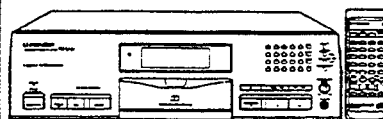


Service Manual

PIONEER®
The Art of Entertainment



● PD - S702/HD

ORDER NO.
ARP2729

COMPACT DISC PLAYER

PD-S702

PD-S702-G

PD-S702 AND PD-S702-G HAVE THE FOLLOWING :

Type	Model		Power Requirement	Remarks
	PD-S702	PD-S702-G		
HB	○	—	AC220-230V, 230-240V (switchable) *	
HEM	○	○	AC220-230V, 230-240V (switchable) *	
HPW	○	—	AC220-230V, 230-240V (switchable) *	
SD	○	—	AC110V, 120-127V, 220V, 240V (switchable)	

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

- This manual is applicable to the following : PD-S702/HD; HEM, HPW and SD; PD-S702-G/HEM.
- For the following : PD-S702/HEM, HPW and SD; PD-S702-G/HEM, refer to page 32.

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IFJ APR. 1993 Printed in Japan

1. SAFETY INFORMATION

(FOR EUROPEAN MODEL ONLY)

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

ADVERSEL:
USYNLIG LASERSTRÅLING VED ÅBNING
NÅR SIKKERHEDSAFBRYDERE ER UDE AF
FUNKTION UDGÅ UDSÆTTELSE FOR
STRÅLING.

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



LASER
Kuva 1
Lasersateilyn
varoituserkki

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.



LASER
Picture 1
Warning sign for
laser radiation

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

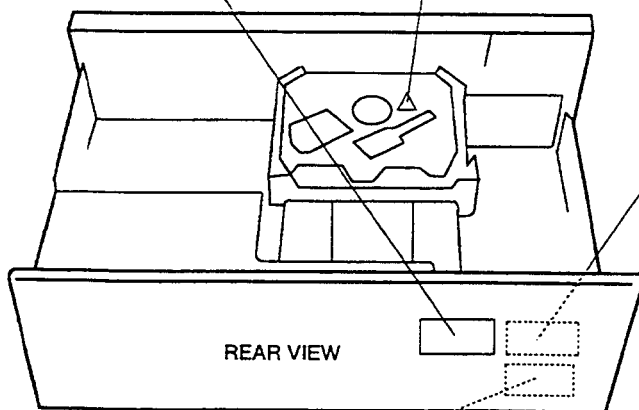
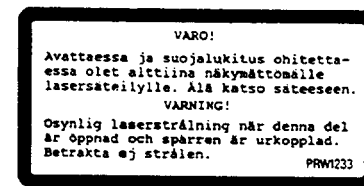
LASER DIODE CHARACTERISTICS
MAXIMUM OUTPUT POWER: 5 mw
WAVELENGTH: 780-785 nm

LABEL CHECK

HB and HEM types

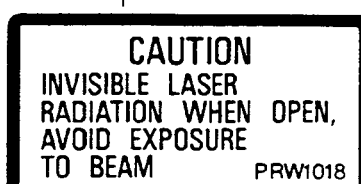
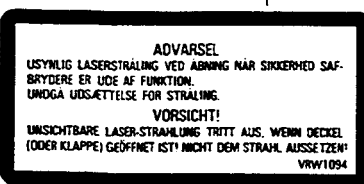


HEM type



Additional Laser Caution

- Laser Interlock Mechanism**
The position of the switch (S601) for detecting loading completion is detected by the system microprocessor, and the design prevents laser diode oscillation when the switch (S601) is not CLMP terminal side (when CLMP signal is OFF, that is, high level). Thus, the interlock will no longer function if the switch (S601) is deliberately set to CLMP terminal side (if CLMP signal is low level). In the test mode *, the interlock mechanism will not function. Laser diode oscillation will continue, if pin 1 of M51593FP (IC101) on the preamplifier board loaded on pickup assembly are connected to GND, or pin 19 is connected to low level (ON), or else the terminals of Q101 are shorted to each other (fault condition).
- When the cover is opened with the servo mechanism block removed to be turned over, close viewing of the objective lens with the naked eye will cause exposure to a Class 1 laser beam.



HEM type

HB type

* : Refer to page 24.

2. DISASSEMBLY

2.1 REMOVE THE TRAY PANEL AND THE TRAY LENS

Hold the tray panel with your hands as shown in Fig. 1, and grasp the tray with your thumbs and then lift the tray panel up while pulling it toward you with the other fingers. (Fig. 2)

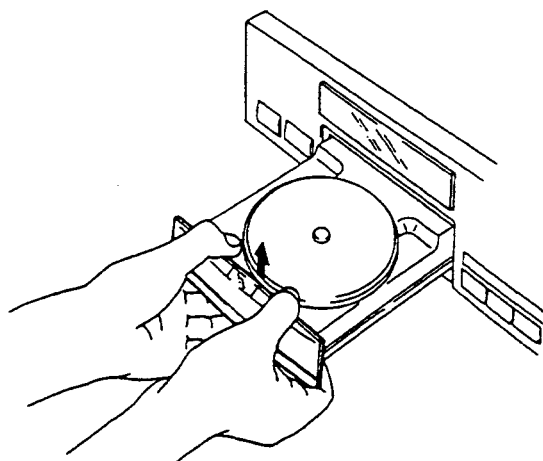


Fig. 1

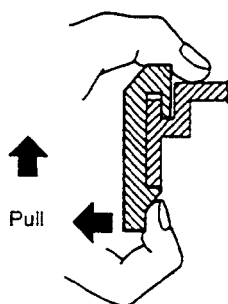


Fig. 2

2.2 INSTALL THE TRAY PANEL AND THE TRAY LENS

Align the tray panel with the grooves located at both edges of the tray while holding the tray lens with your fingers, and then press it down till it stops. (Fig. 3)

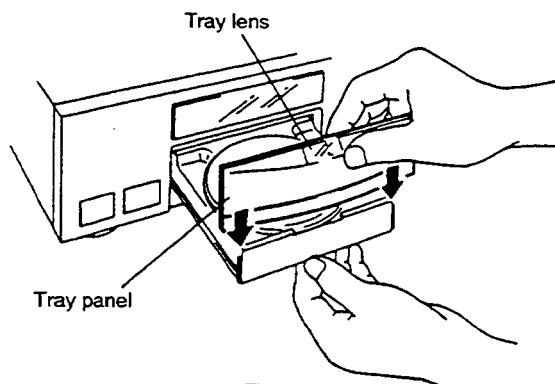


Fig. 3

Hold the tray panel and the tray as shown in Fig. 4, and slide them down till you hear a click sound while pressing strongly with your thumbs. (Fig. 5)

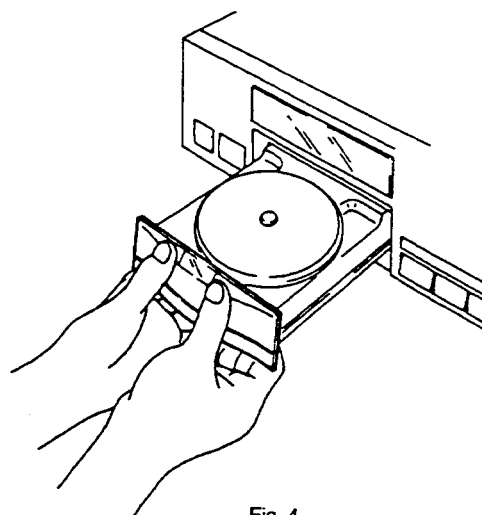


Fig. 4

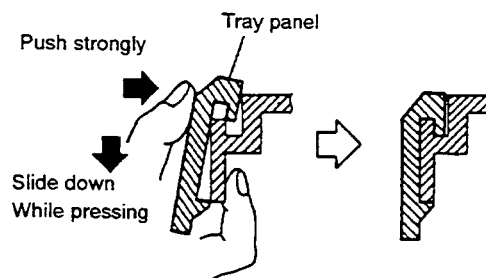


Fig. 5

3. EXPLODED VIEWS, PACKING AND PARTS LIST

NOTES:

- Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.
- 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.
- Parts marked by "⊙" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.

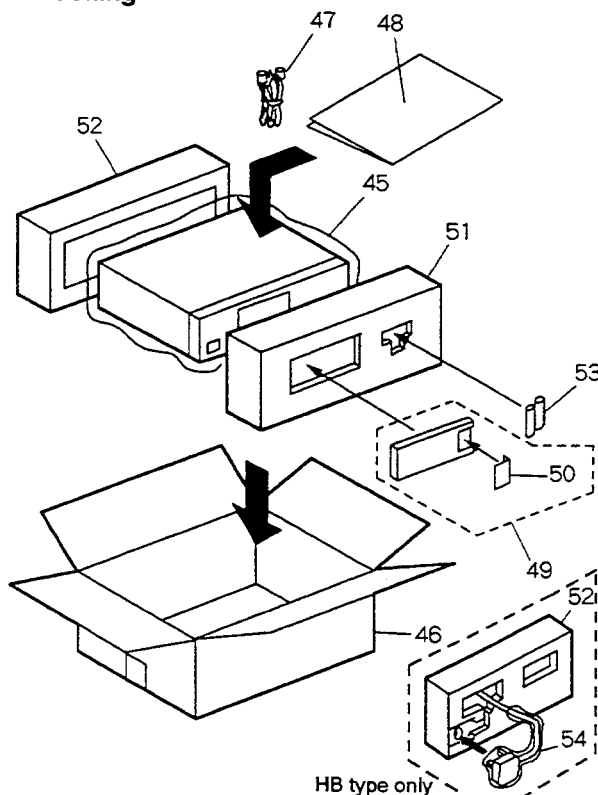
3.1 EXTERIOR SECTION AND PACKING

Parts List

Mark	No.	Description	Part No.
	1	Front panel 7	PAN1280
	2	Name plate	VAM1032
	3	Function panel 7	PNW2278
	4	Display window	PAM1609
	5	LED lens	PNW2019
	6	Power button 78	PAC1743
	7	28 key	PAC1734
	8	Function button 78	PAC1744
NSP	9	SW PCB assembly	PWZ2537
	10	Screw	PPZ30P150FMC
	11	FUNCTION PCB assembly	PWZ2536
	12	Tray panel	PNW2280
	13	.....	
	14	Screw	BBT30P080FCC
	15	Tray lens	PNW2242
	16	Screw	IBZ30P060FCC
	17	Screw	IBZ30P080FCC
	18	Insulator	PNW1912
	19	Screw	PPZ30P050FMC
NSP	20	PCB spacer	PNY-404
	21	MAIN PCB assembly	PWZ2499
NSP	22	Under base 7	PNA1969
	23	Screw	BBZ30P080FCC
Δ	24	Power transformer (11W)(AC220-230/230-240V)	PTT1242
Δ	25	Cord stopper	CM-22B
Δ	26	AC power cord HB	VDG1051
	27	Screw	IBZ30P150FCC
	28	Screw	PDZ30P050FMC
	29	Screw	FBT40P080FZK
	30	.....	
	31	Bonnet	PYY1175
NSP	32	Rear base B7	PNA2021
NSP	33	HEADPHONE PCB assembly	PWZ2497
NSP	34	MOTOR VR PCB assembly	PWZ2498
	35	SERVO TRANS. PCB assembly	PWZ2539
NSP	36	Loading mechanism assembly TT	PXA1521
Δ	37	Fuse (FU1:T13A)	VEK1003
	38	Fuse holder	VKR1002
NSP	39	Cushion (3.5)	PEB1110
NSP	40	Spacer A	PEB1228
NSP	41	H. P. angle	PNB1434

Mark	No.	Description	Part No.
NSP	42	PCB holder	PNW2100
	43	H. P. lens	PNW2157
	44	Knob C	RAC1608
	45	Mirror mat sheet	Z23-007
	46	CD packing case B7	PHG1962
	47	Cord with plug	PDE1001
	48	Operating instructions (English)	PRB1196
	49	Remote control unit	PWW1069
	50	Battery cover	PZN1001
	51	Protector F	PHA1243
	52	Protector R	PHA1253
NSP	53	Battery (R03, AAA)	VEM-022
	54	Polyethylene bag	Z21-013
NSP	55	Cord holder	DNF1128
	56	Screw	IBZ30P050FZK
	57	Cord clammer	RNH-184

● Packing



Accessories for the volume on
the MOTOR VR PCB assembly.

Accessories for the
HEADPHONE PCB assembly.

3.2 LOADING MECHANISM ASSEMBLY TT

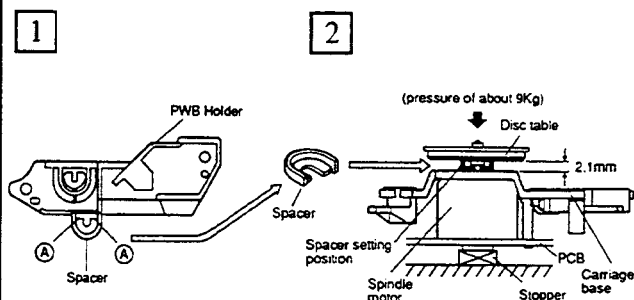
Parts List

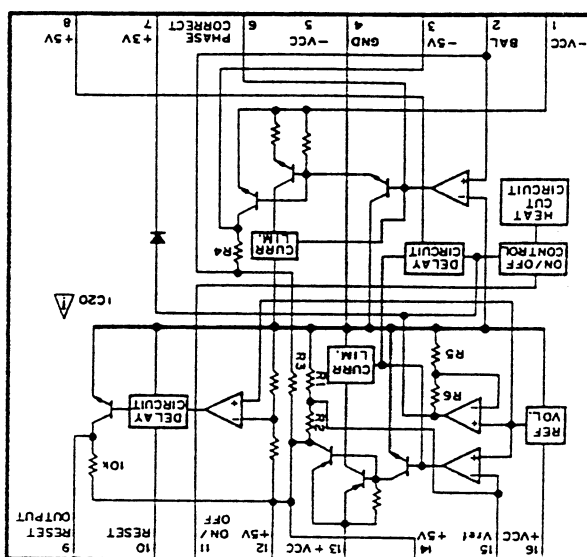
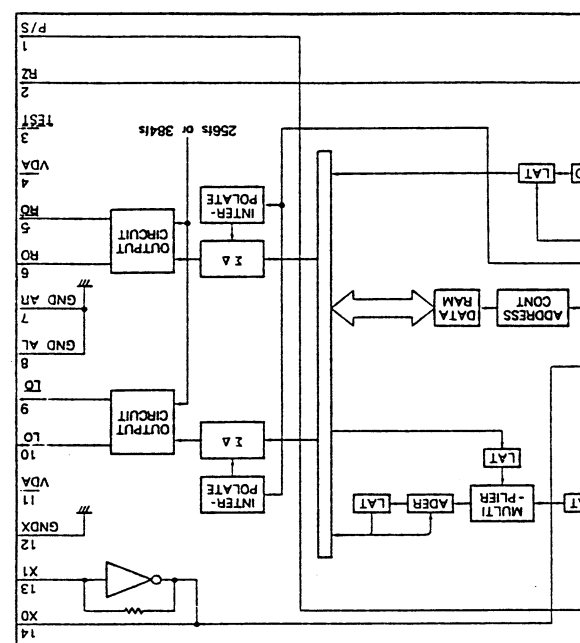
Mark	No.	Description	Part No.
	1	Lever switch (S601)	DSK1003
	2	Float screw	PBA1027
	3	Rubber belt	PEB1186
	4	Motor pulley	PNW1634
	5	Drive gear	PNW1996
	6	Synchronized lever	PNW2168
	7	Gear pulley	PNW1998
	8	SW head	PNW1999
	9	Float base	PNW2000
	10	Left cam	PNW2001
	11	Right cam	PNW2002
	12	Float spring	PBH1120
	13	Lock spring	PBH1121
	14	Float rubber	PEB1014
	15	Table rubber sheet	PEB1181
	16	Tray	PNW2003
	17	Table guide	PNW2004
	18	Lock plate	PNW2005
	19	D.C. motor (0.75W, LOADING)	PXM1010
	20	Float rubber	PEB1031
	21	Float rubber	PEB1170
	22	Screw	BMZ26P040FMC
	23	Screw	IPZ26P060FCU
	24	Screw	IPZ20P080FMC
	25	Turn table assembly	PEA1165
	26	• • • • •	
NSP	27	Loading base	PNW1995
NSP	28	Table shaft holder	PXA1383
NSP	29	Turn table (AL)	PNR1035
	30	Carriage D.C. motor (0.3W)	PXM1027
	31	Pinion gear	PNW2055
	32	D.C. motor assembly (SPINDLE, with oil)	PEA1236
	33	Carriage base	PNW2058
	34	Disc table	PNW1067
	35	Screw	JFZ20P030FNI
	36	Screw	JFZ17P025FZK
	37	Gear 3	PNW2054
	38	Gear 2	PNW2053
	39	Washer	WT12D032D025
	40	Pickup assembly	PEA1179
	41	Guide bar	PLA1094
	42	Gear 1	PNW2052
NSP	43	Gear stopper	PNB1303
	44	Screw	BPZ20P060FMC
	45	Earth spring	PBH1132
NSP	46	Mechanism base TT	PNB1431
	47	Screw	BPZ26P100FMC
	48	PWB holder	PNW2057

Mark	No.	Description	Part No.
	49	• • • • •	
NSP	50	Mechanism board assembly	PWX1192
NSP	51	Binder	PEC-107
NSP	52	Servo mechanism assembly TT92	PXA1479
	53	Stop ring	YE20S
	54	Shaft holder	PNB1382
	55	• • • • •	
	56	Screw	BPZ26P060FMC
	57	Screw	BBZ26P060FMC
	58	Earth lead	PDF1148
	59	Caution label	PRW1244

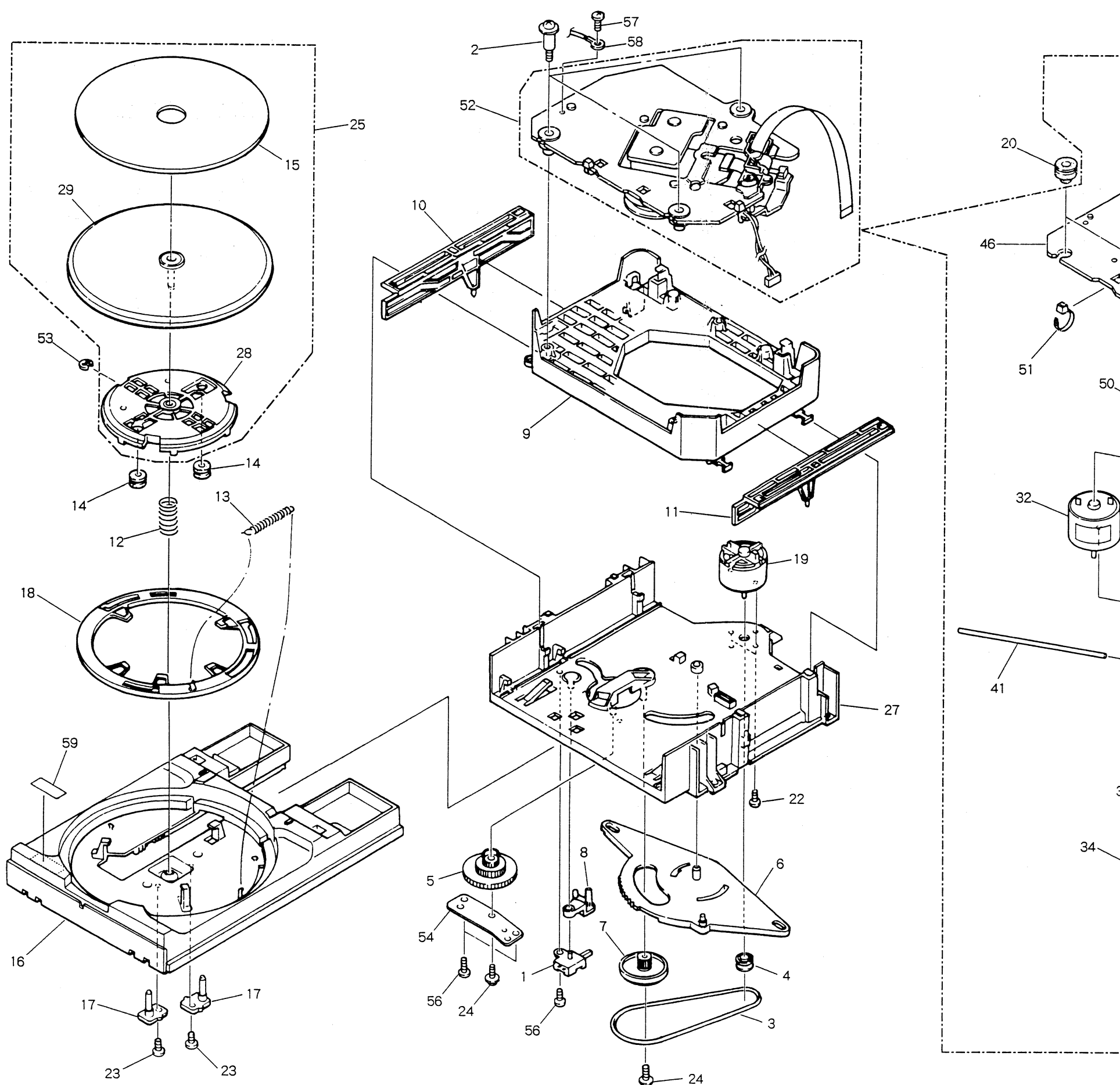
• How to install the disc table

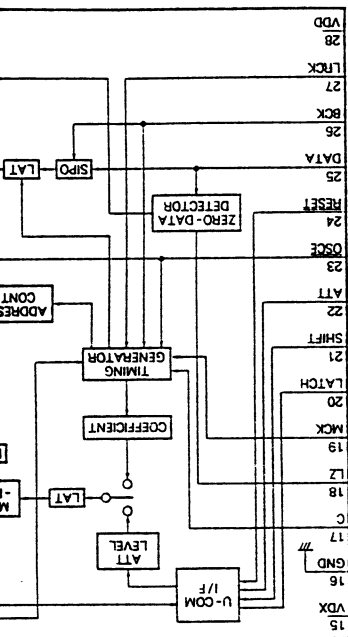
- 1 Use nippers or other tool to cut the two sections marked (A) in figure 1. Then remove the spacer.
- 2 While supporting the spindle motor shaft with the stopper, put the spacer on top of the carriage base and stick the disc table on top (takes about 9Kg pressure).
Take off the spacer.



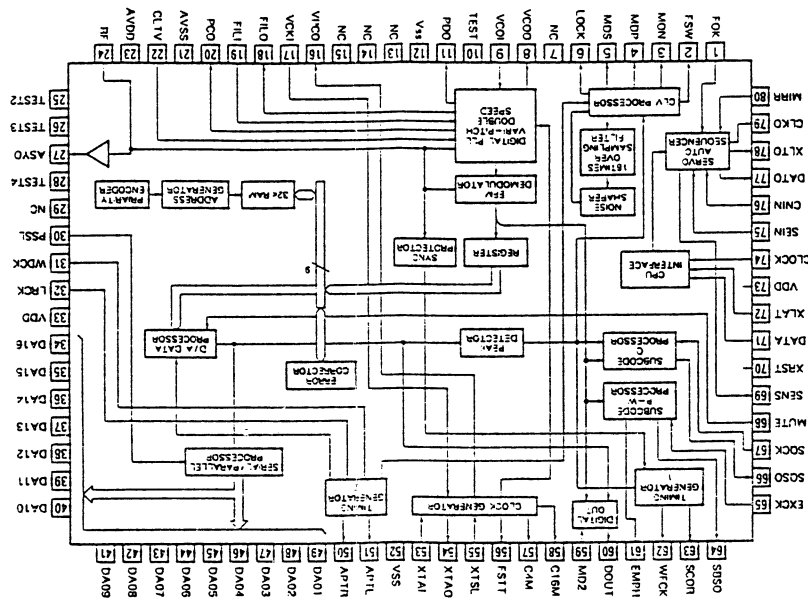


IC20 : M5298P

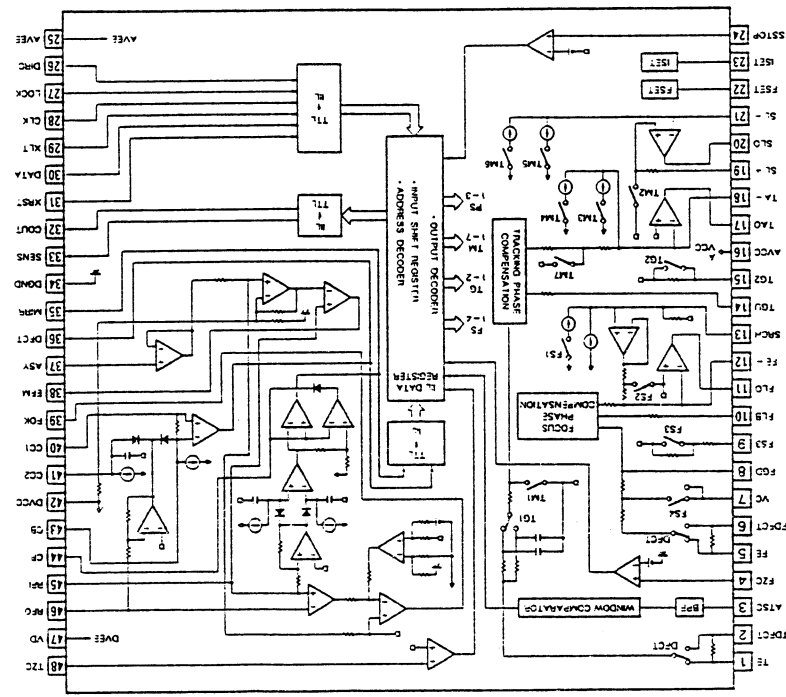




IC401: PD2029A



IC301: CXD2500BQ



IC151: CXA1372Q

● IC BLOCK DIAGRAMS

4. SCHEMATIC AND PCB CONNECTION DIAGRAMS

For SCHEMATIC DIAGRAM

Note: (Type 4)
1. When ordering service parts, be sure to refer to "PARTS LIST of EXPLODED VIEWS" or "PCB PARTS LIST".

2. Since these are basic circuits, some parts of them or the values of some components may be changed for improvement.

3. RESISTORS:
Unit: k Ω , M Ω , or Ω unless otherwise noted.
Rated power: 1/4W, 1/6W, 1/8W, 1/10W unless otherwise noted.
Tolerance: (F): $\pm 1\%$, (G): $\pm 2\%$, (K): $\pm 10\%$, (M): $\pm 20\%$ or $\pm 5\%$ unless otherwise noted.

4. CAPACITORS:
Unit: pF or μ F unless otherwise noted.
Ratings: capacitor (μ F)/voltage (V) unless otherwise noted.
Rated voltage: 50V except for electrolytic capacitors.

5. COILS:
Unit: mH or μ H unless otherwise noted.

6. VOLTAGE AND CURRENT:
 $\square$: DC voltage (V) in PLAY mode unless otherwise noted.
 $\Rightarrow$ mA or $\leftarrow$ mA: DC current in PLAY mode unless otherwise noted.
Value in () is DC current in STOP mode.

7. OTHERS:
● $\rightarrow$: Signal route.
● $\odot$: Adjusting point.
● ∇ (Red): Measurement point.
● The Δ mark found on some component parts indicates the importance of the safety factor of the parts. Therefore, when replacing, be sure to use parts of identical designation.

8. SWITCHES (Underline indicates switch position):

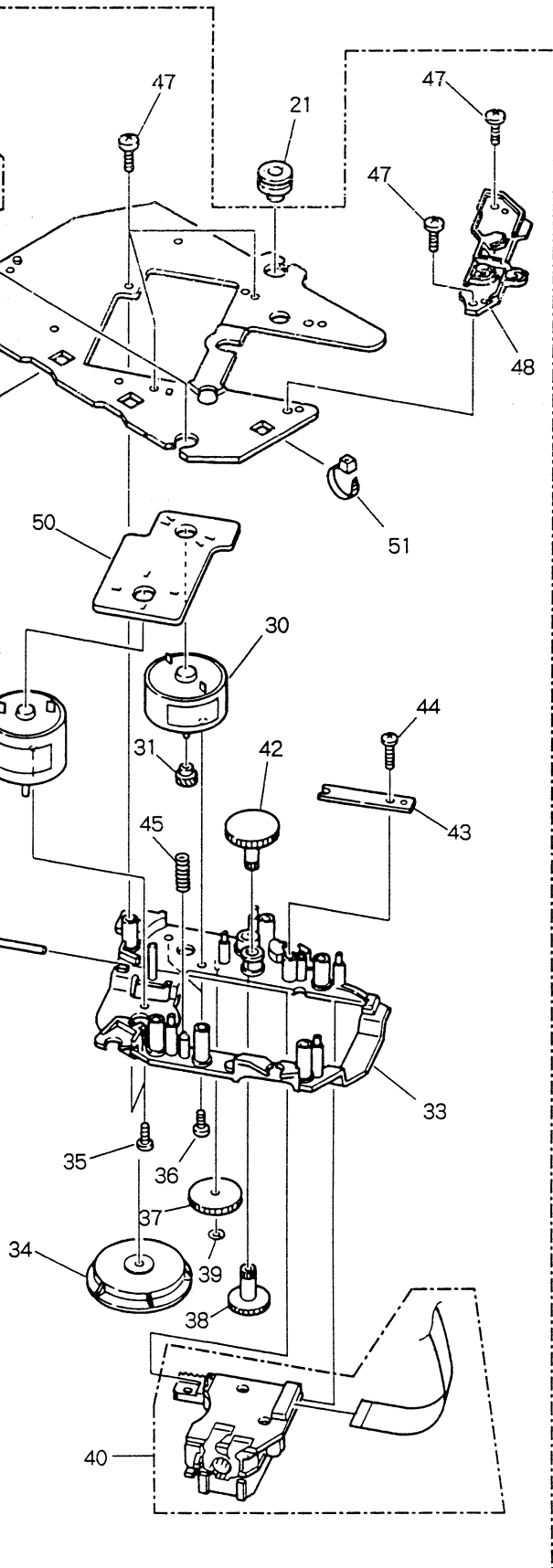
- OUT OF P.C. BOARD ASSEMBLY
S601: CLAMP
MECHANISM BOARD ASSEMBLY
S610: INSIDE
FUNCTION PCB ASSEMBLY
S702: PLAY(▶)
S703: PAUSE(⏸)
S704: OPEN/CLOSE(▲)
S705: TRACK/MANUAL SEARCH(▶▶▶▶)
S706: TRACK/MANUAL SEARCH(◀◀◀◀)
S707: STOP(■)
S708: > 20
S709: CLEAR
S710: CHECK
S711: PGM
S712: 20
S713: 15
S714: 10
S715: 5
S716: COMPU/AUTO EDIT
S717: TIME FADE EDIT
S718: PEAK SEARCH
S719: DELETE
S720: 19
S721: 18
S722: 17
S723: 16
S724: 14
S725: 13
S726: 12
S727: 11
S728: 9
S729: 8
S730: 7
S731: 6
S732: 4
S733: 3
S734: 2
S735: 1

SW PCB ASSEMBLY
S751: TIME
S752: REPEAT
S753: POWER STANDBY ON - OFF
S754: DISPLAY ON - OFF

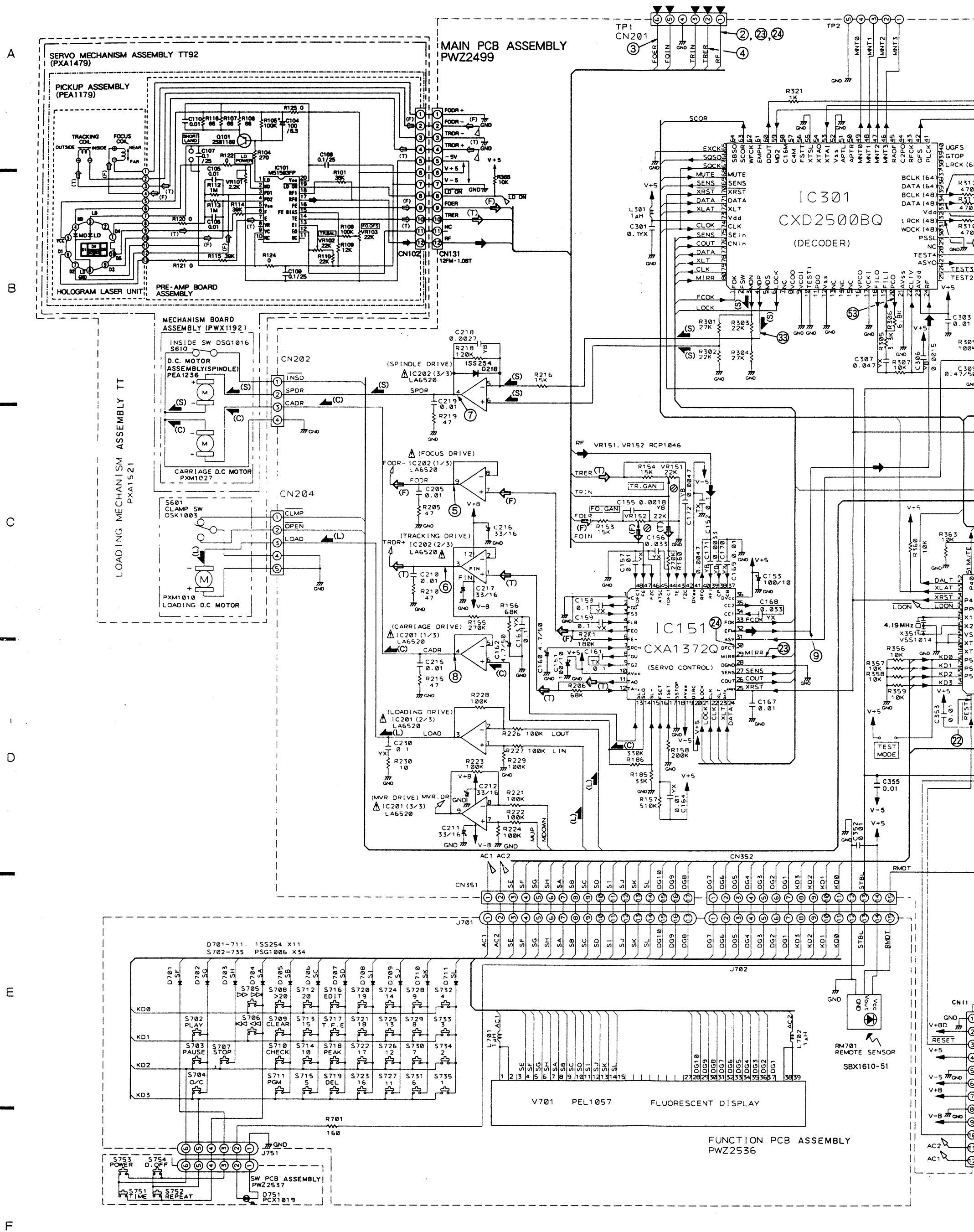
For PCB CONNECTION DIAGRAMS

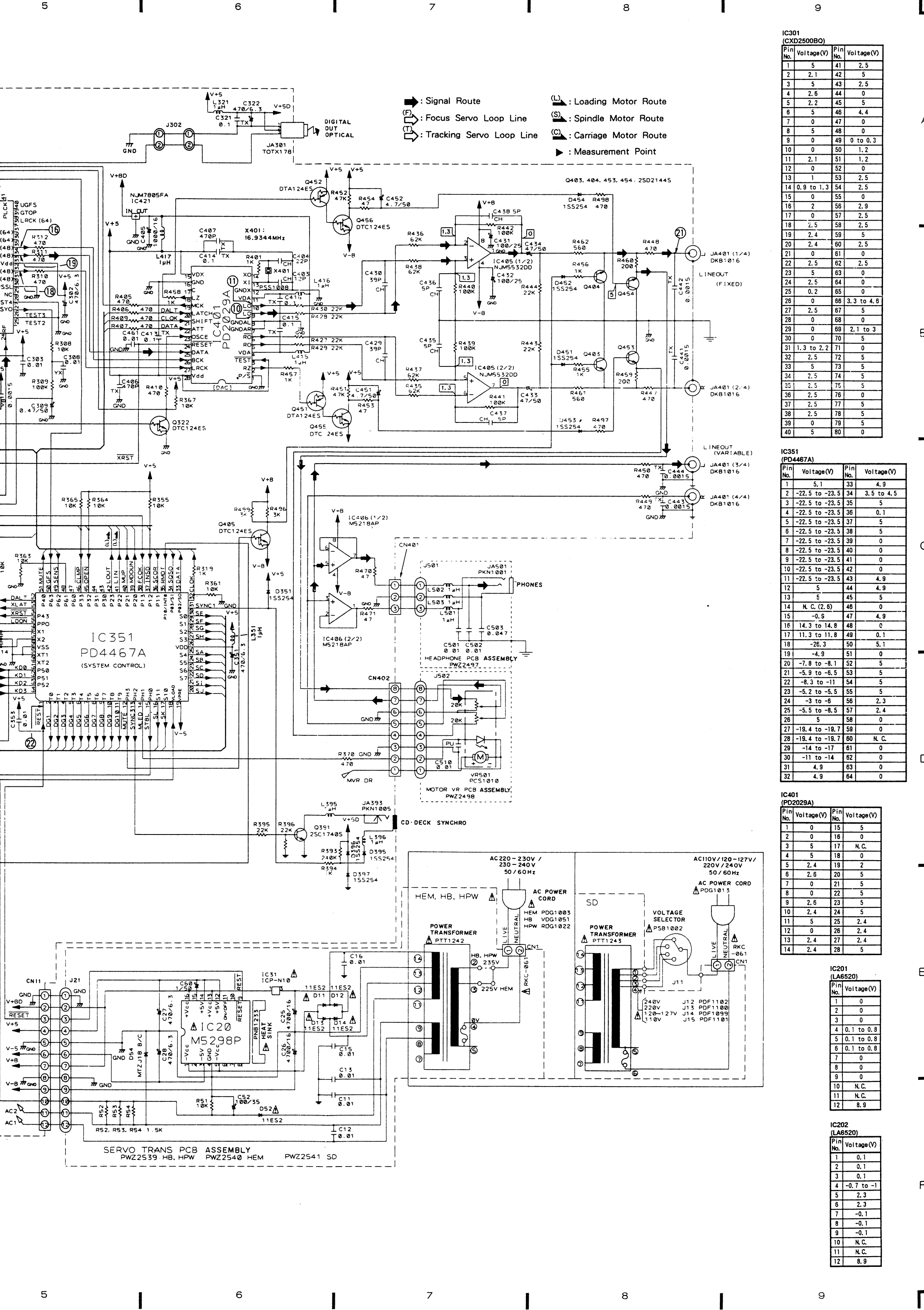
P.C.B. pattern diagram indication	Corresponding part symbol	Part name
		Resistor
		FET
		Diode
		Zener diode
		LED
		Varactor
		Test switch
		Inductor
		Coil
		Transformer
		Filter
		Ceramic capacitor
		Mylar capacitor
		Styro capacitor
		Electrolytic capacitor (Non polarized)
		Electrolytic capacitor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

- This P.C.B. connection diagram is viewed from the parts mounted side.
- 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.
- The capacitor terminal marked with $\square$ shows negative terminal.
- The diode marked with $\odot$ shows cathode side.
- The transistor terminal marked with $\square$ shows emitter.



4.1 SCHEMATIC DIAGRAM



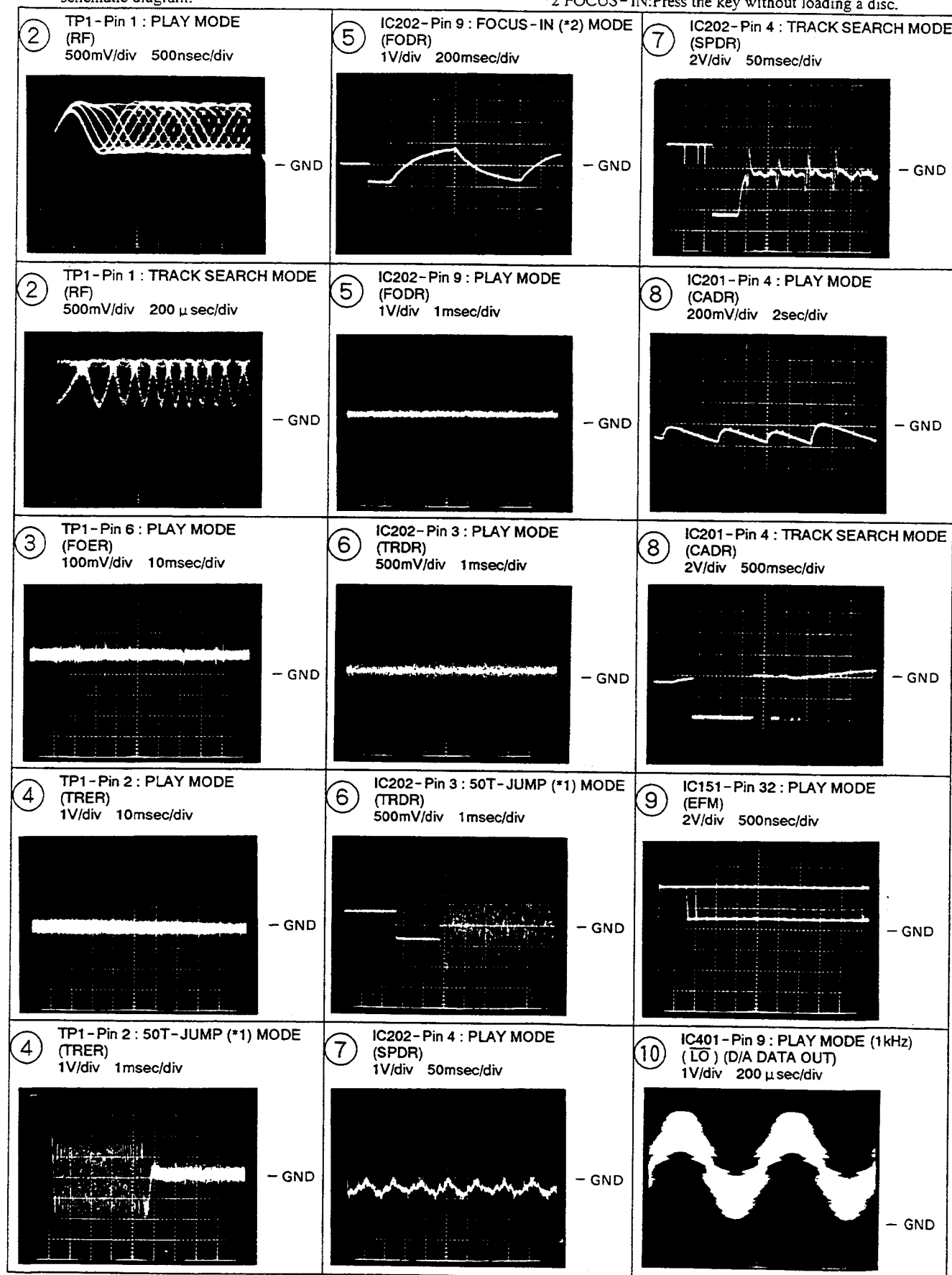


WAVEFORMS

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

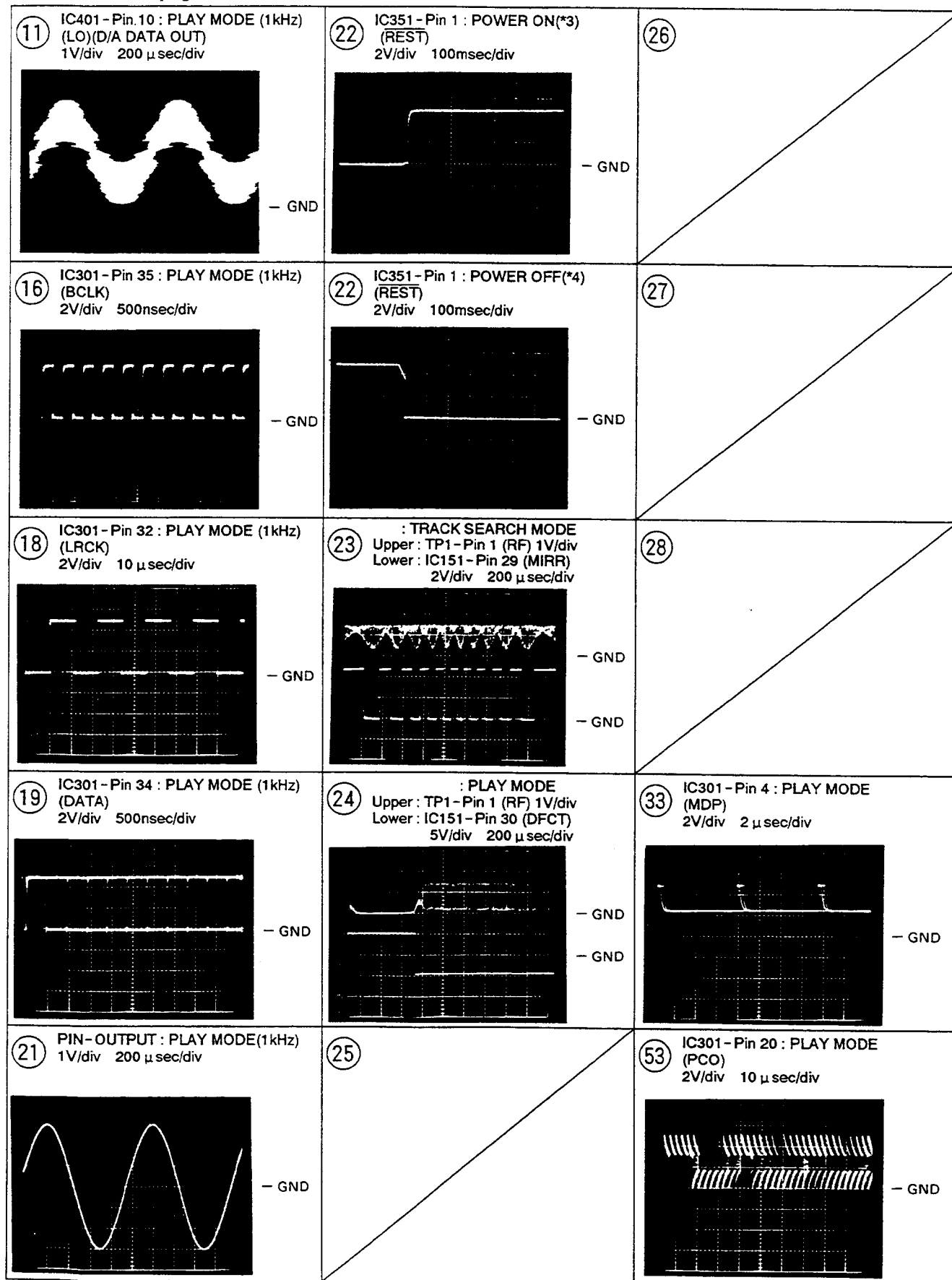
*1 50T-JUMP: After switching to the pause mode, press the manual search key.

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

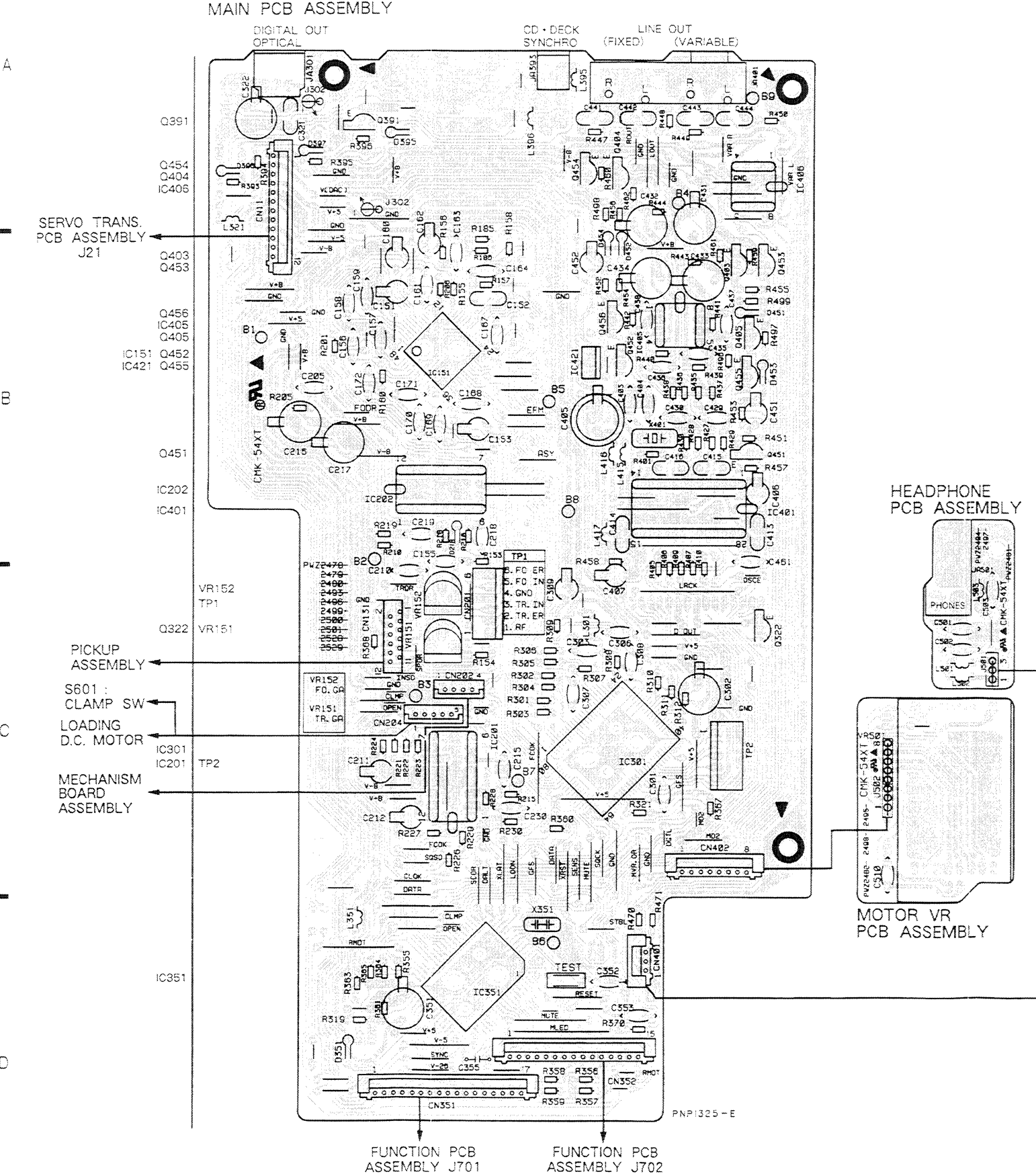


*3 POWER ON: Plug AC cord into AC wall socket.

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



4.2 PCB CONNECTION DIAGRAMS

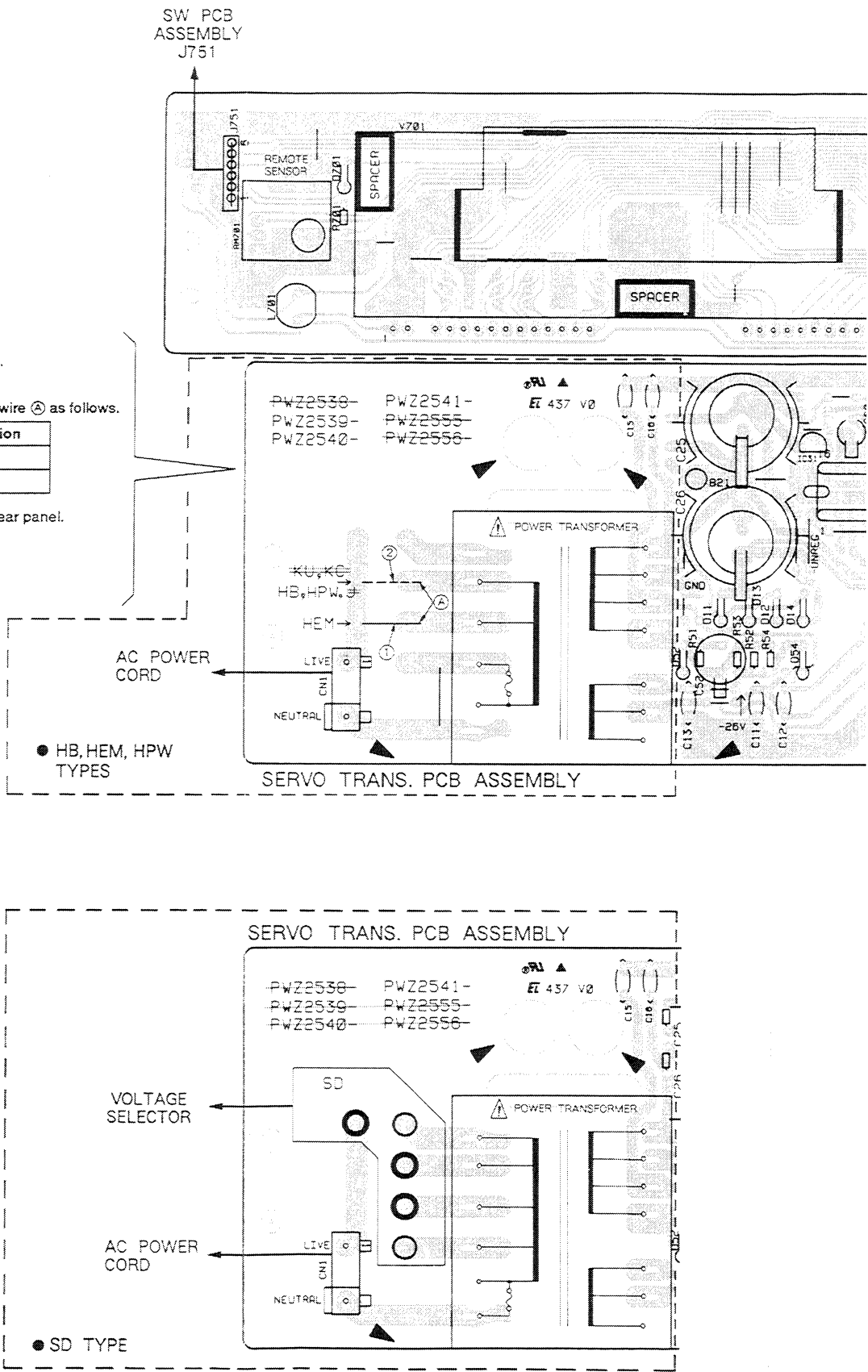


Line voltage selection
Line voltage can be changed as follows.
1. Disconnect the AC power cord.
2. Remove the bonnet.
3. Change the position of the jumper wire ④ as follows.

Voltage	Jumper wire ④ position
220-230V	①
230-240V	②

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

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



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

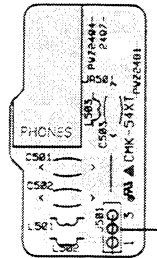
Line voltage selection
Line voltage can be changed as follows.
1. Disconnect the AC power cord.
2. Remove the bonnet.
3. Change the position of the jumper wire ④ as follows.

Voltage	Jumper wire ④ position
220-230V	①
230-240V	②

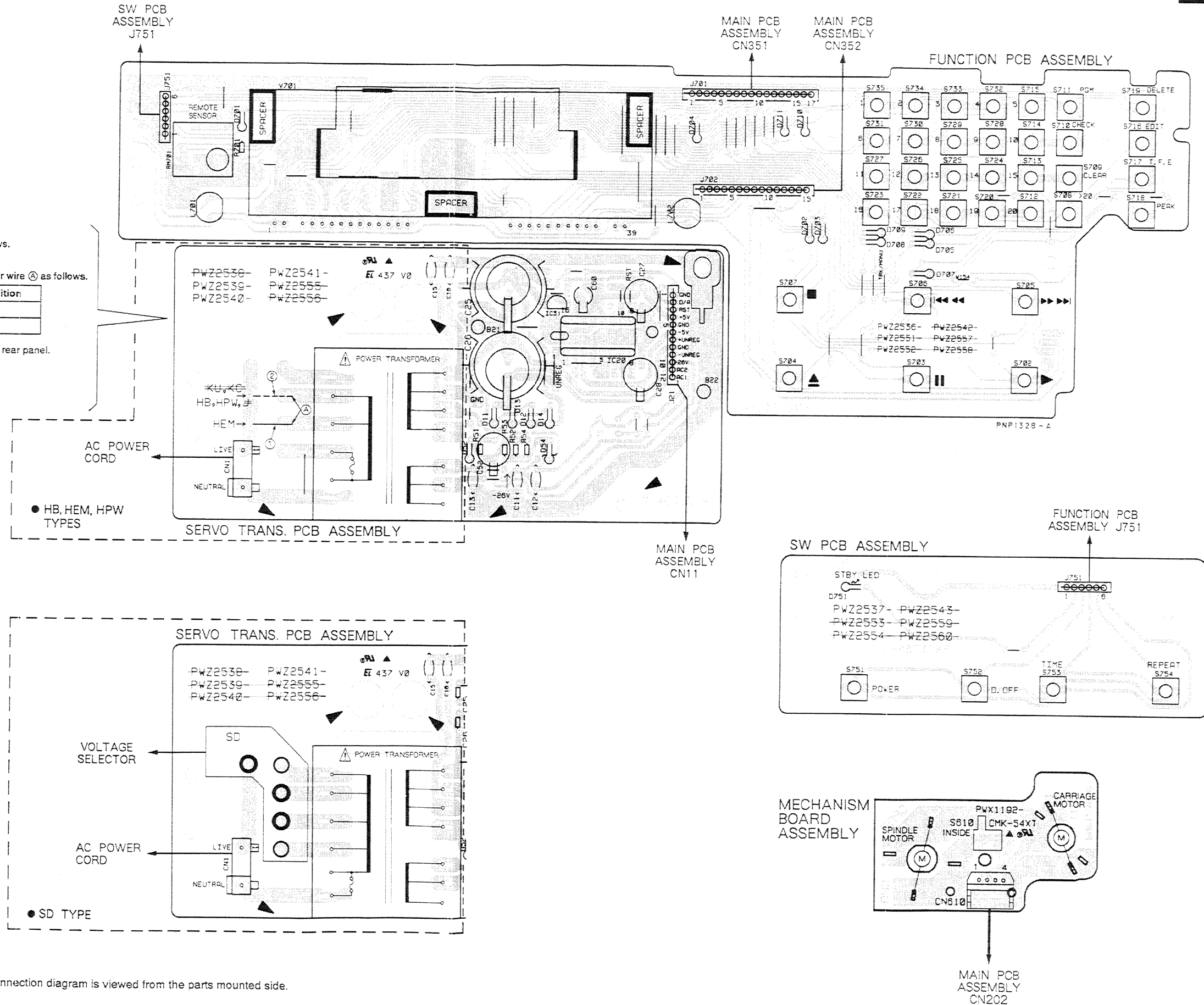
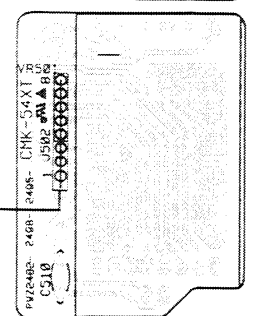
4. Stick the line voltage label on the rear panel.

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

HEADPHONE PCB ASSEMBLY



MOTOR VR PCB ASSEMBLY



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

5. PCB PARTS LIST

NOTES:

- Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.
- 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.
- Parts marked by "⊙" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- When ordering resistors, first convert resistance values into code form as shown in the following examples.

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

560 Ω $\rightarrow$ $56 \times 10^1 \rightarrow 561$ RD1/8PM $\boxed{5}\boxed{6}\boxed{1}J$

47k Ω $\rightarrow$ $47 \times 10^3 \rightarrow 473$ RD1/4PS $\boxed{4}\boxed{7}\boxed{3}J$

0.5 Ω $\rightarrow$ 0R5 RN2H $\boxed{0}\boxed{R}\boxed{5}K$

1 Ω $\rightarrow$ 010 RS1P $\boxed{0}\boxed{1}\boxed{0}K$

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

5.62k Ω $\rightarrow$ $562 \times 10^1 \rightarrow 5621$ RN1/4PC $\boxed{5}\boxed{6}\boxed{2}\boxed{1}F$

Mark	No.	Description	Part No.
LIST OF ASSEMBLIES			
NSP		MOTHER PCB ASSEMBLY	PWM1765
NSP		— HEADPHONE PCB ASSEMBLY	PWZ2497
NSP		— MOTOR VR PCB ASSEMBLY	PWZ2498
		— MAIN PCB ASSEMBLY	PWZ2499
NSP		SUB PCB ASSEMBLY	PWX1282
		— FUNCTION PCB ASSEMBLY	PWZ2536
NSP		— SW PCB ASSEMBLY	PWZ2537
		— SERVO TRANS. PCB ASSEMBLY	PWZ2539
NSP		LOADING MECHANISM ASSEMBLY TT	PXA1521
NSP		— SERVO MECHANISM ASSEMBLY TT92	PXA1479
NSP		— MECHANISM BOARD ASSEMBLY	PWX1192

HEADPHONE PCB ASSEMBLY

COILS

L501-L503 LAU010K

CAPACITORS

C501, C502 CKCYF103Z50
C503 CKCYF473Z50

OTHERS

JA501 JACK (PHONES) PKN1001

MOTOR VR PCB ASSEMBLY

RESISTOR

VR501 (20k Ω) PCS1010

CAPACITOR

C510 CKPUYF103Z25

Mark	No.	Description	Part No.
MAIN PCB ASSEMBLY			
SEMICONDUCTORS			
		IC151	CXA1372Q
		IC301	CXD2500BQ
Δ		IC201, IC202	LA6520
		IC406	M5218AP
		IC405	NJM5532DD
		IC421	NJM7805FA
		IC401	PD2029A
		IC351	PD4467A
		Q391	2SC1740S
		Q403, Q404, Q453, Q454	2SD2144S
		Q451, Q452	DTA124ES
		Q322, Q405, Q455, Q456	DTC124ES
		D218, D351, D395-D397, D451-D454	1SS254

COILS

L301, L321, L351, L395, L396, L415-L417 LAU010K

CAPACITORS

C435-C438 CCCCH050C50
C403 CCCCH120J50
C404 CCCCH220J50
C429, C430 CCCCH390J50
C151, C153 CEAS101M10

C431, C432 CEAS101M25
C405 CEAS102M16
C211, C212, C216, C217 CEAS330M16
C433, C434 CEAS470M50
C302, C322, C351 CEAS471M6R3

C160, C162, C451, C452 CEAS4R7M50
C309 CEASR47M50
C152, C161, C321, C413-C416 CFTXA104J50
C441-C444 CFTXA152J50
C406, C407 CFTXA471J50

C157, C164, C169, C308 CGCYX103K25
C158, C159, C163, C230, C301 CGCYX104K25
C156, C168 CGCYX333K25
C307 CGCYX473K25
C306 CKCYB152K50

Mark	No.	Description	Part No.
	C155		CKCYB182K50
	C218		CKCYB272K50
	C170		CKCYB332K50
	C171, C172		CKCYB472K50
	C167, C205, C210, C215, C219, C303, C352, C353, C461		CKCYF103Z50
	C355		CKPUYF103Z25

RESISTORS

VR151, VR152 (22k Ω)	RCP1046
Other resistors	RD1/6PM□□□J

OTHERS

CN131	FFC CONNECTOR(12P)	12FM-1.0BT
JA393	MINI JACK(CD-DECK SYNCHRO)	PKN1005
JA301	OPTICAL OUTPUT JACK	TOTX178
JA401	4P PIN JACK(LIN OUT L, R)	DKB1016
X401	CRYSTAL RESONATOR (16.934MHz)	PSS1008
X351	CERAMIC RESONATOR (4.19MHz)	VSS1014

FUNCTION PCB ASSEMBLY

SEMICONDUCTORS

D701-D711	1SS254
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SWITCHES

S702-S735	PSG1006
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COILS

L701, L702	LFA010K
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RESISTORS

All resistors	RD1/6PM□□□J
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OTHERS

V701 FLUORESCENT DISPLAY	PEL1057
REMOTE SENSOR	SBX1610-51

SW PCB ASSEMBLY

SEMICONDUCTOR

D751	PCX1019
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SWITCHES

S751-S754	PSG1006
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Mark	No.	Description	Part No.
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SERVO TRANS. PCB ASSEMBLY

SEMICONDUCTORS

△ IC31	ICP-N10
△ IC20	M5298P
△ D11-D14, D52	11ES2
D54	MTZJ18B

CAPACITORS

C60	CEAS010M50
C52	CEAS101M35
C27, C28	CEAS471M6R3
C25, C26	CEAS472M16
C11-C13, C15, C16	CKCYF103Z50

RESISTORS

All resistors	RD1/6PM□□□J
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OTHERS

△ TERMINAL	RKC-061
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MECHANISM BOARD ASSEMBLY

SWITCH

S610	DSG1016
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6. ADJUSTMENTS

● Adjustment Methods

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

● Adjustment Items/Verification Items and Order

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

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

● Abbreviation table

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

● Measuring Instruments and Tools

1. Dual trace oscilloscope (10:1 probe)
2. Low-frequency oscillator
3. Test disc (YEDS-7)
4. Low pass filter ($39\text{k}\Omega$ $\pm 0.001\ \mu\text{F}$)
5. Resistor (100 $\text{k}\Omega$)
6. Standard tools

● Test Point and Adjustment Variable Resistor Positions

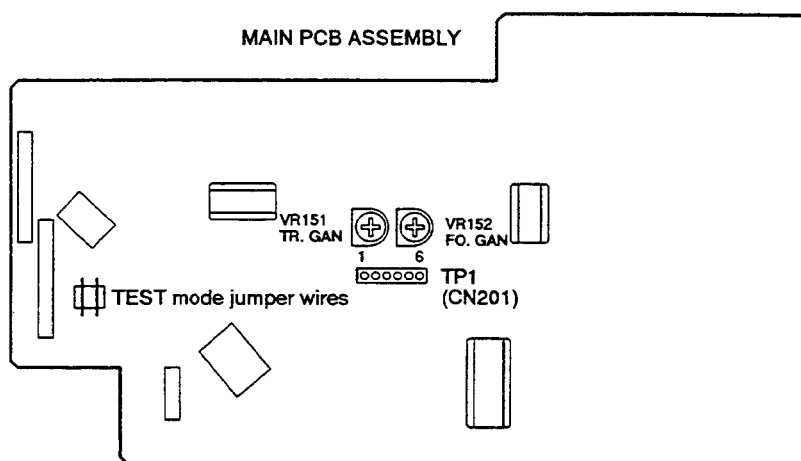


Figure 1. Adjustment Locations

● Notes

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

● Test Mode

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

[Setting these models to test mode]

How to set this model into test mode.

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

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

[Release from test mode]

Here is the procedure for releasing the test mode:

1. Press the STOP key and stop all operations.
2. Turn off the power switch on the front panel.

[Operations of the keys in test mode]

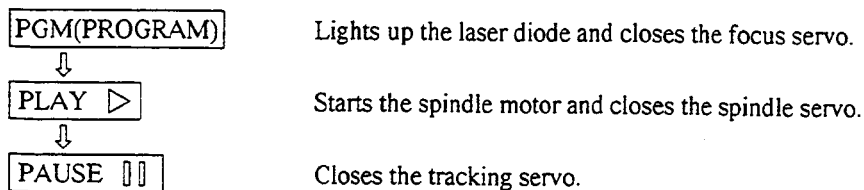
Code	Key Name	Function in Test Mode	Explanation
	PGM (PROGRAM)	Focus servo close	The laser diode is lit up and the focus actuator is lifted up, then lowered slowly and the focus servo is closed at the point where the objective lens is focused on the disc. With the player in this state, if you lightly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

Code	Key Name	Function In Test Mode	Explanation
 	TRACK / MANUAL SEARCH REV	Carriage reverse (inwards)	Moves the pickup position toward the inner diameter of the disc. When this key is pressed with the tracking servo in a closed loop, the tracking servo automatically goes into an open loop. Since the motor does not automatically stop at the mechanical end point in test mode, be careful with this operation.
 	TRACK / MANUAL SEARCH FWD	Carriage forward (outwards)	Moves the pickup position toward the outer diameter of the disc. When this key is pressed with the tracking servo in a closed loop, the tracking servo automatically goes into an open loop. Since the motor does not automatically stop at the mechanical end point in test mode, be careful with this operation.
	STOP	Stop	Initializes and the disc rotation stops. The pickup and disc remain where they are when this key is pressed.
	OPEN/CLOSE	Disc tray open / close	Open/close the disc tray. This key is a toggle key and open/close tray alternately. Pressing this key when the disc is turning stops the disc, then opens the tray. This key operation does not affect the position of the pickup.

[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.



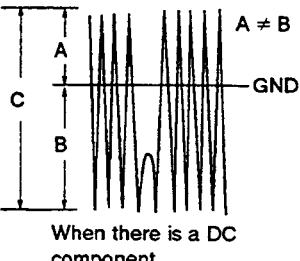
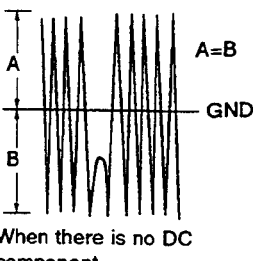
Wait at least 2-3 seconds between each of these operations.

1. Focus Offset Verification

● Objective	Verify the DC offset for the focus error amp.		
● Symptom when out of adjustment	The model does not focus in and the RF signal is dirty.		
● Measurement instrument connections	Connect the oscilloscope to TP1, Pin 6 (FCS. ERR)	● Player state	Test mode, stopped (just the Power switch on)
	[Settings] 5 mV/division 10 ms/division DC mode	● Adjustment location	None
		● Disc	None needed
[Procedure]			
Verify the DC voltage at TP1, Pin 6 (FCS. ERR) is 0 ± 50 mV.			

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

2. Tracking Error Balance Verification

● Objective	To verify that there is no variation in the sensitivity of the tracking photo diode.		
● 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.	● Player state	Test mode, focus and spindle servos closed and tracking servo open
	[Settings] 50 mV/division 5 ms/division DC mode	● Adjustment location	None
		● Disc	YEDS-7
[Procedure]			
1. Move the pickup to midway across the disc (R=35mm) with the TRACK/MANUAL SEARCH FWD $\triangleright \triangleright \triangleright$ or REV $\triangleleft \triangleleft \triangleleft$ key. 2. Press the PGM (PROGRAM) key, then the PLAY $\triangleright$ key in that order to close the focus servo then the spindle servo. 3. Line up the bright line (ground) at the center of the oscilloscope screen and put the oscilloscope into DC mode. 4. Supposing that the positive amplitude of the tracking error signal at TP1, pin 2 (TRK ERR) is (A) and the negative amplitude is (B), the following expression is satisfied.			
When $A \geq B$, $\frac{A-B}{C} \times \frac{1}{2} \leq 0.1$ When $A < B$, $\frac{B-A}{C} \times \frac{1}{2} \leq 0.1$  When there is a DC component  When there is no DC component			

3. Pickup Radial/Tangential Direction Tilt Adjustment

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

[Procedure]

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

Note: Radial and tangential mean the directions relative to the disc shown in Figure 2.

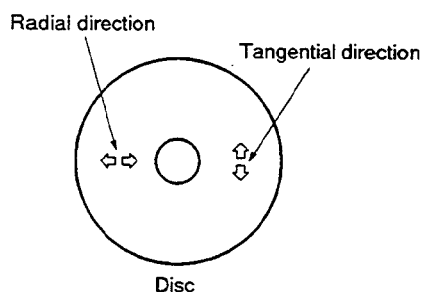
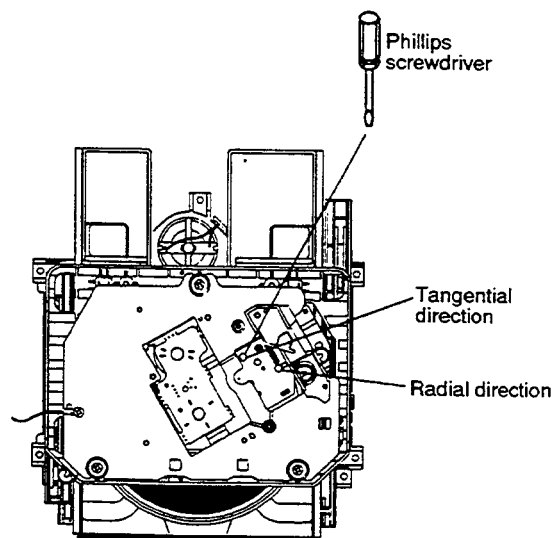
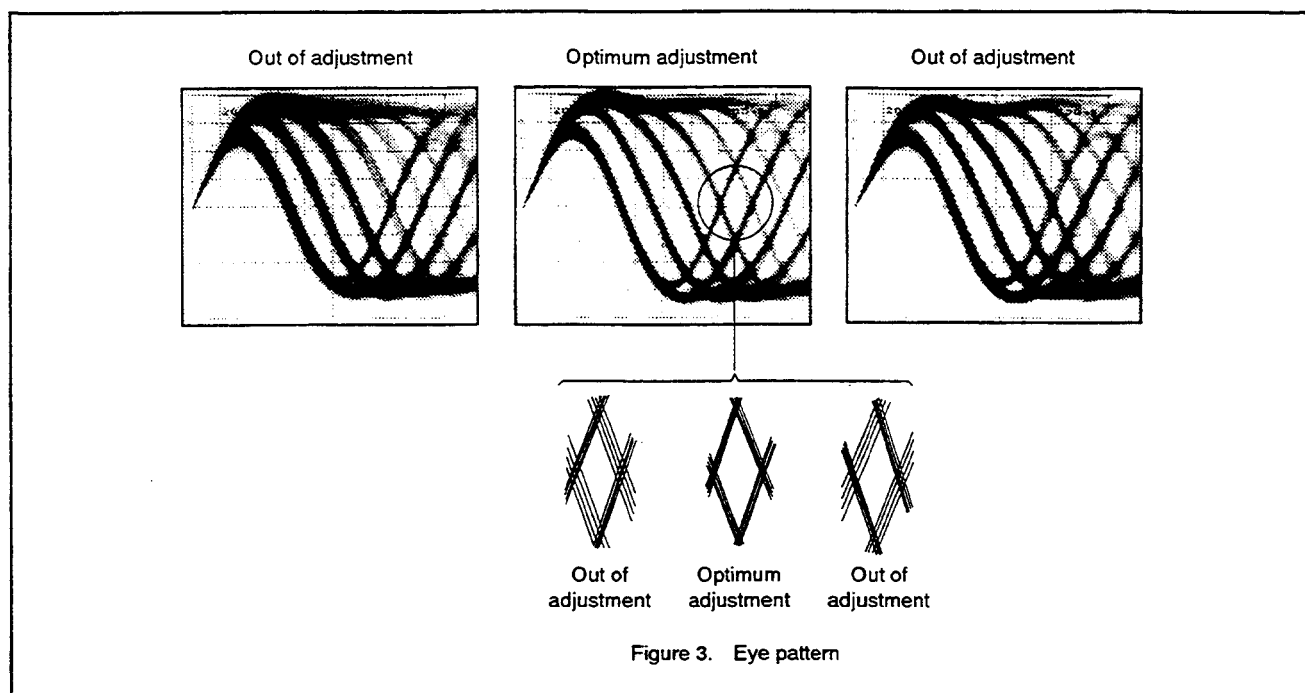


Figure 2



Adjustment locations



4. RF Level Verification

● Objective	To verify 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).	● Player state	Test mode, play
	[Settings] 50 mV/division 10 ms/division AC mode	● Adjustment location	None
		● Disc	YEDS-7
[Procedure] 1. Move the pickup to midway across the disc (R=35 mm) with the TRACK/MANUAL SEARCH FWD $\triangleright\triangleright\triangleright$ or REV $\triangleleft\triangleleft\triangleleft$ key, then press the PGM (PROGRAM) key, the PLAY $\triangleright$ key, then the PAUSE $\square\square$ key in that order to close the respective servos and put the player into play mode. 2. Verify the RF signal amplitude is $1.2\text{ V}_{\text{p-p}} \pm 0.2\text{ V}$.			

5. Focus Servo Loop Gain Adjustment

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

[Procedure]

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

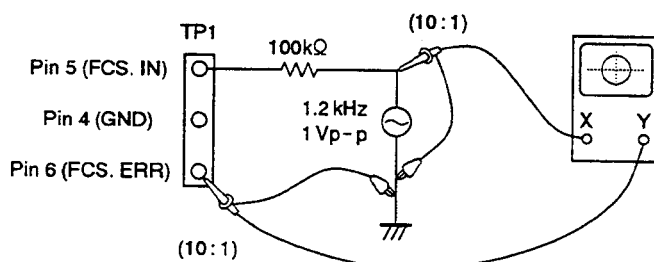
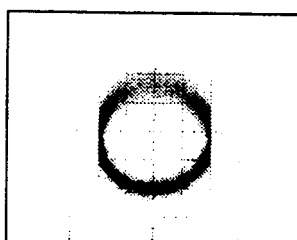


Figure 4

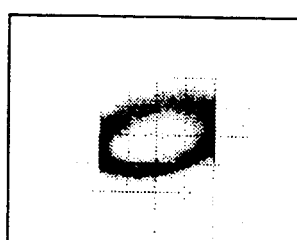
Focus Gain Adjustment



Higher gain



Optimum gain



Lower gain

6. Tracking Servo Loop Gain Adjustment

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

[Procedure]

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

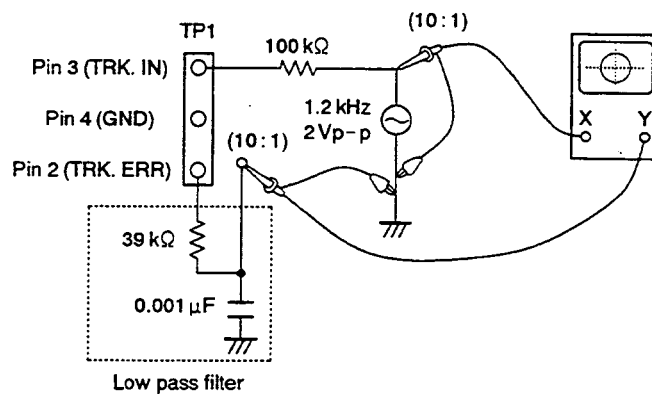
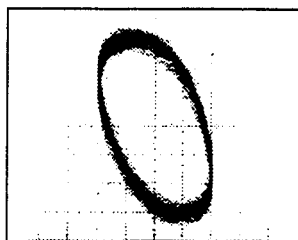
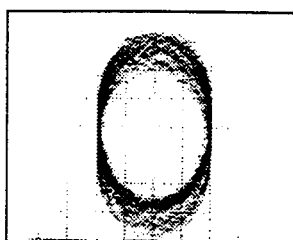


Figure 5

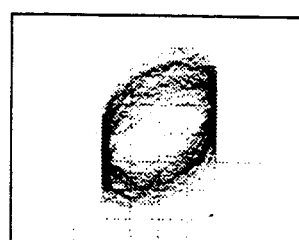
Tracking Gain Adjustment



Higher gain



Optimum gain



Lower gain

7. FOR PD-S702 / HEM, HPW, SD AND PD-S702-G / HEM

NOTES:

- Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.
- 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.
- Parts marked by "⊙" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.

CONTRAST OF MISCELLANEOUS PARTS

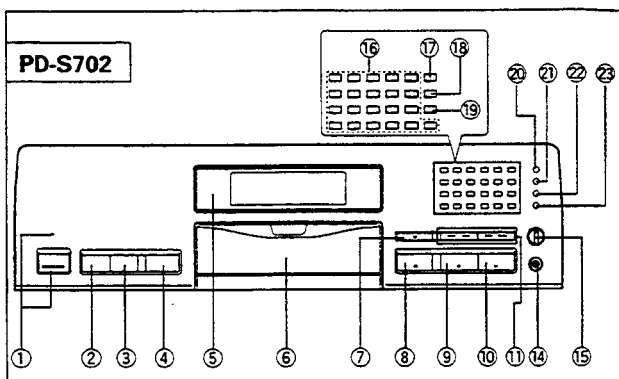
PD-S702 / HEM, HPW, SD, PD-S702-G / HEM and PD-S702 / HB have the same construction except for the following :

Mark	Symbol & Description	Part No.					Remarks
		PD-S702 /HB	PD-S702 /HEM	PD-S702 /HPW	PD-S702 /SD	PD-S702 -G/HEM	
NSP	SUB PCB assembly	PWX1282	PWX1283	PWX1282	PWX1284	PWX1283	
	SERVO TRANS. PCB assembly	PWZ2539	PWZ2540	PWZ2539	PWZ2541	PWZ2540	
Δ	AC power cord HB	VDG1051					Refer to P5.
Δ	Fuse (FU1, T13A)	VEK1003	.....	.....	.....	.....	
	Fuse holder	VKR1002	.....	.....	.....	.....	
Δ	AC power cord	.....	PDG1003	RDG1022	PDG1013	PDG1003	
Δ	Power transformer (11W) (AC220-230V/230-240V)	PTT1242	PTT1242	PTT1242	.....	PTT1242	
Δ	Power transformer (11W) (AC110V/120-127V/220V/240V)	.....	.....	.....	PTT1243	.....	
	Voltage selector (AC110V/120-127V/220V/240V)	.....	.....	.....	PSB1002	.....	
NSP							
NSP	Rear base B7	PNA2021	.....	PNA2021	.....	.....	
NSP	Rear base E7	.....	PNA1970	.....	.....	.....	
NSP	Rear base D7				PNA2023		For knob C
	Rear base E7G	.....	.....	.....	.....	PNA2016	
	Display window	PAM1609	PAM1609	PAM1622	PAM1622	PAM1609	
	Knob C	RAC1608	RAC1608	RAC1608	RAC1608	.....	
	Headphone knob G	.....	.....	.....	.....	PAC1680	
	28key	PAC1734	PAC1734	PAC1734	PAC1734	.....	
	28key G	.....	.....	.....	.....	PAC1749	
	Power button 78	PAC1743	PAC1743	PAC1743	PAC1743	.....	
	Power button 78G	.....	.....	.....	.....	PAC1750	
	Function button 78	PAC1744	PAC1744	PAC1744	PAC1744	.....	
	Function button 78G					PAC1751	
	Front panel 7	PAN1280	PAN1280	PAN1280	PAN1280	.....	
	Front panel 7G	.....	.....	.....	.....	PAN1288	
	Function panel 7	PNW2278	PNW2278	PNW2278	PNW2278	.....	
	Function panel 7G	.....	.....	.....	.....	PNW2334	
	Tray panel	PNW2280	PNW2280	PNW2280	PNW2280	.....	
	Tray panel G	.....	.....	.....	.....	PNW2335	
	Name plate	VAM1032	VAM1032	VAM1032	VAM1032	.....	
	Name plate 3182N	.....	.....	.....	.....	RAN1011	
	Bonnet	PYY1175	PYY1175	PYY1175	PYY1175	PYY1176	
	Protector R	PHA1253	PHA1245	PHA1245	PHA1245	PHA1245	
	CD packing case B7	PHG1962	.....	PHG1962	PHG1962	.....	
	CD packing case E7	.....	PHG1940	.....	.....	.....	
	CD packing case E7G	.....	.....	.....	.....	PHG1957	
	Polyethylene bag	Z21-013	.....	.....	.....	.....	
	Remote control unit	PWW1069	PWW1069	PWW1069	PWW1069	PWW1076	
	Battery cover	PZN1001	PZN1001	PZN1001	PZN1001	PZN1011	
	Operating instructions (English)	PRB1196	.....	PRB1196	PRB1196	.....	
	Operating instructions (English/French/German/Italian/Dutch/ Swedish/Spanish/Portuguese)	.....	PRE1183	.....	.....	PRE1183	

SERVO TRANS. PCB ASSEMBLY

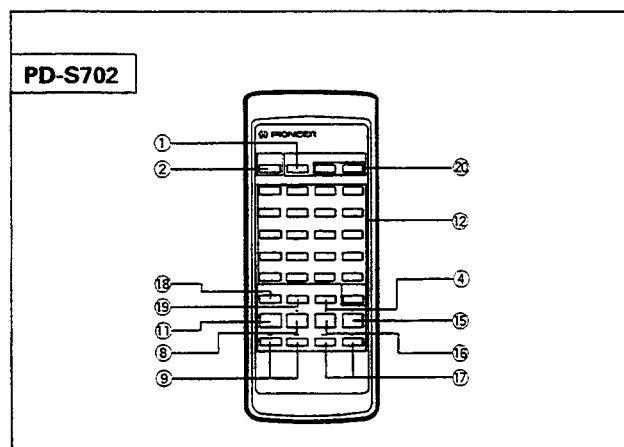
Although PWZ2540, PWZ2541 and PWZ2539 are different in part number, they have the same service parts.

8. PANEL FACILITIES



FRONT PANEL

- ① **POWER STANDBY/ON switch and STANDBY indicator**
- ② **DISPLAY OFF button**
- ③ **TIME button**
- ④ **REPEAT button**
- ⑤ **Remote sensor**
Receives the signal from the remote control unit.
- ⑥ **Disc tray**
- ⑦ **Stop button (■)**
- ⑧ **OPEN/CLOSE button (▲)**
- ⑨ **Pause button (II)**
- ⑩ **Play button (▶)**
- ⑪ **Track/Manual search buttons (◀◀◀/▶▶▶)**
- ⑫ **Headphones jack (PHONES)**
- ⑬ **Headphones line/volume control (PHONES/ LINE LEVEL)**
- ⑭ **Track number/Digit buttons (1 - 20, >20)**
- ⑮ **PGM button**
- ⑯ **CHECK button**
- ⑰ **CLEAR button**
- ⑱ **DELETE button**
- ⑲ **•COMPU/••AUTO EDIT button**
- ⑳ **TIME FADE EDIT button**
- ㉑ **PEAK SEARCH button**



REMOTE CONTROL UNIT

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

- ① OPEN/CLOSE button
- ② POWER button
- ④ Program button (PROGRAM/PGM)
- ⑧ STOP button (■)
- ⑨ MANUAL search buttons (◀◀ / ▶▶)
- ⑪ RANDOM PLAY button
- ⑫ Track number/Digit buttons (1 - 20, >20)
- ⑮ PLAY button (▶)
- ⑯ PAUSE button (II)
- ⑰ TRACK search buttons (◀◀ / ▶▶)
- ⑱ HI-LITE SCAN button
- ⑲ RESERVE button
- ⑳ OUTPUT LEVEL buttons (-/+)

