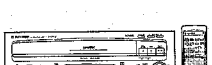
PIONEER
The Art of Entertainment

Service Manual



ORDER NO.
ARP2787

CD CDV LD PLAYER

CLD-2850

CLD-2850 HAS THE FOLLOWING :

Type	Power Requirement	Remarks
WEZ	AC220-240V	
WB	AC220-240V	

- **This manual is applicable to CLD-2850/WEZ and WB.**
- **For WB type, refer to page 75.**

CONTENTS

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IFO JUNE 1993 Printed in Japan

1. SAFETY INFORMATION

(FOR EUROPEAN MODEL ONLY)

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

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

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

LASER
Kuva 1
Lasersateilyn varoitusmerkki

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

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

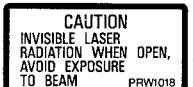
LASER DIODE CHARACTERISTICS
MAXIMUM OUTPUT POWER: 5 mw
WAVELENGTH: 780-785 nm

LASER
Picture 1
Warning sign for laser radiation

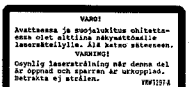
LABEL CHECK

WEZ model

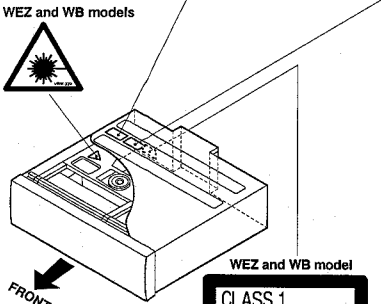
WB model



WEZ model



WEZ and WB models



WEZ and WB model

Additional Laser Caution

1. The ON/OFF statuses of the side-A/B detection switch (TURN switch on the MECHANISM assembly), slider-position detection switches (PARK 1, 2 and 3 on the MECHANISM assembly) and loading-status detection switches (SW 1, 2 and 3 on SW board assembly) are detected by the microprocessor (IC101 in the MAIN board assembly).
   To permit the laser diode to oscillate, it is required to set the side-A/B detection switch for side A (IC101 in the MAIN board assembly, pin 60 XTURN A=L and pin 61 XTURN B=H) or the slider-position detection switch for the LD ACTIVE status (PARK 1: OFF, PARK 2: OFF, PARK 3: OFF), and to set the loading-status detection switch for clamped state (SW 1:OFF, SW 2:ON, SW 3:ON). (These requirements assume that the shipping screws have been removed.) As long as these requirements are not satisfied, the laser diode will not oscillate. When the requirements are met in any way, the laser diode can oscillate. The laser diode oscillation will continue if the collector and the base of Q822 in the MAIN board assembly are shorted to each other (fault condition).
   In test mode ✱ , the laser diode oscillates when the microprocessor detects a PLAY signal, or when the PLAY key is pressed (S116 : ON in the FLKY assembly), with the above requirements satisfied.
2. When the cover is open, close viewing through the objective lens with the naked eye will cause exposure to a Class 1 laser beam.

✱ : Refer to page 84.

2. DISASSEMBLY

1. Disc Tray

①Turn the power switch on and press the OPEN button then pull the tray out from the player.
②Remove two tray stopper screws Ⓐ .
③Pull out the tray toward the front.

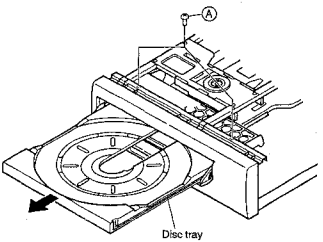


Fig. 1

Note 1: How to open the tray by hand

①Remove two screws Ⓐ for tray stopper. (Fig. 1)
②Remove the front panel. (by loosening three screws at the top side and a fixing screw of the earth lead.)
③Turn the gear pulley (Fig.2) counterclockwise by hand.
④After the disc tray is lifted up and moved toward you, pull out the disc tray toward you by hand.

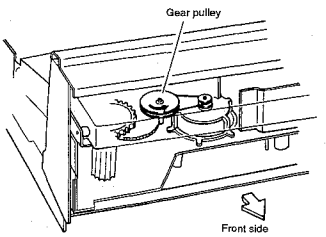


Fig. 2

2. Clamper Assembly

①Remove four screws Ⓐ to remove the clamper assembly.

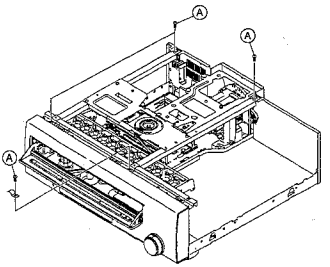


Fig. 3

3. Carriage Assembly

①Slide the carriage assembly to the shaft of the turn plate by hand.

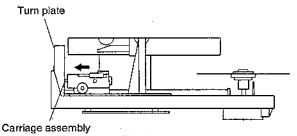


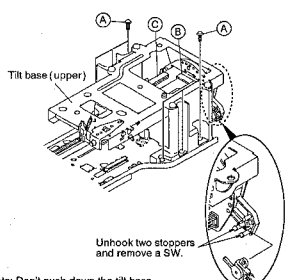
Fig. 4

②Disconnect two connectors Ⓑ and Ⓒ from the CNNB assembly to remove the flexible cable (Fig. 5).

③Remove six screws Ⓐ from the post (L) and (R) to remove the tilt base.

④Pull out the carriage assembly by setting the tilt base (upper) toward the upper (Fig. 6).

⑤Unhook two stoppers and remove a SW.



Note: Don't push down the tilt base while removing screws.

Fig.5

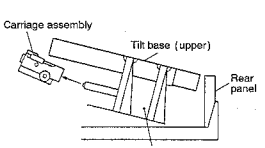


Fig. 6

• How to replace the flexible cable

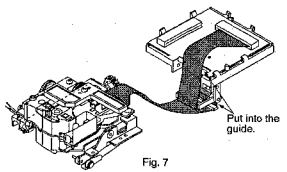


Fig. 7

4. How to install the cam gear

①Grease the cam gear. (Fig.8)

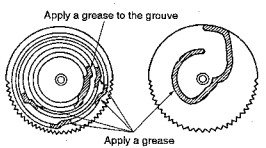


Fig. 8

②Move switch levers Ⓐ and Ⓑ (Fig.9) in the direction of arrow① (SW is ON), switch leverⒸ in the direction of arrow ② and lever Ⓓ in the direction of arrow ③.

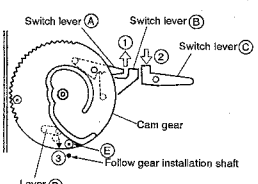


Fig. 9

③Install the cam gear in the position where projection Ⓔ of the cam gear comes to the front of the follow gear installation shaft..

5. How to install the spring slanting cam

①Grease the spring slanting cam. (Fig. 10)

②Install the cam gear when the cam gear comes to the position as shown in Fig. 9.

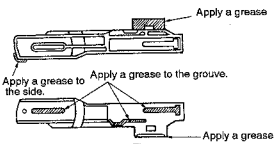


Fig. 10

③Install a nylon washer and an E ring, and hang the cam spring on the hook. (Fig.11)

Note: The cam gear and spring slanting cam as shown in Fig.11 are positioned when installing the slide cam.

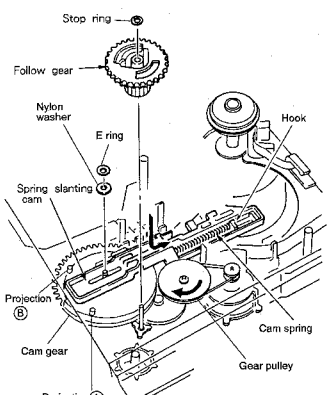


Fig. 11

6. How to install the follow gear

①Grease the follow gear. (Fig.12)

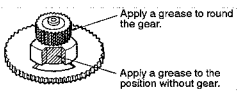


Fig. 12

②Install the follow gear where the portion of chipped tooth of the follow gear come to the position as shown in Fig. 13.

③Install the stop ring. (Fig.11)

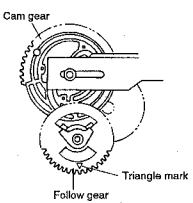


Fig. 13

7. How to install the roller plate assembly

①Mount the roller plate assembly in the position where the tooth with a triangle mark of the follow gear meshes with the gap of the gear of the roller plate assembly. (Fig.14)

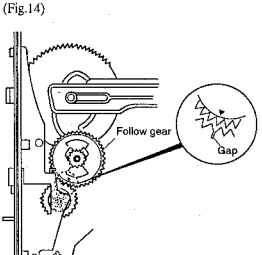


Fig. 14

8. Caution for installing the tray guide assembly

①Install the tray guide assembly in the position where projection Ⓐ of the tray guide assembly fits into the long hole Ⓑ of the chassis assembly and the long hole Ⓒ of the roller plate assembly. (Fig.15)

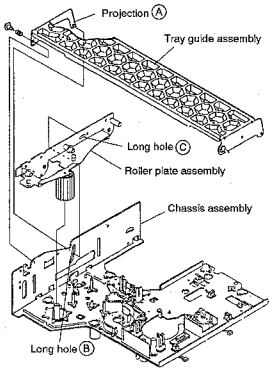


Fig. 15

9. How to install the slide cam

①Set the position of projection Ⓐ and Ⓑ of the cam gear by turning the gear pulley clockwise by hand as shown in Fig.11.

②Tighten four screws Ⓒ to install the slide cam. (Fig. 16)

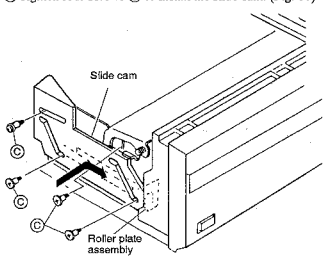


Fig. 16

10. How to install the disc tray

①Adjust the gear positions in the loading mechanism for the disc tray open status, as Ⓐ and Ⓑ mentioned below.

ⓐ : The position where the cam gear turns counter-clockwise and stops when the OPEN/CLOSE button is pressed.

ⓑ : The position where the cam gear stops when the pulley is continuously turned by hand.

②The top of one of the gear teeth of the roller plate assembly has been chipped off. Finely adjust the position of this chipped tooth by turning the gear counterclockwise so that the tooth comes halfway on the roller plate line.(Fig.17)

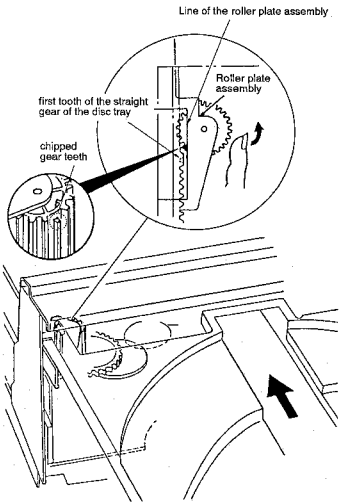


Fig. 17

③ Insert so that the first tooth of the straight gear on the rear of the disc tray meshes with the chipped gear teeth of the roller plate assembly.

④Tighten two screws Ⓐ for disc tray stopper. (Fig.1)

3. EXPLODED VIEWS, PACKING AND PARTS LIST

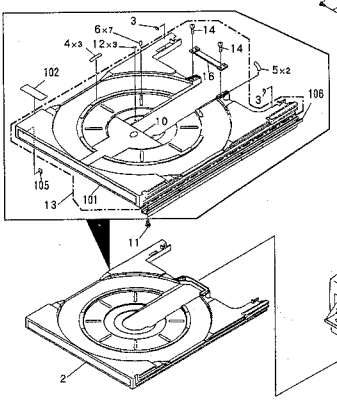
NOTES:

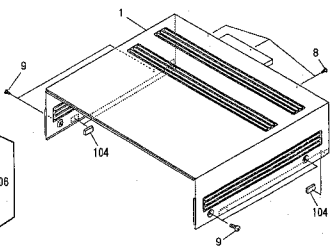
- *Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *Parts marked by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

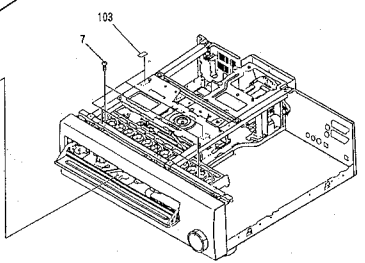
3.1 EXTERIOR SECTION

Parts List

Mark	No.	Description	Part No.
	1	Bonnet-S	VXX1535
	2	Tray assembly-S	VXX1808
	3	Tray rubber	VEB1089
	4	Disc pad (Large)	VEC1191
	5	Disc pad (B)	VEC1379
	6	Disc pad (C)	VEC1380
	7	Screw	VCZ30P120FMC
	8	Screw	BBT30P060FCC
	9	Screw	BCZ40P060FZK
	10	Transportation sheet QD	VRY1036
	11	Screw	BPZ30P080FCU
	12	CD pad	VEC1252
	13	Tray assembly	VXA1922
	14	Screw	BPZ26P060FZK
	15	• • • • •	
	16	Tray bridge	VNE1855
NSP	101	Tray	VNK2185
NSP	102	Carry label	VRW1289
NSP	103	Cushion	VEC1092
NSP	104	Cushion	VEC1004
NSP	105	Cushion	VEC1609
NSP	106	Tray reinforced plate	VNE1679





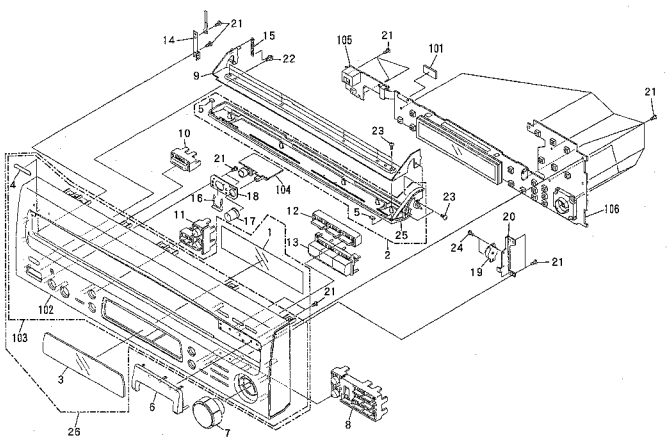


NOTE: Screws adjacent to ▼ mark on the product are used for disassembly.

3.2 FRONT PANEL SECTION

Parts List

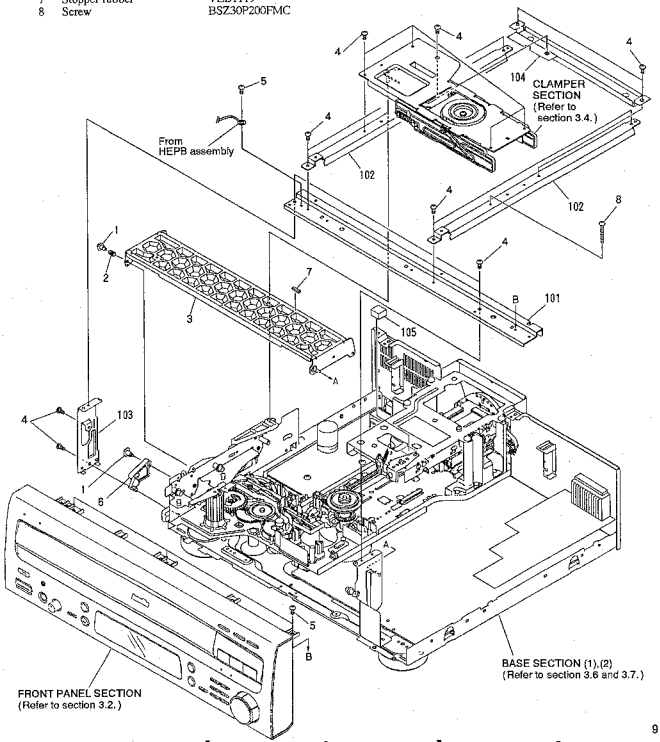
Mark	No.	Description	Part No.
	1	FL filter	VEC1591
	2	Door assembly - S	VXX1835
	3	FL lens	VEC1590
	4	Name plate	VAM1032
	5	Door rubber	VEB1106
	6	Door panel	VNK2137
	7	Shuttle knob	VNK2039
	8	Function key	VNK2147
	9	Door base assembly	VXA1790
	10	PW button	VNK2140
	11	L key assembly	VXA1896
	12	Disc side key	VNK2144
	13	Main key	VNK2138
	14	Door shaft holder	VNE1842
	15	Door spring	VBH1194
	16	Snap plate	VNE1102
	17	Volume knob	VNK2003
	18	Jack holder	VNE1863
	19	Damper assembly	VXA1053
	20	Damper plate	VNE1843
	21	Screw	BPZ26P060FCU
	22	Screw	IPZ26P060FMC
	23	Screw	BBZ20P050FZK
	24	Screw	PMZ20P040FCU
	25	Front door assembly	VXA1930
	26	Front panel assembly - S	VXX1857
NSP	101	Damp cushion	VEC1112
NSP	102	Front panel	VNK2263
NSP	103	Front panel assembly	VXA1964
NSP	104	HEPB assembly	VWV1295
NSP	105	IRPS assembly	VWG1448
NSP	106	FLKY assembly	VWG1412



3.3 TOP VIEW SECTION

Parts List

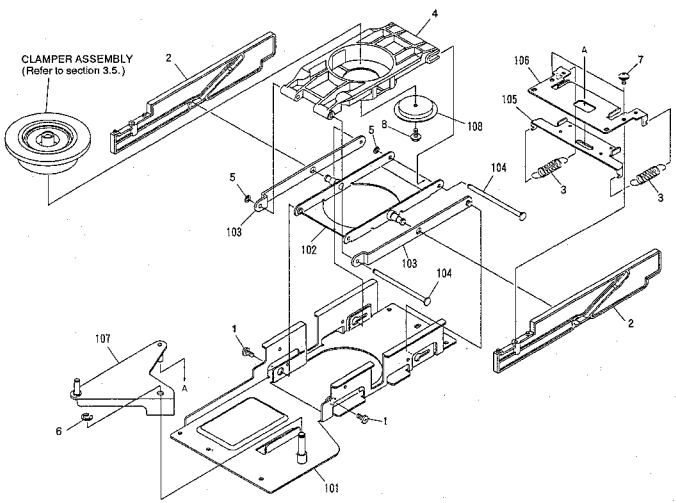
Mark	No.	Description	Part No.
	1	Screw(B)	VBA1008
	2	Arm spring	VBH1093
	3	Tray guide assembly	VXA1576
	4	Screw	BBZ30P060FCC
	5	Screw	IBZ30P060FCC
	6	Door lever	VNL1330
	7	Stopper rubber	VEB1119
	8	Screw	BSZ30P200FMC
NSP	101	Front angle	VNE1543
NSP	102	Center angle	VNE1761
NSP	103	Side stay(L)	VNE1545
NSP	104	Reinforced angle	VNE1673
NSP	105	Damp cushion	VEC1602



3.4 CLAMPER SECTION

Parts List

Mark	No.	Description	Part No.	Mark	No.	Description	Part No.
	1	Screw	VBA1022	NSP	101	Center plate assembly	VXA1506
	2	Clamp cam	VNL1527	NSP	102	Lever(B) assembly	VXA1504
	3	Limiter spring	VBH1168	NSP	103	Lever(A) assembly	VXA1503
	4	Clamper holder	VNL1305	NSP	104	Clamp shaft	VLL1299
	5	Washer	WT26D060D050	NSP	105	Limiter plate	VNE1551
	6	E ring	YE40FUC	NSP	106	Slide plate	VNE1556
	7	Screw	IPZ30P060FMC	NSP	107	Lever(C) assembly	VXA1505
	8	Screw	PMB30P080FMC	NSP	108	Clamper head	VNE1546

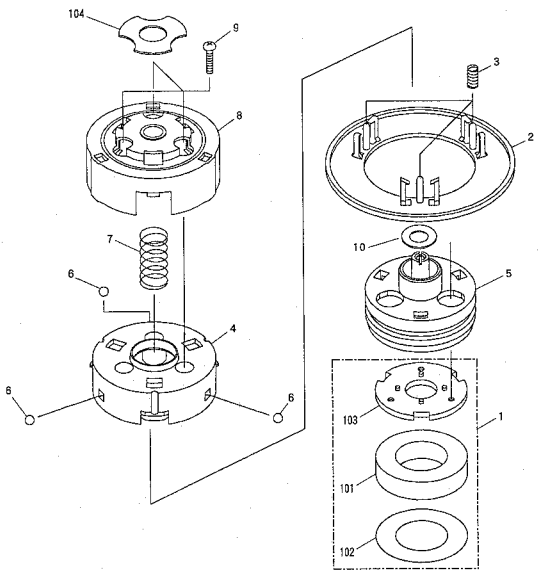


3.5 CLAMPER ASSEMBLY

Parts List

Mark	No.	Description	Part No.
	1	Magnet assembly - S	VXX1475
	2	Disc clamper	VNL1362
	3	Clamper spring	VBH1153
	4	Clamper base	VNL1364
	5	Centering hab(B)	VNL1435
	6	Steel ball	VNX1006
	7	Centering spring(B)	VBH1130
	8	Clamper cover	VNL1363
	9	Screw	AMZ20P040FMC
	10	Washer	WA60F115M160

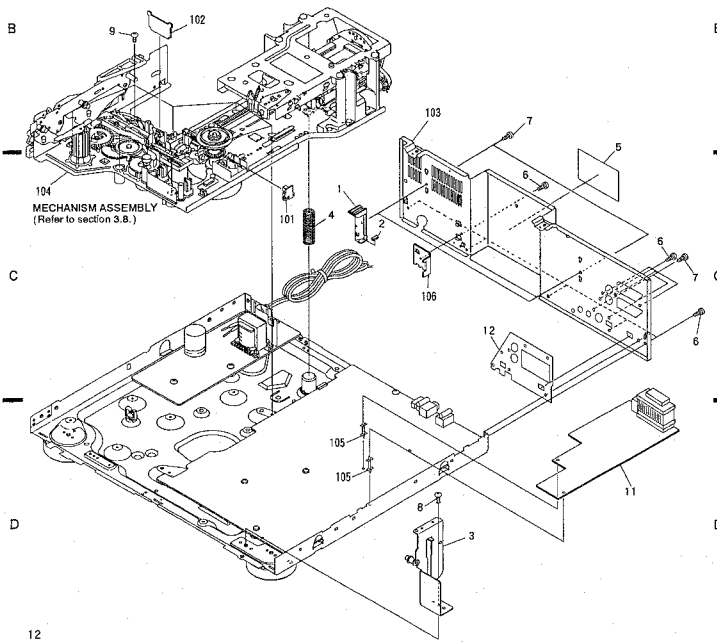
Mark	No.	Description	Part No.
NSP	101	Magnet	VMG1010
NSP	102	Gap sheet	VEC1561
NSP	103	Clamper plate	VNE1549
NSP	104	Absorber rubber(A)	VEB1146



3.6 BASE SECTION (1)

Parts List

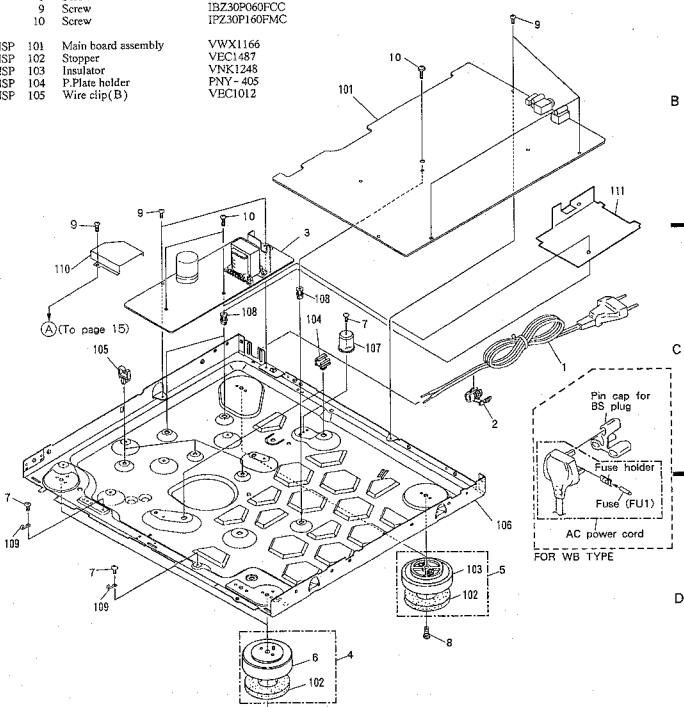
Mark	No.	Description	Part No.
	1	Tray stopper	VNL1202
	2	Door damp rubber	VEB1033
	3	Side stay (R) assembly	VXA1690
	4	Base spring	VBH1145
	5	Model name label	VRW1309
	6	Screw	BBT30P060FCC
	7	Screw	BPZ30P080FCU
	8	Screw	BBZ30P060FCC
	9	Screw	VBA1023
	10	• • • • •	
	11	DSCB assembly	VWV1305
	12	Rear earth	VNE1876
NSP	101	FG board assembly	VWG1358
NSP	102	SW board assembly	VWG1359
	103	Rear panel	VNA1319
NSP	104	Mechanism assembly	VWT1097
NSP	105	PC support	VEC1415
NSP	106	TB holder	VNE1612



3.7 BASE SECTION (2)

Parts List

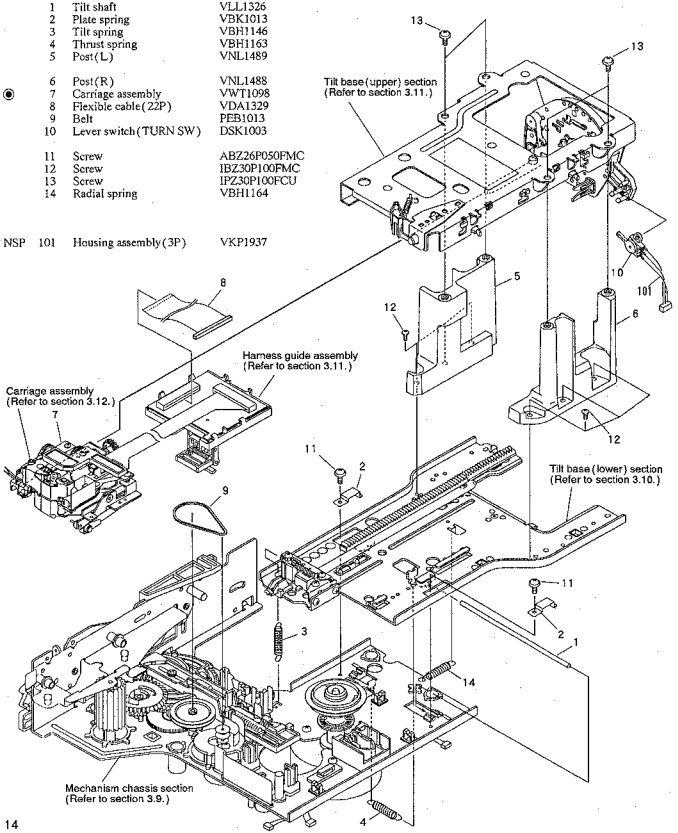
Mark	No.	Description	Part No.
⚠	1	AC power cord	PDG1003
⚠	2	Cord stopper	CM-22B
	3	SYPS assembly	VWR1144
	4	Insulator assembly	VXA1686
	5	Insulator assembly	VXA1687
	6	Insulator	VNK1095
	7	Screw	BBZ30P060FCC
	8	Screw	BBZ30P080FCC
	9	Screw	IBZ30P060FCC
	10	Screw	IPZ30P160FMC
NSP	101	Main board assembly	VWX1166
NSP	102	Stopper	VEC1487
NSP	103	Insulator	VNK1248
NSP	104	P.Plate holder	PNY-405
NSP	105	Wire clip(B)	VEC1012
NSP	106	Base chassis	VNA1254
NSP	107	Spring guide	VNL1343
NSP	108	PCB spacer	PNY-404
NSP	109	Cord holder	ZD9-061
NSP	110	Heat guard	VNE1864
NSP	111	Power board insulation sheet	VEC1492



3.8 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	VWT1098
	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
NSP	101	Housing assembly(3P)	VKP1937

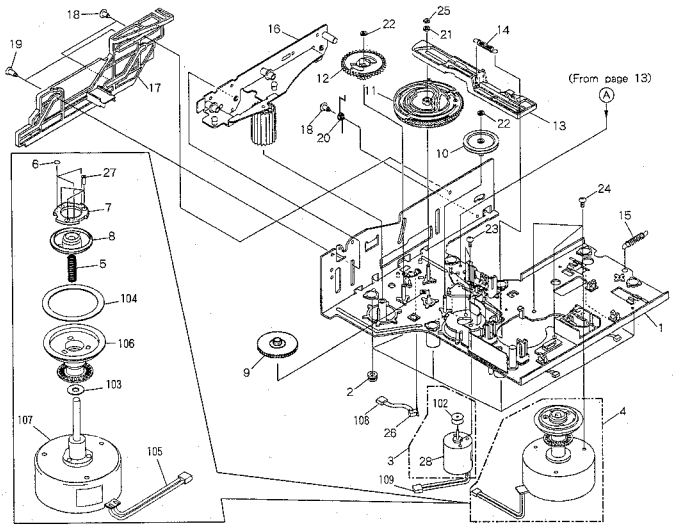


3.9 MECHANISM CHASSIS SECTION

Parts list

Mark	No.	Description	Part No.
◉	1	Chassis assembly	VXA1577
	2	Rubber bushing	VEB1138
	3	Loading motor assembly	VXX1262
⚠	4	Spindle motor assembly	VXA2003
	5	Centering spring	VBH1024
	6	Sheet	VEB1194
	7	Yoke plate A	VNE1835
	8	Centering hab(A)	VNL1296
	9	Two stair gear	VNL1326
	10	Gear pulley	VNL1249
	11	Cam gear	VNL1350
	12	Follow gear	VNL1317
	13	Spring slanting cam	VNL1316
	14	Cam spring	VBH1082
	15	Radial spring	VBH1164
	16	Roller plate assembly	VXA1770
	17	Slide cam	VNL1304
	18	Screw(B)	VBA1008
	19	Screw(C)	VBA1015
	20	Return spring	VBH1129

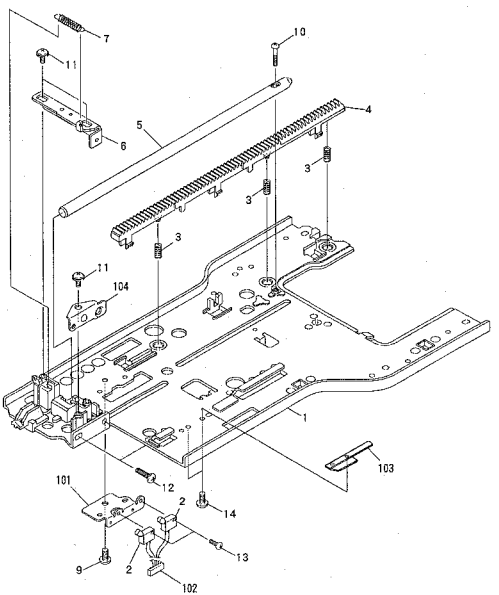
Mark	No.	Description	Part No.
	21	Washer	WA32N080W050
	22	Washer	WT26D047D025
	23	Screw	PMZ30P040FCU
	24	Screw	PMA30P050FCU
	25	E ring	YE23FUC
	26	Push switch (TRAY SW)	DSG1014
	27	Screw	CPZ20P080FMC
	28	Loading motor	VXM1034
	101	• • • • •	
NSP	102	Motor pulley	VLL1176
NSP	103	Oil stopped washer	VBF1002
NSP	104	Rubber sheet	VEB1135
NSP	105	Housing assembly(02P)	VKP1566
NSP	106	Turn table assembly	VXA1760
NSP	107	Spindle motor	VXM1053
NSP	108	Housing assembly(02P red)	VKP1815
NSP	109	Housing assembly	VKP1875



3.10 TILT BASE (LOWER) SECTION

Parts list

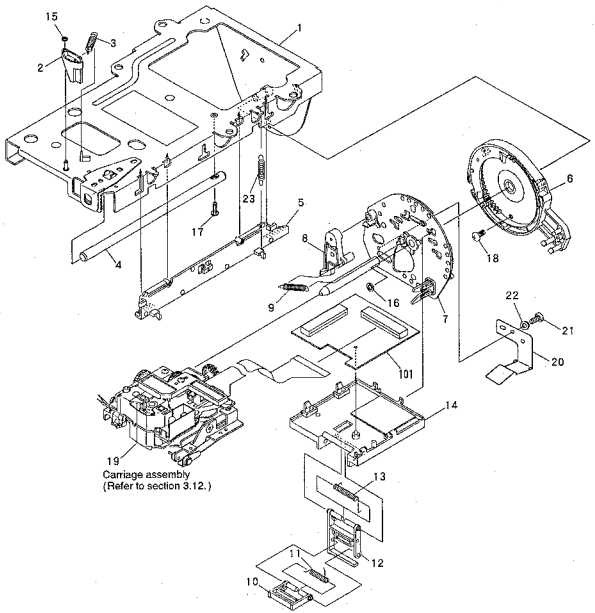
Mark	No.	Description	Part No.	Mark	No.	Description	Part No.
◉	1	Tilt base (Lower) assembly	VXA1798		11	Screw	IPZ20P080FMC
	2	Slide switch (LD,CDV INSIDE)	QSH1001		12	Screw	BMZ26P100FMC
					13	Screw	PMZ20P060FMC
	3	Rack spring	VBH1133		14	Screw	PMZ20P030FMC
	4	Rack gear (Lower)	VNL1346				
	5	Carriage shaft (Lower)	VLL1325				
	6	Shaft plate (Lower) assembly	VXA1626	NSP	101	SW holder	VNE1620
	7	S plate spring	VBH1149	NSP	102	Housing assembly (04P white)	VKP1851
	8	• • • • •					
	9	Screw	BBZ30P060FCC	NSP	103	Roller shaft holder plate	VNE1666
	10	Screw	PPZ20P120FMC	NSP	104	S plate holder	VNE1621



3.11 TILT BASE (UPPER) SECTION

Parts list

Mark	No.	Description	Part No.
	1	Tilt base (Upper) assembly	VXA1808
	2	SW lever	VNL1359
	3	SW lever spring	VBH1150
	4	Carriage shaft (Upper)	VLL1324
	5	Rack gear (Upper)	VNL1345
	6	Internal gear assembly	VXA1903
◉	7	R plate assembly	VXA1579
	8	Rock lever	VNL1351
	9	Lever spring	RBH1323
	10	Harness guide (C)	VNL1361
	11	Guide spring (B)	VBH1155
	12	Harness guide (B)	VNL1408
	13	Guide spring (A)	VBH1166
	14	Harness guide (A)	VNL1349
	15	Washer	WT16D032D025
	16	Washer	WT36D072D050
	17	Screw	PMZ20P120FMC
	18	Screw	BBZ26P050FCC
	19	Carriage assembly	VWT1098
	20	Rock plate	VBK1026
	21	Screw	IBZ20P040FZK
	22	Washer	WB20FMC
	23	Rack spring (upper)	VBH1198
NSP	101	CNNB assembly	VWG1194

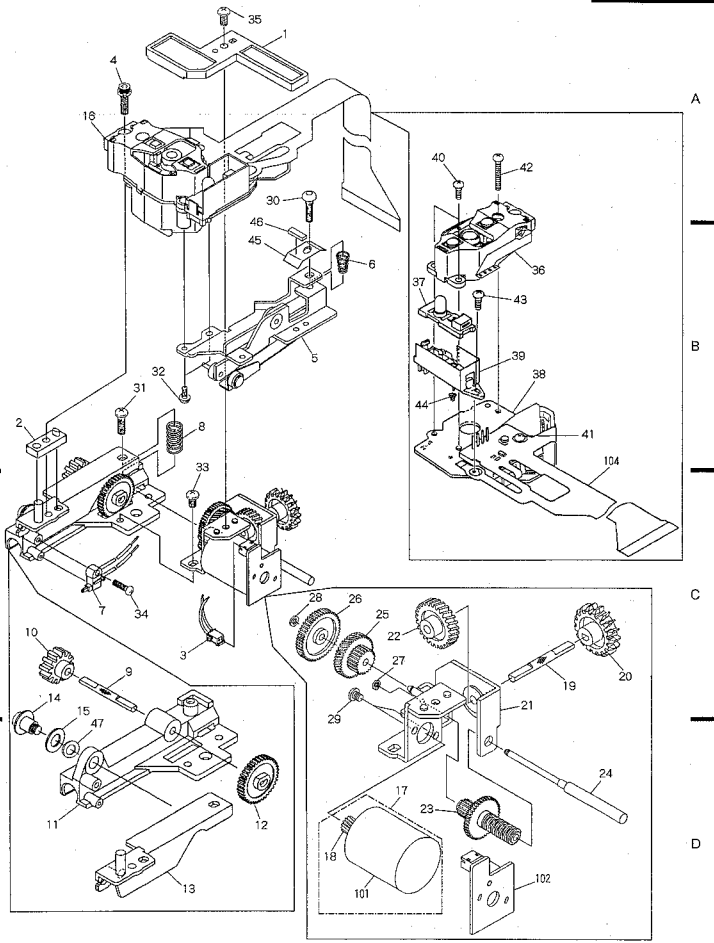


3.12 CARRIAGE ASSEMBLY

Parts list

Mark	No.	Description	Part No.
	1	Flexible holder	VNL1358
	2	PU base	VNT1037
	3	Housing assembly (1.5MP2P)	VKP1852
	4	Bolt 2.6 × 10	VLL1192
	5	TAN base assembly	VXA1752
	6	TAN spring	VBH1151
	7	Slide switch (CD,B INSIDE)	VSK1008
	8	TRKG spring	VBH1204
	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	VXX1856
	17	Carriage motor assembly-S	VXX1537
	18	SL gear(A)	VNL1250
	19	SL shaft(C)	VLL1289
	20	Gear(G)	VNL1365
	21	Motor holder assembly	VXA1939
	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	PBZ20P080FMC
	35	Screw	BBZ26P050FMC
	36	Actuator assembly	VXX1740
	37	Sensor assembly	VEX1018
	38	Pre-pickup assembly	VXX1855
	39	Sensor stay	VNH1037
	40	Screw	PMA20P060FMC
	41	Screw	PMA20P080FMC
	42	Screw	PMA20P160FMC
	43	Screw	BMZ20P060FMC
	44	Sensor spring	VBH1087
	45	Spacer	VEC1496
	46	Cushion	VEC1497
	47	Washer	WA42B080D010

Mark	No.	Description	Part No.
NSP	101	Slider motor	VXM1027
NSP	102	P.C.board, SLMB	VNP1295
	103	* * * * *	
NSP	104	HEAD assembly	VWV1178


1
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104
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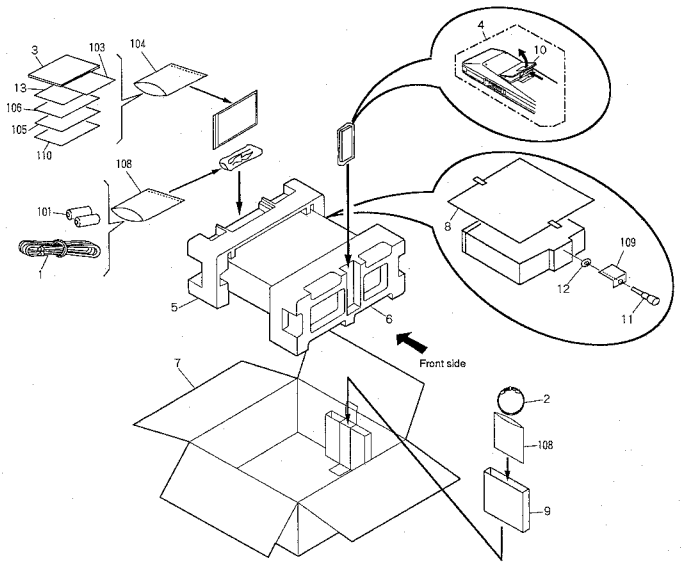
101
102

3.13 PACKING

Parts List

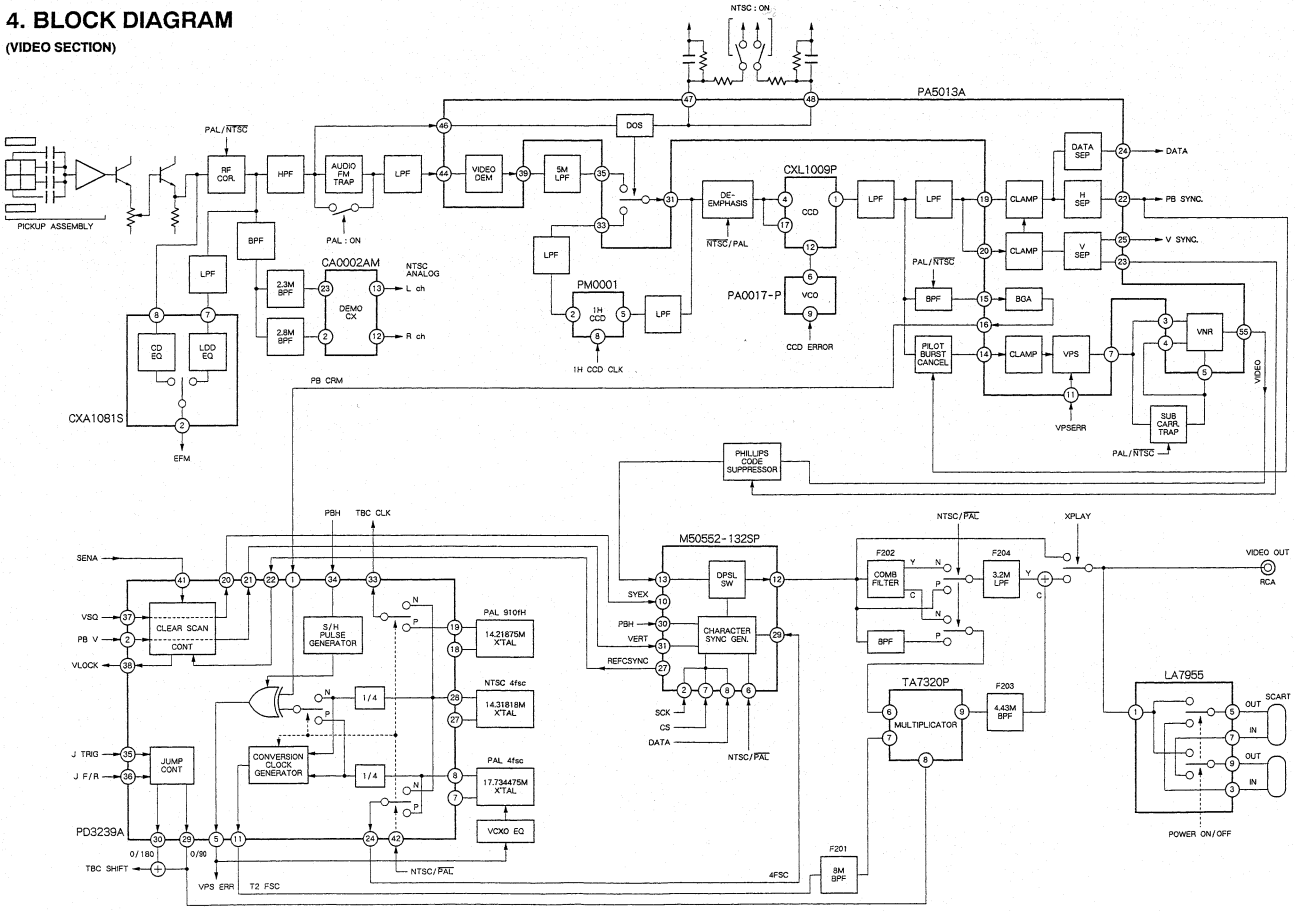
Mark	No.	Description	Part No.
	1	Connection cord	VDE-055
	2	Euro scart cable (21P)	VDE1031
	3	Operating instructions (English/French/German/Italian)	VRE1016
	4	Remote control unit (CU-CLD081)	VXX1833
	5	Pad(R)	VHA1099
	6	Pad(F)	VHA1100
	7	Packing case	VHG1266
	8	Mirror mat	VHL1012
	9	Cable case	VHG1200
	10	Battery cover	DNK2286
	11	Shipping screw	VLL1358
	12	Washer	WT36D072D025
	13	Operating instructions (Dutch/Swedish/Spanish/Portuguese)	VRF1023

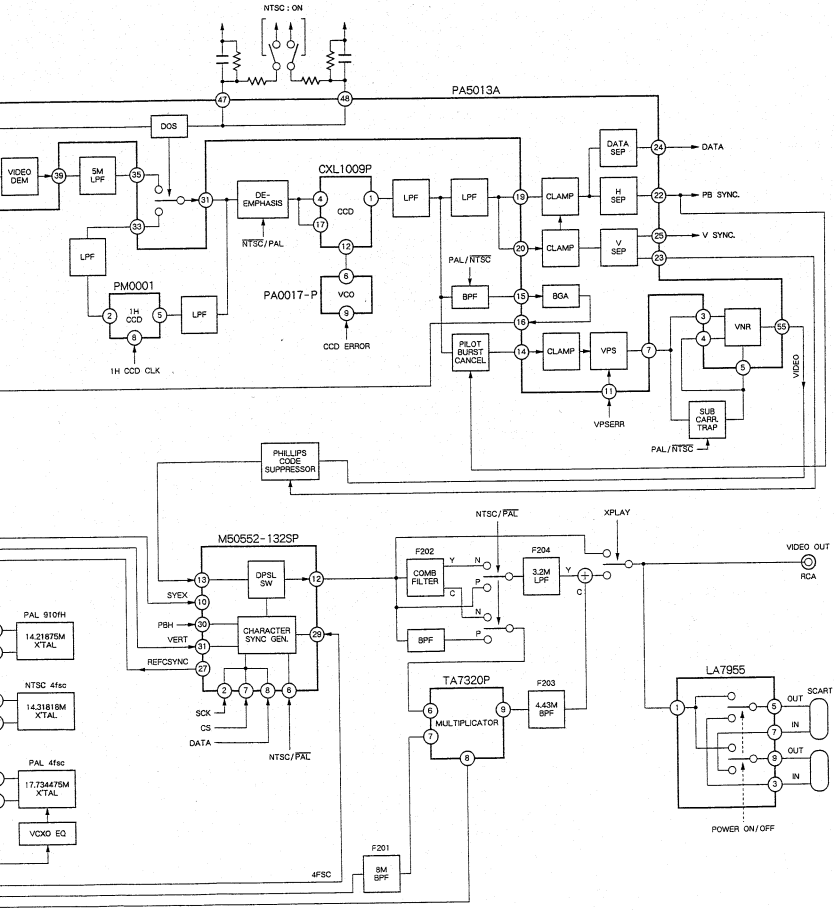
Mark	No.	Description	Part No.
NSP	101	Dry cell battery (R03, AAA)	VEM-022
	102	∗ ∗ ∗ ∗ ∗	
NSP	103	Warranty card	ARW-088
NSP	104	Polyethylene bag	VHL-014
NSP	105	Caution card (EW)	VRM1027
NSP	106	Caution card (UC)	VRM1039
	107	∗ ∗ ∗ ∗ ∗	
NSP	108	Polyethylene bag	Z21-029
NSP	109	Tac card	VRW1240
NSP	110	Caution card (UC)	VRR1009



4. BLOCK DIAGRAM

(VIDEO SECTION)





5. SCHEMATIC AND PCB CONNECTION DIAGRAMS

NOTE FOR SCHEMATIC DIAGRAMS (Type 4A)

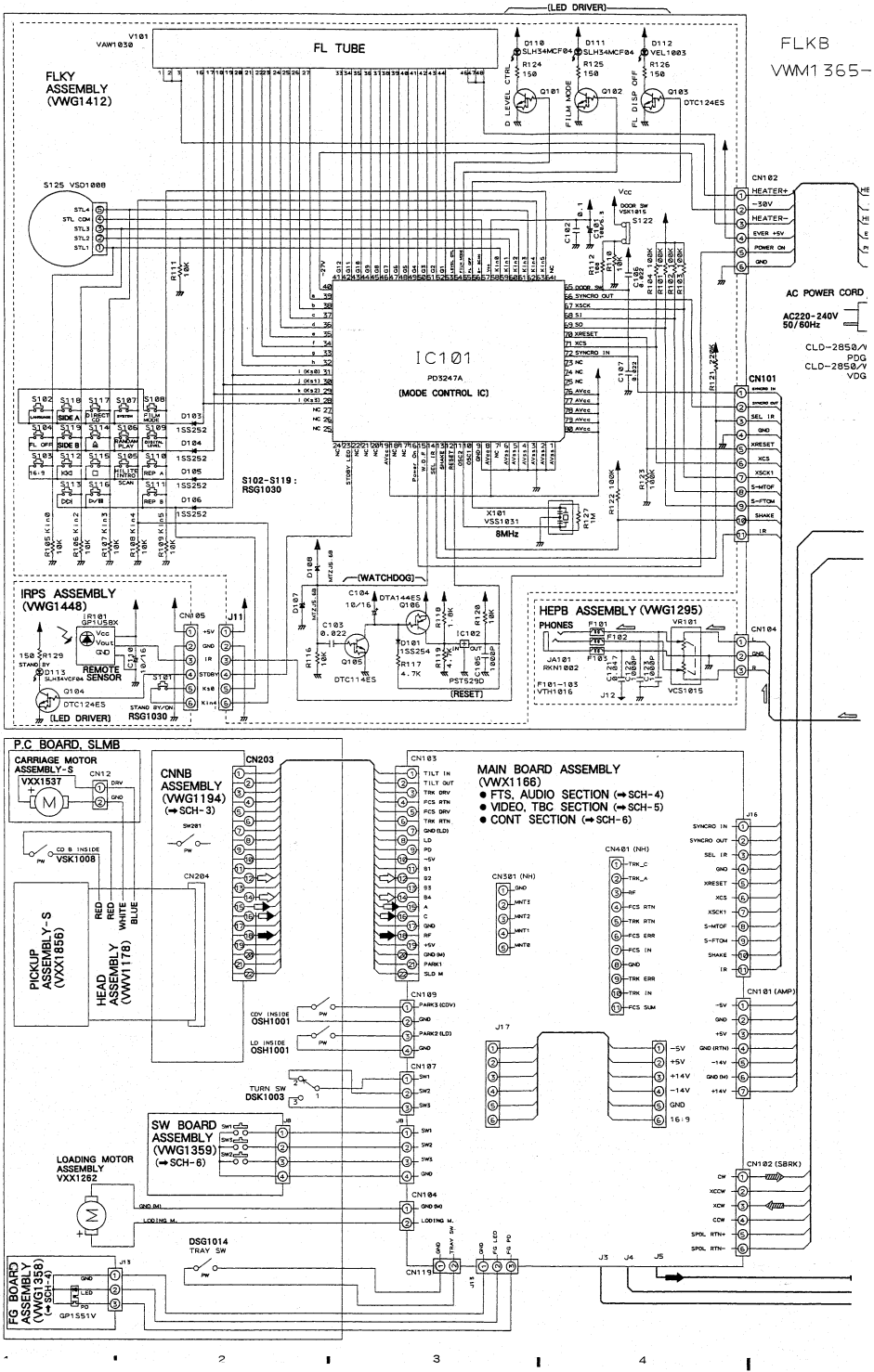
1. **When ordering service parts, be sure to refer to "PARTS LIST of EXPLODED VIEWS" or "PCB PARTS LIST".**
2. **Since these are basic circuits, some parts of them or the values of some components may be changed for improvement.**
3. **RESISTORS:**
   Unit: kΩ, MΩ, or Ω unless otherwise noted.
   Rated power: 1/4W, 1/8W, 1/8W, 1/10W unless otherwise noted.
   Tolerance:(F):±1%, (G):±2%, (K):±10%, (M):±20% or ±5% unless otherwise noted.
4. **CAPACITORS:**
   Unit : pF or μF unless otherwise noted.
   Ratings : capacitor (μF) / voltage (V) unless otherwise noted.
   Rated voltage : 50V except for electrolytic capacitors.
5. **COILS:**
   Unit : mmH or μH unless otherwise noted.
6. **VOLTAGE AND CURRENT:**
   ⊏ or ← V :
   DC voltage (V) in PLAY mode unless otherwise noted.
   ⇨mA or ←mA :
   DC current in PLAY mode unless otherwise noted.
   Value in ( ) is DC current in STOP mode.
7. **OTHERS:**
   - ⊕ or ⊘ : Adjusting point.
   - ◀ ▲ : Measurement point.
   - The ⚠ mark found on some component parts indicates the importance of the safety factor of the parts. Therefore, when replacing, be sure to use parts of identical designation.
8. **SCH – □ ON THE SCHEMATIC DIAGRAM:**
   - SCH– □ indicates the drawing number of the schematic diagram. (SCH stands for schematic diagram.)
9. **SWITCHES** (Underline indicates switch position):
   OUT OF P.C.BOARD ASSEMBLY
   Push switch :TRAY SW
   Lever switch :TURN SW
   Slide switch :LD, CDV INSIDE
   Slide switch :CD, B INSIDE
   SW BOARD ASSEMBLY
   SW1 - SW3:LOADING/TILT
   CNNB ASSEMBLY
   S201:PARK1
   FLKY ASSEMBLY
   S102:LANGUAGE
   S103:16:9
   S104:FL DISPLAY OFF
   S105:HILITE/INTRO
   S106:RANDOM PLAY
   S107:SYSTEM
   S108:FILM MODE
   S109:D - LEVEL CONTROL
   S110:A ┐REPEAT
   S111:B ┘
   S112: ⏮ ┐SKIP
   S113: ⏭ ┘
   S114: ⏏ (OPEN/CLOSE)
   S115: ■ (STOP)
   S116: ▶/II (PLAY/PAUSE)
   S117:DIRECT CD
   S118:A ┐DISC SIDE
   S119:B ┘
   S122:DOOR SW
   S125:JOG & SHUTTLE(REV ↶ FWD)
   IRPS ASSEMBLY
   S201:POWER STANDBY/ON

NOTE FOR PCB CONNECTION DIAGRAMS

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

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

5.1 OVERALL WIRING DIAGRAM, FLKY, IRPS AND HEPB ASSEMBLIES

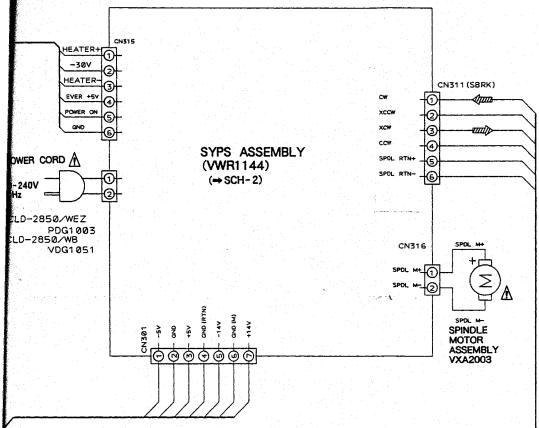


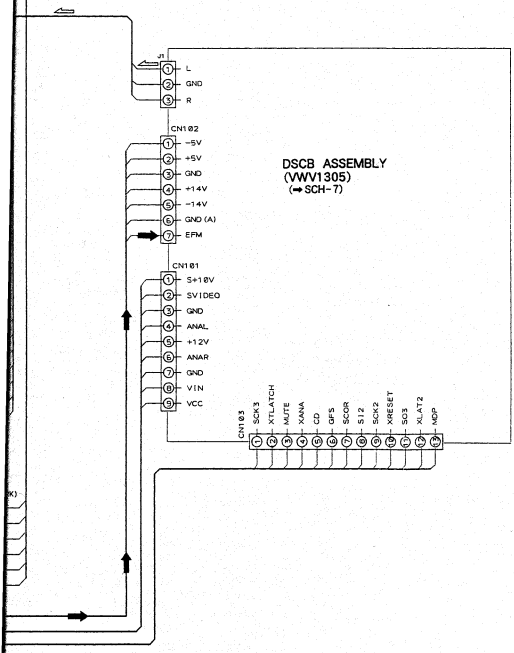
OVERALL WIRING DIAGRAM, FLKY ASSY, IRPS ASSY, HEPB ASSY

SCH-1

SCH-1

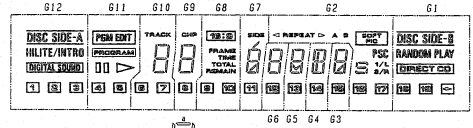
➡: RF Signal Route
⇨: Tracking Servo Loop Line
⇨: Focus Servo Loop Line
⇨: Spindle Servo Loop Line
⇨: Audio Signal Route





FL TUBE (VAW1030)

ANODE GRID ASSIGNMENT & PIN ASSIGNMENT



PIN ASSIGNMENT

Pin No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Assignment	F(+)	F(+)	F(+)	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	1

Pin No.	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Assignment	k	j	i	h	g	f	e	d	c	b	a	NP	NP	NP	NP	NP

Pin No.	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
Assignment	G12	G11	G10	G9	G8	G7	G6	G5	G4	G3	G2	G1	NP	F(-)	F(-)	F(-)

F:Filament G1~G12:Grid a~l:Anode NP:No pin

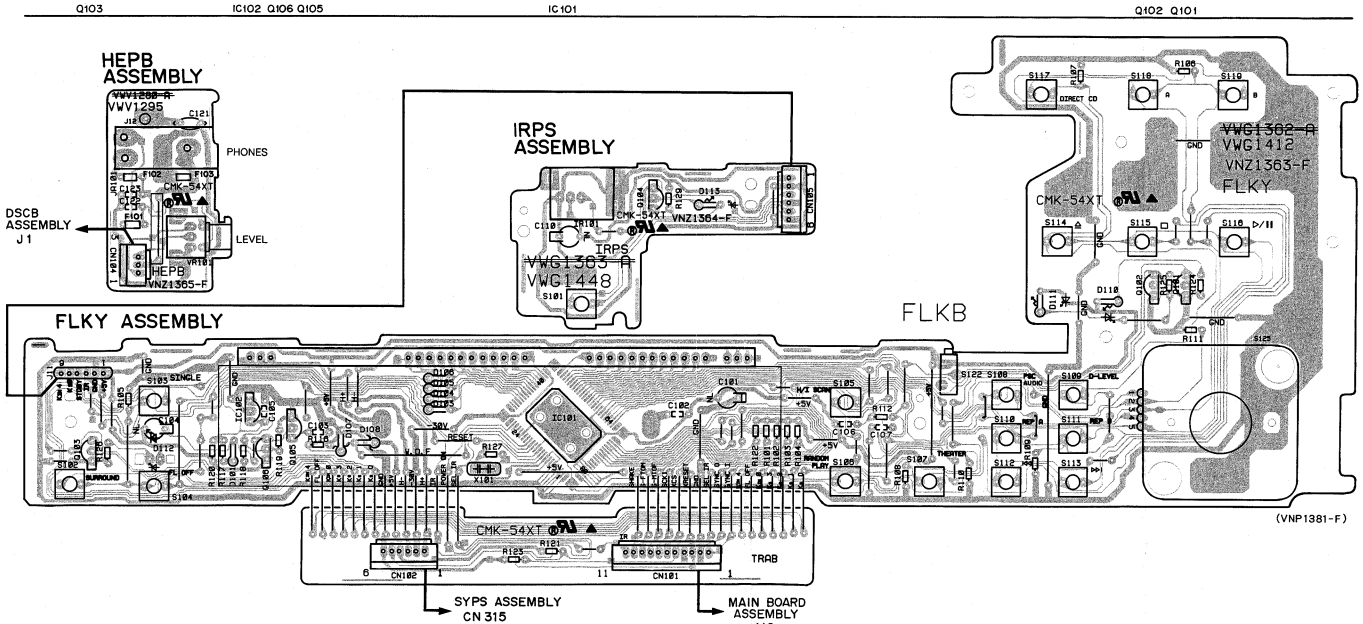
ANODE GRID ASSIGNMENT

	G12	G11	G10	G9	G8	G7	G6	G5	G4	G3	G2	G1
a	(SIDE-A)	PGM EDIT	a	a	TIME	a	a	a	a	a	◁	(SIDE-B)
b	DISC SIDE-A	PROGRAM	b	b	FRAME	b	b	b	b	b	REPEAT	DISC SIDE-B
c	(SIDE-A)	▯▯	c	c	TIME	c	c	c	c	c	▷	(SIDE-B)
d	HILITE/INTRO	▷	d	d	TOTAL	d	d	d	d	d	A	RANDOM PLAY
e	DIGITAL SOUND		e	e	REMAIN	e	e	e	e	e	B	DIRECT CD
f			f	f		f	f	f	f	f	SOFT PIC	
g			g	g		g	g	g	g	g	PSC	
h			TRACK	CMP		SIDE		∨	∨	∨	⇆	
i	1	4	5	8	9	11	12	13	14	15	1/L	18
j	3	6	7		10						2/R	19
k	2										16	<>
l											17	

OVERALL WIRING DIAGRAM.
FLKY ASSY, IRPS ASSY, HEPB ASSY

SCH-1

PCB-1



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.

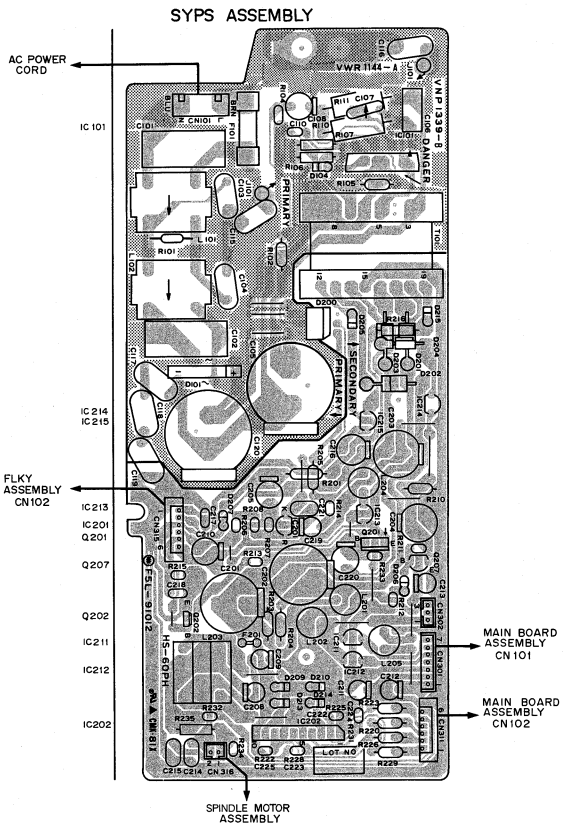
5.2 SYPS ASSEMBLY

PCB-2

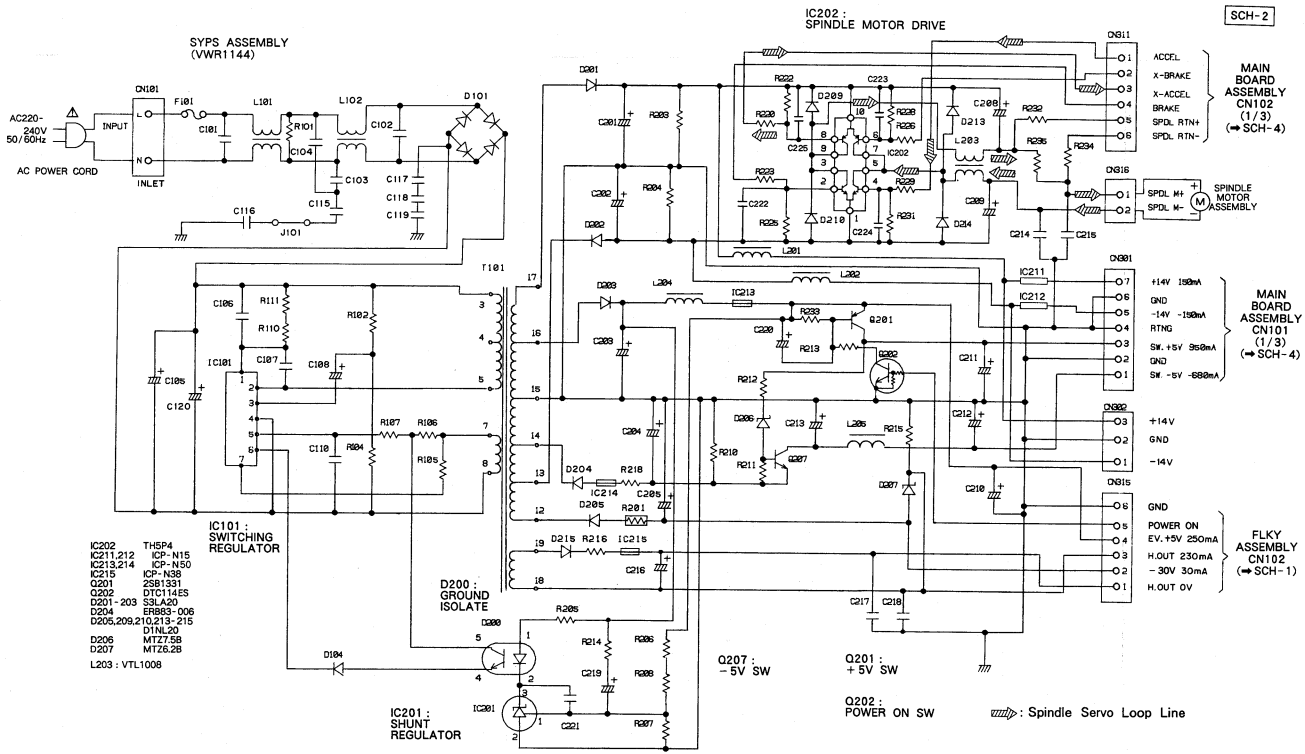
This P. C. B. connection diagram is viewed from the foil side.

5.2 SYPS ASSEMBLY

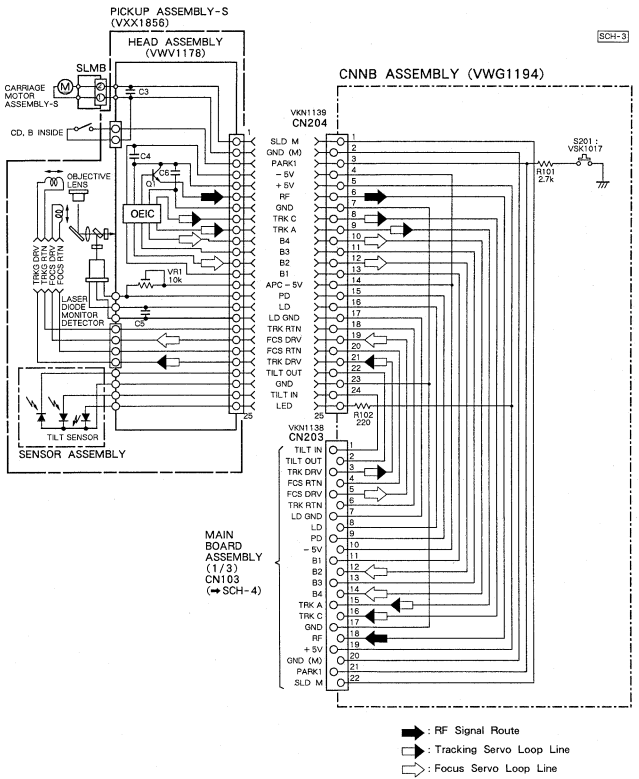
PCB-2

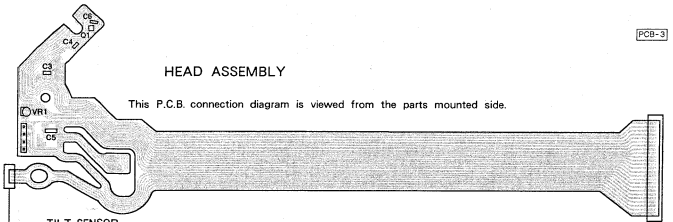


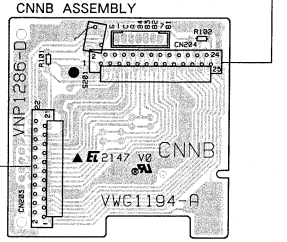
This P. C. B. connection diagram is viewed from the parts mounted side.

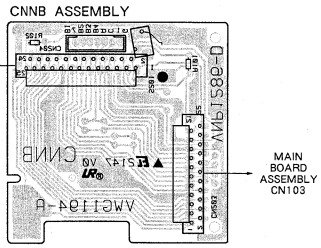

SYPS ASSEMBLY
(VWR1144)
IC202 :
SPINDLE MOTOR DRIVE
SCH-2
AC220-
240V
50/60Hz
AC POWER CORD
INPUT
INLET
MAIN
BOARD
ASSEMBLY
CN102
(1/3)
(➡ SCH-4)
ACCEL
X-BRAKE
X-ACCEL
BRAKE
SPDL RTN+
SPDL RTN-
SPINDLE
MOTOR
ASSEMBLY
SPDL M+
SPDL M-
MAIN
BOARD
ASSEMBLY
CN101
(1/3)
(➡ SCH-4)
+14V 150mA
GND
-14V -150mA
RTNG
SW.+5V 950mA
GND
SW.-5V -680mA
+14V
GND
-14V
FLKY
ASSEMBLY
CN102
(➡ SCH-1)
GND
POWER ON
EV.+5V 250mA
H.OUT 230mA
-30V 30mA
H.OUT 0V
IC101 :
SWITCHING
REGULATOR
IC202 TH5P4
IC211,212 ICP-N15
IC213,214 ICP-N50
IC215 ICP-N38
Q201 2SB1331
Q202 DTC114ES
D201-203 S3LA20
D204 ERB83-006
D205,209,210,213-215
D1NL20
D206 MTZ7.5B
D207 MTZ6.2B
L203 : VTL1008
D200 :
GROUND
ISOLATE
IC201 :
SHUNT
REGULATOR
Q207 :
-5V SW
Q201 :
+5V SW
Q202 :
POWER ON SW
: Spindle Servo Loop Line

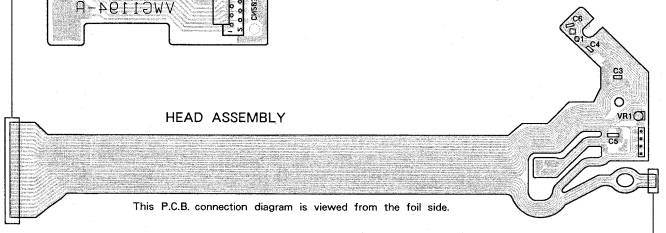
5.3 PICKUP AND CNNB ASSEMBLIES









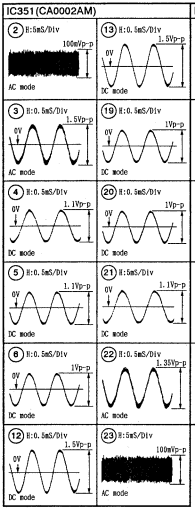


SCH-3 PICKUP ASSY, CNNB ASSY

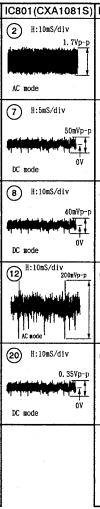
FTS AND AUDIO SECTION

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

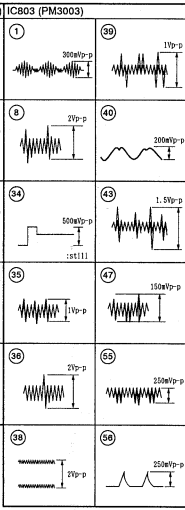
IC351 (CA0002AM)



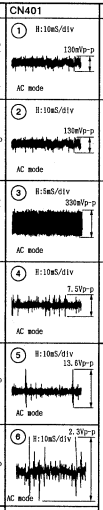
IC801 (CXA1081S)



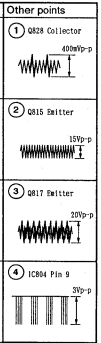
IC803 (PM3003)



CN401



Other points



Note : These waveforms and voltage are in the play mode.

- IC351 (CA0002AM)

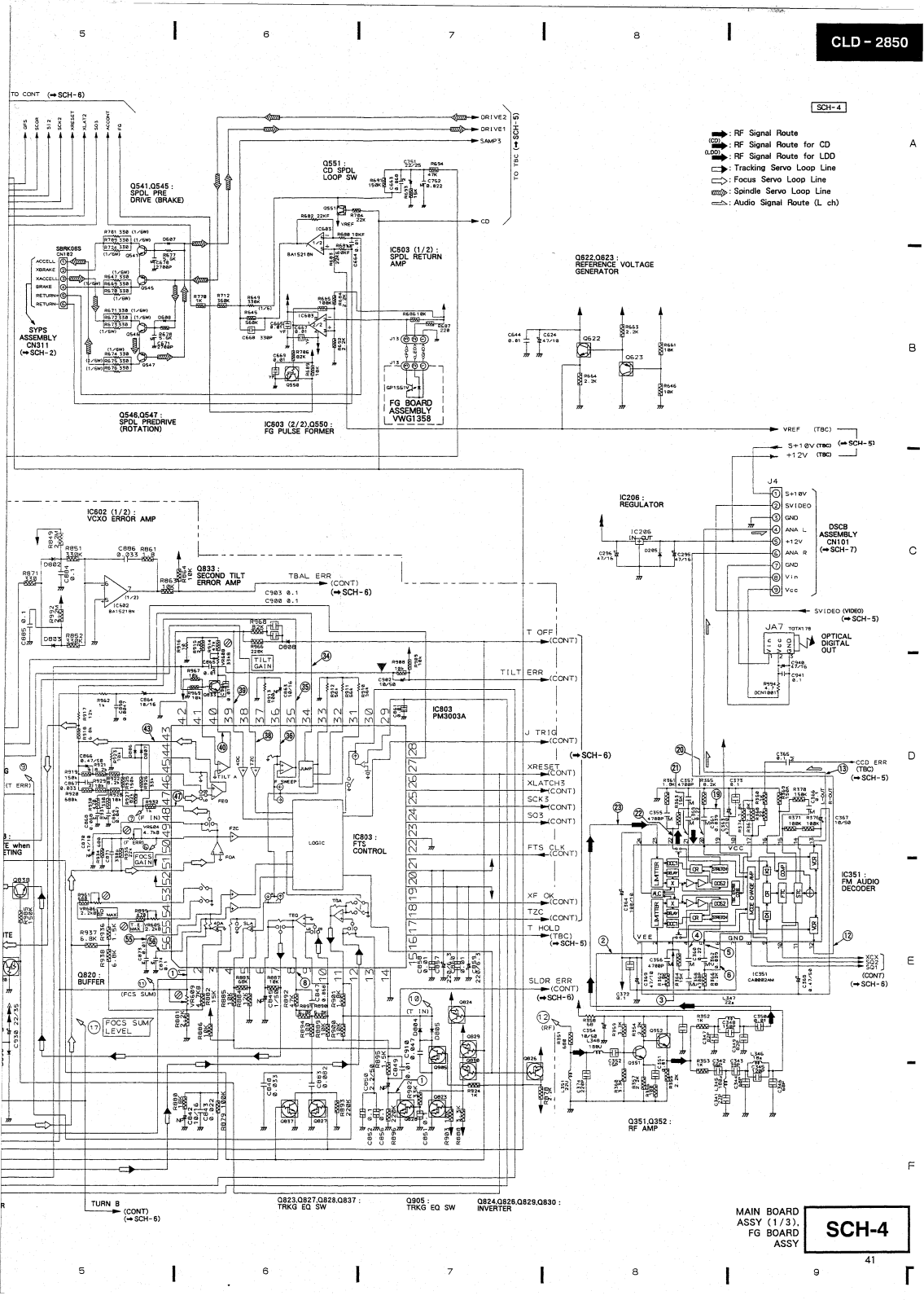
Pin No.	Voltage (V)	Pin No.	Voltage (V)	Pin No.	Voltage (V)	Pin No.	Voltage (V)
1	− 5	7	0	13	*	19	*
2	*	8	0	14	− 0.6	20	*
3	*	9	0	15	− 0.6	21	*
4	*	10	5	16	0	22	*
5	*	11	2	17	0	23	*
6	*	12	*	18	5	24	− 2.2

* : Refer to waveforms.

5.4 MAIN BOARD (1/3) AND FG BOARD ASSEMBLIES

MAIN BOARD ASSEMBLY (1/3) (VWX1166)

SCH-4 MAIN BOARD ASSY (1/3), FG BOARD ASSY

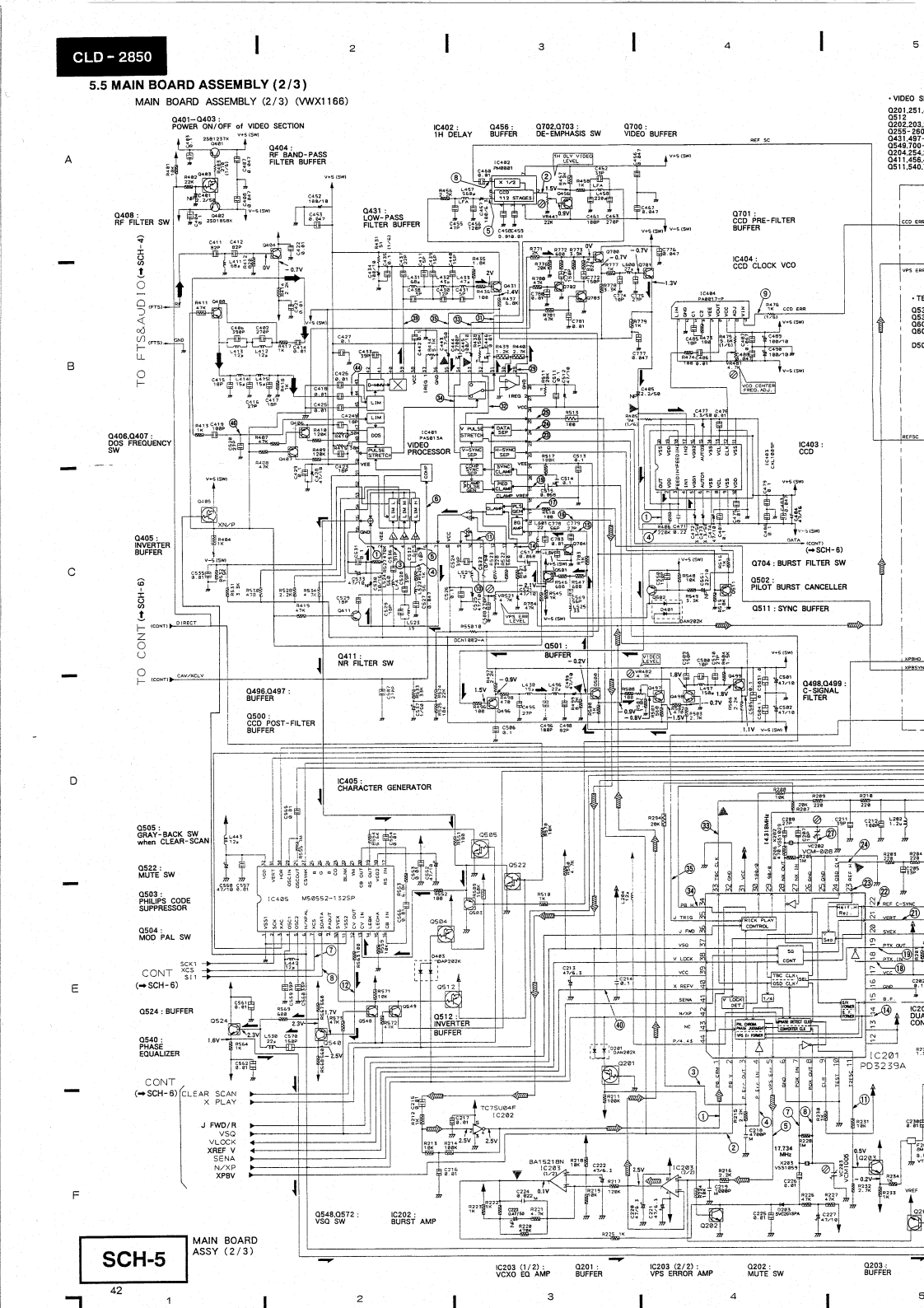


MAIN BOARD ASSY (1/3), FG BOARD ASSY

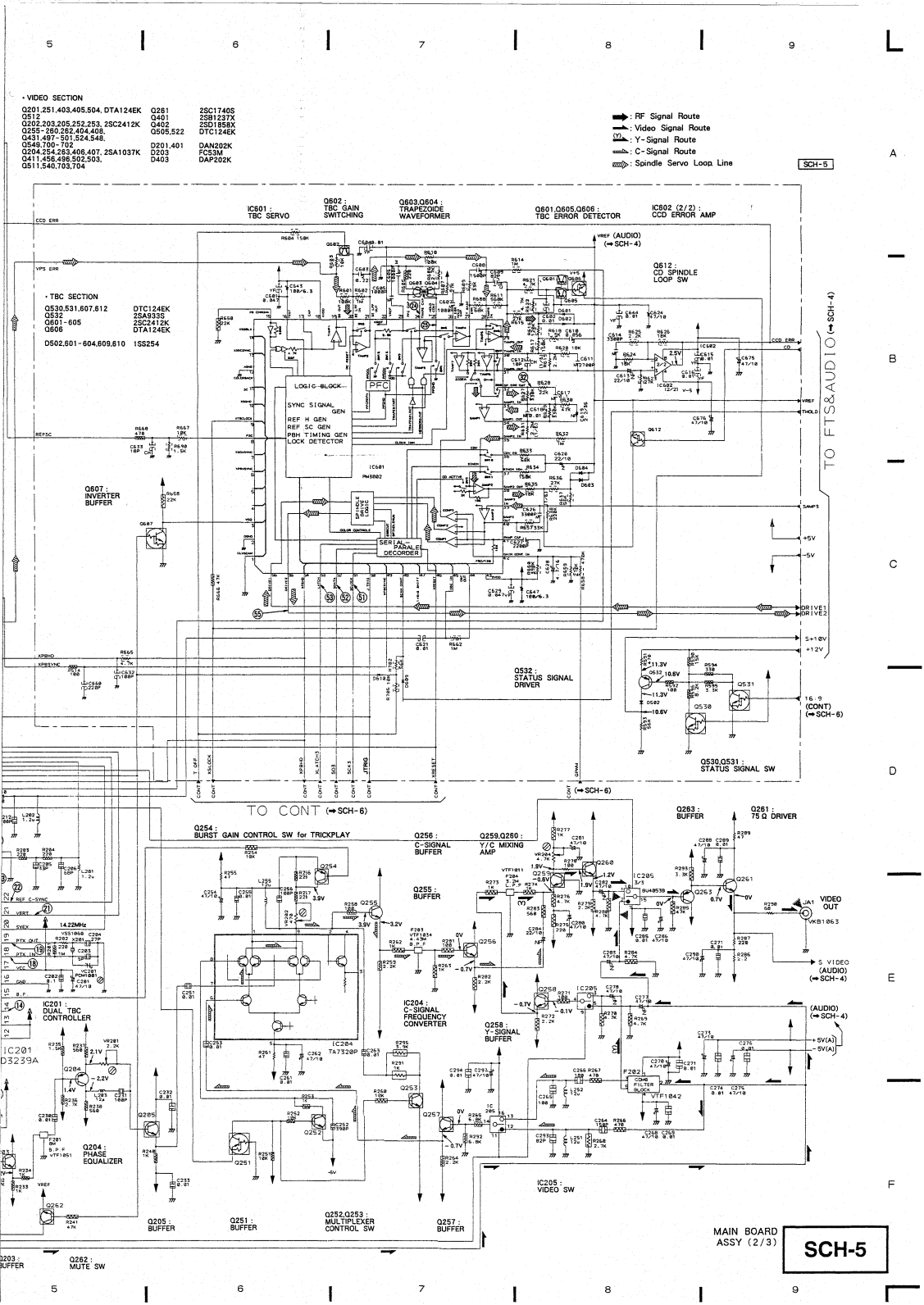
SCH-4

5.5 MAIN BOARD ASSEMBLY (2/3)

MAIN BOARD ASSEMBLY (2/3) (VWX1166)



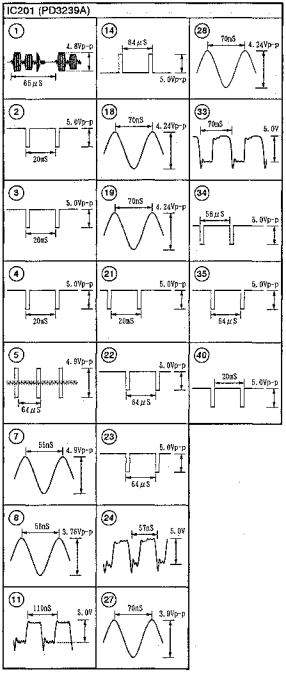
SCH-5 MAIN BOARD ASSY (2/3)


· VIDEO SECTION
Q201,251,403,405,504, DTA124EK
Q512
Q202,203,205,252,253, 2SC2412K
Q255~260,262,404,408,
Q431,497~501,524,548,
Q549,700~702
Q204,254,263,406,407, 2SA1037K
Q411,456,496,502,503,
Q511,540,703,704
Q261
Q401
Q402
Q505,522
D201,401
D203
D403
2SC1740S
2SB1237X
2SD1858X
DTC124EK
DAN202K
FC53M
DAP202K
: RF Signal Route
: Video Signal Route
: Y-Signal Route
: C-Signal Route
: Spindle Servo Loop Line
SCH-5
IC501 : TBC SERVO
Q502 : TBC GAIN SWITCHING
Q503,Q504 : TRAPEZOIDE WAVEFORMER
Q601,Q605,Q606 : TBC ERROR DETECTOR
IC602 (2/2) : CCD ERROR AMP
· TBC SECTION
Q530,531,607,612
Q532
Q601 ~ 605
Q606
D502,601 ~ 604,609,610
DTC124EK
2SA933S
2SC2412K
DTA124EK
1SS254
VREF (AUDIO) (→ SCH-4)
Q612 : CD SPINDLE LOOP SW
TO FTS&AUDIO (→ SCH-4)
LOGIC BLOCK
PFC
SYNC SIGNAL GEN
REF H GEN
REF SC GEN
PBH TIMING GEN
LOCK DETECTOR
IC601
PM3002
SERIAL PARALEL DECORDER
Q607 : INVERTER BUFFER
Q532 : STATUS SIGNAL DRIVER
Q530,Q531 : STATUS SIGNAL SW
TO CONT (→ SCH-6)
Q254 : BURST GAIN CONTROL SW for TRICKPLAY
Q256 : C-SIGNAL BUFFER
Q259,Q260 : Y/C MIXING AMP
Q263 : BUFFER
Q261 : 75 Ω DRIVER
Q255 : BUFFER
IC204 : C-SIGNAL FREQUENCY CONVERTER
Q258 : Y-SIGNAL BUFFER
IC205 : VIDEO SW
IC201 : DUAL TBC CONTROLLER
Q204 : PHASE EQUALIZER
Q205 : BUFFER
Q251 : BUFFER
Q252,Q253 : MULTIPLEXER CONTROL SW
Q257 : BUFFER
Q203 : BUFFER
Q262 : MUTE SW
VIDEO OUT
S VIDEO (AUDIO) (→ SCH-4)
(AUDIO) (→ SCH-4)
MAIN BOARD ASSY (2/3)
SCH-5

VIDEO AND TBC SECTION (1/2)

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

IC201 (PD3239A)



Note : These waveforms and voltage are in the PAL DISC playback.

* IC201 (PD3239A)

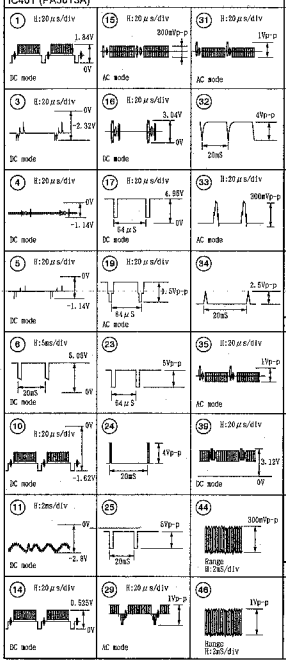
Pin No.	Voltage (V)	Pin No.	Voltage (V)	Pin No.	Voltage (V)	Pin No.	Voltage (V)
1	*	12	5.0	23	*	34	*
2	*	13	5.0	24	*	35	*
3	*	14	*	25	0	36	5.0
4	*	15	5.0	26	0	37	5.0
5	*	16	0	27	*	38	5.0
6	0	17	5.0	28	*	39	5.0
7	*	18	*	29	5.0	40	*
8	*	19	*	30	5.0	41	0
9	5.0	20	5.0	31	5.0	42	0
10	0	21	*	32	0	43	5.0
11	*	22	*	33	*	44	5.0

* : Refer to waveforms

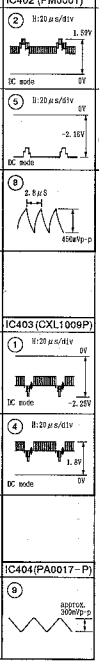
VIDEO AND TBC SECTION (2/2)

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

IC401 (PA5013A)



IC402 (PM0001)

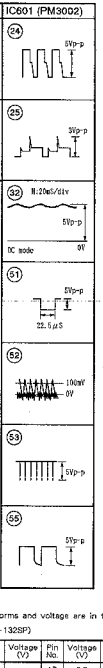


IC403 (CXL1009P)

IC404(PA0017-P)

IC405 (M50552-132SP)

IC601 (PM3002)



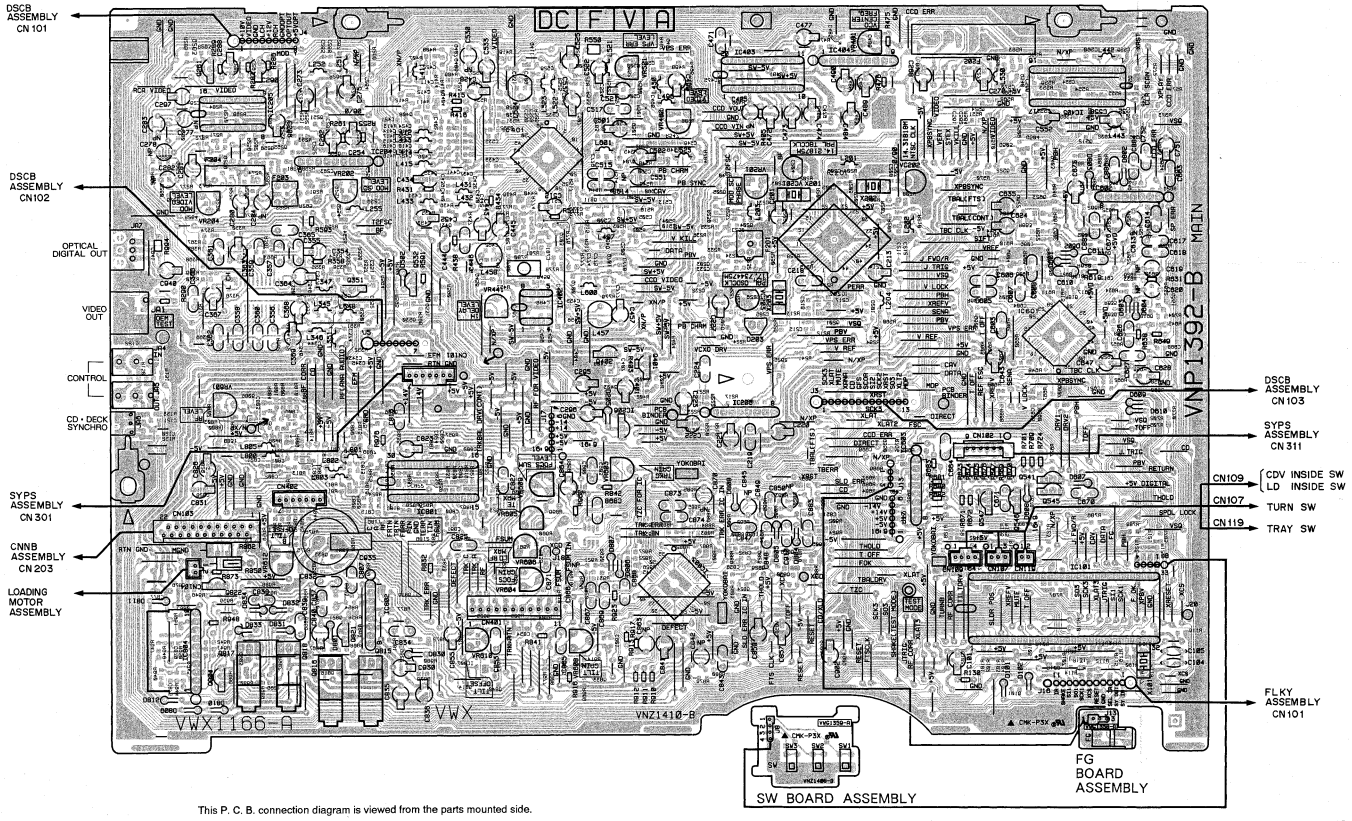
Note : These waveforms and voltage are in the play mode.

- IC405 (M50552-132SP)

Pin No.	Voltage (V)	Pin No.	Voltage (V)	Pin No.	Voltage (V)	Pin No.	Voltage (V)
1	0	9	–	17	0.8	25	–
2	5	10	5	18	–	26	–
3	5	11	0	19	0	27	–
4	2.4	12	1.1	20	0	28	2.3
5	2.4	13	1.1	21	–	29	2.3
6	–	14	–	22	–	30	–
7	5	15	1.6	23	–	31	–
8	0.4	16	0.6	24	–	32	–

MAIN BOARD ASSEMBLY

PCB-4

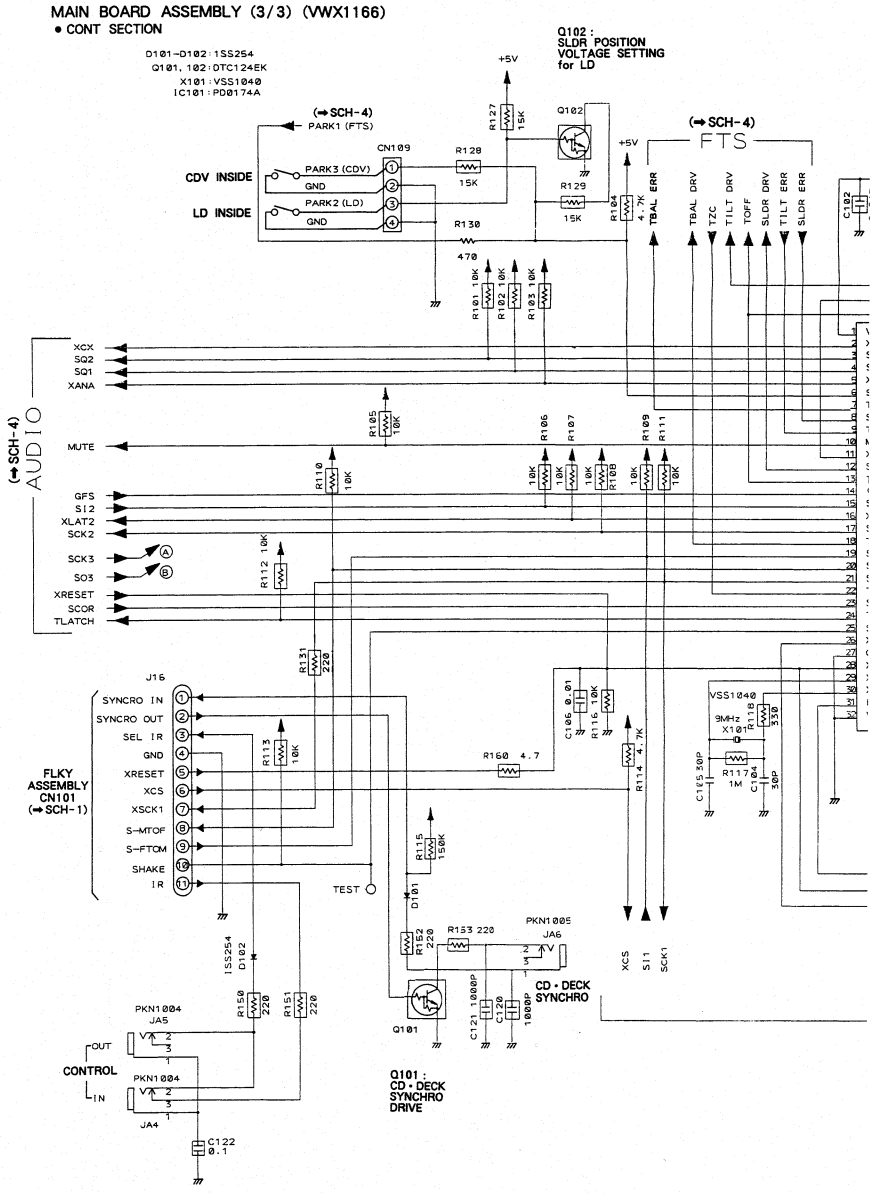


This P. C. B. connection diagram is viewed from the parts mounted side.

PCB-4

MAIN BOARD ASSEMBLY

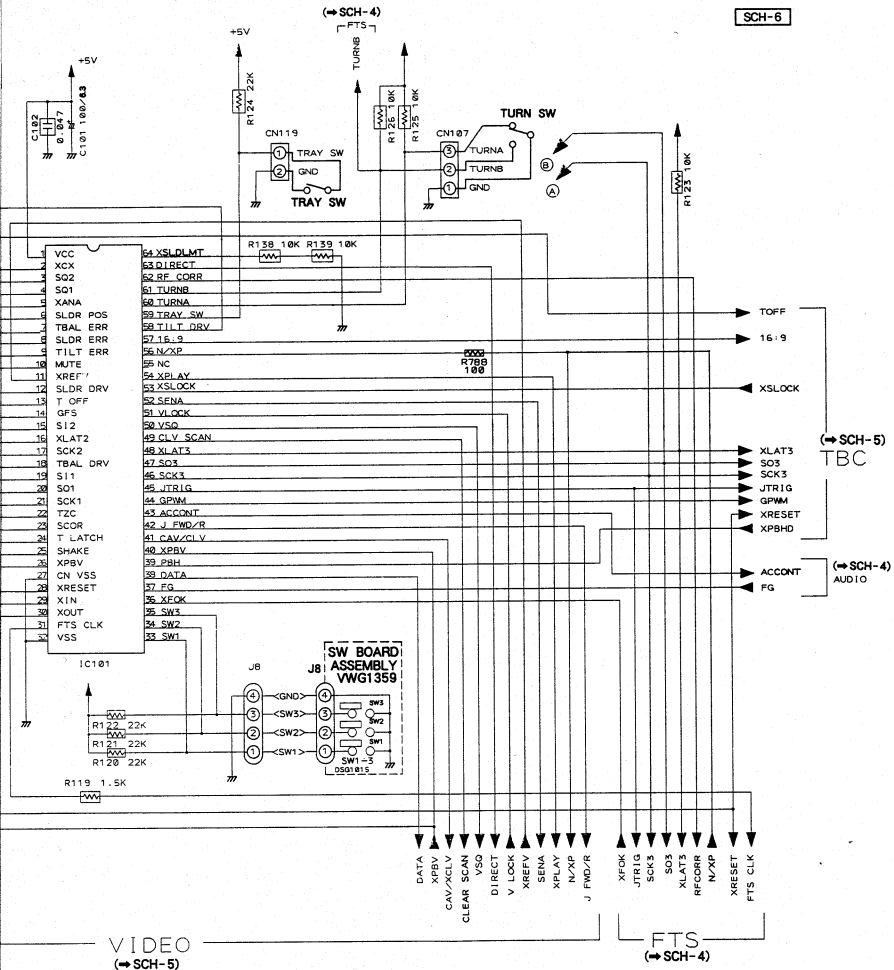
This P. C. B. connection diagram is viewed from the foil side.



SCH-6 MAIN BOARD ASSY (3/3), SW BOARD ASSY

IC101 :
MECHANISM
CONTROL IC

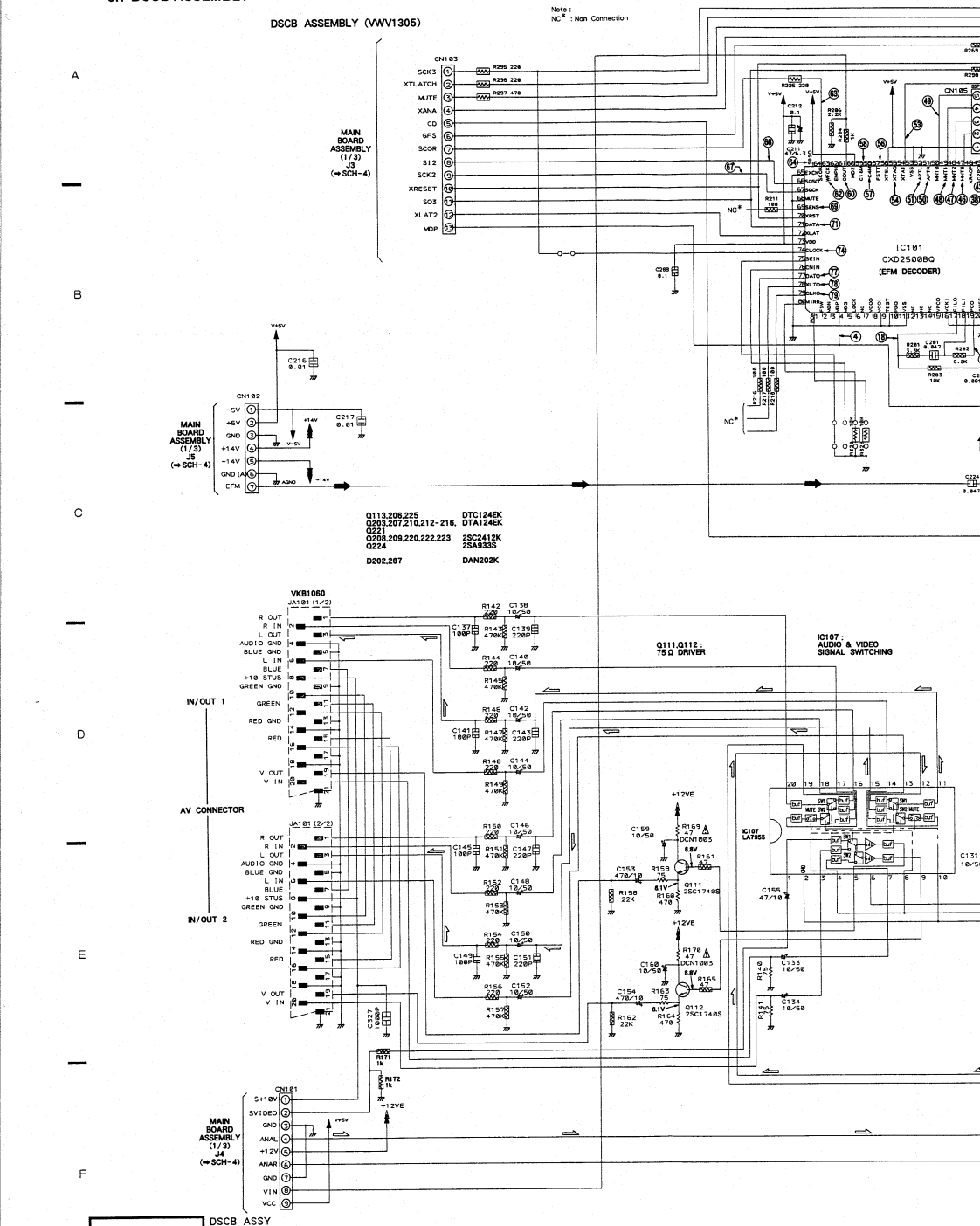
SCH-6

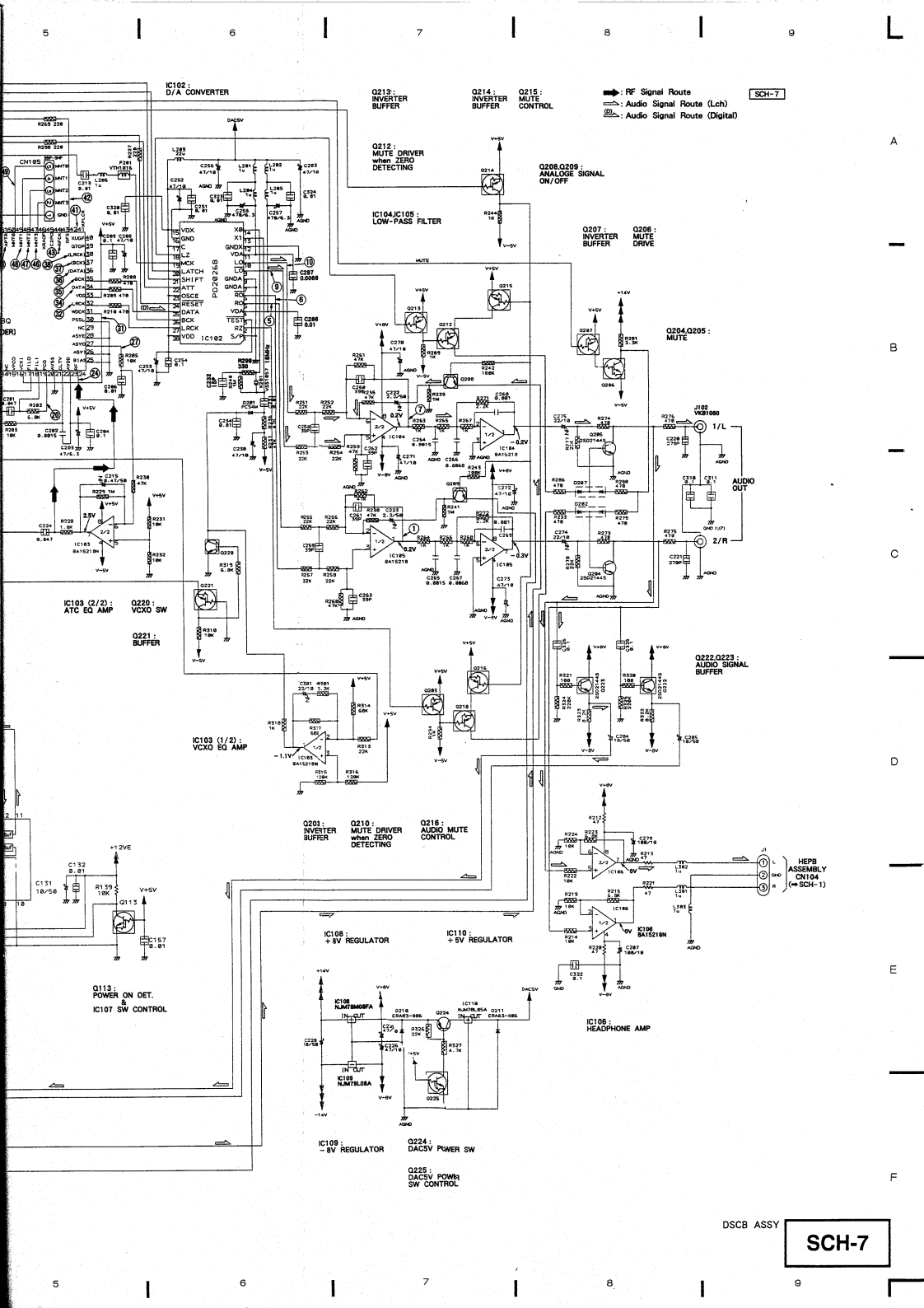


5.7 DSCB ASSEMBLY

DSCB ASSEMBLY (VWV1305)

Note :
NC* : Non Connection

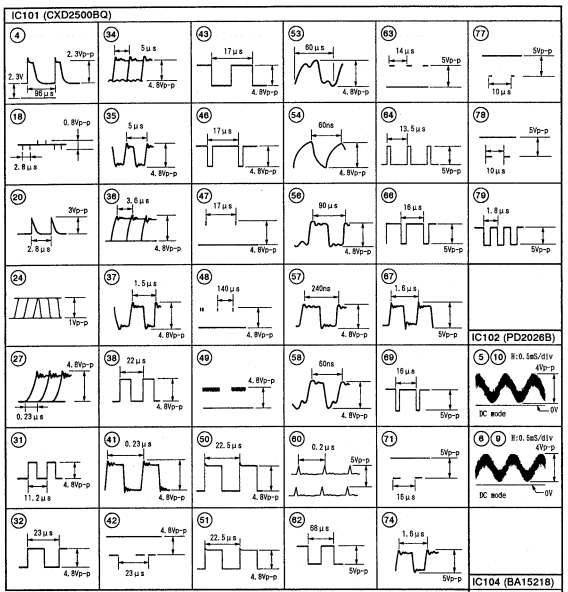



IC102 : D/A CONVERTER
Q213 : INVERTER BUFFER
Q214 : INVERTER BUFFER
Q215 : MUTE CONTROL
: RF Signal Route
: Audio Signal Route (Lch)
: Audio Signal Route (Digital)
SCH-7
Q212 : MUTE DRIVER when ZERO DETECTING
Q208,Q209 : ANALOGE SIGNAL ON/OFF
IC104,IC105 : LOW-PASS FILTER
Q207 : INVERTER BUFFER
Q206 : MUTE DRIVE
Q204,Q205 : MUTE
J102 VKB1090
1/L
2/R
AUDIO OUT
IC103 (2/2) : ATC EQ AMP
Q220 : VCXO SW
Q221 : BUFFER
IC103 (1/2) : VCXO EQ AMP
Q222,Q223 : AUDIO SIGNAL BUFFER
Q203 : INVERTER BUFFER
Q210 : MUTE DRIVER when ZERO DETECTING
Q216 : AUDIO MUTE CONTROL
HEPB ASSEMBLY CN104 (→SCH-1)
IC108 : +8V REGULATOR
IC110 : +5V REGULATOR
Q113 : POWER ON DET. & IC107 SW CONTROL
IC106 : HEADPHONE AMP
IC109 : -8V REGULATOR
Q224 : DAC5V POWER SW
Q225 : DAC5V POWER SW CONTROL
DSCB ASSY
SCH-7

DSCB ASSEMBLY

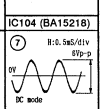
Note: (No.) in the table correspond to the pin number.

IC101 (CXD2500BQ)

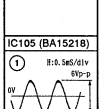


IC102 (PD2026B)

IC104 (BA15218)



IC105 (BA15218)



Note : These waveforms and voltage are in the play mode.

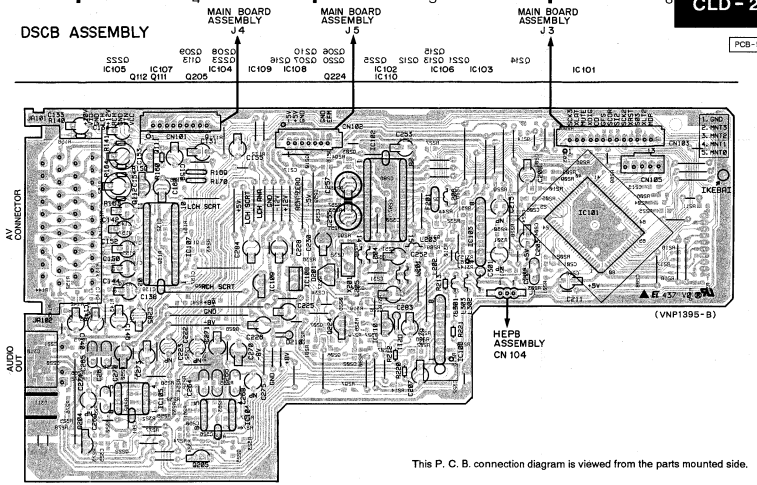
● IC101 (CXD2500BQ)

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

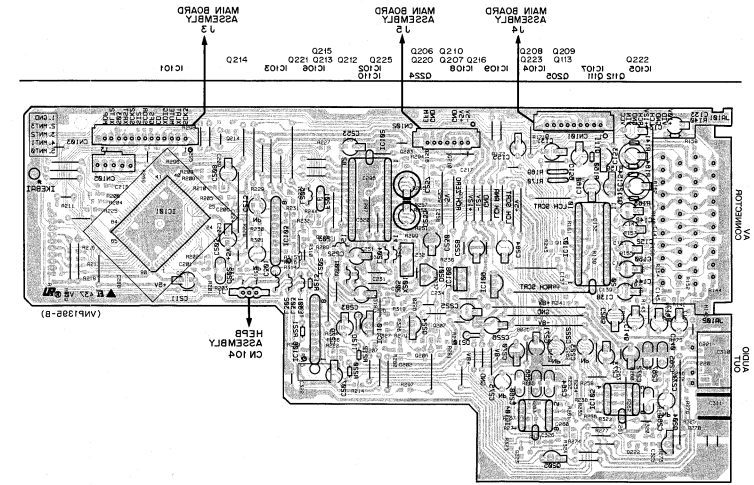
* : Refer to waveforms.

DSCB ASSEMBLY

PCB-5



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.

6. PCB PARTS LIST

NOTES:

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

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

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

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

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

Mark	No.	Description	Part No.
LIST OF ASSEMBLIES			
		MOTHER ASSEMBLY	VWM1364
NSP		├ FG BOARD ASSEMBLY	VWG1358
NSP		├ SW BOARD ASSEMBLY	VWG1359
NSP		└ MAIN BOARD ASSEMBLY	VWX1166
		FLKB ASSEMBLY	VWM1365
NSP		├ FLKY ASSEMBLY	VWG1412
NSP		├ IRPS ASSEMBLY	VWG1448
NSP		└ HEPB ASSEMBLY	VWV1295
		DSCB ASSEMBLY	VWV1305
		SYPS ASSEMBLY	VWR1144
NSP		CNNB ASSEMBLY	VWG1194
NSP		HEAD ASSEMBLY	VWV1178
FG BOARD ASSEMBLY			
SEMICONDUCTOR			
	D		GP1S51V
SW BOARD ASSEMBLY			
SWITCHES			
	SW1-SW3		DSG1015
MAIN BOARD ASSEMBLY			
SEMICONDUCTORS			
	IC203, IC602, IC603, IC802		BA15218N
	IC205		BU4053B
	IC351		CA0002AM
	IC801		CXA1081S
	IC403		CXL1009P
	IC804		LA6510L
	IC405		M50552-132SP
	IC206		NJM78L12A
	IC404		PA0017-P
	IC401		PA5013A
	IC101		PD0174A
	IC201		PD3239A
	IC402		PM0001
	IC601		PM3002
	IC803		PM3003A
	IC204		TA7320P
	IC807		TC4S66F
	IC202		TC7SU04F
	Q204, Q254, Q263, Q406, Q407, Q411, Q456, Q496, Q502, Q503, Q511, Q540, Q551, Q623, Q703, Q704, Q806, Q812, Q819, Q831, Q836, Q901		2SA1037K
	Q532, Q545, Q547		2SA933S
	Q816, Q818		2SB1185-F8
	Q401		2SB1237X
	Q261, Q541, Q546, Q904		2SC1740S
	Q202, Q203, Q205, Q252, Q253, Q255-Q260, Q262, Q352, Q404, Q408, Q431, Q497-Q501, Q524, Q548, Q549, Q601-Q605, Q622, Q700-Q702, Q802-Q804, Q807, Q814, Q825, Q833, Q838		2SC2412K
	Q351		2SC2786
	Q815, Q817		2SD1762-F8
	Q402, Q822		2SD1858X
	Q821		2SK184
	Q201, Q251, Q403, Q405, Q504, Q512, Q606, Q820, Q824, Q826, Q829, Q830, Q840, Q903		DTA124EK
	Q101, Q102, Q505, Q522, Q530, Q531, Q550, Q607, Q612, Q811, Q823, Q827, Q828, Q835, Q837, Q905		DTC124EK
	D809-D812		1SR139-100
	D101, D102, D502, D601-D604, D607-D610, D801-D808, D830-D832		1SS254
	D201, D401		DAN202K
	D403		DAP202K
	D205		ERA83-006
	D203		SVC201SPA
	D834		MTZJ10B
	D833		MTZJ6.2B

Mark	No.	Description	Part No.
COILS AND FILTERS			
	L800		LAU100J
	L203, L204, L251, L252, L255, L412, L413, L442, L443, L521		LAU120J
	L414, L415, L430		LAU150J
	L497, L801, L803		LAU151J
	L346		LAU180J
	L345, L348, L802		LAU181J
	L201, L202		LAU1R2J
	L347, L351, L496, L530, L601		LAU220J
	L600		LAU270J
	L525		LAU330J
	L523		LAU390J
	L432		LAU430J
	L433		LAU470J
	L805		LAU4R7J
	L522		LAU560J
	L411, L431		LAU680J
	L458		LFA221J
	L457, L524		LFA561J
	F204		VTF1011
	F203		VTF1034
	F202		VTF1042
	F201		VTF1051
CAPACITORS			
	VC201		PCM1001
	VC202		VCM-008
	VC203		VCM1005
	C816		CCCCH120J50
	C104, C105		CCCCH300J50
	C837, C871		CCCSL331J50
	C203, C431, C438, C441, C804, C817		CCSQCH050C50
	C207, C500, C532, C774		CCSQCH100D50
	C212, C231		CCSQCH101J50
	C256, C265, C419, C461, C496, C632, C810, C811, C822		CCSQCH101J50
	C430		CCSQCH120J50
	C345, C456		CCSQCH121J50
	C352, C439, C440		CCSQCH150J50
	C264, C348, C509, C550, C570, C771, C772		CCSQCH151J50
	C409, C415, C417, C423, C424, C485, C529, C612, C633		CCSQCH180J50
	C437		CCSQCH220J50
	C266, C374, C660		CCSQCH221J50
	C204, C208, C341, C416, C495, C510, C520, C775, C779, C812, C815		CCSQCH270J50
	C402, C463, C507, C508		CCSQCH271J50
	C205, C462, C560		CCSQCH330J50
	C668, C818		CCSQCH331J50
	C211, C343, C433, C524, C528, C559		CCSQCH390J50
	C252, C406		CCSQCH391J50
	C455, C890, C891, C893		CCSQCH470J50
	C342, C549, C778		CCSQCH560J50
	C206, C344, C346, C809, C813		CCSQCH680J50
	C293, C347, C349, C411, C412, C498, C609, C806		CCSQCH820J50
	C536		CCSQCH910J50

Mark	No.	Description	Part No.
	C819		CCSQSL561J50
	C840		CEAL010M50
	C902		CEAL100M50
	C101, C643, C647		CEAL101M6R3
	C835, C836, C930		CEAL220M35
	C213, C220-C222, C841		CEAL470M6R3
	C842, C863		CEALNP100M16
	C845		CEANP010M50
	C530, C864		CEANP100M16
	C284, C551, C613		CEANP220M10
	C401, C405, C850		CEANP2R2M50
	C277, C278, C283, C870		CEANP470M10
	C866		CEANPR47M50
	C537, C823		CEAS010M50
	C354, C522, C855		CEAS100M50
	C364, C434, C445, C452, C457, C489, C490		CEAS101M10
	C751		CEAS220M25
	C857, C859		CEAS221M6R3
	C472, C473, C477		CEAS3R3M50
	C201, C254, C262, C268, C270, C273, C275, C280-C282, C286, C288, C290, C297, C363, C369, C428, C474, C499, C501, C502, C512, C521, C525, C533, C552, C558, C824-C676, C826, C831, C940		CEAS470M10
	C484		CEAS470M16
	C443		CEAS4R7M50
	C368		CEASR47M50
	C367		CEHAQ100M50
	C227		CEJA470M10
	C295, C296		CEJA470M16
	C223		CEJANPR47M50
	C620		CEJANP220M10
	C619		CEJANP2R2M35
	C628		CEJANP4R7M16
	C446, C618, C664, C849, C865, C873		CFTYA103J50
	C365, C366, C514, C617, C832, C838, C874, C884, C885		CFTYA104J50
	C807		CFTYA124J50
	C224, C752, C843		CFTYA223J50
	C359, C360, C471, C603		CFTYA224J50
	C827, C848, C867, C886		CFTYA333J50
	C361, C362		CFTYA393J50
	C869, C910		CFTYA473J50
	C610		CFTYA563J50
	C515, C517, C663, C847, C868		CFTYA683J50
	C883		CFTYA823J50
	C120, C121		CKSQYB102K50
	C875, C879		CKSQYB562K50
	C854		CKSQYB821K50
	C106, C122, C215-C217, C225, C226, C230, C232, C233, C251, C253, C255, C261, C263, C269, C271, C274, C276, C285, C289, C291, C294, C350, C351, C414, C418, C421, C422, C425, C426, C458-C460, C475, C476, C486, C535, C553, C554, C557, C561, C562, C565, C566, C602, C604, C615, C616, C621, C644, C665, C667, C669, C780, C781, C783, C801, C803, C824, C828, C829, C858, C860, C861, C896, C901, C908		CKSQYF103Z50

Mark	No.	Description	Part No.
	C202, C214, C372, C373, C403, C404, C427, C429, C435, C442, C479~C481, C503~C506, C511, C513, C528, C531, C814, C821, C851, C852, C856, C876~C878, C880~C882, C897, C900, C903, C941		CKSQYF104Z25
	C102, C407, C408, C453, C466, C467, C483, C487, C488, C527, C801, C829, C776, C777, C802, C808, C820		CKSQYF473Z25
	C219, C605~C607, C839		CQMA102J50
	C608, C834		CQMA152J50
	C627		CQMA222J50
	C444, C611, C670, C671		CQMA272J50
	C614, C626, C853		CQMA332J50
	C218, C355~C358, C898		CQMA472J50
	C825		CQMA682J50
	C935		VCH1039
RESISTORS			
	VR601		VRTB6VS102
	VR603, VR610, VR612		VRTB6VS103
	VR201, VR605, VR606		VRTB6VS222
	VR441, VR608		VRTB6VS333
	VR202		VRTB6VS471
	VR204, VR481, VR482, VR521, VR604, VR609		VRTB6VS472
	R994		DCN1001
	R550		DCN1002
	R873, R916		RD1/6PM100J
	R913		RD1/6PM101J
	R476, R962		RD1/6PM102J
	R923		RD1/6PM103J
	R948		RD1/6PM104J
	R405		RD1/6PM105J
	R917		RD1/6PM123J
	R287		RD1/6PM221J
	R842		RD1/6PM222J
	R638		RD1/6PM224J
	R619, R631		RD1/6PM225J
	R403		RD1/6PM271J
	R286		RD1/6PM282J
	R647, R669~R676, R701, R709, R724		RD1/6PM331J
	R549		RD1/6PM334J
	R255, R261, R289, R976		RD1/6PM470J
	R130, R591		RD1/6PM471J
	R431		RD1/6PM510J
	R475		RD1/6PM562J
	R593, R841, R910~R912		RD1/6PM563J
	R290, R358		RD1/6PM680J
	R832		RD1/6PM823J
	R680, R681		RN1/6PQ1002F
	R438		RN1/6PQ1503F
	R511		RN1/6PQ2002F
	R682, R683		RN1/6PQ2202F
	R415, R416		RN1/6PQ3002F
	R434		RN1/6PQ5101F
	R850, R862		RS1LMF3R3J
	Other resistors		RS1/10S□□□J

Mark	No.	Description	Part No.
OTHERS			
	CN401	11P TOP POST	B11P-SHF-1AA
	CN107	3P KR CONNECTOR	B3B-PH-K-S
	CN103	22P TOP CONNECTOR	VKN113T
		7P CABLE HOLDER	S1048-0700
		9P CABLE HOLDER	S1048-0900
	CN402	CONNECTOR	B7B-PH-K-S
	J5	7P JUMPER WIRE	D20PDY0720G
	J4	9P JUMPER WIRE	D20PDY0910G
	J3	13P JUMPER WIRE	D20PDY1325G
	JA4, JA5	REMOTE CONTROL JACK/12V (CONTROL IN, OUT)	PKN1004
	JA6	MINI JACK (CD-DECK SYNCHRO)	PKN1005
	CN102	6P JUMPER CONNECTOR	SBRK06S
	JA7	OPTICAL OUTPUT JACK (OPTICAL DIGITAL OUT)	TOTX178
		PCB BINDER	VEP1040
	JA1	1P JACK (VIDEO OUT)	VKB1063
		SCREW TERMINAL	VNE1841
		EARTH HOLDER	VNF-091
	X202	CRYSTAL RESONATOR (14.318MHz)	VSS1029
	X101	CERAMIC RESONATOR (8.00MHz)	VSS1040
	X203	CRYSTAL RESONATOR (17.734MHz)	VSS1059
	X201	CRYSTAL RESONATOR (14.22MHz)	VSS1060

FLKY ASSEMBLY

SEMICONDUCTORS			
	IC101		PD3247A
	IC102		PST529D
	Q106		DTA144ES
	Q105		DTC114ES
	Q101~Q103		DTC124ES
	D103~D106		1SS252
	D101		1SS254
	D107, D108		MTZJ5.6B
	D110, D111		SLH34MCF04
	D112		VEL1003
SWITCHES			
	S102~S119		RSG1030
	S125		VSD1008
	S122		VSK1015
CAPACITORS			
	C104		CEAL100M16
	C101		CEAL101M6R3
	C102		CGDYF104Z25
	C105		CKPUYB102K50
	C103, C108, C107		CKPUYF223Z25
RESISTORS			
	All resistors		RD1/6PM□□□J

Mark	No.	Description	Part No.
OTHERS			
	V101	FL TUBE	VAV1030
		SPACER	VEC1599
		FL HOLDER	VNF1078
	X101	CERAMIC RESONATOR (8MHz)	VSS1031
IRPS ASSEMBLY			
SEMICONDUCTORS			
	Q104		DTC124ES
	D113		SLH34VCF04
SWITCH			
	S101		RSG1030
CAPACITOR			
	C110		CEAS100M16
RESISTOR			
	R129		RD1/6PM151J
OTHERS			
		REMOTE SENSOR UNIT	GP1US8X
HEPB ASSEMBLY			
FILTERS			
	F101-F103		VIP1016
CAPACITORS			
	C121		CGCYF473Z25
	C122, C123		CKPUYB102K50
RESISTOR			
	VR101		VCS1015
OTHERS			
	JA101	HEADPHONE JACK (PHONES)	HKN1002
DSCB ASSEMBLY			
	IC104, IC105		BA15218
	IC103, IC106		BA15218N
	IC101		CXD2500BQ
	IC107		LA7955
	IC110		NJM78L05A
	IC108		NJM78M08FA
	IC109		NJM79L08A
	IC102		PD2026B
	Q224		2SA933S
	Q111, Q112		2SC1740S
	Q208, Q209, Q220, Q222, Q223		2SC2412K
	Q204, Q205		2SD2144S
	Q203, Q207, Q210, Q212-Q216, Q221		DTA124EK
	Q113, Q206, Q225		DTC124EK
	D202, D207		DAN202K
	D210, D211		ERA83-006
	D201		FC54M

Mark	No.	Description	Part No.
COILS AND FILTER			
	L201, L202, L204-L206, L301-L303		LAU010K
	L203		LAU220J
	F201		VTH1016
CAPACITORS			
	C137, C141, C145, C149		CCSQCH101J50
	C232		CCSQCH150J50
	C139, C143, C147, C151		CCSQCH221J50
	C220, C221		CCSQCH271J50
	C258-C263		CCSQCH390J50
	C222, C223		CEANPR2R2M50
	C215		CEANPR47M50
	C131		CEAS100M50
	C133, C134, C138, C140, C142, C144, C146, C148, C150, C152, C159, C160, C228, C284		CEAS100M50
	C285		
	C207, C279		CEAS101M10
	C155, C208, C225, C226, C230, C252, C253, C270-C273, C283		CEAS470M10
	C153, C154		CEAS471M10
	C255, C257		CEAS471M6R3
	C203, C211		CEJA470M6R3
	C274, C275, C301		CEJANP220M10
	C327		CKSQYB102K50
	C287		CKSQYB682K50
	C132, C157, C206, C213, C216, C217, C231, C254, C251, C286, C320, C323, C324		CKSQYF103Z50
	C204, C209, C212, C254, C288, C310, C311, C322, C325, C326		CKSQYF104Z25
	C201, C224		CKSQYF473Z25
	C268, C269		CQMA102J50
	C202, C264, C265		CQMA152J50
	C266, C267		CQMA682J50
RESISTORS			
⚠	R169, R170		DCN1003
	R212, R213, R220, R221		RD1/6PM470J
	R160, R164		RD1/6PM471J
	R140, R141, R159, R163		RD1/6PM750J
	Other resistors		RS1/10S□□□J
OTHERS			
	CN105	5P TOP POST	B5P-SHF
		3P CABLE HOLDER	51048-0300
	J1	3P JUMPER WIRE	D20PDY0360G
	JA101	RGB CONNECTOR (AV CONNECTOR IN/OUT1, 2)	VKB1056
	JA102	2P PIN JACK (AUDIO OUT 1/L, 2/R)	VKB1060
		SCREW TERMINAL	VNB1841
		EARTH PLATE	VNF1081
	X201	CRYSTAL RESONATOR (16MHz)	VSS1057

Mark	No.	Description	Part No.
SYPS ASSEMBLY			
SEMICONDUCTORS			
	IC211, IC212		ICP-N15
	IC215		ICP-N38
	IC213, IC214		ICP-N50
	IC202		TEBP4-PU
	Q201		2SB1331-P
	Q202		DTC114ES
	D205, D209, D210, D213-D215		D1NL20
	D204		ERB83-006
	D207		MTZ6.2B
	D206		MTZ7.5B
	D201-D203		S3LA20
COIL			
	L203		VTL1008
CNNB ASSEMBLY			
SWITCH			
	S201		VSK1017
RESISTORS			
	R102		RD1/6PM221J
	R101		RD1/6PM272J
OTHERS			
	CN203	22P SIDE CONNECTOR	VKN1138
	CN204	25P SIDE CONNECTOR	VKN1139
HEAD ASSEMBLY			
CAPACITORS			
	C4, C6		CKSQYF104Z25
	C3		CKSQYF223Z50
	C5		CKSYF105Z16
RESISTOR			
	VR1		VCP1025

7. ADJUSTMENTS

7.1 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 NTSC test disc (GGV1003)
- LD PAL test disc (GGV1007)
- CD test disc (YEDS - 7)
- Digital voltmeter
- Shorting clip
- L - shaped eccentric screwdriver (GGV - 129)
- TV monitor
- Resistor (47kΩ , 10kΩ × 2, 75Ω)
- Low-pass filter (47kΩ +1μF)
- 10:1 / 1:1 Probe

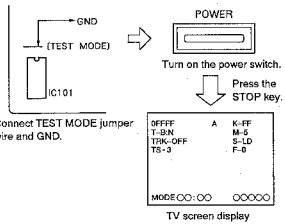
7.2 TEST MODE

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 OFF and ON easily, the test mode is especially useful for mechanical adjustments.

7.2.1 Test Mode Initiation

[Procedure]

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



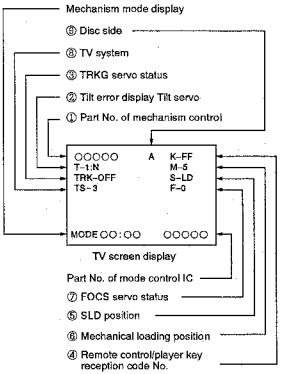
Note: When using the remote control unit (GGF1067) for the test mode.

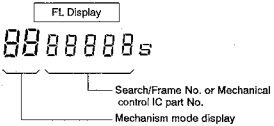
- *Press the TEST key after pressing the ESC key.*

7.2.2 Test Mode Cancellation

Turn off the power switch.

7.2.3 TV Screen and FL Displays in the Test Mode





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

Example: PD0081A1 → 0081A
PD0081B1 → 0081B

② Tilt Servo Status / Tilt Error Display

T-○:○○
- ○ — 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-○○○
- ○ — ON…TRKG servo ON
  OFF…TRKG servo OFF

④ Remote Control/Player Key Reception Code No.

TV screen display
K-○○
- ○ — See Table 1

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 ON : VR606 (RF MAX)
  TRKG OFF : VR605 (TE MAX)
  1… VR606 is activated when the TRKG servo is OFF.

⑧ TV system

0… NTSC
2… MOD PAL (Quasi - PAL)
3… PAL

⑨ Disc side

A… Side A
B… Side B

7.2.4 Key Operation in the Test Mode

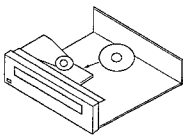
Function	Player Status	Key Operation	Remarks
Open Tray	STOP mode	▲	
Close Tray	Tray open	▲	
Stop	PLAY mode	■	
Play	Disc placement and tray closed.	▶	• Start play with the TRKG servo OFF. • Raise up with tilt neutral. • The disc type (LD/CD/CDV) is determined when playback starts at the SLDR position during start play.
TRKG Servo OFF/ON	PLAY mode	▶	• Each time the PLAY button (▶) is pressed, the TRKG servo will OFF or ON alternately.
Still	PLAY mode TRKG servo closed.	❙❙ (Remote control unit key)	• Each time the STILL button (❙❙) is pressed, the player will switch between the PLAY and STILL modes alternately.
SLDR REV SCAN	PLAY mode	◀◀ (SHUTTLE RING REV)	• Press and hold down the key. To use the shuttle ring, turn it counter-clockwise. • With the TRKG servo OFF, 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 .
SLDR FWD SCAN	PLAY mode	▶▶ (SHUTTLE RING FWD)	• Press and hold down the key. To use the shuttle ring, turn it clockwise. • With the TRKG servo OFF, 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.
TILT Neutral	POWER switch ON	EDIT	
TILT Servo ON	PLAY mode	RANDOM PLAY	
TILT Minus TILT Servo OFF	PLAY mode	❙◀◀	• Press and hold down the keys.
TILT Plus TILT Servo OFF	PLAY mode	▶▶❙	• Press and hold down the keys.
Screen Display ON/OFF	POWER switch ON	PGM key	
Frame search	PLAY mode	+10 key ↓ 0–9 key ↓ ▶	• In the PLAY mode, press the +10 key. (The player will standby for the frame No. entry.) • Use the numeric keys(0—9) to enter the frame No.. Then press the player's PLAY key to search. • After the search is completed, the player will return to the previous mode before the search was performed.
Loading Motor Rotation Clockwise Counterclockwise	Tray open	▶▶❙ ❙◀◀	• FWD : Unloading • REV : Loading
FOCS Offset for checking VR606	PLAY mode TRKG servo OFF	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 ON : VR606 (RF MAX) TRKG OFF : VR605 (TE MAX) F – 1 : VR606 is effectived when the TRKG servo is OFF.

7.2.5 Player Operation in the Test Mode

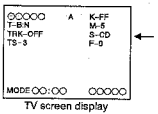
Operate the player by selecting a test mode function with the keys on the player or on the remote control unit.

- 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.

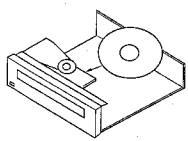


TV screen display

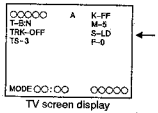
③ Clamp the disc by pressing the PLAY (▶) key once.
Then, press the PLAY (▶) key twice, disc will be normal playbacked.

- 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.



TV screen display

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

7.3 PREPARATIONS FOR ADJUSTMENT AND PRECAUTIONS

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

–Carriage assembly in forward state–

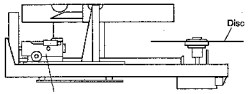
3. Coarse grating adjustment / TRKG error MAX. adjustment
4. Slider shaft horizontal adjustment / RF level MAX. adjustment
5. Pickup inclination adjustment
6. Tilt sensor inclination adjustment
7. Spindle motor centering check
8. Spindle motor centering adjustment
9. Fine grating adjustment
10. FOCS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

–Carriage assembly in reverse state–

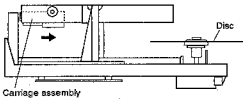
15. Coarse centering adjustment for side B play
16. Pickup tangential direction angle adjustment for side B play / (Tilt offset fine adjustment for side B)
17. Fine centering adjustment for side B play

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 in forward state



Carriage assembly in reverse state



2) How to reverse the carriage assembly

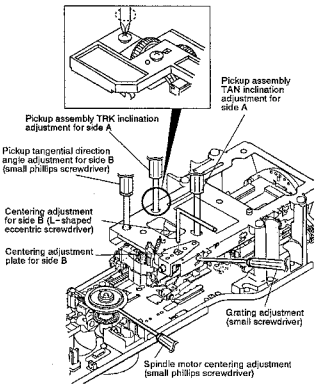
- Carriage assembly is reversed by pressing the DISC SIDE B key of the front panel.
- Side A is returned by pressing the STOP key.

3) Installing the disc

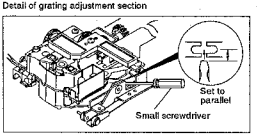
The disc should be placed from behind on the turntable and when Open/Close key is pressed, the clamper comes down to clamp the disc.

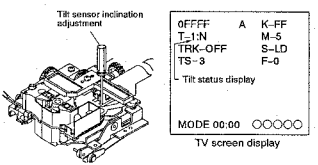
4) Where to insert the screwdriver when adjusting the pickup assembly

–Carriage assembly in forward state–



Detail of grating adjustment section





TV screen display

7.4 MAIN BOARD ASSEMBLY ADJUSTMENT SUMMARY

Note : If the test disc number shown in the "Player Condition" space is not specified, then the frame number shown will be that of the GGV1003 disc.

	ADJUSTMENT	Adjusting Point	Measurement equipment Connecting Point	Player Condition	Adjusting Specification
1	Tilt Offset Adjustment for Side A	VR610	C902 – (minus) lead wire	• Stop mode (Power ON)	• Adjust VR610 so that the DC voltage becomes 0 ± 0.2V.
2	Tilt Servo Gain Adjustment	VR608	None	• Stop mode (Power OFF)	• Marking of Tilt gain VR position Red : Turn to right Clear : Center Blue : Turn to left
3	Coarse Grating / TRKG Error MAX. Adjustment	Grating / VR605 (TE MAX)	CN401 - 9 (TRKG ERR)	• Test mode #6,500 still TRKG servo OFF • Tilt servo OFF	• Null point → TRKG error MAX Slowly turn the grating of pickup counterclockwise from the null point until the waveform amplitude becomes maximum. • TRKG error MAX (VR605)
4	Slider Shaft Horizontal Adjustment / RF Level MAX. Adjustment	SKIP key VR606 (RF MAX)	CN401 - 4 (FOCS RTN) CN401 - 3 (RF)	• Test mode #9,800 , #22,000 - 25,000 still TRKG servo OFF TILT servo OFF • #2,701 /#115 still TRKG servo ON TILT servo OFF	• Adjust the SKIP key so that the FOCS RTN voltage between #9,800 and #22,000 - #25,000 becomes +8 to +12 mV. • RF level MAX (VR606) • Check that the crosstalk of the frame #115 is not appeared.
5	Pickup Inclination Adjustment	Pickup assembly TAN / TRK inclination adjustment screw	CN401 - 3 (RF) Video output terminal (TV monitor)	• Test mode , #2,701 still TRKG servo ON • TILT servo OFF	• RF waveform's amplitude MAX (Pickup TAN / TRK adjustment screw) and minimized crosstalk (checked with TV monitor).
6	Tilt Sensor Inclination Adjustment	Tilt senser inclination adjustment screw	Video output terminal (TV monitor)	• Test mode #16,200 / #115 still TRKG servo ON • TILT servo OFF	• Adjust the adjustment screw so that the tilt error display code of #115 and #16,200 in still mode are 6, 7, or 8.
7	Spindle Motor Centering Check	None	CH1:CN401 - 9(TRKG ERR) CH2:CN401 - 1, 2(TRKG SUM) (X - Y mode) (Fig. 2)	• Test mode #22,000 - 25,000 and #100 still TRKG servo OFF • TILT servo ON	• Check that the amplitude of the lissajous figure of the frame #100 is the same as that of the frame #22,000 - 25,000.
8	Spindle Motor Centering Adjustment	Spindle motor centering adjustment screw.	CH1:CN401 - 9(TRKG ERR) CH2:CN401 - 1, 2(TRKG SUM) (X - Y mode) (Fig.2)	• Test mode #22,000 - 25,000 and #100 still TRKG servo OFF • TILT servo ON	• Adjust the centering adjustment screw so that the lissajous figures of #100 and #22,000 - 25,000 are the same.
9	Fine Grating Adjustment	Grating	CH1:CN401 - 9(TRKG ERR) CH2:CN401 - 1, 2(TRK SUM) (X - Y mode) (Fig.2)	• Test mode #6,500 still TRKG servo OFF • TILT servo ON	• Minimize the Y direction of the lissajous figure.
10	FOCS SUM Level Adjustment	VR609	CN401 - 11 (FOCS SUM)	• Test mode #15,000 still TRKG servo ON • Tilt servo NEUTRAL	• Adjust VR609 so that the voltage becomes 2.2V ± 0.1V DC.
11	RF Gain Adjustment	VR601	CH1:CN401 - 3 (RF)	• Test mode #15,000 still TRKG servo ON • TILT servo NEUTRAL	• Adjust VR601 so that the RF level becomes 300mV ± 50mV.
12	FOCS Servo Loop Gain Adjustment	VR604	CH1:CN401 - 7 (FOCS IN) CH2:CN401 - 6 (FOCS ERR) (X - Y mode) (Fig.3)	• Test mode #15,000 still TRKG servo ON • TILT servo NEUTRAL	• Connect the oscilloscope and AF oscillator as shown in Fig.3 and observe the lissajous figure. Adjust VR604 so that the lissajous figure is symmetrical with respect to the X and Y axes.
13	TRKG Servo Loop Gain Adjustment	VR603	CH1:CN401 - 10 (TRKG IN) CH2:CN401 - 9 (TRKG ERR) (X - Y mode) (Fig.4)	• Test mode #15,000 still TRKG servo ON • TILT servo NEUTRAL	• Connect the oscilloscope and AF oscillator as shown in Fig.4 and observe the lissajous figure. Adjust VR603 so that the lissajous figure is symmetrical with respect to the X and Y axes.
14	Temporary Tilt Offset Adjustment for Side B	VR612	None	• Stop mode (power ON)	• Temporary adjust VR612 so that the VR612 becomes line symmetry as compared with the mechanical inclination of tilt offset VR(VR610) for side A. (Fig.5)
15	Coarse Centering Adjustment for Side B Play	Centering adjustment plate for side B.	CH1:CN401 - 9 (TRKG ERR) CH2:CN401 - 1, 2(TRKG SUM) (X - Y mode)	• Test mode #100 still TRKG servo ON / OFF • TILT servo ON	• Adjust that the X - axis amplitude of the lissajous figure becomes maximum.
16	Pickup Tangential Direction Angle Adjustment for Side B Play/ (Tilt Offset Fine Adjustment for Side B)	Pickup tangential direction angle adjustment screw. /(VR612)	Video output terminal (TV monetor)	• Test mode #115 still TRKG servo ON • TILT servo ON	• Adjust the pickup tangential adjustment screw for side B play so that the crosstalk becomes minimum. • If crosstalk is appeared, adjust the tilt offset fine adjustment for side B(VR612).
17	Fine Centering Adjustment for Side B Play	Centering adjustment plate for side B	CH1:CN401 - 9 (TRKG ERR) CH2:CN401 - 1, 2(TRKG SUM) (X - Y mode)	• Test mode #100 still TRKG servo ON/OFF • TILT servo ON	• Adjust that the X - axis amplitude of the lissajous figure becomes maximum.

	ADJUSTMENT	Adjusting Point	Measurement equipment Connecting Point	Player Condition	Adjusting Specification
18	NTSC Reference Clock Adjustment	VC202	IC201-33 (TBC CLK)	• NTSC PLAY mode. Play the NTSC disc. or Select the NTSC mode with the SYSTEM button of the frot panel. (*1)	• Adjust VC202 so that the 4fsc frequency becomes 14.31818MHz ± 0.1KHz.
19	PAL Reference Clock 910fH Adjustment	VC201	IC201-33 (TBC CLK)	• PAL PLAY mode. Play the PAL disc. or Select the PAL mode with the SYSTEM button of the frot panel. (*1)	• Adjust VC201 so that the 910fH frequency becomes 14.21875MHz ± 0.1KHz.
20	PAL Reference Clock Adjustment	VC203	IC201-24 (OSD CLK)	• PAL PAUSE mode. Play the PAL disc and set to pause state. or Select the PAL mode with the SYSTEM button of the front panel. (*1)	• Adjust VC203 so that the 4fsc frequency becomes 17,734475MHz ± 0.1KHz.
21	PAL VCXO ERR OFFSET Check	VC201	IC203-1	• Play the PAL disc.	• Play the PAL disc and check that the voltage of VCXO ERR at IC203-1 pin is 0V ± 100mV. If the specified voltage is not obtained, adjust VC201 so that the voltage becomes 0V ± 100mV. Note : The adjustment of VC201 in this step should have priority over that in step 19.
22	VCO Center Frequency Adjustment	VR481	CH1: C405 lead wire CH2: C499 + lead wire	• Normal mode GGV1007 #4,000 still	• Adjust VR481 so that the center position of jitter of CH2 video signal is delayed to 75 μS (1H+11 μS) ± 1.4 μS as compared with CH1 video signal. (Fig. 6)
23	Output Video Level Adjustment	VR482	Video output terminal (75 Ω termination or TV monitor connection)	• Normal mode #19,900 still	• Adjust VR482 so that the voltage between the sync tip and the white peak becomes 1.0Vp-p ± 5%. (Fig. 7)
24	1H Delay Video Level Adjustment	VR441	CH1 : C443-(minus) lead wire CH2 : C445-(minus) lead wire	• Normal mode #19,900 still	• Adjust VR441 so that the level of the 1H-delay video signal becomes the same as that of the main video signal. (Fig. 8)
25	VPS Error Adjustment	VR521	Video output terminal (TV monitor)	• Normal mode #6,000 still	• Color irregularity on the magenta screen is minimized.
26	MOD Y-Signal Level Adjustment	VR204	CH1 : IC205-2 (REFERENCE) CH2 : IC205-1	• Normal mode #19,900 still	• Adjust VR204 so that the level of Y signal at IC205-2 pin between the sync tip and the white 100% becomes the same as that of the Y signal at IC205-1 pin. (Fig. 9)
27	MOD C-Signal Level Adjustment	VR202	CH1 : IC205-2 (REFERENCE) CH2 : IC205-1	• Normal mode #6,000 still	• Adjust VR202 so that the level of C signal at IC205-2 pin becomes the same as that of the C signal at IC205-1 pin. (Fig. 10)
28	PAL Inverting SC Phase Adjustment	VR201	Video Output Terminal (TV monitor)	• Normal mode GGV1007 test disc #6,500 still	• Adjust VR201 so that the color irregularity on the magenta screen is minimized at still.

*1 : ⟵ PAL mode ⟵ NTSC mode ⟵ MOD PAL mode ⟵ (Cyclic change)

Adjustment Points in the Main Board Assembly

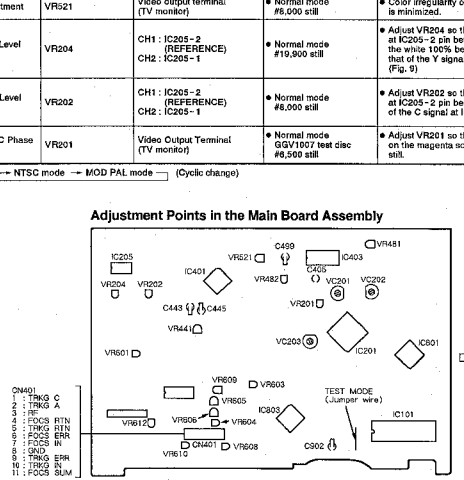


Fig. 1 Adjustment points

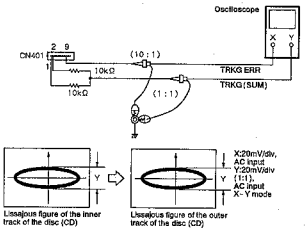


Fig.2 Connection for the spindle motor centering adjustment and fine grating adjustment

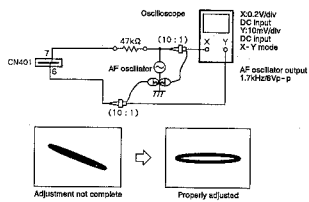


Fig.3 FOCS servo loop gain adjustment

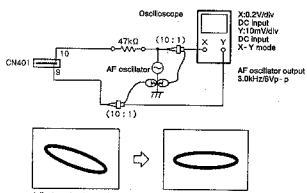


Fig.4 TRKG servo loop gain adjustment

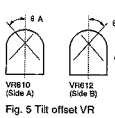


Fig. 5 Tilt offset VR

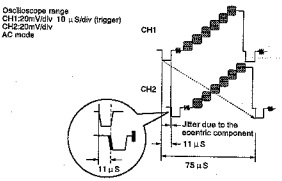


Fig. 6

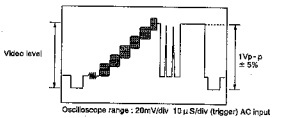


Fig.7 Output video level adjustment

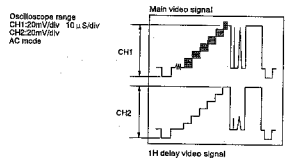


Fig. 8

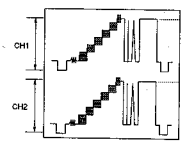


Fig. 9

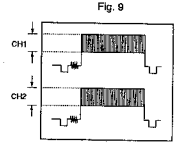


Fig.10

8. IC INFORMATION

- The information shown in the list is basic information and may not correspond exactly to that shown in the schematic diagrams.

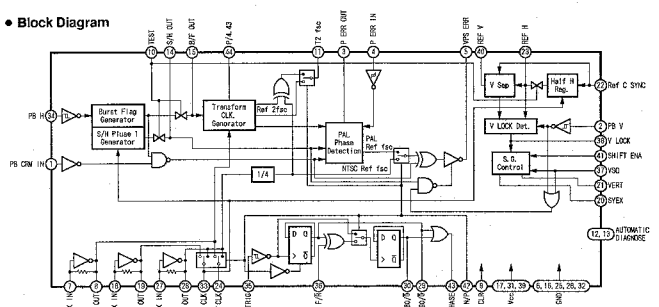
■ PD3239A (IC201)

• Dual TBC Controller

• Pin Functions

No.	Pin Name	Function	No.	Pin Name	Function
1	PB CRM	Burst signal input of NTSC 3.58MHz and PAL 4.43MHz.	22	REFCSYNC	REF composite sync. input.
2	PB V	PB V sync. input which is used to detect the VLOCK of clear scan etc..	23	REF H	REF H output Picking up the H SYNC by REF C SYNC.
3	P ERR OUT	PAL phase detection output for generating the burst error.	24	OSD CLK	4fsc output
4	P ERR IN		25	GND	Ground.
5	VPS ERR	Burst error output. 3 state output.	26		
6	GND	Ground.	27	NX IN	Oscillation circuit of NTSC 4fsc 14.31818MHz.
7	POX IN	Oscillation circuit of PAL 4fsc 17.734475MHz .	28	NX OUT	
8	POX OUT		29	90/0	Phase control signal by jumping.
9	CLR	Clear terminal Clear the internal latch at Low.	30	180/0	
			31	Vcc	Power supply voltage.
10	TEST	TEST terminal	32	GND	Ground.
11	T2 FSC	Quasi-PAL. Conversion clock output for PAL trick play.	33	TBC CLK	910fH output.
12	AUTOMATIC DIAGNOSE	Port for automatic diagnosing by the manufacturer. Normally, use at Low.	34	PB H	PB H sync. input.
13			35	J TRIG	Jump trigger input.
14	S/H	Monitor output of the sample hold for generating the burst error.	36	J F/R	Jump direction input.
			37	VSQ	VSQ input.
15	BF	Burst flag output.	38	V LOCK	Sync. detection signal of PB V and REF V of the clear scan.
16	GND	Ground.			
17	Vcc	Power supply voltage.	39	Vcc	Power supply voltage.
18	PTX IN	Oscillation circuit of PAL 910fH 14.21875MHz.	40	REF V	REF V output.
19	PTX OUT		41	SHIFT ENA	REF V shift control input of the clear scan.
20	SYEX	SYEX output. Perform the clear scan which connecting to M50552 - 132SP.	42	N/P	NTSC / PAL switching signal.
			43	SC PHASE	Phase detection signal by jumping.
21	VERT	VERT output. Perform the clear scan which connecting to M50552 - 132SP.	44	PAL 14.43	Quasi-PAL 4.43 NTSC switching signal.

• Block Diagram



■ PD0174A (IC101)

- Mechanism Control IC

• Pin Functions

No.	Pin Name	Function
1	Vcc	Power supply voltage. Apply 5V ± 10%.
2	XCX	Switching signal output of Analog audio CX noise reduction. ON : L , OFF : H
3	SQ2	Switching signal output of Analog audio. 2/R SQUELCH : H
4	SQ1	Switching signal output of Analog audio. 1/L SQUELCH : H
5	XANA	Switching signal output of Digital/Analog audio. "L"=Analog, "H"=Digital
6	SLDR POS	Pickup position detect switch input. (Analog signal)
7	TBAL ERR	Tracking balance error signal input. (Analog signal)
8	SLDR ERR	Slider error signal input. (Analog signal)
9	TILT ERR	Tilt sensor output signal input. (Analog signal)
10	MUTE	Control signal output of audio mute. MUTE : H Release MUTE : L
11	XREFV	Reference V-SYNC signal output for clear scan.
12	SLDR DRV	Slider control signal output.
13	T OFF	Tracking operation control signal output. Tracking OFF : H Tracking ON : L
14	GFS	CD (EFM signal) frame lock signal input. Lock : H Unlock : L
15	SI2	EFM decoder IC:CXD2500BQ sub cord input.
16	XLAT2	EFM decoder IC:CXD2500BQ control latch signal output. Latch at falling edge.
17	SCK2	Clock signal output for reading the subcode of CXD2500BQ. Read at rising edge.
18	TBAL DRV	Tracking offset control signal output.
19	SI1	Data input from the mode control IC.
20	SO1	Serial data output to the mode control IC.
21	SCK1	Clock for serial communication with the mode control IC.
22	TZC	Tracking error zerocross signal input.
23	SCOR	Subcode sync. signal input. During synchronization : H
24	T LATCH	Serial control latch signal output of D/A converter and digital filter IC PD2026B. Latch at falling edge.
25	SHAKE	Hand shake signal for data communication with the mode control IC.
26	XPBV	Playback vertical sync. signal input of LD/CDV. During vertical synchronization : L
27	CN Vss	Ground for A/D converter.
28	XRESET	Reset signal input. "L"=Reset "H"=Release the reset
29	XIN	8MHz clock oscillation input.
30	XOUT	8MHz clock oscillation output.
31	FTS CLK	External clock output. 9MHz divided by four (2.25MHz), For PM3003A.
32	Vss	GND
33	SW1	Switch input for detecting the loading/tilt position.
34	SW2	
35	SW3	

No.	Pin Name	Function
36	XFOK	Focus servo lock signal input. Lock : L Unlock : H
37	FG	Spindle motor FG signal input. 24 times in one turn and 3 divided into the microcomputer.
38	DATA	Input terminal for the Phillips code decode in the mechanism controller.
39	XPBH	Playback H SYNC input for Phillips code decode.
40	XPBV	Playback V SYNC input for Phillips code decode.
41	CAV/CLV	CAV/CLV switching signal output. "H" : CAV, "L" : CLV
42	J FWD/R	JUMP FWD signal output for PAL. FWD jump/Play : H, Others : L
43	ACCONT	Speed up and down signal output of spindle. Side A→Accelerator : H, Brake : L, Others : Z
44	GPWM	Duty pulse signal output for switching the spindle gain. CLV→inner : L Outer : H
45	J. TRIG	Track jump signal output. "H" while jump will be started as trigger for about 20 μsec.
46	SCK3	Serial 3 clock signal output. Reading at rising edge.
47	SO3	Serial 3 data signal output
48	XLATCH3	Latch signal output for the spindle servo IC. Latch at falling edge.
49	CLR SCAN	Clear scan signal output. During clear scan : H, Others : L
50	VSQ	Switching signal output of video output "H" =Squelch, "L" =Playback video
51	VLOCK	Lock detection signal input of vertical sync.. "H" for fixed time by fitting the phase of REFV with PBV.
52	SENA	Shift enable signal output. Set to "H" when REFV is accessible PBV by extracting H.
53	XSLOCK	Spindle lock signal input. Lock : L Unlock : H
54	XPLAY	PLAY signal output for PAL. L : Play H : Not play
55	N.C.	Not used
56	N/XP	PAL/NTSC signal output. L : PAL, H : NTSC
57	16:9	16:9 switching signal output. "H" for 16:9 "L" for 4:3 (Normal)
58	TILT DRV	Loading and tilt control signal output.
59	TRAY SW	Switch input for detecting the CD direct tray position. CD open position : L, Others : H
60	TURNA	Detection signal input of the α turn position. "L" =side A, "H"=side B and during turn.
61	TURNB	Detection signal input of the α turn position. "L" =side B, "H"=side A and during turn.
62	RF CORR	RF correction switching signal output. H : Gain up, Gain up at inner the CAV
63	DIRECT	Power OFF signal output of the CD direct video section. Video power OFF : H, Normally : L
64	XSLDLMT	Correspondence and uncorrespondence switching input of the slider runaway. Correspondence : L

■ PD3247A (IC101)

• Mode Control IC

• Pin Functions

No.	Pin Name	I/O	Function	No.	Pin Name	I/O	Function
1	AN4	I	GND	41	G12	O	Display grid output.
2	AN5			42	G11		
3	AN6			43	G10		
4	AN7			44	G9		
5	AVSS			45	G8		
6	TEST			46	G7		
7	X2	O	N.C. (Open)	47	G6		
8	X1	I	+5V	48	G5		
9	VSS		GND	49	G4		
10	OSC1	I	Main system clock oscillation (8MHz).	50	G3		
11	OSC2	O		51	G2		
12	RESET	I	CPU reset (L:Reset).	52	G1		
13	SHAKE		Require the serial communication with mechanism control IC.	53	D-CONTROL L		Digital control LED output.
				54	THEATER L		Theater mode LED output.
14	SEL IR		Remote control input.	55	DISP OFF L		FL display off LED output.
15	DOGFOOD	O	Pulse output for watch dog.	56	STLSCAN		Reading signal output for shuttle data.
16	POWERON		Switching output for the motor board power supply.	57	VCC	I	+5V
				58	KIN0/STL1		Key data input/Shuttle data input. STLSCAN="H"
17	P14		N.C. (Open)	59	KIN1/STL2		
18	P15			60	KIN2/STL3		
19	P16	I	+5V	61	KIN3/STL4		
20	P33	O	N.C. (Open)	62	KIN4		Key data input.
21	P32			63	KIN5		
22	P31			64	P66	O	N.C. (Open)
23	STDBYL		Stand by LED.	65	DOORSW	I	Door tray SW input. (H : Open, L : Close)
24	P47		N.C. (Open)	66	SYNCOUT	O	Deck synchro output.
25	P46			67	XSCK	I/O	Mechanism control and character generator serial communication clock.
26	P45						
27	P44			68	S-MTOF	I	Mechanism control serial communication data input.
28	KSCAN3/SEG L	O	Key scan output/display segment output.	69	S-FTOM	O	Mechanism control and character generator serial communication data output.
29	KSCAN3/SEG L						
30	KSCAN3/SEG L			70	XRESET		Main board reset output.
31	KSCAN3/SEG L			71	XCS		Character generator chip select. L : Active
32	SEG h		Display segment output.	72	SYNCIN	I	Deck synchro input.
33	SEG g			73	P07	O	N.C. (Open)
34	SEG f			74	PA0		
35	SEG e			75	PA1		
36	SEG d			76	AVCC	I	+5V
37	SEG c			77	AN0		
38	SEG b			78	AN1		
39	SEG a			79	AN2		
40	VDISP	I	−27V	80	AN3		

9. FOR WB TYPE

NOTES:

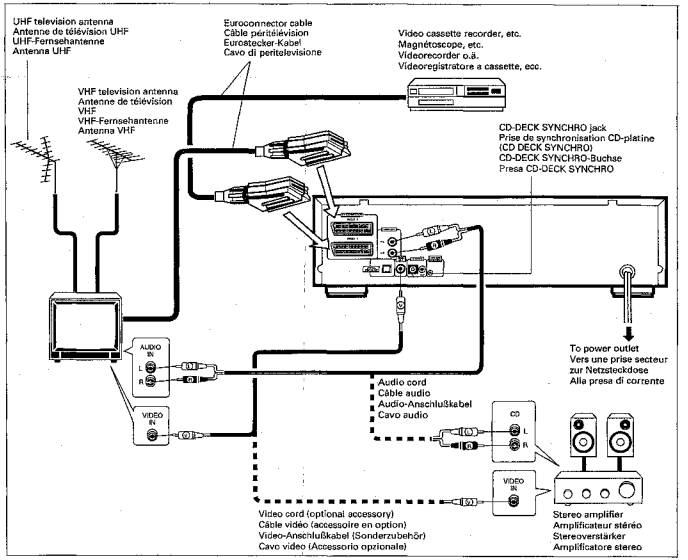
- *Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *Parts marked by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

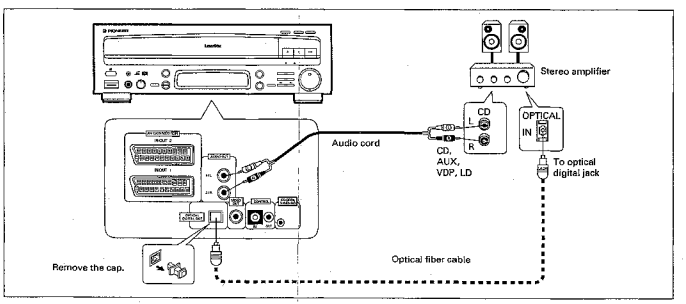
CONTRAST OF MISCELLANEOUS PARTS

CLD–2850/WB and CLD–2850/WEZ have the same construction except for the following :

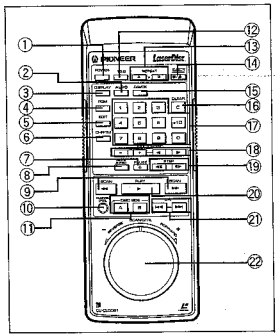
Mark	Symbol & Description	Part No.		Remarks
		CLD–2850/WEZ	CLD–2850/WB	
⚠	AC power cord	PDG1003	VDG1051	Refer to section 3.7.
⚠	Fuse (FU1, 13A)	• • • • •	VEK1003	Refer to section 3.7.
	Fuse holder	• • • • •	VKR1002	Refer to section 3.7.
	Pin cap	• • • • •	VEC1616	Refer to section 3.7.
NSP	Caution card (EW)	VRM1027	• • • • •	
NSP	Caution card (UC)	• • • • •	VRM1026	
NSP	Caution label	• • • • •	PRW1018	
NSP	Caution label	VRW1094	• • • • •	
NSP	Caution label HE	VRW1297	• • • • •	
	Operating instructions (English)	• • • • •	VRB1086	
	Operating instructions (English/French/German/Italian)	VRB1016	• • • • •	
	Operating instructions (Dutch/Swedish/Spanish/Portuguese)	VRF1023	• • • • •	

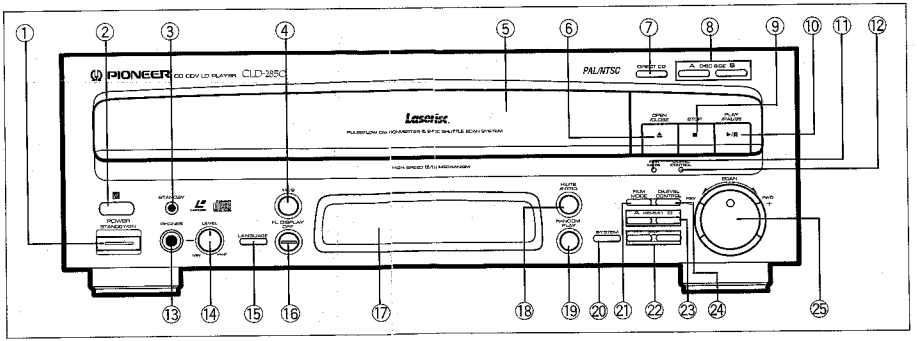
10. CONNECTIONS





11. PANELFACILITIES

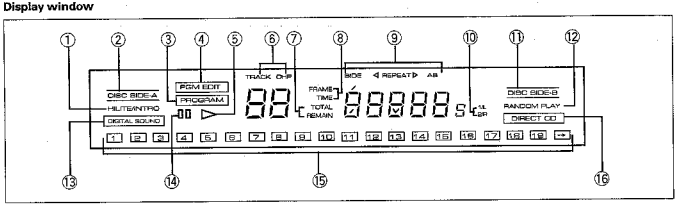




① **POWER button**
Press to turn the power on and off.
② **AUDIO button**
③ **DISPLAY button**
④ **PGM button**
⑤ **EDIT button**
⑥ **CHP/TM button**
⑦ **PAUSE button**
⑧ **HILITE/INTRO button**
⑨ **SCAN buttons**
⑩ **D-LEVEL CTRL button**
⑪ **DISC SIDE A/B buttons**
⑫ **16:9 button**
⑬ **REPEAT A/B buttons**
⑭ **EJECT button**
⑮ **D/A/CX button**
⑯ **CLEAR button**
Used to clear the repeat mode, program mode, random play mode or hi-lite scan/intro scan mode. This button is also for use in correcting input digits.
⑰ **Direct search/Digit buttons**
⑱ **MULTI-SPEED buttons**
⑲ **STEP buttons**
⑳ **PLAY button**
㉑ **SKIP buttons**
㉒ **SCAN/CTRL control**

① **POWER STANDBY/ON switch**
Press to turn the power on and off.
② **REMOTE SENSOR**
③ **STANDBY indicator**
④ **16:9 button**
⑤ **Door/Disc table**
⑥ **OPEN/CLOSE button**
⑦ **DIRECT CD button**
⑧ **DISC SIDE A/B buttons**
⑨ **STOP button**
⑩ **PLAY/PAUSE button**
⑪ **FILM MODE indicator**
⑫ **D-LEVEL CONTROL indicator**
⑬ **PHONES jack**
⑭ **PHONES LEVEL control**
Turn this control in the "MAX" direction to increase the output level from the PHONES jack. Turn this control in the "MIN" direction to decrease the output level from the PHONES jack.
⑮ **LANGUAGE button**
⑯ **FL DISPLAY OFF button/indicator**
⑰ **Display window**
⑱ **HILITE/INTRO button**
⑲ **RANDOM PLAY button**
⑳ **SYSTEM button**
㉑ **FILM MODE button**
㉒ **SKIP buttons**
㉓ **REPEAT A/B buttons**
㉔ **D-LEVEL CONTROL button**
㉕ **SCAN control**

Display window



① **HILITE/INTRO indicator**
Lights during Hi-Lite Scan or Intro Scan mode.
② **DISC SIDE A indicator**
③ **PROGRAM indicator**
Lights during program play.
④ **PGM EDIT indicator**
Lights when editing is performed.
⑤ **► play indicator**
Lights during play. Blinks during search.
⑥ **TRACK/CHP indicator**
Indicates the TRACK number or CHP (chapter) number.
⑦ **REMAIN/TOTAL indicator**
Indicates the REMAIN TIME (remaining play time) or TOTAL TIME (total play time).
⑧ **FRAME/TIME indicator**
Indicates the FRAME number or TIME.
⑨ **REPEAT indicator**
Lights during repeat play.
⑩ **1/L, 2/R indicator**
Indicates the audio output channel.
⑪ **DISC SIDE B indicator**
⑫ **RANDOM PLAY indicator**
Lights during random play.
⑬ **DIGITAL SOUND indicator**
Lights when the disc being played has a digital sound signal. With LD discs, this indicator lights when the digital sound signal is selected.
⑭ **II pause indicator**
Lights when the player is in pause mode.
⑮ **LD/CD/CDV visual calendar**
When a disc is loaded, all of the chapter/track numbers recorded on the disc light up on the display. If the disc contains more than 19 chapters/tracks, the → indicator lights. During program play, only the programmed chapter/track numbers light. When a disc without a TOC section is played, only the selection number being played lights. When a CDV disc is loaded, the track numbers of the video part light followed by the track numbers of the audio p... After a chapter/track is finished playing, the corresp... number goes out.
⑯ **DIRECT CD indicator**

12. SPECIFICATIONS

1. General

System ..... LaserVision Disc system and Compact Disc digital audio system
Laser ..... Semiconductor laser wavelength 780 nm
Power requirements ..... AC 220 ~ **240** V, 50/60 Hz
Power consumption ..... 43 W
Weight ..... 8.6 kg
Dimensions ..... 420 (W) x 435 (D) x 135 (H) mm
Operating temperature ..... +5°C ~ +35°C
Operating humidity ..... 5% ~ 85%
(There should be no condensation of moisture.)

2. Disc

LaserVision Discs

PAL disc

*Maximum playing times
30 cm active play disc ..... 72 min/both sides
30 cm long play disc ..... 2 hours/both sides
20 cm active play disc ..... 28 min/both sides
14 min/one side
20 cm long play disc ..... 40 min/both sides
20 min/one side

Spindle motor speed
Active play disc ..... 1,500 rpm
Long play disc ..... 1,500 rpm (inner circumference) to 570 rpm (outer circumference)
(For a 30 cm disc)

NTSC disc

*Maximum playing times
30 cm standard play disc ..... 1 hour/both sides
30 cm extended play disc ..... 2 hours/both sides
20 cm standard play disc ..... 28 min/both sides
14 min/one side
20 cm extended play disc ..... 40 min/both sides
20 min/one side

Standard play disc ..... 1,800 rpm
Extended play disc ..... 1,800 rpm (inner circumference) to 600 rpm (outer circumference)
(For a 30 cm disc)

Compact Discs

DISC ..... Diameter: 12 cm, 8 cm, Thickness: 1.2 mm
Rotation direction (pickup side) ..... Counterclockwise
Linear speed ..... 1.2 ~ 1.4m/sec
*Maximum playing time ..... 74 min. 12 cm discs
20 min. 8 cm discs
(For stereo playback)

Compact Discs with Video

Disc ..... Diameter: 12 cm, 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 ..... PAL/NTSC specifications
Video output
Level ..... 1 Vp-p nominal, sync. negative, terminated
Impedance ..... 75Ω unbalanced
Jack ..... RCA jack

4. 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

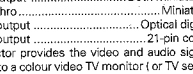
Digital Audio Characteristics

Frequency response	4 Hz - 20 kHz
SN ratio	112 dB (EIAJ)
Dynamic range	97 dB (EIAJ)
Total harmonic distortion	0.003 % (EIAJ)
Wow and flutter	Limit of measurement (EIAJ)

5. Other Terminals

Control input/output ..... Both miniature jacks
CD-DECK synchro ..... Miniature jack
Optical digital output ..... Optical digital jack
AV connector output ..... 21-pin connector
This connector provides the video and audio signals for connection to a colour video TV monitor (or TV set) which has a "AV CONNECTOR" terminal.

PIN assignment



PIN no.			
	1	Audio 2/R out	17 GND
	3	Audio 1/L out	19 Video out
	4	GND	21 GND
	8	Status	

6. Accessories

Remote control unit (CU-CLD081) 1
Size "AAA" (IEC R03) dry cell batteries 2
Euroconnector cable 1
Audio cord 1
Operating instructions 1
Warranty card 1

7. Functions

Remote control unit operations (CU-CLD081)

	Function	Active play Disc (CAV)	Long 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
	All-side repeat	YES	YES	NO	NO
	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	Compu program/Auto program edit	YES*1	YES*1	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	NO	NO
	Audio channel selection (Stereo, 1/L, 2/R)	YES	YES	YES	YES

*1 Only discs with TOC
*2 Valid for analog audio playing a disc with the DX mark.
*3 Can only be used with discs with digital audio 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 improvements.

PLAYER FUNCTIONS

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

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