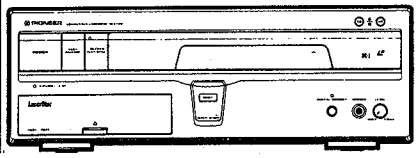
PIONEER®
The Art of Entertainment

Service Manual



ORDER NO.
ARP2757

CD CDV LD PLAYER

CLD-A100

CLD – A100 HAS THE FOLLOWING:

Type	Power Requirement	Remarks
KU	AC 120 V only	

- **This manual is applicable to CLD – A100/KU.**

CONTENTS

PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan
PIONEER ELECTRONICS SERVICE INC. P.O. Box 1760, Long Beach, California 90801 U.S.A.
PIONEER ELECTRONICS OF CANADA, INC. 300 Allstate Parkway Markham, Ontario L3R 0P2 Canada
PIONEER ELECTRONIC [EUROPE] N.V. Haven 1087 Keetberglaan 1, 9120 Melsele, Belgium
PIONEER ELECTRONICS AUSTRALIA PTY. LTD. 178-184 Boundary Road, Braeside, Victoria 3195, Australia TEL: [03] 580-9911

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1. SAFETY INFORMATION

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

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

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

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

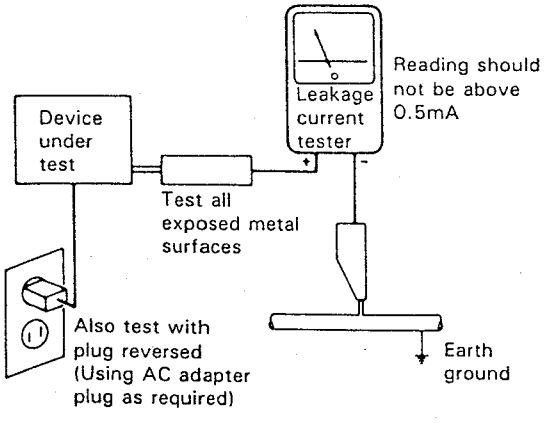
(FOR USA MODEL ONLY)

1. SAFETY PRECAUTIONS

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

LEAKAGE CURRENT CHECK

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



AC Leakage Test

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

2. PRODUCT SAFETY NOTICE

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

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

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

2. DISASSEMBLY

• Removing the Tray Unit

1. Remove the two fixing screws Ⓩ (Fig. 2-1).
2. Press the LD STOP OPEN/CLOSE button to set the tray unit to its OPEN position.

* When manually setting the tray unit to its OPEN position, refer to Notes 1 and 2.

3. Pull out the tray unit while pressing the hook Ⓐ (Fig. 2-1), located on the rear right side of the tray unit, to the left.

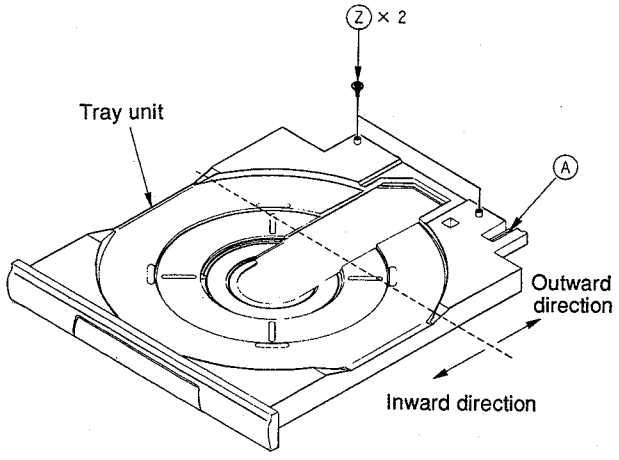


Fig. 2-1

Note 1. Manually setting the tray unit to its OPEN position

1. Remove the clamper holder unit Ⓑ (Fig. 2−2) by loosening its four screws.

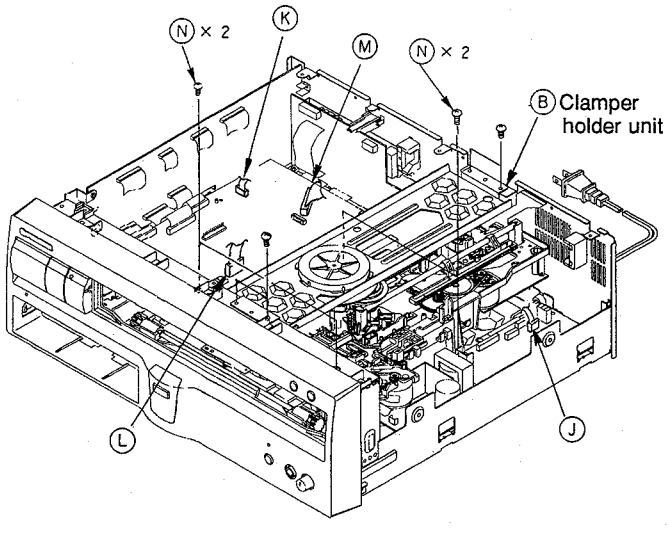


Fig. 2-2

2. Make sure that the position of the lens in the pickup assembly is such that the lens stops outside the position indicated by the dotted line in Fig. 2-1.
   When the lens stops inside the dotted line, slowly press the Ⓠ portion of the rack assembly (Fig. 2-3) to move the lens in the pickup assembly until the lens is outside the position indicated by the dotted line in Fig. 2-1.
   Note that by not going through this process, opening the CD tray and removeing the tray unit would be more time-consuming.

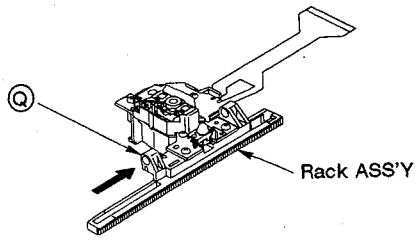


Fig. 2-3

3. Insert your hand through the right side of the tray unit and turn the gear pulley Ⓒ (Fig. 2-4) in a clockwise direction until the servo-mechanism unit Ⓓ (Fig 2-5) lowers. Keep turning the pulley until the tray unit starts to move towards the front.

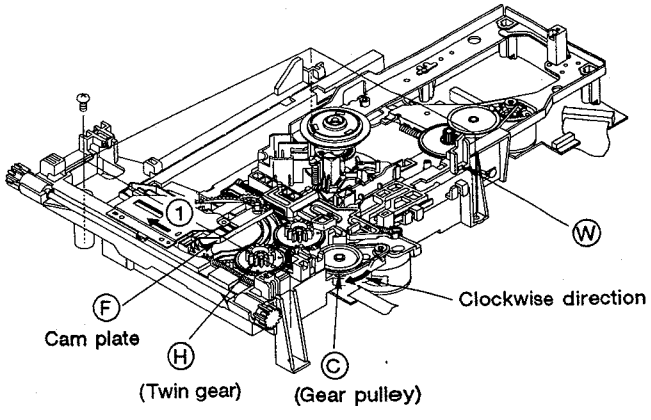


Fig. 2-4

4. Slowly pull out the tray unit to the OPEN position.

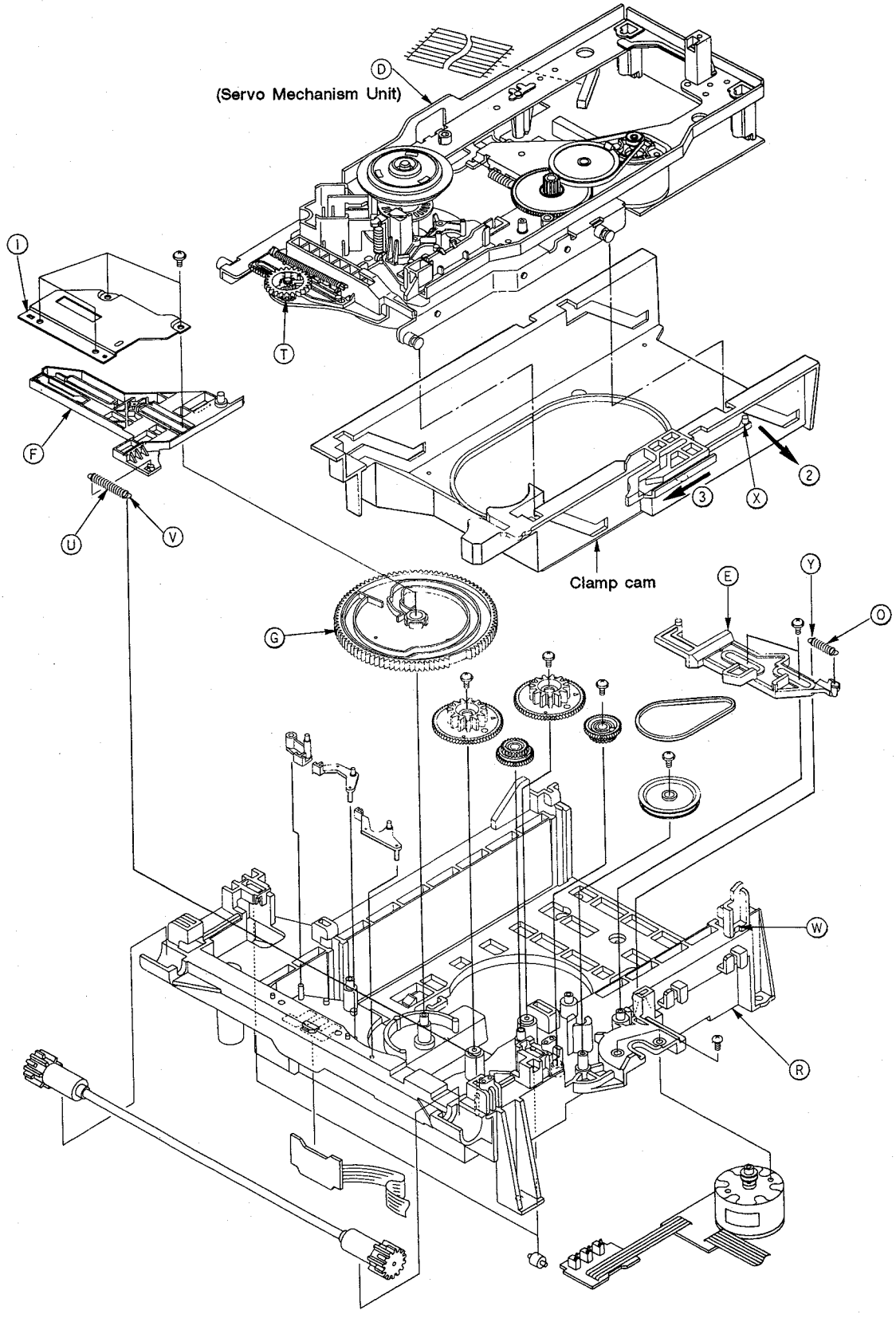


Fig. 2-5

Note 2. Setting the tray unit to its OPEN position when the CD tray is completely or partially OPEN

1. Remove the clamper holder unit Ⓑ (Fig. 2-2) by loosening its four screws.
2. Slowly push in the CD tray to the CLOSE position.
3. Slowly press the Ⓠ portion of the rack assembly (Fig. 2-3) to move the lens in the pickup assembly until the lens is outside the position indicated by the dotted line in Fig. 2-1.
4. Insert your hand through the right side of the tray unit and turn the gear pulley Ⓒ (Fig. 2-4) in a counterclockwise direction until the servo-mechanism unit Ⓓ (Fig. 2-5) starts to move upward. Keep turning the pulley until the clamp position is reached (the LD tray and CD tray become one unit).
5. When the clamp position has been reached, turn the gear pulley Ⓒ (Fig. 2-4) in a clockwise direction until the servo-mechanism unit Ⓓ lowers. Keep turning the pulley until the tray unit starts to move towards the front.
6. Slowly pull out the tray unit to the OPEN position.

• Attaching the Tray Unit

1. Make sure that the CD plate Ⓔ is positioned to the left (LD tray mode) as in Fig. 2-6. When the CD plate Ⓔ is positioned to the right (CD tray mode) as in Fig. 2-6, perform steps 1) to 2).

1) Turn the power ON. After pickup assembly stopped, push cam plate Ⓕ (Fig. 2-6) towards the direction of the arrow Ⓘ .
2) Wait until the cam gear Ⓖ (Fig. 2-6) turns, the servo-mechanism unit Ⓓ (Fig. 2-5) goes upward, and the pickup assembly stops moving.

2. Press the LD STOP OPEN/CLOSE button to open the tray unit, or pull out the power cord from the AC outlet and turn the twin gear Ⓗ (Fig. 2-4) in a counterclockwise direction until the cam gear Ⓖ (Fig. 2-6) can no longer turn.
3. Keeping the tray unit parallel with the front panel, slowly insert the tray unit through the opening of the front panel.

Note that if you insert the tray unit in the front panel when the tray unit and the front panel are not parallel with each other, the tray unit might get stuck while being inserted.

• Removing the Servo-Mechanism Unit

1. Remove the clamper holder unit Ⓑ (Fig. 2-2) by loosening its four screws, and remove the tray unit.
2. Remove the four connectors Ⓙ to Ⓜ (Fig. 2-2).
3. Remove the four fixing screws Ⓝ of the mechanism base and remove the whole servo-mechanism unit from its casing.
4. Remove the Ⓨ side of the CDP spring Ⓞ (Fig. 2-5) as well as the CD plate Ⓔ by loosening the CD plate's two screws.
5. Remove the lead wire from the lead wire hook Ⓢ (Fig. 2-7) for the spindle motor at the rear of the mechanism base Ⓡ .

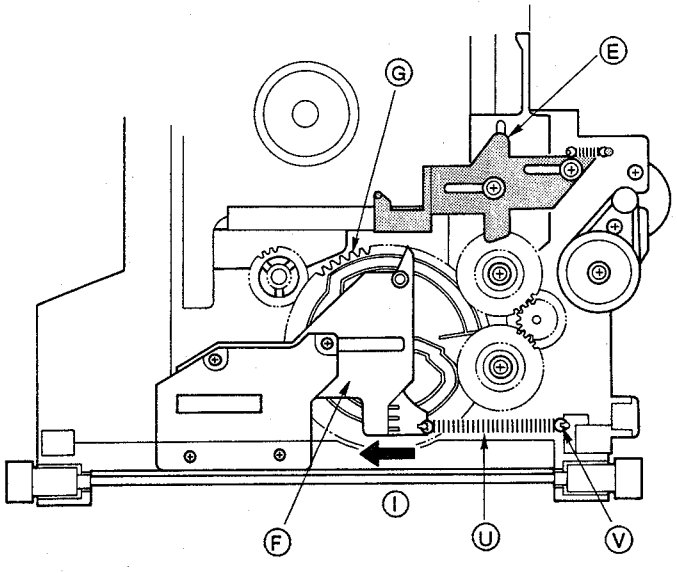


Fig. 2-6

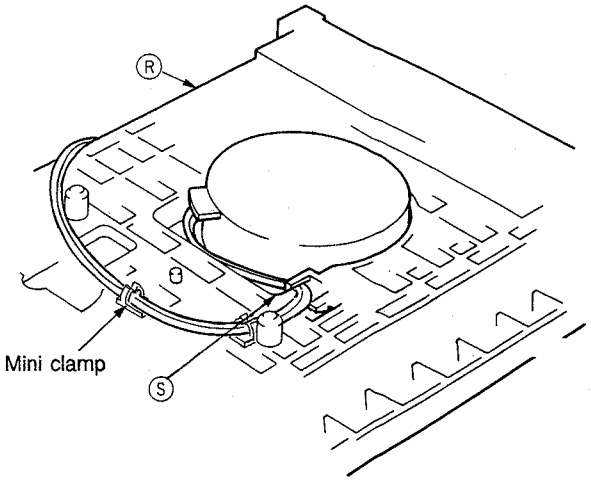


Fig. 2-7

6. While pushing the cam plate Ⓕ (Fig. 2-4) towards the direction of the arrow ①, turn the twin gear Ⓗ (Fig. 2-4) in a clockwise direction.
7. Stop turning the twin gear Ⓗ (Fig. 2-4) when the servo-mechanism unit Ⓓ (Fig. 2-5) has gone upward and the Y-gear Ⓣ is engaged with the cam gear Ⓖ by three to five teeth.
8. While bending the clamp cam hook Ⓧ (Fig. 2-5) in the direction of the arrow ②, move the hook to its "built-in position" Ⓦ (Fig. 2-4) towards the rear.
9. Lift the servo-mechanism unit Ⓓ straight up and remove the unit from the clamp cam (Fig. 2-5).

• Attaching the Servo-Mechanism Unit

1. Return the clamp cam and other parts to their original positions (when the servo-mechanism unit was removed).
2. While turning the Y-gear Ⓣ in a clockwise direction by three to five teeth (Fig. 2-8) in the same manner as when the Y-gear was removed, attach the servo-mechanism unit from above to the clamp cam (Fig. 2-5).
3. While bending the clamp cam hook Ⓧ in the direction of the arrow ② , move the hook in the direction of the arrow ③ (Fig. 2-5).
4. While the servo-mechanism unit is raised, hook the lead wire from the spindle motor to hook Ⓢ (Fig. 2-7) on the rear of the mechanism base Ⓡ .
5. Turn the twin gear Ⓗ (Fig. 2-4) in a counterclockwise direction until the servo-mechanism unit lowers, the cam gear Ⓖ (Fig. 2-5) stops turning, and the twin gear Ⓗ (Fig. 2-4) runs idle.

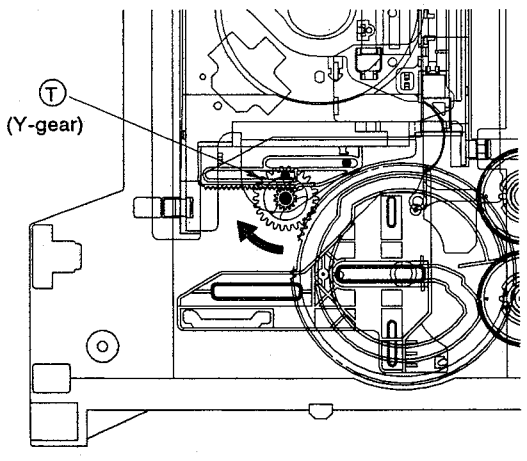


Fig. 2-8

• Attaching the Cam Gear and Cam Plate

1. Bring the clamp cam (Fig. 2-5) close towards you (while the servo-mechanism unit is being lowered).
2. Insert the cam gear Ⓖ upon directing the rib horizontally as shown in Fig. 2-9.

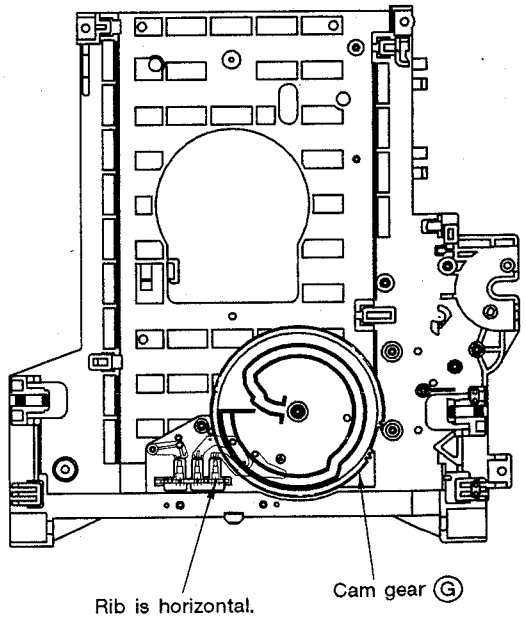


Fig. 2-9

3. Attach the CAS spring, Ⓤ (Fig. 2-6) to the cam plate Ⓕ , and hook the Ⓥ side of the CAS spring to the spring-latching part of the mechanism base.

4. Slightly turn the cam gear Ⓖ in a counterclockwise direction until the cam gear reaches the position shown in Fig. 2-10.

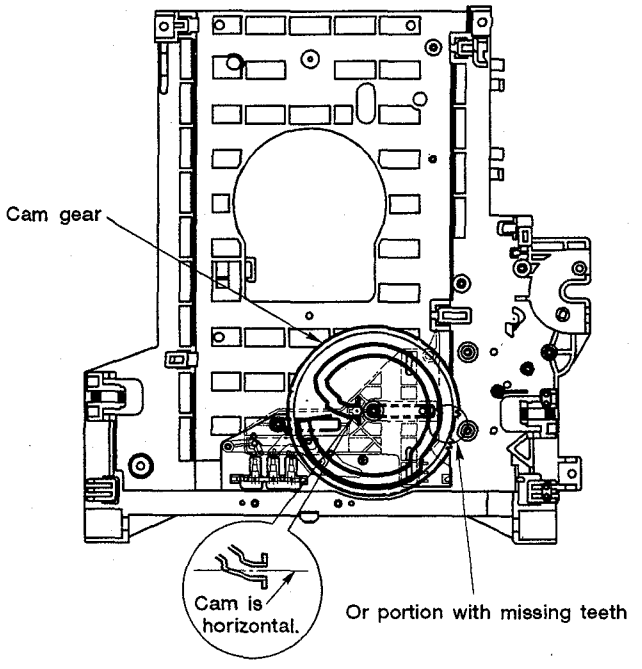


Fig. 2-10

5. Attach the cam plate Ⓕ on the cam gear Ⓖ when the plate has moved to the rightmost position (Fig. 2-6).
6. Fix the shaft holder Ⓘ using four screws (Fig. 2-5).

• Matching the Position of the Gears

1. Attach the center gear Ⓟ , twin gears Ⓗ1 and Ⓗ2, and Y-gear Ⓣ in the positions indicated in Fig. 2-11.

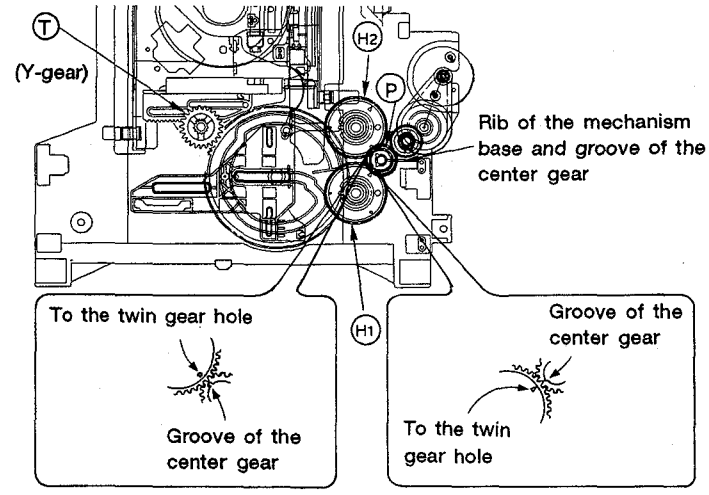


Fig. 2-11

• Attaching the CD Plate

1. Upon attaching the CD spring Ⓞ (Fig. 2-5) to the CD plate Ⓔ , hook the Ⓨ side of the CD spring to the mechanism base hook.
2. Attach the CD plate Ⓔ (from the left side) into the position shown in Fig. 2-6.

3. EXPLODED VIEWS AND PARTS LIST

NOTES:

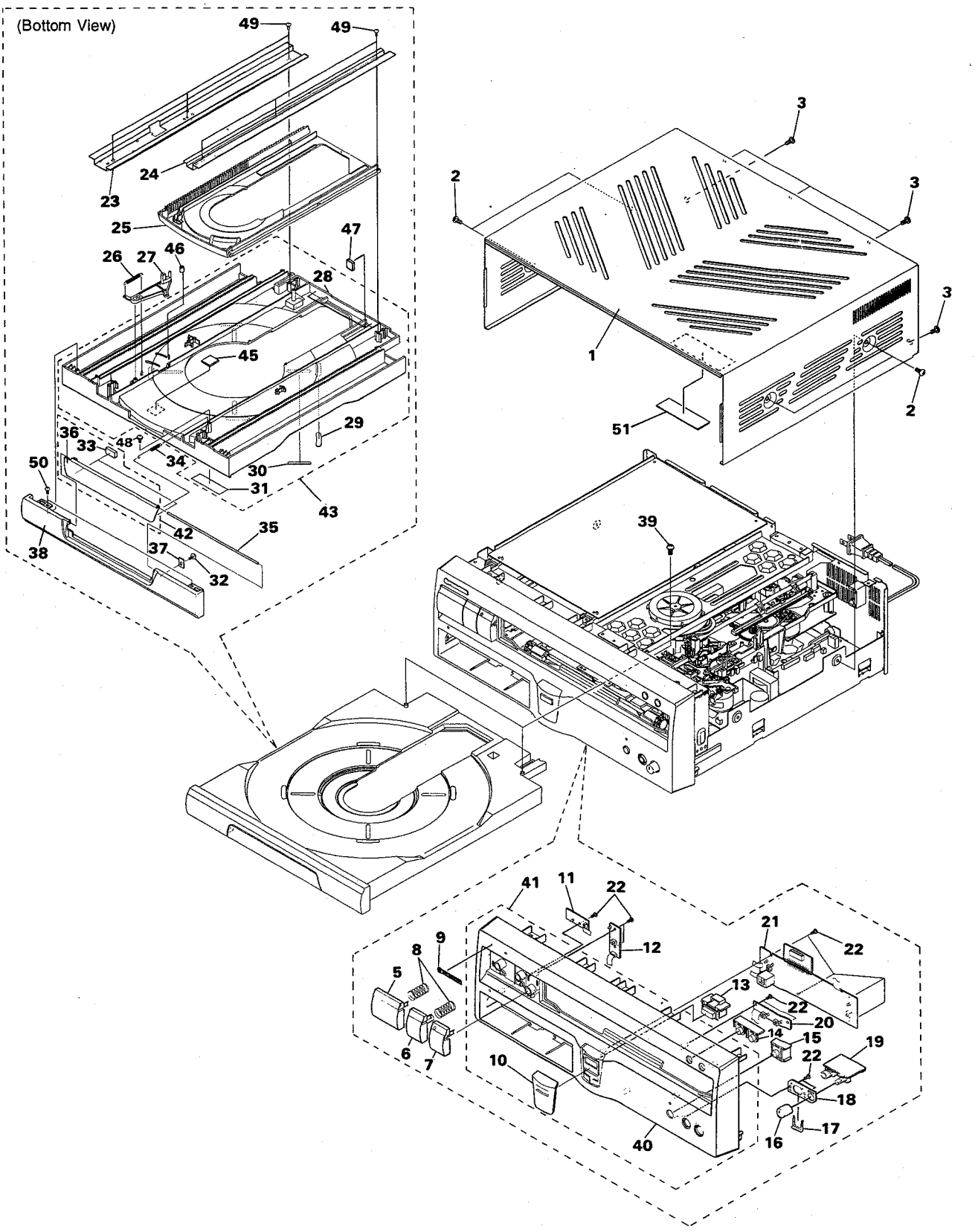
- *Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *Parts marked by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

3.1 EXTERIOR, DISC TRAY AND FRONT PANEL

Part List

Mark	No.	Description	Parts No.
	1	Bonnet−S	DXX2120
	2	Screw	BCZ40P060FZK
	3	Screw	BBZ30P080FMC
	4	.....	
	5	Power button	DNK2725
	6	Release button	DNK2726
	7	Play button ass'y	DXA1624
	8	Panel spring	DBH1226
	9	Name plate	VAM1032
	10	IR panel	DNK2724
NSP	11	STBB ass'y	DWG1361
NSP	12	PLYB ass'y	DWG1360
	13	Reset button	DNK2728
	14	Eject button	DNK2730
	15	Through button	DNK2729
	16	Volume knob	DNK2731
	17	Snap plate	VNE1102
	18	Jack holder	VNE1811
NSP	19	HEPB ass'y	DWG1363
NSP	20	CLDB ass'y	DWG1362
NSP	21	MAIN ass'y	DWG1359
	22	Screw	BPZ26P060FMC
	23	Guide plate (R)	VNE1806
	24	Guide plate (L)	VNE1805
	25	CD tray	VNK1992
	26	Lock plate spring	VBH1188
	27	Lock plate	VNL1513
NSP	28	LD tray	VNK1991
	29	Disc pad (L)	VEC1191
	30	Disc pad (C)	VEC1380
NSP	31	Carry label	VRW1289
	32	Screw	IPZ20P050FMC
	33	Carry cushon	VEC1578
	34	Door spring	DBH1227
	35	Door shaft	VLL1441
NSP	36	CD Door	DNK2733
	37	Door holder	VNE1812
	38	LD door	DNK2732
	39	Screw	VBA1032
NSP	40	Front panel ass'y	DXA1623
	41	Front panel ass'y−S	DXX2119
	42	CD door ass'y−S	DXX2109
	43	Tray ass'y−S	VXX1729
	44	.....	
	45	Damp cushon	VEC1110
	46	Stop ring	VEB1091
NSP	47	Cushion	VEC1618
	48	Screw	VBA1034
	49	Screw	BPZ30P060FCU
	50	Screw	BPZ30P080FCU
NSP	51	65 label	ORW1069

NOTE : Screws adjacent to ▼ mark on product are used for disassembly.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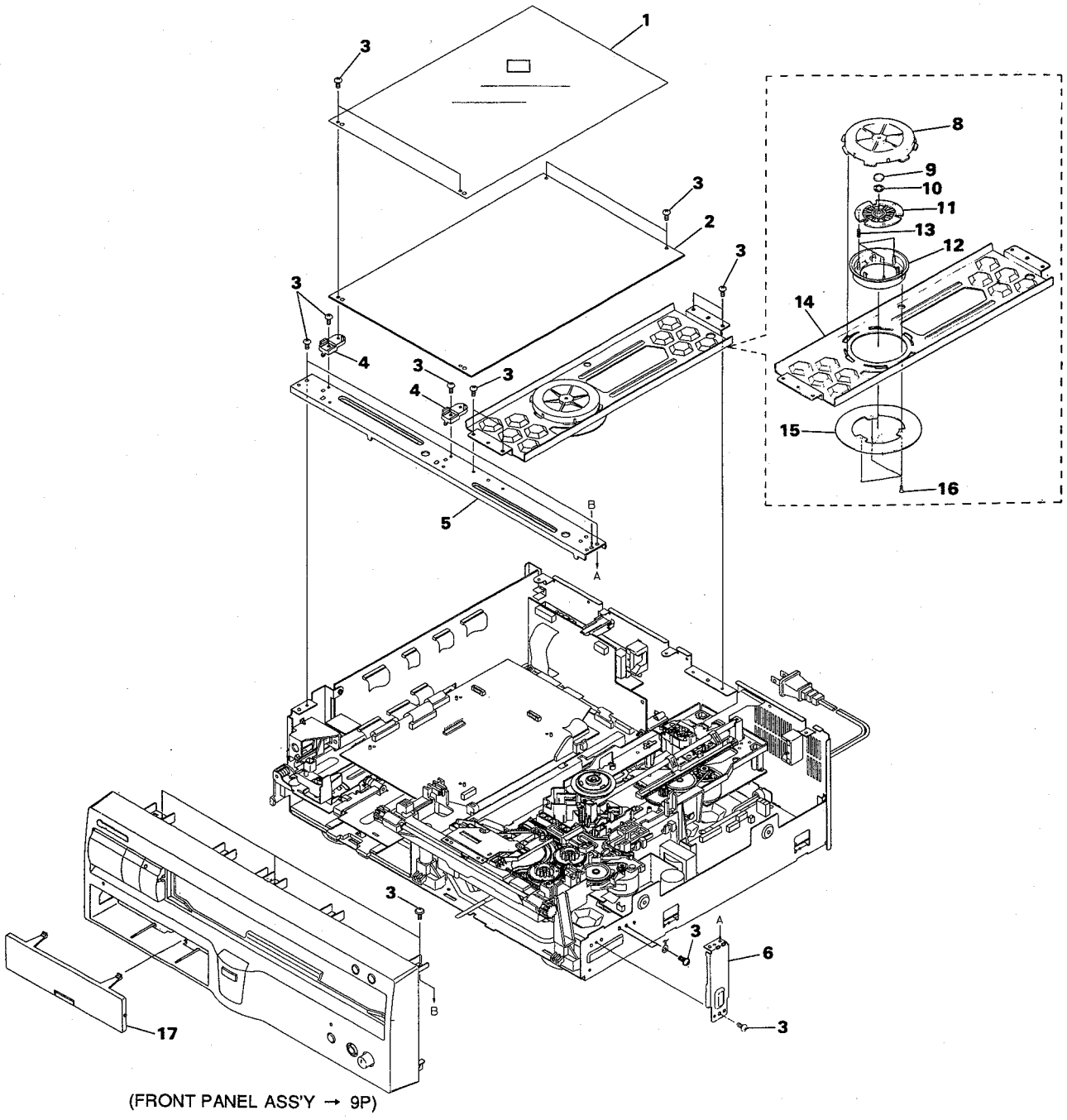
3.2 TOP VIEW AND CLAMPER ASSY

Part List

Mark No.	Description	Parts No.	Mark No.	Description	Parts No.
1	Sheet L	DEC1732	11	Clamper head	VNL1516
2	VIDEO ass'y	DWV1132	12	Clamper	VNL1515
3	Screw	BBZ30P080FMC	13	Clamper spring	VBH1192
4	Base S	DNK2742	14	Clamper arm	VNE1804
5	Front stay	DNE1207	15	Stabilizer	VNE1807
6	Side stay R	DNE1209	16	Screw	CPZ20P050FMC
7	.....		17	Pack port	DNK2743
8	Clamper holder	VNL1514			
9	Rubber sheet	VEB1114			
10	Ball holder	VNL1289			

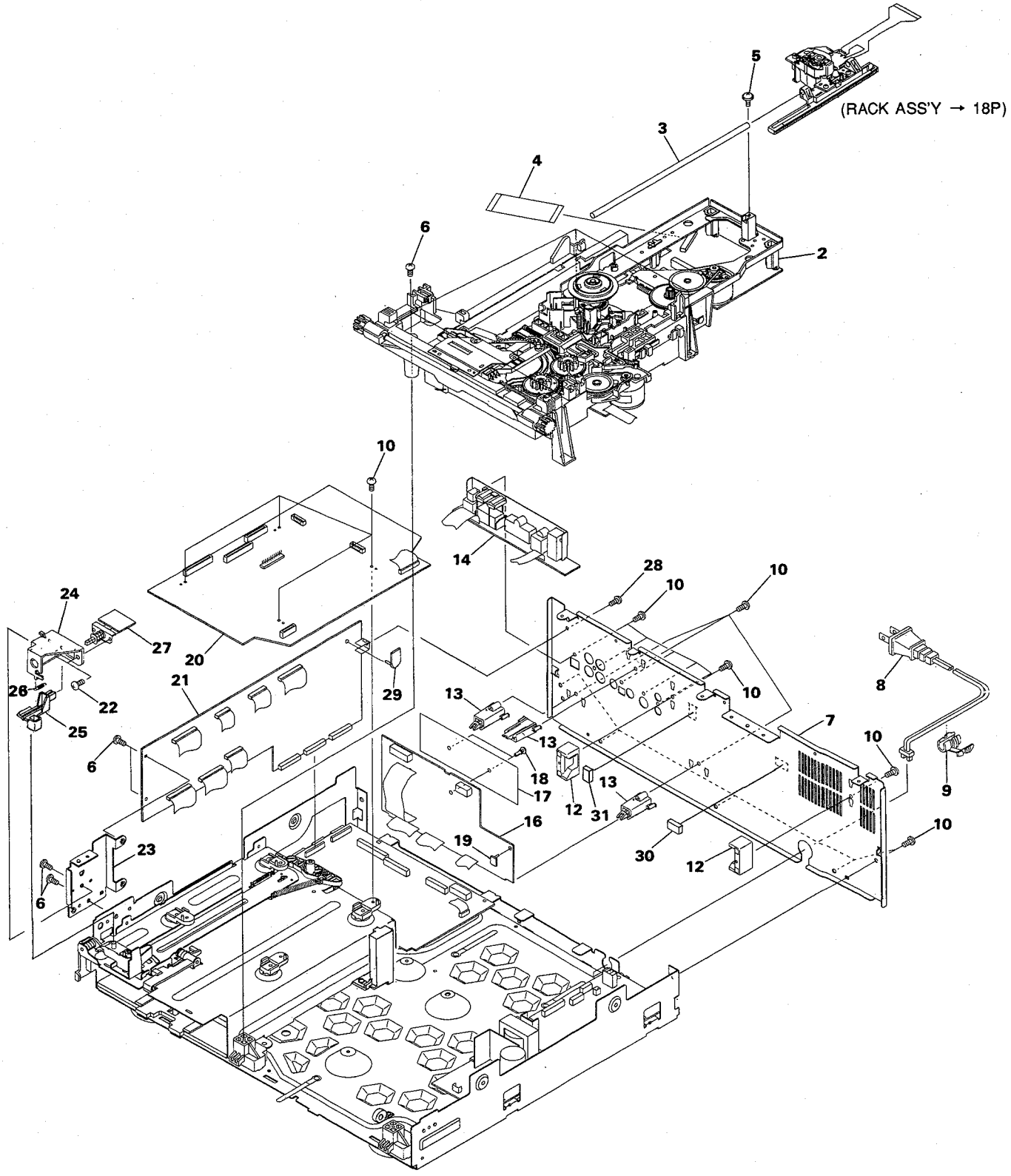


(FRONT PANEL ASS'Y → 9P)

3.3 BOTTOM VIEW

Part List

Mark	No.	Description	Parts No.
	1	.....	
NSP	2	Mech. ass'y	DWT1090
	3	Carriage shaft	VLL1434
	4	Flexible cable	DDD1074
	5	Screw	IPZ30P060FMC
	6	Screw	BBZ30P080FMC
	7	Rear panel	DNA1135
⚠	8	AC power cord	DDG1060
⚠	9	AC cord stopper	CM−22C
	10	Screw	BBZ30P080FMC
	11	.....	
	12	Tray stopper	VNL1519
	13	PCB stay	DNK2764
NSP	14	JACB ass'y	DWX1349
	15	.....	
	16	RGBB ass'y	DWM1346
	17	Sheet S	DEC1699
	18	Nylon rivet (3×4.5)	RBM−003
	19	Mini clamp	DEC1715
	20	FTSB ass'y	DWS1191
	21	CONT ass'y	DWG1367
	22	Screw	PMB30P060FMC
	23	Side stay (L)	DNE1208
	24	PW holder	DNK2740
	25	PW lever	DNK2741
	26	PW spring	DBH1234
NSP	27	PWSW ass'y	DWG1368
	28	Screw	BCZ30P060FMC
NSP	29	PCB holder	VNL1221
NSP	30	Support cushion	VEC1601
NSP	31	Adjust cushion	DEC1734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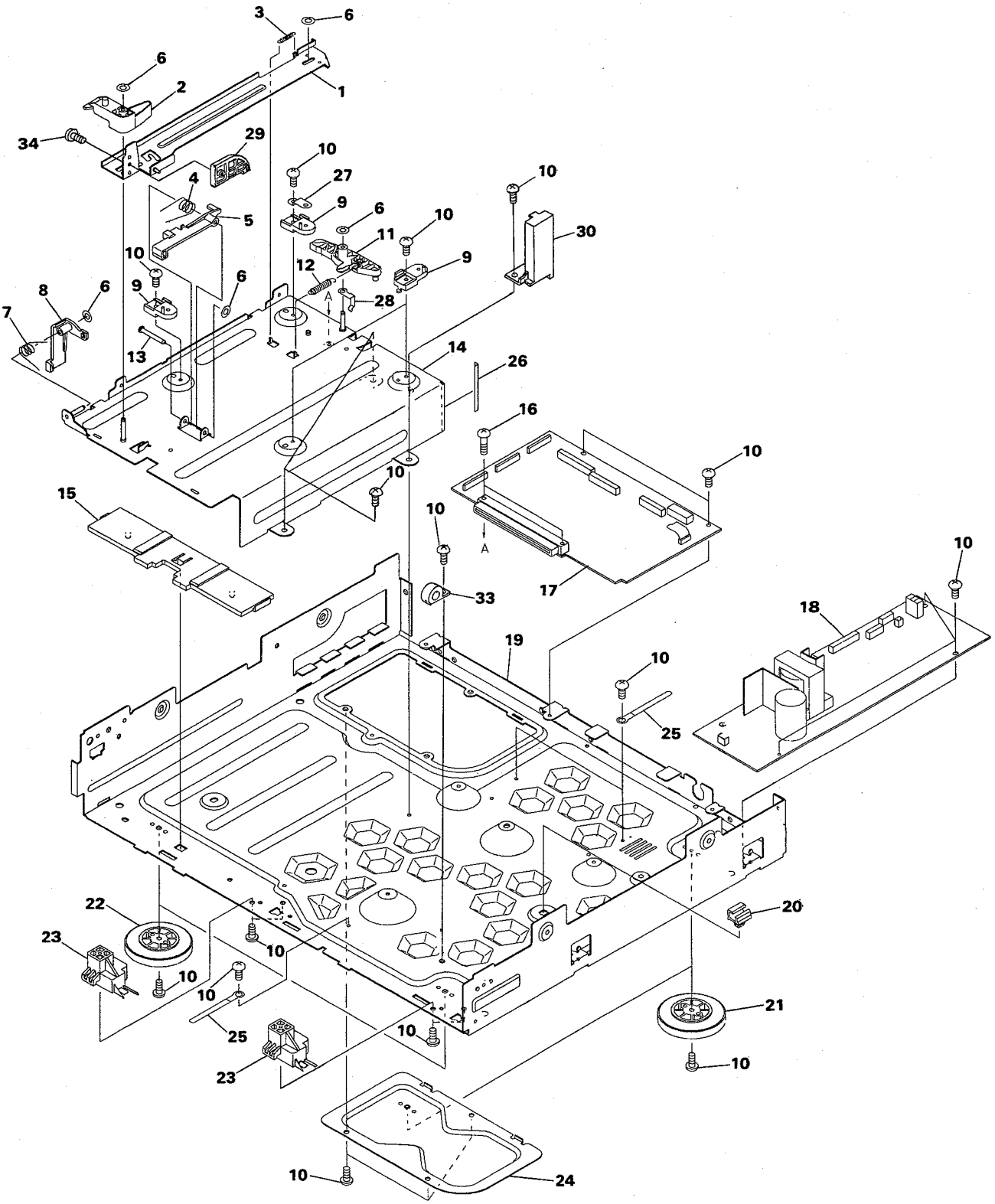
3.4 PACK INSERT SECTION

Part List

Mark No.		Description	Parts No.
	1	Slide plate ass'y	DXA1627
	2	Select lever	DNK2738
	3	Slide spring	DBH1229
	4	Lock lever spring	DBH1230
	5	Lock lever	DNK2737
	6	Washer	WT26D070D050
	7	Pack lever spring	DBH1231
	8	Pack lever	DNK2739
	9	Base S	DNK2742
	10	Screw	BBZ30P080FMC
	11	Eject lever	DNK2736
	12	Eject lever spring	DBH1228
	13	Lock lever shaft	DLL1011
	14	Shield case ass'y	DXA1626
	15	Pack base	DNK2735
	16	Screw	PMZ26P100FMC
	17	INTF ass'y	DWM1341
	18	SYPS ass'y	DWR1156
NSP	19	Chassis	DNA1125
NSP	20	P plate holder	PNY−405
	21	Insulator ass'y	DXA1491
	22	Insulator ass'y	VXA1881
	23	Mech stay	DNK2765
	24	Under panel	DNE1204
NSP	25	Cord holder	Z09−061
	26	Seal A	DEC1363
	27	Earth angle	DNE1213
NSP	28	Earth plate	DNE1234
	29	Slide guide	DNK2838
	30	Core holder	DNK2841
	31	.....	
	32	.....	
	33	Ring core	DTH1161
	34	Screw	BPZ26P060FMC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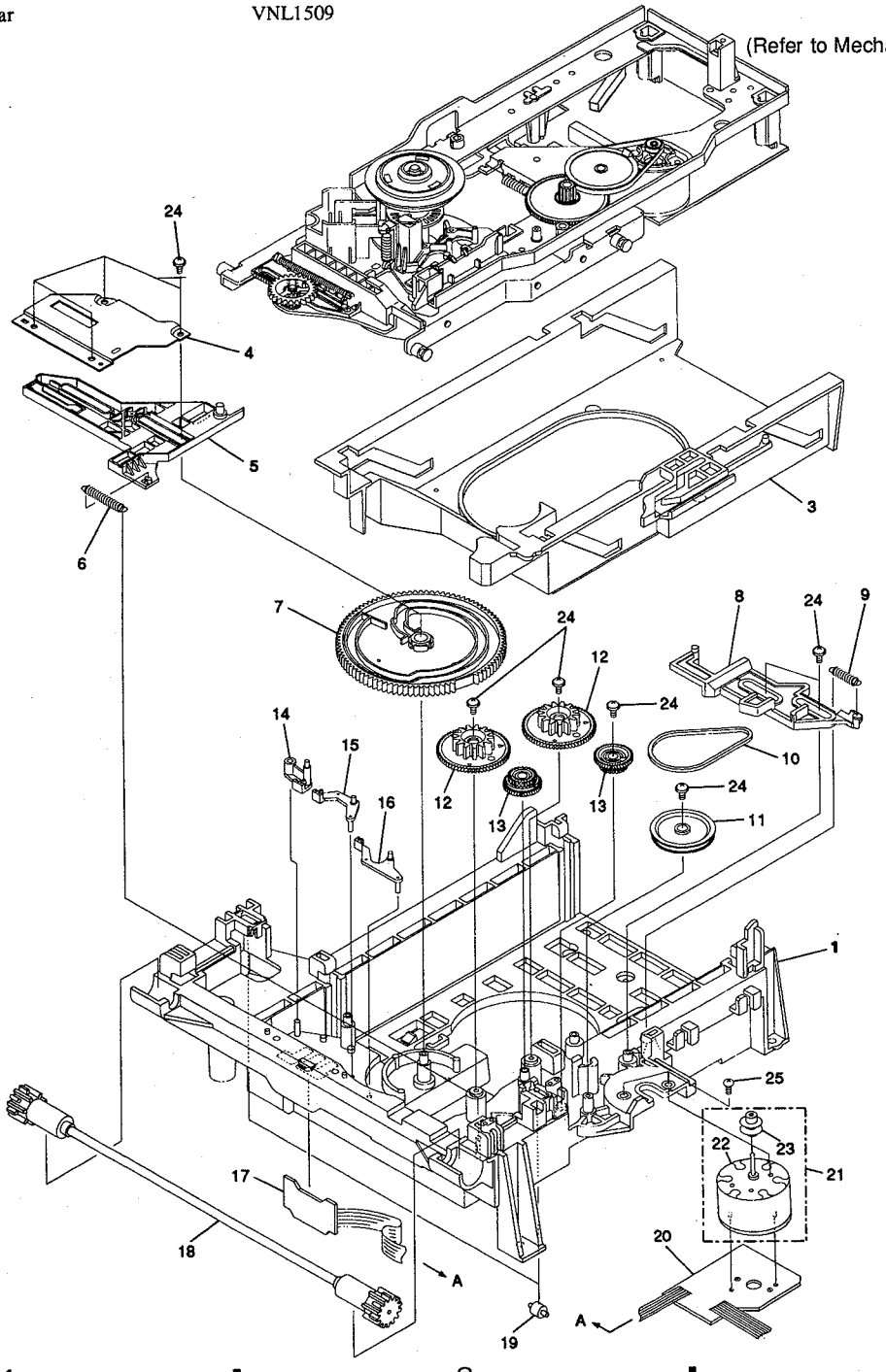
3.5 MECHANISM ASSY (1/2)

Part List

Mark No.	Description	Parts No.
1	Mechanism base	VNK1990
2	.....	
3	Clamp cam	VNL1500
4	Shaft holder	VNE1817
5	Cam plate	VNL1511
6	CAS Spring	VBH1190
7	Cam gear	VNL1507
8	CD plate	VNL1512
9	CDP spring	VBH1191
10	Rubber belt	VEB1184
11	Gear pulley	VNL1510
12	Twin gear	VNL1508
13	Center gear	VNL1509
14	L−SW lever	VNL1504
15	C−SW lever	VNL1505
16	R−SW lever	VNL1506
NSP 17	LOSB ass'y	DWG1357
18	Synchro gear ass'y	VXA1822
19	Roller	VNL1042
NSP 20	LOMB ass'y	DWG1358
21	Loading motor ass'y	VXX1712
NSP 22	Slider motor	VXM1033
23	Motor pulley	PNW1643
24	Screw	Z39−019
25	Screw	BMZ26P040FMC

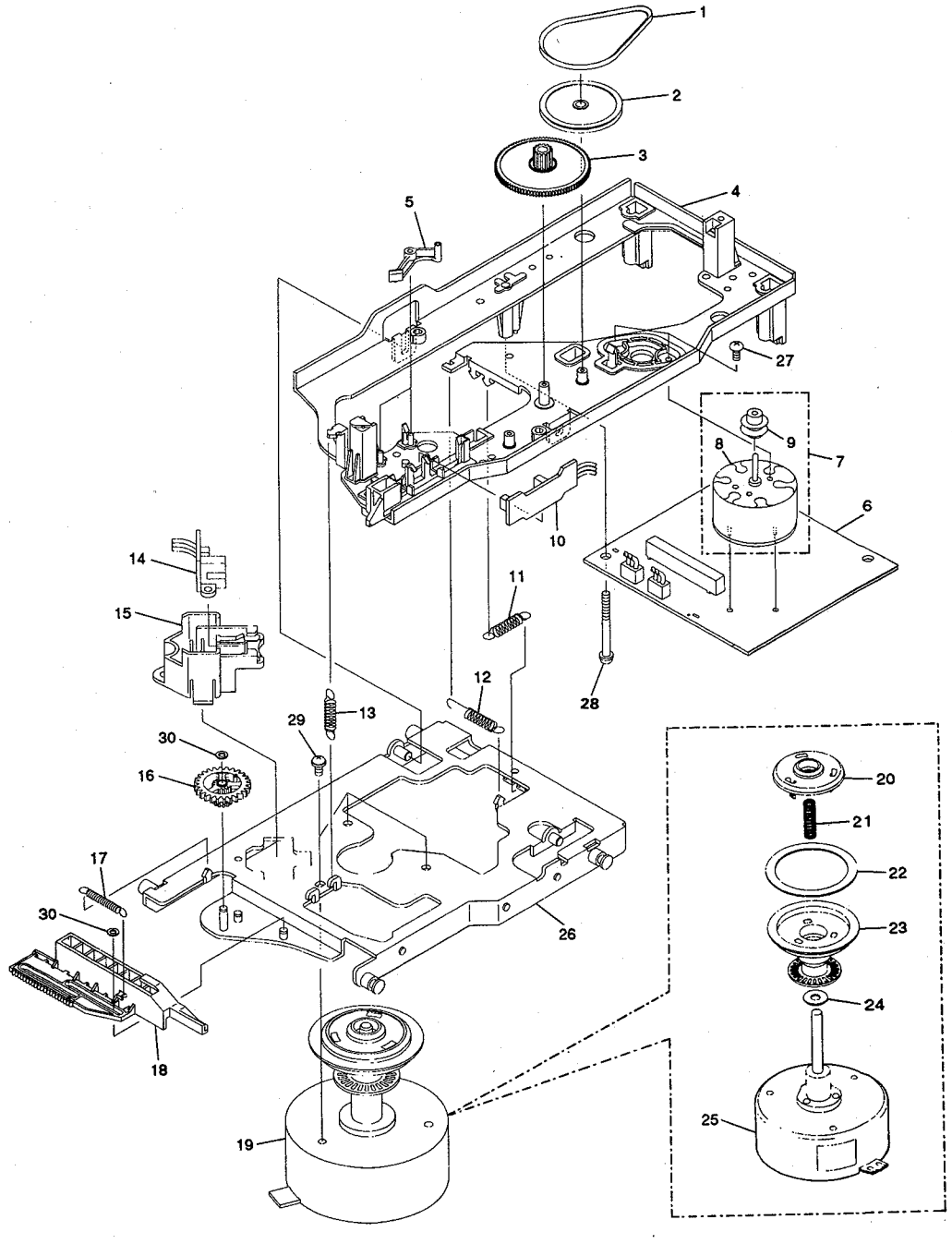
(Refer to Mechanism ASSY (2/2))



3.6 MECHANISM ASSY (2/2)

Part List

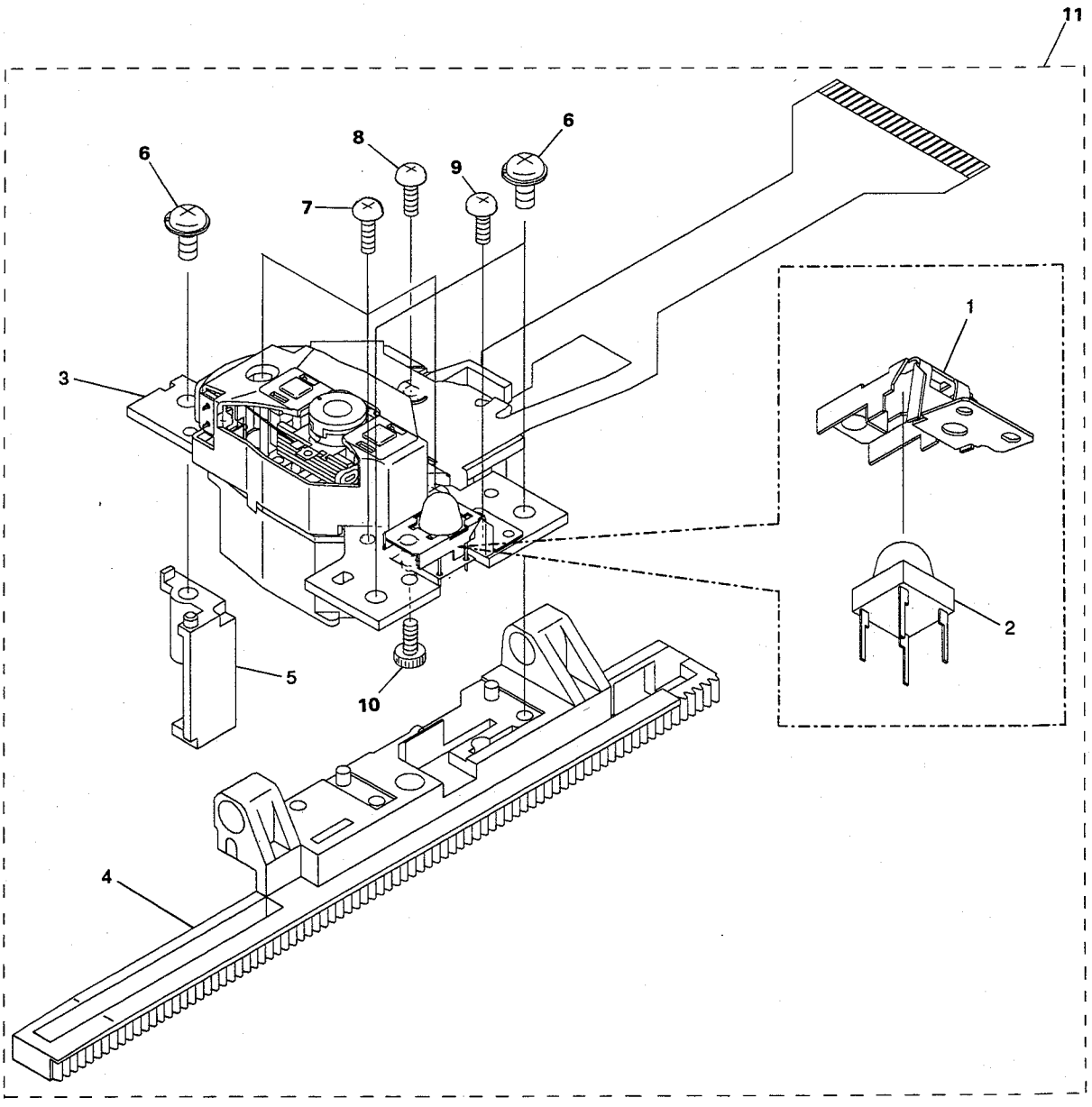
Mark No.	Description	Parts No.
	1 CA belt	VEB1077
	2 CA pulley (2)	VNL1496
	3 CA gear (3)	VNL1497
	4 Tilt base	VNL1499
	5 CA−SW lever	VNL1498
NSP	6 CAMB ass'y	DWG1356
	7 CRG motor ass'y	VXX1261
NSP	8 Slider motor	VXM1033
	9 CA pulley (1)	VNL1197
NSP	10 PKSB ass'y	DWG1355
	11 Radial spring	VBH1201
	12 Thrust spring	VBH1200
	13 Tilt tension	VBH1187
NSP	14 FG ass'y	DWG1354
	15 FG base	VNL1503
	16 Y gear	VNL1501
	17 Tilt cam spring	VBH1189
	18 Tilt cam	VNL1502
	19 Spindle motor ass'y	DXA1639
	20 Centering hub	VNL1174
	21 Centering spring	VBH1083
NSP	22 Rubber sheet	VEB1103
NSP	23 Turn table ass'y	VXA1283
NSP	24 Oil stopper	VBF1002
NSP	25 Spindle motor	VXM1055
	26 Motor base	VNE1803
	27 Screw	BMZ26P040FMC
	28 Screw	ABZ30P300FMC
	29 Screw	PMA30P050FMC
	30 Washer	WT26D060D025



3.7 RACK ASSY

Part List

Mark	No.	Description	Parts No.	No.	Description	Parts No.
NSP	1	Sensor stay	VBK1036	9	Screw	PMH20P040FMC
NSP	2	Tilt sensor	SG−302	10	Screw	SMZ20H120FZK
NSP	3	Pick up ass'y	VWY1030	11	Rack ass'y	VWT1103
	4	Rack	VNL1495			
	5	TAN base	VNL1494			
	6	Screw	PBB26P080FMC			
	7	Screw	PMA20P060FMC			
	8	Screw	PMA20P080FMC			



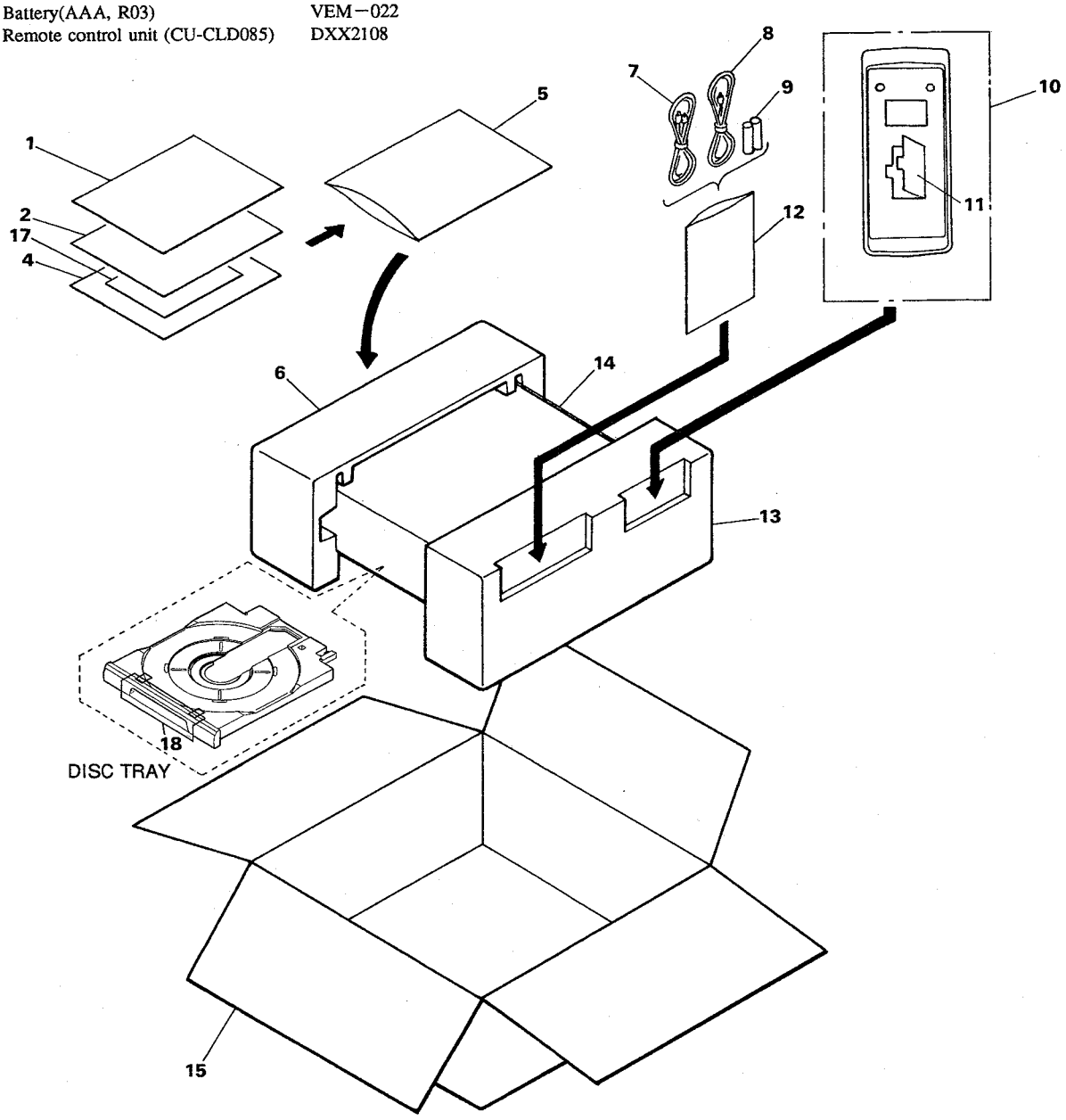
4. PACKING AND PARTS LIST

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.*

Part List

Mark	No.	Description	Parts No.
	1	Operating instructions (English)	DRB1141
NSP	2	Caution (UC)	VRM1026
	3	.....	
NSP	4	Caution	VRR1009
NSP	5	Polyethelene bag	VHL−014
	6	Pad (F)	DHA1236
	7	Connection cord	VDE−055
	8	Video cable	VDE−056
NSP	9	Battery(AAA, R03)	VEM−022
	10	Remote control unit (CU-CLD085)	DXX2108
	11	Battery cover	DNK2766
NSP	12	Polyethelene bag	Z21−029
	13	Pad (R)	DHA1237
	14	Mirror mat	VHL1012
	15	Packing case	DHG1512
	16	.....	
NSP	17	Warranty card	ARY1044
	18	Mirror mat sheet	DHL1082



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: k:kΩ, M:MΩ, or Ω unless otherwise noted.
   Rated power: 1/4W, 1/6W, 1/8W, 1/10W unless otherwise noted.
   Tolerance: (F): ±1%, (G): ±2%, (K): ±10%, (M): ±20% or ±5% unless otherwise noted.
4. **CAPACITORS:**
   Unit: p:pF or µF unless otherwise noted.
   Ratings: capacitor (µF)/ voltage (V) unless otherwise noted.
   Rated voltage: 50V except for electrolytic capacitors.
5. **COILS:**
   Unit: m:mH or µH unless otherwise noted.
6. **VOLTAGE AND CURRENT:**
   ▭ or ← V :
   DC voltage (V) in PLAY mode unless otherwise noted.
   ⇦ mA or ← mA :
   DC current in PLAY mode unless otherwise noted.
   Value in ( ) is DC current in STOP mode.
7. **OTHERS:**
   - ⊘ or ❶ : 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):

MAIN ASSY
- S101 : DIGITAL MEMORY
- S102 : RESET

PLYB ASSY
- S201 : PLAY

CLDB ASSY
- S401 : CD EJECT
- S402 : LD EJECT

PWSW ASSY
- S101 : POWER ON—<u>OFF</u>

PKSB ASSY
- S4 : PARK IN
- S5 : PARK OUT

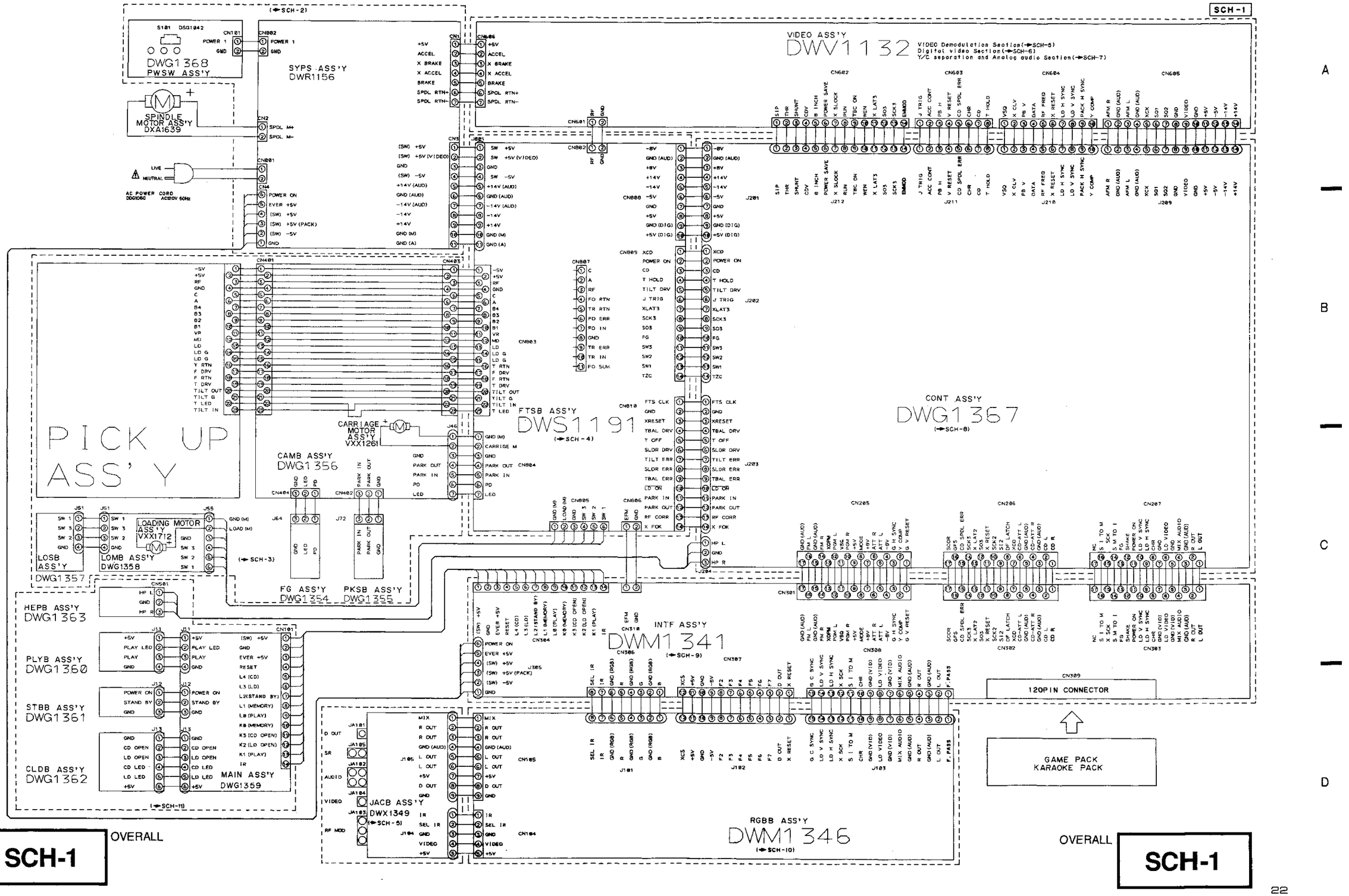
LOSB ASSY
- S1 : SW1
- S2 : SW2
- S3 : SW3

NOTE FOR PCB CONNECTION DIAGRAMS

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

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



5.2 SYPS, PWSW ASS'Y

CAUTION: FOR CONTINUED PROTECTION AGAINST RISK OF FIRE. REPLACE WITH SAME TYPE NO. ICP-N15, MFD BY ROHM CO., LTD. FOR IC101 AND IC102.

SYPS ASS'Y (DWR1156)

SCH-2

IC101, 102 : ICP-N15
IC201 : ICP-N25
IC202, 301 : ICP-N50
IC203 : UPC1093J

D1 : D2SB40-4001
D101, 102 : ERC91-02L
D104-107 : ERA91-02V
D2 : ERB44-04V
D201 : ESAB82M
D3 : ERB44-02V
D301 : ERB83-004
D302 : RD5.6ES
D4, 5 : 1SS178TPA
D6 : PS2501

AC POWER CORD
DDG1060 (KU)
AC120V 60Hz

LIVE
NEUTRAL

PWSW ASS'Y
(DWG1368)

DSG1042

TO VIDEO ASS'Y (2/3) CN606 (→ SCH-6)

SPINDLE MOTOR ASS'Y DXA1639

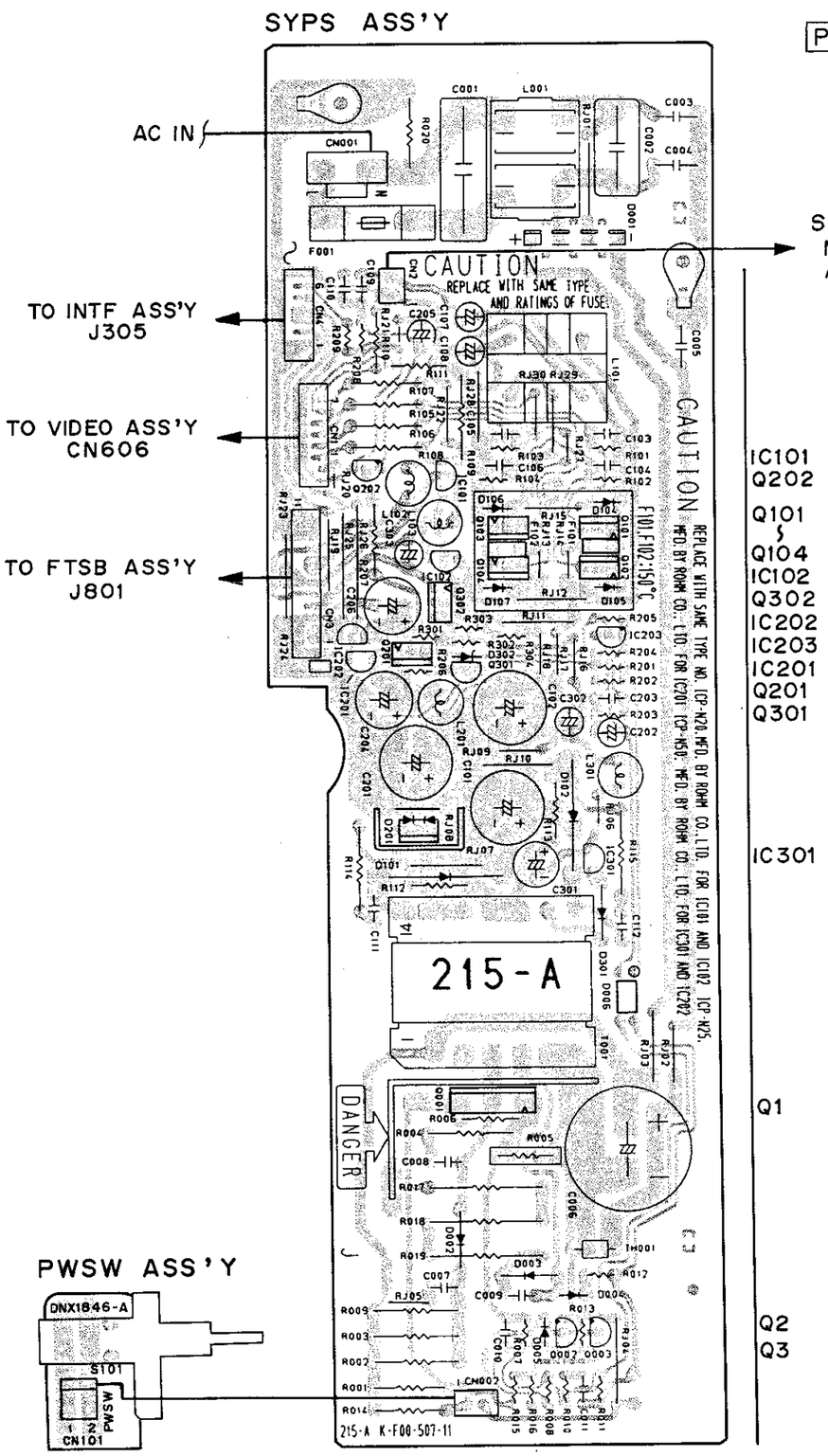
TO FTSB ASS'Y J801 (→ SCH-4)

TO INTF ASS'Y J305 (→ SCH-9)

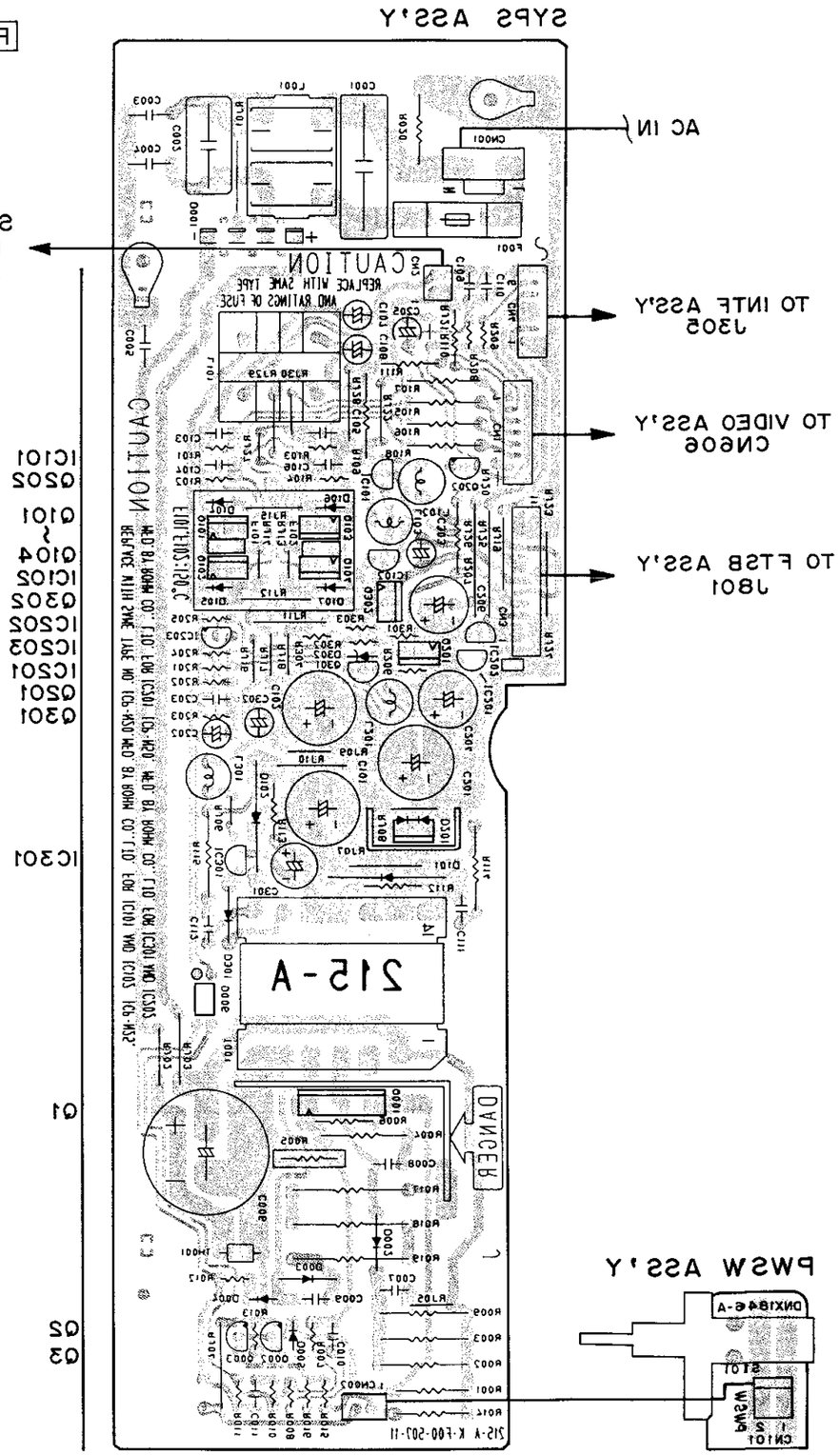
CAUTION: FOR CONTINUED PROTECTION AGAINST RISK OF FIRE. REPLACE WITH SAME TYPE NO. ICP-N50, MFD BY ROHM CO., LTD, FOR IC202 AND IC301.

CAUTION: FOR CONTINUED PROTECTION AGAINST RISK OF FIRE. REPLACE WITH SAME TYPE NO. ICP-N25, MFD BY ROHM CO., LTD, FOR IC201.

This PCB connection diagram is viewed from the parts mounted side.

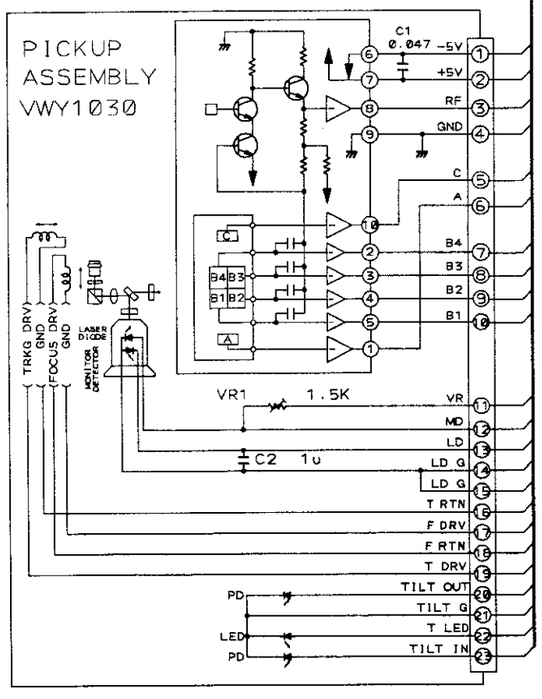


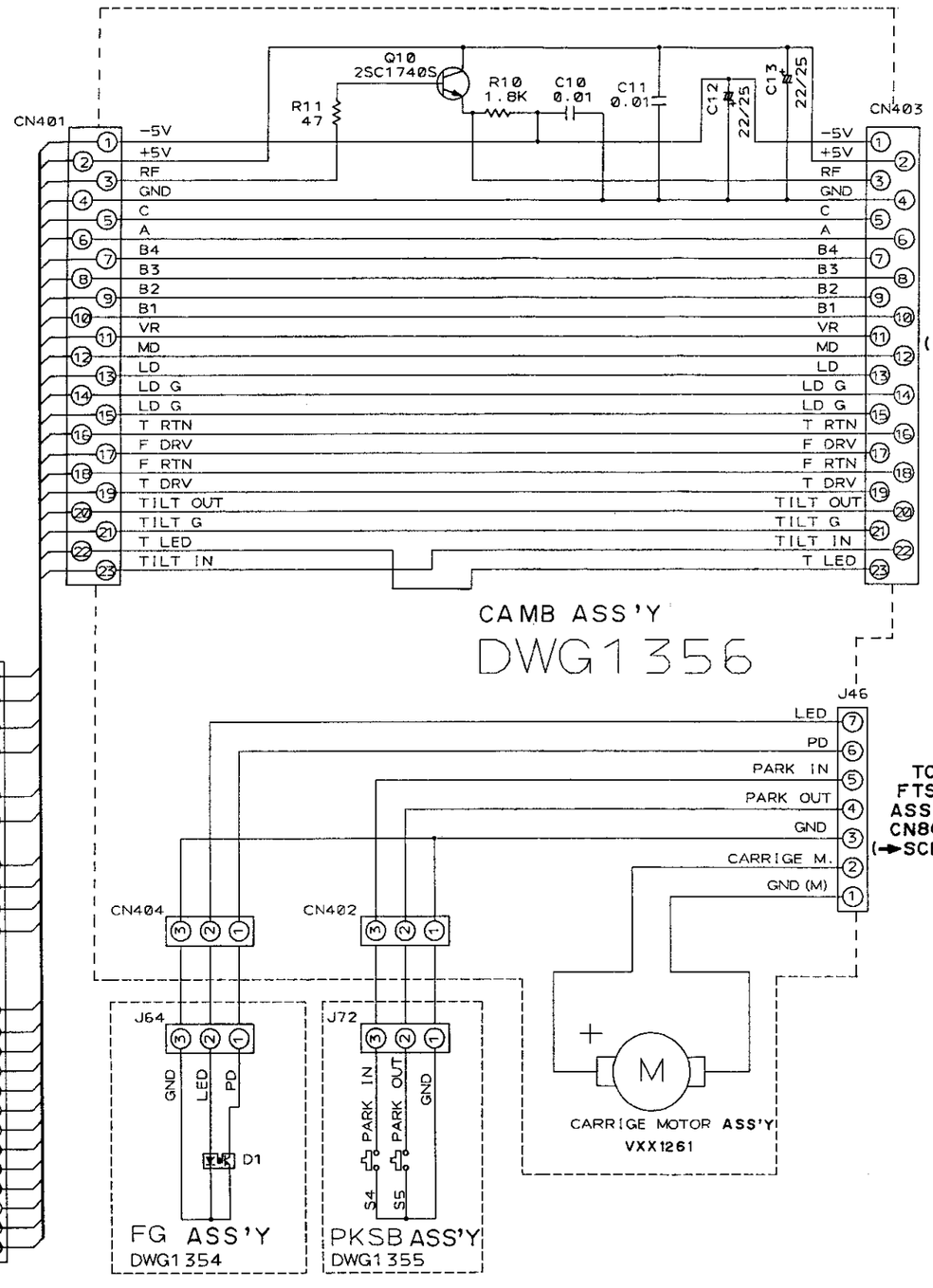
This PCB connection diagram is viewed from the foil side.

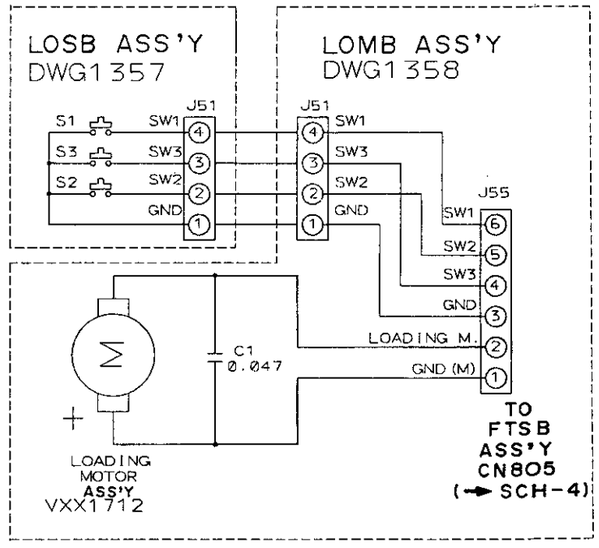


5.3 PICKUP, CAMB, FG, PKSB, LOSB, LOMB ASS'Y

SCH-3







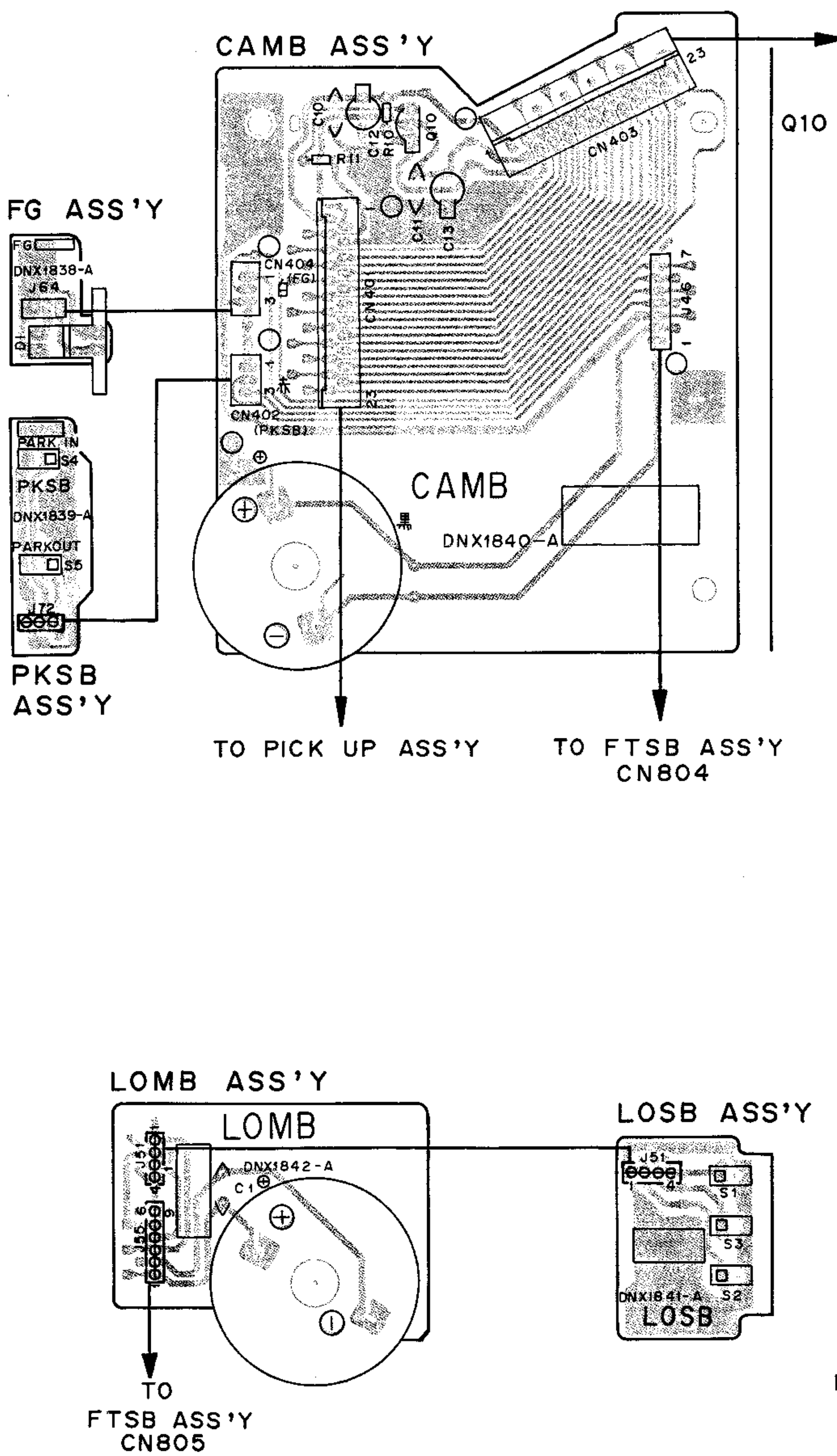
D1 GP1S51V

S1, S2
S3, S4 DSG1015
S5

PICKUP ASSY, CAMB ASSY, FG ASSY, PKSB ASSY, LOSB ASSY, LOMB ASSY SCH-3

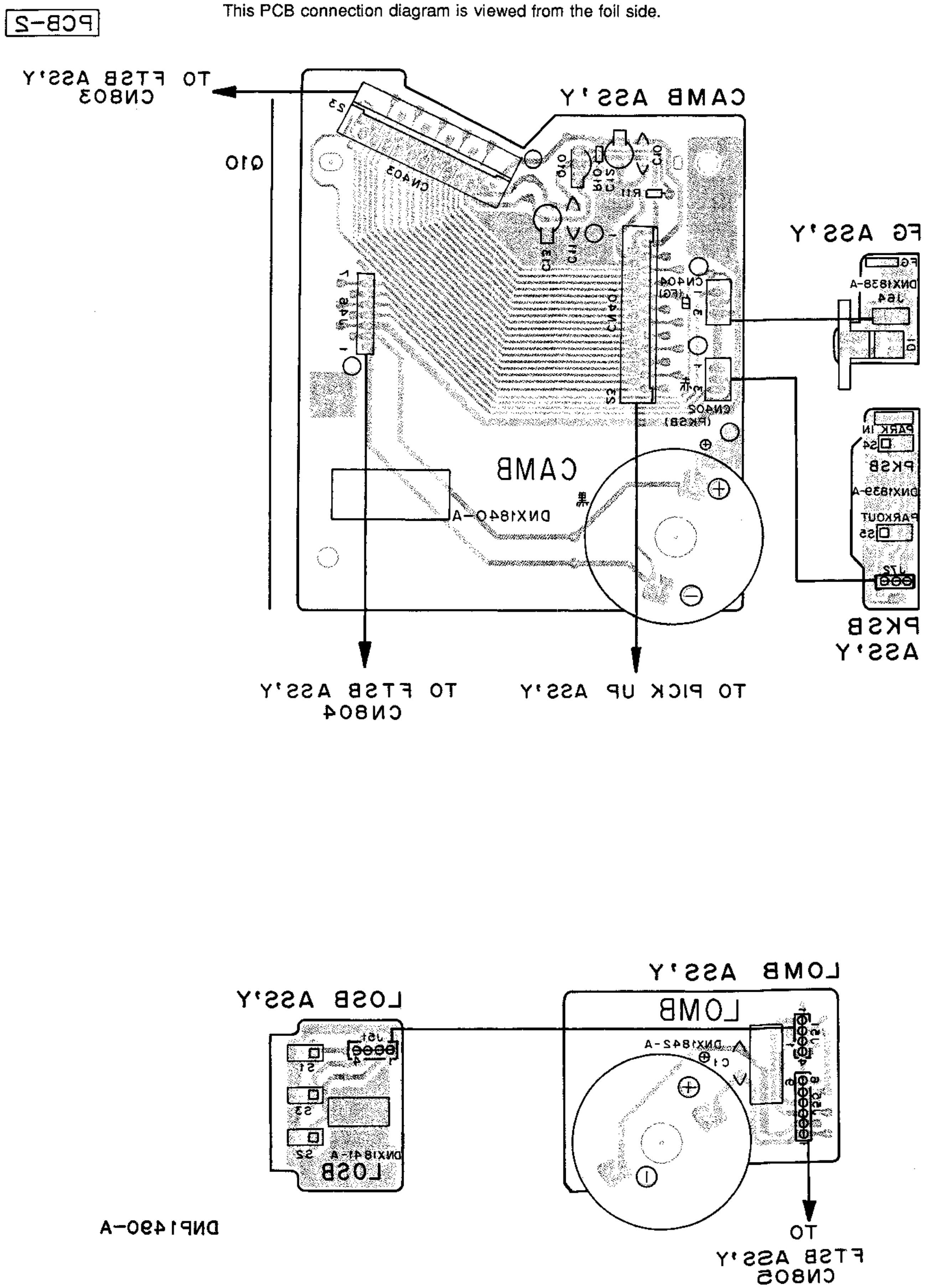
This PCB connection diagram is viewed from the parts mounted side.

PCB-2

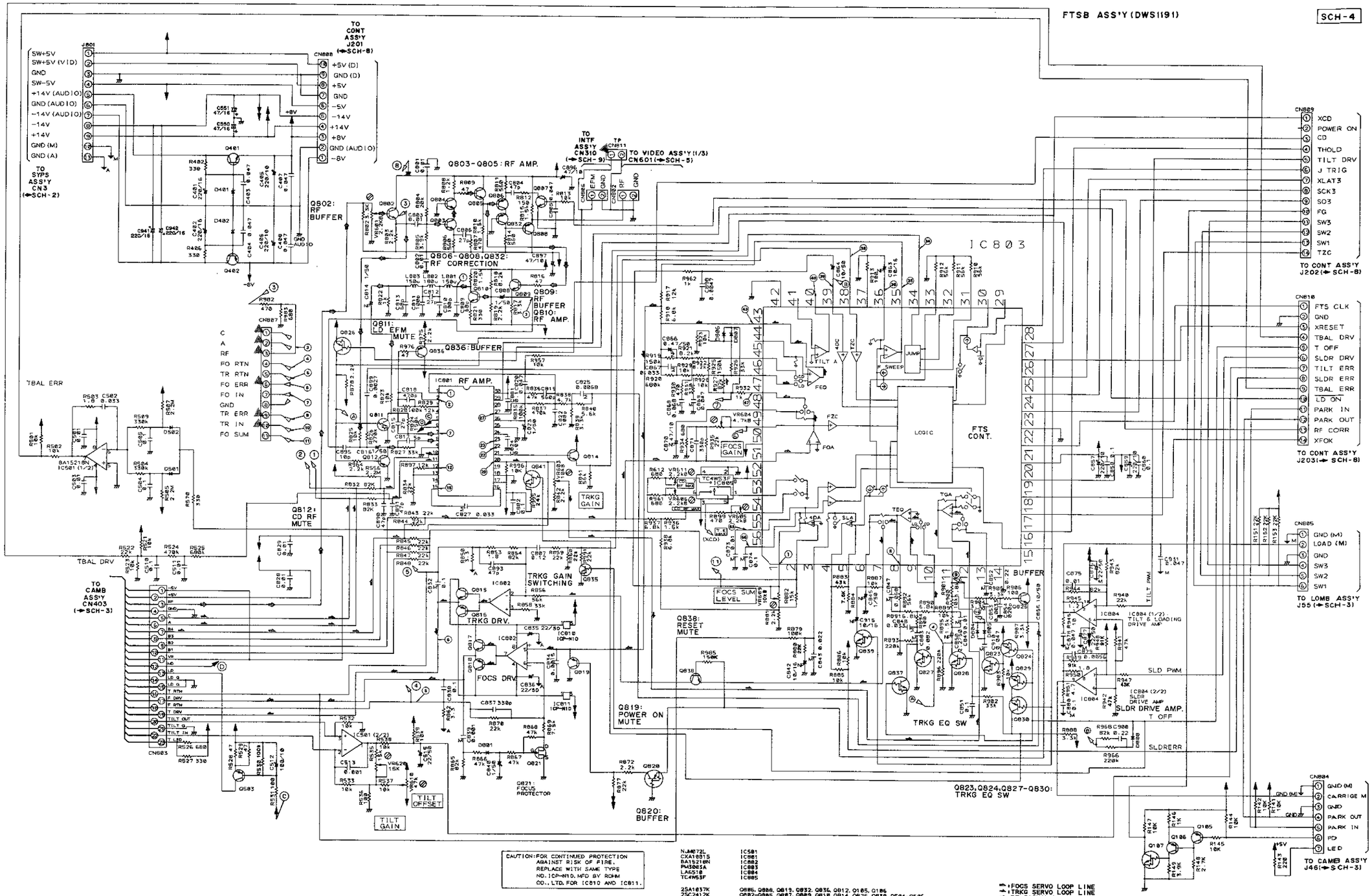


DNP1490-A

This PCB connection diagram is viewed from the foil side.



5.4 FTSB ASS'Y

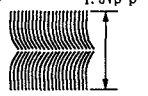

FTSB ASS'Y (DWS1191)
SCH-4
TO CONT ASS'Y J201 (→SCH-8)
TO INTF ASS'Y CN310 (→SCH-9)
TO VIDEO ASS'Y (1/3) CN601 (→SCH-5)
TO SYPS ASS'Y CN3 (←SCH-2)
TO CAMB ASSY CN403 (←SCH-3)
Q803-Q805: RF AMP.
Q802: RF BUFFER
Q806-Q808,Q832: RF CORRECTION
Q809: RF BUFFER
Q810: RF AMP.
Q811: LD EFM MUTE
Q836: BUFFER
IC801 RF AMP.
Q812: CD RF MUTE
TRKG GAIN SWITCHING
TRKG DRV.
FOCS DRV
Q821: FOCUS PROTECTOR
TILT OFFSET
TILT GAIN
Q838: RESET MUTE
Q819: POWER ON MUTE
Q820: BUFFER
IC803
FTS CONT.
LOGIC
TRKG EQ SW
Q823,Q824,Q827-Q830: TRKG EQ SW
IC804 (1/2) TILT & LOADING DRIVE AMP
IC804 (2/2) SLDR DRIVE AMP.
SLD PWM
SLDRERR
T OFF
TO CONT ASS'Y J202 (→SCH-8)
TO CONT ASS'Y J203 (→SCH-8)
TO LOMB ASS'Y J55 (→SCH-3)
TO CAMB ASSY J461 (→SCH-3)
CAUTION: FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE WITH SAME TYPE NO. ICP-N10, MFD BY ROHM CO., LTD. FOR IC810 AND IC811.
NJM872L IC581
CXA1691S IC801
BA15218N IC802
PH1065A IC803
LA6510 IC804
TC4W53F IC805
2SA1037K Q806, Q808, Q819, Q832, Q836, Q812, Q185, Q186
2SC2412K Q802-Q805, Q807, Q809, Q810, Q814, Q825, Q830, Q584-Q586
DTA124EK Q826, Q824, Q826, Q829, Q838
DTC124EK Q811, Q823, Q827, Q828, Q835, Q837, Q839, Q187, Q841
2SB1185 Q815, Q816, Q482
2SD1762 Q815, Q817, Q481
2SA1393 Q583
2SK184 Q821
1SS254 D881, D884-D888, D581, D582
MTZ5.1C D481, D482
→ : FOCS SERVO LOOP LINE
→ : TRKG SERVO LOOP LINE
⇨ : RF SIGNAL LINE
SCH-4 FTSB ASSY
FTSB ASSY SCH-4

WAVEFORMS AND VOLTAGE TABLES
FTS SECTION

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

IC801 (CXA1081S)

(1)



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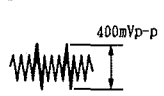

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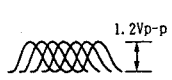

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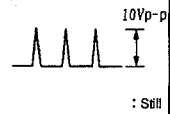
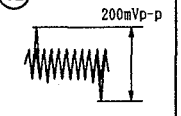


(7)

(23)

(12)



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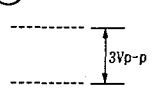

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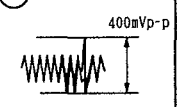
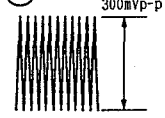


CN807

(3)



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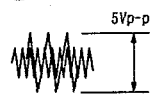

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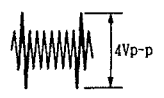

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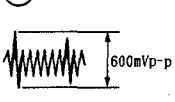

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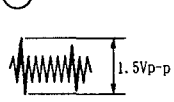

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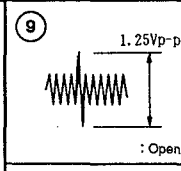

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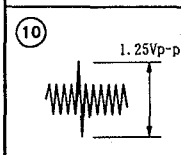

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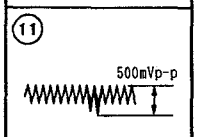
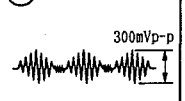


IC803 (PM3003A)

(1)



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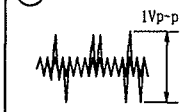

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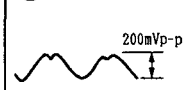

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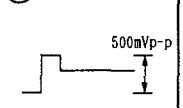

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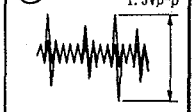

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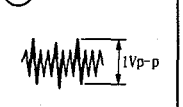
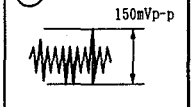
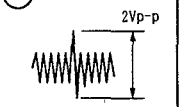


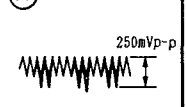
(47)



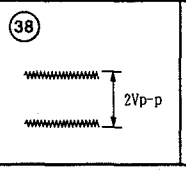
(36)



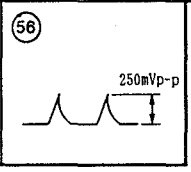
(55)



(38)

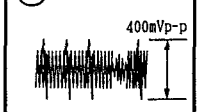


(56)



Other points

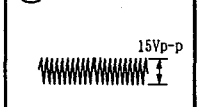
(1) Q810 Collector



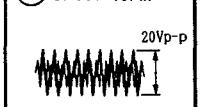
(2) Q809 Emitter

(4) Q828 Collector

(5) CN803 18Pin



(6) CN803 19Pin



This PCB connection diagram is viewed from the parts mounted side.

PCB-3

FTSB ASS'Y

TO INTF ASS'Y
CN310

TO SYPS ASS'Y
CN3

TO LOMB ASS'Y
J55

TO VIDEO ASS'Y
CN601

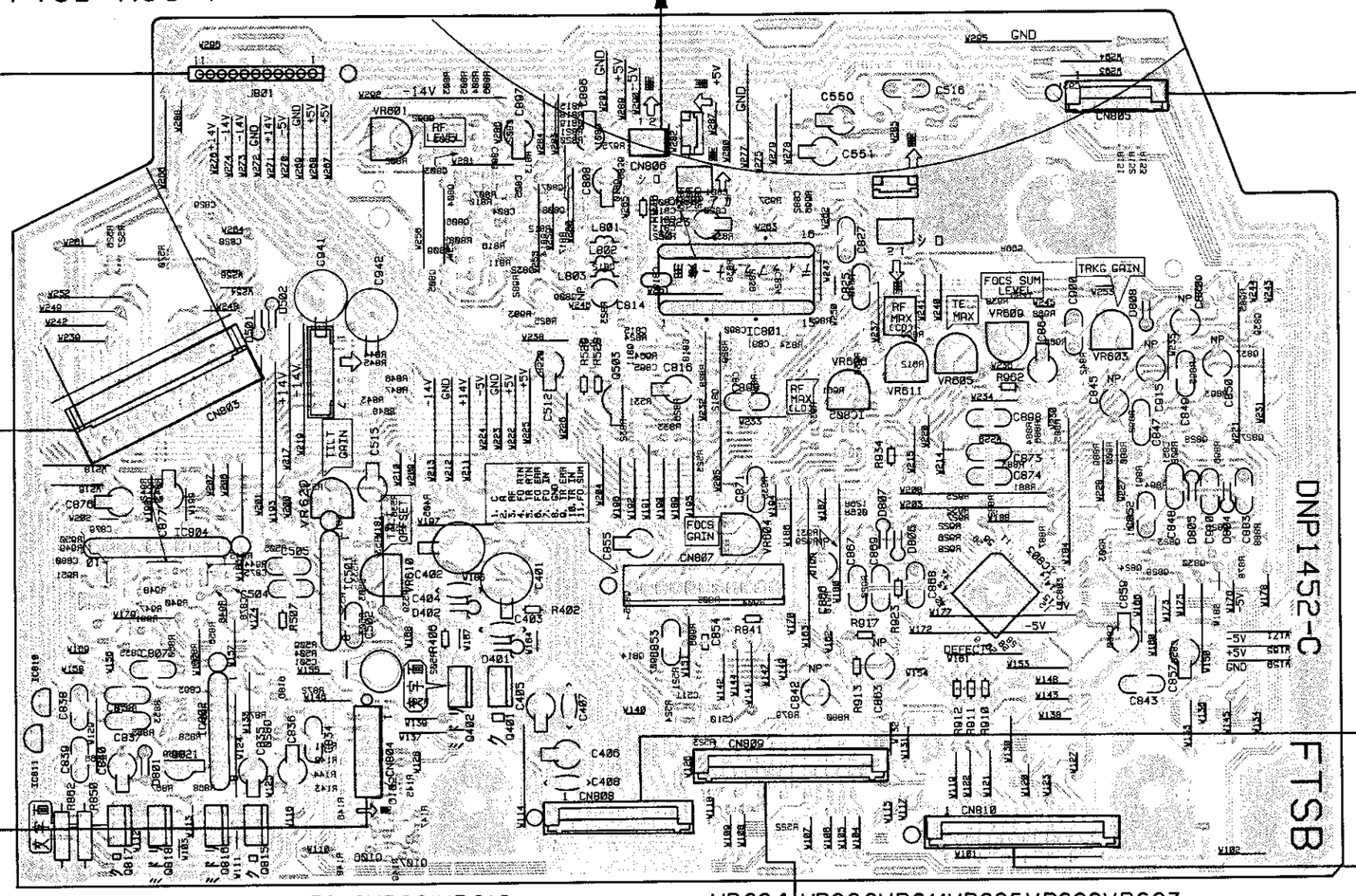
TO CAMB ASS'Y
CN403

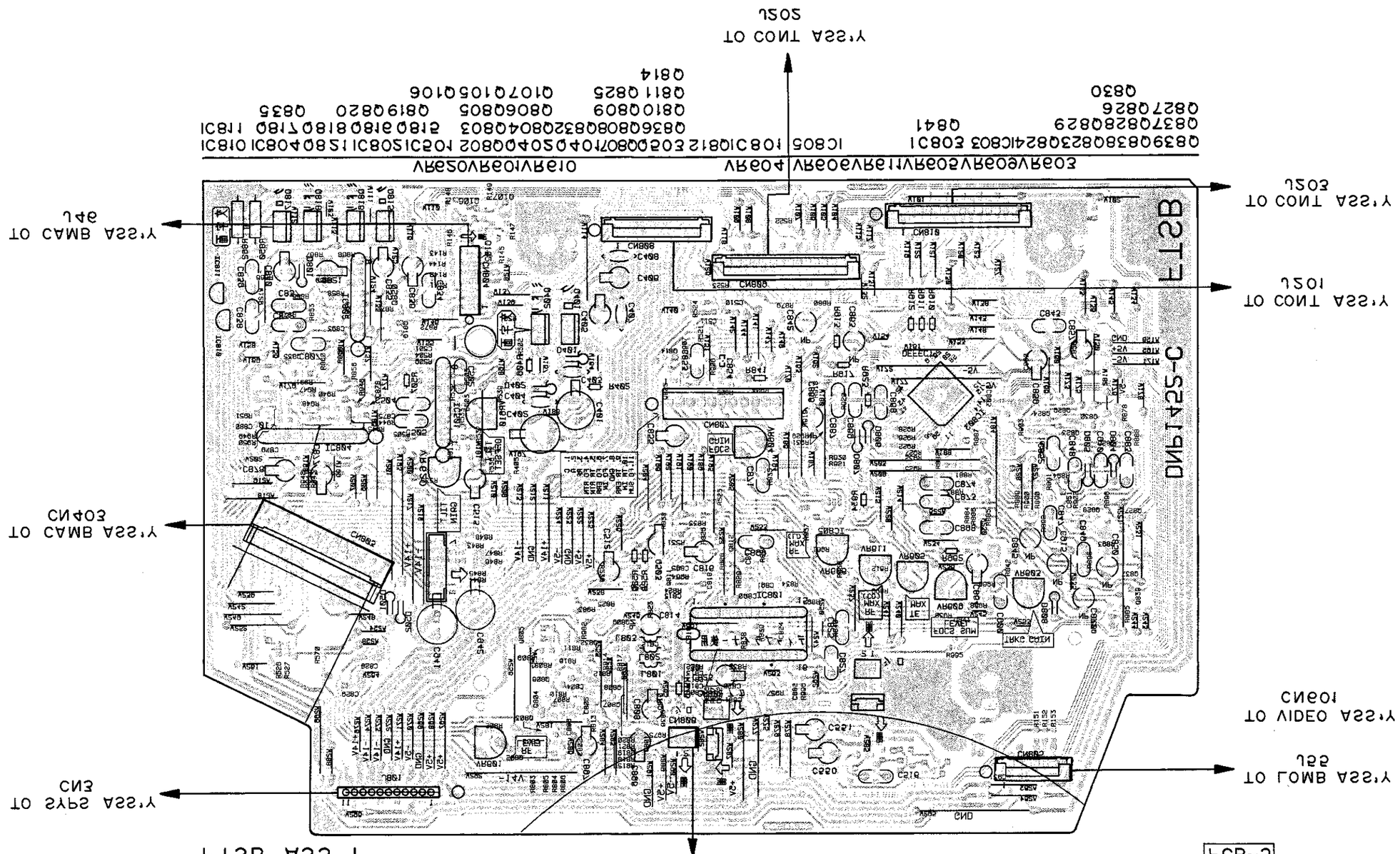
TO CONT ASS'Y
J201

TO CAMB ASS'Y
J46

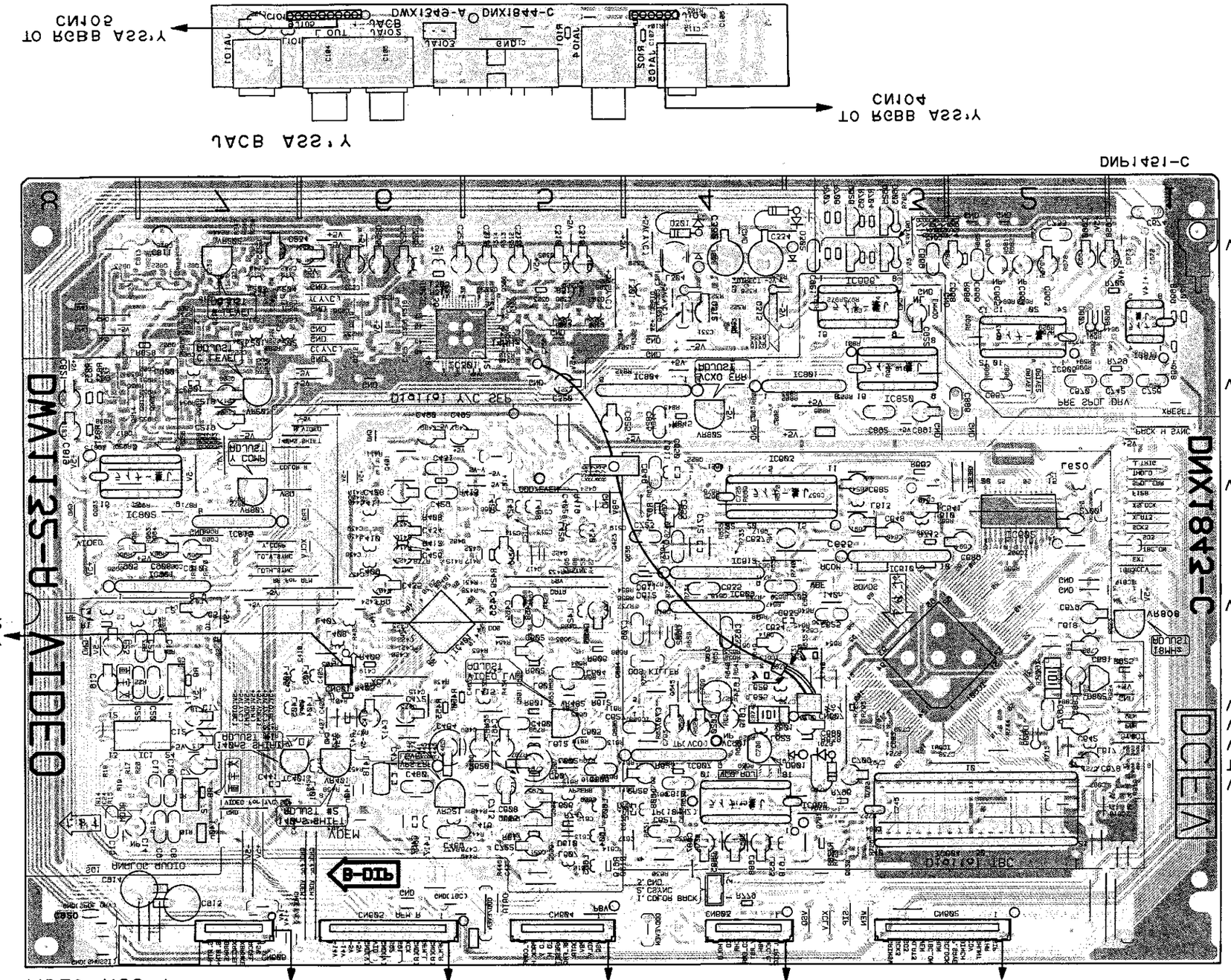
TO CONT ASS'Y
J203

TO CONT ASS'Y
J202





This PCB connection diagram is viewed from the foil side.

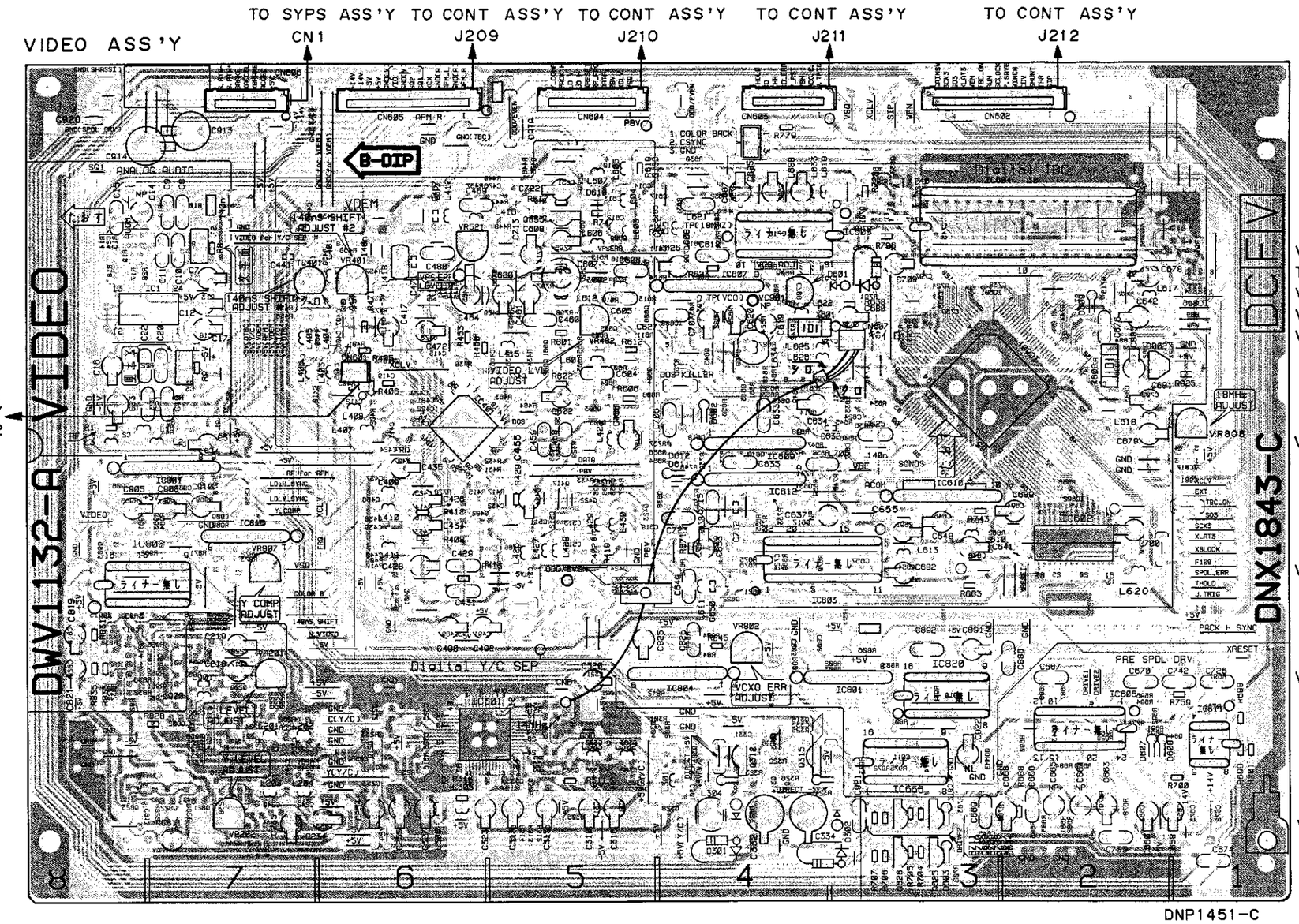


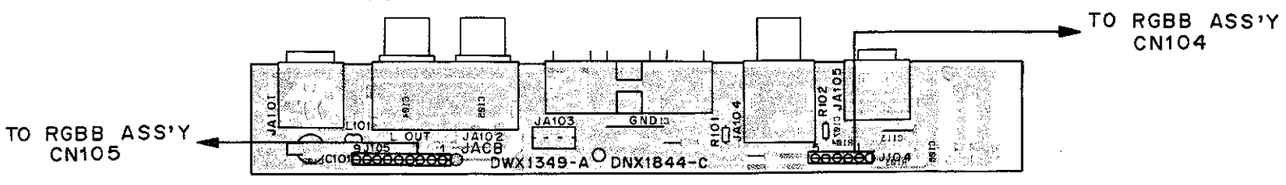
- This PCB is double sided.
- Foil pattern for each side is identified with pink and gray. Black colored parts are mounted on the pink foil side; red colored parts on the gray foil side.
- This diagram is viewed from red colored parts side.

PCB-4

- This PCB is double sided.
- Foil pattern for each side is identified with pink and gray. Black colored parts are mounted on the pink foil side; red colored parts on the gray foil side.
- This diagram is viewed from black colored parts side.

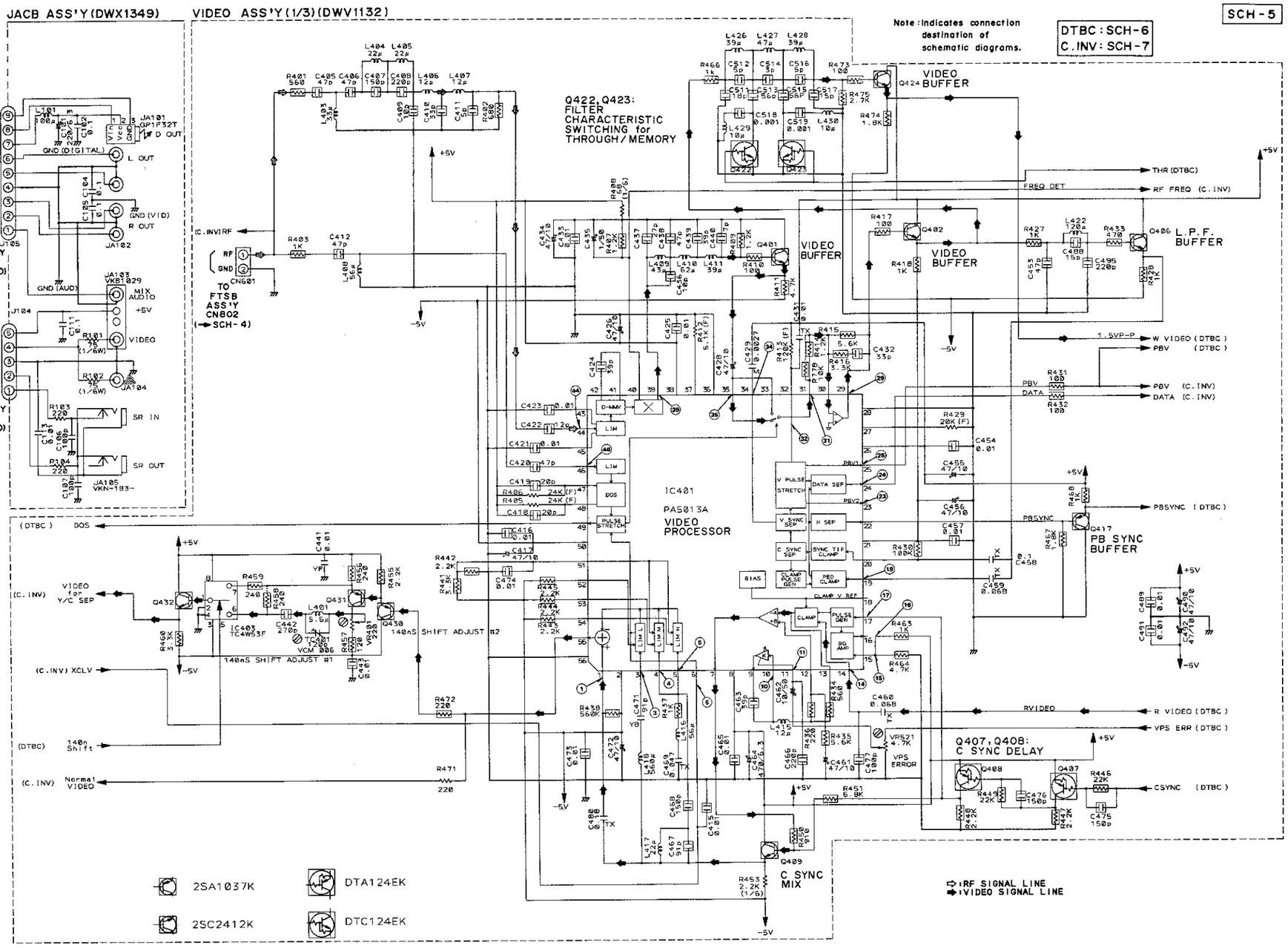
PCB-4





VR521						
TC401						
VR401						
VC901						
VR482						
VR808						
VR807						
VR201						
VR202						

5.5 VIDEO ASS'Y (1/3) (VIDEO DEMODULATION), JACB ASS'Y



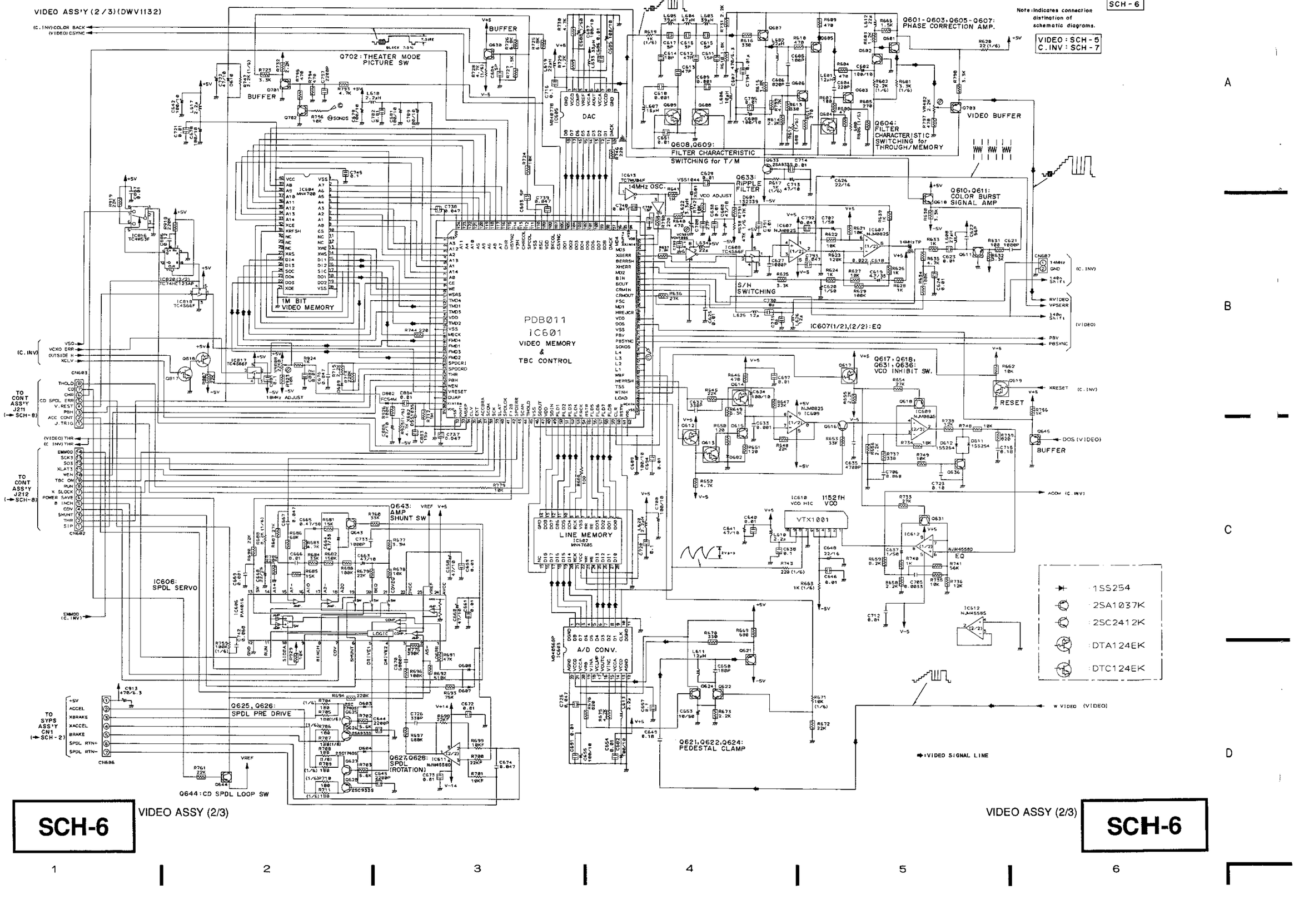
WAVEFORMS AND VOLTAGE TABLES VIDEO SECTION

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

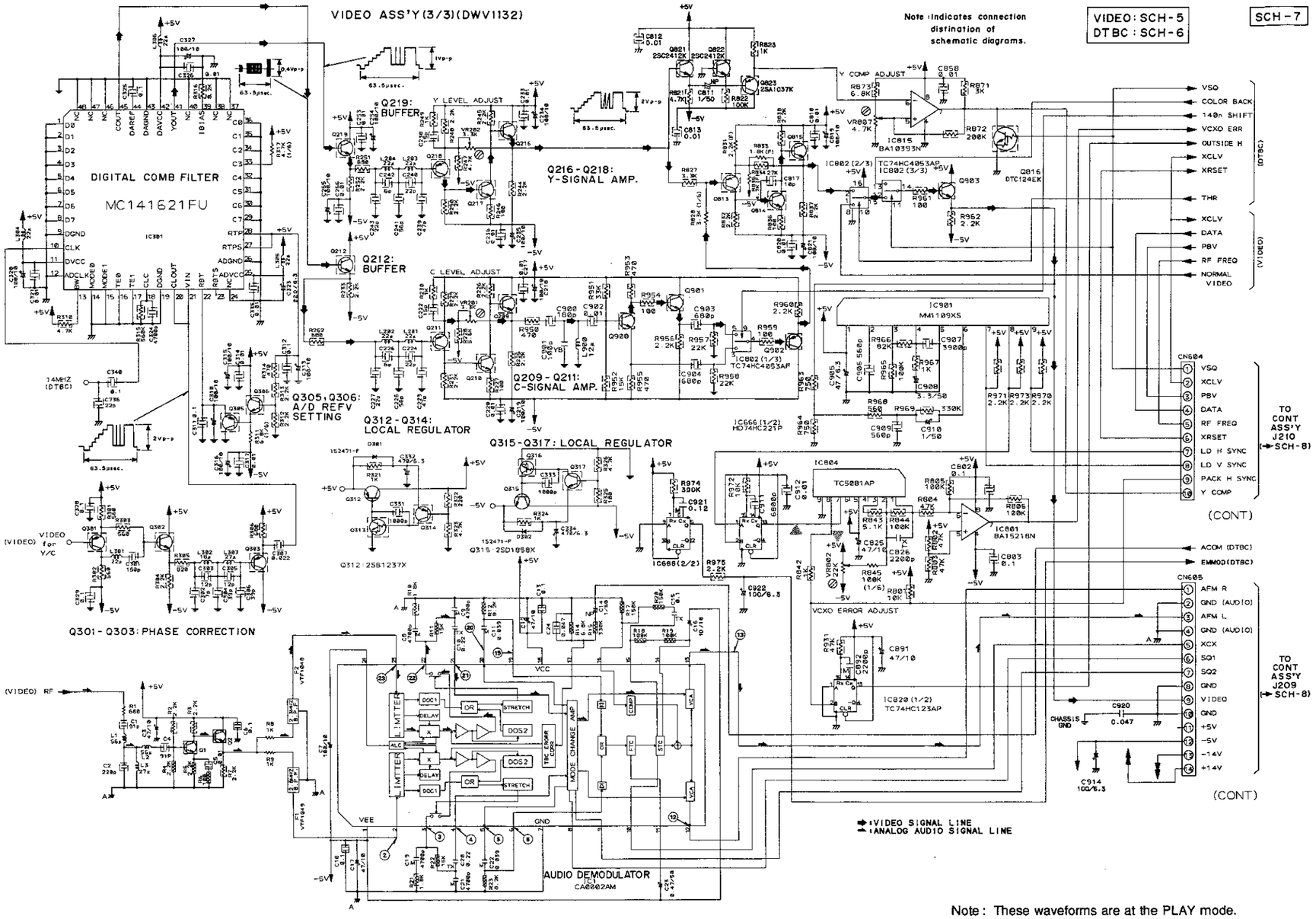
IC401 (PA5013A)

(1) 2Vp-p	(15) 200mVp-p	(31) 700mVp-p
(3) 2Vp-p	(16) 1Vp-p, 63.5 μS	(32) 4Vp-p, 17.5mS
(4) 1.5Vp-p, 63.5 μS	(17) 4Vp-p, 63.5 μS	(34) 2.5Vp-p, 17.5mS
(5) 1.5Vp-p, 63.5 μS	(19) 2.5Vp-p, 63.5 μS	(35) 500mVp-p
(6) 2Vp-p, 17.5mS	(23) 5Vp-p, 63.5 μS	(39) approx. 1.2Vp-p
(10) 500mVp-p	(24) 4Vp-p, 17.5mS	(44) 300mVp-p, Range H : 2mS/div
(11) 1V/div 2mS/div	(25) 5Vp-p, 17.5mS	(46) 1Vp-p, Range H : 2mS/div
(14) 600mVp-p	(29) 1.25Vp-p	

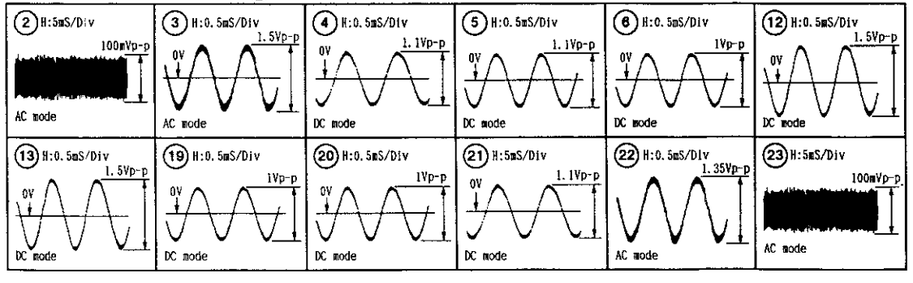
5.6 VIDEO ASS'Y (2/3) (DIGITAL VIDEO)



5.7 VIDEO ASS'Y (3/3) (Y/C SEPARATION AND ANALOG AUDIO)



● IC1 (CA0002AM) Note : (No.) in the table correspond to the pin number.



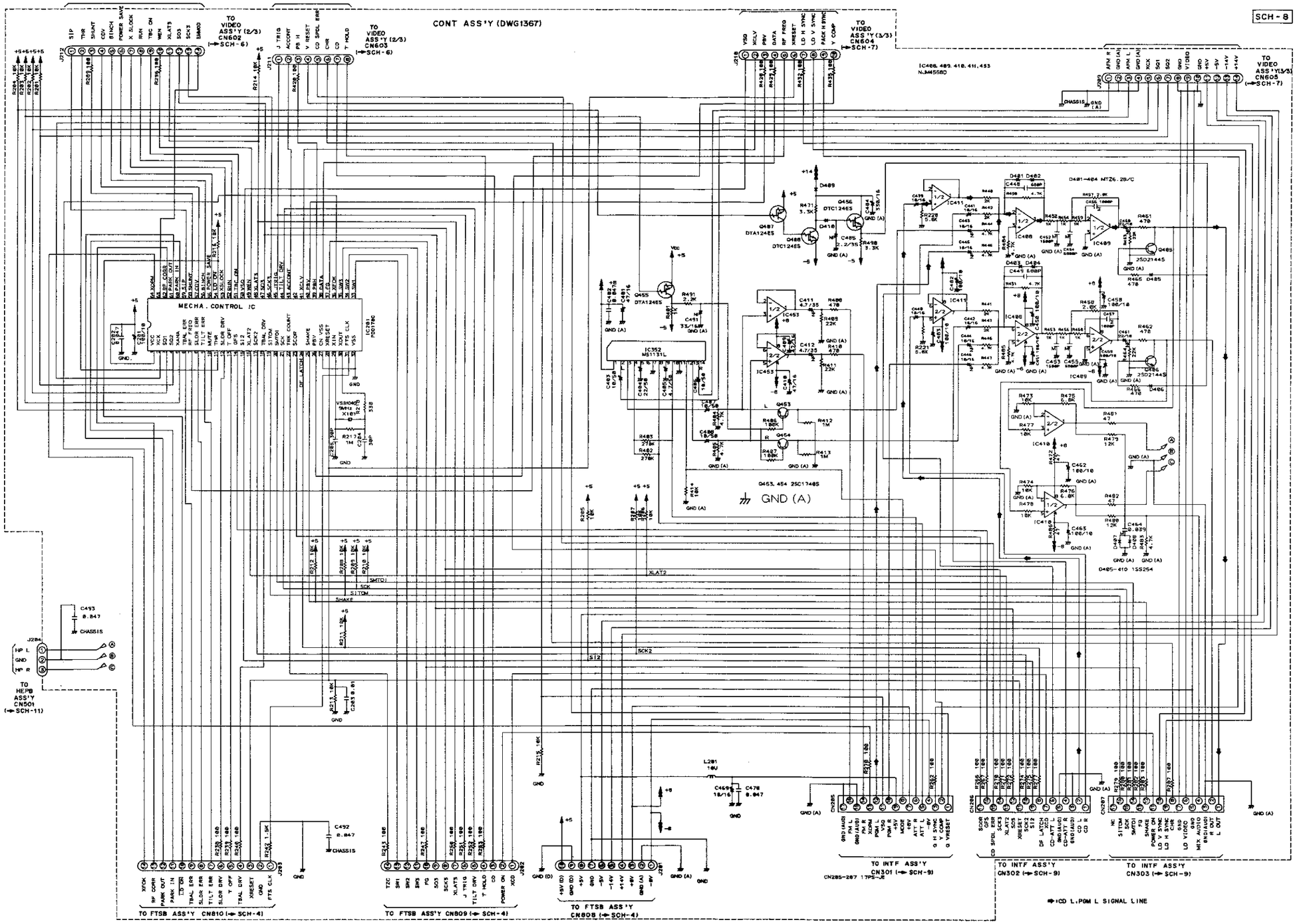
Note : These waveforms are at the PLAY mode.

● IC1 (CA0002AM)

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

* : Refer to waveforms

5.8 CONT ASS'Y (CONTROL)



CONT ASS'Y

PCB-5

TO HEPB ASS'Y CN501

TO VIDEO ASS'Y CN602

IC201

TO VIDEO ASS'Y CN603

TO FTSB ASS'Y CN810

TO FTSB ASS'Y CN809

TO FTSB ASS'Y CN808

TO VIDEO ASS'Y CN604

IC352

Q455

TO VIDEO ASS'Y CN605

Q454

IC453

Q453

Q407

Q408

IC411

IC408

Q456

IC409

IC410

Q405

Q406

TO INTF ASS'Y CN301

TO INTF ASS'Y CN302

TO INTF ASS'Y CN303

DNX1845-C CONT

This PCB connection diagram is viewed from the parts mounted side.

DNP1488-C

CONT ASS'Y

PCB-5

TO HEPB ASS'Y CN501

TO VIDEO ASS'Y CN602

IC201

TO VIDEO ASS'Y CN603

TO FTSB ASS'Y CN810

TO FTSB ASS'Y CN809

TO FTSB ASS'Y CN808

TO VIDEO ASS'Y CN604

IC352

Q455

TO VIDEO ASS'Y CN605

Q454

IC453

Q453

Q407

Q408

IC411

IC408

Q456

IC409

IC410

Q405

Q406

TO INTF ASS'Y CN301

TO INTF ASS'Y CN302

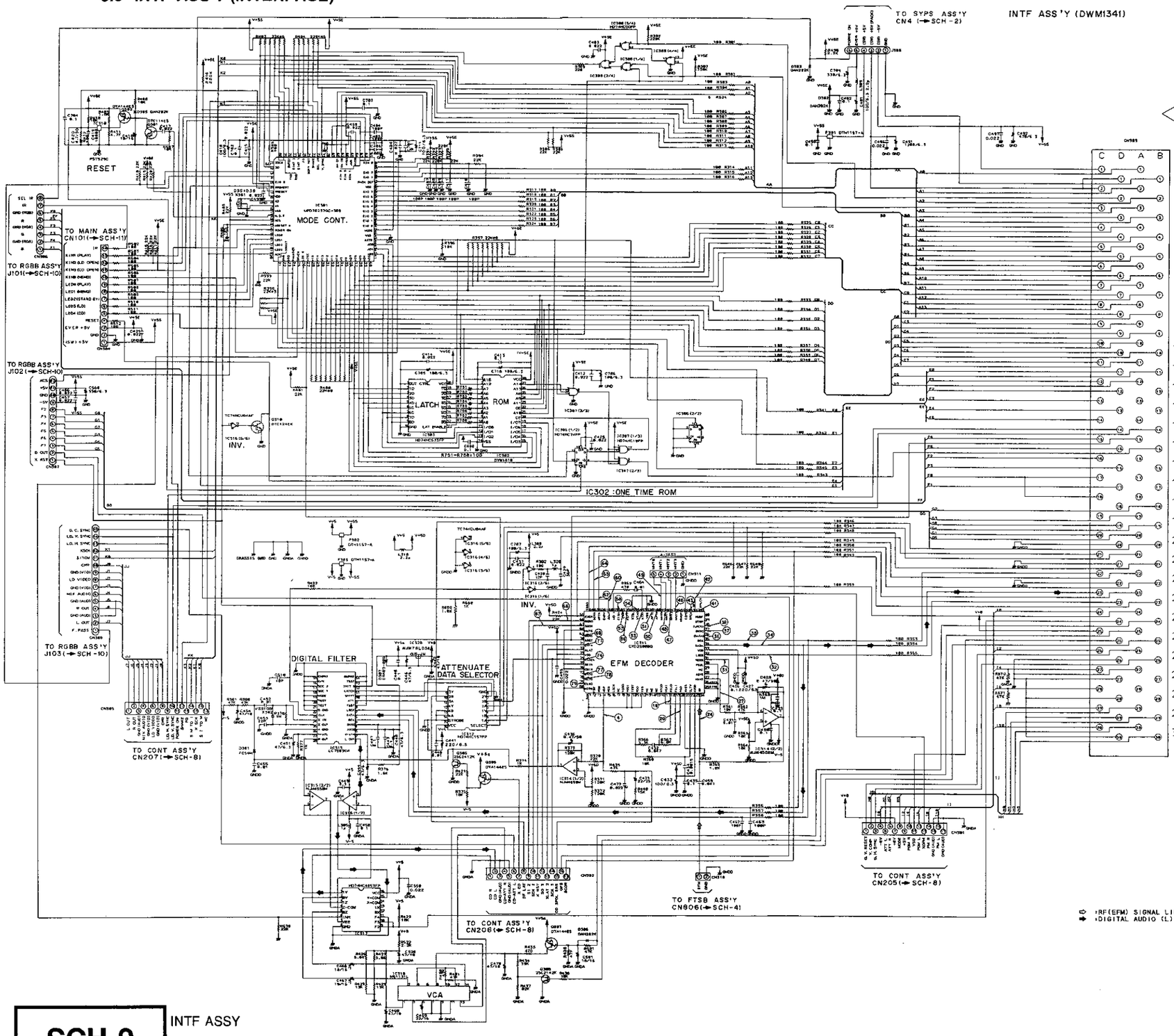
TO INTF ASS'Y CN303

DNX1845-C CONT

This PCB connection diagram is viewed from the foil side.

DNP1488-C

5.9 INTF ASS'Y (INTERFACE)



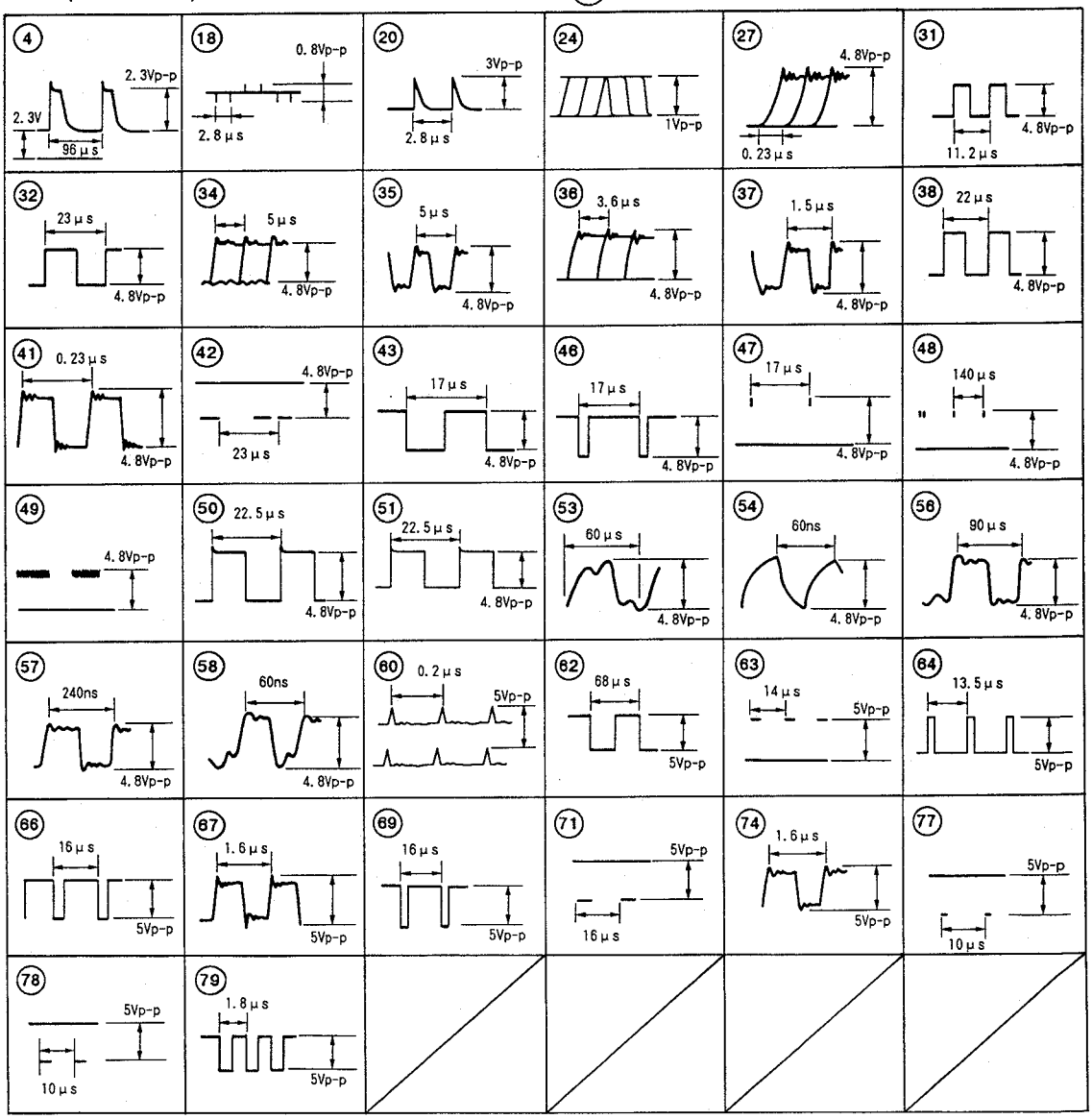
	C	D	A	B
1	(SW) −5V	(SW) +5V	EIO 8	GND (D)
2	(SW) +5V	SEL IR IN	S OUT	X SCK
3	SEL IR OUT	EIO 7	TXD	EINT 2
4	EIO 6	EIO 5	S IN	RXD
5	EIO 4	EIO 3	EINT 1	V SYNC
6	EIO 2	EIO 1	EDA 1	EDA 0
7	EIO 0	AD 0	EAD 2	EAD 1
8	AD 1	AD 2	PACK DEF	A8
9	AD 3	AD 4	A9	A10
10	AD 5	AD 6	A11	A12
11	AD 7	ASTB	A13	A14
12	X WAIT	XRD	A15	EXO 3
13	XWR	RESET IN	EXO 2	EXO 1
14	RESET OUT	LD H SYNC	NC	LD V SYNC
15	GND (RGB)	R	X RST	ROMCS
16	GND (RGB)	G	NC	NC
17	GND (RGB)	B	NC	NC
18	GND (RGB)	F0	NC	F4
19	F1	F2	F5	F6
20	F3	GND (D)	F7	LATCH
21	MT CLK	GND (D)	SHIFT	ATT
22	BCK	GND (D)	EXCK	SBSO
23	DATA	LRCK	SCOR	WFCK
24	−8V	CD SW	C2PO	CD FADE
25	+8V	VSQ	CD SMT	G. C. SYNC
26	+5V	GND (AUD)	G. V. RESET	G. H. SYNC
27	PGM R	GND (AUD)	GND (AUD)	NC
28	PGM L	GND (AUD)	NC	NC
29	FM R	GND (AUD)	Y. COMP	ATT L
30	FM L	GND (AUD)	ATT R	MODE

SCH-9 INTF ASSY

INTF ASSY **SCH-9**

IC311 (CXD2500BQ)

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



Note : These voltages are at the PLAY mode.

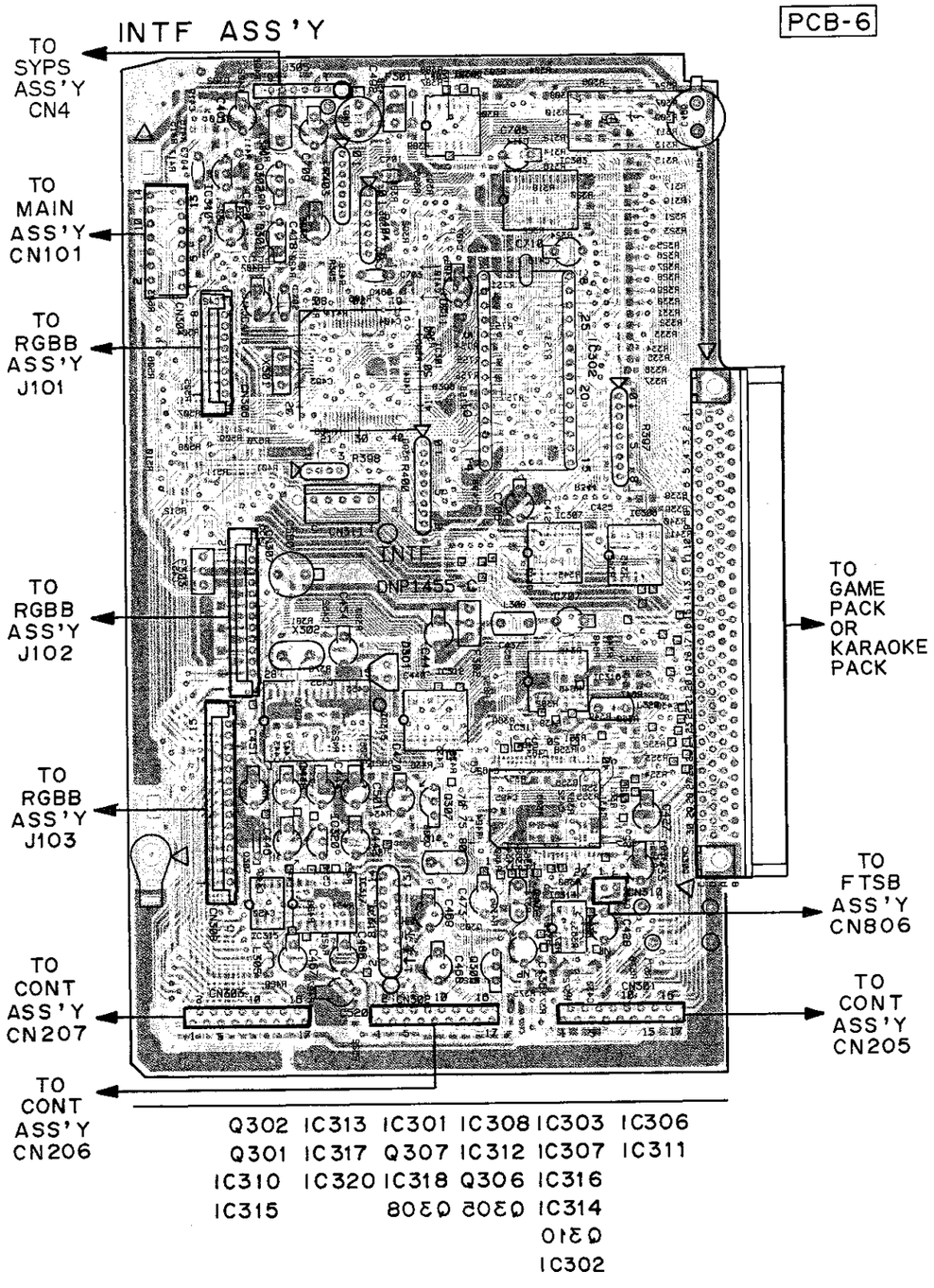
IC311 (CXD2500BQ)

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

* : Refer to waveforms

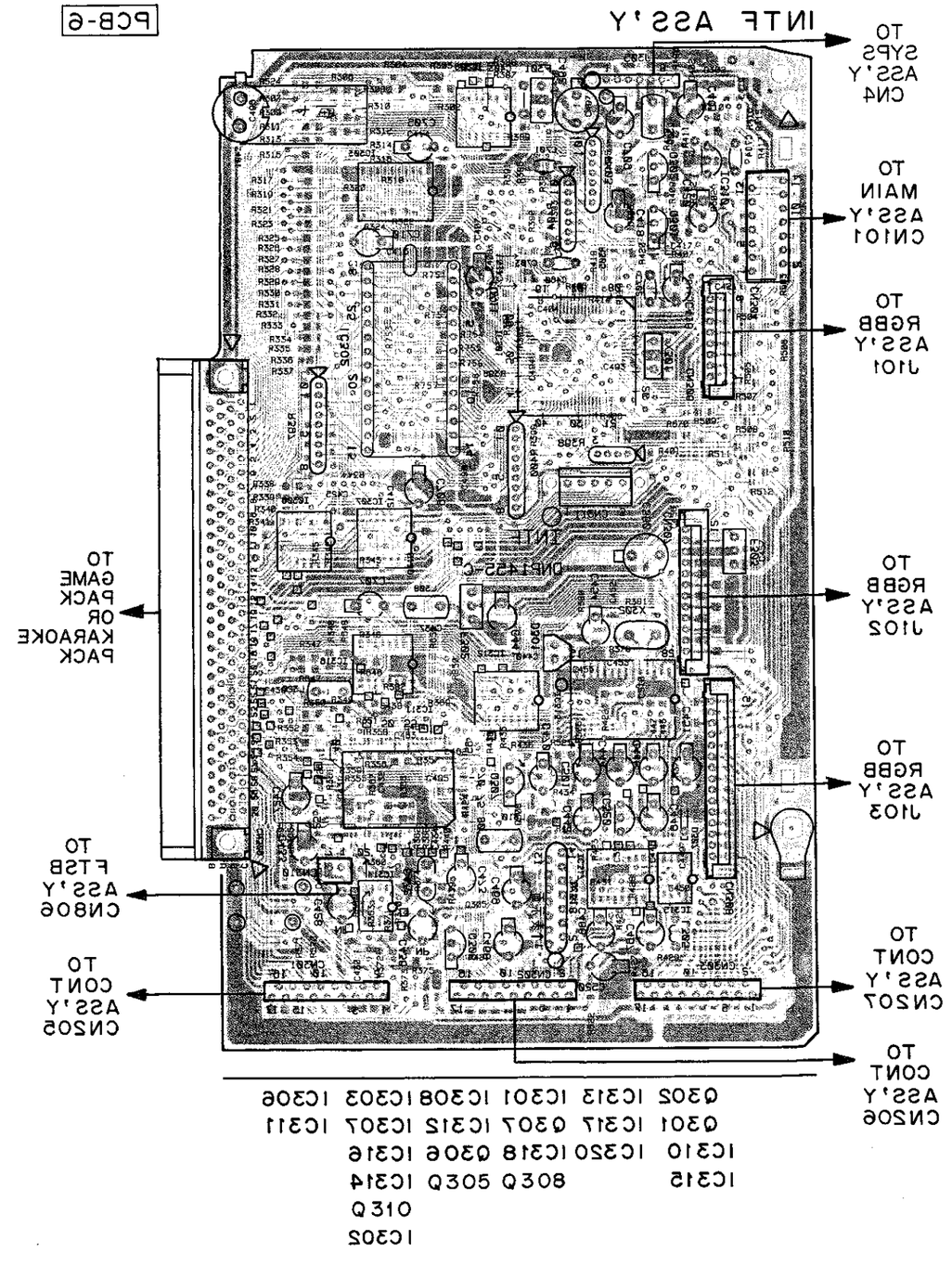
- This PCB is double sided.
- Foil pattern for each side is identified with pink and gray.
  Black colored parts are mounted on the pink foil side;
  red colored parts on the gray foil side.
- This diagram is viewed from black colored parts side.

PCB-6

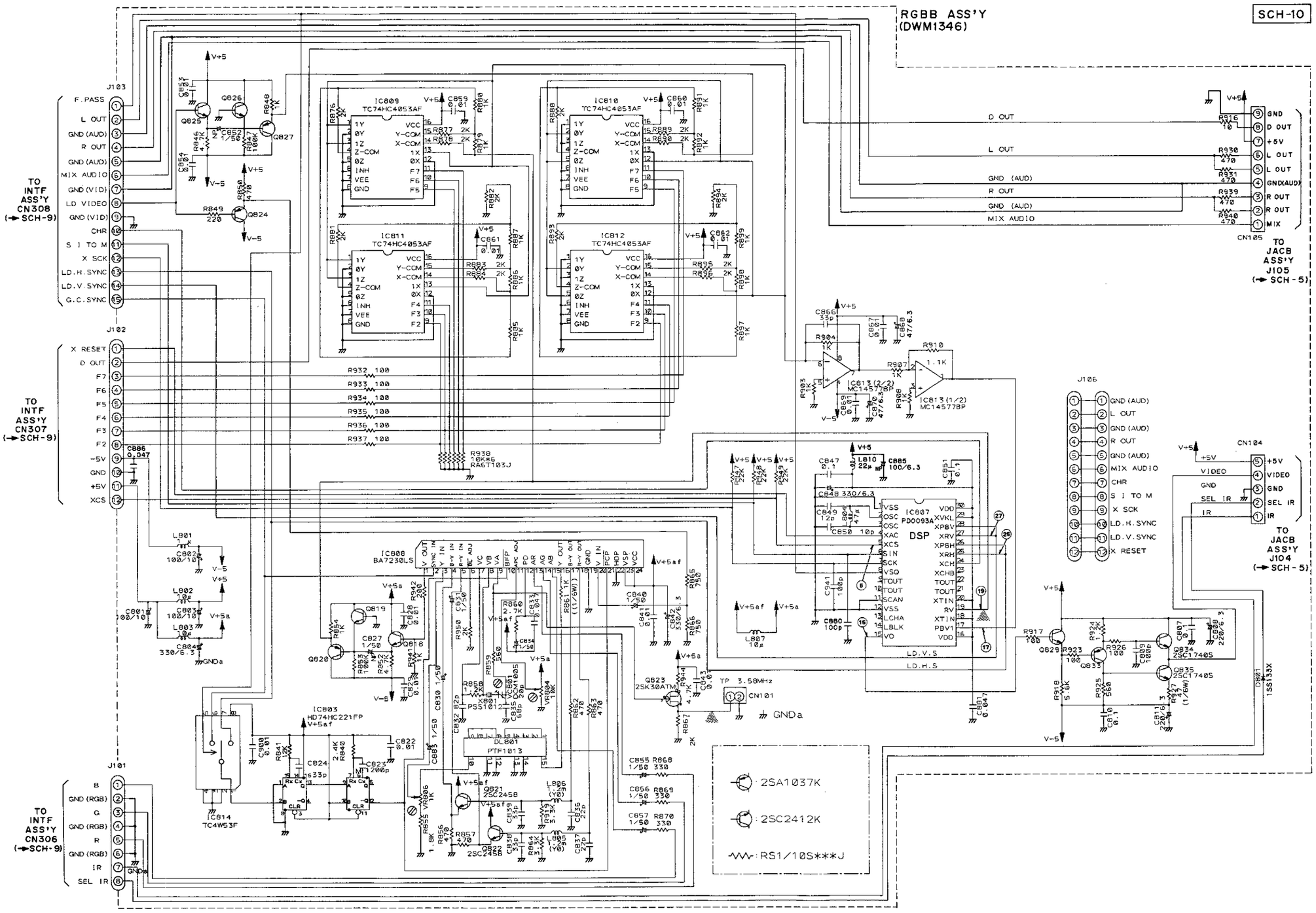


- This PCB is double sided.
- Foil pattern for each side is identified with pink and gray.
  Black colored parts are mounted on the pink foil side;
  red colored parts on the gray foil side.
- This diagram is viewed from red colored parts side.

PCB-6



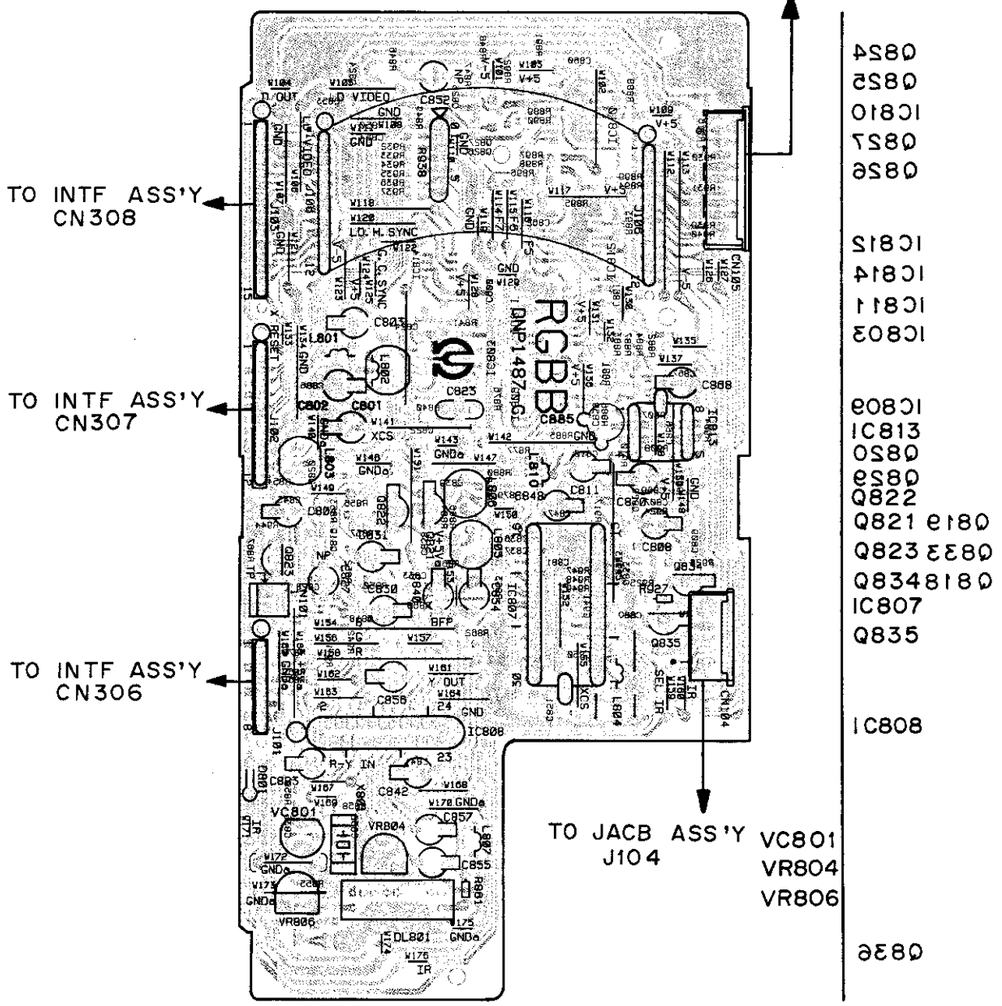
5.10 RGBB ASS'Y



This PCB connection diagram is viewed from the parts mounted side.

PCB-7

RGBB ASS'Y

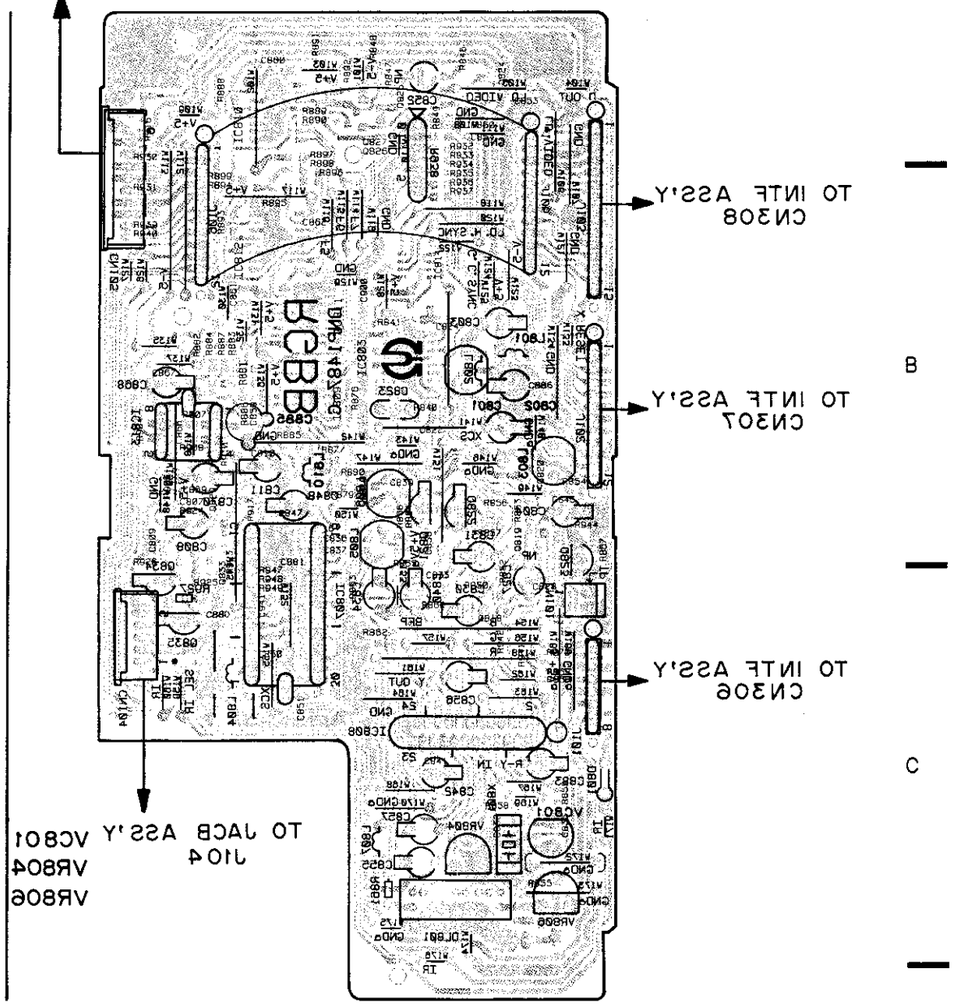


DNP1487-C

This PCB connection diagram is viewed from the foil side.

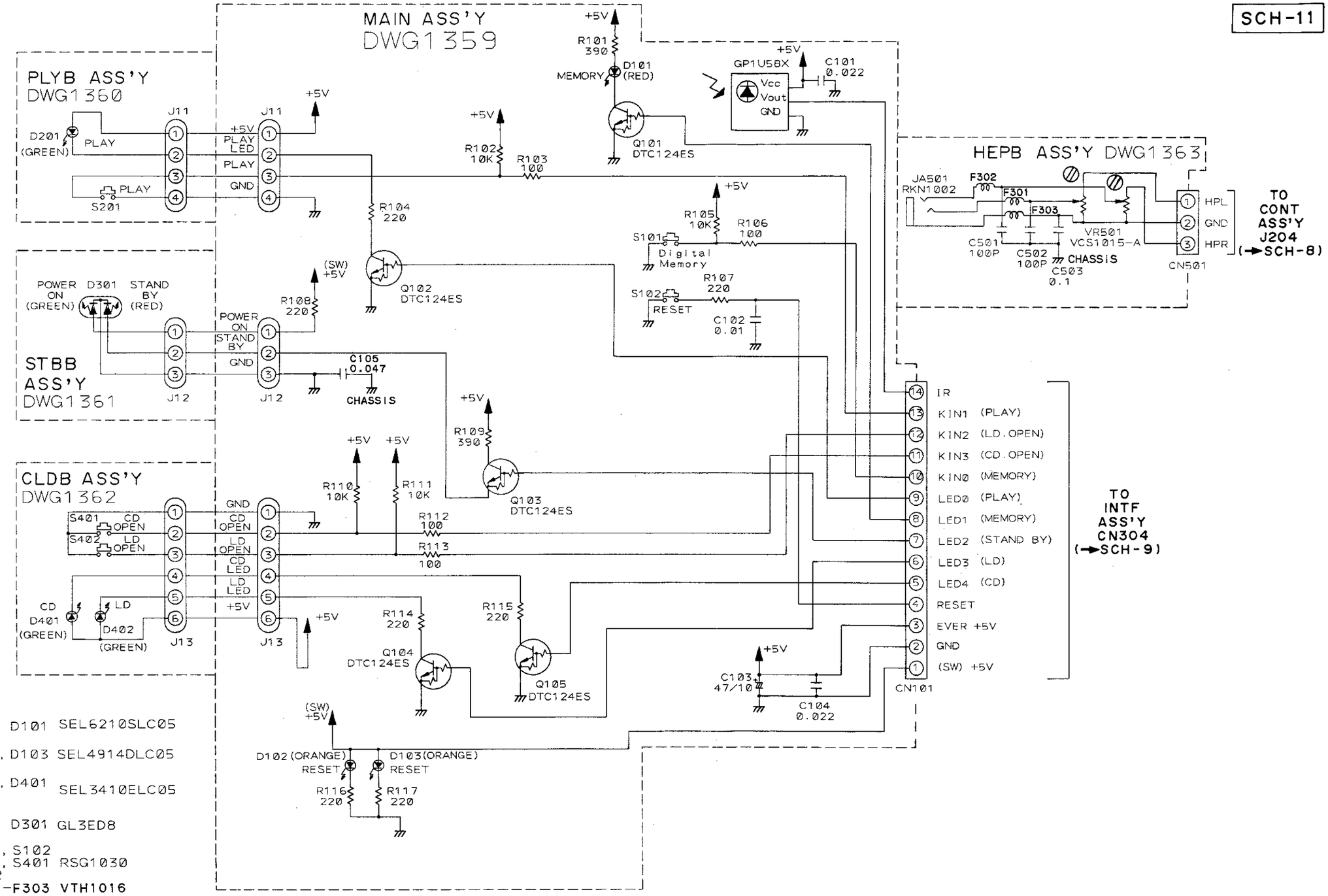
PCB-7

RGBB ASS'Y



DNP1487-C

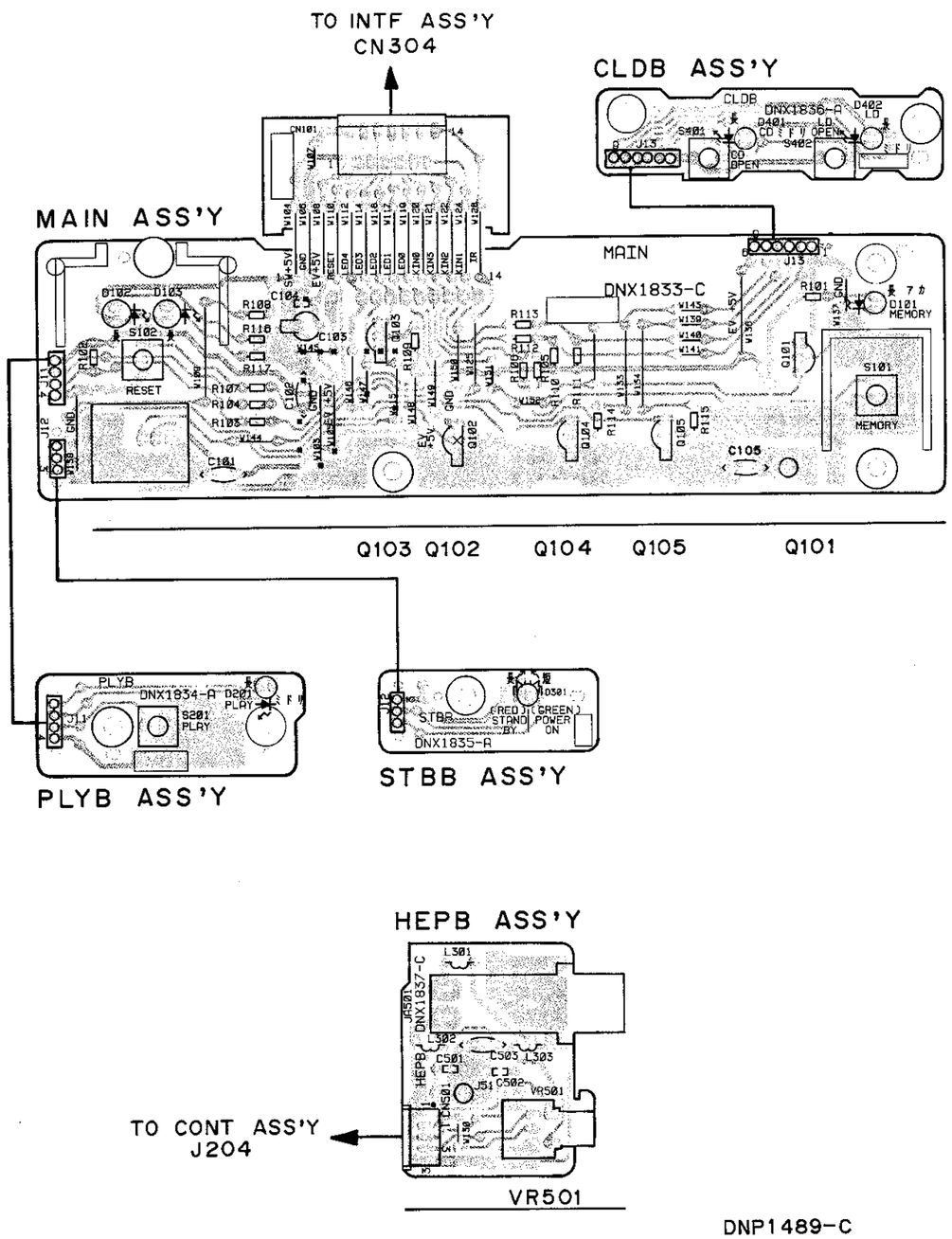
5.11 PLYB, STBB, CLDB, MAIN, HEPB ASS'Y



PLYB ASSY, STBB ASSY, CLDB ASSY, MAIN ASSY, HEPB ASSY SCH-11

This PCB connection diagram is viewed from the parts mounted side.

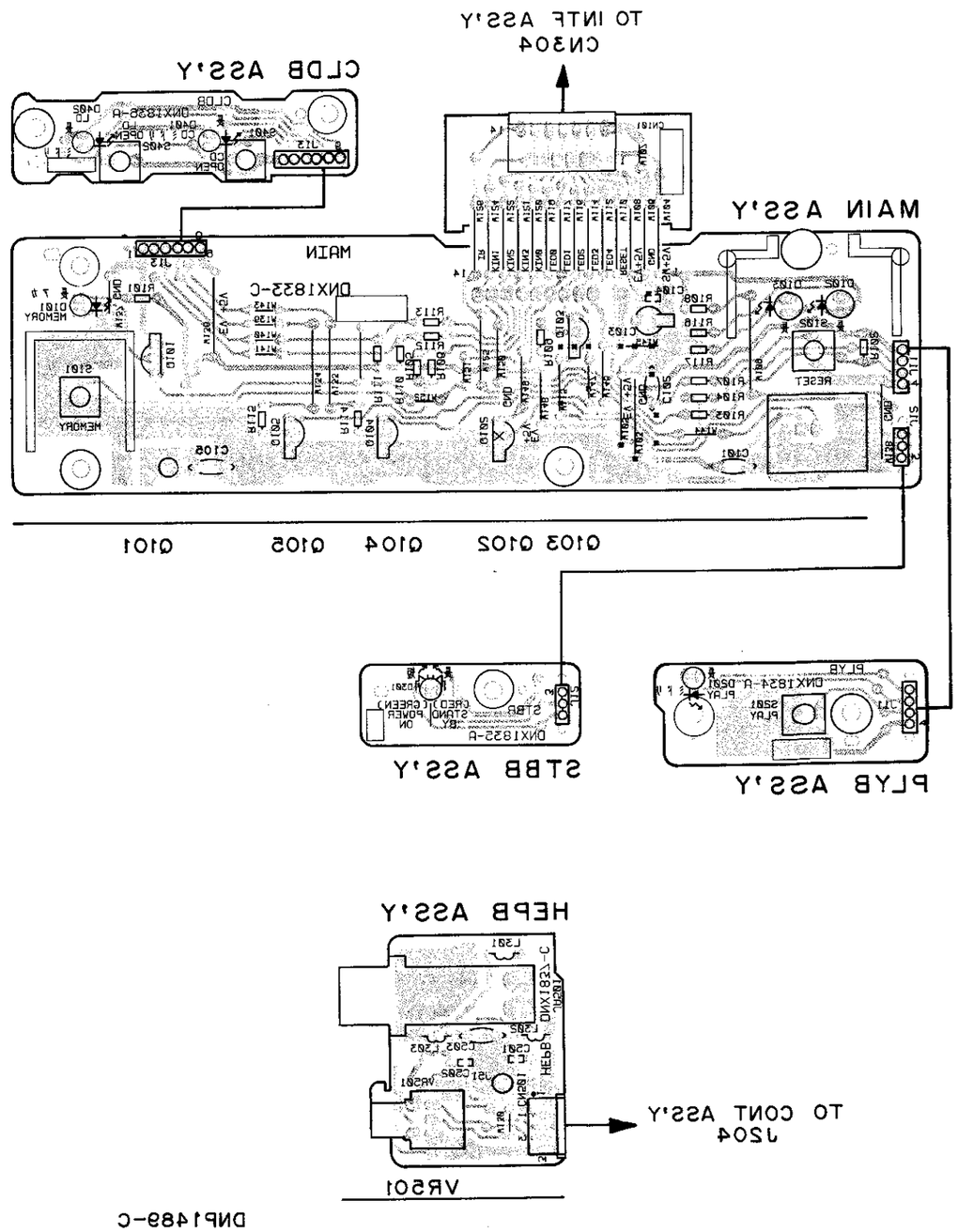
PCB-8



DNP1489-C

This PCB connection diagram is viewed from the foil side.

PCB-8



DNP1489-C

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%).

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

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

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

Mark	No.	Description	Parts No.
LIST OF ASSEMBLIES			
NSP	KEIH ASSY		DWM1343
NSP	├─ MAIN ASSY		DWG1359
NSP	├─ PLYB ASSY		DWG1360
NSP	├─ STBB ASSY		DWG1361
NSP	├─ CLDB ASSY		DWG1362
NSP	└─ HEPB ASSY		DWG1363
NSP	CONT ASSY		DWM1342
	├─ CONT ASSY		DWG1367
NSP	└─ PWSW ASSY		DWG1368
	INTF ASSY		DWM1341
	SYPS ASSY		DWR1156
NSP	VIDEO ASSY		DWM1340
	├─ VIDEO ASSY		DWV1132
NSP	└─ JACB ASSY		DWX1349
NSP	MACB ASSY		DWM1344
NSP	├─ FG ASSY		DWG1354
NSP	├─ PKSB ASSY		DWG1355
NSP	├─ CAMB ASSY		DWG1356
NSP	├─ LOSB ASSY		DWG1357
NSP	└─ LOMB ASSY		DWG1358
	RGBB ASSY		DWM1346
	FTSB ASSY		DWS1191
MAIN ASSY			
SEMICONDUCTORS			
	Q101–Q105		DTC124ES
	D102,D103		SEL4914DLC05
	D101		SEL6210SLC05
SWITCHS			
	S101,S102		RSG1030
CAPACITORS			
	C103		CEJA470M10
	C102		CKCYF103Z50
	C101		CKCYF223Z50
	C105		CKCYF473Z50
	C104		CKPUYF223Z25
RESISTORS			
	R103,R106,R112,R113		RD1/6PM101J
	R102,R105,R110,R111		RD1/6PM103J
	R104,R107,R108,R114–R117		RD1/6PM221J
	R101,R109		RD1/6PM391J
OTHER			
	CN101	AMP Connector (14P)	6–176927–4
		Cable Holder (3P)	51048–0300
		Remote sensor	GP1U58X
PLYB ASSY			
SEMICONDUCTORS			
	D201		SEL3410ELC05
SWITCHS			
	S201		RSG1030
STBB ASSY			
SEMICONDUCTORS			
	D301		GL3ED8
OTHER			
		Cable Holder (3P)	51048–0300
CLDB ASSY			
SEMICONDUCTORS			
	D401,D402		SEL3410ELC05
SWITCHS			
	S401,S402		RSG1030
CONT ASSY			
SEMICONDUCTORS			
	IC352		M51131L
	IC408–IC411,IC453		NJM4558D
	IC201		PD0178C
	Q453,Q454		2SC1740S
	Q405,Q406		2SD2144S
	Q407,Q455		DTA124ES
	Q408,Q456		DTC124ES
	D405–D410		1SS254
	D401–D404		MTZ6.2B/C
COILS, FILTERS			
	L201		LFA100J
CAPACITORS			
	C204,C205		CCCCH300J50
	C485		CEALNP2R2M35
	C443		CEANP100M16
	C491		CEANP330M16
	C411		CEANP4R7M35
	C403,C406–C408		CEAS100M50
	C201		CEAS101M10
	C404		CEAS220M50
	C484		CEAS331M16
	C401,C410		CEAS470M16
	C439–C442,C469		CEJA100M16
	C450,C451,C458,C459,		CEJA101M10
	C462,C463,C482,C483		
	C409		CEJA470M16
	C405		CEJA4R7M50
	C444–C446		CEJANP100M16
	C460,C461		CEJANP220M10
	C412		CEJANP4R7M35
	C456,C457		CFTXA102J50
	C452,C453		CFTXA152J50
	C464		CFTXA393J50
	C454,C455		CFTXA682J50
	C202,C402,C470,C492,C493		CKCYF473Z50
	C448,C449		CKPUYB681K50
	C203		CKPUYF103Z25
RESISTORS			
		All resistors	RD1/6PM□□□J
OTHER			
	CN205–CN207	JE Connector plug	17PS–JE
		Cable holder (3P)	51048–0300
		Cable holder (8P)	51048–0800
	J204	Flat cable (3P)	D20PYY0360E
	J201	Flat cable (10P)	D20PYY1025E
	J202,J203	Flat cable (14P)	D20PYY1425E
	J211	Flat cord (8P)	DDD1075
	J210	Flat cord (10P)	DDD1076
	J209,J212	Flat cord (14P)	DDD1077
		Screw terminal	VNE1856
	X101	Ceramic resonator (9.00MHz)	VSS1040
PWSW ASSY			
SWITCHS			
	S101		DSG1042
INTF ASSY			
SEMICONDUCTORS			
	IC311		CXD2500BQ
	IC302	MBM27C512P (ROM)	DYW1319
	IC308		HD74HC00FP
	IC307		HD74HC10FP
	IC312		HD74HC157FP
	IC317		HD74HC4053FP
	IC303		HD74HC573FP
	IC306		HD74HC74FP
	IC313		LC7883KM
	IC318		M51131L
	IC314,IC315		NJM4558M
	IC320		NJM78L05A
	IC310		PST529C
	IC316		TC74HCU04AF
	IC301	UPD78237GC–3B9	GGC1026
	Q305,Q308		2SC2412K
	Q302,Q306,Q307		DTA144ES
	Q301		DTC114ES
	Q310		DTC124EK
	D302,D303,D305,D306		DAN202K
	D307		ERA83–006
	D301		FC54M
COILS, FILTERS			
	L305		LAU010K
	L320		LFA010J
	L308–L310		LFA2R2J
	F301–F303		DTH1157
CAPACITORS			
	C510		CCSQCH100D50
	C404–C411,C462,C463		CCSQCH101J50
	C438		CCSQCH120J50
	C439		CCSQCH360J50
	C418		CEAL100M16
	C453		CCSQCH220J50
	C401,C416,C433		CEAL101M6R3
	C520		CEAL470M10
	C444,C446,C448,C451		CEAL470M6R3
	C428		CEALNPR47M50
	C436		CEANPR47M50
	C466,C467,C501		CEAS100M16
	C705–C707,C710,C711		CEAS101M6R3
	C473		CEAS220M25
	C427,C441		CEAS221M6R3
	C560,C709		CEAS331M6R3
	C442,C454,C470		CEAS470M10
	C492		CEAS471M6R3
	C469		CEJA220M16
	C468		CEJA470M10
	C420		CEJA4R7M50
	C701–C704		CGCYX104M25
	C434		CK SQYB152K50
	C419		CK SQYF102Z50
	C431,C440,C445,C452,C455,C464		CK SQYF103Z50

Mark	No.	Description	Parts No.
	C402,C413,C426,C429,C430,C435,C443, C447,C449,C450,C458,C498		CKSQYF104Z50
	C403,C412,C414,C415,C417,C421,C425, C437,C456,C457,C460,C493－C497, C550		CKSQYF223Z50
	C432,C459		CKSQYF473Z50
	C472		CQMA223J50
	C491	(1200, 6.3V)	DCH1055
RESISTORS			
	R398	(22K,1W)	RA3T223J
	R403	(22K,1W)	RA6T223J
	R404	(220K)	RA6T224J
	R397,R400	(22K, 1/10W)	RA8T223J
		Other resistors	RS1/10S□□□J
OTHER			
	CN301－CN303	JE Connector Socket	17R－JE
	CN304	AMP Connector (14P)	6－176746－4
	CN310	KR Connector	B2B－PH－K
	CN311	5P Top post (NH)	B5P－SHF
	CN309	Half Pitch Connector (120P)	DKN1097
		Cable Holder (6P)	51048－0600
	J305	Flat cable (6P)	D20PYY0620E
		Earth plate	DNF1446
		IC Socket (28P)	VKH1001
	X301	Ceramic resonator (12.00MHz)	DSS1039
	X302	Crystal oscillator (16MHz)	VSS1051

SYPS ASSY

SEMICONDUCTORS

	IC101,IC102	ICP－N15
	IC201	ICP－N25
	IC202,IC301	ICP－N50
	IC203	UPC1093J
	Q301	2SA1015
	Q201,Q302	2SA1307
	Q101,Q102	2SB1185
	Q202	2SC1815
	Q2,Q3	2SC2655
	Q1	2SC4275
	Q103,Q104	2SD1762
	D4,D5	1SS178TPA
	D1	D2SB40－4001
	D104－D107	ERA91－02V
	D3	ERB44－02V
	D2	ERB44－04V
	D301	ERB83－004
	D101,D102	ERC91－02L
	D201	ESAB82M
	D6	PS2501
	D302	RD5.6ES

Mark	No.	Description	Parts No.

VIDEO ASSY

SEMICONDUCTORS

	IC815	BA10393N
	IC801	BA15218N
	IC1	CA0002AM
	IC666	HD74HC221P
	IC603	MB40568P
	IC605	MB40778
	IC301	MC141621FU
	IC901	MM1109XS
	IC604	MN4700
	IC602	MN4760S
	IC607,IC609	NJM082S
	IC611	NJM4558D
	IC612	NJM4558S
	IC606	PA4016
	IC401	PA5013A
	IC601	PDB011
	IC608,IC817,IC818	TC4S66F
	IC403,IC816	TC4W53F
	IC804	TC5081AP
	IC820	TC74HC123AP
	IC802	TC74HC4053AP
	IC613	TC7WU04F
	IC610	VTX1001
	Q211,Q218,Q301,Q303,Q305,Q314, Q417,Q430,Q431,Q605,Q618,Q621, Q631,Q644,Q645,Q701,Q703,Q813, Q823,Q902	2SA1037K
	Q626,Q628,Q633	2SA933S
	Q312	2SB1237X
	Q625,Q627	2SC1740S
	Q1,Q2,Q209,Q210,Q212,Q216,Q217, Q219,Q302,Q306,Q317,Q401,Q402, Q406,Q409,Q424,Q432,Q601－Q603, Q606,Q607,Q610,Q611,Q615,Q616, Q622,Q624,Q630,Q636,Q643,Q702, Q814,Q815,Q821,Q822,Q900,Q901,Q903	2SC2412K
	Q315	2SD1858X
	Q316,Q407,Q408,Q612,Q614,Q617, Q818	DTA124EK
	Q313,Q422,Q423,Q604,Q608,Q609, Q613,Q619,Q816,Q817	DTC124EK
	D601	1S2339
	D301,D302	1S2471
	D602－D604,D607－D612	1SS254
	D802	FC54M/456

COILS, FILTERS

	L429,L430,L606	LAU100J
	L406,L407,L415,L601,L611, L625,L626,L900	LAU120J
	L422	LAU121J
	L607	LAU150J
	L302	LAU180J

Mark	No.	Description	Parts No.
	L201 – L204,L301,L305,L306, L404,L405,L417,L602,L612, L619		LAU220J
	L3,L303,L608		LAU270J
	L610,L613,L617,L618,L620		LAU2R2M
	L403,L633		LAU330J
	L411,L426,L428,L603,L605		LAU390J
	L622		LAU3R3J
	L409		LAU430J
	L427,L604		LAU470J
	L1,L2,L408,L416		LAU560J
	L401		LAU5R6J
	L410		LAU620J
	L304,L634		LFA220J
	L418		LFA561J
	F2	(2.3MHz)	VTF1048
	F1	(2.8MHz)	VTF1049
CAPACITORS			
	VC901		VCM1005
	C605		CCCCH181J50
	C604		CCCCH221J50
	C726		CCCSL331J50
	C622		CCPUSL560J50
	C514,C616		CCSQCH030C50
	C411,C512,C516,C615,C617, C683,C684		CCSQCH050C50
	C226,C242		CCSQCH060D50
	C302,C440		CCSQCH070D50
	C730,C731		CCSQCH080D50
	C409,C436,C817		CCSQCH100D50
	C477		CCSQCH101J50
	C303,C305,C422		CCSQCH120J50
	C222,C238,C488,C517,C611, C883		CCSQCH150J50
	C301,C407,C468,C475,C476		CCSQCH151J50
	C511,C614,C790		CCSQCH180J50
	C900		CCSQCH181J50
	C418,C419		CCSQCH200J50
	C224,C227,C240,C243,C736		CCSQCH220J50
	C2,C408,C466,C495		CCSQCH221J50
	C437,C708		CCSQCH270J50
	C442		CCSQCH271J50
	C410,C432		CCSQCH330J50
	C304,C306,C424,C439,C463		CCSQCH390J50
	C223,C239,C405,C406,C412, C420,C438,C453,C612,C613		CCSQCH470J50
	C225,C241,C513,C515		CCSQCH560J50
	C1,C4		CCSQCH910J50
	C906,C909		CCSQSL561J50
	C903,C904		CCSQSL681J50
	C620,C707		CEAL010M50
	C914, C922		CEAL101M6R3

Mark	No.	Description	Parts No.
	C626		CEAL220M16
	C905		CEAL470M6R3
	C637,C811		CEANP010M50
	C619,C664		CEANP4R7M35
	C665		CEANPR47M50
	C435,C688,C910		CEAS010M50
	C462,C653		CEAS100M50
	C7,C218,C219,C234,C235,C254, C255,C310,C313,C315,C316,C320, C327,C602,C608,C634,C642,C655, C678,C679,C681,C682,C685,C687, C689,C700,C709		CEAS101M10
	C648		CEAS220M16
	C668		CEAS220M25
	C323		CEAS221M6R3
	C908		CEAS3R3M50
	C3,C12,C17,C417,C426,C428,C434, C455,C456,C461,C472,C490,C492, C641,C658,C660,C663,C680,C713, C722,C825,C885,C891		CEAS470M10
	C332,C334,C464,C607,C913		CEAS471M6R3
	C16		CEJA100M16
	C819,C821		CEJA101M10
	C14		CEJANP010M50
	C23		CEJAR47M50
	C431,C625,C666		CFTXA103J50
	C15,C458		CFTXA104J50
	C886		CFTXA124J50
	C826		CFTXA222J50
	C618		CFTXA223J50
	C10,C20		CFTXA224J50
	C469,C667,C674,C676		CFTXA473J50
	C459,C460,C706,C742		CFTXA683J50
	C480,C649,C715,C723		CFTYA184J50
	C621		CKCYB102K50
	C920		CKCYF473Z50
	C901		CKPUYB101K50
	C650		CKPUYB181K50
	C632		CKPUYB331K50
	C467,C471		CKPUYB910K50
	C441,C712		CKPUYF103Z25
	C331,C333,C518,C519,C609,C610		CKSQYB102K50
	C644,C645,C797		CKSQYB222K50
	C907		CKSQYB392K50
	C324		CKSQYB472K50
	C911		CKSQYB682K50
	C5,C217,C220,C233,C236,C253, C256,C314,C317,C321,C326,C335, C415,C416,C421,C423,C425,C433, C443,C454,C457,C465,C473,C474, C489,C491,C623,C624,C629,C630, C640,C646,C651,C654,C659,C661, C672,C673,C686,C691,C694,C697, C702,C714,C721,C791,C794,C795, C812,C813,C818,C820,C858,C882, C884,C887,C902,C912		CKSQYF103Z50

Mark	No.	Description	Parts No.
	C6,C13,C18,C311,C312,C325,C328, C329,C340,C638,C657,C716,C720, C745,C799,C802,C803,C881		CKSQYF104Z25
	C307		CKSQYF223Z50
	C24,C725,C737－C740,C792,C793		CKSQYF473Z25
	C627,C633,C669,C733		CQMA102J50
	C921		CQMA124J50
	C892		CQMA222J50
	C429		CQMA272J50
	C705		CQMA332J50
	C11,C22		CQMA393J50
	C8,C9,C19,C21,C635		CQMA472J50
	C670		CQMA682J50
	C606		CQMA821J50
RESISTORS			
	VR482 (2.2K)		VRTB6VS222
	VR802,VR808 (22k) VR201,VR202		VRTB6VS223 VRTB6VS332
	VR521,VR807 (4.7K)		VRTB6VS472
	VR401		VRTG6VS221
	R8,R9,R617,R619,R663		RD1/6PM102J
	R671,R779,R796		RD1/6PM103J
	R759,R845		RD1/6PM104J
	R623		RD1/6PM124J
	R704－R711		RD1/6PM181J
	R620		RD1/6PM220J
	R471,R743		RD1/6PM221J
	R453,R602,R747		RD1/6PM222J
	R601,R828		RD1/6PM332J
	R317,R728,R925		RD1/6PM472J
	R638		RD1/6PM473J
	R408		RD1/6PM680J
	R1,R606,R612		RD1/6PM681J
	R311		RD1/6PM682J
	R688		RD1/6PM822J
	R450		RD1/6PM911J
	R699,R701		RN1/6PQ1002F
	R413		RN1/6PQ1203F
	R833		RN1/6PQ1801F
	R429		RN1/6PQ2002F
	R831		RN1/6PQ2201F
	R698,R700		RN1/6PQ2202F
	R405,R406		RN1/6PQ2402F
	R835		RN1/6PQ4701F
	R412		RN1/6PQ5101F
	Other resistors		RS1/10S□□□J
OTHER			
	TC401	Ceramic Trimmer	VCM－006
		HOUSING ASS'Y(2P)	DKP2626
	X602	Crystal resonator (18.1MHz)	DSS1035
	X601	Crystal resonator (14.318MHz)	VSS1044
		PCB Binder	VEF1040

Mark	No.	Description	Parts No.
JACB ASSY			
COILS, FILTERS			
	L101		LAU101J
CAPACITORS			
	C106,C107		CCSQCH101J50
	C101		CEAS221M6R3
	C113		CKSQYF103Z50
	C102,C104,C105,C111		CKSQYF104Z25
RESISTORS			
	R101,R102		RD1/6PM750J
		Other resistors	RS1/10S□□□J
OTHER			
	JA102	Pin jack (4P)	DKB1038
	JA101	Optical output module	GP1F32T
	JA104	Pin jack (Video)	VKB－014
	JA103	Pin jack (RF)	VKB1029
	JA105	Mini jack (2P)	VKN－183
		Cable Holder (3P)	51048－0300
		Shield plate	DNH1842
FG ASSY			
SEMICONDUCTORS			
	D1		GP1S51V
OTHER			
	64	HOUSING ASS'Y	VKP1950
PKSB ASSY			
SWITCHS			
	S4,S5		DSG1015
OTHER			
	72	HOUSING ASS'Y	VKP1951
CAMB ASSY			
SEMICONDUCTORS			
	Q10		2SC1740S
CAPACITORS			
	C12,C13		CEAS220M25
	C10,C11		CKCYF103Z50
RESISTORS			
	R10		RD1/6PM182J
	R11		RD1/6PM470J
OTHER			
	CN404	Connector	B3B－PH－K－S
	CN402	Connector	B3B－PH－K－R
	CN403	Connector (23P)	HLEM23R－1
	CN401	Connector (23P)	VKN1073
		HOUSING ASS'Y	DKP2783

Mark No.	Description	Parts No.
LOSB ASSY		
SWITCHS		
S1 – S3		DSG1015
LOMB ASSY		
CAPACITORS		
C1		CGCYX473M25
HEPB ASSY		
COILS, FILTERS		
F301 – F303		VTH1016
CAPACITORS		
C503		CGCYX104M25
C501,C502		CKPUYB101K50
RESISTORS		
VR501	(0.5K)	VCS1015
OTHER		
CN501	Jamper connector (2MMP)	52151 – 0310
JA501	Headphone Jack	RKN1002
J13	Flat cable (6P)	D20PWW0625E
J11	Flat cable (4P)	D20PWY0415E
J12	Flat cable (3P)	D20PYY0320E
RGBB ASSY		
SEMICONDUCTORS		
IC808		BA7230LS
IC803		HD74HC221FP
IC813		MC14577BP
IC807		PD0093A
IC814		TC4W53F
IC809 – IC812		TC74HC4053AF
Q820,Q824,Q827,Q833		2SA1037K
Q834,Q835		2SC1740S
Q818,Q819,Q825,Q826,Q829		2SC2412K
Q821,Q822		2SC2458
Q823		2SK30ATM
D801		1SS133X
COILS, FILTERS		
L801		LAU010K
L807		LAU100J
L810		LAU220J
L804		LAU470J
L802,L803		LFA100J
L805,L806		LFA122J
CAPACITORS		
VC801		DCM1005
C850		CCSQCH100D50
C809,C880,C941		CCSQCH101J50
C849		CCSQCH120J50
C836,C837		CCSQCH220J50
C824,C838,C839,C866		CCSQCH330J50
C835		CCSQCH680J50
C832		CCSQCH820J50
C885		CEAL101M6R3
C868,C870		CEAL470M6R3
C852		CEANP010M50
C883		CEAS010M50
C808,C811		CEAS221M6R3
C804,C842,C848		CEAS331M6R3
C830,C831,C834,C840,C855 – C857		CEJA010M50
C801 – C803		CEJA101M10
C827		CEJANP010M50
C822,C828,C829,C841,C843,		CKSQYF103Z50
C853,C854,C859 – C862,C867,		CKSQYF104Z25
C869,C900		CKSQYF473Z50
C807,C810,C847,C851		CQMA122J50
C833,C881,C886		
C823		
RESISTORS		
VR806	(1K)	VRTB6VS102
VR804	(10K)	VRTB6VS103
R938	(10K)	RA6T103J
R861		RD1/6PM102J
R927		RD1/6PM470J
	Other resistors	RS1/10S□□□J
OTHER		
	Cable Holder (8P)	51048 – 0800
	Cable Holder (12P)	51048 – 1200
J103	Flat cord (15P)	D20PYY1510E
X801	Crystal oscillator (3.579545MHz)	PSS1012
DL801	Delay line	PTF1013
	PCB Binder	VEF1040
FTSB ASSY		
SEMICONDUCTORS		
IC802		BA15218N
IC801		CXA1081S
IC810,IC811		ICP – N10
IC804		LA6510
IC501		NJM072L
IC803		PM3003A
IC805		TC4W53F
Q105,Q106,Q806,Q808,Q812,		2SA1037K
Q819,Q832,Q836		2SA1399
Q503		2SB1185
Q402,Q816,Q818		2SC2412K
Q802 – Q805,Q807,Q809,Q810,		2SD1762
Q814,Q825,Q838		2SK184
Q401,Q815,Q817		DTA124EK
Q821		DTC124EK
Q820,Q824,Q826,Q829,Q830		1SS254
Q107,Q811,Q823,Q827,Q828,		MTZ9.1C
Q835,Q837,Q839,Q841		
D501,D502,D801,D804 – D808		
D401,D402		

Mark	No.	Description	Parts No.
COILS, FILTERS			
	L801,L803		LAU151J
	L802		LAU181J
CAPACITORS			
	C837,C871		CCCSL331J50
	C817		CCSQCH050C50
	C895		CCSQCH100D50
	C810,C811,C822		CCSQCH101J50
	C806,C812,C815		CCSQCH270J50
	C804,C890,C891,C893		CCSQCH470J50
	C809,C813		CCSQCH680J50
	C818		CCSQSL471J50
	C819		CCSQSL561J50
	C808,C823		CEAL010M50
	C896		CEAL470M16
	C814,C845		CEANP010M50
	C915		CEANP100M16
	C850		CEANP2R2M50
	C870		CEANP470M10
	C866		CEANPR47M50
	C816		CEAS010M50
	C864		CEAS100M50
	C512		CEAS101M10
	C515,C876,C877		CEAS220M50
	C405,C406,C857,C859		CEAS221M10
	C401,C402,C941,C942		CEAS221M16
	C897		CEAS470M10
	C550,C551		CEAS470M16
	C840		CEHAQ010M50
	C835,C836		CEHAQ220M50
	C855		CEJA100M50
	C842,C863		CEJANP100M16
	C849,C873		CFTXA103J50
	C504,C505,C832,C838,C874		CFTXA104J50
	C807		CFTXA124J50
	C843		CFTXA223J50
	C827,C848,C867		CFTXA333J50
	C869,C910		CFTXA473J50
	C847,C868		CFTXA683J50
	C883		CFTXA823J50
	C852,C900		CFTYA224J50
	C403,C404,C407,C408		CGCYX473M25
	C854		CKPUYB821K50
	C513		CKSQYB102K50
	C879		CKSQYB562K50
	C501,C503,C511,C801－C803, C824,C828,C829,C875		CKSQYF103Z50
	C510,C851,C858,C860, C880－C882		CKSQYF104Z25
	C805,C820,C878		CKSQYF473Z25
	C931		CKSQYF473Z50
	C839		CQMA102J50
	C834		CQMA152J50
	C899		CQMA272J50
	C853		CQMA332J50
	C502		CQMA333J50
	C898		CQMA472J50
	C825		CQMA682J50
RESISTORS			
	VR603,VR609	(10K)	VRTB6VS103
	VR620	(15K)	VRTB6VS153
	VR601,VR605,VR606,VR611	(2.2K)	VRTB6VS222
	VR604	(4.7K)	VRTB6VS472
	VR610		VRTB6VS473
	R913		RD1/6PM101J
	R962		RD1/6PM102J
	R923		RD1/6PM103J
	R917		RD1/6PM123J
	R507		RD1/6PM225J
	R402,R406		RD1/6PM331J
	R528,R529,R976		RD1/6PM470J
	R841,R910－R912		RD1/6PM563J
	R934		RD1/6PM681J
	R850,R862 (3.3)		RS1LMF3R3J
		Other resistors	RS1/10S□□□J
OTHER			
	CN807	Top post (11P)	B11P－SHF－1AA
	CN806	Connector	B2B－PH－K
	CN803	Connector (23P)	VKN1013
	J801	Flat cable (11P)	D20PYY1130G
		PCB Binder	VEF1040

7. ADJUSTMENTS

7.1 TEST MODE

1) Test mode startup

With the CONT assembly's IC201 (PD0178) pin25 (SHAKE) connect to GND, turn ON the power switch to start up the test mode.

Use a screwdriver to short circuit the two points on the copper pattern side shown in Fig.1 and turn ON the power switch. This will make the operation easier. or, turn ON the power switch and then press the ESC key and TEST key (in this order) on the test mode remote controller (GGF1067).

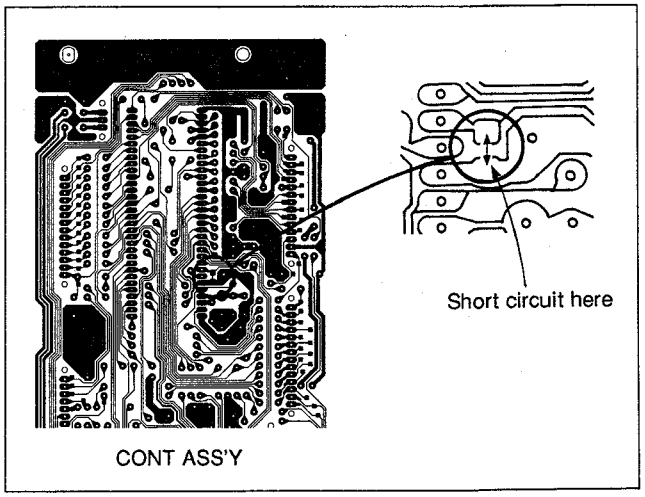


Fig. 1

2) Canceling the test mode

Turn OFF the power switch.

3) Functions and key operations during the test mode

Note : For keys which are not on the player or on the remote controller, use the test mode remote controller (GGF1067).

- Key operation in the Test mode

Player Status	Key Operation	Function	Remarks
Tray Open	⏮/⏭ SKIP (Refer to Note 1)	⏮ : Shifts the tray in the closed direction and also raises the turn table while pressing the key. ⏭ : Shifts the tray in the open direction and also lowers the turn table while pressing the key.	
Tray Open	▶ PLAY	Clamps	
Clamp	▶ PLAY	Turns the disc through TRK Servo OFF	TRK– OFF
TRK Servo Open	▶ PLAY	TRK Servo ON	TRK– ON
TILT Neutral	+ MULTI-SPEED	TILT Servo ON	T–□ : ON
TILT ON	– MULTI-SPEED	TILT Neutral	T–□ : N
TILT Neutral or ON	⏮/⏭ SKIP	Setting TILT Servo to OFF, can force TILT to move.	T–1 to T–E
Clamp	◀◀/▶▶ SCAN	Can force the slider to move	S – LD S – CDV S – CD S – IN
Play	❚❚ PAUSE	Still	
Play	■ STOP	Stop	
Stop	▲ OPEN	Open	
Play	[+10] ⇩ [0] to [9] ⇩ [▶ PLAY]	Sets to SEARCH Lead Address Input mode. Designates the SEARCH lead address through keys 0 to 9. Press the CLEAR [C] key if the designated address is incorrect. Searches the designated address upon pressing the PLAY key.	

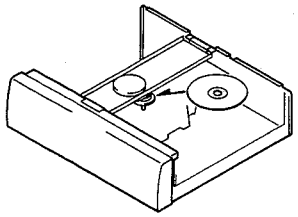
Note 1 : Press SKIP (⏮ / ⏭) Keys after the tray is set to open state by pressing Open (▲) key. Because, in tray open state, pressing PLAY (▶) key causes it to set to TILT control state and SKIP (⏮ / ⏭) keys can not function properly.

● 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.



② Press the PLAY (▶) key once.
(Twin gear starts to move.)

③ Push the cam plate (Fig. 4) in the direction of the arrow and wait until the CD disc is clamped.

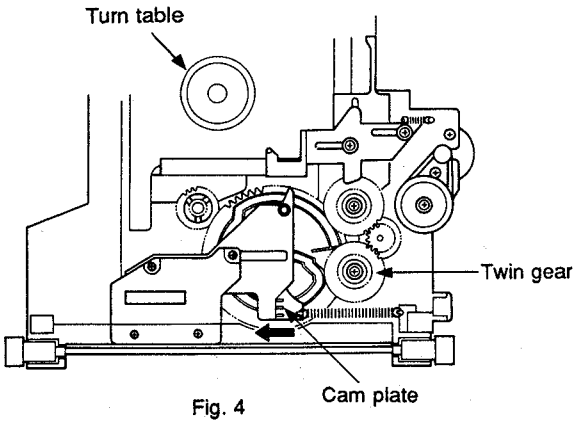
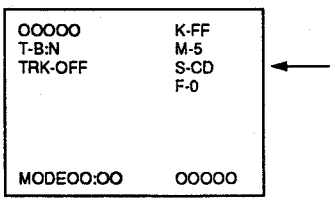


Fig. 4

④ Press the ◀◀ or ▶▶ keys to appear "S-CD" on the TV screen display.

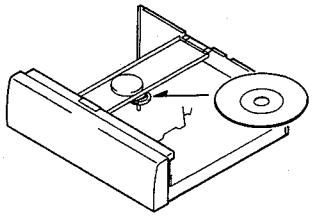


TV screen display

⑤ Press the PLAY (▶) key twice, disc will be normally playbacked.

- LD PLAYBACK

① Place the LD disc on the turn table.

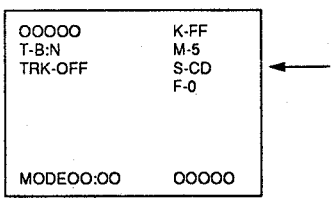


② Press the PLAY (▶) key once. (Twin gear starts to move.)

③ Press the SKIP REV (⏮) key to raise the turn table (spindle motor section) while pressing the cam plate (Fig. 4) in the direction of the arrow. Raise it to the position where the LD disc can be easily placed on the turn table.
If the turn table is raised too high, lower it with the SKIP FWD (⏭) key.

④ Place the LD disc on the turn table and press the PLAY (▶) key once to clamp the disc.

⑤ Press the ◀◀ or ▶▶ keys to appear "S-LD" on the TV screen display.



TV screen display

⑥ Press the PLAY (▶) key twice, disc will be normally playbacked.

7.2 TOOLS REQUIRED FOR ADJUSTMENTS

● Tools Required

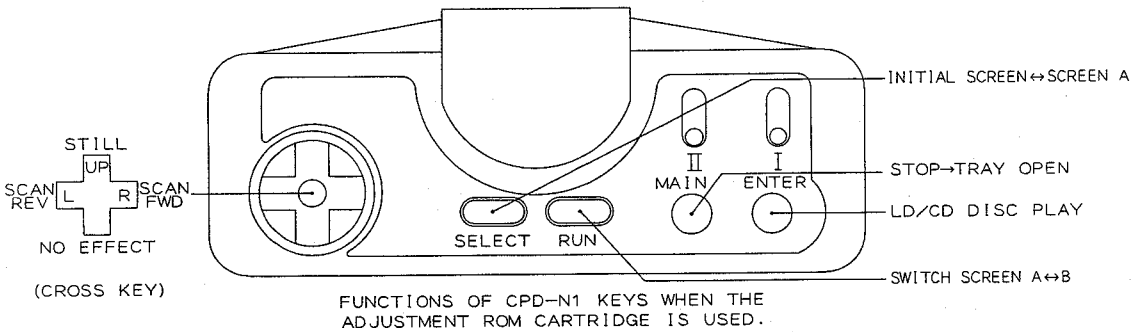
- CD test disc (STD－901 or STD－902)
- LD test disc (GGV1003)
- Medium-size blade screwdriver
- Small blade screwdriver
- Hexagonal wrench (with handle, 3mm sides)
- Resistors (10k ohm×2.47k ohm×1)
- Two-image oscilloscope (with delay)
- AF oscillator
- Frequency counter
- Digital voltmeter
- Monitor TV
- Low－pass filter
- Adjustment ROM cartridge (GGF1244)

7.3 ADJUSTMENT ROM CARTRIDGE (GGF1244)

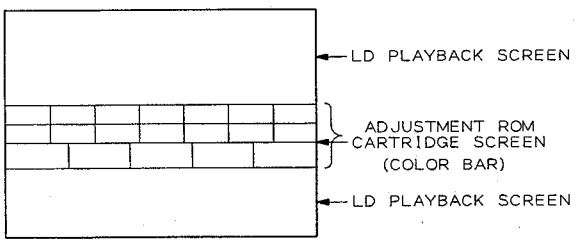
● Adjustment ROM cartridge operation

Use the adjustment ROM cartridge as follows :

1. Turn OFF the CLD－A100 power switch.
2. Attach the PAC－N10, ROM cartridge, and CPD－N1 to the CLD－A100. Turn ON the power switch. The initial display will appear. The keys of the CPD－N1 will also have the following functions :



FUNCTIONS OF CPD－N1 KEYS WHEN THE ADJUSTMENT ROM CARTRIDGE IS USED.

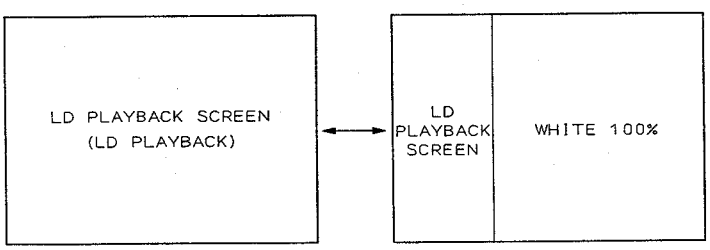


INITIAL SCREEN

Note : This is used in "7.6 RGBB ASSEMBLY ADJUSTMENT" :

1. RGB encoder output level adjustment
3. APC adjustment

3. With the initial display on, press the CPD－N1's SELECT key. Display A will appear. Press the RUN key to switch between display B.



SCREEN A

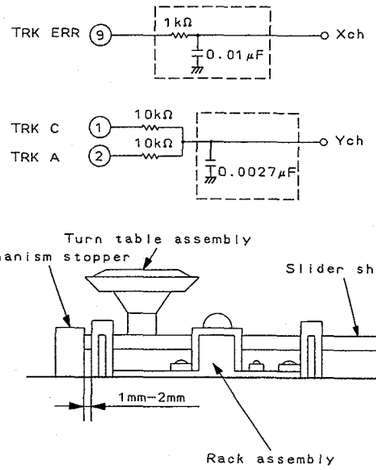
SCREEN B
(WITHOUT LUMINANCE MODE)

Note : This is used in "7.5 VIDEO ASSEMBLY ADJUSTMENT,
7. BRIGHTNESS KEY ADJUSTMENT."

7.4 ADJUSTMENTS OF PICKUP ASSY AND FTSB ASSY

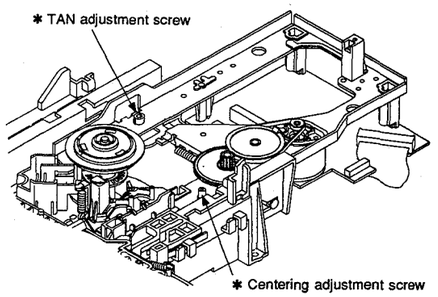
● NOTES FOR CENTERING ADJUSTMENT

Use the low-pass filters below in the coarse centering adjustment 3. and fine centering adjustment 7. when the S/N of the waveform is heard to observe.

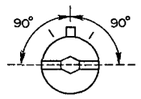


● RACK ASSEMBLY DURING CENTERING ADJUSTMENT

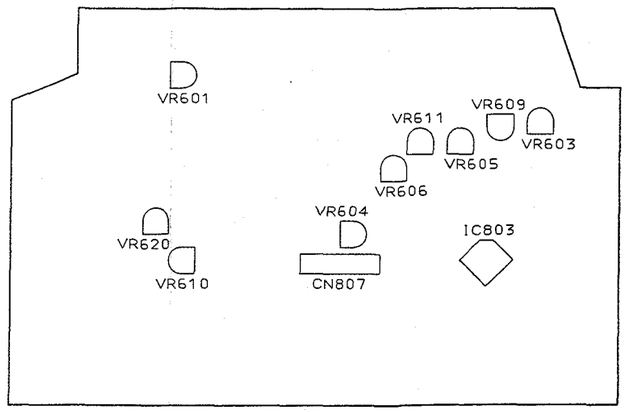
The S-IN position (without hitting the mechanism stopper) of the rack assembly during centering adjustment is indicated below.



✱ : As the adjustment range of both the TAN and centering adjustment screws is only ±90° from the center, do not turn the screws beyond this range.

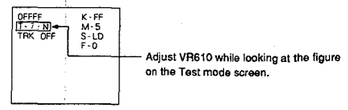
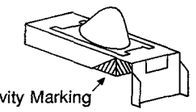
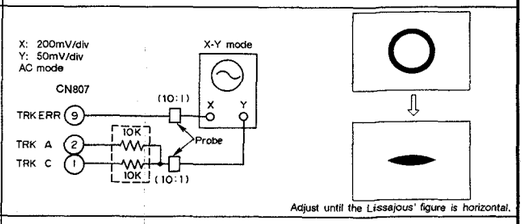
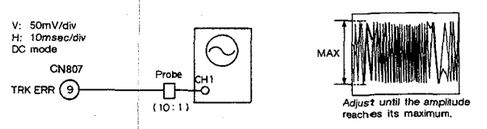
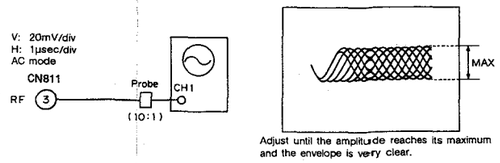


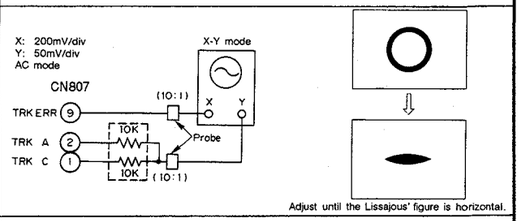
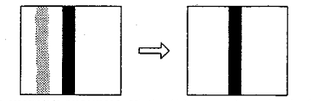
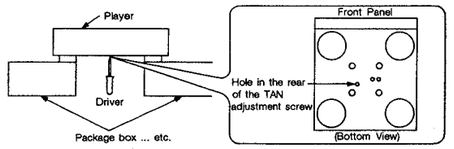
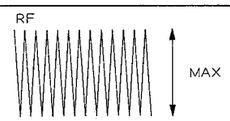
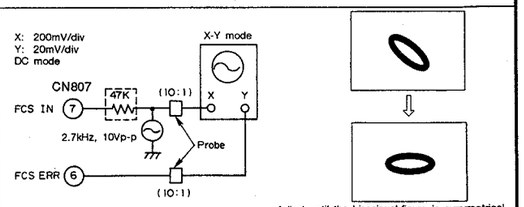
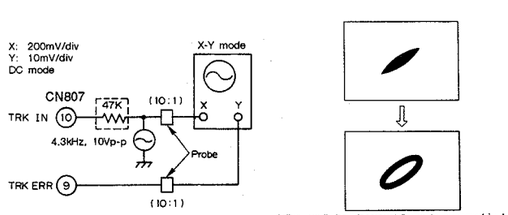
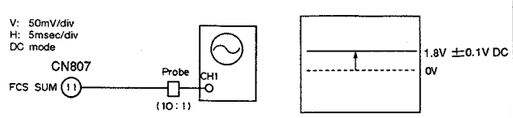
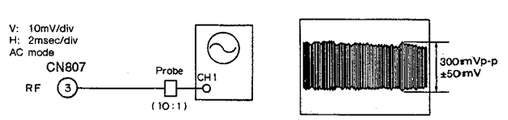
TILT base section



FTSB ASS'Y Adjustment diagram

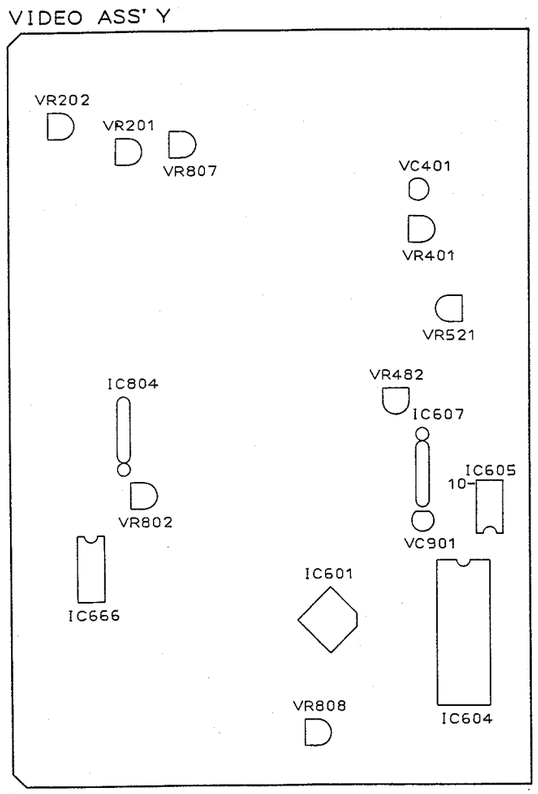
ADJUSTMENT TABLE

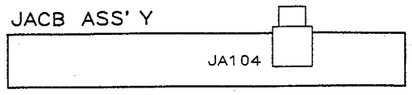
	Adjustment name	Adjustment point	Measuring equipment and jigs	Measurement point	Player condition	Adjustment procedure	Waveform and connection diagram
1	Tilt Offset Check and Adjustment	FTSB assembly VR610	TV monitor	Tilt indication on Test mode screen	· Power ON · Test mode · Disc not installed	1. Check if the tilt indication on the Test mode screen is at T-6 to T-8. 2. If the tilt indication is not at T-6 to T-8, adjust VR610 until the tilt indication reaches T-6 to T-8.	
2	Tilt servo Gain adjustment	FTSB assembly VR620	–	–	· Power ON · Test mode · Disc not installed	Check the dot marking on the tilt sensor and turn VR620 below. Red···turn fully clock wise Non ···middle position Blue···turn fully counter clock wise	
3	Coarse centering adjustment	Tilt base Centering adjustment screw	· Oscilloscope · STD-901 or STD-902 · MIX resistor 10K 10K	CN807 X : ⑨Pin (TRK ERR) Y : ①+②Pin (TRK SUM)	· Test mode TRK servo OFF Tilt servo ON · Innermost track of STD-901 or STD-902 Which dose not come in contact with the mechanical stopper.	1. Move the slider until it does not come in contact with the mechanical stopper at the slider position indication S-IN. 2. Observe TRK ERR (Xch) and TRK SUM (Ych) at the X-Y mode during TRK Servo OFF. 3. Turn the centering adjustment screw until the Lissajous' figure is horizontal.	
4	FCS balance adjustment (1) TRK ERR MAX	FTSB assembly VR605	· Oscilloscope · STD-901 or STD-902	CN807 ⑨Pin (TRK ERR)	· Test mode TRK servo OFF Tilt servo ON · Inner track of STD-901 or STD-902	1. Observe TRK ERR at CH1 of the oscilloscope during TRK Servo OFF. 2. Adjust VR605 until the amplitude of the waveform reaches its maximum.	
5	FCS balance adjustment (2) RF MAX	FTSB assembly VR611	· Oscilloscope · STD-901 or STD-902	CN811 ③Pin (RF)	· Test mode TRK Servo ON Tilt servo ON · Inner track of STD-901 or STD-902	1. TRK servo is ON and observe RF at CH1 of the oscilloscope. 2. Adjust VR611 until the amplitude of the waveform reaches its maximum and the envelope is very clear.	
6	Tangential direction angle adjustment	Tilt base TAN adjustment screw	· Oscilloscope · STD-901 or STD-902	CN811 ③Pin (RF)	· Test mode TRK Servo ON Tilt servo ON · Inner track of STD-901 or STD-902	1. Observe RF at CH1 of the oscilloscope during TRK Servo ON. 2. Adjust the TAN adjustment screw until the amplitude of the waveform reaches its maximum and the envelope is very clear.	

	Adjustment name	Adjustment point	Measuring equipment and jigs	Measurement point	Player condition	Adjustment procedure	Waveform and connection diagram
7	Fine centering adjustment	Tilt base Centering adjustment screw	· Oscilloscope · STD – 901 or STD – 902	CN807 X : ⑨Pin (TRK ERR) Y : ①+②Pin (TRK SUM)	· Test mode TRK servo OFF Tilt servo ON · Innermost track of STD – 901 or STD – 902 which does not come in contact with the mechanical stopper.	Perform fine centering adjustment by following the same procedure as in "Coarse centering adjustment" (2).	 Adjust until the Lissajous' figure is horizontal.
8	Crosstalk check and Tilt offset adjustment	FTSB assembly VR610	· TV monitor · GGV1003	Crosstalk check screen	· Test mode TRK servo ON Tilt servo ON · GGV1003 #115 STILL	1. Search for address 115 of GGV1003 and still the address. 2. Check the crosstalk. If the crosstalk is pronounced, adjust VR610 until the crosstalk is not noticeable.	 If the crosstalk is pronounced, adjust until the crosstalk is not noticeable.
	When the crosstalk is still noticeable in spite of the adjustment in (8), use a hexagonal wrench driver (straight type, size : 3 mm) to adjust the TAN adjustment screw on the bottom side of the player through the GGV1003 #115 STILL screen. Afterwards, perform the adjustment procedures from (7).						
9	FCS Balance adjustment (3) RF level MAX.	FTSB assembly VR606	· Oscilloscope · GGV1003	CN807 ③Pin (RF)	· Test mode TRK servo ON Tilt servo ON	1. Connect the CH1 of oscilloscope to CN807 – 3Pin and check the RF waveform during TRKG servo is ON. 2. Adjust VR606 so that the RF waveform become MAX.	
10	FCS servo loop gain adjustment	FTSB assembly VR604	· Oscilloscope · GGV1003 · AF Oscillator · Resistor (47kΩ)	CN807 X : ⑦Pin (FCS IN) Y : ⑥Pin (FCS ERR)	· Test mode TRK servo ON Tilt servo ON · GGV1003 #15,000STILL	1. Search for address 15,000 of GGV1003 and still the address. 2. Xch : Connect the resistor (47 kΩ) to the channel and connect to FCS IN. Ych : Connect to FCS ERR. 3. Connect the AF oscillator between Xch and the 47 kΩ resistor, and adjust VR604 until the Lissajous' figure is symmetrical.	 Adjust until the Lissajous' figure is symmetrical.
11	TRK servo loop gain adjustment	FTSB assembly VR603	· Oscilloscope · GGV1003 · AF Oscillator · Resistor (47kΩ)	CN807 X : ⑩Pin (TRK IN) Y : ⑨Pin (TRK ERR)	· Test mode Stop mode or TRK servo ON Tilt servo ON · GGV1003 #15,000STILL	1. Xch : Connect the 47 kΩ resistor to channel and connect to TRK IN. Ych : Connect to TRK ERR. 2. Connect the AF oscillator between Xch and the 47 kΩ resistor and note the tilt angle against the horizon with the disc in the stopped state. 3. Search for address 15,000 of GGV1003 and still the address. 4. Set the disc in PLAY mode (TRK servo closed, TILT on). Adjust VR603 so that the tilt angle of the waveform will be the same as the tilt angle noted in step 3.	 Adjust until the Lissajous' figure is symmetrical.
12	FCS SUM level check	FTSB assembly VR609	· Oscilloscope · GGV1003	CN807 ⑪Pin (FCS SUM)	· Test mode TRKGservo ON Tilt servo ON · GGV1003 #15,000STILL	Adjust VR609 so that the voltage of CN807 – ⑪Pin become 1.8 V ±0.1 V DC.	
13	RF level adjustment	FTSB assembly VR601	· Oscilloscope · GGV1003	CN807 ③Pin (RF)	· Test mode TRK servo ON Tilt servo ON · GGV1003 #15,000 STILL	1. Search for address 15,000 of GGV1003 and still the address. Observe RF at CH1 of the oscilloscope. 2. Adjust VR601 until the RF amplitude is 300 mV ±50 mV p – p.	

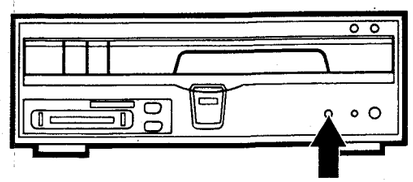
7.5 ADJUSTMENTS OF VIDEO ASSY

● VIDEO ASSEMBLY ADJUSTMENT DIAGRAM





● VIDEO ASSEMBLY ADJUSTMENT NOTES


DIGITAL MEMORY KEY

· To switch between the through mode and memory mode, press the DIGITAL MEMORY key on the CLD－A100.

· Before removing or installing the pack, be sure to turn OFF the power switch.

· Using the LD video and game video together

When the LD video and game video are used together, the LD video will have field playback, with non－interlace. As a result, the vertical resolution will be half of the usual resolution. However, picture flicker will be eliminated. Even when a V shell display is executed while a normal disc (other than LD－ROM games) is played, only one field will playback due to non－interlacing.
For memory through, turning the V shell ON/OFF might result in irregular tints even if the adjustment is correct.
During an LD－ROM game, playback can be switched between field 1 and 2 by game software.

· Key and remote control operations during a game

During a ROM-card based game, only the main unit's OPEN/CLOSE key will be operational. A disc can thereby be removed or loaded.

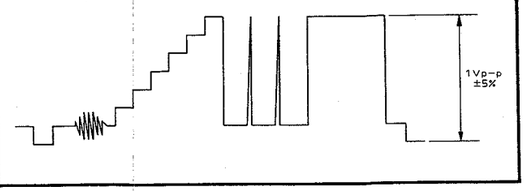
· Remote controller power ON/OFF

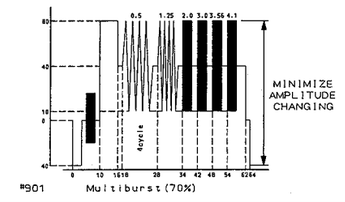
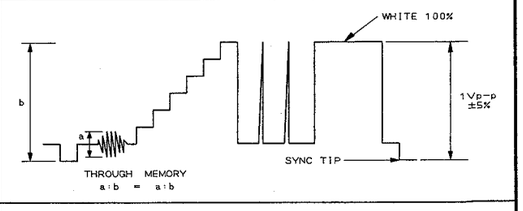
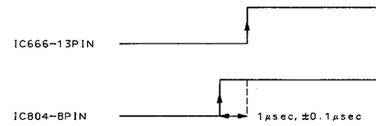
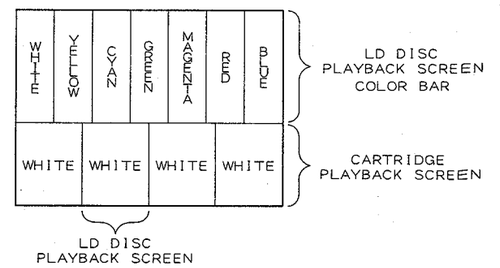
The power can be turned ON/OFF with the remote controller only when a pack has not been installed.
If a pack has been installed, the remote controller cannot be used to turn OFF/ON the power. This is to protect the pack. Since the remote controller cannot be used for power ON/OFF during V shell operation, the last memory function will also be cleared.

· Power OFF with the main unit's POWER key

When the power is turned OFF with the POWER key on the main unit, the power will turn OFF immediately. IN concert with the POWER key, the pack's release mechanism will be canceled. The pack can thereby be installed or removed immediately. If, for example, the power is turned OFF while the tray is open, the power will turn OFF with the tray still open.

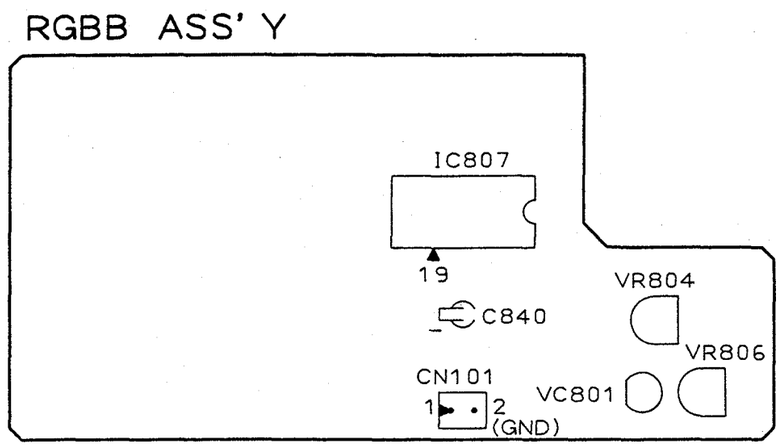
ADJUSTMENT TABLE OF VIDEO ASSY

	Adjustment name	Adjustment point	Measuring equipment and jigs	Measurement point	Player condition	Adjustment procedure	Waveform and connection diagram
1	Master clock adjustment	VR808 VC901	· Frequency counter · Oscilloscope	IC605—10P IC607—8p	· STOP (POWER ON)	Connect a frequency counter to IC605—10P, with the player's power ON (STOP), adjust VR808 so that the frequency becomes 18.12587 MHz. Connect an oscilloscope to IC607—8P, adjust VC901 so that the DC voltage becomes 0.2±0.3V.	
2	Output video level adjustment (1)	VR482	· Oscilloscope · TV monitor	VIDEO output terminal (75Ω terminated)	· Through mode · #19,900Still	Connect an oscilloscope to the video output, during still playback of #19,900 of GGV1003 observe the VIDEO signal waveform in the through mode. Adjust VR482 so that the white 100% level from the sync tip becomes 1Vp-p ± 5%.	

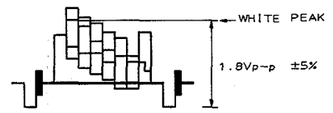
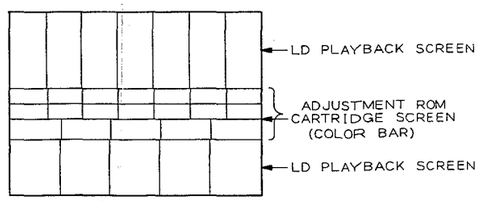
	Adjustment name	Adjustment point	Measuring equipment and jigs	Measurement point	Player condition	Adjustment procedure	Waveform and connection diagram
3	VPS error adjustment	VR521	· TV monitor	Video output terminal (75Ω terminated)	· Through mode · #8,000Still	During still playback (magenta screen) of GGV1003 #8,000 in through mode, adjust VR521 to minimize the color irregularity on the screen.	
4	140nSEC, shift adjustment	VR401 VC401	· Oscilloscope · TV monitor	Video output terminal (75Ω terminated)	· Memory mode · #901Still · #8,000Still	1. Connect an oscilloscope to the video output terminal, during still playback of GGV1003 #19,900 in memory mode, adjust VR401 to minimize the amplitude changing. 2. Connect a TV monitor to the video output terminal, during still playback of GGV1003 #8,000, adjust VC401 to minimize the flicker (especially on the top of display).	
5	Output video level adjustment (2)	VR201 VR202	· Oscilloscope · Test disc (GGV1003)	Video output terminal (75Ω terminated)	· #19,900Still · Memory mode	1. Connect an oscilloscope to the video output terminal, during still playback of GGV1003 #19,900 in the memory mode, adjust VR202 so that the white 100% level from the sync tip becomes 1Vp-p ± 5% 2. During playback, alternately switching memory/through modes, adjust VR 201 so that the ratio of chroma signal level with the white 100% level from the sync tip of the memory mode and of the through mode are the same.	
6	VCXO error adjustment	VR802	· Oscilloscope · PAC—N10	IC666-13 IC804-8	· Power swtch ON · STOP	1. Turn the power switch OFF. 2. Connect IC666-13P to the oscilloscope's CH-1 and IC804-8P to CH-2, then install PAC-N10 to the main unit. 3. Turn the power switch ON, observe waveforms of CH-1 and CH-2, adjust VR802 so that each waveform's time lag becomes 1.0±0.1µsec.	
7	Luminance key adjustment (Y-COMP)	VR807	· TV monitor · PAC—N10 · CPD—N1 · Adjustment ROM cartridge (GGF1244) · LD Test disc (GGV1003)		· Power swtch ON · Without luminance mode · Color bar (#5401) Still	1. Turn the power switch OFF. 2. Set PAC—N10, the adjustment ROM cartridge and CPD-N1 to the main unit,, then turn the power ON. 3. Press Ⅱ key of the CPD—N1, open the disc tray. 4. Set the GGV1003 to the tray, then press the Ⅰ key of CPD-N1, starts playback. 5. Press the cross key (right) of CPD—N1 to scanning disc, then press the cross key (up) to still playback at the color bar (#5401). 6. Press SELECT key of CPD—N1 once, then press RUN key(without luminance mode). Adjust VR807 so that the playback screen's bottom side is white like the figure. Note : Frame No. does not appear on the display when the adjustment ROM cartridge is installed.	

7.6 ADJUSTMENTS OF RGBB ASSY

● RGBB ASSEMBLY ADJUSTMENT DIAGRAM



ADJUSTMENT TABLE OF RGBB ASSY

	Adjustment name	Adjustment point	Measuring equipment and jigs	Measurement point	Player condition	Adjustment procedure	Waveform and connection diagram
1	*RGBencoder output level* adjustment	VR806	· Oscilloscope · PAC—N10 · Adjustment ROM cartridge (GGF1244)	IC807-19		1. Turn the power switch OFF. 2. Connect an oscilloscope to IC807—19 pin. 3. Set PAC—N10 and the adjustment ROM cartridge, turn the power switch ON. 4. Observe the initial screen of the adjustment ROM cartridge by the oscilloscope, adjust VR806 so that the level between the sync tip and the white peak becomes 1.8Vp-p ±5%	 Waveform of the adjustment ROM cartridge initial screen
2	3.58MHz free run frequency adjustment	VC801	· Frequency counter	CN101-1	· Power swtch ON · Connect — side of CN840 to GND.	Note) Remove PAC-N10 before adjustment. Connect a frequency counter to CN101-1 pin, adjust VC801 so that the frequency becomes 3.579545MHz ± 10Hz. (Connect the probe's GND of the frequency counter to CN101-2 pin)	
3	APC adjustment	VR804	· TV monitor · GGV1003 · PAC—N10 · CPD—N1 · Adjustment ROM cartridge (GGF1244)	TV monitor screen	· LD screen and background overlay mode · GGV1003 Color bar(#5,401) still	1. Turn the power switch OFF. 2. Set PAC—N10, the adjustment ROM cartridge and CPD—N1 to the main unit, turn the power switch ON. 3. Press(Ⅱ) key of the CPD—N1, open the disc tray. 4. Set the GGV1003 to the tray, then press the (Ⅰ) key of CPD-N1, starts playback. 5. Press the cross key (right) of CPD—N1 to scanning disc, then press the cross key (up) to still playback at the color bar (#5,401). 6. Adjust VR804 so that color phases of each color bar of LD disc and of cartridge are the same. Note: Frame No. does not appear on the display when the adjustment ROM cartridge is installed.	

8. SYSTEM CONTROL DESCRIPTION

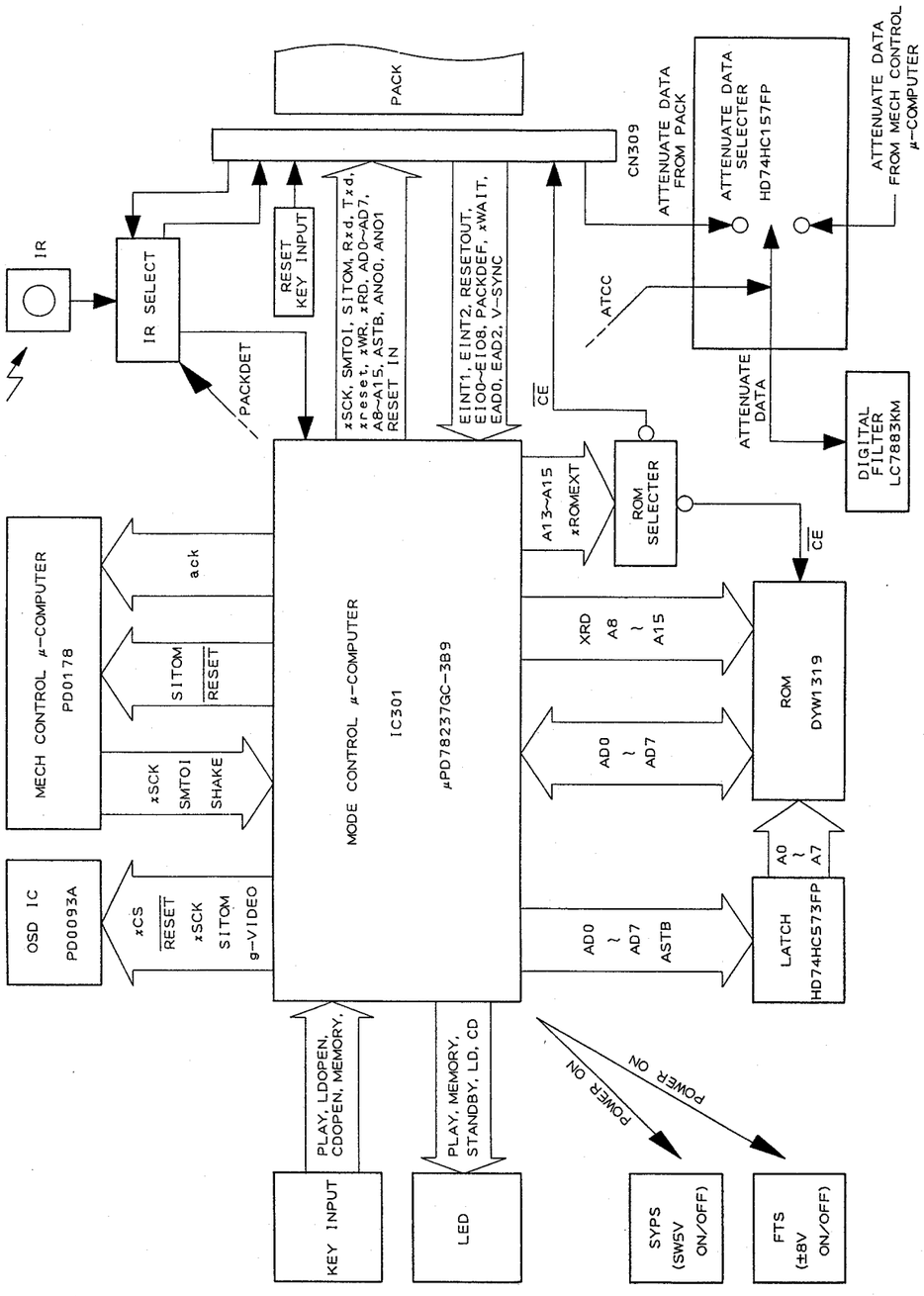


Fig. 8—1 Brock diagram of control section

8.1 MICROCOMPUTER INTERFACE

The microcomputer system of this model consists of two chips, an 8-bit microcomputer (IC201 : PD0178) which controls the mechanism and a 4-bit microcomputer (IC301 : μPD78237GC-3B9) which controls the operations and displays.
These two microcomputers are connected via a serial interface. The communication lines are also used for controlling the character generator IC (IC807 : PD0093A).

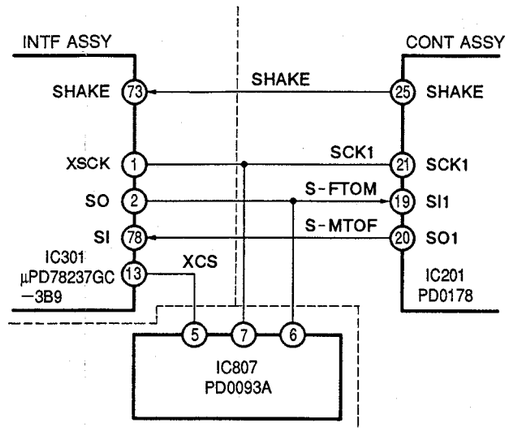


Fig. 8—2 Serial interface connection

8.2 MICROCOMPUTER COMMUNICATION SEQUENCE

1. The PD0178 sets the SHAKE terminal (pin25) to "L" for several microseconds as a request to the μPD78237GC-3B9 for the start of a communication.
2. When the μPD78237GC-3B9 receives the communication start request, it sets the SHAKE terminal (pin73) to "L" and informs the PD0178 that it is ready for communication.
3. The PD0178 then sets SCK1 (pin21), which has been used as an input port, to output mode, The μPD78237GC-3B9 sets XSCK (pin1) to the input mode, connecting the communication lines between the microcomputers.
4. The PD0178 sends the transfer clock (500KHz) in 8bits. The data are then sent and received in synchronization with this clock.
5. When μPD78237GC-3B9 receives data of 8 bits, it sets the SHAKE terminal (pin73) to "H" and reports that a single communication is completed.
6. The PD0178 sets SCK1 (pin21) to input mode, and the μPD 78237GC-3B9 sets XSCK (pin1) to output mode. The communication line is thereby disconnected and a single communication is completed.

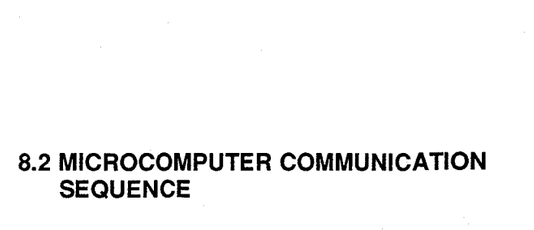


Fig. 8—3 Timing chart of the microcomputer interface

- The communication takes place within a cycle between 10 and 30ms. Twelve bytes of data are transmitted at one time.
- The handshake is done on a single line. Both the PD0178 and the μPD78237GC-3B9 use a single port for both input and output. The port is set to output mode when the output is "L". In other conditions, it will be set to input mode (high impedance). Before "L" is output, both ports mutually confirm that the SHAKE terminal is "H". This is to prevent signal interference between tray output signals.
- The communication data is appended with a check code to prevent transfer errors. If sixteen consecutive transfer errors are detected, the μPD78237GC-3B9 will send the reset signal to the PD0178 to reset it to its initial state. This will also happen when the communication is not executed for 300ms or longer.

8.3 OUTLINE OF THE MECHANISM CONTROL SYSTEM

1) Processing immediately after power ON

When power is applied, the mechanism－control microcomputer (IC201 : PD0178) will execute initialization in the following sequence upon reset cancellation (pin28 : L to H).

1. The internal RAM and ports are initialized.
2. The CXD2500BQ is initialized.
3. The tray position is detected.
4. The FTS－IC PM3003 is initialized.
5. The TBC－IC PDB011 is initialized.
6. Communication with the μPD78237GC－3B9 is confirmed. (If any trouble is found, the subsequent initialization procedures will not be performed.)
7. The pickup position is initialized.
8. Disc rotation stops.
9. Loading mode is initialized.

After all the initialization procedures are completed, normal operations can begin.

2) Control of the loading motor

Driving of the loading motor is controlled by a PWM signal supplied from pin18 of the mechanism－control CPU (IC201) in the CONT Assembly. The voltage applied to the loading motor is switched according to the duty of the PWM signal as follows. The PWM cycle is approximately 910μsec.

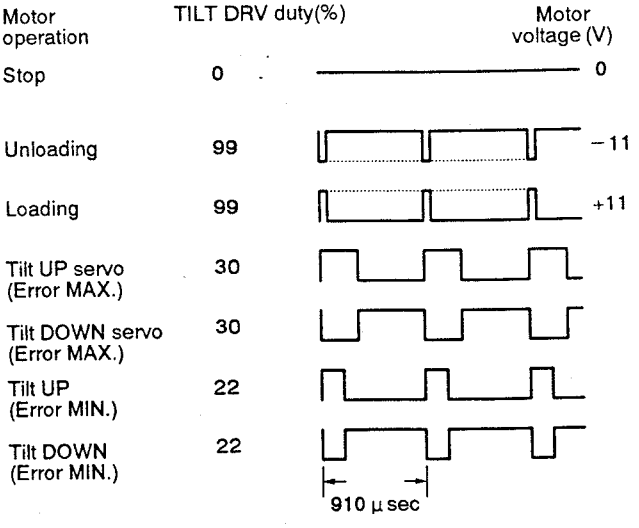


Fig. 8－4

● Loading/clamp operation

For the disc tray open/close and disc clamp and stop operations, the motor is operated while the position of the cam gear is detected by the loading/tilt－position detection switch connected to pins33 through 35 of the PD0178.

● Tilt servo operation

When an LD disc or a CDV disc (video portion) is played back and when a CDV disc is started up, the loading motor is used for the tilt servo. The loading motor is driven by a PWM drive in this mode as well.

The tilt servo operates the loading motor so that the input voltage at pin9 (TILT ERR) of the PD0178 becomes 2.5 V.
The tilt servo operates in the following ranges during normal playback.

CAV disc	(12-inch)	: Frames 0－40999
	(8-inch)	: Frames 0－16999
CLV disc	(12-inch)	: 0 min. －44 min. 59 sec.
	(8-inch)	: 0 min. －13 min. 59 sec.
CDV disc	(video portion)	: 0 min. 0 sec.－
	(Recording time － 1 min. 23 sec.)	
CD disc	: The tilt servo is ON only at start-up.	

If some trouble occurs with the disc or tilt sensor circuit which prevents the input voltage at the TILT terminal from being within the specified range even if the pickup inclines to more than ±2° (degrees), the loading motor will be stopped upon detection of the state of the mechanism switch.

The tilt servo switchs the duty of the PWM signal in 2 levels according to the error value. When the error value is small (1.25V－3.75V), a PWM signal for small duty 22% is output, and when the error value is large (0V－1.25V, 3.75－5V), a PWM signal for large duty 30% is output. (See Fig. 8－4)

● Auto Tracking Balance Operation

AUTO TRKG BAL Control (ATB)

ATB can start only after the disc makes one rotation. Sampling is done for 300msec (150 rotations) and the corresponding PWM is set. The PWM set in the end is calculated from the total of 8 rotations from 142nd to 149th rotation. In the test mode during tracking open, the count starts (from 140) after the tracking closes when the current rotation is deemed to be the 140th. The PWM is calculated from the total of 8 rotations from the 142nd to the 149th one. During TRK open, the tracking error signal which is output from CXA1081S (IC801, pin 20) is detected respectively by the upper and lower sides and added. The tracking balance error signal is thereby obtained. After undergoing equalizing and level conversion, the error signal is input to IC101 pin8 as TBAL ERR. Based on this error, the duty pulse is output form IC101 pin12 and smoothed. Then it is supplied to IC801 pin11 input TRK C so that the tracking balance becomes 0V center. Each time a disc starts up, the tracking balance is obtained during the tracking open period.
The corresponding voltage is held thereafter. The auto tracking balance is set to operate constantly during the test mode tracking open.

3) Slider motor control

The mechanism control IC controls the drive signal output from pin20 of the FTS servo IC by the serial command.

The voltage applied to the slider motor is switched according to the duty of the PWM signal as follows. The PWM cycle is 36mS.

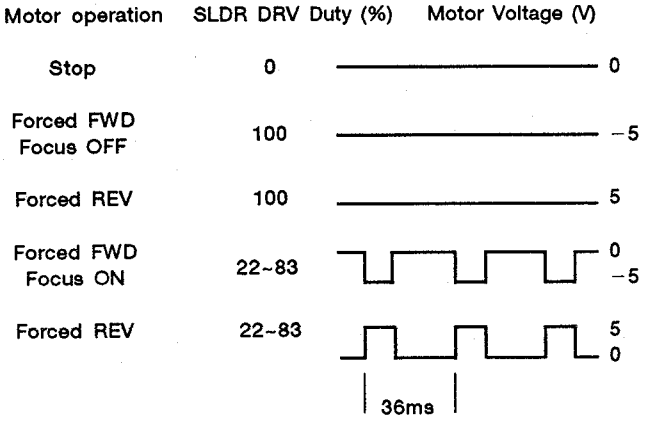


Fig. 8—5

4) Audio control

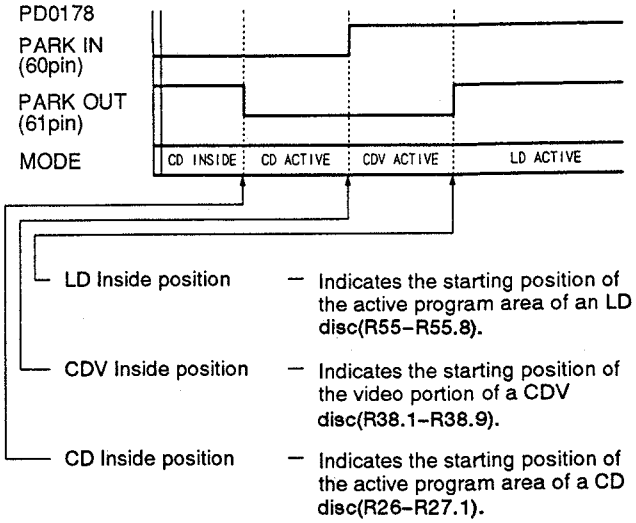
Digital audio channel switching is performed by the CXD2500BQ by using a command from the microcomputer.

DIGITAL 45	SQ1 14	SQ2 13	L-ch Line Out	R-ch Line Out
L	L	L	Analog L ch	Analog R ch
	H	L	Analog L ch	Analog L ch
	L	H	Analog R ch	Analog R ch
	H	H	Mute	Mute
H	L	L	Digital L ch	Digital R ch
			Digital L ch	Digital L ch
			Digital R ch	Digital R ch
			Digital – 12dB-L	Digital – 12dB-L

Table. 8—1

• SLDR POSITION

* The following positions can be detected by using two switches in combination.



R:The distance from the center of the spindle motor.

Fig. 8—6

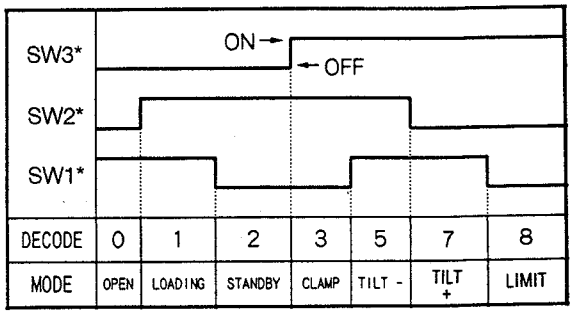


Fig. 8—7 LOADING/TILT POSITION

5) CLV Clear Scan

Clear scan without picture distortion is possible also for CLV discs by using the shuttle ring (either on the player or the remote control unit).

The conventional color-lock scan and the clear scan can be switched depending on the angle of the shuttle ring rotation. In a clear-scan operation, scanning is performed while outputting digital audio at −12 dB (the same as scanning on CD). (No audio is output when analog audio is selected.)

The principle of the operation is as follows.

1. **When clear scan mode is activated, the specified number of tracks is skipped in a multi-track jump operation.**
2. Measures the time lag (phase difference) between PB − V and REF − V and when the measured value is within a certain range, decreases REF − H by 7 H until the phase difference between PB − V and REF − V is lost (VLOCK), then cancels squelch, displaying the video portion of the disc for a certain period. Returns to step 1 and repeats steps 1 and 2.

When the time lag between PB − V and REF − V exceeds a certain range, performs a 1-track jump (2-track jump in the REV direction) and measures the lag again. When the measured value is within a certain range, decreases REF − H by 7 H waiting for VLOCK between PB − V and REF − V. Otherwise, repeats a 1-track jump and time-lag measurement.

If the time lag does not enter a certain range even after repeating the 1-track jump and time-lag measurement operation three times, a multi-track jump is performed for a larger skip and is repeated step 2 from the beginning.
If the lag persists in not entering a certain range, VLOCK wait state is activated.

* Gray-background video is output when no disc video is supplied.
* Digital audio to be played during clear scan is output while the disc video is being supplied and in VLOCK wait state.
* For CAV discs, nearly the same operation is performed.
* PB − V (playback V) means V − sync of the playback video signal.
* REF − V (reference V) means V − sync used as the reference.
* VLOCK means the signal generated when the PB − V and REF − V are in a certain range.

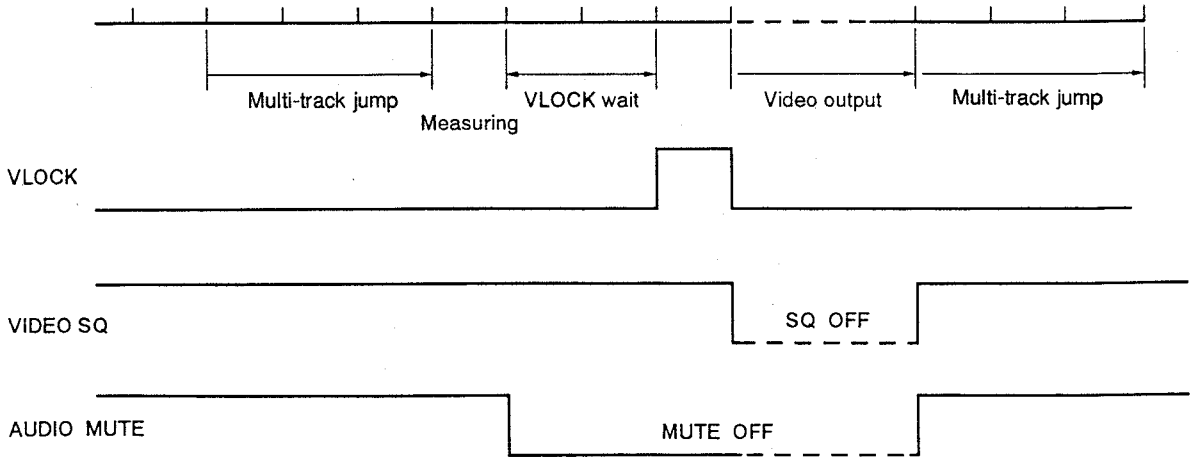
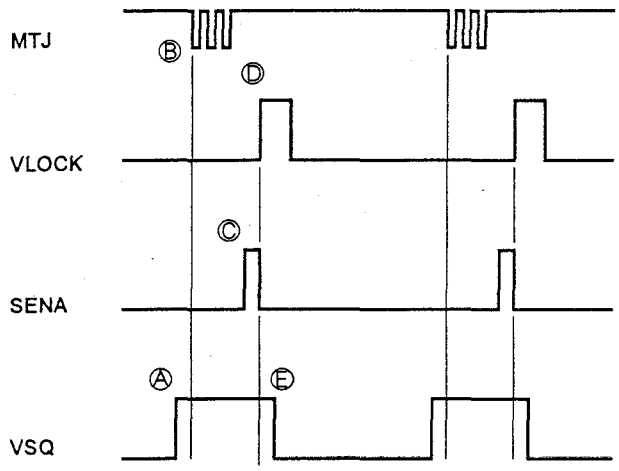


Fig. 8—8

● Timing Chart of the Clear Scan

CAV

32 × 2 × 3 jump



The audio mute signal is applied at the same time with VSQ but is *canceled before VSQ is canceled.*

- Ⓐ :Activates video squelch.
- Ⓑ :Executes a multitrack jump 32 × 2 × 3.
- Ⓒ :Decreases Reference H to match the playback V-sync phase and the reference V-sync phase. Shift enable (SENA)ON.
- Ⓓ :As the phases have matched (VLOCK).
- Ⓔ :Cancels video squelch and plays the disc for a certain time.

CLV

Compared with CAV, a longer time is required to match the phases after a jump operation. Ⓒ

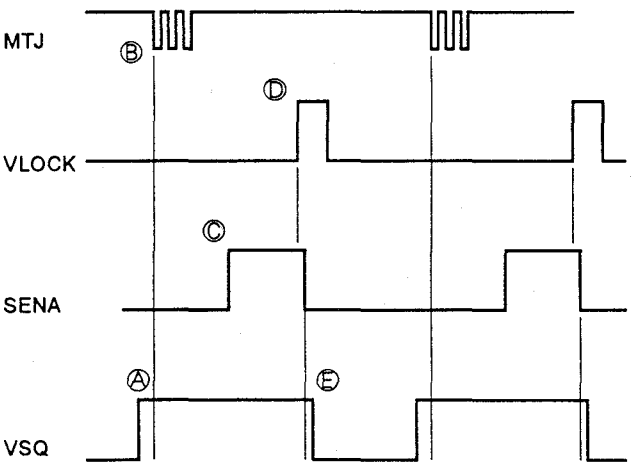
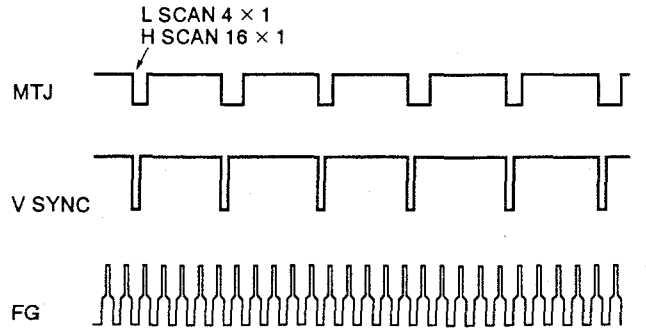


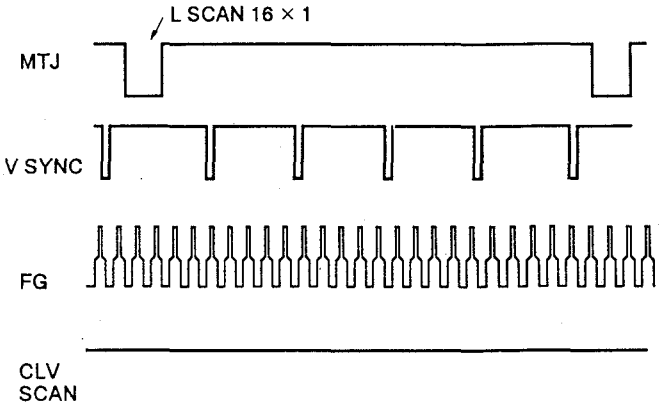
Fig. 8—9

● Timing Chart of the Normal Scan

CAV Performs a multitrack jump in synchronization with the playback V SYNC.



CLV Performs a multitrack jump in synchronization with FG.



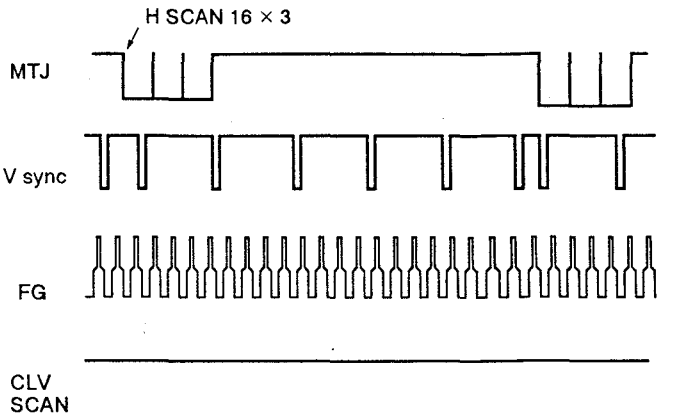
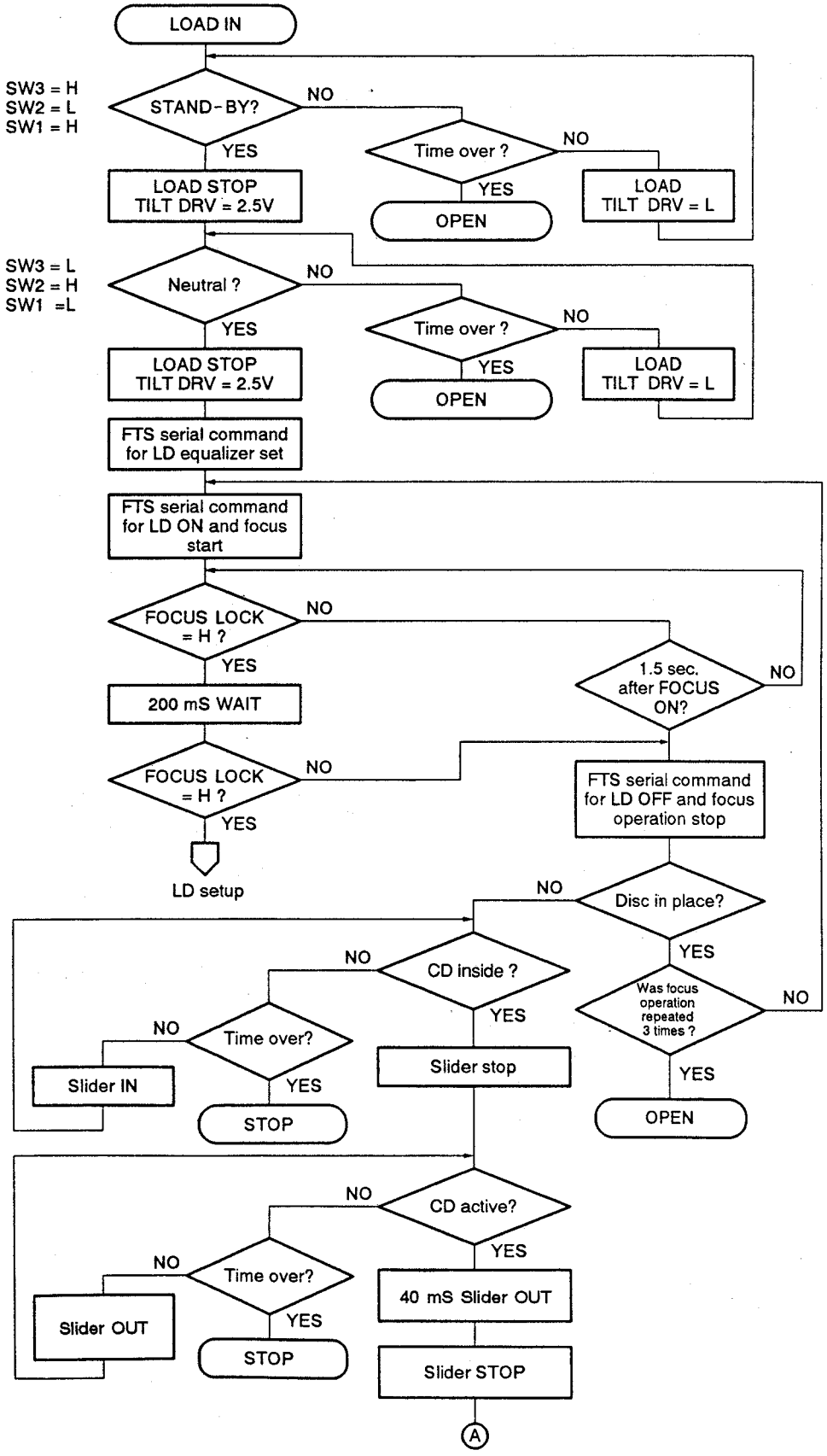


Fig. 8—10

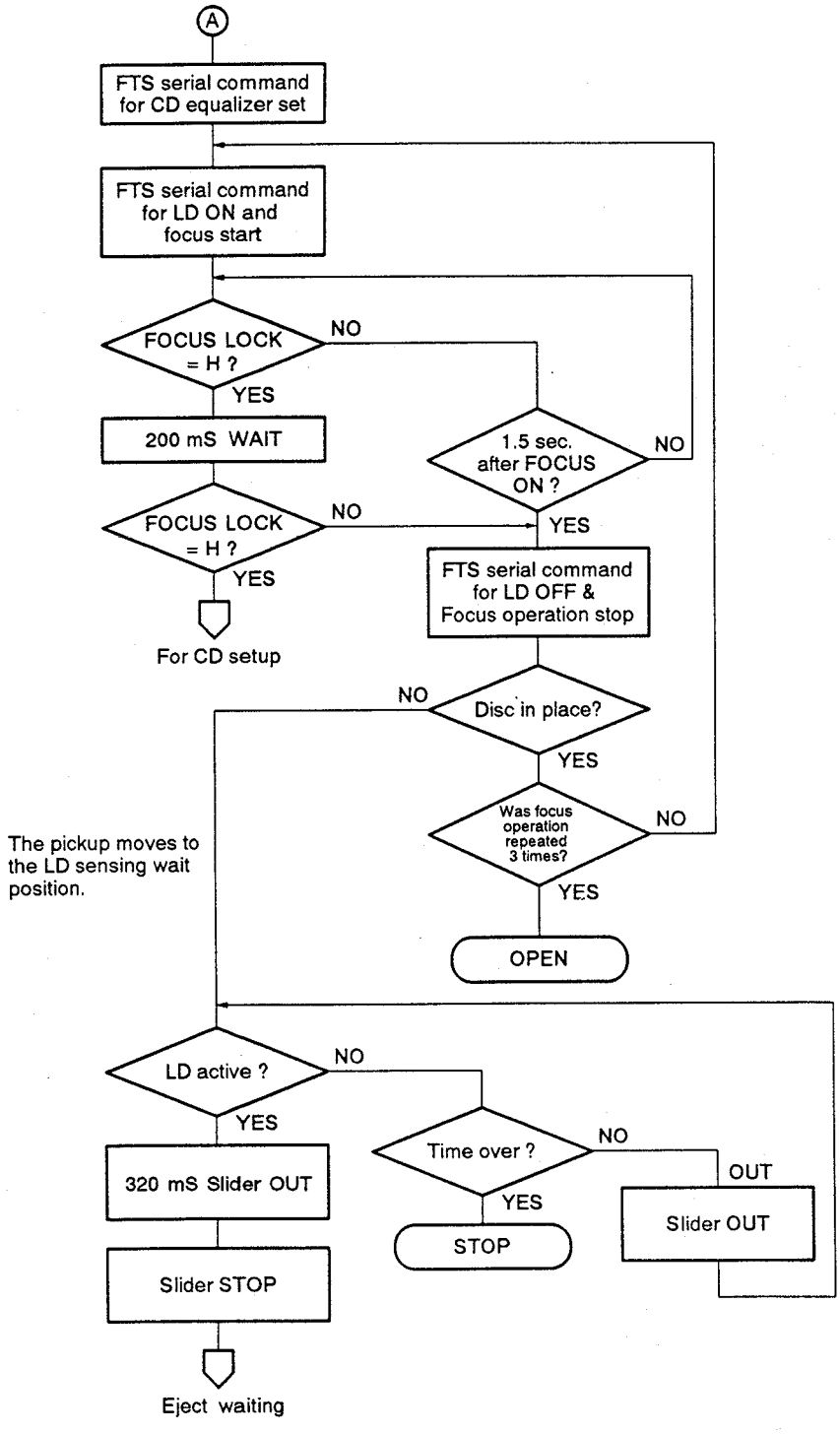
8.4 FLOW CHARTS OF VARIOUS OPERATIONS

Flow from the tray-opening to tray-IN operations



- From the state that the tray is open to the completion of the tray-IN operation.
- If the loading operation does not enter the stand-by position with in five seconds, it is judged as an abnormal condition, and the tray opens.
- Clamp operation
  Timer = 10 seconds
- Pickup position in LD focusing ≒ around R65
  R:Distance from the center of the spindle motor.
- Judged as "Disc in place" when FOCUS LOCK becomes "L" during focus sweeping.
- If the focus is not locked even if focus sweeping is repeated three times with the disc in place, the tray opens, judging it to be an abnormal condition.
- Slider operation limit timer ≒ approx. 10 seconds.
- If the slider operation is not completed within a certain time, the operation stops and any key other than OPEN is not accepted.

Fig. 8—11



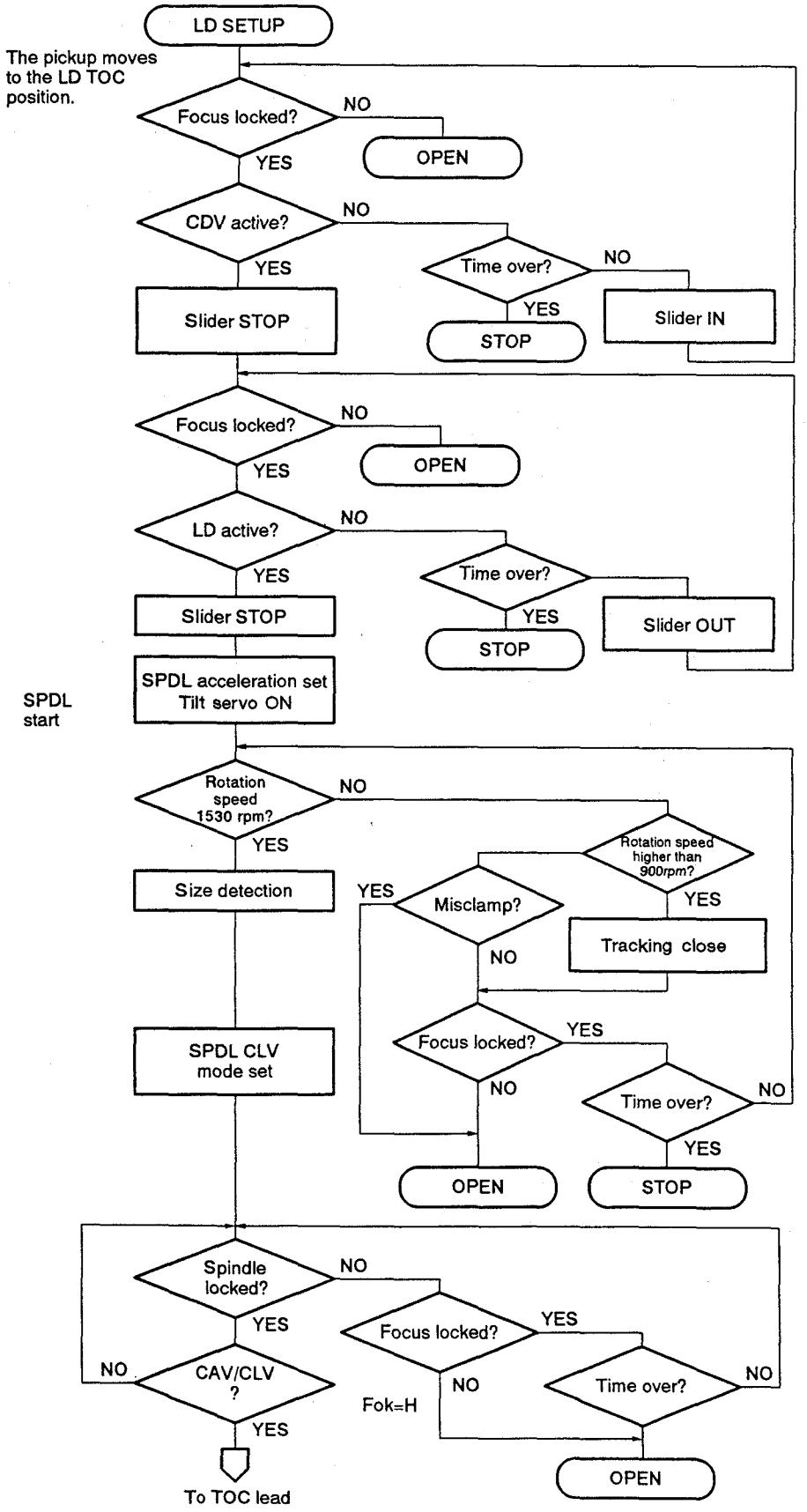
- Pickup position for CD focusing ≒ R30
- CD focusing is the same as LD focusing.
  R:Distance from the center of the spindle motor.

- R65, the LD sensing position
  R:Distance from the center of the spindle motor.

- Timer for 10 seconds
  Timer indicates the time over.

Fig. 8—12

Flow of the LD Setup Operation



- If focus is lost while the pickup is moving to the spindle startup position, the tray opens, judging it to be CD and LD disc-stacking error.
- Timer for approx. 10 seconds
  Timer indicates the time over.
- Timer for approx. 10 seconds.
- Tracking servo open mode is active until disc rotation exceeds 900 rpm.
- The disc rotation is forcibly accelerated until it reaches 1530 rpm, and the disc size is determined by the time required to reach 1200rpm.
- If 800 or more tracks are crossed in a single rotation of the disc, the tray opens, regarding it to be a misclamp.
- If focus is lost during the startup operation, the tray opens, assuming a damaged disc or the flip side of a single-sided disc.
- If the spindle is not locked within 60 seconds after beginning SPDL acceleration, the operation stops.

Fig. 8—13

● Player Operation Modes

MODE 1 — OPEN

Step	Operation
0	Clears internal registers, sets the spindle to STOP and waits for focus OFF.
1	Double side: Side B — Starts tilt up; Side A; During α-turn — Starts tilt down. Single side.
2	Wait for tilt up. Starts to move the slider B to the out side.
3	Waits for the spindle to stop.
4	Waits for the slider B to move the out side.
5	Starts clamp switching (B to A).
6	Waits for clamp switching (B to A).
7	Starts tilt down.
8	Wait for tilt down
9	Starts to move the slider to the LD sensing position.
A	Waits for the spindle to stop.
B	Waits for the slider to reach the LD sensing position.
C	Starts unloading.
D	Performs unloading until the OUT SW activates.
E	Sets the 100 ms timer.
F	Waits for 100 ms.
10	Sets the OPEN mode.
	Completed

MODE 2 — STANDBY

Step	Operation
0	Clears internal registers, sets the spindle to STOP and waits for focus OFF.
1	Double side: Side B — Starts tilt up; Side A; During α-turn — Starts tilt down. Single side.
2	Wait for tilt up. Starts to move the slider B to the out side.
3	Waits for the spindle to stop.
4	Waits for the slider B to move the out side.
5	Starts clamp switching (B to A).
6	Waits for clamp switching (B to A).
7	Starts tilt down.
8	Wait for tilt down
9	Starts to move the slider to the LD sensing position.
A	Waits for the spindle to stop.
B	Waits for the slider to reach the LD sensing position.
C	Starts to move the tilt to the neutral position.
D	Waits for the tilt to reach the neutral positon.
	Completed

MODE 3 — STOP

Step	Operation
0	Clears internal registers, sets the spindle to STOP and waits for focus OFF.
1	Double side: Side B — Starts tilt up; Side A; During α-turn — Starts tilt down. Single side.
2	Wait for tilt up. Starts to move the slider B to the out side.
3	Waits for the spindle to stop.
4	Waits for the slider B to move the out side.
5	Starts clamp switching (B to A).
6	Waits for clamp switching (B to A).
7	Starts tilt down.
8	Wait for tilt down
9	Starts to move the slider to the LD sensing position.
A	Waits for the spindle to stop.
B	Waits for the slider to reach the LD sensing position.
C	Starts to move the tilt to the neutral position.
D	↓
E	Waits fot the tilt to reach the neutral position.
	Completed

MODE 4 — DISC SENSING

Step	Operation
0	Waits fot the tilt to be neutral. Single side / Double side (Side A / Side B) Normal / CD direct mode LD sensing / CD sensing / LD side B sensing
1	Starts to move the slider to the LD sensing position. Clears the focus-try counter.
2	Waits until the slider reaches the LD sensing position.
3	Tries focusing. Focus unlocked / Focus locked. LD presence assured. Completed.
4	Focus OFF
5	Starts to move the slider to the CD sensing position.
6	Watis until the slider reaches the CD sensing position.
7	Tries focusing. Focus unlocked. / Focus locked. CD presence assured. Completed.
8	Focus OFF
9	Starts to move the slider to the LD sensing position. Clears the focus-try counter.
A	Starts to move the slider to the LD sensing position.
B	Checks for CD direct mode. CD direct mode / Normal
C	Tries focusing. Focus unlocked / Focus locked LD presence assured. Completed.
D	Focus OFF
E	No disc assured. Completed.
F	Starts to move the slider to the B inside position.
10	Waits until the slider reaches to the B inside position.
11	Tries focusing. Focus unlocked / Focus locked
12	Focus OFF / B side presence assured. Completed.
13	No B side assured.
	Completed.

MODE 5 — SETUP

Step	Operation
0	Waits for the tilt to be neutral. Sets the slider target position. CD: Starts to move the slider to the CD TOC position. LD Side A: Starts to move the slider to the LD TOC position. LD Side B: Starts to move the slider to the LD B inside position.
1	Check focus. Simultaneously checks for disc stacking (LD + CD) Focus locked (OK): Waits until the slider reaches the target position. Focus unlocked (NG): LD: Ends with the focus error status. / CD: Ends with the focus error after three unsuccessful tries.
2	Sets the spindle. CD set / CDV set / LD set Sets the 60-second timer. Starts to run the spindle.
3	Checks focus. Focus locked (OK): Waits until the spindle locks while checking for misclamping. / Time over. Ends with the spindle error status. Focus unlocked (NG): Ends with the clamping error status. Sets the 60-second timer.
4	LD / CD, CDV Distinguishes CAV/CLV Not distinguished / Distinguished
5	Checks focus. Focus locked (OK): Waits the codes to be read. / Time over. / Slowly moves the slider to the inner or outer periphery until the PGM area code is read. After reading the code, sets the 60-second timer and returns to step 4. / Ends with the code error. Focus unlocked (NG): Ends with the focus error.
6	Completed.

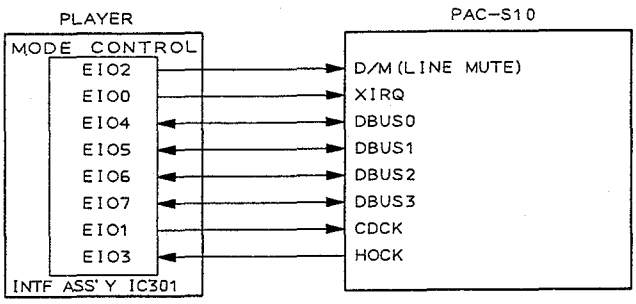
MODE 6 — TOC READ

Step	Operation
0	Diverges depending on the disc type. LD: Clears 1st address. Sets the 15-second timer. CD, CDV
1	Moves to the lead-in area and checks the focus time. A 24-bit code read. → Not read Lead-in area → PGM area, lead-out area. ↓ → 32-track REV jump → Playback
2	Moves to the PGM area and checks the focus time. A 24-bit code read. → Not read PGM area → Lead-in area ↓ → 16-track FWD jump → Playback
3	Moves to the lead-in area and checks the focus time. A 24-bit code read. → Not read Lead-in area → PGM area ↓ → 4-track REV jump → Playback
4	Plays to the PGM area and checks the focus time. A 24-bit code read. → Not read PGM area → Lead-in Stes the 0.5-second timer. ↓ → Playback
5	Stores the 1st address (CH, time) in memory and checks the focus time. After 0.5 seconds, checks for the CH and the seconds. Sets the 0.5-second timer ↓
6	Checks fot TOC (subcodes) and checks the focus time. TOC available ↓ → Ends with no TOC if no subcode can be read in 0.5 seconds.
7	Sets the 15-second timer.
8	Waits until TOC is read. → Time over. → TOC reading completed. PGM area → Lead-in area. Subcode NG. → Ends. ↓ → Playback
9	Subcode OK and focus check NG. 32-track REV jump ↓ → Playback
A	Subcode OK and focus check NG. 32-track REV jump ↓ → Playback
B	Subcode OK and focus check NG. 32-track REV jump ↓ → Playback
C	Subcode OK and focus check NG. 32-track REV jump ↓ → Playback
D	Returns to step 8.
E	CD-R backup: Starts to move the PGM area. CD-R identified.
F	CD-R backup: Move to the PGM area. Confirmed.
10	CD-R backup: Ends with the code error. / Time over. Ends with no TOC.
11	Moves to the user code reading area.
12	Checks user code.

MODE 8 — SEARCH

Step	Operation
0	Focus ON: Sets the 15-second timer. / Focus OFF: Ends with the recovery error. Diverges dipending on disc, search target or playing game. CDV: A→V, V→A, A→A, V→V → CD, CDV: CAV frame search, CLV time search (During game) CD, CAV, CLV → CAV chapter search, CLV chapter search, CLV time search (Not during game)
1	Clears the focus-try counter and starts to the spindle STOP operation. Starts to move the slider. To A→V CDV TOCposition. / To V→A CD TOC position
2	Waits until the slider reaches the specified position. Waits for spindle STOP. →Ends with the disc stack (clamp) error if the spindle does not stop in 1.6 seconds. Focus locked (Sets the 15-seconds timer.) / Tries focusing. Sets the spindle for CD audio. / Sets the spindle for CDV video. / Ends with the recovery error after four unsuccessful tries.
3	Waits until the spindle locks. Waits until the subcode is read. ↓
4	If the disc is CDV, go to step 9.. Sets the 20-times track counter. Less than 256 track or CLV→step 6. Others→step 7. / More than 256 track →step 5.
5	Performs track counter searching. Less than 256 track→step 6. / CLV→step 7.
6	Performs multi-track jump searching. When not playing game →step 9 / Less than 32 track of CAV, performs 1-track jump searching.
	After search is completed, sets the 5-seconds timer. CD →step E, Other →step C
7	Drives the slider to cross the target address. (CAV: High speed, Other: Mid speed)
8	Drives the slider to cross the target address.(Low speed)
9	Performs 32-track jumps to cross the target address.
A	Performs 4-track jumps to cross the target address.
B	Performs 4-track jumps to reach the front of the target address. Sets the timer and goes to step C Time check NG→Ends with the search error.
C	Plays until the target address is reached. CD,CDV-A → REV 1 jump Spindle locked. / Unlocked → Go to step B. Game → REV 2 jump. Go step 10. / Not Game → REV 1 jump. Go step E.
D	Performs 4-track jumps to a point before the target address. Sets the timer and goes to step E. Time check NG→Ends with the search error.
E	Plays until the target address is reached. During game and except CD, sets REV 2-track jump and goes to step 10. Time check NG→Ends with the search error.
F	If another new search target is specified during search, waits the spindle to lock and returns to step 0.
10	Plays until the target address is reached. Then, goes to step 11. Time check NG→Ends with the search error.
11	If the operation is lead-in search, backs 32-track and goes to step 12. If not, completed.
12	Performs 32-track back jump, goes to step 13.
13	Lead-in area→Search completed. PGM area→Returns to step 7 to start searching one more times.

8.5 INTERFACE BETWEEN THE PLAYER AND PAC—S10 PLAYER



※ The mode controller receives commands from the PAC－S10.

Fig. 8－14

<Mode Controller and PAC－S10 Communication Process>

As a data bus (DBUS 0 to 3), the communications board sends and receives 4－bit parallel signals. During CD playback, communications occur every 13.3msec according to the sync signal. During LD playback, it occurs every 16.6msec according to the sync signal. At other times, it occurs every 20msec (approx.) according to the mode controller's timer.

The 5－byte (10 nibbles) data is sent according to the following process :

① Mode Controller → PAC－S10
- Response to a command received from PAC－S10 in the preceding transmission.
- Current status (including errors) of the mode controller.
- Transmission of the player's current status (response to a report specification). Since the PAC－S10 monitors the status disclosed by the mode controller, the player operates as desired according to whether the issued command has been received or whether an error has occurred. Such information can be obtained.

② PAC－S10 → Mode controller (1 nibble = 4 bits)
- Command which controls the player.
- Report specification which reports the player's status.

The general communications flow is shown below. (Fig 8－15)

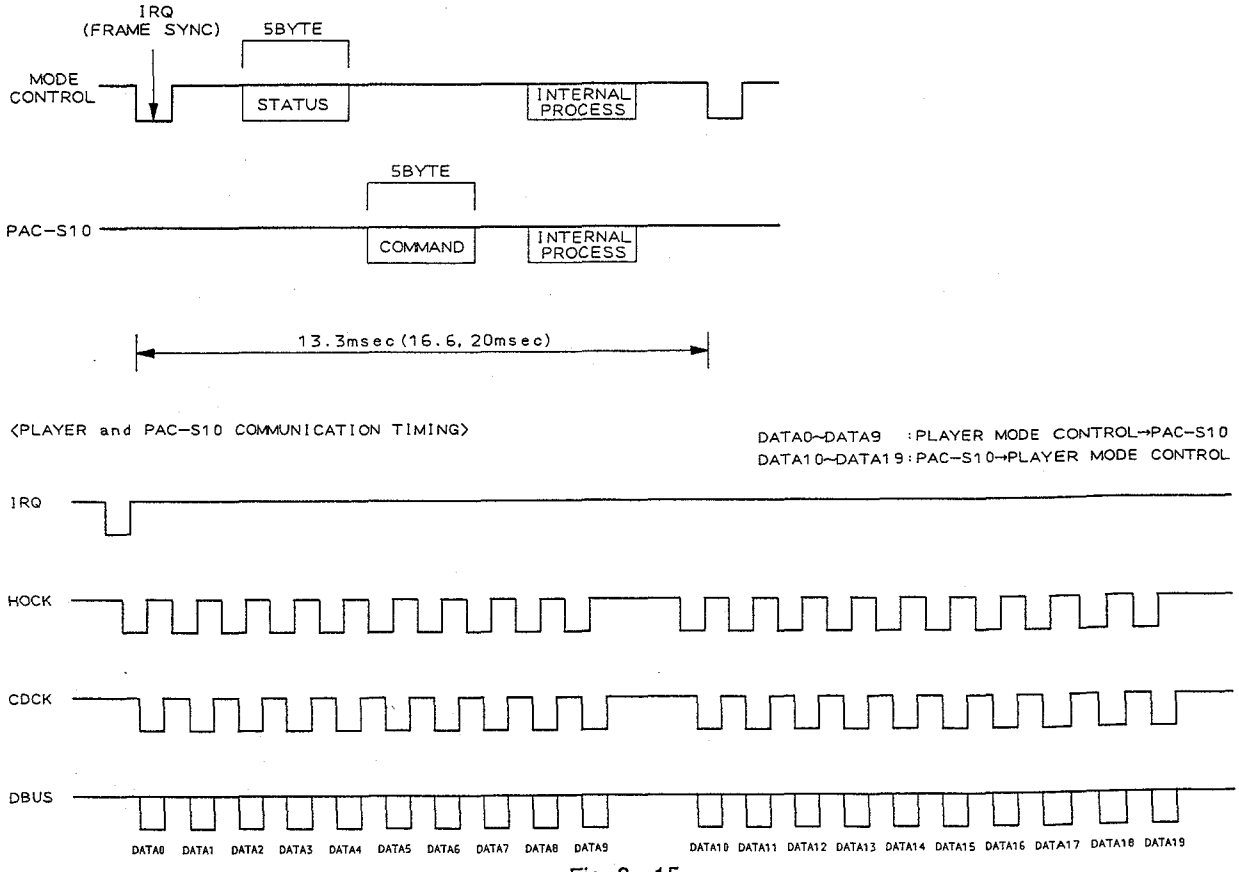
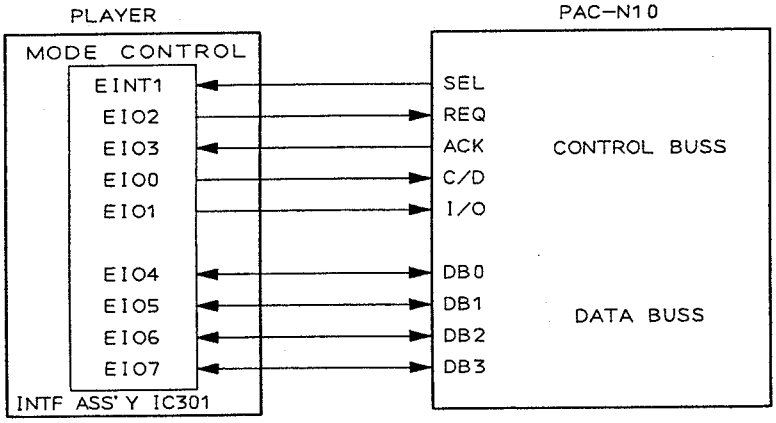


Fig. 8－15

8.6 INTERFACE BETWEEN THE PLAYER AND PAC – N10



※The control bus is Low Active, and the data bus is High Active.

Fig. 8–16

The operating request from the PAC – N10 to the player starts with the SEL from PAC – N10.
When the player responds with REQ, PAC – N10 issues a 4 – byte command.
By giving a 1 – byte status to PAC – N10, the player completes a command operation.

Even while a command is still being executed, the player will issue a new command after receiving SEL from PAC – N10.
If this happens, the preceding status will be cleared entirely.
Commands, data, status, etc., are transferred via the REQ/ACK handshake.

<PLAYER and PAC–N10 COMMUNICATION TIMING>

A command operation

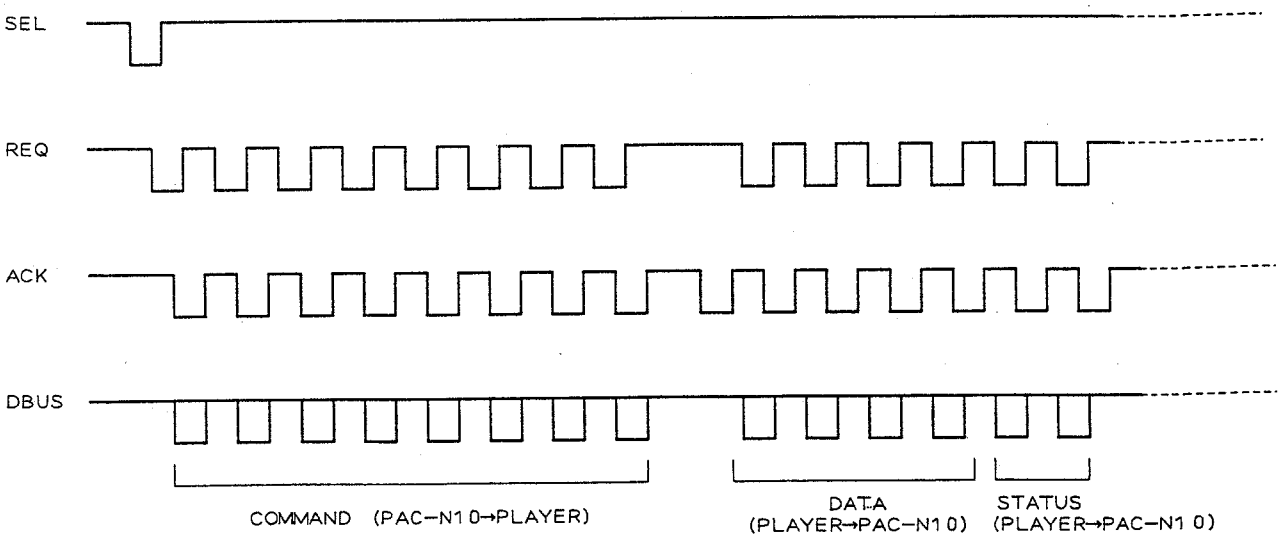


Fig. 8–17

8.7 INTERFACE BETWEEN THE PLAYER AND PAC-K1

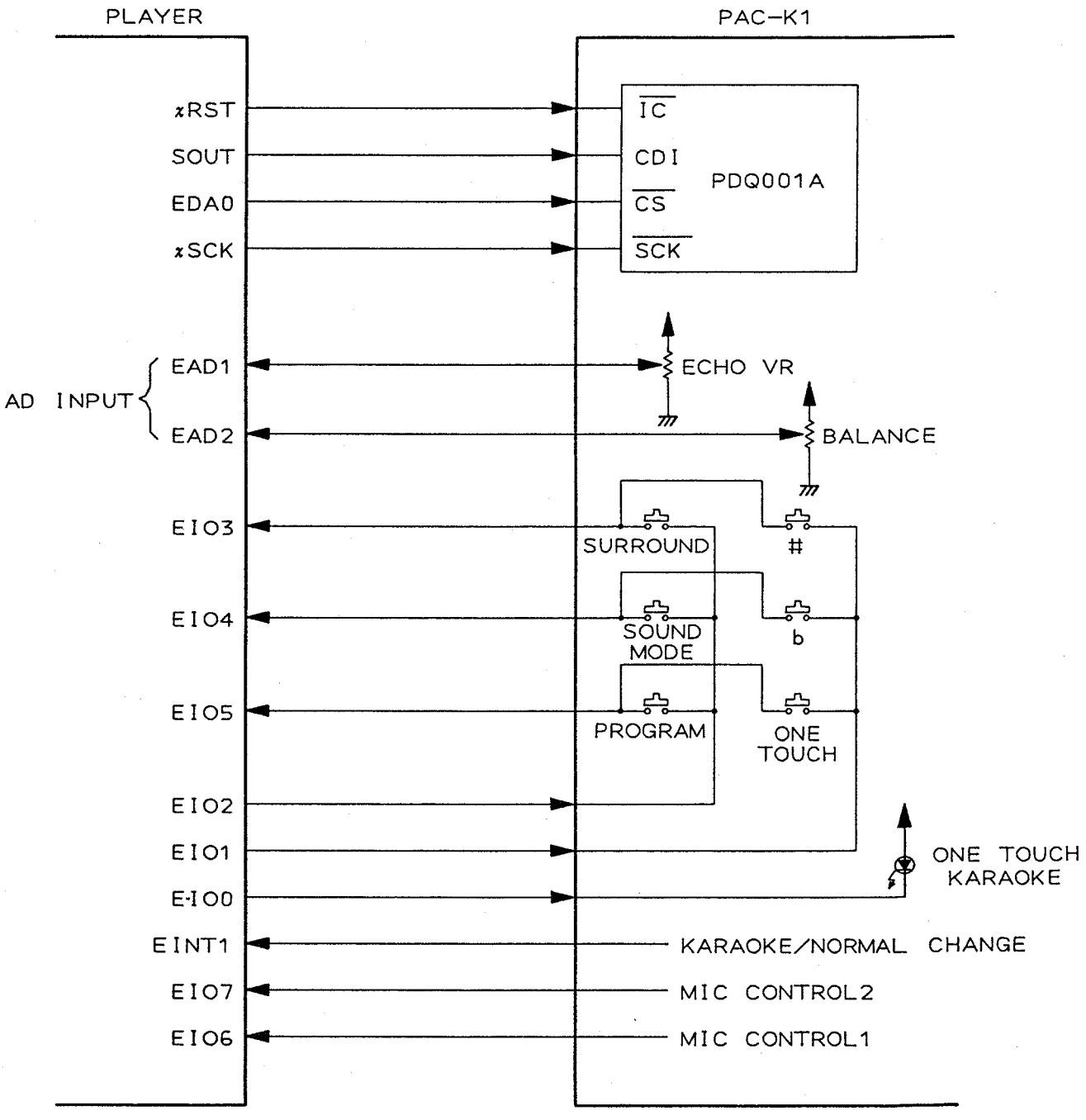


Fig. 8—18

• Microcomputer interface timing chart

a. For address in $0000 to $0005

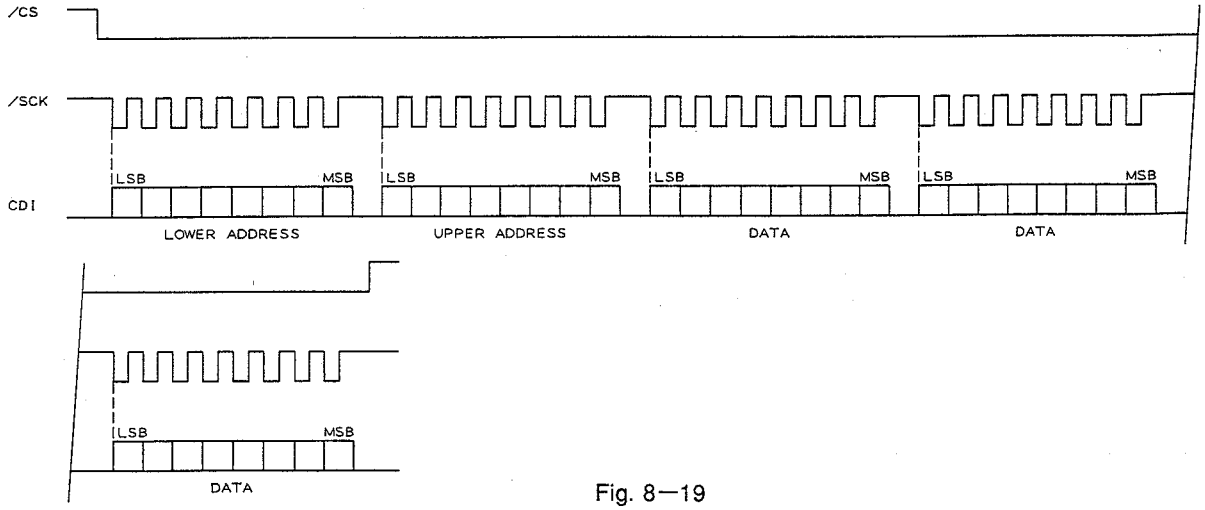


Fig. 8—19

b. For addresses starting from $0040

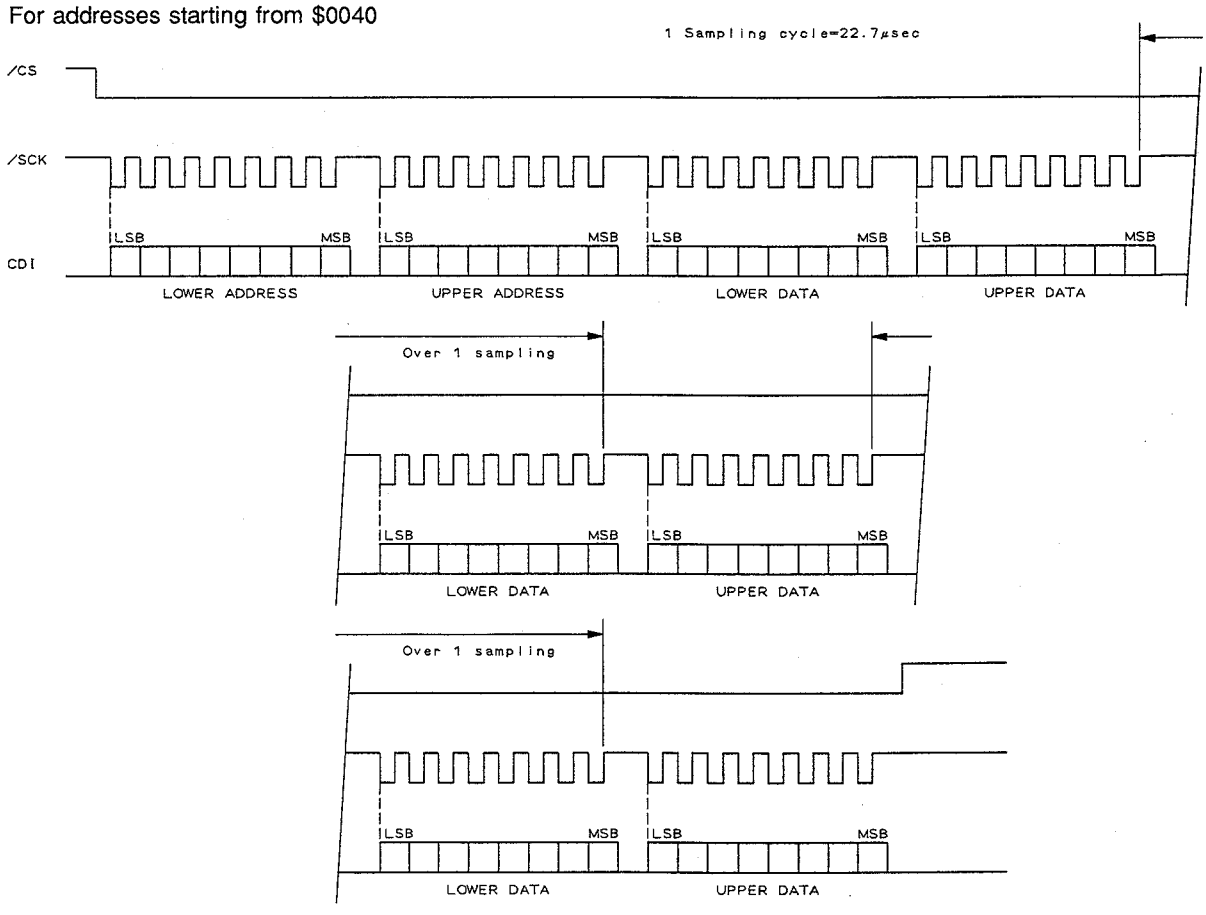


Fig. 8—20

The parameters for the DSP's resistor are set by sending the addresses and data.

After/CS is set to "L" the resistor's address is set for the first and second byte, and the data is set for the third byte and thereafter. The third byte's data is sent to the resistor that was set with the first and second bytes. The fourth byte's data is sent to the resistor whose address is one above (plus one) the address of the resistor set with the first and second bytes.

For each byte of data sent, the address of the resistor set with the first and second bytes will be incremented.

Therefore, continuous addresses can be set just by sending the data. After the setting is completed, /CS will become "H."

c. Data transmission to non-continuous addresses

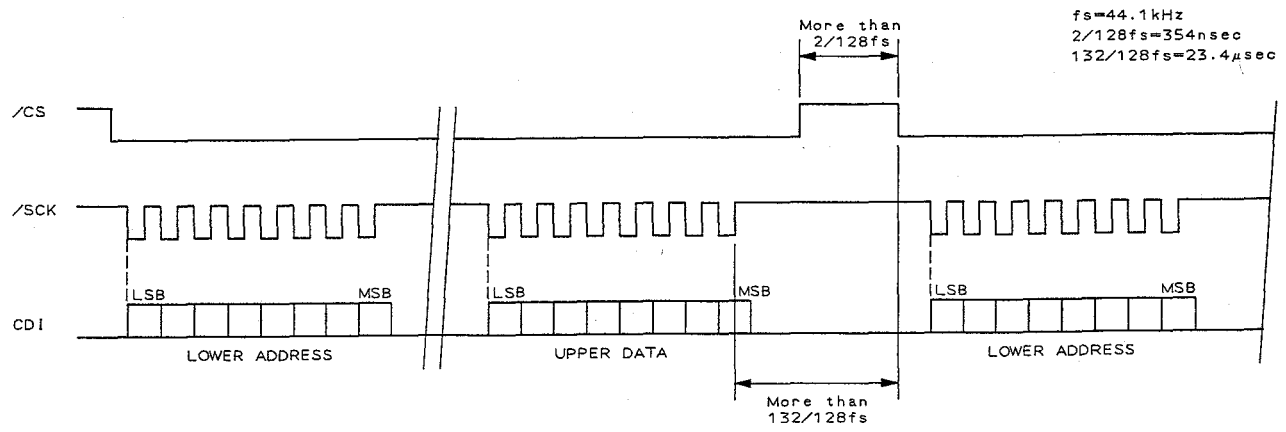
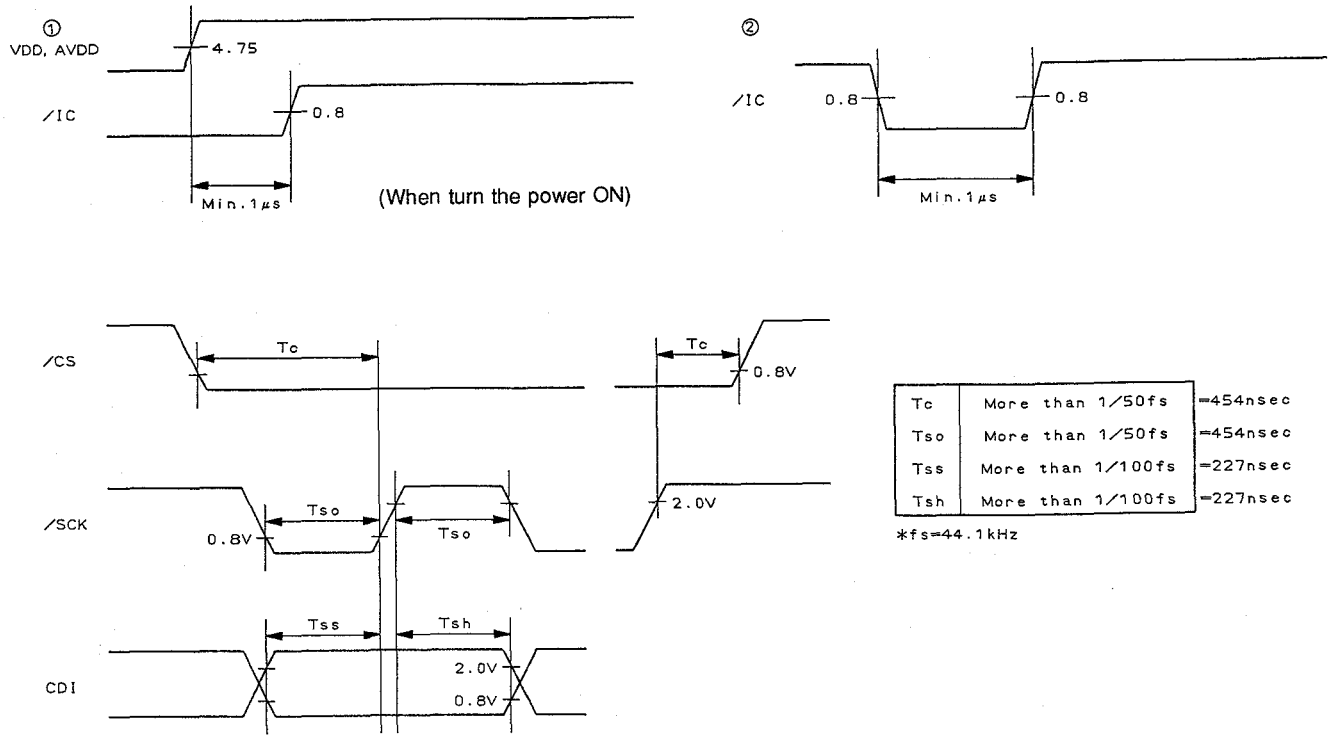


Fig. 8—21

When data is sent to non-continuous addresses, the timing shown in Fig. 8—21 above will take effect.

d. /IC terminals "L" period required for initial clearing



Tc	More than 1/50fs	=454nsec
Tso	More than 1/50fs	=454nsec
Tss	More than 1/100fs	=227nsec
Tsh	More than 1/100fs	=227nsec

*fs=44.1kHz

Fig. 8—22

8.8 PACK IDENTIFICATION FLOWCHART

· POWER OFF → POWER ON → PACK IDENTIFICATION

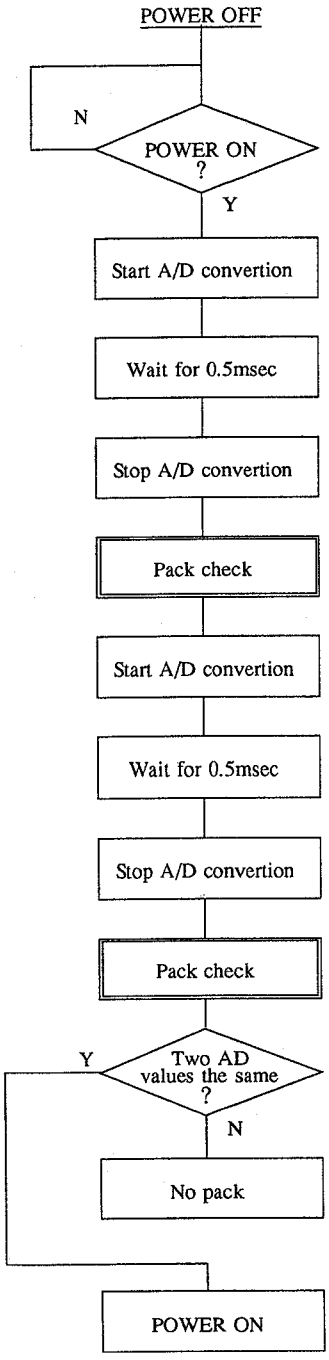
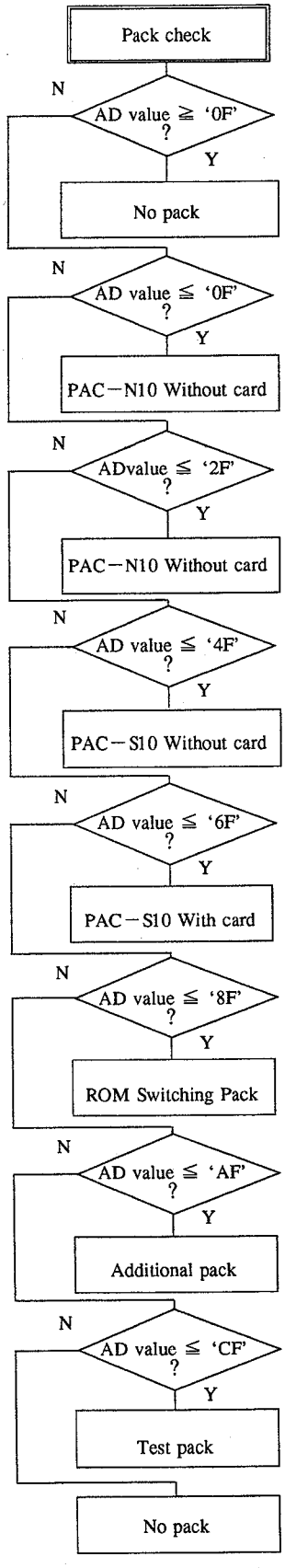


Fig. 8—23



Currently, karaoke pack only

Spare for future use

For testing on the production line

Fig. 8—24

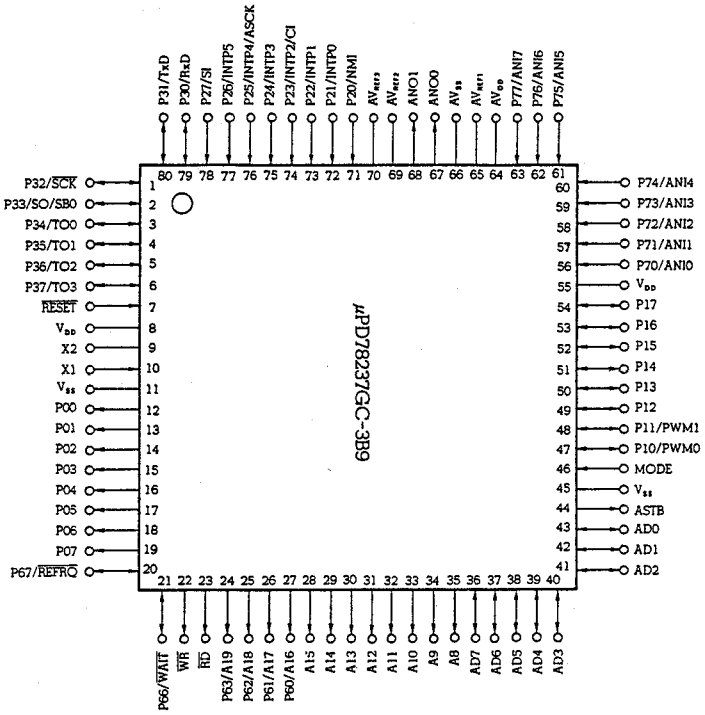
9. IC INFORMATION

■μPD78237GC−3B9 (INTF ASS'Y IC301)

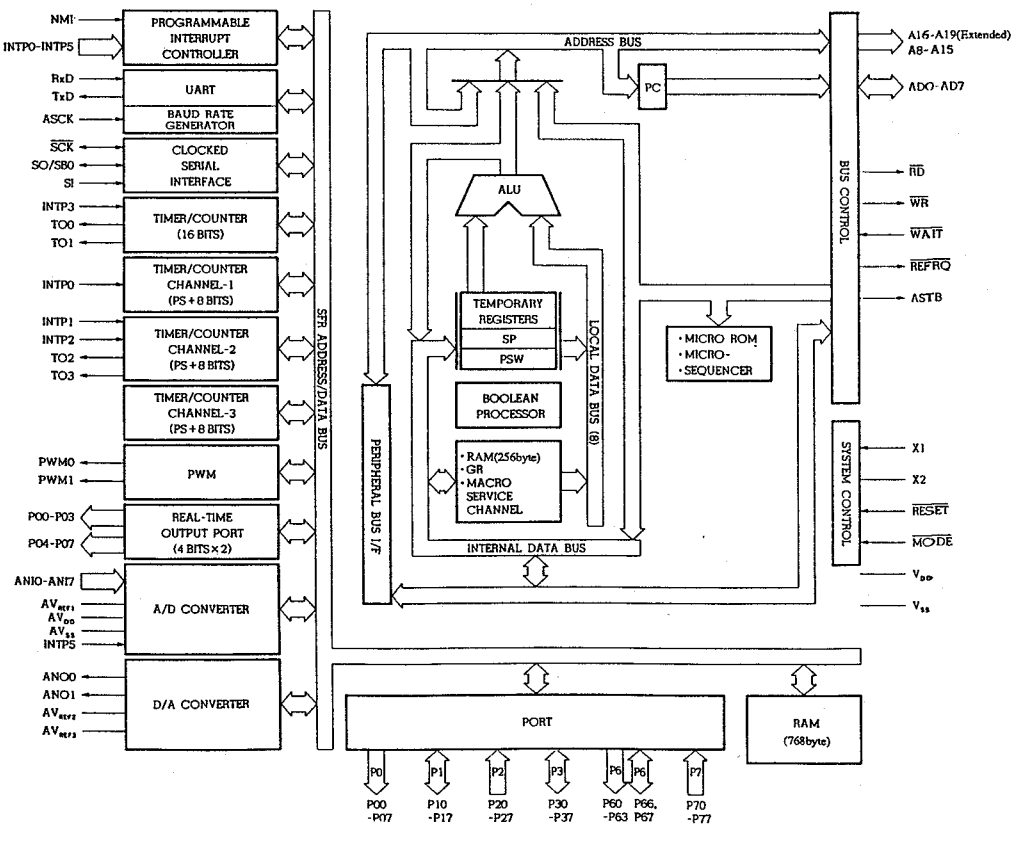
● Mode control IC

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

●Pin Assignment (Top view)



●Block Diagram



● Pin Function

No.	Pin name	I/O	Function
1	XSCK	I/O	Serial communication clock
2	SO	O	Serial communication transmission data
3	GVIDEO	O	Switching game display only or LD and game display overlay H : Game only L : Overlay
4	N.C.	I	Not used
5	EIO 8	I	Detect pack category H : Normal L : Not defined
6	XROMEXT	O	Select Mode control ROM H : Main unit L : Inside Pack
7	XRESET	I	Reset input
8	V_{DD}	–	Standard power supply
9	X_2	–	System clock
10	X_1	I	
11	V_{SS}	–	GND
12	W.D.F	O	Pulse output for watchdog timer
13	XCS	O	Character generator chip select
14	XRESETO	O	Reset output
15	POWER ON	O	Switched 5V ON/OFF H : ON L : OFF
16	LED 0	O	PLAY LED drive output
17	LED 1	O	MEMORY LED drive output
18	LED 2	O	STANDBY/POWER LED drive output
19	LED 3	O	LD LED drive output
20	ACK	I/O	Communication handshake timing clock with mechanism control
21	XWAIT	I	Read/Write wait timing clock with external memory
22	XWR	O	Write strobe with external memory
23	XRD	O	Read strobe with external memory
24	PACKDET	O	Pack detect H : with Pack L : without Pack
25	SEGAMUTE	O	Digital audio mute (When CD – ROM game of PAC – S10 only) H : Mute
26	LED 4	O	CD LED drive output
27	ATCC	O	Switch digital filter attenuate control (Used with SEGA MUTE) H : Controled by Mechanism control L : Controled by Pack
28	A 15	O	Address line for external memory access
29	A 14	O	
30	A 13	O	
31	A 12	O	
32	A 11	O	
33	A 10	O	
34	A 9	O	
35	A 8	O	
36	AD 7	I/O	Address data line for external memory access
37	AD 6	I/O	
38	AD 5	I/O	
39	AD 4	I/O	
40	AD 3	I/O	
41	AD 2	I/O	
42	AD 1	I/O	
43	AD 0	I/O	

No.	Pin name	I/O	Function
44	ASTB	O	Address strobe line for external memory
45	Vss	–	GND
46	MODE	I	Switch external ROM / internal ROM Fixed in H(external).
47	EIO 0	I/O	Pack interface
48	EIO 1	I/O	
49	EIO 2	I/O	
50	EIO 3	I/O	
51	EIO 4	I/O	
52	EIO 5	I/O	
53	EIO 6	I/O	
54	EIO 7	I/O	
55	VDD	–	Standard power supply
56	PACKDEF	I	A/D input, detect Pack type
57	EAD 1	I	A/D input, for barance VR input of PAC – K1
58	EAD 2	I	A/D input, for echo VR input of PAC – K1
59		I	Not used (L fixed)
60	KIN 0	I	MEMORY key input
61	KIN 1	I	PLAY key input
62	KIN 2	I	LD OPEN key input
63	KIN 3	I	CD OPEN key input
64	AVDD	–	Standard power supply for A/D converter
65	AVREF1	–	Reference voltage for A/D converter
66	AVss	–	GND for A/D converter
67	ANO 0	O	D/A output, PAC – K1 DSP chip select
68	ANO 1	O	D/A output
69	AVREF 2	–	Reference voltage for D/A converter
70	AVREF 3	–	
71	VSYNC	I	V – SYNC signal input for game
72	SEL IR	I	Remote control signal input
73	SHAKE	I	Communication handshake timing clock with mechanism control
74	SOFT RST	I	RESET input from pack
75	FG	I	FG input
76	EINT1	I	General interrupt input, Communication start trigger with PAC – N10, switch KARAOKE/NORMAL with PAC – K1
77	EINT2	I	General interrupt input
78	SI	I	Secial communication receive data
79	RxD	I	Serial data input with UART
80	TxD	O	Serial data output with UART

	PAC–S10	PAC–N10	PAC–K1
EIO 0	$\overline{IRQ}$	$\overline{C/D}$	KARA LED
1	CDCK	$\overline{I/O}$	KSOUT0
2	D/M	$\overline{REQ}$	KSOUT1
3	HOCK	ACK	KSIN0
4	DBUS0	DBUS0	KSIN1
5	DBUS1	DBUS1	KSIN2
6	DBUS2	DBUS2	MICCON1
7	DBUS3	DBUS3	MICCON2

■PD0178(CONT ASSY IC201)
● Mechanism control IC

● Pin Function

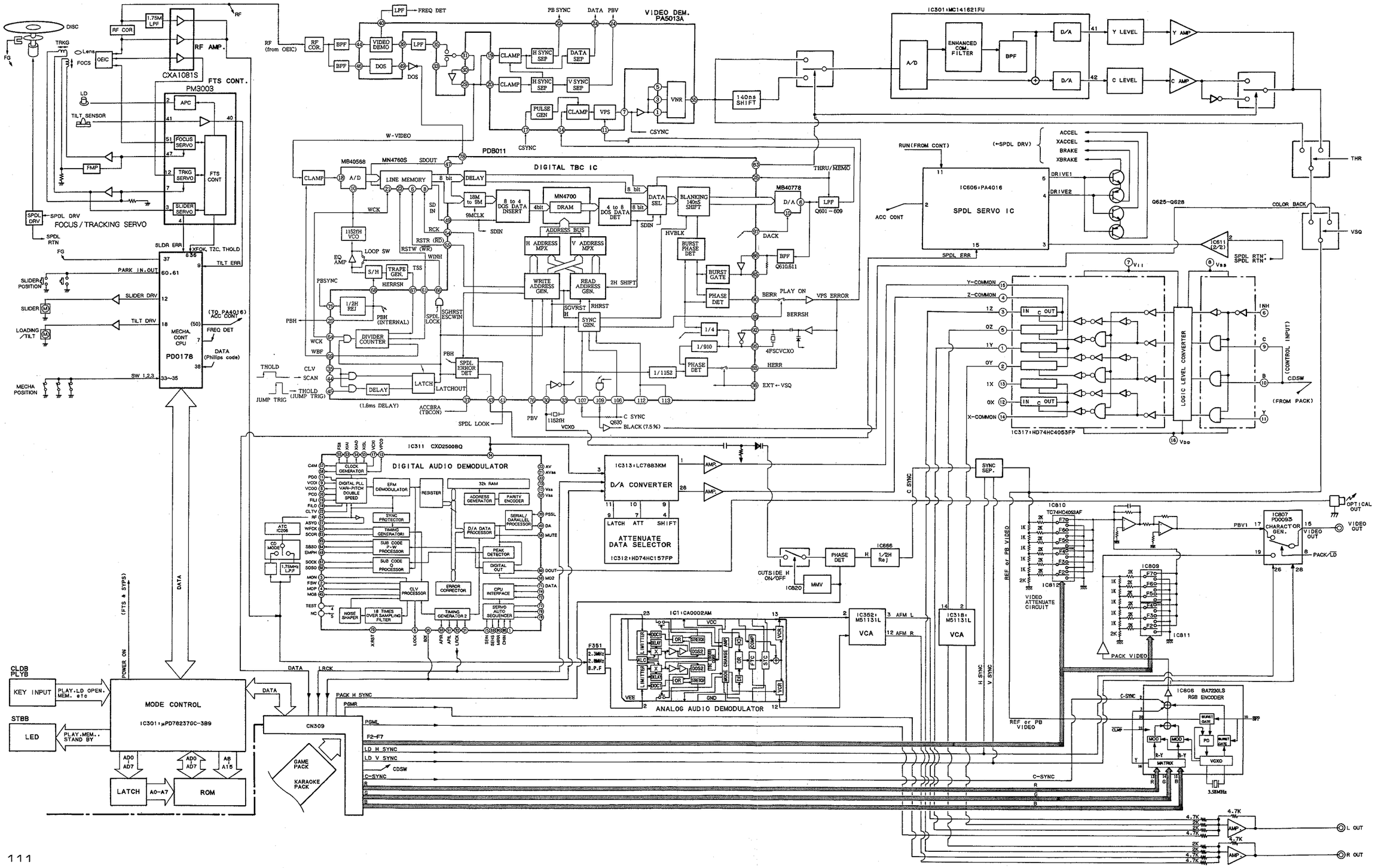
No.	Pin name	I/O	Function
1	VCC	—	Power supply connection pin. Set to 5V ±10%
2	XCX	O	Analog audio CX noise reduction switching signal output pin ON : L, OFF : H
3	SQ1	O	Alalog audio switching signal output pin 1/L Squelch : H When digital audio mode, the signal is output through the control of the EFM decoder IC : CXD2500BQ.
4	SQ2	O	Alalog audio switching signal output pin 2/R Squelch : H
5	XANA	O	Digital/analog audio switching signal output pin Digital : H, Analog : L Signals output by the line out and headphone are switched by the signal.
6	TBAL ERR	I	Tracking balance error signal input pin (analog signal) Signal is A/D converted and is input as the tracking offset control.
7	FREQ DET	I	RF detection signal input pin (analog signal) Inputs the A/D conversion of the RF detection output and is used in the spindle luff servo-mechanism. Voltage and frequency are proportional.
8	SLDR ERR	I	Pickup position detection switch input pin (analog signal) Drives the resistance among the switches, reads the value of the A/D input, and detects the position.
9	TILT ERR	I	Tilt sensor output signal input pin (analog signal) Inputs (0 to 5 V) the tilt sensor output amplified to a 40 to 50 dB signal. The signal is A/D converted and is input as the tilt sensor control. Controls the tilt motor until the signal is 2.5 V.
10	MUTE	O	Audio system audio mute control output pin MUTE ON : H, MUTE OFF : L
11	THR	O	Digital memory control output pin Through : H, Memory ON : L
12	SLDR DRV	O	Slider move drive signal output pin Drive the slider by changing the duty of the signal. Cycle : 36mS, 3-value control H : FWD direction, Z : OFF, L : REV direction
13	T OFF	O	Tracking operation control signal output pin The signal backups ON/OFF of the tracking servo operation. OFF : H, ON : L
14	GFS	I	CD(EFM signal) frame lock signal input pin Connected to pin 12 of the EFM decoder IC : CXD2500BQ. Lock : H, Unlock : L GFS is an abbreviation for Good Frame Sync.
15	SI2	I	EFM decoder IC : CXD2500BQ subcode input pin Reads the subcodes of SCK2 and the signal.
16	XLAT2	O	EFM decoder IC : CXD2500BQ control latch signal output pin Sends the control command using SO3 and 2500CLK
17	SCK2	O	EFM decoder IC : CXD2500BQ subcode read clock signal output pin Sets the clock to 96 and reads the subcode.
18	TBAL DRV	O	Tracking offset control signal output pin Outputs the tracking offset after PWM and is used in auto tracking offset. Cycle : 910µsec, 3-value control H, L, Z.
19	SITOM	I	Input pin of data from mode control IC Serial Used with the data signal to the character generator IC.
20	SMTOI	O	Serial data output to the mode control IC Serial
21	SCK	I/O	Clock for serial communication with the mode control IC In the input mode except during serial communication with the mode control IC. Used with the clock signal to the character generator IC.

No.	Pin name	I/O	Function
22	TZC	I	Input pin for Tracking Zero Cross signal from IC803 (PM3003)
23	SCOR	I	Subcode SYNC signal input pin Inputs the subcode signal from the EFM decoder IC : CXD2500BQ when the signal is "H". Supervises the disc playback depending on the presence of the signal.
24	DF LATCH	O	Digital filter (LC7883) serial control latch signal output pin
25	SHAKE	I/O	Pin of handshake signal for data communication with the mode control IC This pin is a bi−directional data path which sends the data transfer timing through the I/O mode switching of the respective microcomputers.
26	XPBV	I	LD/CDV playback V − SINC signal input pin IC basically operates in synchronization (falling edge) with the signal. Setting the signal as reference in the CAV special playback mode, generates jump timing. V − SYNC on going : L
27	CN VSS	−	GND for A/D conversion
28	XRESET	I	Reset signal input pin Reset : L, Cancel reset : H This pin controled by mode control.
29	XTAL IN	I	9 MHz clock generation input pin
30	XTAL OUT	O	9 MHz clock generation output pin
31	FTS CLK	O	Clock output pin for FTS IC
32	VSS	−	GND
33	SW1	I	Loading/tilt position detection switch input pin
34	SW2	I	Loading/tilt position detection switch input pin
35	SW3	I	Loading/tilt position detection switch input pin
36	XFOK	I	Focus lock signal input pin Focus lock : L
37	FG	I	Spindle motor FG signal input pin 24 pulses per signal Devided into thirds and used inside the microcomputer
38	DATA	I	Input pin for Phillips code decoder in the mechanism controller
39	XPBH	I	Playback H − SYNC input for Phillips code decoder
40	XPBV	I	Playback V − SYNC input for Phillips code decoder
41	CAV/XCLV	O	CAV/CLV switching signal output pin CAV : H CLV : L Connected to pin 6 of PA5013A and used as a VIDEO NR switching signal.
42	XYCS	O	Y/C separation control output pin Y/C separation ON : L
43	AC CONT	O	Spindle acceleration signal output pin Acceleration : H, Deceleration : L, CD, stop and play : Z
44	TILT/LOAD DRV	O	Loading and tilt control signal output pin Output tilt drive in PWM format to control loading and tilt servo mechanism.
45	J. TRIG	O	Track jump signal output pin Used for single track jump Start of track : H, Other : L, Width of "H" : approx. 20µsec
46	SCK3	O	Serial 3 clock signal output pin Reads the rising edge H : Within 2µsec, L : Within 20µsec.
47	SO3	O	Serial 3 data signal output pin With the serial data as the common signal, divides the signals into three types of latch signals (XLAT3, XLAT2, XT LATCH). LSB first

No.	Pin name	I/O	Function
48	XLAT3	O	Spindle servo mechanism IC latch signal output pin
49	WEN	O	Video memory write enable signal output pin Write enable : H, Freeze : L
50	VSQ	O	Video output switching signal output pin Squelch : H, Playback video : L
51	TBC ON	O	TBC control signal output pin During multi-track jump : H, Other : L
52	RUN	O	Spindle motor ON/OFF control signal output pin ON(RUN) : H, OFF(STOP) : L
53	XSLOCK	I	Spindle lock signal input pin Lock : L, Unlock : H
54	XLD ON	O	Laser diode ON/OFF switching signal output OFF : H, ON : L
55	POWER SAVE	O	Spindle drive circuit power save mode control output pin with IC606 (PA4016) Power save mode : H, Normal : L
56	8INCH	O	Disc size detection signal output pin 8 inch : H, 12 inch : L Used for IC606 (PA4016) EQ switching.
57	CDV	O	EQ switching detect signal output pin with IC606(PA4016) CDV : H
58	SHUNT	O	CD/LD switching signal output pin CD, CDV − A : H LD, CDV − V : L
59	SIP	O	Super-inpose signal output pin Super-inpose ON : H
60	PARK IN	I	Slider position detect switch input pin
61	PARK OUT	I	
62	RFCORR	O	RF correction switching signal output pin Gain up : H Increases gain (#8000 to #8100) within the CAV.
63	EMMOD	I	Emergency mode input signal pin Emergency mode : H Sets forcely video memory ON mode when "H" input four seconds. Reset is tray open.
64	XOPM	O	Optical output mute output pin Mute Optical output : L

PARK IN	PARK OUT	
L	L	CD active
L	H	CD INSIDE
H	L	CDV active
H	H	LD active

10. BLOCK DIAGRAM



11. PANEL FACILITIES

POWER SWITCH
Press to switch the power supply ON/OFF. When installing/detaching the Control Pack, ensure that the power supply is OFF.

PLAY/STILL BUTTON
Press to perform playback of the disc. Press during performing playback of an LD or CDV disc, and the picture becomes still.

STANDBY/ON INDICATOR
Illuminates green when the power supply is switched ON by the power switch. When the power supply is switched OFF by the remote control unit, the indicator lights up red.

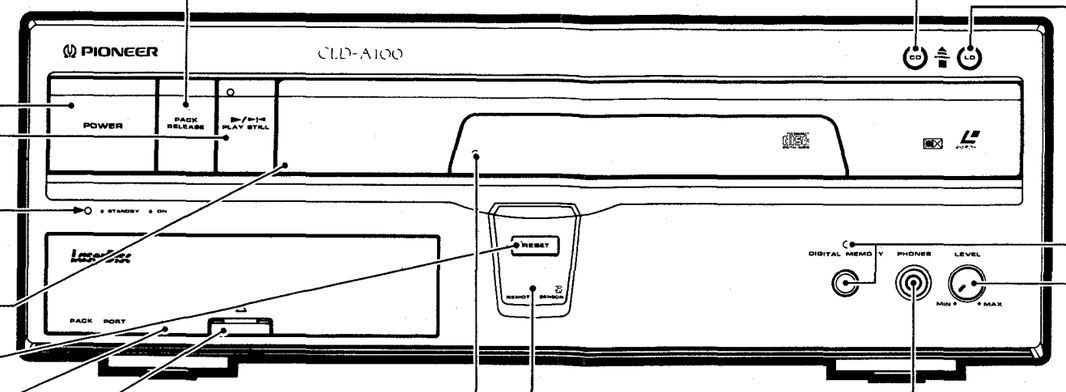
DISC TABLE

RESET BUTTON
Resets the games software when playing games software utilized by the separately sold Control Pack.

Control Pack installation slot

Control Pack installation slot cover
Attach when the Control Pack is not installed.

PACK RELEASE BUTTON
Press to release the Control Pack.



CD DISC TABLE
Exclusive use CD disc table

REMOTE CONTROL SENSOR

CD STOP OPEN/CLOSE BUTTON (⏏)
Stops disc playback and open/closes the CD disc table

HEADPHONES TERMINAL (PHONES)
Insert standard type headphones.

HEADPHONES VOLUME ADJUSTMENT KNOB (LEVEL)

LD STOP OPEN/CLOSE BUTTON (⏏)
Stops disc playback and open/closes the LD disc table

DIGITAL MEMORY button/INDICATOR
When playing a CAV or CLV disc, turning the digital memory function ON allows you to enjoy special playback functions such as still frame and multi-speed playback with no screen disturbance. If the digital memory function is OFF, it will automatically turn ON when you fast-forward, fast-reverse or activate a special playback function (except with CAV discs). When digital memory is OFF, screen disturbance may occur momentarily when an operation such as fast-forward is carried out. However, horizontal resolution is better than when digital memory is ON.

NOTES:
- *When using a special function obtained by connecting a commercially available adaptor (such as a caption adaptor), be sure to turn the digital memory function OFF. The adaptor will not function properly if digital memory is left ON.*
- *Screen disturbance may occur momentarily when an operation such as fast-forward, fast-reverse or a special playback function is carried out when digital memory is OFF. This is not a malfunction or disc defect.*
- *This player memorizes the ON/OFF condition of the digital memory function even if the power is turned off. Turn the digital memory function ON or OFF as required the next time you play a disc. The " DIGITAL MEMORY" indicator lights when digital memory is ON.*

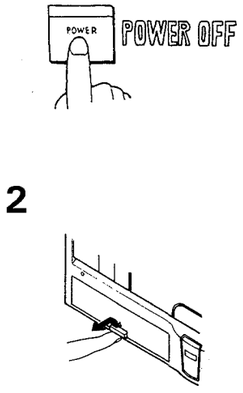
INSTALLING THE CONTROL PACK

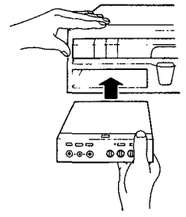
1. Switch OFF the power supply to the main unit.

2. Remove the Control Pack installation slot cover.
While lifting up the center of the cover with a finger nail, pull forward and detach.

3. Insert the Control Pack into the interior of the main appliance.
To install accurately, lightly hold the main appliance by the top surface and carefully insert the Control Pack until the front panel is flush with the front panel of the player.

NOTES:
- *Carefully put the detached Control Pack installation cover somewhere for safekeeping, as it will be required when the Control Pack is removed from the main appliance.*
- *When the black lever protrudes in the top center of the Control Pack insertion slot and the Control Pack cannot be inserted, press in the RELEASE button.*





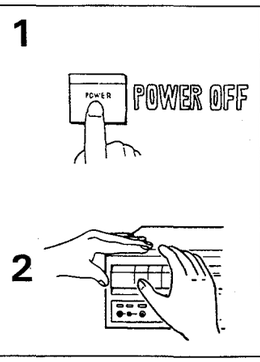
DETACHING THE CONTROL PACK

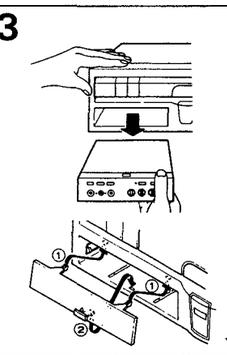
1. Switch OFF the power supply to the main unit.

2. To detach the Control Pack accurately, lightly hold the main appliance by the top surface and press the RELEASE button.
The Control Pack is partially ejected forward.

3. Detach the Control Pack.

4. Fit the Control Pack insertion slot cover.
First, introduce the top edge of the cover into the cover attachment slots on the main appliance, then fit the bottom edge into place.





12. SPECIFICATIONS

1. General

System ·····Laser Vision Disc system and Compact Disc digital audio system
Laser ·····Semiconductor laser wavelength 780 nm
Power requirements ·····AC120 V, 60 Hz
Power consumption ·····47W
Weight ·····7.8 kg (17 lbs 3 oz)
Dimensions ·····420 (W)×390.5 (D)×145 (H) mm
16-9/16 (W)×15-3/8 (D)×5-11/16 (H) in
Operating temperature ·····+5°C—+35°C (41°F—95°F)
Operating humidity ·····5%—85%
(There should be no condensation of moisture.)

2. Disc

Laser Vision Discs

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

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

Compact Discs

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

Compact Discs with Video

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

**Actual playback time differs for each disc.*

3. Video characteristics (two pairs)

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

4. Audio characteristics (two pairs)

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

5. Other Terminals

Control input/output ·····Both miniature jacks
Optical digital output ·····Optical digital jack
VHF ADAPTER Output ·····JA—RF3L

6. Accessories

Remote control unit (CU-CLD085) ····· 1
Size "AAA" (IEC R03) dry cell batteries ····· 2
Video cord ····· 1
Audio cord ····· 1
Operating instructions ····· 1
Warranty card ····· 1

7. Functions

Remote control operations (CU-CLD085)

	Function	Standard-play Disc (CAV)	Extended-play Disc (CLV)	Compact Disc with Video	Compact Disc
Basic Functions	Single-side play	YES	YES	YES	YES
	Pause	YES	YES	YES	YES
	Stop	YES	YES	YES	YES
Search	Fast forward (forward and reverse)	YES	YES	YES	YES
	Chapter/track skip	YES	YES	YES	YES
	Direct Chapter/track number search	YES	YES	YES	YES
	Frame number search	YES	NO	NO	NO
	Time number search	NO	YES	YES	YES
Time display	Elapsed time display	NO	YES	YES	YES
	Absolute time display	YES*1	NO	NO	YES
	Remaining track time display	NO	NO	YES*4	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	CX system ON/OFF	YES*2	YES*2	NO	NO
	Auto Digital/Analog switch	YES*3	YES*3	NO	NO
	Audio channel selection (stereo, 1/L, 2/R)	YES	YES	YES	YES

*1 Only discs with TOC
*2 Valid for analog sound playing a disc with the CX mark.
*3 Can only be used with discs with digital sound tracks.
*4 Audio part only

PLAYER FUNCTIONS

- LaserActive compatible
- Digital Sound for LaseVision Discs
- Picture Stop Cancel Function
- Last Memory
- Digital Video Memory.

NOTE:

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

Published by Pioneer Electronic Corporation.