PIONEER®
The Art of Entertainment

Service Manual

ORDER NO.
RRV1139

COMPACT DISC PLAYER

PD-S603
PD-S603-G

- **Refer to the service manual ARP2765 for PD-S602/WEMXK.**

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

Type	Model		Power Requirement	Remarks
	PD-S603	PD-S603-G		
WEMXK	○	○	AC220 – 240V	

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PIONEER ELECTRONIC [EUROPE] N.V. Haven 1087 Keetberglaan 1, 9120 Melsele, Belgium
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T – SSK APR. 1994 Printed in Japan

1. SAFETY INFORMATION

(FOR EUROPEAN MODEL ONLY)

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

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

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

LASER
Kuva 1
Lasersateilyn varoitusmerkki

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

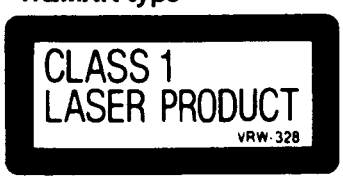
IMPORTANT
THIS PIONEER APPARATUS CONTAINS LASER OF CLASS 1.
SERVICING OPERATION OF THE APPARATUS SHOULD BE DONE BY A SPECIALLY INSTRUCTED PERSON.

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

LASER
Picture 1
Warning sign for laser radiation

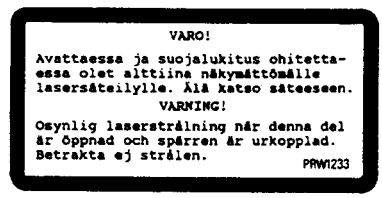
LABEL CHECK

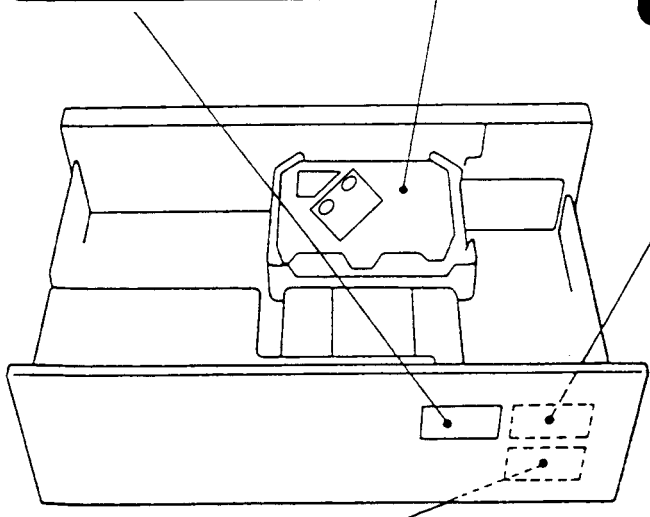
WEMXK type

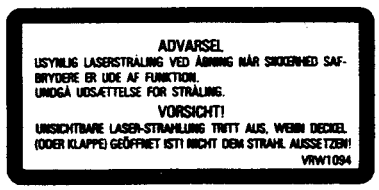


WEMXK type

WEMXK type







WEMXK type

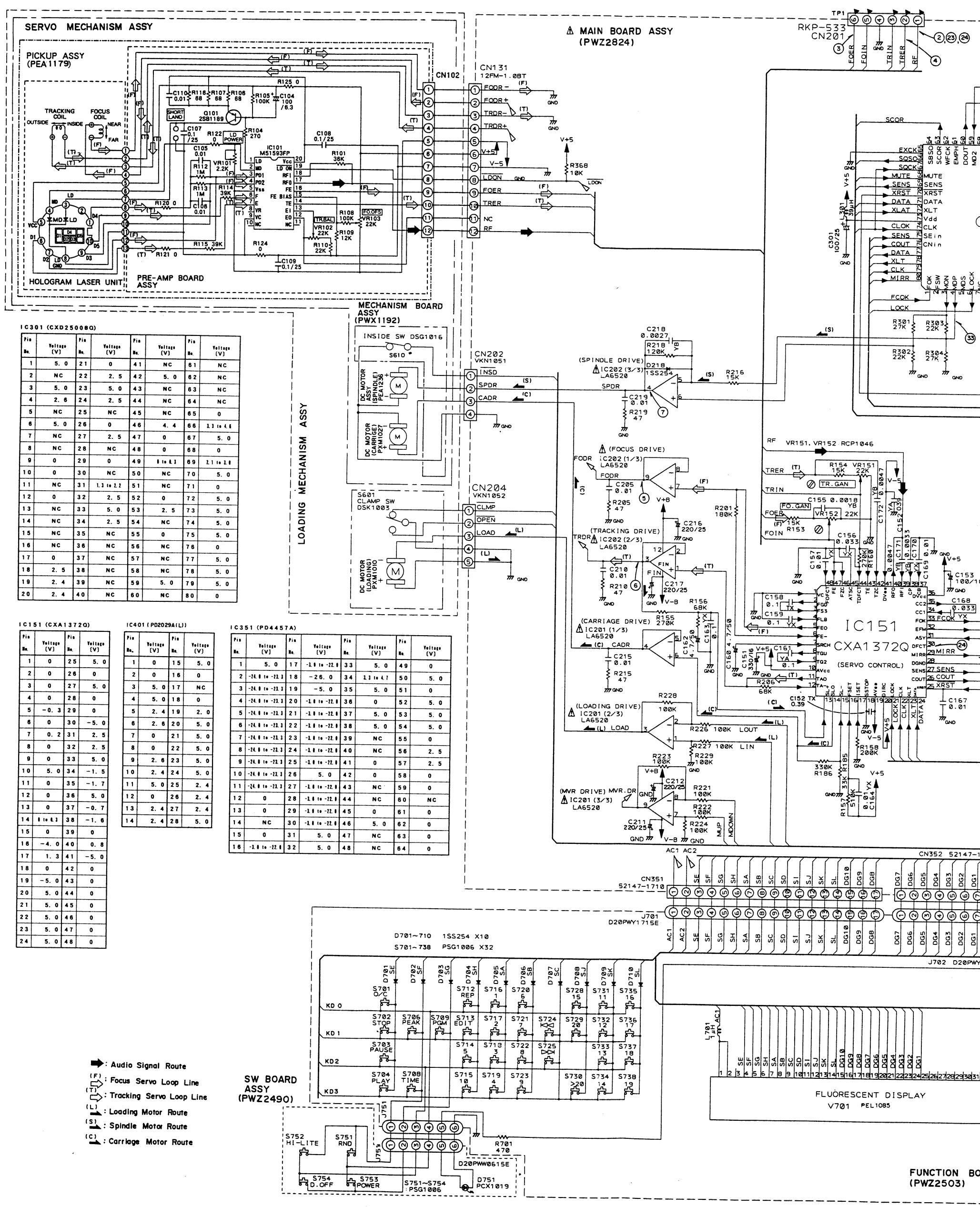
Additional Laser Caution

1. Laser Interlock Mechanism
   The position of the switch (S601) for detecting loading state is detected by the system microprocessor, and the design prevents laser diode oscillation when the switch (S601) is not on $\overline{\text{CLMP}}$ terminal side ($\overline{\text{CLMP}}$ signal is OFF or high level).
   Thus, the interlock will no longer function if the switch (S601)is deliberately set to $\overline{\text{CLMP}}$ terminal side(low level).
   The interlock also does not function in the test mode *.
   Laser diode oscillation will continue, if pin 1 of M51593FP (IC101) on the PRE AMP BOARD ASSY mounted on the pickup assembly is connected to GND, or pin 19 is connected to low level (ON), or else the terminals of Q101 are shorted to each other (fault condition).
2. When the cover is opened, close viewing of the objective lens with the naked eye will cause exposure to a Class 1 laser beam.

92S1B

* Refer to page 26 on the service manual ARP2765.

3. SCHEMATIC DIAGRAM



IC301 (CXD2500BQ)

Pin No.	Voltage (V)	Pin No.	Voltage (V)	Pin No.	Voltage (V)	Pin No.	Voltage (V)
1	5.0	21	0	41	NC	61	NC
2	NC	22	2.5	42	5.0	62	NC
3	5.0	23	5.0	43	NC	63	NC
4	2.6	24	2.5	44	NC	64	NC
5	NC	25	NC	45	NC	65	0
6	5.0	26	0	46	4.4	66	3.3 to 4.8
7	NC	27	2.5	47	0	67	5.0
8	NC	28	NC	48	0	68	0
9	0	29	0	49	0 to 0.3	69	2.1 to 2.8
10	0	30	NC	50	NC	70	5.0
11	NC	31	1.3 to 2.2	51	NC	71	0
12	0	32	2.5	52	0	72	5.0
13	NC	33	5.0	53	2.5	73	5.0
14	NC	34	2.5	54	NC	74	5.0
15	NC	35	NC	55	0	75	5.0
16	NC	36	NC	56	NC	76	0
17	0	37	NC	57	NC	77	5.0
18	2.5	38	NC	58	NC	78	5.0
19	2.4	39	NC	59	5.0	79	5.0
20	2.4	40	NC	60	NC	80	0

IC151 (CXA1372Q)

Pin No.	Voltage (V)	Pin No.	Voltage (V)
1	0	25	5.0
2	0	26	0
3	0	27	5.0
4	0	28	0
5	-0.3	29	0
6	0	30	-5.0
7	0.2	31	2.5
8	0	32	2.5
9	0	33	5.0
10	5.0	34	-1.5
11	0	35	-1.7
12	0	36	5.0
13	0	37	-0.7
14	0 to 0.3	38	-1.6
15	0	39	0
16	-4.0	40	0.8
17	1.3	41	-5.0
18	0	42	0
19	-5.0	43	0
20	5.0	44	0
21	5.0	45	0
22	5.0	46	0
23	5.0	47	0
24	5.0	48	0

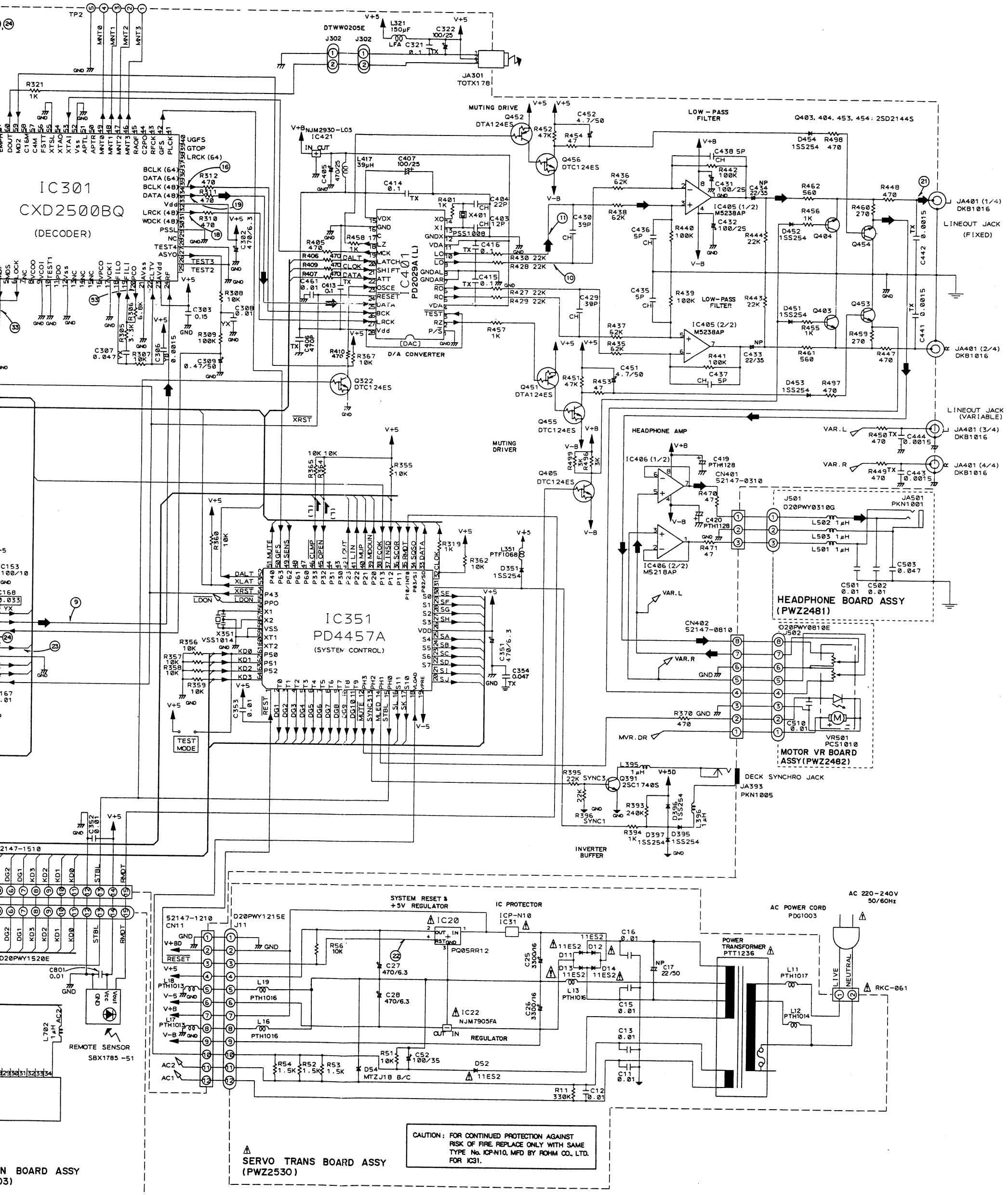
IC401 (PD2029A(L))

Pin No.	Voltage (V)	Pin No.	Voltage (V)
1	0	15	5.0
2	0	16	0
3	5.0	17	NC
4	5.0	18	0
5	2.4	19	2.0
6	2.6	20	5.0
7	0	21	5.0
8	0	22	5.0
9	2.6	23	5.0
10	2.4	24	5.0
11	5.0	25	2.4
12	0	26	2.4
13	2.4	27	2.4
14	2.4	28	5.0

IC351 (PD4457A)

Pin No.	Voltage (V)	Pin No.	Voltage (V)	Pin No.	Voltage (V)	Pin No.	Voltage (V)
1	5.0	17	-3.0 to -22.0	33	5.0	49	0
2	-24.0 to -23.3	18	-26.0	34	3.3 to 4.7	50	5.0
3	-24.0 to -23.3	19	-5.0	35	5.0	51	0
4	-24.0 to -23.3	20	-3.0 to -22.0	36	0	52	5.0
5	-24.0 to -23.3	21	-3.0 to -22.0	37	5.0	53	5.0
6	-24.0 to -23.3	22	-3.0 to -22.0	38	5.0	54	5.0
7	-24.0 to -23.3	23	-3.0 to -22.0	39	NC	55	0
8	-24.0 to -23.3	24	-3.0 to -22.0	40	NC	56	2.5
9	-24.0 to -23.3	25	-3.0 to -22.0	41	0	57	2.5
10	-24.0 to -23.3	26	5.0	42	0	58	0
11	-24.0 to -23.3	27	-3.0 to -22.0	43	NC	59	0
12	0	28	-3.0 to -22.0	44	NC	60	NC
13	0	29	-3.0 to -22.0	45	0	61	0
14	NC	30	-3.0 to -22.0	46	5.0	62	0
15	0	31	5.0	47	NC	63	0
16	-3.0 to -22.0	32	5.0	48	NC	64	0

: Audio Signal Route
(F): Focus Servo Loop Line
(T): Tracking Servo Loop Line
(L): Loading Motor Route
(S): Spindle Motor Route
(C): Carriage Motor Route


IC301
CXD2500BQ
(DECODER)
IC351
PD4457A
(SYSTEM CONTROL)
IC401
PD2029A(L)
D/A CONVERTER
MUTING DRIVE
MUTING DRIVER
LOW-PASS FILTER
HEADPHONE AMP
INVERTER BUFFER
SYSTEM RESET & +5V REGULATOR
IC PROTECTOR
REGULATOR
HEADPHONE BOARD ASSY (PWZ2481)
MOTOR VR BOARD ASSY (PWZ2482)
SERVO TRANS BOARD ASSY (PWZ2530)
LINEOUT JACK (FIXED)
LINEOUT JACK (VARIABLE)
DECK SYNCHRO JACK
REMOTE SENSOR
TEST MODE
AC POWER CORD
POWER TRANSFORMER
CAUTION : FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE ONLY WITH SAME TYPE No. ICP-N10, MFD BY ROHM CO., LTD. FOR IC31.

2. CONTRAST OF MISCELLANEOUS PARTS

NOTES:

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

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

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

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

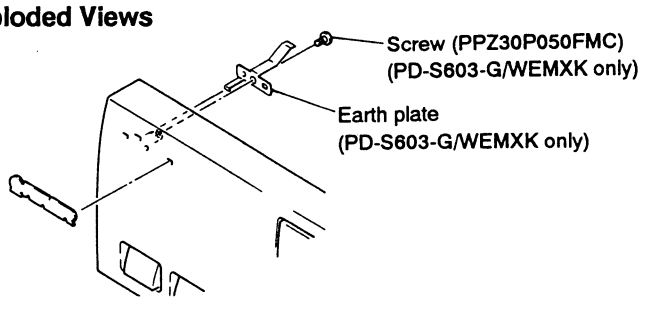
5.62k Ω → 562 × 10^1 → 5621 ····· RN1/4PC 5 6 2 1 F

■ CONTRAST OF PD-S603/WEMXK, PD-S603-G/WEMXK and PD-S602/WEMXK

PD-S603/WEMXK, PD-S603-G/WEMXK and PD-S602/WEMXK have the same construction except for the following:

Mark	Symbol & Description	Part No. PD-S602/WEMXK	Part No. PD-S603/WEMXK	Part No. PD-S603-G/WEMXK	Remarks
⚠	MAIN board assembly	PWZ2480	PWZ2824	PWZ2824	
	FUNCTION board assembly	PWZ2489	Not used	Not used	
NSP	FUNCTION board assembly	Not used	PWZ2503	PWZ2503	
⚠	SERVO TRANS board assembly	PWZ2492	Not used	Not used	
⚠NSP	SERVO TRANS board assembly	Not used	PWZ2530	PWZ2530	
	Function panel assembly	PEA1262	Not used	Not used	For Exterior
	Tray lens	PNW2242	Not used	Not used	
	Tray name plate	PNW2244	PNW2457	PNW2458	
	Power button	PAC1712	PAC1712	PAC1779	
	26 key	PAC1715	PAC1715	PAC1781	
	Function button	PAC1713	PAC1713	PAC1780	
	PIONEER badge	PAM1608	PAM1608	RAN1011	
	Function panel	PNW2246	PNW2463	PNW2464	
NSP	Rear base	PNA1925	Not used	Not used	
	Rear base	Not used	PNA2129	PNA2131	
	Bonnet	PYY1162	PYY1162	PYY1177	
	Knob C	RAC1608	RAC1608	Not used	
	Headphone knob	Not used	Not used	PAC1680	For knob C
NSP	Earth plate	Not used	Not used	PBK1132	
	Operating instructions (English/French/German/Italian/Dutch/Swedish/Spanish/Portuguese)	PRE1173	PRE1204	PRE1204	For Packing
	Remote control unit	PWW1060	PWW1060	PWW1095	
	Battery lid	PZN1001	PZN1001	PZN1013	
	CD packing case	PHG1873	PHG2041	PHG2043	

● Exploded Views



FUNCTION BOARD ASSEMBLY

PWZ2503 and PWZ2489 have the same construction exc

Mark	Symbol & Description
	C801 V701 FL INDICATOR TUBE REMOTE SENSOR

SERVO TRANS BOARD ASSEMBLY

PWZ2530 and PWZ2492 have the same construction exc

Mark	Symbol & Description
	IC22 L11 L12 L13, L16, L19 C17 C25, C26 C27, C28

■ PARTS LIST FOR PD-S603/WEMXK AND

Mark	No.	Description	Part

MAIN BOARD ASSEMBLY (PWZ282

SEMICONDUCTORS

	IC151	CXA1372Q
	IC301	CXD2500BQ
⚠	IC201, IC202	LA6520
	IC406	M5218AP
	IC405	M5238AP
	IC421	NJM2930L05
	IC401	PD2029A(L)
	IC351	PD4457A
	Q391	2SC1740S
	Q403, Q404, Q453, Q454	2SD2144S
	Q451, Q452	DTA124ES
	Q322, Q405, Q455, Q456	DTC124ES
	D218, D351, D395-D397	1SS254
	D451-D454	1SS254

COILS AND FILTERS

	L395, L396	LAU010K
	L301, L417	LAU390J
	L321	LFA151J
	L17, L18	PTH1013
	L351	RTF1068

CAPACITORS

	C435-C438	CCCCH050C5
	C403	CCCCH120J5
	C404	CCCCH220J5
	C429, C430	CCCCH390J5
	C433, C434	CEANP220M3

n except for the following:

	Part No.		Remarks
	PWZ2489	PWZ2503	
	Not used	CKCYF103Z50	
	PEL1073	PEL1085	
	SBX1610 − 51	SBX1785 − 51	

LY

n except for the following:

	Part No.		Remarks
	PWZ2492	PWZ2530	
	NJM79L05A	NJM7905FA	
	Not used	PTH1017	
	Not used	PTH1014	
	Not used	PTH1016	
	Not used	CEANP220M50	
	CEAS472M16	PCH1120	
	CEAS471M6R3	PCH1123	

ND PD-S603-G/WEMXK

art No.	Mark	No. Description	Part No.
824)		C153	CEAS101M10
		C151	CEAS331M16
		C160, C162, C451, C452	CEAS4R7M50
2Q		C309	CEASR47M50
0BQ		C301, C322, C407, C431, C432	CENA101M25
P		C405	CENA471M25
P		C158, C321, C413-C416	CFTXA104J50
		C441-C444	CFTXA152J50
0L05		C152	CFTXA394J50
A(L)		C406	CFTXA471J50
A			
0S		C161	CFTYA104J50
4S		C157, C164, C169, C308	CGCYX103K25
		C159, C163	CGCYX104K25
ES		C156, C168	CGCYX333K25
ES		C307, C354	CGCYX473K25
		C306	CKCYB152K50
		C155	CKCYB182K50
		C218	CKCYB272K50
K		C170	CKCYB332K50
J		C171, C172	CKCYB472K50
J			
3		C167, C205, C210, C215, C219	CKCYF103Z50
8		C352, C353, C461	CKCYF103Z50
		C303	CQMA154J50
		C302, C351 (470/6.3)	PCH1123
50C50		C211, C212, C216, C217 (220/25)	PCH1128
20J50			
20J50		C419, C420 (220/25)	PCH1128
90J50			
20M35			

PD-S603, PD-S603-G

NOTE FOR SCHEMATIC DIAGRAMS (Type 4A)

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

FUNCTION BOARD ASSEMBLY

S701 : OPEN/CLOSE
S702 : STOP
S703 : PAUSE
S704 : PLAY
S706 : PEAK SEARCH
S708 : TIME
S709 : PGM
S712 : REPEAT
S713 : EDIT
S714 : 5
S715 : 10
S716 : 1
S717 : 2
S718 : 3
S719 : 4
S720 : 6
S721 : 7
S722 : 8
S723 : 9
S724 : ⏮
S725 : ⏭
S728 : 15
S729 : 20
S730 : > 20
S731 : 11
S732 : 12
S733 : 13
S734 : 14
S735 : 16
S736 : 17
S737 : 18
S738 : 19

SW BOARD ASSEMBLY

S751 : RANDOM
S752 : HI – LITE SCAN
S753 : POWER
S754 : DISPLAY OFF

Mark	No.	Description	Part No.
RESISTORS			
	VR151, VR152 (22K)		PCP1030
	Other Resistors		RD1/6PM□□□J
OTHERS			
	CN131 CONNCTOR 12P		12FM-1.0BT
	CN401 JUMPER CONNECTOR 3P		52147-0310
	CN402 JUMPER CONNECTOR 8P		52147-0810
	CN11 JUMPER CONNECTOR 12P		52147-1210
	CN352 JUMPER CONNECTOR 15P		52147-1510
	CN351 JUMPER CONNECTOR 17P		52147-1710
	PIN JACK 4P		DKB1016
	JA393 MINI JACK		PKN1005
	X401 CRYSTAL RESONATOR (16.9344MHz)		PSS1008
	CN201 CONNETOR 6P		RKP-533
	JA301 OPTICAL OUTPUT JACK		TOTX178
	PCB BINDER		VEF1008
	CN202 CONNECTOR 4P		VKN1051
	CN204 CONNECTOR 5P		VKN1052
	X351 CERAMIC RESONATOR (4.19MHz)		VSS1014

4. PCB DIAGRAM

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

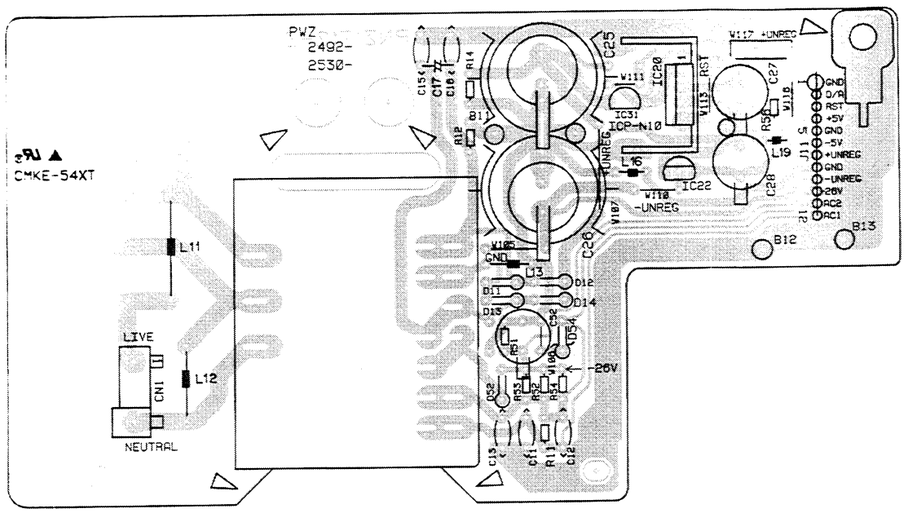
NOTE FOR PCB DIAGRAMS:

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

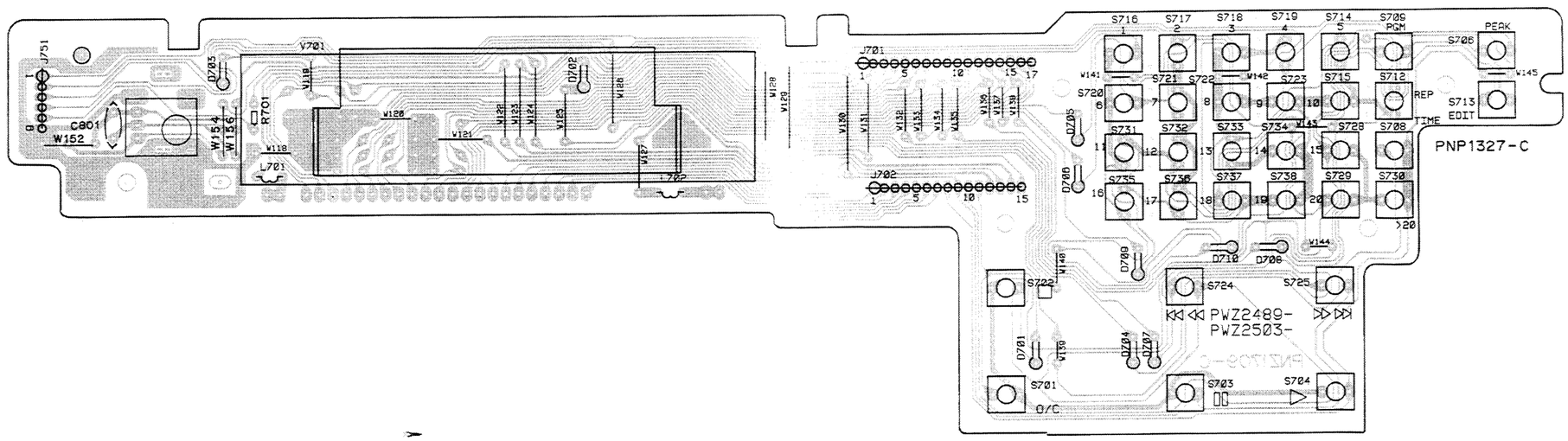
Symbol in PCB Diagrams	Symbol in Schematic Diagrams	Part Name
Q504 (E) Q504	Q504 Q504	Transistor
D203 D203	D203	Diode
C513 C513	C513	Capacitor (Polarized)

3. The transistor terminal marked with E or ⊏ shows the emitter.
4. The diode terminal marked with ⊙ or ⊂ shows cathode side.
5. The capacitor terminal marked with ⊙ or ⊏ shows negative terminal.

SERVO TRANS BOARD ASSY

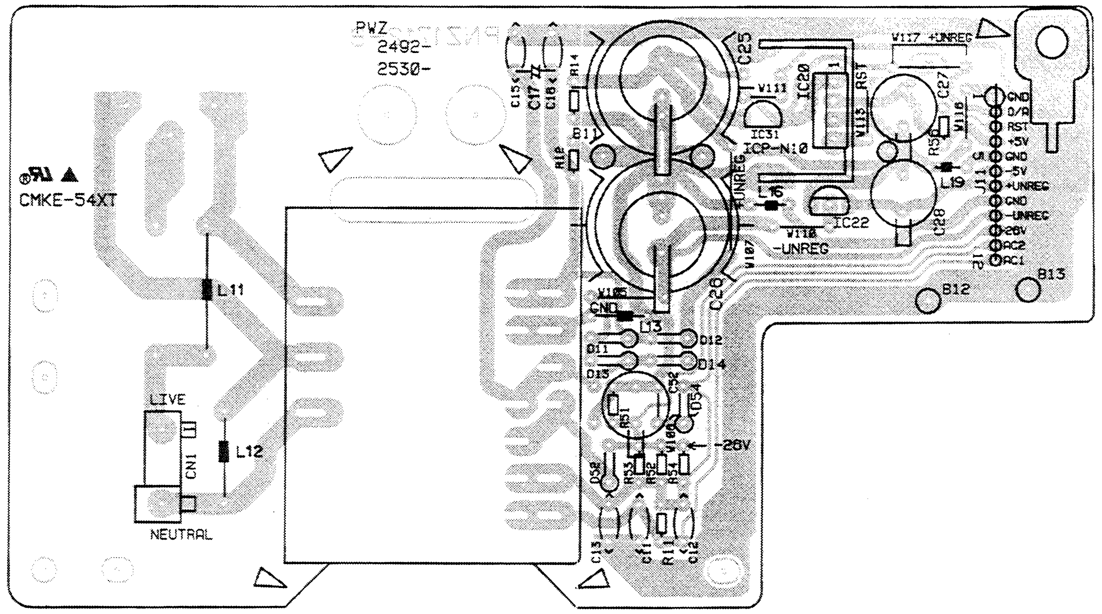


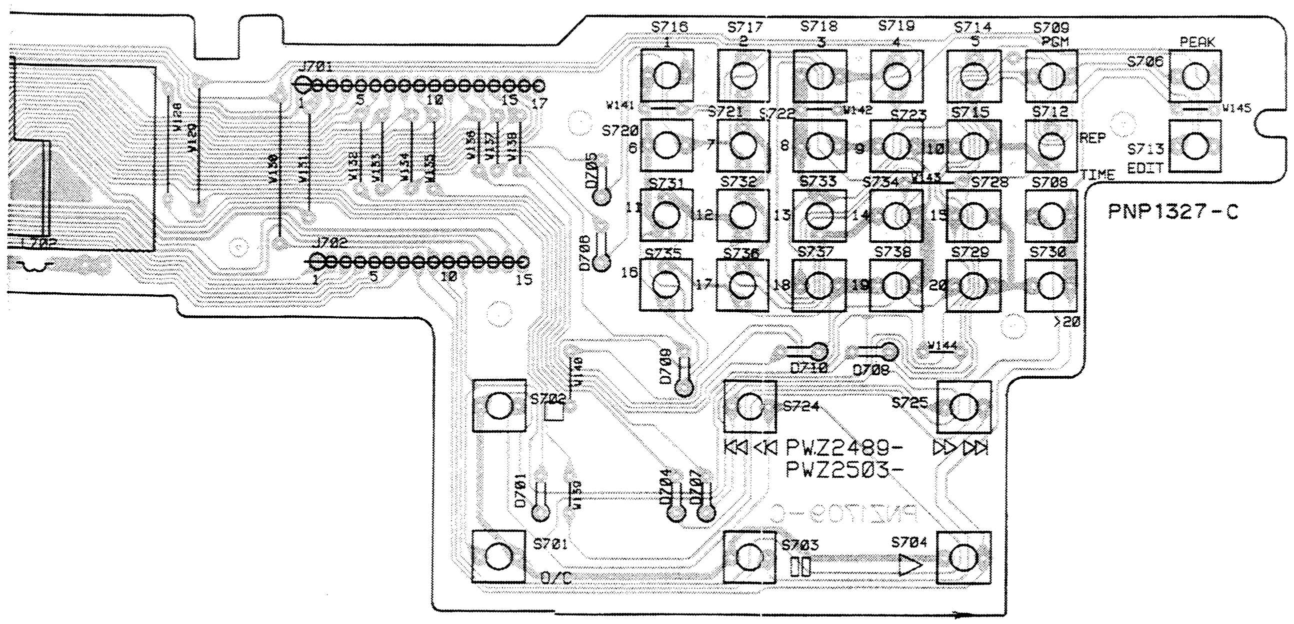
FUNCTION BOARD ASSY



Q391
Q454
Q404
IC406
Q453
Q403
Q456
IC405
Q405
IC151 IC421 Q452 Q455
Q451
IC202 IC401
VR152
Q322
VR151
IC301
IC201
IC351

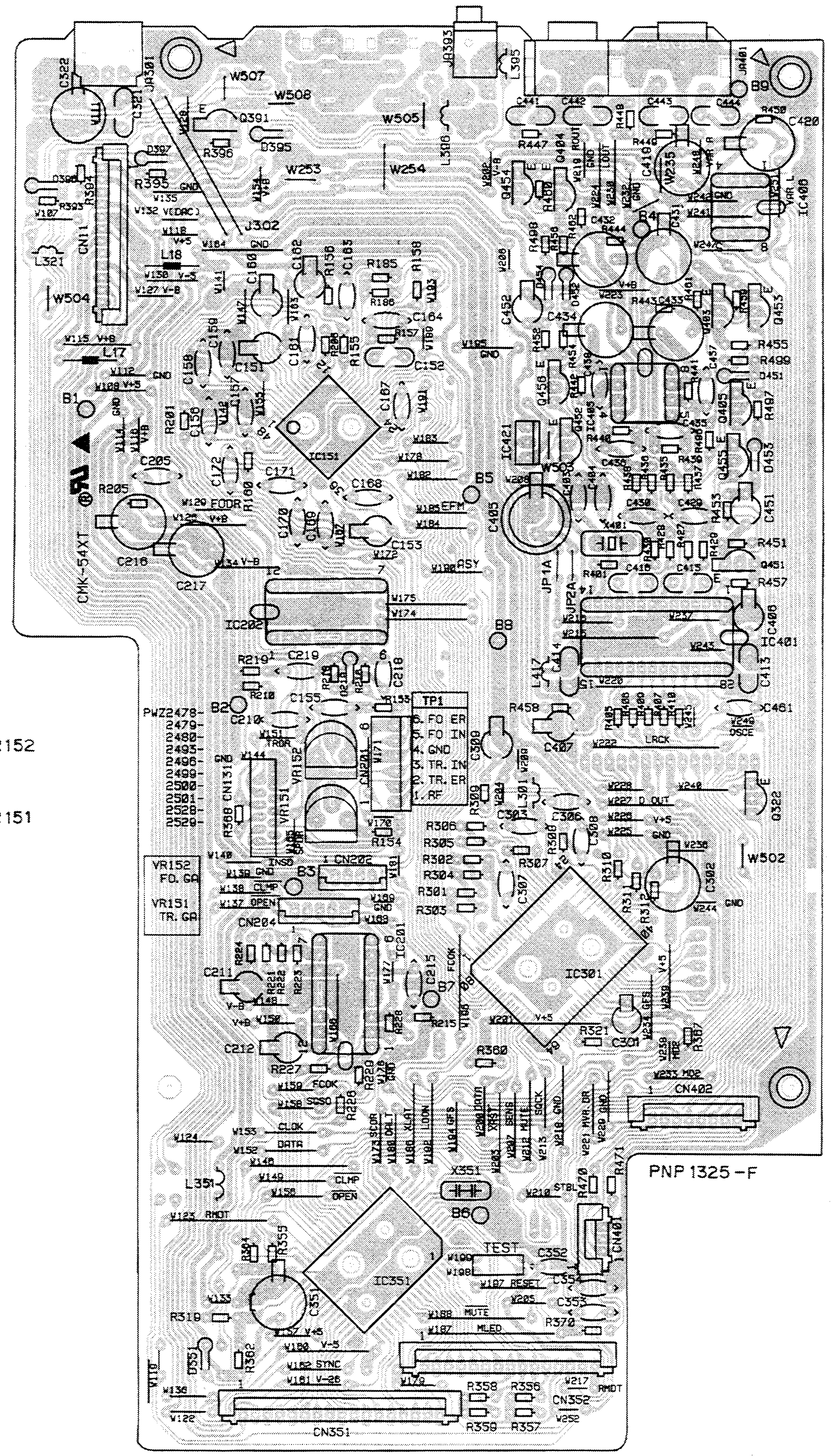
SERVO TRANS BOARD ASSY



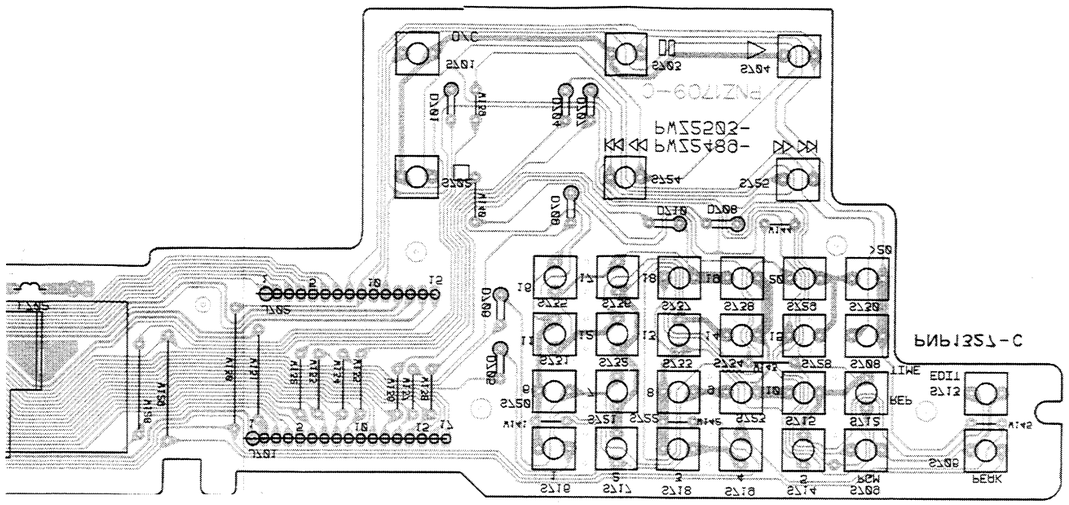


MAIN BOARD ASSY

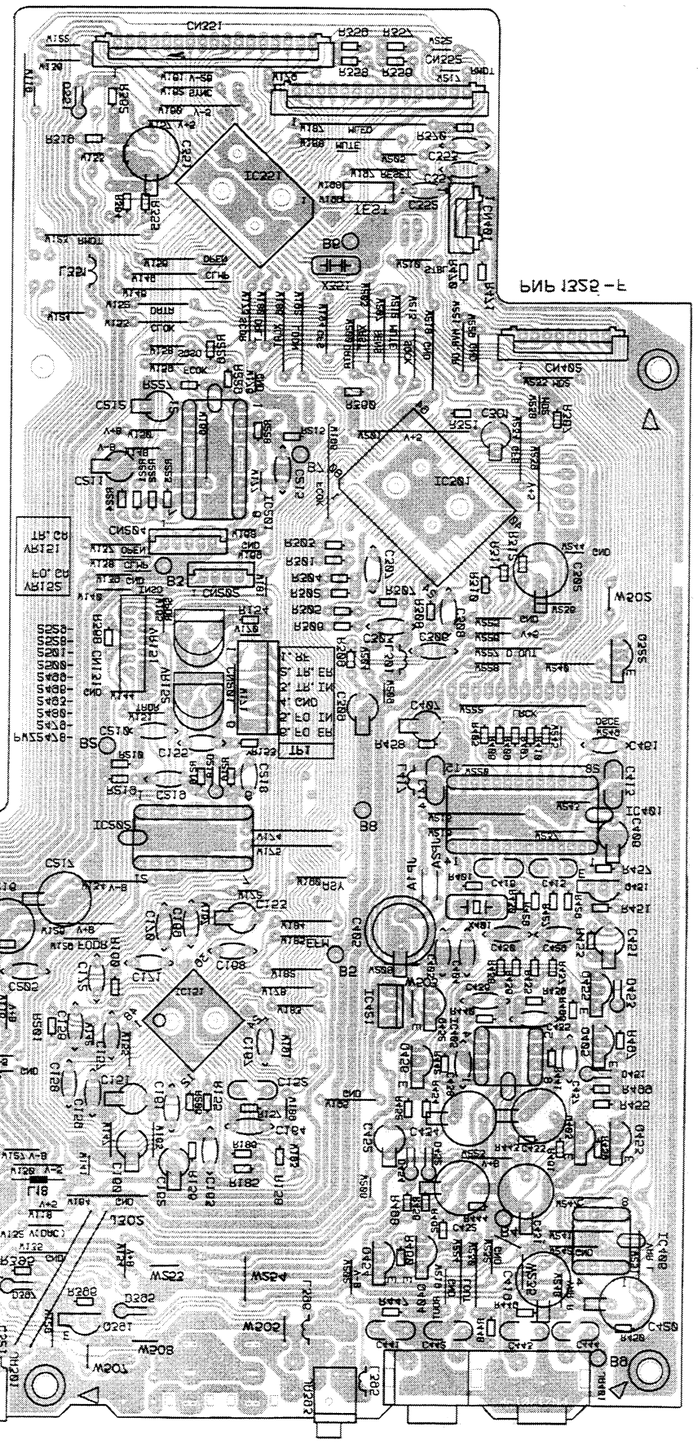
Q391
Q454
Q404
IC406
Q453
Q403
Q456
IC405
Q405
IC151 Q452
IC421 Q455
Q451
IC202 IC401
VR152
Q322
VR151
IC301
IC201
IC351



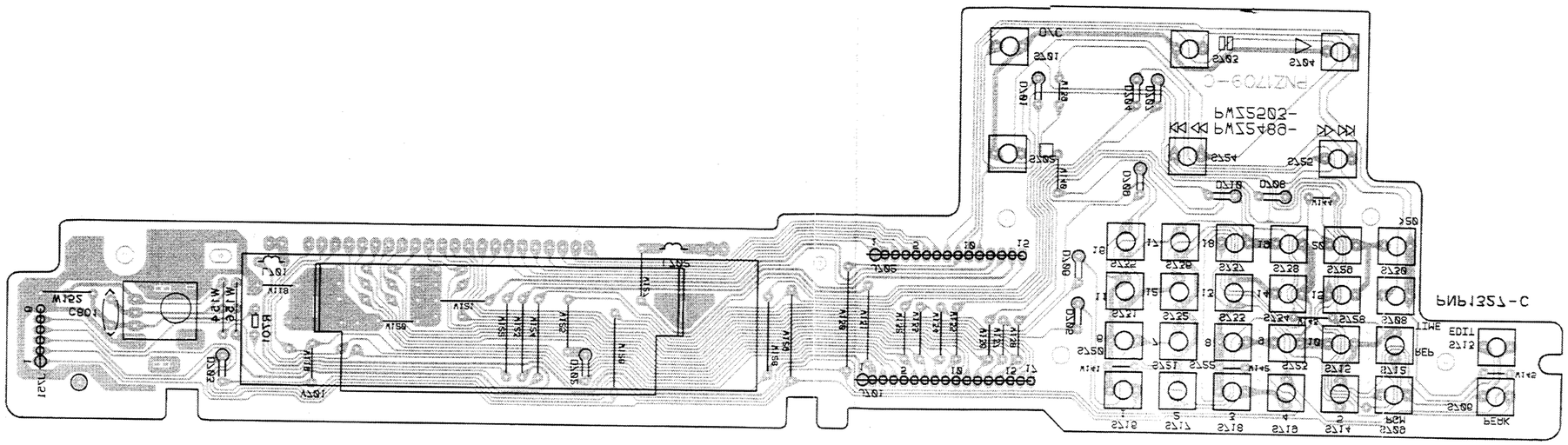
A B C D



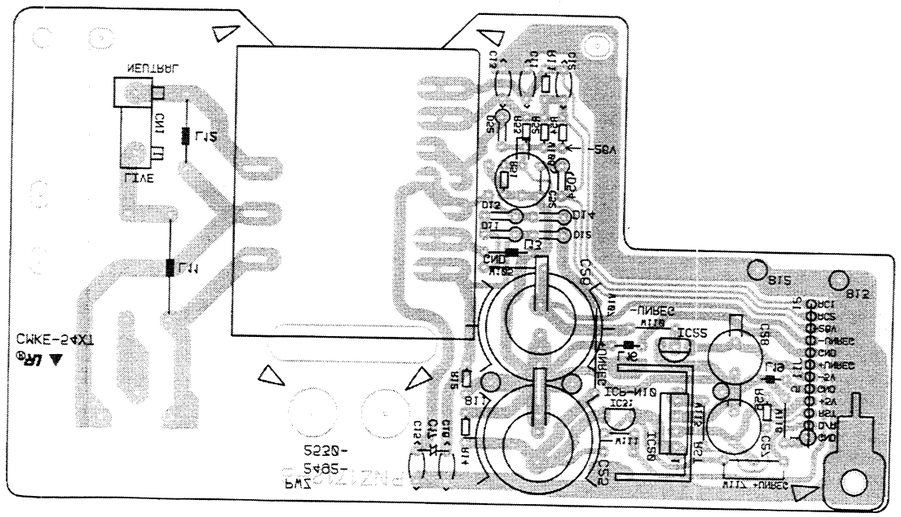
SERVO TRANS BOARD ASSY



MAIN BOARD ASSY



FUNCTION BOARD ASSY



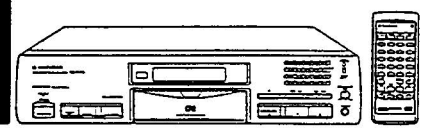
SERVO TRANS BOARD ASSY

4. PCB DIAGRAM

• This diagram is viewed from the foil side.

PIONEER®
The Art of Entertainment

Service Manual



COMPACT DISC PLAYER

PD-S602

PD-S602 HAS THE FOLLOWING:

Type	Power Requirement	Remarks
WEMXK	AC220 – 240V	
WBXK	AC220 – 240V	

- **This manual is applicable to PD-S602/WEMXK and WBXK.**

CONTENTS

1. SAFETY INFORMATION ·····2
2. EXPLODED VIEWS, PACKING AND PARTS LIST··4
3. PCB PARTS LIST ·····11
4. SCHEMATIC AND PCB CONNECTION DIAGRAMS·····13
5. ADJUSTMENTS ·····25
6. PANEL FACILITIES·····34
7. SPECIFICATIONS ·····34

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SG MAY 1993 Printed in Japan

1. SAFETY INFORMATION

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

WARNING

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

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

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

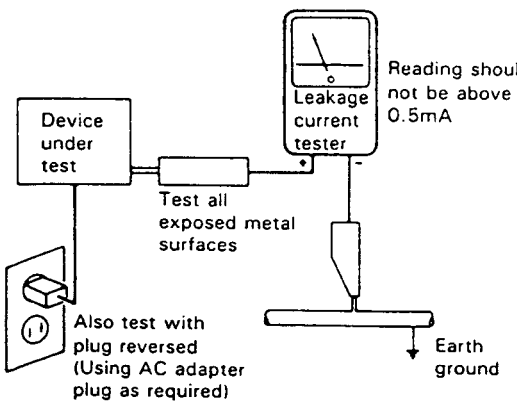
(FOR USA MODEL ONLY)

1. SAFETY PRECAUTIONS

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

LEAKAGE CURRENT CHECK

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



AC Leakage Test

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

2. PRODUCT SAFETY NOTICE

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

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

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

(FOR EUROPEAN MODEL ONLY)

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

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

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

LASER
Kuva 1
Lasersateilyn
varoitusmerkki

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

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

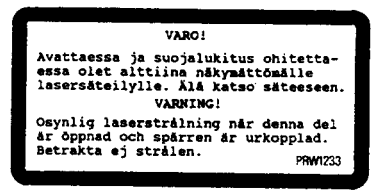
LASER DIODE CHARACTERISTICS
MAXIMUM OUTPUT POWER: 5 mw
WAVELENGTH: 780-785 nm

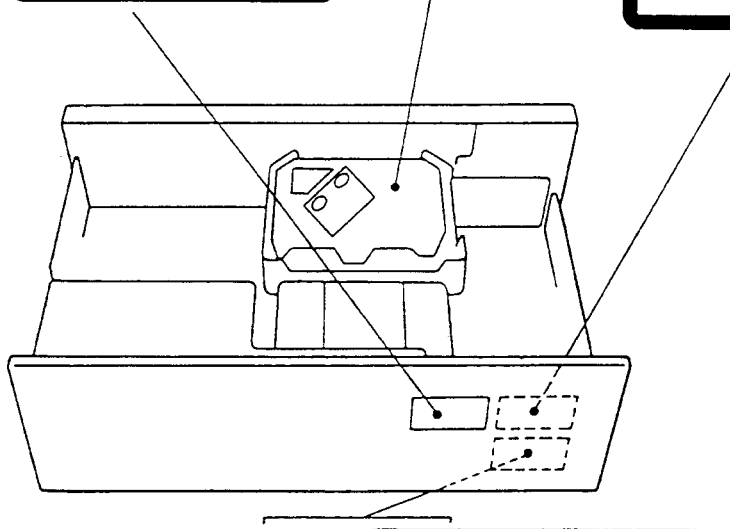
LASER
Picture 1
Warning sign for
laser radiation

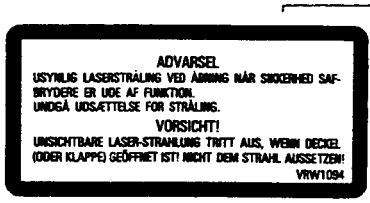
LABEL CHECK

WBXK and WEMXK types

WEMXK type







WEMXK type

WBXK type

Additional Laser Caution

1. 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 in $\overline{\text{CLMP}}$ terminal side (when the mechanism is not clamped and $\overline{\text{CLMP}}$ signal is high level). Thus, the interlock will no longer function if the switch (S601) is deliberately set to $\overline{\text{CLMP}}$ terminal side (if $\overline{\text{CLMP}}$ 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).
2. When the cover is opened, close viewing of the objective lens with the naked eye will cause exposure to a Class 1 laser beam.

* Refer to page 26.

2. EXPLODED VIEWS, PACKING AND PARTS LIST

2.1 EXTERIOR

NOTES:

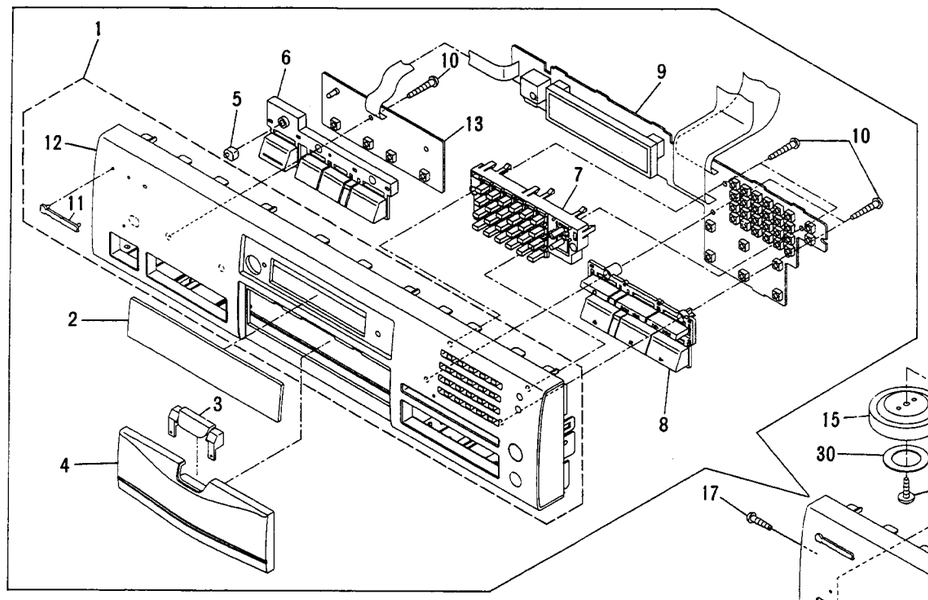
- Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "⊙"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

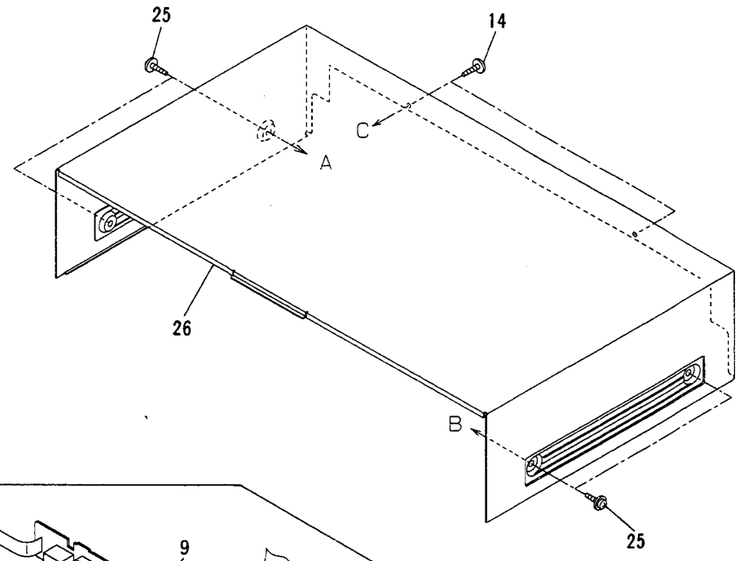
Parts List

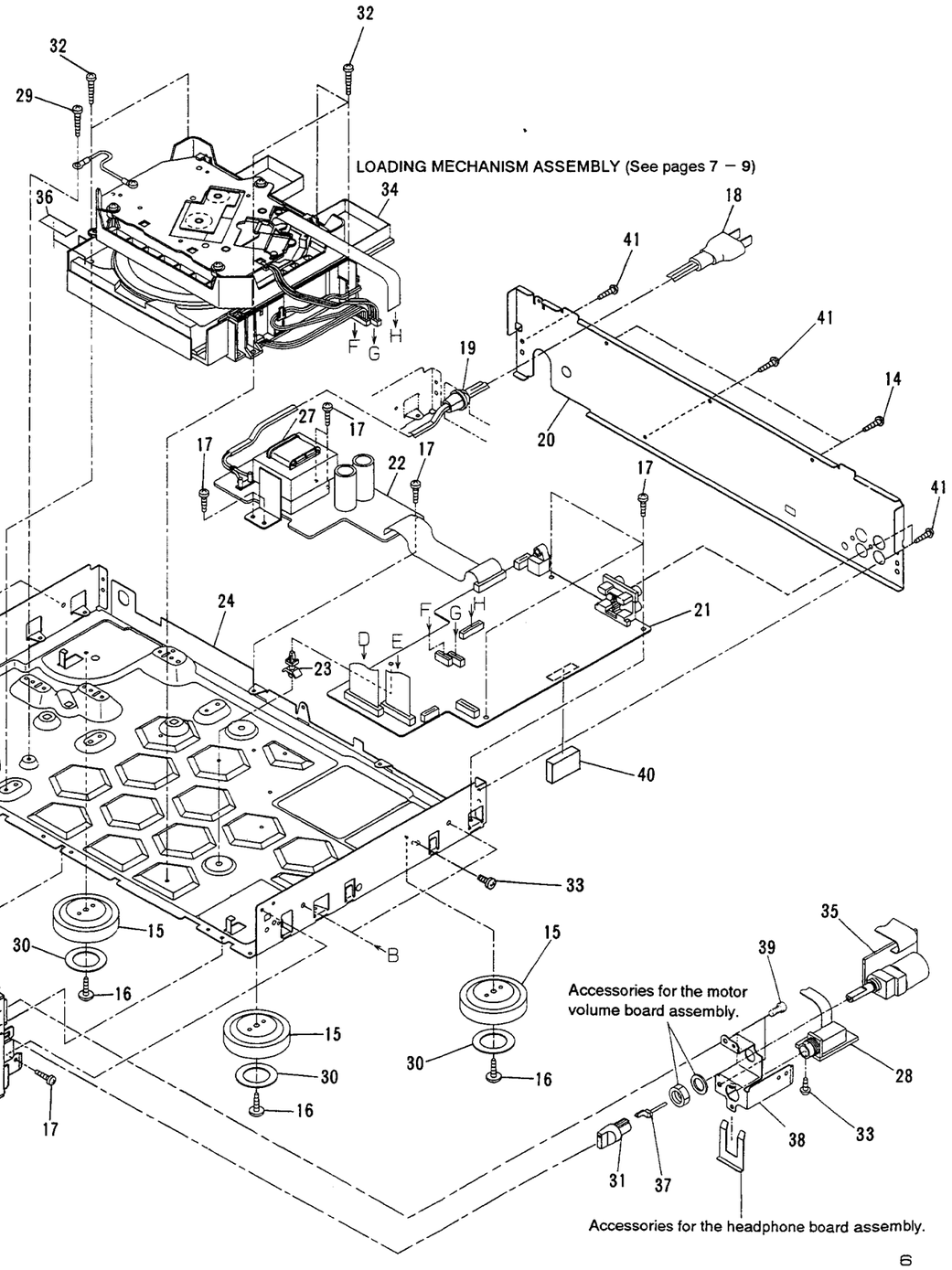
Mark	No.	Description	Part No.
	1	Function panel assembly	PEA1262
	2	Display window	PAM1625
	3	Tray lens	PNW2242
	4	Tray name plate	PNW2244
	5	LED lens	PNW2019
	6	Power button	PAC1712
	7	26key	PAC1715
	8	Function button	PAC1713
	9	FUNCTION board assembly	PWZ2489
	10	Screw	PPZ30P150FMC
	11	PIONEER badge	PAM1608
	12	Function panel	PNW2246
NSP	13	SW board assembly	PWZ2490
	14	Screw	BBZ30P080FCC
	15	Insulator	PNW1263
	16	Screw	IBZ30P100FCC
	17	Screw	BBZ30P060FCC
⚠	18	AC power cord (WEMXK type)	PDG1003
⚠	18	AC power cord (WBXK type)	VDG1051
⚠	19	Strain relief	CM – 22B
NSP	20	Rear base (WEMXK type)	PNA1925
NSP	20	Rear base (WBXK type)	PNA1966
⚠	21	MAIN board assembly	PWZ2480
⚠	22	SERVO TRANS board assembly	PWZ2492
NSP	23	PCB holder	PNW2100
NSP	24	Under base	PNA1912
	25	Screw	FBT40P080FZK
	26	Bonnet	PYY1162
⚠	27	Power transformer	PTT1236
NSP	28	HEADPHONE board assembly	PWZ2481
	29	Screw	PDZ30P050FMC
	30	Stopper	PNM1070
	31	Knob C	RAC1608
	32	Screw	BSZ30P070FMC
	33	Screw	IBZ30P060FCC
NSP	34	Loading mechanism assembly	PXA1509
NSP	35	Motor VR board assembly	PWZ2482
	36	Caution label	PRW1244
	37	H. P. Lens	PNW2157
NSP	38	Headphone angle	PNB1434
	39	Screw	PPZ30P050FMC
NSP	40	Spacer A	PEB1228
	41	Screw	BBT30P080FCC

Exterior

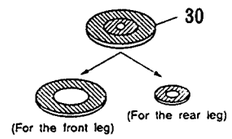
NOTE: Screws adjacent to ▼ mark on the product are used for disassembly.



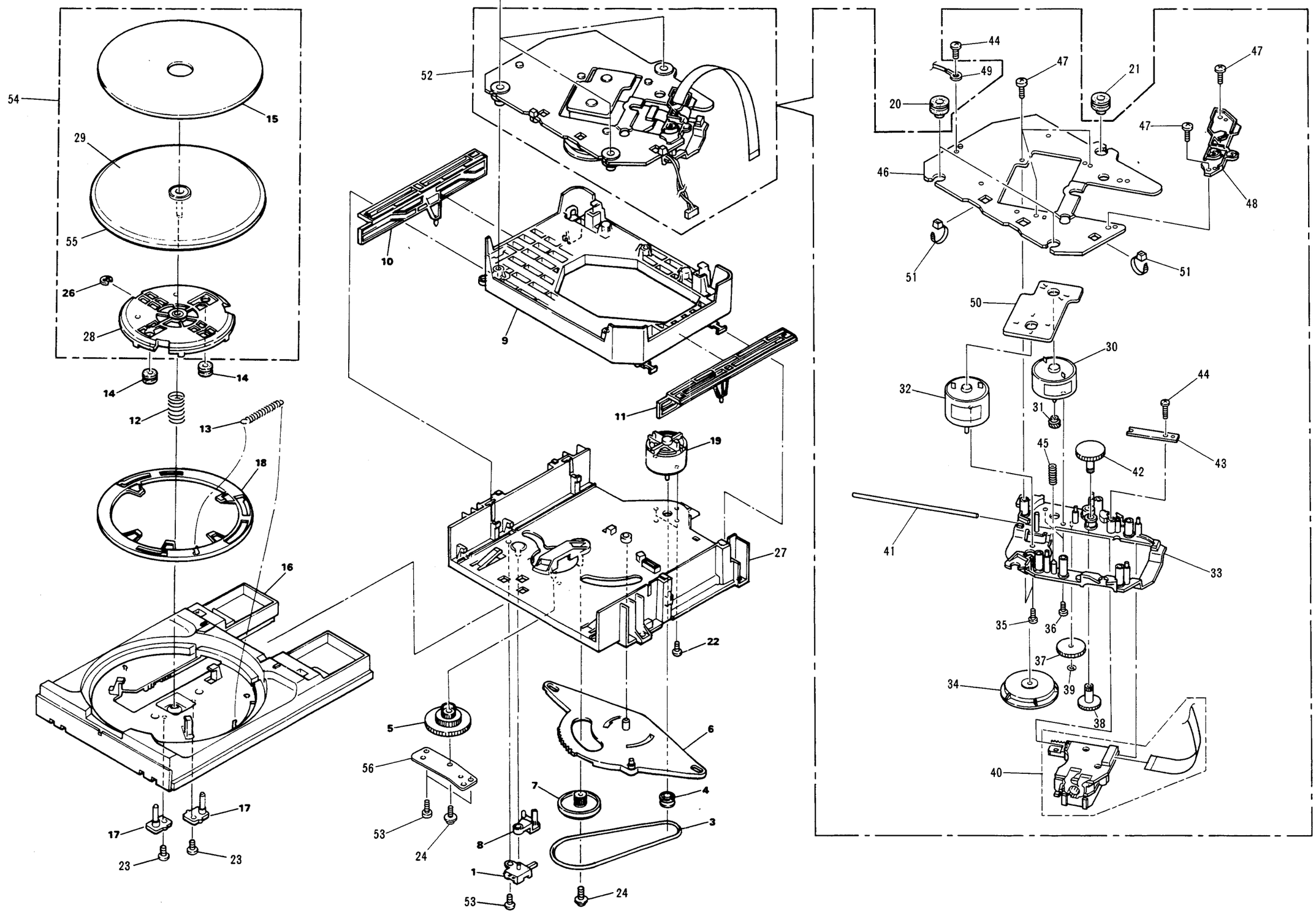




* The stopper consist of the big ring part and the small ring part. If you stick the stopper to the leg, stick the big ring part to the front leg, and the small ring part to the rear leg.



2.2 LOADING MECHANISM ASSEMBLY



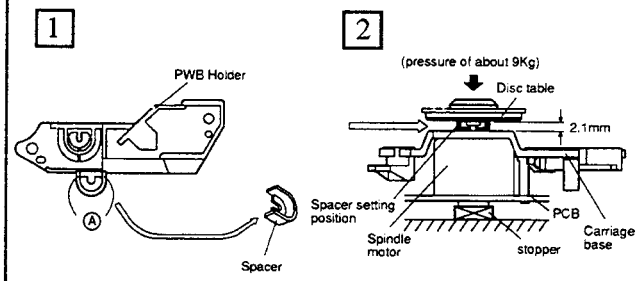
Parts List

Mark	No.	Description	Part No.
	1	Lever switch (S601)	DSK1003
	2	Screw (steel)	PBA1027
	3	Rubber belt	PEB1186
	4	Motror pulley	PNW1634
	5	Drive gear	PNW1996
	6	Synchro lever	PNW2168
	7	Gear pulley	PNW1998
	8	SW head	PNW1999
	9	Float base	PNW2000
	10	Left cam	PNW2001
	11	Right cam	PNW2002
	12	Compression spring	PBH1120
	13	Tention spring	PBH1121
	14	Float (rubber)	PEB1014
	15	Table rubber sheet	PEB1181
	16	Tray	PNW2003
	17	Table guide	PNW2004
	18	Lock plate	PNW2005
	19	DC motor (LOADING)	PXM1010
	20	Rubber bush	PEB1031
	21	Rubber bush	PEB1170
	22	Screw	BMZ26P040FMC
	23	Screw	IPZ26P060FCU
	24	Screw	IPZ20P080FMC
	25	.....	
	26	Washer	YE20S
NSP	27	Loading base	PNW1995
NSP	28	Table bearing assembly	PXA1383
NSP	29	Turn table (AL)	PNR1035
	30	DC motor (CARRIAGE)	PXM1027
	31	Pinion gear	PNW2055
	32	DC 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	Spring	PBH1132
NSP	46	Mechanism base	PNB1431
	47	Screw	BPZ20P100FMC
	48	PWB holder	PNW2057
NSP	49	Earth lead unit	XDF – 503
NSP	50	Mechanism board assembly	PWX1192
NSP	51	Cord clamper	PEC – 107
NSP	52	Servo mechanism assembly	PXA1479
	53	Screw	BPZ26P060FMC
	54	Turn table assembly	PEA1165
NSP	55	Table base assembly	PXA1382
	56	Shaft holder	PNB1382

•How to install the disc table

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

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

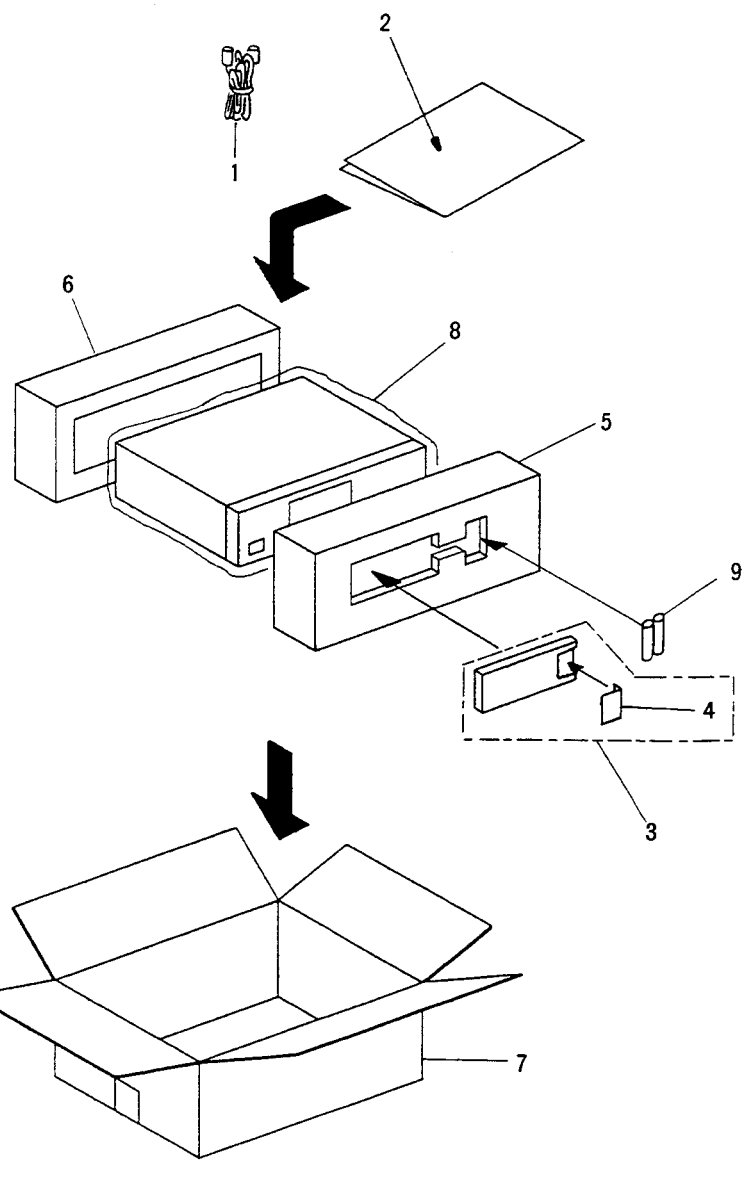


2.3 PACKING

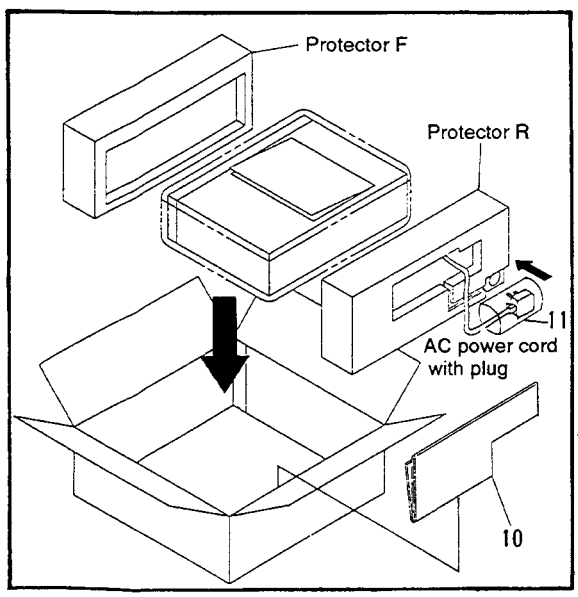
Parts List

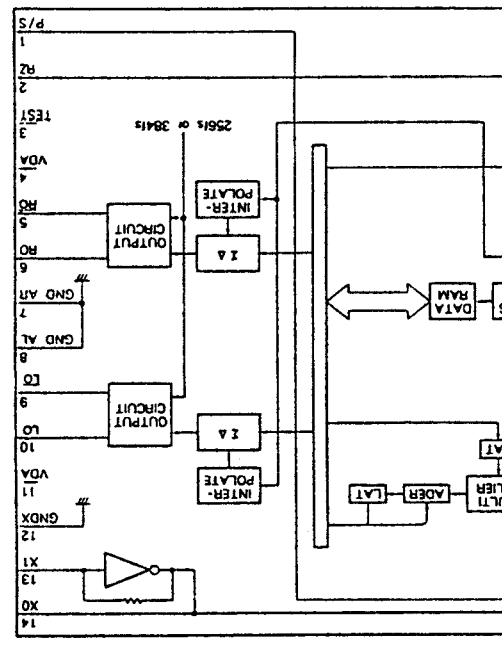
Mark	No.	Description	Part No.
	1	Cord with pin plug	PDE1109
	2	Operating instructions (WEMXK type) (English/French/German/Italian /Dutch/Swedish/Spanish/Portuguese)	PRE1173
	2	Operating instructions (WBXK type) (English)	PRB1191
	3	Remote control unit	PWW1060
	4	Battery lid	PZN1001
	5	Protector F	PHA1237
	6	Protector R (WEMXK type)	PHA1261
	6	Protector R (WBXK type)	PHA1259
	7	CD packing case (WEMXK type)	PHG1873
	7	CD packing case (WBXK type)	PHG1933
	8	Sheet	Z23 – 007
NSP	9	Battery (R03, AAA)	VEM – 022
	10	Spacer (WBXK type only)	PHC1078
	11	Vinyl bag (WBXK type only)	Z21 – 013

● For WEMXK type



● For WBXK type





3. PCB PARTS LIST

NOTES:

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

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

560 Ω → 56 × 10¹ → 561 ····· RD1/8PM 5 6 1 J
47k Ω → 47 × 10³ → 473 ····· RD1/4PS 4 7 3 J
0.5 Ω → 0R5 ····· RN2H 0 R 5 K
1 Ω → 010 ····· RS1P 0 1 0 K

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

5.62k Ω → 562 × 10¹ → 5621 ····· RN1/4PC 5 6 2 1 F

Mark	No.	Description	Part No.

LIST OF ASSEMBLIES

NSP	⚠	MOTHER BOARD ASSEMBLY	PWM1761
⚠		├MAIN BOARD ASSEMBLY	PWZ2480
NSP		├HEADPHONE BOARD ASSEMBLY	PWZ2481
NSP		└MOTOR VR BOARD ASSEMBLY	PWZ2482
NSP	⚠	SUB BOARD ASSEMBLY	PWX1275
		├FUNCTION BOARD ASSEMBLY	PWZ2489
NSP		├SW BOARD ASSEMBLY	PWZ2490
⚠		└SERVO TRANS BOARD ASSEMBLY	PWZ2492
NSP		MECHANISM BOARD ASSEMBLY	PWX1192

MAIN BOARD ASSEMBLY

SEMICONDUCTORS

	IC151	CXA1372Q
	IC301	CXD2500BQ
⚠	IC201, IC202	LA6520
	IC421	LM2940CT-5.0
	IC406	M5218AP
	IC405	NJM5532DD
	IC401	PD2026B
	IC351	PD4457A
	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, 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
	C413-C416	CFTXA104J50
	C441-C444	CFTXA152J50
	C406, C407	CFTXA471J50
	C152, C161, C321	CFTYA104J50
	C157, C164, C169, C308	CGCYX103K25
	C158, C159, C163, C230, C301	CGCYX104K25
	C156, C168	CGCYX333K25
	C307, C354	CGCYX473K25
	C306	CKCYB152K50
	C155	CKCYB182K50
	C218	CKCYB272K50
	C170	CKCYB332K50
	C171, C172	CKCYB472K50
	C167, C205, C210, C215, C219, C303, C352, C353, C461	CKCYF103Z50

RESISTORS

	VR151, VR152 (22K)	RCP1046
	OTHER RESISTORS	RD1/6PM□□□J

OTHERS

	CN131 CONNECTOR (12P)	12FM-1.0BT
	JA393 MINI JACK	PKN1005
	JA301 OPTICAL OUTPUT JACK	TOTX178
	PIN JACK (4P)	DKB1016
	X401 CRYSTAL RESONATOR (16.9344MHz)	PSS1008
	X351 CERAMIC RESONATOR (4.19MHz)	VSS1014

HEADPHONE BOARD ASSEMBLY

COILS

	L501-L503	LAU010K

CAPACITORS

	C501, C502	CKCYF103Z50
	C503	CKCYF473Z50

OTHERS

	JA501 HEADPHONE JACK	PKN1001

MOTOR VOLUME BOARD ASSEMBLY

CAPACITORS

	C510	CKPUYF103Z25

RESISTORS

	VR501 (20KB)	PCS1010

FUNCTION BOARD ASSEMBLY

SEMICONDUCTORS

	D701-D710	1SS254

SWITCHES

	S701-S704, S706, S708, S709, S712-S725, S728-S738	PSG1006

COILS

	L701, L702	LAU010K

RESISTORS

	ALL RESISTORS	RD1/6PM□□□J

OTHERS

	V701 FL INDICATOR TUBE	PEL1073
	REMOTE SENSOR	SBX1610

SW BOARD ASSEMBLY

SEMICONDUCTORS

	D751	PCX1019

SWITCHES

	S751-S754	PSG1006

SERVO TRANS BOARD ASSEMBLY

SEMICONDUCTORS

⚠	IC31	ICP-N10
⚠	IC22	NJM79L05A
⚠	IC20	PQ05RR12
⚠	D11-D14, D52	11ES2
	D54	MTZJ18B/C

CAPACITORS

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

RESISTORS

	ALL RESISTORS	RD1/6PM□□□J

OTHERS

⚠	TERMINAL	RKC-061

MECHANISM BOARD ASSEMBLY

SWITCHES

	S610	DSG1016

art No.

3Z50

BLY

03Z225

□□□J

LY

5A
2

/C

M35
M6R3
M16
3Z50

□□□J

4. SCHEMATIC AND PCB CONNECTION DIAGRAMS

Note: Type 4

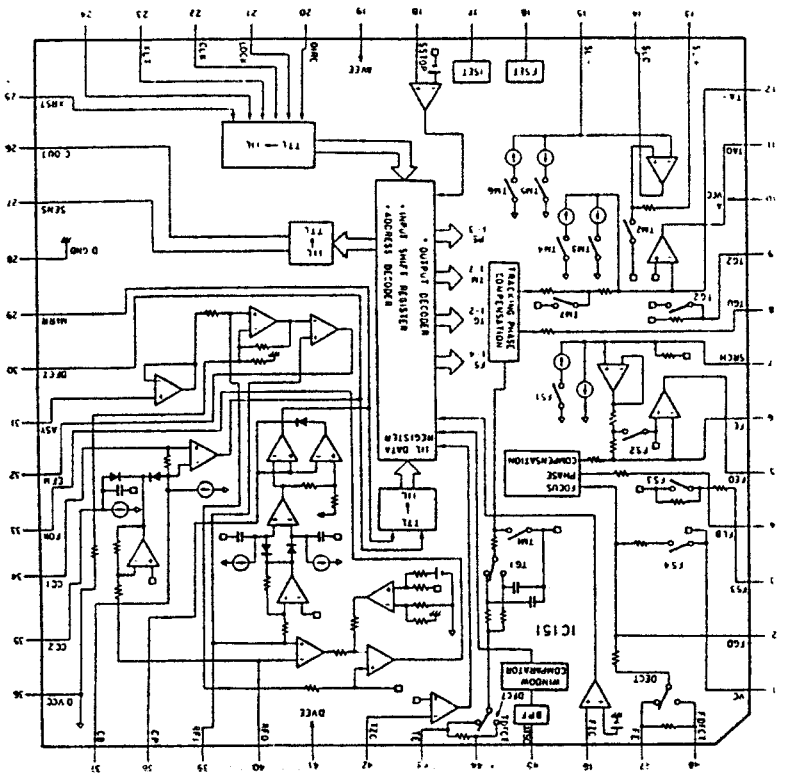
1. **When ordering service parts, be sure to refer to "PARTS LIST of EXPLODED VIEWS" or "PCB PARTS LIST".**
2. **Since these are basic circuits, some parts of them or the values of some components may be changed for improvement.**
3. **RESISTORS:**
   Unit: k:kΩ, M:MΩ, or Ω unless otherwise noted.
 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

FUNCTION BOARD ASSEMBLY

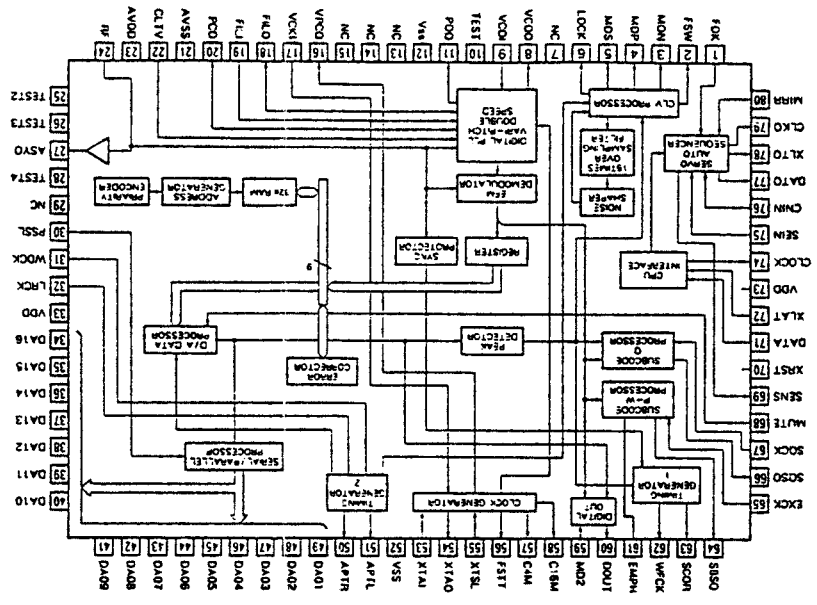
S701	:	O/C
S702	:	STOP
S703	:	PAUSE
S704	:	PLAY
S706	:	PEAK
S708	:	TIME
S709	:	PGM
S712	:	REP
S713	:	EDIT
S714	:	5
S715	:	10
S716	:	1
S717	:	2
S718	:	3
S719	:	4
S720	:	6
S721	:	7
S722	:	8
S723	:	9
S724	:	⏮
S725	:	⏭
S728	:	15
S729	:	20
S730	:	> 20
S731	:	11
S732	:	12
S733	:	13
S734	:	14
S735	:	16
S736	:	17
S737	:	18
S738	:	19

SW BOARD ASSEMBLY

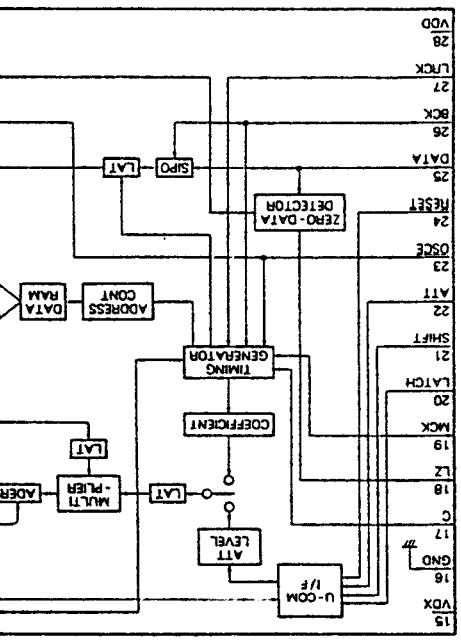
S751	:	RND
S752	:	HI – LITE
S753	:	POWER
S754	:	D. OFF



IC151: CXA1372Q

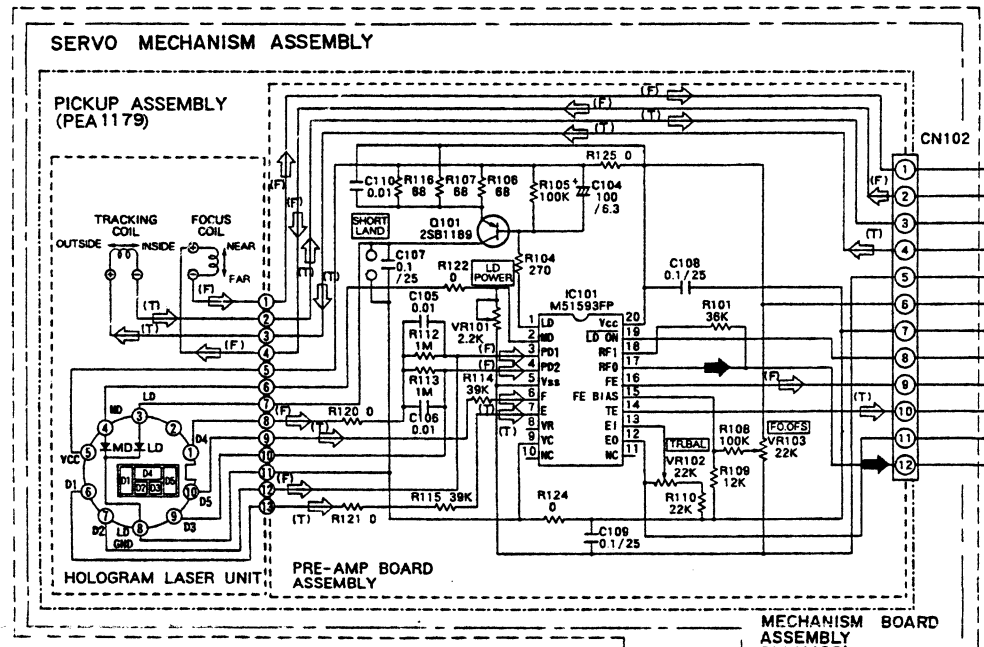


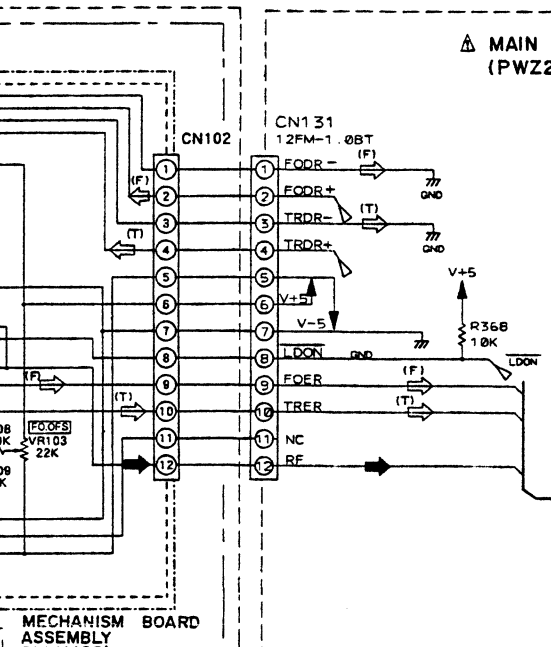
IC301: CXD2500BQ



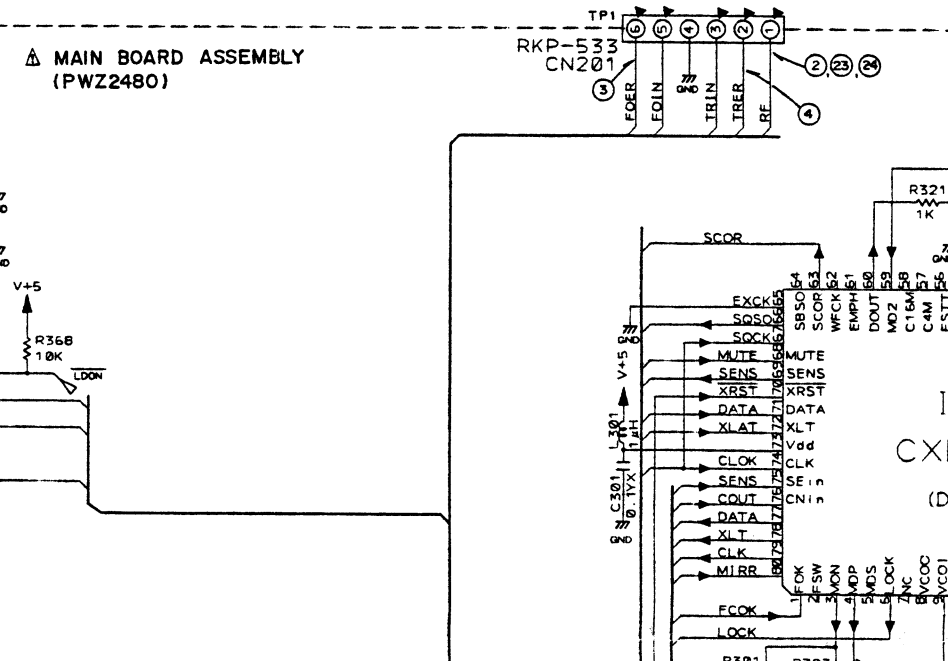
IC401: PD2026B

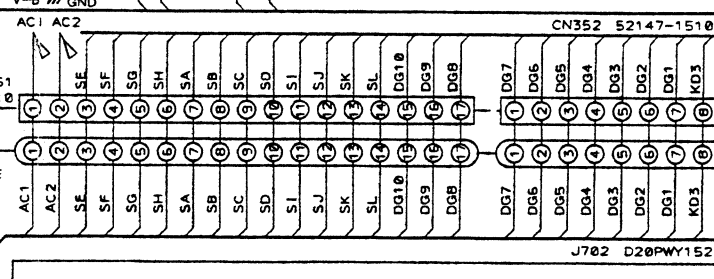
4.1 SCHEMATIC DIAGRAM

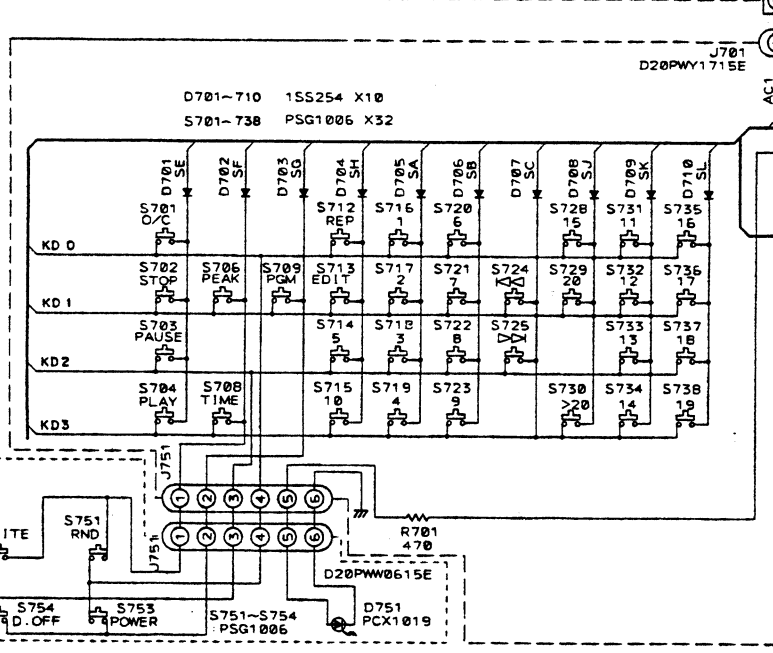


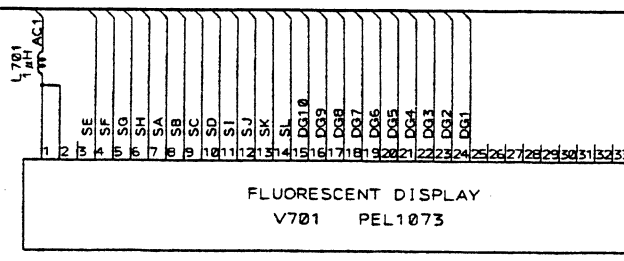


LOADING MECHANISM ASSEMBLY









FUNCTION BOAR (PWZ2489)

IC301 (CXD2500BQ)

Pin No.	Voltage (V)	Pin No.	Voltage (V)	Pin No.	Voltage (V)	Pin No.	Voltage (V)
1	5.0	21	0	41	NC	61	NC
2	NC	22	2.5	42	5.0	62	NC
3	5.0	23	5.0	43	NC	63	NC
4	2.6	24	2.5	44	NC	64	NC
5	NC	25	NC	45	NC	65	0
6	5.0	26	0	46	4.4	66	2.1 to 4.6
7	NC	27	2.5	47	0	67	5.0
8	NC	28	NC	48	0	68	0
9	0	29	0	49	3 to 6.3	69	2.1 to 3.8
10	0	30	NC	50	NC	70	5.0
11	NC	31	1.3 to 2.2	51	NC	71	0
12	0	32	2.5	52	0	72	5.0
13	NC	33	5.0	53	2.5	73	5.0
14	NC	34	2.5	54	NC	74	5.0
15	NC	35	NC	55	0	75	5.0
16	NC	36	NC	56	NC	76	0
17	0	37	NC	57	NC	77	5.0
18	2.5	38	NC	58	NC	78	5.0
19	2.4	39	NC	59	5.0	79	5.0
20	2.4	40	NC	60	NC	80	0

IC151 (CXA1372Q)

Pin No.	Voltage (V)	Pin No.	Voltage (V)
1	0	25	5.0
2	0	26	0
3	0	27	5.0
4	0	28	0
5	-0.3	29	0
6	0	30	-5.0
7	0.2	31	2.5
8	0	32	2.5
9	0	33	5.0
10	5.0	34	-1.5
11	0	35	-1.7
12	0	36	5.0
13	0	37	-0.7
14	3 to 6.1	38	-1.6
15	0	39	0
16	-4.0	40	0.8
17	1.3	41	-5.0
18	0	42	0
19	-5.0	43	0
20	5.0	44	0
21	5.0	45	0
22	5.0	46	0
23	5.0	47	0
24	5.0	48	0

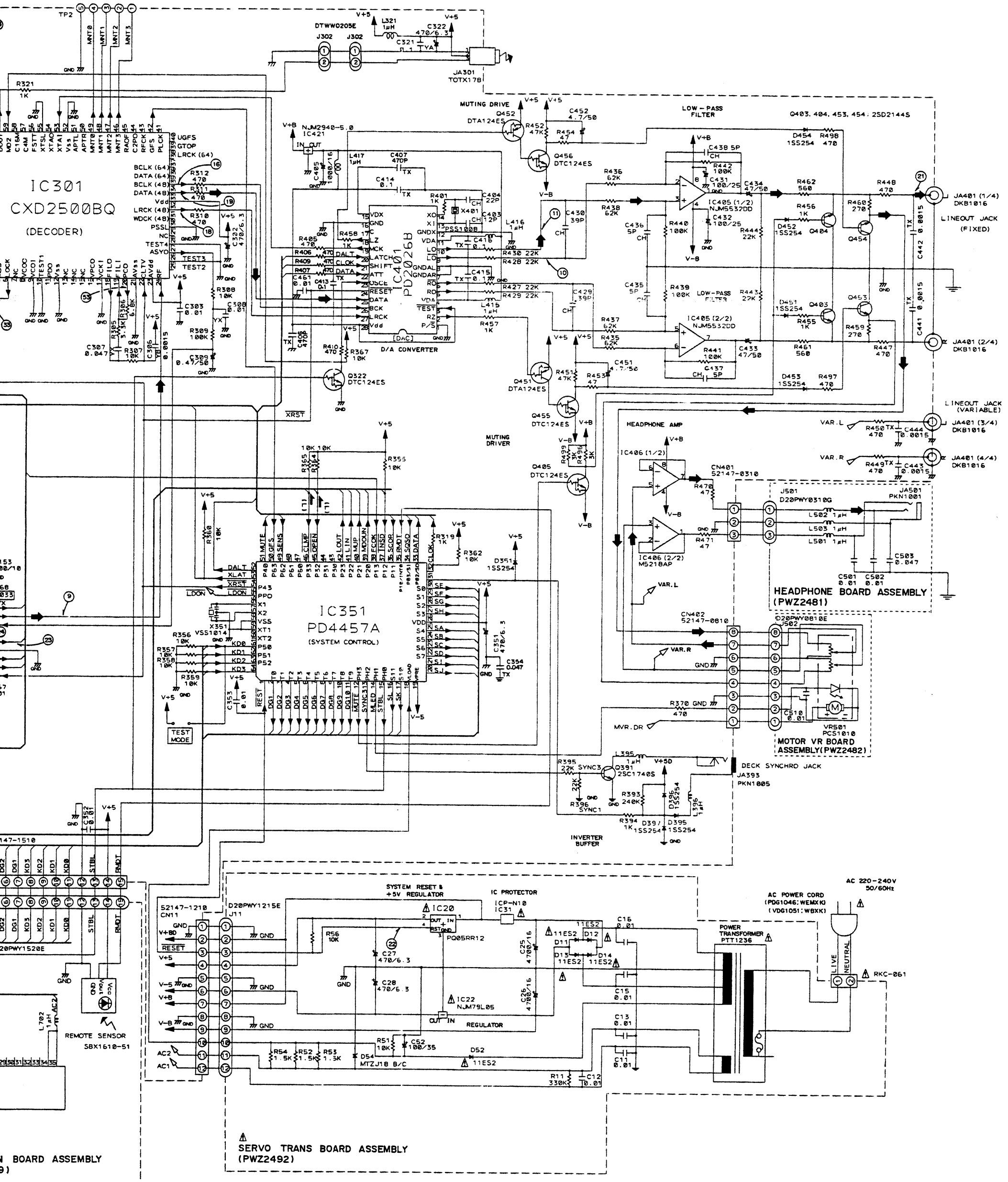
IC401 (PD20268)

Pin No.	Voltage (V)	Pin No.	Voltage (V)
1	0	15	5.0
2	0	16	0
3	5.0	17	NC
4	5.0	18	0
5	2.4	19	2.0
6	2.6	20	5.0
7	0	21	5.0
8	0	22	5.0
9	2.6	23	5.0
10	2.4	24	5.0
11	5.0	25	2.4
12	0	26	2.4
13	2.4	27	2.4
14	2.4	28	5.0

IC351 (PD4457A)

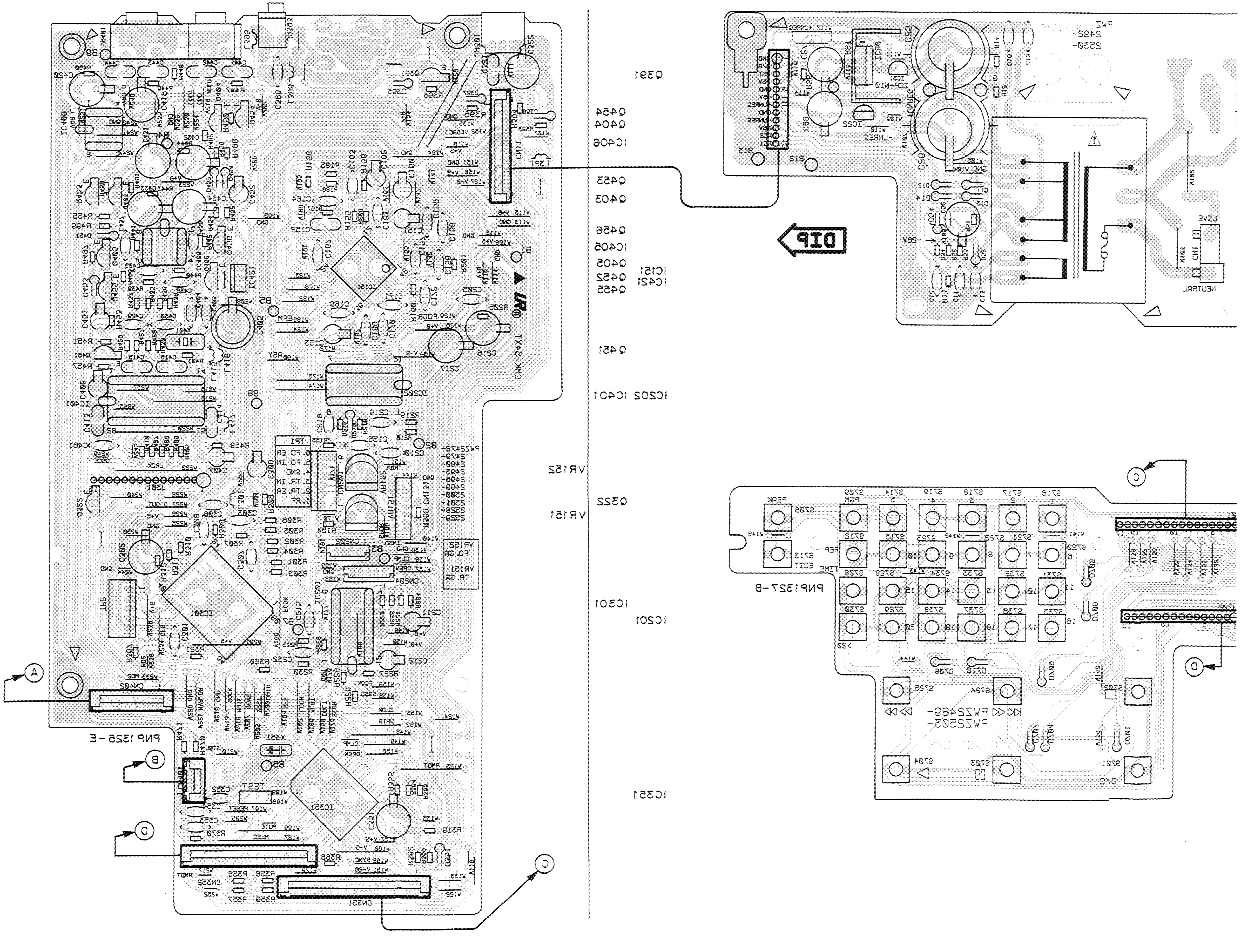
Pin No.	Voltage (V)	Pin No.	Voltage (V)	Pin No.	Voltage (V)	Pin No.	Voltage (V)
1	5.0	17	-2.1 to -22.8	33	5.0	49	0
2	-24.8 to -23.1	18	-26.0	34	3.3 to 4.1	50	5.0
3	-24.8 to -23.1	19	-5.0	35	5.0	51	0
4	-24.8 to -23.1	20	-2.1 to -22.8	36	0	52	5.0
5	-24.8 to -23.1	21	-2.1 to -22.8	37	5.0	53	5.0
6	-24.8 to -23.1	22	-2.1 to -22.8	38	5.0	54	5.0
7	-24.8 to -23.1	23	-2.1 to -22.8	39	NC	55	0
8	-24.8 to -23.1	24	-2.1 to -22.8	40	NC	56	2.5
9	-24.8 to -23.1	25	-2.1 to -22.8	41	0	57	2.5
10	-24.8 to -23.1	26	5.0	42	0	58	0
11	-24.8 to -23.1	27	-2.1 to -22.8	43	NC	59	0
12	0	28	-2.1 to -22.8	44	NC	60	NC
13	0	29	-2.1 to -22.8	45	0	61	0
14	NC	30	-2.1 to -22.8	46	5.0	62	0
15	0	31	5.0	47	NC	63	0
16	-2.1 to -22.8	32	5.0	48	NC	64	0

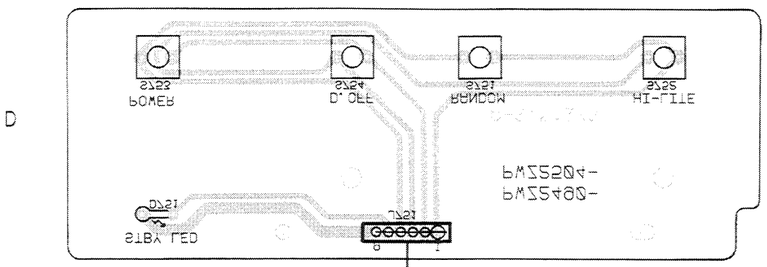
: Audio Signal Route
(F) : Focus Servo Loop Line
(T) : Tracking Servo Loop Line
(L) : Loading Motor Route
(S) : Spindle Motor Route
(C) : Carriage Motor Route


IC301
CXD2500BQ
(DECODER)
IC351
PD4457A
(SYSTEM CONTROL)
IC401
PD2026B
D/A CONVERTER
[DAC]
LOW-PASS FILTER
MUTING DRIVE
MUTING DRIVER
HEADPHONE AMP
HEADPHONE BOARD ASSEMBLY
(PWZ2481)
MOTOR VR BOARD
ASSEMBLY(PWZ2482)
SERVO TRANS BOARD ASSEMBLY
(PWZ2492)
INVERTER BUFFER
SYSTEM RESET &
+5V REGULATOR
IC PROTECTOR
REGULATOR
POWER TRANSFORMER PTT1236
AC POWER CORD
(PDG1046:WEMXK)
(VDG1051:WBXK)
AC 220-240V
50/60Hz
LINEOUT JACK
(FIXED)
LINEOUT JACK
(VARIABLE)
DECK SYNCHRO JACK
JA393
PKN1005
REMOTE SENSOR
SBX1610-51
TEST MODE
Q403, 404, 453, 454 : 2SD2144S

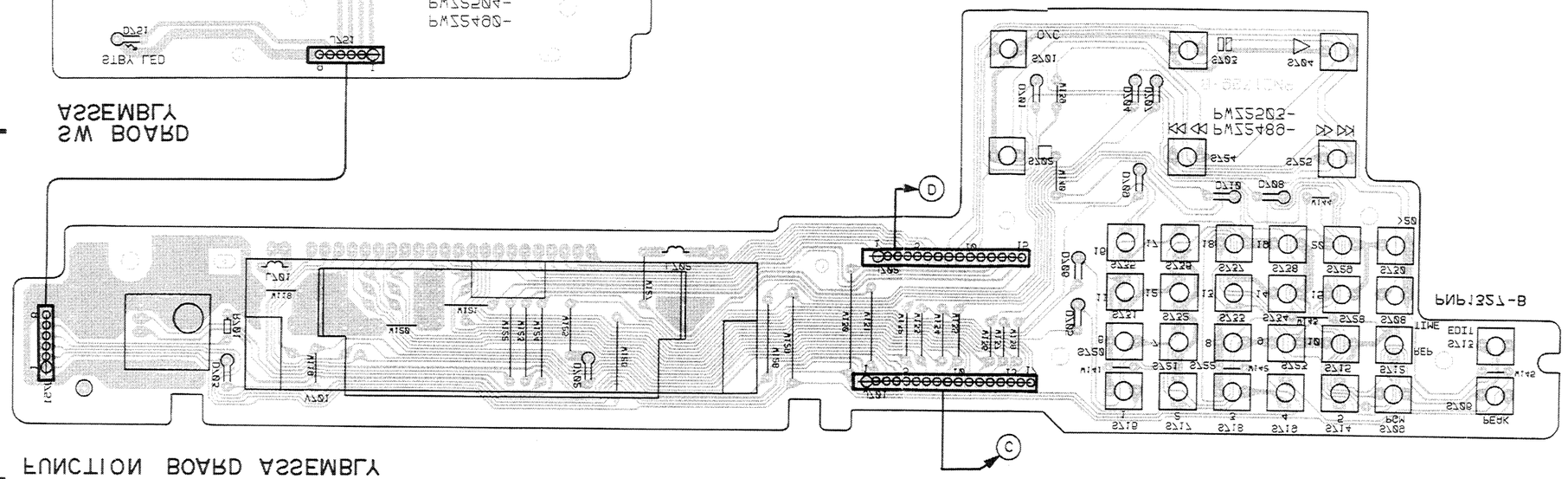
MAIN BOARD ASSEMBLY

TRANS BOARD ASSEMBLY

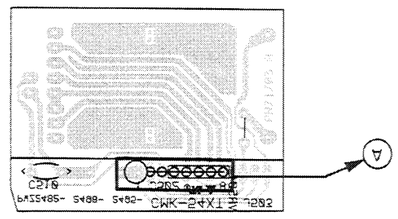




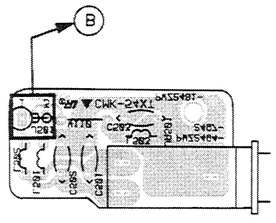
ASSEMBLY
SW BOARD



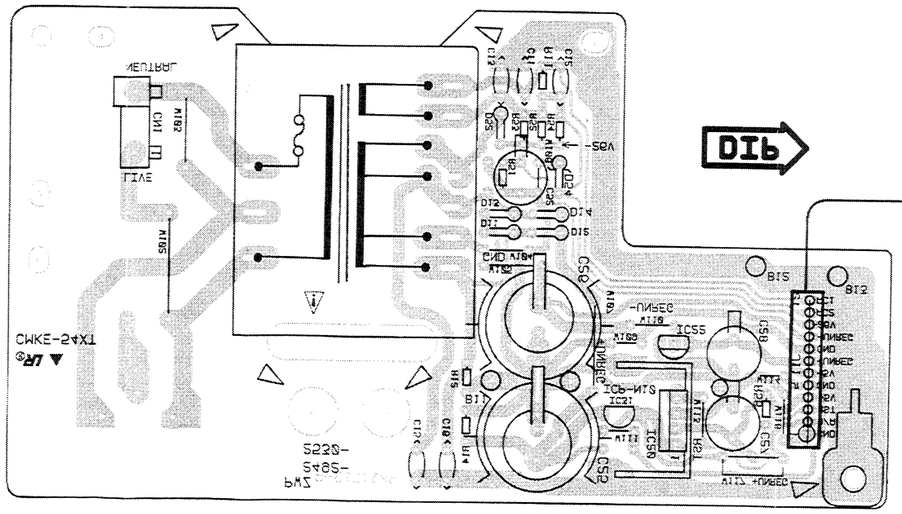
FUNCTION BOARD ASSEMBLY



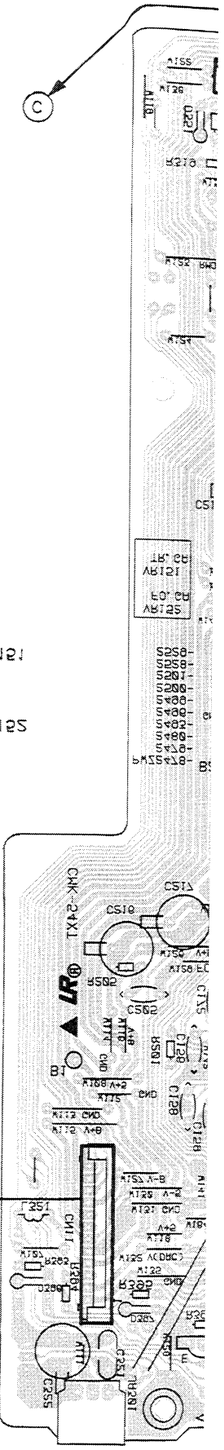
ASSEMBLY
MOTOR VR BOARD



ASSEMBLY
BOARD
HEADPHONE



SERVO TRANS BOARD ASSEMBLY



MAIN BOARD

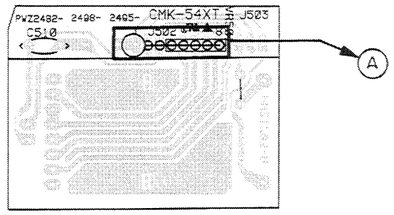
A.3 PCB CONNECTION DIAGRAM

• View from soldering side

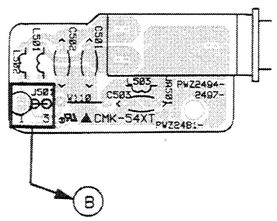
4.2 PCB CONNECTION DIAGRAM

- View from component side

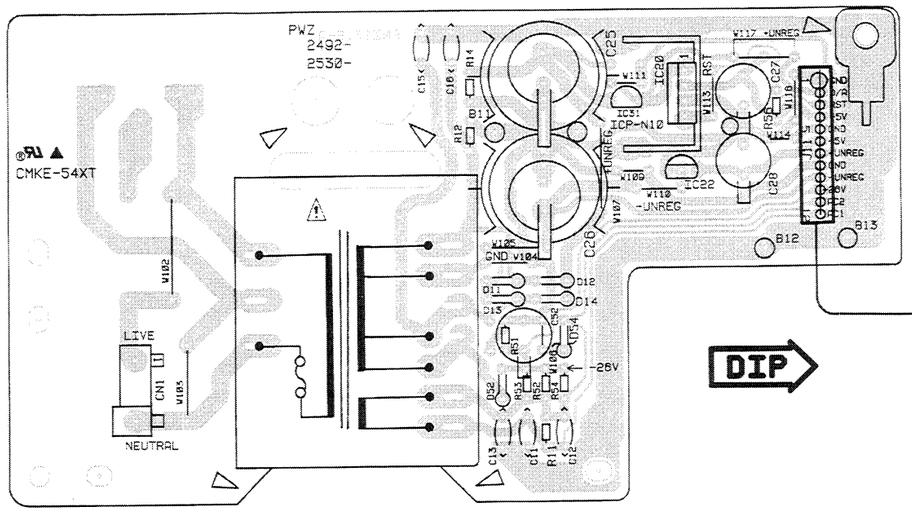
MOTOR VR BOARD ASSEMBLY



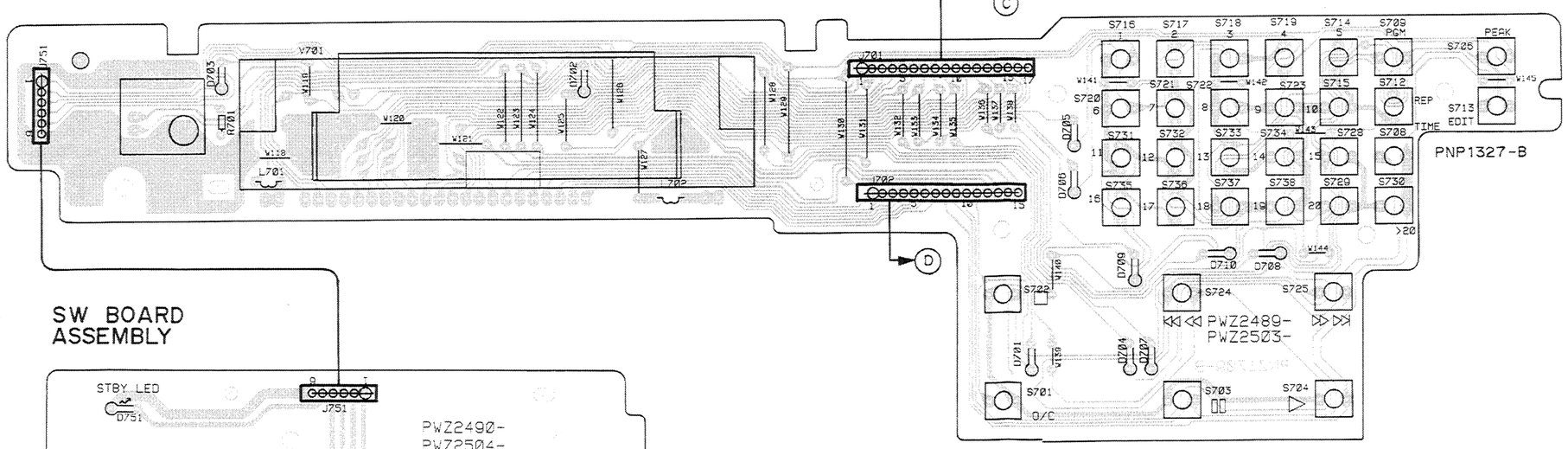
HEADPHONE BOARD ASSEMBLY



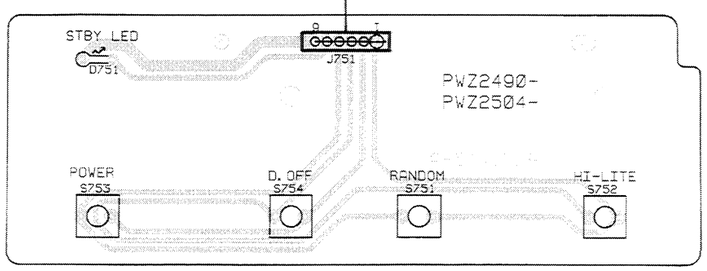
SERVO TRANS BOARD ASSEMBLY



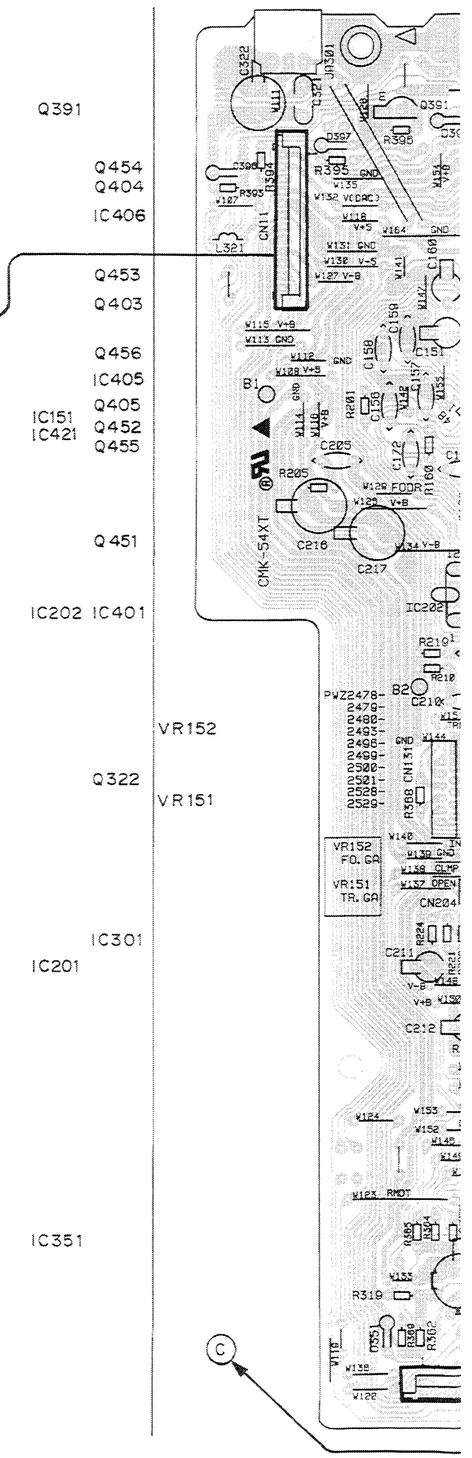
FUNCTION BOARD ASSEMBLY



SW BOARD ASSEMBLY

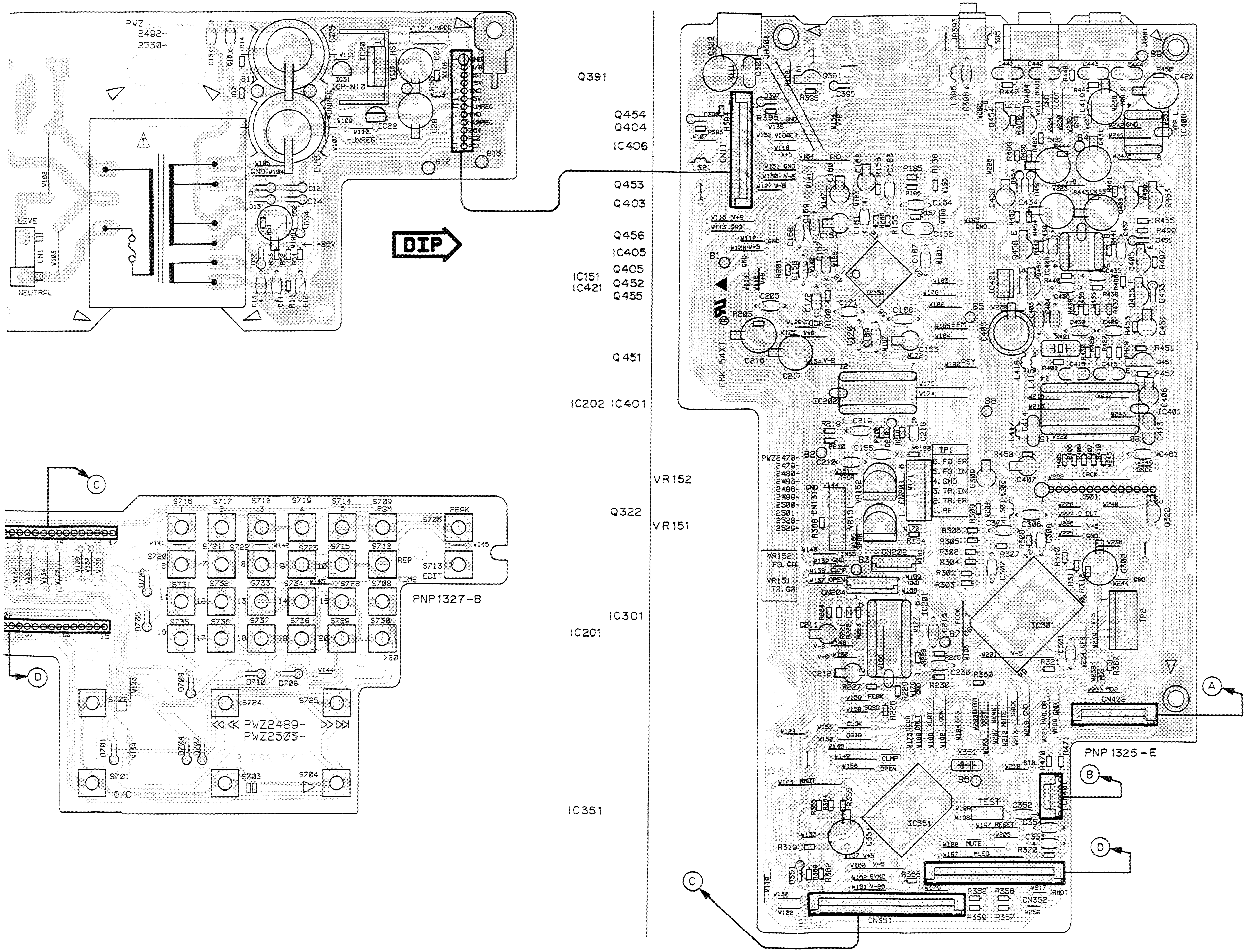


MAIN BOARD ASS



TRANS BOARD ASSEMBLY

MAIN BOARD ASSEMBLY



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

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

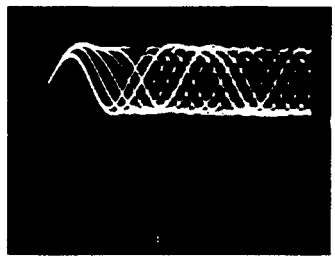
● WAVEFORMS

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.

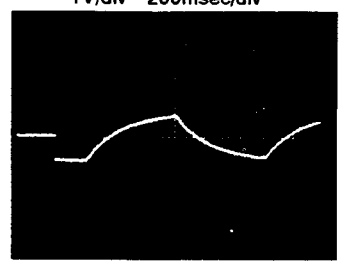
*2 FOCUS-IN: Press the key without loading a disc.

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



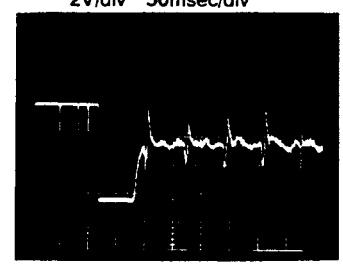
– GND

⑤ IC202-Pin 9: FOCUS-IN (* 2) MODE (FODR)
1V/div 200msec/div



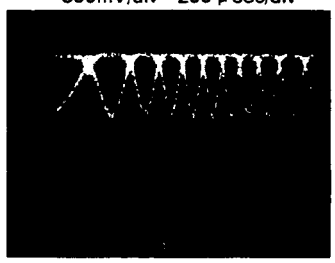
– GND

⑦ IC202-Pin 4: TRACK SEARCH MODE (SPDR)
2V/div 50msec/div



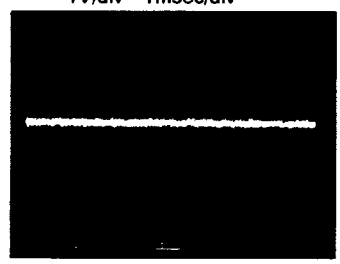
– GND

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



– GND

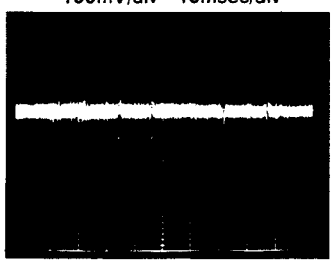
⑤ IC202-Pin 9: PLAY MODE (FODR)
1V/div 1msec/div



– GND

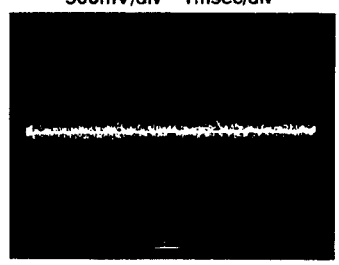
⑧

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



– GND

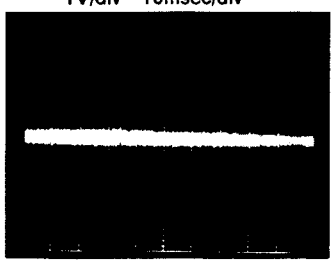
⑥ IC202 - Pin 3: PLAY MODE (TRDR)
500mV/div 1msec/div



– GND

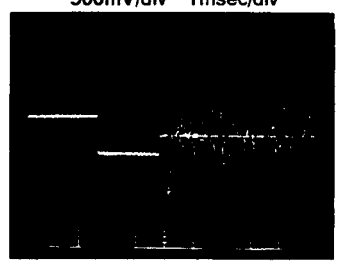
⑧

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



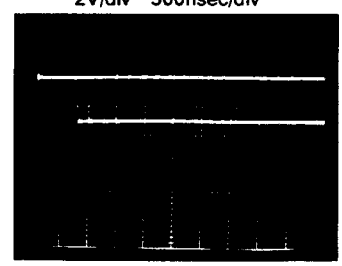
– GND

⑥ IC202 - Pin 3: 50T - JUMP (*1) MODE (TRDR)
500mV/div 1msec/div



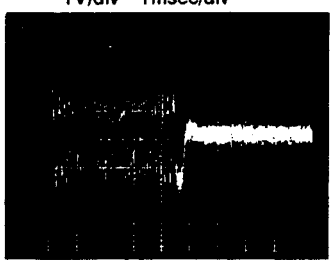
– GND

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



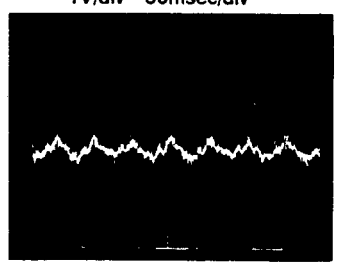
– GND

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



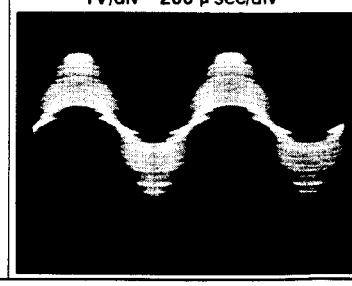
– GND

⑦ IC202-Pin 4: PLAY MODE (SPDR)
1V/div 50msec/div



– GND

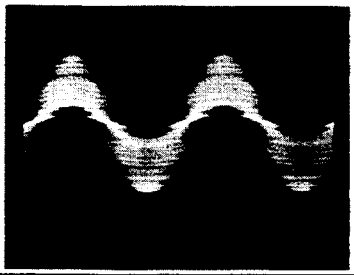
⑩ IC401 - Pin 9: PLAY MODE (1kHz) ($\overline{LO}$) (D/A DATA OUT)
1V/div 200 μ sec/div



– GND

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

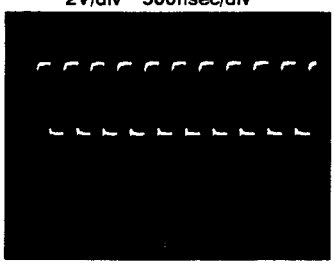
(11) IC401 - Pin 10:PLAY MODE (1kHz) (LO) (D/A DATA OUT)
1V/div 200 μ sec/div



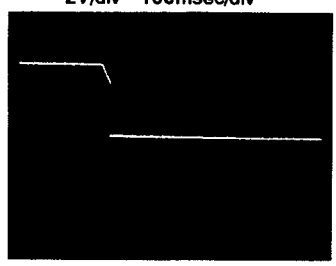
(22) IC20-Pin 4:POWER ON (* 3) (RST)
2V/div 100msec/div

(26)

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

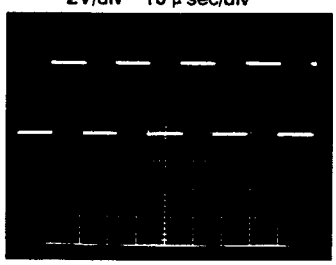


(22) IC20-Pin 4:POWER OFF (* 4) (RST)
2V/div 100msec/div

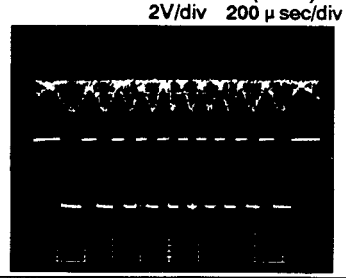


(27)

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

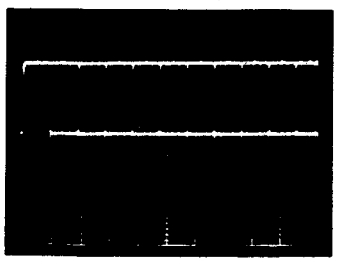


(23) :TRACK SEARCH MODE
Upper:TP1 - Pin 1 (RF) 1V/div
Lower:IC151-Pin 29(MIRR)
2V/div 200 μ sec/div

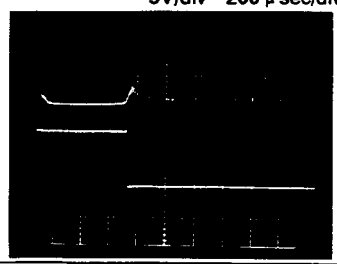


(28)

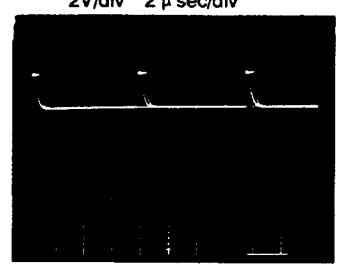
(19) IC301 - Pin 34:PLAY MODE (1kHz) (DATA)
2V/div 500nsec/div



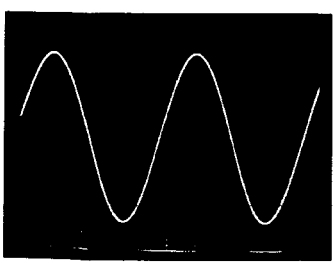
(24) :PLAY MODE
Upper:TP1-Pin 1(RF)1V/div
Lower:IC151-Pin 30(DFCT)
5V/div 200 μ sec/div



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

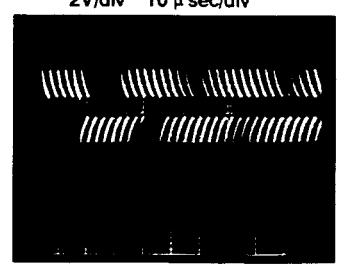


(21) Pin - OUTPUT:PLAY MODE(1kHz)
1V/div 200 μ sec/div



(25)

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



5. ADJUSTMENTS

5.1. Adjustment Methods

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

● Adjustment Items/Verification Items and Order

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

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

● **Abbreviation table**

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

● Measuring Instruments and Tools

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

● Test Point and Adjustment Variable Resistor Positions

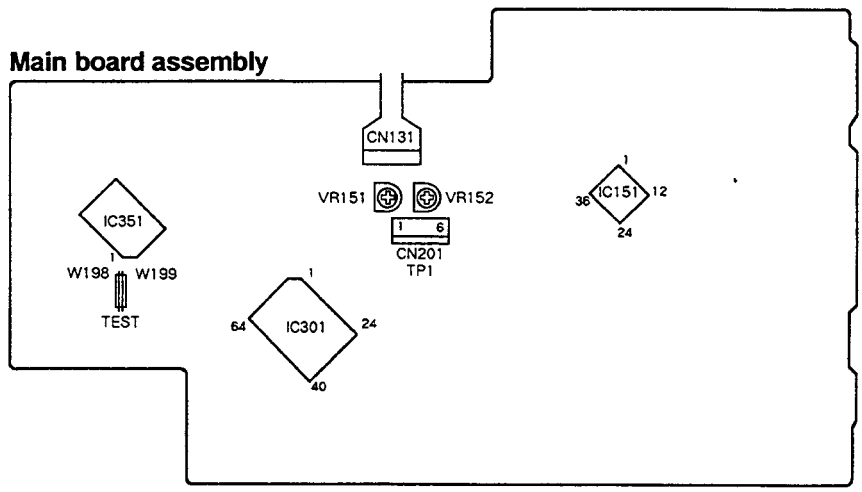


Figure 1. Adjustment Locations

● Notes

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

● Test Mode

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

[Setting these models to test mode]

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

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

[Release from test mode]

Here is the procedure for releasing the test mode:

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

[Operations of the keys in test mode]

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

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 altenately. 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.

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

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

1. Focus Offset Verification

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

[Procedure]

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

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

2. Tracking Error Balance Verification

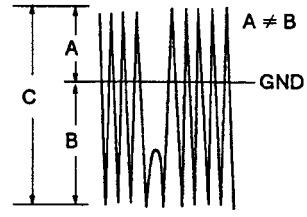
● Objective ● Symptom when out of adjustment	To verify that there is no variation in the sensitivity of the tracking photo diode. Play does not start or track search is impossible.		
● Measurement instrument connections	Connect the oscilloscope to TP1, Pin 2 (TRK. ERR). This connection may be via a low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

[Procedure]

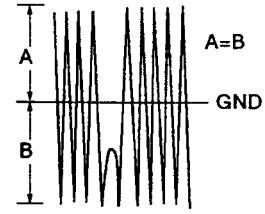
1. Move the pickup to midway across the disc (R=35 mm) with the TRACK/MANUAL SEARCH FWD ▷▷ • ▷▷| or REV |◁◁ • ◁◁ key.
2. Press the PGM (PROGRAM) key, then the PLAY ▷ key in that order to close the focus servo then the spindle servo.
3. Line up the bright line (ground) at the center of the oscilloscope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

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

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



When there is a DC component



When there is no DC component

3. Pickup Radial/Tangential Tilt Adjustment

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

[Procedure]

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

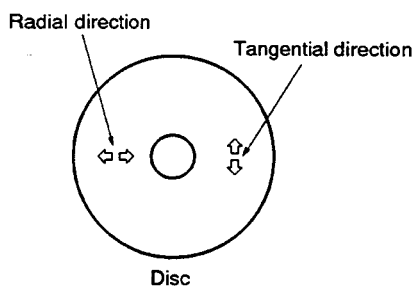
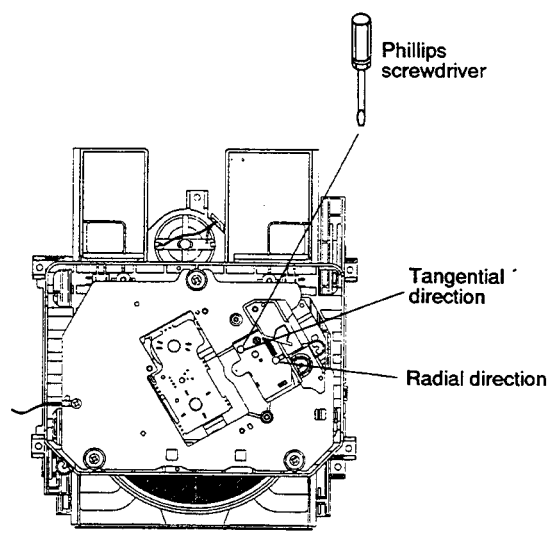


Figure 2



Adjustment locations

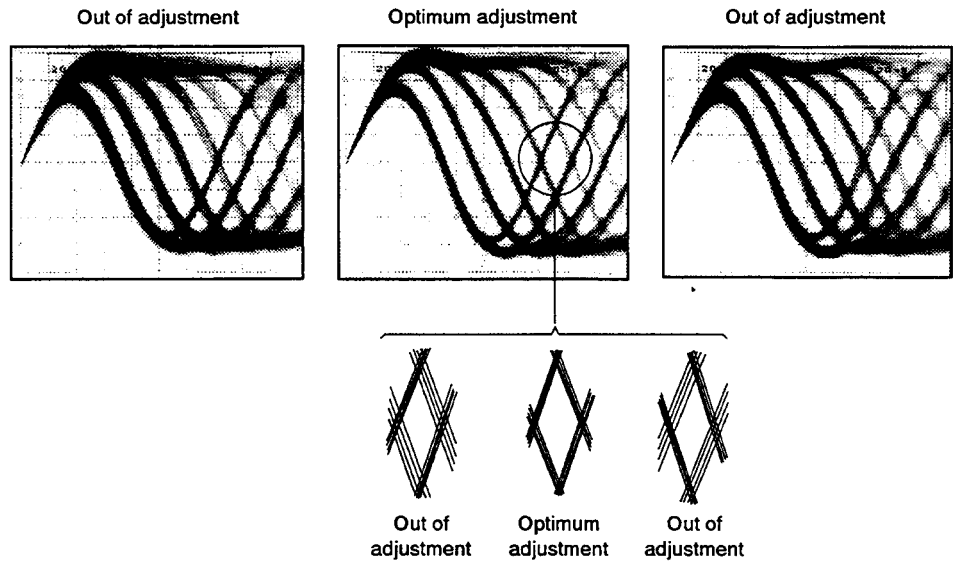


Figure 3. Eye pattern

4. RF Level Verification

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

[Procedure]

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

5. Focus Servo Loop Gain Adjustment

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

[Procedure]

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

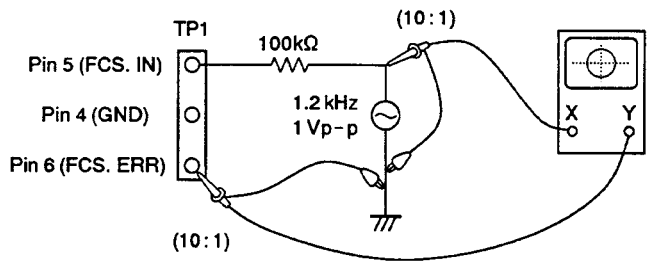
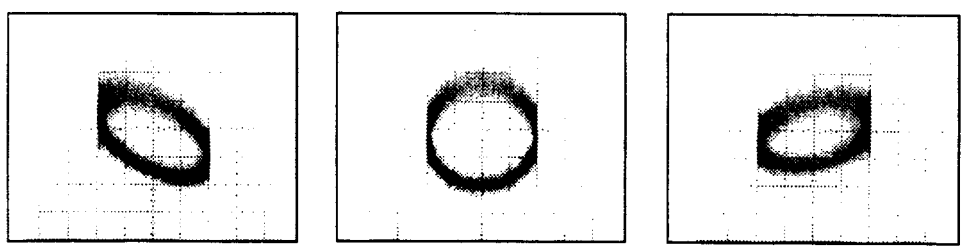


Figure 4

Focus Gain Adjustment



Higher gain | Optimum gain | Lower gain

6. Tracking Servo Loop Gain Adjustment

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

[Procedure]

1. Set the AF generator output to 1.2 kHz and 2 Vp-p.
2. Press the TRACK / MANUAL SEARCH FWD ▷▷ • ▷▷| or REV |◁◁ • ◁◁ key to move the pickup to halfway across the disc (R=35 mm), then press the PGM (PROGRAM) key, the PLAY ▷ key and 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.

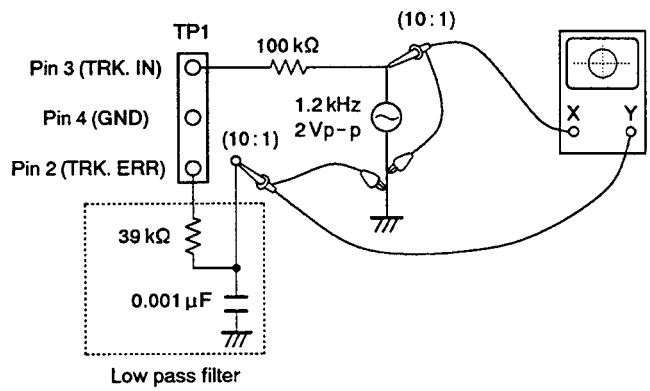
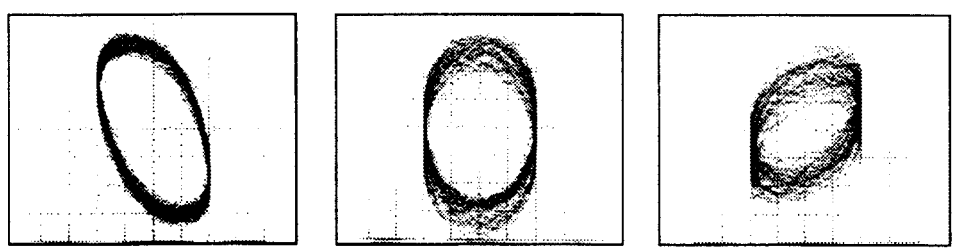


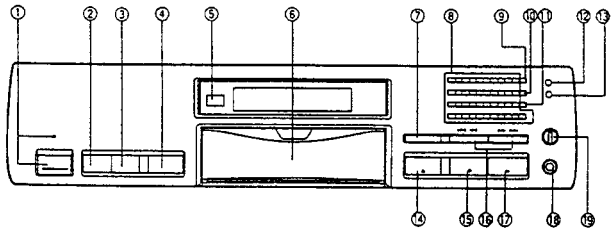
Figure 5

Tracking Gain Adjustment



Higher gain | Optimum gain | Lower gain

6. PANEL FACILITIES



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

7. SPECIFICATIONS

1. General

Type ..... Compact disc digital audio system
Power requirements ..... AC 220 - 240 V, 50/60 Hz
Power consumption ..... 15 W
Operating temperature ..... +5°C - +35°C
Weight ..... 3.9 kg

2. Audio section

Frequency response ..... 2 Hz - 20 kHz
S/N ratio ..... 108 dB or more (EIAJ)
Dynamic range ..... 96 dB or more (EIAJ)
Harmonic distortion ..... 0.0028% or less (EIAJ)
Output voltage ..... 2.0 V
Wow and flutter ..... Limit of measurement (±0.001% W.PEAK) or less (EIAJ)
Channels ..... 2-channel (stereo)

3. Output terminal

Audio line output jacks (VARIABLE)
Audio line output jacks (FIXED)
Optical digital output jack
CD-DECK SYNCHRO jack
Headphone jack (with motor drive volume control)

4. Functions

Basic operation buttons
- PLAY, PAUSE, STOP

Search function
- Direct play
- Track search
- Manual search

Hi-Lite scan

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

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

Random play (repeat also available)

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

Timer start

Peak search

Compu/Auto program editing
Selects the tracks within the specified time.

Display off

5. Accessories

- Remote control unit 1
- Size AAA/R03/dry batteries 2
- Output cable 1
- Operating instructions 1

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