTOR	DTA124ES
⚠	D21-24	DIODE	11ES2
⚠	D52	DIODE	11ES2
⚠	D53	ZENER DIODE	MTZ30B
⚠	D54	ZENER DIODE	MTZ6.2B
	D211	ZENNER DIODE	MTZJ6.2B
	D301	DIODE	1SS254
	D351	DIODE	1SS254
	D353	DIODE	1SS254
	D391-399	DIODE	1SS254

COILS/TRANSFORMERS

	L393	AXIAL COIL	LAUR22K

CAPACITORS

	C11-14	CERAMIC CAPACITOR	CKCYF103Z50
	C21, 22	ELECTR. CAPACITOR	CEAS222M16
	C23, 24	ELECTR. CAPACITOR	CEAS102M16
	C52	ELECTR. CAPACITOR	CEAS101M50
	C53, 54	ELECTR. CAPACITOR	CEAS470M50
	C61	ELECTR. CAPACITOR	CEASR33M50
	C62	ELECTR. CAPACITOR	CEAS2R2M50
	C101, 102	ELECTR. CAPACITOR	CEAS101M10
	C104	ELECTR. CAPACITOR	CEAS101M10
	C110	CERAMIC CAPACITOR	CKCYF103Z50
	C125	CERAMIC CAPACITOR	CCCCH200J50
	C151-154	ELECTR. CAPACITOR	CEAS101M10
	C155	MYLOR FILM CAPACITOR	CQMA182J50
	C156	MYLOR FILM CAPACITOR	CQMA333K50
	C157	MYLOR FILM CAPACITOR	CQMA103K50
	C158, 159	MYLOR FILM CAPACITOR	CQMA104K50
	C160	ELECTR. CAPACITOR	CEAS4R7M50
	C161	MYLOR FILM CAPACITOR	CQMA104K50
	C162	ELECTR. CAPACITOR	CEAS010M50
	C163	MYLOR FILM CAPACITOR	CQMA104K50
	C164	MYLOR FILM CAPACITOR	CQMA103K50
	C167	CERAMIC CAPACITOR	CKCYF103Z50
	C168	MYLOR FILM CAPACITOR	CQMA333K50
	C169	MYLOR FILM CAPACITOR	CQMA103K50
	C170	MYLOR FILM CAPACITOR	CQMA332J50
	C171, 172	MYLOR FILM CAPACITOR	CQMA472J50
	C173	ELECTR. CAPACITOR	CEASR47M50
	C202	CERAMIC CAPACITOR	CKCYF103Z50
	C211	MYLOR FILM CAPACITOR	CQMA103K50
	C216, 217	ELECTR. CAPACITOR	CEAS330M16
	C301	MYLOR FILM CAPACITOR	CQMA104K50
	C302	ELECTR. CAPACITOR	CEAS470M50
	C303	ELECTR. CAPACITOR	CEAS101M10
	C306	CERAMIC CAPACITOR	CKCYB152K50
	C307	MYLOR FILM CAPACITOR	CQMA473J50
	C308	MYLOR FILM CAPACITOR	CQMA103K50
	C309	CERAMIC CAPACITOR	CKCYF103Z50
	C313	MYLOR FILM CAPACITOR	CQMA473K50
	C331	ELECTR. CAPACITOR	CEAS330M16
	C332	CERAMIC CAPACITOR	CCCSL100D50
	C338	CERAMIC CAPACITOR	CKCYF103Z50
	C352	ELECTR. CAPACITOR	CEAS101M10
	C353		PCH1100
	C355	ELECTR. CAPACITOR	CEAS101M10

Mark	No.	Description	Part No.

RESISTORS

	R51-54	CARBONFILM RESISTOR	RD1/6PM□□□J
	R58, 59	CARBONFILM RESISTOR	RD1/6PM□□□J
	R61-63	CARBONFILM RESISTOR	RD1/6PM□□□J
	R101-110	CARBONFILM RESISTOR	RD1/6PM□□□J
	R153-160	CARBONFILM RESISTOR	RD1/6PM□□□J
	R201-203	CARBONFILM RESISTOR	RD1/6PM□□□J
	R205	CARBONFILM RESISTOR	RD1/6PM□□□J
	R207	CARBONFILM RESISTOR	RD1/6PM□□□J
	R211, 212	CARBONFILM RESISTOR	RD1/6PM□□□J
	R221-228	CARBONFILM RESISTOR	RD1/6PM□□□J
	R301-308	CARBONFILM RESISTOR	RD1/6PM□□□J
	R310-312	CARBONFILM RESISTOR	RD1/6PM□□□J
	R331, 332	CARBONFILM RESISTOR	RD1/6PM□□□J
	R353-364	CARBONFILM RESISTOR	RD1/6PM□□□J
	R370	CARBONFILM RESISTOR	RD1/6PM□□□J
	R373	CARBONFILM RESISTOR	RD1/6PM□□□J
	R391-394	CARBONFILM RESISTOR	RD1/6PM□□□J
	VR102	VR	VRTB6VS223
	VR103	VR	VRTB6VS102
	VR151, 152	VR	VRTB6VS223

OTHERS

CN12	JUMPER CONNECTOR	KPC6
CN101	CONNECTOR	52045-1610
JA331	OPTICAL OUTPUT JACK	TOTX178
JA391, 392	JACK	RKN1004
JA393	JACK	PKN1005
X351	CERAMIC RESONATOR	VSS1014
X352	CERAMIC RESONATOR	FCR4.0MC

HEADPHONE BOARD ASSEMBLY

SEMICONDUCTORS

IC481	OP-AMP, IC	M5218AL

COILS/TRANSFORMERS

L481-483	AXIAL COIL	LAUR22K
L501, 502	AXIAL INDUCTOR	LAU010K
L503	AXIAL COIL	LAUR22K

CAPACITORS

C481-483	CERAMIC CAPACITOR	CKCYF103Z50
C484, 485	ELECTR. CAPACITOR	CEAS330M16
C486, 487	MYLOR FILM CAPACITOR	CQMA104J50
C488	CERAMIC CAPACITOR	CKCYF102Z50
C489	CERAMIC CAPACITOR	CKDYF473Z50
C490	CERAMIC CAPACITOR	CKCYF102Z50

RESISTORS

R481-490	CARBONFILM RESISTOR	RD1/6PM□□□J
VR481	VARIABLE RESISTOR	PCS1002

OTHERS

JA481	JACK	RKN1002

TRANS BOARD ASSEMBLY

OTHERS

⚠	TERMINAL	RKC-061

Mark	No.	Description	Part No.

ADAPTOR BOARD ASSEMBLY

SWITCHES

S901	SWITCH	PSG-064

⊙ FUNCTION BOARD ASSEMBLY (PWZ2079)

SEMICONDUCTORS

Q701, 702	TRANSISTOR	DTA124ES
Q706-708	TRANSISTOR	2SC1740S
D701-705	DIODE	1SS254
D712, 713	LED	SLH-34VC3H3
D714, 715	LED	SLH-34DC3H3

SWITCHES

S705-707	SWITCH	PSG1006
S709-720	SWITCH	PSG1006

RESISTORS

R701-708	CARBONFILM RESISTOR	RD1/6PM□□□J
R712-720	CARBONFILM RESISTOR	RD1/6PM□□□J

OTHERS

V701	FL INDICATOR TUBE	PEL1055

POWER SW BOARD

SEMICONDUCTORS

Q801	TRANSISTOR	DTA124ES
D801	LED	SLH-56VC3H

SWITCHES

S801	SWITCH	PSG1006

CAPACITORS

C801	ELECTR. CAPACITOR	CEAS330M16

RESISTORS

R801	CARBONFILM RESISTOR	RD1/6PM□□□J

OTHERS

	REMOTE SENSOR	HC-177

6. ADJUSTMENTS

1. Adjustment Methods

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

1-1 Adjustment items/verification items and order

Step	Item	Test point	Adjustment location
1	Focus offset adjustment	TP1, Pin 6 (FCS. ERR)	VR103 (FCS. OFS)
2	Grating adjustment	TP1, Pin 2 (TRK. ERR)	Grating adjustment slit
3	Tracking error balance adjustment	TP1, Pin 2 (TRK. ERR)	VR102 (TRK. BAL)
4	Pickup radial/ tangential direction tilt adjustment	TP1, Pin 1 (RF)	Radial tilt adjustment screw, Tangential tilt adjustment screw
5	RF level adjustment	TP1, Pin 1 (RF)	VR1 (RF level)
6	Focus servo loop gain adjustment	TP1, Pin 5 (FCS. IN) TP1, Pin 6 (FCS. ERR)	VR152 (FCS. GAN)
7	Tracking servo loop gain adjustment	TP1, Pin 3 (TRK. IN) TP1, Pin 2 (TRK. ERR)	VR151 (TRK. GAN)
8	Focus error signal verification	TP1, Pin 6 (FCS. ERR)	———

● **Abbreviation table**

FCS. ERR : Focus Error
FCS. OFS : Focus Offset
TRK. ERR : Tracking Error
TRK. BAL : Tracking Balance
FCS GAN : Focus Gain
TRK GAN : Tracking Gain
FCS. IN : Focus In
TRK. IN : Tracking In

1-2 Measuring instruments and tools

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

1-3 Test point and adjustment variable resistor positions

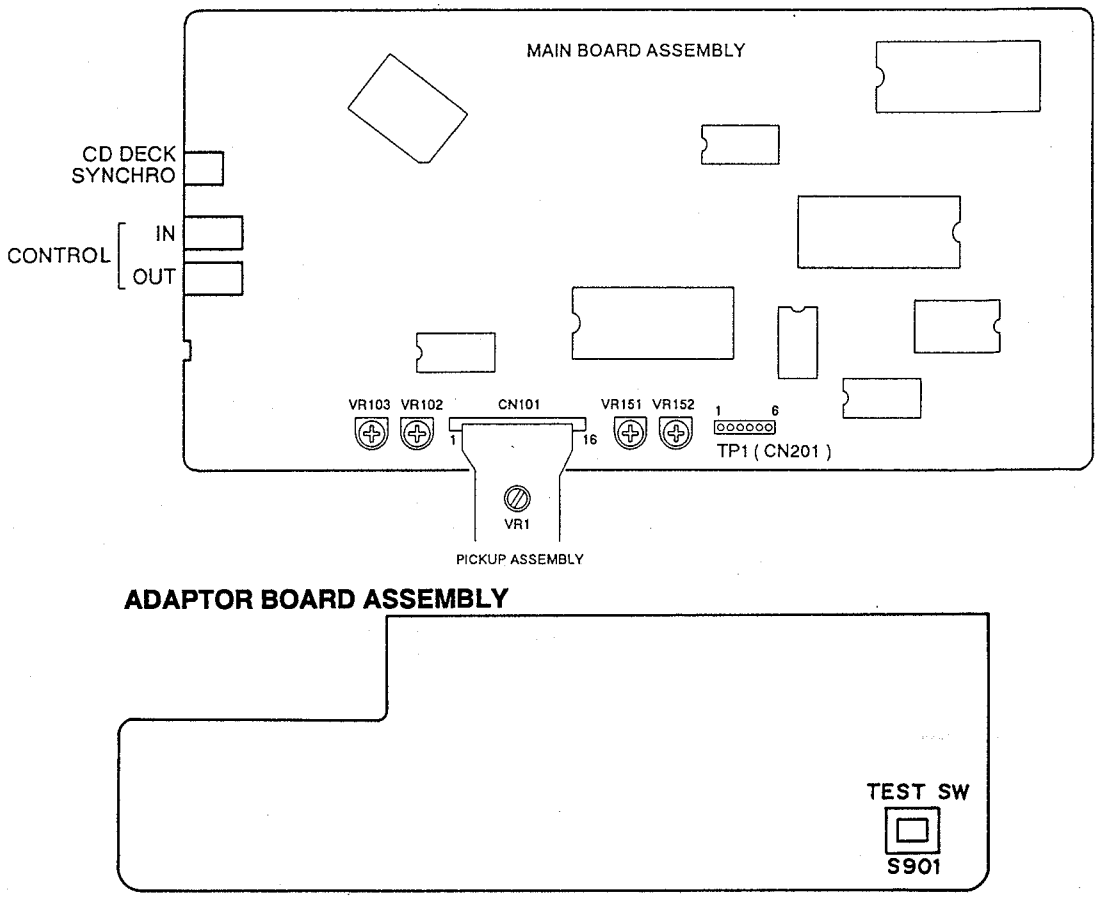


Figure 1 Adjustment Locations

1-4 Notes

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

1-5 Test mode

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

[Setting these models to test mode]

How to set this model into test mode.
1. Unplug the power cord from the AC socket.
2. Press the TEST mode switch (S901). (See Figure 1.)
3. Plug the power cord back into the AC socket.

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

[Release from test mode]

Here is the procedure for releasing the test mode:
1. Press the STOP key to stop all operations.
2. Unplug the power cord from the AC socket.

[Operations of the keys in test mode]

Code	Key name	Function in test mode	Explanation
	MULTI MEMORY STORE	Focus servo close	The laser diode is lit up and the focus actuator is lifted up, then lowered slowly and the focus servo is closed at the point where the objective lens is focused on the disc. With the player in this state, if you lightly rotate the stopped disc by hand, you can hear the sound the focus servo. If you can hear this sound, the focus servo is operating correctly. If you press this key with no disc mounted, the laser diode lights up, the focus actuator is pulled up, then the actuator is lowered and raised twice and returned to its original position.
►	PLAY	Spindle servo ON	Starts the spindle motor in the clockwise direction and when the disc rotation reaches the prescribed speed (about 500 rpm at the inner periphery), sets the spindle servo in a closed loop. Be careful. Pressing this key when there is no disc mounted makes the spindle motor run at the maximum speed. If the focus servo does not go correctly into a closed loop or the laser light shines on the mirror section at the outermost periphery of the disc, the same symptom is occurred.
▮▮	PAUSE	Tracking servo close/open	Pressing this key when the focus servo and spindle servo are operating correctly in closed loops puts the tracking servo into a closed loop, displays the track number being played back and the elapsed time on the front panel, and outputs the playback signal. If the elapsed time is not displayed or not counted correctly or the audio is not played back correctly, it may be that the laser is shining on the section with no sound recorded at the outer edge of the disc, that something is out of adjustment, or that there is some other problem. This key is a toggle key and open/close the tracking servo alternately. This key has no effect if no disc is mounted.
⏮	TRACK SEARCH REV	Carriage reverse (inwards)	Moves the pickup position toward the inner periphery of the disc. When this key is pressed with the tracking servo in a closed loop, the tracking servo automatically goes into an open loop. Since the pickup does not automatically stop at the mechanical end point in test mode, be careful with this operation.
⏭	TRACK SEARCH FWD	Carriage forward (outwards)	Moves the pickup position toward the outer periphery of the disc. When this key is pressed with the tracking servo in a closed loop, the tracking servo automatically goes into an open loop. Since the pickup does not automatically stop at the mechanical end point in test mode, be careful with this operation.
■	STOP	Stop	Initializes and the disc rotation stops. The pickup remains where they are when this key is pressed.
▲	EJECT	CD magazine eject	Stores Disc 1 in the CD magazine, then ejects the CD magazine. However, even though the CD magazine is ejected, the pickup does not return to the park position. Even if the CD magazine is mounted again, the pickup remains where it is.

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

[How to play back a disc in test mode]

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

MULTI MEMORY STORE	Lights up the laser diode and closes the focus servo.
⇓	
PLAY ▶	Starts the spindle motor and closes the spindle servo.
⇓	
PAUSE ▮▮	Closes the tracking servo.

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

1. Focus offset adjustment

● Objective ● Symptom when out of adjustment	Sets the DC offset for the focus error amp. The player does not focus in and the RF signal is dirty.		
● Measurement instrument connections	Connect the oscilloscope to TP1, Pin 6 (FCS ERR). [Settings] 5 mV/division 10 ms/division DC mode	● Player state ● Adjustment location ● Disc	Test mode, stopped (just the Power switch on) VR103 (FCS OFS) None needed

[Procedure]

Adjust VR103 (FCS OFS) so that the DC voltage at TP1, Pin 6 (FCS ERR) is −150 ± 50 mV.

2. Grating adjustment

● Objective	To align the tracking error generation laser beam spots to the optimum angle on the track		
● Symptom when out of adjustment	Play does not start, track search is impossible, tracks are skipped.		
● Measurement instrument connections	Connect the oscilloscope to TP1, Pin 2 (TRK ERR) via a low pass filter. (See Figure 2) [Settings] 50 mV/division 5 ms/division DC mode	● Player state ● Adjustment location ● Disc	Test mode, focus and spindle servos closed and tracking servo open Pickup grating adjustment slit YEDS–7

[Procedure]

1. Move the pickup to midway across the disc (R = 35 mm) with the TRACK SEARCH FWD ▶▶| or REV |◀◀ key.
2. Press the MULTI MEMORY STORE key, then the PLAY ▶ key in that order to close the focus servo then the spindle servo.
3. Insert an ordinary screwdriver into the grating adjustment slit and adjust the grating to find the null point. For more details, see the next page.
4. If you slowly turn the screwdriver clockwise from the null point, the amplitude of the wave gradually increases, then if you continue turning the screwdriver, the amplitude of the wave becomes smaller again. Turn the screwdriver clockwise from the null point and set the grating to the first point where the wave amplitude reaches its maximum.

   Reference: Figure 3 shows the relation between the angle of the tracking beam with the track and the wave form.

   Note: The amplitude of the tracking error signal is about 3 Vp-p (when a 39 kΩ + 0.001 µF low pass filter is used). If this amplitude is extremely small (2 Vp-p or less), the objective lens or the pickup malfunction may be the cause. If the difference between the amplitude of the error signal at the innermost edge and outermost edge of the disc is more than 10%, the grating is not adjusted to the optimum point, so adjust it again.
5. Return the pickup to more or less midway across the disc with the TRACK SEARCH REV |◀◀ key, press the PAUSE ▮▮ key and check that the track number and elapsed time are displayed on the front panel. If they are not displayed at this time or the elapsed time changes irregularly, check the null point and adjust the grating again.

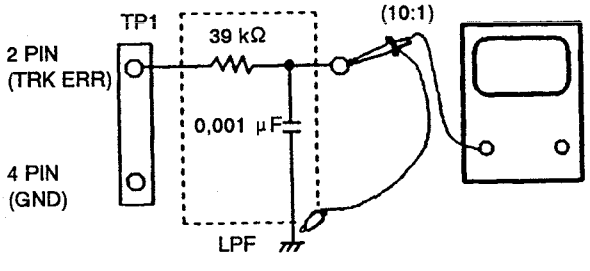
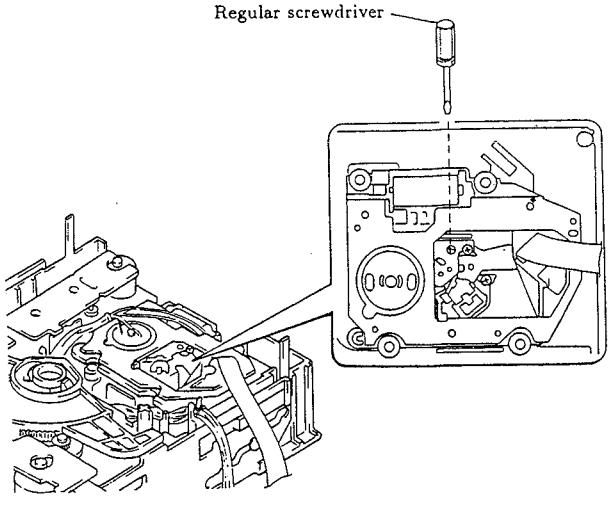


Figure 2



Adjustment Locations

[How to find the null point]

When you insert the regular screwdriver into the slit for the grating adjustment and change the grating angle, the amplitude of the tracking error signal at TP1 Pin 2 changes. Within the range for the grating, there are five or six locations where the amplitude of the wave reaches a minimum. Of these five or six locations, there is only one at which the envelope of the wave form is smooth. This location is where the three laser beams divided by the grating are all right above the same track. (See Figure 3.)
This point is called the null point. When adjusting the grating, this null point is found and used as the reference position.

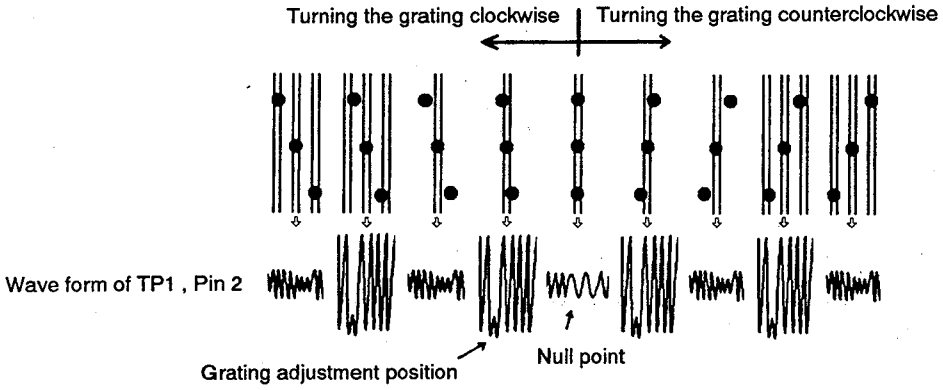
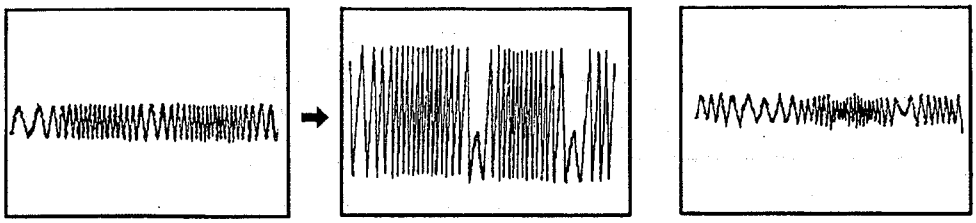


Figure 3



Null point waveform

Maximum amplitude waveform

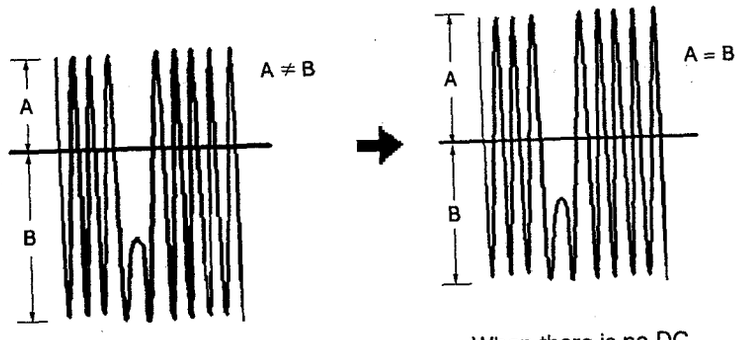
Waveform other than the null point

3. Tracking error balance adjustment

● Objective	To correct the variation in the sensitivity of the tracking photodiode		
● Symptom when out of adjustment	Play does not start or track search is impossible		
● Measurement instrument connections	Connect the oscilloscope to TP1, Pin 2 (TRK ERR). This connection may be via a low pass filter. [Settings] 50 mV/division 5 ms/division DC mode	● Player state ● Adjustment location ● Disc	Test mode, focus and spindle servos closed and tracking servo open VR102 (TRK BAL) YEDS-7

[Procedure]

1. Move the pickup to midway across the disc (R = 35 mm) with the TRACK SEARCH FWD ▶▶| or REV |◀◀ key.
2. Press the MULTI MEMORY STORE key, then the PLAY ▶ key in that order to close the focus servo then the spindle servo.
3. Line up the bright line (ground) at the center of the oscilloscope screen and put the oscilloscope into DC mode.
4. Adjust VR102 (TRK BAL) so that positive amplitude and negative amplitude of the tracking error signal at TP1 Pin 2 (TRK ERR) are the same (in other words, so that there is no DC component).



When there is a DC component

When there is no DC component

4. Pickup radial/tangential tilt adjustment

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

[Procedure]

1. Press the TRACK SEARCH FWD ▶▶| or REV |◀◀ key to move the pickup to halfway across the disc (R = 35 mm). Press the MULTI MEMORY STORE key, the PLAY ▶ key, then the PAUSE ▮▮ key in that order to close the focus servo then the spindle servo and put the player into play mode.
2. First, adjust the radial tilt adjustment screw with a Phillips screwdriver so that the eye pattern (the diamond shape at the center of the RF signal) can be seen the most clearly.
3. Next, adjust the tangential tilt adjustment screw with a Phillips screwdriver so that the eye pattern (the diamond shape at the center of the RF signal) can be seen the most clearly (Figure 5).
4. Adjust the radial tilt adjustment screw and the tangential tilt adjustment screw again so that the eye pattern can be seen the most clearly. As necessary, adjust the two screws alternately so that the eye pattern can be seen the most clearly.

Note: Radial and tangential mean the directions relative to the disc shown in Figure 4.

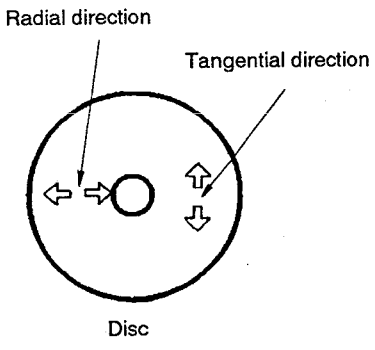
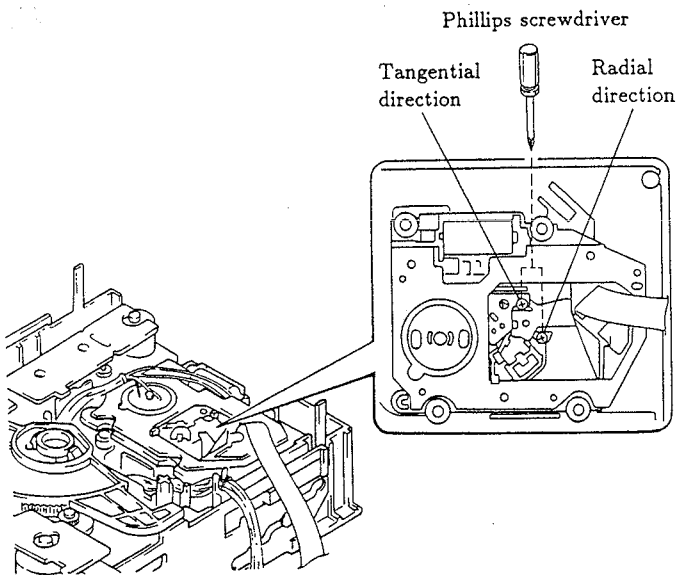


Figure 4



Adjustment Locations

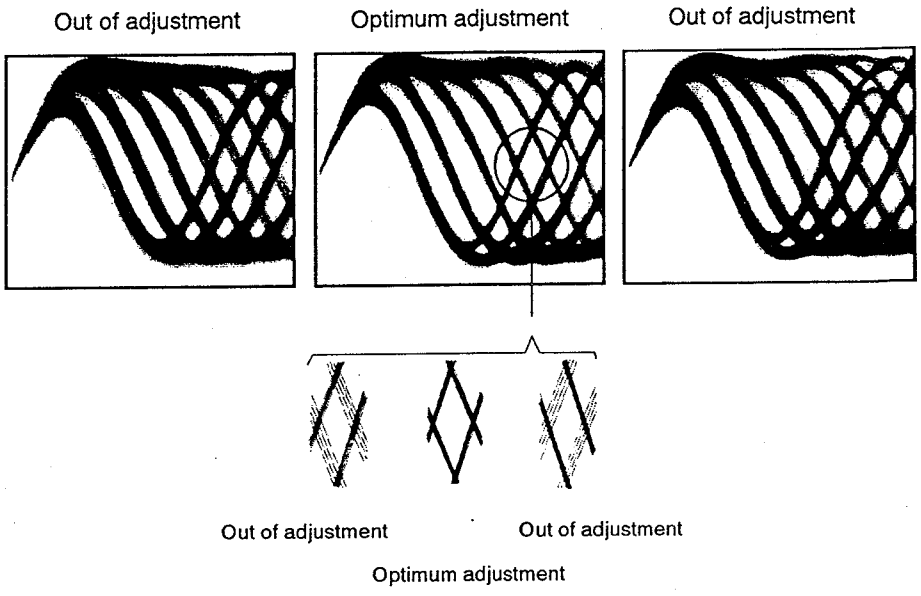


Figure 5 Eye Pattern

5. RF level adjustment

● Objective	To optimize the playback RF signal amplitude		
● Symptom when out of adjustment	No play or no search		
● Measurement instrument connections	Connect the oscilloscope to TP1, Pin 1 (RF). [Settings] 50 mV/division 10 ms/division AC mode	● Player state ● Adjustment location ● Disc	Test mode, play VR1 (laser power) YEDS-7

[Procedure]

1. Move the pickup to midway across the disc (R = 35 mm) with the TRACK SEARCH FWD ▶▶| or REV |◀◀ key, then press the MULTI MEMORY STORE key, then the PLAY ▶ key in that order to close the respective servos and put the player into play mode.
2. Adjust VR1 (laser power) so that the RF signal amplitude is 1.2 Vp-p ± 0.1V.

6. Focus servo loop gain adjustment

● Objective	To optimize the focus servo loop gain		
● Symptom when out of adjustment	Playback does not start or focus actuator noisy		
● Measurement instrument connections	See Figure 6. [Settings] CH1 CH2 20 mV/division 5 mV/division X-Y mode	● Player state ● Adjustment location ● Disc	Test mode, play VR152 (FCS GAN) YEDS-7

[Procedure]

1. Set the AF generator output to 1.2 kHz and 1 Vp-p.
2. Press the TRACK SEARCH FWD ▶▶| or REV |◀◀ key to move the pickup to halfway across the disc (R = 35 mm), then press the MULTI MEMORY STORE key, the PLAY ▶ key, then the PAUSE ▮▮ key in that order to close the corresponding servos and put the player into play mode.
3. Adjust VR152 (FCS GAN) so that the Lissajous wave form is symmetrical about the X axis and the Y axis.

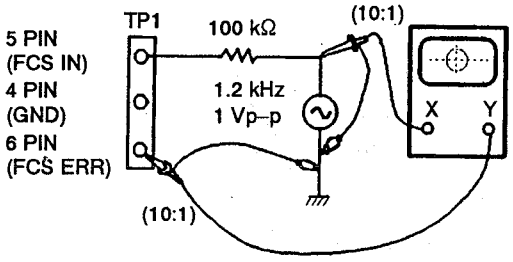
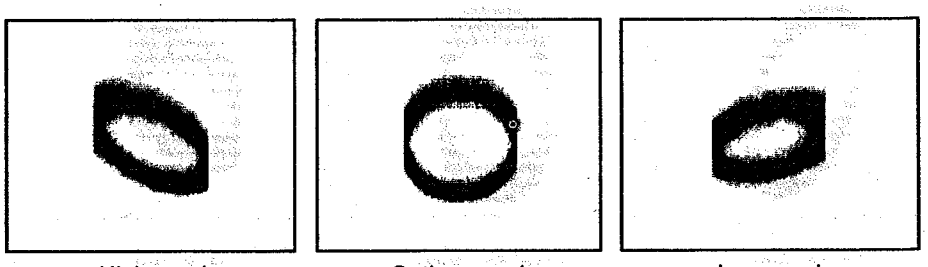


Figure 6

Focus Gain Adjustment



Higher gain | Optimum gain | Lower gain

7. Tracking servo loop gain adjustment

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

[Procedure]

1. Set the AF generator output to 1.2 kHz and 2 Vp-p.
2. Press the TRACK SEARCH FWD ▶▶| or REV |◀◀ key to move the pickup to halfway across the disc (R = 35 mm), then press the MULTI MEMORY STORE key, the PLAY ▶ key, then the PAUSE ▮▮ key in that order to close the corresponding servos and put the player into play mode.
3. Adjust VR151 (TRK GAN) so that the Lissajous wave form is symmetrical about the X axis and the Y axis.

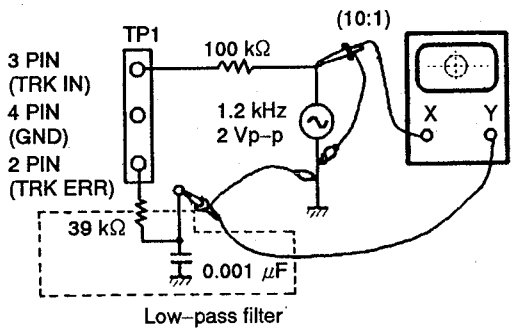
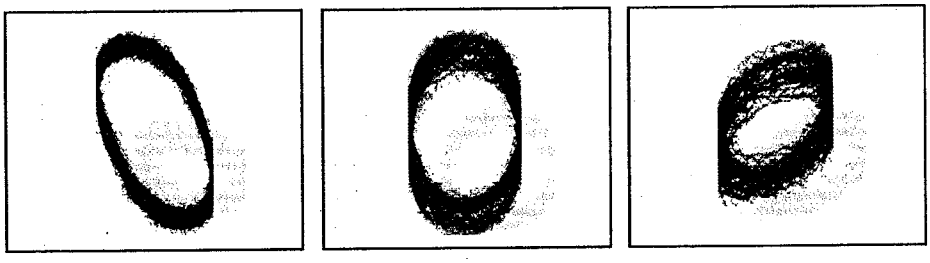


Figure 7

Tracking Gain Adjustment



Higher gain | Optimum gain | Lower gain

8. Focus error signal (focus S curve) verification

● Objective ● Symptom when out of adjustment	To judge whether the pickup is OK or not by observing the focus error signal. The pickup is judged from the amplitude of the tracking error signal (as discussed in the section on adjusting the tracking error balance) and the wave form for the focus error signal.		
● Measurement instrument connections	Connect the oscilloscope to TP1, Pin 6 (FCS ERR). [Settings] 100 mV/division 5 ms/division DC mode	● Player state ● Adjustment location ● Disc	Test mode, stop None YEDS-7

[Procedure]

1. Connect TP1 Pin 5 to ground.
2. Mount the disc.
3. While watching the oscilloscope screen, press the MULTI MEMORY STORE key and observe the waveform in Figure 8 for a moment. Verify that the amplitude is at least 2.5 Vp-p and that the positive and negative amplitude are about equal. Since the waveform is only output for a moment when the MULTI MEMORY STORE key is pressed, press this key over and over until you have checked the waveform.

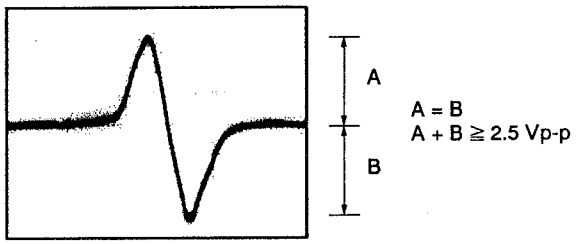


Figure 8

[Judging the pickup]

Do not judge the pickup until all the adjustments have been made correctly. In the following cases, there may be something wrong with the pickup.

1. The tracking error signal amplitude is extremely small (less than 2 Vp-p).
2. The focus error signal amplitude is extremely small (less than 2.5 Vp-p).
3. The positive and negative amplitudes of the focus error signal are extremely asymmetrical (2:1 ratio or more).
4. The RF signal is too small (less than 0.8 Vp-p) and even if VR1 is adjusted (laser power), the RF signal can not be brought up to the standard level.

6. RÉGLAGES

1. Méthodes de réglage

Si le lecteur CD est mal réglé, il risque de ne plus fonctionner normalement, voire ne plus fonctionner du tout, même si le capteur et la circuiterie en présentent aucune anomalie. Par conséquent, ajuster le lecteur correctement en suivant les démarches de réglage.

1–1 Points de réglage/Point et ordre de vérification

Etape	Point	Point d'essai	Emplacement du réglage
1	Réglage du décalage de la mise au point	TP1, Broche 6 (FCS. ERR)	VR103 (FCS. OFS)
2	Réglage du réseau de diffraction	TP1, Broche 2 (TRK. ERR)	Fente de réglage du réseau de diffraction
3	Réglage d'équilibrage d'erreur d'alignement	TP1, Broche 2 (TRK. ERR)	VR102 (TRK. BAL)
4	Réglage d'inclinaison radiale/tangentielle du capteur	TP1, Broche 1 (RF)	Vis de réglage d'inclinaison radiale, Vis de réglage d'inclinaison tangentielle
5	Réglage du niveau RF	TP1, Broche 1 (RF)	VR1 (niveau RF)
6	Réglage de gain de boucle asservie de la mise au point	TP1, Broche 5 (FCS. IN) TP1, Broche 6 (FCS. ERR)	VR152 (FCS. GAN)
7	Réglage de gain de boucle asservie de l'alignement	TP1, Broche 3 (TRK. IN) TP1, Broche 2 (TRK. ERR)	VR151 (TRK. GAN)
8	Vérification du signal d'erreur de la mise au point	TP1, Broche 6 (FCS. ERR)	———

● **Tableau des abbréviations**

FCS. ERR : erreur de mise au point
FCS. OFS : décalage de mise au point
TRK. ERR : erreur d'alignement
TRK. BAL : équilibrage d'erreur d'alignement
FCS GAN : Gain de mise au point
TRK GAN : Gain d'alignement
FCS. IN : mise au point correcte
TRK. IN : alignement correct

1–2 Intruments de mesure et outils

1. Oscilloscope cathodique à deux faisceaux (sonde 10:1)
2. Oscillateur de basse fréquence
3. Disque d'essai (YEDS-7)
4. Filtre passe-bas (39 kΩ + 0,001 μF)
5. Résistance (100 kΩ)
6. Outils conventionnels

1–3 Point d'essai et positions de réglage de la résistance variable

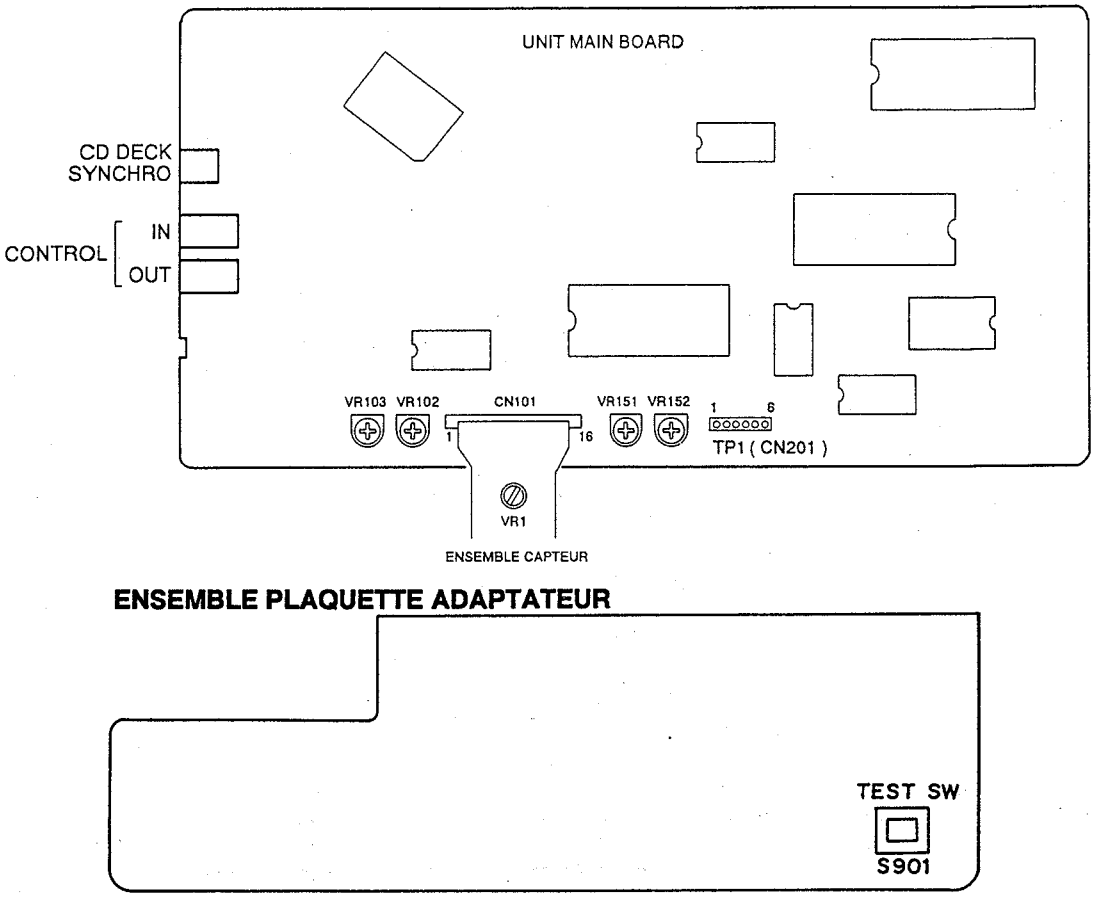


Figure 1 Emplacement des Réglages

1–4 Remarques

1. Utiliser une sonde 10:1 pour l'oscilloscope.
2. Toutes les positions (réglages) des boutons de l'oscilloscope, dans les démarches de réglage, sont conçues pour l'usage d'une sonde 10:1.

1–5 Mode d'essai

Ces modèles sont munis d'un mode d'essai, de façon que les réglages requis à la réparation puissent être effectués aisément. Quand ces modèles sont en mode d'essai, les touches du panneau avant ne fonctionnent pas comme à l'ordinaire. Les réglages et les vérifications peuvent s'effectuer par l'enclenchement de ces touches, à conditions de suivre les démarches requises. Dans le cas de ces modèles, tous les réglages sont réalisés en mode d'essai.

[Mise en mode d'essai]

Voici la manière de mettre le modèle en mode d'essai.
1. Débrancher le cordon d'alimentation de la prise secteur.
2. Appuyer sur la touche TEST (S901). (Voir Figure 1.)
3. Rebrancher le cordon d'alimentation dans la prise secteur.

Quand le mode d'essai est correctement réglé, l'affichage est différent de celui qui apparaît généralement à la mise sous tension. Si l'affichage reste le même, le mode d'essai n'a pas été réglé correctement. Dans ce cas, répéter les étapes 1 à 3.

[Pour sortir du mode d'essai]

Voici la procédure pour sortir du mode d'essai.

1. Appuyer sur la touche STOP pour arrêter toutes les opérations.
2. Débrancher le cordon d'alimentation de la prise secteur.

[Fonctionnement des touches en mode d'essai]

Code	Nom de la touche	Fonction en mode d'essai	Explications
	MULTI MEMORY STORE	Fermeture du circuit asservi de la mise au point	La diode laser s'allume et l'actuateur de la mise au point se relève, puis s'abaisse lentement et le circuit servo de la mise au point se ferme au point où la lentille de l'objectif se focalise sur le disque. Quand l'appareil est dans cet état, si l'on fait légèrement tourner à la main le disque arrêté, le bruit produit par le circuit servo de la mise au point sera audible. Si ce bruit est perçu, le circuit servo de la mise au point fonctionne correctement. Si cette touche est enclenchée et qu'aucun disque n'est installé, la diode laser s'allume, l'actuateur de la mise au point se soulève, se relève, puis s'abaisse et se soulève une deuxième fois et enfin, revient à sa position de départ.
▶	PLAY	Asservissement de rotation en service	Démarre le moteur de rotation dans le sens des aiguilles d'une montre, quand la rotation du disque atteint la vitesse prescrite (environ 500 tours/min à la circonférence interne) et place le circuit servo de rotation dans une boucle fermée. Attention. Si cette touche est enfoncée et qu'un disque n'est pas installé, le moteur de rotation va tourner á la vitesse maximum. Si le circuit servo de la mise au point ne passe pas comme prévu dans une boucle fermée ou que la diode laser brille dans le miroir à la périphérie externe du disque, le même symptôme se produit.
▮▮	PAUSE	Ouverture/Fermeture du circuit servo de l'alignement	Le fait d'appuyer sur cette touche quand le circuit servo de la mise au point et de la rotation fonctionnent correctement en boucles fermées, place le circuit servo de l'alignement dans une boucle fermée, fait apparaître, sur le panneau avant, le numéro de la piste en cours de lecture et la durée écoulée, puis sort le signal de lecture. Si la durée écoulée n'est pas affichée ou n'est pas correctement calculée, ou si la reproduction sonore est anormale, il se peut que la diode laser s'active dans la section dépourvue de signaux enregistrés, au bord externe du disque, qu'un ajustement quelconque soit déréglé, ou qu'un autre problème se manifeste. Cette touche est de type à bascule et ouvre/ferme alternativement le circuit servo de l'alignement. Cette touche est inopérante si un disque n'est pas installé.
⏮	TRACK SEARCH REV	Inversion du chariot (vers l'intérieur)	Déplace le capteur vers la périphérie interne du disque. Quand cette touche est enclenchée et que le circuit servo de l'alignement travaille en boucle fermée, celui-ci change automatiquement dans une boucle ouverte. Comme le capteur ne s'arrête pas automatiquement au point de fin mécanique du mode d'essai, effectuer cette démarche avec précaution.
⏭	TRACK SEARCH FWD	Inversion du chariot (vers l'extérieur)	Déplace le capteur vers la périphérie externe du disque. Quand cette touche est enclenchée et que le circuit servo de l'alignement travaille en boucle fermée, celui-ci change automatiquement dans une boucle ouverte. Comme le capteur ne s'arrête pas automatiquement au point de fin mécanique du mode d'essai, effectuer cette démarche avec précaution.
■	STOP	Arrêt	Initialiser et la rotation du disque s'arrête. Le capteur et le disque ne bougnet pas lorsque cette touche est enclenchée.
▲	EJECT	Ejection du magasin à disques	Range le disque n ° 1 dans le magasin à disques, puis éjecte celui–ci. Cependant, bien que le magasin soit éjecté, le capteur ne revient pas sur sa position de départ. Même si le magasin à disques est réinstallé, la position du capteur reste inchangée.

Remarque: Lors de l'insertion du magasin, le disque 1 est chargé automatiquement.

[Lecture de disque en mode d'essai]

En mode d'essai, comme les circuits servo fonctionnent de manière indépendante, la lecture d'un disque exige que les touches soient enclenchées dans l'ordre prescrit, afin de fermer les circuits servo.
Voici l'ordre d'enclenchement des touches pour reproduire un disque en mode d'essai.

MULTI MEMORY STORE	Allume la diode laser et ferme le circuit servo de la mise au point.
⇓	
PLAY ►	Démarre le moteur de rotation et ferme le circuit servo de la rotation.
⇓	
PAUSE ▮▮	Ferme le circuit servo de l'alignement.

Attendre 2 à 3 secondes entre chaque opération.

1. Réglage du décalage de la mise au point

● Objectif	Règle le décalage CC de l'amplificateur d'erreur de mise au point.		
● Symptôme quand déréglé	Le lecteur ne procède plus à la mise au point et le signal RF n'est pas clair.		
● Raccordement des instruments de mesure	Raccorder l'oscilloscope à TP1, broche 6 (FCS ERR).	● Etat du lecteur	Mode d'essai, arrêté (juste l'interrupteur d'alimentation commuté sur marche)
	[Réglages] 5 mV/division 10 ms/division mode CC	● Emplacement du réglage	VR103 (FCS OFS)
		● Disque	Aucun requis

[Marche à suivre]

Ajuster VR103 (FCS OFS) de façon que la tension à TP1 broche 6 (FCS ERR) soit −150 ± 50 mV.

2. Réglage du réseau de diffraction

● Objectif	Pour aligner les points du rayon laser producteur d'erreur d'alignement sur l'angle optimum de la piste		
● Symptôme quand déréglé	La lecture ne commence pas, la recherche de piste est impossible, les pistes sont sautées.		
● Raccordement des instruments de mesure	Raccorder l'oscilloscope à TP1, broche 2 (TRK ERR) via un filtre passe-bas. (Voir Figure 2) [Réglages] 50 mV/division 5 ms/division mode CC	● Etat du lecteur	Mode d'essai, circuits servo de la mise au point et de la rotation fermés, circuit servo de l'alignement ouvert
		● Emplacement du réglage	Fente de réglage du réseau de diffraction du capteur
		● Disque	YEDS–7

[Marche à suivre]

1. Déplacer le capteur à mi–chemin sur le disque (R = 35 mm) par la touche TRACK SEARCH FWD ▶▶| ou la touche REV |◀◀.
2. Appuyer sur la touche MULTI MEMORY STORE, puis sur la touche PLAY ▶, dans cet ordre, pour fermer le circuit servo de la mise au point, puis celui de la rotation.
3. Insérer un tournevis ordinaire dans le réseau de diffraction pour trouver le point zéro. Pour plus de détails, voir page suivante.
4. Si l'on tourne lentement le tournevis dans le sens des aiguilles d'une montre à partir du point zéro, l'amplitude de l'onde augmente graduellement et si l'on continue à tourner le tournevis, l'amplitude de l'onde diminue de nouveau. Tourner le tournevis dans le sens des aiguilles d'une montre à partir du point zéro et régler le réseau de diffraction au premier point où l'amplitude de l'onde atteint son maximum.

   Référence: La Figure 3 illustre la relation entre l'angle du faisceau de l'alignement et la piste et la forme d'onde.

   Remarque: L'amplitude du signal d'erreur d'alignement se situe aux environs de 3 Vc-c (quand un filtre passe-bas de 39 kΩ + 0,001 µF est utilisé). Si cette amplitude est extrêmement petite (2 Vc-c ou moins), il peut s'ensuivre un mauvais fonctionnement de la lentille d'objectif ou du capteur. Si la différence entre l'amplitude du signal d'erreur au bord le plus intérieur et au bord le plus extérieur du disque est supérieure à 10%, ceci signifie que le réseau de diffraction n'est pas réglé à son point optimum. Dans ce cas, recommencer le réglage.

5. Replacer le capteur plus ou moins à mi-chemin sur le disque par la touche TRACK SEARCH REV |◀◀, appuyer sur la touche PAUSE ▮▮ et vérifier que le numéro de piste et la durée écoulée sont affichés sur le panneau avant. Si ces paramètres n'apparaissent pas ce moment, ou que la durée écoulée change de manière irrégulière, vérifier le point zéro et recommencer le réglage du réseau de diffraction.

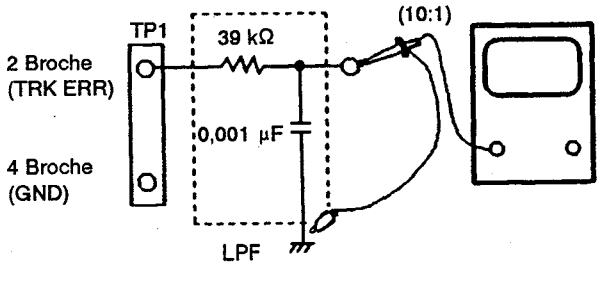
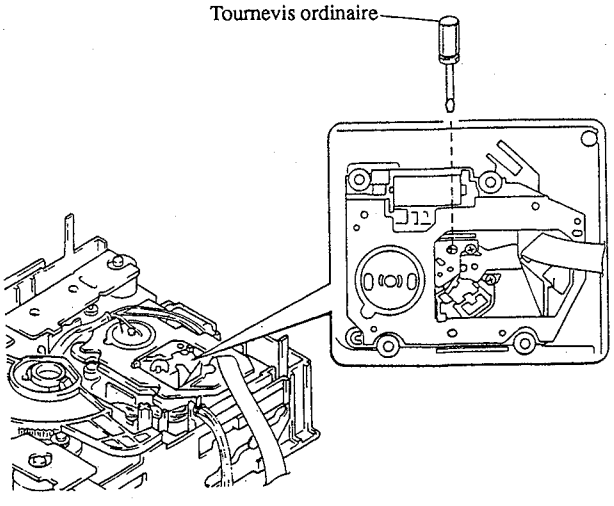


Figure 2



Emplacement des Réglages

[Repérage du point zéro]

Quand le tournevis est introduit dans la fente de réglage du réseau de diffraction et que l'angle du réseau de diffraction est modifié, l'amplitude du signal d'erreur d'alignement à TP1, broche 2, change. Dans les limites de la plage du réseau de diffraction, il existe six emplacements où l'amplitude de l'onde atteint le minimum. Mais l'enveloppe de la forme d'onde n'est régulière qu'à un seul de ces emplacements. Ce point se situe à l'endroit où les trois rayons laser, divisés par le réseau de diffraction, se situent exactement sur la même piste (voir Figure 3).
Ce point s'appelle le point zéro. Lors du réglage du réseau de diffraction, ce point zéro est repéré et utilisé comme position de référence.

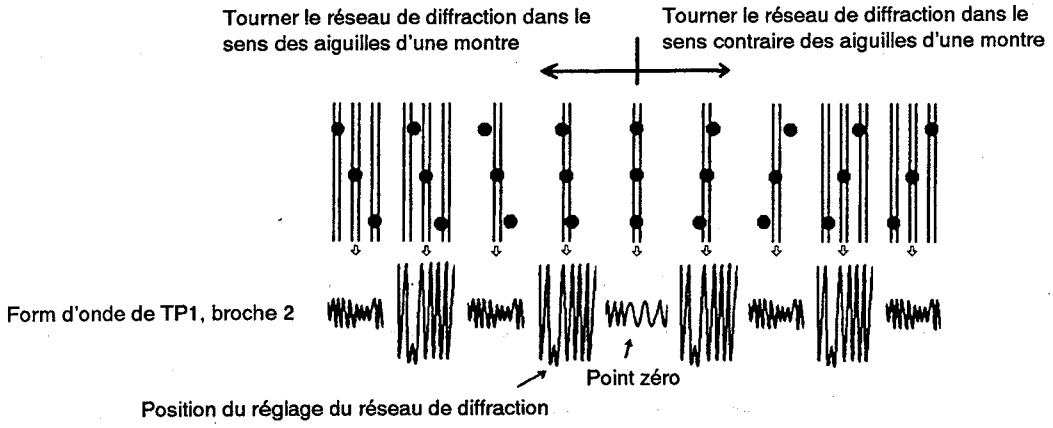
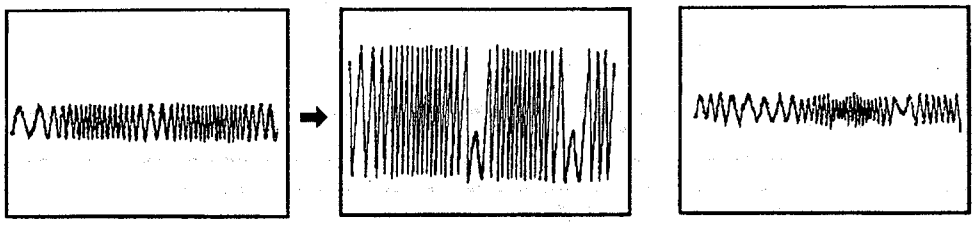


Figure 3



Forme d'onde du point zéro

Forme d'onde d'amplitude maximum

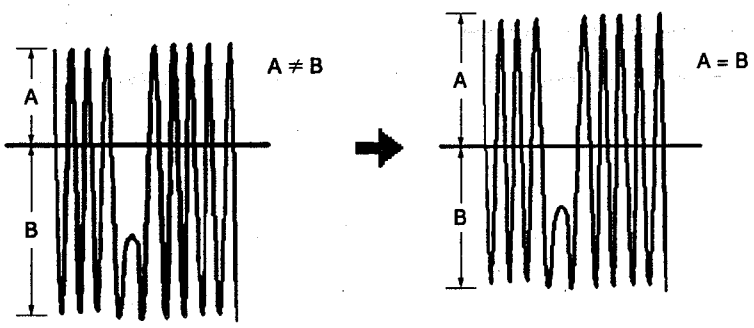
Forme d'onde autre que du point zéro

3. Réglage d'équilibrage d'erreur d'alignement

● Objectif	Pour corriger la variation de sensibilité de la photodiode d'alignement		
● Symptôme quand déréglé	La lecture ne commence pas, la recherche de piste est impossible.		
● Raccordement des instruments de mesure	Raccorder l'oscilloscope à TP1, broche 2 (TRK ERR). Cette connexion peut être faite par l'intermédiaire d'un filtre passe-bas. [Réglages] 50 mV/division 5 ms/division mode CC	● Etat du lecteur ● Emplacement du réglage ● Disque	Mode d'essai, circuits servo de la mise au point et de la rotation fermés, circuit servo de l'alignement ouvert VR102 (TRK BAL) YEDS-7

[Marche à suivre]

1. Déplacer le capteur à mi-chemin sur le disque (R = 35 mm) par la touche TRACK SEARCH FWD ▶▶| ou REV |◀◀.
2. Appuyer sur la touche MULTI MEMORY STORE, puis sur la touche PLAY ▶, dans cet ordre, pour fermer le circuit servo de la mise au point, puis celui de la rotation.
3. Aligner la ligne lumineuse (masse) au centre de l'écran de l'oscilloscope et placer celui-ci en mode CC.
4. Ajuster VR102 (TRK BAL) de façon que l'amplitude positive et l'amplitude négative du signal d'erreur d'alignement à TP1, broche 2 (TRK ERR) soient identiques (c'est-à-dire, qu'il n'y ait aucun composant CC).



S'il y a un composant CC

S'il n'y a pas de composant CC

4. Réglage d'inclinaison radiale/tangentielle du capteur

● Objectif	Pour régler l'angle du capteur par rapport au disque, de façon que les rayons laser frappent verticalement le disque et permettre ainsi la lecture optimum des signaux RF.		
● Symptôme quand déréglé	Son interrompu; certains disques peuvent être lus et pas d'autres.		
● Raccordement des instruments de mesure	Raccorder l'oscilloscope à TP1, broche 1 (RF). [Réglages] 20 mV/division 200 ns/division mode CA	● Etat du lecteur ● Emplacement du réglage ● Disque	Mode d'essai, lecture Vis de réglage d'inclinaison radiale Vis de réglage d'inclinaison tangentielle YEDS–7

[Marche à suivre]

1. Dans le cas d'un lecteur multidisque, utiliser la touche TRACK SEARCH FWD ▶▶| ou la touche REV |◀◀ pour déplacer le capteur à mi–chemin sur le disque (R = 35 mm).

   Appuyer sur la touche MULTI MEMORY STORE, PLAY ▶ et PAUSE ▮▮ dans cet ordre, afin de fermer le circuit servo de la mise au point, puis celui de la rotation et placer le lecteur en mode de lecture.

2. D'abord, ajuster la vis d'inclinaison radiale à l'aide un tournevis Phillips, de façon que le motif en oeil (c'est-à-dire, le diamant au centre du signal RF) soit le plus clairement visible.

3. Ensuite, ajuster la vis d'inclinaison tangentielle à l'aide un tournevis Phillips, de façon que le motif en oeil (c'est-à-dire, le diamant au centre du signal RF) soit le plus clairement visible (Figure 5).

4. Ajuster de nouvear la vis d'inclinaison radiale et la vis d'inclinaison tangentielle de façon que le motif en oeil soit le plus clairement visible. Le cas échéant, régler les deux vis de façon que le motif en oeil soit le plus clairement visible.

   Remarque: "Radial" et "tangentiel" se rapportent aux sens par rapport au disque illustré à la Figure 4.

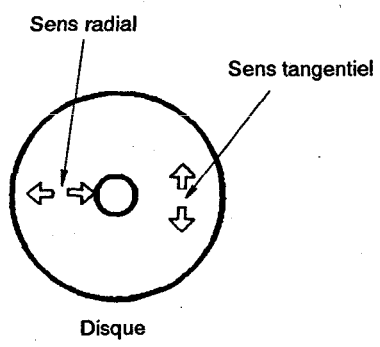
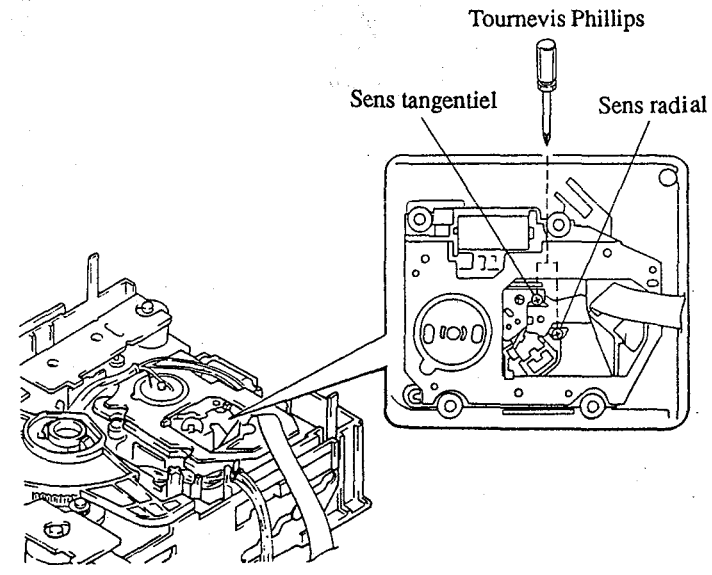


Figure 4



Emplacements des Réglages

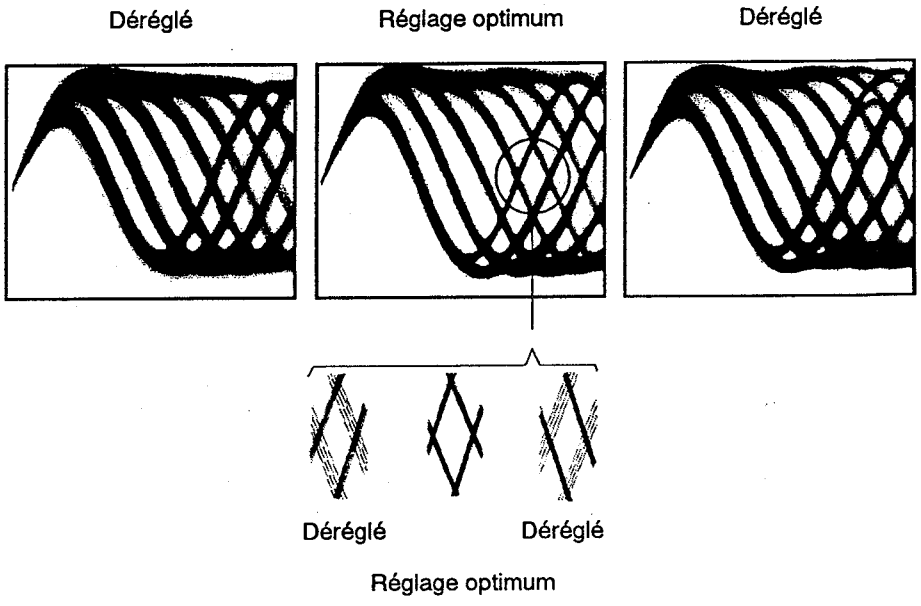


Figure 5 Motif en oeil

5. Réglage du niveau RF (niveau RF)

● Objectif	Pour optimaliser l'amplitude du signal RF de lecture		
● Symptôme quand déréglé	Pas de lecture ni de recherche		
● Raccordement des instruments de mesure	Raccorder l'oscilloscope à TP1, broche 1 (RF) [Rélages] 50 mV/division 10 ms/division mode CA	● Etat du lecteur	Mode d'essai, lecture
		● Emplacement du réglage	VR1 (alimentation du laser)
		● Disque	YEDS-7

[Marche à suivre]

1. Placer le capteur à mi-chemin sur le disque (R = 35 mm) à l'aide de la touche TRACK SEARCH FWD ▶▶| ou REV |◀◀. Ensuite, appuyer sur la touche MULTI MEMORY STORE puis sur la touche PLAY ▶, dans cet ordre, pour fermer les circuits servo respectifs et mettre le lecteur en mode de lecteur.
2. Ajuster VR1 (alimentation du laser) de façon que l'amplitude du signal RF atteigne 1,2 Vc-c ± 0,1V.

6. Réglage de gain de boucle asservie de la mise au point

● Objectif ● Symptôme quand déréglé	Pour optimaliser le gain de la boucle d'asservissement de la mise au point. La lecture ne commence pas ou l'actuateur de la mise au point est parasité.		
● Raccordement des instruments de mesure	Voir Figure 6 [Réglages] CAN. 1 CAN. 2 20 mV/division 5 mV/division Mode X-Y	● Etat du lecteur ● Emplacement du réglage ● Disque	Mode d'essai, lecture VR152 (FCS GAN) YEDS-7

[Marche à suivre]

1. Régler la sortie du générateur AF sur 1,2 kHz et 1 Vc-c.
2. Appuyer sur la touche TRACK SEARCH FWD ▶▶| ou la touche REV |◀◀ pour placer le capteur à mi-chemin sur le disque (R = 35 mm). Ensuite, appuyer sur la touche MULTI MEMORY STORE, la touche PLAY ▶, puis sur la touche PAUSE ❚❚, dans cet ordre, pour fermer les circuits servo respectifs et placer le lecteur en mode de lecture.
3. Ajuster VR152 (FSC GAN) de façon que la forme d'onde de Lissajous soit symétrique aux alentours de l'axe X et l'axe Y.

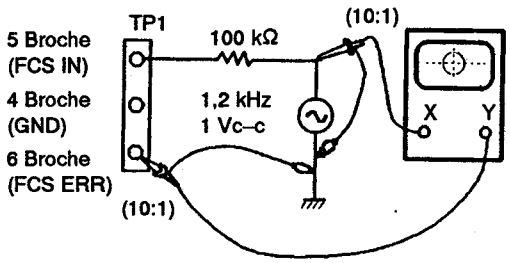
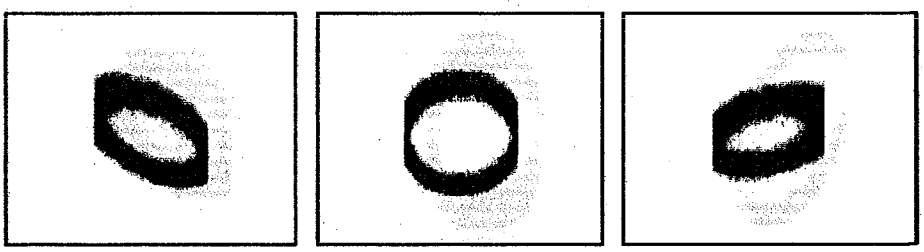


Figure 6

Adjustment de gain de mise au point



Gain supérieur | Gain optimum | Gain inférieur

7. Réglage de gain de boucle asservie de l'alignement

● Objectif ● Symptôme quand déréglé	Pour optimaliser le gain de la boucle d'asservissement de l'alignement. La lecture ne commence pas, l'actuateur est parasité pendant la recherche, ou des pistes sont sautées.		
● Raccordement des instruments de mesure	Voir Figure 7 [Réglages] CAN. 1 CAN. 2 50 mV/division 50 mV/division Mode X-Y	● Etat du lecteur ● Emplacement du réglage ● Disque	Mode d'essai, lecture VR151 (TRK GAN) YEDS-7

[Marche à suivre]

1. Régler la sortie du générateur AF sur 1,2 kHz et 1 Vc-c.
2. Appuyer sur la touche TRACK SEARCH FWD ▶▶| ou la touche REV |◀◀ pour placer le capteur à mi-chemin sur le disque (R = 35 mm). Ensuite, appuyer sur la touche MULTI MEMORY STORE, la touche PLAY ▶, puis sur la touche PAUSE ▮▮, dans cet ordre, pour fermer les circuits servo respectifs et placer le lecteur en mode de lecture.
3. Ajuster VR151 (TRK GAN) de façon que la forme d'onde de Lissajous soit symétrique aux alentours de l'axe X et l'axe Y.

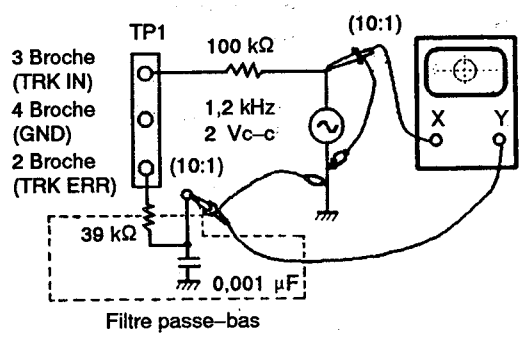
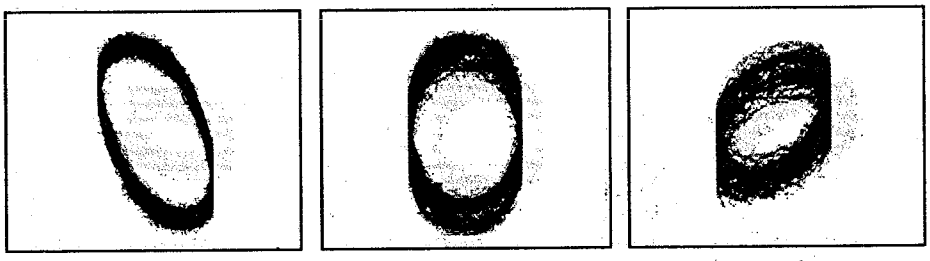


Figure 7

Adjustment de gain d'alignement



Gain supérieur | Gain optimum | Gain inférieur

8. Vérification du signal d'erreur de la mise au point

● Objectif ● Symptôme quand déréglé	Pour juger si le capteur est bon ou pas, en observant le signal d'erreur de la mise au point. L'état du capteur s'évalue à partir de l'amplitude du signal d'erreur d'alignement (comme décrit dans le paragraphe relatif à l'équilibrage d'erreur d'alignement), ainsi qu'à partir de la forme d'onde du signal d'erreur de mise au point.		
● Raccordement des instruments de mesure	Raccorder l'oscilloscope à TP1, broche 6 (FCS ERR). [Réglages] 100 mV/division 5 ms/division mode CC	● Etat du lecteur ● Emplacement du réglage ● Disque	Mode de test, arrêt Aucun YEDS-7

[Marche à suivre]

1. Raccorder TP1, broche 5 à la masse.
2. Installer le disque.
3. Tout en regardant l'écran de l'oscilloscope, appuyer sur la touche MULTI MEMORY STORE et observer la forme d'onde de la Figure 8, pendant quelques instants.Vérifier que l'amplitude atteint au moins 2,5 Vc-c et que les amplitudes positive et négatives soient égales. Comme la forme ne sort que pour un moment, quand la touche MULTI MEMORY STORE est enclenchée, appuyer sur à plusieurs reprises sur cette touche, jusqu'à ce que la forme d'onde ait été vérifiée.

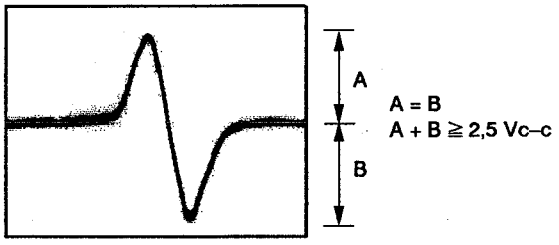


Figure 8

[Evaluation du capteur]

Ne pas tenter d'évaluer l'état du capteur tant que tous les réglages ne sont pas corrects. Les cas suivants témoignent de l'anomalie du capteur.

1. L'amplitude du signal d'erreur d'alignement est extrêmement petite (inférieure à 2 Vc-c).
2. L'amplitude du signal d'erreur de mise au point est extrêmement petite (inférieure à 2,5 Vc-c).
3. Les amplitudes positive et négative du signal d'erreur de mise au point sont extrêmement asymétriques (taux 2:1 ou plus).
4. Le signal RF est trop petit (inférieur à 0,8 Vc-c) et même si VR1 (alimentation du laser) est ajustée, le signal RF ne peut être élevé au niveau standard.

6. AJUSTES

1. Métodos de ajuste

Si un reproductor de discos compactos se ajusta incorrecta o inadecuadamente, puede funcionar mal o no trabajar incluso aunque no exista ningún problema en el captor ni en los circuitos. Ajuste correctamente siguiendo el procedimiento de ajuste.

1-1 Ítemes de ajuste/verificación y orden

Paso	Ítem	Punto de prueba	Lugar de ajuste
1	Ajuste del descentramiento de enfoque	TP1, Patilla 6 (FCS. ERR)	VR103 (FCS. OFS)
2	Ajuste de retícula	TP1, Patilla 2 (TRK. ERR)	Ranura de ajuste de retícula
3	Ajuste del equilibrio de ajuste de seguimiento	TP1, Patilla 2 (TRK. ERR)	VR102 (TRK. BAL)
4	Ajuste de la inclinación en sentido radial/tangencial del captor	TP1, Patilla 1 (RF)	Tornillo de ajuste de la inclinación radial Tornillo de ajuste de la inclinación tangencial
5	Ajuste del nivel de RF	TP1, Patilla 1 (RF)	VR1 (Nivel de RF)
6	Ajuste de la ganancia del bucle del servo de enfoque	TP1, Patilla 5 (FCS. IN) TP1, Patilla 6 (FCS. ERR)	VR152 (FCS. GAN)
7	Ajuste de la ganancia del bucle del servo de seguimiento	TP1, Patilla 3 (TRK. IN) TP1, Patilla 2 (TRK. ERR)	VR151 (TRK. GAN)
8	Verificación de la señal de error de enfoque	TP1, Patilla 6 (FCS. ERR)	———

● **Tabla de abreviaturas**

FCS. ERR : Error de enfoque
FCS. OFS : Descentramiento de enfoque
TRK. ERR : Error de seguimiento
TRK. BAL : Equilibrio de seguimiento
FCS GAN : Ganacia de enfoque
TRK GAN : Ganacia de seguimiento
FCS. IN : Entrada de enfoque
TRK. IN : Entrada de seguimiento

1-2 Instrumentos y herramientas de medición

1. Osciloscopio de doble traza (Sonda de 10:1)
2. Oscilador de baja frecuencia
3. Disco de prueba (YEDS-7)
4. Filtro de paso bajo (39 kΩ + 0,001 μF)
5. Resistor (100 kΩ)
6. Herramientas estándar

1-3 Ubicación de los puntos de prueba y los resistores variables de ajuste

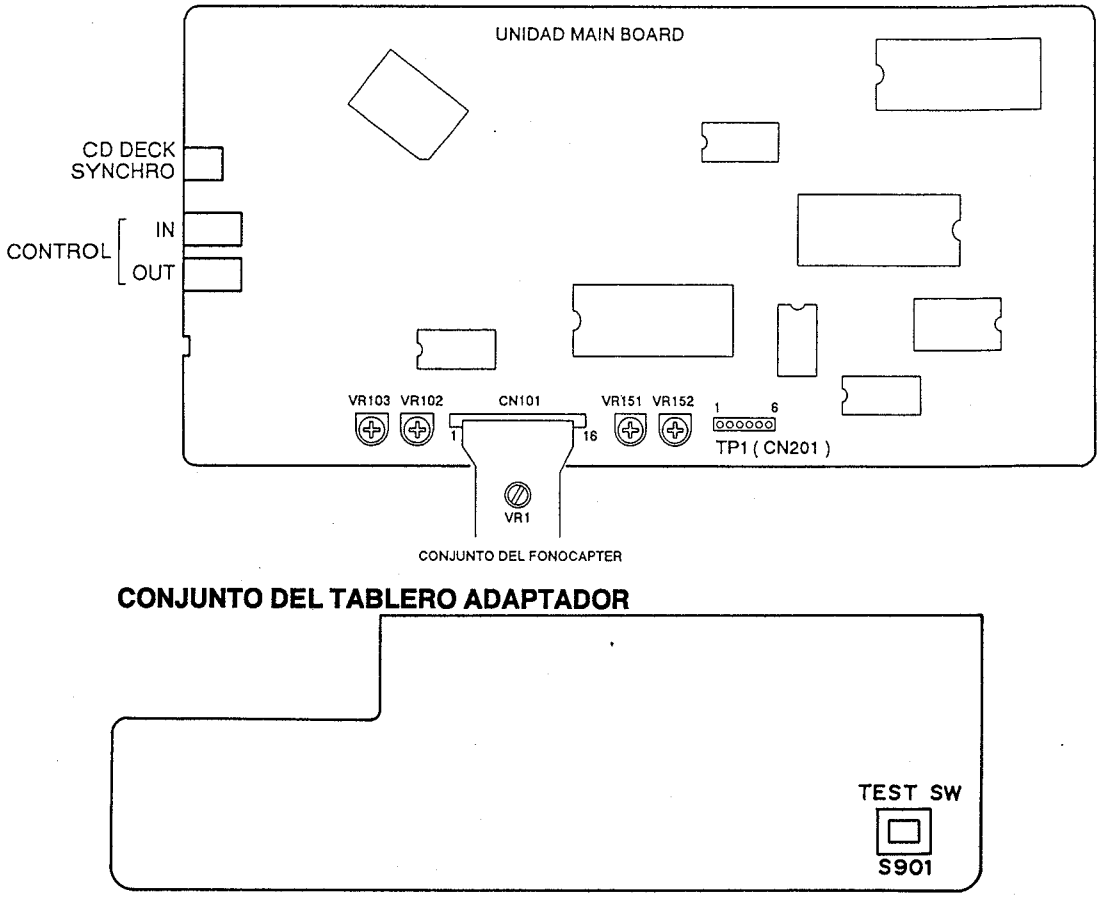


Figura 1 Lugares de Ajuste

1-4 Notas

1. Emplee una sonda de 10:1 para el osciloscopio.
2. Todas las posiciones de los mandos (ajustes) para el osciloscopio de los procedimientos de ajuste son para cuando se emplee la sonda de 10:1.

1-5 Modo de prueba

Estos modelos poseen un modo de prueba que permite realizar fácilmente los ajustes y las comprobaciones requeridos para el servicio. Cuando estos modelos estén en el modo de prueba, las teclas del panel frontal trabajarán de forma diferente a la normal. Los ajustes y las comprobaciones podrán realizarse accionando estas teclas de acuerdo con el procedimiento correcto. Para estos modelos, todos los ajustes se realizarán en el modo de prueba.

[Puesta de estos modelos en el modo de prueba]

A continuación se indica cómo poner estos modelos en el modo de prueba.

1. Desenchufe el cable de alimentación de la toma de CA.
2. Ponga la tecla TEST (S901). (Consulte la figura 1.)
3. Enchufe el cable de alimentación de la toma de CA.

Cuando haya ajustado correctamente el modo de prueba, la visualización será diferente a la obtenida normalmente al conectar la alimentación. Si la visualización sigue siendo la normal, el modo de prueba no se habrá ajustado normalmente, por lo que tendrá que repetir los pasos 1 a 3.

[Desactivación del modo de prueba]

A continuación se indica el procedimiento para desactivar el modo de prueba.
1. Presione la tecla STOP para parar todas las operaciones.
2. Desenchufe el cable de alimentación de la toma de CA.

[Operaciones de teclas en el modo de prueba]

Código	Nombre de la tecla	Función en el modo de prueba	Explicación
	MULTI MEMORY STORE	Cierre del servo de enfoque	El diodo láser se encenderá y el actuador de enfoque se eleva, después se desciende lentamente, y el servo de enfoque se cerrará en el punto en el que el objetivo se enfoque sobre el disco. Con el reproductor en este estado, si gira ligeramente con la mano el disco parado podrá oír el sonido del servo de enfoque. Si puede oír éste sonido, el servo de enfoque estará funcionando correctamente. Si presiona esta tecla sin disco montado, el diodo láser se encenderá, el actuador de enfoque se verá empujado hacia arriba, y después se levantará y descenderá y se eleva dos veces, y volverá a su posición original.
►	PLAY	Activación del servo del eje	Pondrá en marcha el motor del eje haciéndolo girar hacia la derecha y después la rotación del disco alcanzará la velocidad prescrita (unas 500 rpm en la periferia interior), y pondrá el servo del eje en un bucle cerrado. Tenga cuidado. Si presiona esta tecla cuando no haya disco montado, el motor del eje girará a la velocidad máxima. Si el servo de enfoque no pasa correctamente a un bucle cerrado, o si el haz lasérico incide en la sección del espejo en el la periferia del disco, ocurrirá el mismo síntoma.
▮▮	PAUSE	Apertura/cierre del servo de seguimiento	Si presiona esta tecla cuando el servo de enfoque y el servo del eje están funcionando correctamente en bucles cerrados, el servo de sequimiento se pondrá en bucle cerrado, en el panel frontal se visualizarán el número de canción que esté reproduciéndose y el tiempo transcurrido, y se producirá la salida de la señal de reproducción. Si el tiempo transcurrido no se visualiza o no se cuenta correctamente, o si el sonido no se reproduce correctamente, es posible que el rayo lasérico esté incidiendo en la sección sin sonido grabado en el borde exterior del disco, o que exista algún otro problema. Esta tecla es basculante (de acción alternativa) y abre/cierra el servo de seguimiento alternativamente. Esta tecla no funcionará cuando no haya disco montado.
⏮	TRACK SEARCH REV	Retroceso del carro (hacia adentro)	Moverá la posición del captor hacia el diámetro interior del disco. Si presiona esta tecla con el servo de seguimiento en bucle cerrado, dicho bucle pasará automáticamente a bucle abierto. Como el captor no se para automáticamente en el punto final mecánico en el modo de prueba, tenga cuidado cuando realice esta operación.
⏭	TRACK SEARCH FWD	Avance del carro (hacia afuera)	Moverá la posición del captor hacia la periferia del disco. Si presiona esta tecla con el servo de seguimiento en bucle cerrado, dicho bucle pasará automáticamente a bucle abierto. Como el captor no se para automáticamente en el punto final mecánico en el modo de prueba, tenga cuidado cuando realice esta operación.
■	STOP	Parada	Inicializa y se para la rotacion del desco. El captor y el disco permanecen donde están cuando se presiona esta tecla.
▲	EJECT	Expulsión del cargador de discos compactos	Almacenará el disco 1 en el cargador de discos compactos, y después expulsará dicho cargador. Sin embargo, aunque el cargador de discos compactos sea expulsado, el captor no volverá a su posición de reposo. Aunque vuelva a montar el cargador de discos compactos, el captor permanecerá donde estaba.

Nota: Cuando inserte el cargador, el disco 1 del mismo se cargará automáticamente.

[Cómo reproducir un disco en el modo de prueba]

En el modo de prueba, como los servos funcionan independientemente, la reproducción de un disco requiere el que usted emplee las teclas en el orden correcto para cerrar los servos.
A continuación se indica la secuencia de operación de teclas para reproducir un disco en el modo de prueba.

MULTI MEMORY STORE	Hará que se encienda el diodo láser y cerrará el servo de enfoque.
⇓	
PLAY ►	Pondrá en marcha el motor del eje y hará que se cierre el servo del eje.
⇓	
PAUSE ▮▮	Cerrará el servo de seguimiento.

Espere de 2 a 3 segundos por lo menos entre cada una de estas operaciones.

1. Ajuste del descentramiento del enfoque

● Objetivo	Ajuste de la tensión de CC para el amplificador de error de enfoque.		
● Síntomas en caso de desajuste	El reproductor no enfoca y la señal de RF contiene perturbaciones.		
● Conexión de los instrumentos de medición	Conecte el osciloscopio a TP1, patilla 6, (FCS ERR). [Ajustes] 5 mV/división 10 ms/división modo de CC	● Estado del reproductor ● Lugar de ajuste ● Disco	Modo de prueba, parado (con el interruptor de alimentación en ON) VR103 (FCS OFS) No es necesario

[Procedimiento]

Ajuste VR103 (FCS OFS) de forma que la tensión de CC de TP1, patilla 6, (FCS ERR) sea de –150 ± 50 mV.

2. Ajuste de retícula

● Objetivo	Alineación de los puntos del haz lasérico de generación de error de seguimiento al ángulo óptimo en la pista		
● Síntomas en caso de desajuste	La reproducción no se inicia, la búsqueda de canciones es imposible, las pistas se saltan.		
● Conexión de los instrumentos de medición	Conecte el osciloscopio a TP1, patilla 2, (TRK ERR) a través de un filtro de paso bajo. (Consulte la figura 2) [Ajustes] 50 mV/división 5 ms/división modo de CC	● Estado del reproductor ● Lugar de ajuste ● Disco	Modo de prueba, servos de enfoque y del eje cerrados, y servo de seguimiento abierto Ranura de ajuste de retícula del captor YEDS–7

[Procedimiento]

1. Mueva el captor hasta el la mitad del disco (R = 35 mm) con la tecla TRACK SEARCH FWD ▶▶| o la tecla REV |◀◀.
2. Presione la tecla MULTI MEMORY STORE, y después la tecla PLAY ▶, por este orden, a fin de cerrar el servo de enfoque y después el servo del eje.
3. Inserte un destornillador normal en la ranura de ajuste de la retícula y ajuste la retícula hasta encontrar el punto nulo. Para más detalles, consulte la página siguiente.
4. Si gira lentamente el destornillador hacia la derecha desde el punto nulo, la amplitud de la onda aumentará gradualmente. Después, si continúa girando el destornillador, la amplitud de la onda se volverá otra vez más pequeña. Gire el destornillador hacia la derecha desde el punto nulo y ajuste la retícula al primer punto en el que la amplitud de la onda alcance su valor máximo.

   Referencia: En la figura 3 se muestra la relación entre el ángulo del haz de seguimiento con la pista y la forma de onda.

   Nota: La amplitud de la señal de error de seguimiento será de aproximadamente 3 Vp-p (cuando se emplee un filtro de paso bajo de 39 kΩ , 0,001 μF). Si esta amplitud es extremadamente pequeña (2 Vp-p o menos), la causa será el funcionamiento malo en el lente objetivo o en el captador. Si la diferencia entre la amplitud de la señal de error en el borde interior y exterior del disco es superior al 10%, la retícula no estará ajustada al punto óptimo, por lo que tendrá que volver a ajustarla.
5. Devuelva el captor hasta la mitad más o menos del disco con la tecla TRACK SEARCH REV |◀◀, presione la tecla PAUSE ▮▮, y vuelva a comprobar si en el panel frontal se visualizan el número de canción y el tiempo transcurrido. Si no se visualizan esta vez, o si el tiempo transcurrido cambia irregularmente, vuelva a comprobar el punto nulo y ajuste otra vez la retícula.

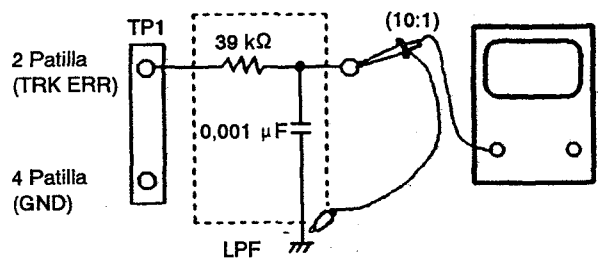
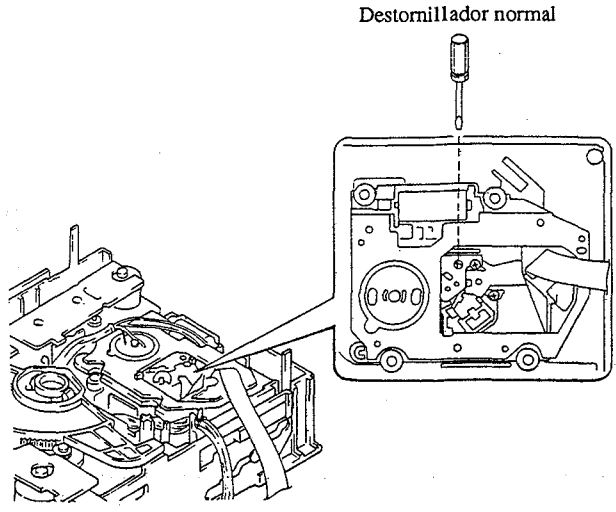


Figura 2



Lugares de Ajuste

[Cómo encontrar el punto nulo]

Cuando inserte el destornillador normal en la ranura para el ajuste de la retícula y cambie el ángulo de la misma. La amplitud de la señal de error de seguimiento de TP1, patilla 2, cambiará. Dentro del margen para la retícula existen cinco o seis lugares en los que la amplitud alcanza el valor mínimo. De estos cinco o seis lugares, solamente hay uno en el que la envolvente de la forma de onda es uniforme. Este lugar es donde los tres haces lasércicos divididos por la retícula se encuentran exactamente sobre la misma pista. (Consulte la figura 3.) Este punto se denomina punto nulo. Cuando ajuste la retícula, este punto se encontrará y empleará como posición de referencia.

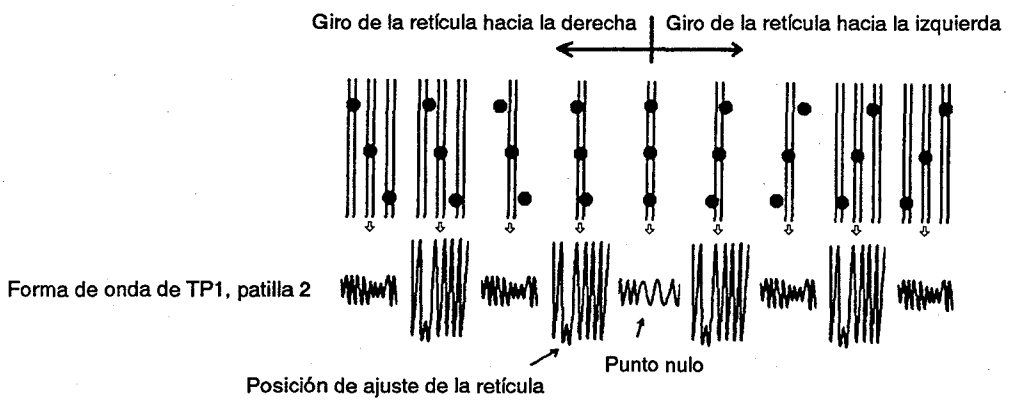
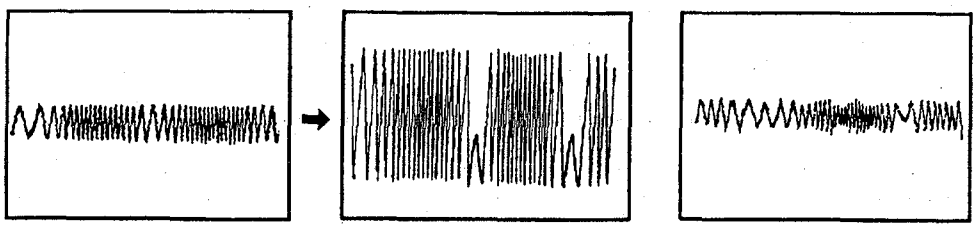


Figura 3



Forma de onda del punto nulo

Forma de onda de amplitud máxima

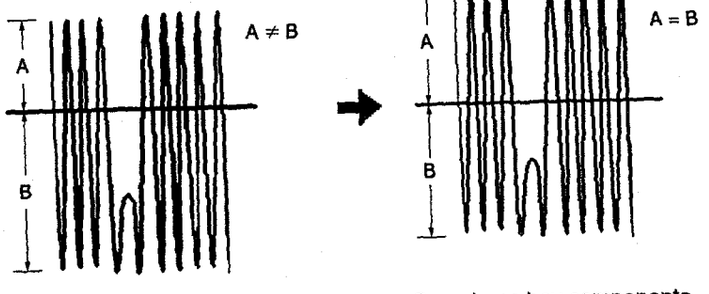
Forma de onda que no es el punto nulo

3. Ajuste del equilibrio de error de seguimiento

● Objetivo	Corrección de la variación de la sensibilidad del fotodiodo de seguimiento		
● Síntomas en caso de desajuste	La reproducción no se inicia o la búsqueda de canciones es imposible.		
● Conexión de los instrumentos de medición	Conecte el osciloscopio a TP1, patilla 2, (TRK ERR). Esta conexión puede realizarse a través de un filtro de paso bajo. [Ajustes] 50 mV/división 5 ms/división modo de CC	● Estado del reproductor	Modo de prueba, servos de enfoque y del eje cerrados, y servo de seguimiento abierto
		● Lugar de ajuste	VR102 (TRK BAL)
		● Disco	YEDS-7

[Procedimiento]

1. Mueva el captor hasta la mitad del disco (R = 35 mm) con la tecla TRACK SEARCH FWD ▶▶| o REV |◀◀.
2. Presione la tecla MULTI MEMORY STORE, y después la tecla PLAY ▶, por este orden, a fin de cerrar el servo de enfoque y después el servo del eje.
3. Haga coincidir la línea brillante (masa) del centro de la pantalla del osciloscopio y ponga éste en el modo de CC.
4. Ajuste VR102 (TRK BAL) de forma que la amplitud positiva y la negativa de la señal de error de seguimiento de TP1, patilla 2, (TRK ERR) sean iguales (en otras palabras, de forma que no haya componente de CC).



Cuando hay componente de CC

Cuando no hay componente de CC

4. Ajuste de la inclinación en sentido radial/tangencial del captor

● Objetivo	Ajustar el ángulo del captor en relación con el disco de forma que los haces lasércicos incidan perpendicularmente sobre el mismo a fin de poder leer con la mayor exactitud las señales de RF.		
● Síntomas en caso de desajuste	Sonido quebrado, algunos discos pueden reproducirse pero otros no.		
● Conexión de los instrumentos de medición	Conecte el osciloscopio a TP1, patilla 1, (RF). [Ajustes] 20 mV/división 200 ns/división modo de CA	● Estado del reproductor ● Lugar de ajuste ● Disco	Modo de prueba, reproducción Tornillo de ajuste de la inclinación radial y tornillo de ajuste de la inclinación tangencial YEDS-7

[Procedimiento]

1. Para un tipo de reproducción múltiple de disco compacto, emplee la tecla TRACK SEARCH FWD ▶▶| o la tecla REV |◀◀ a fin de mover el captor hasta la mitad del disco (R = 35 mm).
   Presione la tecla MULTI MEMORY STORE, la tecla PLAY ▶, y después la tecla PAUSE ▮▮, por este orden, a fin de cerrar el servo de enfoque, después el servo del eje, y por último para poner el reproductor en el modo de reproducción.
2. En primer lugar, gire el tornillo de ajuste de inclinación radial con un destornillador Phillips hasta que el patrón ocular (la forma de diamante del centro de la señal de RF) pueda verse con la mayor claridad.
3. A continuación, ajuste el tornillo de ajuste de inclinación tangencial con un destornillador Phillips hasta que el patrón ocular (la forma de diamante del centro de la señal de RF) pueda verse con la mayor claridad (figura 5).
4. Vuelva a girar el tornillo de ajuste de inclinación radial y el tornillo de inclinación tangencial hasta que el patrón ocular pueda verse con la mayor claridad. Si es necesario, ajuste alternativamente los dos tornillos hasta que el patrón ocular pueda verse con la mayor claridad.

   Nota: Radial y tangencial significan las direcciones en relación con el disco mostrado en la figura 4.

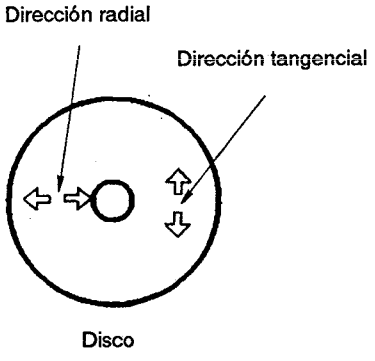
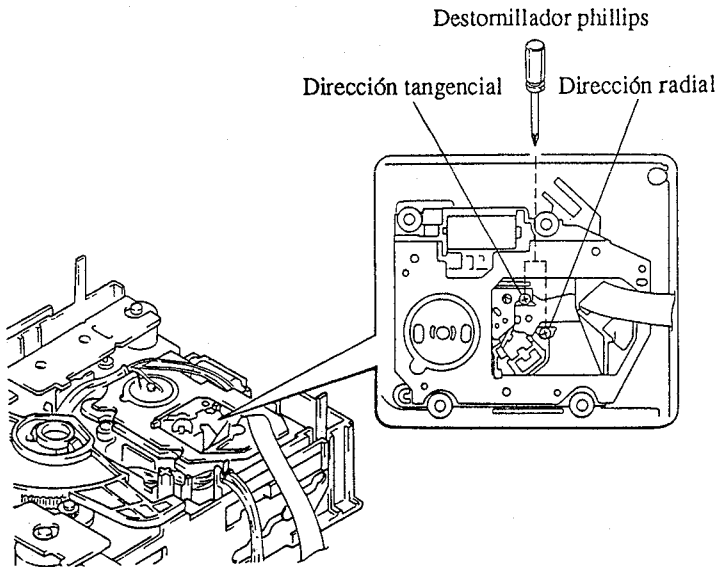


Figura 4



Lugares de Ajuste

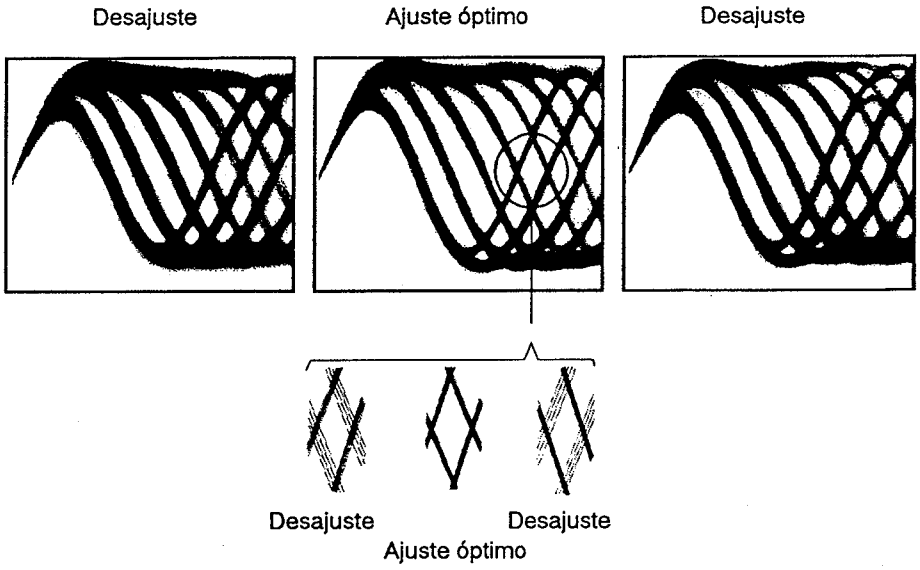


Figura 5 Patron Optico

5. Ajuste del nivel de RF

● Objetivo ● Síntomas en caso de desajuste	Optimización de la amplitud de la señal de RF de reproducción La reproducción no se inicia o la búsqueda de canciones es imposible.		
● Conexión de los instrumentos de medición	Conecte el osciloscopio a TP1, patilla 1, (RF). [Ajustes] 50 mV/división 10 ms/división modo de CA	● Estado del reproductor ● Lugar de ajuste ● Disco	Modo de prueba, reproducción VR1 (potencia de láser) YEDS-7

[Procedimiento]

1. Mueva el captor hasta la mitad del disco (R = 35 mm) con la tecla TRACK SEARCH FWD ▶▶| o REV |◀◀, presione la tecla MULTI MEMORY STORE, depués la tecla PLAY ▶, por este orden a fin de cerrar los servos respectivos, y ponga el reproductor en el mode de reproducción.
2. Ajuste VR1 (potencia de láser) de forma que la amplitud de la señal de RF sea de 1,2 Vp-p ± 0,1 V.

6. Ajuste de la ganancia del bucle del servo de enfoque

● Objetivo ● Síntomas en caso de desajuste	Optimización de la ganancia del bucle del servo de enfoque La reproducción no se inicia o el actuador de enfoque produce ruido.		
● Conexión de los instrumentos de medición	Consulte la figura 6. [Ajustes] CH1 CH2 20 mV/división 5 mV/división Modo X-Y	● Estado del reproductor ● Lugar de ajuste ● Disco	Modo de prueba, reproducción VR152 (FCS GAN) YEDS-7

[Procedimiento]

1. Ajuste la salida del generador de AF a 1,2 kHz y 1 Vp-p.
2. Presione la tecla TRACK SEARCH FWD ▶▶| o REV |◀◀ para mover el captor hasta la mitad del disco (R = 35 mm), y después presione la tecla MULTI MEMORY STORE, la tecla PLAY ▶, y después la tecla PAUSE ▮▮, por este orden, a fin de cerrar los servos correspondientes y poner el reproductor en el modo de reproducción.
3. Ajuste VR152 (FCS GAN) hasta que la forma de onda de Lissajous sea simétrica alrededor del eje X y el eje Y.

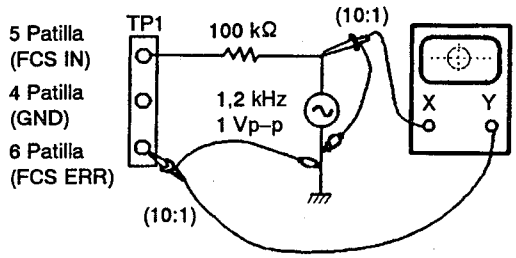
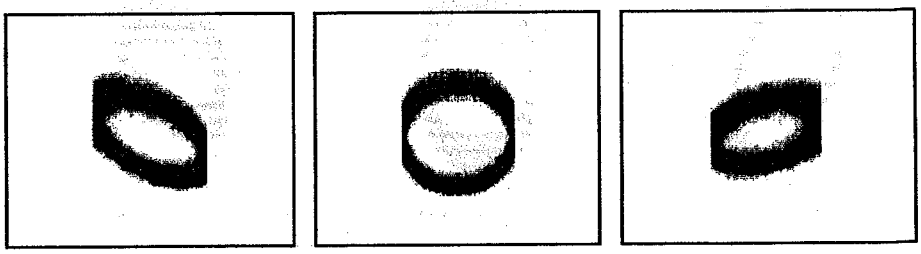


Figura 6

Ajuste de la ganancia de enfoque



Ganancia superior Ganancia óptima Ganancia inferior

7. Ajuste de la ganancia del bucle del servo de seguimiento

● Objetivo ● Síntomas en caso de desajuste	Optimización de la ganancia del bucle del servo de seguimiento La reproducción no se inicia, el actuador de enfoque produce ruido, o se saltan pistas.		
● Conexión de los instrumentos de medición	Consulte la figura 7. [Ajustes] CH1 CH2 50 mV/división 50 mV/división Modo X-Y	● Estado del reproductor ● Lugar de ajuste ● Disco	Modo de prueba, reproducción VR151 (TRK GAN) YEDS-7

[Procedimiento]

1. Ajuste la salida del generador de AF a 1,2 kHz y 1 Vp-p.
2. Presione la tecla TRACK SEARCH FWD ▶▶| o REV |◀◀ para mover el captor hasta la mitad del disco (R = 35 mm), y después presione la tecla MULTI MEMORY STORE, la tecla PLAY ▶, y la tecla PAUSE ▮▮, por este orden, a fin de cerrar los servos respectivos y poner el reproductor en el modo de reproducción.
3. Ajuste VR151 (TRK GAN) hasta que la forma de onda de Lissajous sea simétrica alrededor del eje X y el eje Y.

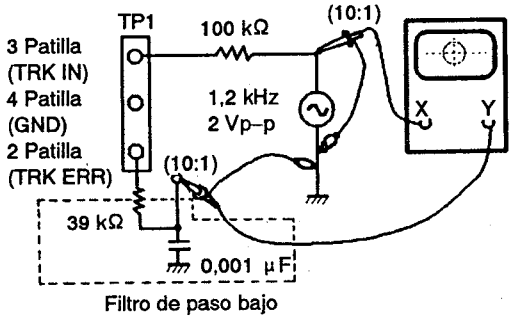
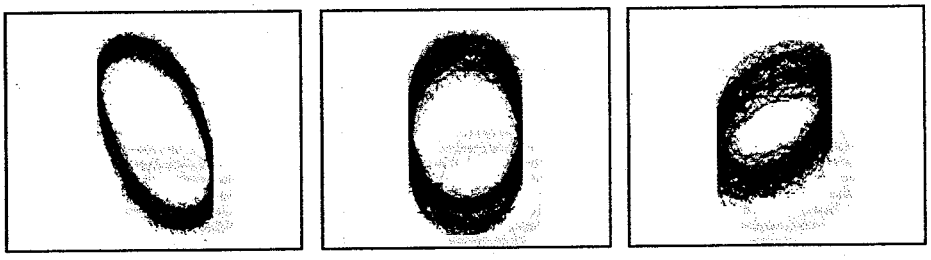


Figura 7

Ajuste de la ganancia de seguimiento



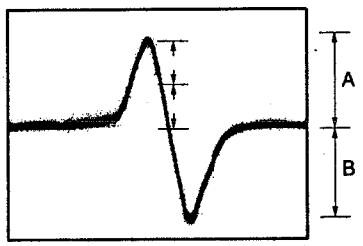
Ganancia superior | Ganancia óptima | Ganancia inferior

8. Verificación de la señal de error de enfoque (curva S de enfoque)

● Objetivo ● Síntomas en caso de desajuste	Juzgar si el captor est'a bien o no observando la señal de error de enfoque. El captor se juzga por la amplitud de la señal de error de seguimiento (como se ha indicado en la sección sobre el ajuste del equilibrio de error de seguimiento) y la forma de onda de la señal de error de enfoque.		
● Conexión de los instrumentos de medición	Conecte el osciloscopio a TP1, patilla 6, (FCS ERR). [Ajustes] 100 mV/división 5 ms/división modo de CC	● Estado del reproductor ● Lugar de ajuste ● Disco	Modo de prueba, parada Ninguno YEDS-7

[Procedimiento]

1. Conecte TP1, patilla 5, a masa.
2. Coloque el disco.
3. Contemplando la pantalla del osciloscopio, presione la tecla MULTI MEMORY STORE y observe durante un momento la forma de onda de la figura 8. Verifique si la amplitud es de 2,5 Vp-p por lo menos y si la amplitud de las partes positiva y negativa son iguales. Como la forma de onda solamente sale durante un momento cuando se presiona la tecla MULTI MEMORY STORE, presione una y otra vez esta tecla hasta que logre comprobar la forma de onda.



A = B
A + B ≧ 2,5 Vp–p

Figura 8

[Juicio sobre el captor]

No juzgue el captor hasta haber finalizado correctamente todos los ajustes. En los casos siguientes es posible que haya algo erróneo en el captor.

1. La amplitud de la señal de error de seguimiento es extremadamente pequeña (menos de 2 Vp-p).
2. La amplitud de la señal de error de enfoque es extremadamente pequeña (menos de 2,5 Vp-p).
3. Las amplitudes de las partes positiva y negaiva de la señal de error de enfoque son extremadamente asimétricas (relación de 2:1 o superior).
4. La señal de RF es demasiado pequeña (menos de 0,8 Vp-p) y aunque se ajuste VR1 (potencia de láser), la señal de RF no puede aumentarse hasta el nivel estándar.

7. IC INFORMATION

● PD2028A (D/A CONVERTER)

Pin Function

Pin No.	Symbol	I/O	Function	Remarks
1	GNDA	—	Ground terminal for DA converter (RO–)	
2	RO–	O	R channel data output terminal	
3	RO+	O	R channel data output terminal	
4	GNDA	—	Ground terminal for DA converter (RO+)	
5	VDDA	—	Power terminal for DA converter (RO+)	
6	VDDX	—	Power terminal of oscillation section	
7	XO	O	Crystal oscillator connection terminal	
8	XI	I	Generates clocks necessary for system by connecting the crystal oscillator.	
9	GNDX	—	Ground terminal of oscillation section	
10	VDDA	—	Power terminal for DA converter (LO–)	
11	GNDA	—	Ground terminal for DA converter (LO–)	
12	LO–	O	L channel data output terminal	
13	LO+	O	L channel data output terminal	
14	GNDA	—	Ground terminal for DA converter (LO+)	
15	VDDA	—	Power terminal for DA converter (LO+)	
16	VDD	—	Power terminal of logic section	
17	$\overline{\text{RESET}}$	I	Reset terminal. "L": resets the Σ Δ circuit.	With pull–up resistor
18	LZ	O	L channel digital zero detection output terminal	
19	WCK	I	Word clock input terminal	
20	BCK	I	Bit clock input terminal	
21	DLI	I	L channel data input terminal	
22	DRI	I	R channel data input terminal	
23	M1	I	Mode setting terminal 1	
24	M2	I	Mode setting terminal 2	
25	RZ	O	R channel digital zero detection output terminal	
26	MCK	O	System clock output terminal	
27	GNDD	—	Ground terminal of logic section	
28	VDDA	—	Power terminal for DA converter (RO–)	

8. FOR PD–M750/KU, HEM AND SD TYPES

CONTRAST OF MISCELLANEOUS PARTS

NOTES:

- Parts without part number cannot be supplied.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "⊙" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.

The PD–M750/KU, HEM and SD types are the same as the PD–M51/KU type with the exception of the following sections.

Mark	Symbol & Description	Part No.				Remarks
		PD–M51/ KU type	PD–M750/ KC type	PD–M750/ HEM type	PD–M750/ SD type	
⊙	Main board assembly	PWZ2052	PWZ2052	PWZ2053	PWZ2054	
⊙	Audio board assembly	PWM1413	PWM1413	PWM1414	PWM1413	
	Headphone board assembly	Non supply	Non supply	Non supply	Non supply	
	Transformer board assembly	Non supply	Non supply	Non supply	Non supply	
⚠	Strain relief	CM–22C	CM–22C	CM–22B	CM–22B	
⚠	AC Power cord	PDG1015	PDG1015	PDG1003	PDG1013	
⚠	Power transformer/W (AC120V)	PTT1175	PTT1175	.....	.....	
⚠	Power transformer/W (AC110/120–127/220/240V)	.....	.....	.....	PTT1177	
⚠	Power transformer/W (AC220–230/230–240V)	.....	.....	PTT1176	.....	
⚠	Power transformer/VA (AC120V)	PTT1192	PTT1192	.....	.....	
⚠	Power transformer/VA (AC110/120–127/220/240V)	.....	.....	.....	PTT1194	
⚠	Power transformer/VA (AC220–230/230–240V)	.....	.....	PTT1193	.....	
⚠	Voltage selector	.....	.....	.....	PSB1002	
	Display screen	PAM1479	PAM1479	PAM1507	PAM1479	
	Front panel assembly	PEA1163	PEA1150	PEA1150	PEA1150	
	Packing case	PHG1613	PHG1665	PHG1688	PHG1688	
	Cord with mini plug	PDE–319	PDE–319	.....	.....	
	Operating instructions (English)	PRB1150	PRB1150	.....	PRB1150	
	Operating instructions (French)	.....	PRC1034	.....	.....	
	Operating instructions (English/French/German/Italian)	.....	.....	PRE1146	.....	
	Operating instructions (Dutch/Swedish/Spanish/Portuguese)	.....	.....	PRF1045	.....	

MAIN BOARD ASSEMBLY (PWZ2054 and PWZ2053)

The main board assemblies (PWZ2054 and PWZ2053) are the same as the main board assembly (PWZ2052) with the exception of the following sections.

Mark	Symbol & Description	Part No.			Remarks
		PWZ2052	PWZ2054	PWZ2053	
	D391–D394 J391, J392	1SS254 RKN1004	....	....	

AUDIO BOARD ASSEMBLY (PWM1414)

The audio board assembly (PWM1414) is the same as the audio board assembly (PWM1413) with the exception of the following sections.

Mark	Symbol & Description	Part No.		Remarks
		PWM1413	PWM1414	
	Q501 R531 R532	....	2SA1399 RD1/6PM103J RD1/6PM332J	

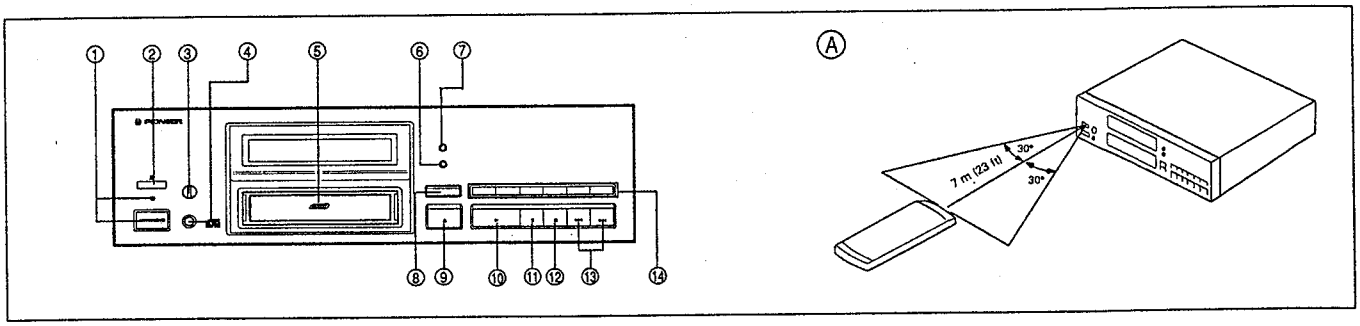
HEADPHONE BOARD ASSEMBLY

The headphone board assembly of PD–M750/HEM type is the same as that of PD–M51/KU type for the service supply parts.

TRANSFORMER BOARD ASSEMBLY

The transformer board assembly of PD–M750/HEM type is the same as that of PD–M51/KU type for the service supply parts.

9. PANEL FACILITIES



① **POWER STANDBY/ON switch/indicator**
② **Remote sensor**
Receives the signal from the remote control unit.
③ **Headphones volume (PHONES LEVEL)**
④ **Headphones jack (PHONES)**
⑤ **Magazine insertion slot**
⑥ **MUSIC TYPE button**
⑦ **MULTI MEMORY STORE button**
⑧ **RANDOM PLAY button**
⑨ **EJECT button (⏏)**
⑩ **PLAY button and indicator (►)**
⑪ **PAUSE button and indicator (❚❚)**
⑫ **STOP button (■)**
⑬ **TRACK search buttons (⏮/⏭)**
⑭ **DISC NUMBER buttons (DISC 1 - DISC 6)**

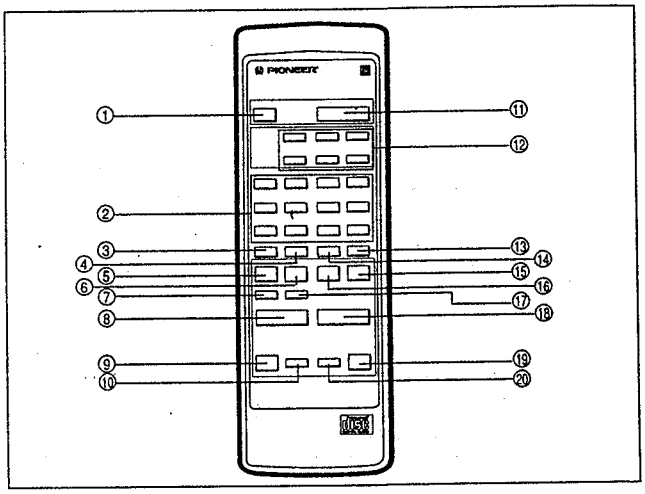
Ⓐ REMOTE CONTROL OPERATIONS

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.*

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

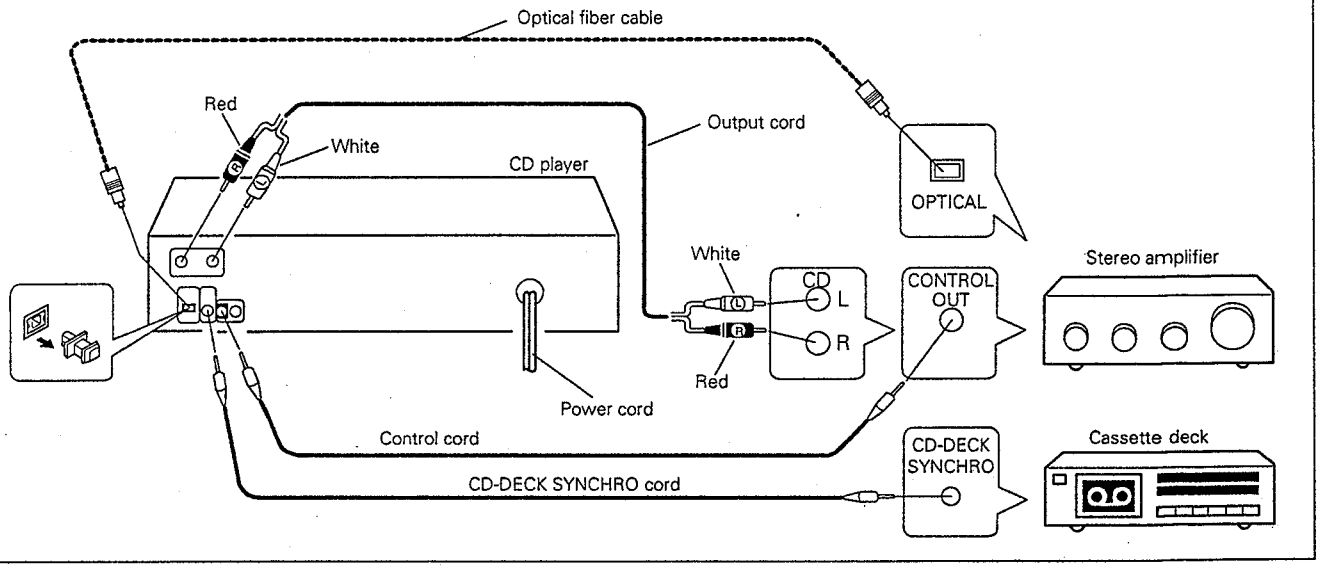
REMOTE CONTROL UNIT



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 **POWER button**
② **Track number/Digit buttons (1-10, +10, ≧20)**
③ **PGM (program) button**
④ **CHECK button**
⑤ **RANDOM play button**
⑥ **STOP button (■)**
⑦ **COMPU EDIT button**
⑧ **MANUAL search button (◄◄ / ►►)**
⑨ **HI-LITE scan button**
⑩ **TIME button**
⑪ **OUTPUT LEVEL button (+/–)**
⑫ **DISC NUMBER buttons (1 - 6)**
⑬ **DELETE button**
⑭ **CLEAR button**
⑮ **PLAY button (►)**
⑯ **PAUSE button (❚❚)**
⑰ **TIME FADE EDIT button**
⑱ **TRACK search button (⏮ / ⏭)**
⑲ **ADLC button**
⑳ **REPEAT button**

- Make sure that all of the components are turned off before making connections.



Making connections

1 Connect the OUTPUT jacks of this unit to the input jacks (CD or AUX) of the amplifier. Make sure that the white plugs are connected to the left (L) jacks and the red plugs to the right (R) jacks.
- Be sure not to connect this unit to the amplifier's PHONO jacks, as sound will be distorted and normal playback will not be possible.

2 Connect the power cord to a household AC wall outlet or an AC outlet on your amplifier.
- Make sure plugs are inserted fully into the jacks and wall outlet.

Connecting to an optical digital jack

This unit can be connected to an amplifier equipped with an optical digital jack.

1. Remove the protective dust cap from this unit's OPTICAL DIGITAL OUT jack.
2. Use an optical fiber cable to connect OPTICAL DIGITAL OUT jack of this unit to the optical digital input jack of the amplifier.

- Align the plug of the optical fiber cable with the optical digital jack and fully insert the plug to make a secure connection.

Use a separately sold optical fiber cable for the optical digital jack connections. However, when making optical digital connections, the player can only be connected to an amplifier which uses the same type of optical transmission/reception module.

Precautions concerning use of optical fiber cables

- Fully insert the optical fiber cable plugs all the way into the jacks.
- Be careful not to fold or crimp the cable. When coiling an optical fiber cable for storage, make sure the diameter of the coil is 15 cm (6 in) or larger.
- Use an optical fiber cable with a length of 3 m (9 ft) or less.
- Protect the optical fiber cable plugs from scratches and dust.
- When the unit is not connected using an optical fiber cable, be sure to keep the protective dust cap plugged into the optical digital output jack at all time.

CD-Deck synchro function

If you have a Pioneer cassette deck provided with the CD-Deck synchro function, connect the CD-DECK SYNCHRO jacks of the CD player and cassette deck. With this function, synchro recording can be carried out between player and deck.

- For details on connections and operation, refer to the instruction manual supplied with the cassette deck.
- The CD-DECK SYNCHRO cord is not supplied with the CD player.

NOTE:

When only the digital output is connected, the CD-Deck synchro recording does not function. To operate it, connect the output cord to the stereo amplifier as well as connecting the digital output.

System remote control with a Pioneer stereo amplifier that has the SR mark

(Available with PD-M51 and Canadian model of PD-M750 only)

When a Pioneer stereo amplifier bearing the SR mark is used, connect the CONTROL IN jack on the rear panel of the CD player to the CONTROL OUT jack of the amplifier. This will enable the CD player to be controlled using the remote control unit supplied with the stereo amplifier. If you do not plan to use this feature, it is not necessary to connect CONTROL IN/OUT jacks.

- The control cord is supplied with the CD player.
- The remote control unit supplied with the amplifier can be used to control Play, Stop, Pause, Track/Disc Search and Disc Change operations.
- For instructions regarding connections and operation, refer to the operating instruction manual provided with your stereo amplifier.

NOTES:

- *When a control cord is connected to the player's CONTROL IN jack, direct control of the player with the remote control unit is not possible. Operate the player with the remote control unit by aiming it at the amplifier.*
- *Be sure to connect both of the control cord's plugs securely to the CONTROL IN and CONTROL OUT terminals. Do not connect only one end of the cord.*
- *When only the optical digital output is connected, the remote sensor of the amplifier does not function. To operate it, connect the output cord to the stereo amplifier as well as connecting the digital output.*
- *Be sure to turn off the power of the amplifier when connecting the power cord and output cord.*

10. SPECIFICATIONS

1. General

Type ..... Compact disc digital audio system
Power requirements
European models .....AC 220 - 230 V, 50/60 Hz
U.K., Australian models .....AC 230 - 240 V, 50/60 Hz
U.S., Canadian models .....AC 120 V, 60 Hz
Other models ..... AC 110/120 - 127/220/240V (switchable) 50/60 Hz
Power consumption 19W
Operating temperature ..... +5°C - +35°C (+41°F - +95°F)
Weight ..... 6.3 kg (13 lb, 14 oz)
External dimensions ..... 420(W) X 328(D) X 130(H) mm 16-9/16(W) X12-15/16(D) X 5-2/16(H) in

2. Audio section

Frequency response ..... 2 Hz - 20 kHz
S/N ratio ..... 110 dB or more (EIAJ)
Dynamic range ..... 98 dB or more (EIAJ)
Channel separation .....105 dB or more (EIAJ)
Harmonic distortion .....0.002 % or less (EIAJ)
Output voltage .....2.0 V
Wow and flutter .....less than ±0.001% (W.PEAK) (below measurable level) (EIAJ)
Channels ..... 2-channel (stereo)

3. Output terminal

Audio line output
Digital optical output
Headphone jack with volume control
Control input/output jacks (Equipped with PD-M51 and Canadian models of PD-M750 only)
CD-DECK SYNCHRO jack

4. Functions

Number of discs to be stored - maximum 6.

Basic Operation Buttons
- PLAY, PAUSE, STOP

Search Function
- Disc Search
- Track Search
- Manual Search

Programming
- Maximum 40 steps
- Pause
- Program Check/Correction (remote control unit)
- Program Clear (single track or all tracks)
- Delete Play

Repeat Functions
- 1 Track Repeat
- All Discs Repeat
- Program Repeat
- Random Play Repeat
- Delete Play Repeat
- Delete Random Play Repeat
- Magazine Hi-Lite Scan Repeat

Random Play
- Random Play (repeat also available)
- Delete Random Play (repeat also available)

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

Timer Start

Digital Level Controller
Volume control can be done.

Compu Program Editing
Selects the tracks for both sides of the tape within the specified time.

Time Fade Editing
Selects the tracks within the specified time. Playback stops with a fade-out.

Magazine Hi-Lite Scan
- DISC SCAN
- TRACK SCAN

Multi-Memory
Stores programs/music type/disc data

Power On/Off (remote control unit)

Automatic Power On Function

Power Down Eject Function

5. Display

FL Tube Display
- Elapsed Time Display (min, sec)
- Remaining Time (track/disc) Display
- Total Time Display
- Disc Number, Track Number
- Program Step Number
- Program Indicator
- Repeat Indicator
- Random Play Indicator
- ATT Level Display
- Time Fade Editing Indicator
- Compu Program Editing Indicator
- Delete Indicator
- Multi-Memory Disc Data/Music Type/Program/Delete Indicators
- Disc Symbol Indicators
- Music calendar
- ADLC indicator
- DISC SCAN indicators
- FADER indicators

6. Accessories

- Remote control unit 1
- Size AAA/R03/dry batteries 2
- Six-compact-disc magazine 1
- Single-compact-disc magazine 1
- Output cord 1
- Control cord 1
(PD-M51 and Canadian model of PD-M750 only)
- Operating instructions 1

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