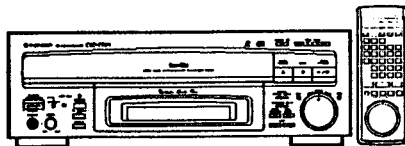


3884

# Service Manual



ORDER NO.  
ARP2458

CD CDV LD PLAYER

# CLD-D501

## CLD-D550

CLD-D501 AND CLD-D550 HAVE THE FOLLOWING :

Type	Model		Power Requirement	Remarks
	CLD-D501	CLD-D550		
KU/CA	○	—	AC120V only	
RD	—	○	AC110-127V, 220-240V	

- This manual is applicable to the following : CLD-D501/KU/CA ; CLD-D550/RD.
- For CLD-D550/RD, refer to page 102.
- For the circuit and mechanism descriptions, refer to the service guide ARP2234 for CLD-1090/2090/3090.

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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

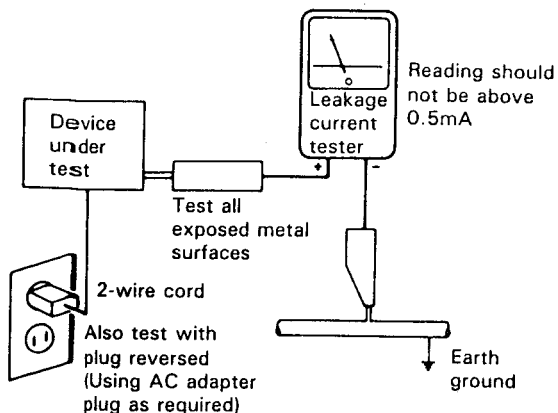
(FOR USA MODEL ONLY)

### 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.



AC Leakage Test

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

### 2. PRODUCT SAFETY NOTICE

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

Electrical components having such features are identified by marking with a  $\Delta$  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.

## 2. EXPLODED VIEWS, PACKING AND PARTS LIST

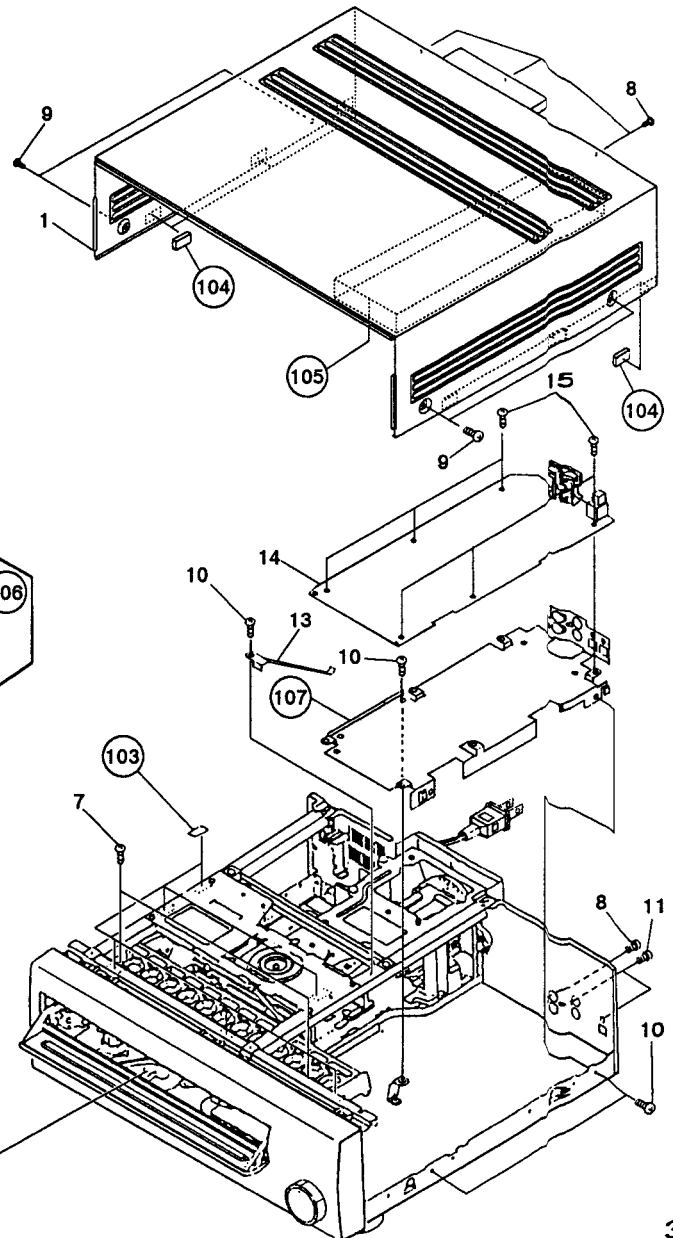
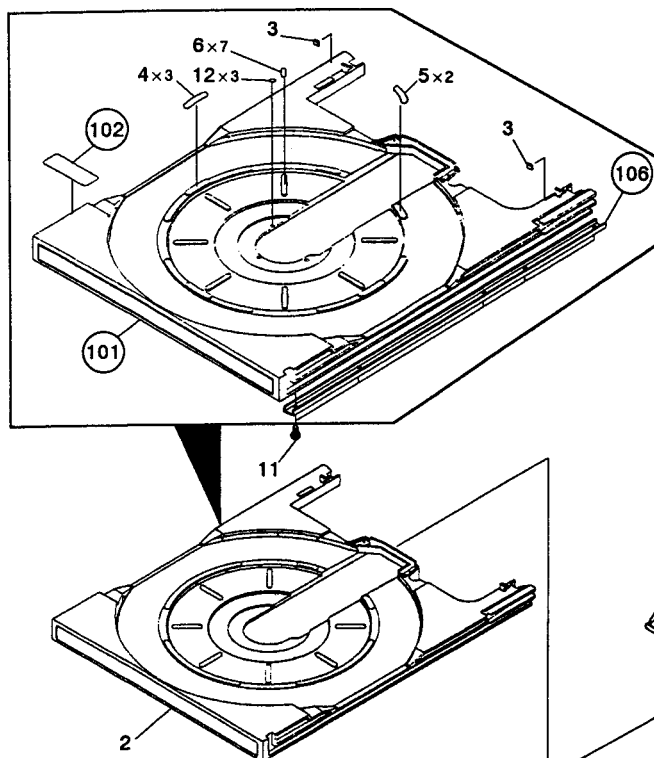
**NOTES:**

- A
- The parts with an encircled number are generally unavailable because they are not in our Master Spare Parts List.
  - The  $\Delta$  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.

### 2.1 EXTERIOR SECTION

**Parts List**

Mark No.	Description	Part No.	Mark No.	Description	Part No.
1	Bonnet - S	VXX1535	101	Tray	VNK1672
2	Tray assembly - S	VXX1707	102	Label (plastic)	VRW1274
3	Tray rubber	VEB1089	103	Cushion	VEC1092
4	Disc pad (Large)	VEC1191	104	Cushion	VEC1004
5	Disc pad (B)	VEC1379	105	Cushion	VEC1104
6	Disc pad (C)	VEC1380	106	Reinforced plate	VNE1679
7	Screw	VCZ30P120FMC	107	PCB holder (A)	VNE1771
8	Screw	BBT30P060FCC			
9	Screw	BCZ40P060FZK			
10	Screw	BBZ30P060FCC			
11	Screw	BPZ30P080FCU			
12	CD pad	VEC1252			
13	Tray push plate	VBK1029			
⊙ 14	AUDIO assembly	VWV1250			
15	Screw	IBZ30P060FCC			



## 2.2 FRONT PANEL SECTION

### Parts List

Mark	No.	Description	Part No.	Mark	No.	Description	Part No.
	1	Door panel	VNK2010		101	FL lens (B)	VEC1515
	2	Function key assembly	VXA1838		102	FL filter	VEC1566
	3	Scan dial	VNK2006		103	Center panel (B)	VNK1999
	4	PW button	VNK2002		104	IR window	VNK1937
	5	Sub key assembly	VXA1837		105	Name plate	PAN1035
	6	Disc side key assembly	VXA1836		106	Front panel	VNK1994
	7	Main key	VNK2011		107	Front door assembly	VXA1833
	8	Front panel assembly	VXA1831		108	Jack holder	VNE1768
	9	Door damp rubber	VEB1185		109	FLKY assembly	VWG1331
	10	Door base assembly	VXA1790		110	IRPS assembly	VWG1289
	11	Damper assembly	VXA1053		111	HEPB assembly	VWV1252
	12	Damper plate	VNE1765		112	Damp cushion	VEC1112
	13	Door spring	VBH1194				
	14	Volume knob	VNK2003				
	15	Snap plate	VNE1102				
	16	Screw	BPZ26P060FCU				
	17	Screw	IPZ26P060FMC				
	18	Screw	BBZ20P050FZK				
	19	Screw	PMZ20P040FCU				
	20	Hinge plate	VNE1763				
	21	•••••					
	22	•••••					
	23	Center panel assembly - S	VXX1743				
	24	Door assembly - S	VXX1744				

1 2 3 4 5 6

A

A

B

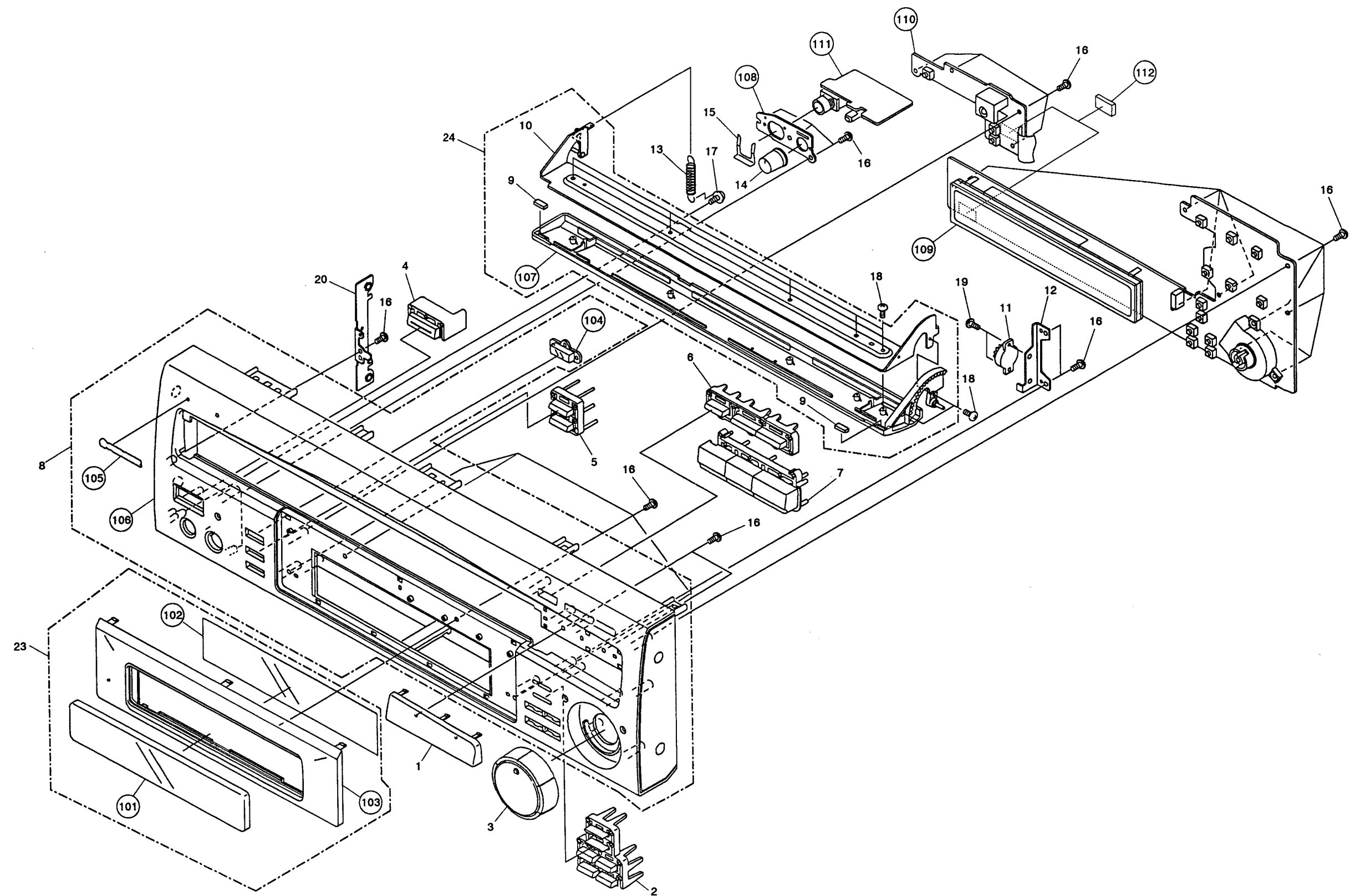
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D

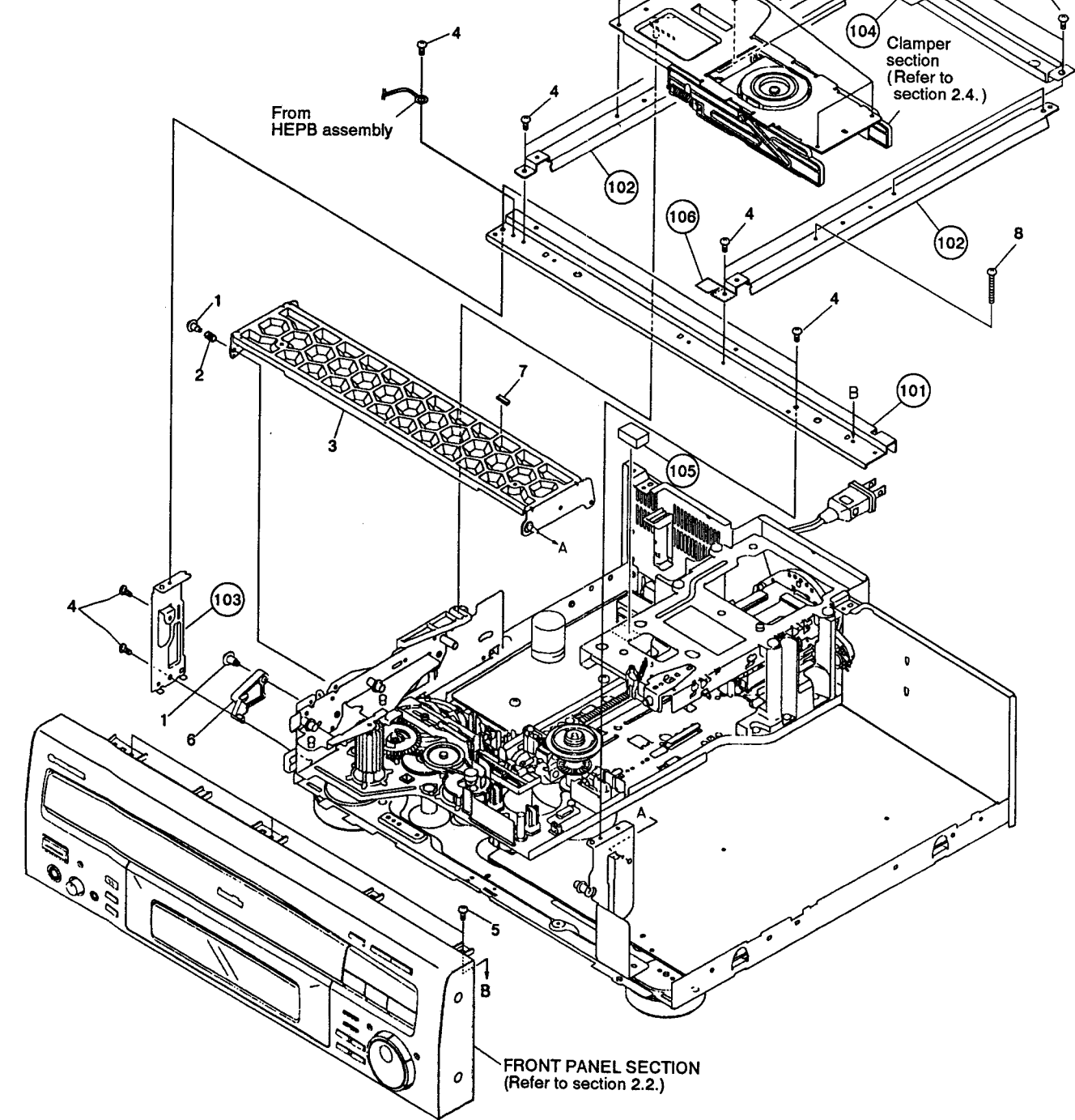


1 2 3 4 5 6

2.3 TOP VIEW SECTION

Parts List

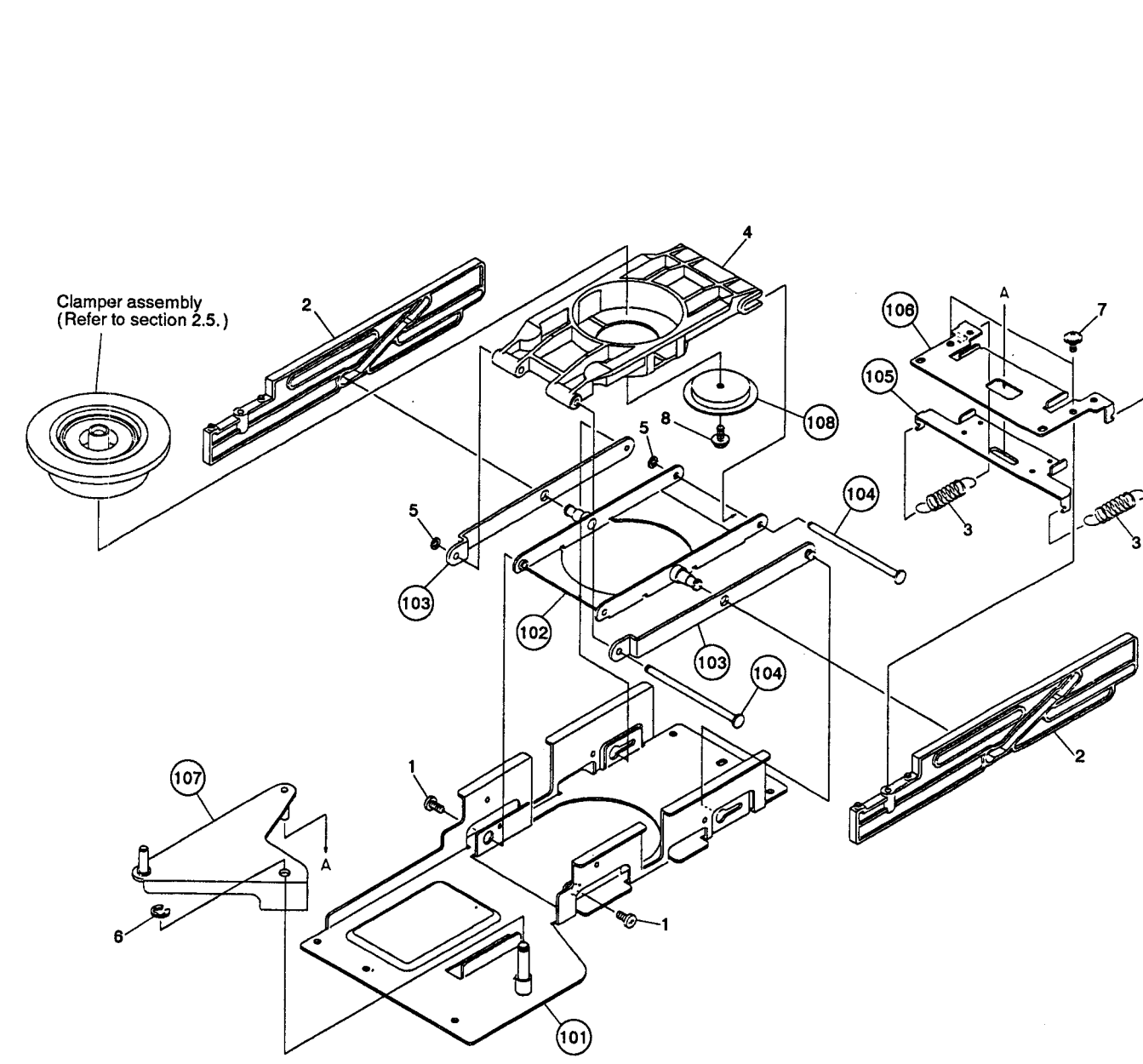
Mark No.	Description	Part No.	Mark No.	Description	Part No.
1	Screw (B)	VBA1008	101	Front angle	VNE1543
2	Arm spring	VBH1093	102	Center angle	VNE1761
3	Tray guide assembly	VXA1576	103	Side stay (L)	VNE1545
4	Screw	BBZ30P060FCC	104	Reinforced angle	VNE1673
5	Screw	IBZ30P060FCC	105	Damp cushion	VEC1493
6	Door lever	VNL1330	106	Earth plate	VNE1518
7	Stopper rubber	VEB1119			
8	Screw	BSZ30P200FMC			



2.4 CLAMPER SECTION

Parts List

Mark No.	Description	Part No.	Mark No.	Description	Part No.
1	Screw	VBA1022	101	Center plate assembly	VXA1506
2	Clamp cam	VNL1527	102	Lever (B) assembly	VXA1504
3	Limiter spring	VBH1168	103	Lever (A) assembly	VXA1503
4	Clamper holder	VNL1305	104	Clamp shaft	VLL1299
5	Washer	WT26D060D050	105	Limiter plate	VNE1551
6	E ring	YE40FUC	106	Slide plate	VNE1556
7	Screw	IPZ30P060FMC	107	Lever (C) assembly	VXA1505
8	Screw	IMZ30P060FMC	108	Clamper head	VNE1546

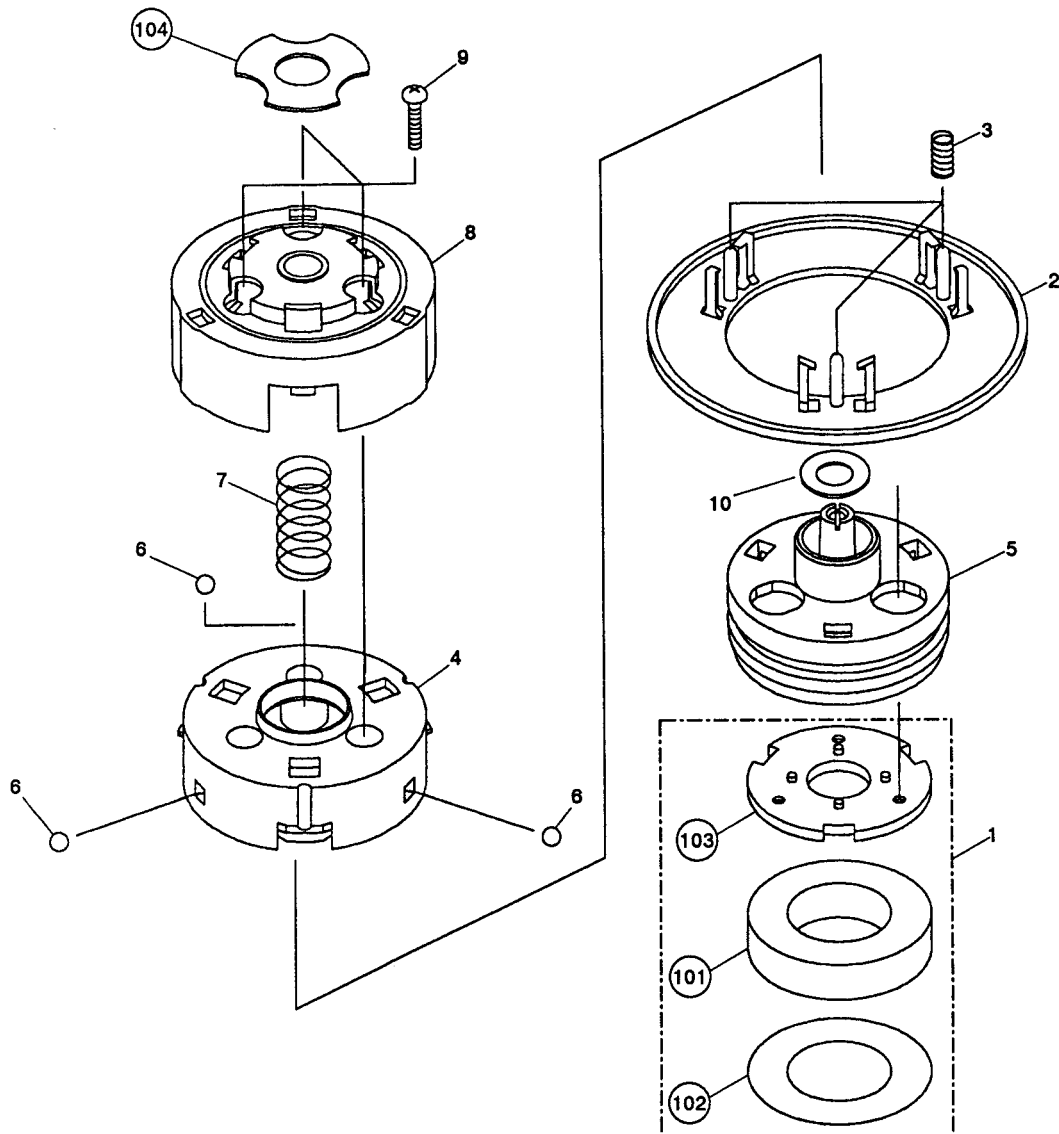


## 2.5 CLAMPER ASSEMBLY

### A Parts List

Mark No.	Description	Part No.	Mark No.	Description	Part No.
1	Magnet assembly - S	VXX1475	101	Magnet	VMG1010
2	Disc clamber	VNL1362	102	Gap sheet	VEC1561
3	Clamber spring	VBH1153	103	Clamber plate	VNE1549
4	Clamber base	VNL1364	104	Absorber rubber(A)	VEB1146
5	Centering hab(B)	VNL1435			
6	Steel ball	VNX1006			
7	Centering spring(B)	VBH1130			
8	Clamber cover	VNL1363			
9	Screw	AMZ20P040FMC			
10	Washer	WA60F115M160			

B



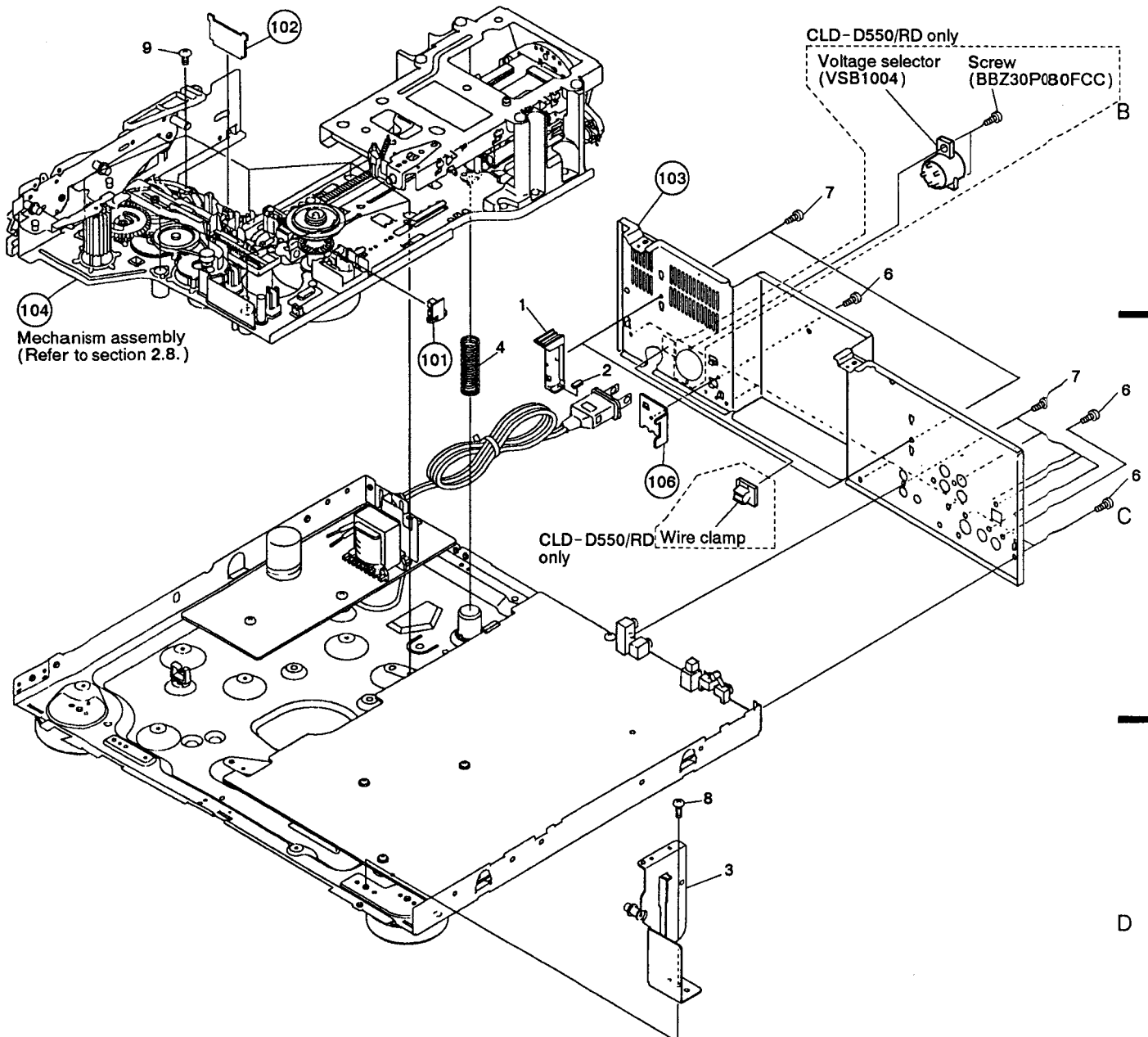
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## 2.6 BASE SECTION(1)

### Parts List

Mark No.	Description	Part No.	Mark No.	Description	Part No.
1	Tray stopper	VNL1202	101	FG board assembly	VWG1286
2	Door damp rubber	VEB1033	102	SW board assembly	VWG1287
3	Side stay (R) assembly	VXA1690	103	Rear panel	VNA1258
4	Base spring	VBH1145	104	Mechanism assembly	VWT1078
5	.....		105	.....	
6	Screw	BBT30P060FCC	106	TB holder	VNE1612
7	Screw	BBZ30P080FCU			
8	Screw	BBZ30P060FCC			
9	Screw	VBA1023			

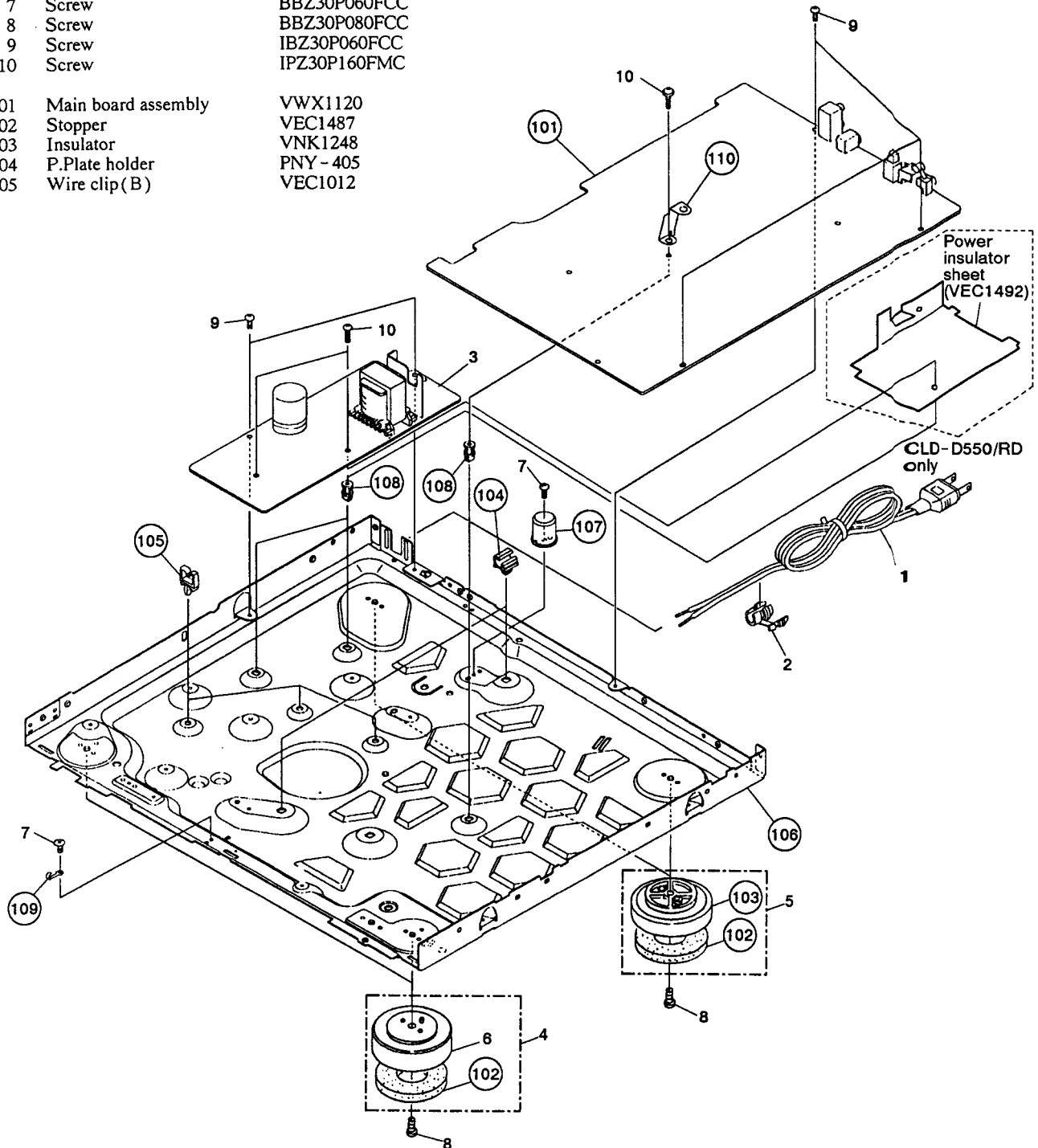




## 2.7 BASE SECTION (2)

### Parts List

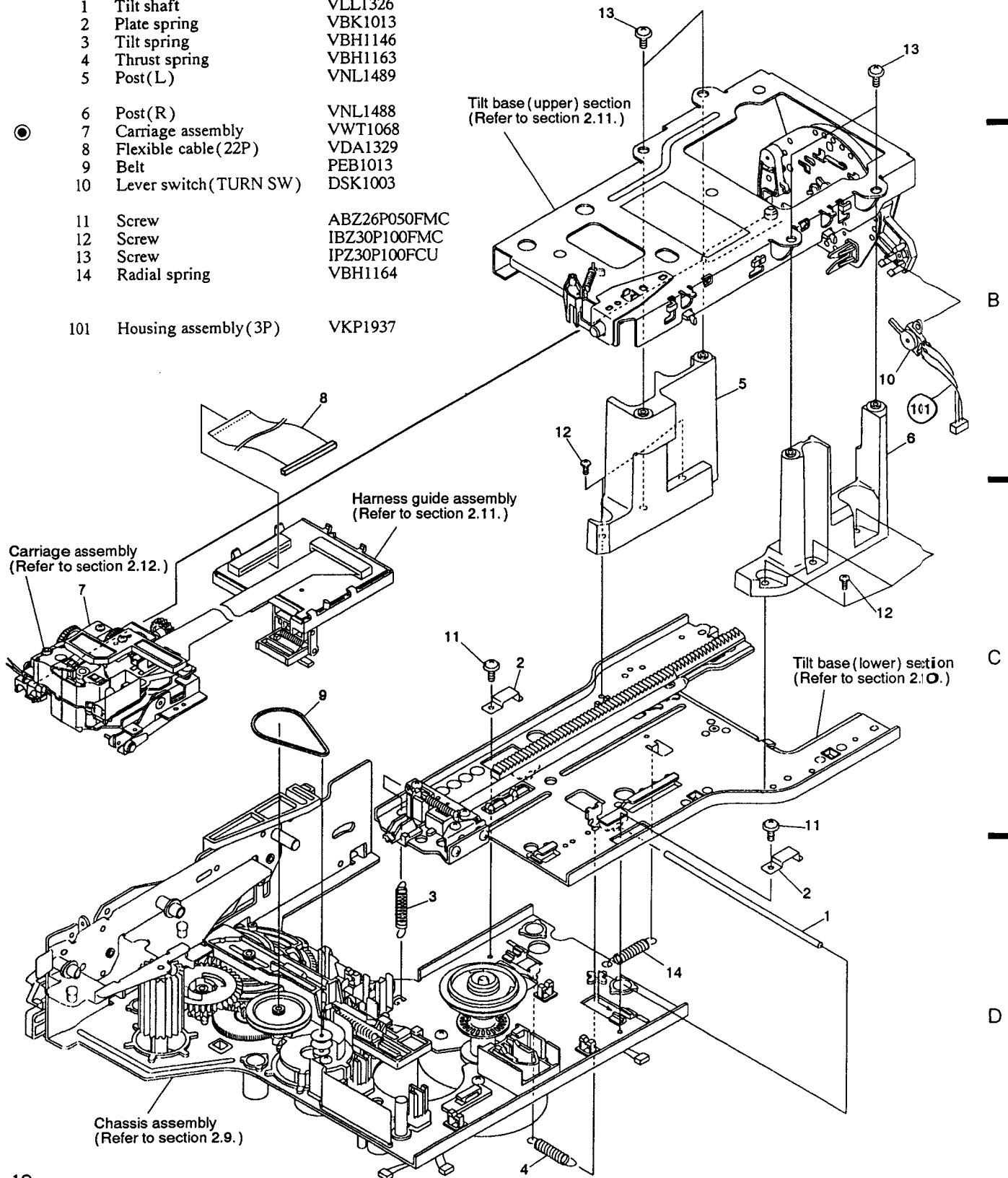
Mark No.	Description	Part No.	Mark No.	Description	Part No.
△ 1	AC power cord	PDG1015	106	Base chassis	VNA1254
△ 2	Cord stopper	CM - 22C	107	Spring guide	VNL1343
3	Power supply assembly	VWR1131	108	Spacer(plastic)	PNY - 404
4	Insulator assembly	VXA1686	109	.....	
5	Insulator assembly	VXA1687	110	PCB holder(B)	VNE1772
6	Insulator	VNK1095			
7	Screw	BBZ30P060FCC			
8	Screw	BBZ30P080FCC			
9	Screw	IBZ30P060FCC			
10	Screw	IPZ30P160FMC			
101	Main board assembly	VWX1120			
102	Stopper	VEC1487			
103	Insulator	VNK1248			
104	P.Plate holder	PNY - 405			
105	Wire clip(B)	VEC1012			



## 2.8 MECHANISM ASSEMBLY

### Parts List

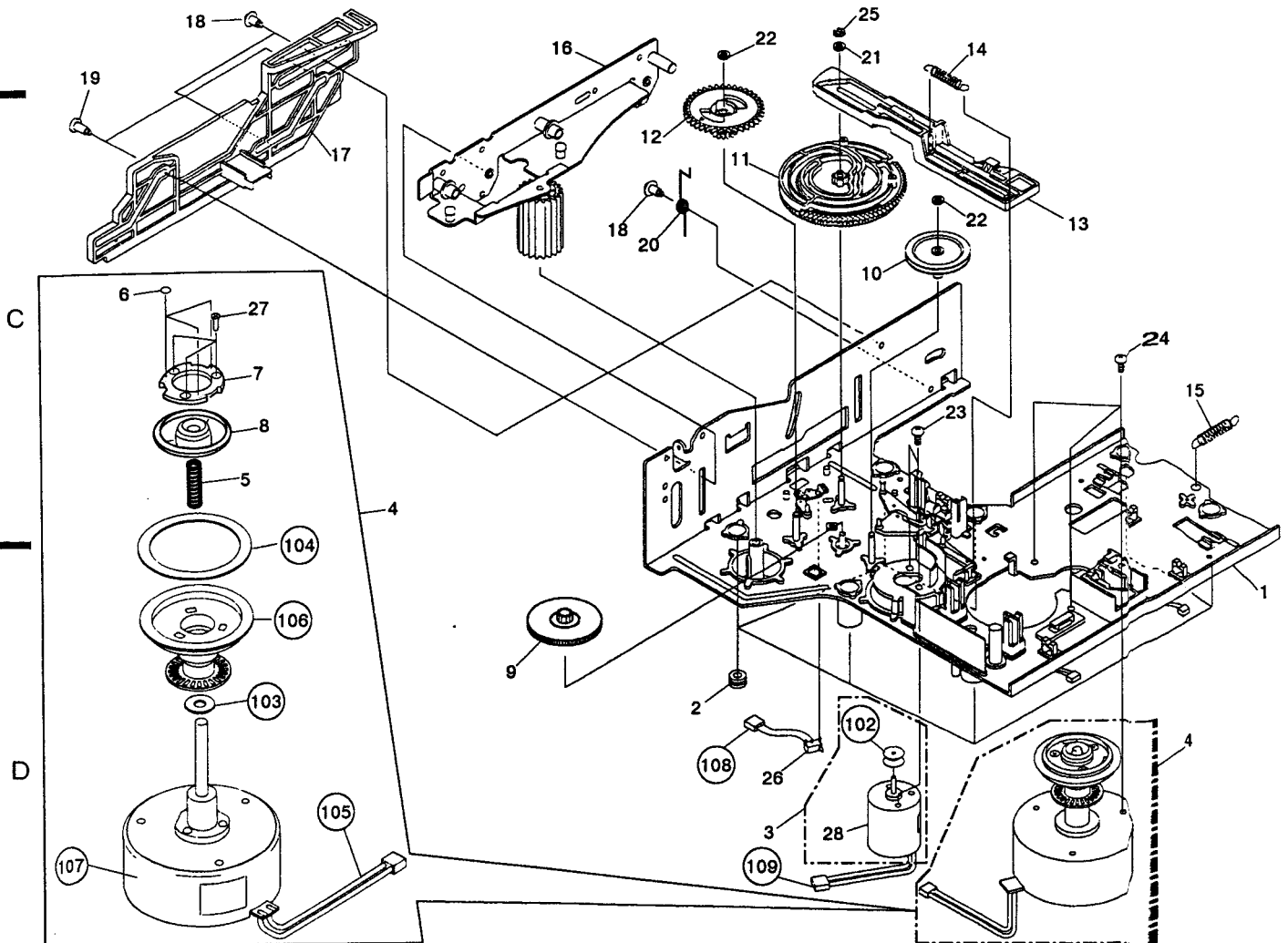
Mark	No.	Description	Part No.
	1	Tilt shaft	VLL1326
	2	Plate spring	VBK1013
	3	Tilt spring	VBH1146
	4	Thrust spring	VBH1163
	5	Post(L)	VNL1489
	6	Post(R)	VNL1488
●	7	Carriage assembly	VWT1068
	8	Flexible cable(22P)	VDA1329
	9	Belt	PEB1013
	10	Lever switch(TURN SW)	DSK1003
	11	Screw	ABZ26P050FMC
	12	Screw	IBZ30P100FMC
	13	Screw	IPZ30P100FCU
	14	Radial spring	VBH1164
	101	Housing assembly(3P)	VKP1937



## 2.9 MECHANISM CHASSIS SECTION

### Parts List

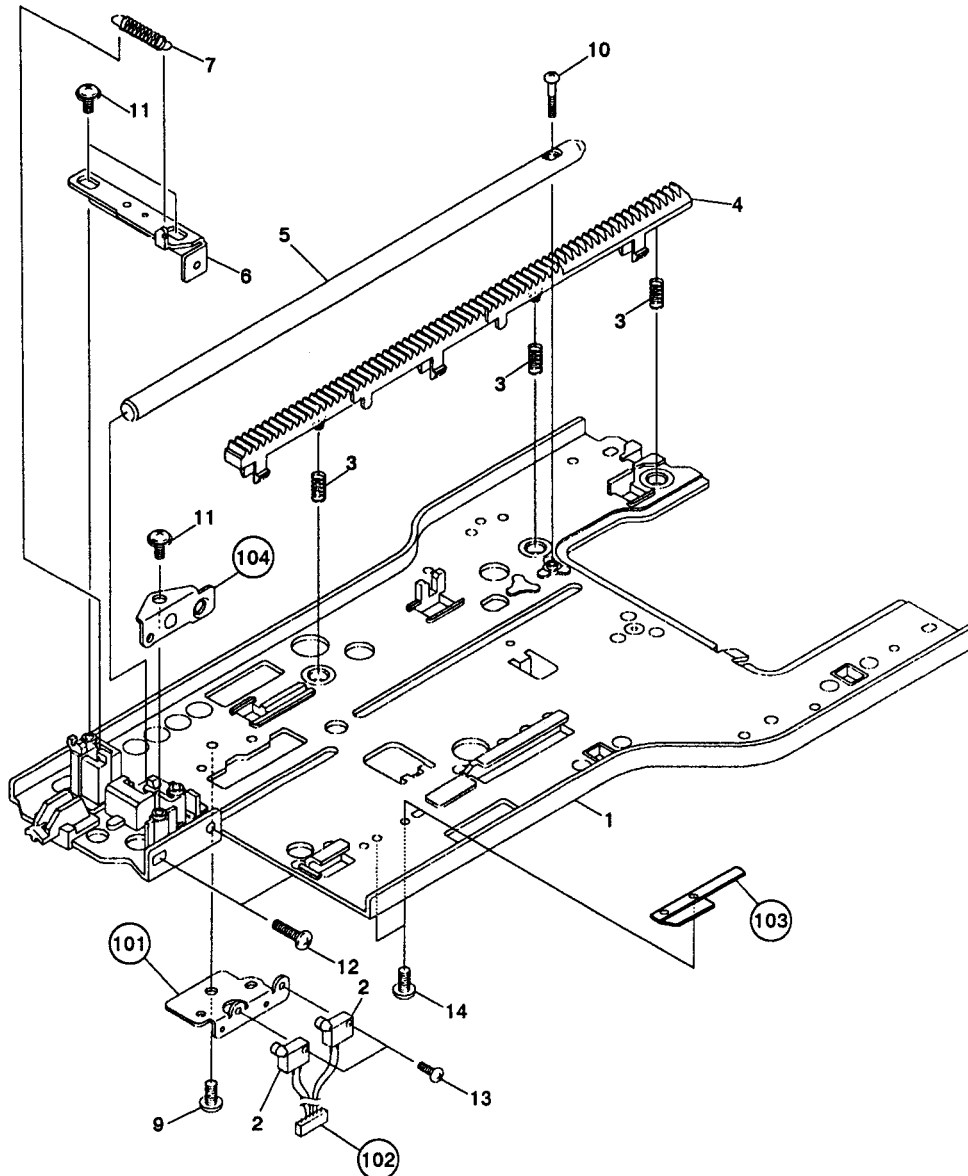
A	Mark No.	Description	Part No.	Mark No.	Description	Part No.
●	1	Chassis assembly	VXA1577	21	Washer	WA32N080W050
	2	Rubber bushing	VEB1138	22	Washer	WT26D047D025
	3	Loading motor assembly	VXX1262	23	Screw	PMZ30P040FCU
	4	Spindle motor assembly	VXA1761	24	Screw	PMA30P050FCU
	5	Centering spring	VBH1024	25	E ring	YE23FUC
	6	Sheet	VEC1510	26	Push switch (TRAY SW)	DSG1014
	7	Yoke plate A	VNE1360	27	Screw	CPZ20P080FMC
	8	Centering hab(A)	VNL1296	28	Loading motor	VXM1034
	9	Two stair gear	VNL1326			
	10	Gear pulley	VNL1249	101	.....	
	11	Cam gear	VNL1350	102	Motor pulley	VLL1176
	12	Follow gear	VNL1317	103	Oil stopped washer	VBF1002
	13	Spring slating cam	VNL1316	104	Rubber sheet	VEB1135
	14	Cam spring	VBH1082	105	Housing assembly (02P)	VKP1566
	15	Radial spring	VBH1164	106	Turn table assembly	VXA1760
B	16	Roller plate assembly	VXA1770	107	Spindle assembly	VXM1046
	17	Slide cam	VNL1304	108	Housing assembly (02P red)	VKP1815
	18	Screw(B)	VBA1008	109	Housing assembly	VKP1875
	19	Screw(C)	VBA1015			
	20	Return spring	VBH1129			



## 2.10 TILT BASE (LOWER) SECTION

### Parts List

Mark	No.	Description	Part No.	Mark	No.	Description	Part No.
◎	1	Tilt base (Lower) assembly	VXA1798	11	Screw	IPZ20P080FMC	
	2	Slide switch (LD, CDV INSIDE)	OSH1001	12	Screw	BMZ26P100FMC	
	3	Rack spring	VBH1133	13	Screw	PMZ20P060FMC	
	4	Rack gear (Lower)	VNL1346	14	Screw	PMZ20P030FMC	
	5	Carriage shaft (Lower)	VLL1325	101	SW holder	VNE1620	
	6	Shaft plate (Lower) assembly	VXA1626	102	Housing assembly (04P white)	VKP1851	
	7	S plate spring	VBH1149	103	Roller shaft holder plate	VNE1666	
	8	• • • • •		104	S plate holder	VNE1621	
	9	Screw	BBZ30P060FCC				
	10	Screw	PPZ20P120FMC				



A

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C

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### 2.11 TILT BASE (UPPER) SECTION

#### Parts List

Mark No.	Description	Part No.	Mark No.	Description	Part No.
1	Tilt base (Upper) assembly	VXA1808	11	Guide spring (B)	VBH1155
2	SW lever	VNL1359	12	Harness guide (B)	VNL1408
3	SW lever spring	VBH1150	13	Guide spring (A)	VBH1166
4	Carriage shaft (Upper)	VLL1324	14	Harness guide (A)	VNL1349
5	Rack gear (Upper)	VNL1345	15	Washer	WT16D032D025
6	Internal gear assembly	VXA1491	16	Washer	WT36D072D050
7	R plate assembly	VXA1579	17	Screw	PMZ20P120FMC
8	Rock lever	VNL1351	18	Screw	BBZ26P050FCC
9	Lever spring	RBH1323	19	Carriage assembly	VWT1068
10	Harness guide (C)	VNL1361	20	Rock plate	VBK1026
			21	Screw	IBZ20P040FZK
			22	Washer	WB20FMC
			101	CNNB assembly	VWG1194

### 2.12 CARRIAGE ASSEMBLY

#### Parts List

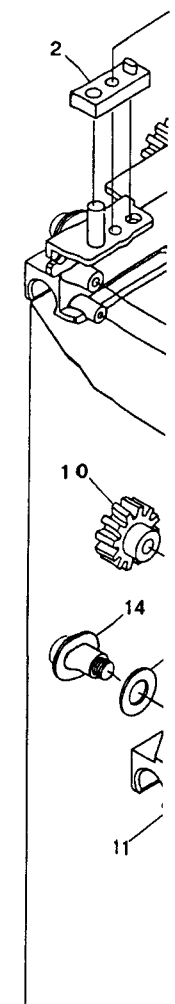
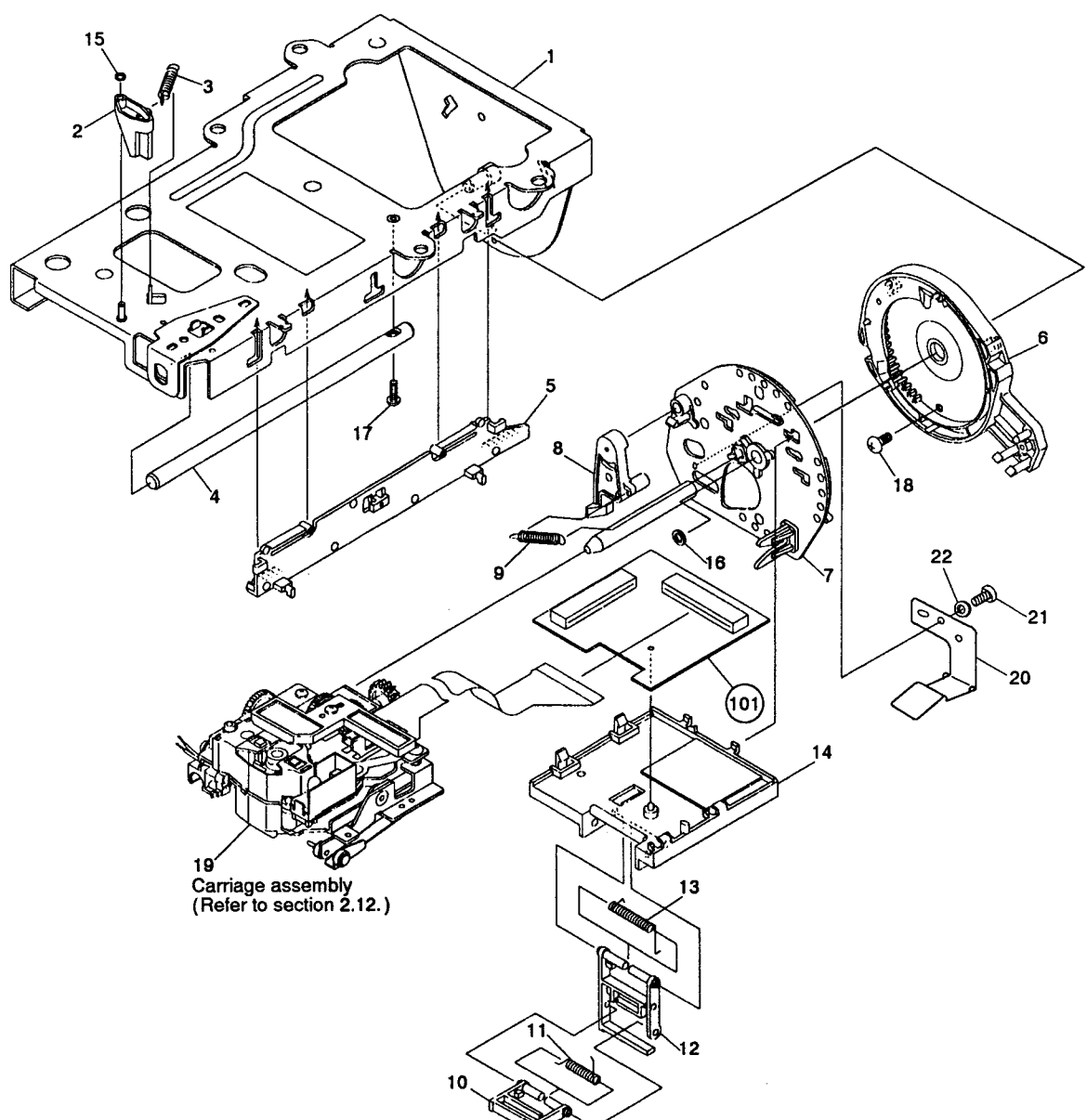
Mark No.	Description	Part No.	Mark No.	Description	Part No.
1	Flexible holder	VNL1358	101	Slider motor	VXM1027
2	PU base	VNT1037	102	P.C.board, SLMB	VNP1295
3	Housing assembly (1.5MP2P)	VKP1852			
4	Bolt 2.6 x 10	VLL1192			
5	TAN base assembly	VXA1752			
6	TAN spring	VBH1151			
7	Slide switch (CD,B INSIDE)	VSK1008			
8	TRKG spring	VBH1152			
9	SL shaft (B)	VLL1334			
10	Gear (F)	VNL1356			
11	Carriage shaft holder	VNT1039			
12	Gear (E)	VNL1355			
13	PU plate assembly	VXA1583			
14	Screw 4	VLL-183			
15	Spring washer φ 4	VEF-027			
16	Pickup assembly - S	VXX1553			
17	Carriage motor assembly - S	VXX1537			
18	SL gear (A)	VNL1250			
19	SL shaft (C)	VLL1289			
20	Gear (G)	VNL1365			
21	Motor holder assembly	VXA1751			
22	Gear (H)	VNL1357			
23	Gear (C)	VNL1353			
24	SL shaft (A)	VLL1333			
25	Gear (B)	VNL1352			
26	Gear (D)	VNL1354			
27	Stop ring	YE12FUC			
28	Washer	WT17D034D050			
29	Screw	JGZ20P022FMC			
30	Screw	PMZ26P100FMC			
31	Screw	BMZ26P080FMC			
32	Screw	PMA20P040FMC			
33	Screw	PMH26P050FMC			
34	Screw	PBZ20P070FCC			
35	Screw	BBZ26P050FMC			
36	Actuator assembly	VXX1551			
37	Sensor assembly	VEX1018			
38	Pre-pickup assembly	VXX1554			
39	Sensor stay	VNH1024			
40	Screw	PMA20P060FMC			
41	Screw	PMA20P080FMC			
42	Screw	PMA20P160FMC			
43	Screw	BMZ20P060FMC			
44	Sensor spring	VBH1087			
45	Spacer	VEC1496			
46	Cushion	VEV1497			

A

B

C

D



1

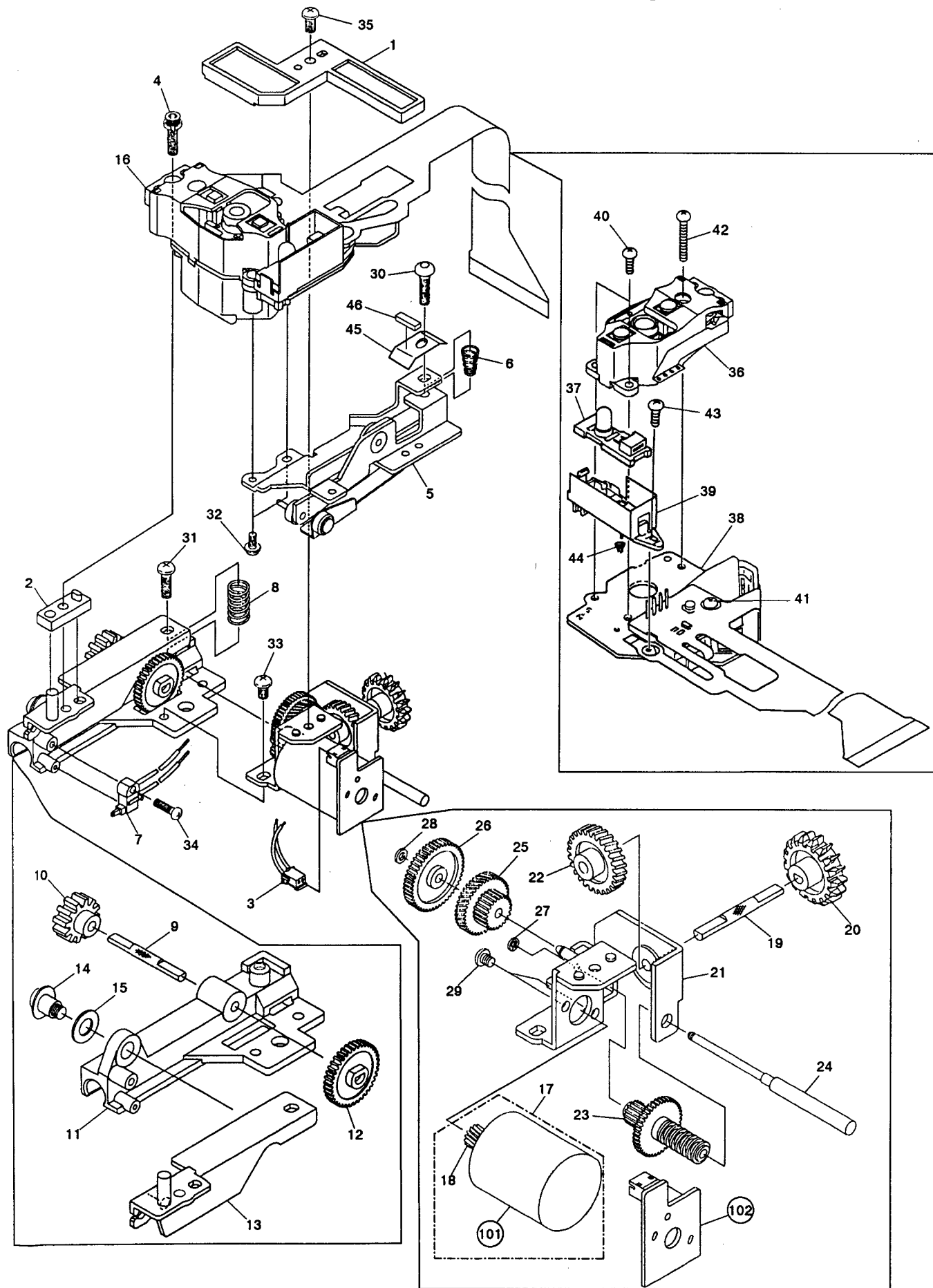
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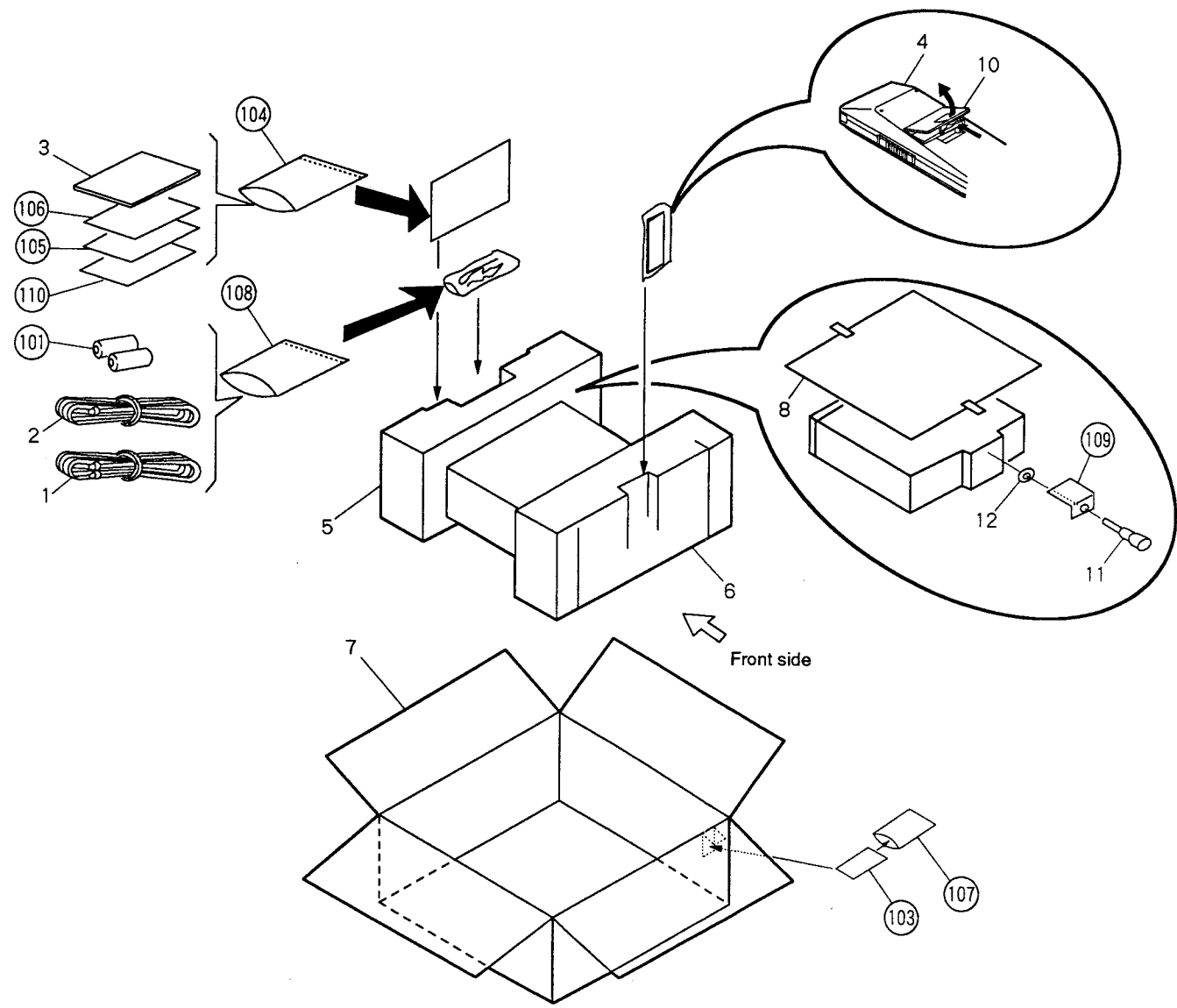
6



2.13 PACKING

Parts List

Mark No.	Description	Part No.	Mark No.	Description	Part No.
1	Connection cord	VDE-055	101	Dry cell battery (R03, AAA)	VEM-022
2	Video cable	VDE-056	102	.....	
3	Operating instructions	VRB1067	103	Warranty card	ARY1044
4	Remote control unit	VXX1722	104	Polyethylene bag	VHL-014
5	Pad (R)	VHA1099	105	Caution card	VRR1009
6	Pad (F)	VHA1100	106	Caution card (UC)	VRM1026
7	Packing case	VHG1211	107	Polyethylene bag	Z21-010
8	Mirror mat	VHL1012	108	Polyethylene bag	Z21-029
9	.....		109	Tac card	VRW1200
10	Battery cover	DNK2286	110	Caution card (UC)	VRM1039
11	Shipping screw	VLL1358			
12	Washer	WT36D072D025			



7

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11

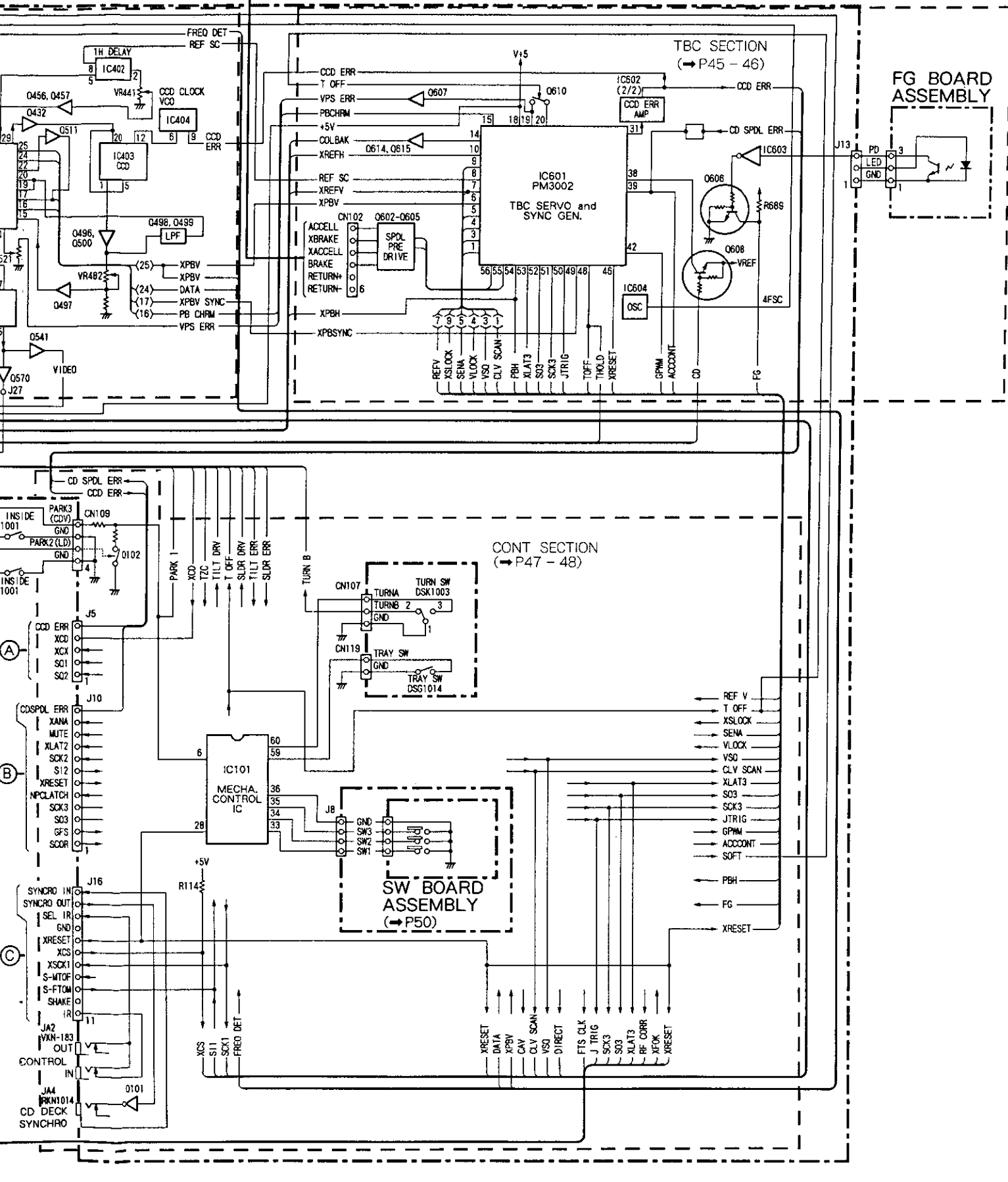
12

18

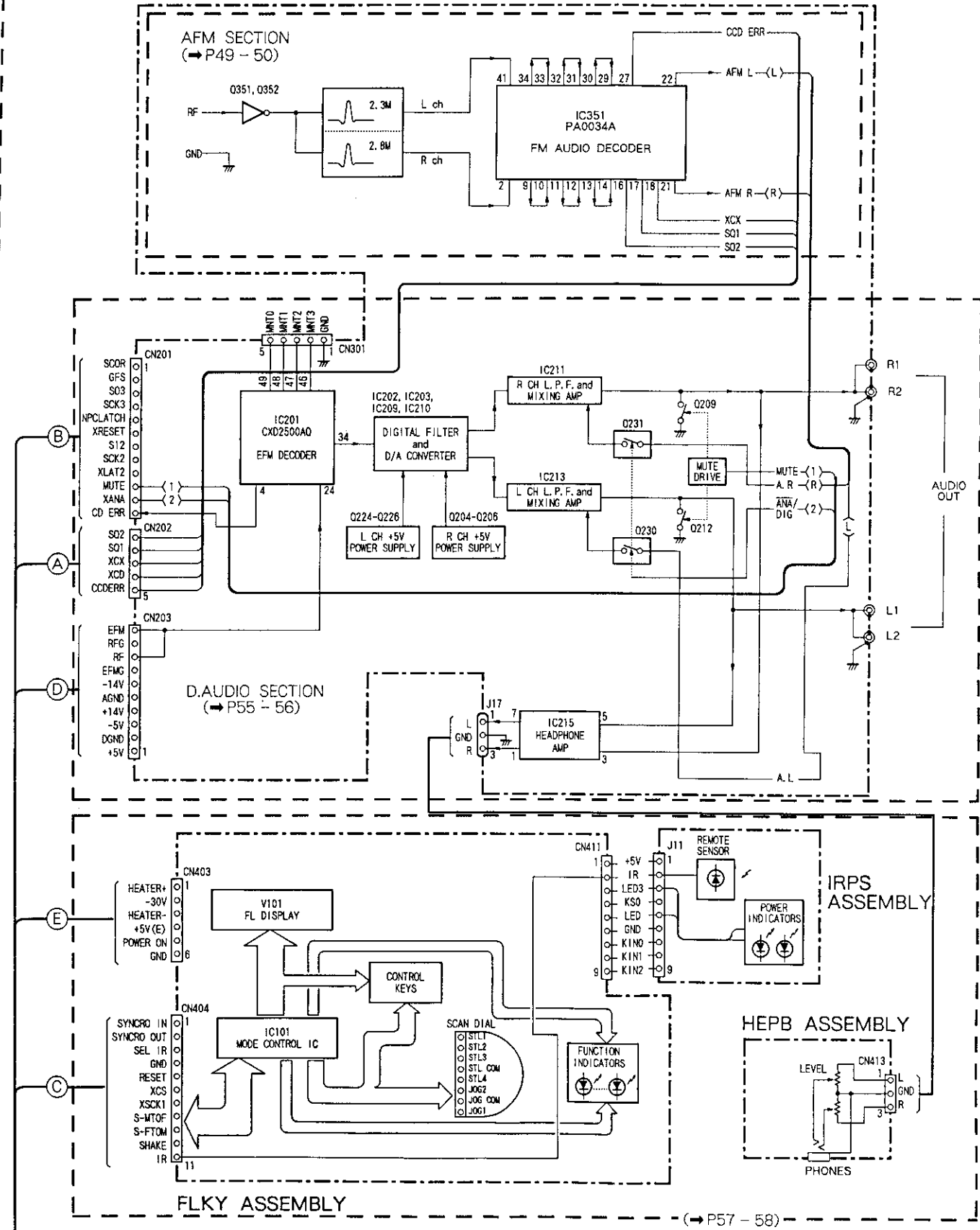


7 8 9 10 11 12

MAIN BOARD ASSEMBLY

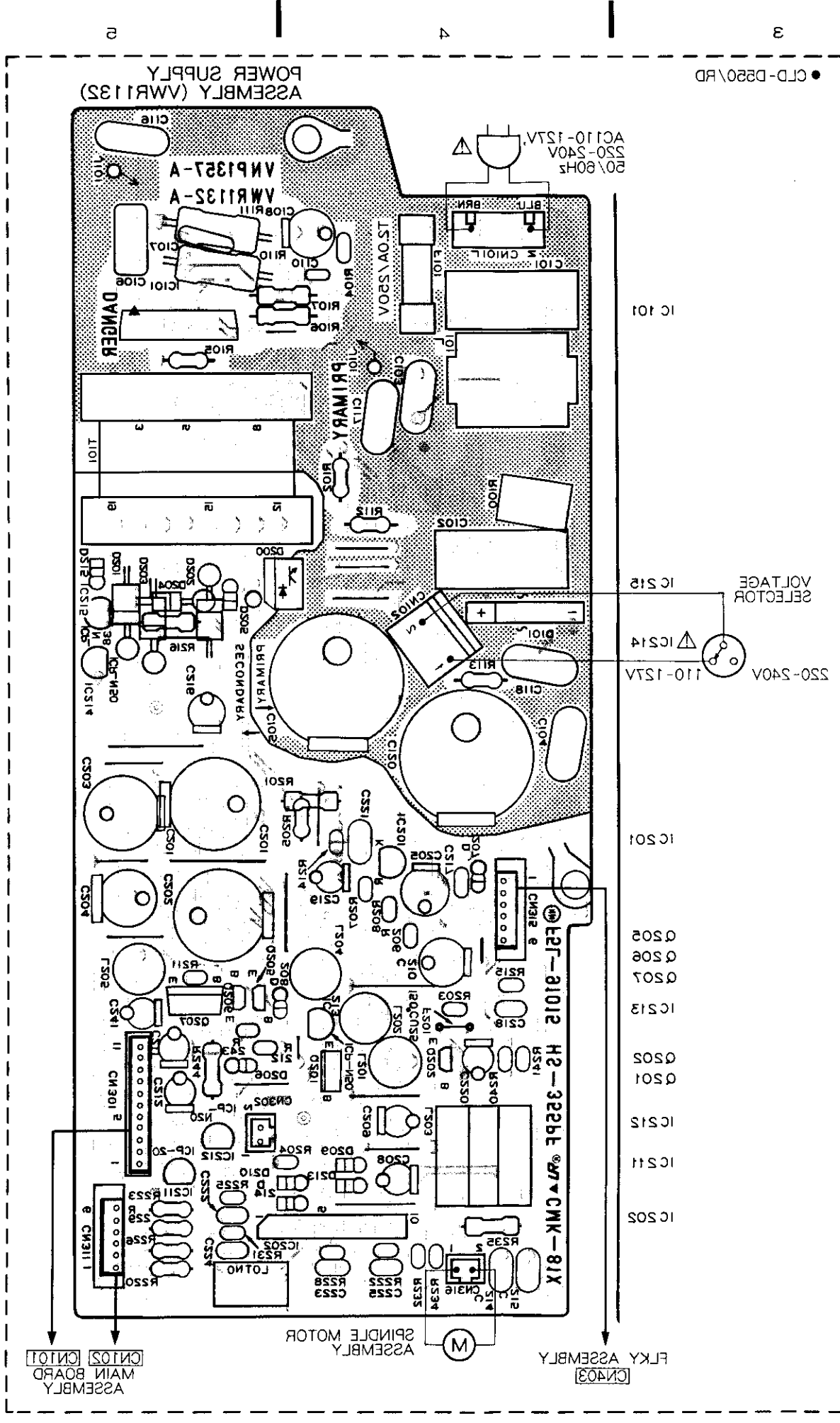
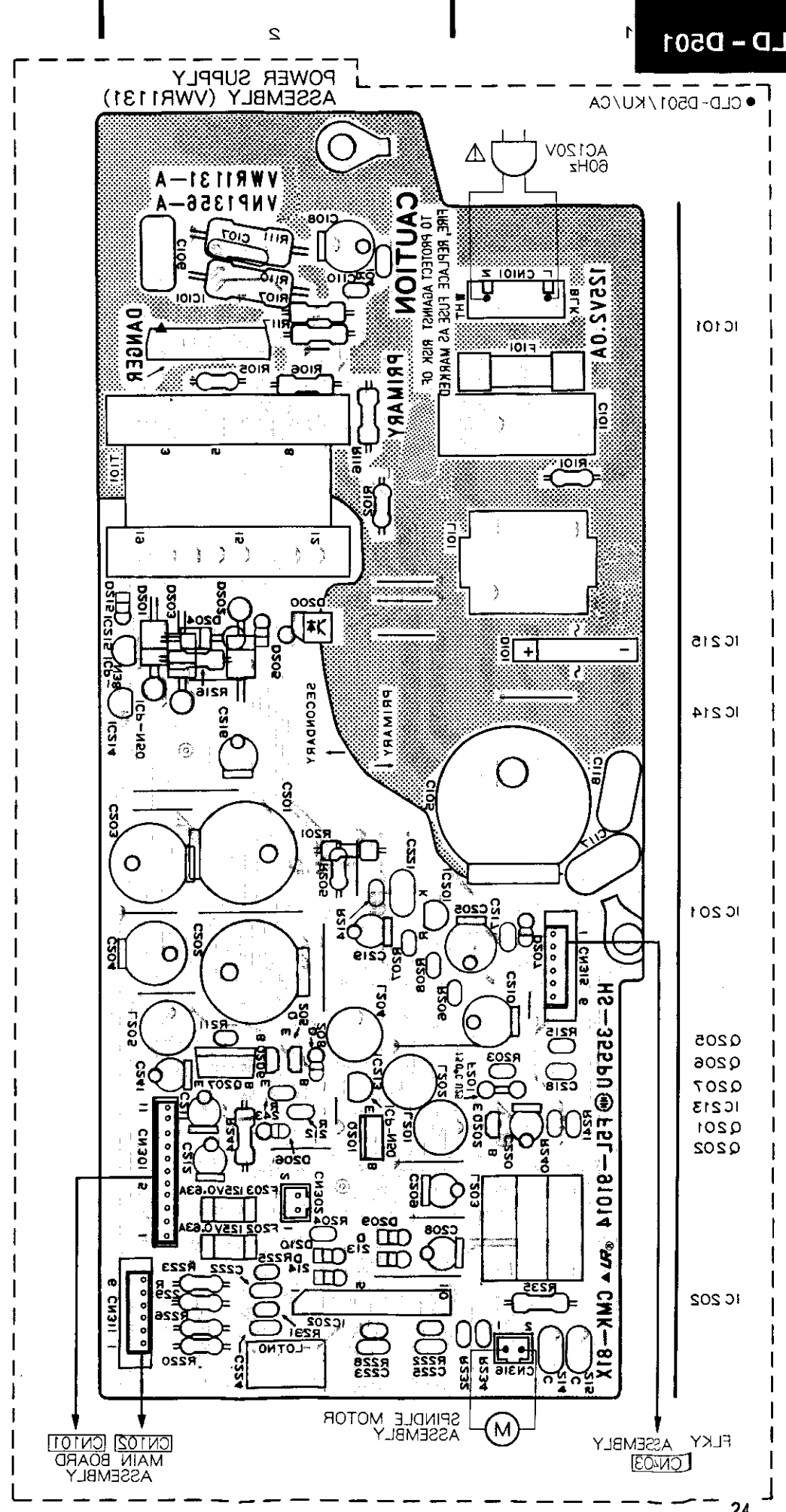


AUDIO ASSEMBLY (VWV1250)



A  
B  
C  
D





Part name	Corresponding bar	Indicator	P.C.B. pattern alignment
Transformer			
FET			
Diode			
Turner diode			
LED			
Varactor			
Test switch			
Inductor			
Coil			
Transformer			
Filter			
Ceramic capacitor			
Mylar capacitor			
Electrolytic capacitor (Non polarized)			
Electrolytic capacitor (Polarized)			
Power capacitor			
2-watt fixed resistor			
Resistor array			
Resistor			
Resistor			
Thermistor			

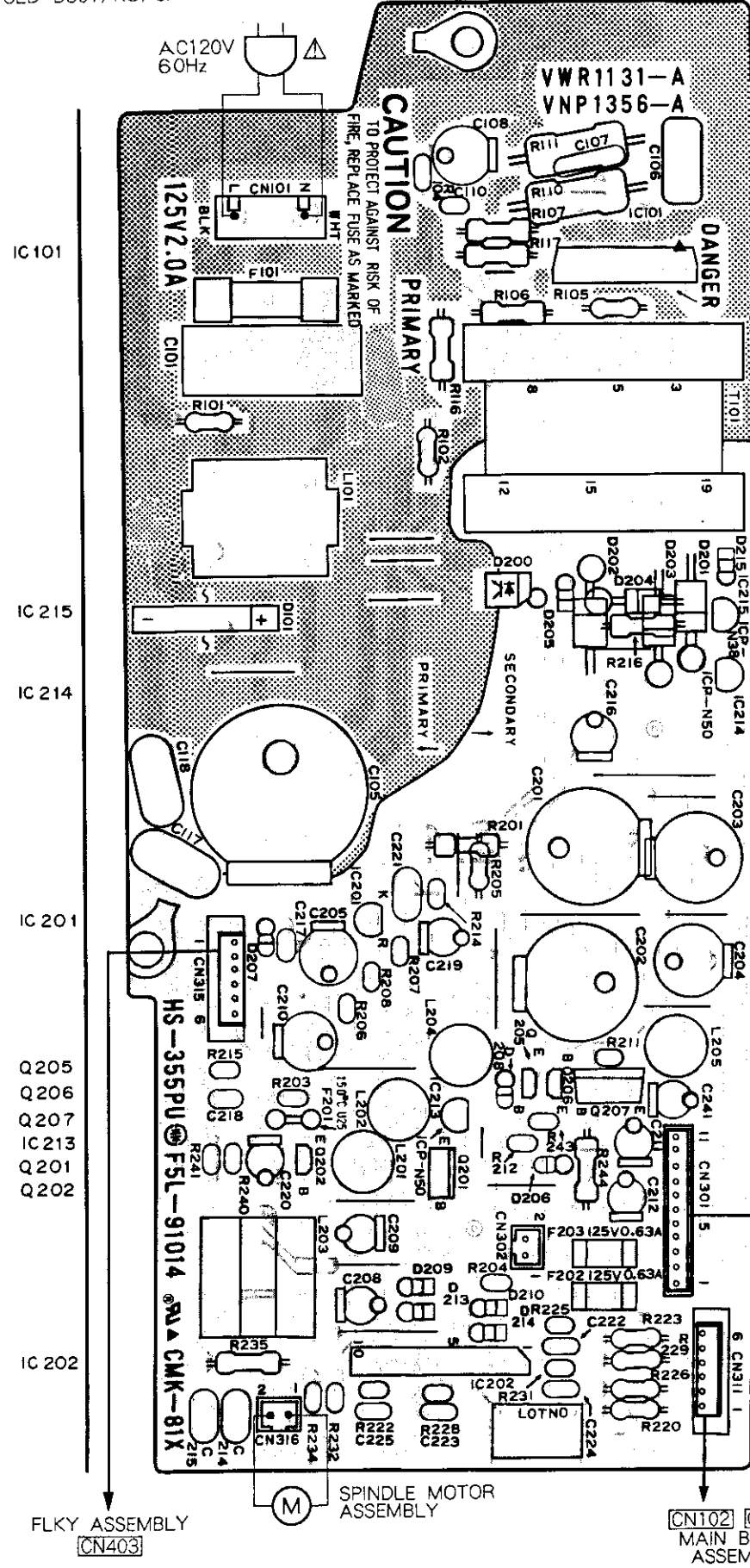
This P.C.B. connection diagram is viewed from the foil side.

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

A  
B  
C  
D

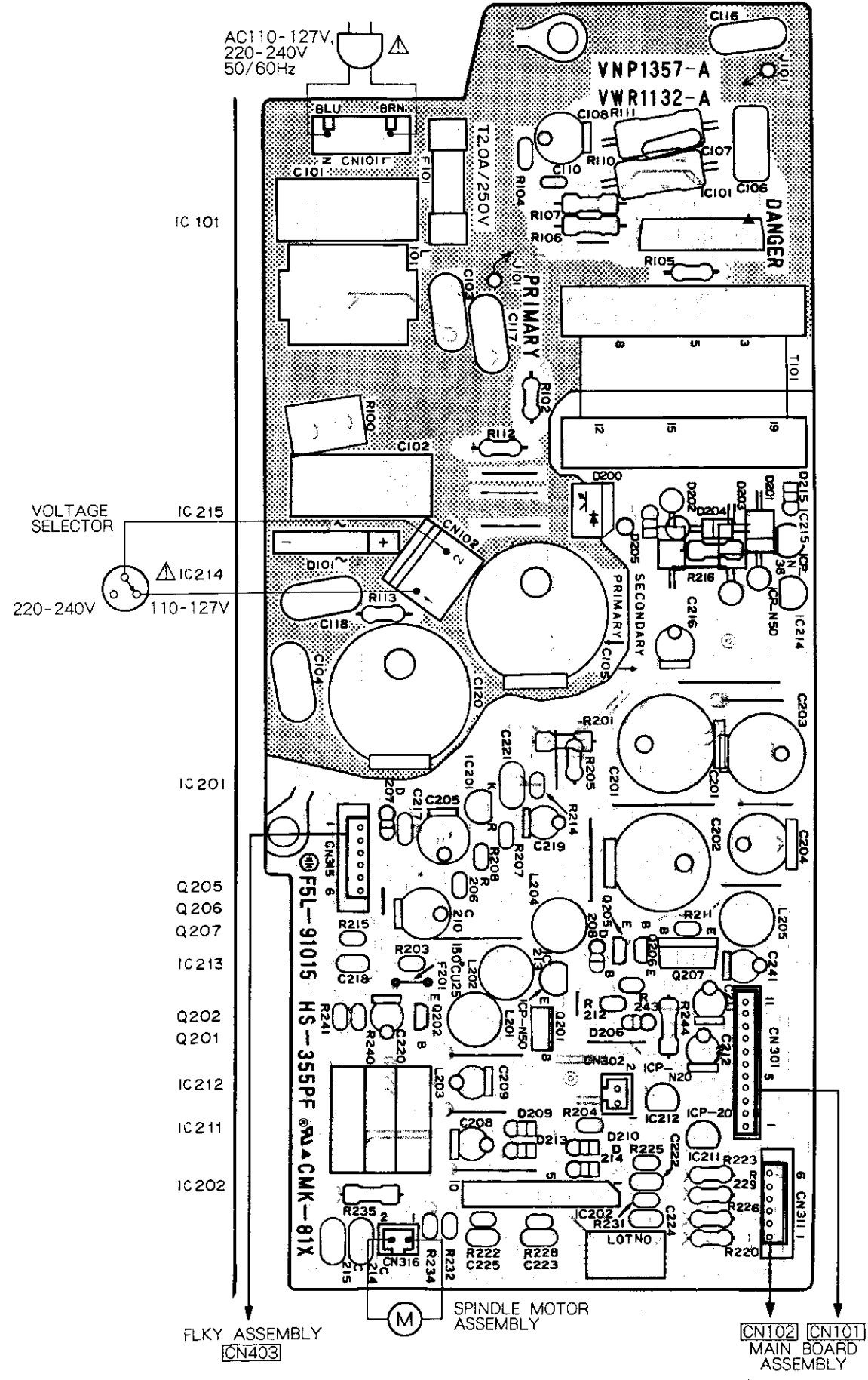
• CLD-D501/KU/CA

POWER SUPPLY ASSEMBLY (VWR1131)



• CLD-D550/RD

POWER SUPPLY ASSEMBLY (VWR1132)

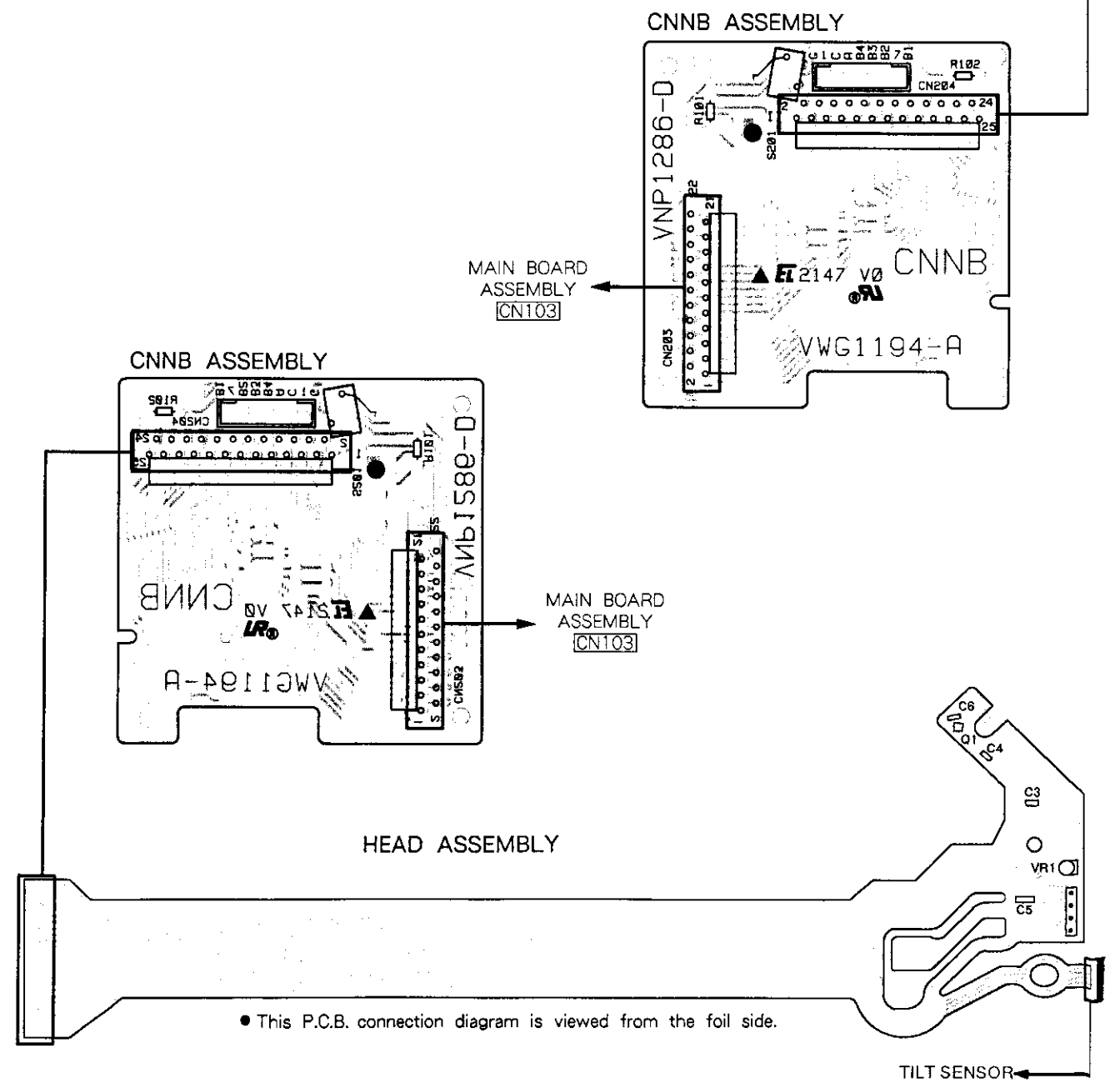
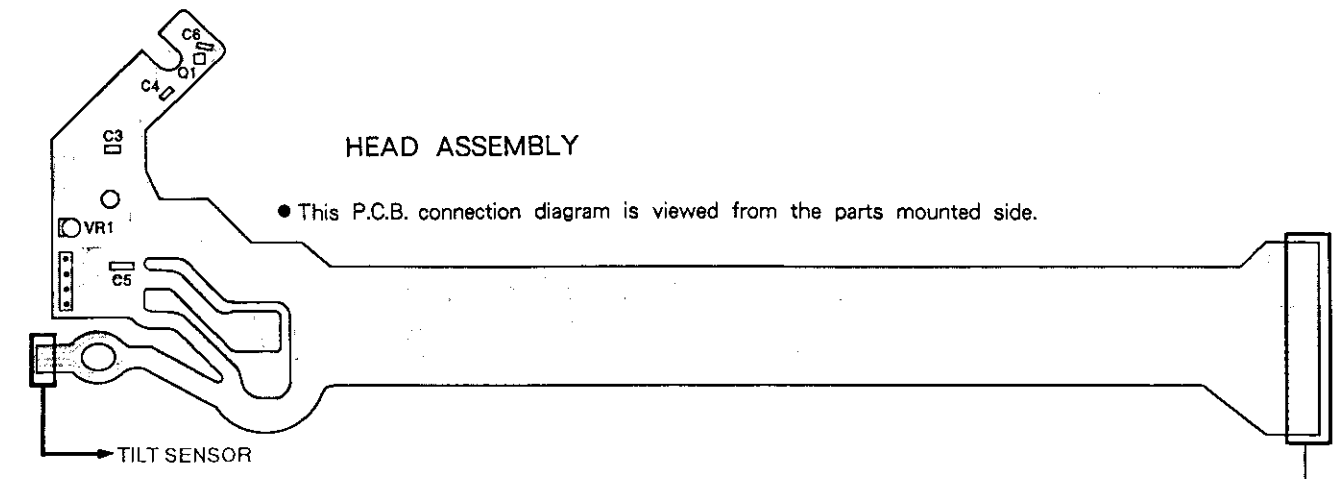
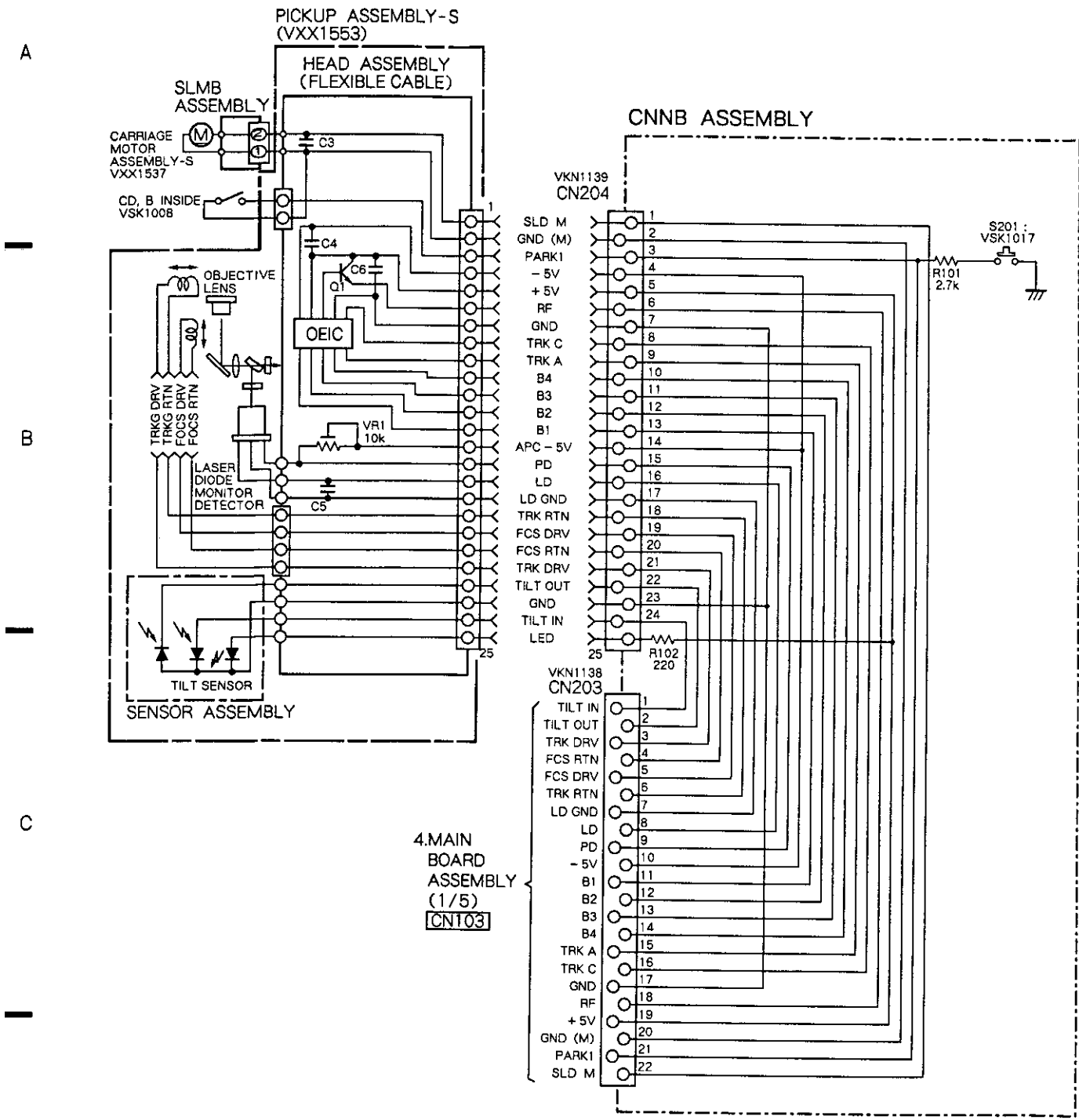


P.C.B. pattern diagram indication	Corresponding part symbol	Part name
		Transformer
		FET
		Diode
		Zener diode
		LED
		Varactor
		Tact switch
		Inductor
		Coil
		Transformer
		Filter
		Ceramic capacitor
		Mylar capacitor
		Styroly capacitor
		Electrolytic capacitor (Non polarized)
		Electrolytic capacitor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

1. This P.C.B. connection diagram is viewed from the parts mounted side.
2. The parts which have been mounted on the board can be replaced; if 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.



3. PICKUP AND CNNB ASSEMBLIES



Waveforms of the FTS section

Note : (No.) in the table correspond to the pin No.

IC801 (CXA1081S)		CN401	IC803 (PM3003)		Other points
(1)	(20)	(3)	(1)	(39)	(1) Q810 Collector
(2)	(22)	(4)	(8)	(40)	(2) Q809 Emitter
(7)	(23)	(5)	(34)	(43)	(3) Between C830 and C832.
(12)	(27)	(6)	(35)	(47)	(4) Q828 Collector
(15)	/		(7)	(36)	(5) CN103 Pin 18
(9)			(38)	(56)	(6) CN103 Pin 20
(10)	/		(11)		

4. MAIN BOARD ASSEMBLY (1/5)

MAIN BOARD ASSEMBLY (1/5)  
● FTS SECTION

Note: Abbreviations listed indicate circuit connections.

FTS	: 4. MAIN BOARD ASSEMBLY (1/5)
VIDEO	: 5. MAIN BOARD ASSEMBLY (2/5)
Y/C SEP	: 6. MAIN BOARD ASSEMBLY (3/5)
TBC	: 7. MAIN BOARD ASSEMBLY (4/5)
CONT	: 8. MAIN BOARD ASSEMBLY (5/5)

A

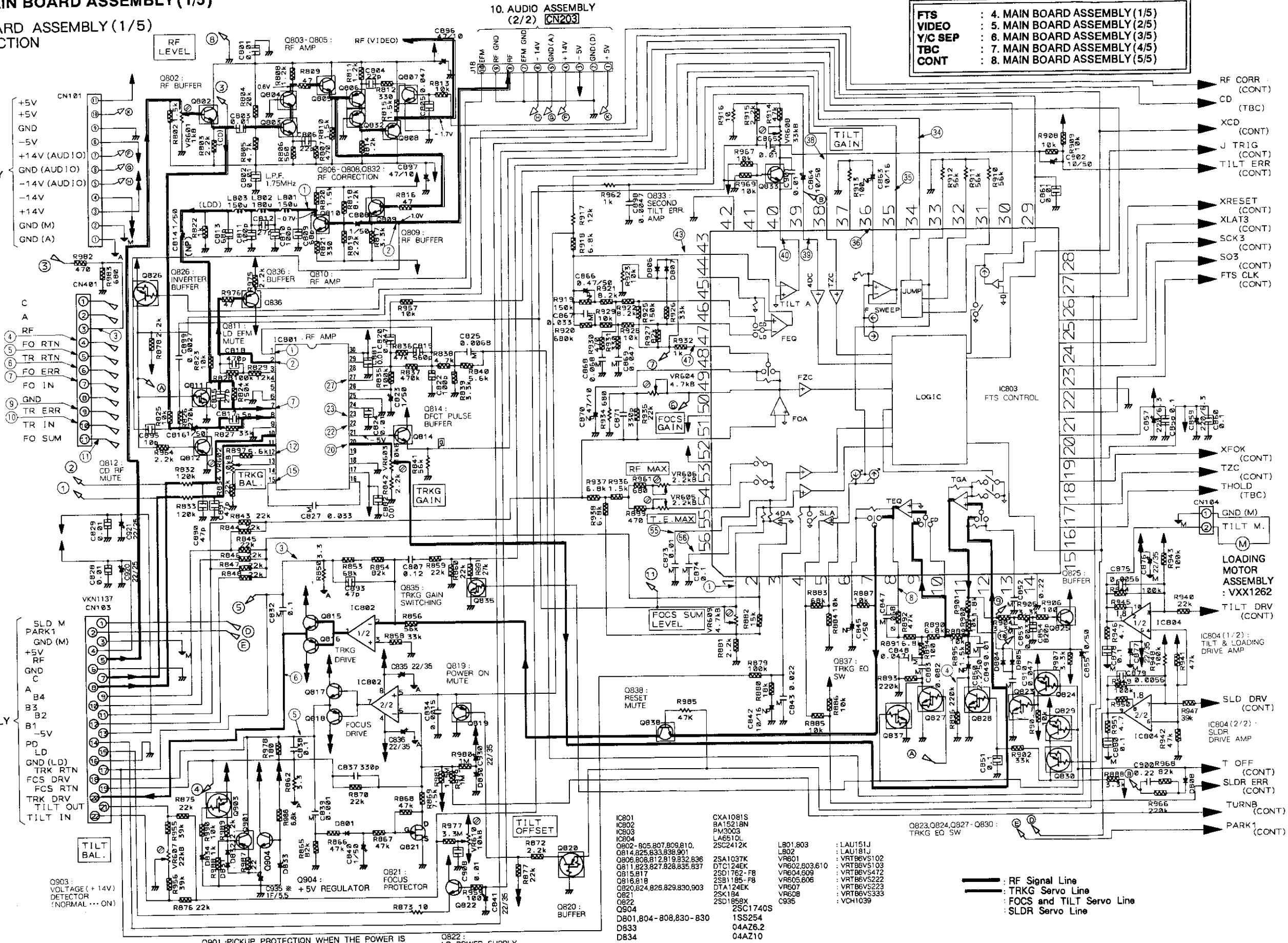
2. POWER SUPPLY ASSEMBLY (CN301)

B

C

3. CNNB ASSEMBLY (CN203)

D



IC801	CXA1081S	L801.803	: LAU151J
IC802	BA15218N	L802	: LAU181J
IC803	PM3003	VR601	: VRTBEVS102
IC804	LA6510L	VR602.603.610	: VRTBEVS103
Q802-805.807.809.810.	2SC2412K	VR604.609	: VRTBEVS472
Q814.825.833.836.901	2SA1037K	VR605.606	: VRTBEVS222
Q806.808.812.819.832.836	DTC124EK	VR607	: VRTBEVS223
Q811.823.827.828.835.837	2SD1762-F8	VR608	: VRTBEVS333
Q815.817	2SB1185-F8	VR609	: VCH1039
Q816.818	DTA124EK		
Q820.824.826.829.830.903	2SK134		
Q821	2SD1858X		
Q822	2SC1740S		
Q823	1SS254		
Q824	04AZ6.2		
Q825	04AZ10		
Q826			
Q827			
Q828			
Q829			
Q830			

RF Signal Line  
TRKG Servo Line  
FOCUS and TILT Servo Line  
SLDR Servo Line

Q901: PICKUP PROTECTION WHEN THE POWER IS SHUT OFF IN THE DISC B PLAYBACK  
Q822: LD POWER SUPPLY

AUDIO ASSEMBLY (CN203)

POWER SUPPLY ASSEMBLY (CN301)

CNNB ASSEMBLY (CN203)

LOADING MOTOR ASSEMBLY

LOADING MOTOR ASSEMBLY

LOADING MOTOR ASSEMBLY

LOADING MOTOR ASSEMBLY

LOADING MOTOR ASSEMBLY

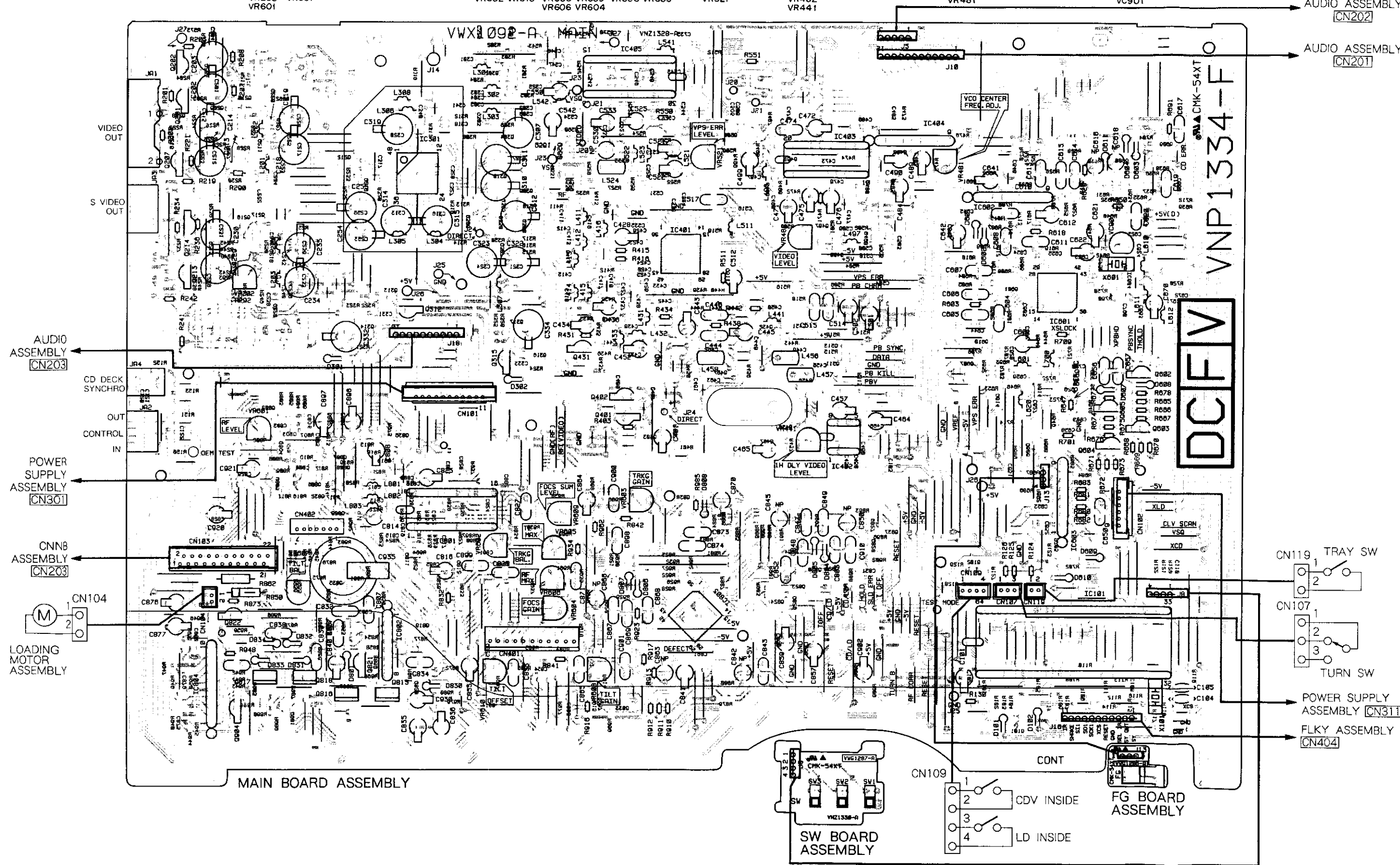
LOADING MOTOR ASSEMBLY

LOADING MOTOR ASSEMBLY

LOADING MOTOR ASSEMBLY

VR202 VR607 VR601 VR602 VR610 VR605 VR609 VR608 VR603 VR521 VR482 VR441 VR481 VC901

IC207 IC214 IC213 IC822 IC815 IC818 IC802 IC301 IC801 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 IC1000



A  
B  
C  
D





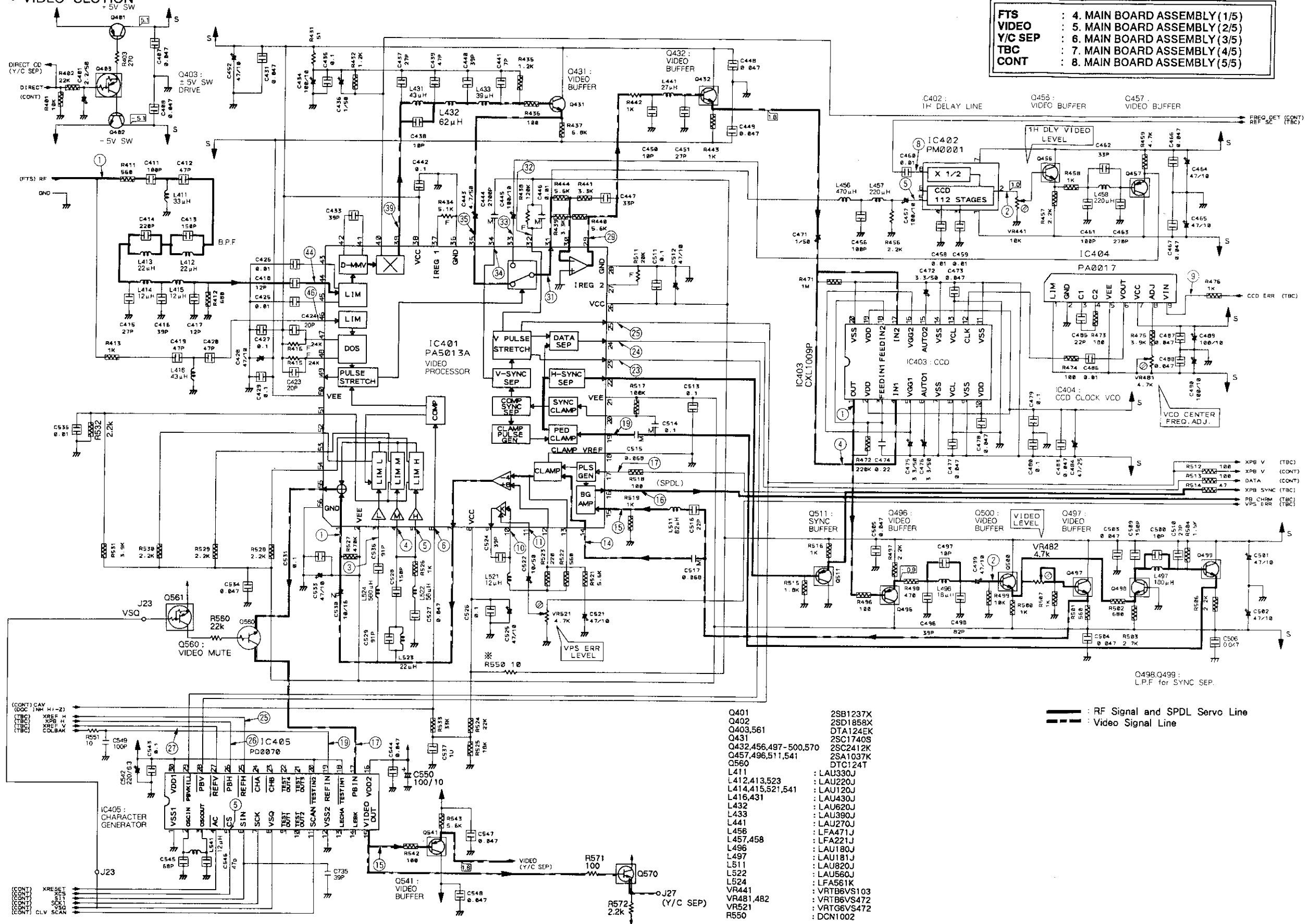
5. MAIN BOARD ASSEMBLY (2/5)

MAIN BOARD ASSEMBLY (2/5)

● VIDEO SECTION

Note: Abbreviations listed indicate circuit connections.

FTS	: 4. MAIN BOARD ASSEMBLY (1/5)
VIDEO	: 5. MAIN BOARD ASSEMBLY (2/5)
Y/C SEP	: 6. MAIN BOARD ASSEMBLY (3/5)
TBC	: 7. MAIN BOARD ASSEMBLY (4/5)
CONT	: 8. MAIN BOARD ASSEMBLY (5/5)



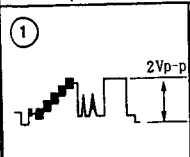
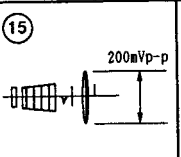
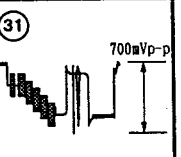
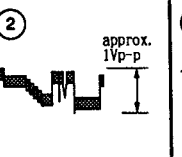
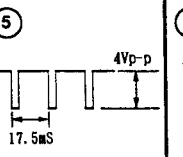
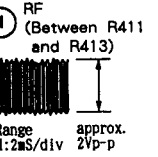
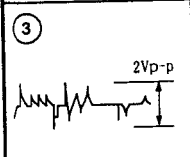
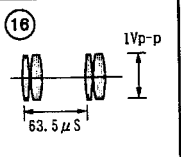
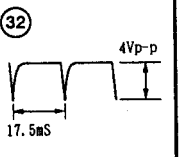
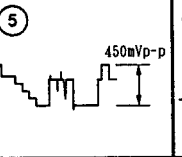
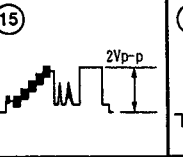
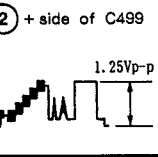
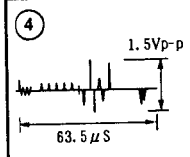
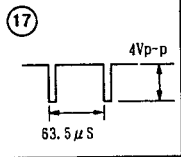
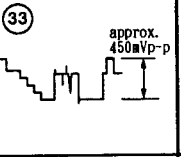
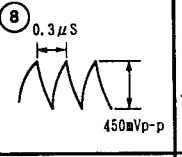
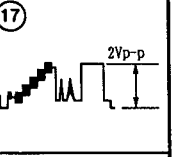
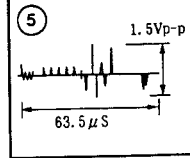
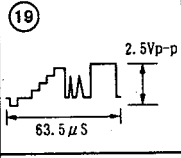
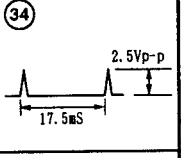
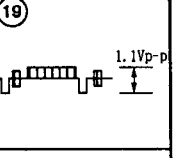
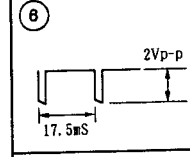
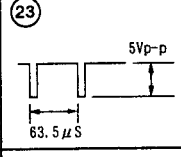
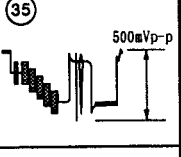
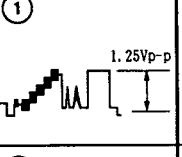
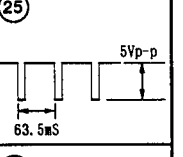
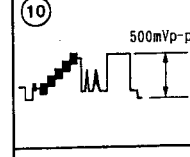
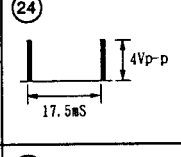
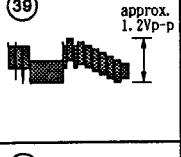
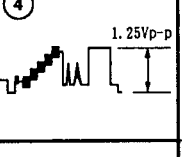
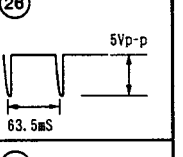
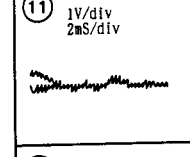
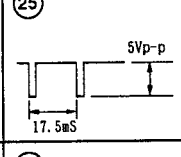
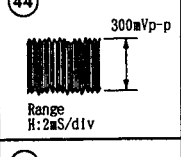
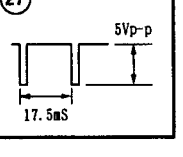
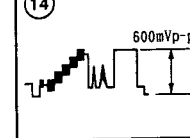
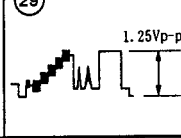
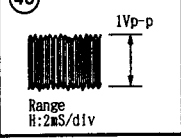
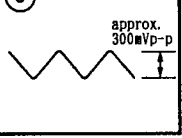
VIDEO ASSEMBLY (CN303)  
 POWER SUPPLY ASSEMBLY (CN301)  
 CNMB ASSEMBLY (CN303)  
 MOTOR LOADING ASSEMBLY (M)

- O401 : 2B81237X
- O402 : 2SD1858X
- O403,561 : DTA124EK
- O431 : 2SC1740S
- O432,456,497-500,570 : 2SC2412K
- O457,496,511,541 : 2SA1037K
- O560 : DTC124T
- L411 : LAU330J
- L412,413,523 : LAU220J
- L414,415,521,541 : LAU20J
- L416,431 : LAU430J
- L432 : LAU620J
- L433 : LAU390J
- L441 : LAU270J
- L456 : LFA471J
- L457,458 : LFA221J
- L496 : LAU180J
- L497 : LAU181J
- L511 : LAU820J
- L522 : LAU560J
- L524 : LFA561K
- VR441 : VRTB6VS103
- VR481,482 : VRTB6VS472
- VR521 : VRTG6VS472
- R550 : DCN1002

--- : RF Signal and SPDL Servo Line  
 - - - : Video Signal Line

A  
 B  
 C  
 D

Waveforms of the VIDEO section Note : (No.) in the table correspond to the pin No.

IC401 (PA5013A)			IC402 (PM0001)	IC405 (PD0070)	Other points
(1) 	(15) 	(31) 	(2) 	(5) 	(1) RF (Between R411 and R413)  Range H: 2mS/div
(3) 	(16) 	(32) 	(5) 	(15) 	(2) + side of C499 
(4) 	(17) 	(33) 	(8) 	(17) 	
(5) 	(19) 	(34) 	IC403 (CXL1009P)		(19) 
(6) 	(23) 	(35) 	(1) 	(25) 	
(10) 	(24) 	(39) 	(4) 	(26) 	
(11) 	(25) 	(44) 	IC404 (PA0017)		(27) 
(14) 	(29) 	(46) 	(9) 		

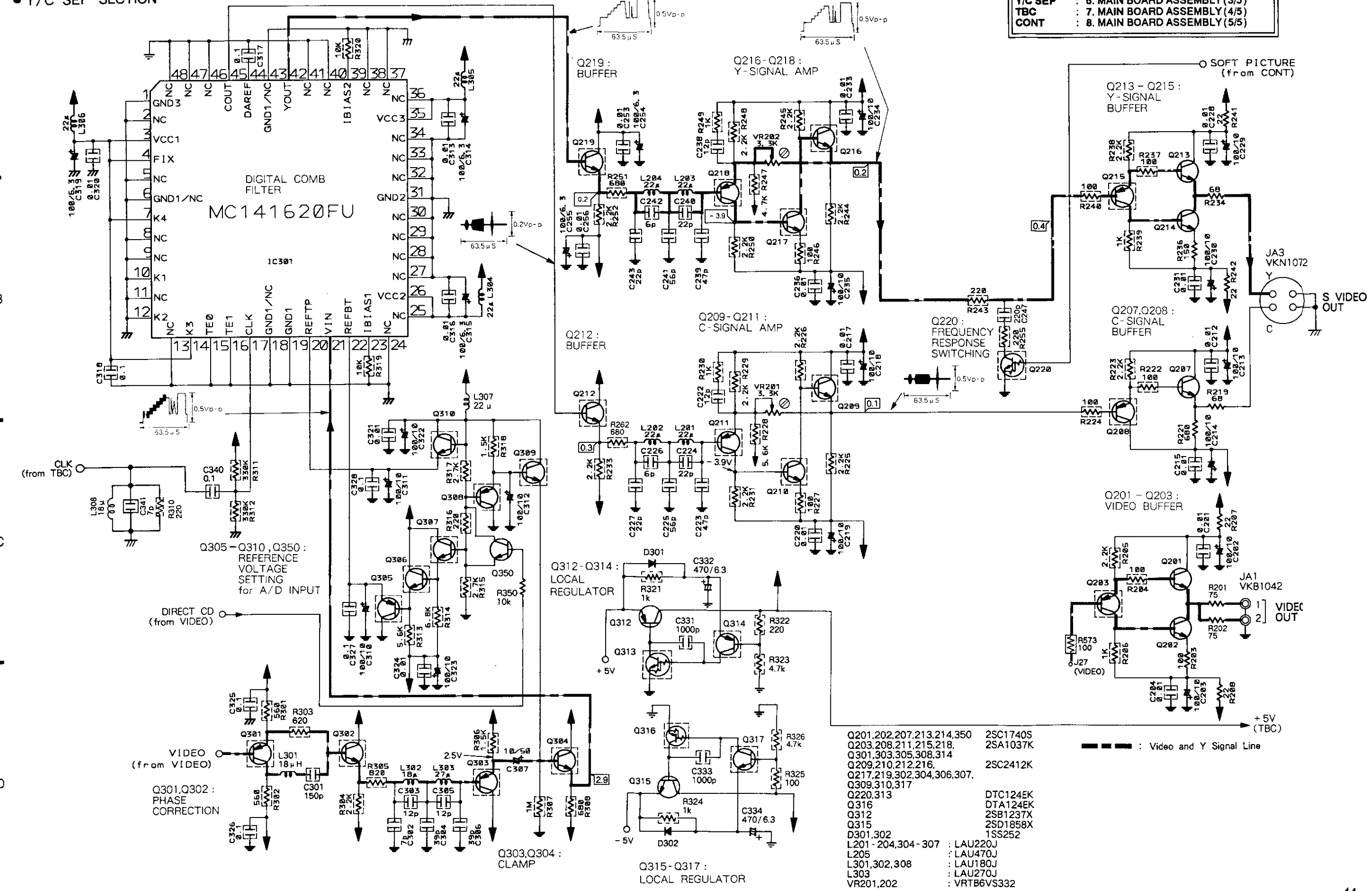
6. MAIN BOARD ASSEMBLY (3/5)

MAIN BOARD ASSEMBLY (3/5)

● Y/C SEP SECTION

Note : Abbreviations listed indicate circuit connections.

- FTS : 4. MAIN BOARD ASSEMBLY (1/5)
- VIDEO : 5. MAIN BOARD ASSEMBLY (2/5)
- Y/C SEP : 6. MAIN BOARD ASSEMBLY (3/5)
- TBC : 7. MAIN BOARD ASSEMBLY (4/5)
- CONT : 8. MAIN BOARD ASSEMBLY (5/5)



- Q201,202,207,213,214,350 : 2SC1740S
- Q203,208,211,215,218, : 2SA1037K
- Q301,303,305,308,314 : 2SC2412K
- Q209,210,212,216, : 2SC2412K
- Q217,219,302,304,306,307, : 2SC2412K
- Q309,310,317 : 2SC2412K
- Q220,313 : 2SC2412K
- Q316 : DTC124EK
- Q312 : DTA124EK
- Q315 : 2SB1237X
- D301,302 : 2SD1858X
- L201 - 204,304 - 307 : 1SS252
- L205 : LAU220J
- L301,302,308 : LAU470J
- L303 : LAU180J
- VR201,202 : LAU270J
- VR201,202 : VRTB6VS332

--- : Video and Y Signal Line

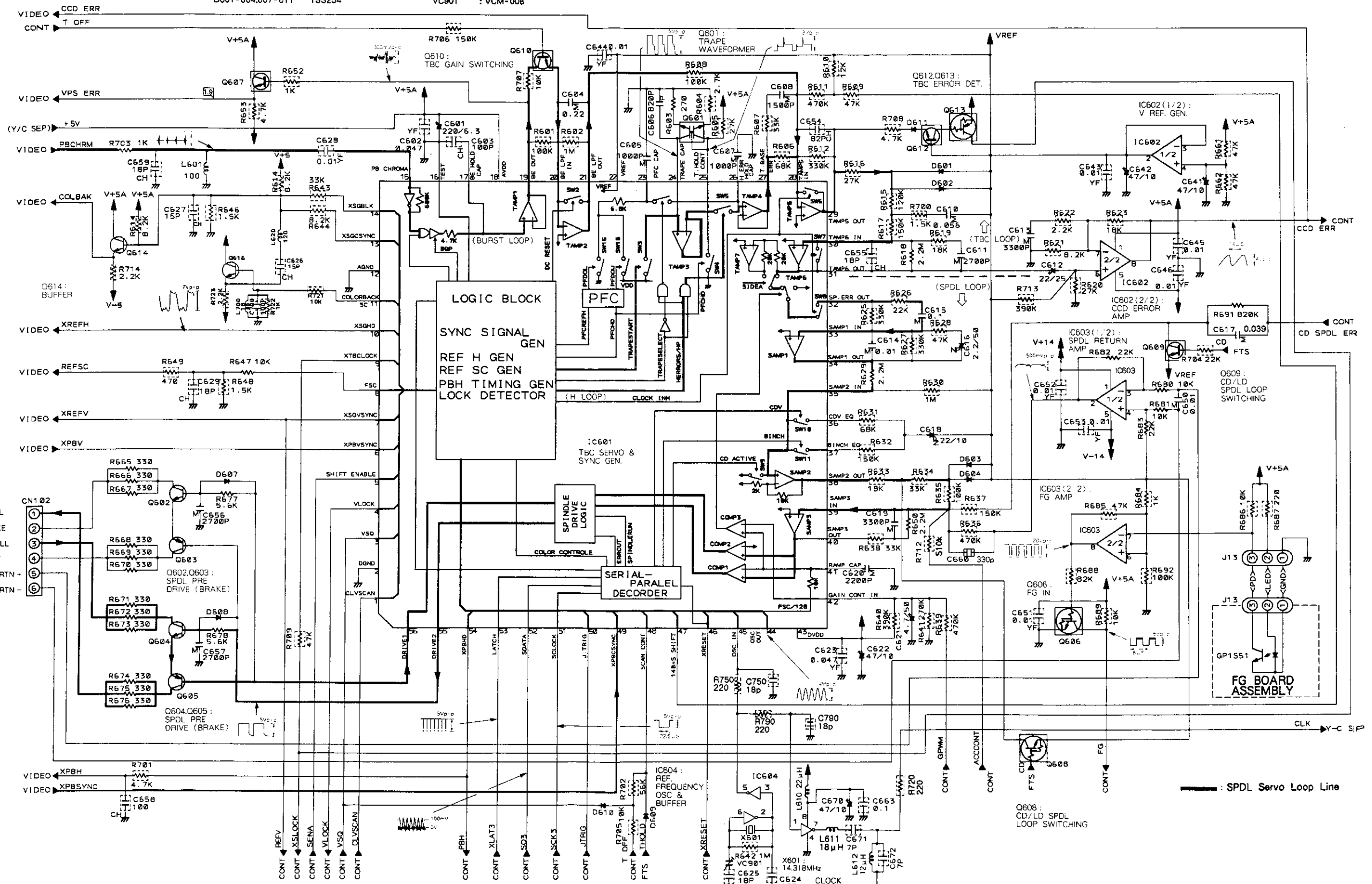
7. MAIN BOARD ASSEMBLY (4/5) AND FG BOARD ASSEMBLY

MAIN BOARD ASSEMBLY (4/5)  
 ● TBC SECTION

IC601	PM3002	L601	: LAU101J
IC602,603	NJM4558S	L610	: LAU220J
IC604	TC7WU04F	L611,700	: LAU180J
Q601	FMW2	L612	: LAU120J
Q602,604	2SC1740S	L620	: LAU121J
Q603,605	2SA933S	X601	: VSS1026
Q606,608	DTC124EK	VC901	: VCM-008
Q607,610,612,614,616	2SC2412K		
Q609	2SA1037K		
Q613	DTA124EK		
D601-604,607-611	1SS254		

Note : Abbreviations listed indicate circuit connections.

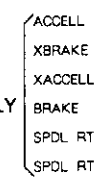
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VIDEO	: 5. MAIN BOARD ASSEMBLY (2/5)
Y/C SEP	: 6. MAIN BOARD ASSEMBLY (3/5)
TBC	: 7. MAIN BOARD ASSEMBLY (4/5)
CONT	: 8. MAIN BOARD ASSEMBLY (5/5)



A  
B  
C  
D

A  
B  
C  
D

2. POWER SUPPLY ASSEMBLY (CN311)

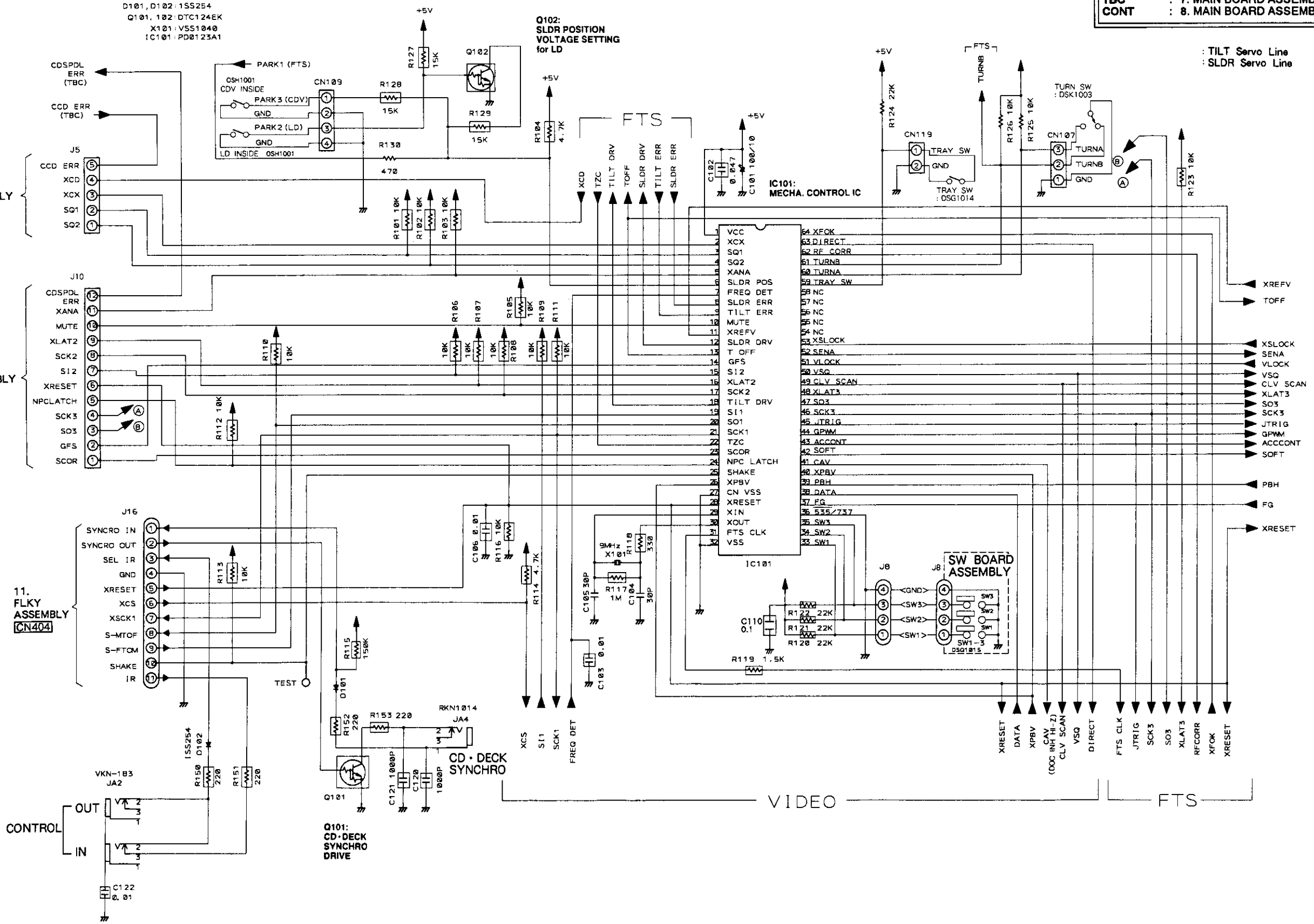


8. MAIN BOARD ASSEMBLY (5/5), SW BOARD ASSEMBLY

Note : Abbreviations listed indicate circuit connections.

FTS	: 4. MAIN BOARD ASSEMBLY (1/5)
VIDEO	: 5. MAIN BOARD ASSEMBLY (2/5)
Y/C SEP	: 6. MAIN BOARD ASSEMBLY (3/5)
TBC	: 7. MAIN BOARD ASSEMBLY (4/5)
CONT	: 8. MAIN BOARD ASSEMBLY (5/5)

MAIN BOARD ASSEMBLY (5/5)  
● CONT SECTION



A  
B  
C  
D

TBC  
Y-CSEP  
TBC

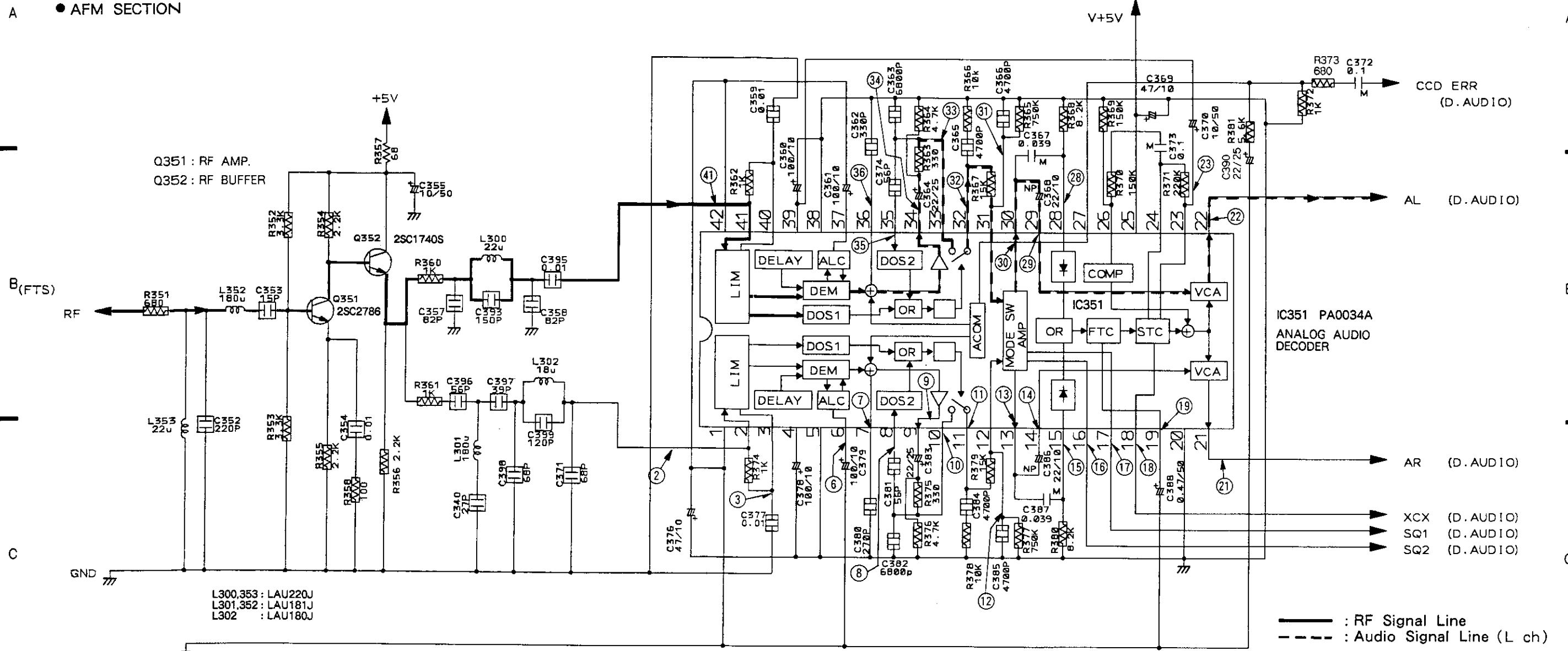
: TILT Servo Line  
: SLDR Servo Line

9. AUDIO ASSEMBLY (1/2)

Note : Abbreviations listed indicate circuit connections.

AFM : 9. AUDIO ASSEMBLY (1/2)  
D.AUDIO : 10. AUDIO ASSEMBLY (2/2)

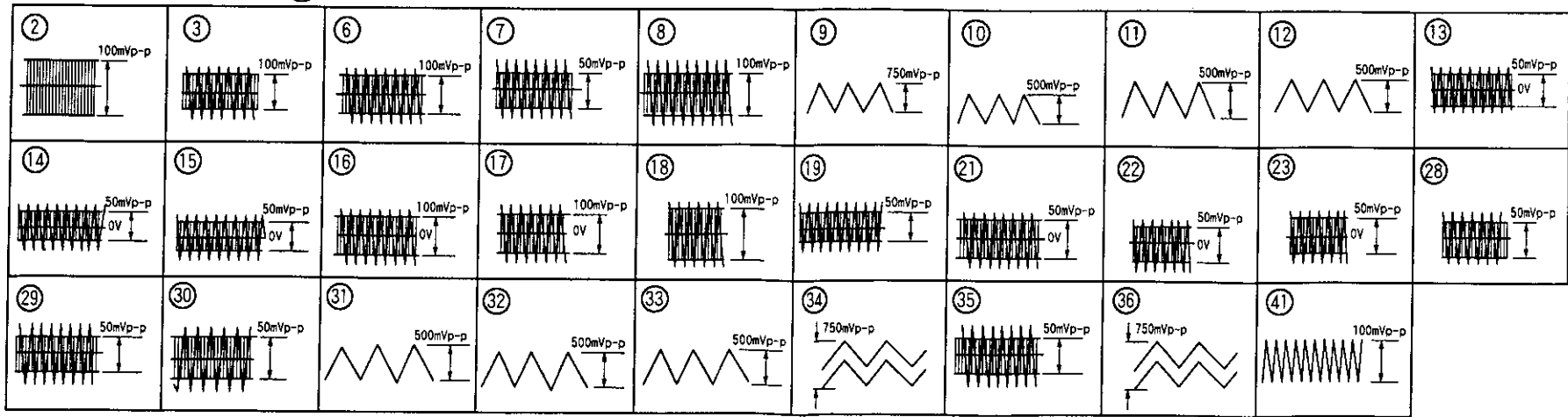
AUDIO ASSEMBLY (1/2) (VWV1250)  
● AFM SECTION



L300,353 : LAU220J  
L301,352 : LAU181J  
L302 : LAU180J

— : RF Signal Line  
- - - : Audio Signal Line (L ch)

● IC351 (PA0034A) Note : (No.) in the table correspond to the pin No.

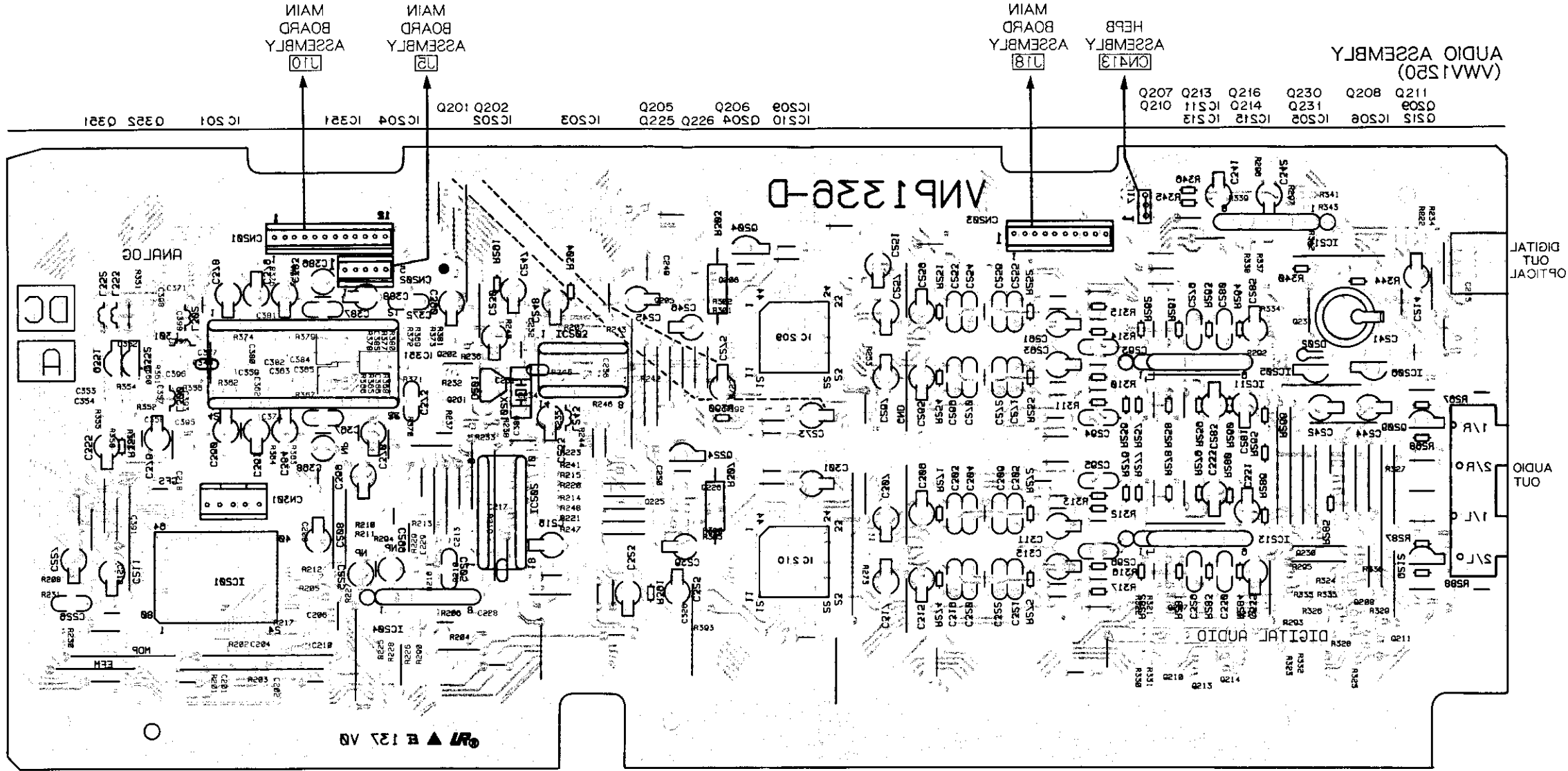


Note : These waveforms and voltage are the play mode.

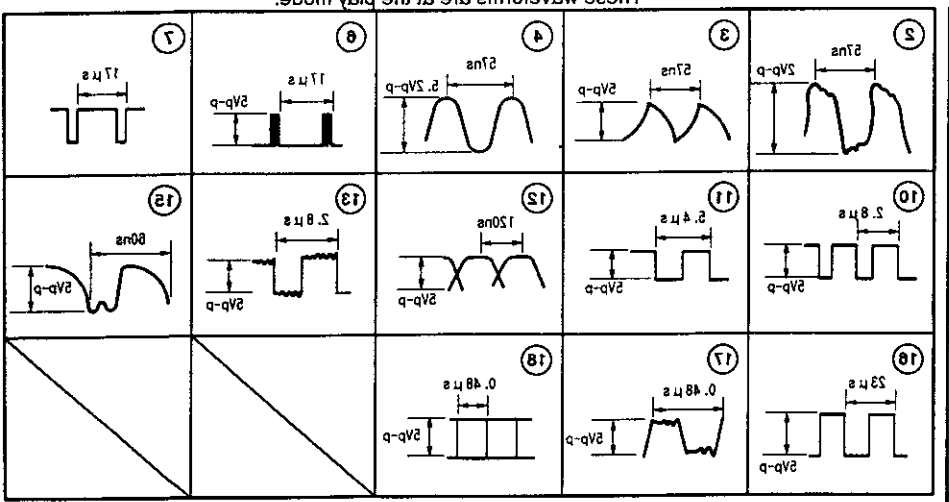
● IC351 (PA0034A)

Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage
1	-5V	15	*	29	*
2	*	16	*	30	*
3	*	17	*	31	*
4	---	18	*	32	*
5	---	19	*	33	*
6	*	20	0	34	*
7	*	21	*	35	*
8	*	22	*	36	*
9	*	23	*	37	---
10	*	24	0	38	---
11	*	25	5V	39	---
12	*	26	0	40	*
13	*	27	0	41	*
14	*	28	*	42	-5V

\*: Refer to the waveforms

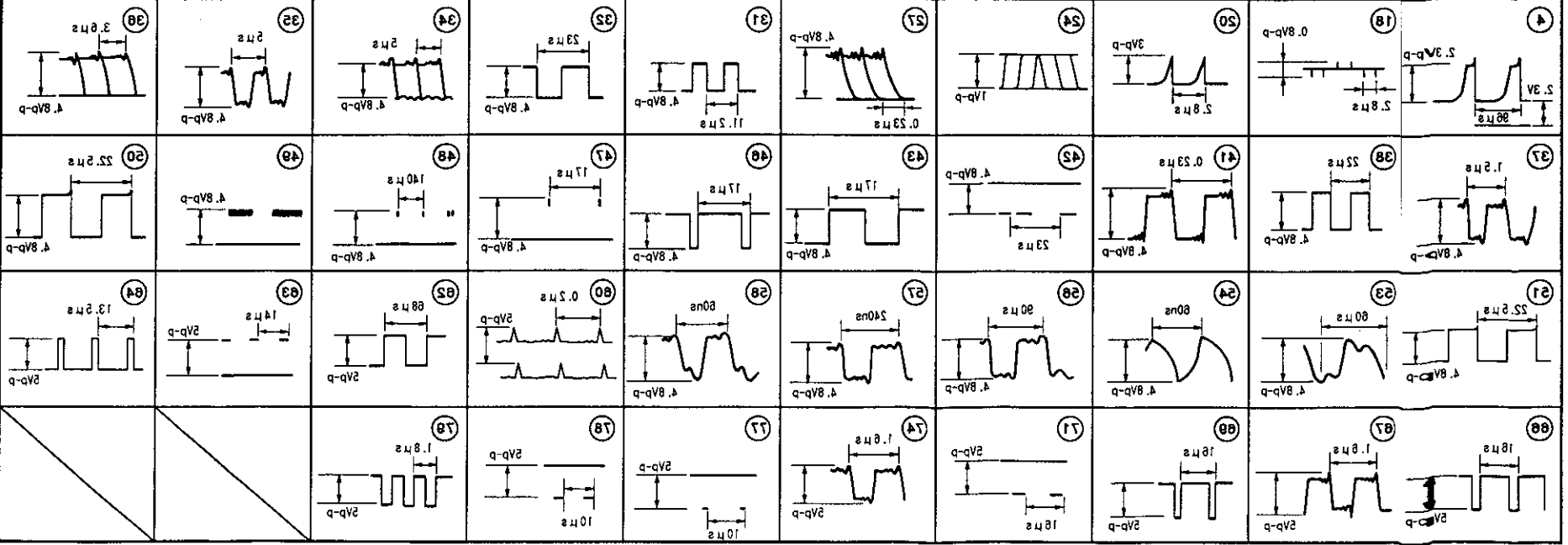


IC505 (2M5840AP) Note: (No.) in the table correspond to the pin No.



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

ICX5200 AC Note: (No.) in the table correspond to the pin No. These waveforms are at the play mode.



A

B

C

D

e

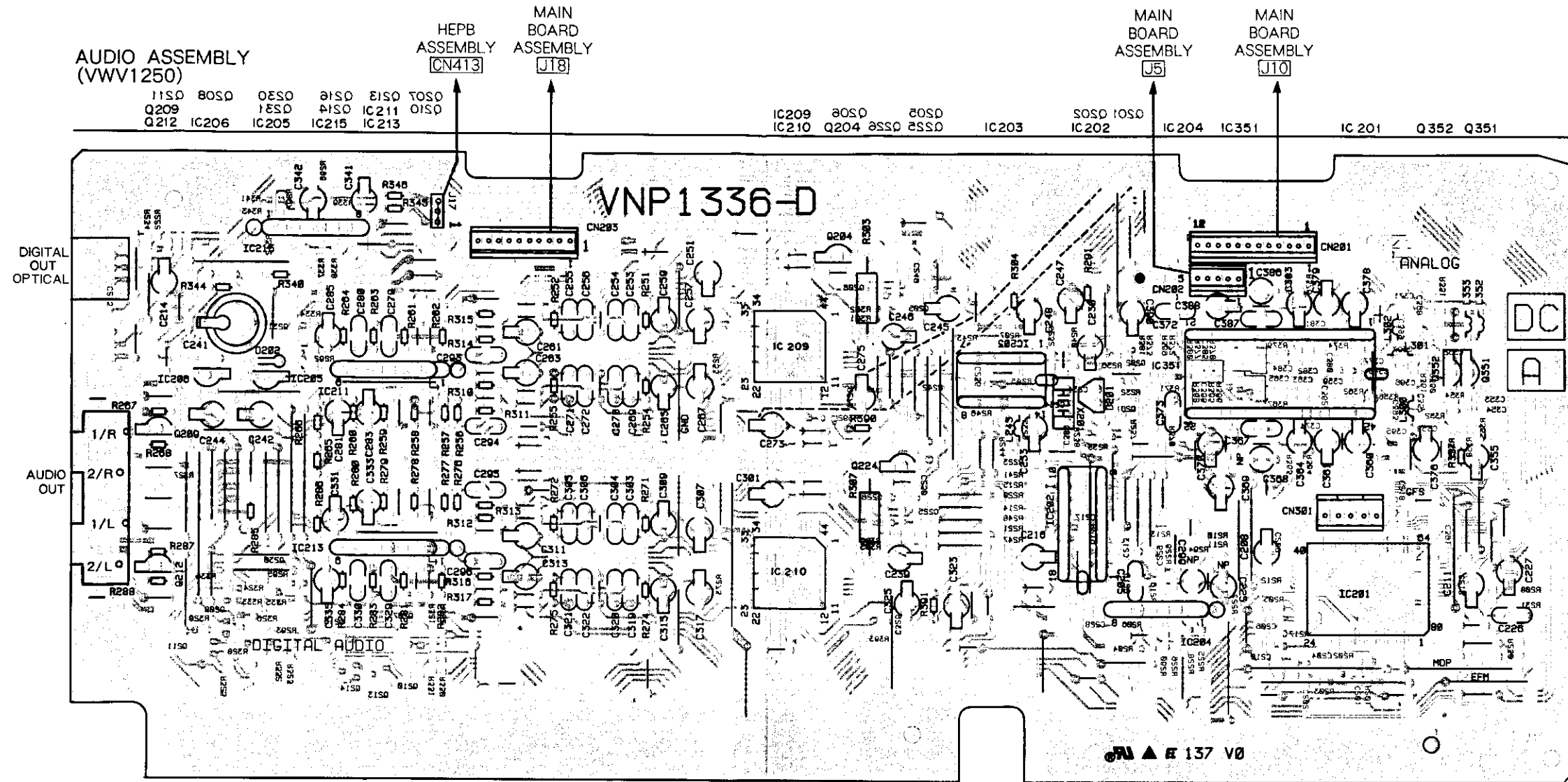
2

4

3

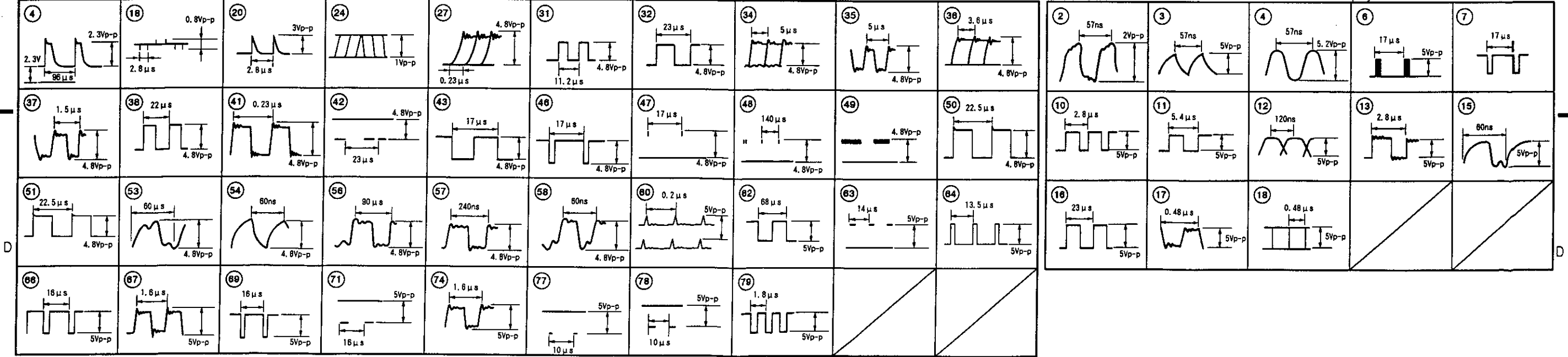
5

1



IC201 (CXD2500AQ) Note : (No.) in the table correspond to the pin No. These waveforms are at the play mode.

IC202 (SM5840AP) Note : (No.) in the table correspond to the pin No. These waveforms are at the play mode.



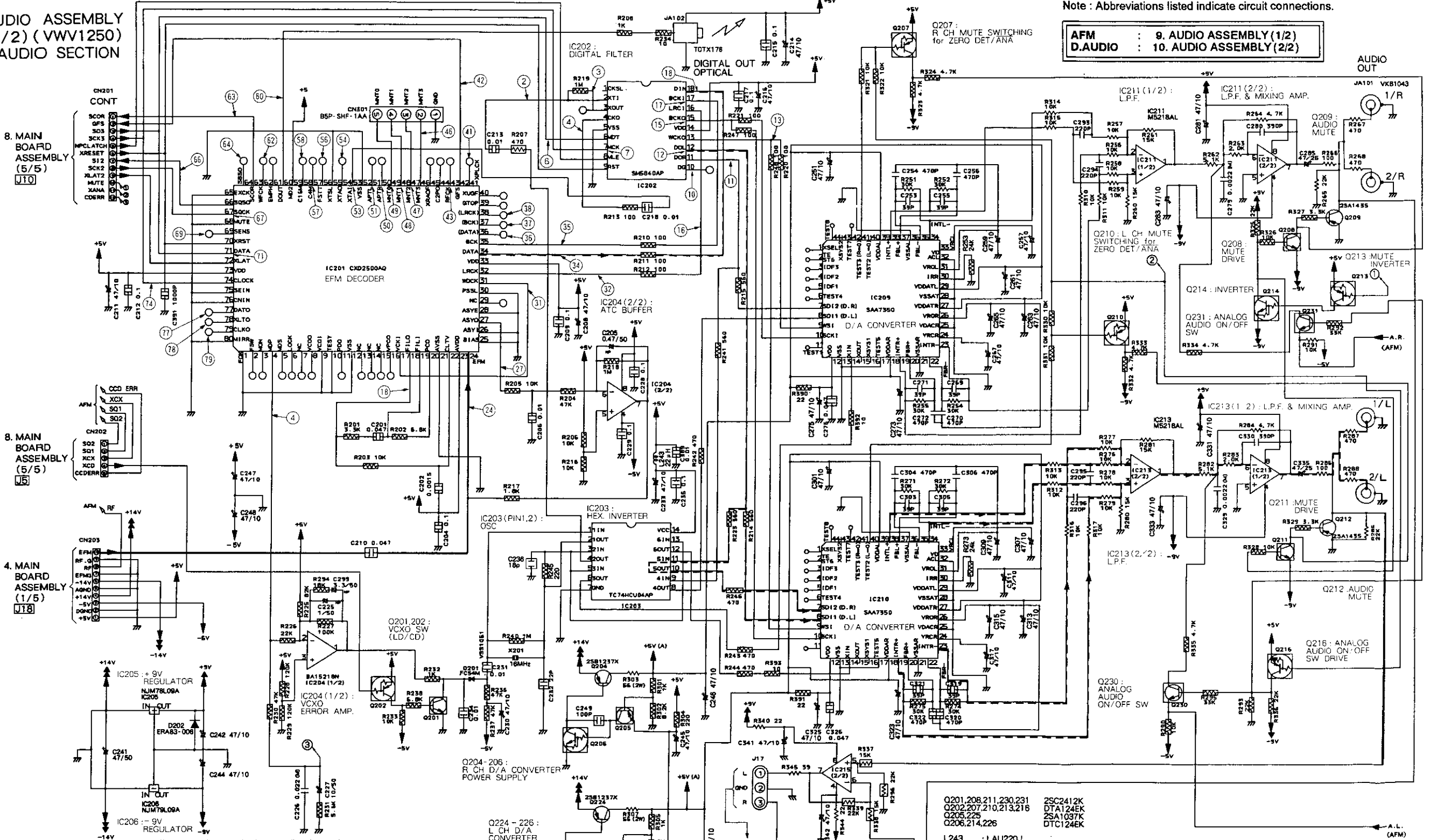


10. AUDIO ASSEMBLY (2/2)

AUDIO ASSEMBLY (2/2) (VW1250)  
● D.AUDIO SECTION

Note : Abbreviations listed indicate circuit connections.

AFM : 9. AUDIO ASSEMBLY (1/2)  
D.AUDIO : 10. AUDIO ASSEMBLY (2/2)



8. MAIN BOARD ASSEMBLY (5/5) U10

8. MAIN BOARD ASSEMBLY (5/5) U5

4. MAIN BOARD ASSEMBLY (1/5) U18

IC205 : +9V REGULATOR NUM78L09A  
IC206 : -9V REGULATOR NUM79L09A

Note: These waveforms and voltage are the play mode.

IC201 (CXD2500AQ)

Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage
1	0	15	0	29	0	43	*	57	*
2	0	16	4.8	30	0	44	0	58	*
3	0	17	0	31	*	45	4.8	59	5
4	*	18	*	32	*	46	*	60	*
5	0	19	2.4	33	4.8	47	*	61	5
6	4.8	20	*	34	*	48	*	62	*
7	0	21	0	35	*	49	*	63	*
8	4.8	22	2.3	36	*	50	*	64	*
9	0	23	4.8	37	*	51	*	65	0
10	0	24	*	38	0	52	0	66	*
11	0	25	0	39	0	53	*	67	*
12	0	26	0	40	4.8	54	*	68	0
13	0	27	*	41	*	55	0	69	*
14	0	28	0	42	*	56	*	70	5

Note: These waveforms and voltage are the play mode.

IC202 (SM5640AP)

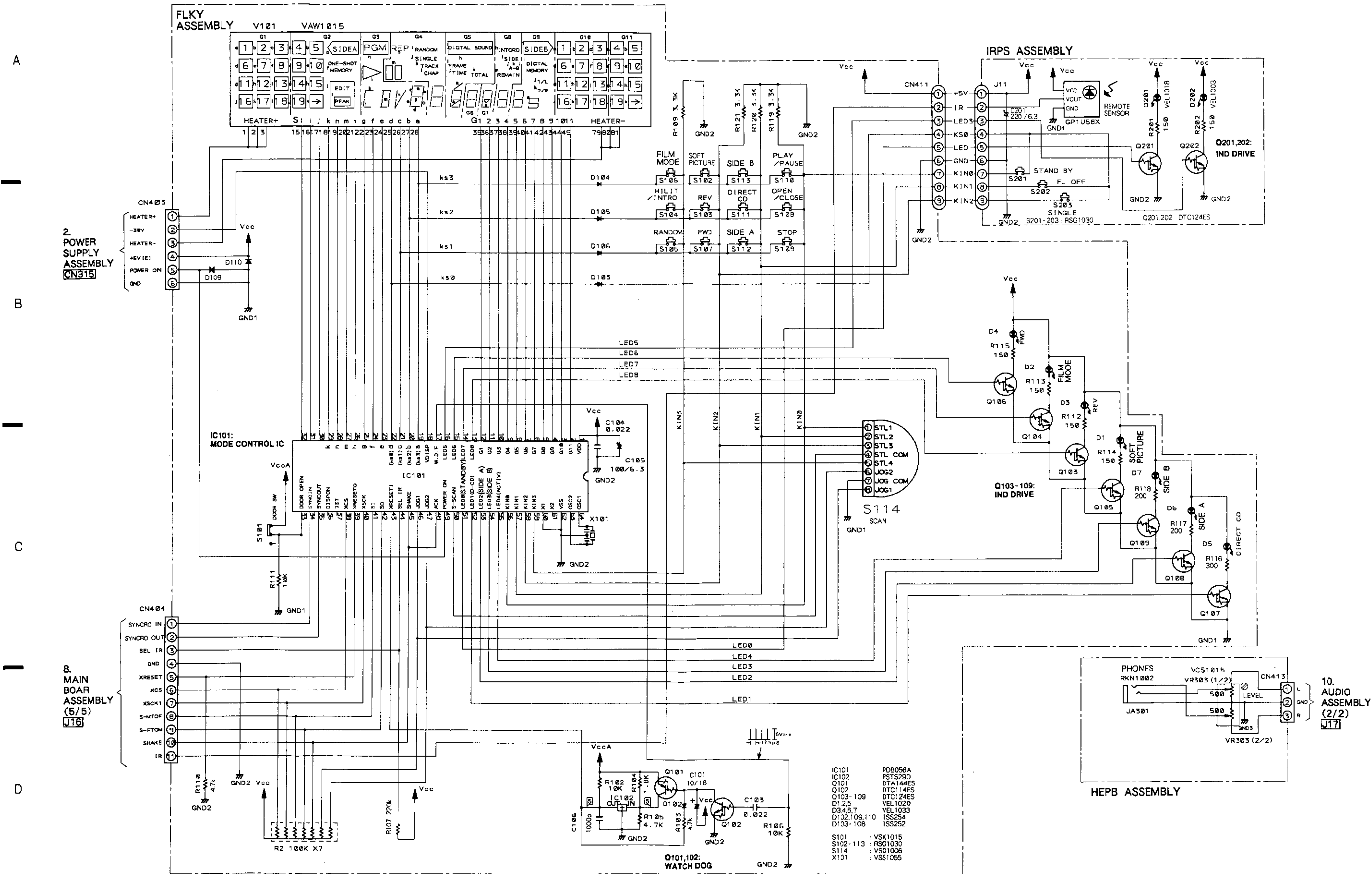
Pin No.	Voltage	Pin No.	Voltage
1	5	10	*
2	*	11	*
3	*	12	*
4	*	13	*
5	0	14	5
6	*	15	*
7	*	16	*
8	5	17	*
9	5	18	*

\*: Refer to the waveforms

Q201,208,211,230,231 : 2SC2412K  
Q202,207,210,213,216 : DTA124EK  
Q205,225 : 2SA1037K  
Q206,214,226 : DTC124EK  
L243 : LAU220J

—— RF Signal Line  
- - - - Audio Signal Line (Lch)

11. FLKY, IRPS AND HEPB ASSEMBLY



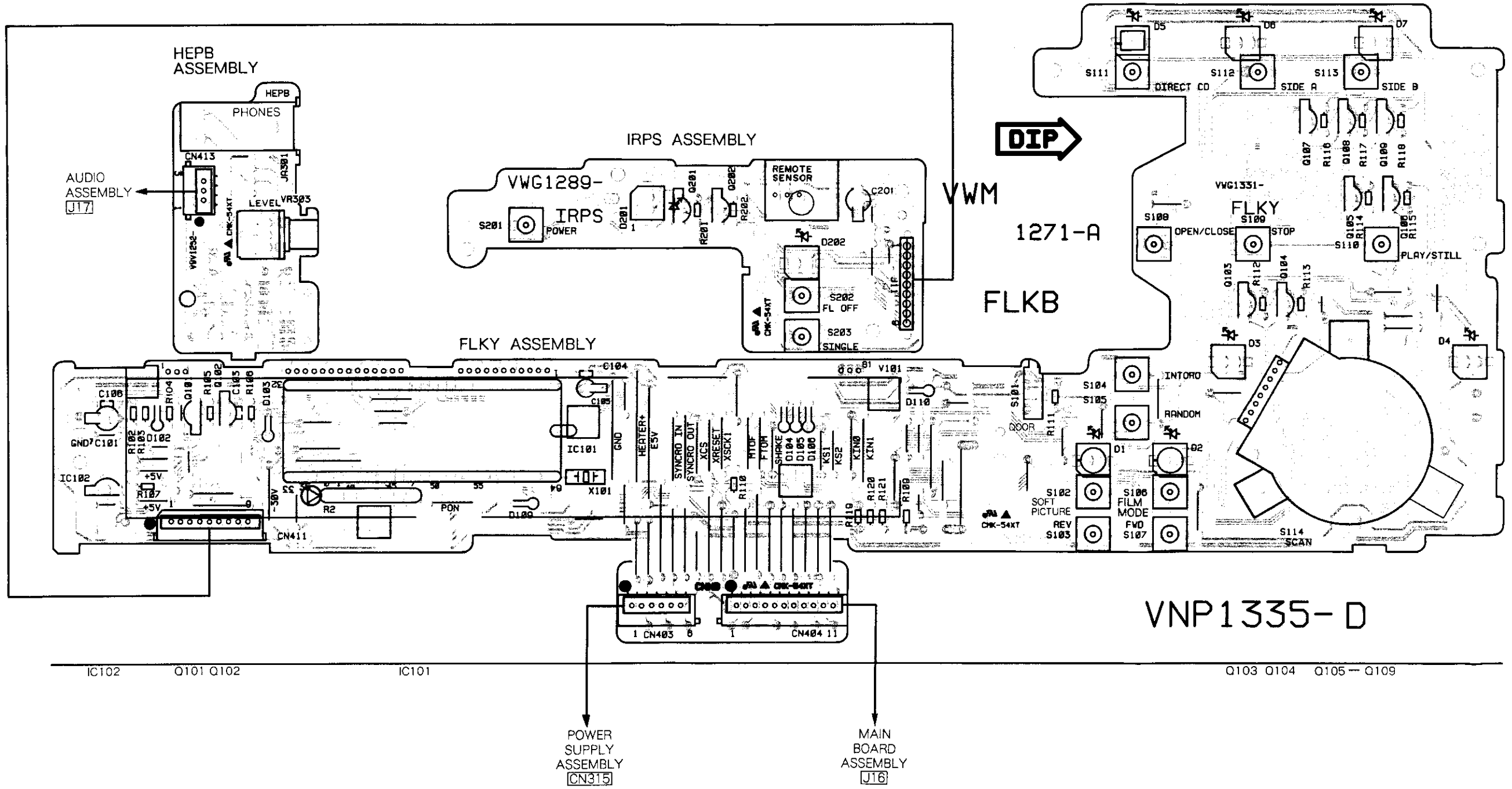
1 2 3 4 5 6

A

B

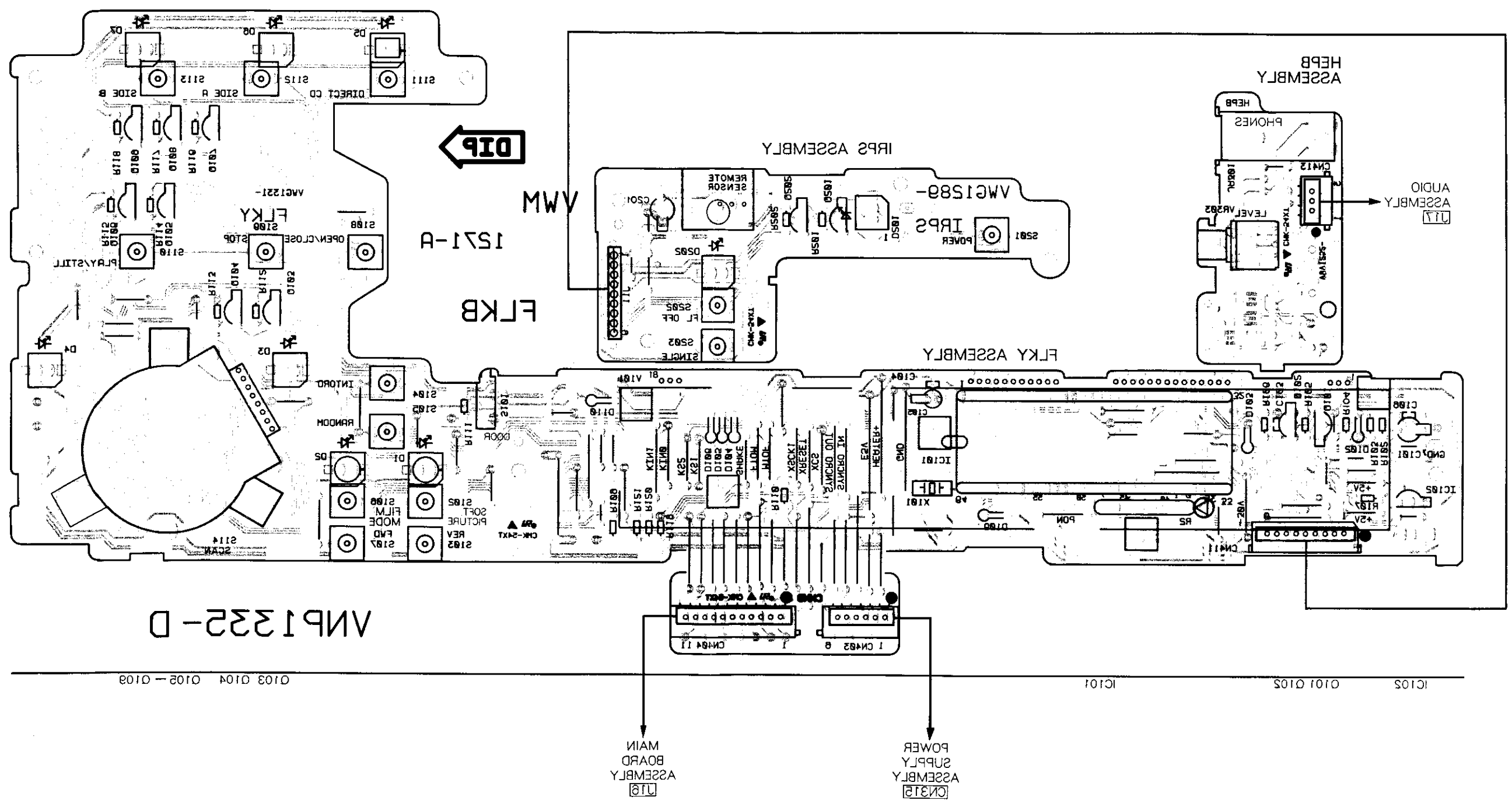
C

D



1 2 3 4 5 6

A  
B  
C  
D



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

## 4. PCB PARTS LIST

**NOTES:**

- Part 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%).

560 Ω	56 × 10 <sup>1</sup>	561	RD1/8PM	561J
47k Ω	47 × 10 <sup>3</sup>	473	RD1/4PS	473J
0.5 Ω	0R5		RN2H	0R5K
1 Ω	010		RS1P	010K

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

5.62k Ω	562 × 10 <sup>1</sup>	5621	RN1/4SR	5621F
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Mark	No.	Description	Part No.
<b>LIST OF ASSEMBLIES</b>			
⊙		VSOP ASSEMBLY	VWM1269
		├── FG BOARD ASSEMBLY	
		├── SW BOARD ASSEMBLY	
		└── MAIN BOARD ASSEMBLY	
⊙		AUDIO ASSEMBLY	VWV1250
⊙		FUNCTION BOARD ASSEMBLY	VWM1271
		├── IRPS ASSEMBLY	
		├── FLKY ASSEMBLY	
		└── HEPB ASSEMBLY	
		POWER SUPPLY ASSEMBLY	VWR1131
		CNNB ASSEMBLY	
		HEAD ASSEMBLY	

### FG BOARD ASSEMBLY

#### SEMICONDUCTOR

PHOTO INTERRUPTER      GP1S51

### SW BOARD ASSEMBLY

#### SWITCHES

S1-3      PUSH SWITCH      DSG1015  
 (LOADING/TILT)

Mark	No.	Description	Part No.
<b>MAIN BOARD ASSEMBLY</b>			
<b>SEMICONDUCTORS</b>			
	IC101	MECHANISM CONT. MCU	PD0123A1
	IC301	DIGI-COMB FILTER IC	MC141620FU
	IC401	VIDEO IC	PA5013A
	IC402	CDD DELAY LINE	PM0001
	IC403	IC	CXL1009P
	IC404	IC	PA0017
	IC405	CHARACTER GENE IC	PD0070
	IC601	TBC IC	PM3002
	IC602, 603	OP-AMP IC	NJM4558S
	IC604	LOGIC IC	TC7FU04F
	IC801	PRE AMP IC	CXA1081S
	IC802	IC	BA15218N
	IC803	FTS IC	PM3003
	IC804	POWER OP AMP	LA6510L
	Q101, 102	DIGITAL TRANSISTOR	DTC124EK
	Q201, 202	TRANSISTOR	2SC1740S
	Q203	CHIP TRANSISTOR	2SA1037K
	Q207	TRANSISTOR	2SC1740S
	Q208	CHIP TRANSISTOR	2SA1037K
	Q209, 210	CHIP TRANSISTOR	2SC2412K
	Q211	CHIP TRANSISTOR	2SA1037K
	Q212	CHIP TRANSISTOR	2SC2412K
	Q213, 214	TRANSISTOR	2SC1740S
	Q215	CHIP TRANSISTOR	2SA1037K
	Q216, 217	CHIP TRANSISTOR	2SC2412K
	Q218	CHIP TRANSISTOR	2SA1037K
	Q219	CHIP TRANSISTOR	2SC2412K
	Q220	DIGITAL TRANSISTOR	DTC124EK
	Q301	CHIP TRANSISTOR	2SA1037K
	Q302	CHIP TRANSISTOR	2SC2412K
	Q303	CHIP TRANSISTOR	2SA1037K
	Q304	CHIP TRANSISTOR	2SC2412K
	Q305	CHIP TRANSISTOR	2SA1037K
	Q306, 307	CHIP TRANSISTOR	2SC2412K
	Q308	CHIP TRANSISTOR	2SA1037K

Mark	No.	Description	Part No.	Mark	No.	Description	Part No.
Q309, 310		CHIP TRANSISTOR	2SC2412K	Q836		CHIP TRANSISTOR	2SA1037K
Q312		TRANSISTOR	2SB1237X	Q837		DIGITAL TRANSISTOR	DTC124EK
Q313		DIGITAL TRANSISTOR	DTC124EK	Q838		CHIP TRANSISTOR	2SC2412K
Q314		CHIP TRANSISTOR	2SA1037K	Q901		CHIP TRANSISTOR	2SA1037K
Q315		TRANSISTOR	2SD1858X	Q903		DIGITAL TRANSISTOR	DTA124EK
Q316		DIGITAL TRANSISTOR	DTA124EK	Q904		TRANSISTOR	2SC1740S
Q317, 350		CHIP TRANSISTOR	2SC2412K	D101, 102		DIODE	1SS254
Q401		TRANSISTOR	2SB1237X	D301, 302		DIODE	1SS252
Q402		TRANSISTOR	2SD1858X	D601-604		DIODE	1SS254
Q403		DIGITAL TRANSISTOR	DTA124EK	D607-611		DIODE	1SS254
Q431		TRANSISTOR	2SC1740S	D801		DIODE	1SS254
Q432, 456		CHIP TRANSISTOR	2SC2412K	D804-808		DIODE	1SS254
Q457, 496		CHIP TRANSISTOR	2SA1037K	D830-832		DIODE	1SS254
Q497-500		CHIP TRANSISTOR	2SC2412K	D833		ZENER DIODE	04A26. 2
Q511, 541		CHIP TRANSISTOR	2SA1037K	D834		ZENER DIODE	04A210
Q560		CHIP TRANSISTOR	2SC2412K	<b>COILS</b>			
Q561		DIGITAL TRANSISTOR	DTA124EK	L201-204		AXIAL INDUCTOR	LAU220J
Q570		CHIP TRANSISTOR	2SC2412K	L301, 302		AXIAL INDUCTOR	LAU180J
Q601		CHIP TRANSISTOR	FMW2	L303		AXIAL INDUCTOR	LAU270J
Q602		TRANSISTOR	2SC1740S	L304-307		AXIAL INDUCTOR	LAU220J
Q603		TRANSISTOR	2SA933S	L308		AXIAL INDUCTOR	LAU180J
Q604		TRANSISTOR	2SC1740S	L411		AXIAL INDUCTOR	LAU330J
Q605		TRANSISTOR	2SA933S	L412, 413		AXIAL INDUCTOR	LAU220J
Q606		DIGITAL TRANSISTOR	DTC124EK	L414, 415		AXIAL INDUCTOR	LAU120J
Q607		CHIP TRANSISTOR	2SC2412K	L416, 431		AXIAL INDUCTOR	LAU430J
Q608		DIGITAL TRANSISTOR	DTC124EK	L432		AXIAL INDUCTOR	LAU620J
Q609		CHIP TRANSISTOR	2SA1037K	L433		AXIAL INDUCTOR	LAU390J
Q610, 612		CHIP TRANSISTOR	2SC2412K	L441		AXIAL INDUCTOR	LAU270J
Q613		DIGITAL TRANSISTOR	DTA124EK	L456		RADIAL INDUCTOR	LFA471J
Q614, 616		CHIP TRANSISTOR	2SC2412K	L457, 458		RADIAL INDUCTOR	LFA221J
Q802-805		CHIP TRANSISTOR	2SC2412K	L496		AXIAL INDUCTOR	LAU180J
Q806		CHIP TRANSISTOR	2SA1037K	L497		AXIAL INDUCTOR	LAU181J
Q807		CHIP TRANSISTOR	2SC2412K	L511		AXIAL INDUCTOR	LAU820J
Q808		CHIP TRANSISTOR	2SA1037K	L521		AXIAL INDUCTOR	LAU120J
Q809, 810		CHIP TRANSISTOR	2SC2412K	L522		AXIAL INDUCTOR	LAU560J
Q811		DIGITAL TRANSISTOR	DTC124EK	L523		AXIAL INDUCTOR	LAU220J
Q812		CHIP TRANSISTOR	2SA1037K	L524		RADIAL INDUCTOR	LFA561K
Q814		CHIP TRANSISTOR	2SC2412K	L541		AXIAL INDUCTOR	LAU120J
Q815		TRANSISTOR	2SD1762	L542		AXIAL INDUCTOR	LAU220J
Q816		TRANSISTOR	2SB1185	L601		AXIAL INDUCTOR	LAU101J
Q817		TRANSISTOR	2SD1762	L610		AXIAL INDUCTOR	LAU220J
Q818		TRANSISTOR	2SB1185	L611		AXIAL INDUCTOR	LAU180J
Q819		CHIP TRANSISTOR	2SA1037K	L612		AXIAL INDUCTOR	LAU120J
Q820		DIGITAL TRANSISTOR	DTA124EK	L620		AXIAL INDUCTOR	LAU121J
Q821		N-FET	2SK184	L700		AXIAL INDUCTOR	LAU180J
Q822		TRANSISTOR	2SD1858X	L801		AXIAL INDUCTOR	LAU151J
Q823		DIGITAL TRANSISTOR	DTC124EK	L802		AXIAL INDUCTOR	LAU181J
Q824		DIGITAL TRANSISTOR	DTA124EK	L803		AXIAL INDUCTOR	LAU151J
Q825		CHIP TRANSISTOR	2SC2412K	<b>CAPACITORS</b>			
Q826		DIGITAL TRANSISTOR	DTA124EK	C101		ELECTR. CAPACITOR	CEAS101M0
Q827, 828		DIGITAL TRANSISTOR	DTC124EK	C102		CERAMIC CAPACITOR	CKSQYF470225
Q829, 830		DIGITAL TRANSISTOR	DTA124EK	C103		CHIP CAPACITOR	CKSQYF100250
Q832		CHIP TRANSISTOR	2SA1037K	C104, 105		CERAMIC CAPACITOR	CCCCH300050
Q833		CHIP TRANSISTOR	2SC2412K	C106		CHIP CAPACITOR	CKSQYF100250
Q835		DIGITAL TRANSISTOR	DTC124EK				

Mark	No.	Description	Part No.	Mark	No.	Description	Part No.
	C110	CERAMIC CAPACITOR	CKSQYF104Z25		C411	CHIP CAPACITOR	CCSQCH101J50
	C120, 121	CHIP CAPACITOR	CKSQYB102K50		C412	CHIP CAPACITOR	CCSQCH470J50
	C122, 201	CHIP CAPACITOR	CKSQYF103Z50		C413	CHIP CAPACITOR	CCSQCH151J50
	C202, 203	ELECTR. CAPACITOR	CEAS101M10		C414	CHIP CERAMIC C.	CCSQCH221J50
	C204, 212	CHIP CAPACITOR	CKSQYF103Z50		C415	CHIP CAPACITOR	CCSQCH270J50
	C213, 214	ELECTR. CAPACITOR	CEAS101M10		C416	CHIP CAPACITOR	CCSQCH390J50
	C215, 217	CHIP CAPACITOR	CKSQYF103Z50		C417, 418	CHIP CAPACITOR	CCSQCH120J50
	C218, 219	ELECTR. CAPACITOR	CEAS101M10		C419, 420	CHIP CAPACITOR	CCSQCH470J50
	C220	CHIP CAPACITOR	CKSQYF103Z50		C423, 424	CHIP CERAMIC C.	CCSQCH200J50
	C222	CHIP CAPACITOR	CCSQCH120J50		C425, 426	CHIP CAPACITOR	CKSQYF103Z50
	C223	CHIP CAPACITOR	CCSQCH470J50		C427	CERAMIC CAPACITOR	CKSQYF104Z25
	C224	CHIP CERAMIC C.	CCSQCH220J50		C428	ELECTR. CAPACITOR	CEAS470M10
	C225	CERAMIC CAPACITOR	CCSQCH560J50		C429	CERAMIC CAPACITOR	CKSQYF104Z25
	C226	CHIP CAPACITOR	CCSQCH060D50		C431	CERAMIC CAPACITOR	CKSQYF473Z25
	C227	CHIP CERAMIC C.	CCSQCH220J50		C433	CHIP CAPACITOR	CCSQCH390J50
	C228	CHIP CAPACITOR	CKSQYF103Z50		C434	ELECTR. CAPACITOR	CEAS101M10
	C229, 230	ELECTR. CAPACITOR	CEAS101M10		C435	CERAMIC CAPACITOR	CKSQYF104Z25
	C231, 233	CHIP CAPACITOR	CKSQYF103Z50		C436	ELECTR. CAPACITOR	CEAS010M50
	C234, 235	ELECTR. CAPACITOR	CEAS101M10		C437	CHIP CAPACITOR	CCSQCH270J50
	C236	CHIP CAPACITOR	CKSQYF103Z50		C438	CHIP CAPACITOR	CCSQCH100D50
	C238	CHIP CAPACITOR	CCSQCH120J50		C439	CHIP CAPACITOR	CCSQCH470J50
	C239	CHIP CAPACITOR	CCSQCH470J50		C440	CHIP CAPACITOR	CCSQCH390J50
	C240	CHIP CERAMIC C.	CCSQCH220J50		C441	CHIP CAPACITOR	CCSQCH070D50
	C241	CERAMIC CAPACITOR	CCSQCH560J50		C442	CERAMIC CAPACITOR	CKSQYF104Z25
	C242	CHIP CAPACITOR	CCSQCH060D50		C443	ELECTR. CAPACITOR	CEAS4R7M50
	C243	CHIP CERAMIC C.	CCSQCH220J50		C444	MYLAR FILM CAPACITOR	CMMA272J50
	C247	CHIP CERAMIC C.	CCSQCH221J50		C445	ELECTR. CAPACITOR	CEAS101M10
	C253	CHIP CAPACITOR	CKSQYF103Z50		C446	AUDIO FILM CAPACITOR	CTXA103J50
	C254, 255	ELECTR. CAPACITOR	CEJA101M6R3		C447	CHIP CAPACITOR	CCSQCH330J50
	C256	CHIP CAPACITOR	CKSQYF103Z50		C448, 449	CERAMIC CAPACITOR	CKSQYF473Z25
	C301	CHIP CAPACITOR	CCSQCH151J50		C450	CHIP CAPACITOR	CCSQCH100D50
	C302	CHIP CAPACITOR	CCSQCH070D50		C451	CHIP CAPACITOR	CCSQCH270J50
	C303	CHIP CAPACITOR	CCSQCH120J50		C452	ELECTR. CAPACITOR	CEAS470M10
	C304	CHIP CAPACITOR	CCSQCH390J50		C456	CHIP CAPACITOR	CCSQCH101J50
	C305	CHIP CAPACITOR	CCSQCH120J50		C457	ELECTR. CAPACITOR	CEAS101M10
	C306	CHIP CAPACITOR	CCSQCH390J50		C458-460	CHIP CAPACITOR	CKSQYF103Z50
	C307	ELECTR. CAPACITOR	CEAS100M50		C461	CHIP CAPACITOR	CCSQCH101J50
	C310-312	ELECTR. CAPACITOR	CEAS101M10		C462	CHIP CAPACITOR	CCSQCH330J50
	C313	CHIP CAPACITOR	CKSQYF103Z50		C463	CHIP CERAMIC C.	CCSQCH271J50
	C314, 315	ELECTR. CAPACITOR	CEJA101M6R3		C464, 465	ELECTR. CAPACITOR	CEAS470M10
	C316	CHIP CAPACITOR	CKSQYF103Z50		C466, 467	CERAMIC CAPACITOR	CKSQYF473Z25
	C317, 318	CERAMIC CAPACITOR	CKSQYF104Z25		C471	ELECTR. CAPACITOR	CEAS010M50
	C319	ELECTR. CAPACITOR	CEJA101M6R3		C472	ELECTR. CAPACITOR	CEAS3R3M50
	C320, 321	CHIP CAPACITOR	CKSQYF103Z50		C473	CERAMIC CAPACITOR	CKSQYF473Z25
	C322, 323	ELECTR. CAPACITOR	CEAS101M10		C474	AUDIO FILM CAPACITOR	CTXA224J50
	C324	CHIP CAPACITOR	CKSQYF103Z50		C475, 476	ELECTR. CAPACITOR	CEAS3R3M50
	C325-328	CERAMIC CAPACITOR	CKSQYF104Z25		C477, 478	CERAMIC CAPACITOR	CKSQYF473Z25
	C331	CHIP CAPACITOR	CKSQYB102K50		C479, 480	CERAMIC CAPACITOR	CKSQYF104Z25
	C332	ELECTROLYTIC CAPACITOR	CEAS471M6R3		C483	CERAMIC CAPACITOR	CKSQYF473Z25
	C333	CHIP CAPACITOR	CKSQYB102K50		C484	ELECTR. CAPACITOR	CEAS470M25
	C334	ELECTROLYTIC CAPACITOR	CEAS471M6R3		C485	CHIP CERAMIC C.	CCSQCH220J50
	C340	CERAMIC CAPACITOR	CKSQYF104Z25		C486	CHIP CAPACITOR	CKSQYF103Z50
	C341	CHIP CERAMIC C.	CCSQCH070D50		C487, 488	CERAMIC CAPACITOR	CKSQYF473Z25
	C401	ELECTR. CAPACITOR	CEAL2R2M50		C489, 490	ELECTR. CAPACITOR	CEAS101M10
	C407, 408	CERAMIC CAPACITOR	CKSQYF473Z25		C496	CHIP CAPACITOR	CCSQCH390J50

Mark	No.	Description	Part No.	Mark	No.	Description	Part No.
	C497	CHIP CAPACITOR	CCSQCH100D50		C619	MYLAR FILM CAPACITOR	CQMA332J50
	C498	CHIP CAPACITOR	CCSQCH820J50		C620	MYLAR FILM CAPACITOR	CQMA222J50
	C499	ELECTR. CAPACITOR	CEAS470M10		C621	ELECTR. CAPACITOR	CEAS4R7M50
	C500	CHIP CAPACITOR	CCSQCH100D50		C622	ELECTR. CAPACITOR	CEAS470M10
	C501, 502	ELECTR. CAPACITOR	CEAS470M10		C623	CERAMIC CAPACITOR	CKSQYF473Z25
	C503-506	CERAMIC CAPACITOR	CKSQYF473Z25		C624, 625	CHIP CAPACITOR	CCSQCH180J50
	C509	CHIP CAPACITOR	CCSQCH151J50		C626, 627	CHIP CERAMIC C.	CCSQCH150J50
	C510	CHIP CAPACITOR	CCSQCH270J50		C628	CHIP CAPACITOR	CKSQYF103Z50
	C511	CERAMIC CAPACITOR	CKSQYF104Z25		C629	CHIP CAPACITOR	CCSQCH180J50
	C512	ELECTR. CAPACITOR	CEAS470M10		C641, 642	ELECTR. CAPACITOR	CEAS470M10
	C513	CERAMIC CAPACITOR	CKSQYF104Z25		C643-646	CHIP CAPACITOR	CKSQYF103Z50
	C514	AUDIO FILM CAPACITOR	CFTXA104J50		C650	AUDIO FILM CAPACITOR	CFTXA103J50
	C515	AUDIO FILM CAPACITOR	CFTXA683J50		C651-653	CHIP CAPACITOR	CKSQYF103Z50
	C516	CHIP CERAMIC C.	CCSQCH220J50		C654	CHIP CAPACITOR	CCSQCH820J50
	C517	AUDIO FILM CAPACITOR	CFTXA683J50		C655	CHIP CAPACITOR	CCSQCH180J50
	C521	ELECTR. CAPACITOR	CEAS470M10		C656, 657	MYLAR FILM CAPACITOR	CQMA272J50
	C522	ELECTR. CAPACITOR	CEAS100M50		C658	CHIP CAPACITOR	CCSQCH101J50
	C524	CHIP CAPACITOR	CCSQCH390J50		C659	CHIP CAPACITOR	CCSQCH180J50
	C525	ELECTR. CAPACITOR	CEAS470M10		C660	CHIP CAPACITOR	CCSQCH331J50
	C526	CERAMIC CAPACITOR	CKSQYF104Z25		C663	CERAMIC CAPACITOR	CKSQYF104Z25
	C527	CERAMIC CAPACITOR	CKSQYF473Z25		C670	ELECTR. CAPACITOR	CEAS470M10
	C528	CHIP CAPACITOR	CCSQCH151J50		C671, 672	CHIP CAPACITOR	CCSQCH070D50
	C529	CHIP CAPACITOR	CCSQCH910J50		C700	CHIP CAPACITOR	CCSQCH101J50
	C530	ELECTR. CAPACITOR	CEANP100M16		C735	CHIP CAPACITOR	CCSQCH390J50
	C531	CERAMIC CAPACITOR	CKSQYF104Z25		C750, 790	CHIP CAPACITOR	CCSQCH180J50
	C533	ELECTR. CAPACITOR	CEAS470M10		C801-803	CHIP CAPACITOR	CKSQYF103Z50
	C534	CERAMIC CAPACITOR	CKSQYF473Z25		C804	CHIP CERAMIC C.	CCSQCH220J50
	C535	CHIP CAPACITOR	CKSQYF103Z50		C805	CERAMIC CAPACITOR	CKSQYF473Z25
	C536	CHIP CAPACITOR	CCSQCH910J50		C806	CHIP CERAMIC C.	CCSQCH220J50
	C537	CAPACITOR(CERAMIC)	CKSYF105Z16		C807	AUDIO FILM CAPACITOR	CFTXA124J50
	C542	ELECTROLYTIC CAPACITOR	CEAS221M6R3		C808	ELECTR. CAPACITOR	CEAS010M50
	C543	CERAMIC CAPACITOR	CKSQYF104Z25		C809	CHIP CAPACITOR	CCSQCH680J50
	C544	CERAMIC CAPACITOR	CKSQYF473Z25		C810, 811	CHIP CAPACITOR	CCSQCH101J50
	C545	CHIP CAPACITOR	CCSQCH680J50		C812	CHIP CAPACITOR	CCSQCH270J50
	C546	CHIP CAPACITOR	CCSQCH470J50		C813	CHIP CAPACITOR	CCSQCH680J50
	C547, 548	CERAMIC CAPACITOR	CKSQYF473Z25		C814	ELECTR. CAPACITOR	CEANP010M50
	C549	CHIP CAPACITOR	CCSQCH101J50		C815	CHIP CAPACITOR	CCSQCH270J50
	C550	ELECTR. CAPACITOR	CEAS101M10		C816	ELECTR. CAPACITOR	CEAS010M50
	C601	ELECTROLYTIC CAPACITOR	CEAS221M6R3		C817	CHIP CAPACITOR	CCSQCH050C50
	C602	CERAMIC CAPACITOR	CKSQYF473Z25		C818	CHIP CAPACITOR	CCSQL471J50
	C603	CHIP CAPACITOR	CCSQCH101J50		C819	CHIP CAPACITOR	CCSQL561J50
	C604	AUDIO FILM CAPACITOR	CFTXA224J50		C820	CERAMIC CAPACITOR	CKSQYF473Z25
	C605	MYLAR FILM CAPACITOR	CQMA102J50		C822	CHIP CAPACITOR	CCSQCH101J50
	C606	AUDIO FILM CAPACITOR	CFTXA821J50		C823	ELECTR. CAPACITOR	CEAS010M50
	C607	MYLAR FILM CAPACITOR	CQMA102J50		C824	CHIP CAPACITOR	CKSQYF103Z50
	C608	MYLAR FILM CAPACITOR	CQMA152J50		C825	AUDIO FILM CAPACITOR	CFTXA682J50
	C610	AUDIO FILM CAPACITOR	CFTXA563J50		C827	AUDIO FILM CAPACITOR	CFTXA333J50
	C611	MYLAR FILM CAPACITOR	CQMA272J50		C828, 829	CHIP CAPACITOR	CKSQYF103Z50
	C612	ELECTR. CAPACITOR	CEAS220M25		C832	AUDIO FILM CAPACITOR	CFTXA104J50
	C613	MYLAR FILM CAPACITOR	CQMA332J50		C834	MYLAR FILM CAPACITOR	CQMA152J50
	C614	AUDIO FILM CAPACITOR	CFTXA103J50		C835, 836	ELECTROLYTIC CAPACITOR	CEAL220M5
	C615	AUDIO FILM CAPACITOR	CFTXA104J50		C837	CERAMIC CAPACITOR	CCCSL331J50
	C616	ELECTR. CAPACITOR	CEANP2R2M50		C838	AUDIO FILM CAPACITOR	CFTXA104J50
	C617	AUDIO FILM CAPACITOR	CFTXA393J50		C839	MYLAR FILM CAPACITOR	CQMA102J50
	C618	ELECTR. CAPACITOR	CEANP220M10		C840	ELECTR. CAPACITOR	CEAL010M50



Mark	No.	Description	Part No.	Mark	No.	Description	Part No.
C841		ELECTROLYTIC CAPACITOR	CEAS220M35	VR602, 603		SEMI-FIXED VR(10k $\Omega$ )	VRTB6VS103
C842		ELECTR. CAPACITOR	CEANP100M16	VR604		SEMI-FIXED VR(4.7k $\Omega$ )	VRTB6VS472
C843		AUDIO FILM CAPACITOR	CFTXA223J50	VR605, 606		SEMI-FIXED VR(2.2k $\Omega$ )	VRTB6VS222
C845		ELECTR. CAPACITOR	CEANP010M50	VR607		SEMI-FIXED VR(2.2k $\Omega$ )	VRTB6VS223
				VR608		VARIABLE RESISTOR(33k $\Omega$ )	VRTB6VS333
C847		AUDIO FILM CAPACITOR	CFTXA683J50	VR609		SEMI-FIXED VR(4.7k $\Omega$ )	VRTB6VS472
C848		AUDIO FILM CAPACITOR	CFTXA473J50	VR610		SEMI-FIXED VR(10k $\Omega$ )	VRTB6VS103
C849		AUDIO FILM CAPACITOR	CFTXA103J50	R124		CARBON FILM RESISTOR	RD1/6PM223J
C850		ELECTR. CAPACITOR	CEANP2R2M50	R125, 126		CARBON FILM RESISTOR	RD1/6PM103J
C851		CERAMIC CAPACITOR	CKSQYF104Z25	R130		CARBON FILM RESISTOR	RD1/6PM471J
C852		FILM CAPACITOR	CFTNA224J50	R201, 202		CARBON FILM RESISTOR	RD1/6PM750J
C853		MYLAR FILM CAPACITOR	CQMA332J50	R203		CARBON FILM RESISTOR	RD1/6PM101J
C854		CERAMIC CAPACITOR	CKSQYB821K50	R207, 208		CARBON FILM RESISTOR	RD1/6PM220J
C855		ELECTR. CAPACITOR	CEAS100M50	R219		CARBON FILM RESISTOR	RD1/6PM680J
C857		ELECTROLYTIC CAPACITOR	CEAS221M6R3	R221		CARBON FILM RESISTOR	RD1/6PM681J
C858		CERAMIC CAPACITOR	CKSQYF104Z25	R234		CARBON FILM RESISTOR	RD1/6PM680J
C859		ELECTROLYTIC CAPACITOR	CEAS221M6R3	R236		CARBON FILM RESISTOR	RD1/6PM151J
C860		CERAMIC CAPACITOR	CKSQYF104Z25	R241, 242		CARBON FILM RESISTOR	RD1/6PM220J
C861		CHIP CAPACITOR	CKSQYF103Z50	R290		CARBON FILM RESISTOR	RD1/6PM222J
C863		ELECTR. CAPACITOR	CEANP100M16	R403		CARBON FILM RESISTOR	RD1/6PM271J
C864		ELECTR. CAPACITOR	CEAS100M50	R415, 416		METALFILM RESISTOR	RNI/6PQ2402F
C865		AUDIO FILM CAPACITOR	CFTXA103J50	R431		CARBON FILM RESISTOR	RD1/6PM510J
C866		ELECTROLYTIC CAPACITOR	CEANPR47M50	R434		METALFILM RESISTOR	RNI/6PQ5101F
C867		AUDIO FILM CAPACITOR	CFTXA333J50	R438		METALFILM RESISTOR	RNI/6PQ1203F
C868		AUDIO FILM CAPACITOR	CFTXA683J50	R442		CARBON FILM RESISTOR	RD1/6PM102J
C869		AUDIO FILM CAPACITOR	CFTXA473J50	R511		METALFILM RESISTOR	RNI/6PQ2002F
C870		ELECTROLYTIC CAPACITOR	CEANP470M10	R550		FUSE RESISTOR(10 $\Omega$ )	DCN1 002
C871		CERAMIC CAPACITOR	CCCSL331J50	R551		CARBON FILM RESISTOR	RD1/6PM100J
C873		AUDIO FILM CAPACITOR	CFTXA103J50	R603		CARBON FILM RESISTOR	RD1/6PM271J
C874		AUDIO FILM CAPACITOR	CFTXA104J50	R618, 629		CARBON FILM RESISTOR	RD1/6PM225J
C875		CERAMIC CAPACITOR	CKSQYB562K50	R647		CARBON FILM RESISTOR	RD1/6PM103J
C876, 877		ELECTROLYTIC CAPACITOR	CEAL220M35	R650		CARBON FILM RESISTOR	RD1/6PM225J
C878		CERAMIC CAPACITOR	CKSQYF104Z25	R665-676		CARBON FILM RESISTOR	RD1/6PM331J
C879		CERAMIC CAPACITOR	CKSQYB562K50	R677, 678		CARBON FILM RESISTOR	RD1/6PM562J
C880		CERAMIC CAPACITOR	CKSQYF104Z25	R680, 681		METALFILM RESISTOR	RNI/6PQ1002F
C881, 882		CHIP CAPACITOR	CKSQYF103Z50	R682, 683		METALFILM RESISTOR	RNI/6PQ2202F
C883		AUDIO FILM CAPACITOR	CFTXA823J50	R691		CARBON FILM RESISTOR	RD1/6PM824J
C890, 891		CHIP CAPACITOR	CCSQCH470J50	R701		CARBON FILM RESISTOR	RD1/6PM472J
C893		CHIP CAPACITOR	CCSQCH470J50	R709		CARBON FILM RESISTOR	RD1/6PM473J
C895		CHIP CAPACITOR	CCSQCH100D50	R832		CARBON FILM RESISTOR	RD1/6PM124J
C896, 897		ELECTR. CAPACITOR	CEAS470M10	R841		CARBON FILM RESISTOR	RD1/6PM563J
C898, 899		MYLAR FILM CAPACITOR	CQMA272J50	R842		CARBON FILM RESISTOR	RD1/6PM222J
C900		FILM CAPACITOR	CFTNA224J50	R850, 862		METAL OXIDE RESISTOR	RS1LMF3R3J
C901		AUDIO FILM CAPACITOR	CFTXA103J50	R873		CARBON FILM RESISTOR	RD1/6PM100J
C902		ELECTR. CAPACITOR	CEAS100M50	R910-912		CARBON FILM RESISTOR	RD1/6PM563J
C908		CHIP CAPACITOR	CKSQYF103Z50	R913		CARBON FILM RESISTOR	RD1/6PM101J
C910		AUDIO FILM CAPACITOR	CFTXA473J50	R916		CARBON FILM RESISTOR	RD1/6PM100J
C920, 921		ELECTR. CAPACITOR	CEAS220M25	R917		CARBON FILM RESISTOR	RD1/6PM123J
C930		ELECTROLYTIC CAPACITOR	CEAL220M35	R923		CARBON FILM RESISTOR	RD1/6PM103J
C935		(1F/5.5V)	VCH1039	R934		CARBON FILM RESISTOR	RD1/6PM681J
VC901		VARIABLE CAPACITOR(20P)	VCM-008	R948		CARBON FILM RESISTOR	RD1/6PM104J
				R962		CARBON FILM RESISTOR	RD1/6PM102J
				R985		CARBON FILM RESISTOR	RD1/6PM473J
						OTHER RESISTORS	RS/ 10S□□□J
<b>RESISTORS</b>							
VR202		SEMI-FIXED VR(3.3k $\Omega$ )	VRTB6VS332				
VR441		SEMI-FIXED VR(10k $\Omega$ )	VRTB6VS103				
VR481, 482		SEMI-FIXED VR(4.7k $\Omega$ )	VRTB6VS472				
VR521		SEMI-FIXED VR(4.7k $\Omega$ )	VRTG6VS472				
VR601		SEMI-FIXED VR(1k $\Omega$ )	VRTB6VS102				

Mark No.	Description	Part No.
<b>OTHERS</b>		
CN103	22P TOP CONNECTOR	VKN1137
JA1	2P PIN JACK (VIDEO OUT1, 2)	VKB1042
JA2	2P MINI JACK (CONTROL IN)	VKN-183
JA3	4P MINI DIN SOCKET (S VIDEO OUT)	VKN1072
JA4	MINI JACK (CD DECK SYNCHRO)	RKN1014
X101	CERAMIC RESONATOR (9.00MHz)	VSS1040
X601	CRYSTAL RESONATOR (14.318MHz)	VSS1026

**AUDIO ASSEMBLY (VWV1250)**

**SEMICONDUCTORS**

IC201	EFM DEMODULATION IC	CXD2500AQ
IC202	8FS DIGITAL FILTER, IC	SM5840AP
IC203	LOGIC IC	TC74HCU04AP
IC204	IC	BA15218N
IC205	REGULATOR IC	NJM78L09A
IC206	REGULATOR IC	NJM79L09A
IC209, 210	DA CONVERTER IC	SAA7350
IC211, 213	OP-AMP, IC	M5218AL
IC215	OP-AMP, IC	M5218AL
IC351	AUDIO IC	PA0034A
Q201	CHIP TRANSISTOR	2SC2412K
Q202	DIGITAL TRANSISTOR	DTA124EK
Q204	TRANSISTOR	2SB1237X
Q205	CHIP TRANSISTOR	2SA1037K
Q206	DIGITAL TRANSISTOR	DTC124EK
Q207	DIGITAL TRANSISTOR	DTA124EK
Q208	CHIP TRANSISTOR	2SC2412K
Q209	TRANSISTOR	2SA1435
Q210	DIGITAL TRANSISTOR	DTA124EK
Q211	CHIP TRANSISTOR	2SC2412K
Q212	TRANSISTOR	2SA1435
Q213	DIGITAL TRANSISTOR	DTA124EK
Q214	DIGITAL TRANSISTOR	DTC124EK
Q216	DIGITAL TRANSISTOR	DTA124EK
Q224	TRANSISTOR	2SB1237X
Q225	CHIP TRANSISTOR	2SA1037K
Q226	DIGITAL TRANSISTOR	DTC124EK
Q230, 231	CHIP TRANSISTOR	2SC2412K
Q351	TRANSISTOR	2SC2786
Q352	TRANSISTOR	2SC1740S
D201	VARI-CAP	FC54M
D202	SCHOTTKY DIODE	ERA83-006

**COILS**

L243, 300	AXIAL INDUCTOR	LAU220J
L301	AXIAL INDUCTOR	LAU181J
L302	AXIAL INDUCTOR	LAU180J
L352	AXIAL INDUCTOR	LAU181J
L353	AXIAL INDUCTOR	LAU220J

Mark No.	Description	Part No.
<b>CAPACITORS</b>		
C201	CERAMIC CAPACITOR	CKSQYF473Z25
C202	CERAMIC CAPACITOR	CKSQYB152K50
C204	CERAMIC CAPACITOR	CKSQYF104Z25
C205	ELECTROLYTIC CAPACITOR	CEANPR47M50
C206	CHIP CAPACITOR	CKSQYF103Z50
C208	ELECTR. CAPACITOR	CEAS470M10
C209	CERAMIC CAPACITOR	CKSQYF104Z25
C210	CERAMIC CAPACITOR	CKSQYF473Z25
C211	ELECTR. CAPACITOR	CEAS470M10
C212	CERAMIC CAPACITOR	CKSQYF104Z25
C213	CHIP CAPACITOR	CKSQYF103Z50
C214	ELECTR. CAPACITOR	CEAS470M10
C215	CERAMIC CAPACITOR	CKSQYF104Z25
C216	ELECTR. CAPACITOR	CEAS470M10
C217	CERAMIC CAPACITOR	CKSQYF104Z25
C218	CHIP CAPACITOR	CKSQYF103Z50
C225	ELECTR. CAPACITOR	CEANP010M50
C226	AUDIO FILM CAPACITOR	CFTXA223J50
C227	ELECTR. CAPACITOR	CEAS100M50
C228, 229	CERAMIC CAPACITOR	CKSQYF104Z25
C230	ELECTR. CAPACITOR	CEAS470M10
C231	CHIP CAPACITOR	CKSQYF103Z50
C232	CHIP CERAMIC C.	CCSQCH220J50
C233	ELECTR. CAPACITOR	CEAS470M10
C234	CHIP CAPACITOR	CKSQYF103Z50
C235	CERAMIC CAPACITOR	CKSQYF104Z25
C236	CHIP CAPACITOR	CCSQCH180J50
C239	ELECTR. CAPACITOR	CEAS470M10
C241	ELECTR. CAPACITOR	CEAS470M50
C242	ELECTR. CAPACITOR	CEAS470M10
C244-248	ELECTR. CAPACITOR	CEAS470M10
C249, 250	CHIP CAPACITOR	CCSQCH101J50
C251	ELECTR. CAPACITOR	CEAS470M10
C253	AXIAL CERAMIC C	CCPUSL390J50
C254	AUDIO FILM CAPACITOR	CFTXA471J50
C255	AXIAL CERAMIC C	CCPUSL390J50
C256	AUDIO FILM CAPACITOR	CFTXA471J50
C257, 259	ELECTR. CAPACITOR	CEAS470M10
C261, 263	ELECTR. CAPACITOR	CEAS470M10
C265, 267	ELECTR. CAPACITOR	CEAS470M10
C269	AXIAL CERAMIC C	CCPUSL390J50
C270	AUDIO FILM CAPACITOR	CFTXA471J50
C271	AXIAL CERAMIC C	CCPUSL390J50
C272	AUDIO FILM CAPACITOR	CFTXA471J50
C273, 275	ELECTR. CAPACITOR	CEAS470M10
C276	CERAMIC CAPACITOR	CKSQYF473Z25
C279	AUDIO FILM CAPACITOR	CFTXA222J50
C280	CERAMIC CAPACITOR	CCCSL391J50
C281, 283	ELECTR. CAPACITOR	CEAS470M10
C285	ELECTR. CAPACITOR	CEAS470M25
C293-296	CERAMIC CAPACITOR	CCCSL221J50
C299	ELECTR. CAPACITOR	CEANP3R3M50
C301	ELECTR. CAPACITOR	CEAS470M10
C303	AXIAL CERAMIC C	CCPUSL390J50
C304	AUDIO FILM CAPACITOR	CFTXA471J50

Mark	No.	Description	Part No.
C305		AXIAL CERAMIC C	CCPUSL390J50
C306		AUDIO FILM CAPACITOR	CFTXA471J50
C307, 309		ELECTR. CAPACITOR	CEAS470M10
C311, 313		ELECTR. CAPACITOR	CEAS470M10
C315, 317		ELECTR. CAPACITOR	CEAS470M10
C319		AXIAL CERAMIC C	CCPUSL390J50
C320		AUDIO FILM CAPACITOR	CFTXA471J50
C321		AXIAL CERAMIC C	CCPUSL390J50
C322		AUDIO FILM CAPACITOR	CFTXA471J50
C323, 325		ELECTR. CAPACITOR	CEAS470M10
C326		CERAMIC CAPACITOR	CKSQYF473Z25
C329		AUDIO FILM CAPACITOR	CFTXA222J50
C330		CERAMIC CAPACITOR	CCCSL391J50
C331, 333		ELECTR. CAPACITOR	CEAS470M10
C335		ELECTR. CAPACITOR	CEAS470M25
C340		CHIP CAPACITOR	CCSQCH270J50
C341, 342		ELECTR. CAPACITOR	CEAS470M10
C352		CHIP CERAMIC C.	CCSQCH221J50
C353		CHIP CERAMIC C.	CCSQCH150J50
C354		CHIP CAPACITOR	CKSQYF103Z50
C355		ELECTR. CAPACITOR	CEAS100M50
C357, 358		CHIP CAPACITOR	CCSQCH820J50
C359		CHIP CAPACITOR	CKSQYF103Z50
C360, 361		ELECTR. CAPACITOR	CEAS101M10
C362		CHIP CAPACITOR	CCSQL331J50
C363		CHIP CAPACITOR	CKSQYB682K50
C364		ELECTR. CAPACITOR	CEAS220M25
C365, 366		CERAMIC CAPACITOR	CKSQYB472K50
C367		AUDIO FILM CAPACITOR	CFTXA393J50
C368		ELECTR. CAPACITOR	CEANP220M10
C369		ELECTR. CAPACITOR	CEAS470M10
C370		ELECTR. CAPACITOR	CEAS100M50
C371		CHIP CAPACITOR	CCSQCH680J50
C372, 373		AUDIO FILM CAPACITOR	CFTXA104J50
C374		CERAMIC CAPACITOR	CCSQCH560J50
C376		ELECTR. CAPACITOR	CEAS470M10
C377		CHIP CAPACITOR	CKSQYF103Z50
C378, 379		ELECTR. CAPACITOR	CEAS101M10
C380		CHIP CERAMIC C.	CCSQCH271J50
C381		CERAMIC CAPACITOR	CCSQCH560J50
C382		CHIP CAPACITOR	CKSQYB682K50
C383		ELECTR. CAPACITOR	CEAS220M25
C384, 385		CERAMIC CAPACITOR	CKSQYB472K50
C386		ELECTR. CAPACITOR	CEANP220M10
C387		AUDIO FILM CAPACITOR	CFTXA393J50
C388		ELECTR. CAPACITOR	CEASR47M50
C389		CHIP CAPACITOR	CKSQYF103Z50
C390		ELECTR. CAPACITOR	CEAS220M25
C391		CHIP CAPACITOR	CKSQYB102K50
C393		CHIP CAPACITOR	CCSQCH151J50
C395		CHIP CAPACITOR	CKSQYF103Z50
C396		CERAMIC CAPACITOR	CCSQCH560J50
C397		CHIP CAPACITOR	CCSQCH390J50
C398		CHIP CAPACITOR	CCSQCH680J50
C399		CHIP CAPACITOR	CCSQCH121J50

Mark	No.	Description	Part No.
<b>RESISTORS</b>			
	R251, 252	CARBON FILM RESISTOR	RD1/6PM303J
	R254-268	CARBON FILM RESISTOR	RD1/6PM□□□J
	R271, 272	CARBON FILM RESISTOR	RD1/6PM303J
	R274-288	CARBON FILM RESISTOR	RD1/6PM□□□J
	R291	CARBON FILM RESISTOR	RD1/6PM103J
	R303	METAL OXIDE RESISTOR	RS2LMF560J
	R304	CARBON FILM RESISTOR	RD1/6PM221J
	R307	METAL OXIDE RESISTOR	RS2LMF560J
	R310-317	CARBON FILM RESISTOR	RD1/6PM103J
	R340, 344	CARBON FILM RESISTOR	RD1/6PM220J
	R345, 346	CARBON FILM RESISTOR	RD1/6PM390J
	R357	CARBON FILM RESISTOR	RD1/6PM680J
	R390, 391	CARBON FILM RESISTOR	RD1/6PM220J
	OTHER RESISTORS		RS1/10S□□□J

**OTHERS**

CN301	5P TOP POST (NH)	B5P-SHF-1AA
JA101	4P PIN JACK (AUDIO OUT 1, 2)	VKB1043
JA102	OPTICAL OUTPUT JACK (DIGITAL OUT OPTICAL)	TCTX178
X201	CRYSTAL RESONATOR (16MHz)	VSS1051

**IRPS ASSEMBLY****SEMICONDUCTORS**

D201	LED INDICATOR (RED)	VEL1018
D202	LED INDICATOR (YELLOW)	VEL1003
Q201, 202	TRANSISTOR	DTC124ES

**SWITCHES**

S201-203	TACT SWITCH (POWER STANDBY/ON, FL DISPLAY OFF, SINGLE)	RSS1030
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**CAPACITOR**

C201	ELECTROLYTIC CAPACITOR	CAS221M6R3
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**RESISTORS**

R201, 202	CARBON FILM RESISTOR	RD1/6PM151J
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**OTHERS**

	REMOTE CONTROL SENSOR UNIT	GHLJ58X
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**FLKY ASSEMBLY****SEMICONDUCTORS**

IC101	MODE CONTROL MCU	PB056A
IC102	RESET IC	PT529D
Q101	TRANSISTOR	DA144ES
Q102	TRANSISTOR	DC114ES
Q103-109	TRANSISTOR	DC124ES
D1	LED INDICATOR (GREEN)	VL1020
D102	DIODE	1S254
D103-106	DIODE	1S252
D109, 110	DIODE	1S254
D2	LED INDICATOR (GREEN)	VL1020

Mark	No.	Description	Part No.
	D3, 4	LED INDICATOR(YELLOW)	VEL1003
	D5	LED INDICATOR(GREEN)	VEL1020
	D6, 7	LED INDICATOR(YELLOW)	VEL1003

**SWITCHES**

S101	DOOR SWITCH(DOOR)	VSK1015
S102-113	TACT SWITCH { SOFT PICTURE, ◀◀, HILITE/INTRO SCAN, RANDOM PLAY, THEATER, ▶▶, ▲, ■, ▶/  , DIRECT CD, DISC SIDE (A, B) }	RSG1030

S114	ROTARY ENCODER(SCAN)	VSD1006
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**CAPACITORS**

C101	ELECTR. CAPACITOR	CEAL100M16
C103, 104	CERAMIC CAPACITOR	CKPUYF223Z25
C105	ELECTR. CAPACITOR	CEAL101M6R3
C106	CERAMIC CAPACITOR	CKPUYB102K50

**RESISTORS**

R2	RESISTOR ARRAY(100kΩ)	RA7S104J
OTHER RESISTORS		RD1/6PM□□□J

**OTHERS**

V101	FL TUBE	VAW1015
X101	CERAMIC RESONATOR	VSS1055
	FL SPACER	VEB1140
	CUSHION(A)	VEC1551
	CUSHION(B)	VEC1552

**HEPB ASSEMBLY**

**RESISTOR**

VR303	DOUBLE ROTARY VOLUME (LEVEL)	VCS1015
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**OTHERS**

JA301	HEADPHONE JACK(PHONES)	RKN1002
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**POWER SUPPLY ASSEMBLY (VWR1131)**

**SEMICONDUCTORS**

IC202	TRANSISTOR ARRAY WITH FUSE	TH5P4-FU
IC213, 214	IC PROTECTOR	ICP-N50
IC215	IC PROTECTOR	ICP-N38
Q201	TRANSISTOR	2SB1331
Q202	TRANSISTOR	2SC1740S
Q205, 206	TRANSISTOR	2SA933S
Q207	TRANSISTOR	2SD1762
D201, 202	DIODE	S3LA20
D203	DIODE	S3S4M
D204	DIODE	ERB83-006
D205	DIODE	D1NL20
D206	ZENER DIODE	MTZJ2. 4A
D207	ZENER DIODE	MTZJ3. 3A
D208	ZENER DIODE	MTZJ5. 6C
D209, 210	DIODE	D1NL20
D213-215	DIODE	D1NL20

**COIL**

L203	SPDL CHOKE COIL	VTL1043
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Mark	No.	Description	Part No.
<b>OTHERS</b>			
	F202, 203	MICRO FUSE(0. 63A)	NT1-0. 63A

OTHER PARTS ARE NOT SUPPLIED.

**CNNB ASSEMBLY**

**SWITCH**

S201	LEVER SWITCH	VSK1017
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**RESISTORS**

R101	CARBON FILM RESISTOR	RD1/6PM272J
R102	CARBON FILM RESISTOR	RD1/6PM221J

**OTHERS**

CN203	22P SIDE CONNECTOR	VKN1138
CN204	25P SIDE CONNECTOR	VKN1139

**HEAD ASSEMBLY**

**CAPACITORS**

C3	CHIP CAPACITOR	CKSQYF223Z50
C4	CHIP CAPACITOR	CKSQYF104Z25
C5	CHIP CAPACITOR	CKSYF105Z16
C6	CHIP CAPACITOR	CKSQYF104Z25

**RESISTOR**

VR1	SEMI-FIXED VR(10kΩ)	VCP1025
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## 5. ADJUSTMENTS

### 5.1 JIGS AND INSTRUMENTS REQUIRED FOR ADJUSTMENT

- Small screwdriver (about 10cm long)
- Small Phillips screwdriver (about 7cm long)
- Phillips screwdriver
- Dual-trace oscilloscope (with delay)
- AF oscillator
- Frequency counter
- LD test disc (GGV1003)
- CD test disc (YEDS - 7)
- Digital voltmeter
- Shorting clip
- L - shaped eccentric screwdriver (GGV - 129)
- TV monitor
- Resistor ( $47k\Omega$  ,  $10k\Omega \times 2$ ,  $75\Omega$ )
- Low-pass filter ( $47k\Omega + 1\mu F$ )

### 5.2 TEST MODE

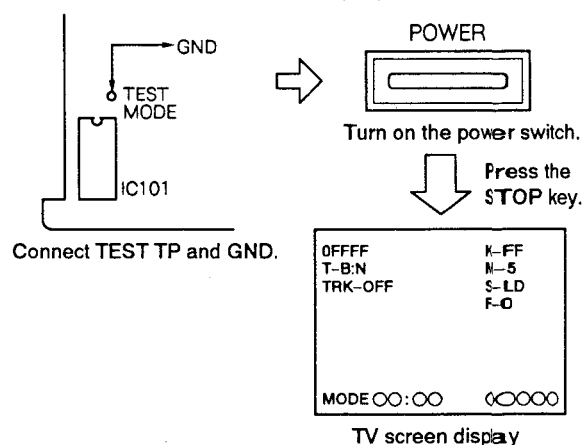
The player has a test mode function which allows the servicer to check the player's status on the TV screen by executing the respective key operation.

Also, since the TRKG servo opens and closes easily, the test mode is especially useful for mechanical adjustments.

#### 5.2.1 TEST MODE INITIATION

[Procedure]

1. Remove the bonnet and disc tray.
2. Connect the TEST MODE (TP) to GND.
3. Turn on the power switch.
4. Disconnect the TEST MODE (TP) from GND.



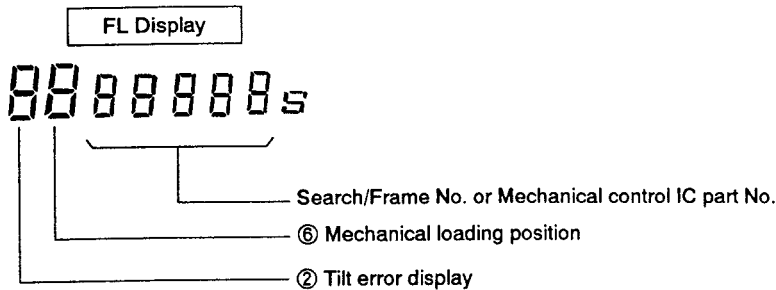
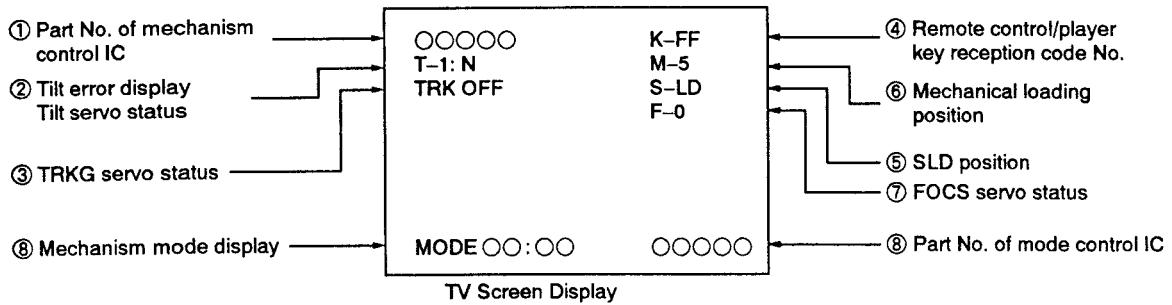
*Note: When using the remote control unit (GG F1067) for the test mode.*

- Press the **TEST** key after pressing the **ESC** key.

#### 5.2.2 TEST MODE CANCELLATION

Turn off the power switch.

### 5.2.3 TV SCREEN AND FL DISPLAYS IN THE TEST MODE



① The Mechanical Control IC Part No. will be Displayed.

Example: PD0081A1 → 0081A  
 PD0081B1 → 0081B  
 PD0123A1 → 0123A

④ Remote Control/Player Key Reception Code No.  
 TV screen display

K-00  
 ↑ See table 1

② Tilt Servo Status / Tilt Error Display

T-0:00  
 ↑ Tilt servo status : N ...Tilt neutral  
 ON ...Tilt servo ON  
 OFF ...Tilt servo OFF  
 Tilt error display: 0 Tilt -  
 ↑ Tilt neutral  
 F Tilt +

③ TRKG Servo Status

TV screen display  
 TRK-0000  
 ↑ ON...TRKG servo close  
 OFF...TRKG servo open

Code	Function	Code	Function	Code	Function	Code	Function
00	0	20	F JOG0	40	(CHAP / TRK)	60	
01	1	21	F JOG1	41	(FRAM / TIM)	61	
02	2	22	F JOG2	42	(SEARCH)	62	
⋮	⋮	⋮	⋮	⋮	⋮	⋮	
1C	POW ON/OFF	3C		5C		7C	
1D	EDIT	3D		5D		7D	
1E	AUDIO	3E		5E	RNDM (TEST)	7E	
1F	+10	3F		5F	(ESC)	7F	

Table 1 Example of Code

⑤ **SLDR Position**

TV screen display	FL display	Mode
S-○○○ └─ IN	—	CD inside SW ON
CD	CD	CD active area
CDV	CDV	CDV active area
LD	LD	LD active area
B IN	—	LD B inside SW ON

⑥ **Mechanical Loading Position**

TV screen display

M-○

- └─ 0 ... Tray open
- 1 ... Loading
- 2 ... Standby
- 3 ... Clamped
- 5 ... Tilt minus
- 7 ... Tilt plus
- 8 ... Tilt limit
- 9 ... B side clamped (two sides)

⑦ **Focus Offset VR Status**

TV screen display

F-○

- └─ 0 ... Normal mode
  - TRKG close : VR606 (RF MAX)
  - TRKG open : VR605 (TE MAX)
- 1 ... VR606 is activated when opening the TRKG servo loop.

⑧ **The mode control IC part No. will be displayed.**

Example PDB056A → B056A

## 5.2.4 KEY OPERATION IN THE TEST MODE

Function	Player Status	Key Operation	Remarks
Open Tray	STOP mode	▲	
Close Tray	Tray open	▲	
Stop	PLAY mode	■	
Play	Disc placement and tray closed.	▶	<ul style="list-style-type: none"> <li>• Start play with the TRKG servo open.</li> <li>• Raise up with tilt neutral.</li> <li>• The disc type (LD/CD/CDV) is determined when playback starts at the SLDR position during start play.</li> </ul>
TRKG Servo Open/Close	PLAY mode	▶	<ul style="list-style-type: none"> <li>• Each time the PLAY button (▶) is pressed, the TRKG servo will open or close alternately.</li> </ul>
Still	PLAY mode TRKG servo closed.	(Remote control unit key)	<ul style="list-style-type: none"> <li>• Each time the STILL button (  ) is pressed, the player will switch between the PLAY and STILL modes alternately.</li> </ul>
SLDR REV SCAN	PLAY mode	◀◀ (SHUTTLE RING REV)	<ul style="list-style-type: none"> <li>• Press and hold down the key. To use the shuttle ring, turn it clockwise.</li> <li>• With the TRKG servo open, the pickup can be damaged if the SLDR moves further inward than the lead-in area on the disc. Do not allow the SLDR to move further inward than the lead-in area.</li> </ul>
SLDR FWD SCAN	PLAY mode	▶▶ (SHUTTLE RING REV)	<ul style="list-style-type: none"> <li>• Press and hold down the key. To use the shuttle ring, turn it clockwise.</li> <li>• With the TRKG servo open, the pickup can be damaged if the SLDR moves further outward than the lead-in area on the disc. Do not allow the SLDR to move further outward than the lead-in area.</li> </ul>
TILT Neutral	POWER switch ON	EDIT	
TILT Servo ON	PLAY mode	RANDOM PLAY	
TILT Minus TILT Servo OFF	PLAY mode	◀◀	<ul style="list-style-type: none"> <li>• Press and hold down the keys.</li> </ul>
TILT Plus TILT Servo OFF	PLAY mode	▶▶	<ul style="list-style-type: none"> <li>• Press and hold down the keys.</li> </ul>
Screen Display ON/OFF	POWER switch ON	PGM key	
Frame search	PLAY mode	+10 key ↓ 0-9 key ↓ ▶	<ul style="list-style-type: none"> <li>• In the PLAY mode, press the +10 key. (The player will standby for the frame No. entry.)</li> <li>• Use the numeric keys (0—9) to enter the frame No.. Then press the player's PLAY key to search.</li> <li>• After the search is completed, the player will return to the previous mode before the search was performed.</li> </ul>
Loading Motor Rotation Clockwise Counterclockwise	Tray open	▶▶  ◀◀	<ul style="list-style-type: none"> <li>• FWD : Unloading</li> <li>• REV : Loading</li> </ul>
FOCS Offset (RF MAX) for checking VR606	PLAY mode TRKG servo open	Remote control unit key •MULTI-SPEED FWD → F-1 REV → F-0 Player key •INTRO SCAN (toggle)	VR606 and VR605 : For check F - 0 : Normal state ..... TRKG close : VR606 (RF MAX) TRKG open : VR605 (TE MAX) F - 1 : VR606 is effected when opening the TRKG.

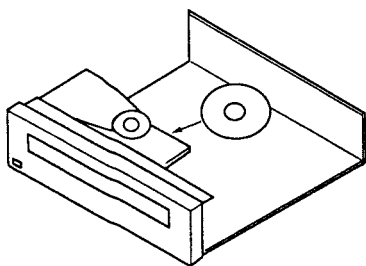


### 5.2.5 PLAYER OPERATION IN THE TEST MODE

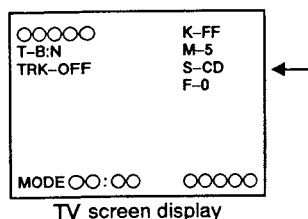
Operate the player by selecting a test mode function with the keys on the player or on the remote control unit.

#### ● CD PLAYBACK

- ① Place the CD disc on the turn table.  
(Clamper is already lifted up.)



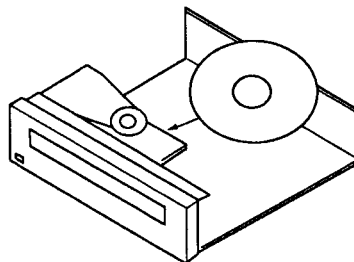
- ② Press the or key to appear "S-CD" on the TV screen display.



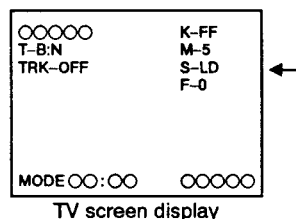
- ③ Clamp the disc by pressing the PLAY () key once. Then, press the PLAY () key twice, disc will be normal playbacked.

#### ● LD PLAYBACK

- ① Place the LD disc on the turn table.  
(Clamper is already lifted up.)



- ② Press the or key to appear "S-LD" on the TV screen display.



- ③ Clamp the disc by pressing the PLAY () key once. Then, press the PLAY () key twice, disc will be normal playbacked.

### 5.3 PREPARATIONS FOR ADJUSTMENT AND PRECAUTIONS

#### 1) When replacing the pickup assembly, adjust in the following way:

##### –Carriage assembly in forward state–

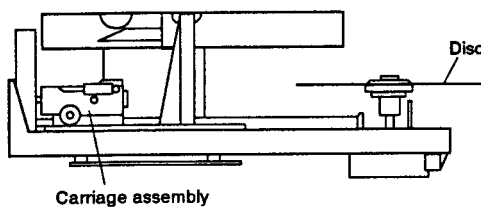
1. Tilt offset adjustment
2. Tilt servo gain adjustment
3. Coarse grating adjustment, tracking balance adjustment
4. Slider shaft horizontal adjustment
5. Pickup inclination adjustment
6. TRKG error MAX. / crosstalk MAX. adjustment
7. Tilt sensor inclination/tilt balance adjustment
8. Spindle motor centering check
9. Spindle motor centering adjustment
10. Fine grating adjustment
11. FOCS SUM level adjustment
12. FOCS servo loop gain adjustment
13. TRKG servo loop gain adjustment
14. RF gain adjustment

##### –Carriage assembly in reverse state–

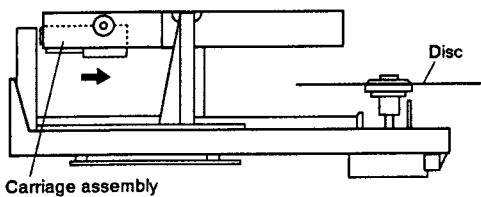
15. Coarse centering adjustment for side B play
16. Pickup tangential direction angle adjustment for side B play
17. Fine centering adjustment for side B play

*Note : The forward status of carriage assembly is when the carriage assembly is in the position to play side A of the disc. The reverse status is when it is in the position to play side B of the disc.*

Carriage assembly forward state



Carriage assembly reverse state

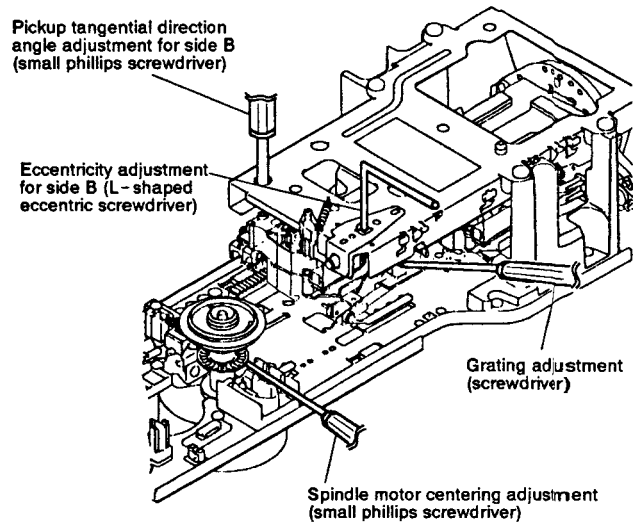


#### 2) Side B play

Direct side B play is possible by pressing the SIDE B key of the front panel.

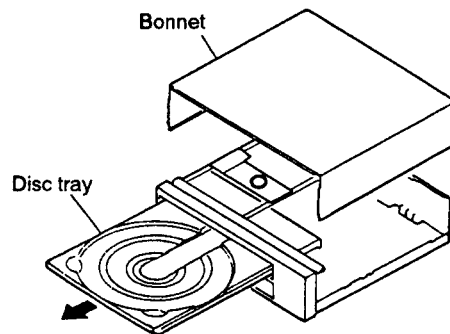
#### 3) Where to insert the screwdriver when adjusting the pickup assembly

##### –Carriage assembly in forward state–



#### 4) Setting the player

Adjustment should be performed with the bonnet, disc tray and AUDIO assembly removed.



#### 5) Installing the disc

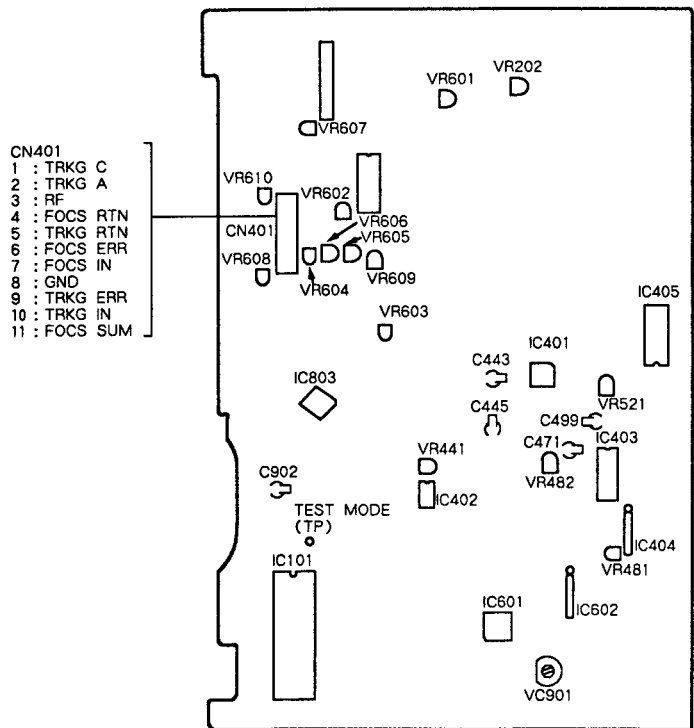
The disc should be placed from behind on the turntable and when Open/Close key is pressed, the damper comes down to clamp the disc.

## 5.4 MAIN BOARD ASSEMBLY ADJUSTMENT SUMMARY

	ADJUSTMENT	Adjusting Point	Measurement equipment Connecting Point	Player Condition	Adjusting Specification
1	Tilt Offset Adjustment	VR610	C902 - (minus) lead wire	<ul style="list-style-type: none"> <li>• Stop mode (power on)</li> </ul>	<ul style="list-style-type: none"> <li>• Adjust VR610 so that the DC voltage becomes <math>0 \pm 0.2V</math>.</li> </ul>
2	Tilt Servo Gain Adjustment	VR608	None	<ul style="list-style-type: none"> <li>• Power OFF</li> </ul>	<ul style="list-style-type: none"> <li>• Making of Tilt gain VR position Red : Turn to right Clear : Center Blue : Turn to left</li> </ul>
3	Coarse Grating and Tracking Balance Adjustment	Grating / VR602	CN401-9 (TRKG ERR)	<ul style="list-style-type: none"> <li>• Test mode #8,500 still TRKG servo open</li> <li>• Tilt servo NEUTRAL</li> </ul>	<ul style="list-style-type: none"> <li>• Null point → TRK error MAX</li> <li>• Adjust VR602 so that the TRK error waveform amplitude's positive and negative level become equal.</li> </ul>
4	Slider Shaft Horizontal Adjustment	SKIP key	CN401-4 (FOCS RTN)	<ul style="list-style-type: none"> <li>• Test mode #9,800 , #22,000-25,000 still TRKG servo open</li> <li>• TILT servo OFF</li> </ul>	<ul style="list-style-type: none"> <li>• Adjust the SKIP key so that the FOCS RTN voltage between #9,800 and #22,000-#25,000 becomes equal.</li> </ul>
5	Pickup Inclination Adjustment	Pickup assembly TAN / TRK inclination adjustment screw	CN401-3 (RF)	<ul style="list-style-type: none"> <li>• Test mode , #2,701 still TRKG servo loop close</li> <li>• TILT servo OFF</li> </ul>	<ul style="list-style-type: none"> <li>• RF waveform's amplitude MAX (Pickup TAN / TRK adjustment screw)</li> <li>• Minimized crosstalk.</li> </ul>
6	TRKG Error MAX / RF LEVEL MAX Adjustment	VR605 (TE MAX) VR606 (CT MAX)	CN401-9 (TRKG ERR) CN401-3 (RF)	<ul style="list-style-type: none"> <li>• Test mode #2,701 / #115 still TRKG servo close /open</li> <li>• TILT servo OFF</li> </ul>	<ul style="list-style-type: none"> <li>• TRK error MAX (VR605) RF MAX (VR606)</li> <li>• Check crosstalk</li> </ul>
7	Tilt Sensor Inclination/ Tilt Balance Adjustment	Tilt sensor inclination adjustment screw VR607 (TILT BAL.)	Video output terminal (TV monitor) (Test mode screen)	<ul style="list-style-type: none"> <li>• Test mode #16,200 / #115 still TRKG servo loop close</li> <li>• TILT servo OFF</li> </ul>	<ul style="list-style-type: none"> <li>• Set VR607 to the center.</li> <li>• Adjust the adjustment screw so that the tilt error display code is 6, 7, or 8.</li> <li>• Adjust VR607 so that the tilt error display becomes 7.</li> </ul>
8	Spindle Motor Centering Check	None	CH1:CN401-9 (TRKG ERR) CH2:CN401-1, 2 (TRKG A+C) (X-Y mode)	<ul style="list-style-type: none"> <li>• Test mode #22,000-25,000 and #100 TRKG servo open</li> <li>• TILT servo ON</li> </ul>	<ul style="list-style-type: none"> <li>• Check that the amplitude of the lissajous figure of the frame #100 is the same as that of the frame #22,000-25,000.</li> </ul>
9	Spindle Motor Centering Adjustment	Spindle motor centering adjustment screw.	CH1:CN401-9 (TRKG ERR) CH2:CN401-1, 2 (TRKG A+C) (X-Y mode)	<ul style="list-style-type: none"> <li>• Test mode #22,000-25,000 and #100 TRKG servo open / close</li> <li>• TILT servo ON</li> </ul>	<ul style="list-style-type: none"> <li>• Adjust the centering adjustment screw so that the lissajous figures of #100 and #22,000-25,000 are the same.</li> </ul>
10	Fine Grating Adjustment	Grating	CH1:CN401-9 (TRKG ERR) CH2:CN401-1, 2 (TRK A+C) (X-Y mode)	<ul style="list-style-type: none"> <li>• Test mode #8,500 still TRKG servo open</li> <li>• TILT servo ON</li> </ul>	<ul style="list-style-type: none"> <li>• Minimize the Y direction of the lissajous figure.</li> <li>• Check TRKG balance.</li> </ul>
11	FOCS SUM Level Adjustment	VR609	CN401-11 (FOCS SUM)	<ul style="list-style-type: none"> <li>• Test mode #15,000 still TRKG servo close</li> <li>• Tilt servo NEUTRAL</li> </ul>	<ul style="list-style-type: none"> <li>• Adjust VR609 so that the voltage becomes 1.8V DC.</li> </ul>
12	FOCS Servo Loop Gain Adjustment	VR604	CH1:CN401-6 (FOCS ERR) CH2:CN401-7 (FOCS IN) (X-Y mode)	<ul style="list-style-type: none"> <li>• Test mode #15,000 still TRKG servo close</li> <li>• TILT servo NEUTRAL</li> </ul>	<ul style="list-style-type: none"> <li>• Adjust VR604 so that the lissajous figure is symmetrical with respect to the X and Y axes.</li> </ul>
13	TRKG Servo Loop Gain Adjustment	VR603	CH1:CN401-9 (TRKG ERR) CH2:CN401-10 (TRKG IN) (X-Y mode)	<ul style="list-style-type: none"> <li>• Test mode #15,000 still TRKG servo close</li> <li>• TILT servo NEUTRAL</li> </ul>	<ul style="list-style-type: none"> <li>• Adjust VR603 so that the lissajous figure is symmetrical with respect to the X and Y axes.</li> </ul>
14	RF Gain Adjustment	VR601	CH1:CN401-3 (RF)	<ul style="list-style-type: none"> <li>• Test mode #15,000 still TRKG servo close</li> <li>• TILT servo NEUTRAL</li> </ul>	<ul style="list-style-type: none"> <li>• Adjust VR601 so that the RF level becomes <math>300mV \pm 50mV</math>.</li> </ul>
15	Coarse Centering Adjustment for Side B Play	Centering adjustment plate for side B.	CH1:CN401-9 (TRKG ERR) CH2:CN401-1, 2 (TRKG A+C) (X-Y mode)	<ul style="list-style-type: none"> <li>• Test mode #100 still TRKG servo open / close</li> <li>• TILT servo ON</li> </ul>	<ul style="list-style-type: none"> <li>• Adjust that the X-axis amplitude of the lissajous figure becomes maximum.</li> </ul>
16	Pickup Tangential Direction Angle Adjustment for Side B Play	Pickup tangential direction angle adjustment screw.	Video output terminal (TV monitor)	<ul style="list-style-type: none"> <li>• Test mode #115 still TRKG servo close</li> <li>• TILT servo ON</li> </ul>	<ul style="list-style-type: none"> <li>• Adjust that the crosstalk is minimized.</li> </ul>
17	Fine Centering Adjustment for Side B Play	Centering adjustment plate for side B	CH1:CN401-9 (TRKG ERR) CH2:CN401-1, 2 (TRKG A+C) (X-Y mode)	<ul style="list-style-type: none"> <li>• Test mode #100 still TRKG servo open</li> <li>• TILT servo ON</li> </ul>	<ul style="list-style-type: none"> <li>• Adjust that the X-axis amplitude of the lissajous figure becomes maximum.</li> </ul>

	ADJUSTMENT	Adjusting Point	Measurement equipment Connecting Point	Player Condition	Adjusting Specification
18	Reference Frequency Adjustment	VC901	IC402 - pin 8	<ul style="list-style-type: none"> <li>• Stop mode (blueback screen)</li> </ul>	<ul style="list-style-type: none"> <li>• Adjust VC901 so that the frequency becomes 3.579545MHz.</li> </ul>
19	VCO Centering Frequency Adjustment	VR481	CH1 : C471 + side lead wire CH2 : C499 + side lead wire	<ul style="list-style-type: none"> <li>• Normal mode</li> <li>• #5,100 still</li> </ul>	<ul style="list-style-type: none"> <li>• The center of CH1's video signal jitter is delayed by 71 <math>\mu</math>S with CH2's video signal.</li> </ul>
20	Input Video Level Adjustment for Y/C SEP Circuit	VR482	IC405 - pin 15	<ul style="list-style-type: none"> <li>• Normal mode</li> <li>• #19,900 still</li> </ul>	<ul style="list-style-type: none"> <li>• Adjust VR482 so that the voltage between the sync tip and the white peak becomes 2Vp-p <math>\pm</math> 5%.</li> </ul>
21	Output Video Level Adjustment	VR202	VIDEO OUTPUT terminal	<ul style="list-style-type: none"> <li>• Normal mode</li> <li>• #19,900 still</li> </ul>	<ul style="list-style-type: none"> <li>• Adjust VR202 so that the voltage between the sync tip and the white peak becomes 1Vp-p <math>\pm</math> 5%.</li> </ul>
22	1H Delay Video Level Adjustment	VR441	CH1 : C443 lead wire CH2 : C445 lead wire	<ul style="list-style-type: none"> <li>• Normal mode</li> <li>• #3,800 still</li> </ul>	<ul style="list-style-type: none"> <li>• The 1H delay video level becomes the same as the main line video signal.</li> </ul>
23	VPS Video Level Adjustment	VR521	TV monitor	<ul style="list-style-type: none"> <li>• Normal mode</li> <li>• #8,000 still</li> </ul>	<ul style="list-style-type: none"> <li>• Color irregularity on the magenta screen is minimized.</li> </ul>

**5.5 ADJUSTMENT POINTS OF THE MAIN BOARD ASSEMBLY**



Adjustment Locations

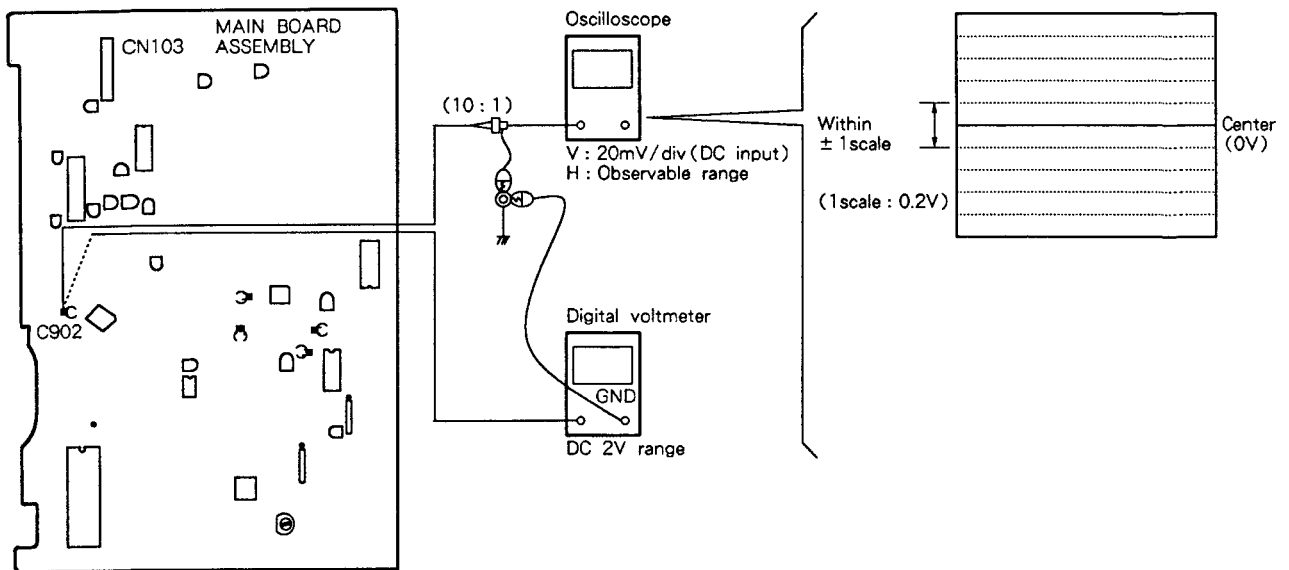
**5.6 MECHANICAL ADJUSTMENTS**  
**1. TILT OFFSET ADJUSTMENT**

Mechanical Adjustment

- Purpose: To adjust the tilt offset voltage to 0V.
- When not properly adjusted: Playability is poor when playing side B of the disc.  
Crosstalk will be generated.

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>● Measuring instruments and jigs:</li> <li>● Measuring point:</li> <li>● Test disc and player mode</li> <li>● Positions to be adjusted</li> </ul> | <ul style="list-style-type: none"> <li>● Oscilloscope ● (Digital voltmeter)</li> <li>● - (minus) lead wire of C902</li> <li>● Normal mode (STOP mode)</li> <li>● VR610 (TILT OFFSET)</li> </ul> |
|--|---|

**Connection diagram**



**Adjustment Procedure**

1. Disconnect the flexible cable from CN103.  
(Perform this step by turning off the power.)
2. Set the oscilloscope to no input (GND) mode and set the main scale to the center position (0V).
3. Set the oscilloscope to the DC input mode and connect to the - (minus) lead wire of C902.
4. Adjust VR610 so that the DC level which appears on the oscilloscope within  $\pm$  one scale ( $\pm 0.2V$ ) as compared with center (0V).
5. Connect the flexible cable to CN103.  
(Perform this step by turning off the power.)

**How to adjustment when using the Digital voltmeter**

1. Disconnect the flexible cable from CN103.  
(Perform this step by turning off the power.)
2. Connect the digital voltmeter to the - (minus) lead wire of C902.
3. Adjust VR610 so that the DC voltage becomes  $0 \pm 0.2V$ .
4. Connect the flexible cable to CN103.  
(Perform this step by turning off the power.)

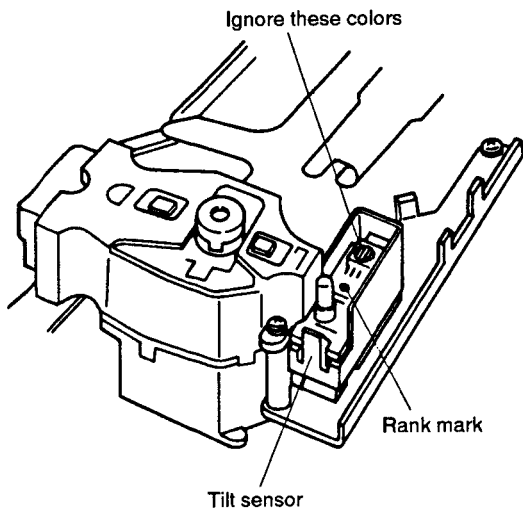
**2. TILT SERVO GAIN ADJUSTMENT**

**Mechanical Adjustment**

- Purpose: Adjustment of the tilt servo's gain according to the tilt sensor's sensitivity rank.
- When not properly adjusted: Increased tilt servo hunting and increased crosstalk.

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>• Measuring instruments and jigs:</li> <li>• Measuring point:</li> <li>• Test disc and player mode</li> <li>• Positions to be adjusted</li> </ul> | <ul style="list-style-type: none"> <li>• Small screwdriver</li> <li>• Power OFF</li> <li>• VR608</li> </ul> |
|--|---|

**Connection diagram**



**Adjustment Procedure**

1. Use a screwdriver to adjust the angle of VR608 according to the rank indicator's color.

Rank	Color	VR Angle
A	Red	Clockwise all the way
B	Clear	Mechanical center
C	Blue	Counterclockwise all the way

## 3. COARSE GRATING AND TRACKING (TRKG) BALANCE ADJUSTMENT

## Mechanical Adjustment

- **Purpose:** To adjust the laser beam which is divided into three by the grating to the optimum position on the track. Set the TRKG servo offset voltage to 0 V.
- **When not properly adjusted:** Disc playback will be impossible. During play, tracks may be skipped.

## ● Measuring instruments and jigs:

## ● Measuring point:

## ● Test disc and player mode

## ● Positions to be adjusted

## ● Small screwdriver ● Oscilloscope

## ● CN401 -9 (TRKG ERR)

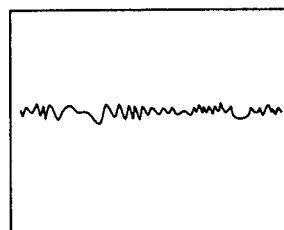
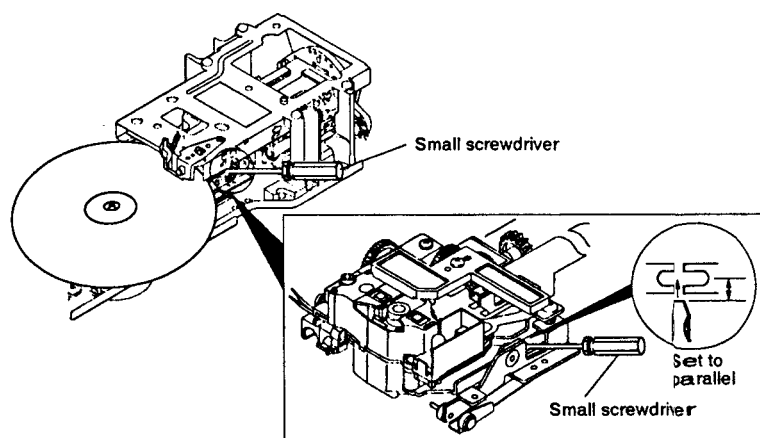
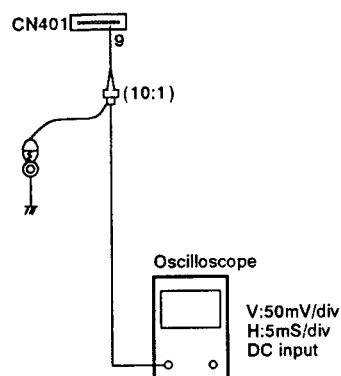
## ● 8 - inch LD test disc GGV1003

## ● Test Mode (#6,500, TRKG servo : Open, Tilt servo : Neutral)

## ● The carriage assembly should be in the forward state.

## ● Grating ● VR602 (TRKG BAL)

## Connection diagram



Not null point

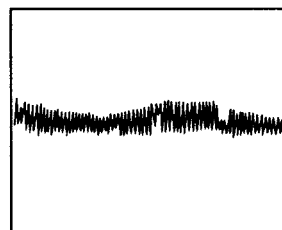
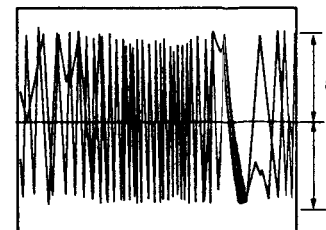


Fig. 2 Null point

Fig. 3 Maximize the TRKG error  
a=b**Adjustment Procedure**

## &lt;Coarse Grating Adjustment&gt;

1. Play the LD test disc.
2. Search around for frame #6,500.
3. Open the TRKG servo.  
(See the table of operation in the test mode.)
4. Connect an oscilloscope to CN401-9 and observe the waveform.
5. Coarse adjust the TRKG error waveform becomes maximum by turning the TRKG and tangential direction angle adjustment screw for the pickup adjustment. (This is indispensable in order to minimize dispersion in the subsequent adjustments.)
6. Insert the small screwdriver into the grating adjustment hole. Turning the grating will allow you to vary the amplitude of the TRKG error waveform. Find the position where the waveform amplitude becomes minimum with a smooth envelope. (Fig. 2) (This indicates that the 3-way split laser beams are directed onto the track. This is called the null point.)

7. Slowly turn the grating counterclockwise from the on track position until the waveform amplitude becomes maximum. (Fig. 3)
8. Close the TRKG servo and check that a normal picture is displayed on the TV screen.

## &lt;TRKG Balance Adjustment&gt;

1. Align the oscilloscope GND so that it comes to the center of the oscilloscope screen.
2. Adjust VR602 so that the positive and negative amplitude of the TRKG error waveform become equal. (Fig. 3)

*Note: If adjustment of VR602 fails to disturb the tracking, perform the adjustment after set VR607 to the mechanical center.*

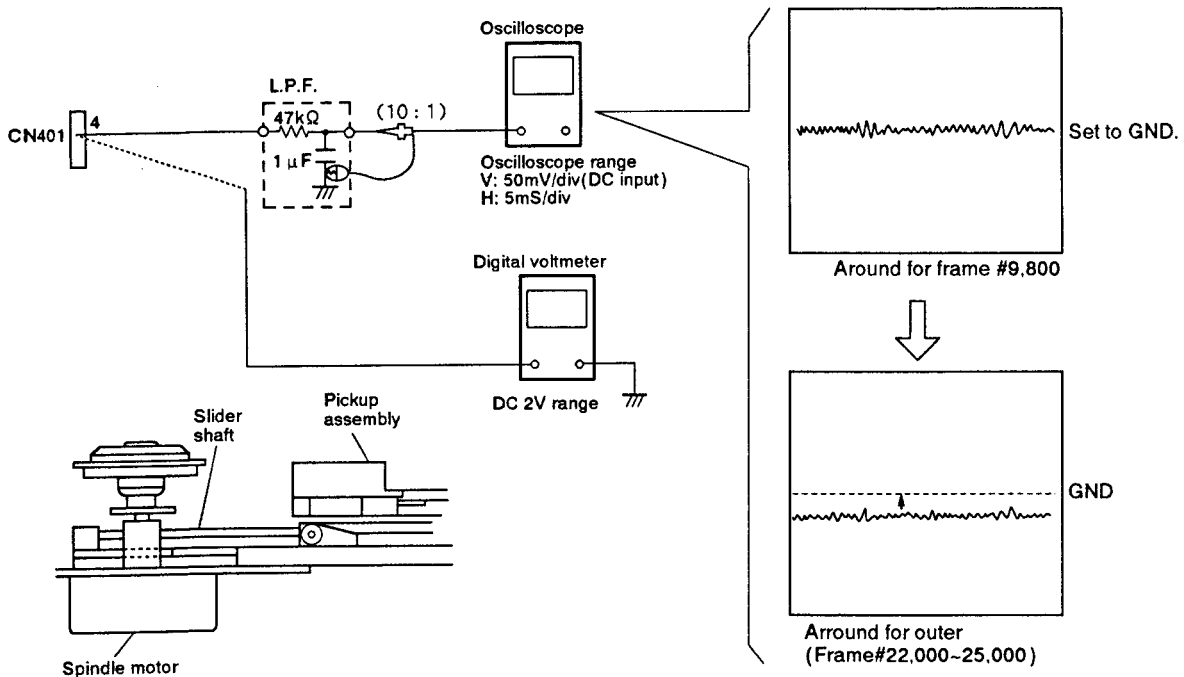
**4. SLDR SHAFT HORIZONTAL ADJUSTMENT**

**Mechanical Adjustment**

- Purpose: Setting the slider shaft horizontally to enable the pickup to more in parallel with the disc.
- When not properly adjusted: With a warped disc, the FOCS servo does not function at the inner or outer periphery. All following adjustments can be done correctly.

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>● Measuring instruments and jigs:</li> <li>● Measuring point:</li> <li>● Test disc and player mode</li> <li>● Positions to be adjusted</li> </ul> | <ul style="list-style-type: none"> <li>● Oscilloscope ● Low-pass filter (47kΩ + 1 μF) ● (Digital voltmeter)</li> <li>● CN401 - 4 (FOCS RTN) and GND.</li> <li>● 8 - inch LD test disc GGV1003</li> <li>● Test Mode (#9,800 / #22,000 - 25,000, TRKG servo : Open, Tilt servo : OFF)</li> <li>● Player SKIP ( ◀◀ or ▶▶ ) key (During test mode)</li> </ul> |
|--|---|

**Connection diagram**



**Adjustment Procedure**

1. Connect a digital voltmeter to CN401-4 via L. P. F.
2. Open the TRKG servo, and search around for frame #9,800.
3. Check the voltage.
3. Search around for frame #22,000 - 25,000 and check that the voltage is same as the frame #9,800. If not, adjust the SKIP key so that the voltage is same as the frame #9,800.



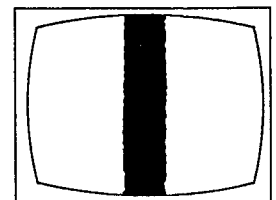
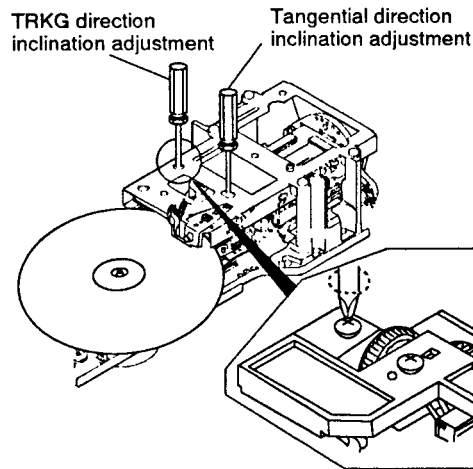
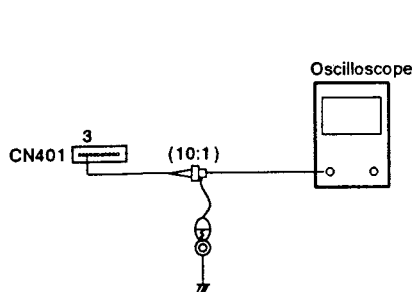
**5. PICKUP INCLINATION ADJUSTMENT**

**Mechanical Adjustment**

- Purpose: Adjustment of the pickup inclination to direct the laser beam vertically with respect to the disc.
- When not properly adjusted: Crosstalk will be generated.

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>● Measuring instruments and jigs:</li> <li>● Measuring point:</li> <li>● Test disc and player mode</li> <li>● Positions to be adjusted</li> </ul> | <ul style="list-style-type: none"> <li>● TV monitor ● Phillips screwdriver ● Oscilloscope</li> <li>● CN401 - 3(RF) ● Player's VIDEO OUT terminal</li> <li>● 8-inch LD test disc GGV1003</li> <li>● Test Mode [#2,701 (Black,7.5%) still , TRKG servo : close, Tilt servo : OFF]</li> <li>● Pickup assembly TRKG/Tangential direction inclination adjustment screws</li> </ul> |
|--|---|

**Connection diagram**



Minimum crosstalk on the screen

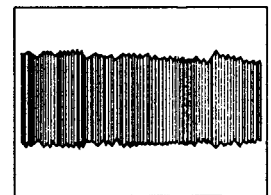


Fig. 1 RF waveform

**Adjustment Procedure**

1. Connect the oscilloscope to CN401 - 3.
2. Search for frame #2,701 and observe the RF waveform.(Fig. 1)
3. Adjust the pickup's TRKG/Tangential direction inclination adjustment screw to maximize the waveform's amplitude.
4. Look at the TV screen and make sure there is no crosstalk.

*Note : Perform "6. TRKG Error MAX./RF Level MAX. Adjustment" even when the crosstalk is not conspicuous on the TV screen.  
(For improvement of the playability of CDs.)*

6. TRKG ERROR MAX./ RF LEVEL MAX. ADJUSTMENT

Mechanical Adjustment

- Purpose: To set the FOCS servo to the optimum state when playing the normal playback and track jump (search).
- When not properly adjusted: Crosstalk will be generated.

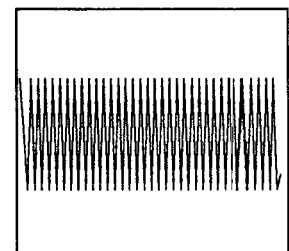
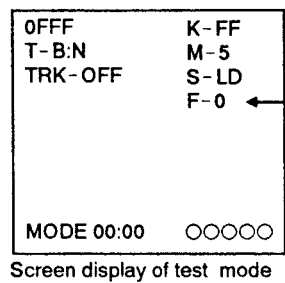
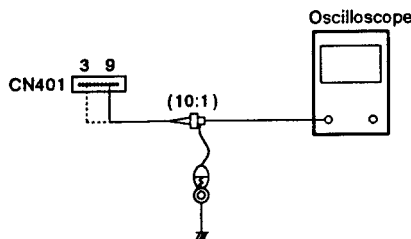
- Measuring instruments and jigs:
- Measuring point:
- Test disc and player mode

- TV monitor • Oscilloscope
- CN401 - 3(RF) • CN401 - 9(TRKG ERR) • Player's VIDEO OUT terminal
- 8-inch LD test disc (GGV1003)
- Test Mode [#2,701 (Black, 7.5%) / #115 (H.V Bar) still, TRKG servo : Close / Open, Tilt servo : OFF]

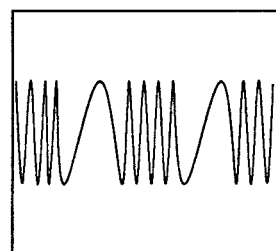
- Positions to be adjusted

- VR605 (TE MAX.) • VR606 (CT MAX.)

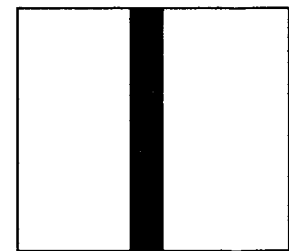
Connection diagram



Set to maximum RF amplitude at frame #2,701.



Maximize the TRKG error.



#115 crosstalk minimum

Adjustment Procedure

1. Connect the oscilloscope to CN401 - 9.
2. Play the LD test disc and open the TRKG servo .
3. Confirm that the test mode screen display is F-0.  
If not, press the MULTI-SPEED REV button to F-0.
4. Adjust VR605 so that the amplitude of the TRKG error waveform becomes maximum.
5. Close the TRKG servo.
6. Connect the oscilloscope to CN401 - 3.
7. Press the MULTI-SPEED FWD button to display "F-1" on the TV screen.
8. Search frame #2,701 and adjust VR606 so that the amplitude of the RF waveform becomes maximum.
9. Confirm that the crosstalk on the TV screen becomes minimum at frame #115.

Note : Perform "RF Level MAX. Adjustment" and "5. Pickup Inclination Adjustment" once or twice repeatedly to the optimum state.

## 7. TILT SENSOR INCLINATION / TILT BALANCE ADJUSTMENT

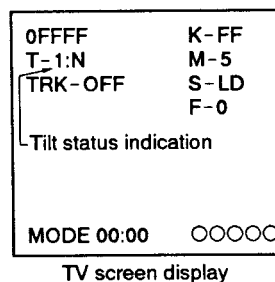
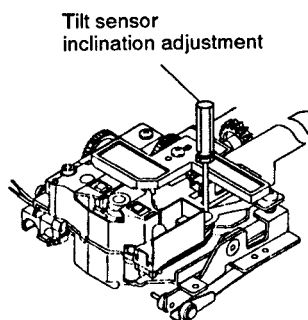
Mechanical Adjustment

- Purpose: Adjustment of the tilt sensor's inclination to direct the tilt sensor's LED vertically with respect to the disc. Also, compensation for the sensitivity difference between the two sensors.
- When not properly adjusted: Crosstalk will be generated.

- Measuring instruments and jigs:
- Measuring point:
- Test disc and player mode
- Positions to be adjusted

- TV monitor ● Small Phillips screwdriver
- Player's VIDEO OUT terminal
- 8-inch LD test disc (GGV1003)
- Test Mode (#16,200 and #115 still, TRKG servo : close, Tilt servo : OFF)
- Tilt sensor inclination adjustment screw
- VR607 (TILT BAL).

### Connection diagram



Note: This display indicates the tilt error display's location. Other displays may differ slightly from the actual.

### Adjustment Procedure

1. Search for frame #16,200 on the test disc.
  2. Set VR607 to the mechanical center.
  3. Adjust the tilt sensor inclination adjustment screw so that the tilt status display code is 6, 7, or 8 on the TV monitor.
- Note : When adjusting, turn the tilt-sensor inclination adjustment screw clockwise from the best point an extra quarter of a turn. Then turn the screw back to a quarter of a turn.
4. Search for frame #115.
  5. Adjust VR607 so that the tilt error display becomes 7.

8. SPINDLE MOTOR CENTERING CHECK

Mechanical Adjustment

● Purpose: To check that the center of the spindle motor is on the orbit of the laser beam.

- Measuring instruments and jigs:
- Measuring point:
- Test disc and player mode
- Positions to be adjusted

- Oscilloscope ● Resistor(10kΩ × 2)
- CN401 -9(TRKG ERR), CN401 -1 (TRKG C) and CN401 -2(TRKG A)
- 8-inch LD test disc GGV1003 ● CD test disc (YEDS-7)
- Test mode (#22,000-#25,000 and #100 still, TRKG servo : Open, Tilt servo : ON)
- The carriage assembly should be in the forward state.
- Check the Lissajous figure

Connection diagram

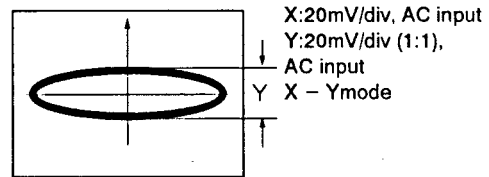
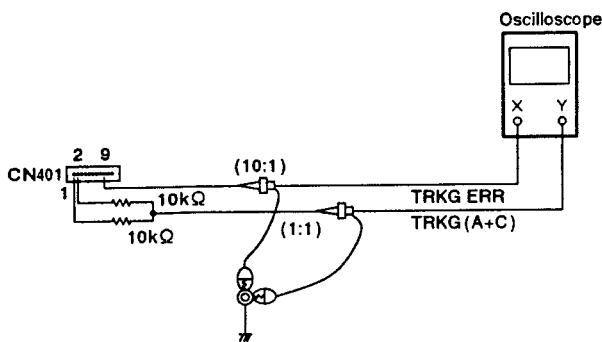


Fig. 1 Lissajous figure of the inner track of the disc (CD)

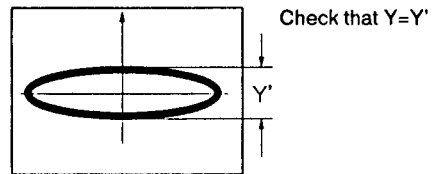


Fig. 2 Lissajous figure of the outer track of the disc (CD)

Checking Procedure

1. Play the 8-inch LD test disc.
2. Move the pickup to frame #22,000 - 25,000 by scanning or searching, then open the TRKG servo.
3. Connect the X-input (CH-1) of the oscilloscope to CN401 -9 and the Y-input (CH-2) to CN401 -1 and 2 via the 10kΩ resistor.  
Set the oscilloscope to the X-Y mode and observe the Lissajous figures of the TRKG error signal and the TRKG (A+C) signal.
4. Write down the Y-axis amplitudes of the Lissajous figures. (Fig. 1)
5. Close the TRKG servo and search frame #100, then open the TRKG servo again to observe the Lissajous figure. At this time, check that the Y-axis amplitude of the Lissajous figure is the same as that noted in step 4. (Fig. 2)

6. Remove the 8-inch LD test disc from the player, then load the CD test disc and repeat the checking procedures steps 1 to 5. However, it is not necessary to specify the inner or outer track positions of the disc. If the Y-axis amplitude of the Lissajous figure is different for the inner and outer tracks, perform "9. Spindle Motor Centering Adjustment".

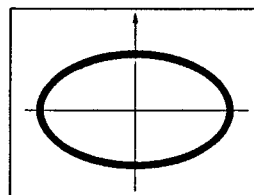


Fig. 3 Lissajous figure when not properly adjusted

9. SPINDLE MOTOR CENTERING ADJUSTMENT

Mechanical Adjustment

- Purpose: To adjust so that the center of the spindle motor is on the orbit of the laser beam.
- When not properly adjusted: Track skips, or searching takes too long.

- Measuring instruments and jigs:
- Measuring point:
- Test disc and player mode
- Positions to be adjusted

- Small phillips screwdriver
- Oscilloscope
- Resistor(10kΩ × 2)
- CN401 - 9 (TRKG ERR), CN401 - 1 (TRKG C) and CN401 - 2 (TRKG A)
- 8 - inch LD test disc GGV1003
- CD test disc (YEDS - 7)
- Test Mode (#22,000 - #25,000 and #100 still, TRKG servo : Open/Close, Tilt servo : ON)
- The carriage assembly should be in the forward state.
- Spindle motor centering adjustment screw

Connection diagram

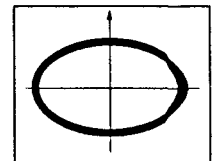
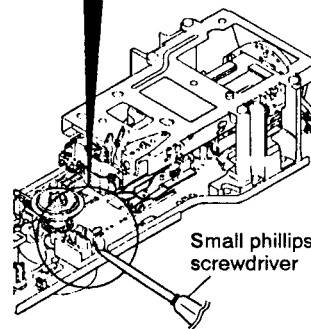
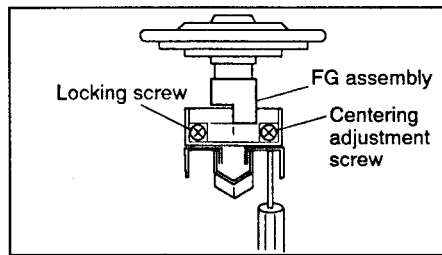
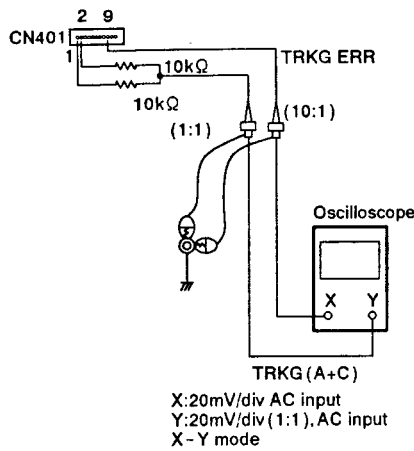


Fig. 1

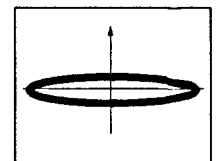


Fig. 2

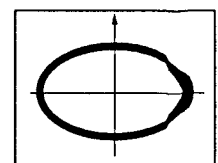


Fig. 3

Lissajous figure

Adjustment Procedure

1. Connect the X - input (CH - 1) of the oscilloscope to CN401 - 9 and the Y - input (CH - 2) to CN120 - 1 and 2 via the 10kΩ resistor.
2. Play the 8 - inch LD test disc and search frame #22,000 - #25,000.
3. Open the TRKG servo and observe the Lissajous figures of the TRKG error signal and the TRKG sum signal.
4. Fine - adjust the grating so that the Y - axis amplitude of the Lissajous figure is minimized. (Fig. 2)
5. Close the TRKG servo and search frame #100.
6. Open the TRKG servo again and observe the Lissajous figure and write the values down. (Fig. 1)

7. Loosen a locking screw and insert the small phillips head screwdriver from the adjusting hole, and turn the centering adjustment screw slowly so that the Y - axis amplitude of the Lissajous figure is reduced. After the Y - axis amplitude of the Lissajous figure is minimized, turn the adjusting screw further until the amplitude becomes the same shape as that observed in step 6. (Fig. 1 - 3)
8. Close the TRKG servo, and move the pickup assembly to the outer track of the disc (#22,000 - #25,000), then perform the adjustments in steps 4 to 7 again.
9. Re - open the TRKG servo and observe the Lissajous figure to check that the Y - axis amplitude is minimum. (Fig. 2) If the Y - axis amplitude of the Lissajous figure is larger than specified, repeat the adjustment procedures from steps 5 to 8.
10. After adjustment is complete, perform the adjustment in "8. Spindle Motor Centering Check" item 6.
11. Tighten the locking screw.

10. FINE GRATING ADJUSTMENT

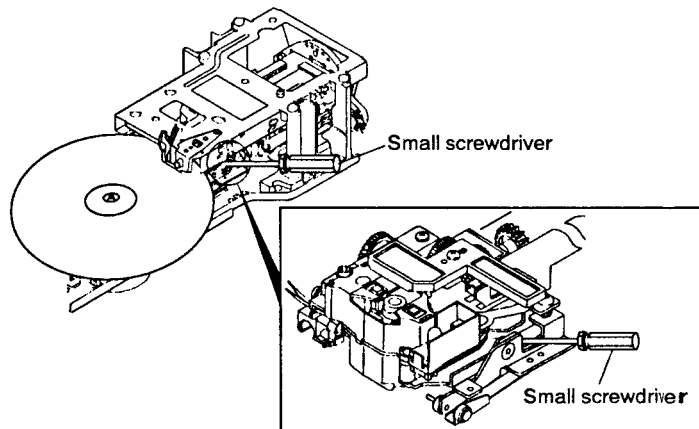
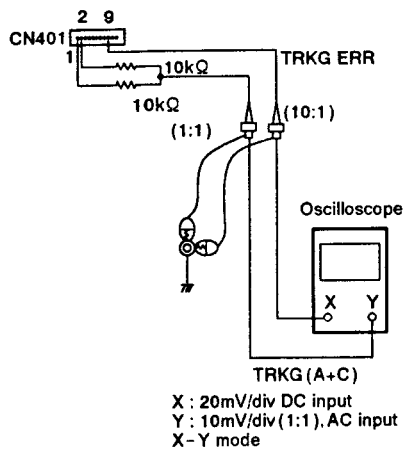
Mechanical Adjustment

- Purpose: To fine adjust the grating so that the two tracking beams for the TRKG servo are projected in the optimum positions on the tracks being played. Set the TRKG servo loop offset voltage to 0V.
- When not properly adjusted: During play, tracks may be skipped.

- Measuring instruments and jigs:
- Measuring point:
- Test disc and player mode
- Positions to be adjusted

- Oscilloscope ● Small screwdriver ● Resistor (10kΩ × 2)
- CN401 - 9 (TRKG ERR), CN401 - 1 (TRKG C) and CN401 - 2 (TRKG A)
- 8 - inch LD test disc GGV1003
- Test Mode (#6,500 still, TRKG servo : Open, Tilt servo : ON)
- The carriage assembly should be in the forward state.
- Grating

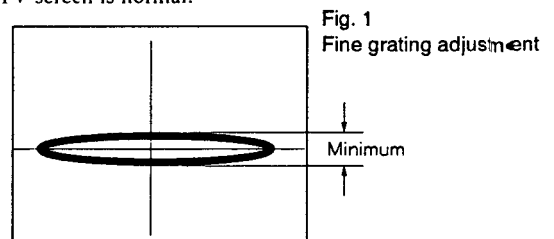
Connection diagram



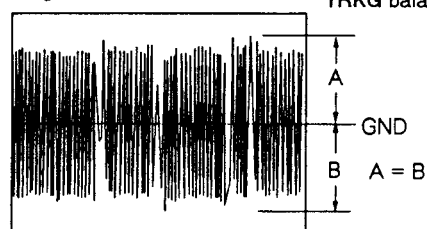
Adjustment Procedure

1. Connect the X-input(CH-1) of the oscilloscope to CN401 - 9 and the Y-input(CH2) to CN401 - 1 and 2 via the 10kΩ resistor.
2. Play the LD test disc and search frame #6,500, then open the TRKG servo.  
Set the oscilloscope to the X-Y mode and observe the Lissajous figures of the TRKG error signal and the TRKG sum signal.
3. Insert the small screwdriver into the grating adjustment hole, and fine-adjust the grating so that the Y-axis amplitude of the Lissajous figures is minimized. (Fig. 1)  
If the grating is turned too much and the optimum position can no longer be found, repeat the "3. Coarse Grating Adjustment".
4. Select the oscilloscope's X-input(CH-1) and check that the positive and negative amplitudes of the TRKG error signal are equal. (Fig. 2)  
If they are not, repeat the "3. Tracking Balance Adjustment".

5. Close the TRKG servo and check that the picture (image) on the TV screen is normal.



3. Y-axis amplitude of Lissajous figure becomes minimum.



**11. FOCS SUM LEVEL ADJUSTMENT**

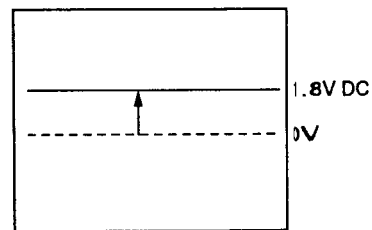
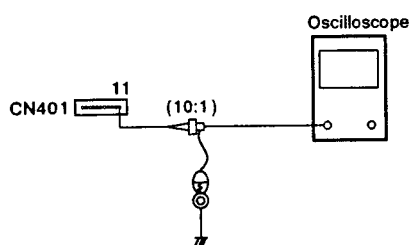
**Mechanical Adjustment**

- Purpose: To set the sum level (FOCS A+B) of B1 – B4 to the optimum value for activating the FOCS servo.
- When not properly adjusted: Playability is poor.

- Measuring instruments and jigs:
- Measuring point:
- Test disc and player mode
- Positions to be adjusted

- Oscilloscope
- CN401 - 11 (FOCS SUM)
- 8 - inch LD test disc GGV1003
- Test mode (#15,000 still, TRKG servo : Close, Tilt servo : Neutral)
- VR609 (FOCS SUM LEVEL)

**Connection diagram**



**Adjustment Procedure**

1. Connect the oscilloscope to CN401 - 11.
2. Adjust VR609 so that the voltage becomes 1.8V DC.

12. FOCUS SERVO LOOP GAIN ADJUSTMENT

Mechanical Adjustment

- Purpose: To set the loop gain of the FOCS servo to the optimum value.
- When not properly adjusted: Playability is poor.

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>● Measuring instruments and jigs:</li> <li>● Measuring point:</li> <li>● Test disc and player mode</li> <li>● Positions to be adjusted</li> </ul> | <ul style="list-style-type: none"> <li>● Oscilloscope ● AF oscillator ● Resistor(47kΩ)</li> <li>● CN401 -6(FOCS ERR) and CN401 -7(FOCS IN)</li> <li>● 8 - inch LD test disc GGV1003</li> <li>● Test mode (#15,000 still, TRKG servo : Close, Tilt servo : Neutral)</li> <li>● The carriage assembly should be in the forward state.</li> <li>● VR604 (FOCS GAIN)</li> </ul> |
|--|---|

Connection diagram

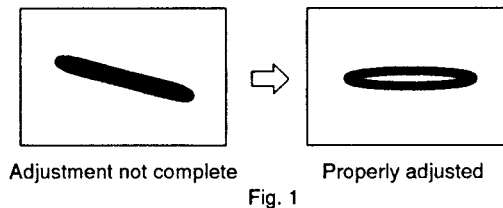
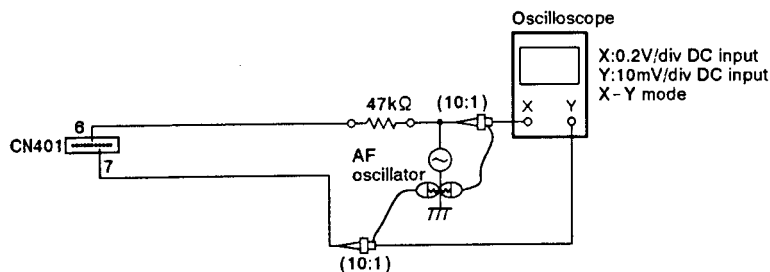


Fig. 1

Adjustment Procedure

1. Connect the oscilloscope's X-input(CH-1) via the 47kΩ resistor and AF oscillator to CN401 -6, and the Y-input (CH-2) to CN401 -7, as shown in the above diagram.
2. Play the 8-inch LD test disc and search frame #15,000.
3. Set the AF oscillator output to 1.7kHz/6Vp-p.
4. Set the oscilloscope to the X-Y mode and observe the Lissajous figure.
5. Adjust VR604 so that the Lissajous figure is symmetrical on both the X-axis and Y-axis of the oscilloscope. (Fig. 1)

*Note: If the AF oscillator output does not exceed 6Vp-p, reduce the value of the resistor (47kΩ) in the above diagram, for easier observation of the Lissajous figure. (not below 33kΩ)*



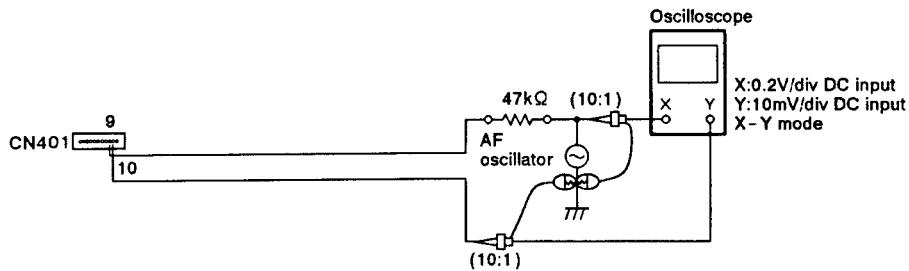
13. TRKG SERVO LOOP GAIN ADJUSTMENT

Mechanical Adjustment

- Purpose: To set the loop gain of the TRKG servo to the optimum value.
- When not properly adjusted: Playability is poor.

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>● Measuring instruments and jigs:</li> <li>● Measuring point:</li> <li>● Test disc and player mode</li> <li>● Positions to be adjusted</li> </ul> | <ul style="list-style-type: none"> <li>● Oscilloscope ● Resistor(47kΩ) ● AF oscillator</li> <li>● CN401 - 9(TRKG ERR), CN401 - 10(TRKG IN)</li> <li>● 8 - inch LD test disc GGV1003</li> <li>● Test mode (#15,000 still, TRKG servo : Close, Tilt servo : Neutral)</li> <li>● The carriage assembly should be in the forward state.</li> <li>● VR603 (TRKG GAIN)</li> </ul> |
|--|---|

Connection diagram



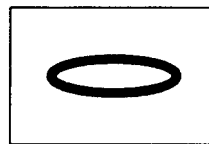
Adjustment Procedure

1. Connect the oscilloscope's X-input(CH-1) via the 47kΩ resistor and AF oscillator to CN401 - 9, and the Y - input (CH-2) to CN401 - 10, as shown in the above diagram.
2. Play the LD test disc and search frame #15,000.
3. Set the AF oscillator output to 3.0kHz/6Vp-p.
4. Set the oscilloscope to the X-Y mode and observe the Lissajous figure.
5. Adjust VR603 so that the Lissajous figure is symmetrical on both the X - axis and Y - axis of the oscilloscope. ( Fig. 1 )

Note : If the AF oscillator output does not exceed 6Vp-p, reduce the value of the resistor (47kΩ) in the above diagram, for easier observation of the Lissajous figure. (not below 33kΩ)



Adjustment not complete



Properly adjusted

5. The X - axis and Y - axis of the Lissajous figure are symmetrical.

Fig. 1

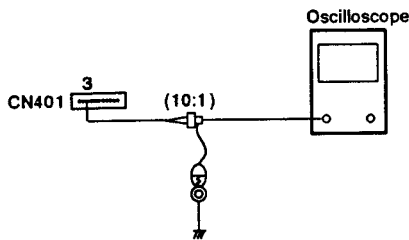
14. RF GAIN ADJUSTMENT

Mechanical Adjustment

- Purpose: To adjust the RF signal amplitude to the optimum value.
- When not properly adjusted: Dropout occurs frequently.

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>● Measuring instruments and jigs:</li> <li>● Measuring point:</li> <li>● Test disc and player mode</li> <li>● Positions to be adjusted</li> </ul> | <ul style="list-style-type: none"> <li>● Oscilloscope</li> <li>● CN401 - 3(RF signal)</li> <li>● 8 - inch LD test disc GGV1003</li> <li>● Test Mode (#15,000 still, TRKG servo : Close, Tilt servo : Neutral)</li> <li>● The carriage assembly should be in the forward state.</li> <li>● VR601 (RF LEVEL)</li> </ul> |
|--|---|

Connection diagram



Adjustment Procedure

1. Play the LD test disc and search frame #15,000.
2. Connect an oscilloscope to CN401 - 3(RF signal) and observe the RF signal.
3. Adjust VR601 so that the amplitude of the RF signal becomes  $300\text{mV} \pm 50\text{mV}$ . (Fig. 1)

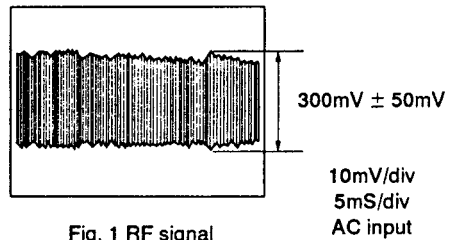


Fig. 1 RF signal

15. COARSE CENTERING ADJUSTMENT FOR SIDE B PLAY

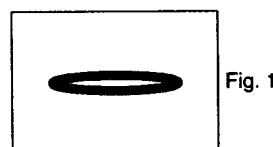
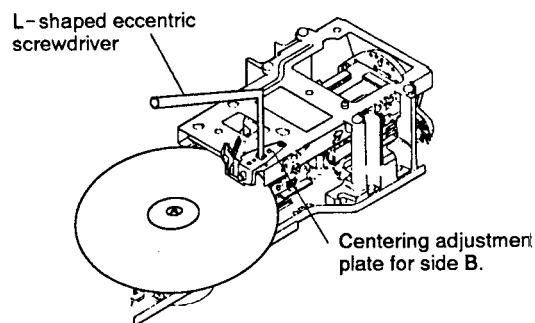
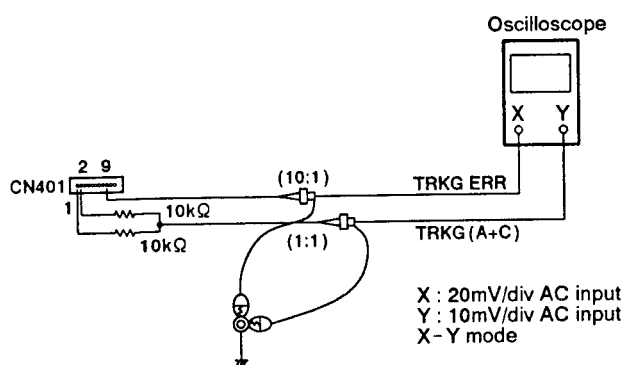
Mechanical Adjustment

- Purpose: To check that the position check at the start play and to set the center of the spindle motor on the path of the laser beam when playing the side B of the disc.
- When not properly adjusted: Tracks skipped, longer searching time or searching is impossible when playing side B of the disc.

- Measuring instruments and jigs:
- Measuring point:
- Test disc and player mode
- Positions to be adjusted

- L-shaped eccentric screwdriver (GGV - 129)
- Oscilloscope
- Resistor (10kΩ × 2)
- CN401 - 9 (TRKG ERR), CN401 - 1 (TRKG C) and CN401 - 2 (TRKG A)
- 8 - inch LD test disc GGV1003
- The carriage assembly should be in the reverse state.
- Test mode (#100 still, TRKG servo : Open /Close, Tilt servo : ON)
- Centering adjustment plate for side B

Connection diagram



Properly adjusted (X:maximum).

Adjustment Procedure

1. Turn the LD test disc upside-down (change from side A to side B). The start play position from side A to B should be within frame #3,500.
2. Set the oscilloscope to the X-Y mode, and connect the oscilloscope's X-input (CH-1) to CN401-9 (TRKG ERR) and the Y-input (CH-2) to CN401-1 and 2 (TRKG A+C) via the 10kΩ resistor.
3. Play the LD test disc and search frame #100, then open the tracking servo.

Note: If the center is too eccentric on side B of the disc, since searching will be impossible on side B, open the TRKG servo when the carriage assembly moves to the side B play position and searches around frame #100.

4. While observing the Lissajous figure on the oscilloscope, insert the eccentric screwdriver into the centering adjustment plate for side B and adjust it so that the X-axis amplitude of the Lissajous figure is minimized (on-track position). Then turn the eccentric screwdriver clockwise further until the X-axis amplitude of the Lissajous figure becomes maximum. (Fig. 1)

Note: When "5. Pickup inclination Adjustment" is performed with the pickup in the forward state, perform "16. Pickup Tangential Direction Angle Adjustment for Side B Play" and "17. Fine Centering Adjustment for Side B Play".

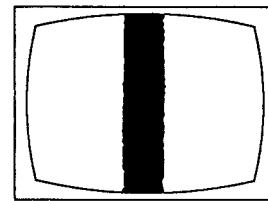
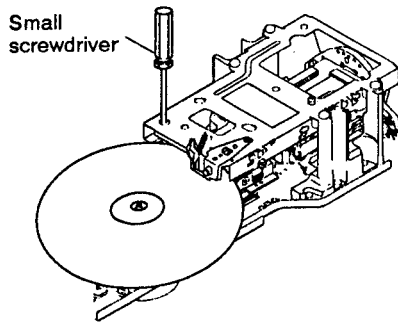
**16. PICKUP TANGENTIAL DIRECTION ANGLE ADJUSTMENT FOR SIDE B PLAY Mechanical Adjustment**

- Purpose: To adjust the crosstalk to become minimum in the tangential direction angle of the pickup assembly when playing side B of the disc.
- When not properly adjusted: Crosstalk is significant.

- Measuring instruments and jigs:
- Measuring point:
- Test disc and player mode
- Positions to be adjusted

- TV monitor
- Small phillips screwdriver
- Player's VIDEO OUT terminal (Monitor screen)
- 8-inch LD test disc GGV1003
- Test mode {#115 (H.V Bar) still, TRKG servo : Close, Tilt servo : ON}
- The carriage assembly should be in the reverse state.
- Pickup tangential direction angle adjustment screw

**Connection diagram**



Minimum crosstalk

**Adjustment Procedure**

1. Play the LD test disc and search frame #115.
2. Check if crosstalk appears on the screen of the TV monitor, and adjust the pickup tangential direction angle adjustment screw so that the crosstalk is minimized.
3. After steps 1 and 2 have been completed, perform "15. Coarse Centering Adjustment for Side B Play" again.

*Note: When the pickup tangential direction angle for side B play is varied by this adjustment, the center of the disc for side B may be shifted slightly. As a countermeasure, perform the centering adjustment again.*

17. FINE CENTERING ADJUSTMENT FOR SIDE B PLAY

Mechanical Adjustment

- Purpose: To set the center of the spindle motor on the track of the laser beam when playing the side B of the disc.
- When not properly adjusted: Tracks skipped when playing side B of the disc.

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>● Measuring instruments and jigs:</li> <li>● Measuring point:</li> <li>● Test disc and player mode</li> <li>● Positions to be adjusted</li> </ul> | <ul style="list-style-type: none"> <li>● Oscilloscope</li> <li>● L- Shaped eccentric screwdriver(GGV - 129)</li> <li>● Resistor (10kΩ × 2)</li> <li>● CN401 -9 (TRKG ERR), CN401 -1 (TRKG C) and CN401 -2 (TRKG A)</li> <li>● 8 -inch LD test disc GGV1003</li> <li>● Test mode (#100 still, TRKG servo : Open, Tilt servo : ON)</li> <li>● The carriage assembly should be in the reverse state.</li> <li>● Centering adjustment plate for side B</li> </ul> |
|--|---|

Connection diagram

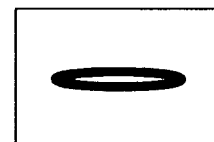
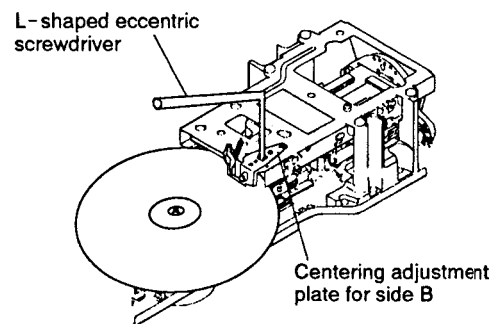
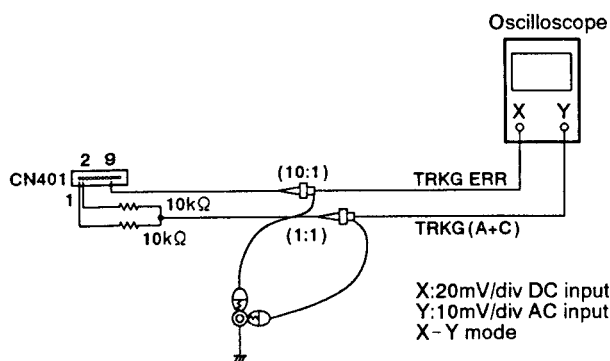


Fig. 1

X - axis of Lissajous figure maximum.

Adjustment Procedure

1. Set the oscilloscope to the X-Y mode, and connect the oscilloscope's X -input (CH-1) to CN401 -9 (TRKG ERR) and the Y -input (CH-2) to CN401 -1 and 2 (TRKG A+C) via the 10kΩ resistor.
2. Play the LD test disc and search frame #100.
3. Open the TRKG servo.
4. While observing the Lissajous figure on the oscilloscope, insert the eccentric screwdriver into the centering adjustment plate for side B and adjust it so that the X-axis amplitude of the Lissajous figure becomes maximum. (Fig. 1)
5. Turn the power OFF.
6. Fixing and locking the screws as follows;
  - Spindle motor centering adjustment screw
  - Pickup tangential direction angle adjustment screw
  - Centering adjustment hole for side B
  - Tilt sensor inclination adjustment screw

**5.7 ELECTRICAL ADJUSTMENT**

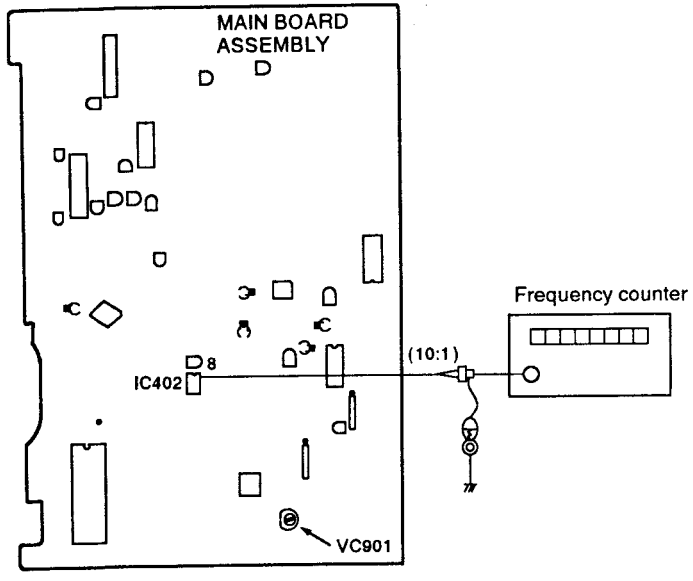
**18. REFERENCE FREQUENCY ADJUSTMENT**

**Electrical Adjustment**

- Purpose: Adjustment of the standard clock frequency.
- When not properly adjusted: Incorrect color tint. No TV color lock. VCXO cannot be adjusted during LDD playback.

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>● Measuring instruments and jigs:</li> <li>● Measuring point:</li> <li>● Test disc and player mode</li> <li>● Positions to be adjusted</li> </ul> | <ul style="list-style-type: none"> <li>● Frequency counter ● Oscilloscope 10:1 probe</li> <li>● IC402-8</li> <li>● Stop mode (blueback screen)</li> <li>● VC901 (REF FREQ)</li> </ul> |
|--|---|

**Connection diagram**



**Adjustment Procedure**

1. Adjust VC901 so that the frequency of the IC402-8 becomes 3.579545MHz in the stop mode. (blueback screen)

*Note: The frequency counter probe should be an oscilloscope 10 : 1 probe.*

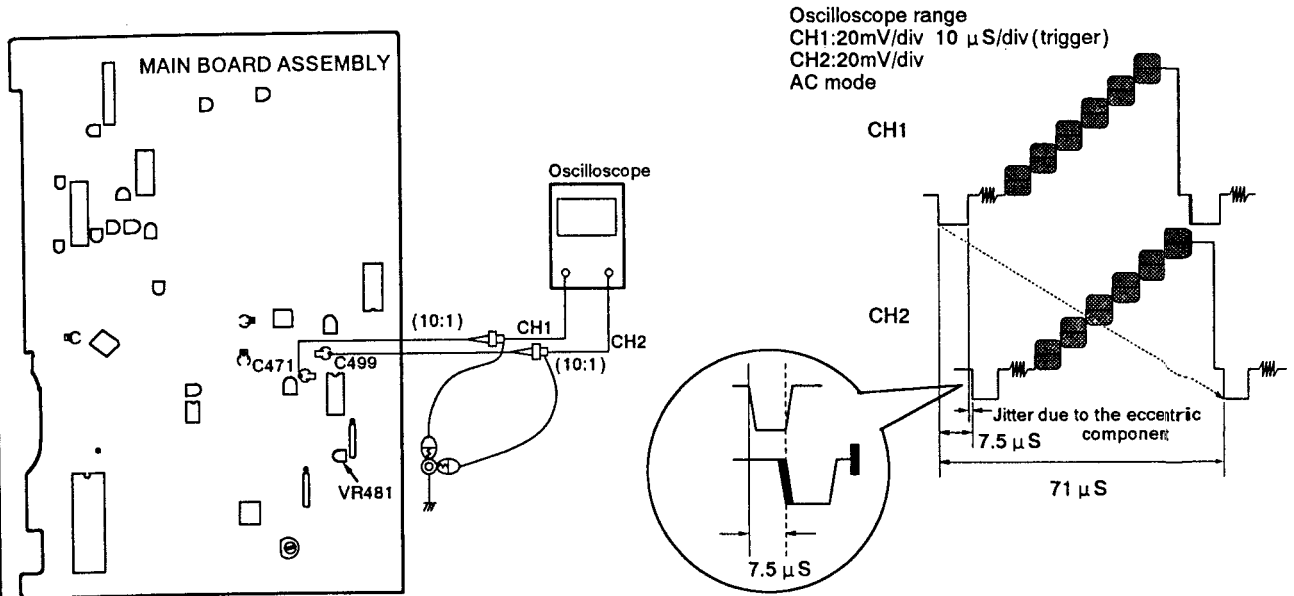
**19. VCO CENTERING FREQUENCY ADJUSTMENT**

**Electrical Adjustment**

- Purpose: Setting the optimum delay time for the time axis error compensation CCD.
- When not properly adjusted: It is difficult to color lock, there is color lock delay after a search, and there is flicker on the white screen.

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li>● Measuring instruments and jigs:</li> <li>● Measuring point:</li> <li>● Test disc and player mode</li> </ul> | <ul style="list-style-type: none"> <li>● Oscilloscope</li> <li>● CH 1 : + side lead wire of C471. ● CH 2 : + side lead wire of C499.</li> <li>● 8 - inch LD test disc (GGV1003)</li> <li>● Normal mode (Still mode, #5,100)</li> </ul> |
| <ul style="list-style-type: none"> <li>● Positions to be adjusted</li> </ul>   | <ul style="list-style-type: none"> <li>● VR481 (VCO FREQ)</li> </ul>   |

**Connection diagram**



**Adjustment Procedure**

1. Connect the + side lead wire of C471 and the + side lead wire of C499 to CH 1 and CH 2 of the oscilloscope respectively.  
 CH 1 : Video signal before time axis error compensation.  
 CH 2 : Video signal after time axis error compensation.
2. Search for frame #5,100 (stair step) on the test disc. Adjust VR481 so that the center of CH2's video signal jitter is delayed by 71 μs (1H + 7.5 μs) with respect to the CH1's video signal.

*Note : Do not confuse CH 1 and CH 2.*

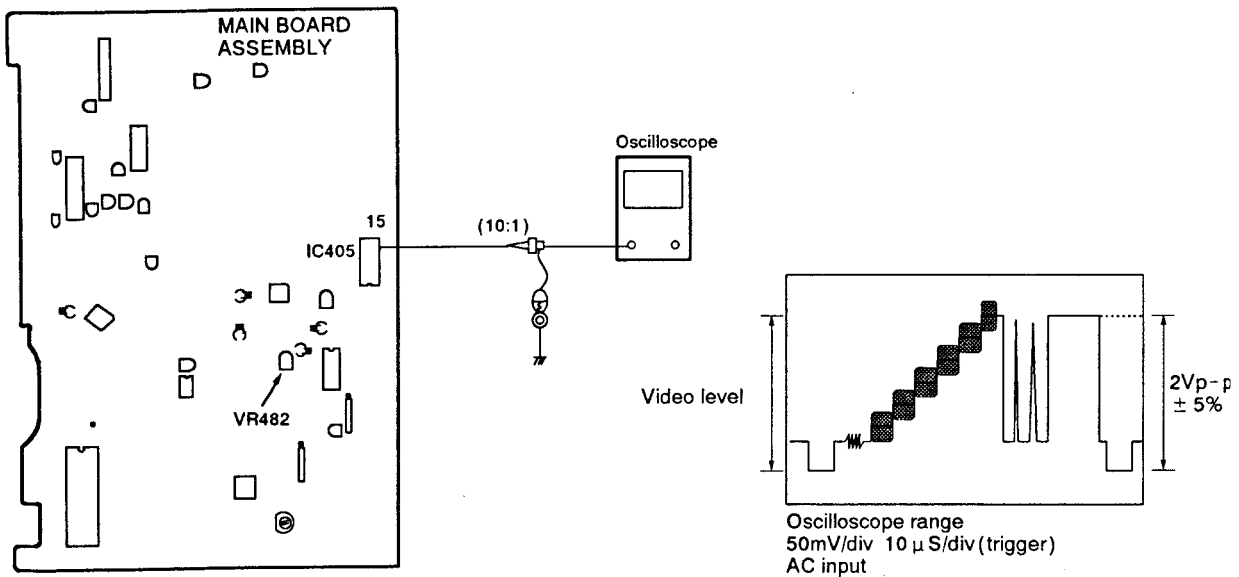
20. INPUT VIDEO LEVEL ADJUSTMENT FOR Y/C SEP CIRCUIT

Electrical Adjustment

- Purpose: Setting the video signal level to  $2V_{p-p} \pm 5\%$ .
- When not properly adjusted: When the video level is high :  
The dynamic range of the A/D conversion block in IC301 is exceeded and the waveform of the video signal is distorted.  
When the video level is low :  
The signal-to-noise ratio is degraded and the gradation becomes rough.

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li>● Measuring instruments and jigs:</li> <li>● Measuring point:</li> <li>● Test disc and player mode</li> </ul> | <ul style="list-style-type: none"> <li>● Oscilloscope</li> <li>● IC405-15</li> <li>● 8-inch LD test disc (GGV1003)</li> <li>● Normal mode [Still mode, #19,900 (Composite Test Signal)]</li> </ul> |
| <ul style="list-style-type: none"> <li>● Positions to be adjusted</li> </ul>   | <ul style="list-style-type: none"> <li>● VR482 (VIDEO LEVEL)</li> </ul>  |

Connection diagram



Adjustment Procedure

Note : Since the VIDEO OUT terminal will be connected to a TV monitor, it is to have  $75\Omega$  termination. (If it is connected to a TV via VHF OUT, terminate the VIDEO OUT terminal with a  $75\Omega$  resistor).

1. Search for frame #19,900 on the LD test disc.
2. Connect the oscilloscope to IC405-15.
3. Adjust VR482 so that the white level becomes  $2V_{p-p} \pm 5\%$  from the video signal's sync tip level.



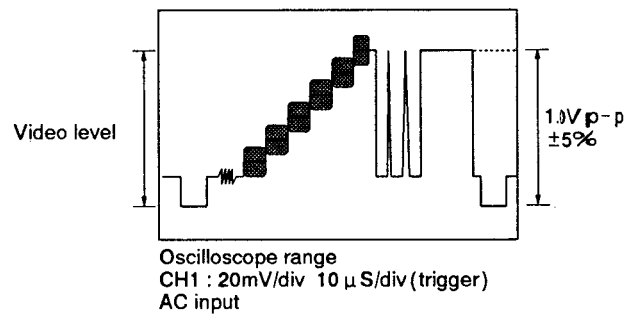
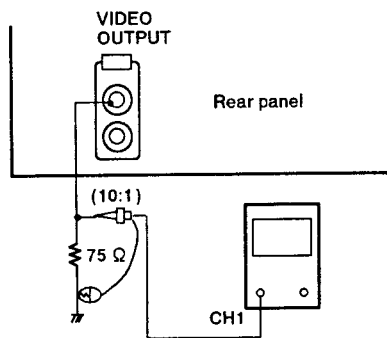
**21. OUTPUT VIDEO LEVEL ADJUSTMENT**

**Electrical Adjustment**

- Purpose: Setting the video signal level to 1.0Vp-p ( 75 Ω termination).
- When not properly adjusted: The screen is too bright or too dark.

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>• Measuring instruments and jigs:</li> <li>• Measuring point:</li> <li>• Test disc and player mode</li> </ul> | <ul style="list-style-type: none"> <li>• Oscilloscope</li> <li>• Resistor (75 Ω )</li> <li>• Player's VIDEO OUT terminal</li> <li>• 8 - inch LD test disc (GGV1003)</li> <li>• Normal mode (Still mode, #19,900)</li> </ul> |
| <ul style="list-style-type: none"> <li>• Positions to be adjusted</li> </ul>   | <ul style="list-style-type: none"> <li>• VR202 (Y-LEVEL)</li> </ul>   |

**Connection diagram**



**Adjustment Procedure**

1. Search for frame #19,900 on the test disc.
2. Connect the CH1 of oscilloscope to VIDEO OUTPUT terminal, it is to have 75Ω termination.
3. Adjust VR202 so that the white level becomes 1.0Vp-p ± 5% from the video signal's sync tip level.

22. 1H DELAY VIDEO LEVEL ADJUSTMENT

Electrical Adjustment

- Purpose: Equalization of the video levels of the 1H delay video signal and the main line video signal.
- When not properly adjusted: If the 1H delay video signal level is high, white dropout will be noticeable and there will be H shifting. (Horizontal stripes across the screen.)

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>• Measuring instruments and jigs:</li> <li>• Measuring point:</li> <li>• Test disc and player mode</li> </ul> | <ul style="list-style-type: none"> <li>• Oscilloscope</li> <li>• CH 1 : lead wire of C443    • CH 2 : lead wire of C445</li> <li>• 8-inch LD test disc (GGV1003)</li> <li>• Normal mode (Still mode, #3,800)</li> </ul> |
| <ul style="list-style-type: none"> <li>• Positions to be adjusted</li> </ul>   | <ul style="list-style-type: none"> <li>• VR441 (1H LEVEL)</li> </ul>  |

Connection diagram

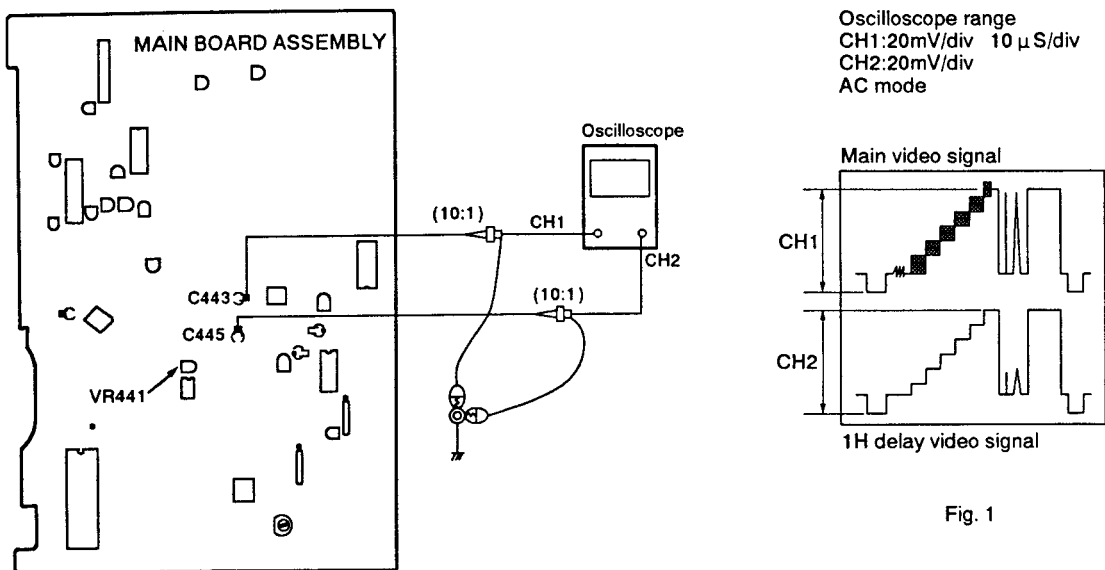


Fig. 1

Adjustment Procedure

1. Search for frame #3,800 on the test disc.
2. Connect lead wire of C443 to the oscilloscope's CH 1 and lead wire of C445 to the CH 2.
3. Adjust VR441 so that the 1H delay video level (CH 1) becomes the same as the main line video level (CH 2). (See Fig. 1)

*Note : The video level is the level between the SYNC tip and the white peak.*

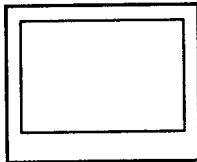
**23. VPS ERROR LEVEL ADJUSTMENT**

**Electrical Adjustment**

- Purpose: Optimization of the color tint compensation section's error signal level.
- When not properly adjusted: There is substantial color irregularity. (especially for CDV.)

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li>● Measuring instruments and jigs:</li> <li>● Measuring point:</li> <li>● Test disc and player mode</li> <br/> <li>● Positions to be adjusted</li> </ul> | <ul style="list-style-type: none"> <li>● TV monitor</li> <br/> <li>● Player's VIDEO OUT terminal (Monitor screen)</li> <li>● 8 - inch LD test disc (GGV1003)</li> <li>● Normal mode [ Still mode, #8,000 (Magenta) ]</li> <br/> <li>● VR521 (VPS LEVEL)</li> </ul> |
|--|--|

**Connection diagram**



Color irregularity on the magenta screen is minimized.

**Adjustment Procedure**

1. Search for frame #8,000 on the test disc. (Magenta screen)
2. Adjust VR521 until the color irregularity on the magenta screen is minimized.

## 6. FOR CLD - D550/RD

**NOTES:**

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

### CONTRAST OF MISCELLANEOUS PARTS

CLD - D550/RD and CLD - D501/KU/CA have the same construction except for the following:

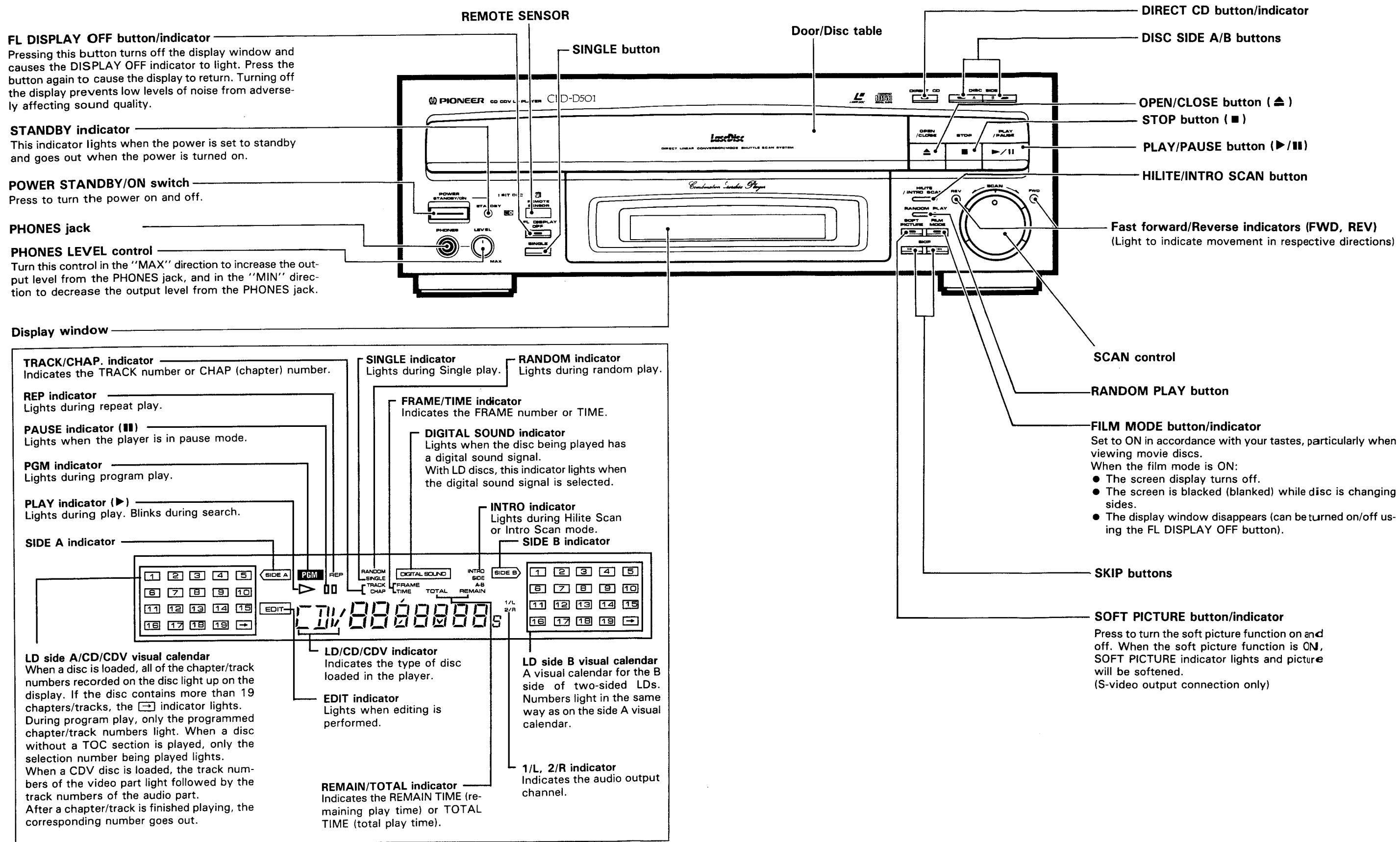
Mark	Symbol & Description	Part No.		Remarks
		CLD - D501/KU/CA	CLD - D550/RD	
	Power supply assembly	VWR1131	VWR1132	
	Front panel assembly	VXA1831	VXA1849	
$\Delta$	Voltage selector(AC110-127V, 220-240V)	.....	VS1004	
$\Delta$	Cord stopper	CM-22C	CM-22B	
$\Delta$	AC power cord	PDG1015	PDG1013	
	Wire clamp	.....	Non supply	
	Power insulator sheet	.....	VEC1492	
	Packing case	VHG1211	VHG1212	

### POWER SUPPLY ASSEMBLY (VWR1132)

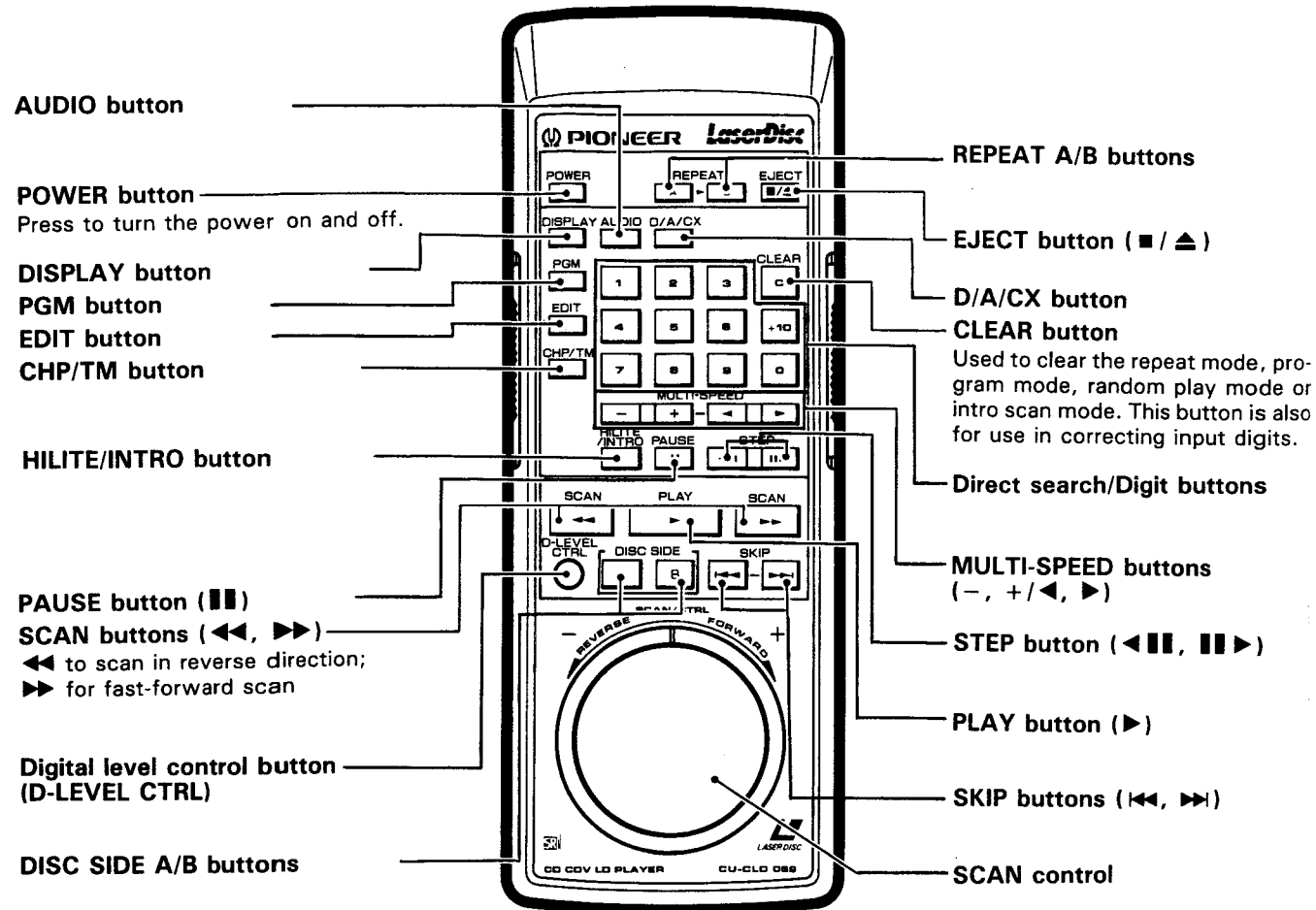
VWR1132 and VWR1131 have the same construction except for the following:

Mark	Symbol & Description	Part No.		Remarks
		VWR1131	VWR1132	
	Fuse (F202, F203)	NT1-0.63A	.....	
	IC protector (IC211, IC212)	.....	ICP-N20	

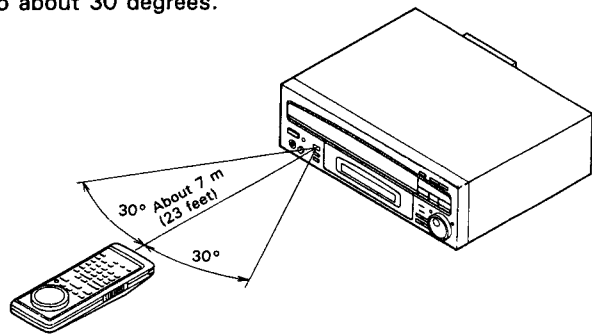
## 7. PANEL FACILITIES



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.



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 FOR USING THE REMOTE CONTROL UNIT**

- If a plug is connected to the CONTROL IN terminal at the rear of the player, remote control operations cannot be done with the remote control unit aimed at the player's remote control sensor. Aim the remote control unit at the AV amplifier or the component display's sensor instead.

- If there is any obstacle between the remote control unit and the player, or if the unit is held at too large an angle relative to the front panel of the player, the signal from the remote control unit will fail to reach the remote sensor.
- If the player is operating in the vicinity of other appliances generating infrared rays, or if other remote control devices using infrared rays are used near the player, the player may operate improperly. Conversely, if the player's remote control unit is operated in the vicinity of other appliances which use an infrared remote control device, the other appliance may operate improperly. If this should happen, change the place of installation so that improper operation does not occur.
- If the range of operation of the remote control unit becomes too short replace the batteries.
- When the unit is not to be used for a long period of time (more than one month), remove the batteries to prevent them from leaking inside the compartment. If leakage occurs, wipe up the liquid inside the compartment and replace the batteries with new ones.
- Do not place books or other objects on the remote control unit, since they might depress the buttons and run down the batteries.
- 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.

**8. SPECIFICATIONS**

**1. General**

System ..... LaserVision Disc system and Compact Disc digital audio system  
 Laser ..... Semiconductor laser wavelength 780nm  
 Power requirements  
 U.S. and Canadian models ..... AC 120V, 60 Hz  
 Multi voltage models ..... AC 110-127V/220-240V (switchable) 50/60 Hz

Power consumption  
 U.S. and Canadian models ..... 39 W  
 Multi voltage models ..... 39 W  
 Weight ..... 9.0 kg (19 lbs 13 oz)  
 Dimensions ..... 420 (W) x 434 (D) x 135 (H) mm  
 16-9/16 (W) x 17-1/14 (D) x 5-5/16 (H) in  
 Operating temperature ..... + 5°C ~ +35°C (41°F - 95°F)  
 Operating humidity ..... 5% ~ 90% (There should be no condensation of moisture.)

**2. Disc**

**LaserVision Discs**

\*Maximum playing time  
 12-inch standard play disc ..... 1 hour/both sides  
 12-inch extended play disc ..... 2 hours/both sides  
 8-inch standard play disc ..... 28 min/both sides  
 14 min/one side  
 8-inch extended play disc ..... 40 min/both sides  
 20 min/one side

Spindle motor speed  
 Standard play disc ..... 1,800 rpm  
 Extended play disc ..... 1,800 rpm (inner circumference) to 600 rpm (outer circumference) (For a 12-inch disc)

**Compact Discs**

Disc ..... Diameter: 5-inch, 3-inch, Thickness: 1.2 mm  
 Rotation direction (pickup side) ..... Counterclockwise  
 Linear speed ..... 1.2 ~ 1.4m/sec

\*Maximum playing time  
 74 min. 5-inch discs  
 20 min. 3-inch discs (For stereo playback)

**Compact Discs with Video**

Disc ..... Diameter: 5-inch, Thickness: 1.2 mm  
 Rotation direction (pickup side) ..... Counterclockwise  
 Linear speed ..... Audio portion: 1.2 ~ 1.4m/sec  
 Video portion: 11 ~ 12m/sec  
 Maximum playing time ..... Video portion: 5 min. (CLV)  
 Audio portion: 20 min. (Digital)

\* Actual playback time differs for each disc.

**3. Video characteristics**

Format ..... NTSC specifications  
 Video output  
 Level ..... 1 Vp-p nominal, sync. negative, terminated  
 Impedance ..... 75Ω unbalanced  
 Jacks ..... Both RCA jacks  
 Number of channels ..... 2

**4. S-Video output**

Y (luminance) - Output level ..... 1 Vp-p (75Ω)  
 C (color) - Output level ..... 286 mVp-p (75Ω)  
 Jack ..... S-VIDEO jack

**5. Audio characteristics**

Output level  
 During analog audio output ..... 200 mVrms (1 kHz, 40%)  
 During digital audio output ..... 200 mVrms (1 kHz, -20 dB)  
 Jacks ..... Both RCA jacks  
 Number of channels ..... 2

**Digital Audio Characteristics**

Frequency response	4 Hz-20 kHz (EIAJ)
SN ratio	114 dB (EIAJ)
Dynamic range	99 dB (EIAJ)
Total harmonic distortion	0.0018% (EIAJ)
Wow and flutter	Limit of measurement (EIAJ)

**6. Other Terminals**

Control input/output ..... Both miniature jacks  
 CD-DECK synchro ..... Miniature jack  
 Optical digital output ..... Optical digital jack

**7. Accessories**


Remote control unit (CU-CLD069) ..... 1  
 Size "AAA" (IEC R03) dry cell batteries ..... 2  
 Video cord ..... 1  
 Audio cord ..... 1  
 Operating instructions ..... 1  
 Warranty card ..... 1

## 8. Functions

Remote control unit operations (CU-CLD069)

	Function	Standard play Disc (CAV)	Extended play Disc (CLV)	Compact Disc with Video	Compact Disc
Basic Functions	Two-side play	YES	YES	NO	NO
	Single-side play	YES	YES	YES	YES
	Pause	YES	YES	YES	YES
	Stop	YES	YES	YES	YES
Search	Fast forward (forward and reverse)	YES	YES	YES	YES
	Chapter/Track skip	YES	YES	YES	YES
	Direct chapter/Track number search	YES	YES	YES	YES
	Frame number search	YES	NO	NO	NO
	Time number search	NO	YES	YES	YES
	Absolute time search	NO	NO	NO	YES
Program	Chapter/Track program play	YES	YES	YES	YES
	Program correction	YES	YES	YES	YES
Repeat	Repeat between 2 points	YES	YES	YES	YES
	Memory repeat	YES	YES	YES	YES
	Chapter/Track repeat	YES	YES	YES	YES
	One-side repeat	YES	YES	YES	YES
	Two-side repeat	YES	YES	—	—
	Program repeat	YES	YES	YES	YES
	Random repeat	YES <sup>*1</sup>	YES <sup>*1</sup>	YES	YES
	Program random repeat	YES	YES	YES	YES
Trick play	Still/Step	YES	NO	NO	NO
	Multi-speed (Forward/reverse 9-level variable)	YES	NO	NO	NO
Time display	Elapsed time display	NO	YES	YES	YES
	Absolute time display	YES <sup>*1</sup>	NO	NO	YES
	Remaining track time display	NO	NO	YES	YES
	Remaining total time display	YES <sup>*1</sup>	YES <sup>*1</sup>	YES	YES
	Total number of selections, total time display	YES <sup>*1</sup>	YES <sup>*1</sup>	YES	YES
Others	CX system ON/OFF	YES <sup>*2</sup>	YES <sup>*2</sup>	NO	NO
	AUTO DIGITAL/ANALOG switch	YES <sup>*3</sup>	YES <sup>*3</sup>	NO	NO
	Audio channel selection (Stereo, 1/L, 2/R)	YES	YES	YES	YES
	Digital level control	YES <sup>*3</sup>	YES <sup>*3</sup>	YES	YES

<sup>\*1</sup> Only discs with TOC

<sup>\*2</sup> Valid for analog sound playing a disc with the  mark.

<sup>\*3</sup> Can only be used with discs with digital sound tracks.

### NOTE:

The specifications and design of this product are subject to change without notice, due to improvements.

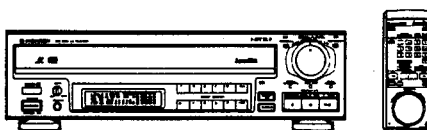
## PLAYER FUNCTIONS

- Display ON/OFF, Visual Calendar Display
- Hilite/Intro Scan, Single Play, Random Playback, Program Random Playback and Compu Program/Auto Program Edit
- Digital Sound for LaserVision Discs
- Last Memory
- Direct CD

3270

**PIONEER**  
The Art of Entertainment

# Service Manual



ORDER NO.  
ARP2225

CD CDV LD PLAYER

# CLD-1090

● This manual is applicable to the KUC type.

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**PIONEER ELECTRONIC CORPORATION** 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan  
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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

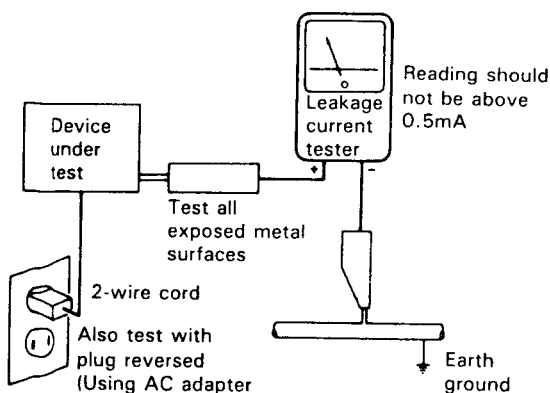
(FOR USA MODEL ONLY)

## 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.



AC Leakage Test

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

## 2. PRODUCT SAFETY NOTICE

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

Electrical components having such features are identified by marking with a  $\Delta$  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.

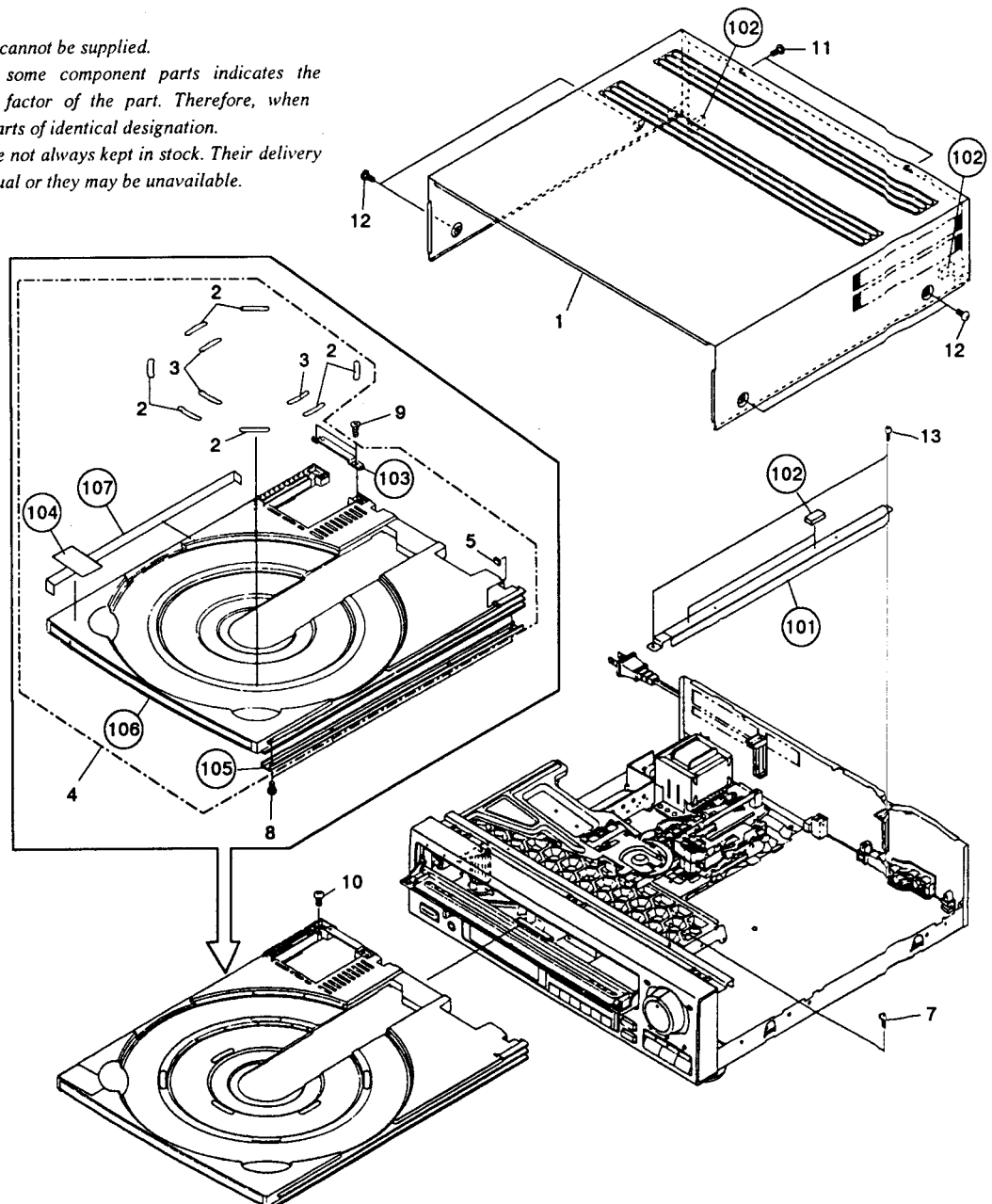
## 2. EXPLODED VIEWS AND PARTS LIST

### 2.1 EXTERIOR SECTION

A Parts List							
Mark	No.	Description	Part No.	Mark	No.	Description	Part No.
	1	Bonnet S	VXX1267	11	Screw		BBZ30P080FCC
	2	Disc pad(L)	VEC1191	12	Screw		BCZ40P060FZK
	3	Disc pad(S)	VEC1192	13	Screw		BBZ30P060FCC
	4	Tray assembly	VXX1453				
	5	Tray rubber	VEB1089	101	Center angle		
	6	• • • • •		102	Cushion		
	7	Screw	PCZ30P080FMC	103	Tray angle		
	8	Screw	BPZ30P080FCU	104	Carry label		
	9	Screw	CPZ30P100FMC	105	Tray reinforced plate		
	10	Screw	BPZ30P140FMC	106	Tray		
				107	Side plate		

**NOTES:**

- Parts without part number cannot be supplied.
- The  $\Delta$  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.



**2.2 FRONT PANEL SECTION**

**Parts List**

<b>Mark</b>	<b>No.</b>	<b>Description</b>	<b>Part No.</b>	<b>Mark</b>	<b>No.</b>	<b>Description</b>	<b>Part No.</b>
	1	Front panel assembly S	VXX1549		101	Front panel assembly	
	2	FL filter	VNK1659		102	Earth lug assembly	
	3	FL lens	VNK1660		103	Dumper plate	
	4	Volume knob	VNK1658		104	Reinforced plate	
	5	Door assembly - S	VXX1548		105	Jack holder	
	6	Front door assembly	VXA1572		106	SHKY assembly	
	7	Door dump rubber	VEB1033		107	FLKY assembly	
	8	Roller	VNL1042		108	PSWB assembly	
	9	Door plate	VNE1482		109	HEPB assembly	
	10	Door spring	VBH1136		110	Spacer	
					111	Dump rubber	
	11	PW button	VNK1649				
	12	Ten key	VNK1653				
	13	Main key	VNK1654				
	14	Sub key	VNK1655				
	15	Sub panel	VNK1661				
	16	Dumper assembly	VXA1053				
	17	L key assembly	VXA1573				
	18	Scan dial assembly	VXA1574				
	19	Scan dial	VNK1656				
	20	LED lens (S)	VNK1657				
	21	Snap plate	VNE1102				
	22	Screw	BPZ20P040FZK				
	23	Screw	BBZ20P050FMC				
	24	Screw	BPZ26P060FCU				
	25	Screw	IPZ26P060FMC				
	26	Screw	BPZ26P080FMC				
	27	Screw	PMZ20P040FCU				

Note: 106 SHKY, 107 FLKY, 108 PSWB and 109 HEPB assemblies are supplied for service as the FLKB assembly (VWM1160).

1

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3

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6

A

A

B

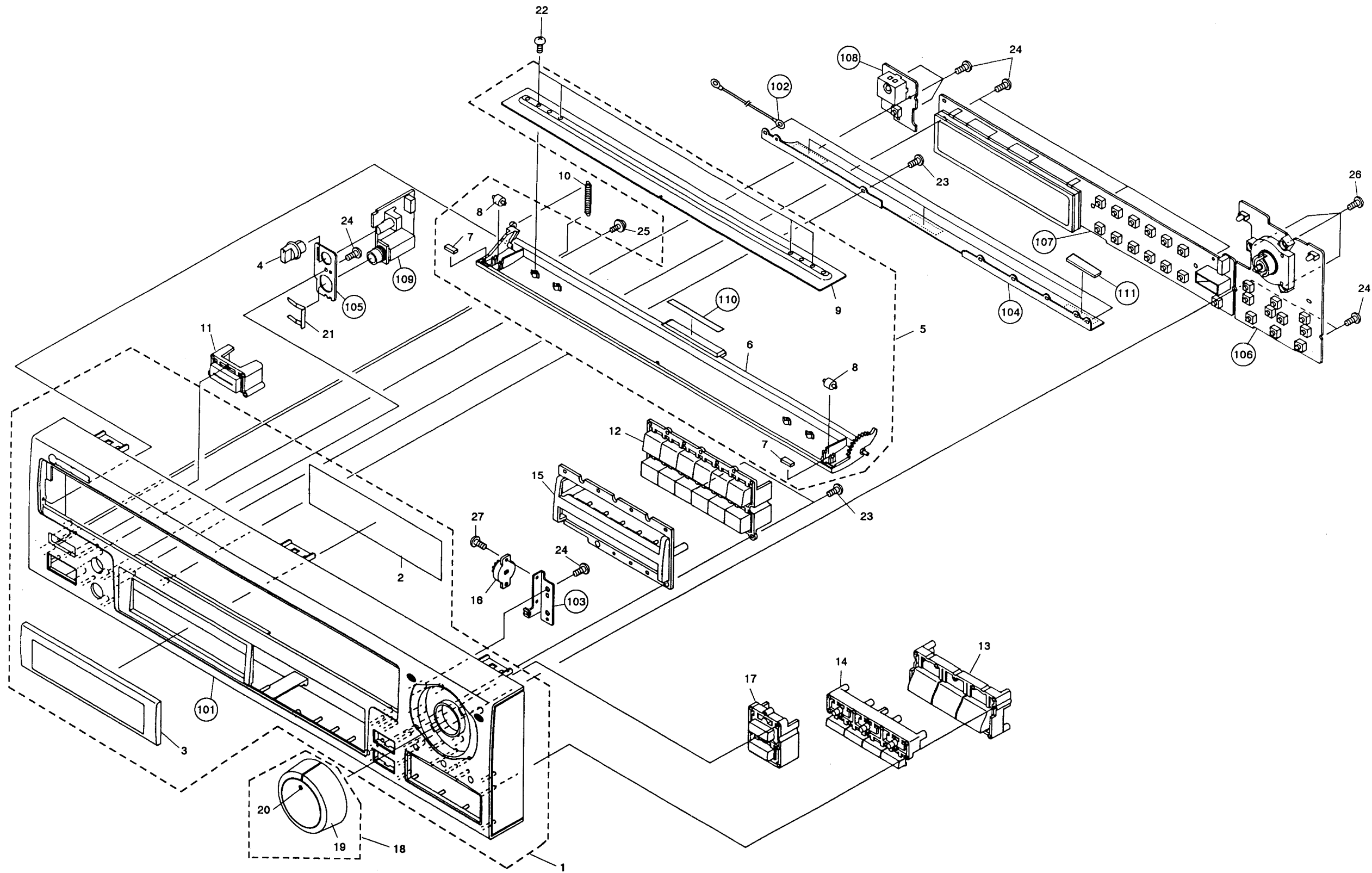
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C

C

D

D



1

2

3

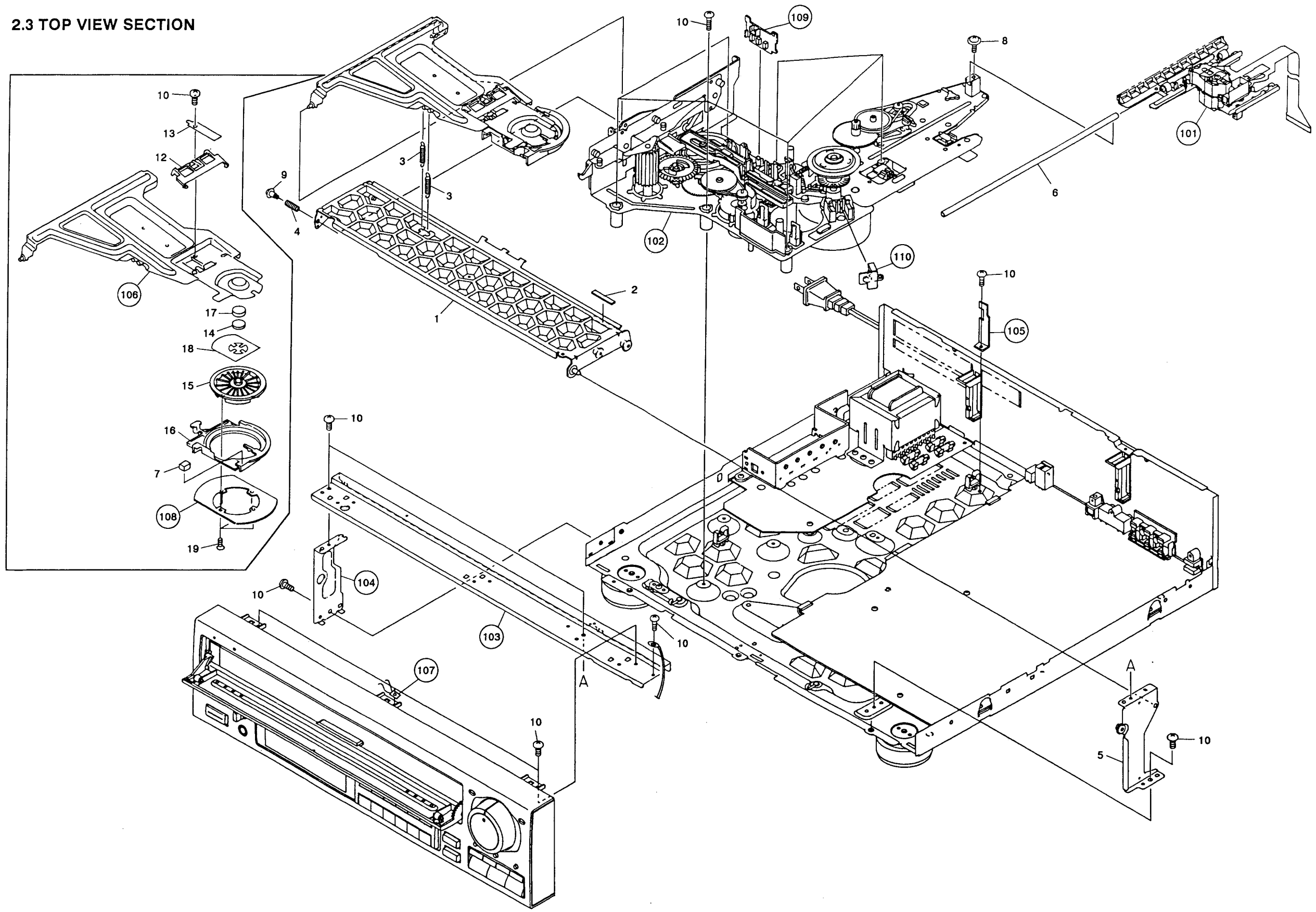
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6

2.3 TOP VIEW SECTION



A  
B  
C  
D

**Parts List**

<u>Mark</u>	<u>No.</u>	<u>Description</u>	<u>Part No.</u>	<u>Mark</u>	<u>No.</u>	<u>Description</u>	<u>Part No.</u>
	1	Clamper arm (A) assembly	VXA1319		101	Rack assembly	
	2	Rubber (A)	VEB1084		102	Mechanism assembly	
	3	Clamper spring	VBH1094		103	Front angle	
	4	Arm spring	VBH1093		104	Side stay (L)	
	5	Side stay (R) assembly	VXA1529		105	SM head holder	
	6	Carriage shaft	VLL1177		106	Clamper arm (B)	
	7	Clamper pad	VEC1264		107	Earth plate	
	8	Screw (B)	VBA1018		108	Stabilizer	
	9	Screw (B)	VBA1008		109	SW assembly	
	10	Screw	BBZ30P060FCC		110	FG assembly	
	11	. . . . .					
	12	Parallel link	VNL1254				
	13	Plate spring	VBK1014				
	14	Ball holder	VNL1289				
	15	Clamper S	VNL1248				
	16	Clamper holder	VNL1205				
	17	Rubber sheet	VEB1114				
	18	Thrust holder	VBK1018				
	19	Screw	CPZ20P050FMC				

Note: 109 SW assembly and 110 FG assembly are supplied for service as the Mother assembly (VWM1159).

**2.4 BASE SECTION**

**Parts List**

<b>Mark</b>	<b>No.</b>	<b>Description</b>	<b>Part No.</b>
△	1	Power transformer	VTT1079
△	2	Strain relief	CM-22C
△	3	AC power cord	PDG1015
△	4	Fuse (FU203,FU204)(1A)	REK-080
△	5	Fuse(FU201,FU202) (3A)	VEK-018
	6	Tray stopper	VNL1202
	7	Insulator assembly	VXA1289
	8	Insulator	VNK1095
	9	Insulator assembly	VXA1290
●	10	SYPS assembly	VWR1090
	11	Door dump rubber	VEB1033
	12	Screw	BBZ30P080FCC
	13	Screw	BBZ30P060FCC
	14	Screw	BCZ40P080FZK
	15	Screw	IPZ30P160FMC

<b>Mark</b>	<b>No.</b>	<b>Description</b>	<b>Part No.</b>
	101	P. C. B spacer	
	102	P plate holder	
	103	Wire crip (B)	
	104	Base chassis	
	105	Rear panel	
	106	Stopper	
	107	Insulator	
	108	MAIN assembly	
	109	Cord holder	

Note: 108 MAIN assembly is supplied for service as the Mother assembly (VWM1159).



1

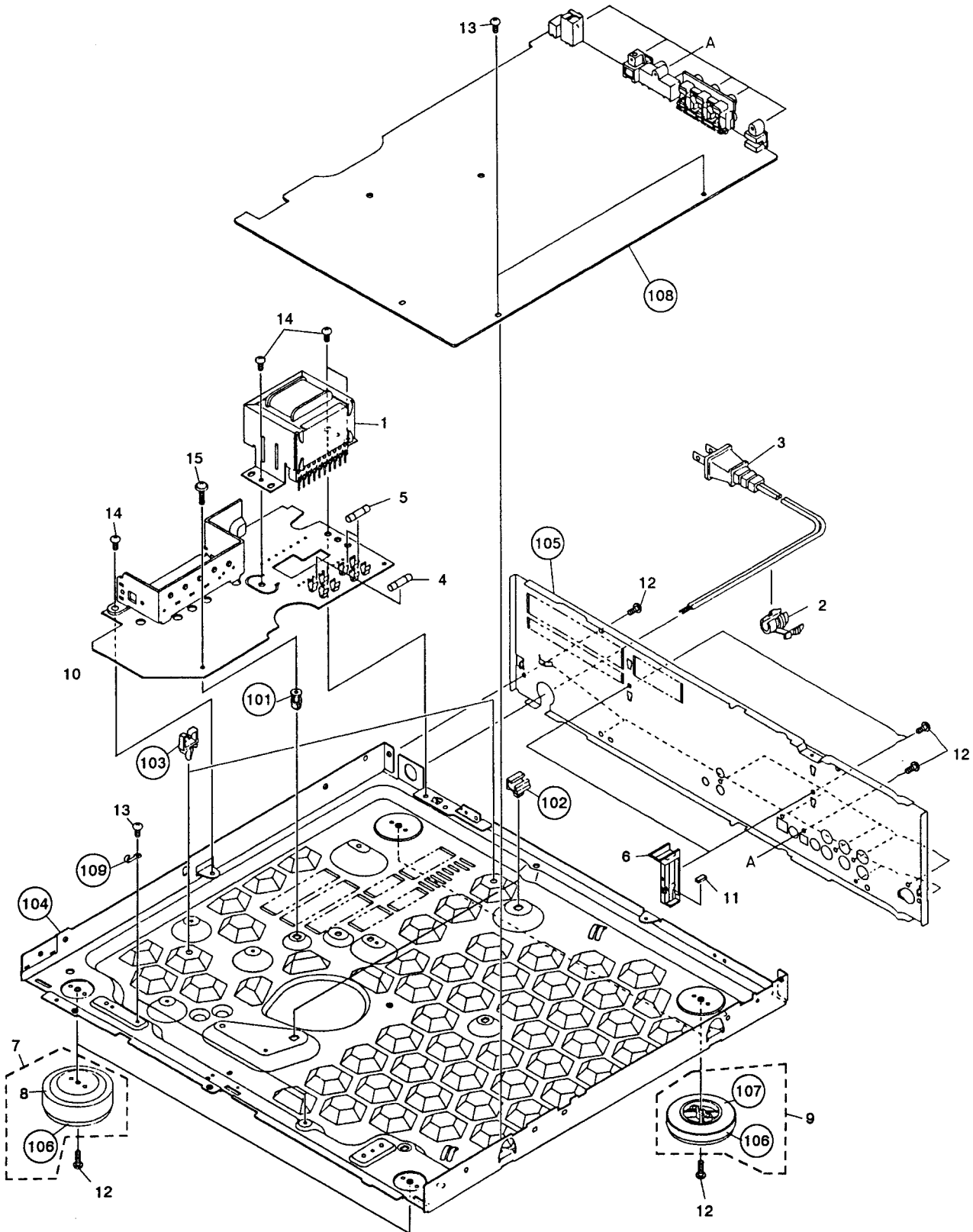
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A

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D



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2

3



1

2

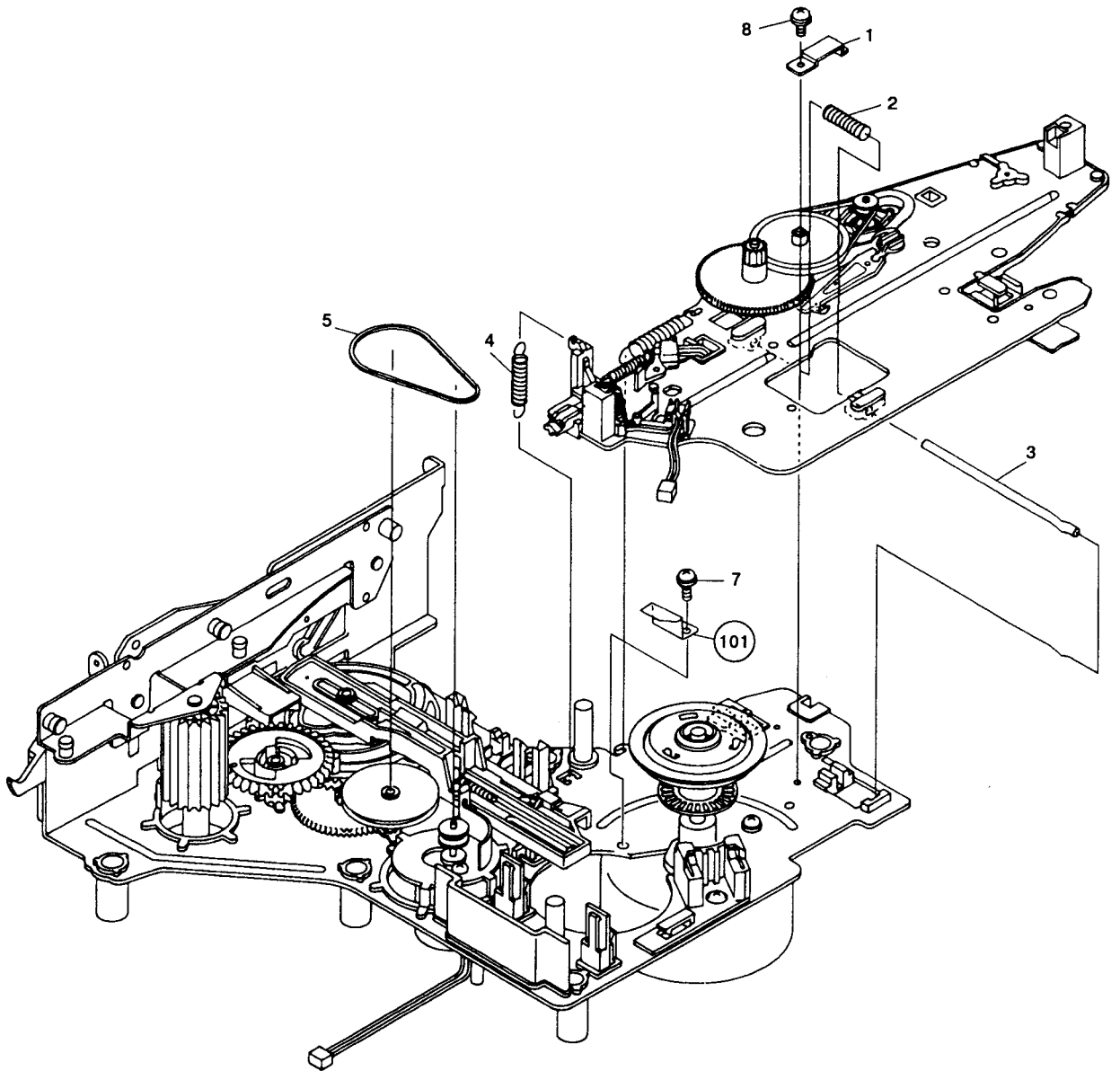
3



### 2.5 MECHANISM ASSEMBLY (1)

**Parts List**

Mark No.	Description	Part No.	Mark No.	Description	Part No.
1	Plate spring	VBK1013	6	• • • • •	
2	Thrust spring	VBH1073	7	Screw	PMA30P050FMC
3	Tilt shaft	VLL1175	8	Screw	ABZ26P050FMC
4	Tilt pulling spring	VBH1074			
5	Belt	PEB1013	101	Cam head stopper	



A

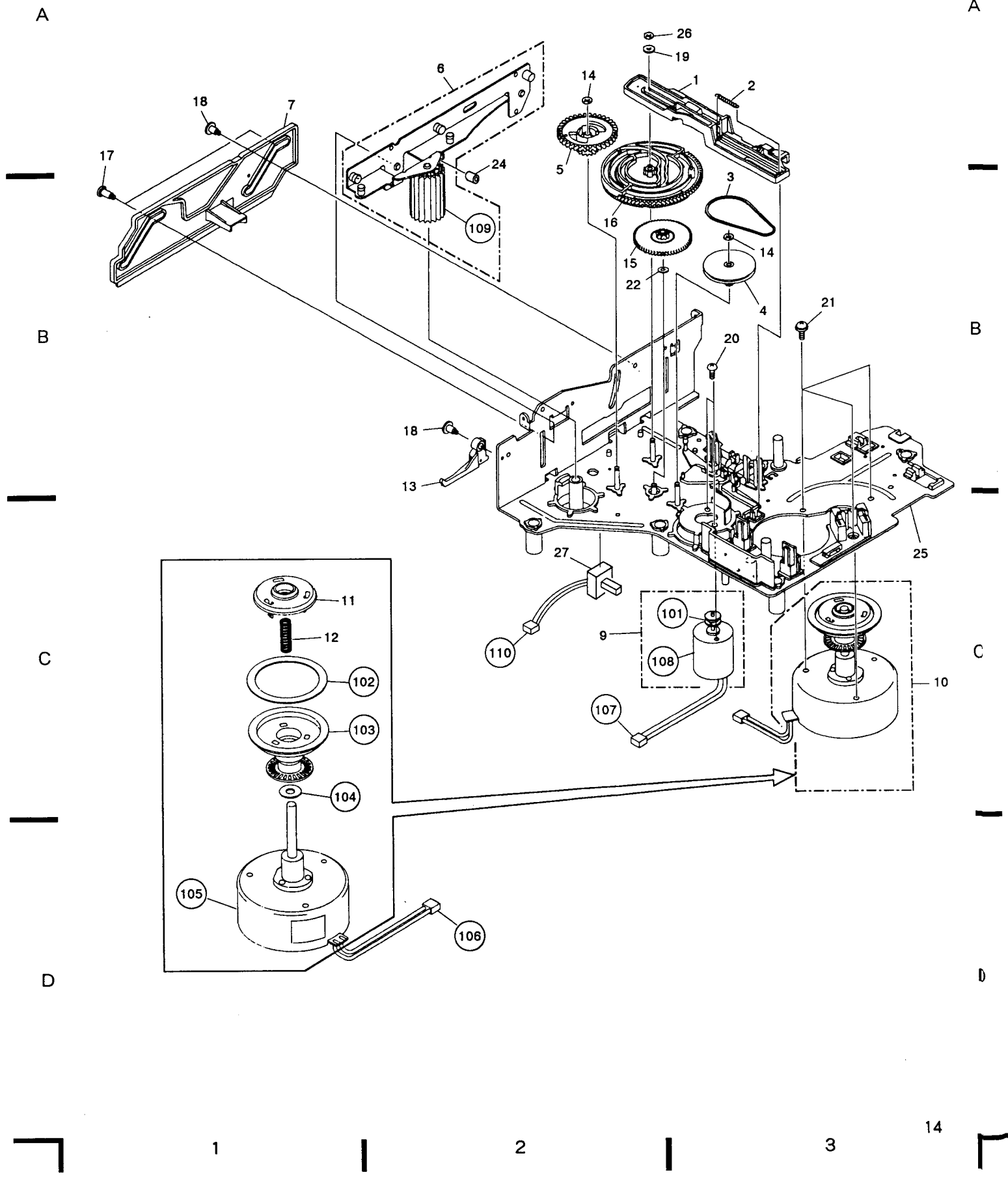
B

C

D

2.6 CHASSIS SECTION

Parts List			Parts List		
Mark No.	Description	Part No.	Mark No.	Description	Part No.
1	Spring slanting cam	VNL1191	101	Motor pulley	
2	Cam spring	VBH1082	102	Rubber sheet	
3	Belt	PEB1013	103	Turn table assembly	
4	Gear pulley	VNL1249	104	Oil stopped washer	
5	Follow gear	VNL1194	105	Spindle motor	
6	Roller plate assembly	VXA1531	106	Housing assembly	
7	Slide cam	VNL1188	107	Housing assembly	
8	•••••		108	Loading motor	
9	Loading motor assembly	VXX1262	109	Slider gear	
10	Spindle motor assembly	VXA1474	110	Housing assembly	
11	Centering hab	VNL1174			
12	Centering spring	VBH1083			
13	Door lever	VNL1407			
14	Washer	WT26D047D025			
15	Two stair gear	VNL1193			
16	Cam gear	VNL1340			
17	Screw (C)	VBA1015			
18	Screw (B)	VBA1008			
19	Nylon washer	WA32N080W020			
20	Screw	PMZ30P040FMC			
21	Screw	PMA30P050FMC			
22	Washer	WA32D060D025			
23	•••••				
24	Stop ring	VEB1091			
25	Chassis assembly	VXA1575			
26	E ring	YE23FUC			
27	Push switch	DSG1014			

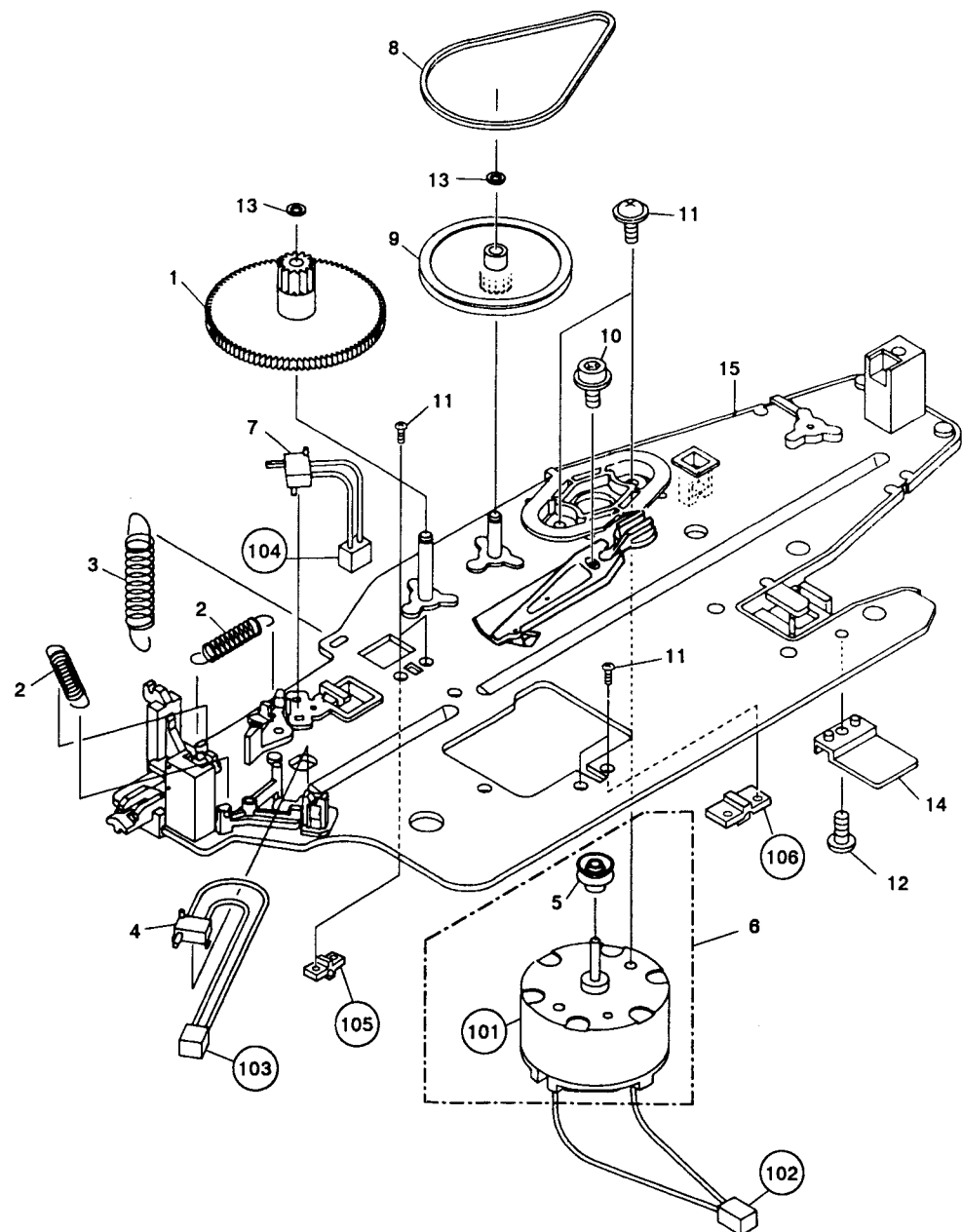


2.7 SERVO MECHANISM BASE SECTION

Parts List

Mark No.	Description	Part No.
1	CA gear (3)	VNL1196
2	Switch pulling spring	VBH1079
3	TC pulling spring	VBH1080
4	Push switch (S5:OUTER)	DSG1014
5	CA pulley (1)	VNL1197
6	Carriage motor assembly	VXX1261
7	Push switch (S4:INNER)	DSG1014
8	CA belt	VEB1077
9	CA pulley (2)	VNL1198
10	Screw	SMF30H080FBT
11	Screw	PMM26P040FMC
12	Screw	BPZ26P050FMC

Mark No.	Description	Part No.
13	Washer	WT26D047D025
14	FLE base	VNL1341
15	Servo mechanism base assembly - S	VXA1583
101	Carriage motor	
102	Housing assembly	
103	Housing assembly	
104	Housing assembly	
105	Holder (A)	
106	Holder (B)	

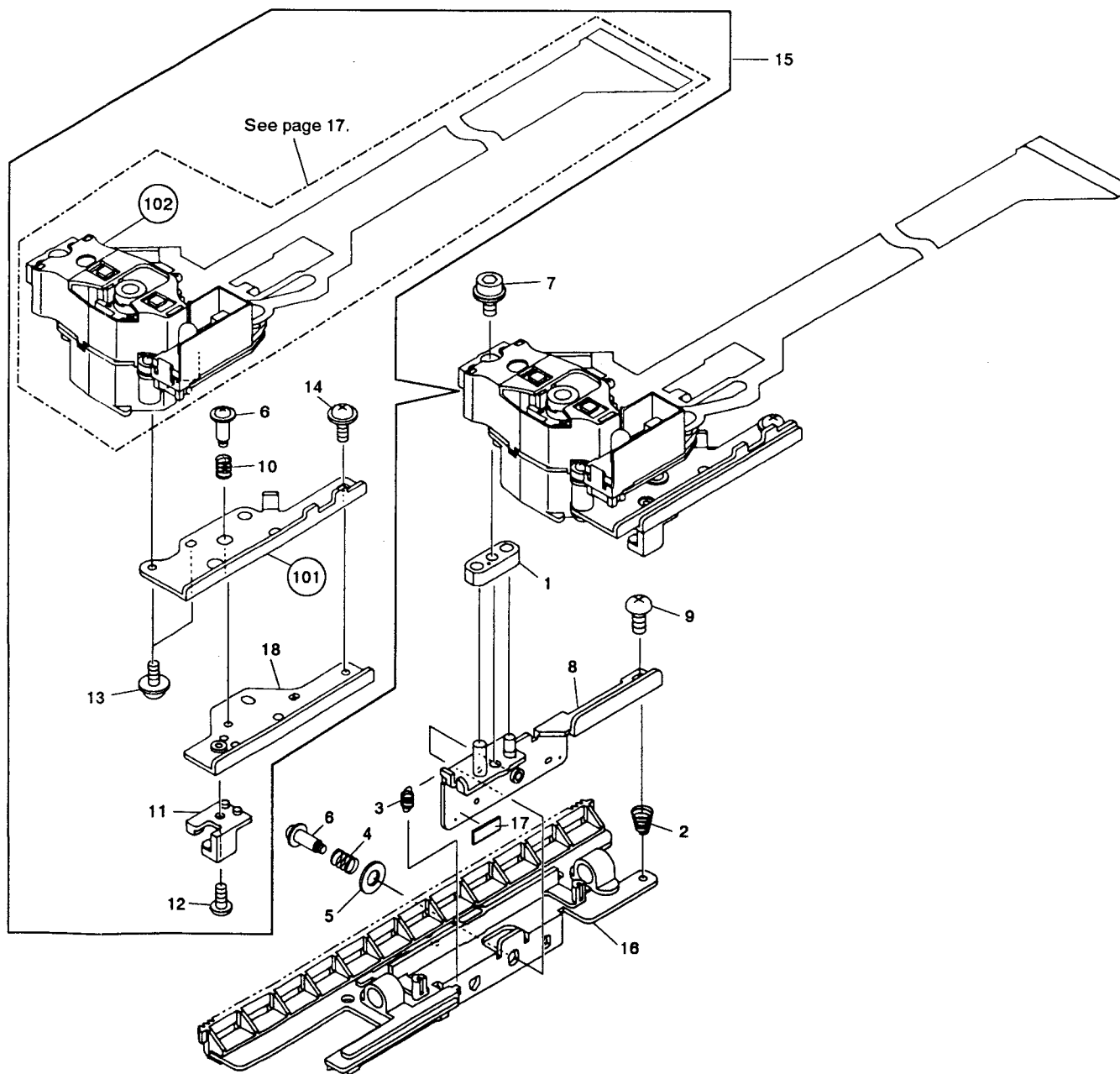


2.8 RACK SECTION

Parts List

Mark No.	Description	Part No.
1	PU base	VNL1209
2	LP center spring	VBH1075
3	PU pulling spring	VBH1089
4	L-2 spring	VBH1090
5	Washer	WC30FMC
6	Screw	VBA1007
7	Screw (2.6 x 10)	VLL1192
8	Rack	VNL1186
9	Screw	BMZ26P080FMC
10	TAN spring	VBH1081

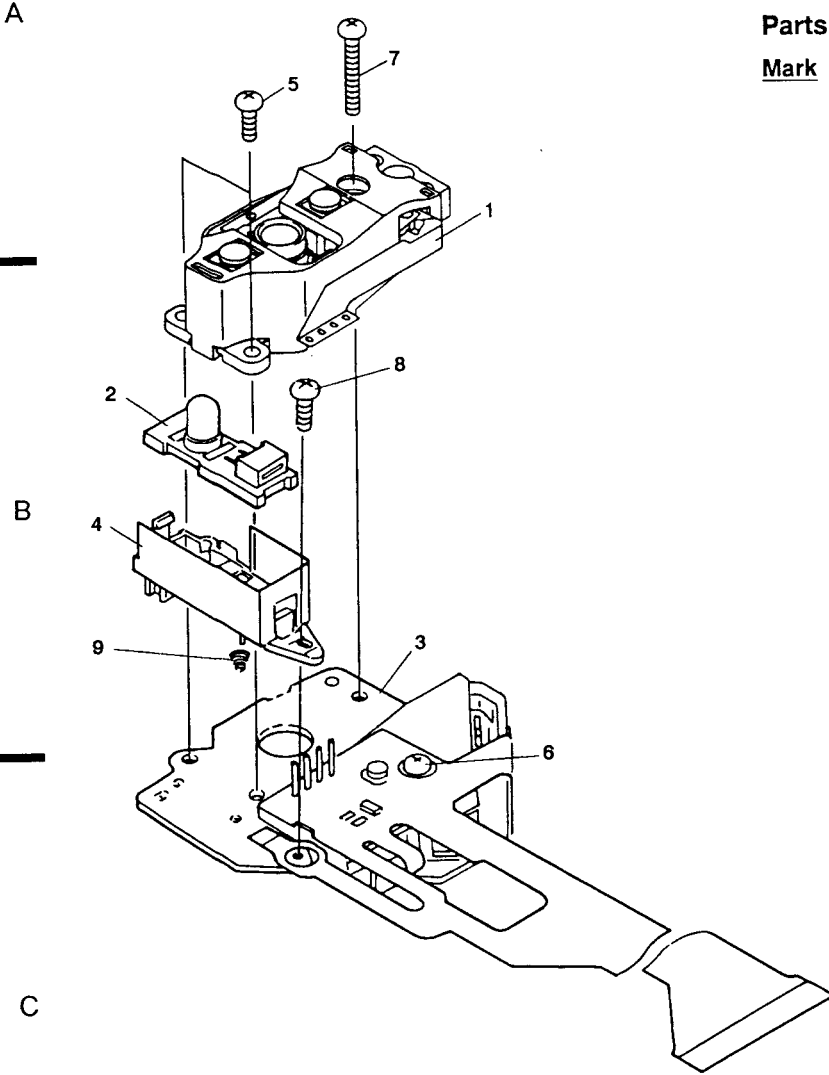
Mark No.	Description	Part No.
11	TAN base	VNL1199
12	Screw	PMZ20P040FMC
13	Screw	PMA20P040FMC
14	Screw	AMZ20P050FMC
15	Slider assembly	VWT1060
16	PU mount base assembly	VXA1567
17	Spacer (S)	VEC1284
18	TAN plate (1)	VNE1606
101	TAN plate (2)	
102	Pickup assembly	



2.9 PICKUP ASSEMBLY

Parts List of Pickup assembly

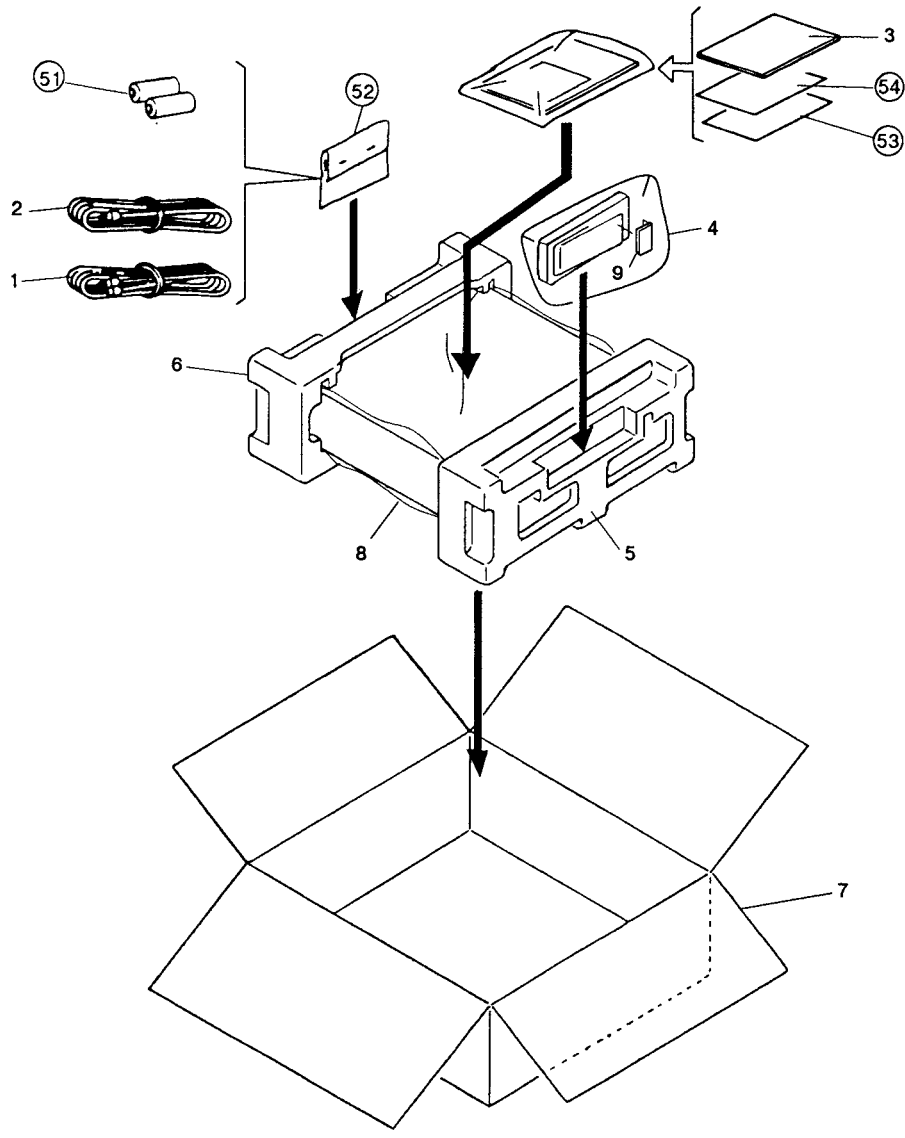
Mark	No.	Description	Part No.
	1	Actuator assembly	VXX1551
	2	Sensor assembly	VEX1018
	3	Pre-pickup assembly	VXX1413
	4	Sensor stay	VNH1024
	5	Screw	PMA20P060FMC
	6	Screw	PMA20P080FMC
	7	Screw	PMA20P140FMC
	8	Screw	BMZ20P060FMC
	9	Sensor spring	VBH1087



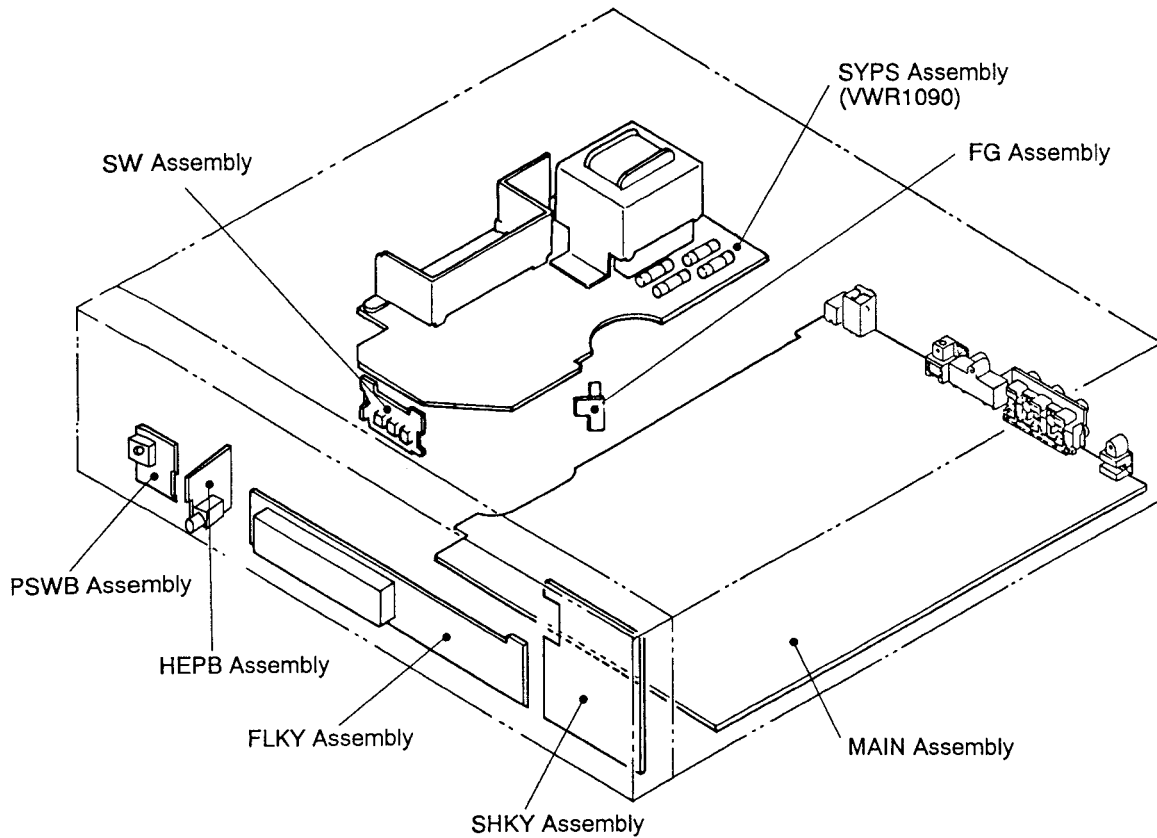
### 3. PACKING

Parts List

Mark No.	Description	Part No.	Mark No.	Description	Part No.
1	Connection cord	VDE-055	51	Dry cell battery (R03, AAA)	
2	Video cable	VDE-056	52	Polyethylene bag	
3	Operating instructions (English)	VRB1048	53	Caution card	
4	Remote control unit	VXX1530	54	Caution card (UC)	
5	Pad (F)	VHA1076			
6	Pad (R)	VHA1077			
7	Packing case	VHG1143			
8	Mirror mat	VHL1006			
9	Battery cover	VNK1806			



## 4. P. C. BOARDS LOCATION



### MOTHER ASSEMBLY (VWM1159)

MOTHER assembly is composed of MAIN, FG and SW assemblies.

### FLKB ASSEMBLY (VWM1160)

FLKB assembly is composed of FLKY, SHKY, PSWB and HEPB assemblies.

MAIN	: MAIN BOARD
FG	: FG COUNTER BOARD
SW	: SW BOARD
FLKY	: FL TUBE AND KEY BOARD
SHKY	: SHUTTLE AND KEY BOARD
PSWB	: POWER SWITCH BOARD
HEPB	: HEADPHONE BOARD
SYPS	: SYSTEM POWER SUPPLY

## 5. SCHEMATIC AND P.C. BOARDS DIAGRAM


### 1. RESISTORS:

Indicated in  $\Omega$ , 1/4W, 1/6W and 1/8W,  $\pm 5\%$  tolerance unless otherwise noted k; k  $\Omega$ , M; M  $\Omega$ , (F);  $\pm 1\%$ , (G);  $\pm 2\%$ , (K);  $\pm 10\%$ , (M);  $\pm 20\%$  tolerance.

### 2. CAPACITORS:

Indicated in capacity ( $\mu\text{F}$ ) / voltage(V) unless otherwise noted p;pF. Indication without voltage is 50V except electrolytic capacitor.

### 3. VOLTAGE, CURRENT:

 :DC voltage (V) at no input signal.  
Value in ( ) is DC voltage at rated power.  
 $\Leftarrow$  mA :DC current at no input signal.

### 4. OTHERS:

$\rightarrow$  ;Signal route.  
 $\otimes$  ;Adjusting point.  
The  $\Delta$  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.  
 $\otimes$  marked capacitors and resistors have parts numbers.

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

### 5. SWITCHES : (The underlined indicates the switch position)

#### OUTSIDE OF P.C. BOARDS

S4 :INNER  
S5 :OUTER  
S6 :TRAY IN

#### SW ASSEMBLY

S1 - S3 :LOADING / TILT

#### FLKY ASSEMBLY

S10 :PGM

S11 :5

S12 :0

S13 :+10

S14 :2

S15 :1

S16 :4

S17 :3

S18 :9

S19 :8

S20 :7

S21 :6

S22 :DIRECT CD

S23 :SINGLE

S24 :DOOR

#### SHKY ASSEMBLY


S40 :DIGITAL LEVEL CTRL


S41 :PGM EDIT

S42 :PEAK SEARCH


S43 :RANDOM PLAY

S44 :HILITE INTRO SCAN

S45 : 

S46 : 

S47 : OPEN / CLOSE (  )

S48 : STOP (  )

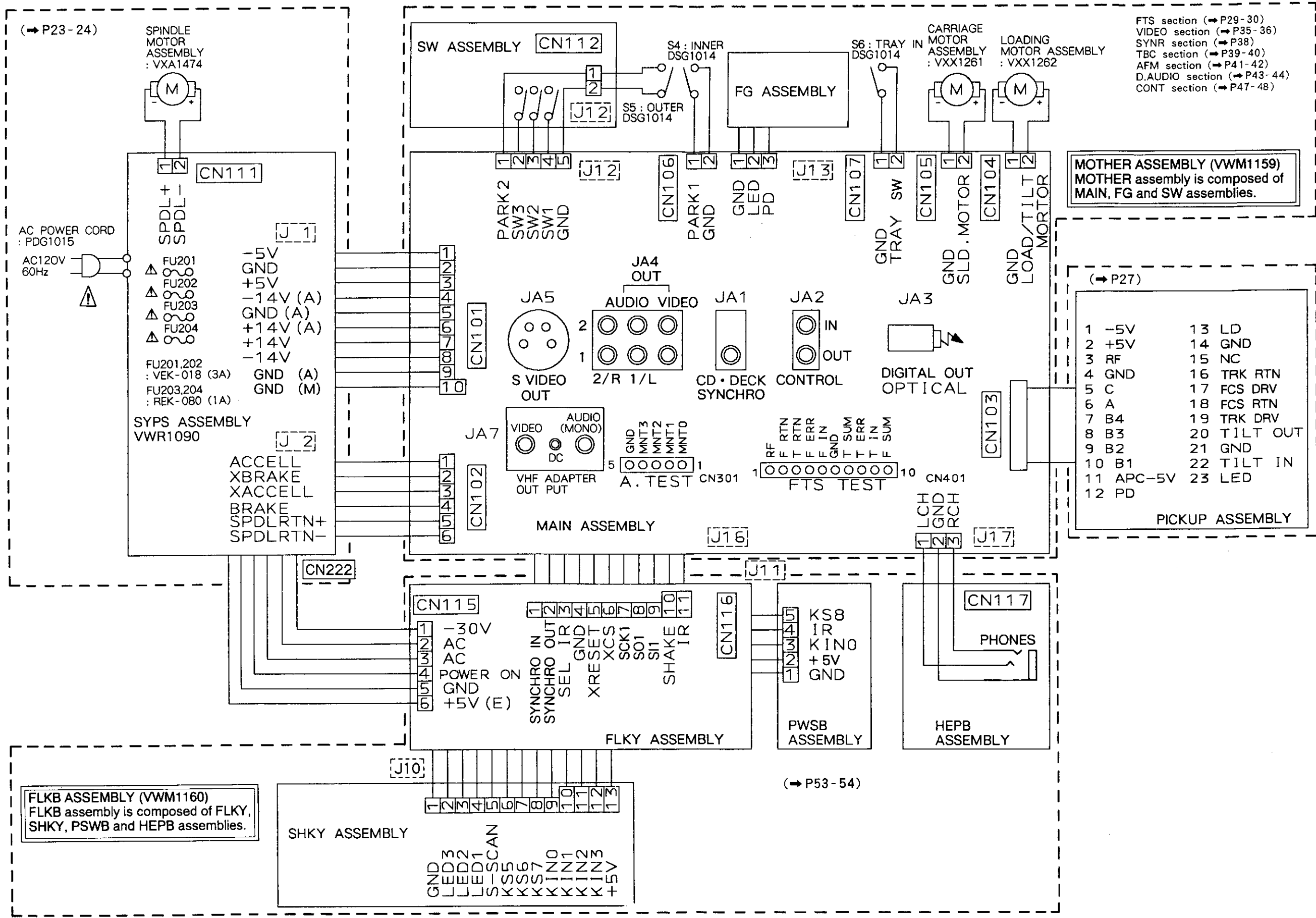
S49 : PLAY / PAUSE (  )

S51 : SCAN / LEVEL (  /  )

#### PSWB ASSEMBLY

S60 :POWER

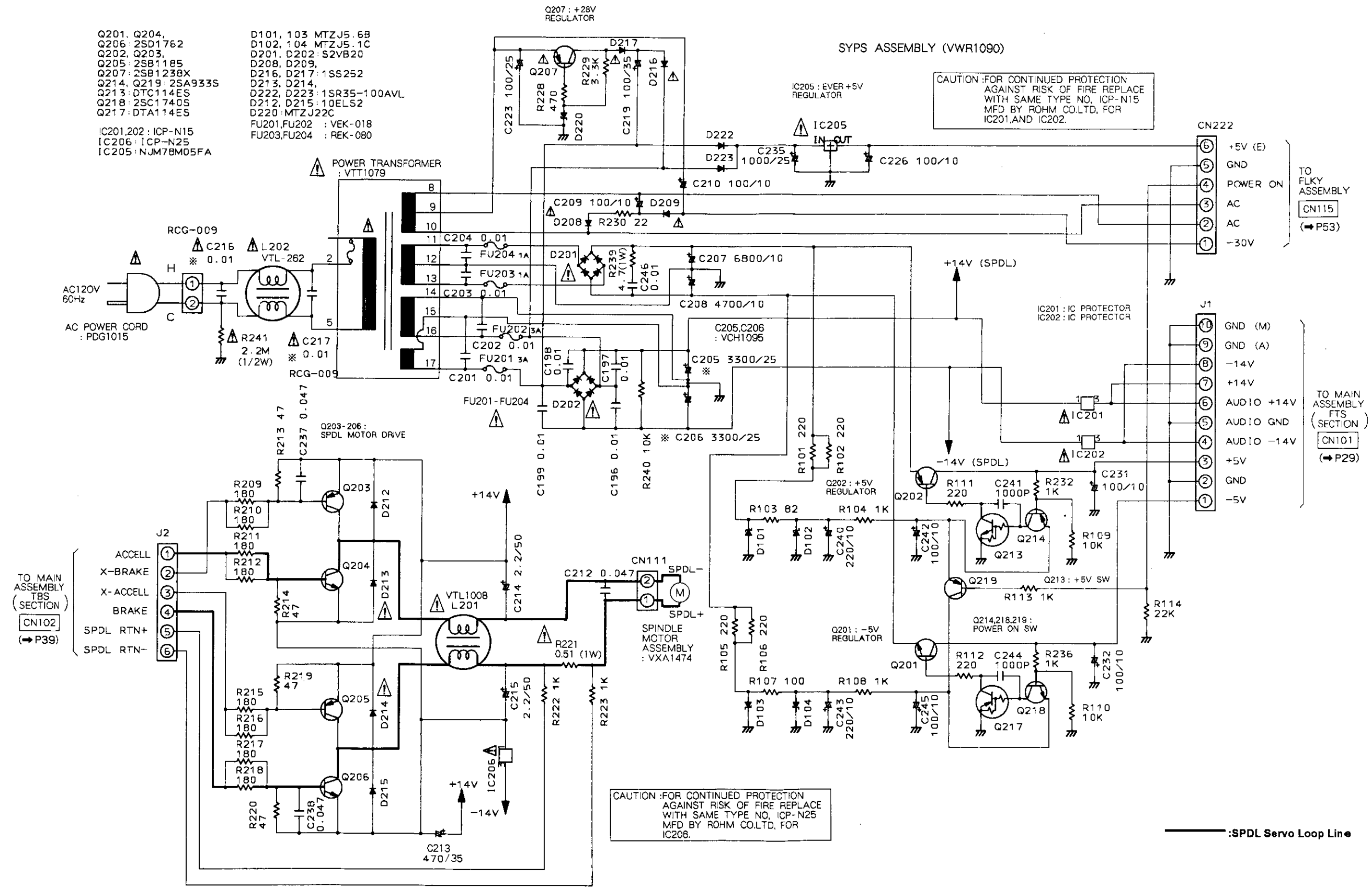
5.1 OVERALL WIRING DIAGRAM





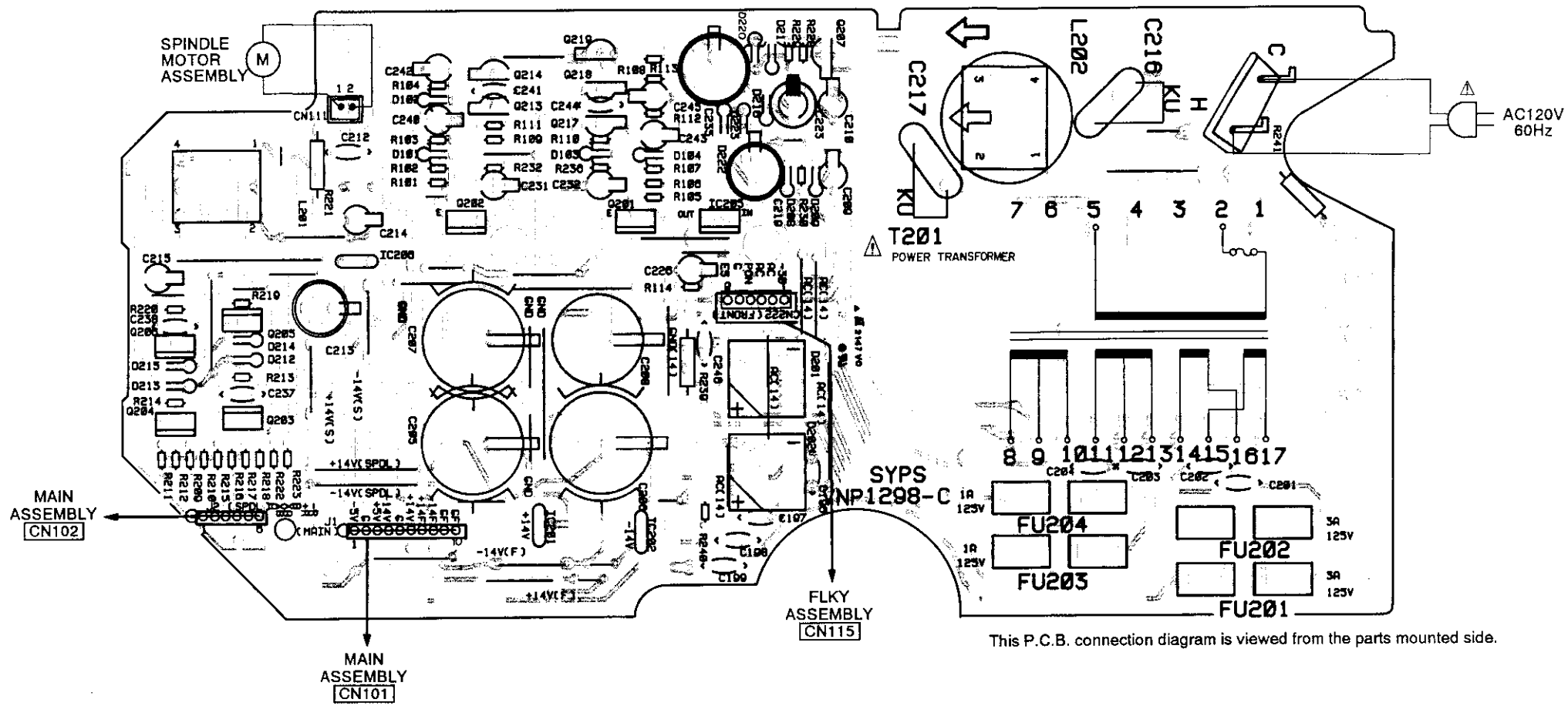
5.2 SYPS ASSEMBLY

- Q201, Q204, Q206: 2SD1762
- Q202, Q203, Q205: 2SB1185
- Q207: 2SB1238X
- Q214, Q219: 2SA933S
- Q213: DTC114ES
- Q218: 2SC1740S
- Q217: DTA114ES
- IC201,202: ICP-N15
- IC206: ICP-N25
- IC205: NJM78M05FA
- D101, 103: MTZJ5.6B
- D102, 104: MTZJ5.1C
- D201, D202: S2VB20
- D208, D209, D216, D217: 1SS252
- D213, D214, D222, D223: 1SR35-100AVL
- D212, D215: 10ELS2
- D220: MTZJ22C
- FU201, FU202: VEK-018
- FU203, FU204: REK-080



Q206 Q205 Q204 Q203 IC206 Q214 Q213 Q202 Q219 Q218 Q217 IC201 IC205 Q207

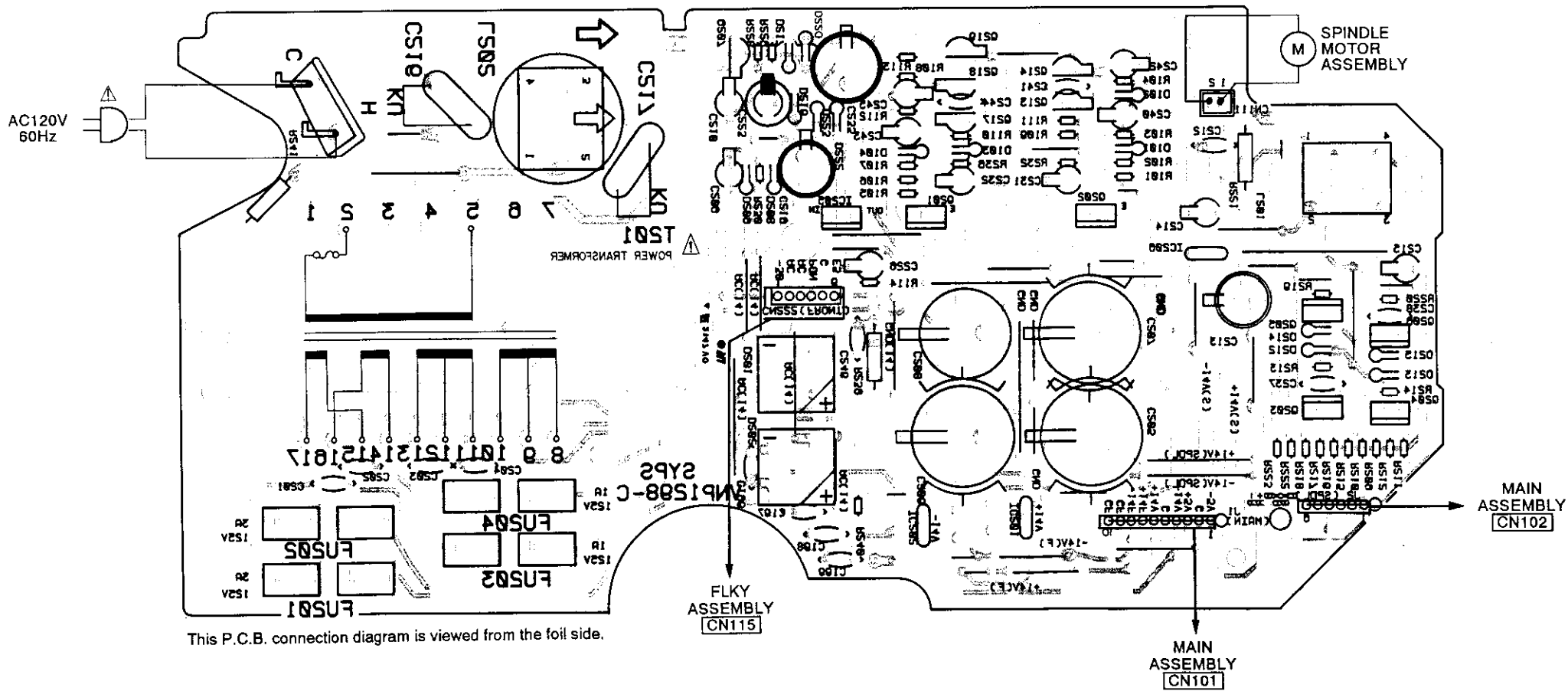
SYPS ASSEMBLY (VWR1090)



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

SYPS ASSEMBLY (VWR1090)

OS04 OS03 OS02 OS01 OS05 OS13 OS01 OS14 OS18 OS19 OS20 OS08 OS09 OS10 OS11 OS12 OS13 OS14 OS15 OS16 OS17 OS18 OS19 OS20 OS21 OS22 OS23 OS24 OS25 OS26 OS27 OS28 OS29 OS30 OS31 OS32 OS33 OS34 OS35 OS36 OS37 OS38 OS39 OS40 OS41 OS42 OS43 OS44 OS45 OS46 OS47 OS48 OS49 OS50 OS51 OS52 OS53 OS54 OS55 OS56 OS57 OS58 OS59 OS60 OS61 OS62 OS63 OS64 OS65 OS66 OS67 OS68 OS69 OS70 OS71 OS72 OS73 OS74 OS75 OS76 OS77 OS78 OS79 OS80 OS81 OS82 OS83 OS84 OS85 OS86 OS87 OS88 OS89 OS90 OS91 OS92 OS93 OS94 OS95 OS96 OS97 OS98 OS99 OS100

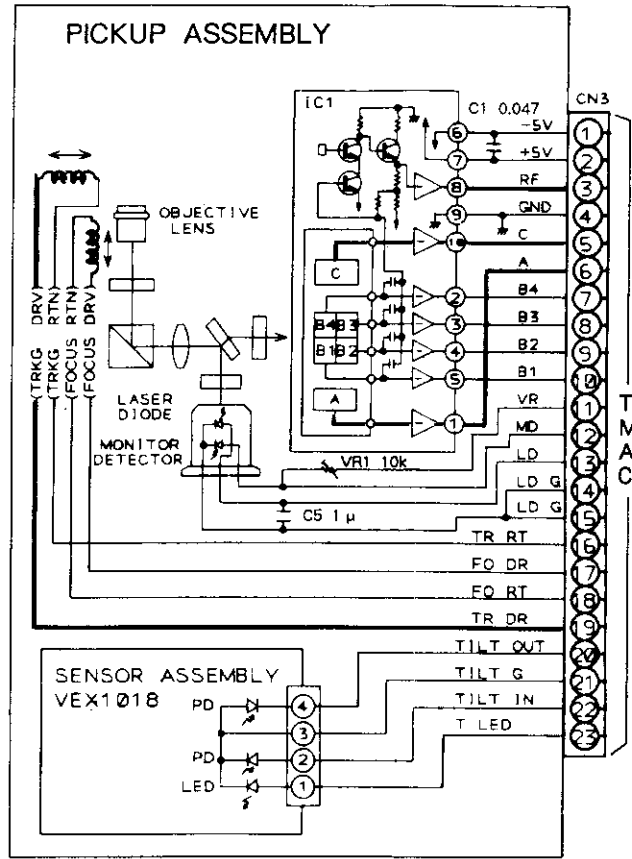


This P.C.B. connection diagram is viewed from the foil side.

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

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

5.3 PICKUP ASSEMBLY

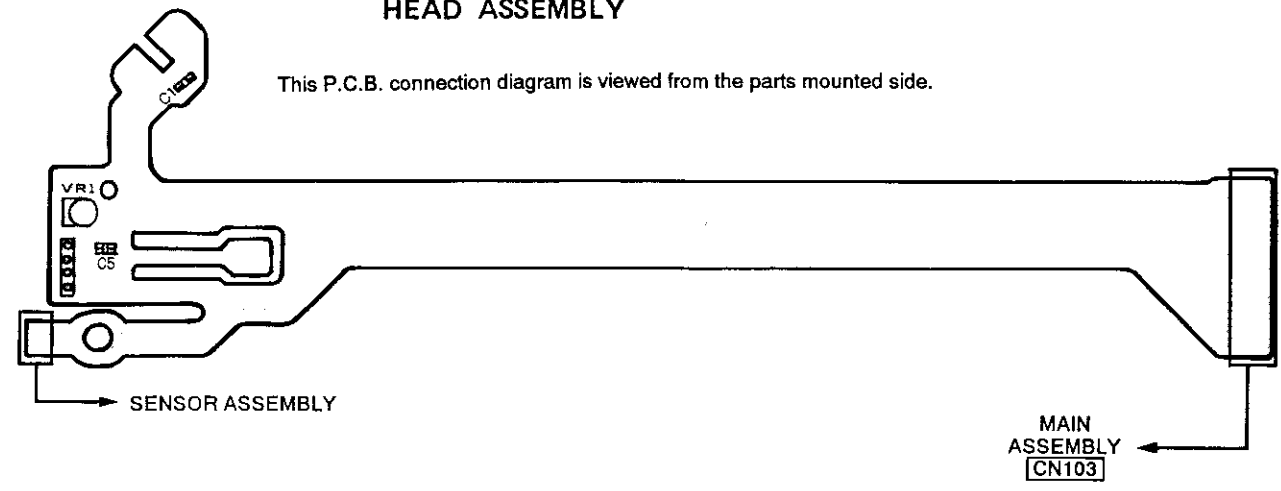


— :RF Signal Route  
 — :FOCS Servo Loop Line  
 — :TRKG Servo Loop Line

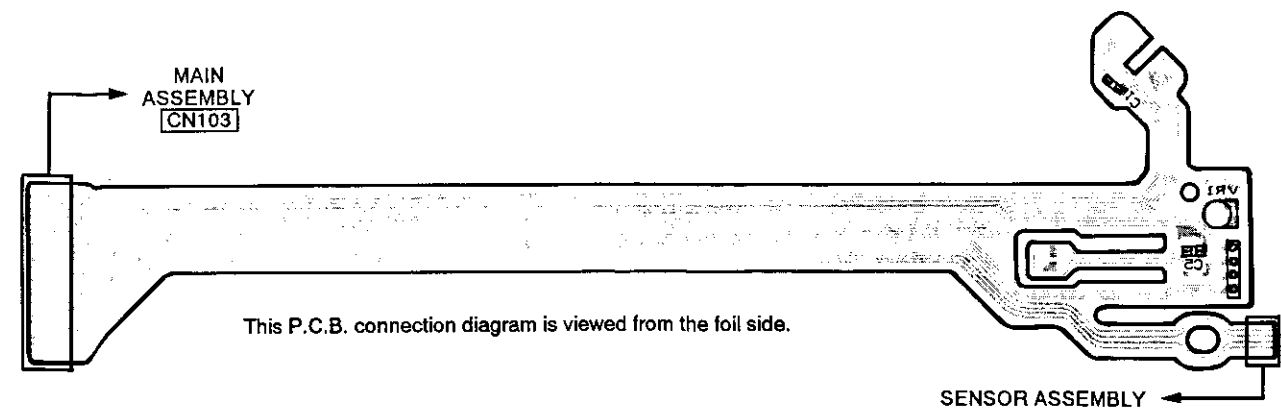
TO MAIN ASSEMBLY  
 CN103 (→P29)

HEAD ASSEMBLY

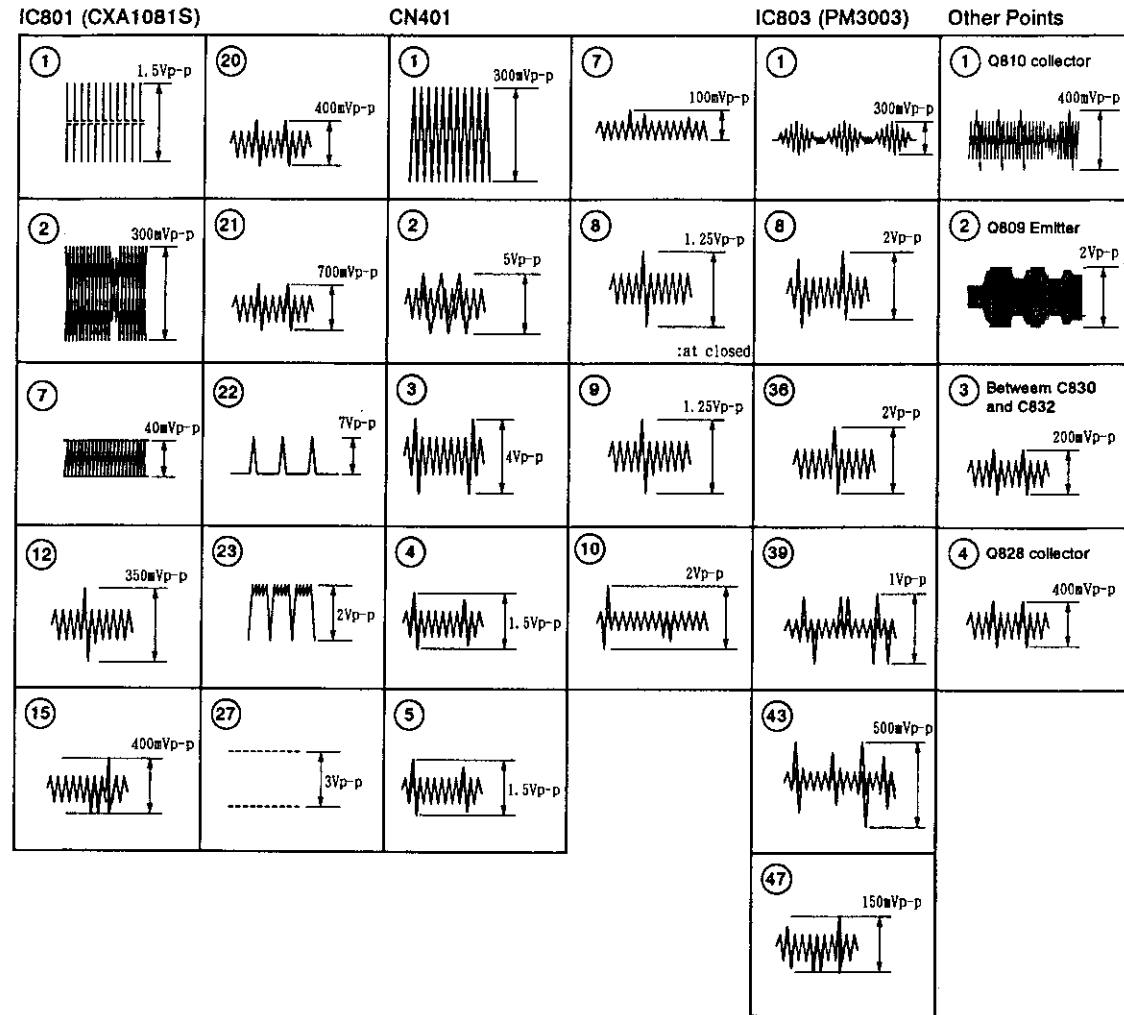
This P.C.B. connection diagram is viewed from the parts mounted side.



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

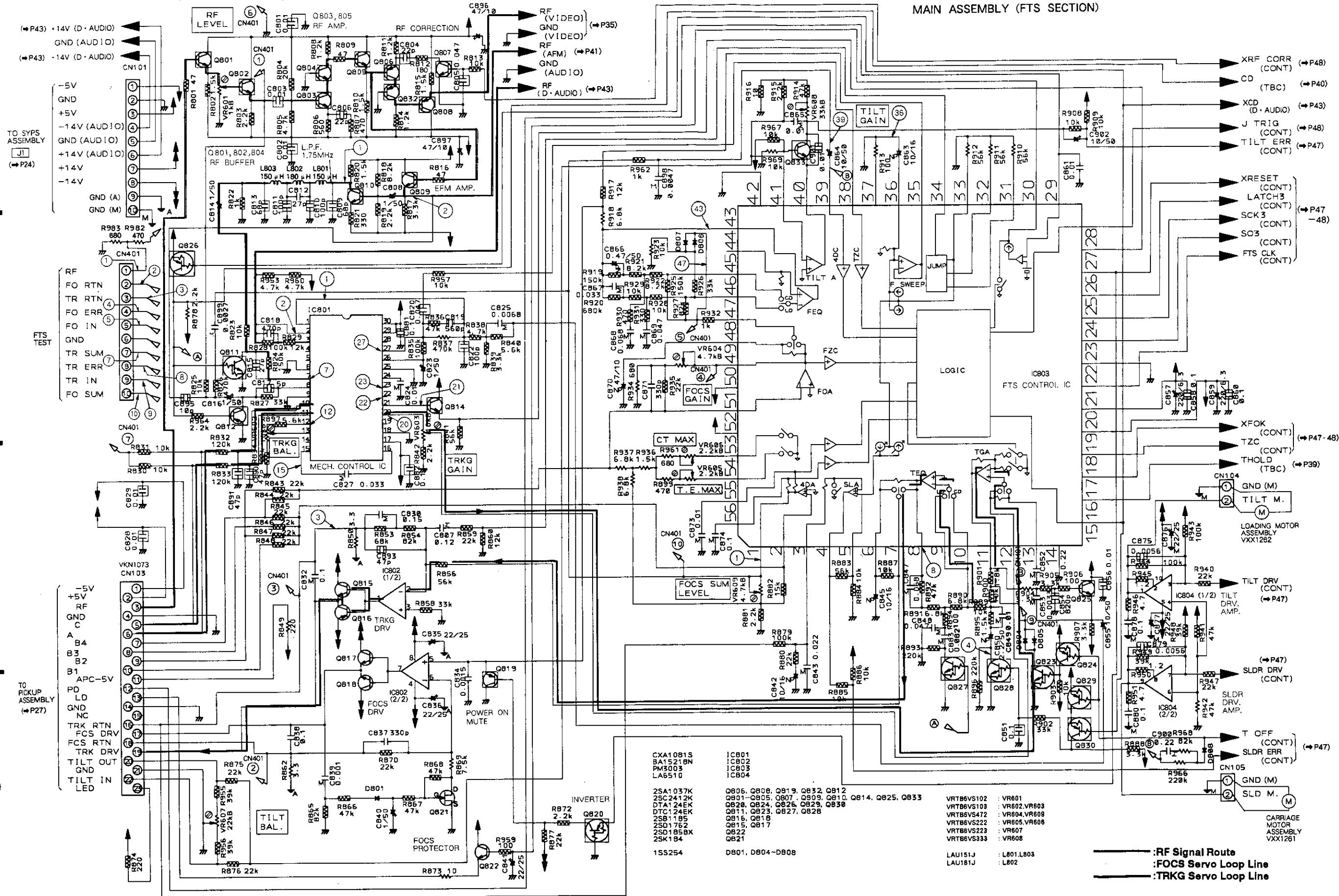


FTS SECTION



5.4 MAIN ASSEMBLY (FTS SECTION)

MAIN ASSEMBLY (FTS SECTION)

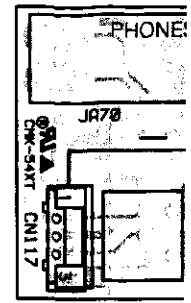


A  
TO SYPS ASSEMBLY (P24)

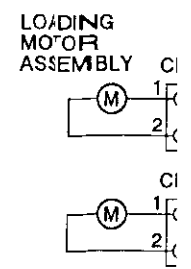
B  
FTS TEST

C  
TO PICKUP ASSEMBLY (P27)

D



HEPB ASSEMBLY



LOADING MOTOR ASSEMBLY VXX1262



CARRIAGE MOTOR ASSEMBLY VXX1261

RF Signal Route  
FOCUS Servo Loop Line  
TRKG Servo Loop Line

7

8

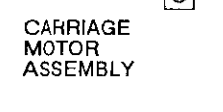
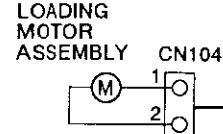
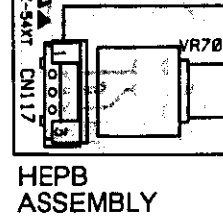
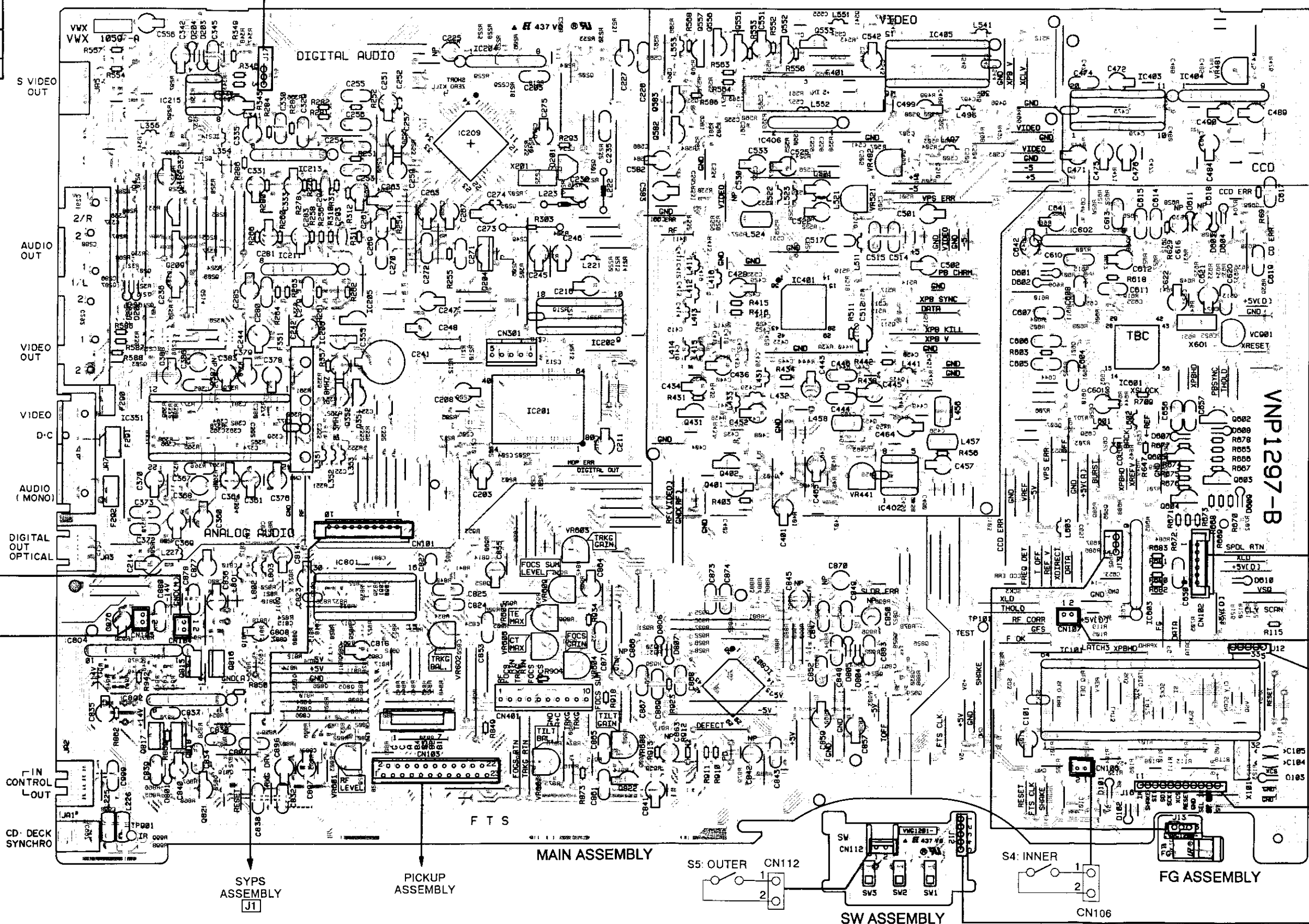
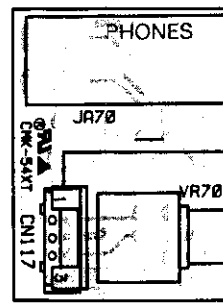
9

10

11

12

01SD T0SD E1SD 81SD E0SD S1SD IC804 Q817 Q818 Q820	IC215 Q212 TSD Q209 TSD IC802 Q815 Q816 Q820	IC213 IC206 IC205 IC211 Q352 Q351 IC801 S280 S180 - T080	IC204 IC209 Q204 A180 80SD 8580 IC201	VR605 VR603 VR606 VR609 VR607 VR604 VR608	S0SD T0SD IC202 O822	Q583 Q557 Q556 Q551 Q582 8800 Q431 Q402 Q401 IC803	Q552 Q553 IC406 IC401 8040 8580 AS80 0880-8S80	TP101	VR521 VR482 VR441	TP101	VR481 VC901
---	--	---	--	---	----------------------------	---	---	-------	----------------------	-------	----------------



7

8

9

10

11

12

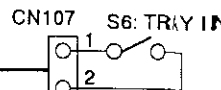
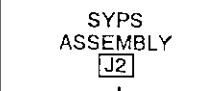
3

A

B

C

D

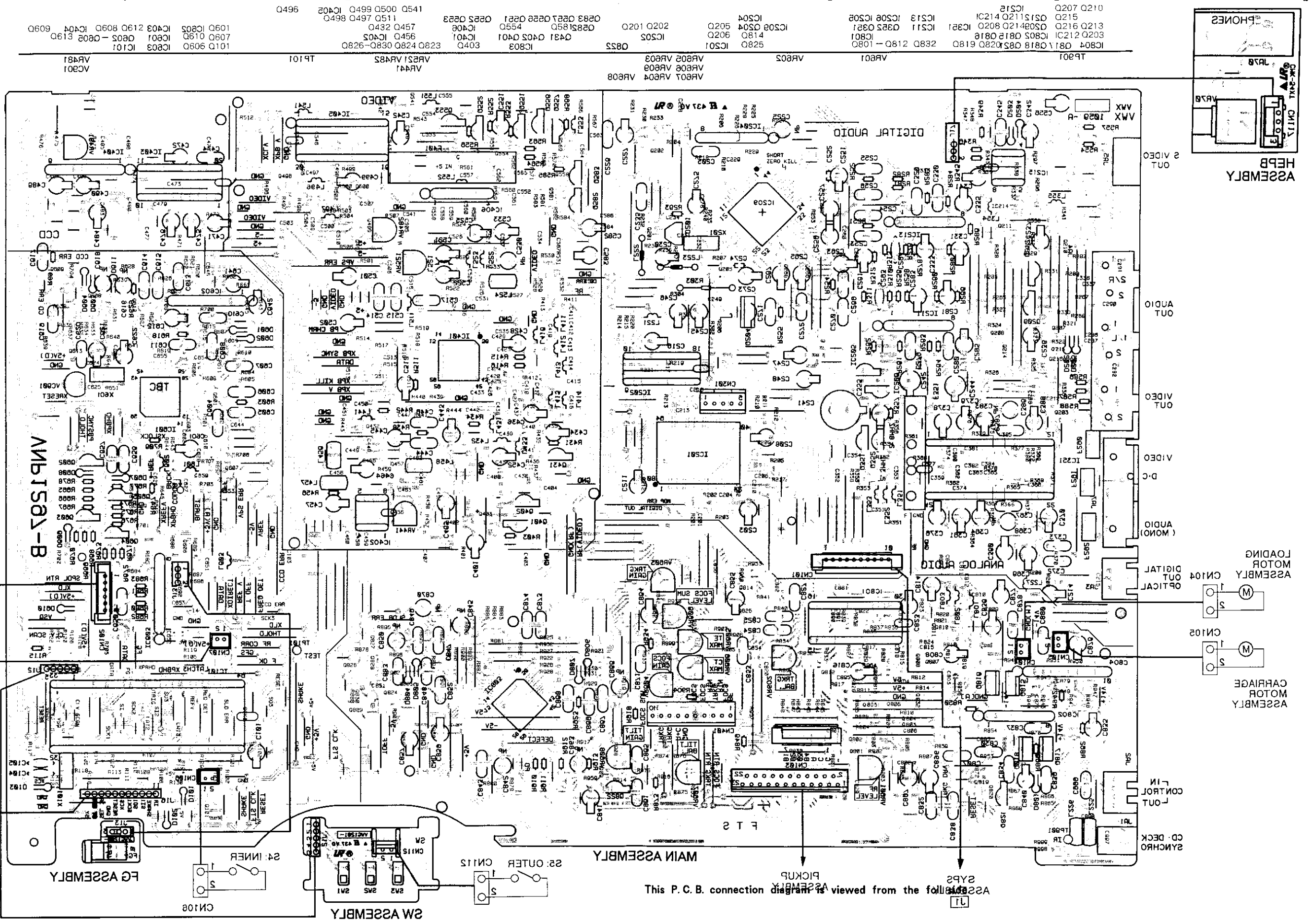


A

B

C

D



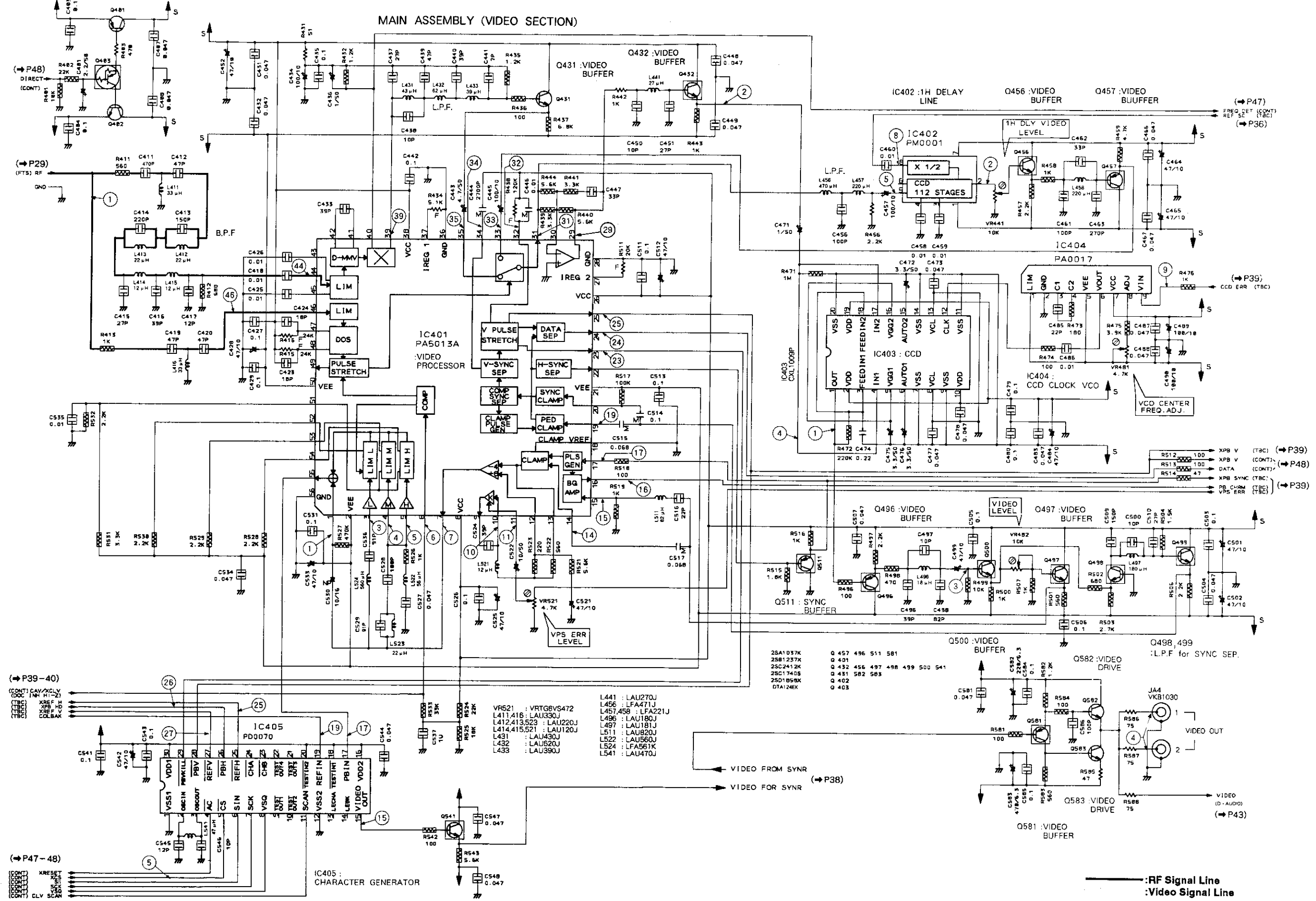
IC604 0811 0818 0820 8180	IC605 0811 0818 0820 8180	IC606 0811 0818 0820 8180	IC607 0811 0818 0820 8180	IC608 0811 0818 0820 8180	IC609 0811 0818 0820 8180
IC504 1810 9020	IC505 0504 1810 9020	IC506 0504 1810 9020	IC507 0504 1810 9020	IC508 0504 1810 9020	IC509 0504 1810 9020
IC401 0403 0401	IC402 0403 0401	IC403 0403 0401	IC404 0403 0401	IC405 0403 0401	IC406 0403 0401
IC301 0202 1020	IC302 0202 1020	IC303 0202 1020	IC304 0202 1020	IC305 0202 1020	IC306 0202 1020
IC201 0499 0500 6600	IC202 0499 0500 6600	IC203 0499 0500 6600	IC204 0499 0500 6600	IC205 0499 0500 6600	IC206 0499 0500 6600
IC101 0101 9090	IC102 0101 9090	IC103 0101 9090	IC104 0101 9090	IC105 0101 9090	IC106 0101 9090



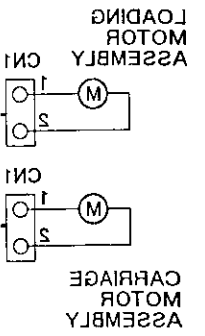
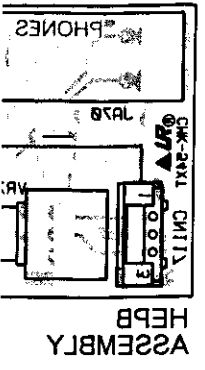
This P.C.B. connection diagram is viewed from the top

5.5 MAIN ASSEMBLY (VIDEO SECTION)

MAIN ASSEMBLY (VIDEO SECTION)



A  
B  
C  
D



(P39-40)

(P47-48)

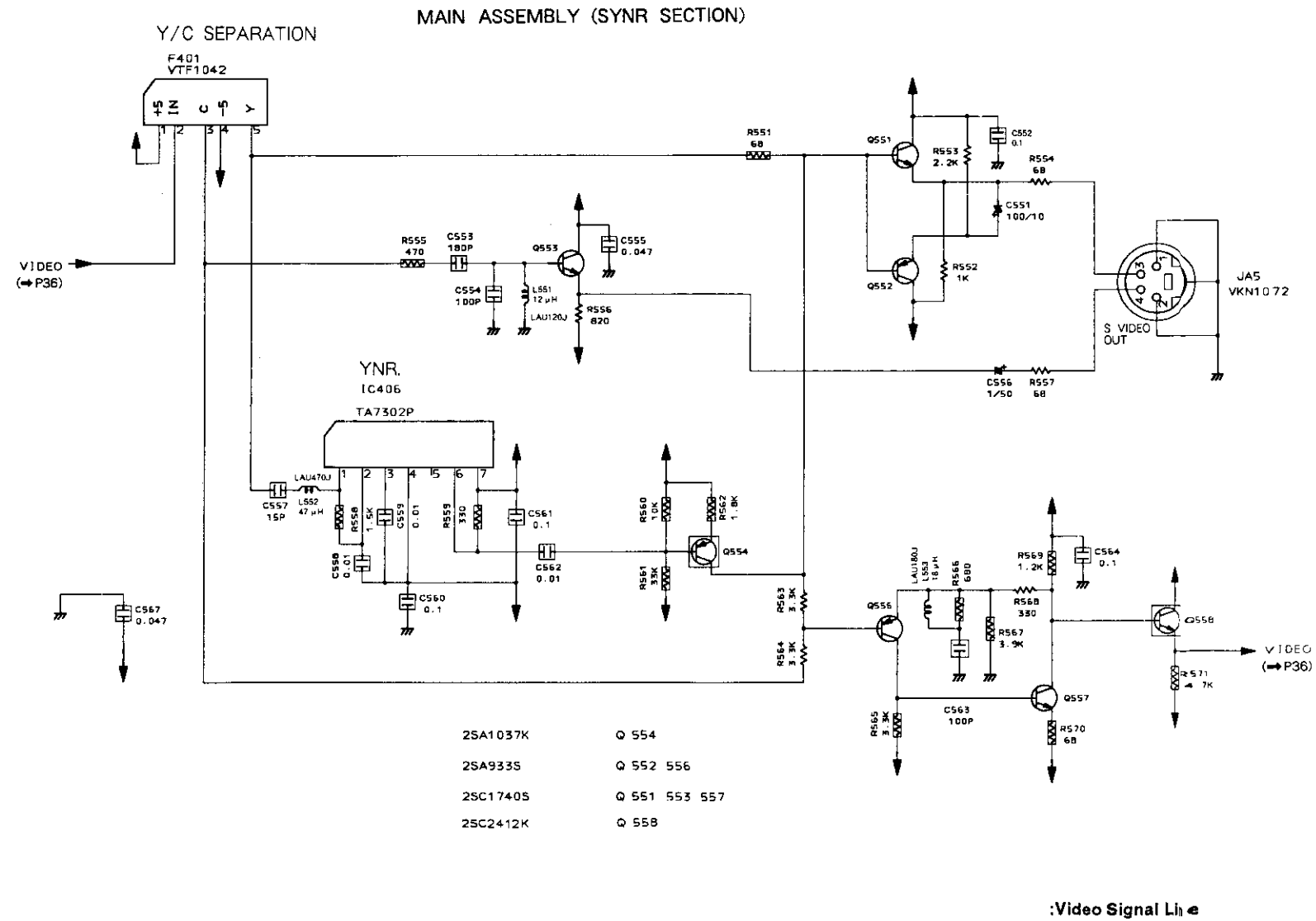
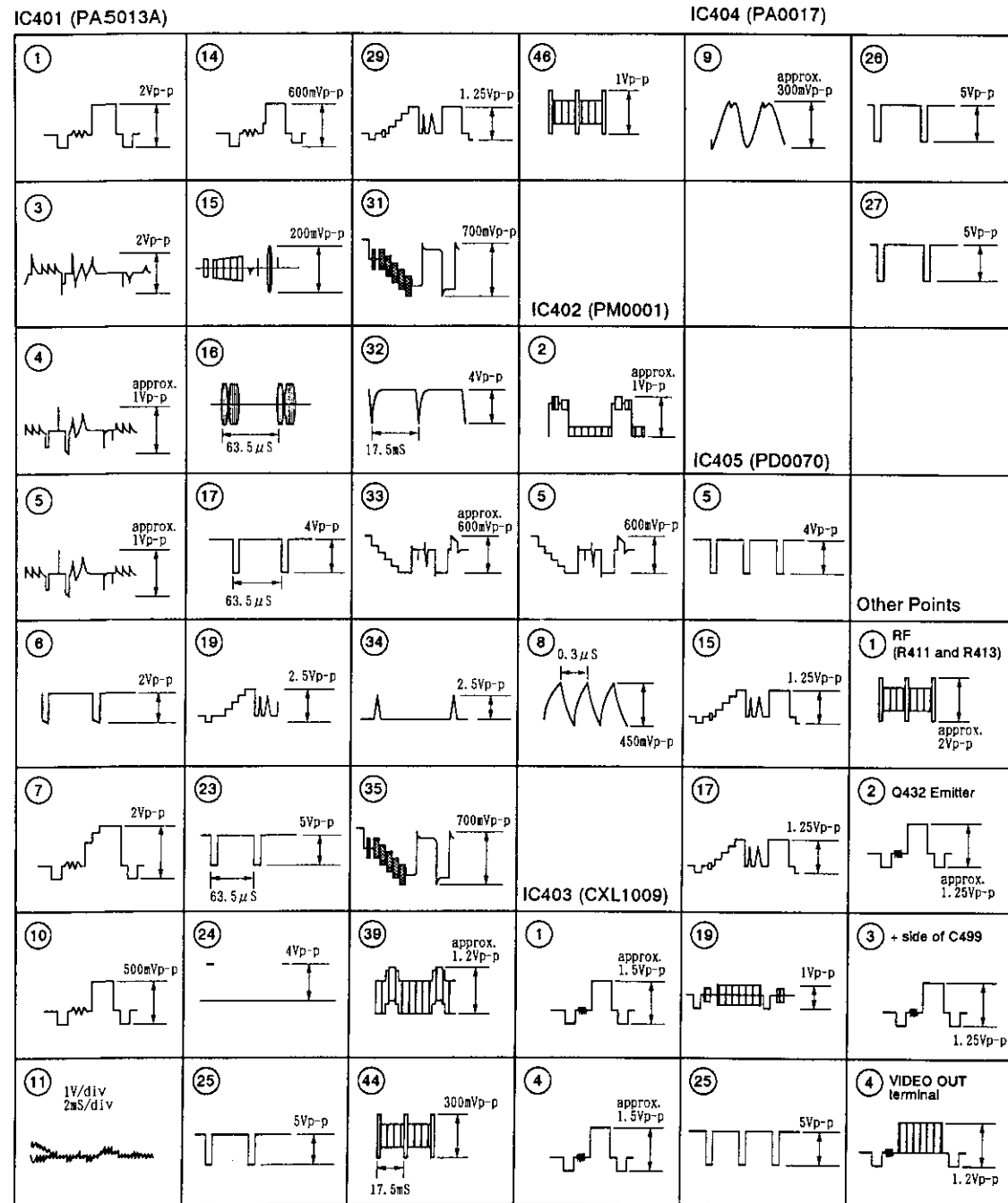
- 25A1037K
- 25B1237K
- 25C2412K
- 25C1740S
- 25D1859K
- DTA124K

- VR521 : VRTG8VS472
- L411,416 : LAU330J
- L412,413,523 : LAU220J
- L414,415,521 : LAU120J
- L431 : LAU430J
- L432 : LAU620J
- L433 : LAU390J
- L441 : LAU270J
- L456 : LFA471J
- L457,458 : LFA221J
- L496 : LAU180J
- L497 : LAU181J
- L511 : LAU820J
- L522 : LAU560J
- L524 : LFA561K
- L541 : LAU470J

:RF Signal Line  
:Video Signal Line

5.6 MAIN ASSEMBLY (SYNR SECTION)

WAVEFORMS OF THE VIDEO SECTION



:Video Signal Line

A

B

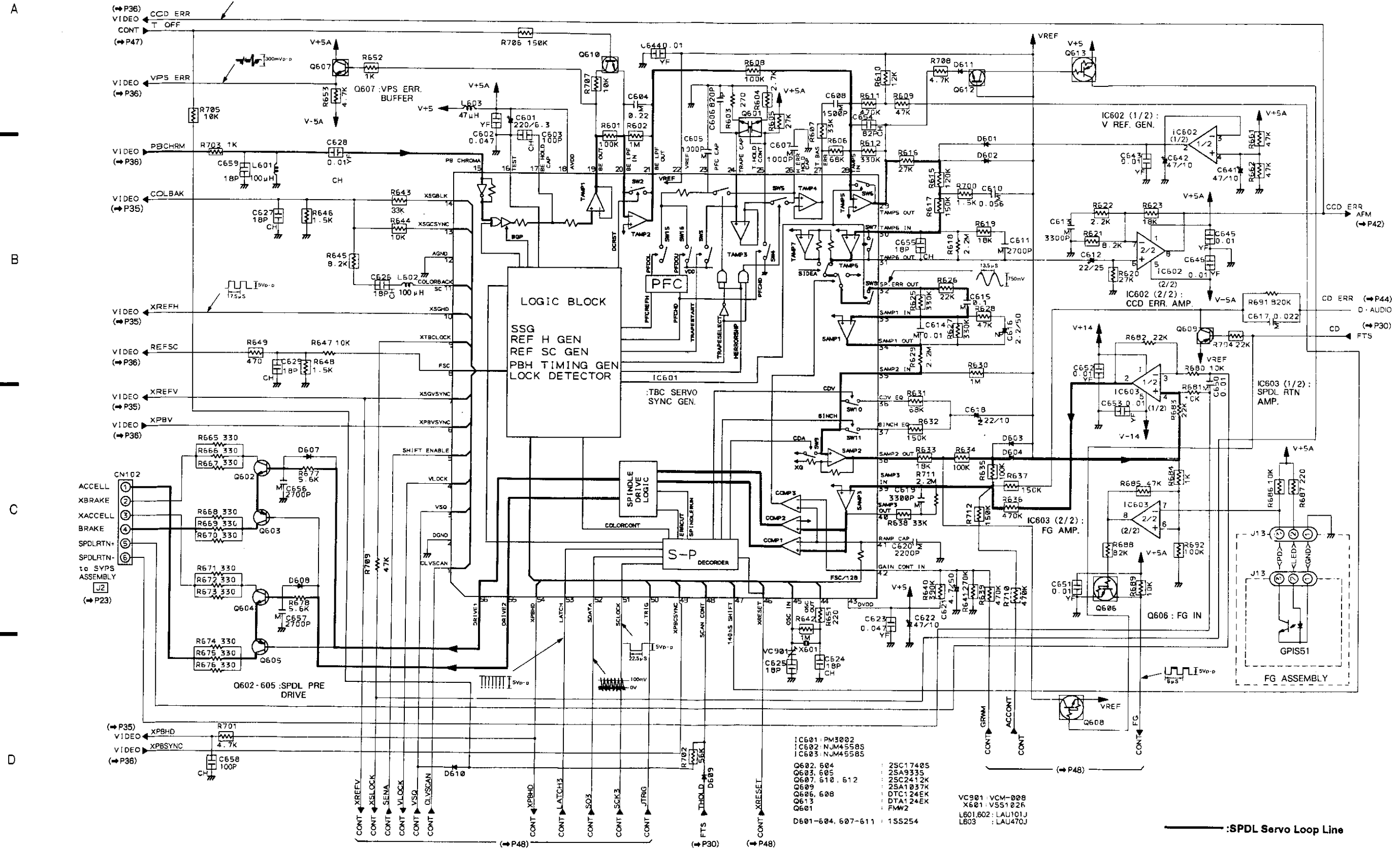
C

D



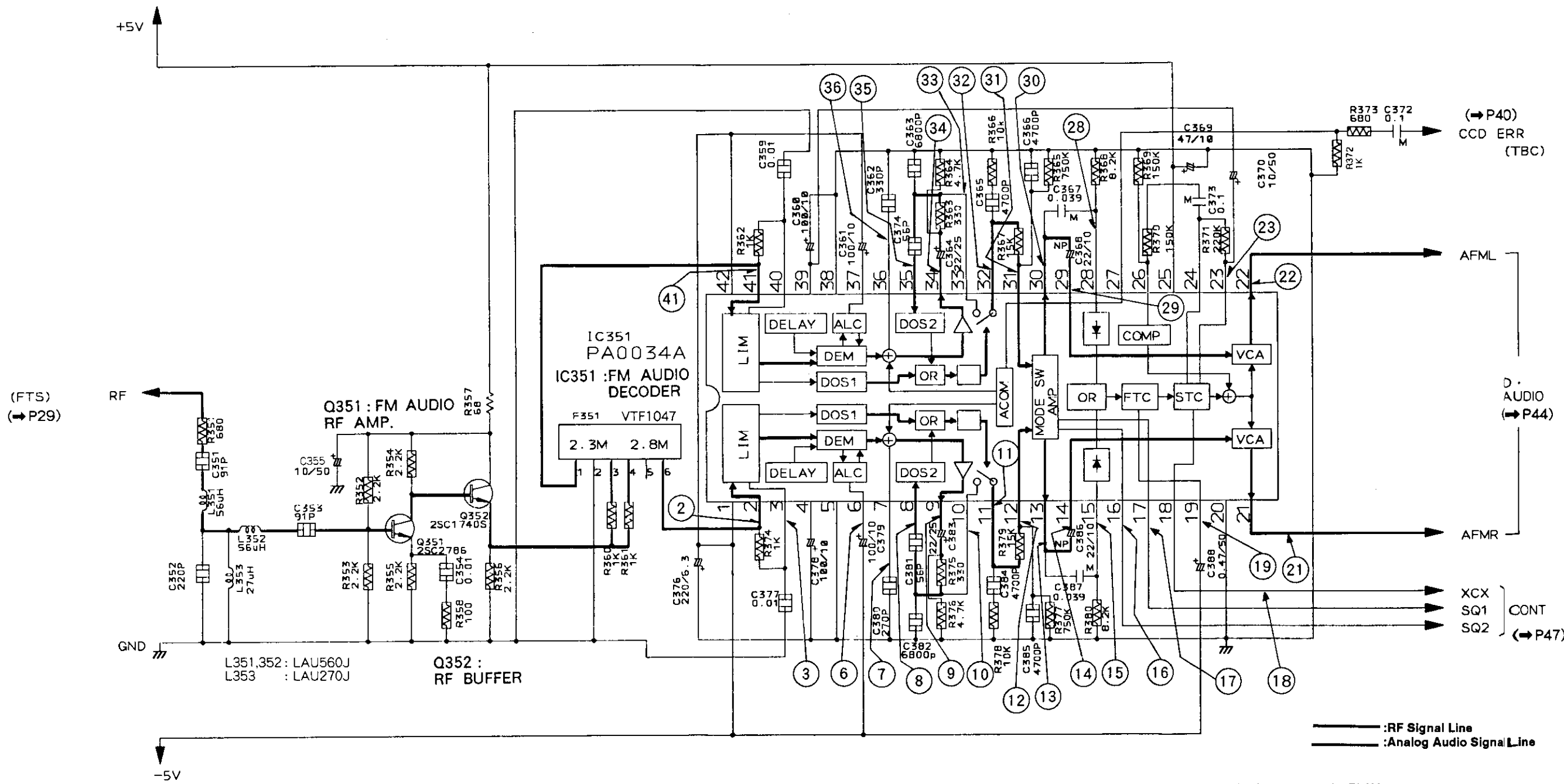
5.7 MAIN ASSEMBLY (TBC SECTION)

MAIN ASSEMBLY (TBC SECTION)

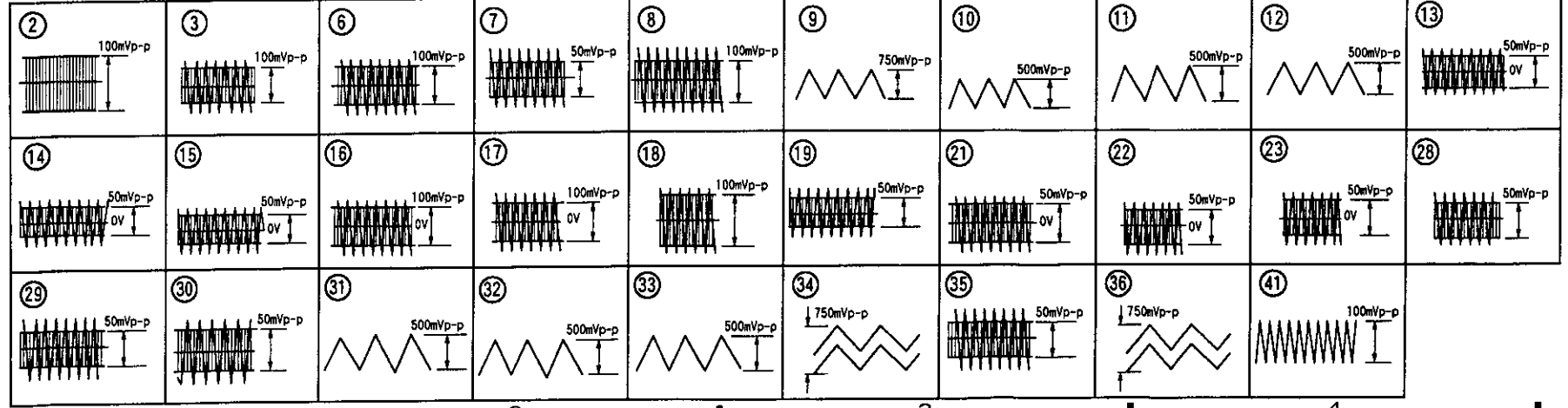


5.8 MAIN ASSEMBLY (AFM SECTION)

MAIN ASSEMBLY (AFM SECTION)



• IC351 (PA0034A)



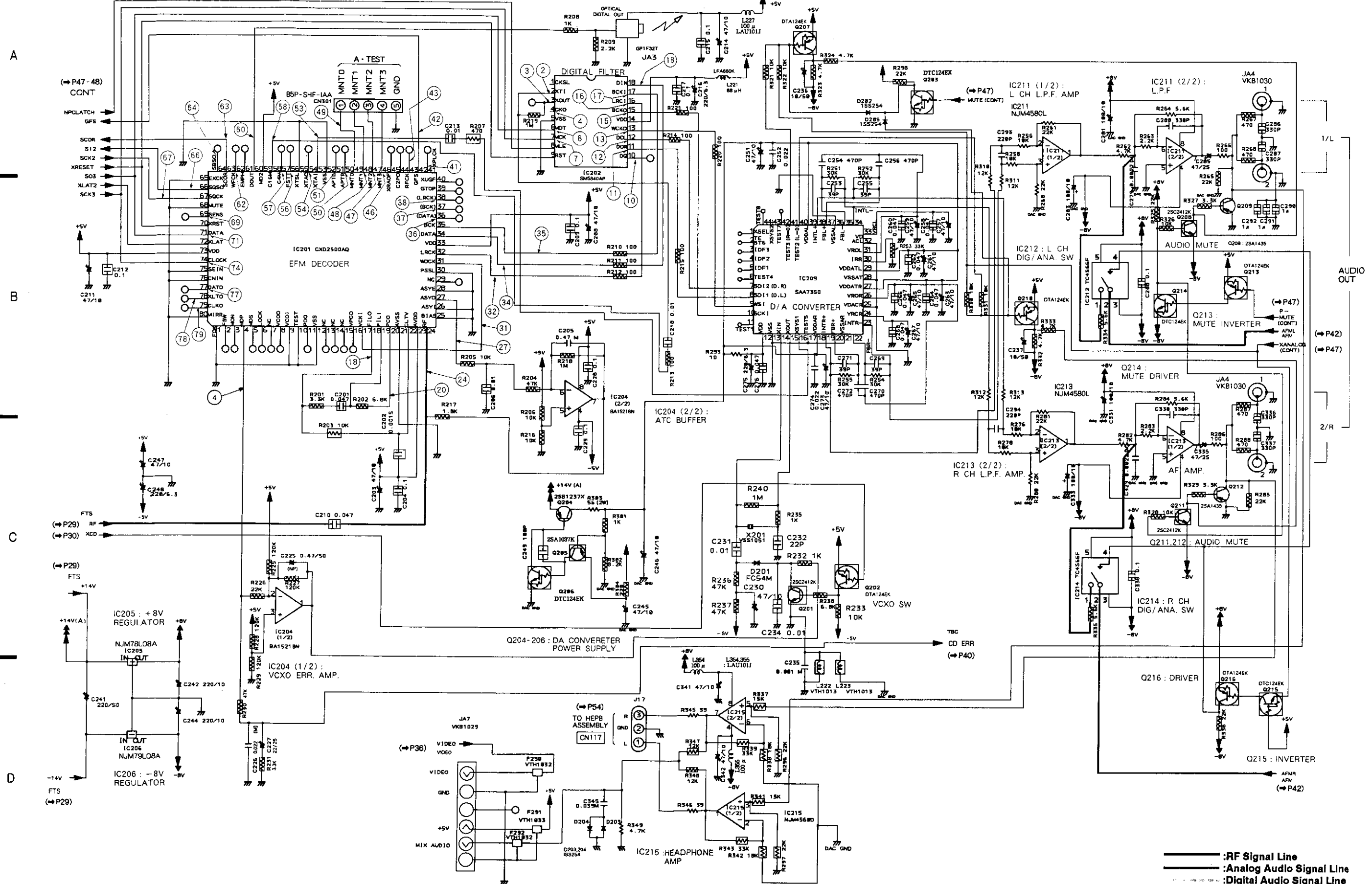
Note: Waveforms and voltages are at the PLAY state.

Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage
1	-5V	15	*	29	*
2	*	16	*	30	*
3	*	17	*	31	*
4	*	18	*	32	*
5	*	19	*	33	*
6	*	20	0	34	*
7	*	21	*	35	*
8	*	22	*	36	*
9	*	23	*	37	*
10	*	24	0	38	*
11	*	25	5V	39	*
12	*	26	0	40	*
13	*	27	0	41	*
14	*	28	*	42	-5V

\*: Refer to Waveforms

5.9 MAIN ASSEMBLY (D. AUDIO SECTION)

MAIN ASSEMBLY (D. AUDIO SECTION)



— RF Signal Line  
 — Analog Audio Signal Line  
 — Digital Audio Signal Line

Note: Waveforms and voltages are at the PLAY  
IC201 (CXD2500AQ)

Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage
1	0	15	0	29	0	43	*	57	*	71	*
2	0	16	4.8	30	0	44	0	58	*	72	5
3	0	17	0	31	*	45	4.8	59	5	73	5
4	*	18	*	32	*	46	*	60	*	74	*
5	0	19	2.4	33	4.8	47	*	61	5	75	0
6	4.8	20	*	34	*	48	*	62	*	76	0
7	0	21	0	35	*	49	*	63	*	77	*
8	4.8	22	2.3	36	*	50	*	64	*	78	*
9	0	23	4.8	37	*	51	*	65	0	79	*
10	0	24	*	38	*	52	0	66	*	80	0
11	0	25	0	39	0	53	*	67	*		
12	0	26	0	40	4.8	54	*	68	0		
13	0	27	*	41	*	55	0	69	*		
14	0	28	0	42	*	56	*	70	5		

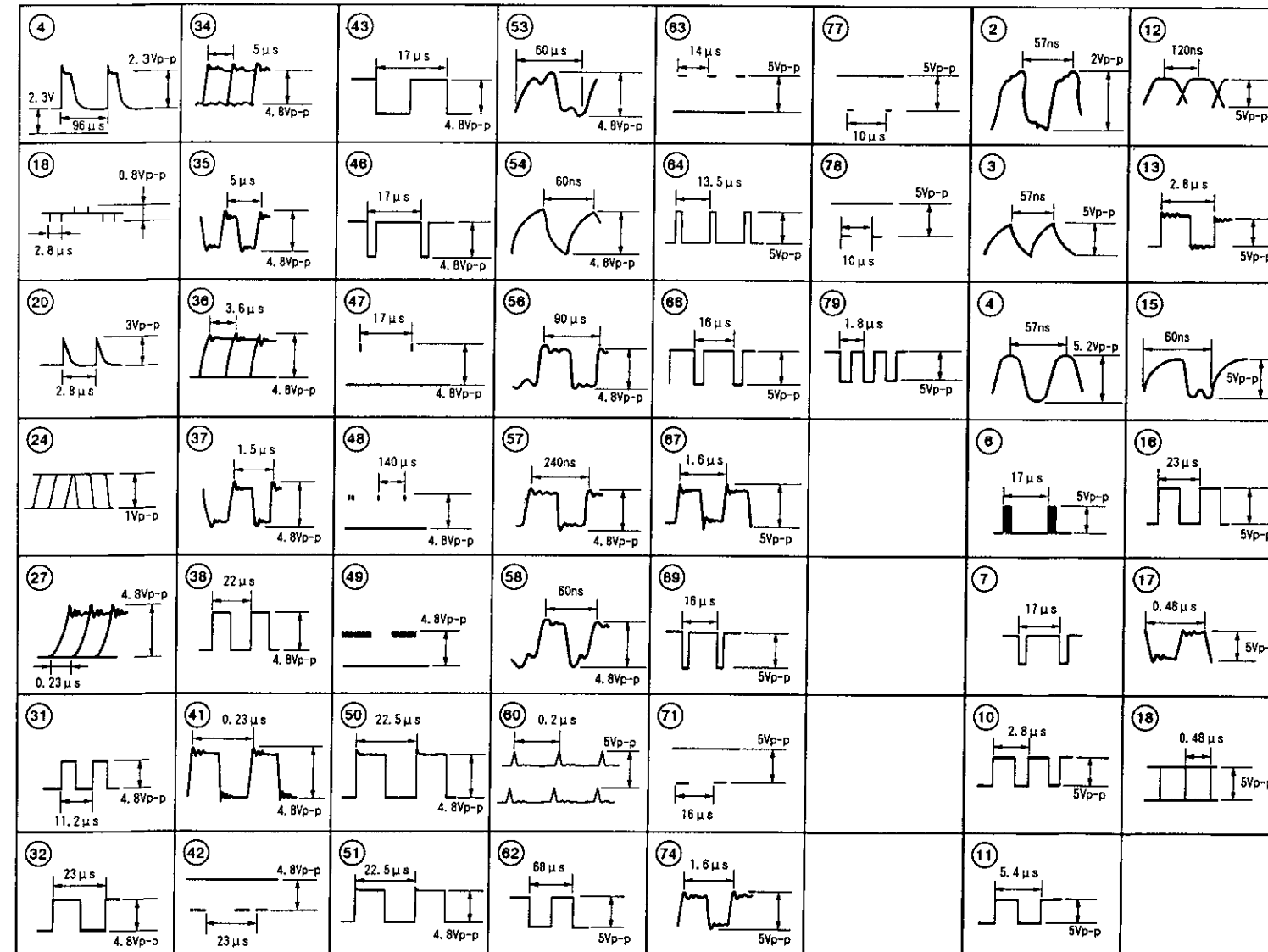
\*: Refer to Waveforms

IC202 (SM5840AP)

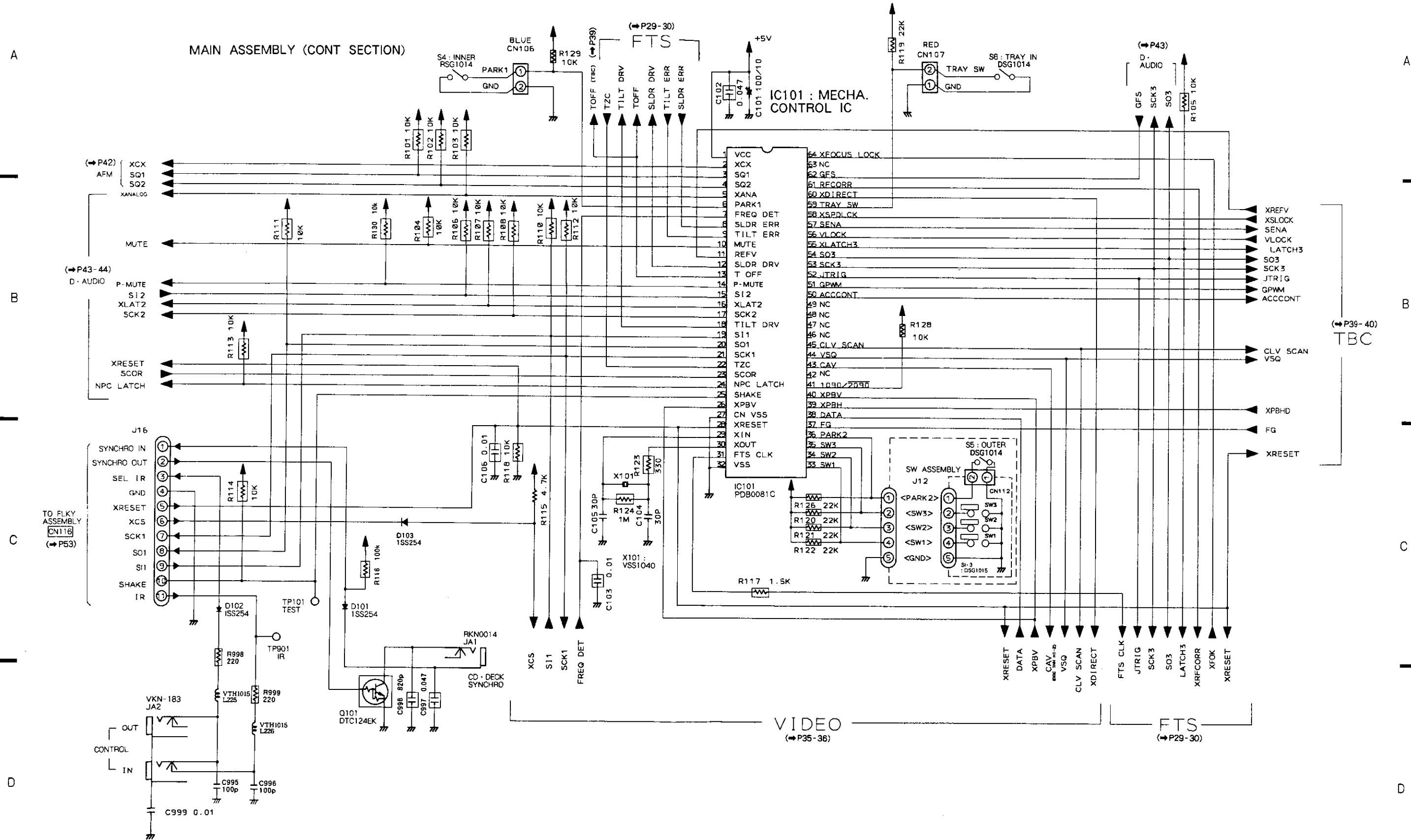
Pin No.	Voltage	Pin No.	Voltage
1	5	10	*
2	*	11	*
3	*	12	*
4	*	13	*
5	0	14	5
6	*	15	*
7	*	16	*
8	5	17	*
9	5	18	*

IC201 (CXD2500AQ)

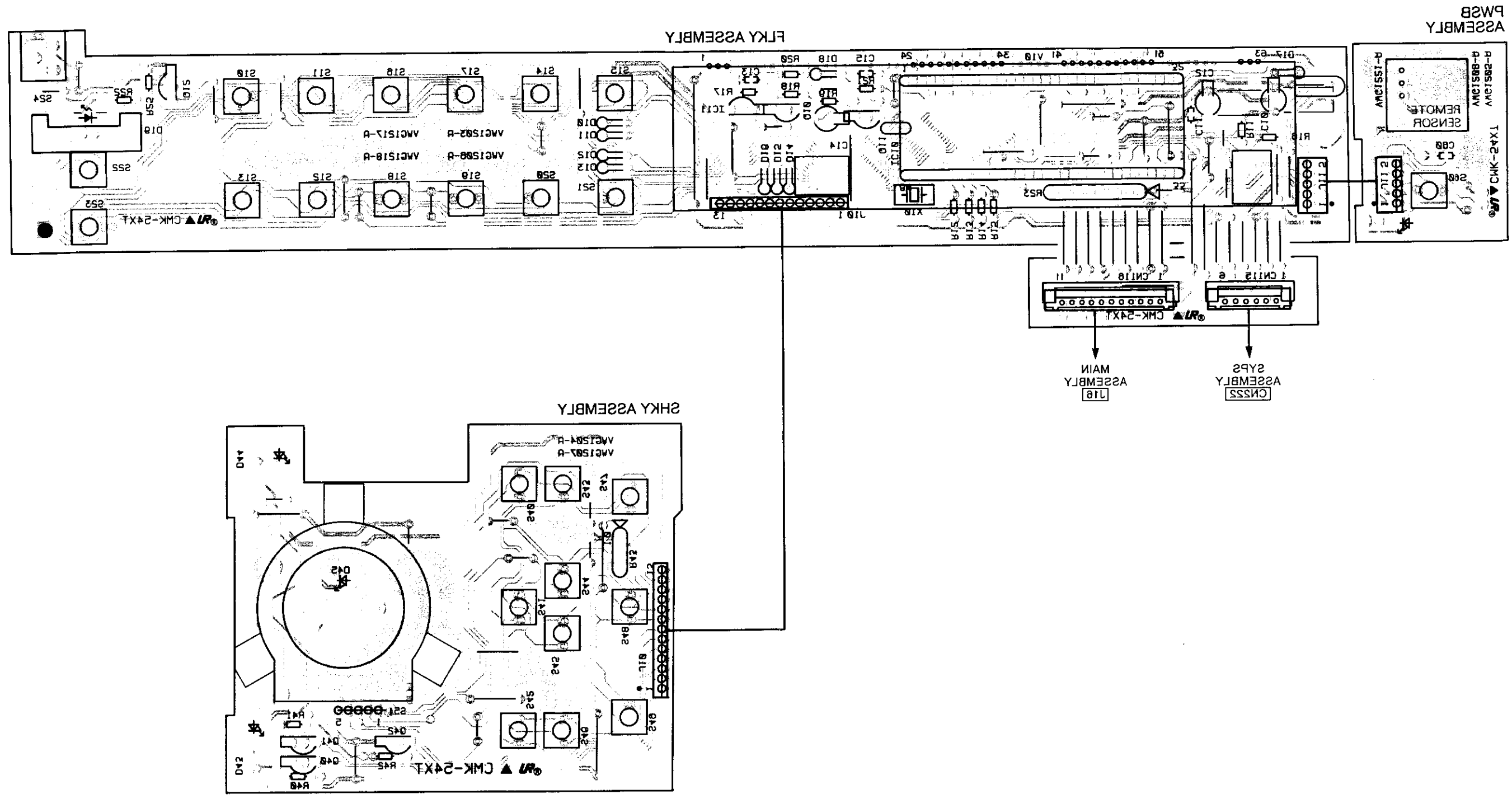
IC202 (SM5840AP)



5.10 MAIN ASSEMBLY (CONT SECTION)



2.11 FLKY, PW2B AND SHKY ASSEMBLIES



ASSEMBLY  
[CNSS]  
2P2

ASSEMBLY  
[J18]  
MAIN

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

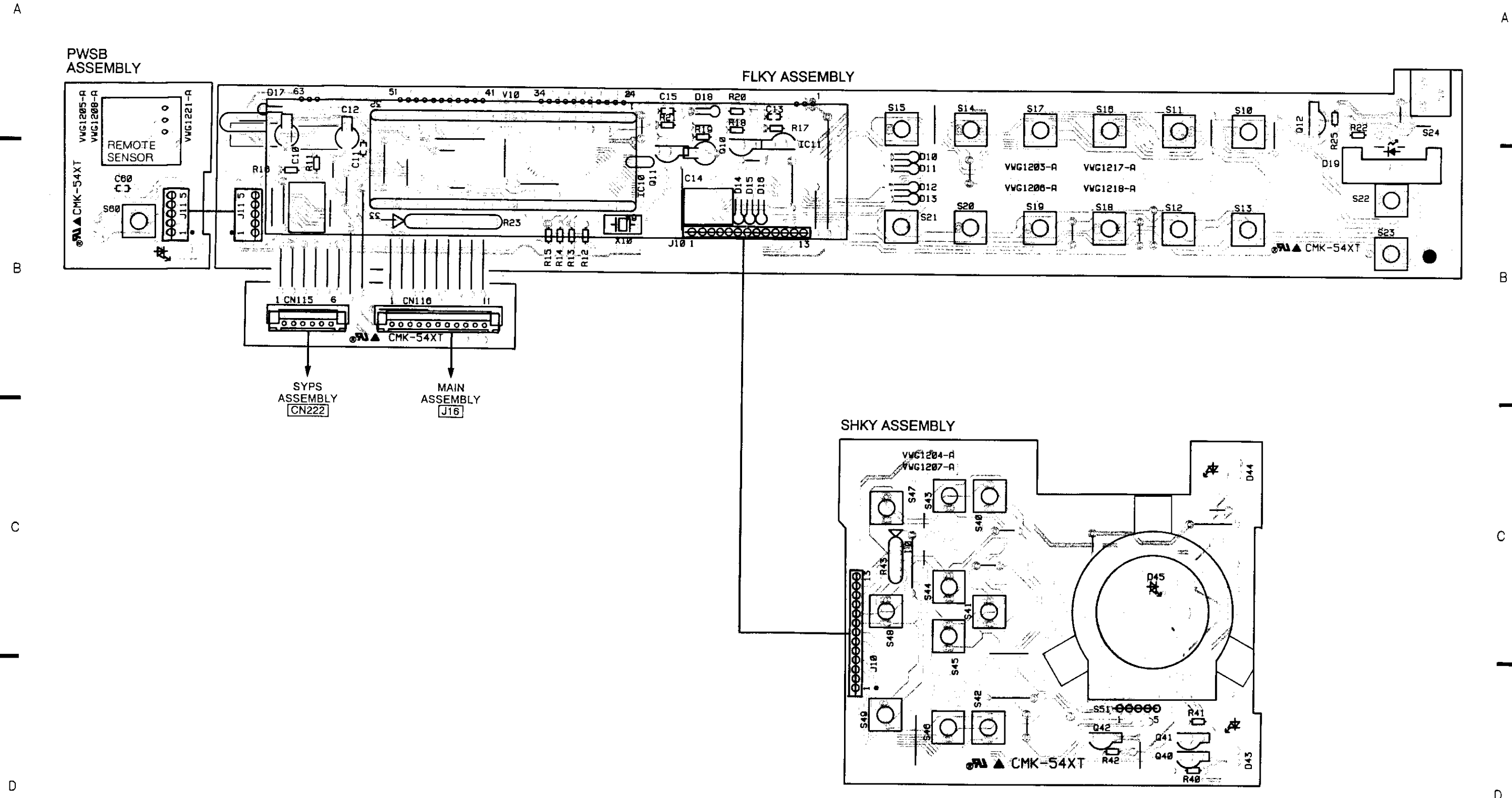
A

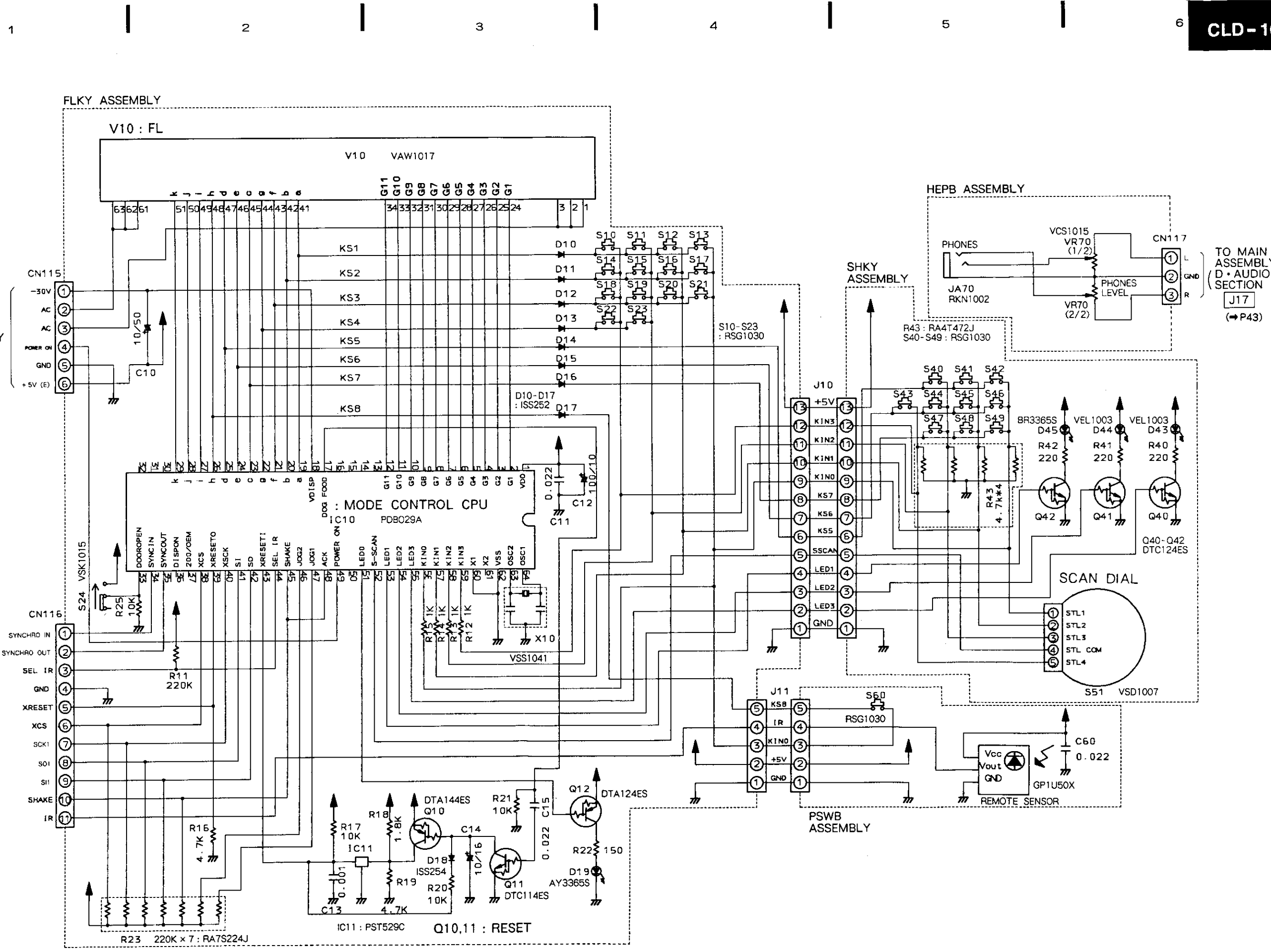
B

C

D

5.11 FLKY, PWSB AND SHKY ASSEMBLIES





TO SYPS ASSEMBLY  
CN222  
(→P24)

TO MAIN ASSEMBLY CONT (SECTION)  
J16  
(→P47)

TO MAIN ASSEMBLY D·AUDIO SECTION  
J17  
(→P43)

A

B

C

D



## 6. ELECTRICAL 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%).

560 Ω → 56 × 10<sup>1</sup> → 561 ..... RD1/4PS 561J

47k Ω → 47 × 10<sup>4</sup> → 473 ..... RD1/4PS 473J

0.5 Ω → 0RS ..... RN2H 0R5K

1 Ω → 010 ..... RSIP 010K

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

5.62k Ω → 562 × 10<sup>1</sup> → 5621 ..... RN1/4SR 5621F

### Miscellaneous Parts

Mark	Symbol & Description	Part No.
⊙	MOTHER assembly	VWM1159
	├ MAIN assembly	
	├ FG assembly	
	└ SW assembly	
⊙	SYPS assembly	VWR1090
⊙	FLKB assembly	VWM1160
	├ FLKY assembly	
	├ SHKY assembly	
	├ PSWB assembly	
	└ HEPB assembly	
Δ	FU201,202 Fuse (3A)	VEK-018
Δ	FU203,204 Fuse (1A)	REK-080
Δ	Power transformer	VTT1079
Δ	Strain relief	CM-22C
Δ	AC power cord	PDG1015
	S4,S5 Push switch (INNER, OUTER)	DSG1014
	S6 Push switch (TRAY IN)	DSG1014
	Carriage motor assembly	VXX1261
	Loading motor assembly	VXX1262
	Spindle motor assembly	VXA1474
	Pre-pickup assembly	VXX1413
	Servo mechanism base assembly-S	VXX1583

### ⊙ MOTHER Assembly(VWM1159)

MOTHER assembly is composed of the MAIN, FG and SW assemblies.

### MAIN Assembly

#### SEMICONDUCTORS

Mark	Symbol & Description	Part No.
	IC204,IC802	BA15218N
	IC801	CXA1081S
	IC201	CXD2500AQ
	IC403	CXL1009P
	IC804	LA6510
	IC802,IC603	NJM4558S
	IC215	NJM4560D
	IC211,IC213	NJM4580L
	IC205	NJM78L08A
	IC208	NJM78M05FA
	IC206	NJM79L08A
	IC404	PA0017
	IC351	PA0034A
	IC401	PA5013A
	IC405	PD0070
	IC101	PD0081C
	IC402	PM0001
	IC601	PM3002
	IC803	PM3003
	IC209	SAA7350
	IC202	SM5840AP
	IC406	TA7302P
	IC212,IC214	TC4S66F-TR
	Q202,Q207,Q210,Q213,Q216,Q403, Q813,Q820,Q824,Q826,Q829,Q830	DTA124EK
	Q101,Q203,Q206,Q214,Q215,Q606, Q608,Q811,Q823,Q827,Q828	DTC124EK
	Q601	FMW2-TR
	Q205,Q457,Q496,Q511,Q554,Q581, Q609,Q806,Q808,Q812,Q819,Q832	2SA1037K

Mark	Symbol & Description	Part No.
	Q209,Q212	2SA1435
	Q552,Q556,Q603,Q605	2SA933S
	Q816,Q818	2SB1185
	Q204,Q401	2SB1237X
	Q352,Q431,Q551,Q553,Q557, Q582,Q583,Q602,Q604	2SC1740S
	Q201,Q208,Q211,Q432,Q456, Q497-Q500,Q541,Q558,Q607, Q610,Q612,Q801-Q805,Q807, Q809,Q810,Q814,Q825,Q833 Q351	2SC2412K  2SC2786
	Q815,Q817	2SD1762
	Q402,Q822	2SD1858X
	Q821	2SK184
	D201	FC54M
	D101-D103,D202-D205, D601-D604,D607-D611,D801, D804-D808	1SS254

### COILS AND FILTERS

Mark	Symbol & Description	Part No.
	L227,L354,L355,L601,L602 L414,L415,L521,L551 L801,L803 L496,L553 L497,L802	LAU101J LAU120J LAU151J LAU180J LAU181J
	L412,L413,L523 L353,L441 L411,L416 L433 L431	LAU220J LAU270J LAU330J LAU390J LAU430J
	L541,L552,L803 L351,L352,L522 L432 L511 L457,L458	LAU470J LAU560J LAU620J LAU820J LFA221J
	L456 L524 L221 L222,L223 Ferrite beads L225,L226	LFA471J LFA561K LFA680K VTH1013 VTH1015
	F401 Comb filter F351 BPF (2.30,02.81MHz) F290,F292 F291	VTF1042 VTF1047 VTH1032 VTH1033

### CAPACITORS

Mark	Symbol & Description	Part No.
	VC901 Ceramic trimmer (20P)	VCM-008
	C995,C996	CCCCH101J50
	C104,C105	CCCCH300J50
	C253,C255,C269,C271	CCCCH390J50
	C837,C871	CCCSL331J50
	C293,C294	CKPUYB221K50

Mark	Symbol & Description	Part No.
	C254,C256,C270,C272 C441 C817 C438,C450,C497,C500,C546,C895 C249,C456,C461,C528,C554,C563, C586,C603,C658,C810,C811,C822	CCCSL471J50 CCSQCH070J50 CCSQCH050C50 CCSQCH100D50 CCSQCH101J50
	C417,C545 C557 C413,C509 C423,C424,C624-C627,C629, C655,C659	CCSQCH120J50 CCSQCH150J50 CCSQCH151J50 CCSQCH180J50
	C553 C232,C485,C516,C806 C352,C414 C415,C437,C451,C510,C812,C815 C380,C463	CCSQCH181J50 CCSQCH220J50 CCSQCH221J50 CCSQCH270J50 CCSQCH271J50
	C447,C462 C416,C433,C440,C496,C524,C804 C412,C419,C420,C439,C890,C891, C893 C374,C381	CCSQCH330J50 CCSQCH390J50 CCSQCH470J50 CCSQCH560J50
	C809,C813 C498,C654 C351,C353,C529,C536 C286,C287,C336,C337,C362 C411,C818	CCSQCH680J50 CCSQCH820J50 CCSQCH910J50 CCSQSL331J50 CCSQSL471J50
	C819 C401 C225,C866 C807,C838 C530,C842,C845,C863	CCSQSL561J50 CEAL2R2M50 CEANPR47M50 CEANP010M50 CEANP100M16
	C616,C850 C368,C386,C618 C870 C388 C436,C471,C556,C808,C814, C816,C823,C840	CEANP2R2M50 CEANP220M10 CEANP470M10 CEASR47M50 CEAS010M50
	C236,C237,C355,C370,C522,C855, C864,C902 C101,C281,C283,C331,C333,C360, C361,C378,C379,C434,C445,C457, C489,C490,551	CEAS100M50 CEAS101M10
	C227,C364,C383,C612,C835,C836, C841,C876,C877 C242,C244 C241 C216,C248,C275,C376,C582,C601, C857,C859	CEAS220M25 CEAS221M10 CEAS221M50 CEAS221M5R3
	C472,C475,C476 C443,C621 C208,C214,C230,C245-C247,C251, C257,C259,C261,C263,C265,C267, C273,C275,C341,C342,C369,C428, C452,C464,C465,C499,C501,C502, C512,C521,C525,C533,C542,C622, C641,C642,C896,C897	CEAS3R3M50 CEAS4R7M50 CEAS470M10

Mark	Symbol & Description	Part No.
C285, C335, C484 C583 C446, C614, C650, C824, C849, C861, C865, C873 C372, C373, C514, C615, C832, C838, C874, C878, C880		CEAS470M25 CEAS471M6R3 CFTNA103J50  CFTNA104J50
C842, C845 C807 C226, C617, C843 C474, C604, C852, C900 C827, C867		CEJANP100M16 CFTNA124J50 CFTNA223J50 CFTNA224J50 CFTNA333J50
C345, C367, C387 C203, C211 C848, C869 C205 C610		CFTNA393J50 CEJA470M10 CFTNA473J50 CFTNA474J50 CFTNA563J50
C515, C517, C847, C868 C999 C830 C252, C274 C280, C330		CFTNA683J50 CKCYF103Z50 CFTNA154J50 CKPUYF223Z25 CKPUYB331K50
C202 C365, C366, C384, C385 C875, C879 C363, C382 C883 C854, C998		CKSQYB152K50 CKSQYB472K50 CKSQYB562K50 CKSQYB682K50 CFTNA823J50 CKSQYB821K50
C103, C106, C206, C213, C218, C231, C234, C354, C359, C377, C418, C425, C426, C458 - C460, C486, C535, C558, C559, C562, C628, C643 - C646, C651 - C653, C801 - C803, C828, C829, C856, C901		CKSQYF103Z50
C204, C209, C212, C215, C217, C228, C229, C288, C338, C403, C404, C427, C429, C435, C442, C479, C480, C503, C505, C506, C511, C513, C526, C531, C541, C543, C552, C560, C561, C564, C584, C585, C851, C858, C860, C881, C882		CKSQYF104Z25
C102, C201, C210, C258, C260, C262, C264, C266, C268, C276, C407, C408, C431, C432, C448, C449, C466, C467, C473, C477, C478, C483, C487, C488, C504, C507, C527, C534, C544, C547, C548, C555, C567, C581, C602, C623, C805, C820, C997		CKSQYF473Z25
C290 - C292, C537 C235, C605, C607, C839 C608, C834 C279, C329, C620 C444, C811, C856, C857, C899		CKSYF105Z16 CQMA102J50 CQMA152J50 CQMA222J50 CQMA272J50
C613, C619, C853 C898 C825 C606		CQMA332J50 CQMA472J50 CQMA682J50 CQPA821J100

**RESISTORS**

Mark	Symbol & Description	Part No.
VR601	Semi-fixed (1k $\Omega$ )	VRTB6VS102
VR441, VR482, VR602, VR603	Semi-fixed (10k $\Omega$ )	VRTB6VS103
VR607	Semi-fixed (22k $\Omega$ )	VRTB6VS223
VR605, VR606	Semi-fixed (2.2k $\Omega$ )	VRTB6VS222
VR608	Semi-fixed (33k $\Omega$ )	VRTB6VS333
VR481, VR604, VR609	Semi-fixed (4.7k $\Omega$ )	VRTB6VS472
VR521	Semi-fixed (4.7k $\Omega$ )	VRTG6VS472
R303 R415, R416, R434, R438, R511, R680 - R683		RS2LMF300J RN1/6PQ□□□□J
R115, R251, R252, R254 - R256, R258, R260 - R264, R266, R276, R278, R280 - R284, R286, R293, R310 - R313, R340, R344 - R346, R349, R357, R403, R431, R442, R456, R552 - R554, R556, R557, R563, R564, R568, R585 - R588, R603, R618, R629, R647, R665 - R678, R691, R709, R849, R850, R862, R869, R873, R904, R910 - R913, R918, R923, R934, R942		RD1/6PM□□□□J
Other resistors		RS1/10S□□□□J

**OTHERS**

Mark	Symbol & Description	Part No.
X601	Crystal resonator (14.318MHz)	VSS1 026
X101	Ceramic resonator (9.00MHz)	VSS1 040
X201	Crystal resonator (16MHz)	VSS1 051
CN301	5P top post	B5P- SHF- 1AA
CN103	23P top connector	VK11 073
JA3	Optical digital module (DIGITAL OUT , OPTICAL)	GPIF32T
JA1	Mini jack (CD- DECK SYNCHRO)	RK11 014
JA7	RF pin jack (VHF ADAPTER OUTPUT)	VK11 029
JA4	6P pin jack AUDIO, VIDEO OUT)	VK11 030
JA2	2P pin jack (CONTROL) 4P mini DIN socket (S VIDEO OUT)	VK11- 183 VK11 072

**FG Assembly**

**SEMICONDUCTORS**

Mark	Symbol & Description	Part No.
	Photo interrupter	GP5S1

**SW Assembly**

**SWITCHES**

Mark	Symbol & Description	Part No.
S1 - S3	Push switch (LOADING/TILT)	DS1-1015

**© FLKB Assembly (VWM1160)**

FLKB assembly is composed of the FLKY, SHKY, PSWB and HEPB assemblies.

**FLKY Assembly**

**SEMICONDUCTORS**

Mark	Symbol & Description	Part No.
	IC10	PDB029A
	IC11	PST529C
	Q12	DTA124ES
	Q10	DTA144ES
	Q11	DTC114ES
	D19	AY3365S
	D10-D17	1SS252
	D18	1SS254

**SWITCHES**

Mark	Symbol & Description	Part No.
	S10-S23 Tact switch ( PGM,DIRECT SEARCH (0-9,+10), DERECT CD,SINGLE )	RSG1030
	S24 Door switch	VSK1015

**CAPACITORS**

Mark	Symbol & Description	Part No.
	C10	CEAS100M50
	C12	CEAS101M10
	C14	CEJA100M16
	C13	CKPUYB102K50
	C11,C15	CKPUYF223Z25

**RESISTORS**

Mark	Symbol & Description	Part No.
	R23 Resistor array Other resistors	RA7S224J RD1/6PM □□□J

**OTHERS**

Mark	Symbol & Description	Part No.
	V10 Fluorescent indicator tube	VAW1017
	X10 Ceramic resonator (6.00MHz) FL spacer	VSS1041 VEB1125

**SHKY Assembly**

**SEMICONDUCTORS**

Mark	Symbol & Description	Part No.
	Q40-Q42	DTC124ES
	D45	BR3365S
	D43,D44	VEL1003

**SWITCHES**

Mark	Symbol & Description	Part No.
	S40-S49 Tact switch ( DIGITAL LEVEL CTRL,PGM EDIT, PEAK SEARCH,RANDOM PLAY, HILITE INTRO SCAN,SKIP (J◀◀, ▶▶I), OPEN/CLOSE(▲), STOP(■), PLAY/PAUSE(▶/  ) )	RSG1030
	S51 Rotary encoder	VSD1007

**RESISTORS**

Mark	Symbol & Description	Part No.
	R43 Resistor array R40-R42	RA4T472J RD1/6PM221J

**PSWB Assembly**

**SWITCH**

Mark	Symbol & Description	Part No.
	S60 Tact switch (POWER)	RSG1030

**CAPACITOR**

Mark	Symbol & Description	Part No.
	C60	CKPUYF23Z25

**OTHERS**

Mark	Symbol & Description	Part No.
	Remote control sensor unit	GP1U50X

**HEPB Assembly**

**RESISTOR**

Mark	Symbol & Description	Part No.
	VR70 Double rotary volume (LEVEL)	VCS1015

**OTHER**

Mark	Symbol & Description	Part No.
	JA70 Headphone jack	RKN1002

◎ SYPS Assembly (VWR1090)

**SEMICONDUCTORS**

Mark	Symbol & Description	Part No.
△	IC201	ICP-N15
	IC202	ICP-N15
	IC206	ICP-N25
△	IC205	NJM78M05FA
	Q217	DTA114ES
	Q213	DTC114ES
	Q214,Q219	2SA933S
	Q202,Q203,Q205	2SB1185
△	Q207	2SB1238X
	Q218	2SC1740S
	Q201,Q204,Q206	2SD1762
	D220	MTZJ22C
	D102,D104	MTZJ5.1C
	D101,D103	MTZJ5.6B
△	D201,D202	S2VB20-F
△	D213,D214	1SR35-100AVL
	D222,D223	1SR35-100AVL
△	D208,D209	1SS252
△	D216,D217	1SS252
	D212,D215	10ELS2

**COILS**

Mark	Symbol & Description	Part No.
△	L202 Line filter	VTL-262
△	L201 Coil (10mH)	VTL1008

**CAPACITORS**

Mark	Symbol & Description	Part No.
	C205,C206 Aluminum (3300/25V)	VCH1095
△	C216 Ceramic(10000p/AC400V)	RCG-009
	C217 Ceramic(10000p/AC400V)	RCG-009
	C209,C210,C226,C231,C232, C242,C245	CEAS101M10
	C213	CEAS471M35
	C223	CEAS101M25
	C219	CEAS101M35
	C235	CEAS102M25
	C214,C215	CEAS2R2M50
	C240,C243	CEAS221M10
	C208	CEAS472M10
	C207	CEAS682M10
	C212,C237,C238	CGCYX473M25
	C196-C199,C246	CKCYF103Z50
	C241,C244	CKPUYB102K50
	C201-C204	CKPUYF103Z25

**RESISTORS**

Mark	Symbol & Description	Part No.
△	R221	RS1LMFR51J
	R239	RS1LMF4R7J
	R241	RD1/2PM225J
	Other resistors	RD1/8PM□□□J

**HEAD Assembly**

**CAPACITORS**

Mark	Symbol & Description	Part No.
	C1	CKSQYF473Z50
	C5	CKSYF105Z16

**RESISTOR**

Mark	Symbol & Description	Part No.
	VR1 Chip semi-fixed	VCP1040

## 7. DISASSEMBLY

### 7.1 REMOVING THE BONNET AND FRONT PANEL (Fig. 7-1, 2)

- ① Remove six screws (A) to remove the bonnet.
- ② To remove the front panel assembly, remove three screws (B) and lift the claws as shown in the figure and lower the front panel toward the front.

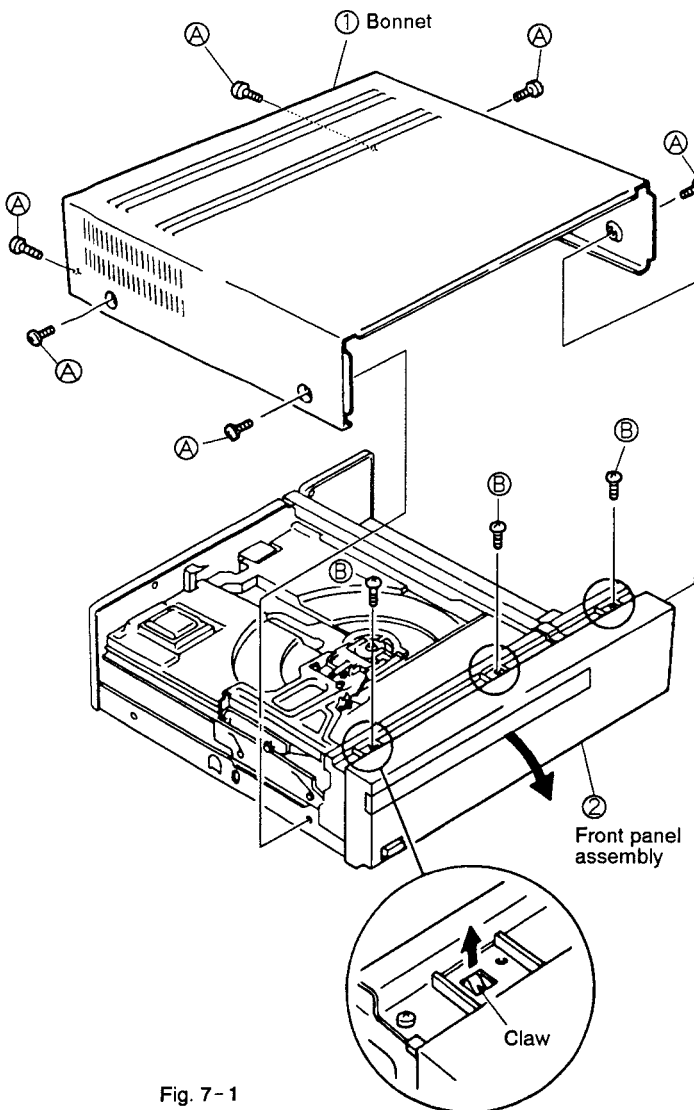


Fig. 7-1

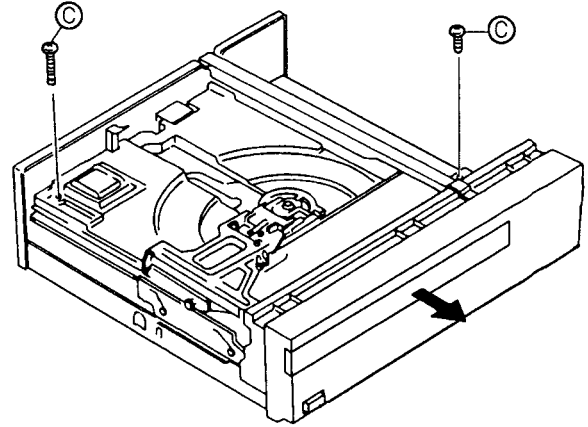


Fig. 7-2

### 7.2 REMOVING THE TRAY (Fig. 7-2, 3)

- ① Remove two stopper screws (C) shown in Fig. 7-2. When the power can be turned ON, press the OPEN (▲) button then pull the tray out from the player.
- ② When the power cannot be turned ON, remove the front panel (Fig. 7-1), and turn the gear pulley shown in Fig. 7-3 counterclockwise, and the tray will slide out toward the front.

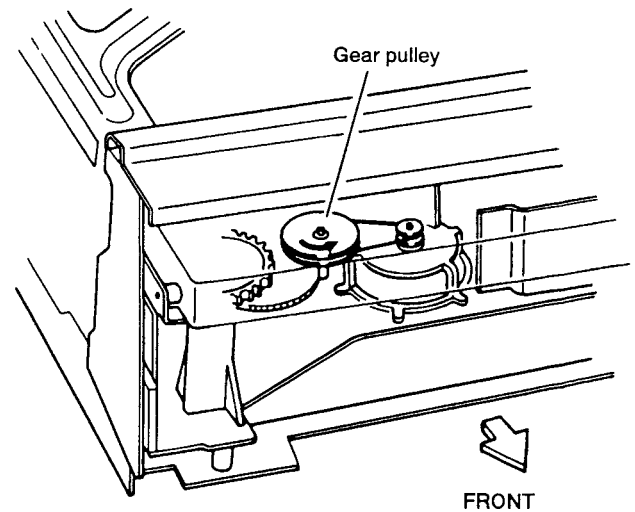


Fig. 7-3

### 7.3 REMOVING THE MAIN ASSEMBLY (Fig. 7-4)

- After removing the main binders, remove by the following procedure:
- ① Remove two screws (A) to remove the center angle.
- ② Remove two screws (B) holding the MAIN assembly, and remove seven screws (C) on the sides of the rear panel.
- ③ Remove the flexible cable from the connector.
- ④ Pull the MAIN assembly in the direction of the arrow.
- ⑤ While sliding the MAIN assembly to the right, lift it upward in the direction of the arrow.

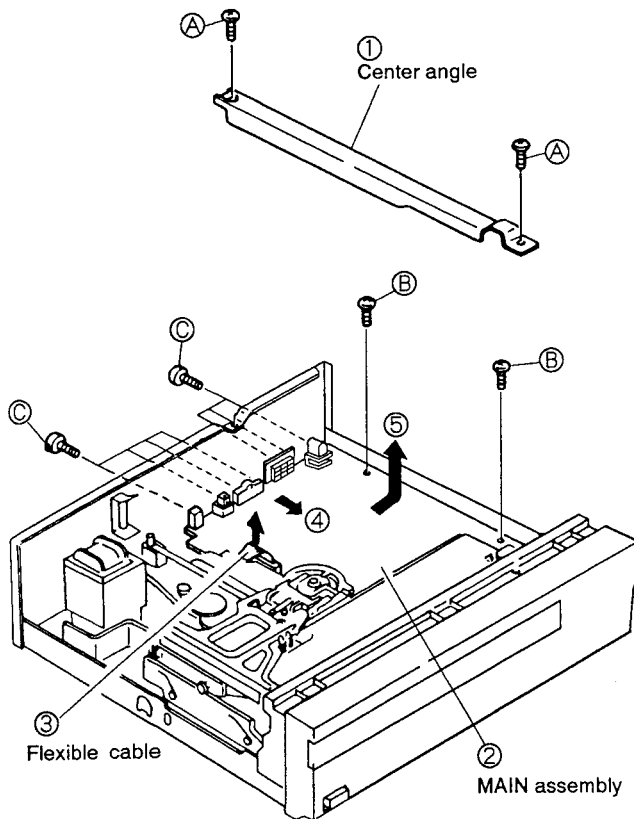


Fig. 7-4

#### ● Diagnosis of the MAIN assembly

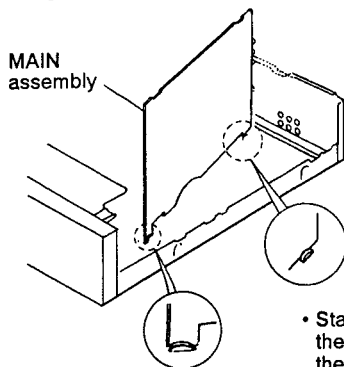


Fig. 7-5

- Stand the MAIN assembly in the chassis as illustrated, and the MAIN assembly is able to diagnose from the foil side.

### 7.4 REMOVING THE CLAMPER ARM (B) AND CLAMPER ARM (A) ASSEMBLY (Fig. 7-6)

Set the player with the tray moved up.

- ① Remove two clamber springs and raise clamber arm (B).
- ② Clamber arm (B) can be removed by pulling it in the direction of the arrow.
- ③ Remove a screw (A) with a arm spring holding the clamber arm (A) assembly.
- ④ Remove the clamber arm (A) assembly by pulling it in the direction of the arrow.

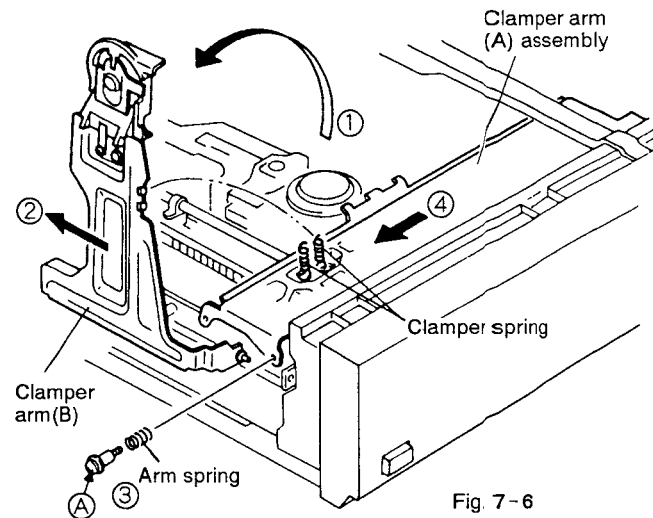


Fig. 7-6

### 7.5 REMOVING THE CLAMPER (Fig. 7-7)

- ① Remove the plate spring by unscrewing screw (A).
- ② Remove the parallel link by sliding it in the direction of the arrow. (Be careful not to damage the claw located on one side of the link.)
- ③ The clumper can be removed by sliding the clumper holder in the direction of the arrow.

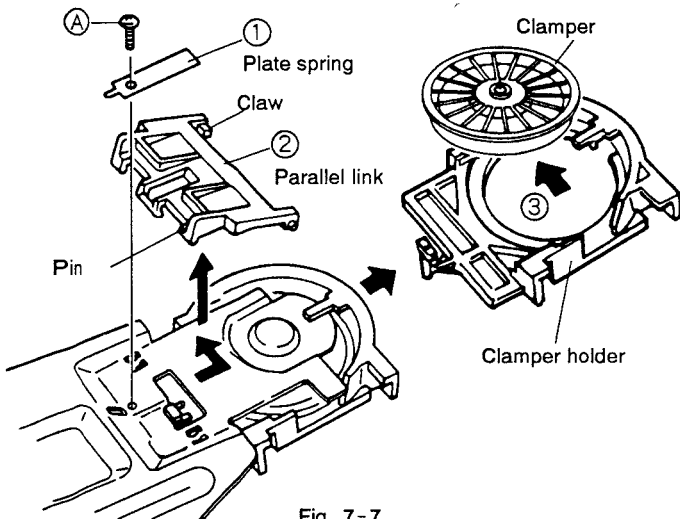


Fig. 7-7

### 7.6 REMOVING THE PICKUP ASSEMBLY (Fig. 7-8)

- ① Remove the flexible cable from the connector and also remove the flexible cable installed at section (a).
- ② Remove a screw (A) holding the carriage shaft.
- ③ Raise the shaft in the direction of the arrow to remove the rack assembly.
- ④ Remove a hexagonal screw (B) and lift up the pickup assembly lightly and turn the pickup assembly in the direction of arrow (5).
- ⑤ Remove two screws (C) on the back of the pickup assembly.

Note: Make sure that the rack assembly is not close to the turntable when it is removed.

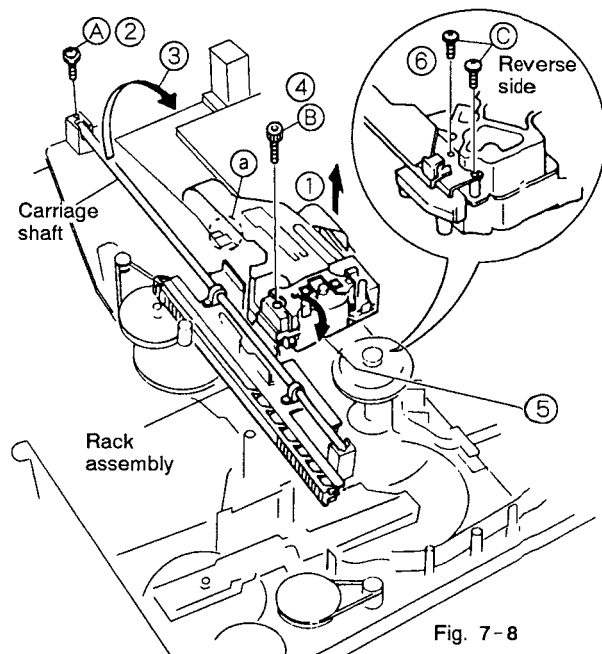


Fig. 7-8

### 7.7 REMOVING THE TILT SENSOR (Fig. 7-9)

- ① Remove the connector (arrow A) of the flexible cable and release the claw (arrow B) to remove the tilt sensor.

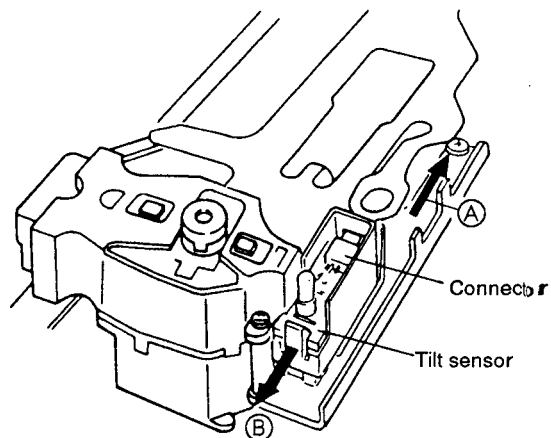
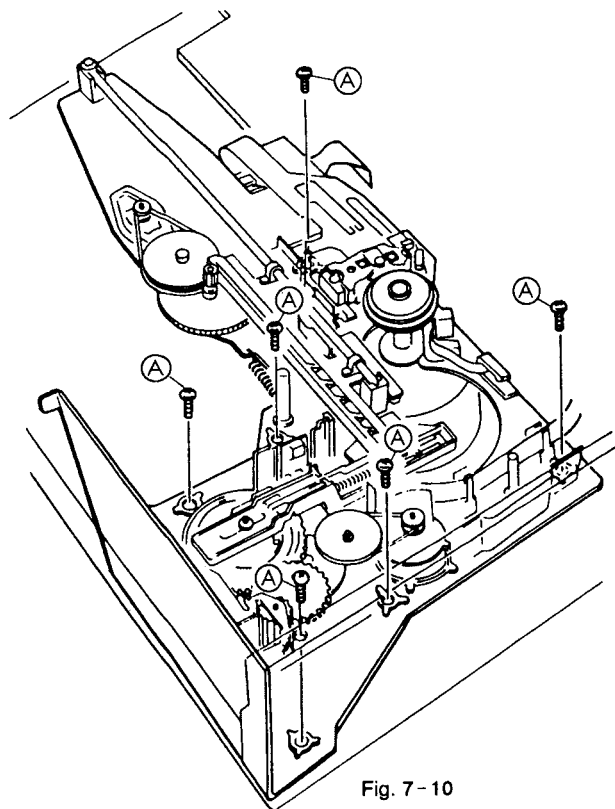


Fig. 7-9

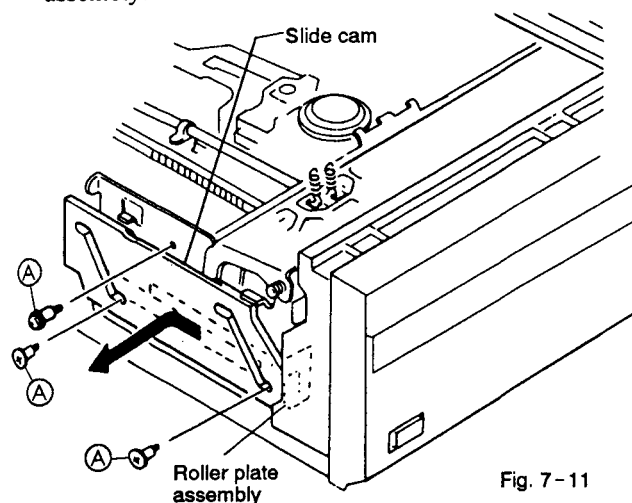
## 7.8 REMOVING THE MECHANISM SECTION (Fig. 7-10)

Remove six screws (A), and the entire mechanism section can be removed.



## 7.9 REMOVING THE SLIDE CAM AND ROLLER PLATE ASSEMBLY (Fig. 7-11)

- ① Set the player with the tray down.
- ② Remove three screws (A) and slide the slide cam toward the rear to remove it.
- ③ Remove the clamber arm (A) assembly (see page 61) after removing slide cam to remove the roller plate assembly.



## 7.10 ASSEMBLING THE MECHANISM SECTION

### 7.10.1. Positioning the gears

(Since the cam gears are used for the detection of all operation modes in this unit, the cam gears and the tray should be positioned correctly. Reassemble in the following procedure.)

- ① Position three switch levers so that they are nearly parallel (approx. 2mm), as shown in Fig. 7-12 (a).
- ② Insert the cam gear so that the end of the spiral groove on the upper surface of the cam gear comes to the position nearest to the shaft located at the front, as shown in Fig. 7-12 (b).

(In this case, the cam gear should be set in the position where the angle between the center line of the cam gear and the pin on the cam gear is 45°, by visual checking.)

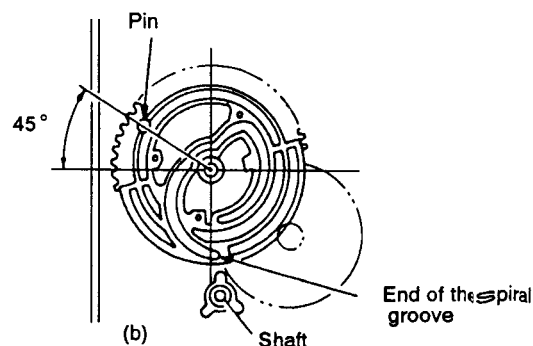
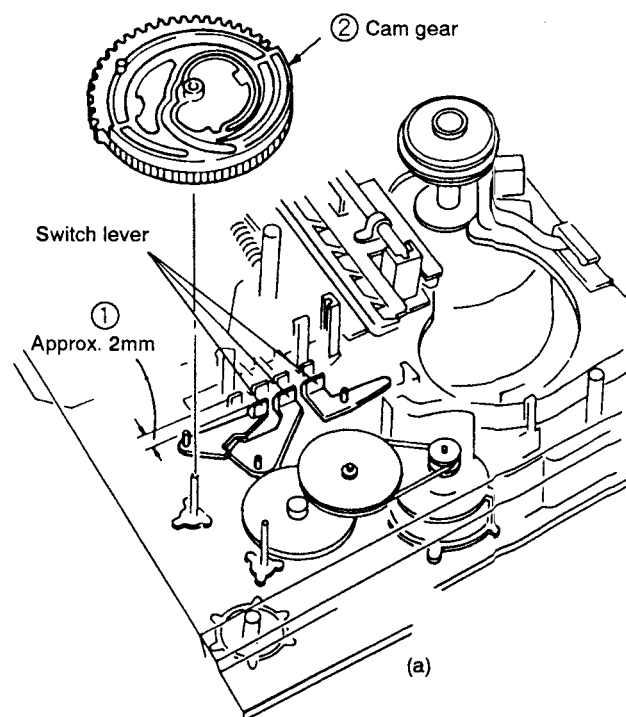


Fig. 7-12



- ③ Mount the spring slanting cam by raising the rack assembly in the direction of the arrow so that the tilt slide section comes under the rack assembly. Then, mount the cam spring. (Fig. 7-13 (a))
- ④ Insert the follow gear so that the "L"-shaped section of the follow gear comes to the end of the cam gear, as shown in Fig. 7-13 (b).

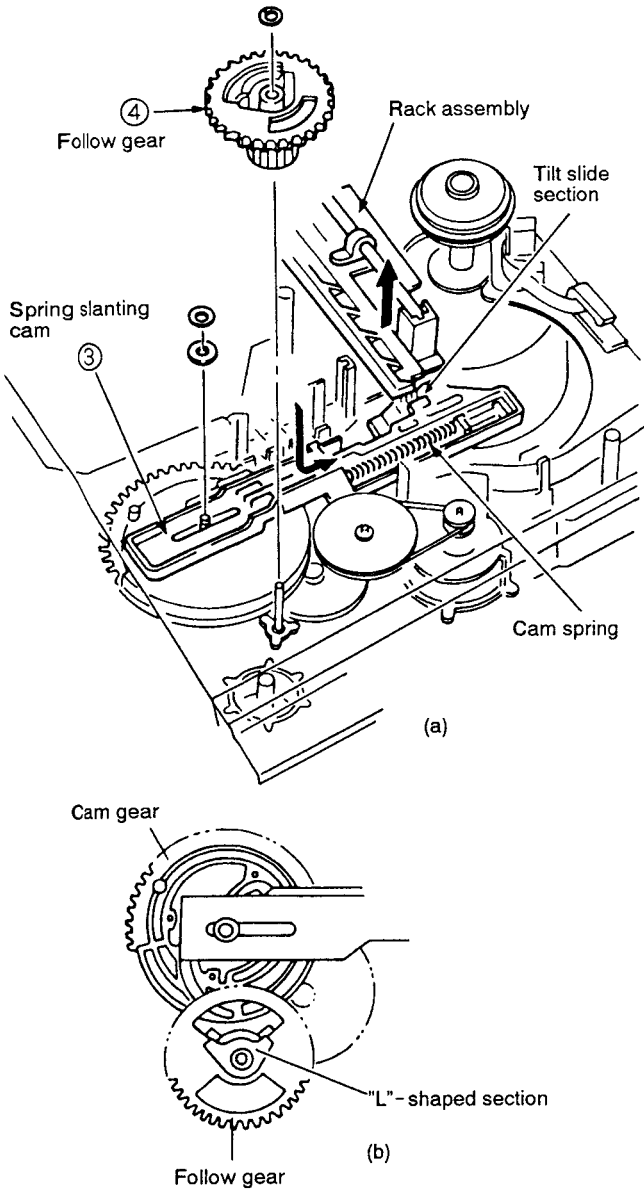


Fig. 7-13

- ⑤ Mount the roller plate assembly in the position where the tooth with the triangle mark (▼) of the follow gear is engaged with the dip of the gear with the short rib on the roller plate gear, as shown in Fig. 7-14.

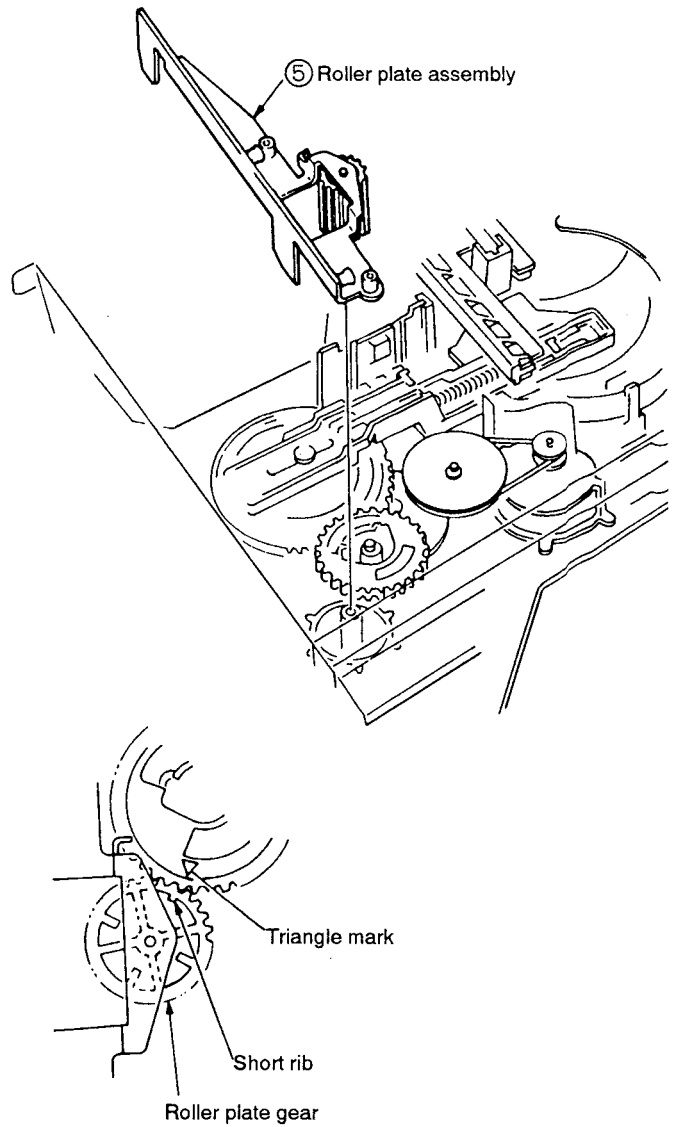
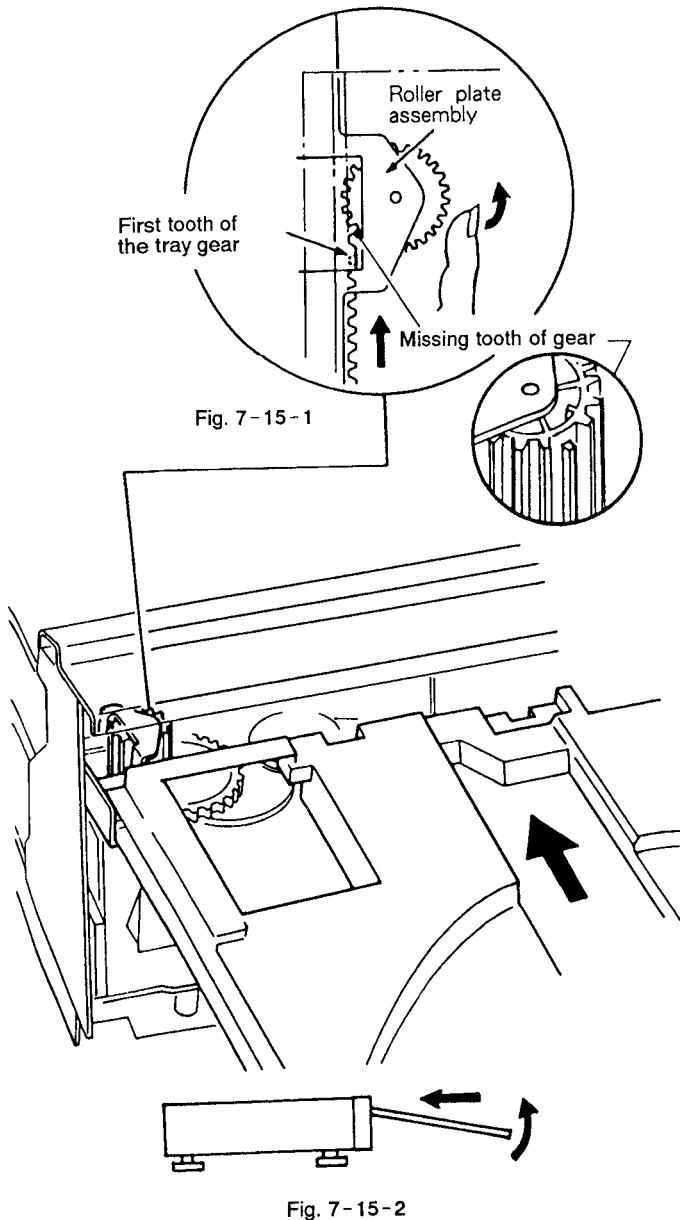


Fig. 7-14

**7.10.2 Positioning the tray (Fig. 7-15)**

- ① Set the player with the tray open.
- ② Set the roller plate gear so that the roller plate line intersects with the mid - point of missing tooth of the roller plate gear.  
(At this time, adjust the position by the method shown in Fig. 7-15, or turn the power ON and use the SKIP (◀▶) buttons in the direction of OUT tilt it stops as shown in Fig. 7-15-1.)

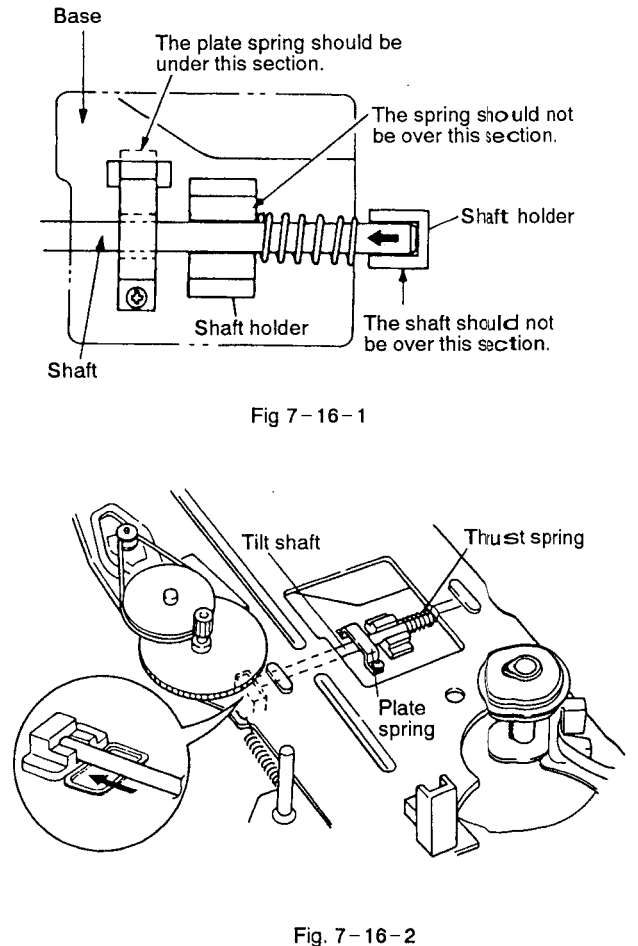
- ③ Insert the tray.  
At this time, the tray can be inserted only when the first missing tooth of the tray gear is engaged with the missing tooth section of the roller plate gear, as shown in the figure. (Fig.7-15-1)  
Tray is easier to insert by pushing slightly upwards. (Fig.7-15-2)



**7.10.3 Assembling the servo mechanism base assembly(Fig. 7-16)**

When assembling the servo mechanism base assembly, pay special attention to the following points:

- After inserting the tilt shaft in the position shown in Fig. 7-16-1 of mechanism chassis assembly, mount the servo mechanism base assembly in the direction of the arrow so that the tilt shaft does not come over the shaft holder as shown in Fig. 7-16-2.
- The thrust spring should not come over the shaft holder.
- Check that the end of the plate spring is inserted under the base.



**7.10.4 Styling of the flexible cable (Fig. 7-17)**

- ① Bend the flexible cable of the pickup assembly by about 45° at the ▲ mark.
- ② Insert the flexible cable into the connector.
- ③ Set the flexible cable under the protruding section.
- ④ Twist the flexible cable by a half turn.
- ⑤ Insert the triangular section.
- ⑥ Further insert the flexible cable under the protruding section.

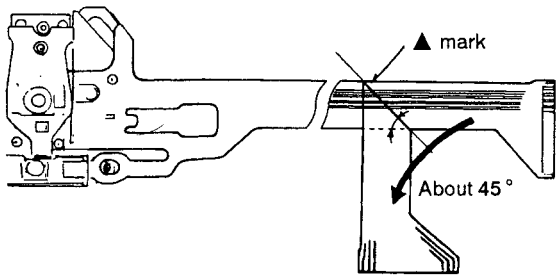


Fig. 7-17-1

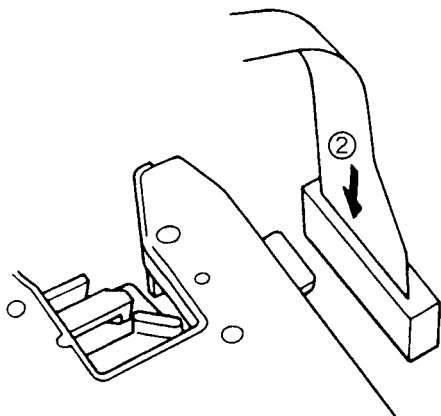


Fig. 7-17-2

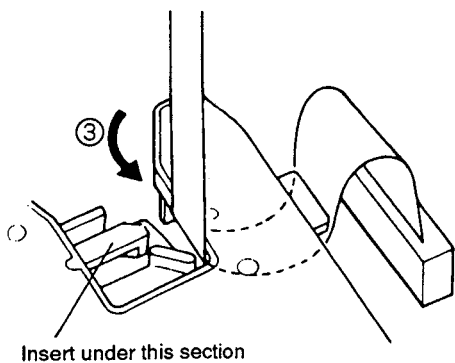


Fig. 7-17-3

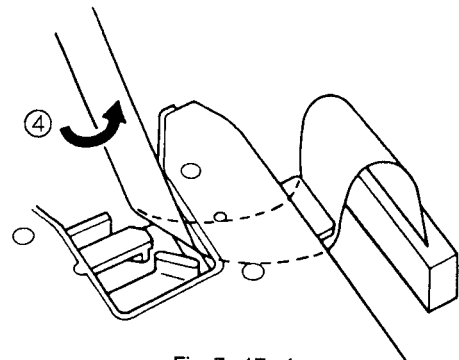


Fig. 7-17-4

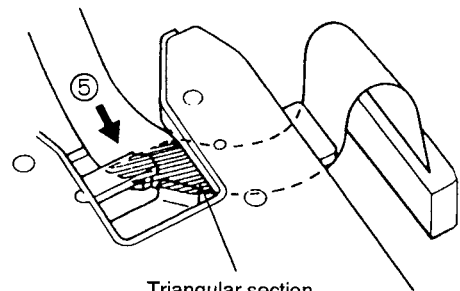


Fig. 7-17-5

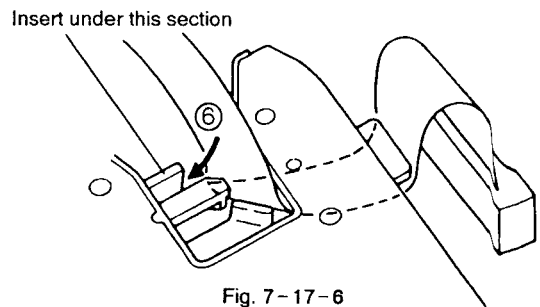
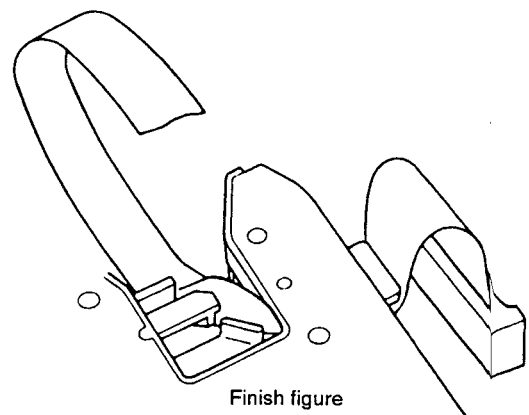


Fig. 7-17-6



Finish figure  
Fig. 7-17-7

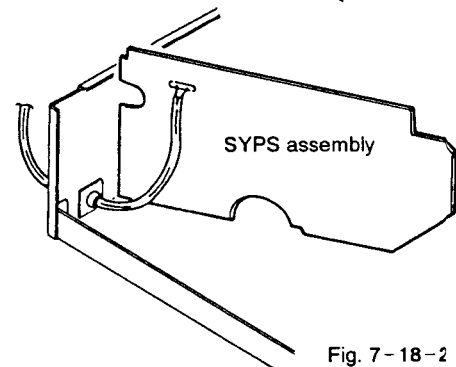
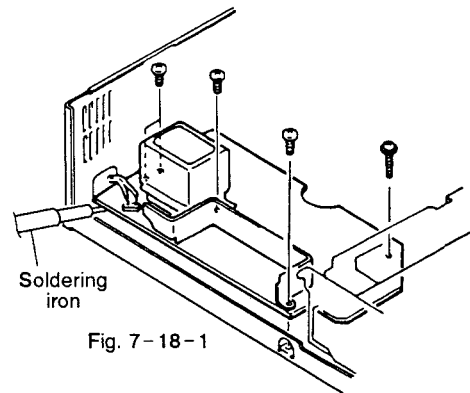
## 7.11 DIAGNOSING THE SYPS ASSEMBLY (Fig. 7-18)

### Procedure - 1

1. Remove the screw fixing the SYPS assembly and keep the SYPS assembly apart about 3cm from the base chassis (See Fig. 7-18-1).
2. Insert a soldering iron between the SYPS assembly and base chassis, alternately desolder the lapping pins of an AC power cord, and remove the lapping pins (See Fig. 7-18-1).
3. Solder the lapping pins through the foil side of the board with the SYPS assembly raised.  
The SYPS assembly can be diagnosed for component replacement through the foil side.  
(See Fig. 7-18-2).

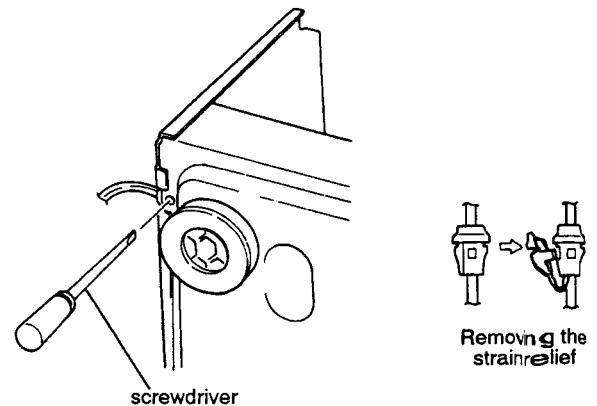
### Notes:

1. Interpose cloth for check so that the SYPS assembly does not touch the chassis.
2. Remove the rear panel when you are difficult to work.



### Procedure - 2

1. Insert a screwdriver into the chassis hole near a strain relief through the back of the base chassis and remove the strain relief stop ring.
2. Remove the strain relief and pull the AC power cord toward the main unit to set up the SYPS assembly.

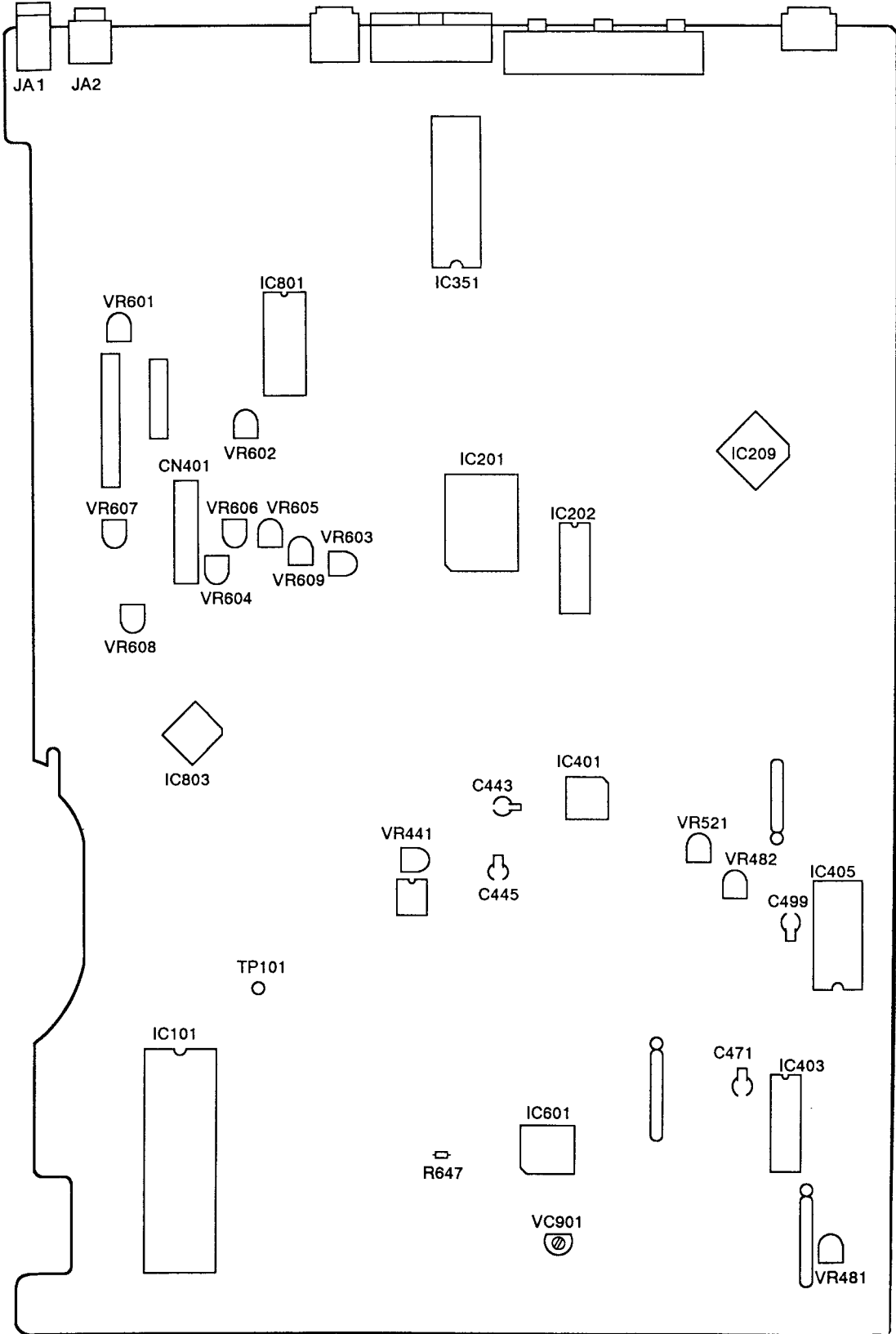


## 8. ADJUSTMENT

### 8.1 MAIN ASSEMBLY ADJUSTMENT SUMMARY

	ADJUSTMENT	P	Adjusting Point	Measurement equipment Connecting Point	Player Condition	Adjusting Specification
1	Tilt Servo Gain Adjustment	75	VR608	None	Power off	<ul style="list-style-type: none"> <li>● Making of Tilt GAIN VR position Red : Turn to Right Clear : Center Blue : Turn to Left</li> </ul>
2	Coarse Adjustment of Grating and TRK Balance Adjustment	76	Grating/VR602	CN401 - 8 (TRK ERR)	<ul style="list-style-type: none"> <li>● Test mode #15,000 TRK servo loop open</li> </ul>	<ul style="list-style-type: none"> <li>● Null point → TRK error MAX</li> <li>● Adjust VR602 so that the TRK error waveform amplitude's positive and negative level become equal.</li> </ul>
3	Slider Shaft Horizontal Adjustment	77	Player SKIP key	CN401 - 2 (FCS RTN)	<ul style="list-style-type: none"> <li>● Test mode Tilt servo loop off TRK servo loop open #5.200</li> </ul>	<ul style="list-style-type: none"> <li>● Use the SKIP key to adjust to <math>0V \pm 20mV</math>.</li> </ul>
4	Pickup Inclination Adjustment	78	Pickup Assembly TAN / TRK inclination adjustment screw	CN401 - 1 (RF)	<ul style="list-style-type: none"> <li>● Test mode #2,701 still TRK servo loop close / open Tilt servo loop open</li> </ul>	<ul style="list-style-type: none"> <li>● RF waveform's amplitude MAX (Pickup TAN / TRK adjustment screw)</li> <li>● Minimized crosstalk.</li> </ul>
5	TRKG Error Best / Crosstalk Best Adjustment	79	VR605 (TE BEST) VR608 (CT BEST)	CN401 - 8 (TRK ERR) CN401 - 1 (RF)	<ul style="list-style-type: none"> <li>● Test mode TRK servo close / open Tilt servo loop off</li> </ul>	<ul style="list-style-type: none"> <li>● RF MAX (VR608) TRK error MAX (VR605)</li> </ul>
6	FOCS SUM Level Adjustment	80	VR609	CN401 - 10 (FCS SUM)	<ul style="list-style-type: none"> <li>● Play mode</li> </ul>	<ul style="list-style-type: none"> <li>● Adjust VR 609 so that the voltage becomes 1.5VDC.</li> </ul>
7	Tilt Sensor Inclination / Tilt Balance Adjustment	81	Tilt sensor inclination adjustment screw VR607(TILT BAL)	TV monitor Test mode screen	<ul style="list-style-type: none"> <li>● Test mode #18,200 / #115 still TRK servo loop close Tilt servo loop off</li> </ul>	<ul style="list-style-type: none"> <li>● Set VR 607 to the center.</li> <li>● Adjust the adjustment screw so that the tilt error display code is 6,7, or 8.</li> <li>● Adjust VR607 so that the tilt error display becomes 7.</li> </ul>
8	Verification and Adjustment of Spindle Motor Centering	82	Spindle motor centering adjustment screw.	CH1:CN401 - 8 (TRK ERR) CH2:CN401 - 7 (TRK SUM) (X - Y mode)	<ul style="list-style-type: none"> <li>● Test mode #25,000 / #1 TRK servo loop open Tilt servo loop on</li> </ul>	<ul style="list-style-type: none"> <li>● Adjust the centering adjustment screw so that the lissajous figures of #1 and #25,000 are the same.</li> </ul>
9	Fine Adjustment of Grating and TRK Balance Adjustment	83	Grating / VR602	CH1:CN401 - 8 (TRK ERR) CH2:CN401 - 7 (TRK SUM) (X - Y mode)	<ul style="list-style-type: none"> <li>● Test mode TRK servo loop open Tilt servo loop on</li> </ul>	<ul style="list-style-type: none"> <li>● Minimize the Y direction of the lissajous figure.</li> <li>● Level of the X direction of the lissajous figures are equal.</li> </ul>
10	FCS Servo Loop Gain Adjustment	84	VR604	CH1:CN401 - 5 (FCS IN) CH2:CN401 - 4 (FCS ERR) (X - Y mode)	<ul style="list-style-type: none"> <li>● Test mode #15,000 still TRK servo loop close Tilt servo loop on</li> </ul>	<ul style="list-style-type: none"> <li>● Adjust VR604 so that the lissajous figure is symmetric with respect to the X and Y axes.</li> </ul>
11	TRK Servo Loop Gain Adjustment	85	VR603	CH1:CN401 - 9 (TRK IN) CH2:CN401 - 8 (TRK ERR) (X - Y mode)	<ul style="list-style-type: none"> <li>● Test mode #15,000 still TRK servo loop close Tilt servo loop on</li> </ul>	<ul style="list-style-type: none"> <li>● Adjust VR603 so that the lissajous figure is symmetric with respect to the X and Y axes.</li> </ul>
12	RF Gain Adjustment	86	VR601	CN401 - 1 (RF)	<ul style="list-style-type: none"> <li>● #15,000 still</li> </ul>	<ul style="list-style-type: none"> <li>● Adjust VR601 so that the RF level becomes <math>300mV \pm 50mV</math>.</li> </ul>
13	Ref. Sub Carrier Adjustment	87	VC901	IC402 pin 8	<ul style="list-style-type: none"> <li>● STOP</li> </ul>	<ul style="list-style-type: none"> <li>● Adjust VC901 so that the frequency becomes 3.579545 MHz.</li> </ul>
14	VC0 Center Frequency Adjustment	88	VR481	CH1:C471 + lead wire CH2:C499 + lead wire	<ul style="list-style-type: none"> <li>● #5,100 still</li> </ul>	<ul style="list-style-type: none"> <li>● The center of CH1's video signal jitter is delayed by <math>71 \mu S</math> with CH2's video signal.</li> </ul>
15	Output Video Level Adjustment	89	VR482	VIDEO OUT terminal	<ul style="list-style-type: none"> <li>● #19,900 still</li> </ul>	<ul style="list-style-type: none"> <li>● Adjust the VR482 so that the voltage between the sync tip and the white peak becomes <math>0.71V \pm 5\%</math>.</li> </ul>
16	1H Delay Video Level Adjustment	90	VR441	CH1:C443 - lead wire CH2:C445 - lead wire	<ul style="list-style-type: none"> <li>● #3,800 still</li> </ul>	<ul style="list-style-type: none"> <li>● The 1H delay video level becomes the same as the main line video level.</li> </ul>
17	VPS Error Adjustment	91	VR521	TV monitor	<ul style="list-style-type: none"> <li>● #8,000 still</li> </ul>	<ul style="list-style-type: none"> <li>● Color irregularity on the magenta screen is minimized.</li> </ul>

8.2 ADJUSTMENT POINTS OF THE MAIN ASSEMBLY

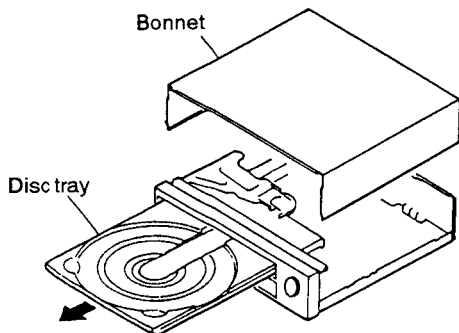


### 8.3 TEST MODE

#### 8.3.1 TEST MODE

The player has a test mode function which allows the servicer to check the player's status on the TV screen by executing the respective key operation.

Also, since the TRK servo opens and closes easily, the test mode is especially useful for mechanical adjustments.



#### 8.3.3 TEST MODE CANCELLATION

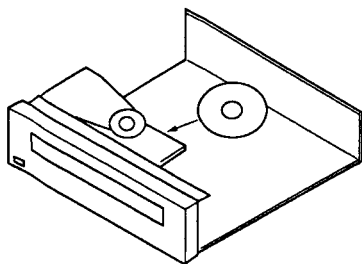
Turn off the power switch.

#### 8.3.4 PLAYER OPERATION IN THE TEST MODE

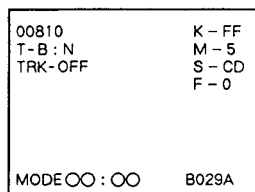
Operate the player by selecting a test mode function with the keys on the player or on the remote control unit.

##### ● CD PLAYBACK

- Place the CD disc on the turn table. (Clamper is already lifted up.)



- Press the or key to appear "S-CD" on the TV screen display.

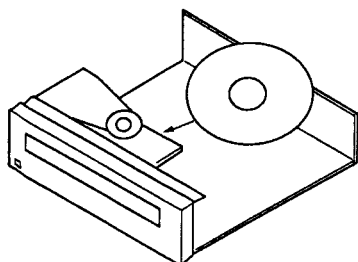


TV screen display

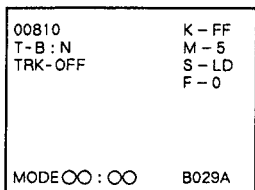
- Clamp the disc by pressing the PLAY () key once. Then, press the PLAY () key twice, disc will be normal playbacked.

##### ● LD PLAYBACK

- Place the LD disc on the turn table. (Clamper is already lifted up.)



- Press the or key to appear "S-LD" on the TV screen display.



TV screen display

#### 8.3.2 TEST MODE INITIATION

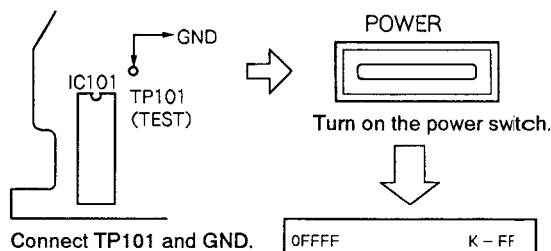
[Procedure]

- When using the remote control unit (GGF1067) for the test mode.

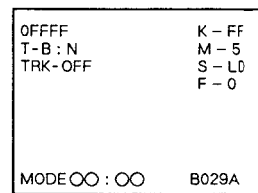
- Press the key after pressing the key.

- When not using the remote control unit (GGF1067) for the test mode.

- Remove the bonnet and disc tray.
- Connect the TP101 (TEST) in the MAIN assembly to GND.
- Turn on the power switch.
- Disconnect the TP101 from GND.



Connect TP101 and GND.

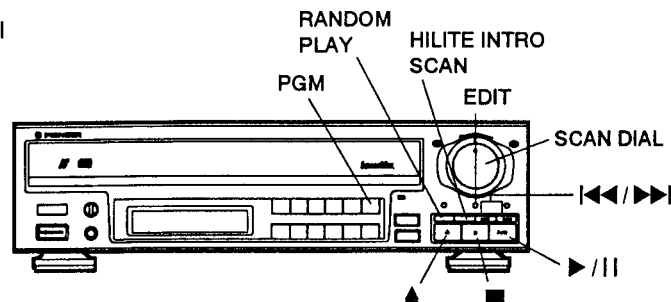


TV screen display

Table. Operation in the test mode by optional remote control unit (VXX1530).

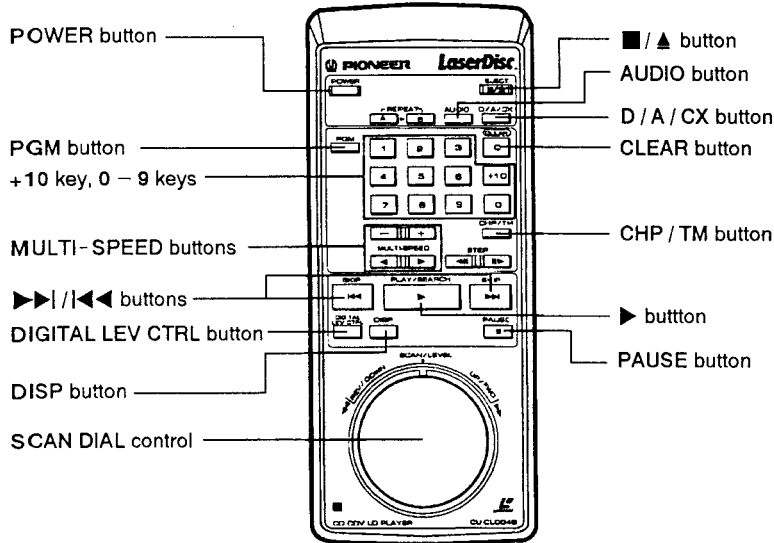
Function	Player Status	Key Operation	Remarks
Open Tray	STOP mode	▲	
Close Tray	Tray open	▲	
Stop	PLAY mode	■	
Play	Disc placement and tray closed.	▶	<ul style="list-style-type: none"> <li>• Start play with the TRK servo open.</li> <li>• Start play with tilt neutral.</li> <li>• The disc type (LD/CD/CDV) is determined when playback starts at the SLDR position during start play.</li> </ul>
TRK Servo Open/Close	PLAY mode	▶	<ul style="list-style-type: none"> <li>• Each time the PLAY button (▶) is pressed, the TRK servo will open or close alternately.</li> </ul>
Still	PLAY mode TRK servo closed.	(Remote control unit key)	<ul style="list-style-type: none"> <li>• Each time the STILL button (  ) is pressed, the player will switch between the PLAY and STILL modes alternately.</li> </ul>
SLDR REV SCAN	PLAY mode	SCAN DIAL	<ul style="list-style-type: none"> <li>• Counterclockwise</li> <li>• With the TRK servo open, the pickup can be damaged if the SLD moves further inward than the lead-in area on the disc. Do not allow the SLD to move further inward than the lead-in area.</li> </ul>
SLDR FWD SCAN	PLAY mode	SCAN DIAL	<ul style="list-style-type: none"> <li>• Clockwise</li> <li>• With the TRK servo open, the pickup can be damaged if the SLD moves further outward than the lead-in area on the disc. Do not allow the SLD to move further outward than the lead-in area.</li> </ul>
TILT Neutral	POWER switch ON	EDIT	
TILT Servo ON	PLAY mode	RANDOM PLAY	
TILT Minus TILT Servo OFF	PLAY mode	◀◀	<ul style="list-style-type: none"> <li>• Press and hold down the keys.</li> </ul>
TILT Plus TILT Servo OFF	PLAY mode	▶▶	<ul style="list-style-type: none"> <li>• Press and hold down the keys.</li> </ul>
Screen Display ON/OFF	POWER switch ON	PGM key	
Frame search	PLAY mode	+10 key ↓ 0-9 key ↓ ▶	<ul style="list-style-type: none"> <li>• In the PLAY mode, press the +10 key. (The player will standby for the frame No. entry.)</li> <li>• Use the numeric keys(0 - 9) to enter the frame No.. Then press the player's PLAY key to search.</li> <li>• After the search is completed, the player will return to the previous mode before the search was performed.</li> </ul>
Loading Motor Rotation Clockwise Counterclockwise	Tray open	▶▶ ◀◀	<ul style="list-style-type: none"> <li>• FWD:Unloading</li> <li>• REV:Loading</li> </ul>
FOCS OFFSET (CT BEST) VR608 Check	PLAY mode (TRK servo OPEN)	(Remote control unit) MULTI-SPEED FWD → F-1 REV → F-0 (Player) HILITE INTRO SCAN	<ul style="list-style-type: none"> <li>• For checking VR604</li> <li>F-0 : Normal mode <ul style="list-style-type: none"> <li>•When closing the TRK servo, ✓VR608 (CT BEST) is effectived.</li> <li>•When opening the TRK servo, VR605 (TE MAX) is effectived.</li> </ul> </li> <li>F-1 : When opening the TRK servo, ✓VR608 (CT BEST) is also effectived.</li> </ul>

● Names of Front Panel

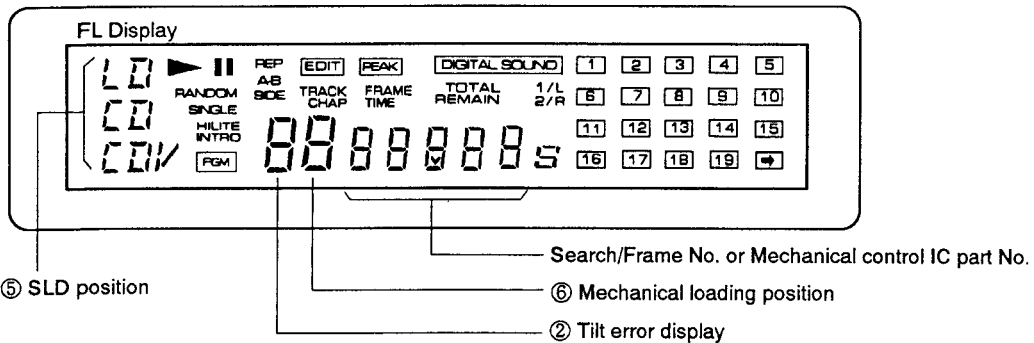
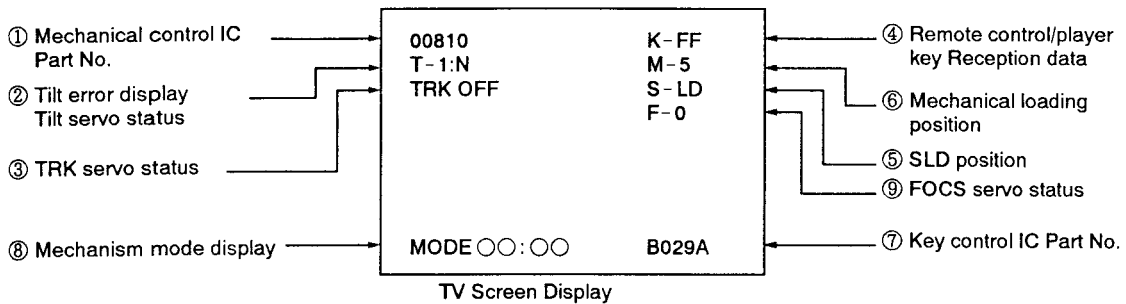




● Names of Remote Control Unit



**8.3.5 TV SCREEN AND LED DISPLAYS IN THE TEST MODE**



① The Mechanical Control IC (MAIN assembly) Part No. will be Displayed.  
PD0081A1 → 00810

② Tilt Servo Status / Tilt Error Display

T-0:00  
 Tilt servo status : N...Tilt neutral  
 ON...Tilt servo ON  
 OFF...Tilt servo OFF  
 Tilt error display: 0 Tilt -  
 ↓ Tilt neutral  
 F Tilt +

③ TRK Servo Status

TV screen display

TRK-○○○

↑ ON...TRK servo close  
OFF...TRK servo open

④ Remote Control / Player Key Reception Data

TV screen display

K-○○

↑ See table below

Code	Function	Code	Function	Code	Function	Code	Function
00	0	20	F JOG0	40	(CHAP / TRK)	60	
01	1	21	F JOG1	41	(FRAM / TIM)	61	
02	2	22	F JOG2	42	(SEARCH)	62	
03	3	23	F JOG3	43	DISPLAY	63	
04	4	24	R JOG0	44	REPEAT B	64	
05	5	25	R JOG1	45	CLEAR	65	
06	6	26	R JOG2	46	SPEED -	66	
07	7	27	R JOG3	47	SPEED +	67	
08	8	28		48	REPEAT A	68	
09	9	29		49	(2 / R)	69	
0A	VOLUME +	2A		4A	(STEREO)	6A	
0B	VOLUME -	2B		4B	(1 / L)	6B	
0C	DGT / ANL	2C		4C	PROGRAM	6C	
0D		2D		4D		6D	PLAY / PAUSE
0E	CX ON/OFF	2E		4E		6E	STOP
0F	(TV / LDP)	2F		4F		6F	OPEN / CLOSE
10	(F-SCAN)	30		50	F-STEP	70	
11	(R-SCAN)	31		51		71	DIRECT CD
12		32		52	F-SKIP	72	PEAK
13	CHAP / FRME	33		53	R-SKIP	73	SINGLE
14		34		54	R-STEP	74	
15		35		55	R-MULT	75	
16	STOP / OPEN	36		56		76	
17	PLAY/SERCH	37	DGT LEVEL	57		77	
18	PAUSE	38		58	F-MULT	78	
19		39		59		79	
1A	(POW ON)	3A		5A	HILIT / INTR	7A	
1B	(POW OFF)	3B		5B		7B	
1C	POW ON/OFF	3C		5C		7C	
1D	EDIT	3D		5D		7D	
1E	AUDIO	3E		5E	RNDM (TEST)	7E	
1F	+10	3F		5F	(ESC)	7F	

⑤ SLD Position

TV screen display

S-○○○

↑ IN ... CD inside SW ON  
CD ... CD active area  
CDV ... CDV active area  
LD ... LD active area

⑥ Mechanical Loading Position

TV screen display

M-○

↑ 0 ... Tray open  
1 ... Loading  
2 ... Standby  
3 ... Clamped  
5 ... Tilt minus  
6 ... Tilt neutral (one side)  
7 ... Tilt plus  
8 ... Tilt limit  
9 ... B side clamped (two sides)

⑦ Focus Offset VR Status

TV screen display

F-○

↑ 0 ... Normal mode  
•When closing the TRK servo, VR606 (CT BEST) is effected.  
•When opening the TRK servo, VR605 (TE MAX) is effected.  
1 ... When opening the TRK servo, VR606 (CT BEST) is also effected.

**8.4 ADJUSTMENTS**

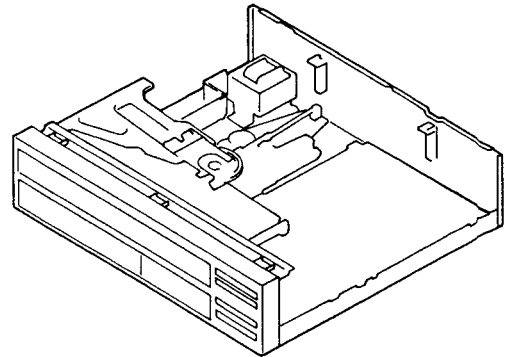
**8.4.1 Required Instruments**

- Small screwdriver (7 cm shaft)
- Small Phillips screwdriver (15 cm shaft)
- Low - pass filter (47k ohms+1 μF / BP)
- Dual - trace oscilloscope (with delay)
- AF oscillator
- Frequency counter
- LD test disc (GGV1003)
- 8 - inch LDD disc
- CDV disc
- Short clip
- TV monitor
- Resistor (100k ohms, 330k ohms)
- Capacitor (0.01 μF)
- Remote control unit
- 2mm hexagonal wrench

**8.4.2 Adjustment Preparation and Notes**

**1. Player Preparation**

Before perform the adjustment, remove the bonnet and the disc tray. Then place the player horizontally on a flat surface.



**2. Disc Insertion**

Insert the disc from the rear of the player. Place it securely on the turntable. When the PLAY key is pressed, the clamper will go down and secure the disc. Playback will then begin.

**3. Use All the Oscilloscope's Probes at 10:1.**

**4. Only the MAIN Assembly Needs to be Adjusted.**

Unless noted otherwise, all adjustment items and measuring instrument connections will be for the parts in the MAIN assembly.

**5. Required adjustment after Replacement of major parts.**

Adjustments	Replacements				
	Pickup	Actuator	Pre-pickup	Spindle motor	Tilt sensor
1. Tilt Sensor Adjustment	⊙				⊙
2. Coarse Grating Adjustment / TRK Balance Adjustment	⊙	⊙	⊙		
3. Slider Shaft Horizontal Adjustment	⊙	⊙	⊙	○	⊙
4. Pickup Inclination Adjustment	⊙	⊙	⊙	○	○
5. TRKG Error Best / Crosstalk Best Adjustment	⊙	⊙	⊙	○	○
6. FOCUS SUM Level Adjustment	⊙	⊙	⊙	○	○
7. Tilt Sensor Inclination / Tilt Balance Adjustment	⊙	⊙	⊙	○	⊙
8. Spindle Motor Shaft Centering and Adjustment	⊙	⊙	⊙	⊙	
9. Fine Grating Adjustment / TRK Balance Adjustment	⊙	⊙	⊙		
10. FCS Servo Loop Gain Adjustment	⊙	⊙	⊙		
11. TRKG Servo Loop Gain Adjustment	⊙	⊙	⊙		
12. RF Gain Adjustment	⊙	⊙	⊙		

*Note: Adjustments indicated by a ○ are made only when there is crosstalk.*

### 8.4.3 MECHANICAL ADJUSTMENTS

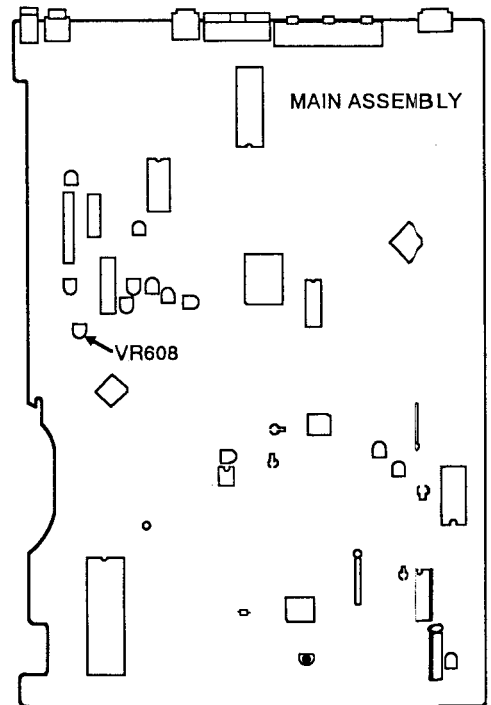
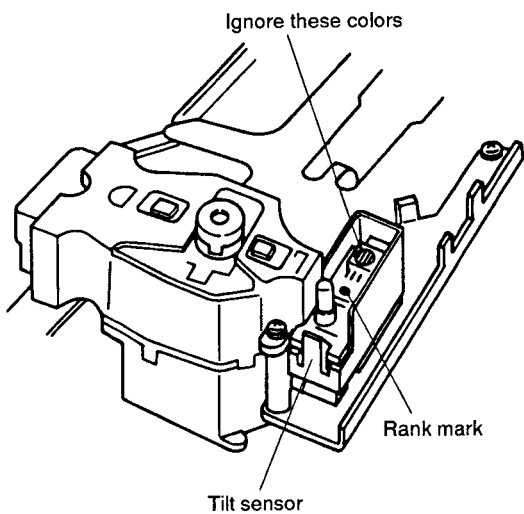
#### 1. TILT SERVO GAIN ADJUSTMENT

Mechanical Adjustment

- Purpose: Adjustment of the tilt servo's gain according to the tilt sensor's sensitivity rank.
- When not properly adjusted: Increased tilt servo hunting and increased crosstalk.

- Measuring instruments and jigs:
- Measuring point:
- Test disc and player mode
- Positions to be adjusted
- Small screwdriver
- VR608

#### Connection diagram



#### Adjustment Procedure

1. Use a screwdriver to adjust the angle of VR608 on the MAIN assembly according to the rank indicator's color.

Rank	Color	VR Angle
A	Red	Clockwise all the way
B	Clear	Mechanical center
C	Blue	Counterclockwise all the way

## 2. COARSE ADJUSTMENT OF GRATING AND TRK BALANCE

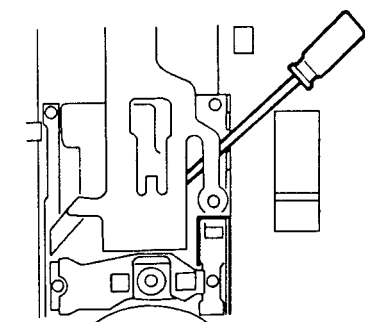
### Mechanical Adjustment

- Purpose: Adjustment of the grating angle to enable disc playback and trick playback.
- When not properly adjusted: The disc cannot be played back. Track skipping occurs.

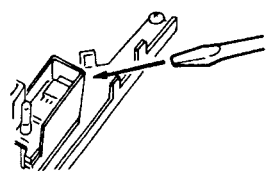
- Measuring instruments and jigs:
- Measuring point:
- Test disc and player mode
- Positions to be adjusted

- TV monitor ● Small screwdriver ● Oscilloscope
- CN401 - 8 (TRK ERR) and GND
- 8-inch LD test disc (GGV1003)
- Test Mode (Disc playback, TRK servo open, Tilt servo OFF)
- Pickup assembly grating
- VR602 (TRK BAL).

#### Connection diagram



(Top view)  
Screwdriver inserting direction



Insert the screwdriver to the slot horizontally for the base.

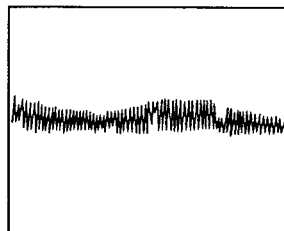
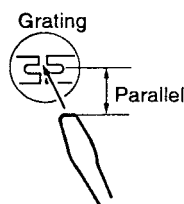


Fig.1 Null Point

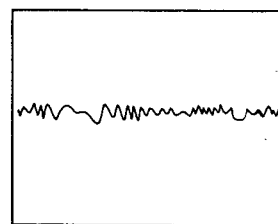
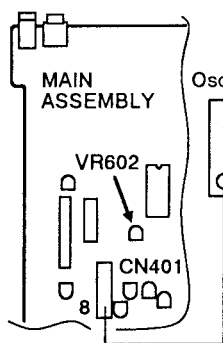


Fig.2 This is not the null point.



Oscilloscope  
Oscilloscope range  
X:50mV / div  
Y:5mS / div  
DC input

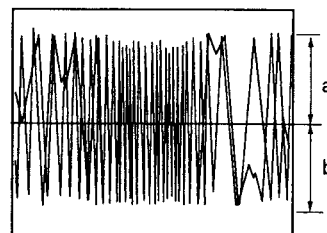


Fig.3 Maximum TRK error.

The positive and negative levels are equal.

#### Adjustment Procedure

##### Coarse grating adjustment

1. Insert the test disc and press the PLAY key.
2. Search for frame #15,000 or thereabouts.
3. Open the TRK servo.
4. Connect CN401 - 8 to the oscilloscope and observe the waveform.
5. Slide the tip of a small screwdriver through the guide and insert it horizontally into the grating adjustment slit. Adjust grating angle so that the waveform becomes small and its envelope is smooth. (This point is called null point.) (See Fig. 1 and Fig. 2.)
6. Turn the screwdriver counterclockwise until the TRK waveform's amplitude reaches the first maximum from the null point. (See Fig. 3.)

##### TRK balance adjustment

1. Adjust VR602 so that the TRK error waveform amplitude's positive and negative level become equal. (See Fig. 3.)
2. Close the TRK servo and check if the image on the TV screen is normal.

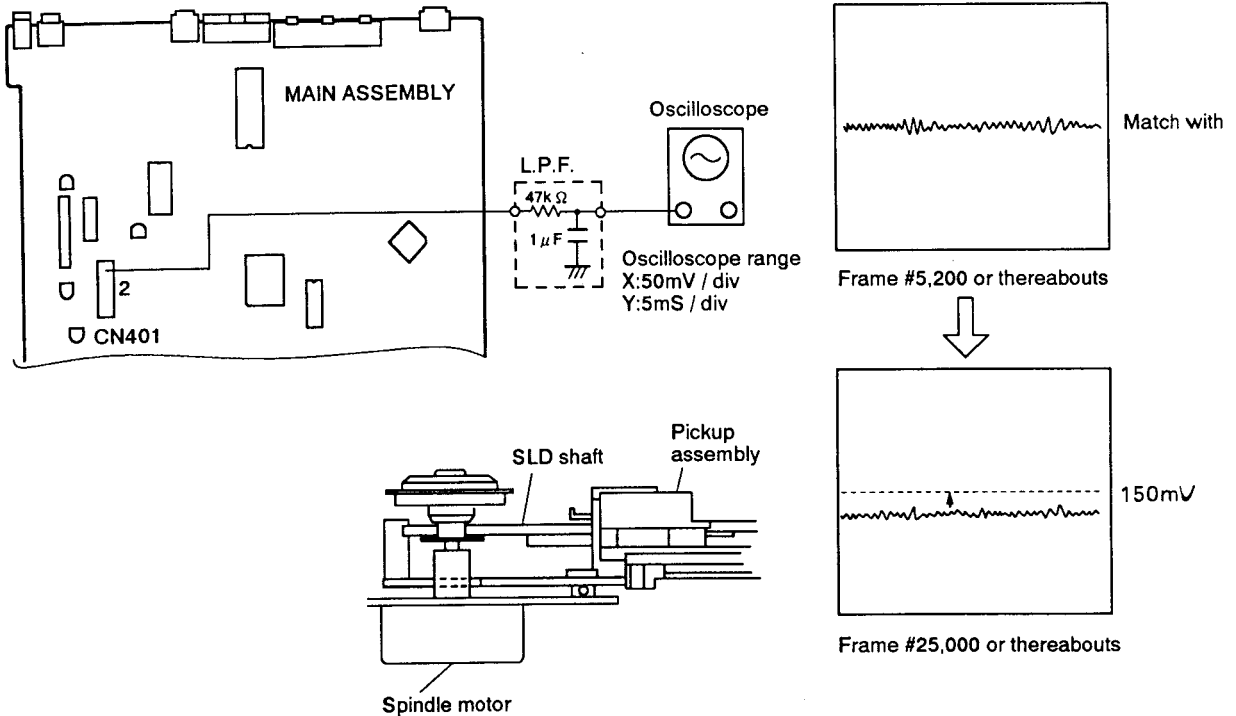
### 3. SLIDER SHFT HORIZONTAL ADJUSTMENT

Mechanical Adjustment

- Purpose: Setting the slider shaft horizontally to enable the pickup to move over the disc horizontally.
- When not properly adjusted: With a warped disc, the FCS servo does not function at the inner or outer periphery.

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>● Measuring instruments and jigs:</li> <li>● Measuring point:</li> <li>● Test disc and player mode</li> <li>● Positions to be adjusted</li> </ul> | <ul style="list-style-type: none"> <li>● Oscilloscope</li> <li>● Low-pass filter (47k <math>\Omega</math> + 1 <math>\mu</math>F)</li> <li>● CN401 - 2 (FCS RTN) and GND</li> <li>● 8-inch LD test disc GGV1003</li> <li>● Test mode (#5,200 still, TRK servo open, Tilt servo OFF)</li> <li>● Player SKIP key (In the test mode)</li> </ul> |
|--|---|

#### Connection diagram



#### Adjustment Procedure

1. Use the SCAN key to send the slider to frame #5,200 or thereabouts (tilt fulcrum) on the test disc. Open the TRK servo.
2. Connect the oscilloscope to CN401 - 2 through L.P.F. and match the center of the waveform with the oscilloscope's GND.
3. Search for frame #25,000 and use the SKIP key to adjust the center of the waveform to 150mV  $\pm$  20mV.

Note : Regarding the test mode, see page 70.

Note : This adjustment is critical in that it will affect the adjustments following.

4. PICKUP INCLINATION ADJUSTMENT

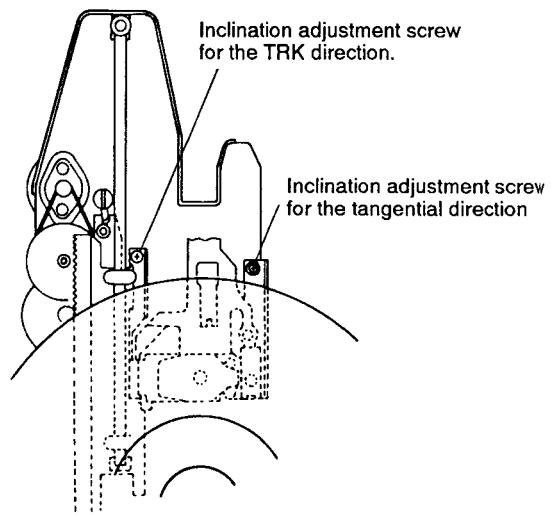
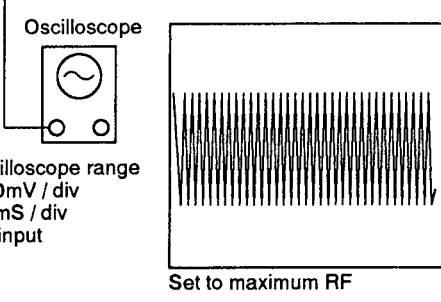
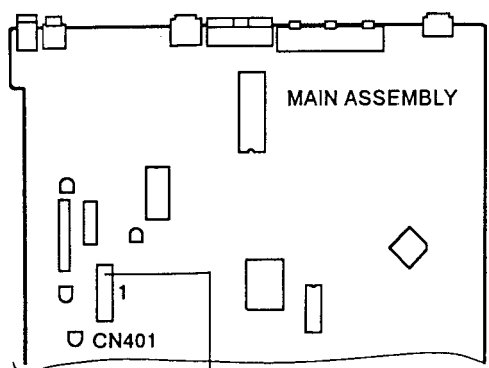
Mechanical Adjustment

- Purpose: Adjustment of the pickup inclination to direct the laser beam vertically with respect to the disc.
- When not properly adjusted: Crosstalk will be generated.

- Measuring instruments and jigs:
- Measuring point:
- Test disc and player mode
- Positions to be adjusted

- TV monitor ● Oscilloscope
- CN401 - 1 (RF)
- 8 - inch LD test disc (GGV1003)
- Test Mode (#2,701 still (Black screen))
- Pickup assembly TRK / Tangential direction inclination adjustment screws

Connection diagram



Adjustment Procedure

1. Connect the oscilloscope to CN401 - 1.
2. Search for #2,701 and observe the RF waveform.
3. Adjust the pickup's TRK / Tangential direction inclination adjustment screw to maximize the waveform's amplitude.
4. Look at the TV screen and make sure there is no crosstalk.

*Note: If there is crosstalk on the TV screen even when the RF level is at the maximum, perform next steps .*

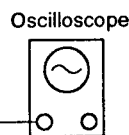
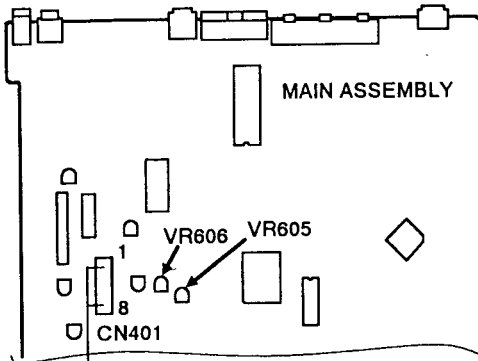
5. TRKG ERROR MAX / CROSTALK BEST ADJUSTMENT

Mechanical Adjustment

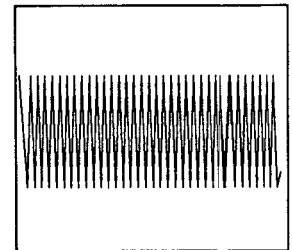
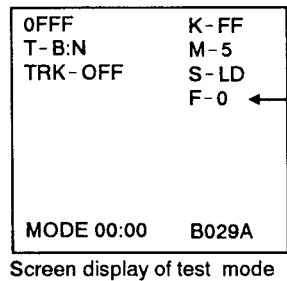
- Purpose: To set the FOCS servo to the optimum state when playing the normal playback and track jump (search).
- When not properly adjusted: Crosstalk will be generated.

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li>● Measuring instruments and jigs:</li> <li>● Measuring point:</li> <li>● Test disc and player mode</li> <li>● Positions to be adjusted</li> </ul> | <ul style="list-style-type: none"> <li>● TV monitor ● Oscilloscope</li> <li>● CN401-1 (RF) ● CN401-8 (TRK ERR) ● Player's VIDEO OUT terminal</li> <li>● 8-inch LD test disc (GGV1003)</li> <li>● Test Mode (TRK servo close / open, Tilt servo OFF)</li> <li>● VR605 (TE MAX) ● VR606 (CT BEST)</li> </ul> |
|--|--|

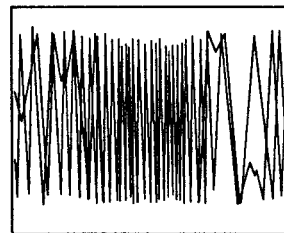
Connection diagram



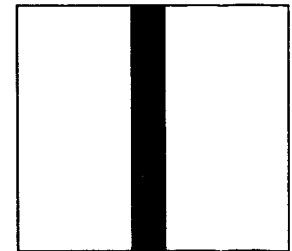
Oscilloscope range  
 X:10mV / div  
 Y:5mS / div  
 AC input



Set to maximum RF amplitude at frame #2701.



Maximize the TRKG error.



#115 crosstalk minimum

Adjustment Procedure

Note : Perform this adjustment when there is still noticeable crosstalk on the TV screen in section "4. Pickup Inclination Adjustment".

1. Connect the oscilloscope to CN401-8.
2. Open the TRK servo.
3. Confirm that the test mode screen display is F-0.  
 If not, set the MULTI-SPEED REV button of the remote control unit to F-0.
4. Adjust VR605 so that the amplitude of the TRKG error waveform becomes maximum.
5. Close the TRKG servo.

6. Connect the oscilloscope to CN401-1.
7. Press the MULTI-SPEED FWD button of the remote control unit to display "F-1" on the TV screen.
8. Search frame #2,701 and adjust VR606 so that the amplitude of the RF waveform becomes maximum.
9. Confirm that the crosstalk on the TV screen becomes minimum at frame #115.

Note : After adjustment is complete, be sure to perform "6. FOCS SUM Level Adjustment".



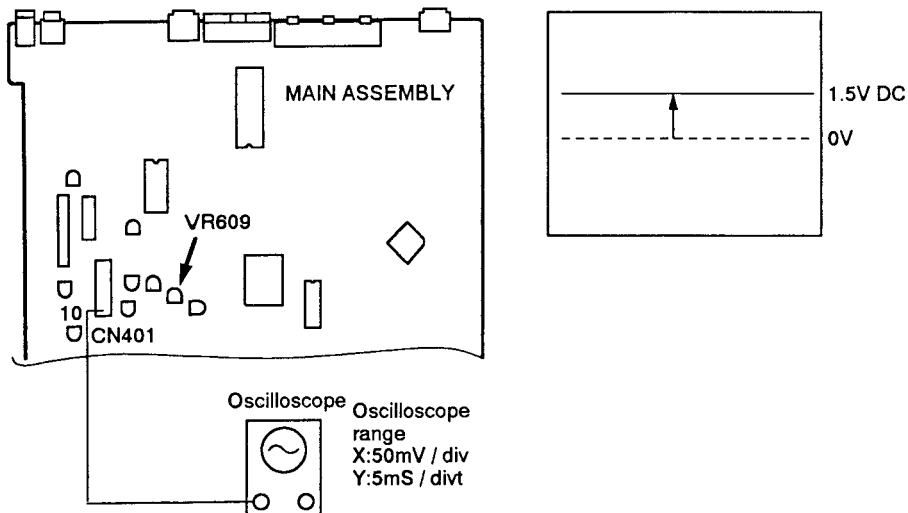
6. FOCS SUM LEVEL ADJUSTMENT

Mechanical Adjustment

- Purpose: To set the sum level (FOCS A+B) of B1 - B4 to the optimum value for activating the FOCS servo.
- When not properly adjusted: Crosstalk will be generated.

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>● Measuring instruments and jigs:</li> <li>● Measuring point:</li> <li>● Test disc and player mode</li> <li>● Positions to be adjusted</li> </ul> | <ul style="list-style-type: none"> <li>● TV monitor ● Oscilloscope</li> <li>● CN401 - 10</li> <li>● 8 - inch LD test disc (GGV1003)</li> <li>● Normal play mode</li> <li>● VR609</li> </ul> |
|--|---|

Connection diagram



Adjustment Procedure

Note: Perform this adjustment after perform the "5. TRKG Error MAX / Crosstalk Best Adjustment".

1. Connect the oscilloscope to CN401 - 10.
2. Adjust VR609 so that the voltage becomes 1.5V DC.

7. TILT SENSOR INCLINATION / TILT BALANCE ADJUSTMENT

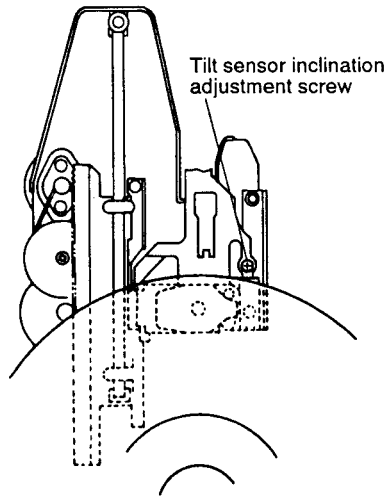
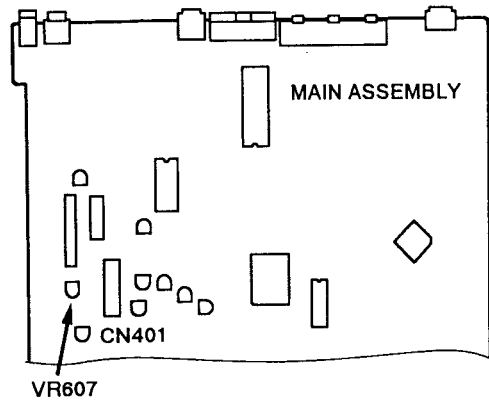
Mechanical Adjustment

- Purpose: Adjustment of the tilt sensor's inclination to direct the tilt sensor's LED vertically with respect to the disc. Also, compensation for the sensitivity difference between the two sensors.
- When not properly adjusted: Crosstalk will be generated.

- Measuring instruments and jigs:
- Measuring point:
- Test disc and player mode
- Positions to be adjusted

- TV monitor
- Small Phillips screwdriver
- Player's VIDEO OUT terminal
- 8-inch LD test disc (GGV1003)
- Test Mode (#16,200 still, TRK servo closed, Tilt servo OFF)
- Tilt sensor inclination adjustment screw
- VR607 (TILT BAL).

Connection diagram



0FFF	K-FF
T-1:N	M-5
TRK-OFF	S-LD
	F-0

Tilt status indication

MODE 00:00 B029A

TV screen display

Note: This display indicates the tilt error display's location. Other displays may differ slightly from the actual.

Adjustment Procedure

1. Search for frame #16,200 on the test disc.
2. Set VR607 to the mechanical center.
3. Adjust the tilt sensor inclination adjustment screw so that the tilt status display code is 6, 7, or 8 on the TV monitor.  
*Note : Turn the tilt sensor inclination adjustment screw clockwise more than 1/4 turn to complete the adjustment.*
4. Search for frame #115.
5. Adjust VR607 so that the tilt error display becomes 7.

8. VERIFICATION AND ADJUSTMENT OF SPINDLE MOTOR CENTERING

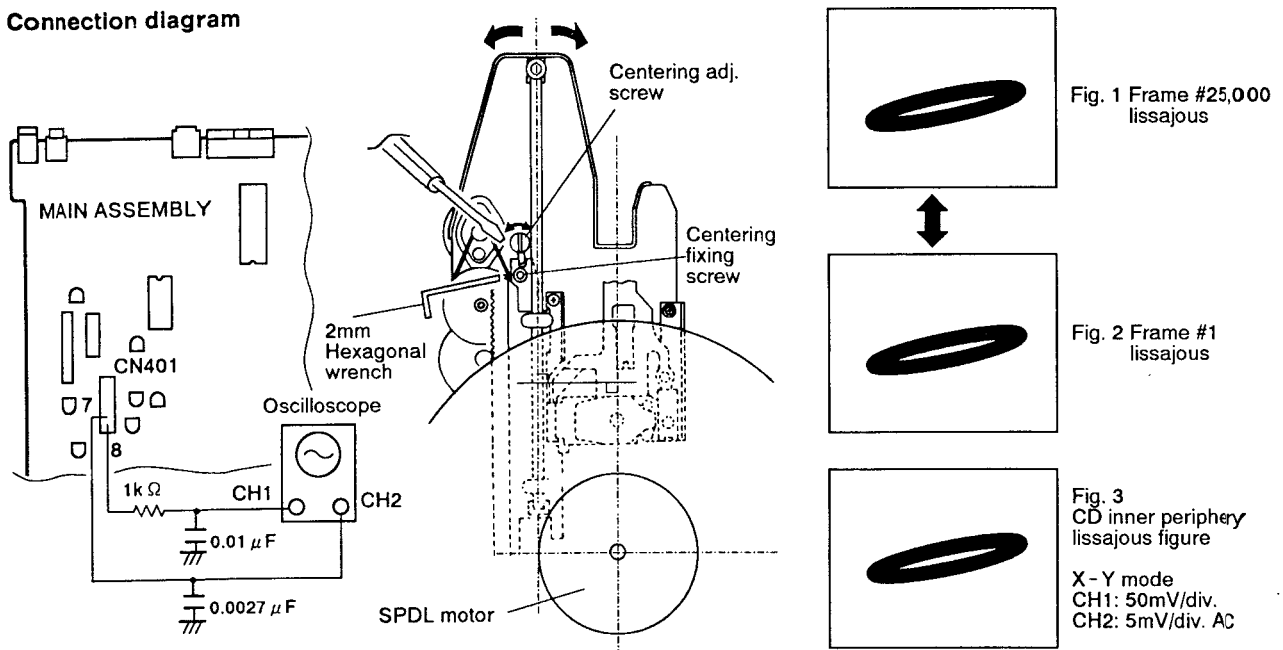
Mechanical Adjustment

- Purpose: Adjustment of the mechanical assembly position to set the spindle motor over the center of the laser beam path when the pickup assembly moves toward the inner or outer periphery of the disc.
- When not properly adjusted: There is track skipping and the search time is long.

- Measuring instruments and jigs:
- Measuring point:
- Test disc and player mode
- Positions to be adjusted

- Oscilloscope ● Small screwdriver ● L.P.F. (0.01  $\mu$ F + 1k  $\Omega$ ), (0.0027  $\mu$ F)
- 2mm Hexagonal wrench
- CH1 : CN401 - 8 (TRK ERR), CH2 : CN401 - 7 (TRK SUM)
- 8 - inch LD test disc (GGV1003)
- Test Mode (#25,000 still, #1 still, TRK servo open, TILT servo ON)
- Spindle motor centering adjustment lever

Connection diagram



Adjustment Procedure

Note: Adjust the position of the slider shaft against the center line of the SPDL motor in this adjustment.

1. Set the oscilloscope to the X-Y mode and connect CH 1 (X input) and CH 2 (Y input) to CN401 - 8 and CN401 - 7 respectively.
2. Search for frame #25,000 on the test disc and look at the lissajous figure.
3. Search for frame #1 and check if the bulge of the lissajous figure is the same as that of frame #25,000's lissajous figure.

Note: If the bulge of the lissajous waveform in step 3 differs for the inner and outer peripheries, do steps 4 to 6.

4. Search for frame #25,000 and #1 alternately. Loosen a centering fixing screw and adjust the spindle motor centering adjustment screw so that the bulge of the lissajous figures become identical.

5. Change to a compact disc and playback the inner periphery. Check if the lissajous figure is the same as the one shown in Fig. 3.

6. If the compact disc's inner periphery lissajous figure differs from the one shown in Fig. 3, repeat steps 4 to 5.

7. Fix the centering fixing screw.

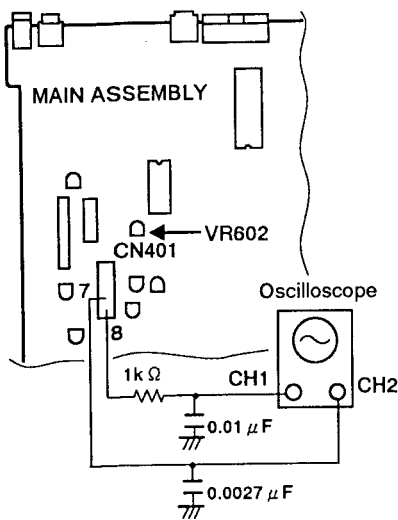
9. FINE ADJUSTMENT OF GRATING AND TRK BALANCE ADJUSTMENT

Mechanical Adjustment

- Purpose: Fine adjustment of the grating to direct the two TRK servo laser beams at the disc at the optimum position over the track.
- When not properly adjusted: There is track skipping.

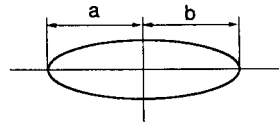
- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li>● Measuring instruments and jigs:</li> <li>● Measuring point:</li> <li>● Test disc and player mode</li> <li>● Positions to be adjusted</li> </ul> | <ul style="list-style-type: none"> <li>● Oscilloscope ● Small screwdriver ● L.P.F. (0.01 <math>\mu</math>F + 1k <math>\Omega</math> ), (0.0027 <math>\mu</math>F)</li> <li>● CH1 (X) : CN401-8 (TRK ERR), CH2 (Y) : CN401-7 (TRK SUM)</li> <li>● 8-inch LD test disc (GGV1003)</li> <li>● Test Mode (Play mode, TRK servo loop open, TILT servo ON)</li> <li>● Grating slit in the pickup assembly</li> <li>● VR602</li> </ul> |
|--|--|

Connection diagram



Set the probe to  $\times 1$  only for Y.

- Oscilloscope range:  
CH1 (X): 50mV/div.  
CH2 (Y): 5mV/div. X-Y mode



Frame #2,000  
Lissajous figure  
Y direction minimum, a=b.

Adjustment Procedure

1. Playback the test disc at frame #3,000 (inner periphery) or thereabouts.
2. Set the oscilloscope to the X-Y mode, and connect CN401-8 (TRK ERR) and CN401-7 (TRK SUM) to the X input and the Y input respectively. Then observe the lissajous figure.
3. Insert the small screwdriver tip into the grating adjustment slit. Fine adjust the grating to minimize the Y direction of the lissajous figure. (Refer to adjustment diagram on page 76.)
4. Check if "a" equals "b" for the lissajous figure. If "a" is not equal to "b", adjust VR602 (TRK BAL).
5. Close the TRK servo loop and check if the image on the TV screen is normal.

10. FCS SERVO LOOP GAIN ADJUSTMENT

Mechanical Adjustment

- Purpose: Setting the FCS servo's loop gain to the optimum setting.
- When not properly adjusted: Playability is poor.

- Measuring instruments and jigs:
- Measuring point:
- Test disc and player mode
- Positions to be adjusted

- Oscilloscope ● AF oscillator (1.7kHz / 10Vp-p) ● Resistor (47k  $\Omega$ )
- CH1 (X) : CN401 - 5 (FCS IN), CH2 (Y) : CN401 - 4 (FCS ERR)
- 8 - inch LD test disc (GGV1003)
- Test Mode (Still mode, TRK servo loop close, TILT servo ON)
- VR604

Connection diagram

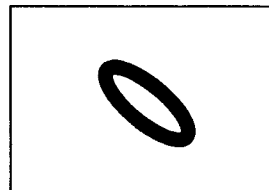
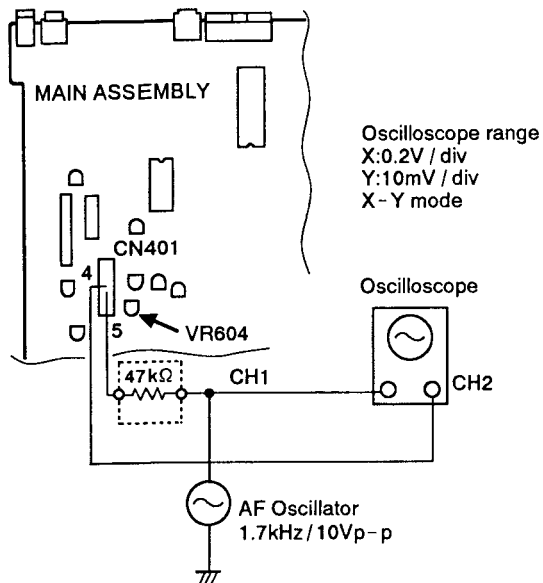


Fig. 1  
Inadequate adjustment

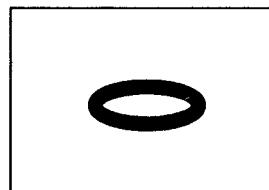


Fig. 2  
After adjustment

Adjustment Procedure

1. Search for frame #15,000 on the test disc.
2. Connect the oscilloscope to CN401 - 4 and CN401 - 5 as shown above.
3. Set the oscilloscope to the X - Y mode and observe the lissajous figure.
4. Adjust VR604 so that the lissajous figure is symmetric with respect to the X and Y axes. (See Fig. 1 and 2.)

11. TRK SERVO LOOP ADJUSTMENT

Mechanical Adjustment

- Purpose: Optimum setting of the TRK servo's loop gain.
- When not properly adjusted: Playability is poor.

- Measuring instruments and jigs:
- Measuring point:
- Test disc and player mode
- Positions to be adjusted

- Oscilloscope ● AF oscillator (3.0kHz / 10Vp-p) ● Resistor (47k  $\Omega$ )
- CH1 (X) : CN401-9 (TRK IN), CH2 (Y) : CN401-8 (TRK ERR)
- 8-inch LD test disc (GGV1003)
- Test Mode (Still mode at #15,000 (Black screen), TRK servo closed, TILT servo ON)
- VR603

Connection diagram

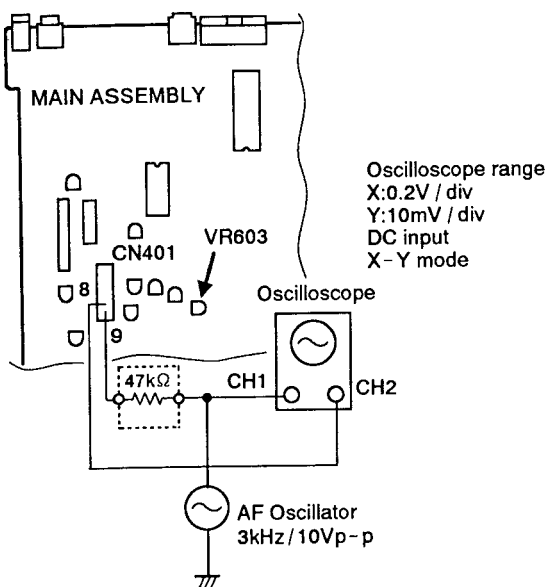


Fig. 1  
Inadequate adjustment

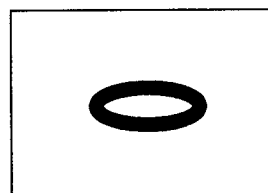


Fig. 2  
After adjustment

Adjustment Procedure

1. Search for frame #15,000 on the test disc.
2. Connect the oscilloscope to CN401-9 (TRK IN) and CN401-8 (TRK ERR) as shown in the diagram below.
3. Set the oscilloscope to the X-Y mode and observe the lissajous figure.
4. Adjust VR603 to make the lissajous figure symmetrical with respect to the X and Y axes. (See Fig. 1 and 2.)

*Note : If the waveform is not observable, either change the 47k $\Omega$  resistor to 33k $\Omega$  or increase the oscillator's output.*

12. RF GAIN ADJUSTMENT

Mechanical Adjustment

- Purpose: Optimum of the RF signal's amplitude.
- When not properly adjusted: There is prominent dropout. Scan and search operations are unstable.

- Measuring instruments and jigs:
- Measuring point:
- Test disc and player mode
- Positions to be adjusted

- Oscilloscope
- CH1 : CN401 - 1 (RF)
- 8 - inch LD test disc (GGV1003)
- Test Mode (Still mode, TRK servo loop close, TILT servo ON)
- VR601

Connection diagram

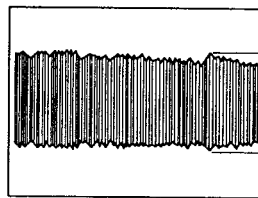
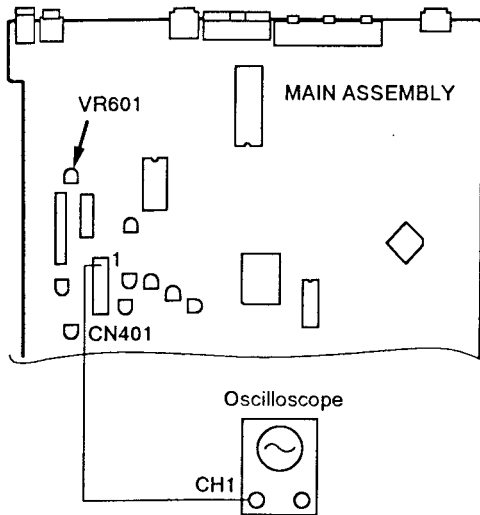


Fig. 1 RF signal

300mV ± 50mV

Oscilloscope range  
5mV/div  
2mS/div  
AC mode

Adjustment Procedure

1. Search for frame #15,000 on the test disc.
2. Connect the oscilloscope to CN401 - 1 (RF) and observe the RF signal.
3. Adjust VR601 so that the RF signal's amplitude becomes 300mV ± 50mV. (See Fig. 1.)

### 8.4.5 ELECTRICAL ADJUSTMENT

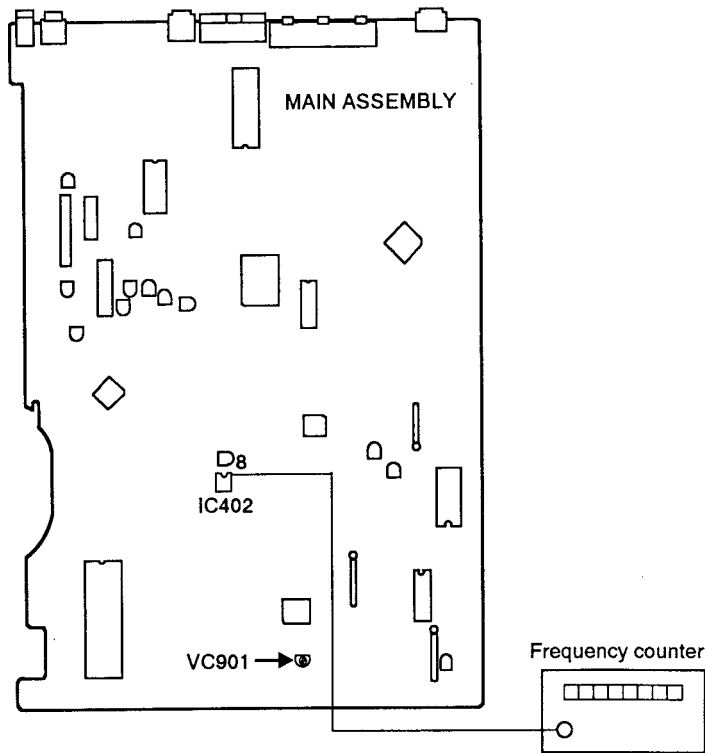
#### 13. Ref. SUB CARRIER ADJUSTMENT

Electrical Adjustment

- Purpose: Adjustment of the standard clock frequency.
- When not properly adjusted: Incorrect color tint, no TV color lock.

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li>● Measuring instruments and jigs:</li> <li>● Measuring point:</li> <li>● Test disc and player mode</li> <li>● Positions to be adjusted</li> </ul> | <ul style="list-style-type: none"> <li>● Frequency counter</li> <li>● Oscilloscope 10:1 probe</li> <li>● IC402 (PM0001) pin 8</li> <li>● Normal mode (Stop mode (Blueback screen))</li> <li>● VC901</li> </ul> |
|--|--|

**Connection diagram**



**Adjustment Procedure**

1. Adjust VC901 on the MAIN assembly so that the frequency of IC402 pin 8 becomes 3.579545MHz in the stop mode (blueback screen).

*Note : The frequency counter probe should be an oscilloscope 10 : 1 probe.*



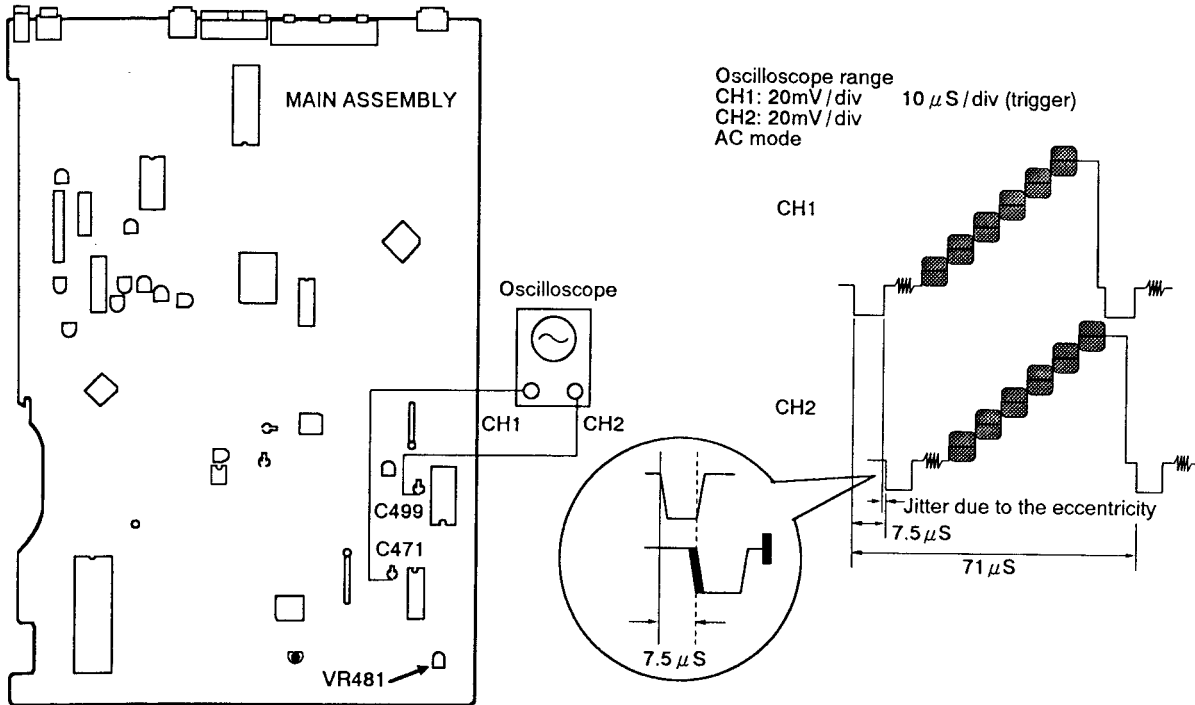
14. VCO CENTER FREQUENCY ADJUSTMENT

Electrical Adjustment

- Purpose: Setting the optimum delay time for the time base error compensation CCD.
- When not properly adjusted: Difficult to color lock, there is color lock delay after a search, and flicker on the white screen.

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li>● Measuring instruments and jigs:</li> <li>● Measuring point:</li> <li>● Test disc and player mode</li> <li>● Positions to be adjusted</li> </ul> | <ul style="list-style-type: none"> <li>● Oscilloscope</li> <li>● CH 1 : + side lead wire of C471.</li> <li>● CH 2 : + side lead wire of C499.</li> <li>● 8 - inch LD test disc (GGV1003)</li> <li>● Normal mode (Still mode)</li> <li>● VR481</li> </ul> |
|--|--|

Connection diagram



Adjustment Procedure

1. Connect the + side lead wire of C471 and the + side lead wire of C499 to CH 1 and CH 2 of the oscilloscope respectively.  
 CH 1 : Video signal before time axis error compensation.  
 CH 2 : Video signal after time base error compensation.
2. Search for frame #5,100 on the test disc. Adjust VR481 so that the center of CH 1's video signal jitter is delayed by 71 μs (1H + 7.5 μs) with respect to the CH 2's video signal.

Note : Do not confuse CH 1 and CH 2.

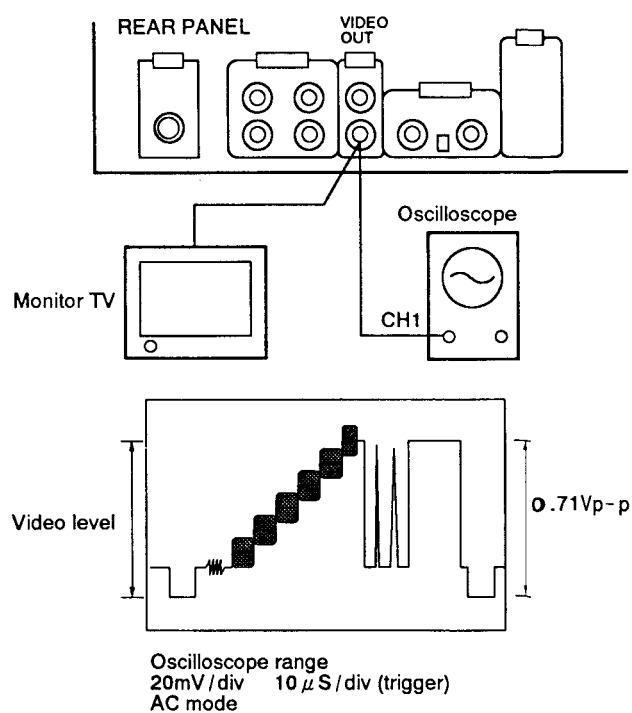
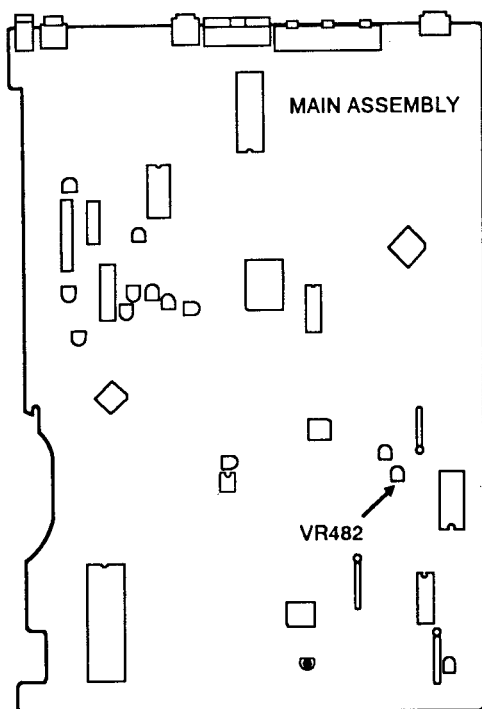
### 15. OUTPUT VIDEO LEVEL ADJUSTMENT

Electrical Adjustment

- Purpose: Setting the video signal level to 1Vp-p (75 Ω termination).
- When not properly adjusted: The player starts up midway without reading the data. The screen is too bright or too dark.

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li>● Measuring instruments and jigs:</li> <li>● Measuring point:</li> <li>● Test disc and player mode</li> <li>● Positions to be adjusted</li> </ul> | <ul style="list-style-type: none"> <li>● Oscilloscope</li> <li>● Player's VIDEO OUT terminal</li> <li>● 8-inch LD test disc (GGV1003)</li> <li>● Normal mode (Still mode, #19,900)</li> <li>● VR482</li> </ul> |
|--|--|

#### Connection diagram



#### Adjustment Procedure

Note : Since the VIDEO OUT terminal is connected to a TV monitor, it is to have 75Ω termination. (If it is connected to a TV via VHF OUT, terminate the VIDEO OUT terminal with a 75Ω resistor).

1. Search for frame #19,900 on the test disc.
2. Adjust VR482 so that the white level becomes 0.71Vp-p ± 5% from the video signal's sync tip level.

16. 1H DELAY VIDEO LEVEL ADJUSTMENT

Electrical Adjustment

- Purpose: Equalization of the video levels of the 1H delay video signal and the main line video signal.
- When not properly adjusted: If the 1H delay video signal level is high, white dropout will be noticeable and there will be H shifting. (Horizontal stripes across the screen.)

- Measuring instruments and jigs:
- Measuring point:
- Test disc and player mode
- Positions to be adjusted

- Oscilloscope
- CH 1 : - side lead wire of C443
- CH 2 : - side lead wire of C445
- 8-inch LD test disc (GGV1003)
- Normal mode (Still mode)
- VR441

Connection diagram

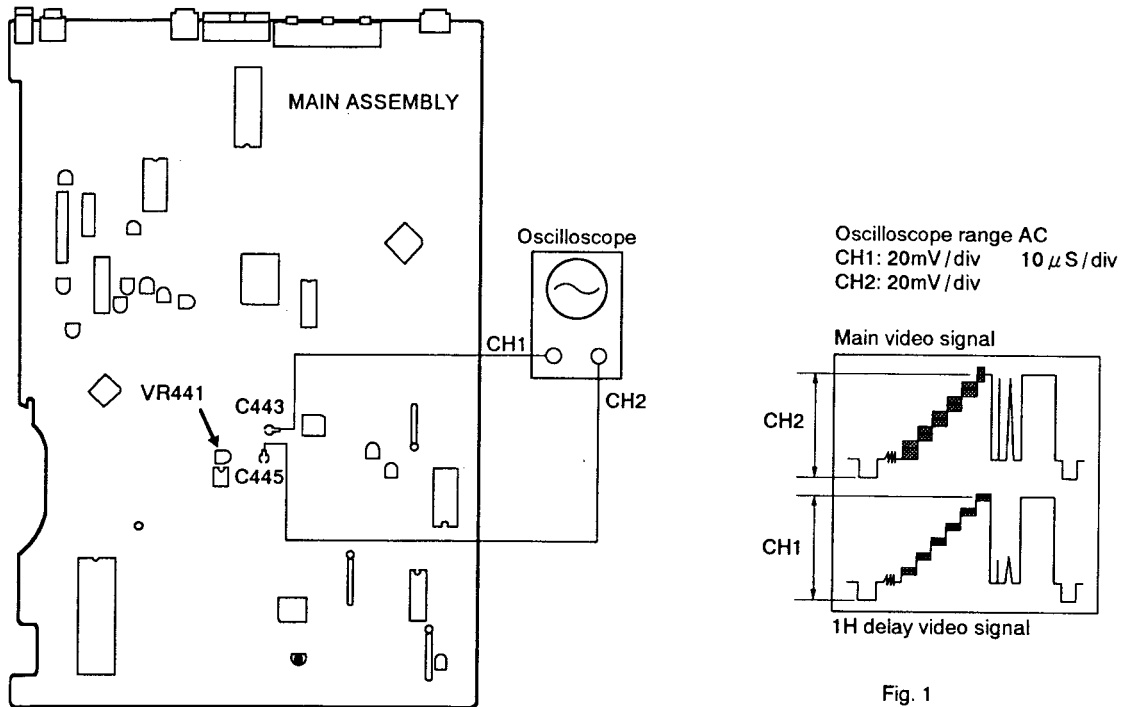


Fig. 1

Adjustment Procedure

1. Search for frame #3,800 on the test disc.
2. Connect - side lead wire of C443 to the oscilloscope's CH 1 and - side lead wire of C445 to the CH 2.
3. Adjust VR441 so that the 1H delay video level (CH 1) becomes the same as the main line video level (CH 2). (See Fig. 1)

Note : The video level is the level between the SYNC tip and the white peak.

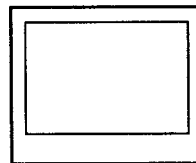
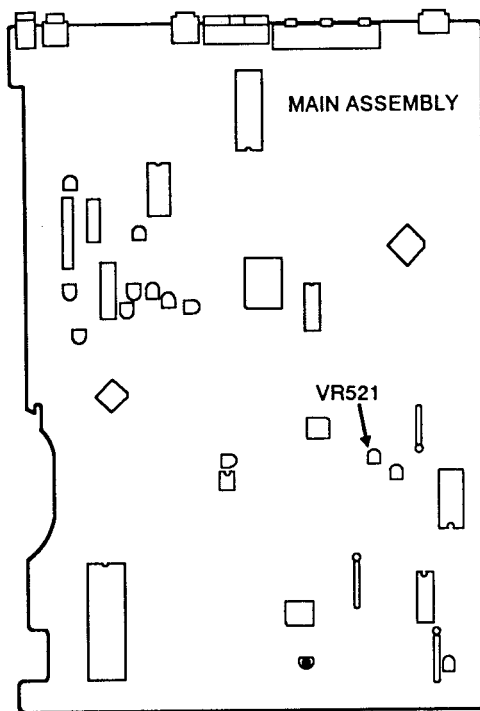
### 17. VPS ERROR ADJUSTMENT

Electrical Adjustment

- Purpose: Optimization of the color tint compensation section's error signal level.
- When not properly adjusted: Substantial color irregularity. (especially on CDV.)

- |   |   |
|---|---|
| <ul style="list-style-type: none"><li>● Measuring instruments and jigs:</li><li>● Measuring point:</li><li>● Test disc and player mode</li><li>● Positions to be adjusted</li></ul> | <ul style="list-style-type: none"><li>● TV monitor</li><li>● 8-inch LD test disc (GGV1003)</li><li>● Normal mode (Still mode)</li><li>● VR521</li></ul> |
|---|---|

#### Connection diagram



Color irregularity on the magenta screen is minimized.

#### Adjustment Procedure

1. Search for frame #8,000 on the test disc. (Magenta screen)
2. Adjust VR521 until the color irregularity on the magenta screen is minimized.

## 9. ABBREVIATIONS TABLE

<b>A</b>		<b>M</b>	
ACCEL	ACCELERATE	MTR	MOTOR
ACOM	AUDIO COMPENSATOR	μCOM	MICROCOMPUTER
AF	AUDIO FREQUENCY	<b>P</b>	
AFM	ANALOGUE FM AUDIO	PD	PHOTO DETECTOR
AGC	AUTOMATIC GAIN CONTROL	PB	PLAYBACK
ALC	AUTOMATIC LEVEL CONTROL	PLL	PHASE LOCKED LOOP
ANT	ANTENNA	P-ON	POWER ON
ATC	AUTOMATIC THRESHOLD CONTROL		
<b>B</b>		<b>R</b>	
BAL	BALANCE	R-CH	RIGHT CHANNEL
<b>C</b>		RTN	RETURN
CAV	CONSTANT ANGULAR VELOCITY	RFMD	RADIO FREQUENCY MODULATOR
CLV	CONSTANT LINEAR VELOCITY	RST	RESET
CCD	CHARGE COUPLED DEVICE	REV	REVERSE
CD	COMPACT DISC	RF-CORR	RF CORRECTION
CK	CLOCK	<b>S</b>	
CONT	CONTROL	SPDL	SPINDLE
C-SYNC	COMPOSITE SYNCHRONIZATION	SLD	SLIDER
CX	AFM NOISE REDUCTION	SO	SERIAL OUTPUT
<b>D</b>		SI	SERIAL INPUT
DEM	DEMODULATOR	SCK	SERIAL CLOCK
DIG/ANA	DIGITAL/ANALOGUE	SC	CHIP SELECT
DL	DELAY LINE	SYPS	SYSTEM POWER SUPPLY
DSP	DIGITAL SIGNAL PROCESSOR	SW	SWITCH
DOS	DROP OUT SENSE	S/H	SAMPLE & HOLD
DRV	DRIVER	SENS	SENSITIVITY
<b>E</b>		SQ	SQUELCH
EFM	EIGHT TO FOURTEEN MODULATION	<b>T</b>	
ERR	ERROR	TRK or TRKG	TRACKING
EQ	EQUALIZER	TP	TEST POINT
EXT	EXTERNAL	TBC	TIME BASE CORRECTION
<b>F</b>		TGL	TOGGLE
FCS or FOCS	FOCUS	<b>U</b>	
FG	FREQUENCY GENERATOR	UNREG	UNREGULATED
FL	FLUORESCENT LAMP	<b>V</b>	
FTS	FOCUS TRACKING SLIDER	V-SYNC	VERTICAL SYNCHRONIZATION
Fsc	CHROMINANCE SUBCARRIER FREQUENCY	VSQ	VIDEO SQUELCH
FWD	FORWARD	VPS	VIDEO PHASE SHIFTER
<b>G</b>		VDEM	VIDEO DEMODULATOR
GFS	GET FRAME SYNC LOCK	VHF	VERY HIGH FREQUENCY
GND	GROUND	VCA	VOLTAGE CONTROLLED AMPLIFIER
<b>H</b>		VCO	VOLTAGE CONTROLLED OSCILLATOR
HLD	HOLD	<b>X</b>	
H SYNC	HORIZONTAL SYNCHRONIZATION	X...	ACTIVATED WHEN LOW VOLTAGE
<b>I</b>			
INT	INTERNAL		
IR	INFRARED RAYS		
<b>L</b>			
L-CH	LEFT CHANNEL		
LAT	LATCH		
LD	LASER DIODE		
LPF	LOW PASS FILTER		
LIM	LIMITER		

## 10. SPECIFICATIONS

### 1. General

System .....	LaserVision Disc system and Compact Disc digital audio system
Laser .....	Semiconductor laser wavelength 780 nm
Power requirements	
U.S. and Canadian models .....	AC 120V, 60 Hz
Multi voltage model .....	AC 110V/120-127V/220V/240V (Switchable), 50/60 Hz
Power consumption	
U.S. and Canadian models .....	39 W
Multi voltage model .....	43 W
Weight .....	7.6 kg (16 lbs 12 oz)
Dimensions .....	420 (W) x 418 (D) x 122 (H) mm 16-9/16 (W) x 16-7/16 (D) x 4-13/16 (H) in
Operating temperature .....	+5°C ~ +35°C (41°F - 95°F)
Operating humidity .....	5% ~ 90% (There should be no condensation of moisture.)

### 2. Disc

#### LaserVision Discs

*Maximum playing times	
12-inch standard play disc .....	1 hour/both sides
12-inch extended play disc .....	2 hours/both sides
8-inch standard play disc .....	28 min/both sides 14 min/one side
8-inch extended play disc .....	40 min/both sides 20 min/one side
Spindle motor speed	
Standard play disc .....	1,800 rpm
Extended play disc .....	1,800 rpm (inner circumference) to 600 rpm (outer circumference) (For a 12-inch disc)

#### Compact Discs

DISC .....	Diameter: 5-inch, 3-inch, Thickness: 1.2 mm
Rotation direction (pickup side) .....	Counterclockwise
Linear speed .....	1.2 ~ 1.4m/sec
*Maximum playing time	
74 min. 5-inch discs	
20 min. 3-inch discs	
(For stereo playback)	

#### Compact Discs with Video

Disc .....	Diameter: 5-inch, Thickness: 1.2 mm
Rotation direction (pickup side) .....	Counterclockwise
Linear speed .....	Audio portion: 1.2 ~ 1.4m/sec Video portion: 11 ~ 12m/sec
*Maximum playing time .....	Video portion: 5 min. (CLV) Audio portion: 20 min. (Digital)

\* Actual playback time differs for each disc.

### 3. Video characteristics (two pairs)

Format .....	NTSC specifications
Video output	
Level .....	1 Vp-p nominal, sync. negative, terminated
Impedance .....	75Ω unbalanced
Jack .....	RCA jack

### 4. S-Video output

Y (luminance) - Output level .....	1 Vp-p (75 Ω)
C (color) - Output level .....	286 mVp-p (75 Ω)
Jack .....	S-VIDEO jack

### 5. Audio characteristics (two pairs)

Output level	
During analog audio output .....	200 mVrms (1 kHz, 40%)
During digital audio output .....	200 mVrms (1 kHz, -20 dB)
Jacks .....	Both RCA jacks
Number of channels .....	2

#### Digital Audio Characteristics

Frequency response	4 Hz - 20 kHz (±0.3 dB) (EIAJ)
SN ratio	112 dB (EIAJ)
Dynamic range	99 dB (EIAJ)
Channel separation	103 dB (EIAJ)
Total harmonic distortion	0.0019% (EIAJ)
Wow and flutter	Limit of measurement (EIAJ)

### 5. Other Terminals

Control input/output .....	Both miniature jacks
CD-DECK synchro .....	Miniature jack
VHF adapter output (Video/Audio) .....	Both RCA jacks with DC jack
Optical digital output .....	Optical digital jack

### 6. Accessories

Remote control unit (CU-CLD048) .....	1
Size "AAA" (IEC R03) dry cell batteries .....	2
Video cord .....	1
Audio cord .....	1
Operating instructions .....	1
Warranty card .....	1

**7. Functions**

Remote control unit operations (CU-CLD048)

	Function	Standard play Disc (CAV)	Extended play Disc (CLV)	Compact Disc with Video	Compact Disc
Basic Functions	Single-side play	YES	YES	YES	YES
	Pause	YES	YES	YES	YES
	Stop	YES	YES	YES	YES
Search	Fast forward (forward and reverse)	YES	YES	YES	YES
	Chapter/Track skip	YES	YES	YES	YES
	Direct chapter/Track number search	YES	YES	YES	YES
	Frame number search	YES	NO	NO	NO
	Time number search	NO	YES	YES	YES
	Absolute time search	NO	NO	NO	YES
Program	Chapter/Track program play	YES	YES	YES	YES
	Program correction	YES	YES	YES	YES
Repeat	Repeat between 2 points	YES	YES	YES	YES
	Memory repeat	YES	YES	YES	YES
	Chapter/Track repeat	YES	YES	YES	YES
	One-side repeat	YES	YES	YES	YES
	Program repeat	YES	YES	YES	YES
	Random repeat	YES*1	YES*1	YES	YES
	Program random repeat	YES	YES	YES	YES
Trick play	Still/Step	YES	NO	NO	NO
	Multi-speed (Forward/reverse 9-level variable)	YES	NO	NO	NO
Time display	Elapsed time display	NO	YES	YES	YES
	Absolute time display	YES*1	NO	NO	YES
	Remaining track time display	NO	NO	YES	YES
	Remaining total time display	YES*1	YES*1	YES	YES
	Total number of selections, total time display	YES*1	YES*1	YES	YES
Others	Single play	YES	YES	YES	YES
	Hi-Lite scan	NO	NO	YES*4	YES
	Intro scan	YES	YES	YES*5	NO
	Digital level control	YES*3	YES*3	YES	YES
	CX system ON/OFF	YES*2	YES*2	—	—
	AUTO DIGITAL/ANALOG switch	YES*3	YES*3	—	—
	Audio channel selection (Stereo, 1/L, 2/R)	YES	YES	YES	YES

\*1 Only discs with TOC

\*2 Valid for analog sound playing a disc with the  mark.

\*3 Can only be used with discs with digital sound tracks.

\*4 Audio part only

\*5 Video part only

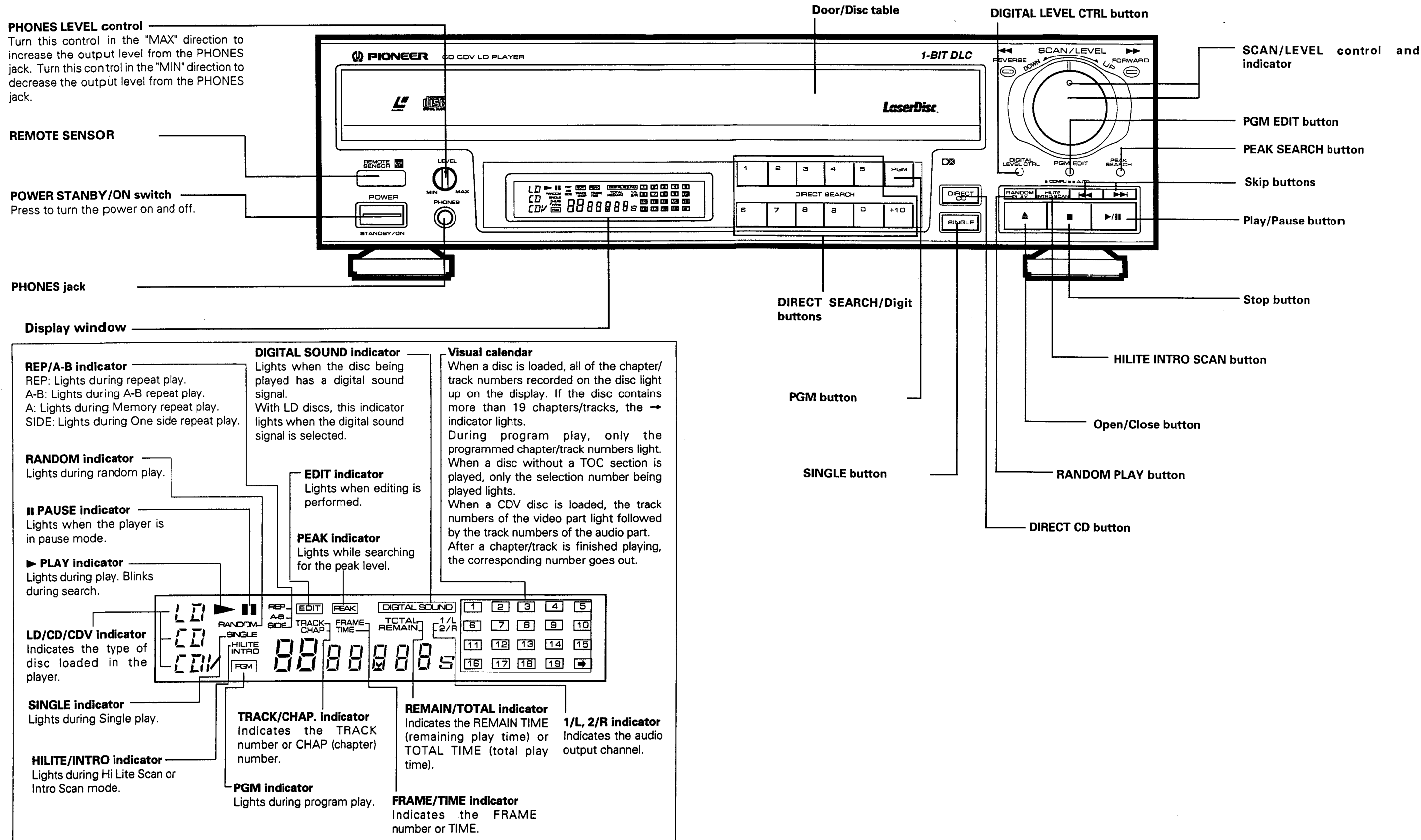
**NOTE:**

The specifications and design of this product are subject to change without notice, due to improvement.

**PLAYER FUNCTIONS**

- Display, Visual Calendar Display
- Intro Scan, Hi-Lite Scan, Direct CD, Singl Play, Digital Level Control, Peak Search, Random Playback, Program Random Playback and Compu Program/Auto Program Edit
- Digital Sound for LaserVision Discs
- Last Memory

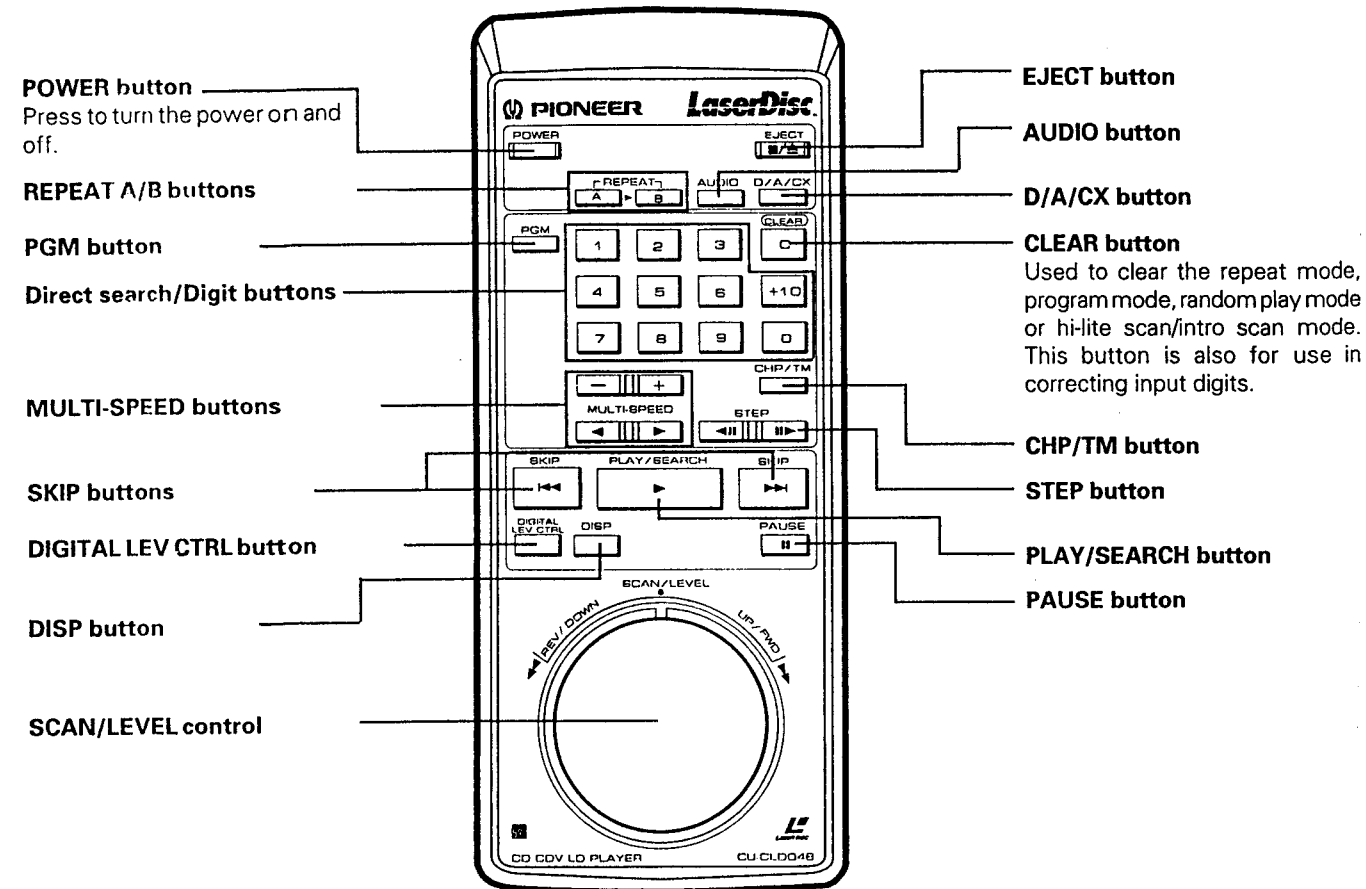
# 11. PANEL FACILITIES



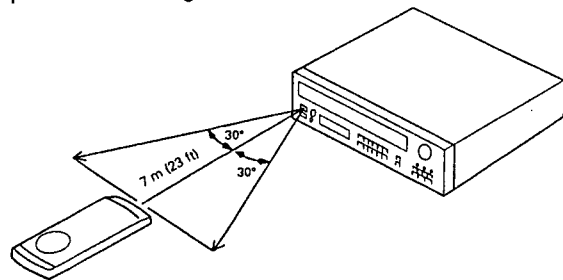


## NAMES AND FUNCTIONS OF REMOTE CONTROL UNIT COMPONENTS

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.



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 FOR USING THE REMOTE CONTROL UNIT

- If a plug is connected to the CONTROL IN terminal at the rear of the player, remote control operations cannot be done with the remote control unit aimed at the player's remote control sensor. Aim the remote control unit at the AV control center or the component display's sensor instead.

- If there is any obstacle between the remote control unit and the player, or if the unit is held at too large an angle relative to the front panel of the player, the signal from the remote control unit will fail to reach the remote sensor.
- If the player is operating in the vicinity of other appliances generating infrared rays, or if other remote control devices using infrared rays are used near the player, the player may operate improperly. Conversely, if the player's remote control unit is operated in the vicinity of other appliances which use an infrared remote control device, the other appliance may operate improperly. If this should happen, change the place of installation so that improper operation does not occur.
- If the range of operation of the remote control unit becomes too short, replace the batteries.
- When the unit is not to be used for a long period of time (more than one month), remove the batteries to prevent them from leaking inside the compartment. If leakage occurs, wipe up the liquid inside the compartment and replace the batteries with new ones.
- Do not place books or other objects on the remote control unit, since they might depress the keys and run down the batteries.