

Service Manual

ORDER NO.
ARP2514

COMPACT DISC PLAYER

PD - 65

KU

PD - S901

HEM, HB, SD

- Refer to the service manual ARP2297 for PD - 41.
- This manual is applicable to the following : PD - 65/KU ; PD - S901/HEM, HB and SD.

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FN MAY 1992 Printed in Japan

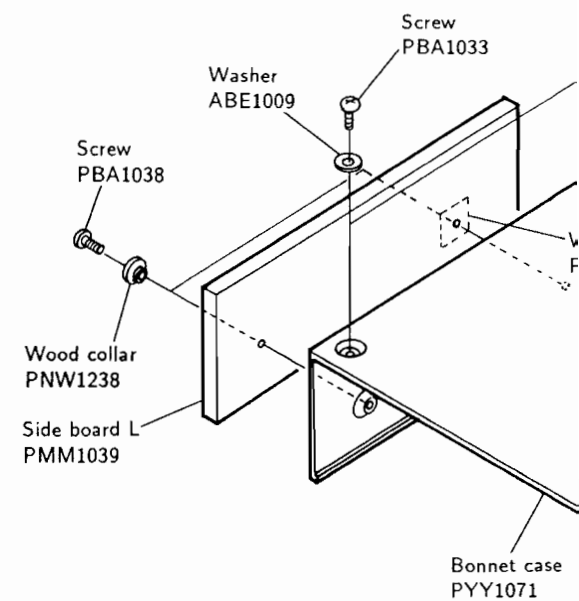
1. CONTRAST OF MISCELLANEOUS PARTS

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.

PD-65/KU, PD-S901/HEM, HB, SD and PD-41/KU have the same construction except for the following :

Mark	Symbol & Description	Part No.					Remarks
		PD-41 /KU	PD-65 /KU	PD-S901 /HEM	PD-S901 /HB	PD-S901 /SD	
NSP	MOTHER BOARD assembly	PMW1486	.....	.....	.....	.....	
⊙	MOTHER BOARD assembly	.....	PWM1647	PWM1648	PWM1649	PWM1650	
⊙	MAIN BOARD assembly	PWZ2150	.....	.....	.....	.....	
NSP	MAIN BOARD assembly	.....	PWZ2382	PWZ2383	PWZ2384	PWZ2385	
NSP	PRIMARY BOARD assembly	PWZ2158	PWZ2158	PWZ2159	PWZ2161	PWZ2160	
⊙	ANALOG BOARD assembly	PWM1490	PWM1643	PWM1643	PWM1644	PWM1643	
⊙	SUB BOARD assembly	PWM1493	PWM1493	PWM1494	PWM1494	PWM1494	
NSP	FUNCTION A BOARD assembly	PWZ2168	PWZ2168	PWZ2169	PWZ2169	PWZ2169	
NSP	FUNCTION B BOARD assembly	PWZ2170	PWZ2170	PWZ2171	PWZ2171	PWZ2171	
	FL sheet	PAM1514	PAM1290	PAM1251	PAM1251	PAM1514	
NSP	Badge	PAN1035	AAM1001	PAN1035	PAN1035	PAN1035	
NSP	Front panel	PAN1211	PAN1254	PAN1255	PAN1255	PAN1255	
	Front panel assembly	PEA1167	PEA1239	PEA1240	PEA1240	PEA1240	
	Side sash	.....	PAN1220	.....	.....	.....	For control panel
	Side rubber	PEB1180	.....	PEB1180	PEB1180	PEB1180	
	Wood collar	.....	PNW1238	.....	.....	.....	For side board
NSP	Wood spacer	.....	PEC1001	.....	.....	.....	For side board
Δ	AC power cord	PDG1015	PDG1015	PDG1003	PDG1036	PDG1013	
Δ	Power transformer (8VA)	PTT1166	PTT1166	PTT1167	PTT1167	PTT1168	
Δ	Power transformer (15VA)	PTT1206	PTT1206	PTT1207	PTT1207	PTT1208	
Δ	Strain relief	CM-22C	CM-22C	CM-22B	CM-22B	CM-22B	
Δ	Voltage selector	.....	.....	.....	.....	PSB1002	
	33P F.F.C / 30V	PDD1094	PDD1094	.....	.....	.....	
	31P F.F.C / 30V	.....	.....	PDD1092	PDD1092	PDD1092	
	Protector F	PHA1145	PHA1171	PHA1145	PHA1145	PHA1145	For packing
	Protector R	PHA1146	PHA1172	PHA1146	PHA1146	PHA1146	For packing
	Packing case	PHG1677	PHG1813	PHG1812	PHG1812	PHG1812	
	Screw	.....	PBA1038	.....	.....	.....	For side board
	Side board L	.....	PMM1039	.....	.....	.....	
	Side board R	.....	PMM1040	.....	.....	.....	
NSP	Rear base	PNA1538	PNA1861	PNA1858	PNA1859	PNA1860	
NSP	Under base	PNA1683	PNA1884	PNA1683	PNA1683	PNA1683	
NSP	Shield plate	PNB1299	PNB1407	PNB1299	PNB1299	PNB1299	
NSP	L angle	PNB1316	PNB1406	PNB1316	PNB1316	PNB1316	
	Control panel	PNW2066	PNW2065	PNW2066	PNW2066	PNW2066	
	Mini plug cord	PDE-319	PDE-319	.....	.....	.....	
	Remote control unit	PWW1058	PWW1057	PWW1058	PWW1058	PWW1058	
	Operating instructions	PRE1149	PRE1165	PRE1165	PRE1165	PRE1165	English, French
	Operating instructions	.....	.....	PRF1058	.....	.....	German, Italian, Dutch, Swedish, Spanish, Portuguese



LIST of assemblies (PD-41, PD-65, PD-S901)

- MOTHER BOARD assembly
 - MAIN BOARD assembly
 - PRIMARY BOARD assembly
- SUB BOARD assembly
 - FUNCTION A BOARD assembly
 - FUNCTION B BOARD assembly

•Exploded views for PD-65/KU only.

2. 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 $\times$ 10¹ $\rightarrow$ 561 RD1/8PM $\boxed{561}J$
47k Ω $\rightarrow$ 47 $\times$ 10³ $\rightarrow$ 473 RD1/4PS $\boxed{473}J$
0.5 Ω $\rightarrow$ 0R5 RN2H $\boxed{0R5}K$
1 Ω $\rightarrow$ 010 RS1P $\boxed{010}K$

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

5.62k Ω $\rightarrow$ 562 $\times$ 10¹ $\rightarrow$ 5621 RN1/4PC $\boxed{5621}F$

FOR PD - 65/KU, PD - S901/HEM,HB AND SD types.

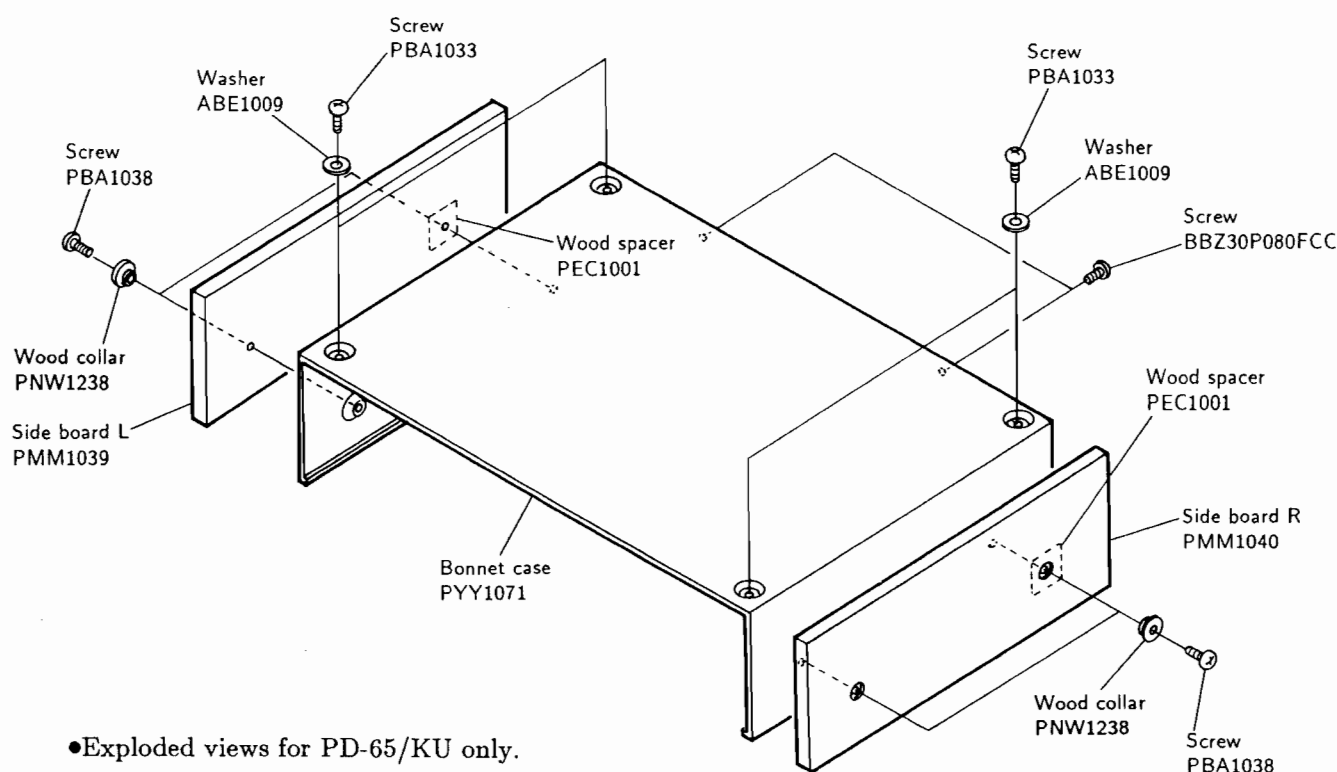
- For part numbers of PCB assemblies, refer to page 2.

Mark No.	Description	Parts No.	Mark No.	Description	Parts No.
MAIN BOARD ASSEMBLY			L391,392	AXIAL COIL	LAUR22K
SEMICONDUCTORS			L393	AXIAL INDUCTOR	LAU010K
Δ IC11	REGULATOR IC	NJM7805FA	CAPACITORS		
Δ IC12	REGULATOR IC	NJM7905FA	C10,11	CERAMIC CAPACITOR	PCL1029
Δ IC13	REGULATOR IC	NJM7808FA	C13-20	CERAMIC CAPACITOR	PCL1029
Δ IC14	REGULATOR IC	NJM7908FA	C21,22	ELECT. CAPACITOR	CEAS222M25
Δ IC30-32	IC PROTECTOR	ICP-N10	C23	ELECT. CAPACITOR	CEAS102M25
IC60	SYSTEM RESET IC	M51957AL	C25,26	ELECT. CAPACITOR	CEAS222M16
IC101	PRE AMP IC	CXA1471S	C27,28	ELECT. CAPACITOR	CEAS222M25
IC151	SERVO IC	CXA1372S	C29,30	ELECT. CAPACITOR	CEAS102M16
Δ IC201	POWER OP-AMP IC	LA6520	C51	ELECT. CAPACITOR	CEAS101M50
Δ IC202	POWER OP-AMP IC	LA6517	C52	ELECT. CAPACITOR	CEAS221M50
IC301	EFM DEMODULATION IC	CXD2500AQ	C53	ELECT. CAPACITOR	CEAS100M50
IC331	IC	MC74HCU04N	C54	ELECT. CAPACITOR	CEAS470M50
Δ Q51	TRANSISTOR	2SB1187	C55	ELECT. CAPACITOR	CEAS330M35
Q101	TRANSISTOR	2SA854S	C56	ELECT. CAPACITOR	CEAS101M50
Q240	TRANSISTOR	2SA933S	C61	ELECT. CAPACITOR	CEASR33M50
Q241	TRANSISTOR	2SC1740S	C62	ELECT. CAPACITOR	CEAS010M50
Q301	TRANSISTOR	DTC124ES	C101,102	ELECT. CAPACITOR	CEAS101M50
Q302	TRANSISTOR	DTA124ES	C103	CERAMIC CAPACITOR	CCDCH200J50
Q321,331	TRANSISTOR	DTC124ES	C104	ELECT. CAPACITOR	CEAS101M10
Q351	TRANSISTOR	DTA124ES	C105,106	ELECT. CAPACITOR	CEAS101M50
Q391	TRANSISTOR	DTC124ES	C107,108	CERAMIC CAPACITOR	CGCYX103K25
Δ D11-14	DIODE	11ES2	C110	CERAMIC CAPACITOR	CKCYF103Z50
Δ D25	DIODE	RB-152LF	C151-154	ELECT. CAPACITOR	CEAS101M50
Δ D51,52	DIODE	11ES2	C155	CERAMIC CAPACITOR	CKCYB182K50
Δ D53	ZENER DIODE	MTZ27C	C156	CERAMIC CAPACITOR	CGCYX333K25
Δ D54	ZENER DIODE	MTZJ20A	C157	CERAMIC CAPACITOR	CGCYX103K25
Δ D56	DIODE	11ES2	C158,159	MYLAR FILM CAPACITOR	CQMA104K50
D321	DIODE	1SS254	C160	ELECT. CAPACITOR	CEAS4R7M50
D391-394	DIODE(PD-65 only)	1SS254	C161	MYLAR FILM CAPACITOR	CQMA104K50
D395-399	DIODE	1SS254	C162	ELECT. CAPACITOR	CEAS010M50
COILS, FILTERS			C163	MYLAR FILM CAPACITOR	CQMA104K50
L30	AXIAL INDUCTOR	LAU010K	C164	CERAMIC CAPACITOR	CGCYX103K25
L301	RADIAL INDUCTOR	LFA010K	C166	CERAMIC CAPACITOR	CCCSL101J50
L332	COIL	PTL1003	C167	CERAMIC CAPACITOR	CKCYF103Z50
			C168	CERAMIC CAPACITOR	CGCYX333K25

Mark No.	Description	Parts No.
C169	CERAMIC CAPACITOR	CGCYX103K25
C170	CERAMIC CAPACITOR	CKCYB333K50
C171,172	CERAMIC CAPACITOR	CKCYB473K50
C202	CERAMIC CAPACITOR	CKCYF103Z50
C212	CERAMIC CAPACITOR	CKCYB273K50
C216-219	ELECT. CAPACITOR	CEAS221M16
C232	CERAMIC CAPACITOR	CKCYF103Z50
C301	CERAMIC CAPACITOR	CGCYX103K25
C302	ELECT. CAPACITOR	CEAS471M50
C303	ELECT. CAPACITOR	CEAS101M50
C304	CERAMIC CAPACITOR	CGCYX103K25
C305	ELECT. CAPACITOR	CEAS221M16
C306	CERAMIC CAPACITOR	CKCYB153K50
C307	CERAMIC CAPACITOR	CGCYX473K50
C308	CERAMIC CAPACITOR	CGCYX103K25
C309	ELECT. CAPACITOR	CEASR473K50
C310	CERAMIC CAPACITOR	CKCYF103Z50
C311	CERAMIC CAPACITOR	CKCYB103K50
C313	CERAMIC CAPACITOR	CKCYF103Z50
C314	CERAMIC CAPACITOR	CGDYX103K25
C331	CERAMIC CAPACITOR	CGCYX473K50
C332	ELECT. CAPACITOR	CEAS101M50
C334	CERAMIC CAPACITOR	CGCYX103K25
C335	ELECT. CAPACITOR	CEAS470M50
C336	AUDIO FILM CAPACITOR	CFTXA103K25
C337	CERAMIC CAPACITOR	CCCSL471J50
C339,340	CERAMIC CAPACITOR	CGCYX103K25
C391	CERAMIC CAP.(PD-65 only)	CGCYX103K25
C392	CERAMIC CAP.(PD-65 only)	CCCSL101J50
C395	CERAMIC CAPACITOR	CCDSL100J50
RESISTORS		
VR102	VR(22k)	VRTB6VS
VR103	VR(1K)	VRTB6VS
VR151,152	VR(22k)	VRTB6VS
	Other resistors	RD1/6PM
OTHERS		
CN101	CONNECTOR	52045-161
CN351	CONNECTOR(PD-65)	HLEM33S
CN351	CONNECTOR(PD-S901)	HLEM31S
JA331	OPTICAL OUTPUT JACK	TOTX178
JA332	JACK	PKB1004
JA391,392	JACK(PD-65 only)	RKN1004
JA393	JACK	RKN1004

PRIMARY BOARD ASSEMBLY

SWITCH		
Δ S1	SWITCH	PSA-009
CAPACITOR		
Δ C1	CAPACITOR (0.01 μ F)	VCG-048
OTHER		
Δ	TERMINAL(PD-65)	RKC-061



•Exploded views for PD-65/KU only.

Mark No.	Description	Parts No.
C169	CERAMIC CAPACITOR	CGCYX103K25
C170	CERAMIC CAPACITOR	CKCYB332K50
C171,172	CERAMIC CAPACITOR	CKCYB472K50
C202	CERAMIC CAPACITOR	CKCYF103Z50
C212	CERAMIC CAPACITOR	CKCYB272K50
C216-219	ELECT. CAPACITOR	CEAS221M25
C232	CERAMIC CAPACITOR	CKCYF103Z50
C301	CERAMIC CAPACITOR	CGCYX103K25
C302	ELECT. CAPACITOR	CEAS471M10
C303	ELECT. CAPACITOR	CEAS101M50
C304	CERAMIC CAPACITOR	CGCYX103K25
C305	ELECT. CAPACITOR	CEAS221M25
C306	CERAMIC CAPACITOR	CKCYB152K50
C307	CERAMIC CAPACITOR	CGCYX473K25
C308	CERAMIC CAPACITOR	CGCYX103K25
C309	ELECT. CAPACITOR	CEAS47M50
C310	CERAMIC CAPACITOR	CKCYF103Z50
C311	CERAMIC CAPACITOR	CKCYB102K50
C313	CERAMIC CAPACITOR	CKCYF103Z50
C314	CERAMIC CAPACITOR	CGDYX104M25
C331	CERAMIC CAPACITOR	CGCYX473K25
C332	ELECT. CAPACITOR	CEAS101M25
C334	CERAMIC CAPACITOR	CGCYX103K25
C335	ELECT. CAPACITOR	CEAS470M25
C336	AUDIO FILM CAPACITOR	CFTXA103J50
C337	CERAMIC CAPACITOR	CCCSL471J50
C339,340	CERAMIC CAPACITOR	CGCYX103K25
C391	CERAMIC CAP.(PD-65 only)	CGCYX103K25
C392	CERAMIC CAP.(PD-65 only)	CCCSL101J50
C395	CERAMIC CAPACITOR	CCDSL100D50
RESISTORS		
VR102	VR(22k)	VRTB6VS223
VR103	VR(1K)	VRTB6VS102
VR151,152	VR(22k)	VRTB6VS223
	Other resistors	RD1/6PM□□□J
OTHERS		
CN101	CONNECTOR	52045-1610
CN351	CONNECTOR(PD-65)	HLEM33S-1
CN351	CONNECTOR(PD-S901)	HLEM31S-1
JA331	OPTICAL OUTPUT JACK	TOTX178
JA332	JACK	PKB1004
JA391,392	JACK(PD-65 only)	RKN1004
JA393	JACK	RKN1004

PRIMARY BOARD ASSEMBLY

SWITCH		
△ S1	SWITCH	PSA-009
CAPACITOR		
△ C1	CAPACITOR (0.01μF)	VCG-048
OTHER		
△	TERMINAL(PD-65)	RKC-061

Mark No.	Description	Parts No.
ANALOG BOARD ASSEMBLY		
SEMICONDUCTORS		
△ IC501,502	REGULATOR IC	NJM7805FA
IC512	LOGIC IC	TC74HCU04AP
IC513	IC	PD0116A
IC522,523	D/A CONVERTER IC	PD2028B
IC554,555	OP-AMP IC	NJM5532DD
△ IC601	REGULATOR IC	NJM7815FA
△ IC602	REGULATOR IC	NJM7915FA
△ IC620,621	IC PROTECTOR	ICP-N15
Q521	TRANSISTOR	DTC124ES
Q522,523	TRANSISTOR	DTA124ES
Q524,525	TRANSISTOR	DTC124ES
Q554-557	TRANSISTOR	2SC3068
Q558	N-FET	2SK246
Q559,560	P-FET	2SJ103
Q561	N-FET	2SK246
Q562,563	TRANSISTOR	2SC3068
D521	DIODE	1SS254
D550,551	DIODE	1SS254
D570,571	DIODE	1SS254
△ D610-613	DIODE	10DF2
△ D620-627	DIODE	10DF2
COILS, FILTERS		
L511,512	AXIAL INDUCTOR	LAU010K
L513,514	AMORPHOUS BEAD	PTH1006
L518,519	FILTER	PTH1011
L522,523	AXIAL INDUCTOR	LAU010K
L525,526	AXIAL INDUCTOR	LAU010K
L551-554	FERRITE BEADS	VTH1013
F520,521	FILTER	VTH1001
CAPACITORS		
C501,502	AUDIO FILM CAPACITOR	CFTXA104J50
C503,504	CERAMIC CAPACITOR	PCL1029
C505	ELECT. CAPACITOR	CEAS101M25
C506,507	AUDIO FILM CAPACITOR	CFTXA104J50
C510	AUDIO FILM CAPACITOR	CFTXA473J50
C511	CERAMIC CAPACITOR	PCL1029
C512	AUDIO FILM CAPACITOR	CFTXA103J50
C514	CERAMIC CAPACITOR	CGCYF473Z25
C515	AUDIO FILM CAPACITOR	CFTXA103J50
C516	ELECT. CAPACITOR	CEAS102M16
C517,518	CERAMIC CAPACITOR	CCCCH120J50
C519	ELECT. CAPACITOR	CEAS102M16
C520	ELECT. CAPACITOR	CEAS470M50
C521	MYLAR FILM CAPACITOR	CQMA473J50
C522	AUDIO FILM CAPACITOR	CFTXA682J50
C523	CERAMIC CAPACITOR	PCL1029
C524	ELECT. CAPACITOR	CEAS102M16
C526	MYLAR FILM CAPACITOR	CQMA104J50
C527	MYLAR FILM CAPACITOR	CQMA473J50
C528	ELECT. CAPACITOR	CEAS102M16
C529	MYLAR FILM CAPACITOR	CQMA473J50
C530,531	AUDIO FILM CAPACITOR	CFTXA682J50
C532	ELECT. CAPACITOR	CEAS102M16
C534	AUDIO FILM CAPACITOR	CFTXA104J50

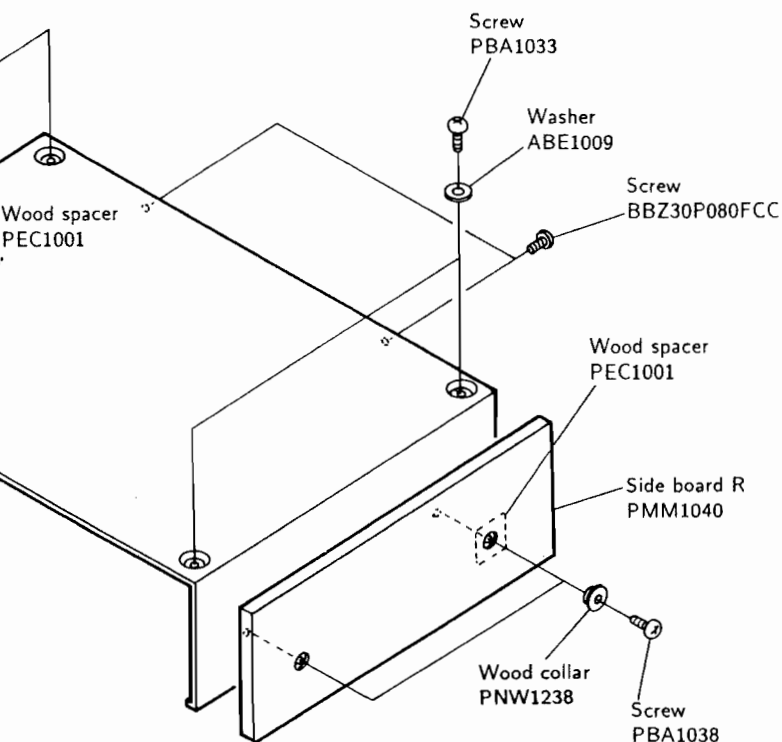
Mark No.	Description	Parts No.
C535	ELECT. CAPACITOR	CEAS102M16
C538,539	CERAMIC CAPACITOR	CCCCH120J50
C540,541	CERAMIC CAPACITOR	CCDCH221J50
C542,543	CERAMIC CAPACITOR	CCCCH181J50
C544,545	CERAMIC CAPACITOR	CCCCH330J50
C546,547	CERAMIC CAPACITOR	CGCYF473Z25
C548	CERAMIC CAPACITOR	CCCCH080D50
C549	CERAMIC CAPACITOR	CCCCH080D50
C550,551	CERAMIC CAPACITOR	CCCCH181J50
C552,553	CERAMIC CAPACITOR	CCCCH330J50
C554,555	MYLAR FILM CAPACITOR	CQMA104J50
C556,557	ELECT. CAPACITOR	CEAS102M16
C558,559	MYLAR FILM CAPACITOR	CQMA104J50
C560-563	CERAMIC CAPACITOR	CCCCH470J50
C564,565	MYLAR FILM CAPACITOR	CQMA681J50
C566,567	MYLAR FILM CAPACITOR	CQMA562J50
C568-571	ELECT. CAPACITOR	CEAS471M50
C572,573	(47/50)	PCH1072
C576,577	ELECT. CAPACITOR	CEAS102M16
C578,579	CERAMIC CAPACITOR	PCL1029
C581	MYLAR FILM CAPACITOR	CQMA104J50
C582,583	AUDIO FILM CAPACITOR	CFTXA683J50
C586	AUDIO FILM CAPACITOR	CFTXA473J50
C587,588	ELECT. CAPACITOR	CEANP220M25
C589	ELECT. CAPACITOR	CEAS102M16
C590	MYLAR FILM CAPACITOR	CQMA104J50
C591	AUDIO FILM CAPACITOR	CFTXA682J50
C593,594	ELECT. CAPACITOR	CEAS102M16
C595	MYLAR FILM CAPACITOR	CQMA104J50
C597	ELECT. CAPACITOR	CEAS102M16
C601	ELECT. CAPACITOR	CENA102M35
C604,605	ELECTR. CAPACITOR	PCH1102
C606,607	ELECT. CAPACITOR	CENA102M35
C608-618	CERAMIC CAPACITOR	PCL1029

RESISTORS		
R502	CARBON FILM RESISTOR	RD1/4PM331J
R514	CARBON FILM RESISTOR	RD1/4PM331J
R540-567	CARBON FILM RESISTOR	RD1/4PM□□□J
R568-581	CARBON FILM RESISTOR	RDR1/4PM□□□J
R582-585	CARBON FILM RESISTOR	RDR1/2PM□□□J
R588,589	CARBON FILM RESISTOR	RDR1/2PM271J
R590,591	CARBON FILM RESISTOR	RDR1/4PM511J
R593,594	CARBON FILM RESISTOR	RDR1/4PM331J
	Other resistors	RD1/6PM□□□J

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

FUNCTION A BOARD ASSEMBLY

SEMICONDUCTORS		
IC401	MICROCOMPUTER,IC	PD4329A



	Mark No.	Description	Parts No.
03K25	ANALOG BOARD ASSEMBLY		
32K50	SEMICONDUCTORS		
72K50	△ IC501,502	REGULATOR IC	NJM7805FA
03Z50	IC512	LOGIC IC	TC74HC04AP
72K50	IC513	IC	PD0116A
M25	IC522,523	D/A CONVERTER IC	PD2028B
	IC554,555	OP-AMP IC	NJM5532DD
03Z50	△ IC601	REGULATOR IC	NJM7815FA
03K25	△ IC602	REGULATOR IC	NJM7915FA
M10	△ IC620,621	IC PROTECTOR	ICP-N15
M50			
03K25			
	Q521	TRANSISTOR	DTC124ES
M25	Q522,523	TRANSISTOR	DTA124ES
52K50	Q524,525	TRANSISTOR	DTC124ES
73K25	Q554-557	TRANSISTOR	2SC3068
03K25	Q558	N-FET	2SK246
7M50			
	Q559,560	P-FET	2SJ103
03Z50	Q561	N-FET	2SK246
02K50	Q562,563	TRANSISTOR	2SC3068
03Z50			
04M25	D521	DIODE	1SS254
73K25	D550,551	DIODE	1SS254
	D570,571	DIODE	1SS254
M25	△ D610-613	DIODE	10DF2
03K25	△ D620-627	DIODE	10DF2
M25			
03J50	COILS, FILTERS		
71J50	L511,512	AXIAL INDUCTOR	LAU010K
	L513,514	AMORPHOUS BEAD	PTH1006
03K25	L518,519	FILTER	PTH1011
03K25	L522,523	AXIAL INDUCTOR	LAU010K
01J50	L525,526	AXIAL INDUCTOR	LAU010K
00D50			
	L551-554	FERRITE BEADS	VTH1013
S223	F520,521	FILTER	VTH1001
S102			
S223	CAPACITORS		
M□□□J	C501,502	AUDIO FILM CAPACITOR	CFTXA104J50
	C503,504	CERAMIC CAPACITOR	PCL1029
	C505	ELECT. CAPACITOR	CEAS101M25
	C506,507	AUDIO FILM CAPACITOR	CFTXA104J50
	C510	AUDIO FILM CAPACITOR	CFTXA473J50
610			
S-1	C511	CERAMIC CAPACITOR	PCL1029
S-1	C512	AUDIO FILM CAPACITOR	CFTXA103J50
8	C514	CERAMIC CAPACITOR	CGCYF473Z25
	C515	AUDIO FILM CAPACITOR	CFTXA103J50
	C516	ELECT. CAPACITOR	CEAS102M16
	C517,518	CERAMIC CAPACITOR	CCCCH120J50
	C519	ELECT. CAPACITOR	CEAS102M16
	C520	ELECT. CAPACITOR	CEAS470M50
	C521	MYLAR FILM CAPACITOR	CQMA473J50
	C522	AUDIO FILM CAPACITOR	CFTXA682J50
9			
	C523	CERAMIC CAPACITOR	PCL1029
	C524	ELECT. CAPACITOR	CEAS102M16
8	C526	MYLAR FILM CAPACITOR	CQMA104J50
	C527	MYLAR FILM CAPACITOR	CQMA473J50
	C528	ELECT. CAPACITOR	CEAS102M16
1			
	C529	MYLAR FILM CAPACITOR	CQMA473J50
	C530,531	AUDIO FILM CAPACITOR	CFTXA682J50
	C532	ELECT. CAPACITOR	CEAS102M16
	C534	AUDIO FILM CAPACITOR	CFTXA104J50

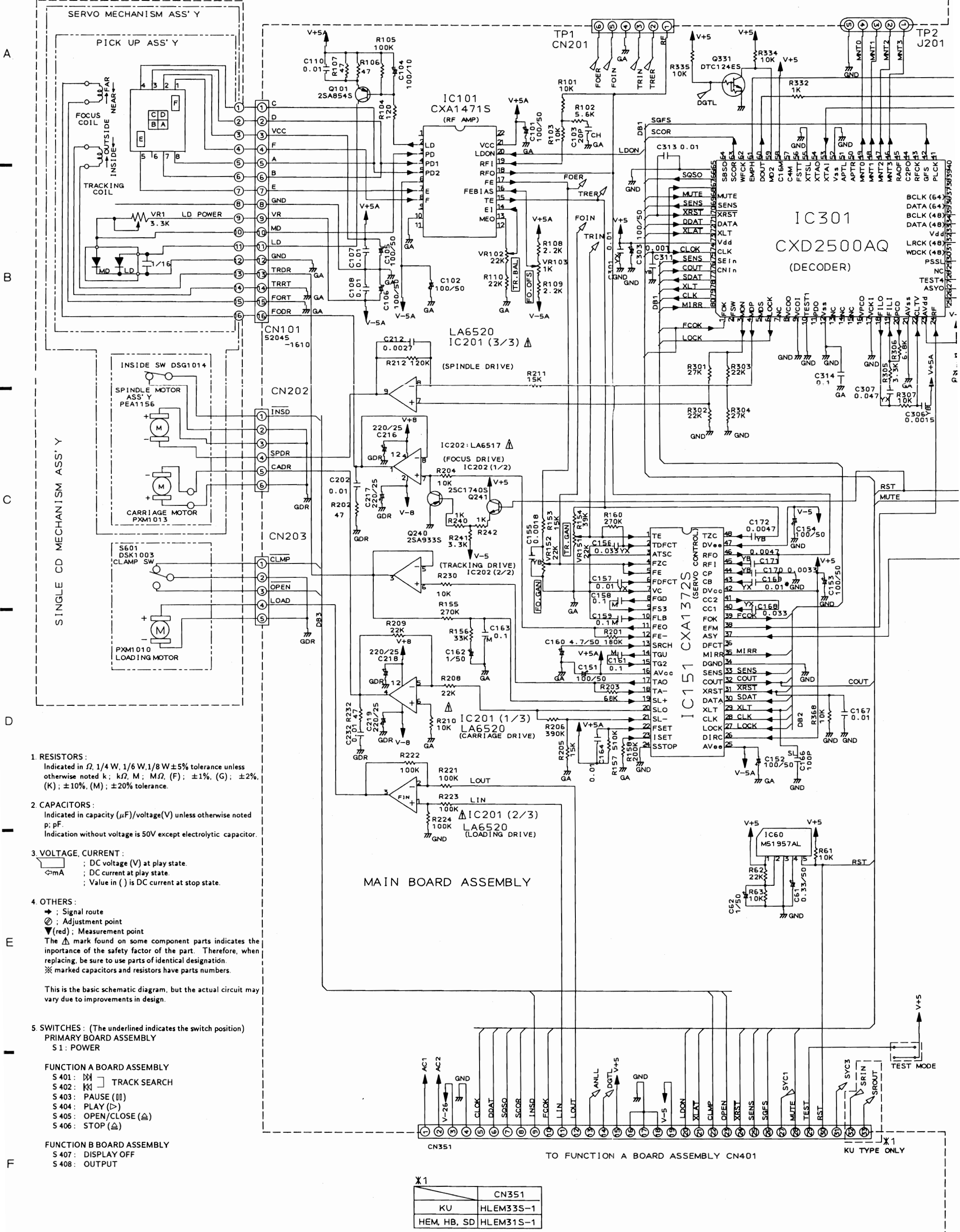
Mark No.	Description	Parts No.
C535	ELECT. CAPACITOR	CEAS102M16
C538,539	CERAMIC CAPACITOR	CCCCH120J50
C540,541	CERAMIC CAPACITOR	CCDCH221J50
C542,543	CERAMIC CAPACITOR	CCCCH181J50
C544,545	CERAMIC CAPACITOR	CCCCH330J50
C546,547	CERAMIC CAPACITOR	CGCYF473Z25
C548	CERAMIC CAPACITOR	CCCCH080D50
C549	CERAMIC CAPACITOR	CCCCH080D50
C550,551	CERAMIC CAPACITOR	CCCCH181J50
C552,553	CERAMIC CAPACITOR	CCCCH330J50
C554,555	MYLAR FILM CAPACITOR	CQMA104J50
C556,557	ELECT. CAPACITOR	CEAS102M16
C558,559	MYLAR FILM CAPACITOR	CQMA104J50
C560-563	CERAMIC CAPACITOR	CCCCH470J50
C564,565	MYLAR FILM CAPACITOR	CQMA681J50
C566,567	MYLAR FILM CAPACITOR	CQMA562J50
C568-571	ELECT. CAPACITOR	CEAS471M50
C572,573	(47/50)	PCH1072
C576,577	ELECT. CAPACITOR	CEAS102M16
C578,579	CERAMIC CAPACITOR	PCL1029
C581	MYLAR FILM CAPACITOR	CQMA104J50
C582,583	AUDIO FILM CAPACITOR	CFTXA683J50
C586	AUDIO FILM CAPACITOR	CFTXA473J50
C587,588	ELECT. CAPACITOR	CEANP220M25
C589	ELECT. CAPACITOR	CEAS102M16
C590	MYLAR FILM CAPACITOR	CQMA104J50
C591	AUDIO FILM CAPACITOR	CFTXA682J50
C593,594	ELECT. CAPACITOR	CEAS102M16
C595	MYLAR FILM CAPACITOR	CQMA104J50
C597	ELECT. CAPACITOR	CEAS102M16
C601	ELECT. CAPACITOR	CENA102M35
C604,605	ELECTR. CAPACITOR	PCH1102
C606,607	ELECT. CAPACITOR	CENA102M35
C608-618	CERAMIC CAPACITOR	PCL1029
RESISTORS		
R502	CARBON FILM RESISTOR	RD1/4PM331J
R514	CARBON FILM RESISTOR	RD1/4PM331J
R540-567	CARBON FILM RESISTOR	RD1/4PM□□□J
R568-581	CARBON FILM RESISTOR	RDR1/4PM□□□J
R582-585	CARBON FILM RESISTOR	RDR1/2PM□□□J
R588,589	CARBON FILM RESISTOR	RDR1/2PM271J
R590,591	CARBON FILM RESISTOR	RDR1/4PM511J
R593,594	CARBON FILM RESISTOR	RDR1/4PM331J
	Other resistors	RD1/6PM□□□J
OTHERS		
JA551	1P PIN JACK(W)	RKB1010
JA552	1P PIN JACK (R)	RKB1011
X512	XTAL RES (OSC)	PSS1011
CN501	CONNECTOR(10P)	KPC10
FUNCTION A BOARD ASSEMBLY		
SEMICONDUCTORS		
IC401	MICROCOMPUTER,IC	PD4329A

Mark No.	Description	Parts No.
Q402,403	TRANSISTOR	DTC124ES
Q404,405	TRANSISTOR	DTA124ES
D401	LED	AA0045
D402	LED	BR0045
D411-416	DIODE	1SS254
SWITCHES		
S401-406	SWITCH	PSG-065
COILS, FILTERS		
L401,402	AXIAL INDUCTOR	LAU010K
CAPACITORS		
C401,402	ELECT. CAPACITOR	CEJA470M16
C403	CERAMIC CAPACITOR	CKPUYF103Z25
C404	ELECT. CAPACITOR	CEJA470M16
C405	CERAMIC CAPACITOR	CKPUYF103Z25
C406-408	CERAMIC CAPACITOR	CGCYX103K25
C409	CERAMIC CAPACITOR	CKCYF103Z50
C411-416	AXIAL CERAMIC C.	CCPUCH100J50
RESISTORS		
	All resistors	RD1/6PM□□□J
OTHERS		
CN401	CONNECTOR(PD-65)	HLEM33R-1
CN401	CONNECTOR(PD-S901)	HLEM31R-1
V401	FL TUBE	PEL1025
X401	CERAMIC RESONATOR	VSS1014
	REMOTE SENSOR	SBX1610-51

FUNCTION B BOARD ASSEMBLY

SEMICONDUCTORS		
D403	LED	SLH-34YC3H3
D404,405	LED	SLH-34VC3H3
D417	DIODE	1SS254
SWITCHES		
S407,408	SWITCH	PSG-065
CAPACITOR		
C417	AXIAL CERAMIC C.	CCPUCH100J50

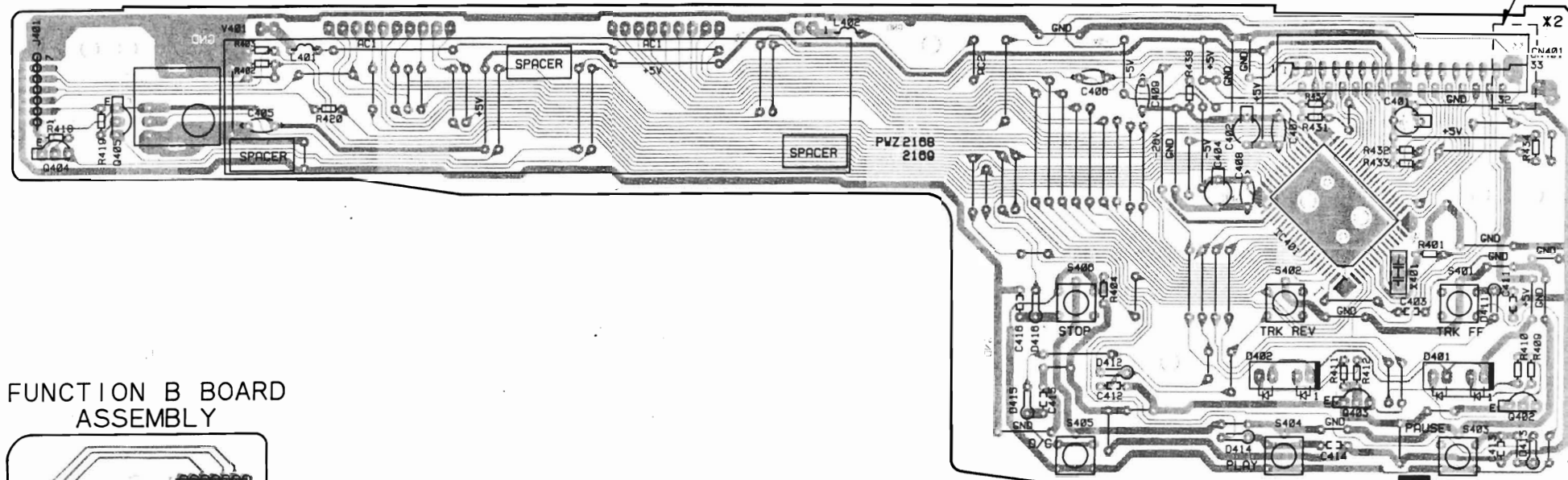
3. SCHEMATIC AND PCB CONNECTIONS DIAGRAMS





FUNCTION A BOARD ASSEMBLY

A

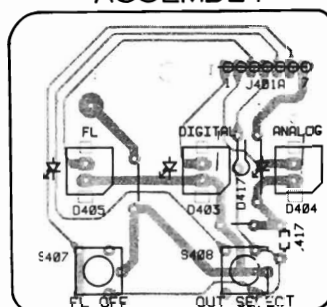


Q405
Q404
IC401

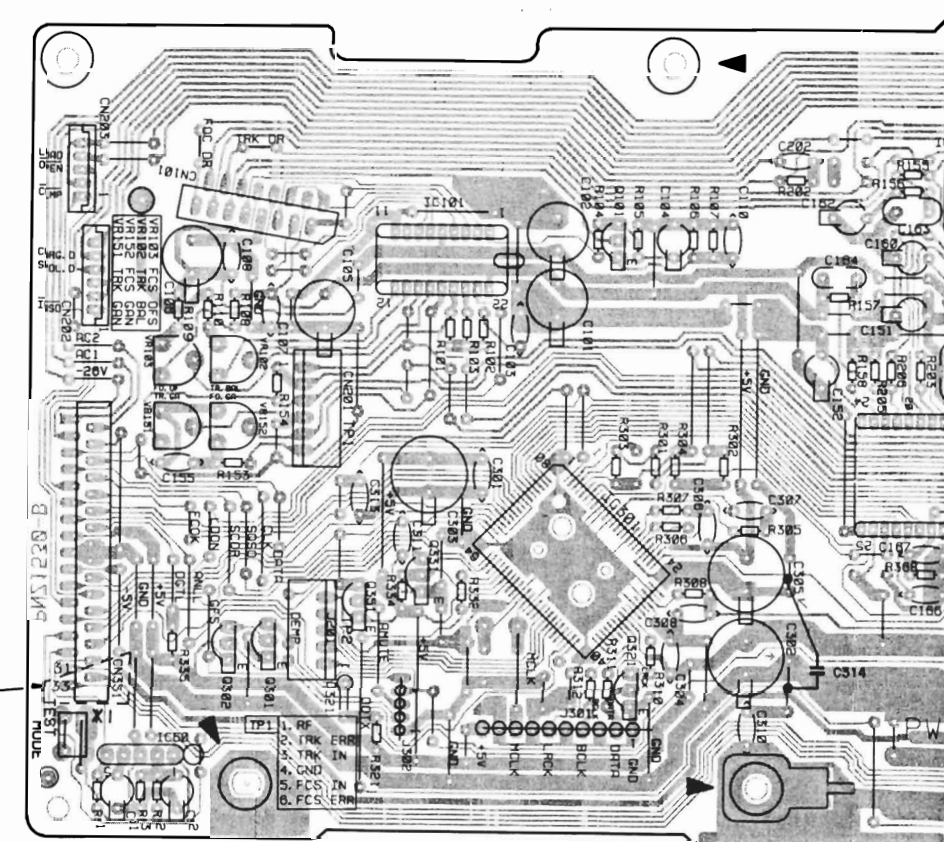
Q403
Q402

FUNCTION B BOARD ASSEMBLY

B



KU TYPE ONLY



VR103 VR102 TP1
VR151 VR152 TP2

IC60 Q301 Q351 Q331 IC301 Q101
Q302 IC101 Q321

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

Line Voltage Selection

Line voltage can be changed with the following steps.

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

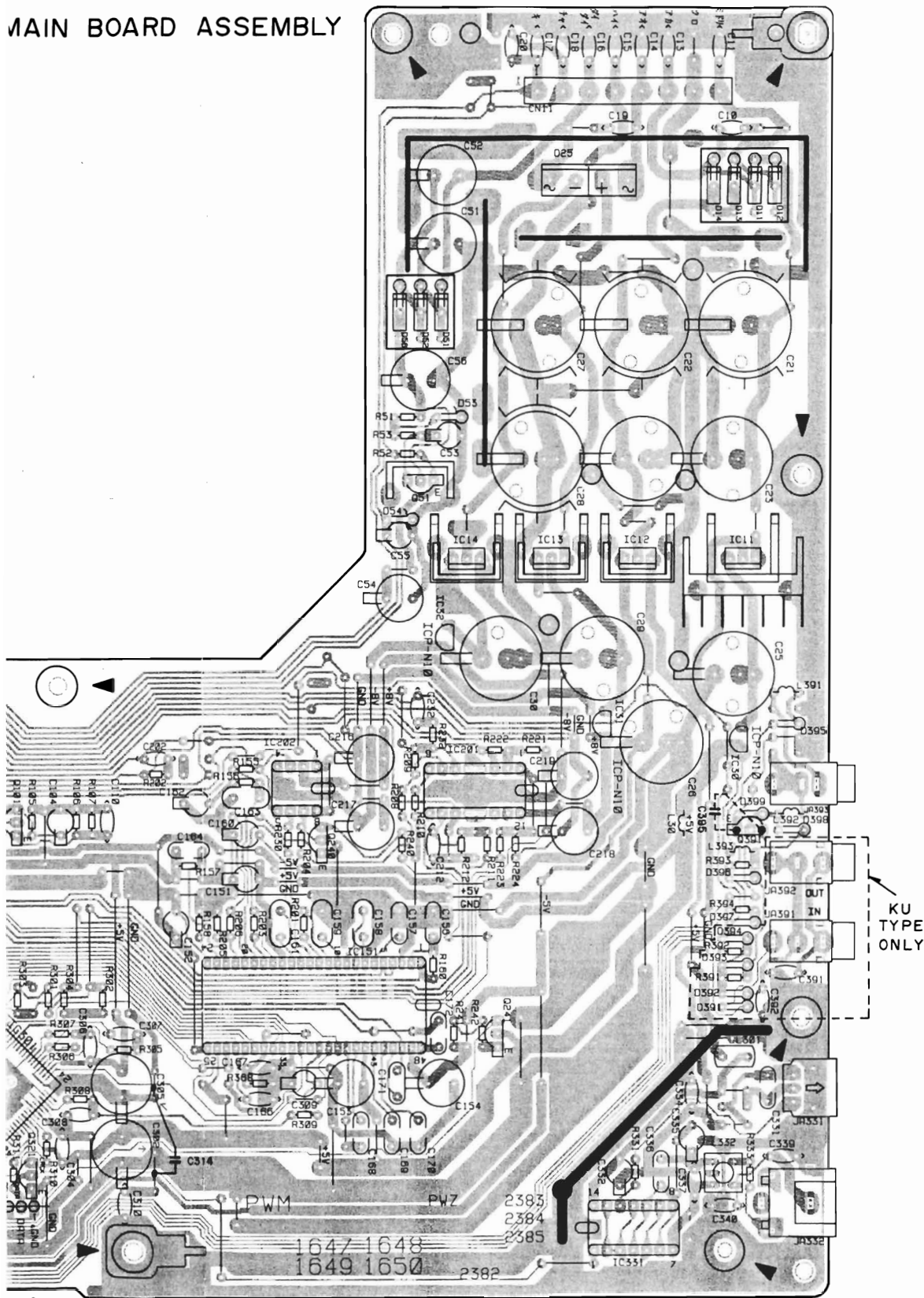
Voltage	Jumper wires A and B position
220 V-230 V	a
230 V-240 V	b

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

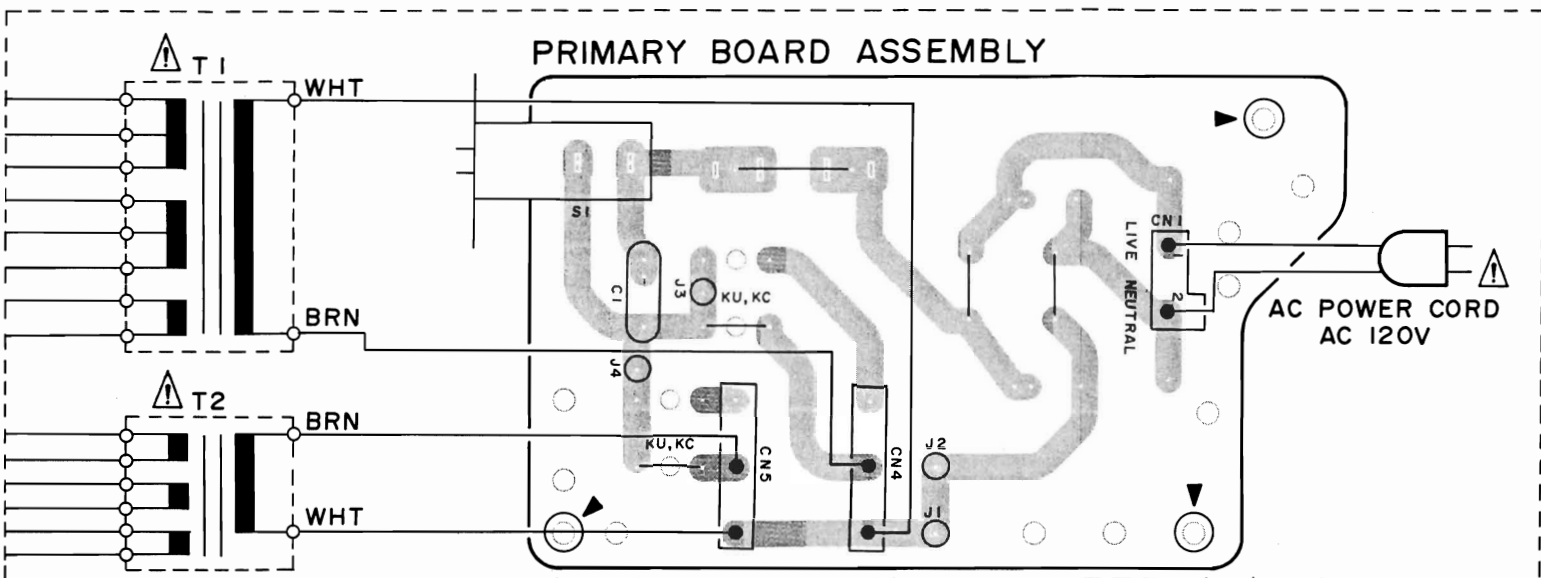
Parts No.	Description
AXX-193	220 V label
AXX-192	240 V label

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.

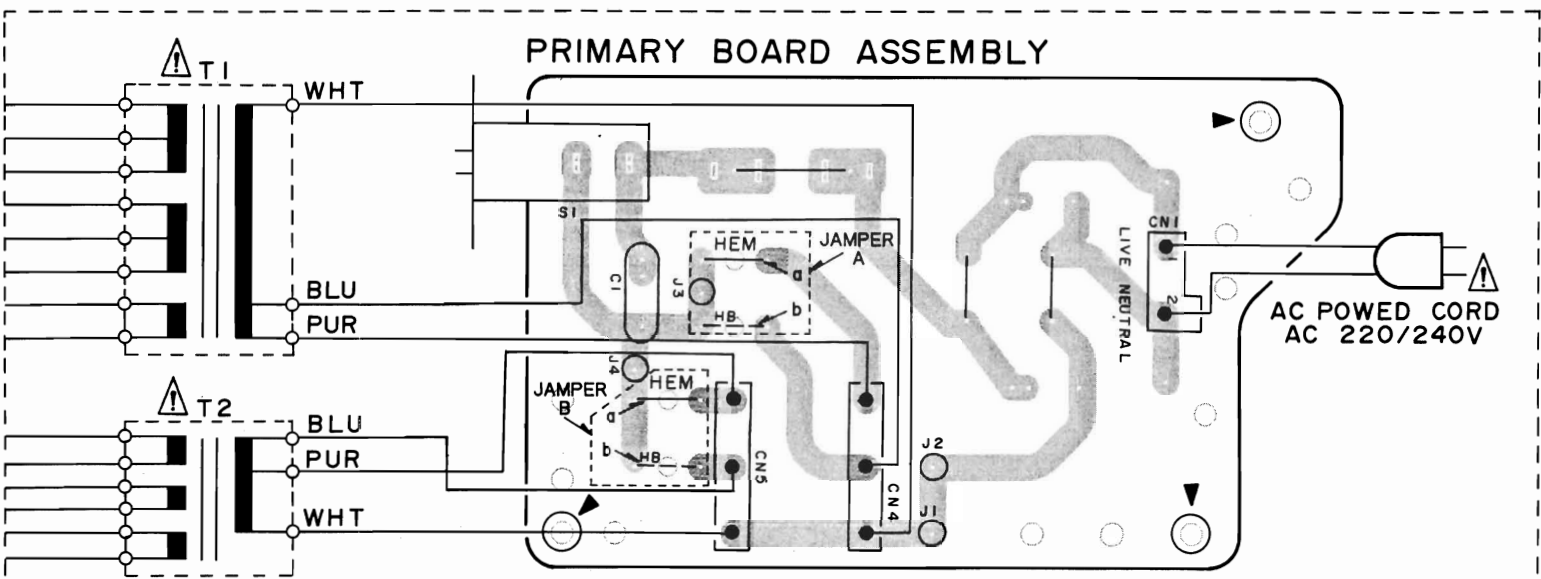
MAIN BOARD ASSEMBLY



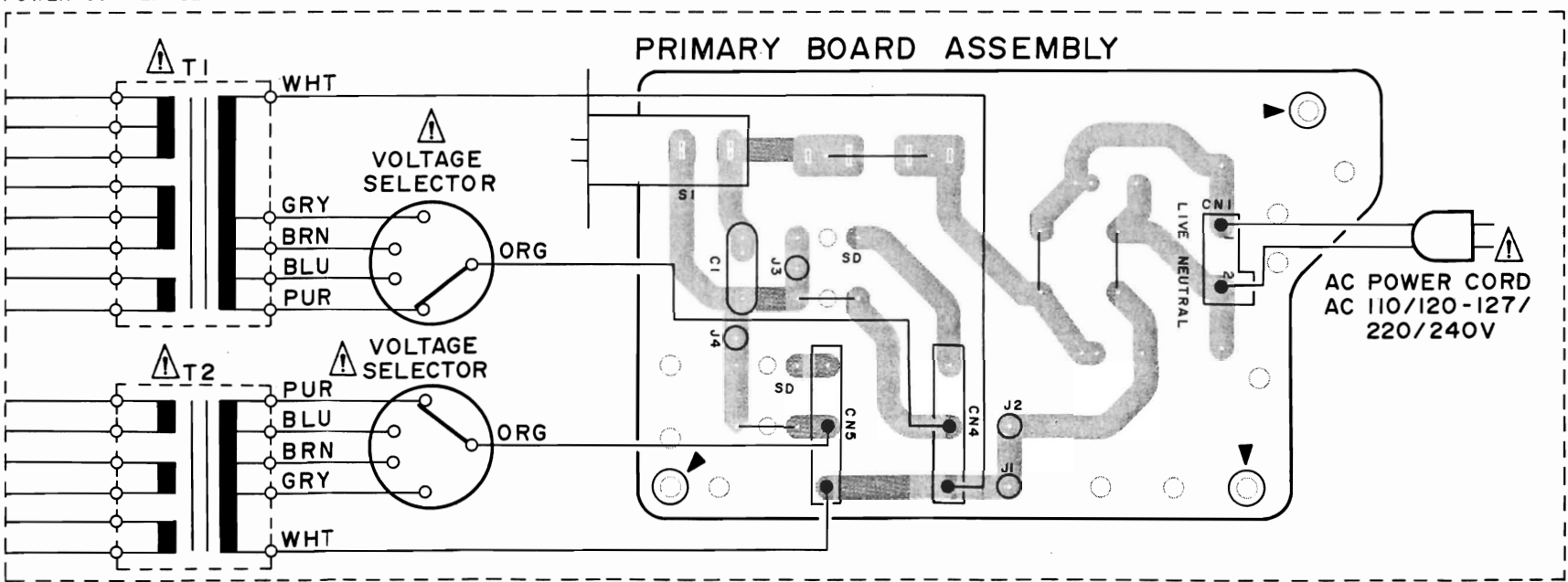
POWER SUPPLY SECTION FOR KU TYPE



POWER SUPPLY SECTION FOR HB AND HEM TYPES

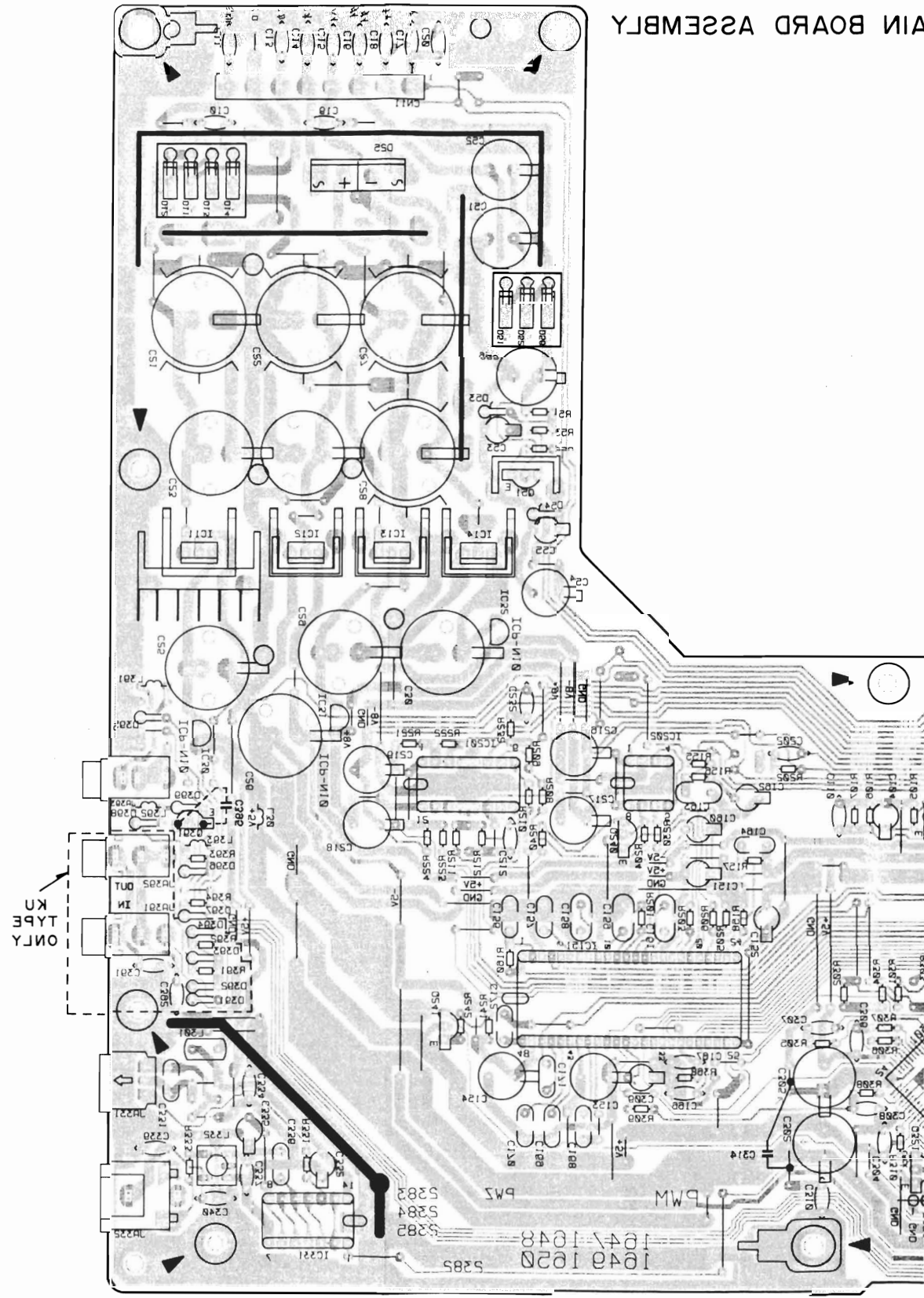


POWER SUPPLY SECTION FOR SD TYPE



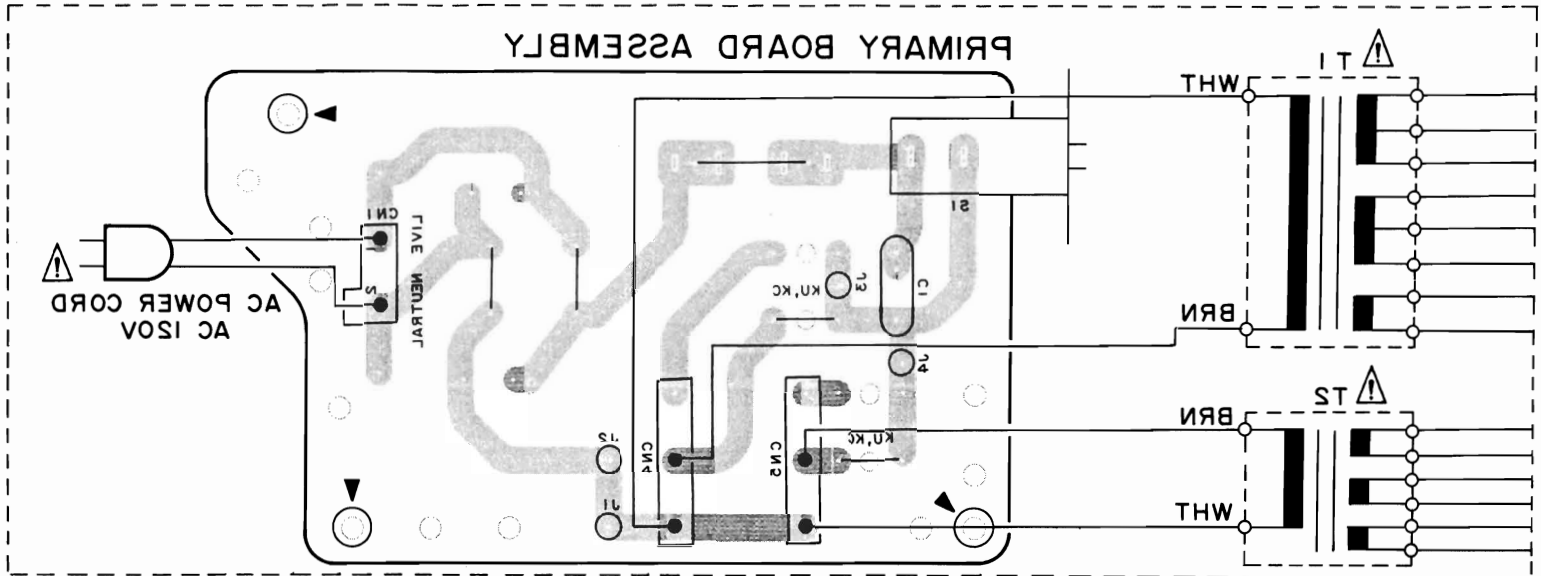
Q101	IC202	Q240	Q51	IC14	IC13	IC12	IC11
Q321		IC151	IC32	IC201	IC31	IC30	
				Q241	IC331	Q391	

MAIN BOARD ASSEMBLY

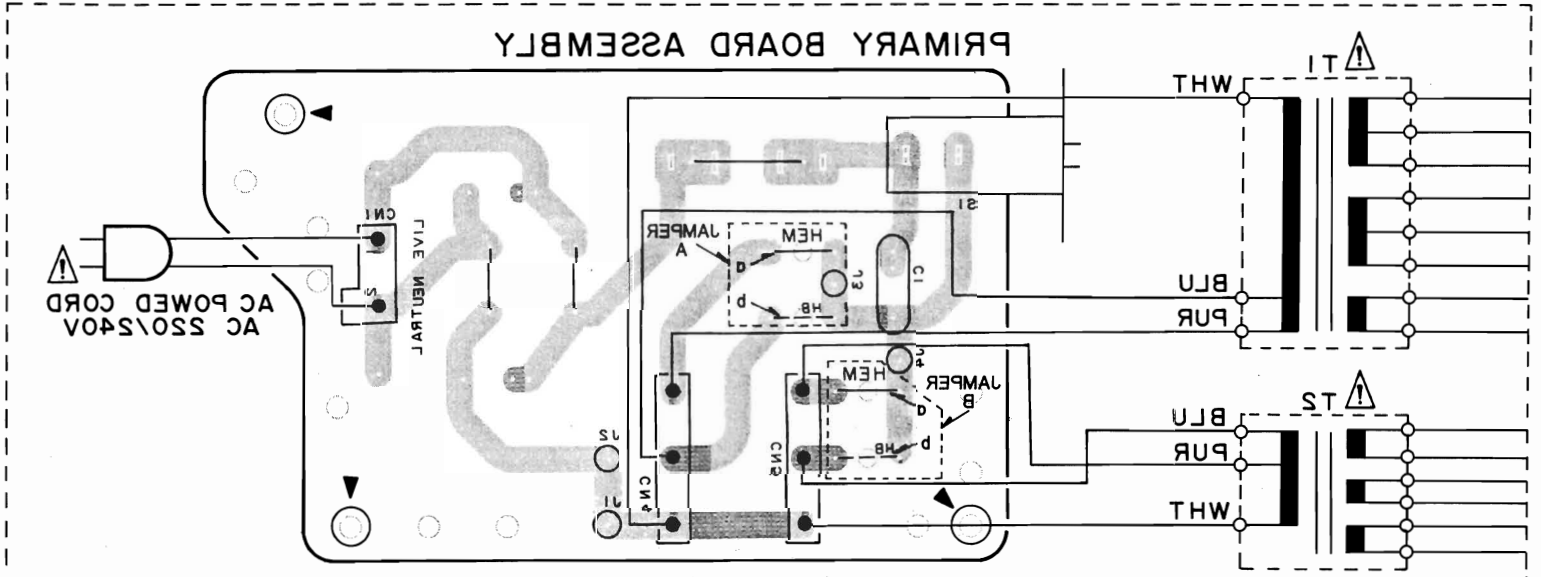


Q351 IC121 IC35 IC501 IC31 IC30
Q541 IC331
Q505 Q540 Q51 IC14 IC13 IC15 IC11

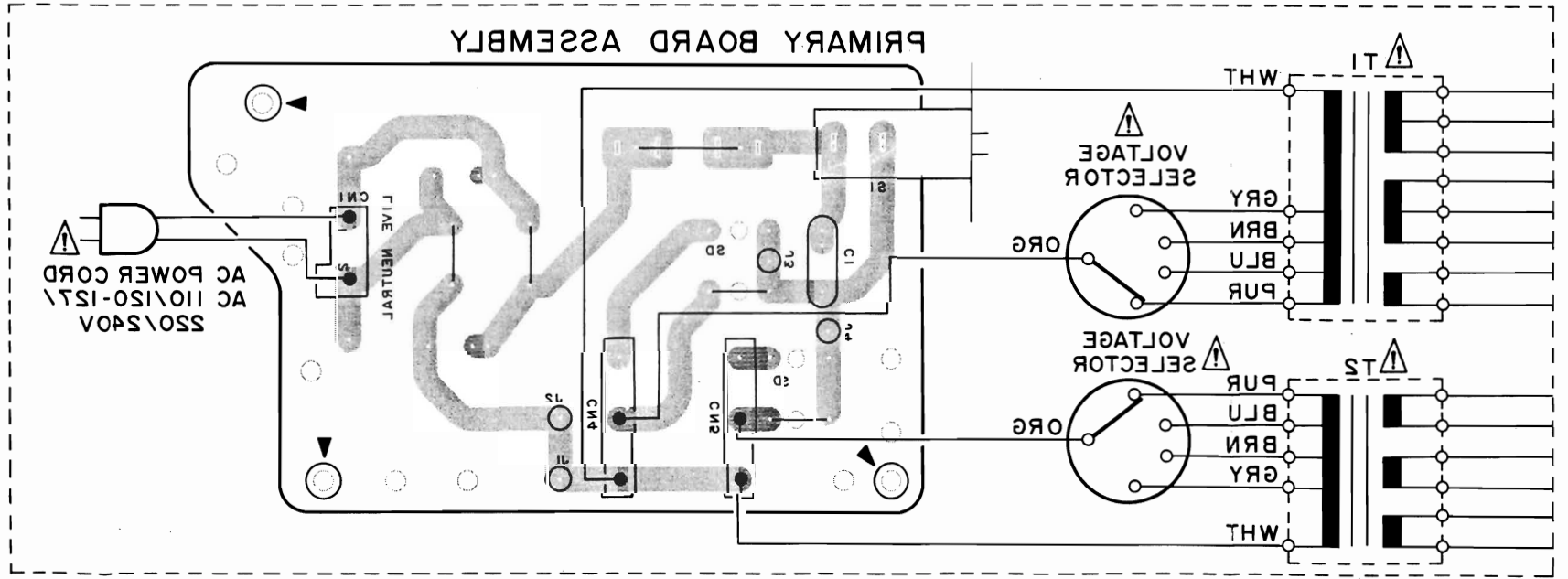
POWER SUPPLY SECTION FOR KU TYPE



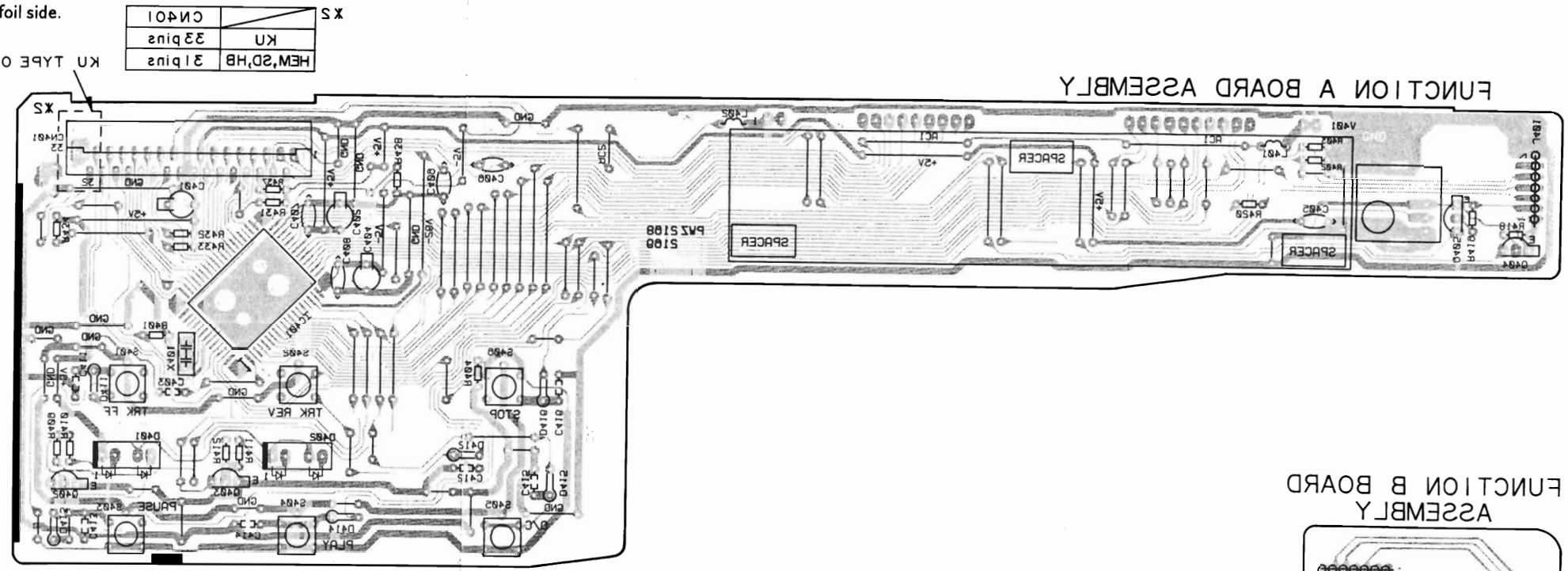
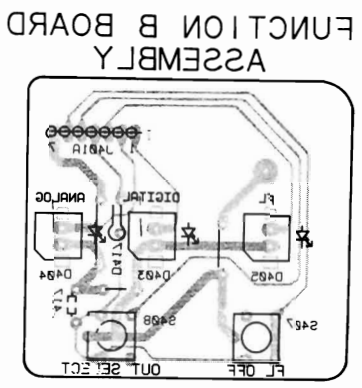
POWER SUPPLY SECTION FOR HB AND HEM TYPES



POWER SUPPLY SECTION FOR SD TYPE



A
B
C
D



HEW'20'HB	3 pins
KU	33 pins
CN401	

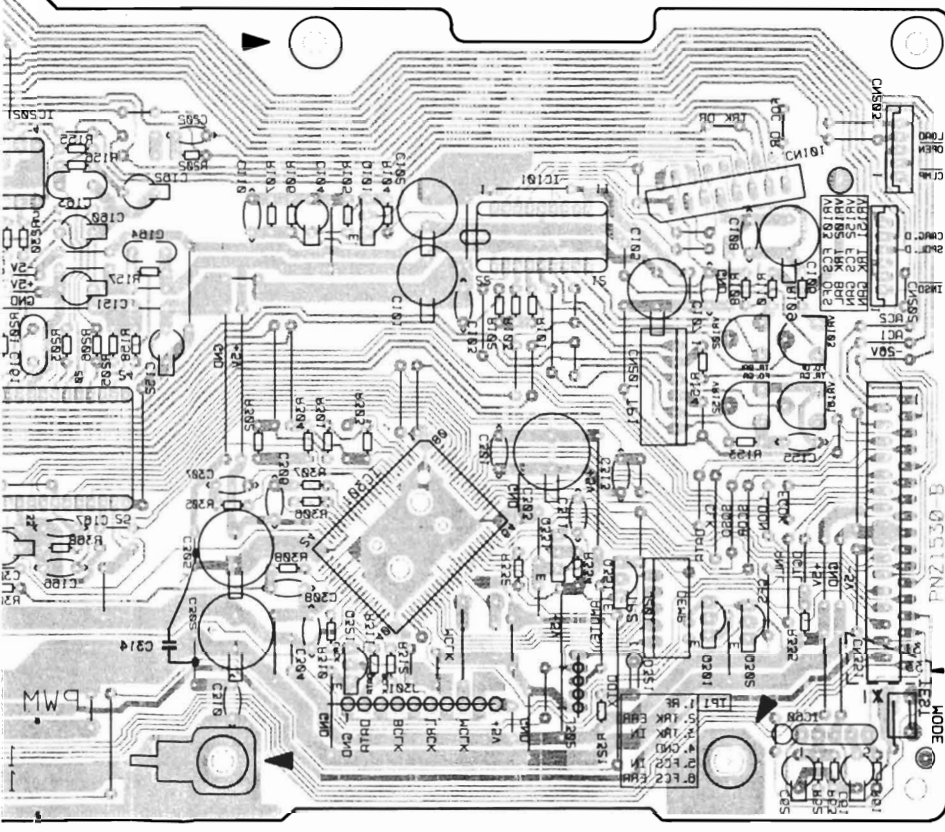
KU TYPE ONLY

IC401
Q404
Q405

Q403

HEW'20'HB	3 pins
KU	33 pins
CN321	

ONLY
KU
TYPE



VR103 VR105 TP1

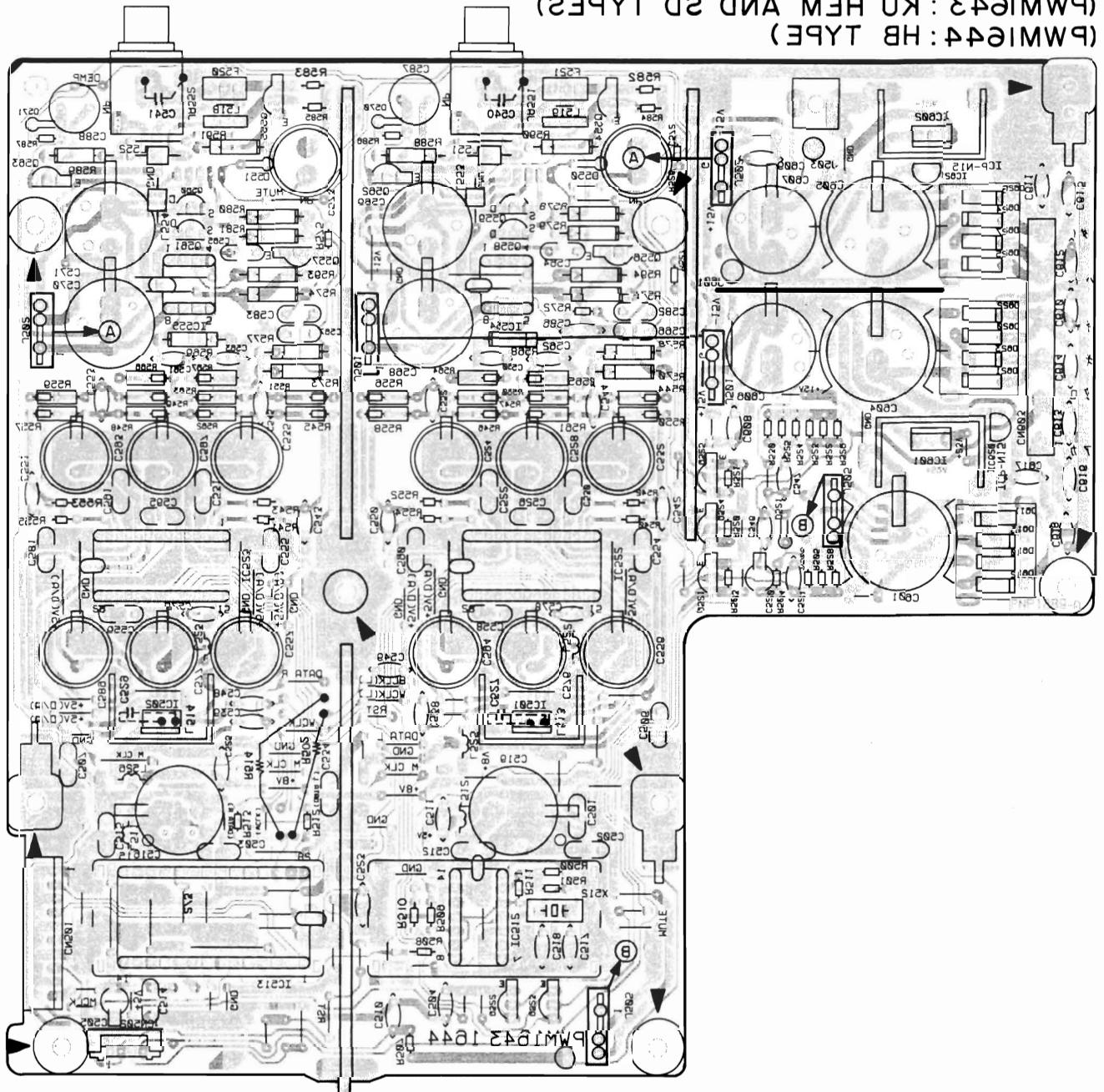
Q305
IC00 Q301 Q321 Q331
Q351
IC301 Q101
ICS

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

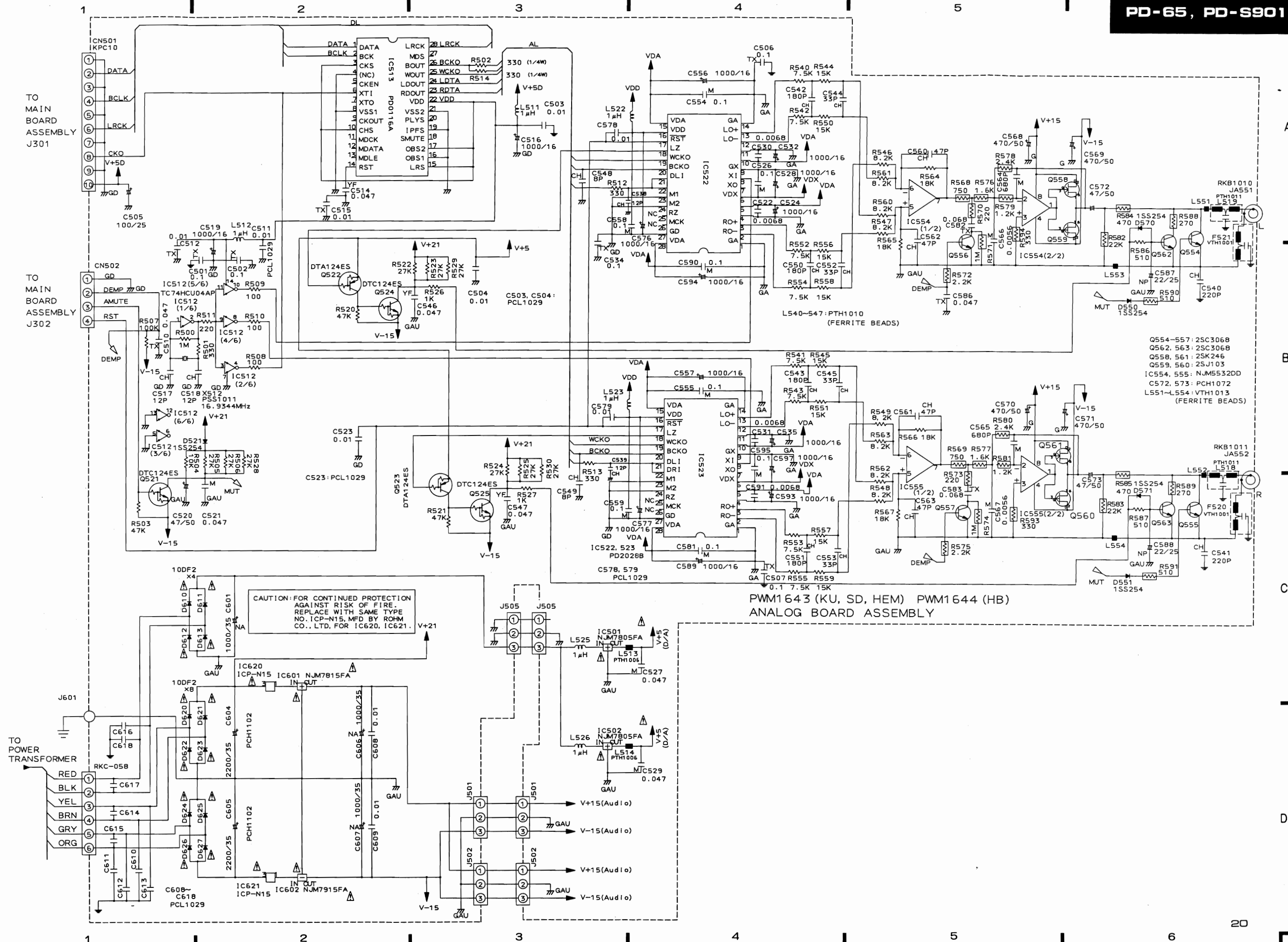
MAIN BOARD ASSEMBLY

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

(P.W.M.644: HB TYPE)
(P.W.M.643: KU HEM AND 2D TYPE2)
ANALOG BOARD ASSEMBLY



IC250 IC251 IC252 IC253 IC254 IC255 IC256 IC257 IC258 IC259 IC260 IC261 IC262 IC263 IC264 IC265 IC266 IC267 IC268 IC269 IC270 IC271 IC272 IC273 IC274 IC275 IC276 IC277 IC278 IC279 IC280 IC281 IC282 IC283 IC284 IC285 IC286 IC287 IC288 IC289 IC290 IC291 IC292 IC293 IC294 IC295 IC296 IC297 IC298 IC299 IC300 IC301 IC302 IC303 IC304 IC305 IC306 IC307 IC308 IC309 IC310 IC311 IC312 IC313 IC314 IC315 IC316 IC317 IC318 IC319 IC320 IC321 IC322 IC323 IC324 IC325 IC326 IC327 IC328 IC329 IC330 IC331 IC332 IC333 IC334 IC335 IC336 IC337 IC338 IC339 IC340 IC341 IC342 IC343 IC344 IC345 IC346 IC347 IC348 IC349 IC350 IC351 IC352 IC353 IC354 IC355 IC356 IC357 IC358 IC359 IC360 IC361 IC362 IC363 IC364 IC365 IC366 IC367 IC368 IC369 IC370 IC371 IC372 IC373 IC374 IC375 IC376 IC377 IC378 IC379 IC380 IC381 IC382 IC383 IC384 IC385 IC386 IC387 IC388 IC389 IC390 IC391 IC392 IC393 IC394 IC395 IC396 IC397 IC398 IC399 IC400 IC401 IC402 IC403 IC404 IC405 IC406 IC407 IC408 IC409 IC410 IC411 IC412 IC413 IC414 IC415 IC416 IC417 IC418 IC419 IC420 IC421 IC422 IC423 IC424 IC425 IC426 IC427 IC428 IC429 IC430 IC431 IC432 IC433 IC434 IC435 IC436 IC437 IC438 IC439 IC440 IC441 IC442 IC443 IC444 IC445 IC446 IC447 IC448 IC449 IC450 IC451 IC452 IC453 IC454 IC455 IC456 IC457 IC458 IC459 IC460 IC461 IC462 IC463 IC464 IC465 IC466 IC467 IC468 IC469 IC470 IC471 IC472 IC473 IC474 IC475 IC476 IC477 IC478 IC479 IC480 IC481 IC482 IC483 IC484 IC485 IC486 IC487 IC488 IC489 IC490 IC491 IC492 IC493 IC494 IC495 IC496 IC497 IC498 IC499 IC500 IC501 IC502 IC503 IC504 IC505 IC506 IC507 IC508 IC509 IC510 IC511 IC512 IC513 IC514 IC515 IC516 IC517 IC518 IC519 IC520 IC521 IC522 IC523 IC524 IC525 IC526 IC527 IC528 IC529 IC530 IC531 IC532 IC533 IC534 IC535 IC536 IC537 IC538 IC539 IC540 IC541 IC542 IC543 IC544 IC545 IC546 IC547 IC548 IC549 IC550 IC551 IC552 IC553 IC554 IC555 IC556 IC557 IC558 IC559 IC560 IC561 IC562 IC563 IC564 IC565 IC566 IC567 IC568 IC569 IC570 IC571 IC572 IC573 IC574 IC575 IC576 IC577 IC578 IC579 IC580 IC581 IC582 IC583 IC584 IC585 IC586 IC587 IC588 IC589 IC590 IC591 IC592 IC593 IC594 IC595 IC596 IC597 IC598 IC599 IC600 IC601 IC602 IC603 IC604 IC605 IC606 IC607 IC608 IC609 IC610 IC611 IC612 IC613 IC614 IC615 IC616 IC617 IC618 IC619 IC620 IC621 IC622 IC623 IC624 IC625 IC626 IC627 IC628 IC629 IC630 IC631 IC632 IC633 IC634 IC635 IC636 IC637 IC638 IC639 IC640 IC641 IC642 IC643 IC644 IC645 IC646 IC647 IC648 IC649 IC650 IC651 IC652 IC653 IC654 IC655 IC656 IC657 IC658 IC659 IC660 IC661 IC662 IC663 IC664 IC665 IC666 IC667 IC668 IC669 IC670 IC671 IC672 IC673 IC674 IC675 IC676 IC677 IC678 IC679 IC680 IC681 IC682 IC683 IC684 IC685 IC686 IC687 IC688 IC689 IC690 IC691 IC692 IC693 IC694 IC695 IC696 IC697 IC698 IC699 IC700 IC701 IC702 IC703 IC704 IC705 IC706 IC707 IC708 IC709 IC710 IC711 IC712 IC713 IC714 IC715 IC716 IC717 IC718 IC719 IC720 IC721 IC722 IC723 IC724 IC725 IC726 IC727 IC728 IC729 IC730 IC731 IC732 IC733 IC734 IC735 IC736 IC737 IC738 IC739 IC740 IC741 IC742 IC743 IC744 IC745 IC746 IC747 IC748 IC749 IC750 IC751 IC752 IC753 IC754 IC755 IC756 IC757 IC758 IC759 IC760 IC761 IC762 IC763 IC764 IC765 IC766 IC767 IC768 IC769 IC770 IC771 IC772 IC773 IC774 IC775 IC776 IC777 IC778 IC779 IC780 IC781 IC782 IC783 IC784 IC785 IC786 IC787 IC788 IC789 IC790 IC791 IC792 IC793 IC794 IC795 IC796 IC797 IC798 IC799 IC800 IC801 IC802 IC803 IC804 IC805 IC806 IC807 IC808 IC809 IC810 IC811 IC812 IC813 IC814 IC815 IC816 IC817 IC818 IC819 IC820 IC821 IC822 IC823 IC824 IC825 IC826 IC827 IC828 IC829 IC830 IC831 IC832 IC833 IC834 IC835 IC836 IC837 IC838 IC839 IC840 IC841 IC842 IC843 IC844 IC845 IC846 IC847 IC848 IC849 IC850 IC851 IC852 IC853 IC854 IC855 IC856 IC857 IC858 IC859 IC860 IC861 IC862 IC863 IC864 IC865 IC866 IC867 IC868 IC869 IC870 IC871 IC872 IC873 IC874 IC875 IC876 IC877 IC878 IC879 IC880 IC881 IC882 IC883 IC884 IC885 IC886 IC887 IC888 IC889 IC890 IC891 IC892 IC893 IC894 IC895 IC896 IC897 IC898 IC899 IC900 IC901 IC902 IC903 IC904 IC905 IC906 IC907 IC908 IC909 IC910 IC911 IC912 IC913 IC914 IC915 IC916 IC917 IC918 IC919 IC920 IC921 IC922 IC923 IC924 IC925 IC926 IC927 IC928 IC929 IC930 IC931 IC932 IC933 IC934 IC935 IC936 IC937 IC938 IC939 IC940 IC941 IC942 IC943 IC944 IC945 IC946 IC947 IC948 IC949 IC950 IC951 IC952 IC953 IC954 IC955 IC956 IC957 IC958 IC959 IC960 IC961 IC962 IC963 IC964 IC965 IC966 IC967 IC968 IC969 IC970 IC971 IC972 IC973 IC974 IC975 IC976 IC977 IC978 IC979 IC980 IC981 IC982 IC983 IC984 IC985 IC986 IC987 IC988 IC989 IC990 IC991 IC992 IC993 IC994 IC995 IC996 IC997 IC998 IC999



Service Manual

 **PIONEER®**
The Art of Entertainment

PION-03524

SERVICE GUIDE

ORDER NO.
ARP2318

COMPACT DISC PLAYER

PD-41

PD-9700

PD-31

PD-8700

PD-8700-S

PD-7700

PD-7700-S

- For information on performing repair works, refer to the respective service manuals, ARP2297(PD-41, PD-9700) and ARP2228(PD-31, PD-8700, PD-8700-S, PD-7700, PD-7700-S).

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- 1. DISASSEMBLY 2
- 2. MECHANISM DESCRIPTION 7

PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan
PIONEER ELECTRONICS SERVICE INC. P.O. Box 1760, Long Beach, California 90801 U.S.A.
PIONEER ELECTRONICS OF CANADA, INC. 505 Cochrane Drive, Markham, Ontario L3R 8E3 Canada
PIONEER ELECTRONIC [EUROPE] N.V. Keetberglaan 1, 9120 Beveren, Belgium
PIONEER ELECTRONICS AUSTRALIA PTY. LTD. 178-184 Boundary Road, Braeside, Victoria 3195, Australia TEL: [03] 580-9911
© PIONEER ELECTRONIC CORPORATION 1991

FI JUL. 1991

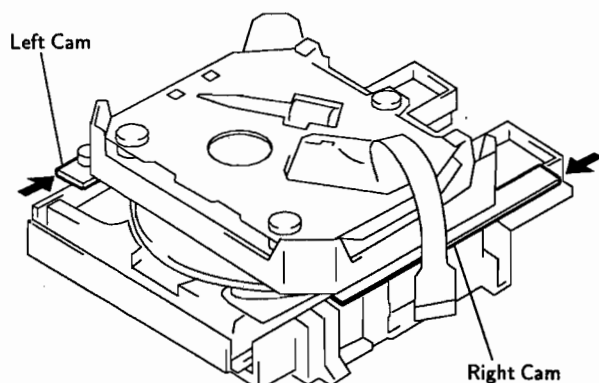
1. DISASSEMBLY

1.1 DISASSEMBLING LOADING MECHANISM ASSEMBLY

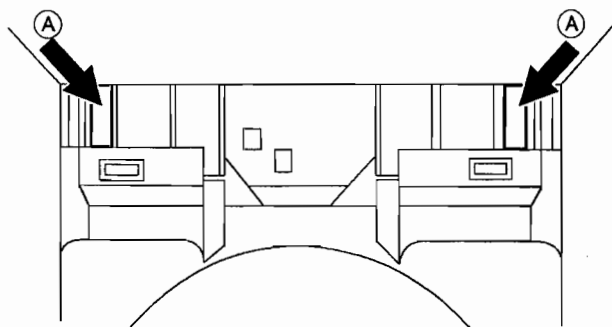
Tray Removal

- ① Open the tray all the way.

Note : If you slide the right cam and the left cam in the direction of the arrow, you can open the tray by hand.

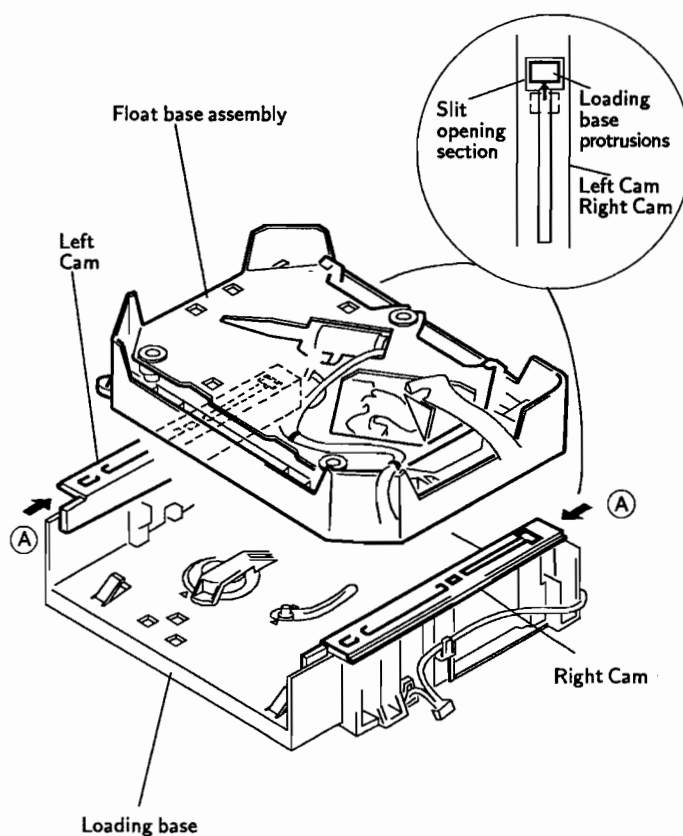


- ② While pressing the plastic springs section (A) at the rear of the tray left and right at the same time, pull out the tray.



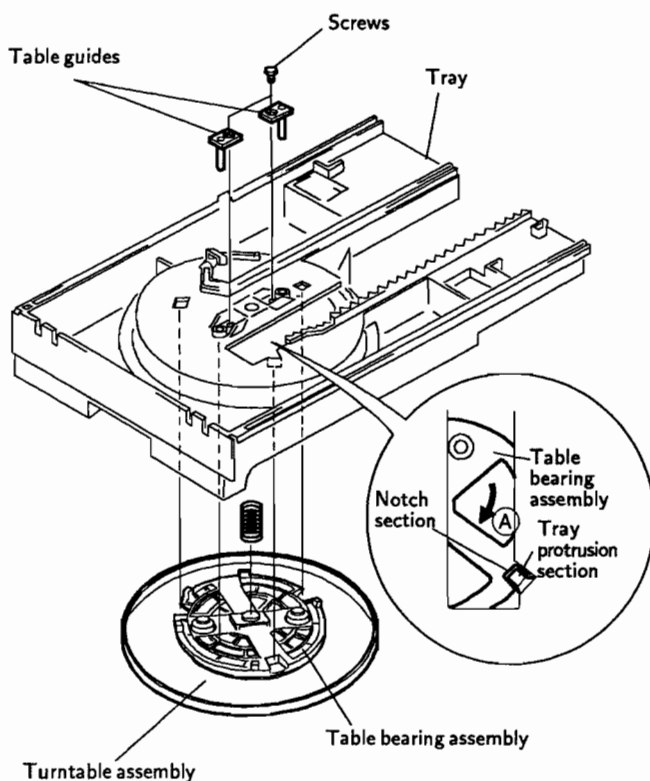
Float Base Assembly Removal

- ① Remove the tray.
- ② Move the right and left cams in the direction of their respective (A) arrows until the protrusions of the loading base come to the slit opening of the right cam and the left cam.
- ③ Pull up the float base assembly and remove it from the loading base.



Turntable Assembly Removal

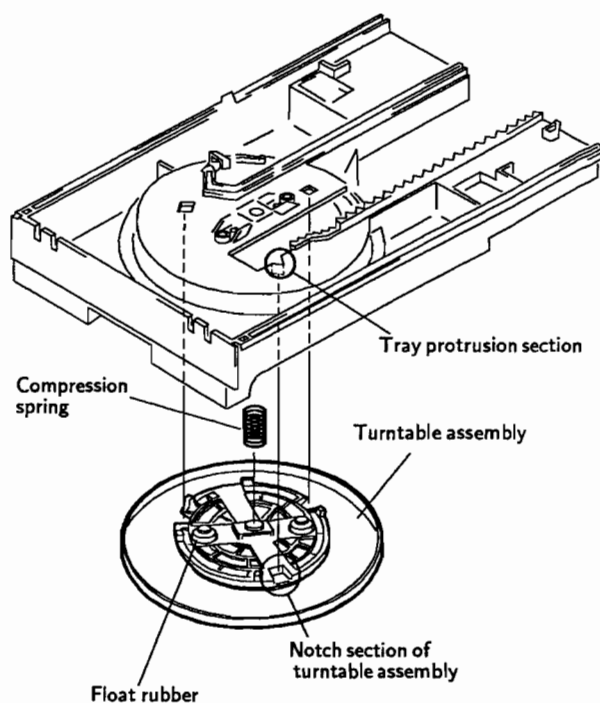
- ① Remove the two screws from the rear of the tray and remove the two table guides.
- ② Turn the table bearing assembly in the direction of the **A** arrow.
- ③ At the position where the tray protrusion is lined up with the table bearing assembly notch (the position shown in the figure), remove the turntable assembly.



1.2 ASSEMBLING THE LOADING MECHANISM ASSEMBLY

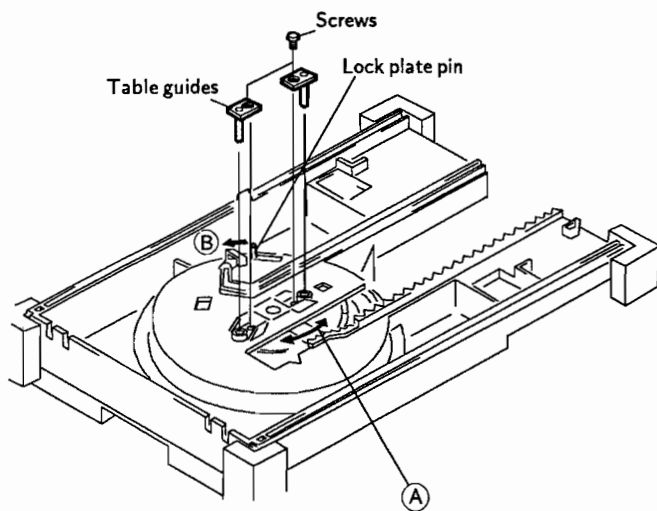
Assembling the Tray Assembly

- ① Place the turntable assembly upside down and place the compression spring in its center.
- ② Line up the notch section of the turntable assembly with the protrusion section of the tray and assemble.



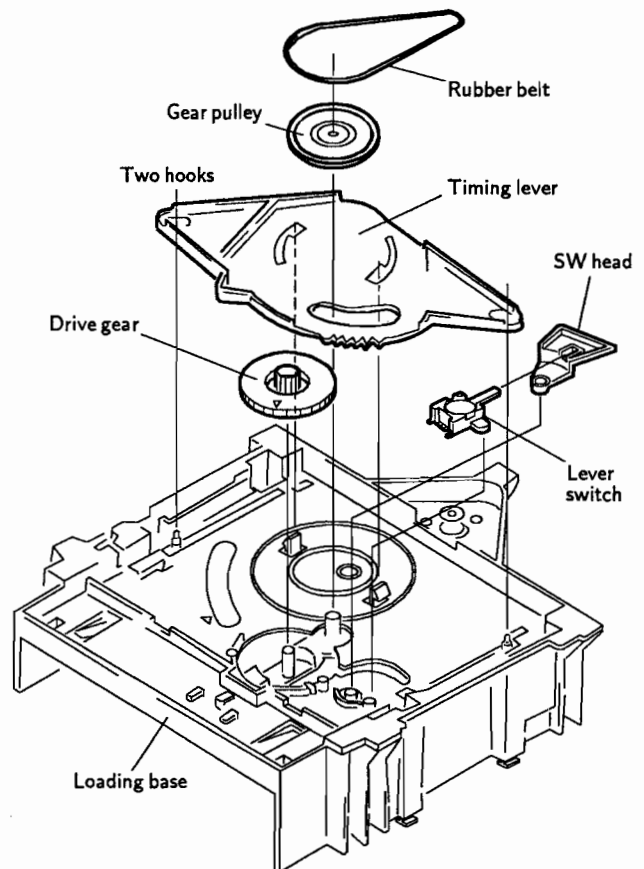
Note: The turntable assembly is to be in the position shown in the figure.

- ③ After assembling the turntable assembly and the tray, turn the lock plate pin somewhat in the direction of the (B) arrow, then hold with your finger.
- ④ While still holding the lock plate pin with your finger, turn the table bearing assembly in the direction of the (A) arrow until the holes in the float rubber piece and in the tray are lined up with each other.
- ⑤ Use the two screws to install the two table guides into the lines up tray and float rubber piece holes.



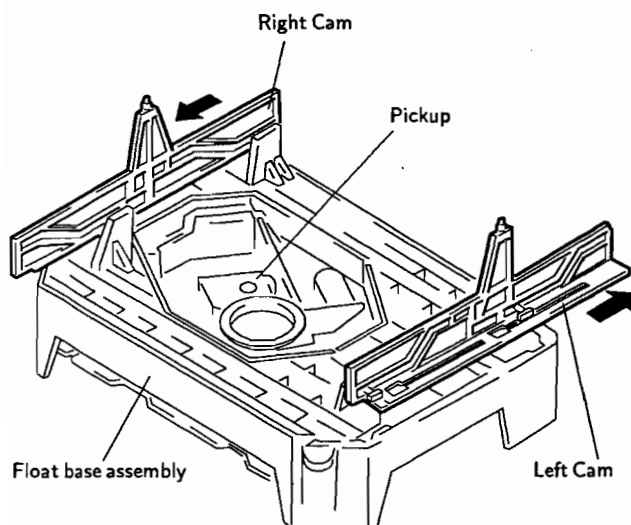
Drive Gear, Timing lever, Gear Pulley, Switch Head, and Lever Switch Installation

- ① Install each part on the loading base as shown in the figure.

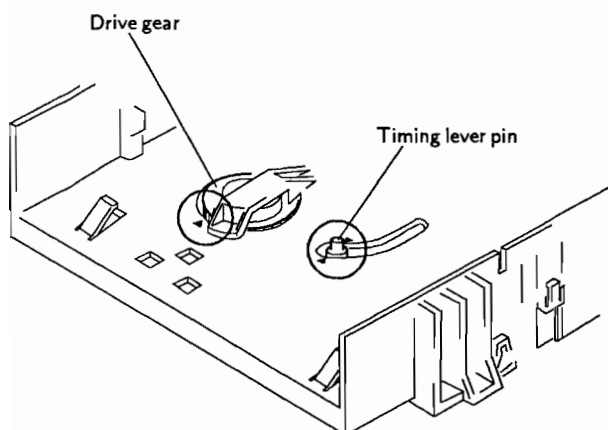


Loading Base Assembly, Float Base Assembly, Right Cam, and Left Cam Installation

- ① Place the float base assembly upside down (with the pickup facing up).
- ② Install the right cam and the left cam on the float base assembly. Position each cam all the way in the direction of its respective arrow.

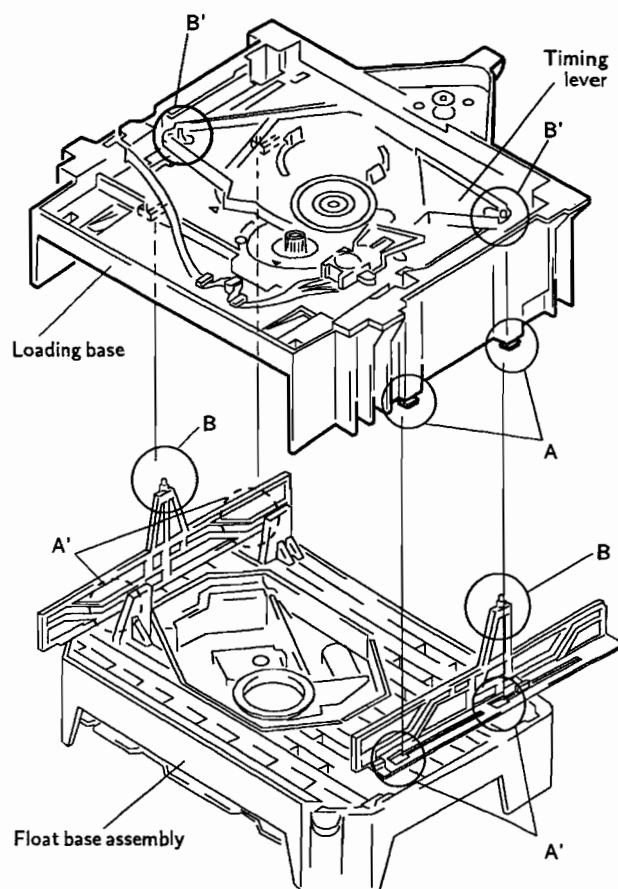


- ③ Line up the Δ marks on the drive gear and the loading base as shown in the figure.
- ④ Line up the ∇ marks on the loading base and the timing lever pin as shown in the figure.



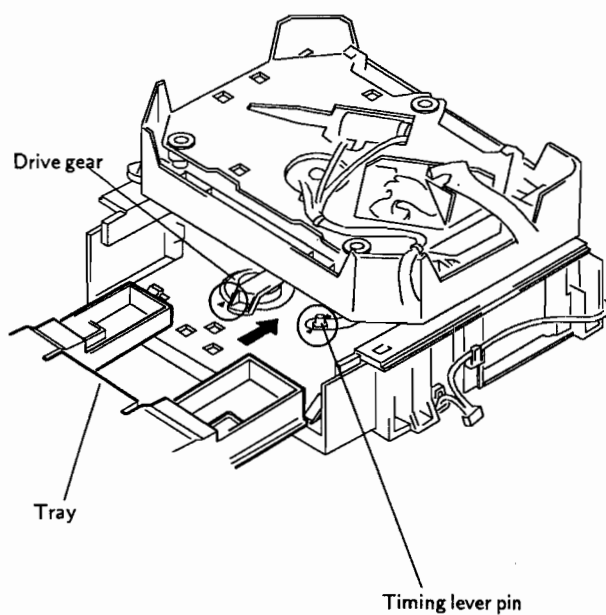
- ⑤ Next, finely adjust the timing lever angle and the left and right cam position and insert the loading base protrusion A sections (two each on the left and right) into the A' openings on the left and right cam.

At the same time, pass the protrusion B sections on the left and right cam (one on each cam) through the loading base slit and insert into the B' holes on the timing lever.

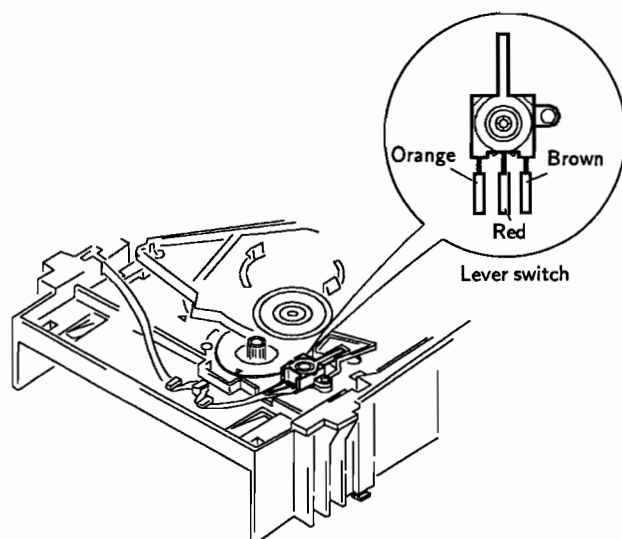
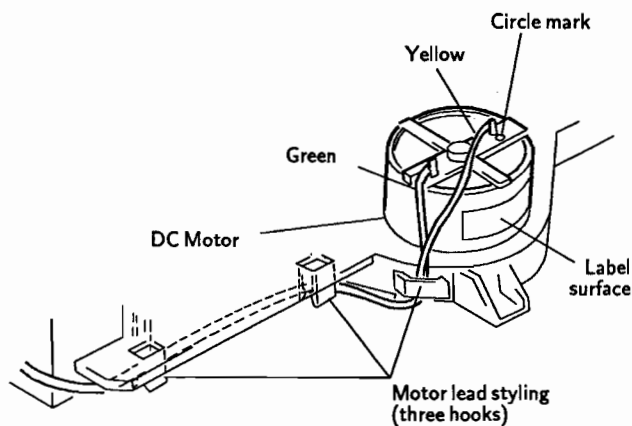


Tray Installation

- ① Place the parts assembled in the last section upside down.
- ② While being careful not to knock the loading base, drive gear, and timing lever pin aligned in the last section out of place, insert the tray.

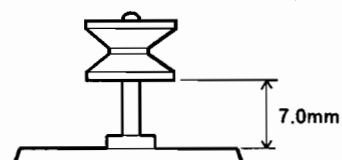


Motor and Switch Wiring and Styling



Assembling the Motor Assembly

Set the gap between the motor and pulley to 7.0 mm.



2. MECHANISM DESCRIPTION

2.1 MECHANISM SUMMARY

Summary

This mechanism is a single mechanism assembly with a turntable mounted.

Mechanism Sections

This mechanism comprises the loading section and the servo mechanism section.

Loading Section

The loading section opens and closes the tray and provides the clamping for the servo mechanism up/down movement. As a new test, this mechanism has a mechanism for decelerating smoothly at the completion of tray take-in in order to make the tray movement look smooth. This done by a spiral shaped drive gear (PNW1996) and the irregularly shaped rack on the tray.

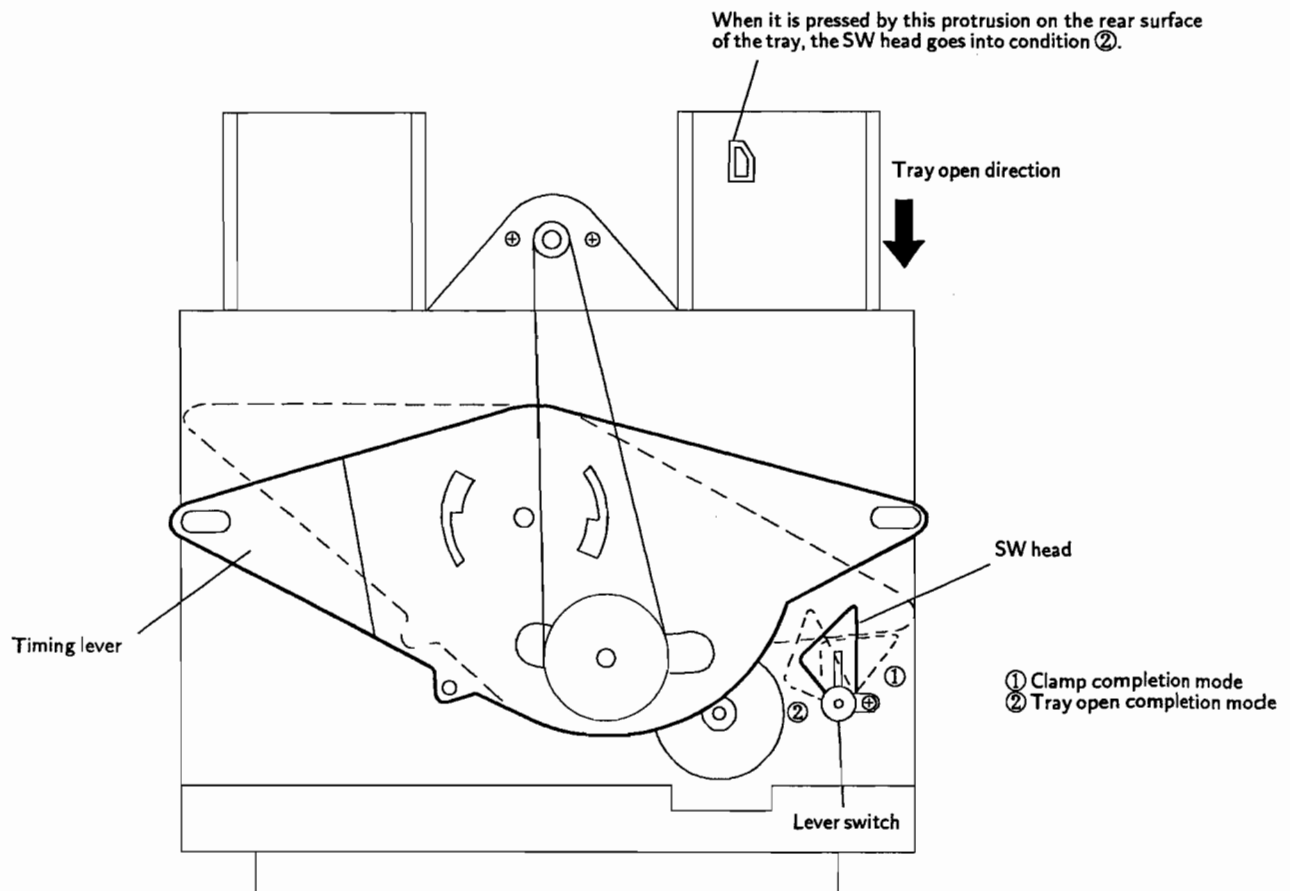
The spring-type clamp quiets the clamping.

Servo Mechanism Section

The basic structure of the servo mechanism is about the same as that for a multi-disc type servo mechanism, but the use of the spring-type clamp makes a turntable magnet unnecessary.

The lever switch (DSK1003) and the switch head (PNW1999) are used to detect the completion of tray opening by means of the protrusion on the tray (PNW 2003) rear surface and clamp completion is detected using the timing lever (PNW1997) side wall.

When it is pressed by the protrusion on the rear surface of the tray, the switch head goes into condition ②.



2.2 OPERATION SUMMARY

This explanation covers operations sequentially from the disc take-in state to the completion of tray opening.

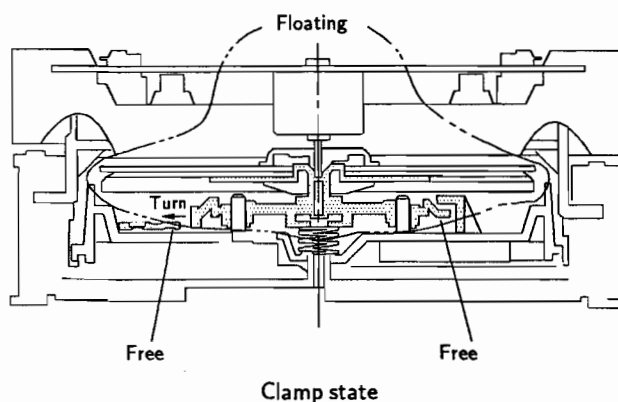
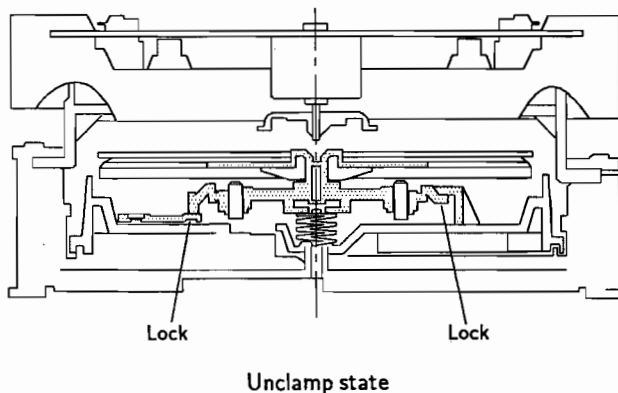
1. Clamp Condition

This explanation starts from the tray assembly.

The turntable in the tray assembly always turns freely, but the height of the turntable is locked while the tray is open. This lock is released by the clamping.

This is because while the tray is open, the table bearing that receives the turntable is locked by the lock plate. Just before the completion of tray take-in, the lock plate is turned to release the lock.

Next, we will explain the clamping. When the lock on the table bearing is released, the turntable is supported from below by the float spring. During clamping, the amount of deflection of the spring generates an upward load to provide the clamping force.



2. Clamp Release

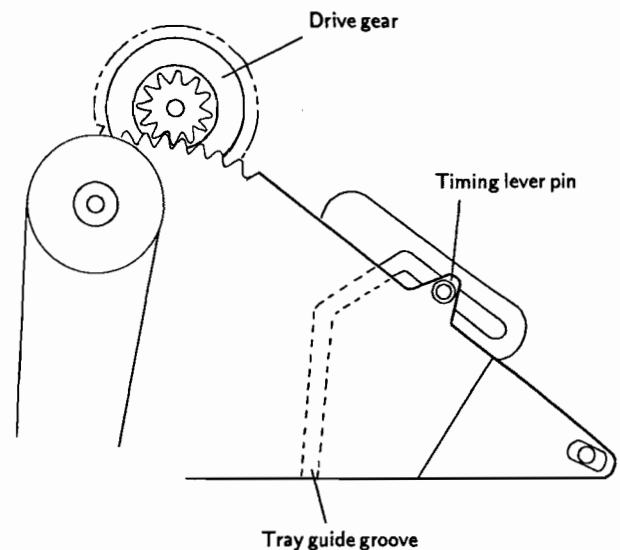
When the timing lever turns, the left and right cams move forward and backward respectively to lift up the float base and release the clamp.

3. Tray Operation

The tray and timing lever have rack sections and these rack sections have notch teeth.

Both mesh with the drive gear, but only one tooth meshes at a time, so normally only one of the rack sections is meshed with the drive gear at a time. The rack section pull-in and separation are synchronized with the timing lever pin and the corresponding tray guide groove. When the servo mechanism separates from the turntable, the tray is pushed out by the timing lever pin and the tray rack meshes with the drive gear. The tray is driven by the drive gear and moves forward while turning the timing lever and releasing the meshing with the drive gear.

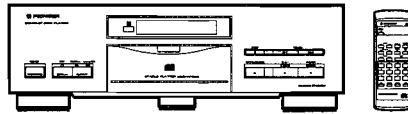
The tray deceleration mechanism mentioned earlier causes the tray to accelerate gradually when it starts to open and causes the tray to decelerate smoothly to the completion of take-in when it closes.



XQ
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3377

Service Manual



ORDER NO.
ARP2297

COMPACT DISC PLAYER

PD-41 PD-9700

PD-41 AND PD-9700 HAVE THE FOLLOWING :

Type	Model		Power Requirement	Remarks
	PD-41	PD-9700		
KU	○	—	AC 120 V only	
KC	—	○	AC 120 V only	
HEM	—	○	AC 220 V-230 V, AC 230 V-240 V (switchable)*	
HB	—	○	AC 220 V-230 V, AC 230 V-240 V (switchable)*	
SD	—	○	AC 110 V, 120 V-127 V, 220 V, 240 V (switchable)	

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

- This manual is applicable to PD-41/KU, PD-9700/KC, HEM, HB and SD types.
- As to the PD-9700/KC, HEM, HB and SD types, refer to page 84.
- As to the disassembly and mechanism descriptions, refer to the PD-41, PD-9700 service guide(ARP2318).
- Ce manuel pour le service comprend les explications de réglage en français.
- Este manual de servicio trata del método ajuste escrito en español.

CONTENTS

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2. EXPLODED VIEWS AND PARTS LIST	4	6. AJUSTE	66
3. PACKING	11	7. IC INFORMATION	82
4. SCHEMATIC DIAGRAM AND	12	8. FOR PD-9700/KC, HEM, HB AND SD TYPES	84
P.C.BOARDS CONNECTION DIAGRAM		9. PANEL FACILITIES	86
5. P.C.B's PARTS LIST	32	10. SPECIFICATIONS	88
6. ADJUSTMENTS	35		

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

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

1. SAFETY INFORMATION

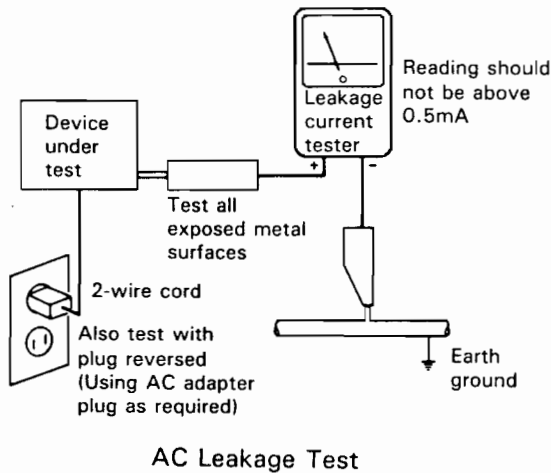
(FOR USA MODEL ONLY)

1. SAFETY PRECAUTIONS

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

LEAKAGE CURRENT CHECK

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



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 Δ on the schematics and on the parts list in this Service Manual. The use of a substitute replacement component which does 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 UNDGA UDSÆTTELSE FOR STRÅLING.

VARNING!

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



LASER
Kuva 1
Lasersäteilyn
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 HIGHER CLASS THAN 1. SERVICING OPERATION OF THE APPARATUS SHOULD BE DONE BY A SPECIALLY INSTRUCTED PERSON.

LASER DIODE CHARACTERISTICS

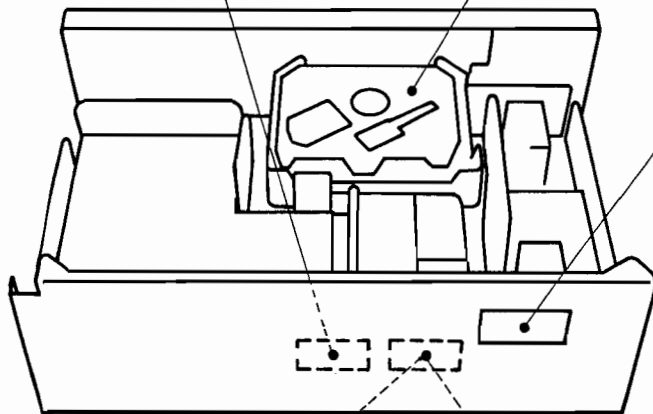
MAXIMUM OUTPUT POWER: 5 mw
WAVELENGTH: 780-785 nm

LABEL CHECK

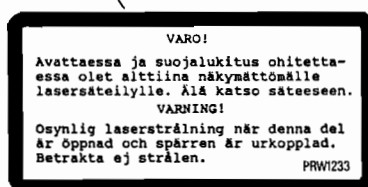
HEM type



HEM and HB types



HB type



HEM type

Additional Laser Caution

1. Laser Interlock Mechanism

The position of the switch (S 601) for the detecting loading completion is detected by the system microprocessor, and the design prevents laser diode oscillation when the switch (S 601) is not in CLMP terminal side (when the mechanism is not clamped and CLMP signal is high level).

Thus, the interlock will no longer function if the switch (S 601) is deliberately set to CLMP terminal side (if CLMP signal is low level).

In the test mode, the interlock mechanism will not function (refer to page 36).

Laser diode oscillation will continue if pins 2 and 3 of CXA 1471 S (IC 101) are connected to ground or pin 20 is connected to high level(ON) or the terminals of Q 101 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 or higher laser beam.

2. EXPLODED VIEWS AND PARTS LIST

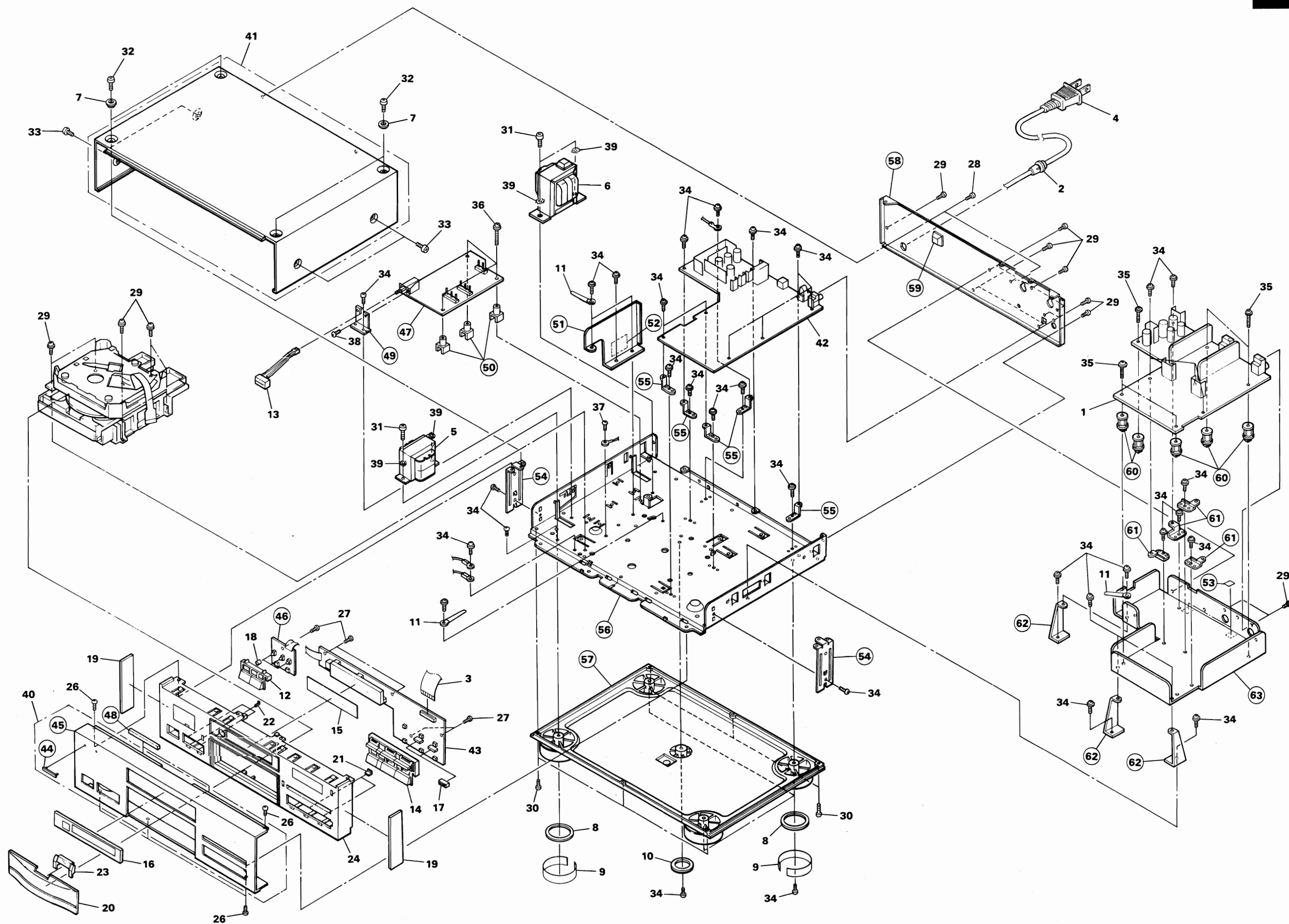
NOTES :

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

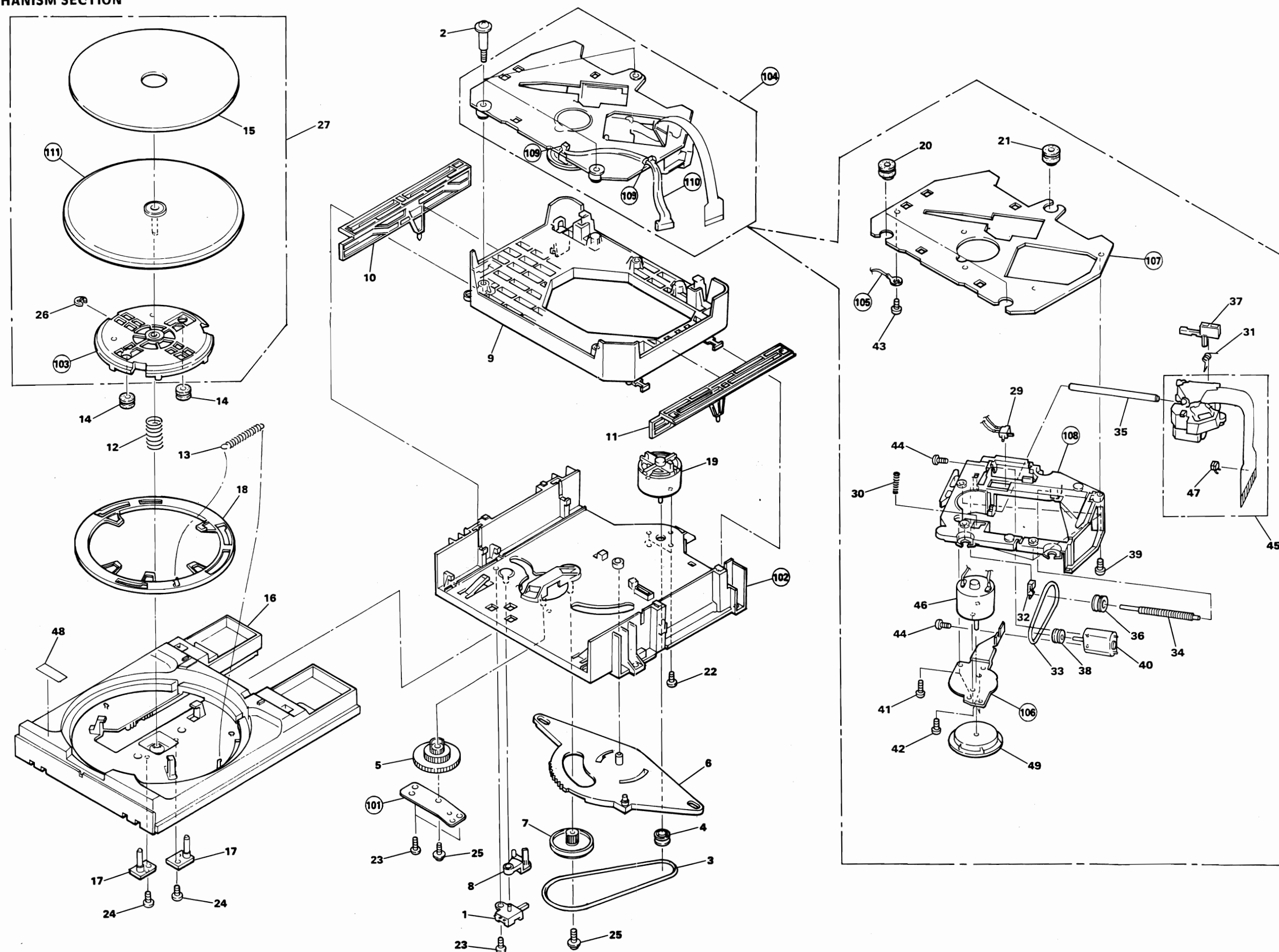
2.1 EXTERIOR

Parts List of Exterior

Mark	No.	Description	Parts No.	Mark	No.	Description	Parts No.
▲●	1	Analog board assembly	PWM1490	▲●	41	Bonnet case	PYY1071
▲	2	Strain relief	CM-22C	▲●	42	Main board assembly	PWZ2150
	3	33P F.F.C/30V	PDD1094	●	43	Function A board assembly	PWZ2168
▲	4	AC power cord	PDG1015		44	Badge	
▲	5	Power transformer	PTT1166		45	Front panel	
▲	6	Power transformer	PTT1206		46	Function B board assembly	
	7	Washer	ABE1009		47	Primary board assembly	
	8	Stopper	PNM1095		48	Rubber sheet	
	9	Tape	PNM1099		49	Switch angle	
	10	Stopper	PNM1107		50	Spacer	
	11	Cord clasper(steel)	RNH-184		51	L angle	
	12	Button	PAC1530		52	Sheet	
	13	Power button	PAC1539		53	Tape	
	14	Control button	PAC1609		54	Side angle	
	15	FL sheet	PAM1514		55	PCB angle	
	16	Display window	PAM1515		56	Under base	
	17	LED cover	PEB1150		57	Base	
	18	LED cover (S)	PEB1167		58	Rear base	
	19	Side rubber	PEB1180		59	Binder holder	
	20	Tray panel	PNW1815		60	PCB spacer	
	21	Lens L	PNW1860		61	Angle B	
	22	Indicator lens	PNW1893		62	Shield angle	
	23	Tray lens	PNW1950		63	Shield plate	
	24	Control panel	PNW2066				
	25						
	26	Screw	BBT30P080FCC				
	27	Screw	BBZ26P080FCC				
	28	Screw	BBZ30P080FCC				
	29	Screw	BBZ30P080FCC				
	30	Screw	BBZ30P140FCC				
	31	Screw	BBZ40P060FCC				
	32	Screw	BBZ40P080FZK				
	33	Screw	FBT40P080FZK				
	34	Screw	IBZ30P060FCC				
	35	Screw	IBZ30P150FCC				
	36	Screw	IBZ30P180FCC				
	37	Screw	PDZ30P050FCC				
	38	Screw	PMZ30P060FCC				
	39	Washer	WH40FUC				
	40	Front panel assembly	PEA1167				



2.2 MECHANISM SECTION



FUNCTION A BOARD ASSEMBLY
(PWZ2168:KU AND KC TYPES)
(PWZ2169:HEM,SD AND HB TYPES)

X2	
KU, KC	33pins
HB,HEM,SD	31pins

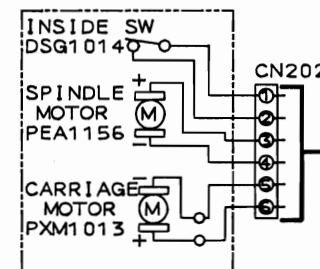
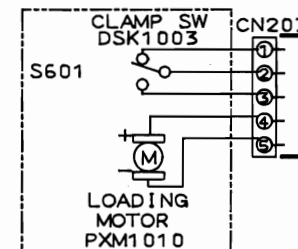
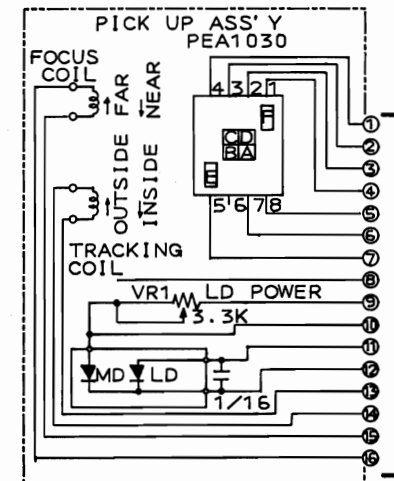
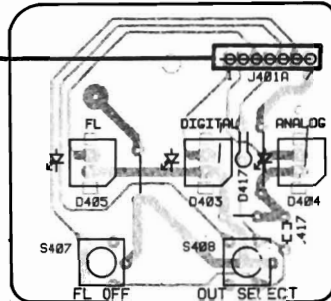
KU AND KC
TYPES ONLY

IC301 (CXD2500AQ)			
Pin No.	Voltage	Pin No.	Voltage
1	5	41	2.5
2	2.1	42	5
3	5	43	2.5
4	2.6	44	0
5	2.2	45	5
6	5	46	4.4
7	0	47	0
8	5	48	0
9	0	49	0~0.3
10	0	50	1.2
11	2.1	51	1.2
12	0	52	0
13	1.0	53	2.5
14	0.9~1.3	54	2.5
15	0	55	0
16	2.0	56	2.9
17	0	57	2.5
18	2.5	58	5
19	2.4	59	5
20	2.4	60	2.5
21	0	61	0
22	2.5	62	2.5
23	5	63	0
24	2.5	64	0
25	0.2	65	0
26	0	66	3.3~4.6
27	2.5	67	5
28	0	68	0
29	0	69	2.1~3
30	0	70	5
31	1.3~2.2	71	5
32	2.5	72	5
33	5	73	5
34	2.5	74	5
35	2.5	75	5
36	2.5	76	0
37	2.5	77	5
38	2.5	78	5
39	0	79	5
40	5	80	0

IC151 (CXA1372S)			
Pin No.	Voltage	Pin No.	Voltage
1	0	25	-5
2	0	26	5
3	0	27	5
4	0	28	5
5	0	29	5
6	0	30	5
7	0	31	5
8	0	32	0
9	0	33	5
10	0	34	0
11	1	35	0
12	0	36	-5
13	0.2	37	2.5
14	0	38	2.5
15	0	39	5
16	5	40	-1.5
17	0	41	-1.7
18	0	42	5
19	0	43	-0.7
20	0.2~0.8	44	-1.6
21	0	45	0
22	-4	46	0.8
23	1.3	47	-5
24	0	48	0

IC401 (PD4329A)							
Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage
1	-24~-24.3	17	-1	33	5	49	5
2	-24~-24.3	18	-2.6	34	3.3~4.7	50	5
3	-24~-24.3	19	-5	35	5	51	0
4	-24~-24.3	20	-17.6~-17.8	36	0	52	5
5	-24~-24.3	21	-1.6	37	5	53	5
6	-24~-24.3	22	-12.5~-15.5	38	5	54	5
7	-24~-24.3	23	-3.4~-6.4	39	0	55	5
8	-24~-24.3	24	-4~-7	40	0	56	2.5
9	-24~-24.3	25	-6.8~-9.8	41	0	57	2.5
10	-24~-24.3	26	5	42	0	58	0
11	-24~-24.3	27	-1.5	43	5	59	0
12	0	28	-1.2~-1.6	44	5	60	5
13	5	29	-12.5~-15.4	45	0	61	0
14	0	30	-12.1~-17.6	46	5	62	0
15	4.9	31	4	47	5	63	0
16	-27.5~-27.8	32	5	48	2.1~3	64	0

FUNCTION B BOARD
ASSEMBLY



Line Voltage Selection (For HEM and HB types)

Line voltage can be changed with the following steps.

1. Disconnect the AC power cord.
2. Remove the top cover.
3. Change the position of the jumper wire A as follows

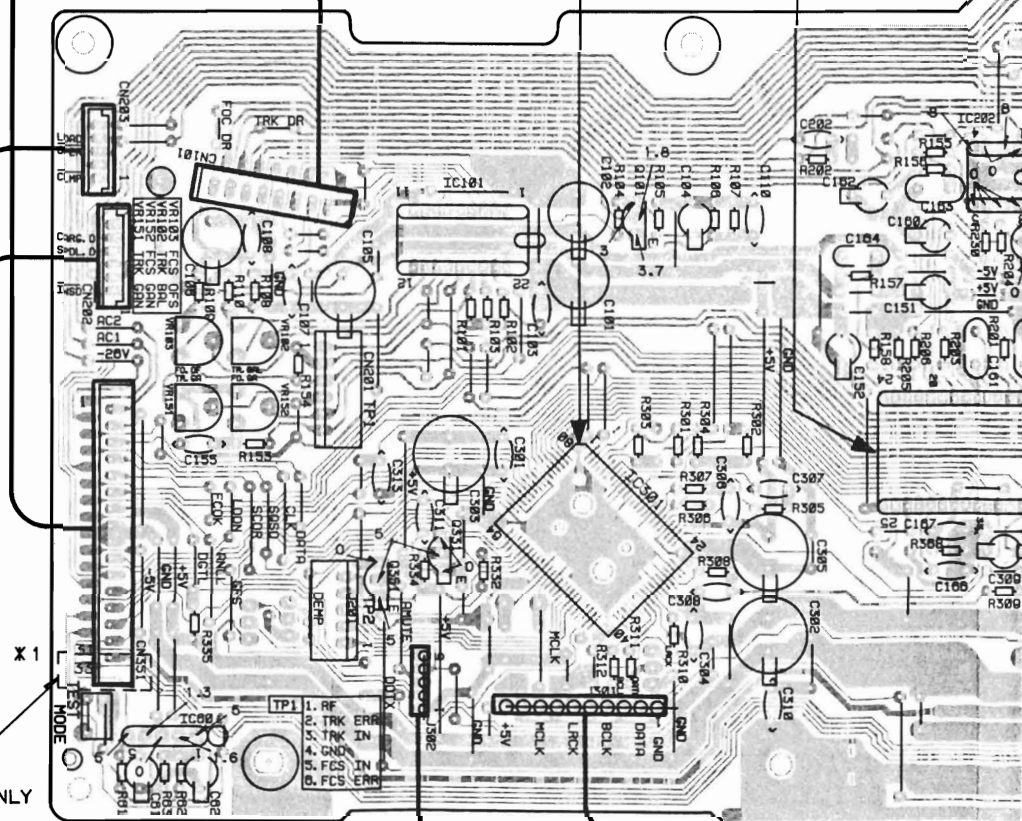
Voltage	Jumper wire A position
220 V-230 V	a
230 V-240 V	b

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

Parts No.	Description
AXX-193	220 V label
AXX-192	240 V label

X1	
KU, KC	33pins
HB,HEM,SD	31pins

KU AND KC TYPES ONLY



•TERMINAL VOLTAGES

Pin No.	1	2	3	4	5	6	7	8	9	10	11
Voltage	0	2.9	-4.7	0	0	-5	0	0	0	0	0
Pin No.	12	13	14	15	16	17	18	19	20	21	22
Voltage	0	-0.9	0	0	0	0	0	0	5	5	0

IC101 (CXA1471S)

Pin No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Voltage	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	0	0
Pin No.	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Voltage	0	0	0	0	0	0	0	0	-5	5	5	5	5	5	5	0

IC151 (CXA1372S)

Pin No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Voltage	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pin No.	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Voltage	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

IC301 (CX2500AQ)

3. PACKING

Mark	No.	Description	Parts No.
	1	Cord with plug(mini plug)	PDE-319
	2	Cord with plug	PDE1001
	3	Operating instructions (English, French)	PRE1149
	4	Remote control unit(CU-PD054)	PWW1058
	5	Battery cover	PZN1001
	6	Polyethelene bag	Z21-038
	7	Protector F	PHA1145
	8	Protector R	PHA1146
	9	CD packing case	PHG1677
	10	Sheet	VHL-037
	11	Label	PRW1253

101 Battery (R03, AAA)

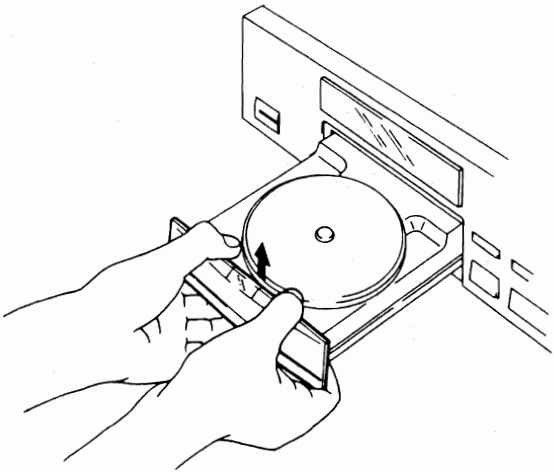


Fig. 1

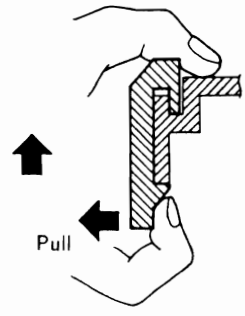


Fig. 2

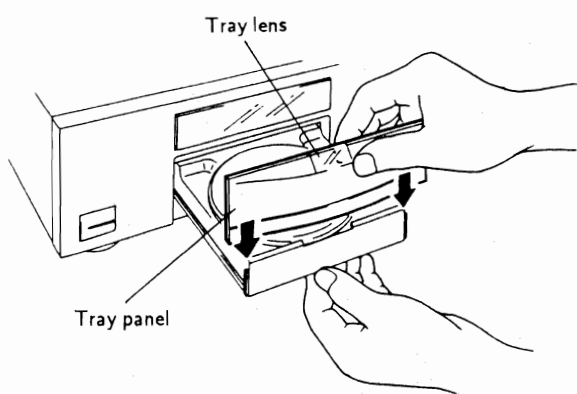


Fig. 3

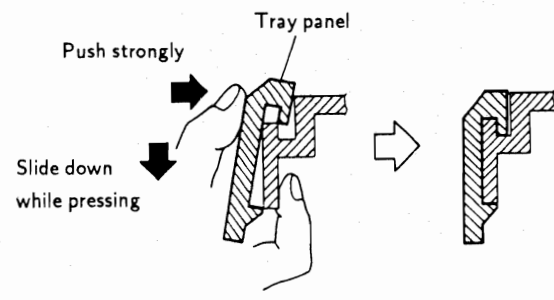
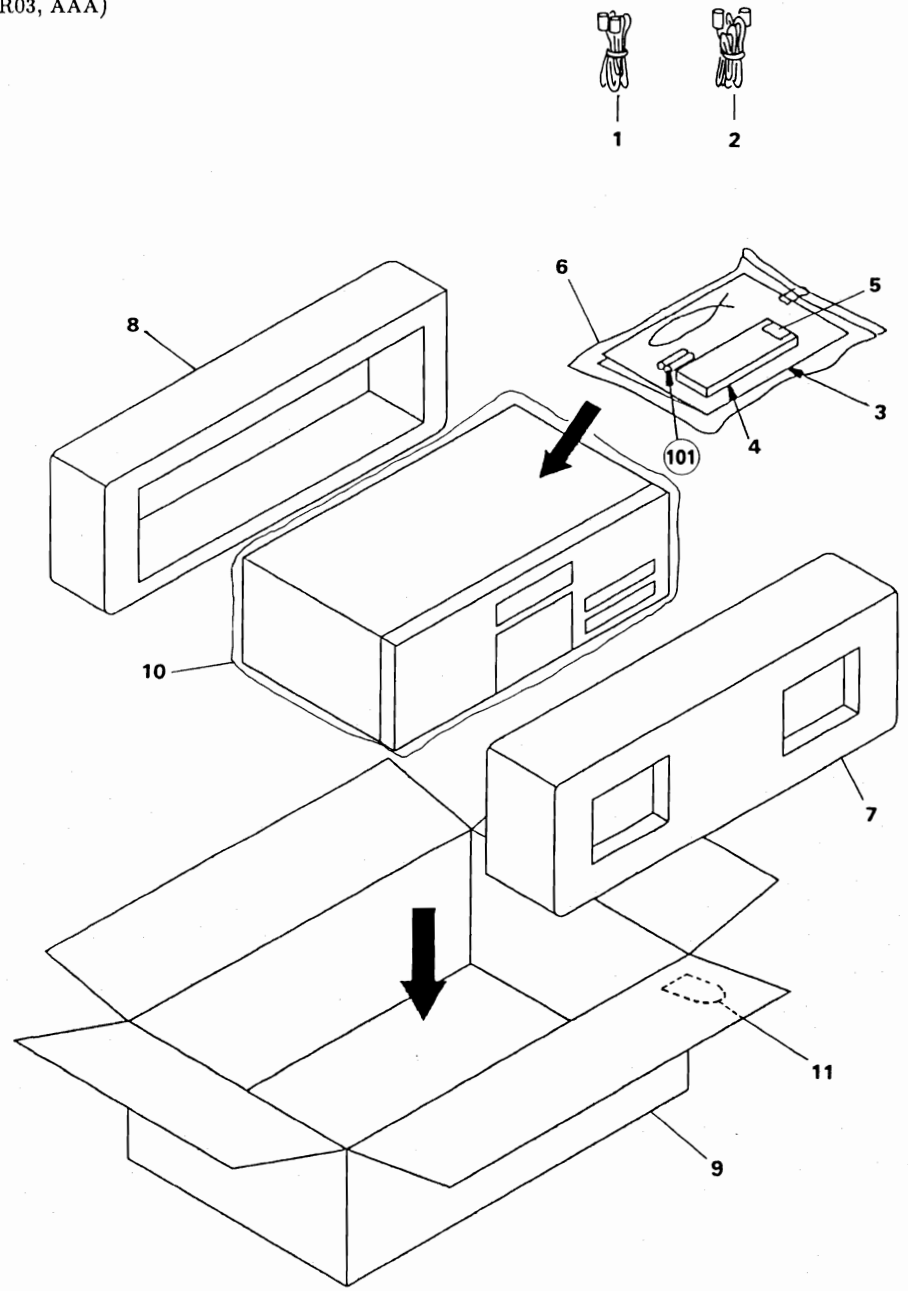
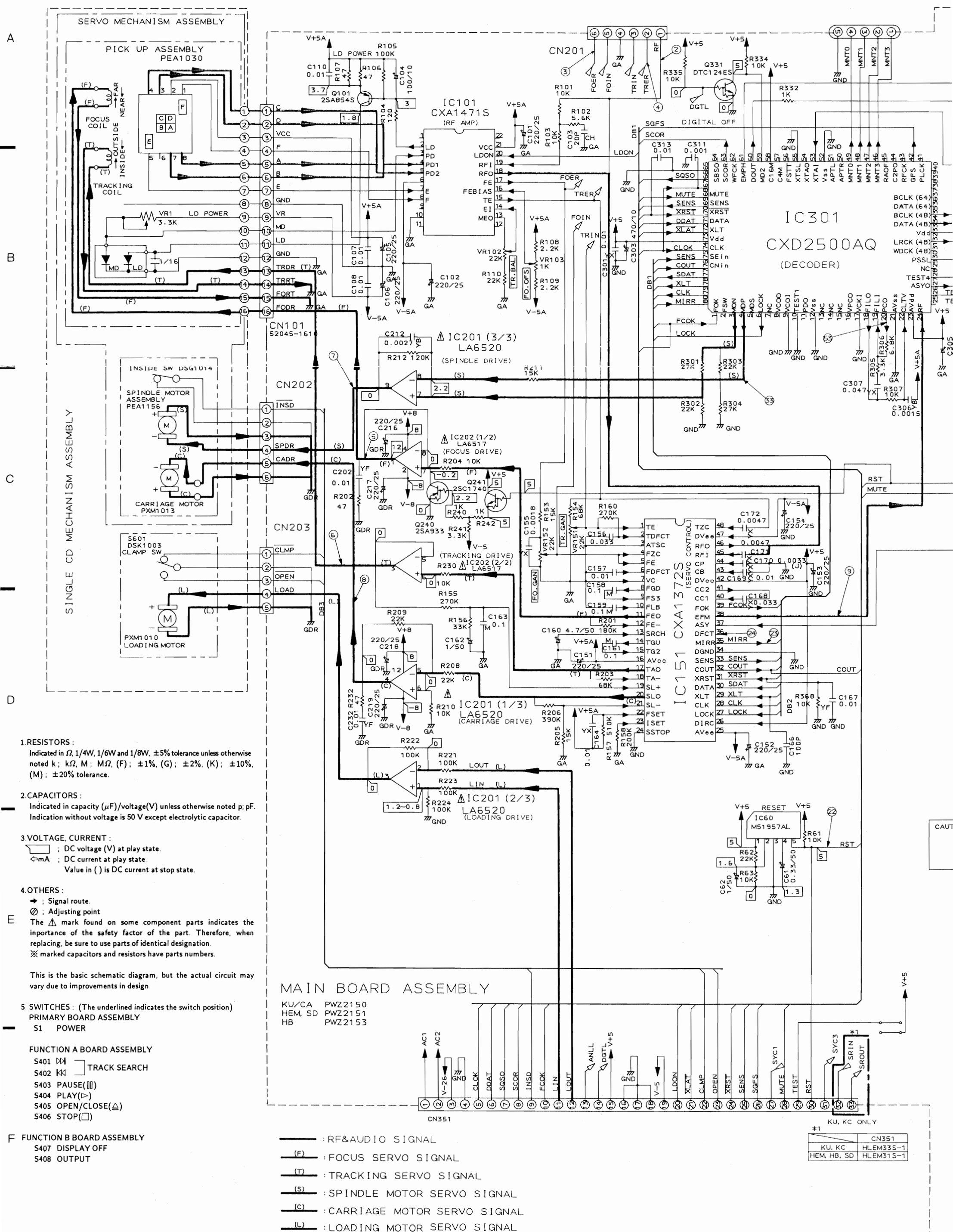


Fig. 5

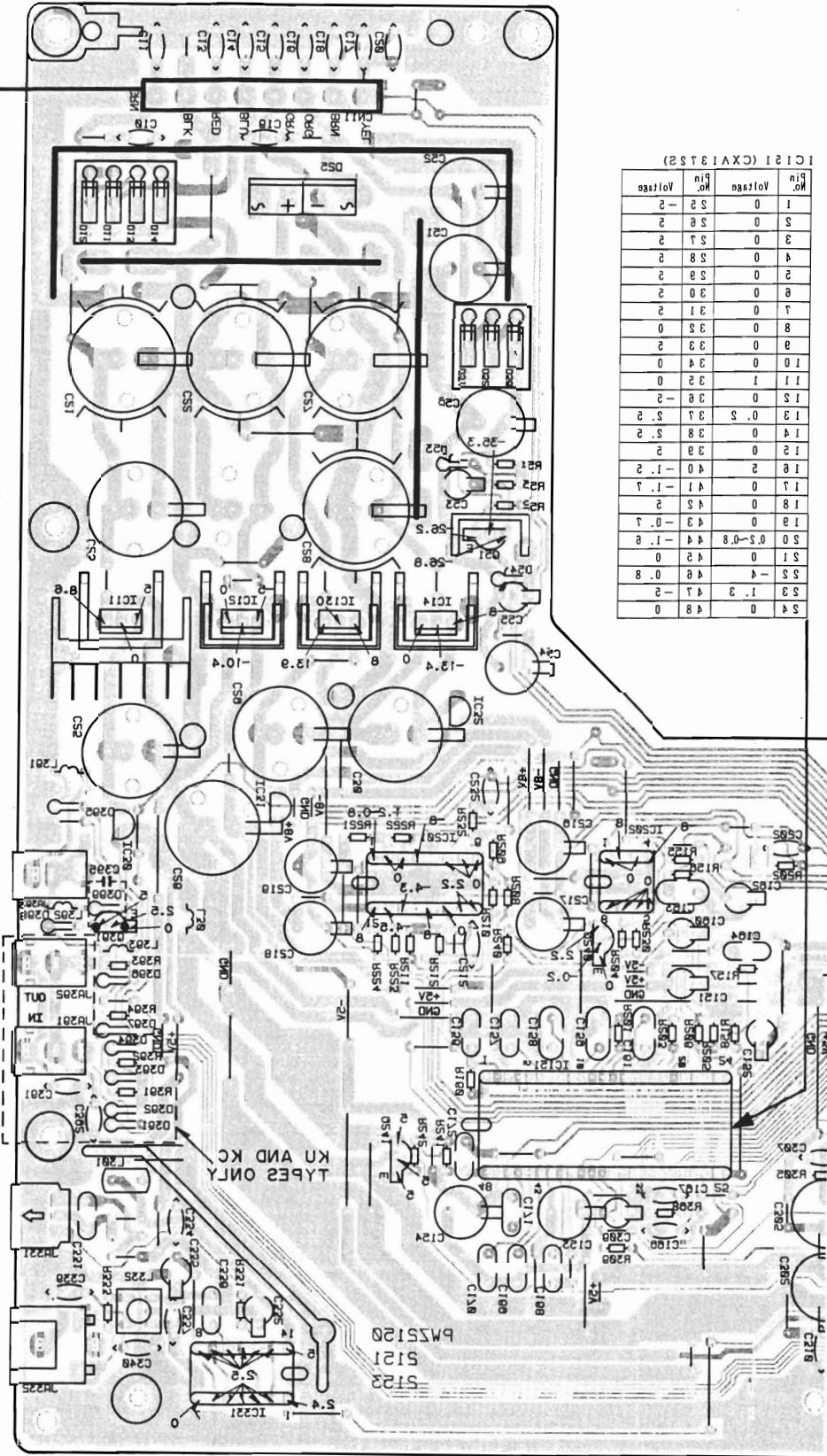


4.1 MAIN BOARD(PWZ 2150), PRIMARY BOARD, FUNCTION A BOARD(PWZ 2168), AND FUNCTION B BOARD ASSEMBLIES





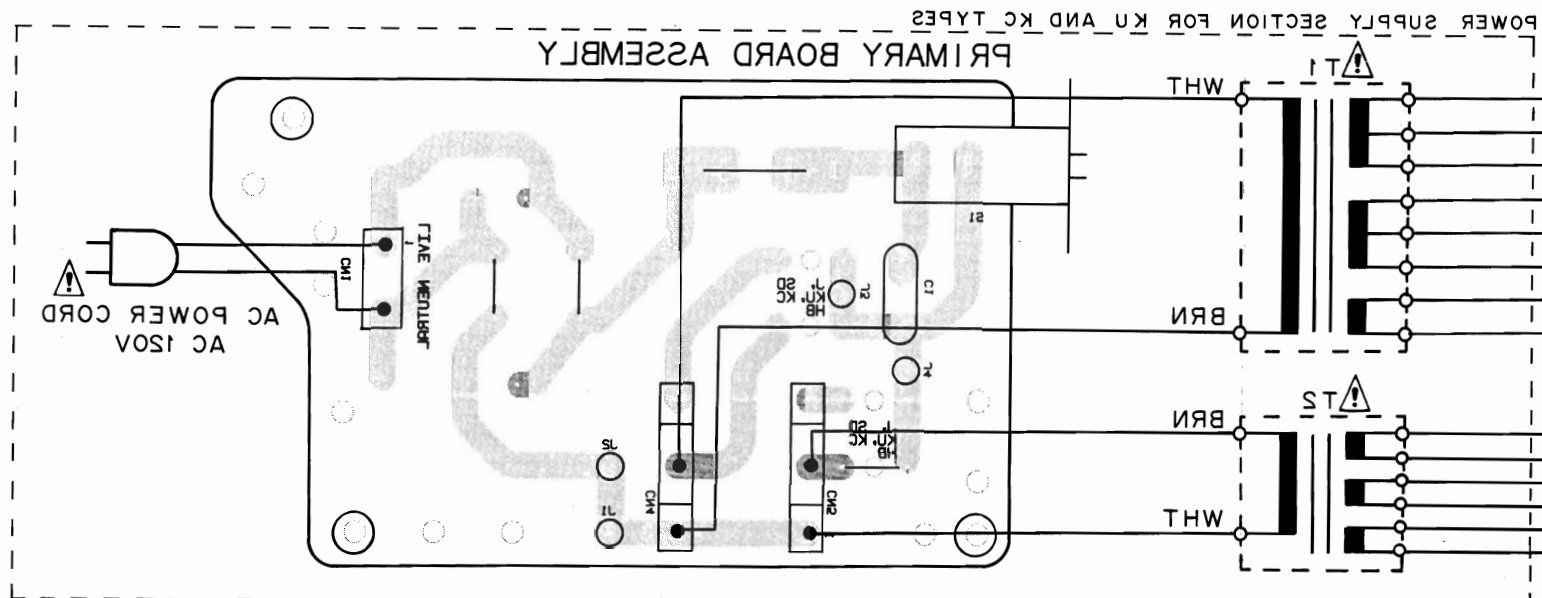
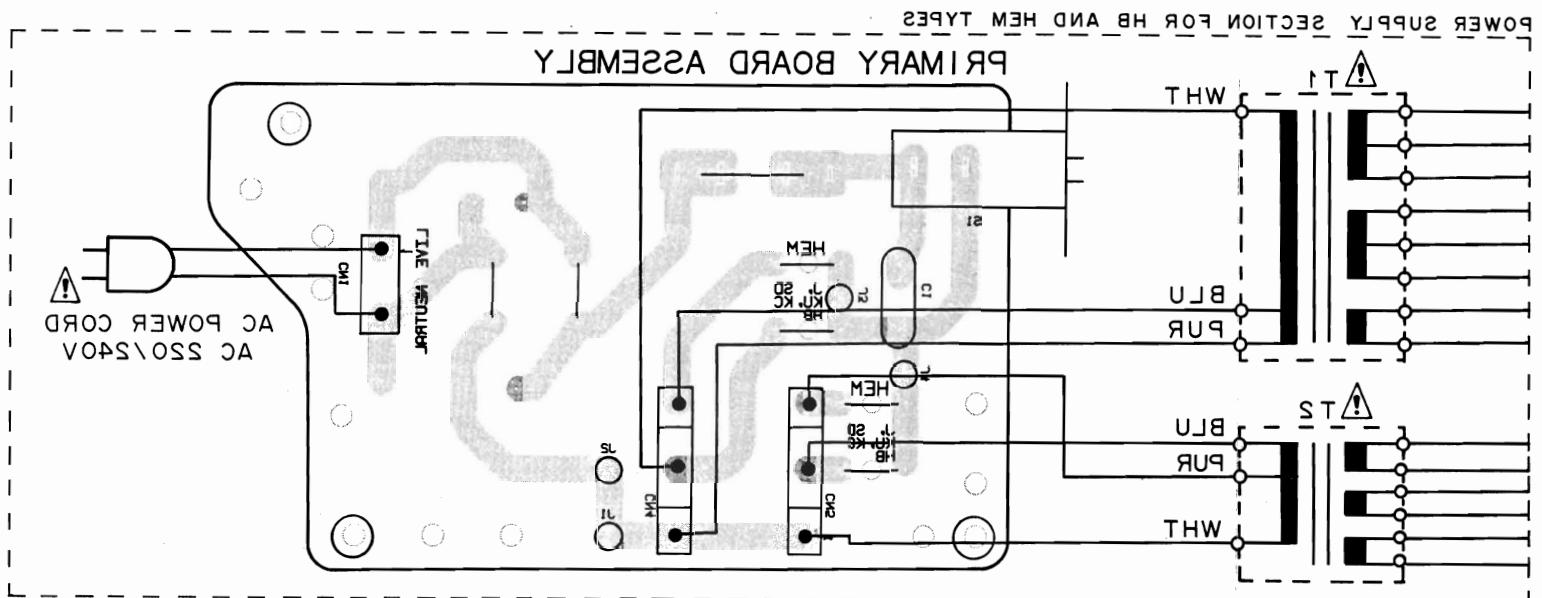
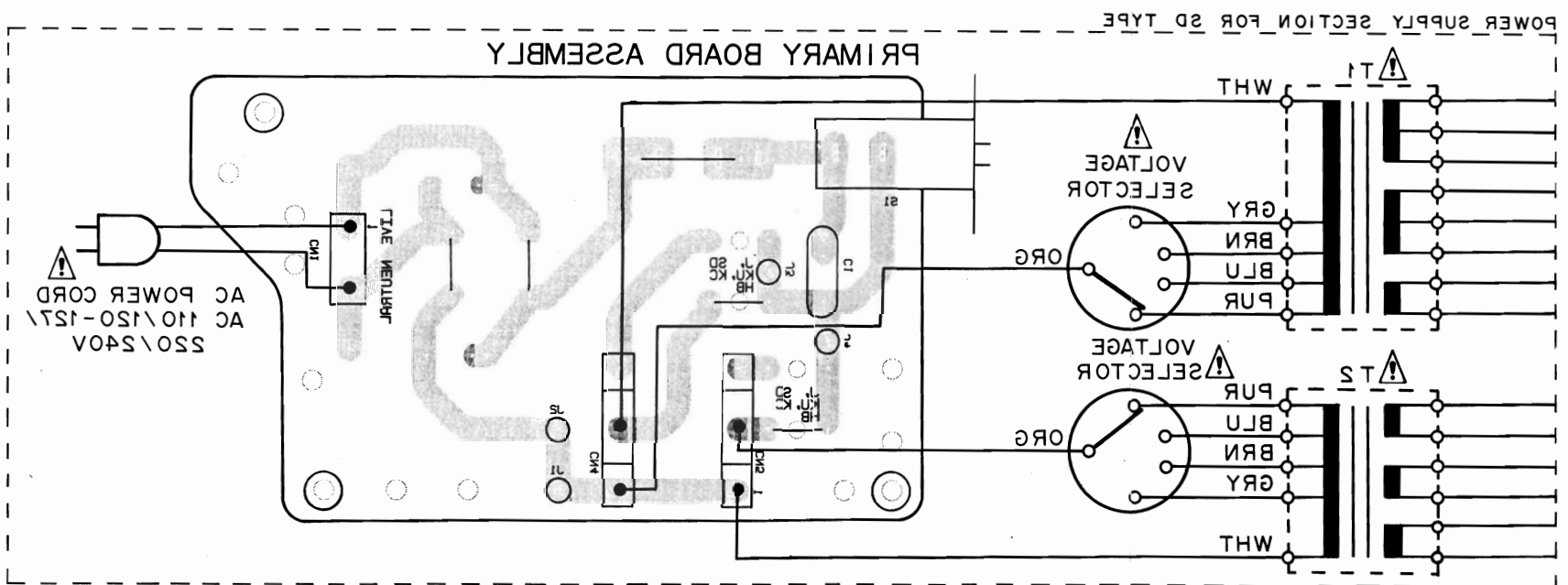
Pin No.	Pin Voltage	Pin Voltage
1	0	2
2	0	2
3	0	2
4	0	2
5	0	2
6	0	2
7	0	2
8	0	2
9	0	2
10	0	2
11	0	2
12	0	2
13	0	2
14	0	2
15	0	2
16	0	2
17	0	2
18	0	2
19	0	2
20	0	2
21	0	2
22	0	2
23	0	2
24	0	2
25	0	2
26	0	2
27	0	2
28	0	2
29	0	2
30	0	2
31	0	2
32	0	2
33	0	2
34	0	2



IC14 IC13 IC15 IC11
Q21 IC35 Q541
IC505 Q540 IC121 IC501
IC31 IC331 IC30

TO
ANALOG
BOARD
ASSEMBLY

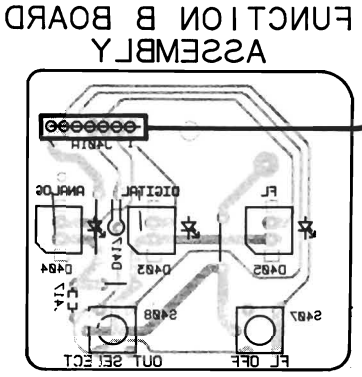
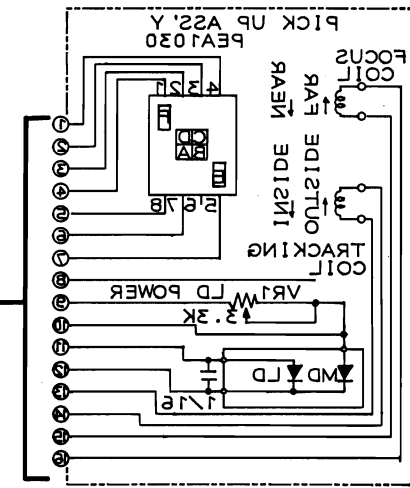
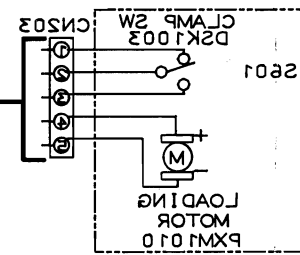
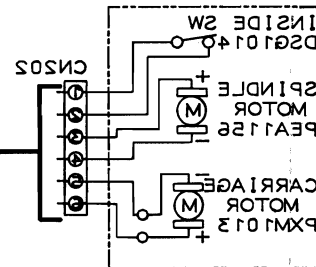
TO ANALOG
BOARD
ASSEMBLY



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

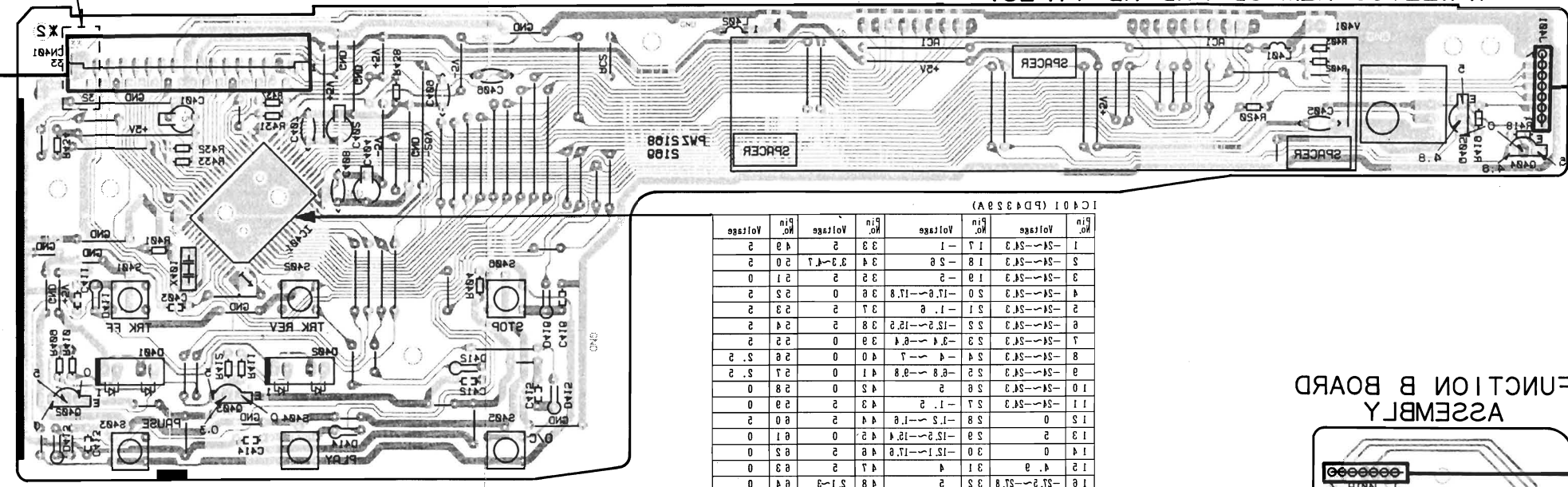
HB'HEM,2D	31pins
KU, KC	33pins
CN381	

KU AND KC TYPES ONLY



FUNCTION B BOARD ASSEMBLY

IC401 (PD438A)	
No.	Pin
1	18
2	17
3	16
4	15
5	14
6	13
7	12
8	11
9	10
10	9
11	8
12	7
13	6
14	5
15	4
16	3
17	2
18	1

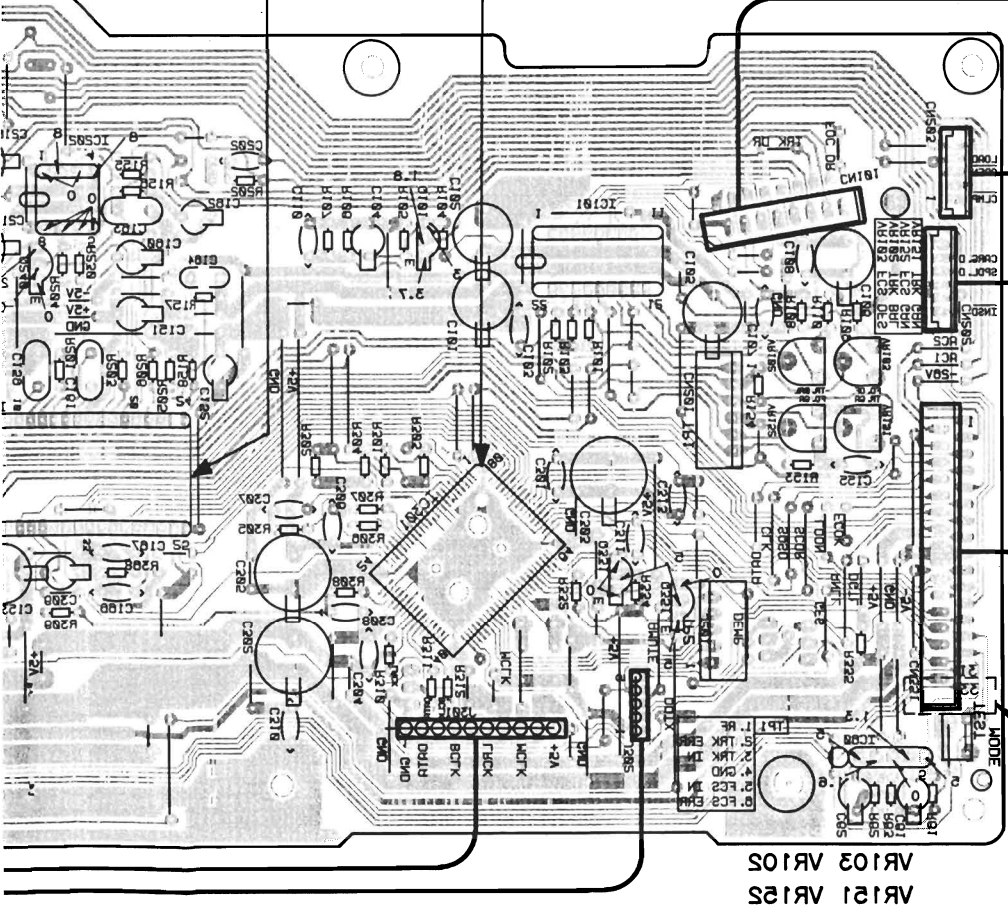


HB'HEM,2D	31pins
KU, KC	33pins
CN401	

KU AND KC TYPES ONLY

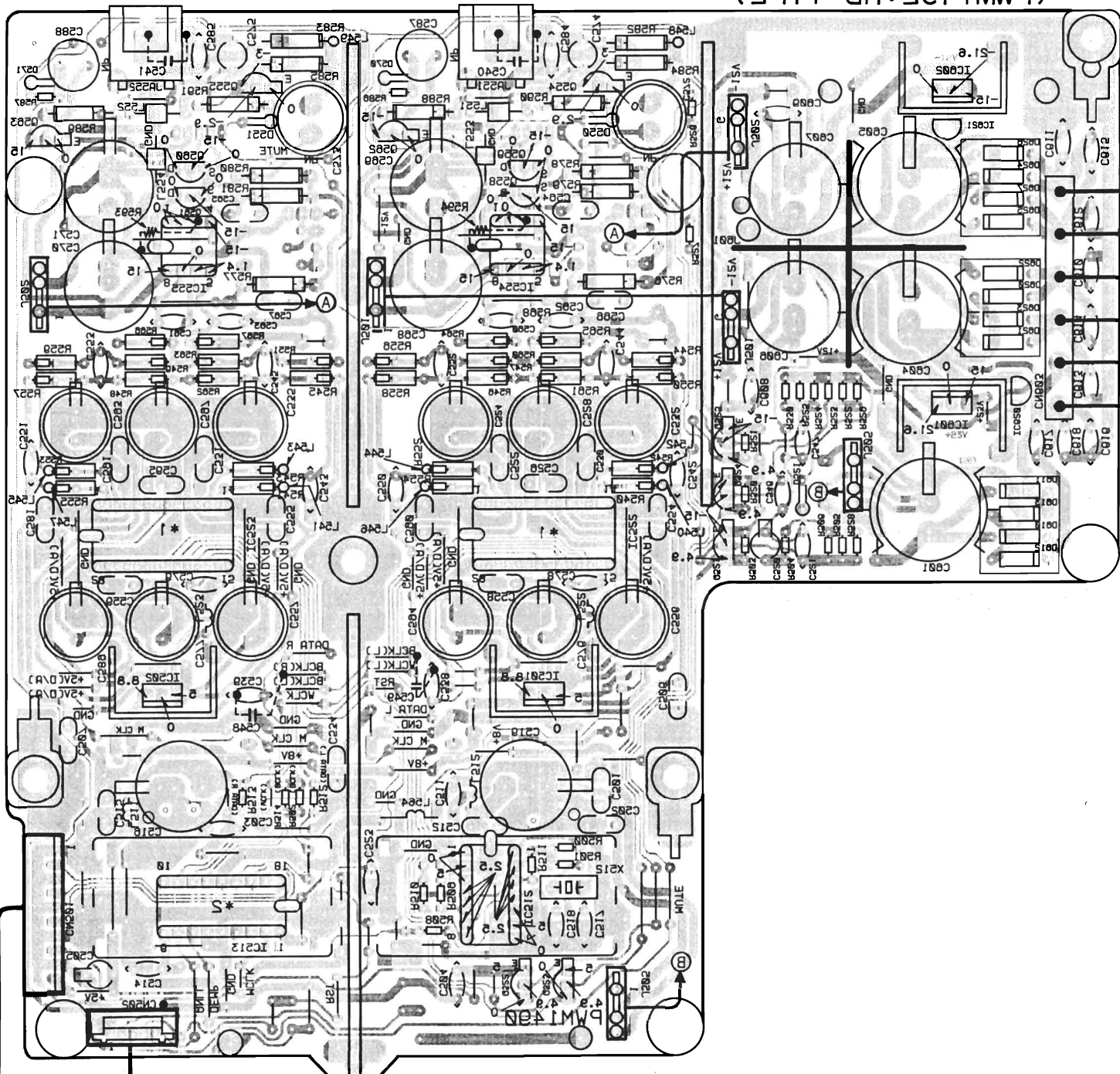
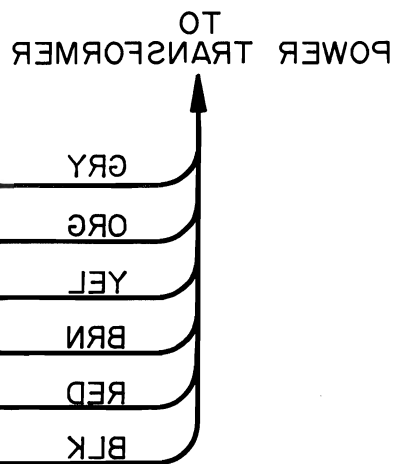
IC301 (CXDS20AD)	
No.	Pin
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
15	15
16	16
17	17
18	18
19	19
20	20
21	21
22	22
23	23
24	24
25	25
26	26
27	27
28	28
29	29
30	30
31	31
32	32
33	33
34	34
35	35
36	36
37	37
38	38
39	39
40	40

IC151 (CXV131S2)	
No.	Pin
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
15	15
16	16
17	17
18	18
19	19
20	20
21	21
22	22
23	23
24	24
25	25
26	26
27	27
28	28
29	29
30	30
31	31
32	32
33	33
34	34
35	35
36	36
37	37
38	38
39	39
40	40



4.3 ANALOG BOARD ASSEMBLY (PWM 1490)

(PWM1495:HB TYPE)
(PWM1490:K.U.K.C.HEM AND 2D TYPE2)
ANALOG BOARD ASSEMBLY



TO MAIN BOARD ASSEMBLY
TO MAIN BOARD ASSEMBLY

- Q253 Q255
- IC213 IC215
- IC201 IC205
- Q251
- IC252 IC253
- Q254
- Q252
- IC201 IC250
- IC254 IC255
- Q258 Q261
- Q259 Q260
- Q265
- IC251 Q263
- Q264
- IC205

*1

Pin	No.	Volts
1	0	2
2	5	1.8
3	5	1.8
4	0	1.8
5	2	1.8
6	2	1.8
7	5	1.8
8	5	1.8
9	0	1.8
10	2	1.8
11	0	1.8
12	5	1.8
13	5	1.8
14	0	1.8

IC253, IC254 (PD5058V)

*5

Pin	No.	Volts
1	2	2
2	5	1.8
3	5	1.8
4	5	1.8
5	0	1.8
6	0	1.8
7	0	1.8
8	0	1.8
9	0	1.8
10	3	1.8
11	3	1.8
12	3	1.8
13	3	1.8
14	2	1.8
15	1	1.8
16	5	1.8
17	5	1.8
18	0	1.8

IC213 (2M2840CP)

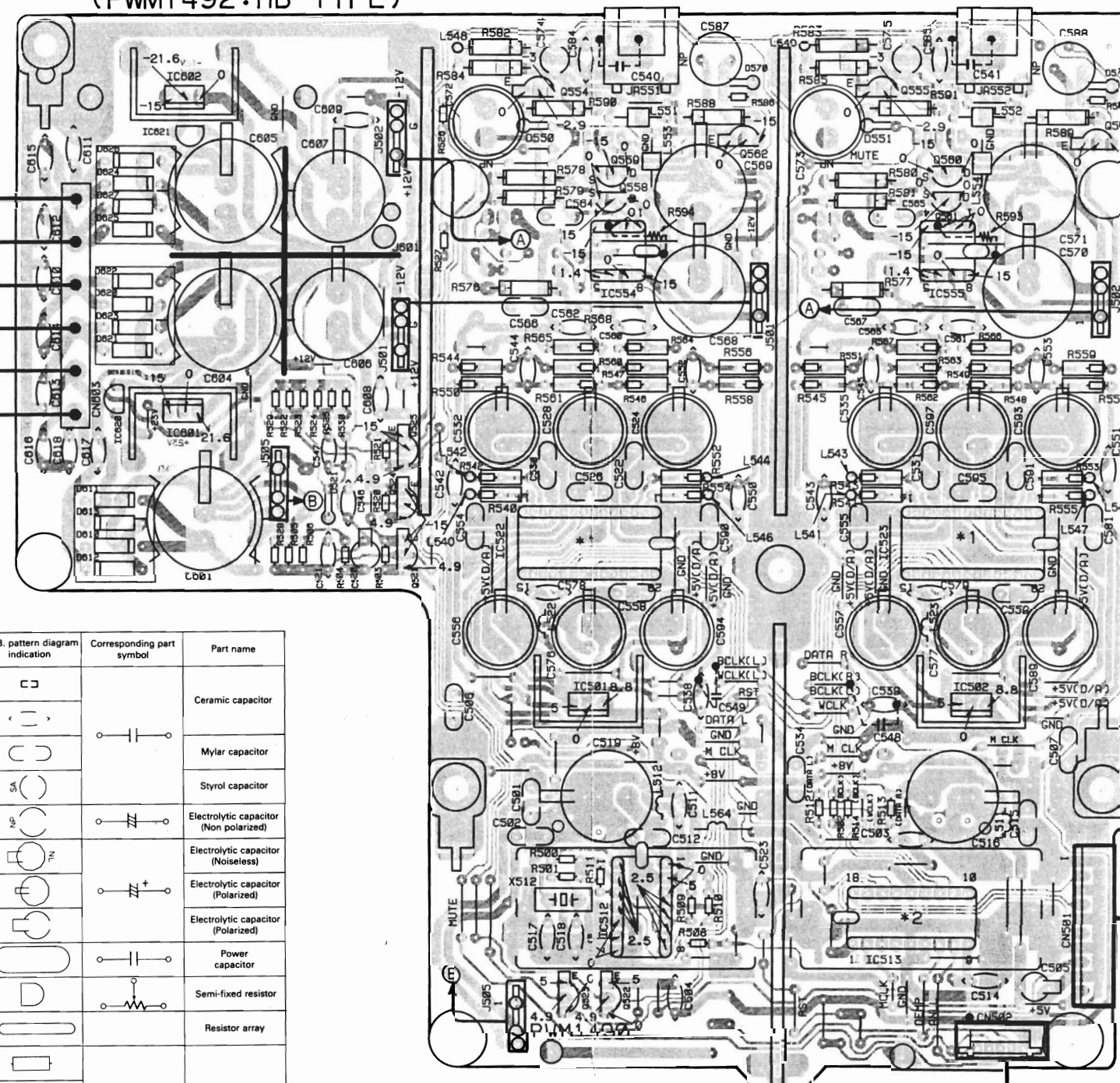
This P.C.B. connection diagram is viewed from the foil side.

4.2 ANALOG BOARD ASSEMBLY(PWM 1490)

ANALOG BOARD ASSEMBLY (PWM1490:KU,KC,HEM AND SD TYPES) (PWM1492:HB TYPE)

TO
POWER TRANSFORMER

GRY
ORG
YEL
BRN
RED
BLK



TO MAIN BOARD
ASSEMBLY

TO MAIN BOARD
ASSEMBLY

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

IC602
Q554 Q555
IC621 Q563
Q562
Q559 Q560
Q558 Q561

IC554 IC555

IC620
IC601
Q525

Q524
IC522 IC523
Q521

IC501 IC502

IC512
IC513

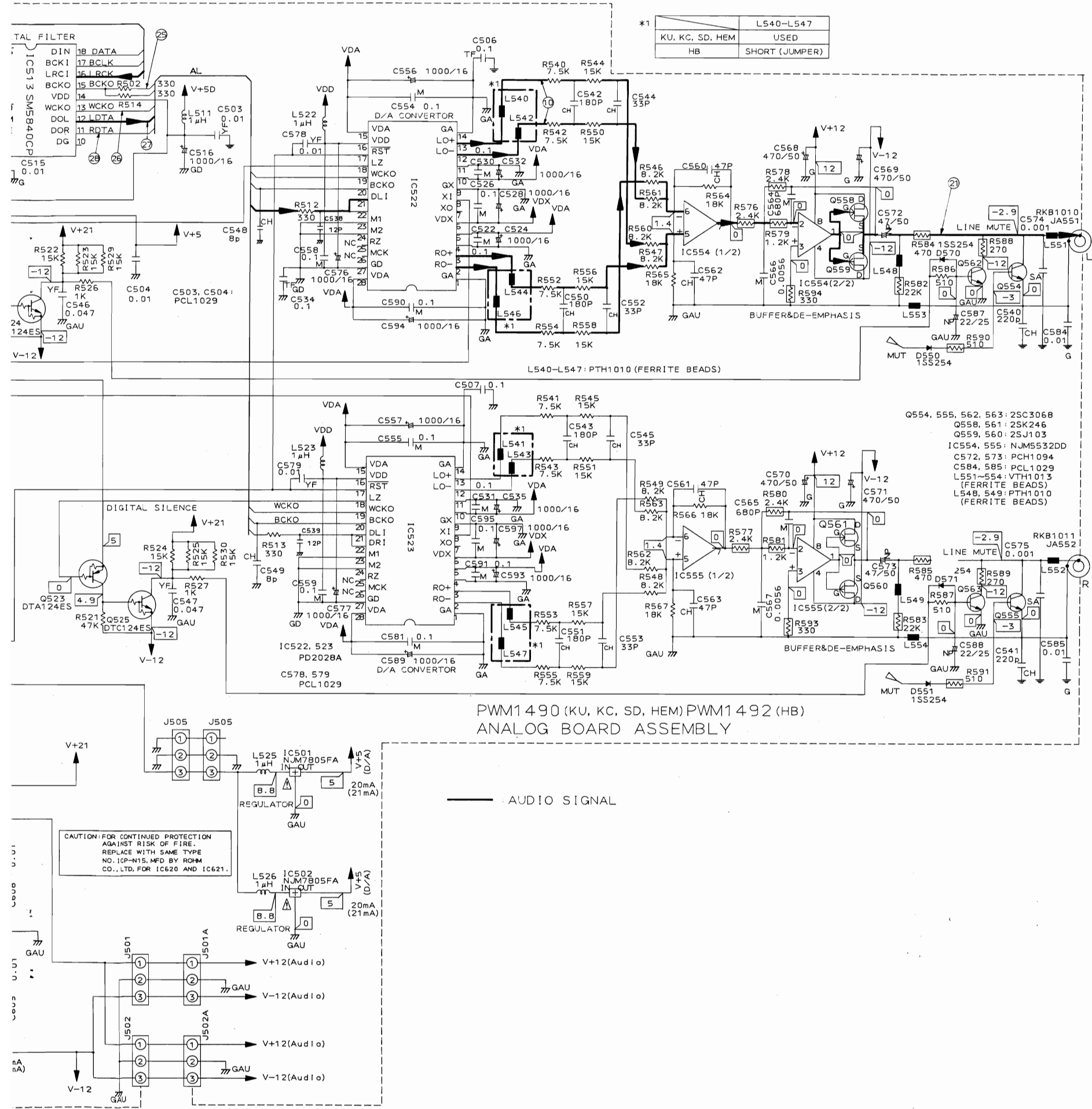
Q523 Q522

*1
IC522, IC523 (PD2028A)

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

*2
IC513 (SM5840CP)

Pin No.	Voltage
1	5
2	2.5
3	2.6
4	2.4
5	0
6	0
7	0
8	0
9	4
10	3
11	3.6
12	3.2
13	3.6
14	5
15	1.4
16	2.5
17	2.4
18	0



A

B

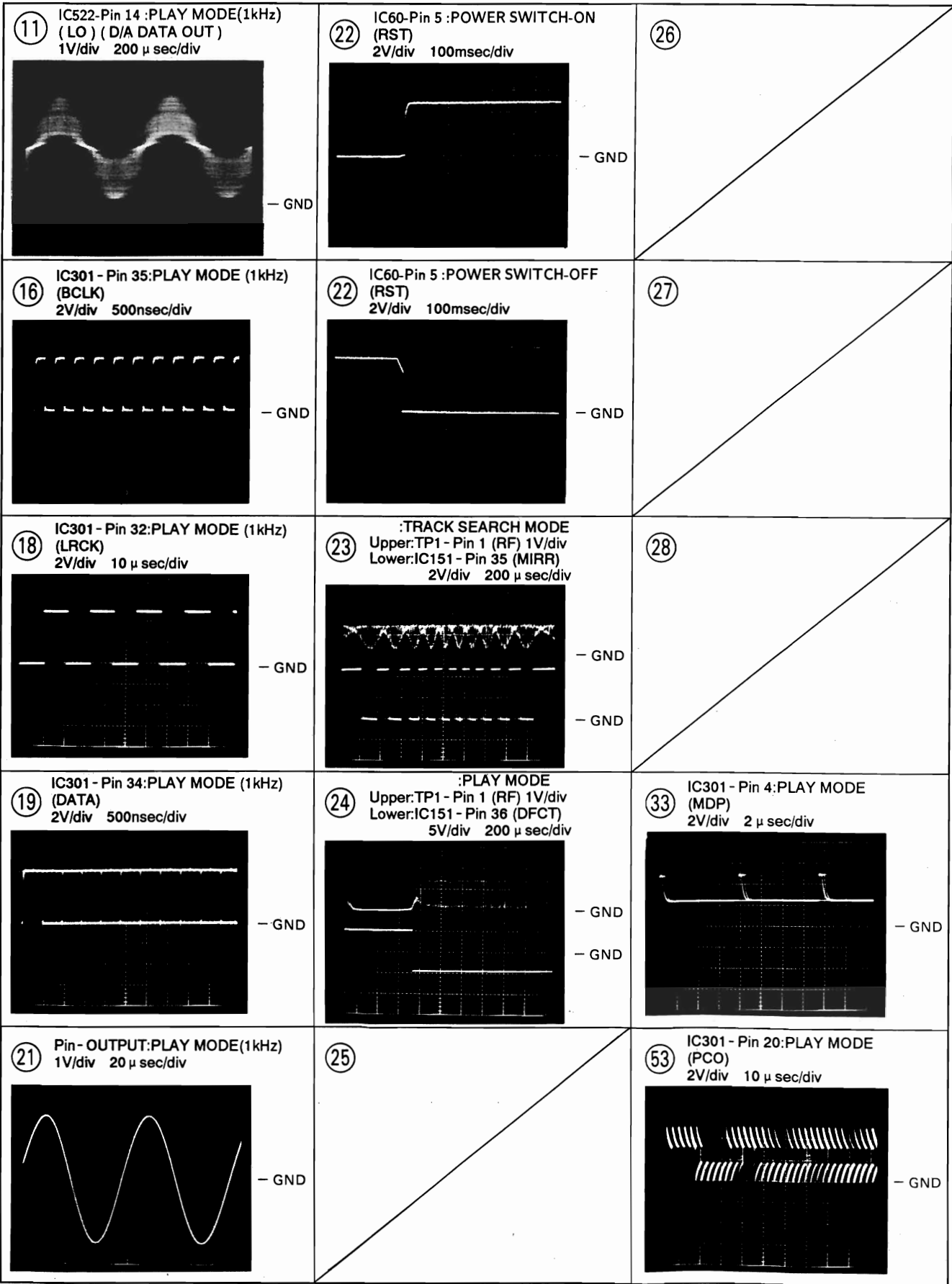
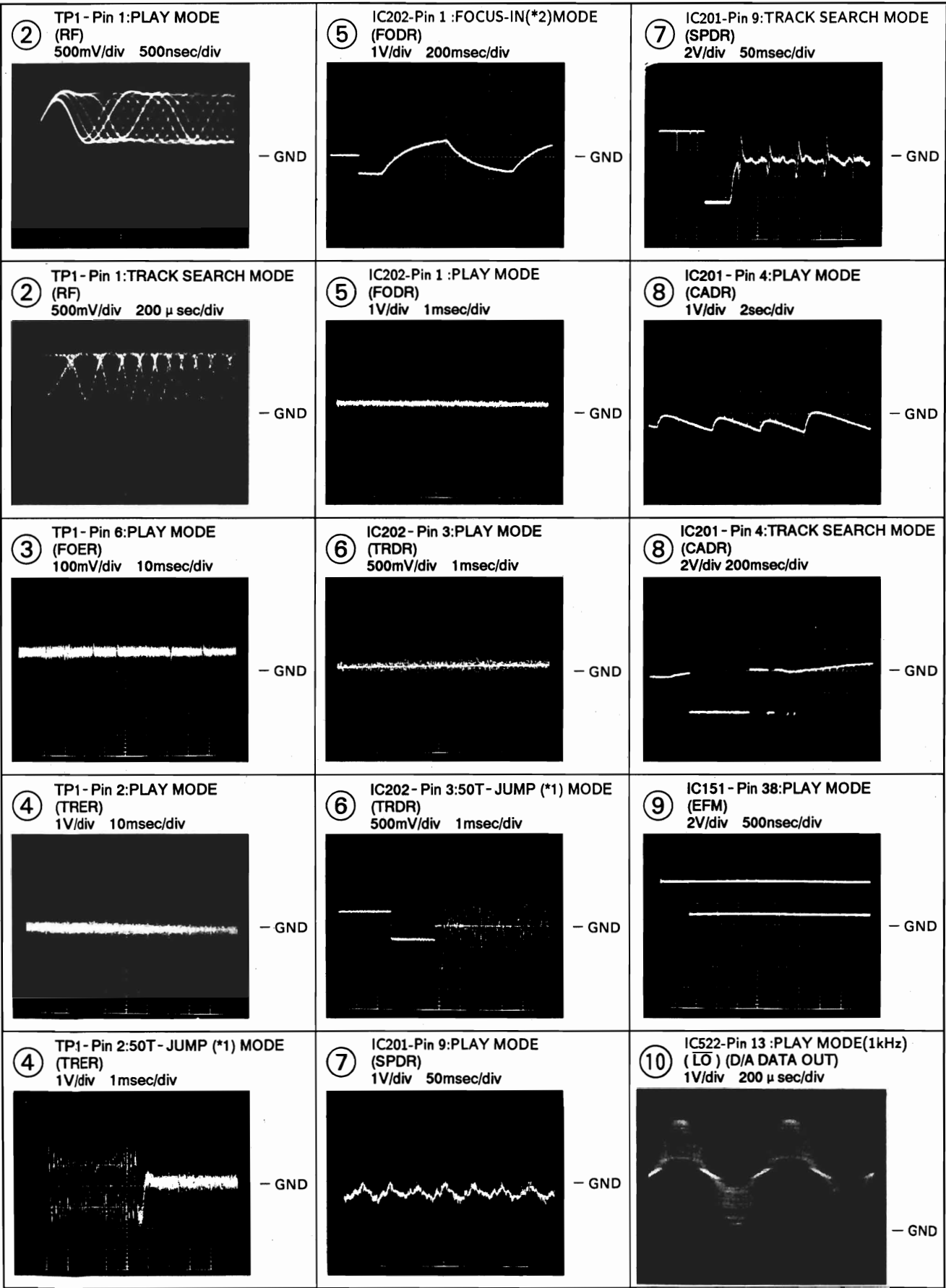
C

D

4.3 WAVEFORMS

Note:The encircled numbers denote measuring 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.



5. P.

NOTES :
• Parts :
• Parts :
unava
• The Δ
There
• When
Ex.1

Ex.2

Mark No.

●ANALO

SEMICON

△ IC501
△ IC512
△ IC513
△ IC522
△ IC554

△ IC601
△ IC602
△ IC620

Q521
Q522,
Q524,
Q554,
Q558

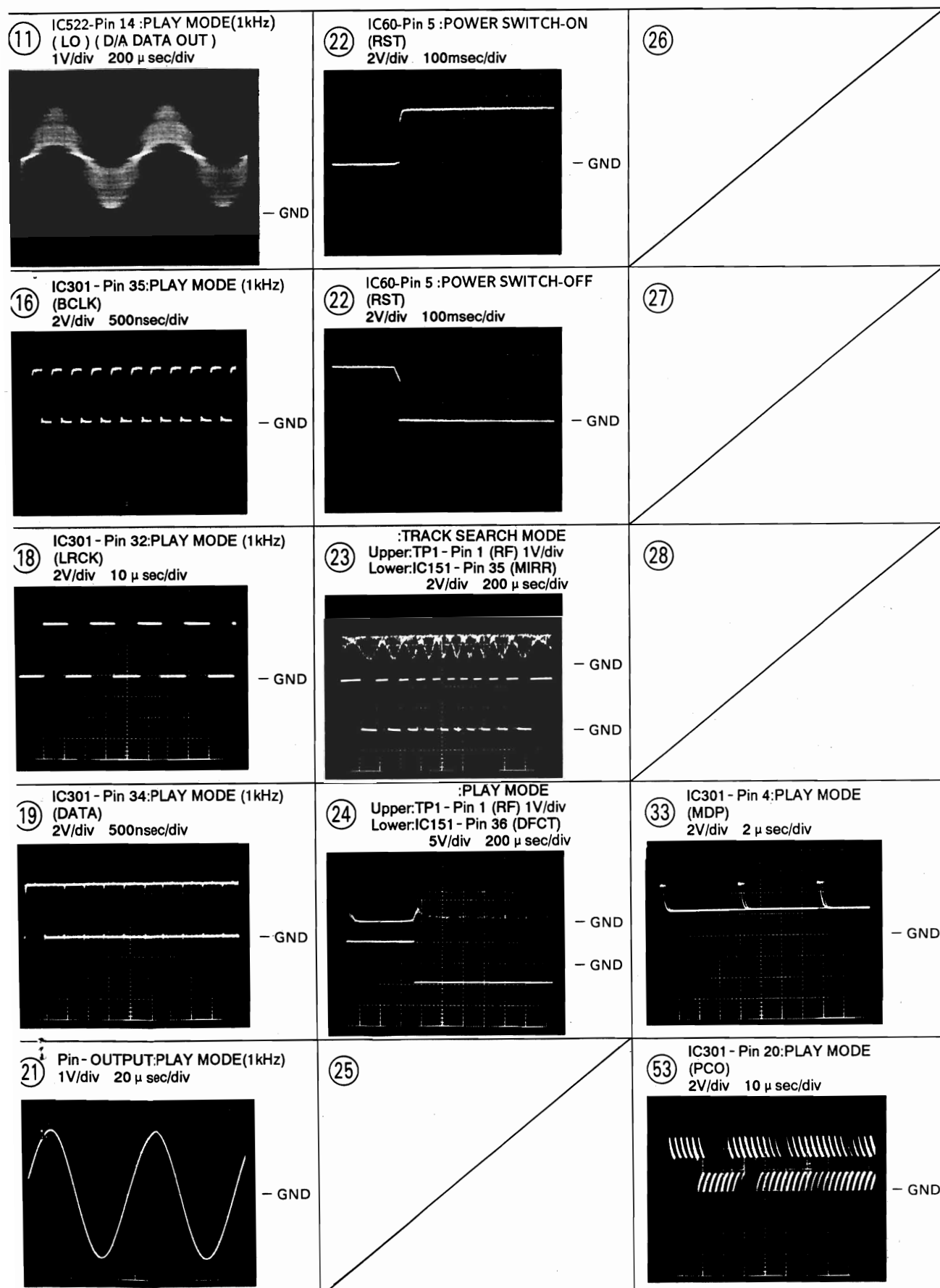
Q559,
Q561
Q562,

D521
D550,
D570,
D610-
D620-]

COILS AN

L511,I
L522,I
L525,I
L540-I
L551-I

L564



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

NOTES:

- Parts without part number cannot be supplied.
- Parts marked by "●" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- The 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.
- When ordering resistors, first convert resistance values into code form as shown in the following examples.

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

560Ω 56 × 10¹ 561 RD1/4PS561J

47kΩ 47 × 10³ 473 RD1/4PS473J

0.5Ω 0R5 RD2H0R5K

1Ω 010 RD1P010K

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

5.62kΩ 562 × 10¹ 5621 RD1/4SR5621F

Mark	No.	Description	Parts No.	Mark	No.	Description	Parts No.
●ANALOG BOARD ASSEMBLY (PWM1490)				CAPACITORS			
SEMICONDUCTORS							
Δ	IC501,IC502	REGULATOR IC	NJM7805FA	C501,C502	AUDIO FILM CAPACITOR	CFTXA104J50	
	IC512	LOGIC IC	TC74HCU04AP	C503,C504	CERAMIC CAPACITOR	PCL1029	
	IC513	DIGITAL FILTER,IC	SM5840CP	C505	ELECTR.CAPACITOR	CEAS101M25	
	IC522,IC523	D/A CONVERTER,IC	PD2028A	C506,C507	AUDIO FILM CAPACITOR	CFTXA104J50	
	IC554,IC555	OP-AMP IC	NJM5532DD	C511	CERAMIC CAPACITOR	PCL1029	
Δ	IC601	REGULATOR IC	NJM7812FA	C512	AUDIO FILM CAPACITOR	CFTXA103J50	
Δ	IC602	REGULATOR IC	NJM7912FA	C514	CERAMIC CAPACITOR	CGCYF473Z25	
Δ	IC620,IC621	IC PROTECTOR	ICP-N15	C515	AUDIO FILM CAPACITOR	CFTXA103J50	
	Q521	TRANSISTOR	DTC124ES	C516	ELECTR.CAPACITOR	CEAS102M16	
	Q522,Q523	TRANSISTOR	DTA124ES	C517,C518	CERAMIC CAPACITOR	CCCCH120J50	
	Q524,Q525	TRANSISTOR	DTC124ES	C519	ELECTR.CAPACITOR	CEAS102M16	
	Q554,Q555	TRANSISTOR	2SC3068	C520	ELECTR.CAPACITOR	CEAS470M50	
	Q558	TRANSISTOR	2SK246	C521	MYLOR FILM CAPACITOR	CQMA473J50	
	Q559,Q560	FET	2SJ103	C522	MYLOR FILM CAPACITOR	CQMA104J50	
	Q561	TRANSISTOR	2SK246	C523	CERAMIC CAPACITOR	PCL1029	
	Q562,Q563	TRANSISTOR	2SC3068	C524	ELECTR.CAPACITOR	CEAS102M16	
	D521	DIODE	1SS254	C526	MYLOR FILM CAPACITOR	CQMA104J50	
	D550,D551	DIODE	1SS254	C528	ELECTR.CAPACITOR	CEAS102M16	
	D570,D571	DIODE	1SS254	C530,C531	MYLOR FILM CAPACITOR	CQMA104J50	
	D610-D613	DIODE	10DF2	C532	ELECTR.CAPACITOR	CEAS102M16	
	D620-D627	DIODE	10DF2	C534	AUDIO FILM CAPACITOR	CFTXA104J50	
COILS AND FILTERS				C535	ELECTR.CAPACITOR	CEAS102M16	
	L511,L512	AXIAL INDUCTOR	LAU010K	C538,C539	CERAMIC CAPACITOR	CCCCH120J50	
	L522,L523	AXIAL INDUCTOR	LAU010K	C540,C541	CERAMIC CAPACITOR	CCDCH221J50	
	L525,L526	AXIAL INDUCTOR	LAU010K	C542,C543	CERAMIC CAPACITOR	CCCCH181J50	
	L540-L549	FERRITE BEADS	PTH1010	C544,C545	CERAMIC CAPACITOR	CCCCH330J50	
	L551-L554	FERRITE BEADS	VTH1013	C546,C547	CERAMIC CAPACITOR	CGCYF473Z25	
	L564		PTH1006	C548,C549	CERAMIC CAPACITOR	CCDCH080D50	
				C550,C551	CERAMIC CAPACITOR	CCCCH181J50	
				C552,C553	CERAMIC CAPACITOR	CCCCH330J50	
				C554,C555	MYLOR FILM CAPACITOR	CQMA104J50	
				C556,C557	ELECTR.CAPACITOR	CEAS102M16	
				C558,C559	MYLOR FILM CAPACITOR	CQMA104J50	
				C560-C563	CERAMIC CAPACITOR	CCCCH470J50	
				C564,C565	MYLOR FILM CAPACITOR	CQMA681J50	

Mark	No.	Description	Parts No.	Mark	No.	Description	Parts No.
		C566,C567 MYLOR FILM CAPACITOR	CQMA562J50			Q351 TRANSISTOR	DTA124ES
		C568-C571 ELECTR.CAPACITOR	CEAS471M50			Q391 TRANSISTOR	DTC124ES
		C572,C573 ELECTROLYTIC CAPACIT	PCH1094	△		D11-D14 DIODE	11ES2
		C574,C575 PL.STYRENE CAPACITOR	CQSA102J50	△		D25	RB-152LF
		C576,C577 ELECTR.CAPACITOR	CEAS102M16	△		D51,D52 DIODE	11ES2
		C578,C579 CERAMIC CAPACITOR	PCL1029	△		D53 ZENER DIODE	MTZ27C
		C581 MYLOR FILM CAPACITOR	CQMA104J50	△		D54 ZENER DIODE	MTZJ20A
		C584,C585 CERAMIC CAPACITOR	PCL1029	△		D56 DIODE	11ES2
		C587,C588 ELECTR.CAPACITOR	CEANP220M25			D391-D399 DIODE	1SS254
		C589 ELECTR.CAPACITOR	CEAS102M16				
		C590,C591 MYLOR FILM CAPACITOR	CQMA104J50				
		C593,C594 ELECTR.CAPACITOR	CEAS102M16				
		C595 MYLOR FILM CAPACITOR	CQMA104J50				
		C597 ELECTR.CAPACITOR	CEAS102M16				
		C601 ELECTROLYTIC CAPACIT	CENA102M35				
		C604,C605 ELECTR. CAPACITOR	PCH1102				
		C606,C607 ELECTROLYTIC CAPACIT	CENA102M35				
		C608-C618 CERAMIC CAPACITOR	PCL1029				
RESISTORS				COILS AND FILTERS			
		R540-R567 CARBON FILM RESISTOR	RD1/4PM□□□J			L30 AXIAL INDUCTOR	LAU010K
		R576-R581 CARBON FILM RESISTOR	RDR1/4PM□□□J			L301 RADIAL INDUCTOR	LRA010K
		R582-R585 CARBON FILM RESISTOR	RDR1/2PM□□□J			L332 COIL	PTL1003
		R588,R589 CARBON FILM RESISTOR	RDR1/2PM271J			L391,L392 AXIAL COIL	LAUR22K
		R590,R591 CARBON FILM RESISTOR	RDR1/4PM511J			L393 AXIAL INDUCTOR	LAU010K
		R593,R594 CARBON FILM RESISTOR	RDR1/4PM331J				
		Other resistors	RD1/6PM□□□J				
OTHERS				CAPACITORS			
		CN501 CONNECTOR(10P)	KPC10			C10,C11 CERAMIC CAPACITOR	PCL1029
		JA551 1P PIN JACK(W)	RKB1010			C13-C20 CERAMIC CAPACITOR	PCL1029
		JA552 1P PIN JACK (R)	RKB1011			C21,C22 ELECTR.CAPACITOR	CEAS222M25
		X512 XTAL RES (OSC)	PSS1011			C23 ELECTR.CAPACITOR	CEAS102M25
		SCREW	BBZ30P080FCC			C25,C26 ELECTR.CAPACITOR	CEAS222M16
●MAIN BOARD ASSEMBLY (PWZ2150)						C27,C28 ELECTR.CAPACITOR	CEAS222M25
SEMICONDUCTORS						C29,C30 ELECTR.CAPACITOR	CEAS102M16
△		IC11 REGULATOR IC	NJM7805FA			C51 ELECTR.CAPACITOR	CEAS101M50
		IC12 REGULATOR IC	NJM7905FA			C52 ELECTR.CAPACITOR	CEAS221M50
△		IC13 REGULATOR IC	NJM7808FA			C53 ELECTR.CAPACITOR	CEAS100M50
△		IC14 REGULATOR IC	NJM7908FA			C54 ELECTR.CAPACITOR	CEAS470M50
△		IC30-IC32 IC PROTECTOR	ICP-N10			C55 ELECTROLYTIC CAPACIT	CEAS330M35
		IC60 SYSTEM RESET IC	M51957AL			C56 ELECTR.CAPACITOR	CEAS101M50
		IC101 PRE AMP IC	CXA1471S			C61 ELECTR.CAPACITOR	CEASR33M50
		IC151 SERVO IC	CXA1372S			C62 ELECTR.CAPACITOR	CEAS010M50
△		IC201 POWER OP-AMP,IC	LA6520			C101,C102 ELECTR.CAPACITOR	CEAS221M25
△		IC202 POWER OP-AMP,IC	LA6517			C103 CERAMIC CAPACITOR	CCCCH200J50
		IC301 EFM DEMODULATION IC	CXD2500AQ			C104 ELECTR.CAPACITOR	CEAS101M10
		IC331 IC	MC74HCU04N			C105,C106 ELECTR.CAPACITOR	CEAS221M25
		Q51 TRANSISTOR	2SB1187			C107,C108 CERAMIC CAPACITOR	CGCYX103K25
		Q101 TRANSISTOR	2SA854S			C110 CERAMIC CAPACITOR	CKCYF103Z50
		Q240 TRANSISTOR	2SA933S			C151-C154 ELECTR.CAPACITOR	CEAS221M25
		Q241 TRANSISTOR	2SC1740S			C155 CERAMIC CAPACITOR	CKCYB182K50
		Q331 TRANSISTOR	DTC124ES			C156 CERAMIC CAPACITOR	CGCYX333K25
						C157 CERAMIC CAPACITOR	CGCYX103K25
						C158,C159 MYLOR FILM CAPACITOR	CQMA104K50
						C160 ELECTR.CAPACITOR	CEAS4R7M50
						C161 MYLOR FILM CAPACITOR	CQMA104K50
						C162 ELECTR.CAPACITOR	CEAS010M50
						C163 MYLOR FILM CAPACITOR	CQMA104K50
						C164 CERAMIC CAPACITOR	CGCYX103K25
						C166 CERAMIC CAPACITOR	CCCSL101J50
						C167 CERAMIC CAPACITOR	CKCYF103Z50
						C168 CERAMIC CAPACITOR	CGCYX333K25
						C169 CERAMIC CAPACITOR	CGCYX103K25

Mark	No.	Description	Parts No.
	C170	CERAMIC CAPACITOR	CKCYB332K50
	C171,C172	CERAMIC CAPACITOR	CKCYB472K50
	C202	CERAMIC CAPACITOR	CKCYF103Z50
	C212	CERAMIC CAPACITOR	CKCYB272K50
	C216-C219	ELECTR.CAPACITOR	CEAS221M25
	C232	CERAMIC CAPACITOR	CKCYF103Z50
	C301	CERAMIC CAPACITOR	CGCYX103K25
	C302,C303	ELECTR.CAPACITOR	CEAS471M10
	C304	CERAMIC CAPACITOR	CGCYX103K25
	C305	ELECTR.CAPACITOR	CEAS471M10
	C306	CERAMIC CAPACITOR	CKCYB152K50
	C307	CERAMIC CAPACITOR	CGCYX473K25
	C308	CERAMIC CAPACITOR	CGCYX103K25
	C309	ELECTR.CAPACITOR	CEAS47M50
	C310	CERAMIC CAPACITOR	CKCYF103Z50
	C311	CERAMIC CAPACITOR	CKCYB102K50
	C313	CERAMIC CAPACITOR	CKCYF103Z50
	C331	CERAMIC CAPACITOR	CGCYX473K25
	C332	ELECTR.CAPACITOR	CEAS101M25
	C334	CERAMIC CAPACITOR	CGCYX103K25
	C335	ELECTR.CAPACITOR	CEAS470M25
	C336	AUDIO FILM CAPACITOR	CFTXA103J50
	C337	CERAMIC CAPACITOR	CCCSL471J50
	C339,C340	CERAMIC CAPACITOR	CGCYX103K25
	C391	CERAMIC CAPACITOR	CGCYX103K25
	C392	CERAMIC CAPACITOR	CCCSL101J50
	C395	CERAMIC CAPACITOR	CCDSL100D50

RESISTORS

VR102	VR	VRTB6VS223
VR103	VR	VRTB6VS102
VR151	VR	VRTB6VS223
VR152	VR	VRTB6VS223
Other resistors		RD1/6PM□□□J

OTHERS

CN101	CONNECTOR	52045-1610
CN351	CONNECTOR	HLEM33S
JA331	OPTICAL OUTPUT JACK	TOTX178
JA332	JACK	PKB1004
JA391,JA392	JACK	RKN1004
JA393	JACK	RKN1014

PRIMARY BOARD ASSEMBLY**SWITCHES**

△	S1 SWITCH (POWER)	PSA-009
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CAPACITORS

△	C1 CAPACITOR (CERAMIC)	VCG-048
---	------------------------	---------

Mark	No.	Description	Parts No.
------	-----	-------------	-----------

●FUNCTION A BOARD ASSEMBLY (PWZ2168)

SEMICONDUCTORS

IC401	MICROCOMPUTER,IC	PD4329A
Q402,Q403	TRANSISTOR	DTC124ES
Q404,Q405	TRANSISTOR	DTA124ES
D401	LED	AA0045
D402	LED	BR0045
D411-D416	DIODE	1SS254

SWITCHES

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

FILTERS

L401,L402	AXIAL INDUCTOR	LAU010K
-----------	----------------	---------

CAPACITORS

C401,C402	ELECTROLYTIC CAPACIT	CEJA470M16
C403	CERAMIC CAPACITOR	CKPUYF103Z25
C404	ELECTROLYTIC CAPACIT	CEJA470M16
C405	CERAMIC CAPACITOR	CKPUYF103Z25
C406-C408	CERAMIC CAPACITOR	CGCYX103K25
C409	CERAMIC CAPACITOR	CKCYF103Z50
C411-C416	AXIAL CERAMIC C.	CCPUCH100J50

RESISTORS

All resistors	RD1/6PM□□□J
---------------	-------------

OTHERS

CN401	CONNECTOR	HLEM33R
V401	FL TUBE	PEL1025
X401	CERAMIC RESONATOR	VSS1014
	REMOTE SENSOR	SBX1610

FUNCTION B BOARD ASSEMBLY**SEMICONDUCTORS**

D403	LED	SLH-34YC3H3
D404	LED	SLH-34VC3H3
D405	LED	SLH-34VC3H3
D417	DIODE	1SS254

SWITCHES

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

CAPACITORS

C417	AXIAL CERAMIC C.	CCPUCH100J50
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6. ADJUSTMENTS

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 pick up or the circuitry. Adjust correctly following the adjustment procedure.

6-1. Adjustment items/verification item and order

Step	Item	Test point	Adjustment location
1	Focus offset adjustment	TP 1, Pin 6(FCS.ERR)	VR 103(FCS.OFS)
2	Grating adjustment	TP 1, Pin 2(TRK.ERR)	Grating adjustment slit
3	Tracking error balance adjustment	TP 1, Pin 2(TRK.ERR)	VR 102(TRK. BAL)
4	Pick up radial/tangential direction tilt adjustment	TP 1, Pin 1(RF)	Radial tilt adjustment screw, Tangential tilt adjustment screw
5	RF level adjustment (RF level)	TP 1, Pin 1(RF)	VR 1(RF level)
6	Focus servo loop gain adjustment	TP 1, Pin 5(FCS.IN) TP 1, Pin 6(FCS.ERR)	VR 152(FCS.GAN)
7	Tracking servo loop gain adjustment	TP 1, Pin 3(TRK.IN) TP 1, Pin 2(TRK.ERR)	VR 151(TRK.GAN)
8	Focus error signal verification	TP 1, Pin 6(FCS.ERR)	—

● Abbreviation table

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

6-2. Measuring instruments and tools

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

6-3. Test point and adjustment variable resistor positions

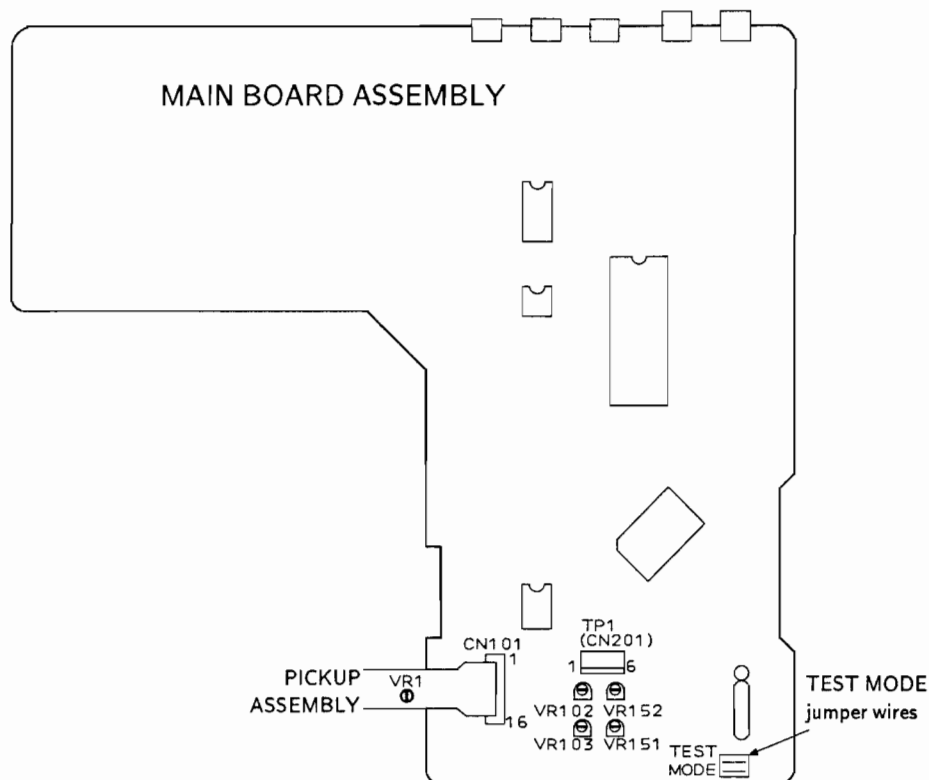


Figure 1 Adjustment Locations

6-4. Notes

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

6-5. Test mode

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

[Setting these models to test mode]

How to set this model into test mode.

1. Turn off the power switch.
2. Short the test mode jumper wires. (See Figure 1.)
3. Turn on the power switch.

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 test mode :

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

[Operations of the keys in test mode]

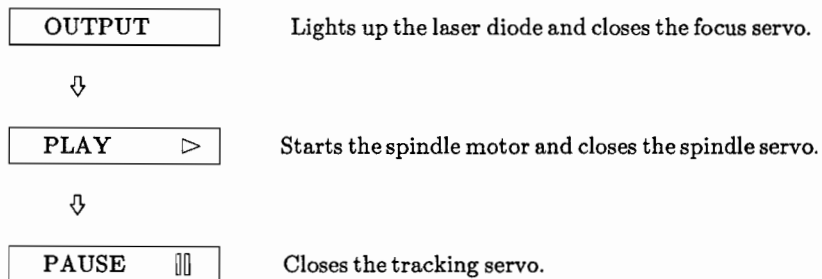
Code	Key name	Function in test mode	Explanation
	OUTPUT	Focus servo close	The laser diode is lit up and the focus actuator is lifted up, then lowered slowly and the focus servo is closed at the point where the objective lens is focused on the disc. With the player in this state, if you lightly rotate the stopped disc by hand, you can hear the sound the focus servo. If you can hear this sound, the focus servo is operating correctly. If you press this key with no disc mounted, the laser diode lights up, the focus actuator is pulled up, then the actuator is lowered and raised twice and returned to its original position.
▷	PLAY	Spindle servo On	Starts the spindle motor in the clockwise direction and when the disc rotation reaches the prescribed speed (about 500 rpm at the inner periphery), sets the spindle servo in a closed loop. Be careful. Pressing this key when there is no disc mounted makes the spindle motor run at the maximum speed. If the focus servo does not go correctly into a closed loop or the laser light shines on the mirror section at the periphery edge 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 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 pickup does not automatically stop at the mechanical end point in test mode, be careful with this operation.
⏭	TRACK 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 pickup does not automatically stop at the mechanical end point in test mode, be careful with this operation.
□	STOP	Stop	Initializes and the disc rotation stops. The pickup and disc remain where they are when this key is pressed.
△	OPEN/CLOSE	Disc tray open/close	Opens/closes the disc tray. This key is a toggle key and open/close tray alternately.

[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 adjustment

● Objective	Sets 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 TP 1, 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	VR 103 (FCS OFS)
		● Disc	None needed

[Procedure]
Adjust VR 103 (FCS OFS) so that the DC voltage at TP 1, Pin 6 (FCS ERR) is -150 ± 50 mV.

2. Grating adjustment

● Objective	To align the tracking error generation laser beam spots to the optimum angle on the track.		
● Symptom when out of adjustment	Play does not start, track search is impossible, tracks are skipped.		
● Measurement instrument connections	Connect the oscilloscope to TP 1, Pin 2 (TRK ERR) via a low pass filter. (See Figure 2)	● Player state	Test mode, focus and spindle servos closed and tracking servo open.
	[Settings] 50 mV/division 5 ms/division DC mode	● Adjustment location	Pickup grating adjustment slit
		● Disc	YEDS-7

[Procedure]

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

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

Note : The amplitude of the tracking error signal is about 3 Vp-p (when a $39\text{ k}\Omega + 0.001\text{ }\mu\text{F}$ low pass filter is used). If this amplitude is extremely small (2 Vp-p or less), then the objective lens or the pickup malfunction may be the cause. If the difference between the amplitude of the error signal at the innermost edge and outermost edge of the disc is more than 10%, the grating is not adjusted to the optimum point, so adjust it again.

5. Return the pickup to more or less midway across the disc with the TRACK REV $\blacktriangleleft$ key, press the PAUSE $\square$ key and double check that the track number and elapsed time are displayed on the front panel. If they are not displayed at this time or the elapsed time changes irregularly, double check the null point and adjust the grating again.

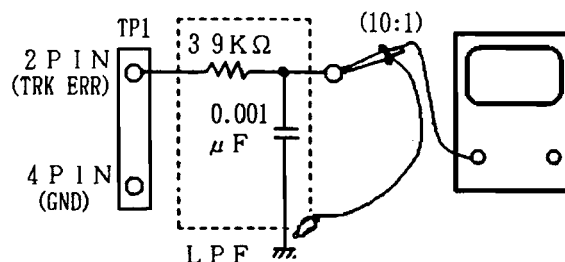
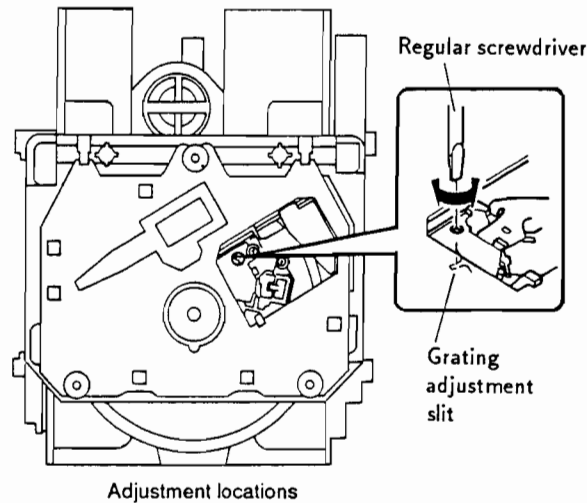


Figure 2



[How to find the null point]

When you insert the regular screwdriver into the slit for the grating adjustment and change the grating angle, the amplitude of the tracking error signal at TP 1 Pin 2 changes. Within the range for the grating, there are five or six locations where the amplitude of the wave reaches a minimum. Of these five or six locations, there is only one at which wave form is smooth. This location is where the three laser beams divided by the grating are all right above the same track. (See Figure 3.)

This point is called the null point. When adjusting the grating, this null point is found and used as the reference position.

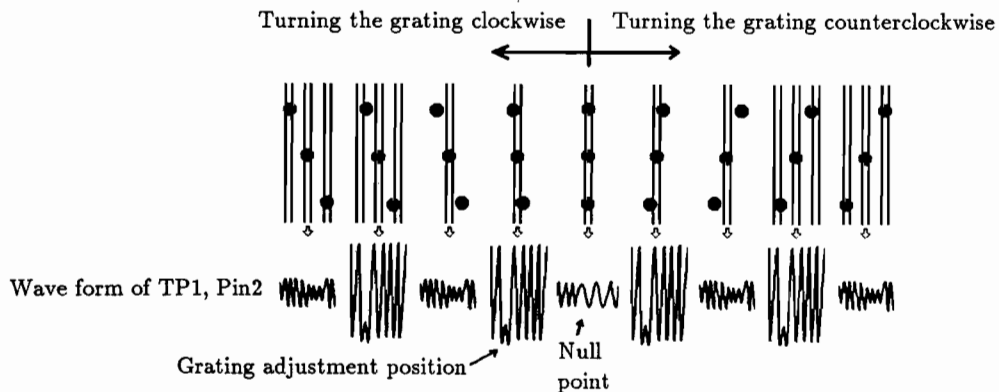
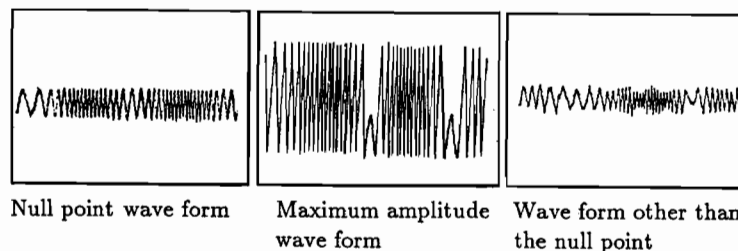


Figure 3

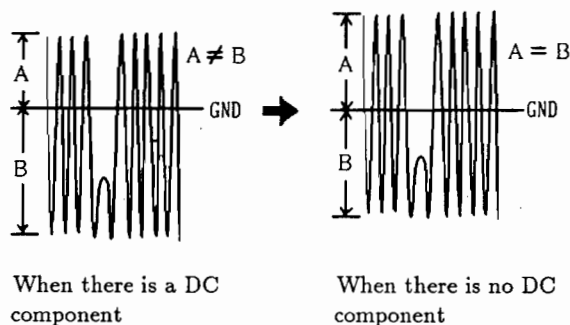


3. Tracking error balance adjustment

● Objective	To correct for the variation in the sensitivity of the tracking photodiode.		
● Symptom when out of adjustment	Play does not start or track search is impossible.		
● Measurement instrument connections	Connect the oscilloscope to TP 1, 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	VR 102 (TRK BAL)
		● Disc	YEDS-7

[Procedure]

1. Move the pickup to midway across the disc (R = 35 mm) with the TRACK FWD $\blacktriangleright$ or REV $\blacktriangleleft$ key.
2. Press the OUTPUT key, then the PLAY key in that order to close the focus servo then the spindle servo.
3. Line up the bright line (ground) at the center of the oscilloscope screen and put the oscilloscope into DC mode.
4. Adjust VR 102 (TRK BAL) so that the positive amplitude and negative amplitude of the tracking error signal at TP 1 Pin 2 (TRK ERR) are the same (in other words, so that there is no DC component).



4. Pickup radial/tangential tilt adjustment

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

[Procedure]

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

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

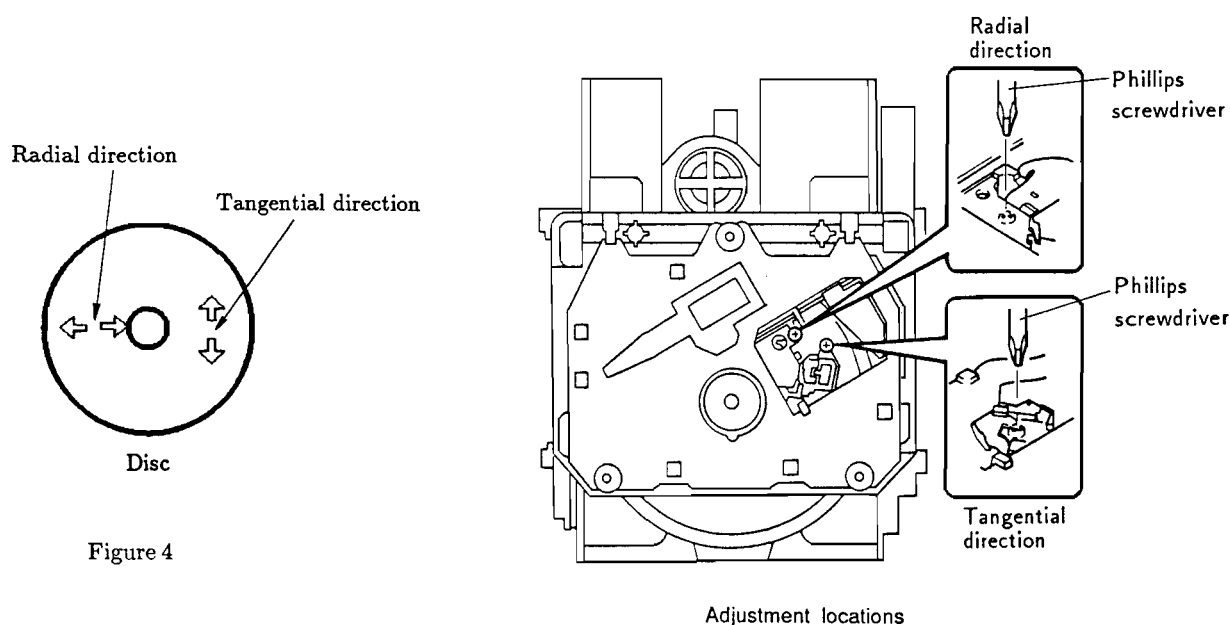


Figure 4

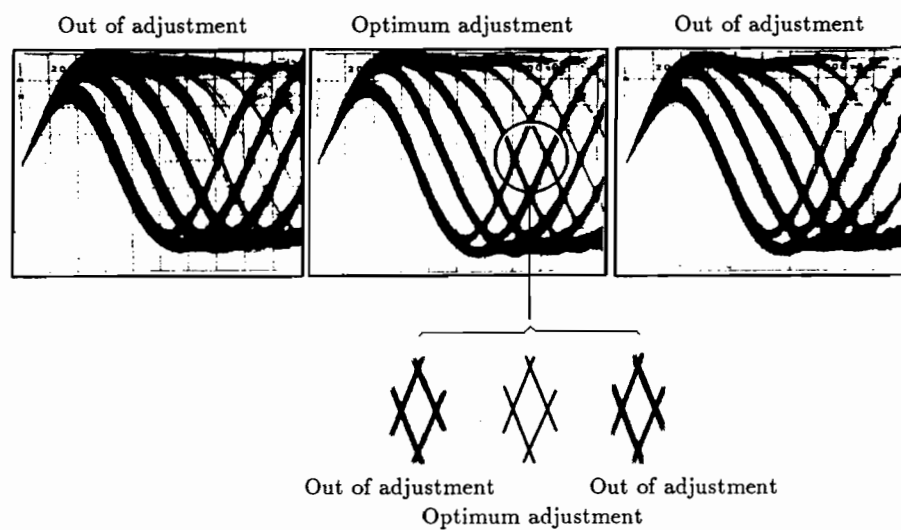


Figure 5 Eye pattern

5. RF level adjustment

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

[Procedure]

1. Move the pickup to midway across the disc ($R = 35 \text{ mm}$) with the TRACK FWD $\blacktriangleright$ or REV $\blacktriangleleft$ key, then press the OUTPUT key, then the PLAY $\triangleright$ key in that order to close the respective servos and put the player into play mode..
2. Adjust VR 1 (laser power) so that the RF signal amplitude is $1.2 \text{ V}_{p-p} \pm 0.1 \text{ V}$.

6. Focus servo loop gain adjustment

● Objective	To optimize the focus servo loop gain		
● Symptom when out of adjustment	Playback does not start or focus actuator noisy		
● Measurement instrument connections	See Figure 6.	● Player state	Test mode, play
	[Settings] CH 1 CH 2 20 mV/division 5 mV/division X-Y mode	● Adjustment location	VR 152 (FCS GAN)
		● Disc	YEDS-7

[Procedure]

1. Set the AF generator output to 1.2 kHz and 1 V_{p-p}.
2. Press the TRACK FWD ⏮ or REV ⏭ key to move the pickup to halfway across the disc (R = 35 mm), then press the OUTPUT 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 VR 152 (FCS GAN) so that the Lissajous wave form is symmetrical about the X axis and the Y axis.

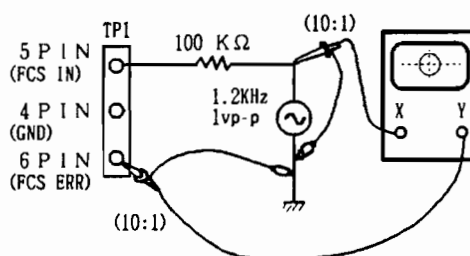
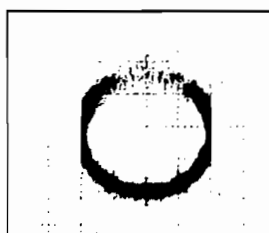


Figure 6

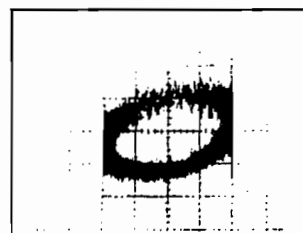
Focus Gain Adjustment



Higher gain



Optimum gain



Lower gain

7. Tracking servo loop gain adjustment

● Objective	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 7.	● Player state	Test mode, play
	[Settings] CH 1 50 mV/division X-Y mode	● Adjustment location	VR 151 (TRK GAN)
	CH 2 50 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 FWD or REV key to move the pickup to halfway across the disc (R = 35 mm), then press the OUTPUT 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 VR 151 (TRK GAN) so that the Lissajous wave form is symmetrical about the X axis and the Y axis.

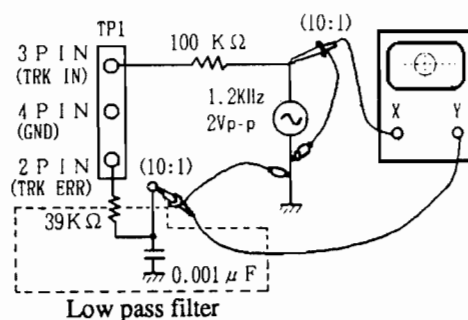
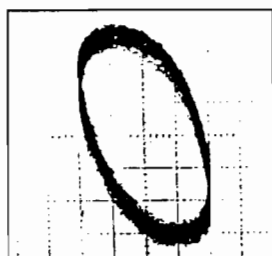
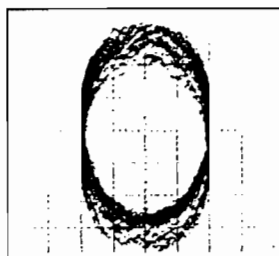


Figure 7

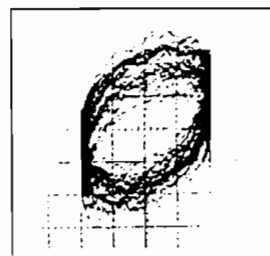
Tracking Gain Adjustment



Higher gain



Optimum gain



Lower gain

8. Focus error signal(focus S curve)verification

● Objective	To judge whether the pickup is O.K. or not by observing the focus error signal. The pickup is judged from the amplitude of the tracking error signal (as discussed in the section on adjusting the tracking error balance) and the wave form for the focus error signal.		
● Symptom when out of adjustment			
● Measurement instrument connections	Connect the oscilloscope to TP 1 Pin 6 (FOCS ERR).	● Player state	Test mode, stop
	[Settings] 100 mV/division 5 ms/division DC mode	● Adjustment location	None
		● Disc	YEDS-7

[Procedure]

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

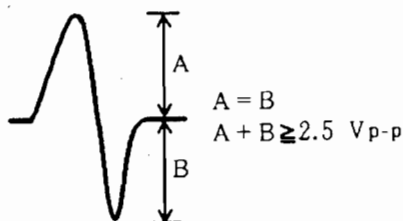


Figure 8

[Judging the pickup]

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

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

6. RÉGLAGE

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

6-1. Points de réglage/Point et ordre de vérification

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

● Tableau des abréviations

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

6-2. Instruments de mesure et outils

1. Oscilloscope cathodique à deux faisceaux (sonde 10 : 1)
2. Oscillateur de basse fréquence
3. Disque d'essai (YEDS-7)
4. Filtre passe-bas ($39\text{k}\Omega + 0,001\ \mu\text{F}$)
5. Résistance ($100\text{k}\Omega$)
6. Outils conventionnels

6-3. Point d'essai et positions de réglage de la résistance variable

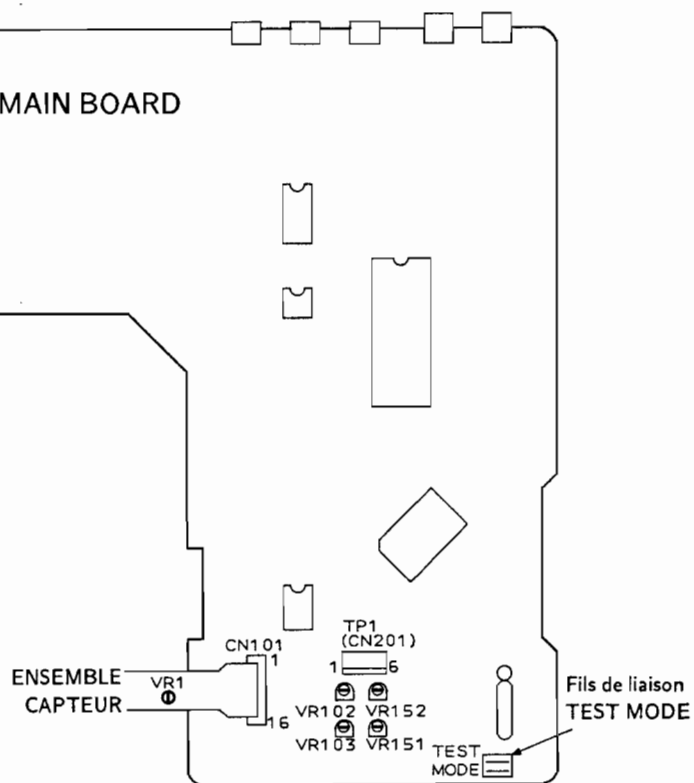


Figure 1 Emplacement des réglages

6-4. Remarques

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

6-5. Mode d'essai

Ces modèles sont munis d'un mode d'essai, de façon que les réglages requis à la réparation puissent être effectués aisément. Quand ces modèles sont en mode d'essai, les touches du panneau avant ne fonctionnent pas comme à l'ordinaire.

Les réglages et les vérifications peuvent s'effectuer par l'enclenchement de ces touches, à conditions de suivre les démarches requises. Dans le cas de ces modèles, tous les réglages sont réalisés en mode d'essai.

[Mise en mode d'essai]

Voici la manière de mettre le modèle en mode d'essai.

1. Commuter l'interrupteur d'alimentation sur arrêt.
2. Court-circuiter les fils de liaison du mode d'essai. (voir Figure 1).
3. Commuter l'interrupteur d'alimentation sur marche.

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

[Pour sortir du mode d'essai]

Voici la procédure qui termine le mode d'essai.

1. Appuyer sur la touche STOP pour arrêter toutes les opérations.
2. Sur le panneau avant, commuter l'interrupteur d'alimentation sur arrêt.

[Fonctionnement des touches en mode d'essai]

Code	Nom de la touche	Fonction en mode d'essai	Explications
	OUTPUT	Fermeture du circuit asservi de la mise au point	La diode laser s'allume et l'actuateur de la mise au point se relève, puis s'abaisse lentement. et le circuit servo de la mise au point se ferme au point où la lentille de l'objectif se focalise sur le disque. Quand l'appareil est dans cet état, si l'on fait légèrement tourner à la main le disque arrêté, le bruit produit par le circuit servo de la mise au point sera audible. Si ce bruit est perçu, le circuit servo de la mise au point fonctionne correctement. Si cette touche est enclenchée et qu'aucun disque n'est installé, la diode laser s'allume, l'actuateur de la mise au point se soulève, se relève, puis s'abaisse et se soulève, une deuxième fois et enfin, revient à sa position départ.
▷	PLAY	Asservissement de rotation en service	Démarré le moteur de rotation dans le sens des aiguilles d'une montre, quand la rotation du disque atteint la vitesse prescrite (environ 500 tours/min à la circonférence interne) et place le circuit servo de rotation dans une boucle fermée. Attention. Si cette touche est enfoncée et qu'un disque n'est pas installé, le moteur de rotation va tourner à la vitesse maximum. Si le circuit servo de la mise au point ne passe pas comme prévu dans une boucle fermée ou que la diode laser brille dans le miroir à la périphérie externe du disque, le même symptôme se produit.
⏸	PAUSE	Ouverture/Fermeture du circuit servo de l'alignement	Le fait d'appuyer sur cette touche quand le circuit servo de la mise au point et de la rotation fonctionnent correctement en boucles fermées, place le circuit servo de l'alignement dans une boucle fermée, fait apparaître, sur le panneau avant, le numéro de la piste en cours de lecture et la durée écoulée, puis sort le signal de lecture. Si la durée écoulée n'est pas affichée ou n'est pas correctement calculée, ou si la reproduction sonore est anormale, il se peut que la diode laser s'active dans la section dépourvue de signaux enregistrés, au bord externe du disque, qu'un ajustement quelconque soit dérégulé, ou qu'un autre problème se manifeste. Cette touche est de type à bascule et ouvre/ferme alternativement le circuit servo de l'alignement. Cette touche est inopérante si un disque n'est pas installé.

Code	Nom de la touche	Fonction en mode d'essai	Explications
⏮	TRACK REV	Inversion du chariot (vers l'intérieur)	Déplace le capteur vers la périphérie interne du disque. Quand cette touche est enclenchée et que le circuit servo de l'alignement travaille en bouche fermée, celui-ci change automatiquement dans une boucle ouverte. Comme le capteur ne s'arrête pas automatiquement au point de fin mécanique du mode d'essai, effectuer cette démarche avec précaution.
⏭	TRACK FWD	Inversion du chariot (vers l'extérieur)	Déplace le capteur vers la périphérie externe du disque. Quand cette touche est enclenchée et que le circuit servo de l'alignement travaille en bouche fermée, celui-ci change automatiquement dans une boucle ouverte. Comme le capteur ne s'arrête pas automatiquement au point de fin mécanique du mode d'essai, effectuer cette démarche avec précaution.
□	STOP	Arrêt	Initialiser et la rotation du disque s'arrête. Le capteur et le disque ne bougent pas lorsque cette touche est enclenchée.
△	OPEN/CLOSE	Ouverture/Fermeture du plateau à disque	Cette touche est de type à bascule et ouvre/ferme alternativement le plateau. Le fait d'enfoncer cette touche quand le plateau est ouvert le ferme et vice versa.

[Lecture de disque en mode d'essai]

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

Voici l'ordre d'enclenchement des touches pour reproduire un disque en mode d'essai.

OUTPUT

Allume la diode laser et ferme le circuit servo de la mise au point.



PLAY ▷

Démarre le moteur de rotation et ferme le circuit servo de la rotation.



PAUSE ||

Ferme le circuit servo de l'alignement.

Attendre 2 à 3 secondes entre chaque opération.

1. Réglage du décalage de la mise au point

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

[Marche à suivre]

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

2. Réglage du réseau de diffraction

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

[Marche à suivre]

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

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

Remarque: L'amplitude du signal d'erreur d'alignement se situe aux environs de $3V_{c-c}$ (quand un filtre passe-bas de $39k\Omega + 0.001\mu F$ est utilisé). Si cette amplitude est extrêmement petite ($2V_{c-c}$ ou moins), il peut s'ensuivre un mauvais fonctionnement de la lentille d'objectif ou du capteur. Si la différence entre l'amplitude du signal d'erreur au bord le plus intérieur et au bord le plus extérieur du disque est supérieure à 10%, ceci signifie que le réseau de diffraction n'est pas réglé à son point optimum. Dans ce cas, recommencer le réglage.

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

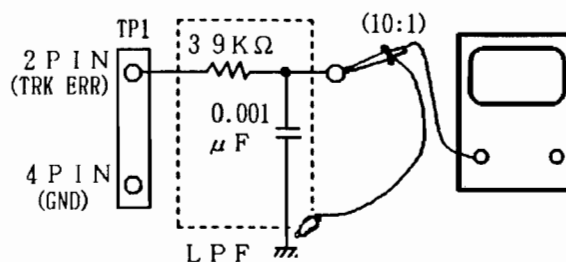
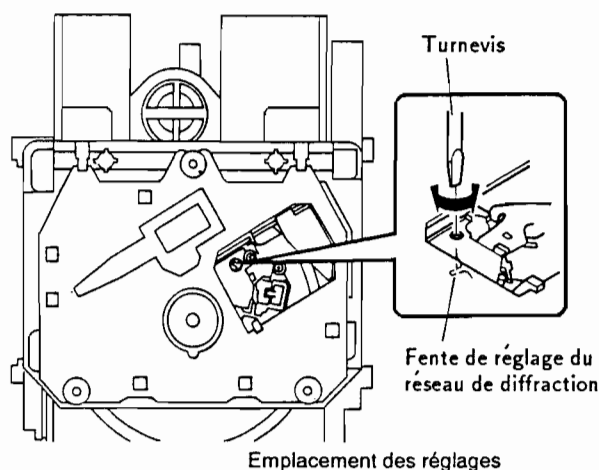


Figure 2



[Repérage du point zéro]

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

Ce point s'appelle le point zéro. Lors du réglage du réseau de diffraction, ce point zéro est repéré et utilisé comme position de référence.

Tourner le réseau de diffraction dans le sens des aiguilles d'une montre Tourner le réseau de diffraction dans le sens contraire des aiguilles d'une montre

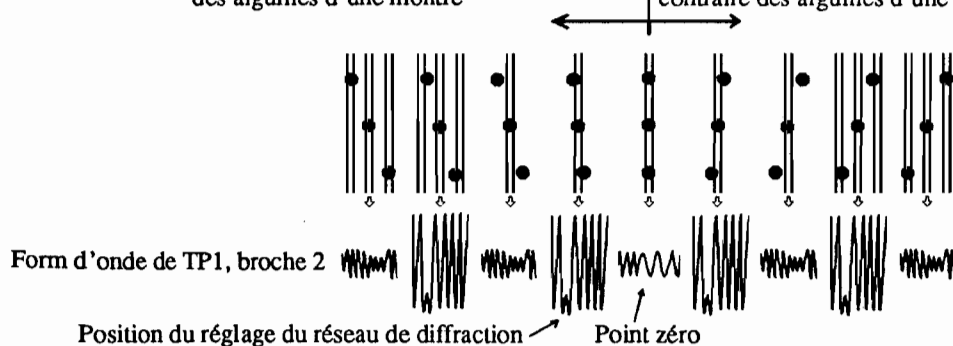
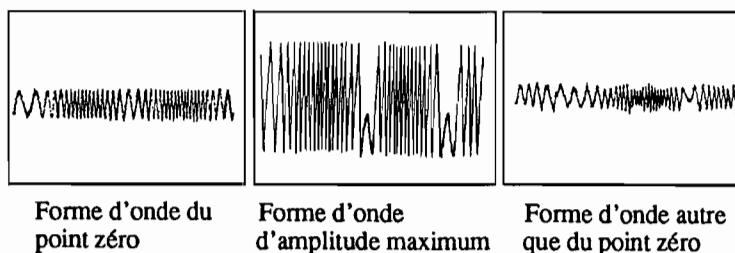


Figure 3

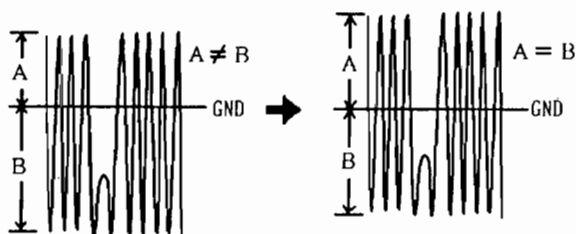


3. Réglage d'équilibrage d'erreur d'alignement

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

[Marche à suivre]

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



S'il y a un composant CC

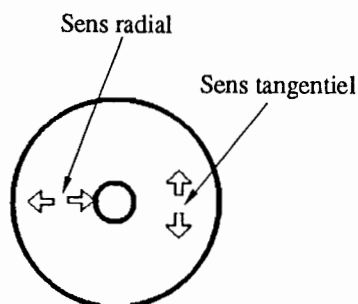
S'il n'y a pas de composant CC

4. Réglage d'inclinaison radiale/tangentielle du capteur

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

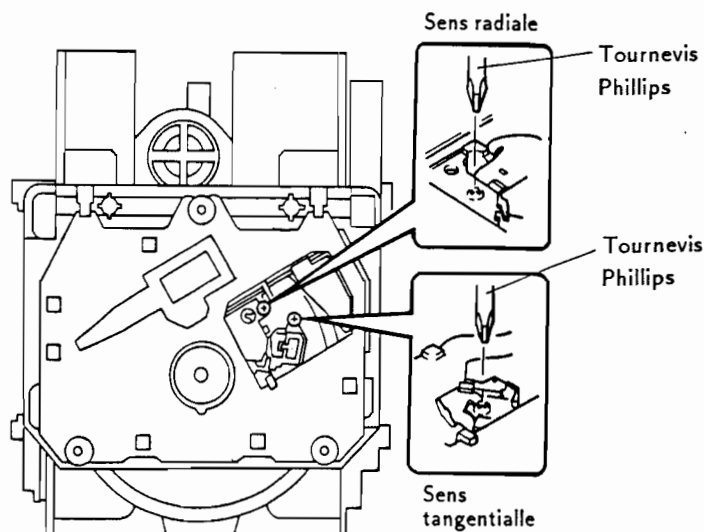
[Marche à suivre]

1. Dans le cas d'un lecteur multidisque, utiliser la touche TRACK FWD ou la touche REV pour déplacer le capteur à mi-chemin sur le disque (R=35mm).
Appuyer sur la touche OUTPUT, PLAY et PAUSE dans cet ordre, afin de fermer le circuit servo de la mise au point, puis celui de la rotation et placer le lecteur en mode de lecture.
 2. D'abord, ajuster la vis d'inclinaison radiale à l'aide un tournevis Phillips, de façon que le motif en oeil (c'est-à-dire, le diamant au centre du signal RF) soit le plus clairement visible.
 3. Ensuite, ajuster la vis d'inclinaison tangentielle à l'aide un tournevis Phillips, de façon que le motif en oeil (c'est-à-dire, le diamant au centre du signal RF) soit le plus clairement visible (Figure 5).
 4. Ajuster de nouveau la vis d'inclinaison radiale et la vis d'inclinaison tangentielle de façon que le motif en oeil soit le plus clairement visible. Le cas échéant, régler les deux vis de façon que le motif en oeil soit le plus clairement visible.
- Remarque : "Radial" et "tangentielle" se rapportent aux sens par rapport au disque illustré à la Figure 4.



Disque

Figure 4



Emplacements des réglages

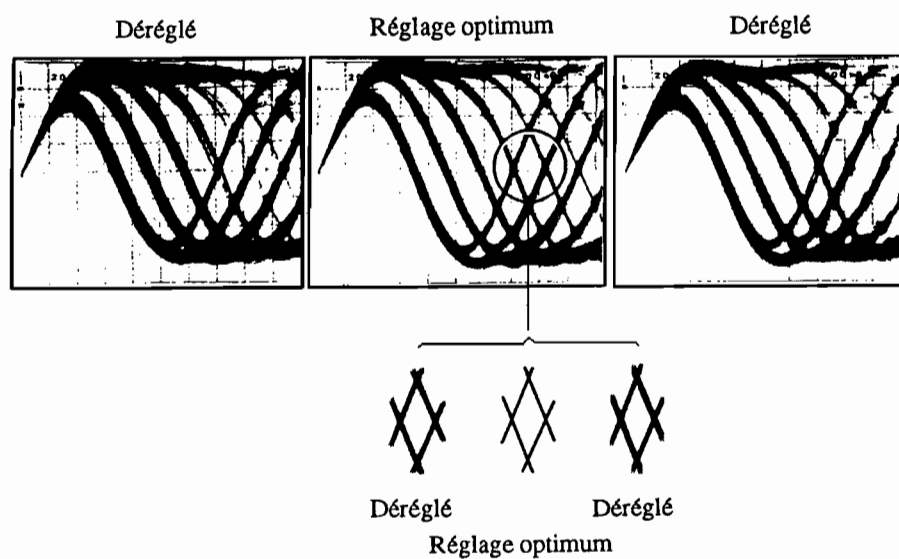


Figure 5 Motif en œil

5. Réglage du niveau RF (niveau RF)

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

[Marche à suivre]

1. Placer le capteur à mi-chemin sur le disque ($R=35\text{mm}$) à l'aide la touche TRACK FWD  ou la touche REV . Ensuite, appuyer sur la touche OUTPUT puis sur la touche PLAY , dans cet ordre, pour fermer les circuits servo respectifs et mettre le lecteur en mode de lecteur.
2. Ajuster VR1 (alimentation du laser) de façon que l'amplitude du signal RF atteigne $1,2 V_{c-c} \pm 0,1 V$.

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

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

[Marche à suivre]

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

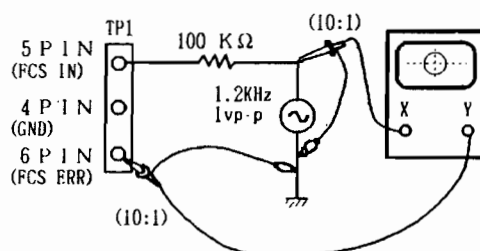
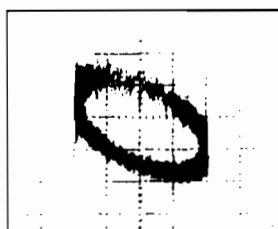
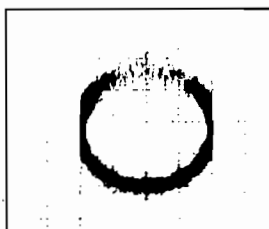


Figure 6

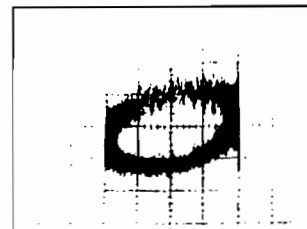
Adjustment de gain de mise au point



Gain Supérieur



Gain optimum



Gain inférieur

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

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

[Marche à suivre]

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

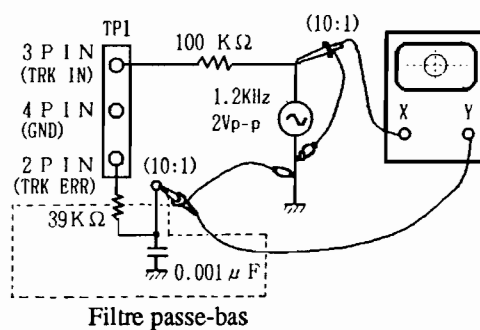
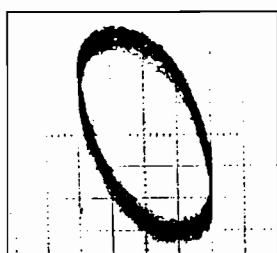
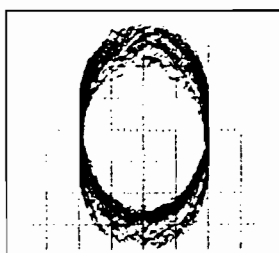


Figure 7

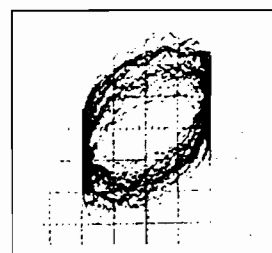
Adjustment de gain d'alignement



Gain Supérieur



Gain optimum



Gain inférieur

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

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

[Marche à suivre]

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

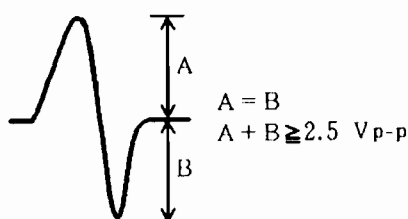


Figure 8

[Evaluation du capteur]

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

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

6. AJUSTE

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

6-1. Ítemes de ajuste/verificación y orden

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

● Tabla de abreviaturas

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

6-2. Instrumentos y herramientas de medición

1. Osciloscopio de doble traza (Sonda de 10 : 1)
2. Oscilador de baja frecuencia
3. Disco de prueba (YEDS-7)
4. Filtro de paso bajo ($39k\Omega$, $0,001\mu F$)
5. Resistor ($100k\Omega$)
6. Herramientas estándar

6-3. Ubicación de los puntos de prueba y los resistores variables de ajuste

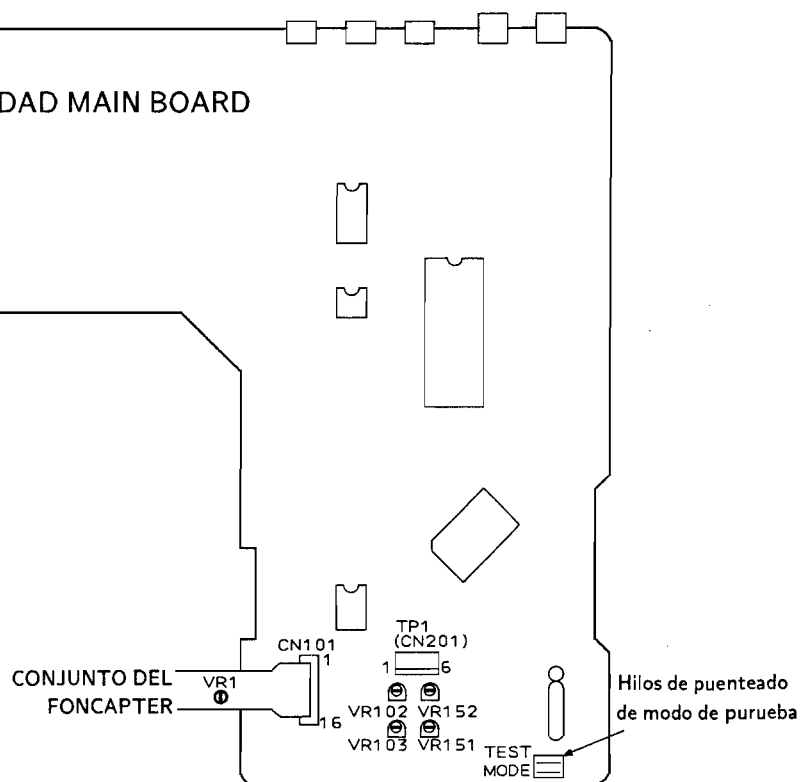


Figura 1 Lugares de ajuste

6-4. Notas

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

6-5. Modo de prueba

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

[Puesta de estos modelos en el modo de prueba]

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

1. Ponga en OFF el interruptor de alimentación.
2. Cortocircuite los hilos de puenteado de modo de prueba. (Consulte la figura 1.)
3. Ponga en ON el interruptor de alimentación.

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

[Desactivación del modo de prueba]

A continuación se indica el procedimiento para desactivar el modo de prueba.

1. Presione la tecla STOP y cese todas las operaciones.
2. Ponga en OFF el interruptor de alimentación del panel frontal.

Código	Nombre de la tecla	Función en el modo de prueba	Explicación
	OUTPUT	Cierre del servo de enfoque	El diodo láser se encenderá y el actuador de enfoque se eleva, después se descende lentamente, y el servo de enfoque se cerrará en el punto en el que el objetivo se enfoca sobre el disco. Con el reproductor en este estado, si gira ligeramente con la mano el disco parado, podrá oír el sonido del servo de enfoque. Si puede oír este sonido, el servo de enfoque estará funcionando correctamente. Si presiona esta tecla sin disco montado, el diodo láser se encenderá, el actuador de enfoque se ve empujado hacia arriba, y después se levantará y descenderá y se eleva dos veces, y volverá a su posición original.
▷	PLAY	Activación del servo del eje	Pondrá en marcha el motor del eje haciéndolo girar hacia la derecha y después la rotación del disco alcanzará la velocidad prescrita (unas 500 rpm en la periferia interior), y pondrá el servo del eje en un bucle cerrado. Tenga cuidado. Si presiona esta tecla cuando no haya disco montado, el motor del eje girará a la velocidad máxima. Si el servo de enfoque no pasa correctamente a un bucle cerrado, o si el haz láser incide en la sección del espejo en el la periferia del disco, ocurrirá el mismo síntoma.
⏏	PAUSE	Apertura/cierre del servo de seguimiento	Si presiona esta tecla cuando el servo de enfoque y el servo del eje están funcionando correctamente en bucles cerrados, el servo de seguimiento se pondrá en bucle cerrado, en el panel frontal se visualizarán el número de canción que esté reproduciéndose y el tiempo transcurrido, y se producirá la salida de la señal de reproducción. Si el tiempo transcurrido no se visualiza o no se cuenta correctamente, o si el sonido no se reproduce correctamente, es posible que el rayo láser esté incidiendo en la sección sin sonido grabado en el borde exterior del disco, o que exista algún otro problema. Esta tecla es basculante (de acción alternativa) y abre/cierra el servo de seguimiento alternativamente. Esta tecla no funcionará cuando no haya disco montado.

Código	Nombre de la tecla	Fonción en el mode de prueba	Explicación
⏮	TRACK REV	Retroceso del carro (hacia adentro)	Moverá la posición del captor hacia el diámetro interior del disco. Si presiona esta tecla con el servo de seguimiento en bucle cerrado, dicho bucle pasará automáticamente a bucle abierto. Como el captor no se para automáticamente en el puto final mecánico en el modo de prueba, tenga cuidado cuando realice esta operación.
⏭	TRACK FWD	Avance del carro (hacia afuera)	Moverá la posición del captor hacia la periferia del disco. Si presiona esta tecla con el servo de seguimiento en bucle cerrado, dicho bucle pasará automáticamente a bucle abierto. Como el captor no se para automáticamente en el puto final mecánico en el modo de prueba, tenga cuidado cuando realice esta operación.
□	STOP	Parada	Inicializa y se para la rotacion del desco. El captor y el disco permanecen donde están cuando se presiona esta tecla.
△	OPEN/CLOSE	Apertura/cierre de la bandeja del disco	Abrirá/cerrará la bandeja del disco. Esta tecla es baseulante de accion alternativa y abre/cierra la bandeja alternativamente.

[Cómo reproducir un disco en el modo de prueba]

En el modo de prueba, como los servos funcionan independientemente, la reproducción de un disco requiere el que usted emplee las teclas en el orden correcto para cerrar los servos.

A continuación se indica la secuencia de operación de teclas para reproducir un disco en el modo de prueba.

OUTPUT 

Hará que se encienda el diodo láser y cerrará el servo de enfoque.



PLAY 

Pondrá en marcha el motor del eje y hará que se cierre el servo del eje.



PAUSE 

Cerrará el servo de seguimiento.

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

1. Ajuste del descentramiento del enfoque

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

[Procedimiento]

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

2. Ajuste de retícula

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

[Procedimiento]

1. Mueva el captor hasta la mitad del disco ($R=35\text{mm}$) con la tecla TRACK FWD $\gg$ o REV $\ll$ de forma que la ranura de ajuste de la retícula quede en el borde exterior del disco, donde puede ajustarse.
2. Presione la tecla OUTPUT, y después la tecla PLAY $\triangleright$, por este orden, a fin de cerrar el servo de enfoque y después el servo del eje.
3. Inserte un destornillador normal en la ranura de ajuste de la retícula y ajuste la retícula hasta encontrar el punto nulo. Para más detalles, consulte la página siguiente.
4. Si gira lentamente el destornillador hacia la derecha desde el punto nulo, la amplitud de la onda aumentará gradualmente. Después, si continúa girando el destornillador, la amplitud de la onda se volverá otra vez más pequeña. Gire el destornillador hacia la derecha desde el punto nulo y ajuste la retícula al primer punto en el que la amplitud de la onda alcance su valor máximo.

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

Nota : La amplitud de la señal de error de seguimiento será de aproximadamente $3V_{p-p}$ (cuando se emplee un filtro de paso bajo de $38k\Omega, 0.001\mu F$). Si esta amplitud es extremadamente pequeña ($2V_{p-p}$ o menos), la causa será el funcionamiento malo en el lente objetivo o en el captador. Si la diferencia entre la amplitud de la señal de error en el borde interior y exterior del disco es superior al 10%, la retícula no estará ajustada al punto óptimo, por lo que tendrá que volver a ajustarla.

5. Devuelva el captor hasta la mitad más o menos del disco con la tecla TRACK REV $\ll$, presione la tecla PAUSE $\square$, y vuelva a comprobar si en el panel frontal se visualizan el número de canción y el tiempo transcurrido. Si no se visualizan esta vez, o si el tiempo transcurrido cambia irregularmente, vuelva a comprobar el punto nulo y ajuste otra vez la retícula.

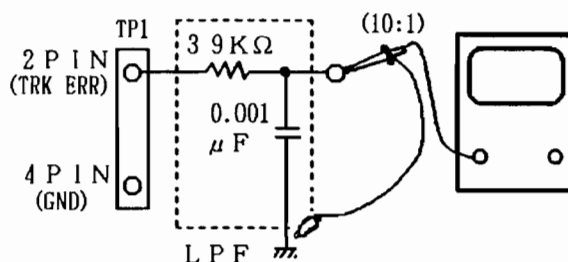
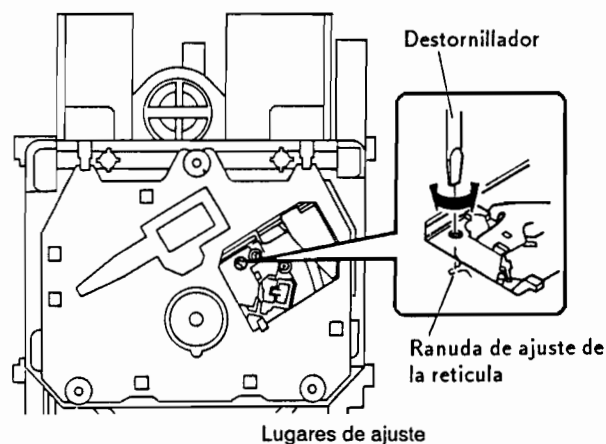


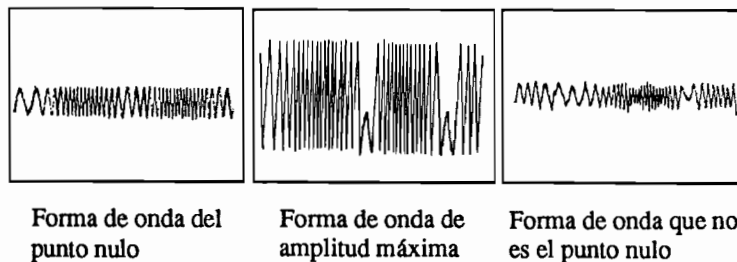
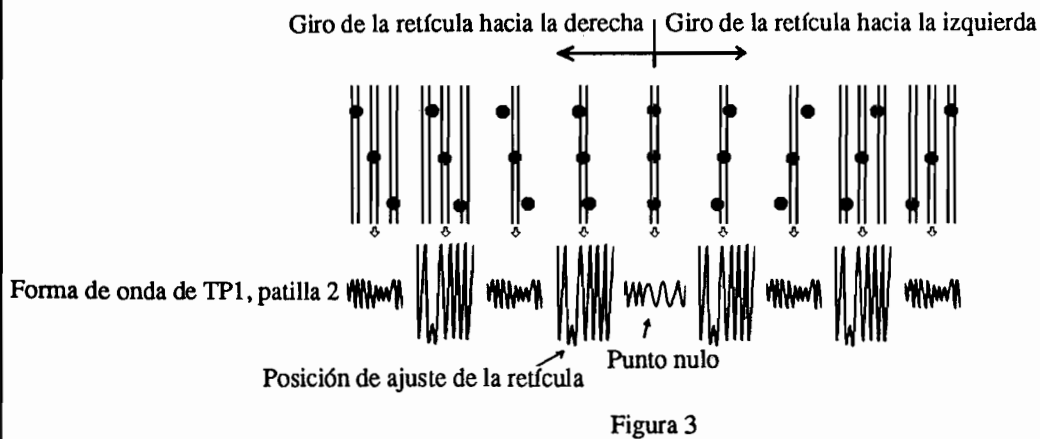
Figura 2



[Cómo encontrar el punto nulo]

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

Este punto se denomina punto nulo. Cuando ajuste la retícula, este punto se encontrará y empleará como posición de referencia.



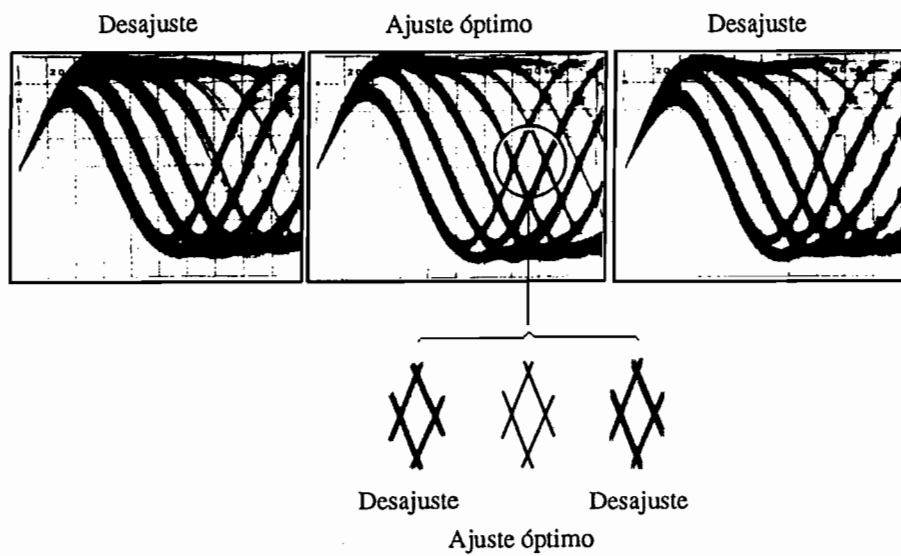


Figura 5 Patron optico

5. Ajuste del nivel de RF

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

[Procedimiento]

1. Mueva el captor hasta la mitad del disco (R=35mm) con la tecla TRACK FWD ►► o REV ◄◄, presione la tecla OUTPUT, después la tecla PLAY ►, por este orden a fin de cerrar los servos respectivos, y ponga el reproductor en el modo de reproducción.
2. Ajuste VR1 (potencia de láser) de forma que la amplitud de la señal de RF sea de $1,2 V_{p-p} \pm 0,1 V$.

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

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

[Procedimiento]

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

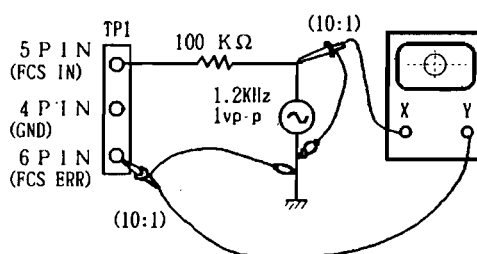
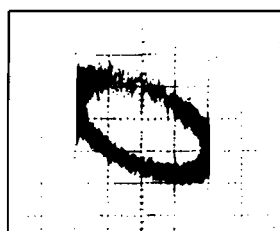


Figura 6

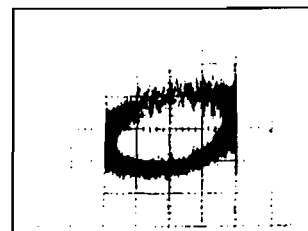
Ajuste de la ganancia de enfoque



Ganancia superior



Ganancia óptima



Ganancia inferior

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

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

[Procedimiento]

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

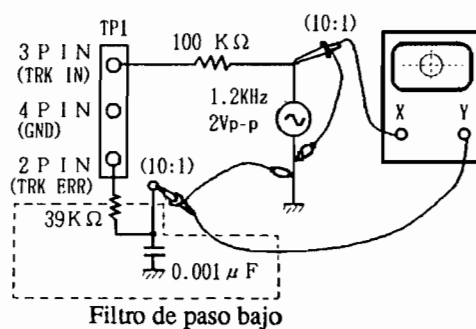
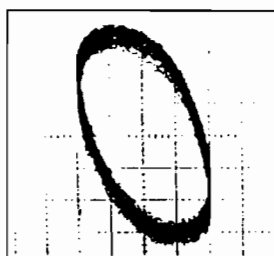
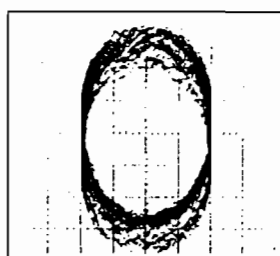


Figura 7

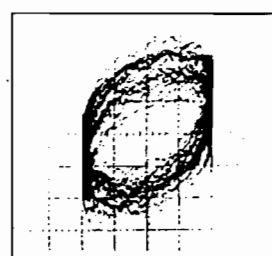
Ajuste de la ganancia de seguimiento



Ganancia superior



Ganancia óptima



Ganancia inferior

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

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

[Procedimiento]

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

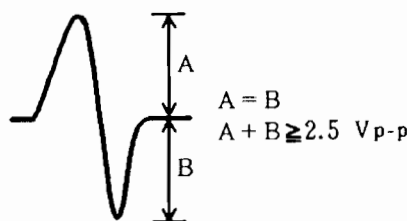


Figura 8

[Juicio sobre el captor]

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

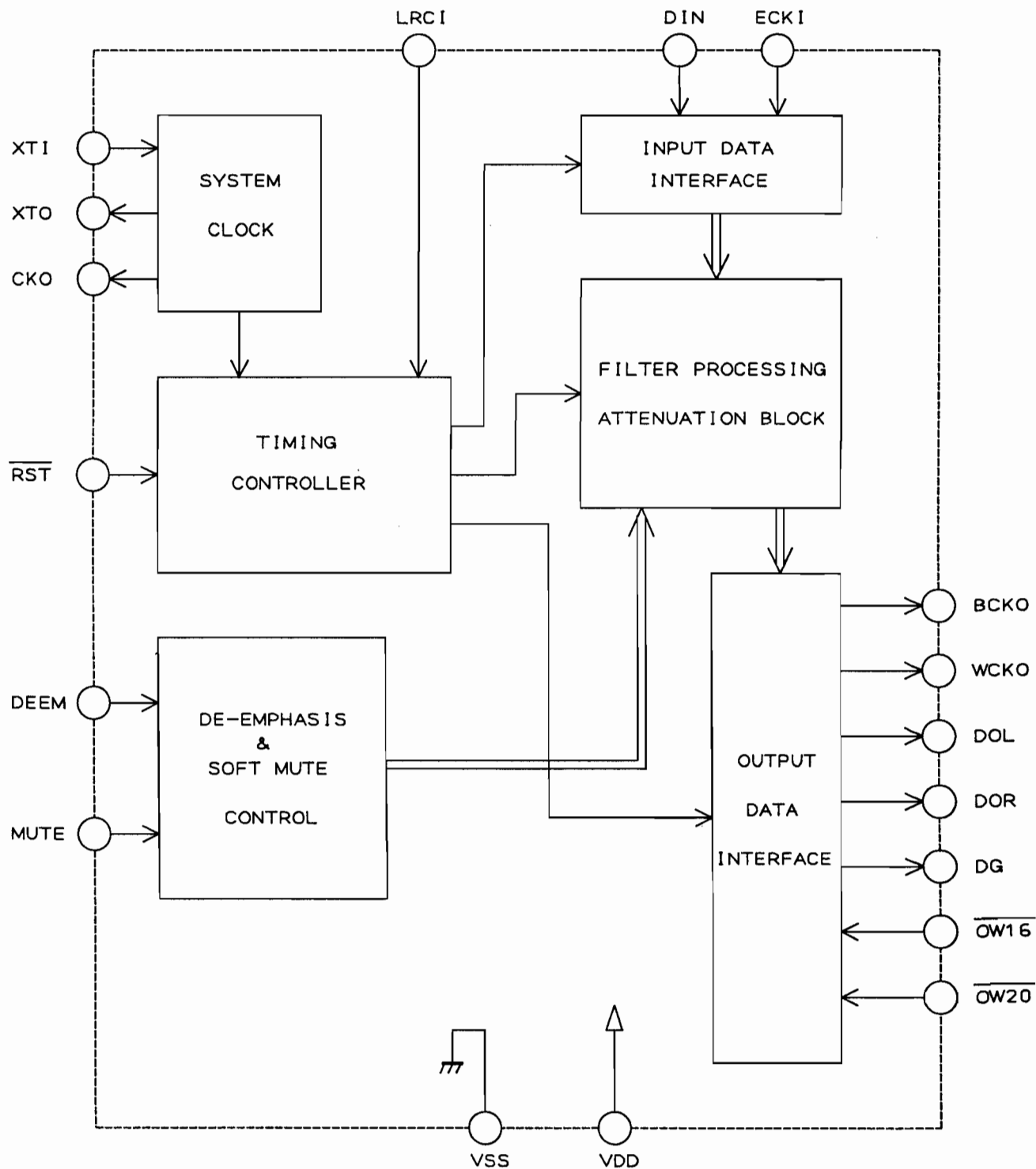
1. La amplitud de la señal de error de seguimiento es extremadamente pequeña (menos de 2 V_{p-p}).
2. La amplitud de la señal de error de enfoque es extremadamente pequeña (menos de 2,5 V_{p-p}).
3. Las amplitudes de las partes positiva y negativa de la señal de error de enfoque son extremadamente asimétricas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

7. IC INFORMATION

■ SM5840CP

Digital Filter

● Block Diagram



● Pin Assignment

(TOP VIEW)

$\overline{OW16}$	1	●	18	DIN
XTI	2		17	BCKI
XTO	3		16	LRCI
CKO	4		15	BCKO
VSS	5		14	VDD
$\overline{OW20}$	6		13	WCKO
DEEM	7		12	DOL
MUTE	8		11	DOR
$\overline{RST}$	9		10	DG

● Pin Function

No.	Pin name	I/O	Function
1	$\overline{OW16}$	I	Output bit rate select input 1. (*1)
2	XTI	I	Oscillator input.
3	XTO	O	Oscillator output.
4	CKO	O	Clock output. (Frequency is the same as XTI.)
5	V _{SS}	—	GND terminal.
6	$\overline{OW20}$	I	Output bit rate select input 2. (*1) Refer to $\overline{OW16}$.
7	DEEM	I	De-emphasis signal input. L : De-emphasis OFF, H : De-emphasis ON
8	MUTE	I	Mute signal input. L : Soft mute OFF, H : Soft mute ON
9	$\overline{RST}$	I	System reset signal input. (Initialize)
10	DG	O	De-glitch output.
11	DOR	O	Data output for R ch.
12	DOL	O	Data output for L ch.
13	WCKO	O	Word clock output.
14	V _{DD}	—	Power supply input(+5V)
15	BCKO	O	Bit clock output.
16	LRCI	I	Sampling rate(fs) clock input for input data.
17	BCKI	I	Bit clock input
18	DIN	I	Data input

*1 : Selection of output bit rate.

Settings		$\overline{OW20}$	
		H	L
$\overline{OW16}$	H	18bit output Noise shaper ON	20bit output Noise shaper ON
	L	16 bit output Noise shaper ON	16bit output Noise shaper OFF (test mode)

8. FOR PD-9700/KC, HEM, HB AND SD TYPES

8.1 CONTRAST OF MISCELLANEOUS PARTS

NOTES :

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

The PD-9700/KC, HEM, HB and SD types are the same as the PD-41/KU type with the exception of the following sections.

Mark	Symbol & Description	Part No.					Remarks
		PD-41 /KU type	PD-9700 /KC type	PD-9700 /HEM type	PD-9700 /HB type	PD-9700 /SD type	
	FL sheet	PAM1514	PAM1514	PAM1251	PAM1251	PAM1514	For packing
	33P F.F.C/30V	PDD1094	PDD1094	.....	.....	.....	
	31P F.F.C/30V	.....	.....	PDD1092	PDD1092	PDD1092	
	Cord with plug(mini plug)	PDE-319	PDE-319	.....	.....	.....	
	Front panel assembly	PEA1167	PEA1166	PEA1166	PEA1166	PEA1166	
	CD packing case	PHG1677	PHG1670	PHG1670	PHG1670	PHG1670	
	Recycle label	PRW1253	PRW1253	.....	.....	.....	
△	AC power cord	PDG1015	PDG1015	PDG1003	PDG1036	PDG1013	
△	Strain relief	CM-22C	CM-22C	CM-22B	CM-22B	CM-22B	
△	Voltage selector	.....	.....	.....	.....	PSB1002	
△	Power transformer(8VA)	PTT1166	PTT1166	PTT1167	PTT1167	PTT1168	
△	Power transformer(15VA)	PTT1206	PTT1206	PTT1207	PTT1207	PTT1208	
△●	MAIN BOARD assembly	PWZ2150	PWZ2150	PWZ2151	PWZ2153	PWZ2151	
△	PRIMARY BOARD assembly	Non supply	Non supply	Non supply	Non supply	Non supply	
△●	ANALOG BOARD assembly	PWM1490	PWM1490	PWM1490	PWM1492	PWM1490	
●	FUNCTION A BOARD assembly	PWZ2168	PWZ2168	PWZ2169	PWZ2169	PWZ2169	
	FUNCTION B BOARD assembly	Non supply	Non supply	Non supply	Non supply	Non supply	
	Operating instructions (German/Italian/Dutch/Swedish /Spanish/Portuguese)			PRF1048			

MAIN BOARD ASSEMBLY(PWZ2151 and PWZ2153)

The MAIN BOARD assemblies (PWZ2151 and PWZ2153) are the same as the MAIN BOARD assembly (PWZ2150) with the exception of the following sections.

Mark	Symbol & Description	Part No.			Remarks
		PWZ2150	PWZ2151	PWZ2153	
	D391-D394	1SS254	.....	.....	
	C391	CGCYX103K25	.....	.....	
	C392	CCCSL101J50	.....	.....	
	R391	RD1/6PM244J	.....	.....	
	R392	RD1/6PM102J	.....	.....	
	CN351	HLEM33S	HLEM31S	HLEM31S	
	JA391,JA392	RKN1004	.....	.....	

PRIMARY BOARD ASSEMBLY

The PRIMARY BOARD assemblies of PD-9700/KC, HEM, HB and SD are the same as the PRIMARY BOARD assembly of PD-41/KU for the service supply parts.

ANALOG BOARD ASSEMBLY(PWM1492)

The ANALOG BOARD assembly (PWM1492) is the same as the ANALOG BOARD assembly (PWM1490) with the exception of the following sections.

Mark	Symbol & Description	Part No.		Remarks
		PWM1490	PWM1492	
	L540-L547	PTH1010	.....	

FUNCTION A BOARD ASSEMBLY(PWZ2169)

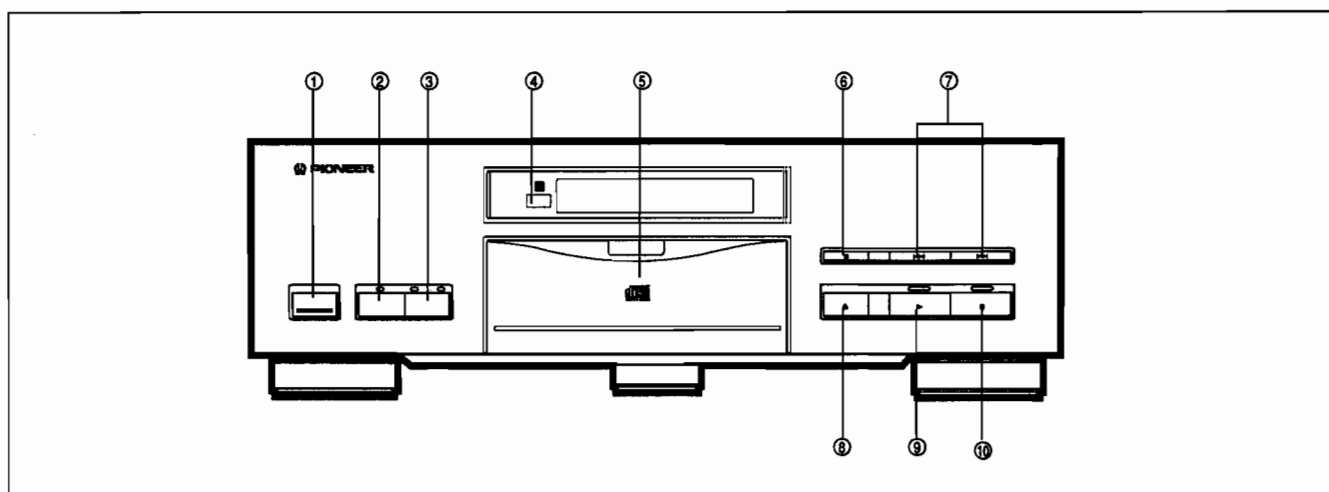
The FUNCTION A BOARD assembly (PWZ2169) is the same as the FUNCTION A BOARD assembly (PWZ2168) with the exception of the following sections.

Mark	Symbol & Description	Part No.		Remarks
		PWZ2168	PWZ2169	
	CN401	HLEM33R	HLEM31R	

FUNCTION B BOARD ASSEMBLY

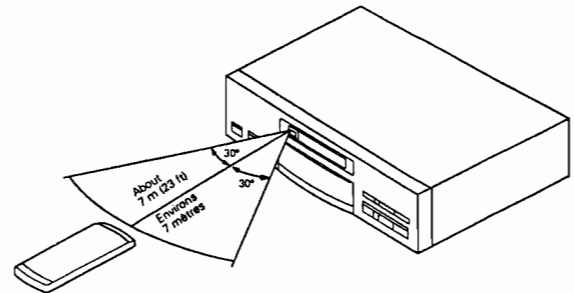
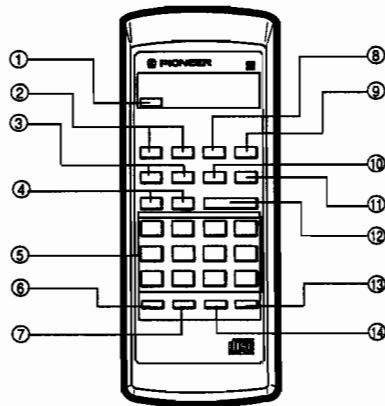
The FUNCTION B BOARD assemblies of PD-9700/KC, HEM, HB and SD are the same as the FUNCTION B BOARD assembly of PD-41/KU for the service supply parts.

9. PANEL FACILITIES



FRONT PANEL

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



REMOTE CONTROL UNIT

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

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

REMOTE CONTROL OPERATIONS

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

NOTE:

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

10. SPECIFICATIONS

1. General

Type	Compact disc digital audio system
Power requirements	
European model	AC 220 - 230 V, 50/60 Hz
U.K. and Australian models	AC 230 - 240 V, 60 Hz
U.S. and Canadian models	AC 120 V, 60Hz
Other models	AC 110/120 - 127/220/240 V (Switchable), 50/60 Hz
Power consumption	22 W
Operating temperature	+5°C - +35°C +41°F - +95°F
Weight	8.0 kg (17 lb, 10 oz)
External dimensions	420(W) X 330(D) X 130(H) mm 16-9/16(W) X 13(D) X 5-2/16(H) in

2. Audio section

Frequency response	2 Hz - 20 kHz
S/N ratio	111 dB or more (EIAJ)
Dynamic range	98 dB or more (EIAJ)
Channel separation	107 dB or more (EIAJ)
Harmonic distortion	0.002% or less (EIAJ)
Output voltage	2.0V
Wow and flutter	Limit of measurement (±0.001% W.PEAK) or less (EIAJ)
Channels	2-channel (stereo)

3. Output terminal

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

4. Functions

Basic operation buttons
● PLAY, PAUSE, STOP

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

Programming

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

Repeat functions

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

Random play (repeat also available)

Switching display

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

Timer start

5. Accessories

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

NOTE:

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