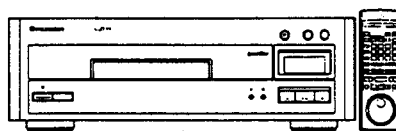


Service Manual

PIONEER
The Art of Entertainment



ORDER NO.
RRV1294

CD CDV LD PLAYER

CLD-99 CLD-79

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

Type	Model		Power Requirement	Remarks
	CLD-99	CLD-79		
KU/CA	○	○	AC120V	

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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.

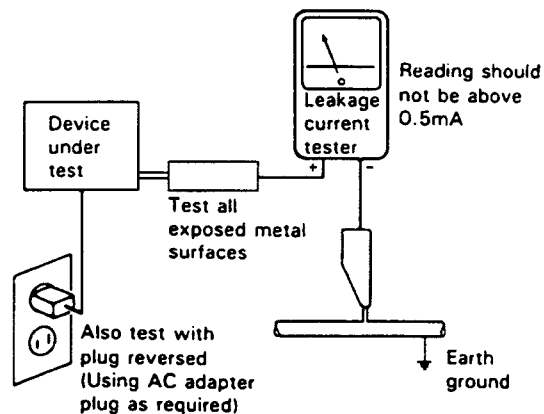
(FOR USA MODEL ONLY)

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 Δ on the schematics and on the parts list in this Service Manual.

The use of a substitute replacement component which does not have the same safety characteristics as the PIONEER recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards.

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

1

2.2 TOP VIEW AND DISC CLAMPER SECTION

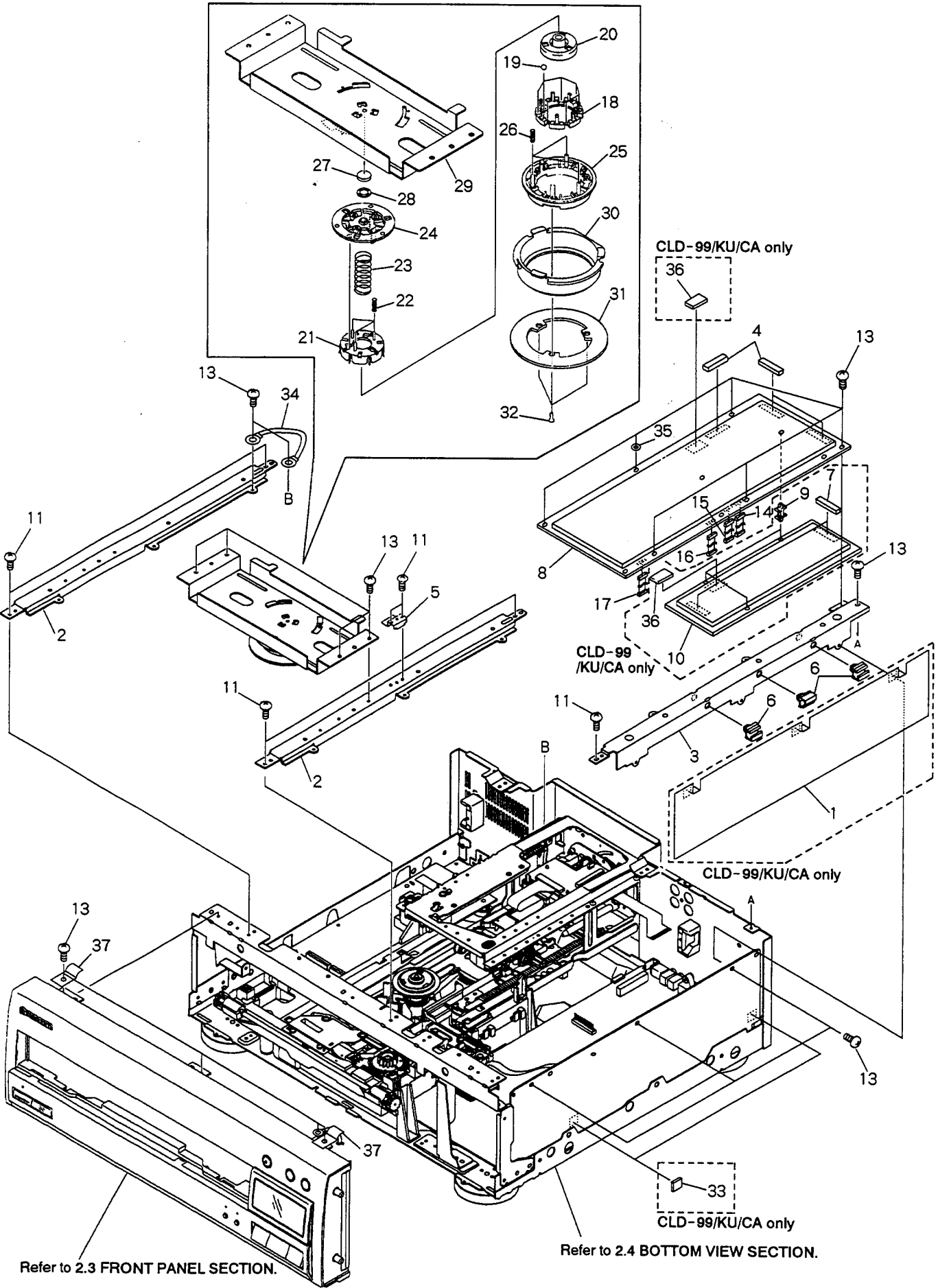
(1) CONTRAST OF CLD - 99/KU/CA AND CLD - 79/KU/CA

CLD - 99/KU/CA and CLD - 79/KU/CA have the same construction except for the following:

Mark	No.	Symbol & Description	Part No.	
			CLD - 99 /KU/CA	CLD - 79 /KU/CA
NSP	1	Shield sheet	VEF1045	Not used
	3	PCB holder	VNE1962	VNE1895
NSP	7	Hold rubber	VEB1216	Not used
	8	DVDB assy	VWV1420	VWV1421
NSP	9	PC support	VEC1415	Not used
	10	TDYC assy	VWV1377	Not used
NSP	33	Support cushion	VEC1750	Not used
	36	EMI gasket	VEC1826	Not used

(2) PARTS LIST FOR CLD-99/KU/CA

Mark	No.	Description	Part No.
NSP	1	Shield sheet	VEF1045
	2	Center angle	VNE1897
	3	PCB holder	VNE1962
	4	Hold rubber	VEB1226
	5	Damper plate	VBK1045
NSP	6	P plate holder	PNY - 405
NSP	7	Hold rubber	VEB1216
	8	DVDB assy	VWV1420
NSP	9	PC support	VEC1415
	10	TDYC assy	VWV1377
	11	Screw	BBT30P080FCC
	12		
	13	Screw	IBZ30P080FCC
	14	Connector assy (5P)	PF05PP2B25
	15	Connector assy (6P)	PF06PP - B25
	16	Connector assy (13P)	PF13PP - B20
	17	Housing assy (5P)	VKP2051
	18	Ball guide	VNL1616
	19	Ball	VNX1013
	20	LD hab	VNT1047
	21	Ball cover	VNL1602
	22	Cover spring	VBH1234
	23	LD spring	VBH1240
	24	Clamper head	VNL1603
	25	Clamper	VNL1604
	26	Clamp spring	VBH1239
	27	Rubber mat	VEB1114
	28	Thrust holder	VNL1663
	29	Center plate	VNE1898
	30	Clamper holder	VNL1605
	31	Stabilizer	VNE1906
	32	Screw	CPZ20P060FMC
NSP	33	Support cushion	VEC1750
NSP	34	Earth lead assy	VDA1479
	35	Washer	VEC1450
	36	EMI gasket	VEC1826
NSP	37	Earth plate	VNE1518



2.3 FRONT PANEL SECTION

(1) CONTRAST OF CLD-99/KU/CA AND CLD-79/KU/CA

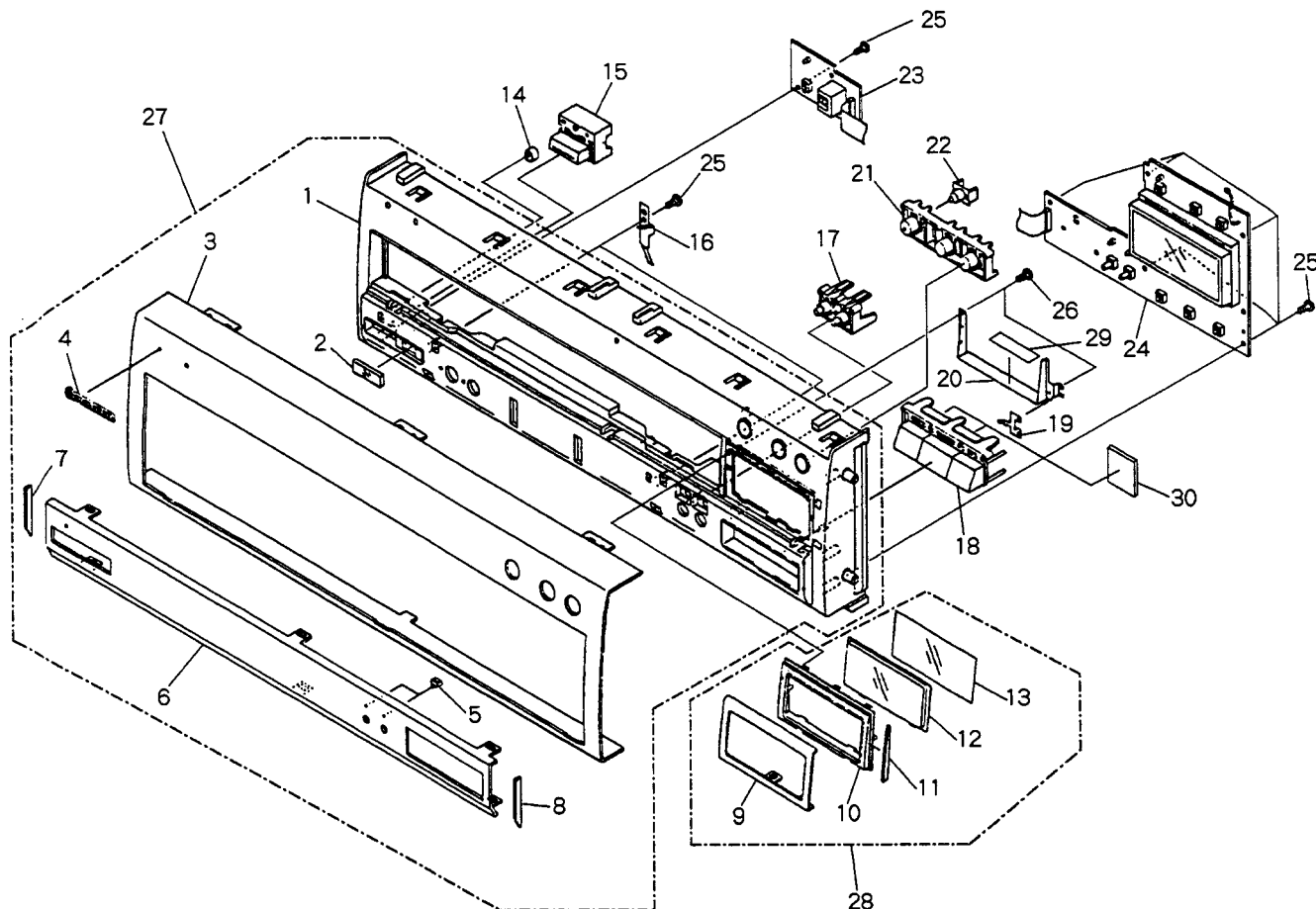
CLD-99/KU/CA and CLD-79/KU/CA have the same construction except for the following:

Mark	No.	Symbol & Description	Part No.	
			CLD-99 /KU/CA	CLD-79 /KU/CA
NSP	1	Front panel	VNK3101	VNK2838
NSP	3	Front panel (AL)	VAH1227	VAH1239
	24	FLKY assy	VWG1644	VWG1645
	27	Front panel assy-S	VXX2229	VXX2271

(2) PARTS LIST FOR CLD-99/KU/CA

Mark	No.	Description	Part No.
NSP	1	Front panel	VNK3101
	2	Sensor lens	RNK2085
NSP	3	Front panel (AL)	VAH1227
	4	Name plate	VAM1032
	5	LED lens 1	RNK2066
NSP	6	Under sash	VAH1228
NSP	7	Sash spacer L	VNK2945
NSP	8	Sash spacer R	VNK2946
NSP	9	Sub alum.	VAH1231
NSP	10	Sub panel	VNK2844

Mark	No.	Description	Part No.
NSP	11	Tray spacer R	VNK2948
	12	FL lens	VNK2845
	13	FL filter	VEC1769
	14	LED lens	PNW2019
	15	PW button	VNK2853
	16	Panel earth	VBK1052
	17	L key (B)	VNK2849
	18	Main key	VNK2851
	19	Sub earth	VBK1048
	20	Back plate	VNE1961
	21	L key (A)	VNK2847
	22	LED lens A	VNL1659
NSP	23	PONS assy	VWG1571
	24	FLKY assy	VWG1644
	25	Screw	BPZ26P080FCU
	26	Screw	BPZ20P060FCU
	27	Front panel assy-S	VXX2229
	28	Sub panel assy-S	VXX2230
	29	Tape	VED1008
	30	Cushion	VEC1807



2.4 BOTTOM VIEW SECTION

(1) CONTRAST OF CLD-99/KU/CA AND CLD-79/KU/CA

CLD-99/KU/CA and CLD-79/KU/CA have the same construction except for the following:

Mark	No.	Symbol & Description	Part No.	
			CLD-99 /KU/CA	CLD-79 /KU/CA
NSP	1	Base chassis	VNA1478	VNA1347
	2	Insulator assy	VXA1450	VXA1996
△	7	AC power cord	VDG1046	PDG1015
	8	AC cord stopper	Not used	CM-22C
	9	Rear panel assy-S	VXX2234	VXX2260
	11	SACB assy	VWS1191	VWS1189
	27	Screw	IBZ30P150FCC	IBZ30P080FCC
NSP	30	Label	VRW1495	VRW1509
NSP	32	Rear panel	VNA1541	VNA1568
NSP	35	Shield cover	VEF1046	Not used
	37	ICP caution label	VRW1538	VRW1401

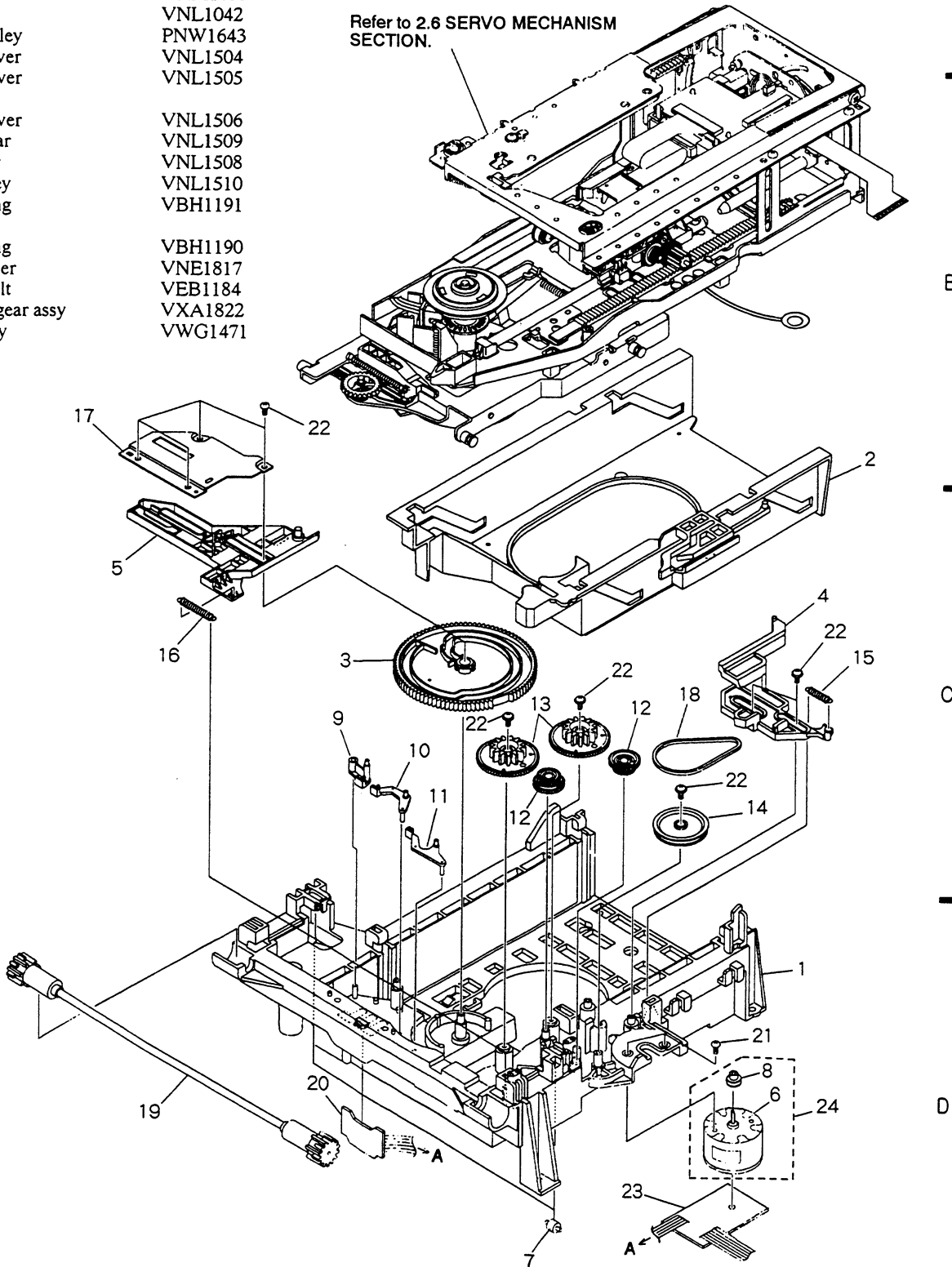
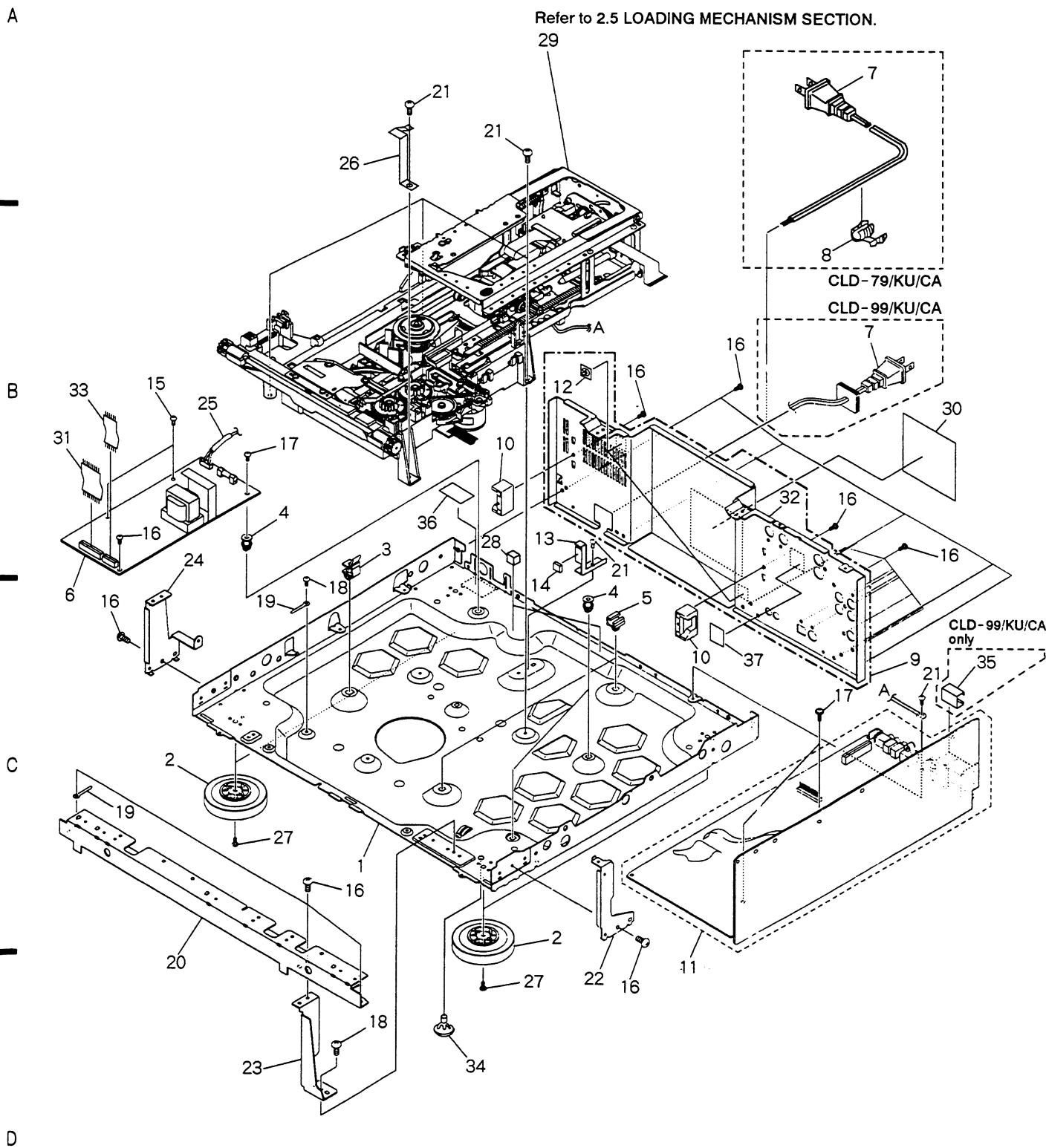
(2) PARTS LIST FOR CLD-99/KU/CA

Mark	No.	Description	Part No.
NSP	1	Base chassis	VNA1478
	2	Insulator assy	VXA1450
	3	PCB spacer	VEC1623
	4	PCB spacer	PNY-404
NSP	5	PCB hinge	VEC1174
△	6	SYPS assy	VWR1200
△	7	AC power cord	VDG1046
	8	• • • • •	
	9	Rear panel assy-S	VXX2234
	10	Tray stopper	VNL1600
	11	SACB assy	VWS1191
NSP	12	Mini clamp	VEC1312
	13	Carriage stopper	VNE1919
NSP	14	Damp cushion	VEC1602
	15	Screw	IBZ30P080FMC
	16	Screw	BBT30P080FCC
	17	Screw	BPZ30P140FMC
	18	Screw	BBZ30P040FMC
NSP	19	Cord holder	Z09-061
	20	Front angle	VNE1894
	21	Screw	BBZ30P060FCC
	22	Side stay	VNE1896
NSP	23	Side stay(R)	VNE1810
NSP	24	Side stay(L)	VNE1809
	25	UL tubing	VEC1651
	26	Mecha. earth	VBK1049
	27	Screw	IBZ30P150FCC
NSP	28	HM spacer	VEB1215
NSP	29	Mechanism assy	VWT1101
	30	Label	VRW1495
	31	Flat cable 12P	D20PYY1275E
NSP	32	Rear panel	VNA1541
NSP	33	Flat cable 6P	D20PYY0640E
NSP	34	PC support	VEC1749
NSP	35	Shield cover	VEF1046
NSP	36	Fuse caution label	VRW-548
	37	ICP caution label	VRW1538

2.5 LOADING MECHANISM SECTION

Parts List

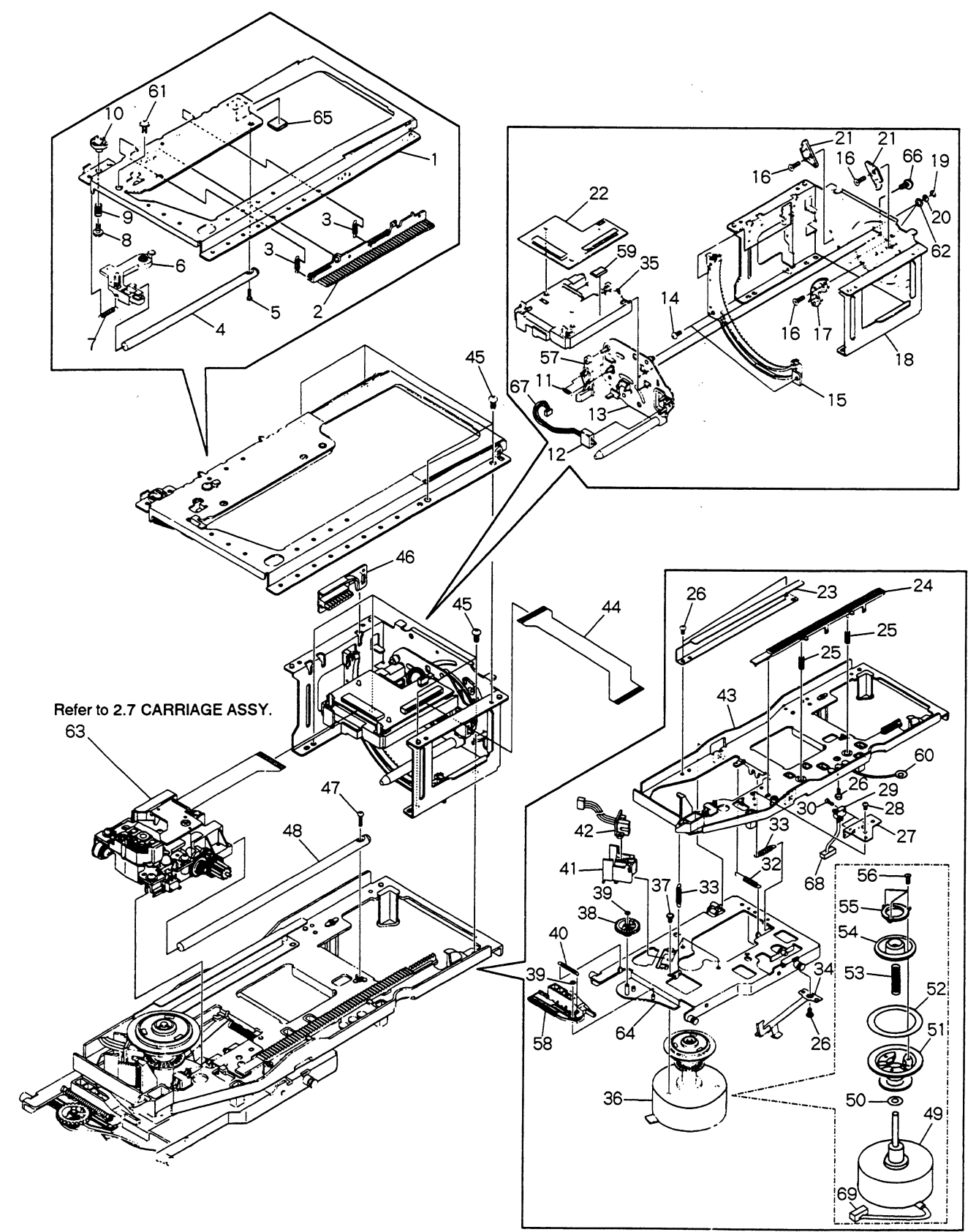
Mark	No.	Description	Part No.	Mark	No.	Description	Part No.	
	1	Mechanism base	VNK1990	21	Screw	BMZ26P040FMC	A	
	2	Clamp cam	VNL1621	22	Screw	Z39-019		
	3	Cam gear	VNL1507	NSP	23	LOMB assy	VWG1470	
	4	CD plate	VNL1576	24	Loading motor assy	VXX1712		
	5	Cam sand	VNL1511					
NSP	6	Carriage motor	VXM1033					
	7	Roller	VNL1042					
	8	Motor pulley	PNW1643					
	9	L- SW lever	VNL1504					
	10	C- SW lever	VNL1505					
	11	R- SW lever	VNL1506					
	12	Center gear	VNL1509					
	13	Twin gear	VNL1508					
	14	Gear pulley	VNL1510					
	15	CDP spring	VBH1191					
	16	CAS spring	VBH1190					
	17	Shaft holder	VNE1817					
	18	Rubber belt	VEB1184					
NSP	19	Synchro. gear assy	VXA1822					
	20	LOSB assy	VWG1471					



2.6 SERVO MECHANISM SECTION

Parts List

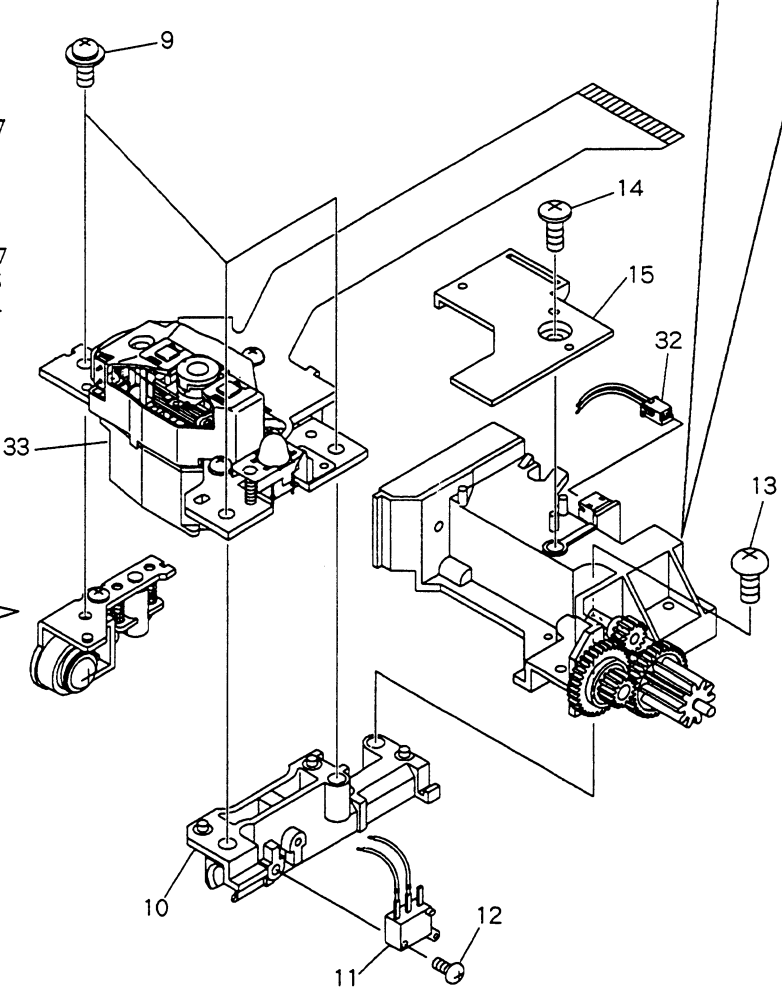
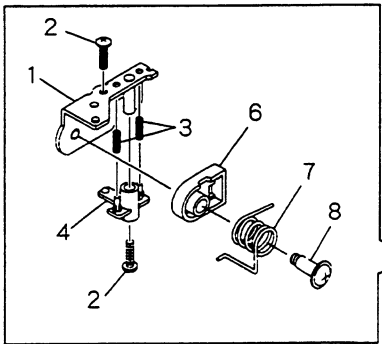
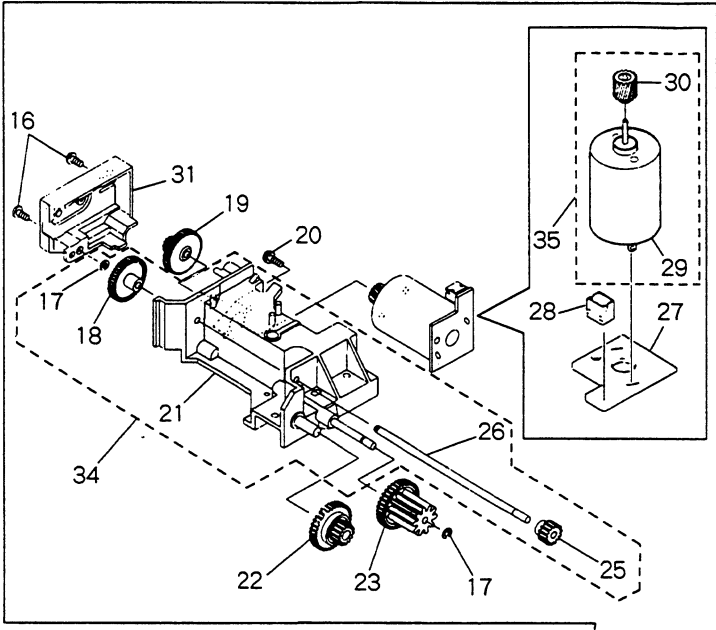
Mark	No.	Description	Part No.	Mark	No.	Description	Part No.
A	1	Tilt base (upper)	VNB1027	NSP	51	Turn table assy	VXA1760
	2	Rack (upper)	VNL1560	NSP	52	Rubber sheet	VEB1237
	3	Rack spring (upper)	VBH1213		53	Centering spring	VBH1024
	4	CA shaft (upper)	VLL1446		54	PRC hub	VNL1612
	5	Screw	PMZ20P070FMC		55	PRC table	VNL1613
	6	Shaft support	VNL1563		56	Screw	CPZ20P060FMC
	7	Support spring	VBH1236		57	Lock lever	VNL1562
	8	Screw	IPZ30P060FMC		58	Tilt cam	VNL1559
	9	B cam spring	VBH1233		59	Spacer	VEB1020
	10	B cam	VNL1564	NSP	60	Earth lead unit	VDA1455
B	11	Lever spring	VBH1214		61	Screw	Z39-019
	12	Lever SW	DSK1003		62	Washer	WA32D080D025
	13	R plate assy	VNL1566		63	Carriage assy	VWT1100
	14	Screw	BBZ26P060FMC		64	Motor base	VNE1889
	15	TM rack	VNL1556	NSP	65	Stop cushion	VEC1605
	16	Screw	CBZ26P060FMC		66	Screw	CPZ26P080FMC
	17	Turn gear	VNL1565		67	Housing assy (3P)	VKP2011
	18	TM support	VNE1888		68	Housing assy (4P)	VKP2025
	19	Washer	YE20FUC		69	Housing assy	VKP2020
	20	Washer	WA32D080D050				
NSP	21	Head lock	VNL1580				
	22	CNNB assy	VWG1469				
	23	TAN guide	VNE1887				
	24	Rack (lower)	VNL1567				
	25	Rack spring (lower)	VBH1215				
	26	Screw	BBZ30P060FMC				
	27	SW base	VNE1886				
	28	Screw	PBZ26P060FMC				
	29	Slide SW	OSH1001				
	30	Screw	PMZ20P060FMC				
C	31						
	32	Thrust spring	VBH1235				
	33	Tilt spring	VBH1218				
	34	Key lock	VBK1044				
	35	CB holder	VNL1618				
	36	Spindle motor assy	VXA1986				
	37	Screw	PMA30P050FMC				
	38	Y gear	VNL1501				
	39	Washer	WT26D060D025				
	40	Tilt cam spring	VBH1189				
NSP	41	FG base	VNL1577				
	42	FG assy	VWG1472				
	43	Tilt base (lower)	VNL1555				
	44	MK flexible	VNP1439				
	45	Screw	ABZ30P060FMC				
	46	TM guide	VNL1558				
	47	Screw	PPZ20P080FMC				
	48	CA shaft (lower)	VLL1447				
	49	Spindle motor	VXM1053				
	50	Oil stopper washer	VBFI002				



2.7 CARRIAGE ASSY

Parts List

Mark	No.	Description	Part No.
A	1	TAN plate assy	VXA1981
	2	Screw	BMZ20P080FMC
	3	TAN spring (B)	VBH1217
	4	TAN lever (B)	VNL1569
	5		
NSP	6	TAN lever (A)	VNL1568
	7	TAN spring (A)	VBH1237
	8	Screw (S)	VBA1016
	9	Screw	PBB26P080FMC
	10	Shaft holder	VNT1042
NSP	11	Limit SW	OSH1001
	12	Screw	PMZ20P060FMC
	13	Screw	BBZ26P060FZK
	14	Screw	BPZ26P060FMC
	15	Flexible holder	VNL1579
B	16	Screw	PPZ20P060FZK
	17	Washer	WT17D034D050
	18	Gear (C)	VNL1572
	19	Gear (B)	VNL1571
	20	Screw	PMA20P040FMC
NSP	21	Motor holder	VNL1584
	22	Gear (E)	VNL1574
	23	Gear (F)	VNL1575
	24		
	25	Gear (D)	VNL1573
NSP	26	Gear shaft	VLL1448
	27	PCB board	VNP1425
	28	ZH connector	B2B-ZR
	29	Slider motor	VXM1027
	30	Gear (A)	VNL1570
NSP	31	Box cover	VNL1578
	32	Housing assy	VKP1852
	33	Pickup assy	VWY1037
	34	Motor holder assy - S	VXX2015
	35	Slider motor assy	VXX2014



2.8 PACKING

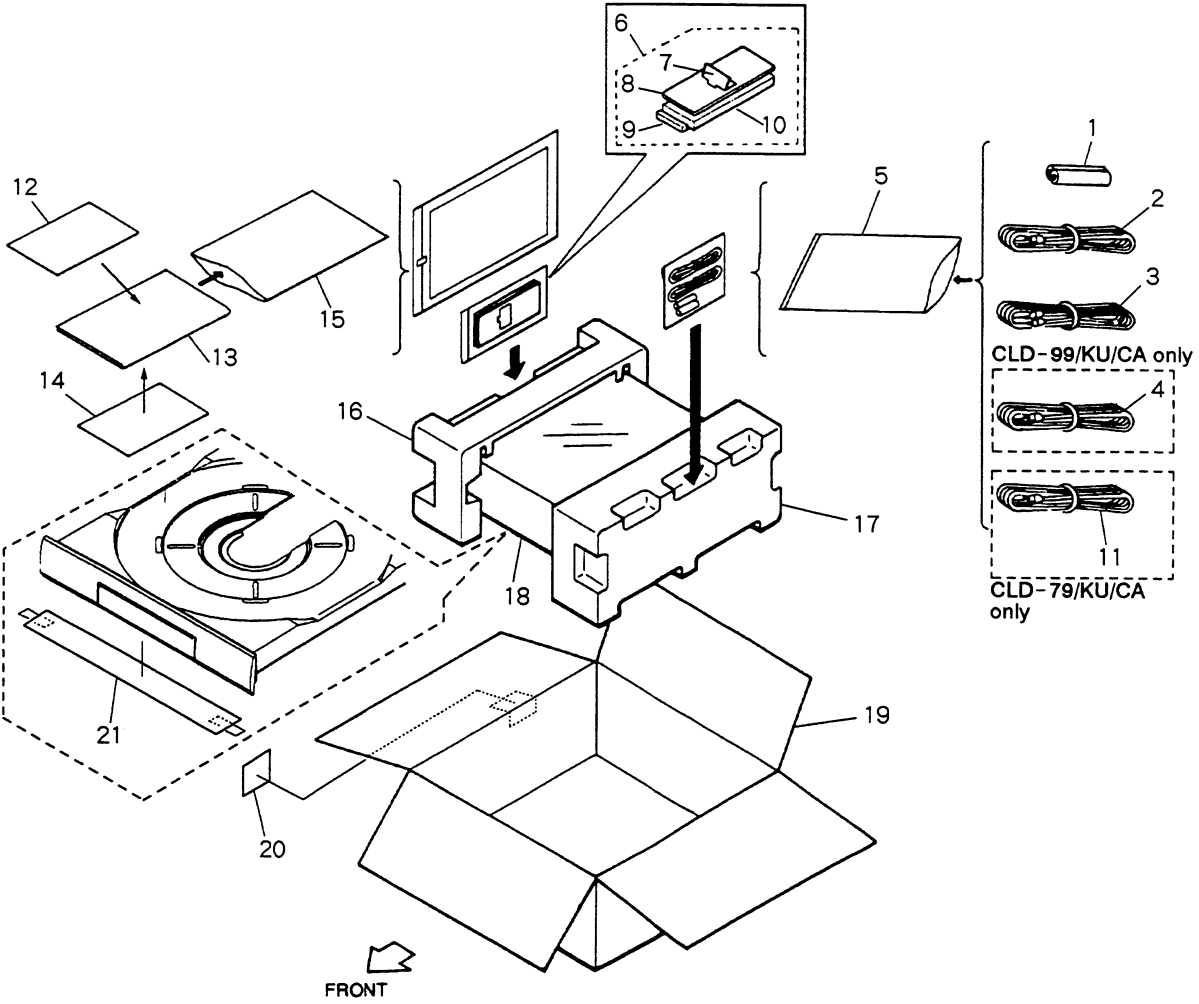
(1) CONTRAST OF CLD - 99/KU/CA AND CLD - 79/KU/CA

CLD - 99/KU/CA and CLD - 79/KU/CA have the same construction except for the following:

Mark	No.	Symbol & Description	Part No.	
			CLD - 99 /KU/CA	CLD - 79 /KU/CA
	2	Video cord	VDE1003	VDE1034
	3	Audio cord	PDE1003	VDE1033
	4	S video cord	VDE1013	Not used
	6	Remote control unit	VXX2224	VXX2255
	11	4P mini DIN cable	Not used	DDE1040
	13	Operating instructions	VRB1139	VRB1141
	19	Packing case	VHG1426	VHG1440

(2) PARTS LIST FOR CLD-99/KU/CA

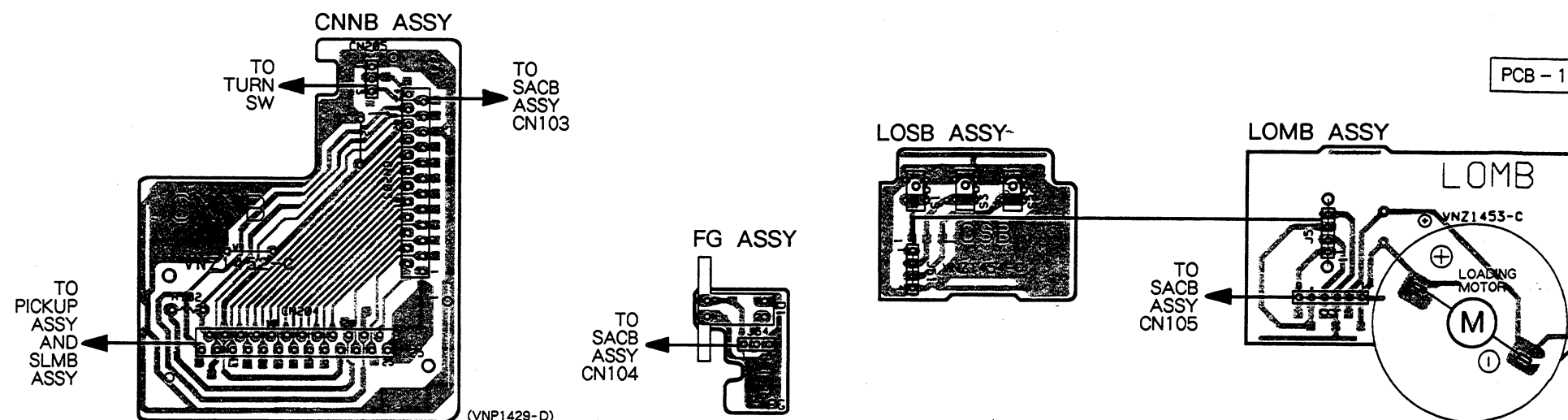
Mark	No.	Description	Part No.
NSP	1	Battery (R03, AAA)	VEM - 022
	2	Video cord	VDE1003
	3	Audio cord	PDE1003
	4	S video cord	VDE1013
NSP	5	Polyethylene bag (205*315*0.05)	Z21 - 029
	6	Remote control unit	VXX2224
NSP	7	Battery cover	DNK2286
	8	Case (below)	VNK2062
	9	Filter	VNK2063
	10	Case (upper)	VNK3183
	11		
NSP	12	Warranty card	ARY1026
	13	Operating instructions (English)	VRB1139
	14	Caution (UC)	VRR1020
	15	Polyethylene bag	VHL - 014
NSP	16	Pad L	VHA1163
	17	Pad R	VHA1164
	18	Mirror mat	VHL1012
	19	Packing case	VHG1426
	20	Caution label	VRM1044
	21	Mirror mat sheet	VHL1024



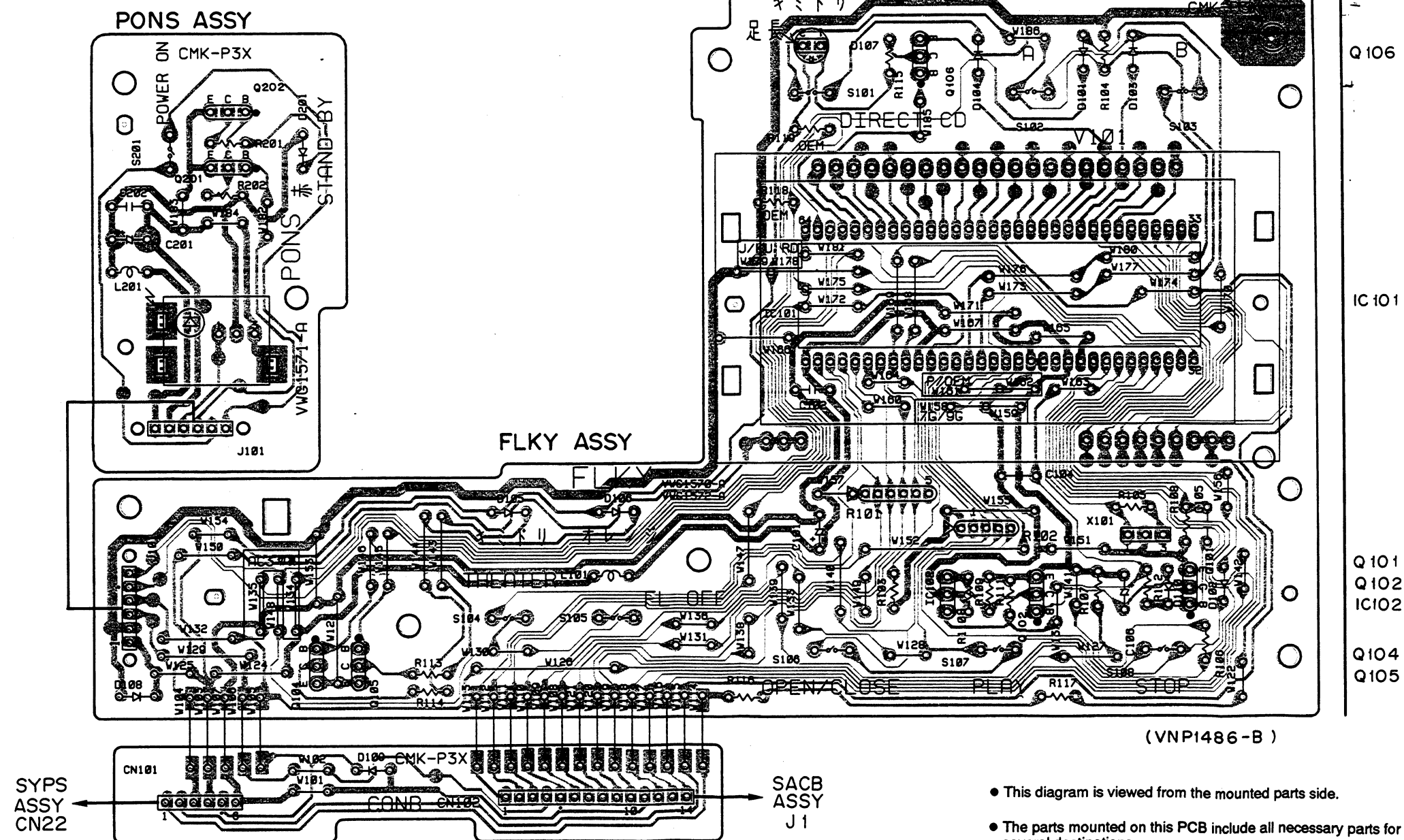
SCH - 1



SCH-1



• This diagram is viewed from the mounted parts side.



• This diagram is viewed from the mounted parts side.

• The parts mounted on this PCB include all necessary parts for several destinations. For further information for respective destinations, be sure to check with the schematic diagram.

3.2 SYPS ASSY

• Power supply assembly warnings

For this power supply assembly, over current is detected by resistor and transistor.
The $\pm 14V$ wiring is short by the thyristor and all output generation is stopped.

• When the circuit is short and the power goes OFF, unplug the unit and let it discharge for 10 - 30 seconds and then plug it again and turn on power.

• When output is stopped, a 120V charge remains for about one minute. Be careful not to touch anything.

- Detection circuit (reference) -

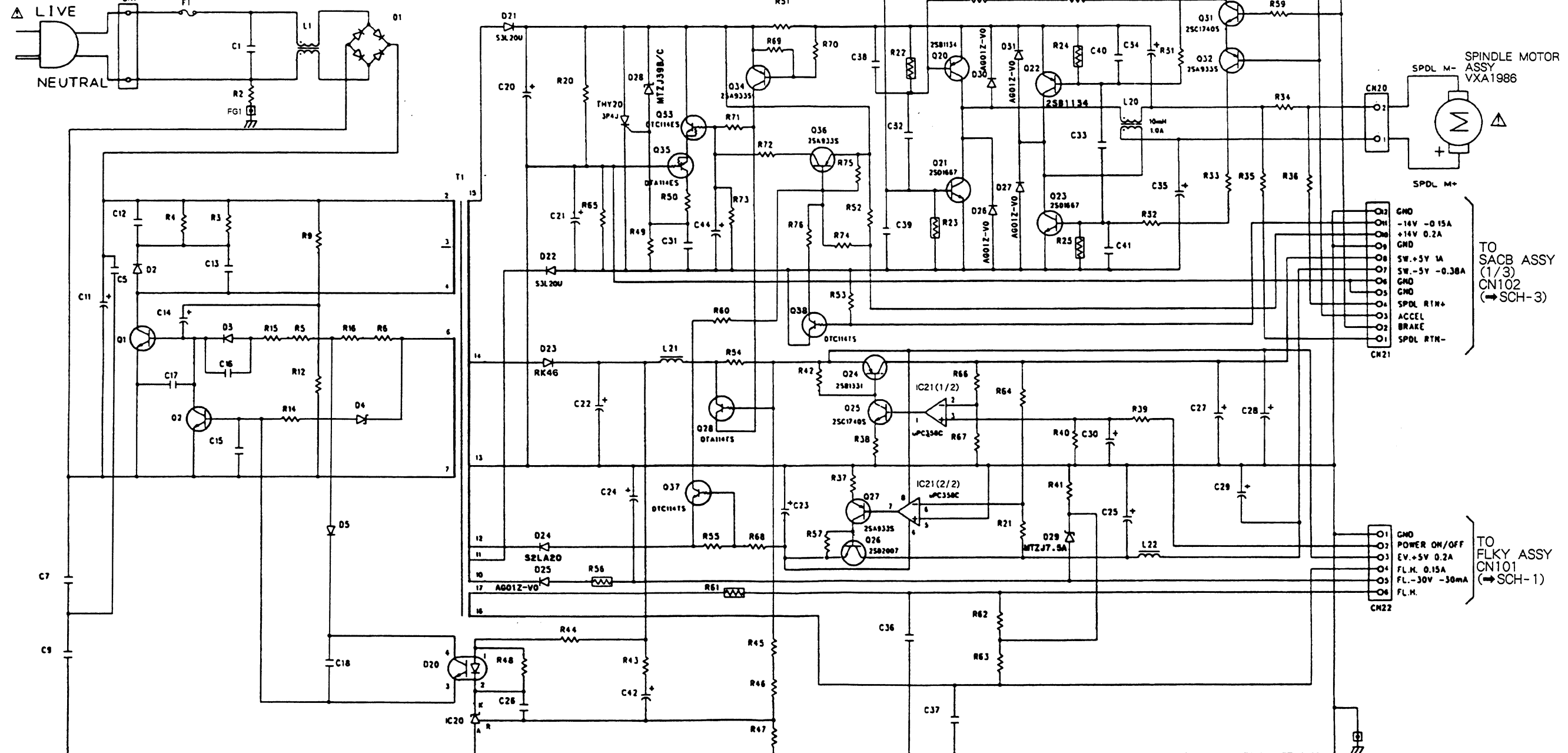
For SPDL use +14V Q34, R51
+14V Q36, R52
-14V Q38, R53
+5V Q28, R54
-5V Q37, R55
thyristor THY20

• NOTE FOR FUSE REPLACEMENT

CAUTION
FOR CONTINUED PROTECTION AGAINST RISK OF FIRE,
REPLACE ONLY WITH SAME TYPE AND RATINGS ONLY.

AC POWER CORD
VDG1046: CLD-99/KU/CA
PDG1015: CLD-79/KU/CA
AC120V
60Hz

SYPS ASSY (VWR1200)

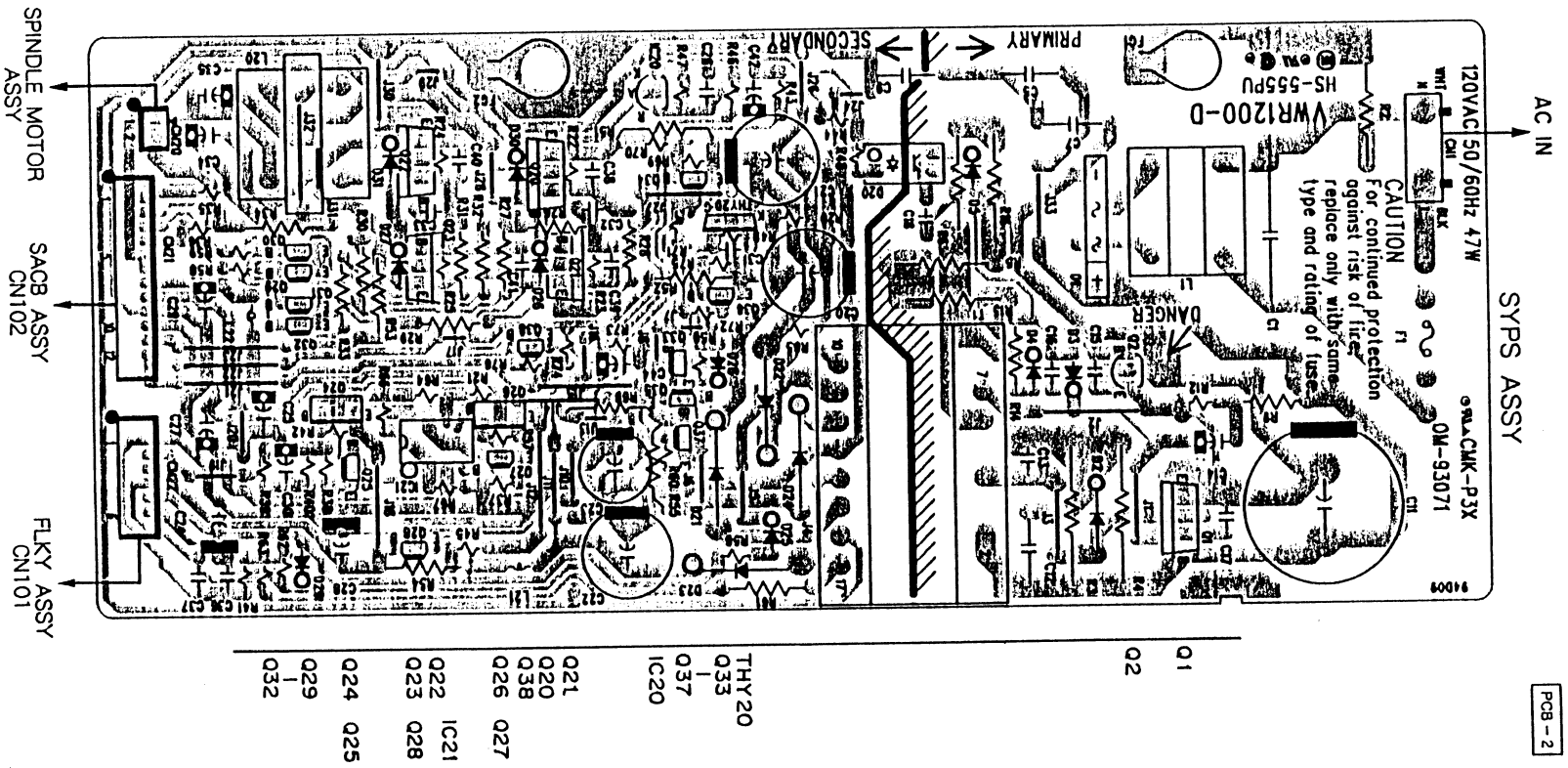


SCH-2

SYPS ASSY

SYPS ASSY

SCH-2



• This diagram is viewed from the mounted parts side.

NOTE FOR SCHEMATIC DIAGRAMS (Type 4A)

- When ordering service parts, be sure to refer to "PARTS LIST of EXPLODED VIEWS" or "PCB PARTS LIST".
- Since these are basic circuits, some parts of them or the values of some components may be changed for improvement.
- RESISTORS:
Unit: kΩ, MΩ, or Ω unless otherwise noted.
Rated power: 1/4W, 1/8W, 1/10W unless otherwise noted.
Tolerance: (F) ±1%, (G) ±2%, (K) ±10%, (M) ±20% or ±5% unless otherwise noted.
- CAPACITORS:
Unit: pμF or μF unless otherwise noted.
Ratings: capacitor (μF) / voltage (V) unless otherwise noted.
Rated voltage: 50V except for electrolytic capacitors.
- COILS:
Unit: mμH or μH unless otherwise noted.
- 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.
- OTHERS:
• Ⓢ or Ⓢ : Adjusting point.
• ◀ : Measurement point.
• The Δ 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.
- ON THE SCHEMATIC DIAGRAM:
• SCH-□ indicates the drawing number of the schematic diagram.
(SCH stands for schematic diagram.)
- SWITCHES (Underline indicates switch position):
FLKY ASSY
S101: DIRECT CD
S102: DISC SIDE A
S103: DISC SIDE B
S104: FILM MODE
S105: FL OFF
S106: OPEN/CLOSE (Δ)
S107: PLAY/PAUSE (▶/◀)
S108: STOP (■)
- PONS ASSY
S201: POWER(STANDBY/ON)
- LOS8 ASSY
S1: SW1
S2: SW2
S3: SW3

NOTE FOR

- Part number diagrams.
 - A comparison diagrams
- Symbol in Diagram:
- B C
- B
- D
- Ⓢ
- Ⓢ

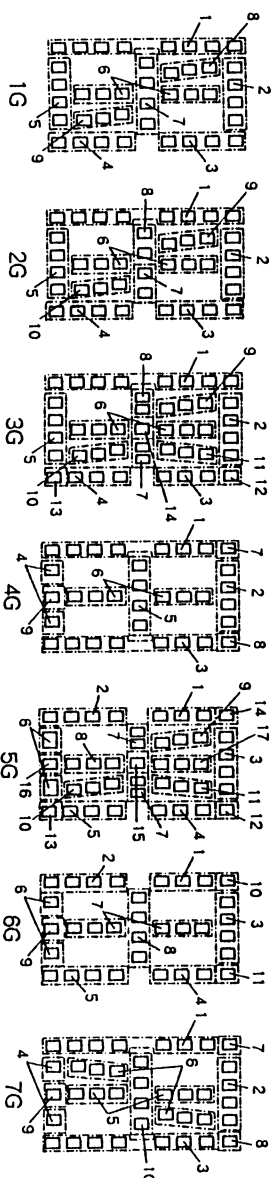
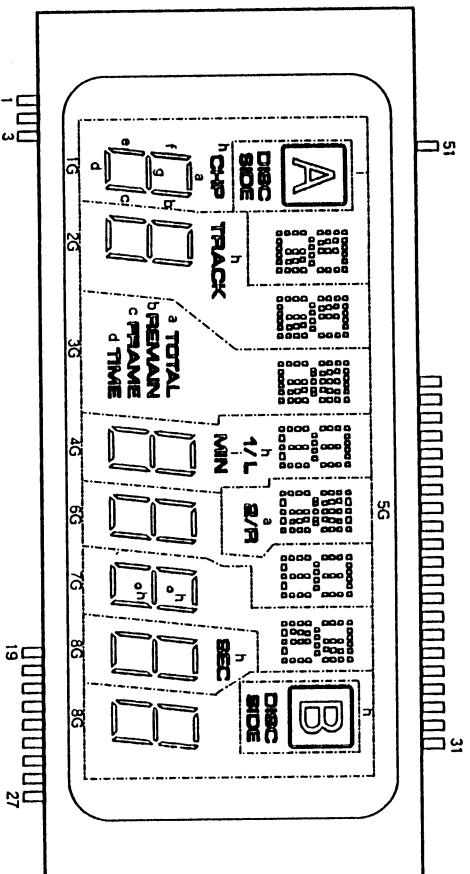
- NOTE FOR PCB DIAGRAMS:
1. Part numbers in PCB diagrams match those in the schematic diagrams.
 2. A comparison between the main parts of PCB and schematic diagrams is shown below.

Symbol in PCB Diagrams	Symbol in Schematic Diagrams	Part Name
		Transistor
		Transistor with resistor
		Field effect transistor
		Resistor array
		3-terminal regulator

FL INFORMATION

- VAW1037 (V101:FLKY ASSY)
- FL TUBE

• ANODE GRID ASSIGNMENT



• PIN ASSIGNMENT

Pin No.	Assignment	Pin No.	Assignment
1	F1	28	NL
2	F1	29	NL
3	F1	30	NL
4	NL	31	g
5	NL	32	h
6	NL	33	i
7	NL	34	j
8	NL	35	k
9	NL	36	l
10	NL	37	m
11	NL	38	n
12	NL	39	o
13	NL	40	p
14	NL	41	q
15	NL	42	r
16	NL	43	9G
17	NL	44	8G
18	NL	45	7G
19	NL	46	6G
20	e	47	5G
21	d	48	4G
22	c	49	3G
23	b	50	2G
24	a	51	1G
25	F2	52	NL
26	F2	53	NL
27	F2	54	NL

F1, F2: Filament
a~r: Anode
1G~9G: Grid
NL: No lead

• ANODE GRID ASSIGNMENT & PIN ASSIGNMENT

	1G	2G	3G	4G	5G	6G	7G	8G	9G
a	a	a	TOTAL	a	2/R	a	a	a	a
b	b	b	REMAIN	b	17	b	b	b	b
c	c	c	FRAME	c	16	c	c	c	c
d	d	d	TIME	d	15	d	d	d	d
e	e	e	14	e	14	e	e	e	e
f	f	f	13	f	13	f	f	f	f
g	g	g	12	g	12	g	g	g	g
h	CHP	TRACK	11	1/L	11	11	11	11	SEC
i	DISC SIDE	10	10	MIN	10	10	10	10	DISC SIDE
j	9	9	9	9	9	9	9	9	
k	8	8	8	8	8	8	8	8	
l	7	7	7	7	7	7	7	7	
m	6	6	6	6	6	6	6	6	
n	5	5	5	5	5	5	5	5	
o	4	4	4	4	4	4	4	4	
p	3	3	3	3	3	3	3	3	
q	2	2	2	2	2	2	2	2	
r	1	1	1	1	1	1	1	1	

P



24



SACB ASSY
(1/3)

SCH-3

WAVEFORMS AND VOLTAGE • FTS AND CONT SECTION

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

Measurement condition : In case when (D. audio) is written, at time when disc that has digital audio recording is played.

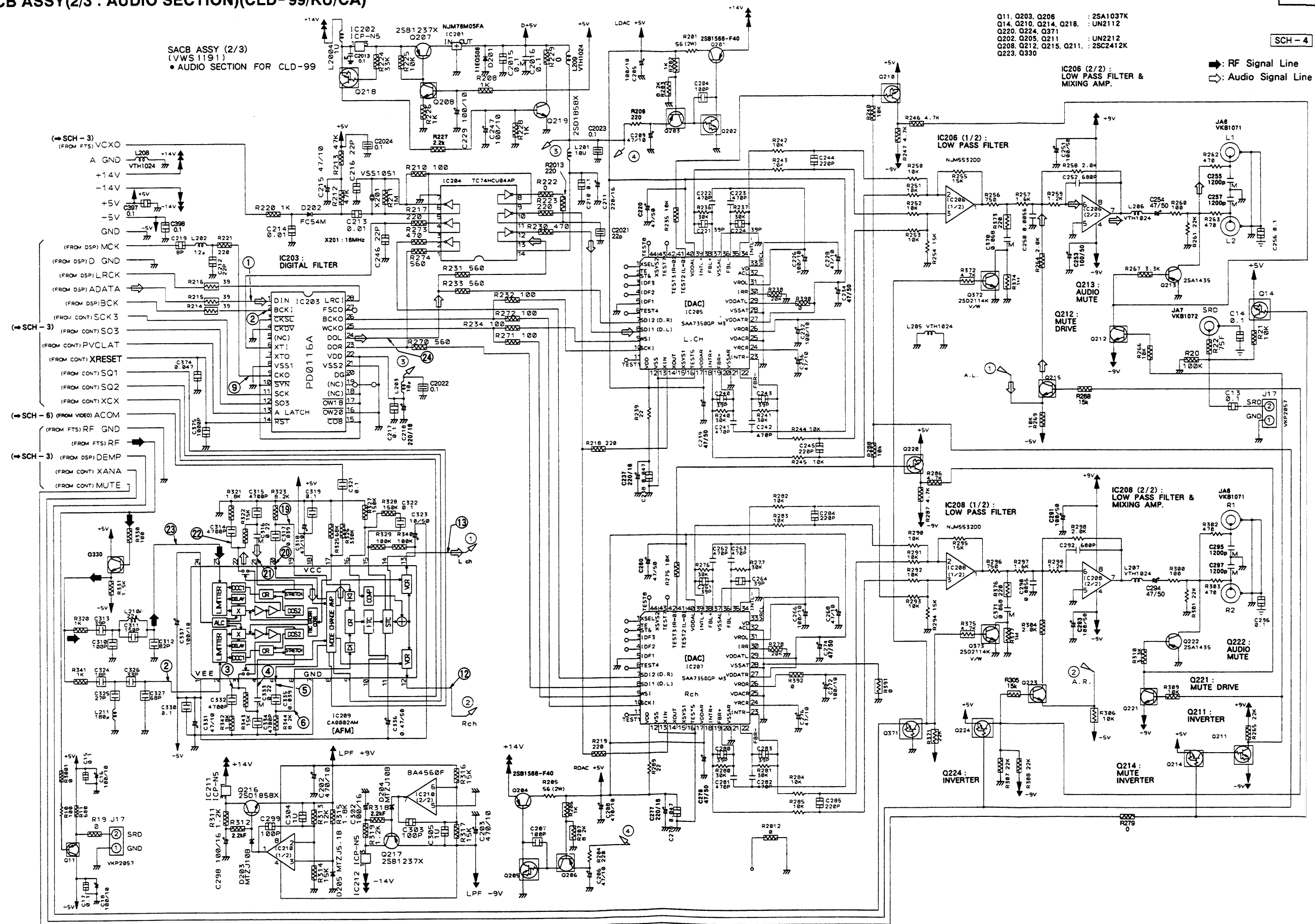
IC801(PAC002A)	IC802(LC78681E)	IC803(LA6510)	IC901(PAC003A)	CN106	IC101 (PD0205D)
②, ③ 1mS/Div. 16mVp-p AC mode	② 0.1μS/Div. 4.3Vp-p AC mode(D.audio)	① 2mS/Div. 1.8Vp-p DC mode	② 0.2mS/Div. 74mVp-p DC mode	①, ② 5mS/Div. 65mVp-p DC mode	⑦ 1V/Div 5ms/Div Approx. 1.2V DC mode(Sldr err)
⑦, ⑧ 1mS/Div. 67mVp-p DC mode	③③ 10μS/Div. 4.2Vp-p AC mode(D.audio)		⑦ 0.2mS/Div. 74mVp-p DC mode	③ 0.5mS/Div. 300mVp-p AC mode	
⑨ 5mS/Div. 0.1Vp-p DC mode	③⑤ 0.2μS/Div. 4.4Vp-p AC mode(D.audio)		①⑥ 0.2mS/Div. 0.61Vp-p DC mode	④ 5mS/Div. 15Vp-p DC mode	
	③⑥ 0.2μS/Div. 4.5Vp-p AC mode(D.audio)		④⑧ 50μS/Div. 6.2Vp-p DC mode	⑤ 5mS/Div. 5.8Vp-p DC mode	
	④③ 0.1μS/Div. 4.5Vp-p AC mode(D.audio)		⑤② 0.2μS/Div. 2.1Vp-p AC mode	⑥ 5mS/Div. 3.5Vp-p DC mode	
	⑤⑨ 0.1μS/Div. 2Vp-p AC mode(D.audio)		⑤⑦ 1mS/Div. 0.53Vp-p DC mode	⑨ 5mS/Div. 1.25Vp-p DC mode	
			⑤⑧ 0.2mS/Div. 0.32Vp-p DC mode	⑪ 10mS/Div. 1.7Vp-p DC mode	

WAVEFORMS OF AUDIO SECTION

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

IC209 (CA0002AM)	
(2) H: 5ms/Div 100mVp-p AC mode	(21) H: 5ms/Div 1.1Vp-p DC mode AC mode
(3) H: 0.5ms/Div 1.5Vp-p AC mode	(22) H: 0.5ms/Div 1.35Vp-p AC mode
(4) H: 0.5ms/Div 1.1Vp-p DC mode	(23) H: 5ms/Div 100mVp-p AC mode
(5) H: 0.5ms/Div 1.1Vp-p DC mode	
(6) H: 0.5ms/Div 1Vp-p DC mode	
IC203 (PD0116A)	
(12) H: 0.5ms/Div 1.5Vp-p DC mode	(1) 2V/Div 50μs/Div 5Vp-p DC mode (D.audio)
(13) H: 0.5ms/Div 1.5Vp-p DC mode	(2) 2V/Div 20μs/Div 5Vp-p DC mode (POWER ON)
(19) H: 0.5ms/Div 1Vp-p DC mode	(9) 2V/Div 20μs/Div 5Vp-p DC mode (D.audio)
(20) H: 0.5ms/Div 1Vp-p DC mode	(24) 2V/Div 0.2ms/Div 1Vp-p 5Vp-p 1Vp-p DC mode (D.audio)

3.4 SACB ASSY(2/3 : AUDIO SECTION)(CLD- 99/KU/CA)



SCH-4

SACB ASSY
(2/3)
(CLD-99/KU/CA)

SACB ASSY
(2/3)
(CLD-99/KU/CA)

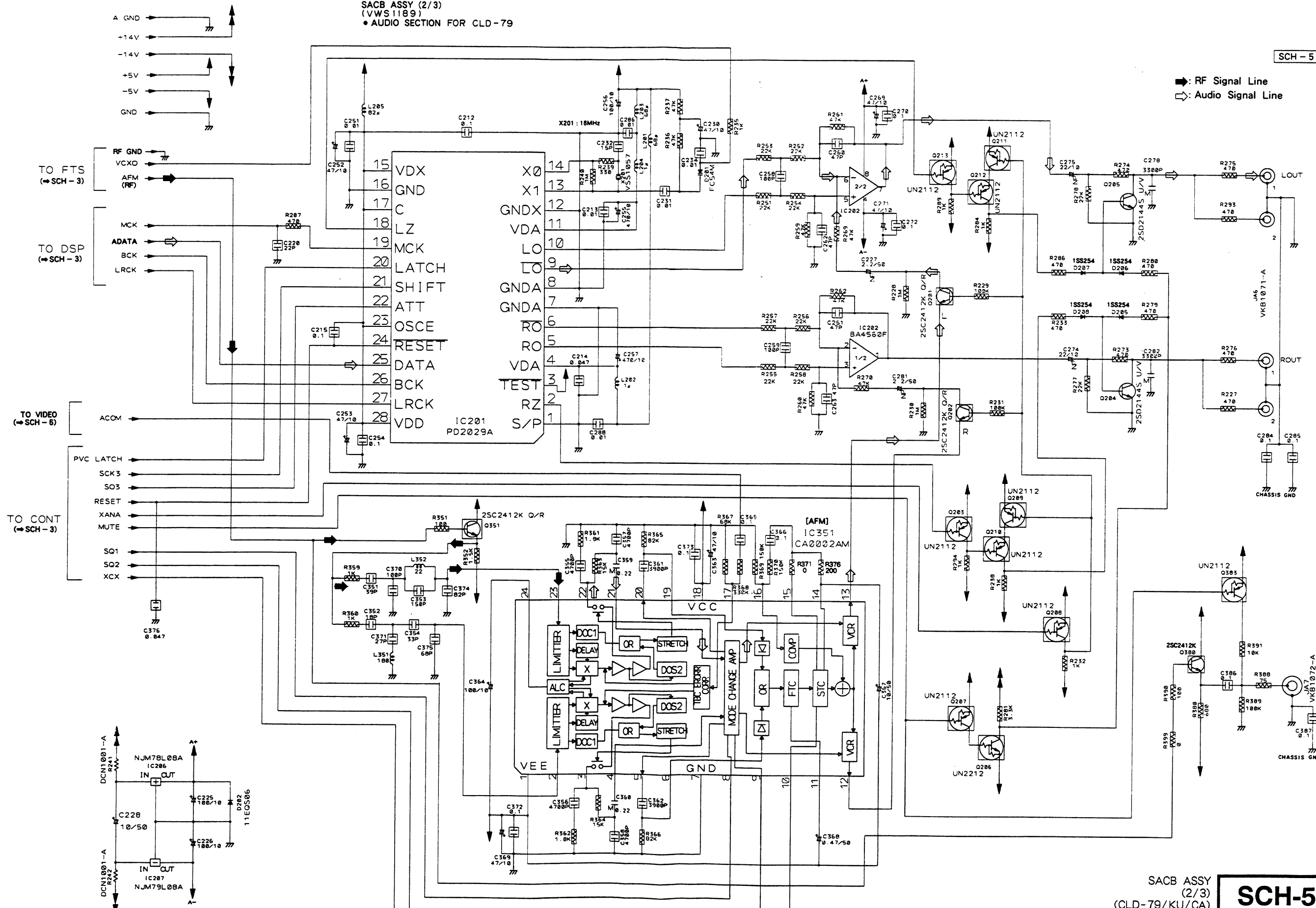
SCH-4

3.5 SACB ASSY(2/3 : AUDIO SECTION)(CLD-79/KU/CA)

SACB ASSY (2/3)
(VWS1189)
• AUDIO SECTION FOR CLD-79

SCH - 5

➡: RF Signal Line
➡: Audio Signal Line

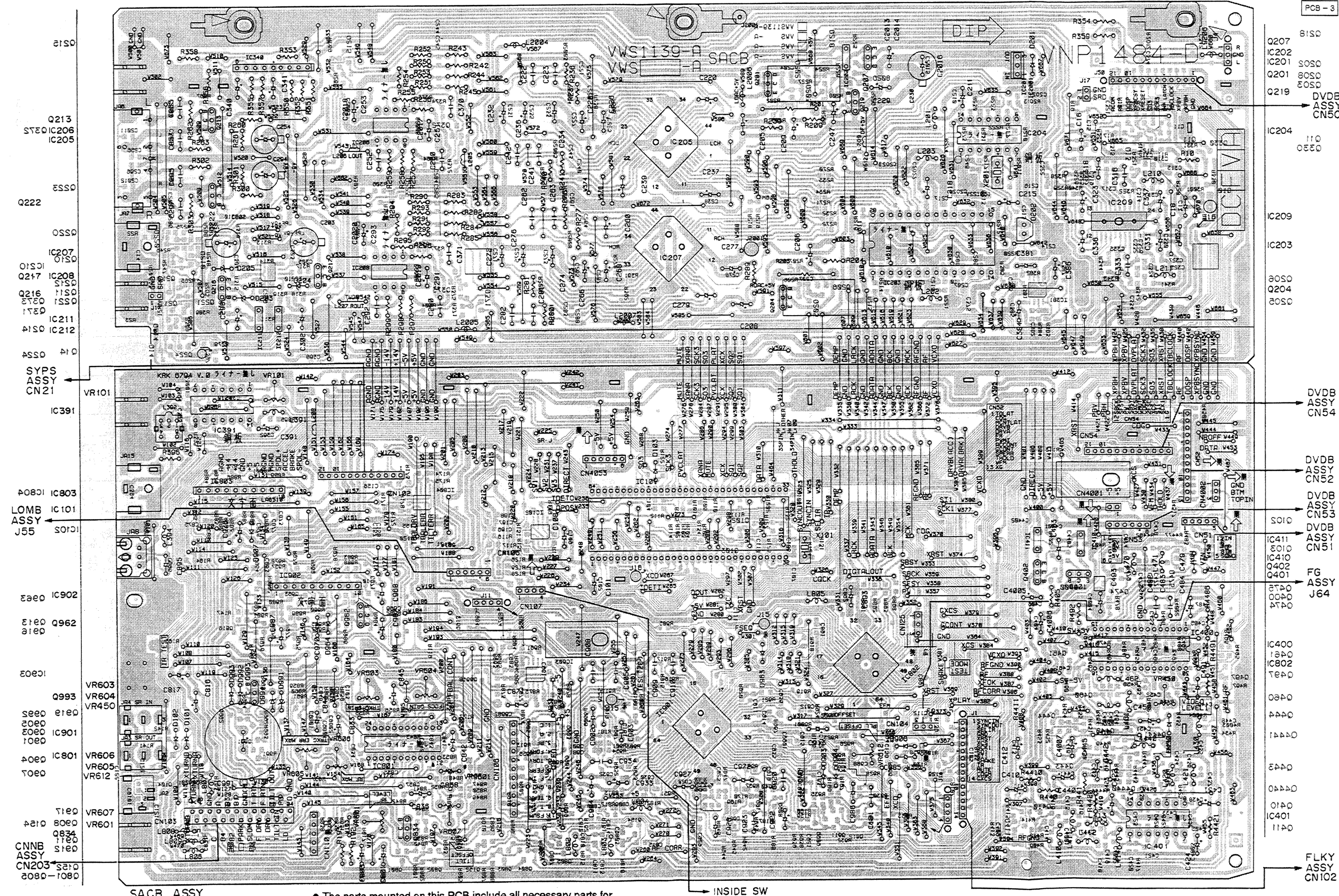


SACB ASSY
(2/3)
(CLD-79/KU/CA)
SCH-5

SACB ASSY
(2/3)
(CLD-79/KU/CA)

SCH-5

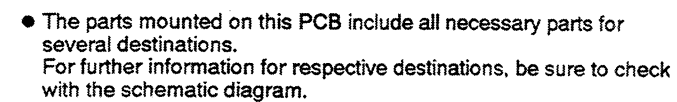
• FOR CLD-99/KU/CA



- The parts mounted on this PCB include all necessary parts for several destinations.
For further information for respective destinations, be sure to check with the schematic diagram.

● This diagram is viewed from the mounted parts side.

PCB - 4



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3.6 SACB ASSY(3/3), DVDB ASSY(1/2)(VIDEO SECTION)

WAVEFORMS OF VIDEO SECTION

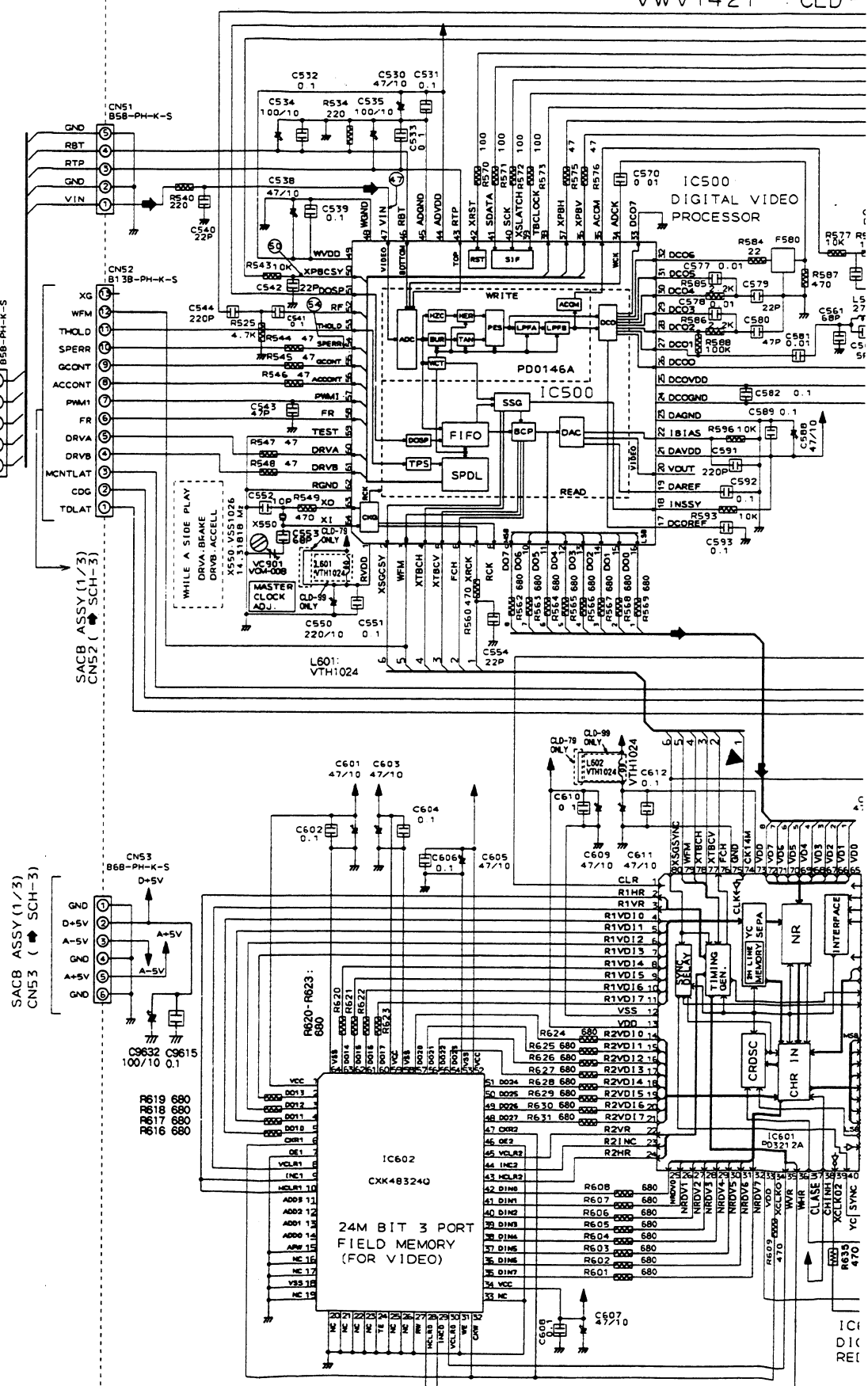
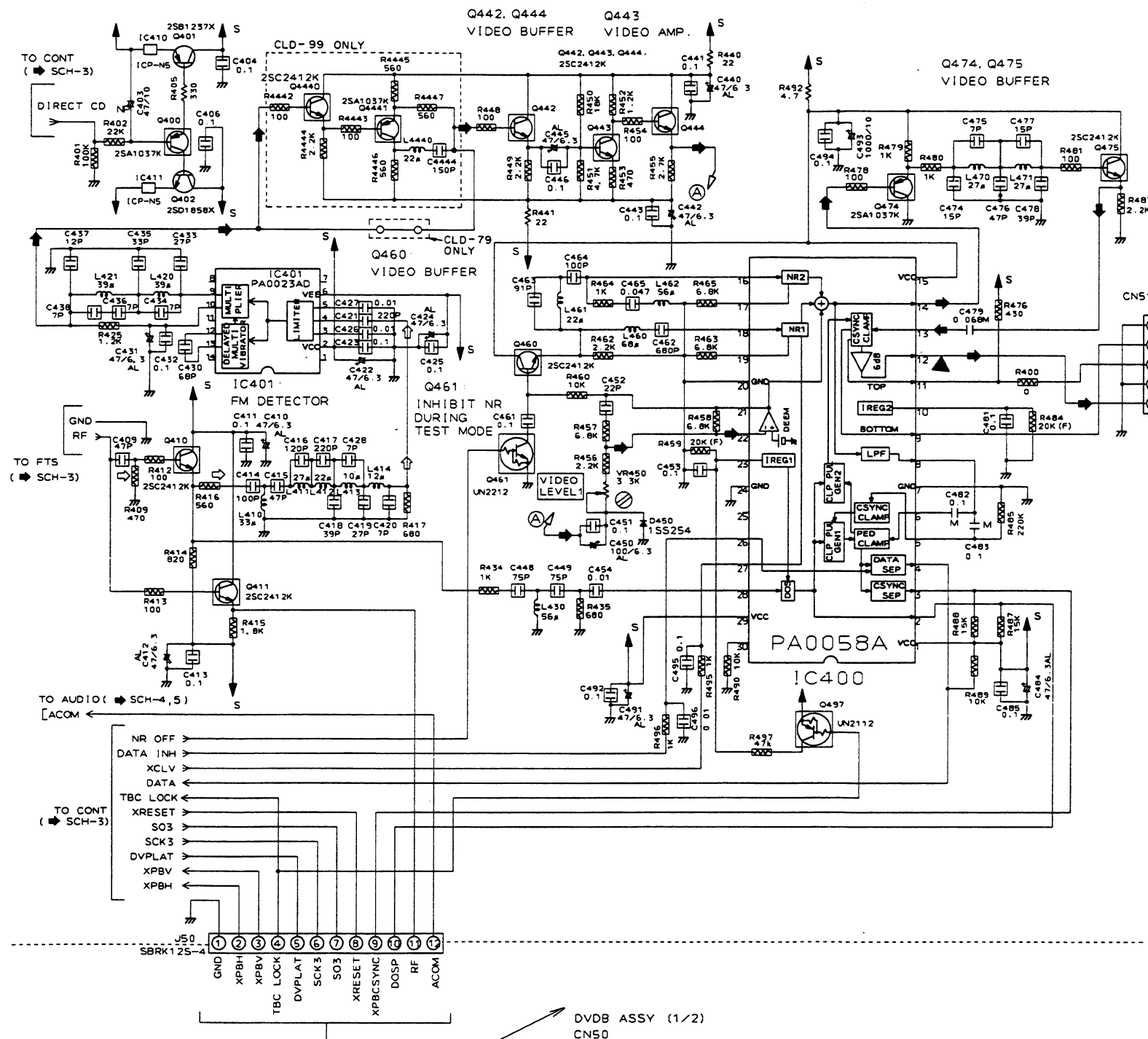
Note: (No.) In the table correspond to the pin number.

Measurement condition: Where (Color bars) is written, at time when color bar screen of disc is being played. Where (Still) is written, at time of still.

IC400(PA0058A)	
⑭	20μS/Div. 0.9Vp-p AC mode(Color bars)
⑰	20μS/Div. 0.9Vp-p AC mode(Color bars)
IC401(PA0023AD)	
⑩	20μS/Div. 0.24Vp-p AC mode(Color bars)
IC500(PD0146A)	
④⑦	20μS/Div. 1.7Vp-p AC mode(Color bars)
⑤⑩	50μS/Div. 5.2Vp-p AC mode[Color bars]
⑤④	50μS/Div. 2.5Vp-p AC mode[Color bars]

SACB ASSY (3/3) VWS1191:CLD-99
(VIDEO SECTION) VWS1189:CLD-79

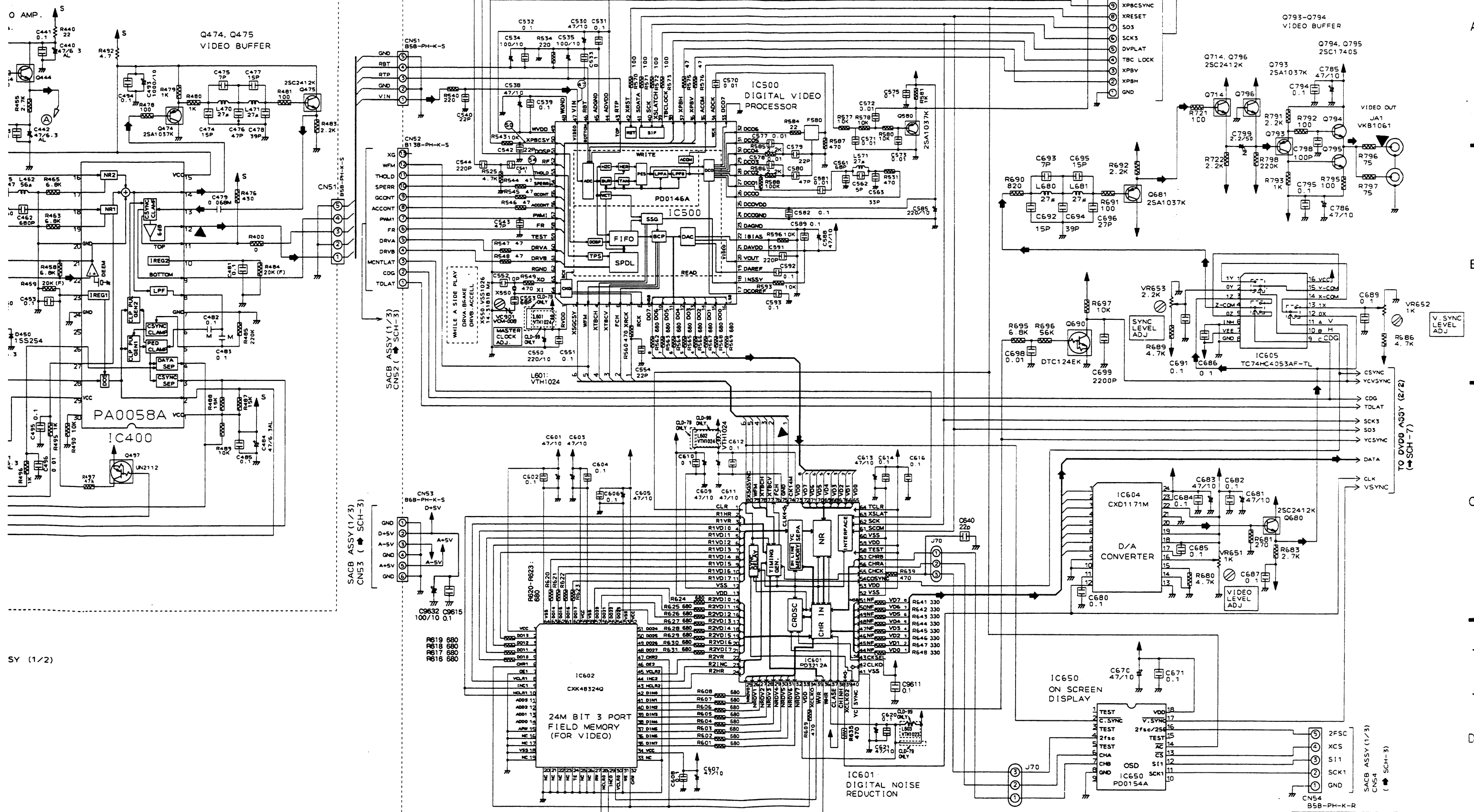
DVDB ASSY (1/2) VVW1420:CLD-
VVW1421:CLD-



SCH-6

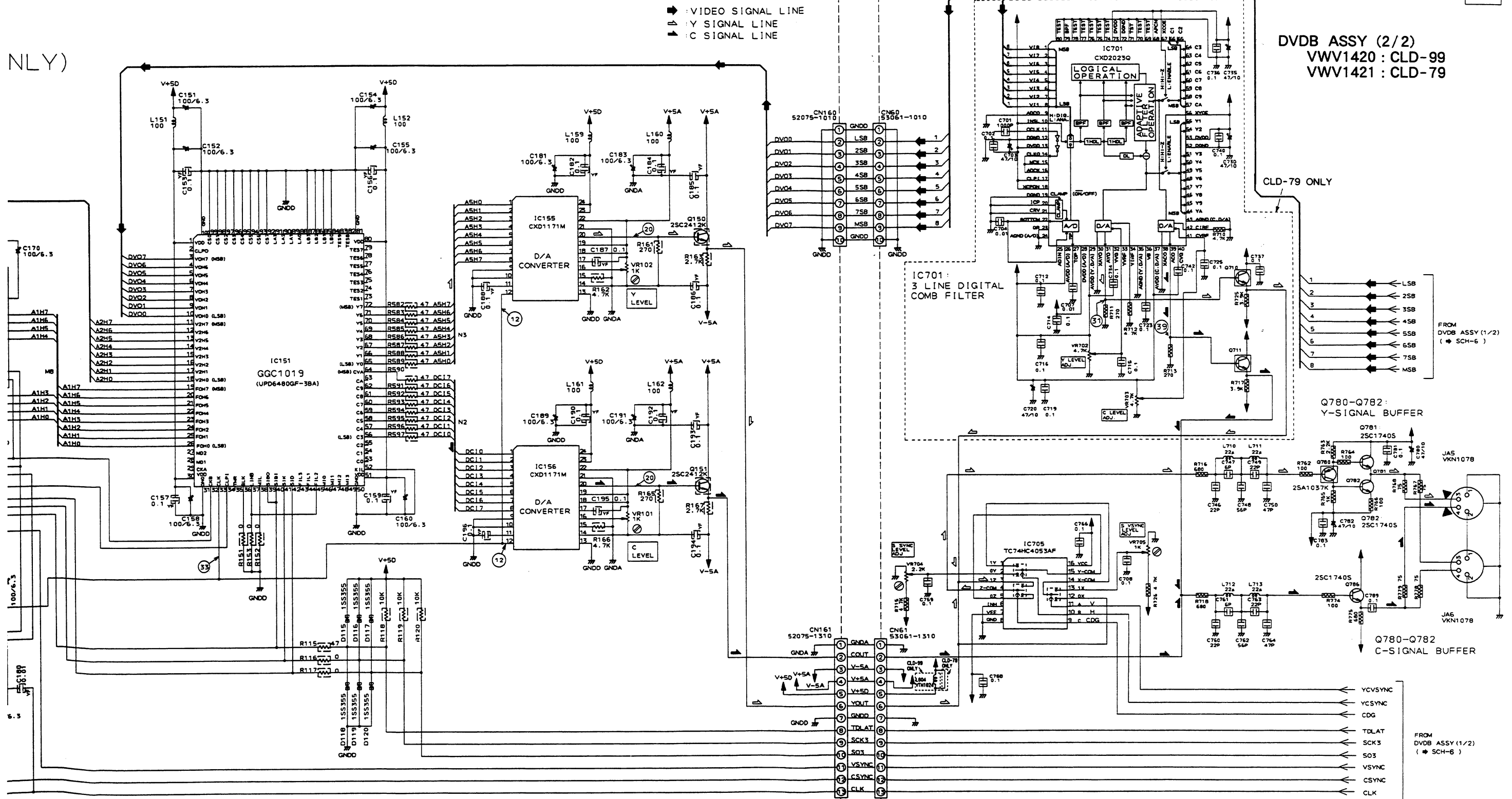
SACB ASSY (3/3),
DVDB ASSY (1/2)

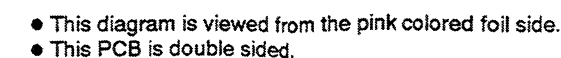
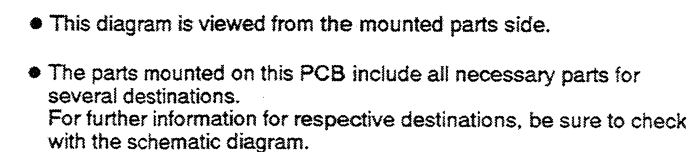
IC1
D1C
RE1

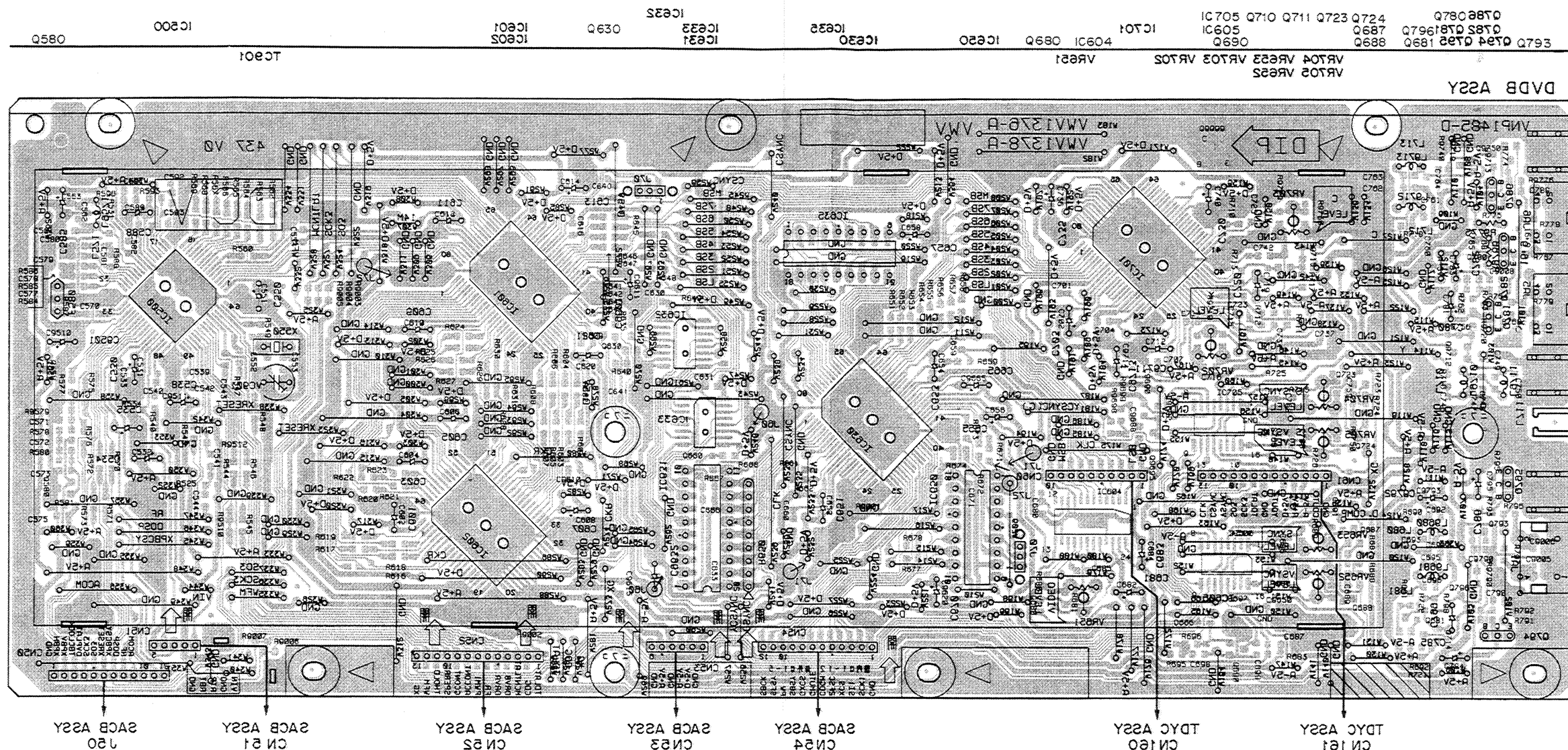
VWS1191:CLD-99
VWS1189:CLD-79DVDB ASSY (1/2) VWV1420:CLD-99
VWV1421:CLD-79SACB ASSY
(3/3)
J50RF SIGNAL LINE
VIDEO SIGNAL LINESACB ASSY (3/3),
DVDB ASSY (1/2)

SCH-6

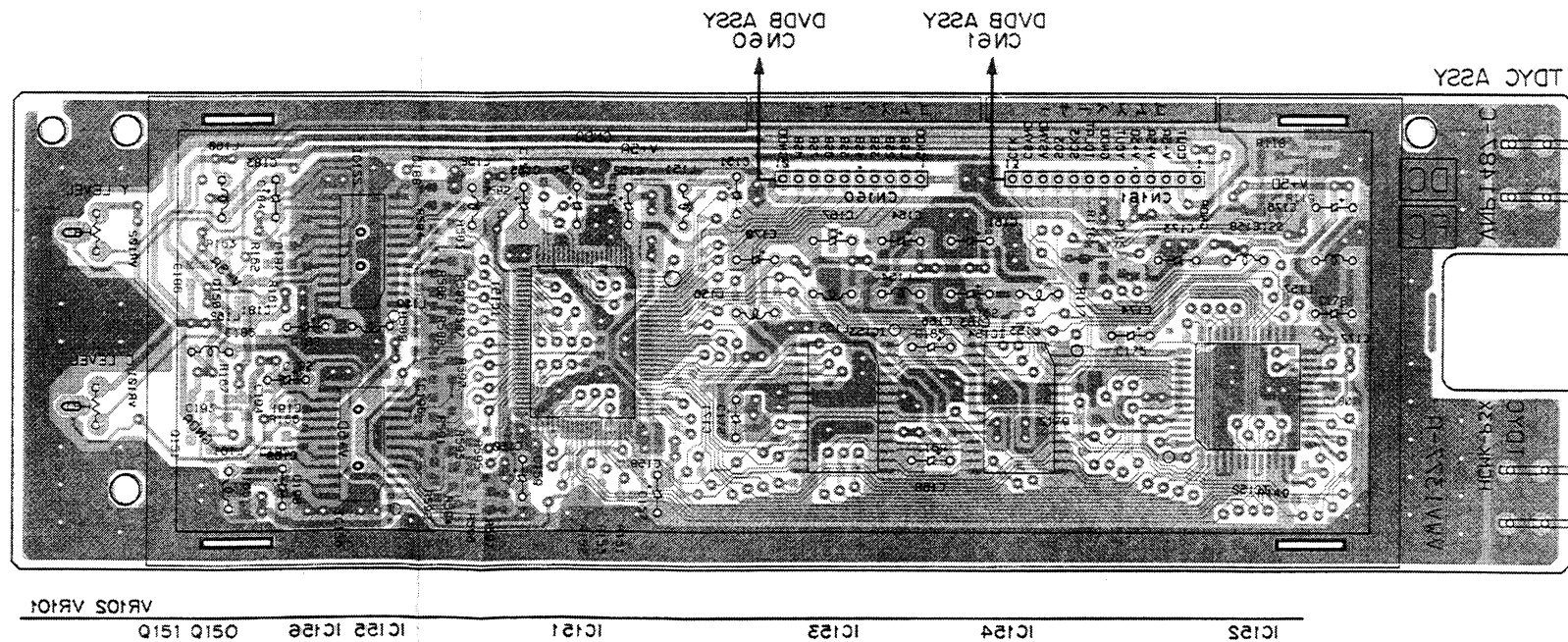
NLY)







● This diagram is viewed from the foil side.



- This diagram is viewed from the gray colored foil side.
- This PCB is double sided.

4. PCB PARTS LIST

NOTES:

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

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

560 Ω $\rightarrow$ $56 \times 10^1 \rightarrow 561$ RD1/8PM $\overline{561}J$
 47k Ω $\rightarrow$ $47 \times 10^3 \rightarrow 473$ RD1/4PS $\overline{473}J$
 0.5 Ω $\rightarrow$ 0R5 RN2H $\overline{0R5}K$
 1 Ω $\rightarrow$ 010 RS1P $\overline{010}K$

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

5.62k Ω $\rightarrow$ $562 \times 10^1 \rightarrow 5621$ RN1/4PC $\overline{5621}F$

Mark	No.	Description	Part No.
LIST OF ASSEMBLIES			
Δ		SYPS ASSY	VWR1200
		SACB ASSY (CLD-99/KU/CA)	VWS1191
		SACB ASSY (CLD-79/KU/CA)	VWS1189
		DVDB ASSY (CLD-99/KU/CA)	VWV1420
		DVDB ASSY (CLD-79/KU/CA)	VWV1421
		TDYC ASSY (CLD-99/KU/CA ONLY)	VWV1377
NSP		FLKB ASSY (CLD-99/KU/CA)	VWM1582
		FLKY ASSY (CLD-99/KU/CA)	VWG1644
NSP		PONS ASSY	VWG1571
NSP		FLKB ASSY (CLD-79/KU/CA)	VWM1583
		FLKY ASSY (CLD-79/KU/CA)	VWG1645
NSP		PONS ASSY	VWG1571
NSP		MACB ASSY	VWM1420
NSP		CNNB ASSY	VWG1469
NSP		LOMB ASSY	VWG1470
NSP		LOSB ASSY	VWG1471
NSP		FG ASSY	VWG1472

SYPS ASSY

SEMICONDUCTORS

IC21	UPC358C
Q27, Q30, Q32, Q34, Q36	2SA933S
Q20, Q22	2SB1134
Q24	2SB1331
Q25, Q29, Q31	2SC1740S
Q21, Q23	2SD1667
Q26	2SD2007
Q35	DTA114ES
Q28	DTA114TS
Q33	DTC114ES
Q37, Q38	DTC114TS
D25-D27, D30, D31	AG012-V0
D28	MTZJ39B
D29	MTZJ7. 5A
D23	RK46

Mark	No.	Description	Part No.
	D24		S2LA20
	D21, D22		S3L20U
	THY20		3P4J
COIL			
	L20	(10 μ H)	VTL1008
RESISTORS			
	R22-R25	(47 Ω)	VCN1033
	R56	(15 Ω)	VCN1034
	R61	(4.7 Ω)	VCN1035
SACB ASSY (CLD-99/KU/CA)			
SEMICONDUCTORS			
	IC102		BA10393F
	IC210, IC804, IC903		BA4560F
	IC209		CA0002AM
	IC202, IC211, IC212, IC410, IC411		ICP-N5
	IC803		LA6510
	IC802		LC78681E
	IC206, IC208		NJM5532DD
	IC201		NJM78M05FA
	IC401		PA0023AD
	IC400		PA0058A
	IC801		PAC002A
	IC901		PAC003A
	IC203		PD0116A
	IC101		PD0205D
	IC205, IC207		SA07350GP
	IC902		TA8464K
	IC204, IC391		TC74HCU04AP
	Q102, Q11, Q154, Q203, Q206		2SA1037K
	Q400, Q4441, Q474, Q802, Q912		2SA1037K
	Q963, Q992		2SA1037K
	Q213, Q222		2SA1435
	Q207, Q217, Q401, Q834		2SB1237X
	Q201, Q204		2SB1566-F40
	Q993		2SC1740S
	Q208, Q212, Q215, Q221, Q223		2SC2412K

Mark	No.	Description	Part No.
	Q330, Q410, Q411, Q442-Q444		2SC2412K
	Q4440, Q460, Q475, Q801, Q805		2SC2412K
	Q903-Q905, Q907-Q909, Q911		2SC2412K
	Q913, Q917, Q919		2SC2412K
	Q152, Q803, Q804		2SC3802K
	Q216, Q219, Q402		2SD1858X
	Q372, Q373		2SD2114K
	Q962		2SK184
	Q14, Q210, Q214, Q218, Q220		UN2112
	Q224, Q371, Q497, Q916, Q991		UN2112
	Q103, Q202, Q205, Q211, Q461		UN2212
	D201		11EQS06
	D102, D103, D450, D903, D904		1SS254
	D906, D907, D963, D964		1SS254
	D992, D993		1SS254
	D202		FC54M
	D203, D204, D991		MTZJ10B
	D205		MTZJ5. 1B
	D994		MTZJ6. 2A

COILS

L201, L203, L413, L805 L394, L808, L809 L202, L391, L414 L802, L803 L211, L804	LAU100J LAU101J LAU120J LAU121J LAU181J
L2004 L210, L412, L4440, L461 L806, L807 L411, L470, L471 L410	LAU1R0J LAU220J LAU220J LAU270J LAU330J
L420, L421 L430, L462 L460 L205-L209 L392	LAU390J LAU560J LAU680J VTH1024 VTL1042

CAPACITORS

C420, C428, C434, C436, C438 C475 C219 C159, C393, C809, C811 C163, C204, C207, C299, C303	CCSQCH070D50 CCSQCH070D50 CCSQCH080D50 CCSQCH100D50 CCSQCH101J50
C310, C414, C464 C437 C416, C814, C846, C848 C474, C477 C161, C311, C4444, C810	CCSQCH101J50 CCSQCH120J50 CCSQCH121J50 CCSQCH150J50 CCSQCH151J50
C324 C2021, C212, C216, C246, C452 C162, C244, C245, C284, C285 C417, C421, C812, C935 C325, C419, C433, C931	CCSQCH180J50 CCSQCH220J50 CCSQCH221J50 CCSQCH221J50 CCSQCH270J50
C106, C107, C326, C435, C813 C221, C224, C240, C243, C261 C264, C280, C283, C313, C418 C478 C112, C409, C415, C476, C963	CCSQCH330J50 CCSQCH390J50 CCSQCH390J50 CCSQCH390J50 CCSQCH470J50

C327, C430, C806 C462 C448, C449 C312 C463	CCSQCH680J50 CCSQCH681J50 CCSQCH750J50 CCSQCH820J50 CCSQCH910J50
C450 C410, C412, C422, C424, C431 C440, C442, C445, C484, C491 C871 C985	CEAL101M6R3 CEAL470M6R3 CEAL470M6R3 CEANP100M25 CEANP101M10
C972 C926 C403, C838 C986 C904	CEANP220M10 CEANP2R2M50 CEANP470M10 CEANPR22M50 CEAS010M50
C323, C902 C16, C18, C229, C247, C337 C816, C817, C833, C844, C893 C927, C933 C298, C302	CEAS100M50 CEAS101M10 CEAS101M10 CEAS101M10 CEAS101M16
C493 C922, C976, C987 C391, C895 C101, C108, C215, C318, C331 C801, C803, C836, C842	CEAS102M10 CEAS220M25 CEAS221M6R3 CEAS470M10 CEAS470M10
C205, C208 C845 C336, C913 C970 C967, C968	CEAS471M10 CEAS4R7M50 CEASR47M50 CEHAQ010M50 CEHAQ100M50
C211, C218, C237, C277 C206, C209, C226, C228, C232 C236, C266, C268, C272, C276 C251, C253, C291, C293 C202, C203	CEYA221M16 CEYA470M10 CEYA470M10 CEZA101M50 CEZA471M25
C2013, C2016 C255, C257, C295, C297 C222, C223, C241, C242 C262, C263, C281, C282 C250, C290	CFTXA104J50 CFTXA122J50 CFTXA471J50 CFTXA471J50 CFTXA562J50
C252, C292 C370, C371 C191 C482, C483, C908, C910, C920 C923	CFTXA681J50 CFTXA683J50 CFTYA103J50 CFTYA104J50 CFTYA124J50
C316, C333, C905 C479 C111, C375, C891, C897, C914 C936, C969 C110, C907	CFTYA224J50 CFTYA683J50 CKSQYB102K50 CKSQYB102K50 CKSQYB222K50
C919 C317, C335 C314, C315, C332, C334, C888 C105, C122, C156-C158 C213, C214, C394, C395	CKSQYB332K50 CKSQYB393K50 CKSQYB472K50 CKSQYF103Z50 CKSQYF103Z50

Mark	No.	Description	Part No.
	C426, C427, C454, C496, C807 C834, C835, C843, C872, C876 C894, C929, C937, C961, C962 C102, C104, C109, C13-C15 C151, C155, C17, C196-C198		CKSQYF103Z50 CKSQYF103Z50 CKSQYF103Z50 CKSQYF104Z25 CKSQYF104Z25
	C2015, C2022-C2024, C210, C217 C256, C296, C319, C321, C322 C330, C392, C397, C398, C404 C406, C411, C413, C423, C425 C432, C441, C443, C446, C451		CKSQYF104Z25 CKSQYF104Z25 CKSQYF104Z25 CKSQYF104Z25 CKSQYF104Z25
	C453, C461, C481, C485, C492 C494, C495, C802, C804 C831, C832, C840, C841 C873, C874, C892, C896, C901 C915, C928, C932, C981, C988		CKSQYF104Z25 CKSQYF104Z25 CKSQYF104Z25 CKSQYF104Z25 CKSQYF104Z25
	C921 C837, C930 C103, C465, C808, C815, C847 C875, C877, C911, C912 C924, C925, C964, C971		CKSQYF223Z50 CKSQYF333Z25 CKSQYF473Z25 CKSQYF473Z25 CKSQYF473Z25
	C983, C984 C238, C278, C374 C304, C305 C934 C903, C909		CKSQYF473Z25 CKSQYF473Z50 CKSYF105Z16 CQMA122J50 CQMA222J50
	C991 C234, C254, C274, C294 C220, C239, C260, C279	(1F/5.5V) (47 μ F/50V) (47 μ F/25V)	VCH1039 VCH1148 VCH1149

RESISTORS

R10, R260, R300 R242-R245, R250-R253 R282-R285, R290-R293 R259, R299 R254, R255, R294, R295	RD1/6PM101J RD1/6PM103J RD1/6PM103J RD1/6PM122J RD1/6PM153J
R257, R297 R258, R298 R192, R193, R239, R289 R440, R441 R204, R209	RD1/6PM162J RD1/6PM202J RD1/6PM220J RD1/6PM220J RD1/6PM221J
R261, R301 R236, R237, R240, R241 R276, R277, R280, R281 R405 R262, R263, R302, R303	RD1/6PM223J RD1/6PM303J RD1/6PM303J RD1/6PM331J RD1/6PM471J
R492 R256, R296 R396 R22 R173, R174	RD1/6PM47J RD1/6PM751J RD1/6PM910J RN1/10SC750D RN1/10SE103D
R459, R484 R312, R318 R171, R172, R175, R178 R201, R205 VR606	RN1/10SE203D RN1/10SE222D RN1/10SE333D RS2LMF560J VRTB6VS153
VR601 VR450 VR605 VR101 VR603	VRTB6VS222 VRTB6VS332 VRTB6VS333 VRTB6VS471 VRTB6VS472

Mark	No.	Description	Part No.
	VR604, VR607, VR612 Other Resistors		VRTB6VS473 RS1/10S□□□J
OTHERS			
		4P CABLE HOLDER 12P CABLE HOLDER 11P TOP POST KR CONNECTOR KR CONNECTOR 3P	51048-0400 51048-1200 B11P-SHF-1AA B13B-PH-K-S B3B-PH-K-S
	CN106 CN52 CN104		
	CN125 CN107 CN110 CN51 CN54	3P TOP POST KR CONNECTOR 5P TOP POST KR CONNECTOR KR CONNECTOR	B3P-SHF-1AA B4B-PH-K-S B5B-EH B5B-PH-K-S B5B-PH-K-R
	CN53 J11 JA8 JA3, JA4 CN105	KR CONNECTOR 2mm PITCH JUMPER 4P OPTICAL OUTPUT MODULE REMOTE CONTROL JACK 2mm PITCH JUMPER 6P	B6B-PH-K-S D20PDD0425E GP1F32T RKN1004 SBRK06S-4
	CN103 JA15 JA6 JA7	24P CONNECTOR PCB BINDER COAXIAL PIN JACK 4P PIN JACK 1P PIN JACK	SLEM24S-2 VEF1040 VKB1052 VKB1071 VKB1072
	X101 X201	CONDUCTIVE PLATE B IC HEAT SINK SCREW TERMINAL EARTH PLATE CERAMIC RESONATOR(9.00MHz) CRYSTAL RESONATOR(16MHz)	VNE1194 VNE1921 VNE1948 VNF-091 VSS1040 VSS1051

SACB ASSY(CLD- 79/KU/CA)

SEMICONDUCTORS

IC102 IC202, IC804, IC903 IC351 IC410, IC411 IC803	BA10393F BA4560F CA0002AM ICP-N5 LA6510
IC802 IC206 IC207 IC401 IC400	LC78681E NJM78L08A NJM79L08A PA0023AD PA0058A
IC801 IC901 IC101 IC201 IC902	PAC002A PAC003A PDO205D PD2029A TA8464K
IC391 Q102, Q154, Q400, Q474, Q802 Q912, Q963, Q992 Q401, Q834 Q993	TC74HCU04AP 2SA1037K 2SA1037K 2SB1237X 2SC1740S
Q201, Q202, Q351, Q380 Q410, Q411, Q442-Q444, Q460 Q475, Q801, Q805, Q903-Q905 Q907-Q909, Q911, Q913, Q917 Q919	2SC2412K 2SC2412K 2SC2412K 2SC2412K 2SC2412K

Mark	No.	Description	Part No.
	Q152, Q803, Q804		2SC3802K
	Q402		2SD1858X
	Q204, Q205		2SD2144S
	Q962		2SK184
	Q203, Q207-Q213, Q383, Q497		UN2112
	Q916, Q991		UN2112
	Q103, Q206, Q461		UN2212
	D202		11EQS06
	D102, D103, D205-D208, D450		1SS254
	D903, D904, D906, D907		1SS254
	D963, D964, D992, D993		1SS254
	D201		FC54M
	D991		MTZJ10B
	D994		MTZJ6. 2A

COILS

L202, L204	LAU010J
L413, L805	LAU100J
L394	LAU101J
L391, L414	LAU120J
L802, L803	LAU121J
L351, L804	LAU181J
L352, L412, L461, L806, L807	LAU220J
L411, L470, L471	LAU270J
L410	LAU330J
L420, L421	LAU390J
L430, L462	LAU560J
L201, L203, L460	LAU680J
L205	LAU820J
L392	VTL1042

CAPACITORS

C420, C428, C434, C436, C438	CCSQCH070D50
C475	CCSQCH070D50
C159, C393, C809, C811	CCSQCH100D50
C163, C258, C259, C370, C414	CCSQCH101J50
C464	CCSQCH101J50
C437	CCSQCH120J50
C416, C814, C846, C848	CCSQCH121J50
C232, C474, C477	CCSQCH150J50
C161, C353, C810	CCSQCH151J50
C352	CCSQCH180J50
C220, C452	CCSQCH220J50
C162, C417, C421, C812, C935	CCSQCH221J50
C371, C419, C433, C931	CCSQCH270J50
C106, C107, C354, C435, C813	CCSQCH330J50
C351, C418, C478	CCSQCH390J50
C112, C260-C263, C409, C415	CCSQCH470J50
C476, C963	CCSQCH470J50
C375, C430, C806	CCSQCH680J50
C462	CCSQCH681J50
C448, C449	CCSQCH750J50
C374	CCSQCH820J50
C463	CCSQCH910J50
C450	CEAL101M6R3
C410, C412, C422, C424, C431	CEAL470M6R3
C440, C442, C445, C484, C491	CEAL470M6R3

Mark	No.	Description	Part No.
	C871		CEANP100M25
	C985		CEANP101M10
	C274, C275, C972		CEANP220M10
	C227, C281, C926		CEANP2R2M50
	C403, C838		CEANP470M10
	C986		CEANPR22M50
	C904		CEAS010M50
	C228, C367, C902		CEAS100M50
	C225, C226, C256, C364		CEAS101M10
	C816, C817, C833, C844, C893		CEAS101M10
	C927, C933		CEAS101M10
	C493		CEAS102M10
	C922, C976, C987		CEAS220M25
	C391, C895		CEAS221M6R3
	C101, C108, C230, C252, C253		CEAS470M10
	C269, C271, C363, C369, C801		CEAS470M10
	C803, C836, C842		CEAS470M10
	C255, C257		CEAS471M10
	C845		CEAS47M50
	C368, C913		CEASR47M50
	C970		CEHAQ010M50
	C967, C968		CEHAQ100M50
	C278, C282		CFTXA332J50
	C191		CFTYA103J50
	C482, C483, C908, C910, C920		CFTYA104J50
	C923		CFTYA124J50
	C359, C360, C905		CFTYA224J50
	C479		CFTYA683J50
	C111, C891, C897, C914, C936		CKSQYB102K50
	C969		CKSQYB102K50
	C110, C907		CKSQYB222K50
	C919		CKSQYB332K50
	C361, C362		CKSQYB392K50
	C355-C358, C888		CKSQYB472K50
	C105, C122, C156-C158, C213		CKSQYF103Z50
	C231, C234, C251, C286, C288		CKSQYF103Z50
	C394, C395, C426, C427, C454		CKSQYF103Z50
	C496, C807, C834, C835, C843		CKSQYF103Z50
	C872, C876, C894, C929, C937		CKSQYF103Z50
	C961, C962		CKSQYF103Z50
	C102, C104, C109, C151, C155		CKSQYF104Z25
	C196-C198, C212, C215, C254		CKSQYF104Z25
	C270, C272, C284, C285		CKSQYF104Z25
	C365, C366, C372, C373		CKSQYF104Z25
	C386, C387, C392, C404, C406		CKSQYF104Z25
	C411, C413, C423, C425, C432		CKSQYF104Z25
	C441, C443, C446, C451, C453		CKSQYF104Z25
	C461, C481, C485, C492		CKSQYF104Z25
	C494, C495, C802, C804		CKSQYF104Z25
	C831, C832, C840, C841		CKSQYF104Z25
	C873, C874, C892, C896, C901		CKSQYF104Z25
	C915, C928, C932, C981, C988		CKSQYF104Z25
	C921		CKSQYF223Z50
	C837, C930		CKSQYF333Z25
	C103, C214, C465, C808, C815		CKSQYF473Z25

Mark	No.	Description	Part No.
	C847, C875, C877, C911, C912 C924, C925, C964, C971 C983, C984 C376 C934		CKSQYF473Z25 CKSQYF473Z25 CKSQYF473Z25 CKSQYF473Z50 CQMA122J50
	C903, C909 C991 (1F/5.5V)		CQMA222J50 VCH1039

RESISTORS

R241, R242 (4.7Ω) R192, R193, R440, R441 R405 R492 R396	DCN1001 RD1/6PM220J RD1/6PM331J RD1/6PM47J RD1/6PM910J
R388 R173, R174 R459, R484 R171, R172, R175, R178 R259-R262	RN1/10SC750D RN1/10SE103D RN1/10SE203D RN1/10SE333D RN1/10SE473D
VR606 VR601 VR450 VR605 VR101	VRTB6VS153 VRTB6VS222 VRTB6VS332 VRTB6VS333 VRTB6VS471
VR603 VR604, VR607, VR612 Other Resistors	VRTB6VS472 VRTB6VS473 RS1/10S□□□J

OTHERS

CN106 CN52 CN104	4P CABLE HOLDER 12P CABLE HOLDER 11P TOP POST KR CONNECTOR KR CONNECTOR 3P	51048-0400 51048-1200 B11P-SHF-1AA B13B-PH-K-S B3B-PH-K-S
CN125 CN107 CN110 CN51 CN54	3P TOP POST KR CONNECTOR 5P TOP POST KR CONNECTOR KR CONNECTOR	B3P-SHF-1AA B4B-PH-K-S B5B-EH-S B5B-PH-K-S B5B-PH-K-R
CN53 J11 JA8 JA3, JA4 CN105	KR CONNECTOR 2mm PITCH JUMPER 4P OPTICAL OUTPUT MODULE REMOTE CONTROL JACK 2mm PITCH JUMPER 6P	B6B-PH-K-S D20PDD0425E GP1F32T RKN1004 SBRK06S-4
CN103 JA15 JA6 JA7	24P CONNECTOR PCB BINDER COAXIAL PIN JACK 4P PIN JACK 1P PIN JACK	SLEM24S-2 VEF1040 VKB1052 VKB1071 VKB1072
X101 X201	IC HEAT SINK SCREW TERMINAL EARTH PLATE CERAMIC RESONATOR(9.00MHz) CRYSTAL RESONATOR(16MHz)	VNE1921 VNE1948 VNF-091 VSS1040 VSS1057

Mark	No.	Description	Part No.
		DVDB ASSY(CLD-99/KU/CA)	

SEMICONDUCTORS

IC604 IC602 IC500 IC650 IC601	CXD1171M CXK48324Q PD0146A PD0154A PD3212A
IC605, IC705 Q580, Q681, Q780, Q793 Q781, Q782, Q786, Q794, Q795 Q680, Q714, Q796 Q690	TC74HC4053AF 2SA1037K 2SC1740S 2SC2412K UN2212

COILS AND FILTER

L710-L713 L571, L680, L681 F580 L601-L604	LFA220J LFA2270K VTF1054 VTH1024
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CAPACITORS

C562 C747, C761 C693 C552 C798	CCSQCH050C50 CCSQCH060D50 CCSQCH070D50 CCSQCH100D50 CCSQCH101J50
C692, C695 C540, C542, C554, C579, C640 C746, C749, C760, C763 C544, C591 C696	CCSQCH150J50 CCSQCH220J50 CCSQCH220J50 CCSQCH221J50 CCSQCH270J50
C563 C694 C543, C580, C750, C764 C748, C762 C553, C561	CCSQCH330J50 CCSQCH390J50 CCSQCH470J50 CCSQCH560J50 CCSQCH680J50
C799 C534, C535, C9632 C550, C585 C530, C538, C588, C601, C603 C605, C607, C609, C611, C613	CEANP2R2M50 CEAS101M10 CEAS221M10 CEAS470M10 CEAS470M10
C621, C670, C681, C683, C780 C782, C785, C786 C699 C570-C573, C577, C578, C581 C698	CEAS470M10 CEAS470M10 CKSQYB222K50 CKSQYF103Z50 CKSQYF103Z50
C531-C533, C539, C541, C551 C575, C582, C589, C592, C593 C602, C604, C606, C608, C610 C612, C614, C616, C620, C671 C680, C682, C684-C687, C689	CKSQYF104Z25 CKSQYF104Z25 CKSQYF104Z25 CKSQYF104Z25 CKSQYF104Z25
C691, C708, C759, C766, C768 C781, C783, C789, C794, C795 C9611, C9615 VC901 (20pF)	CKSQYF104Z25 CKSQYF104Z25 CKSQYF104Z25 VCM-08

RESISTORS

VR651, VR652, VR705 VR653, VR704 Other Resistors	VRTB6VS102 VRTB6VS222 RS1/10S□□□J
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Mark	No.	Description	Part No.
OTHERS			
		3P CABLE HOLDER	51048-0300
CN52		KR CONNECTOR	B13B-PH-K-S
CN51		KR CONNECTOR	B5B-PH-K-S
CN54		KR CONNECTOR	B5B-PH-K-R
CN53		KR CONNECTOR	B6B-PH-K-S
		PCB BINDER	VEF1040
JA1		2P PIN JACK	VKB1061
		4P MINI DIN SOCKET	VKN1078
		SCREW TERMINAL	VNE1948
		SHIELD CASE A	VNE1956
		SHIELD CASE B	VNE1957
		SHIELD CASE C	VNE1958
X550		CRYSTAL RESONATOR(14. 31MHz)	VSS1026

DVDB ASSY(CLD- 79/KU/CA)

SEMICONDUCTORS

IC604	CXD1171M
IC701	CXD2023Q
IC602	CKX48324Q
IC500	PD0146A
IC650	PD0154A
IC601	PD3212A
IC605, IC705	TC74HC4053AF
Q580, Q681, Q780, Q793	2SA1037K
Q781, Q782, Q786, Q794, Q795	2SC1740S
Q680, Q710, Q711, Q714, Q796	2SC2412K
Q690	UN2212

COILS AND FILTER

L710-L713	LFA220J
L571, L680, L681	LFA270K
F580	VTF1054

CAPACITORS

C562	CCSQCH050C50
C747, C761	CCSQCH060D50
C693	CCSQCH070D50
C552	CCSQCH100D50
C798	CCSQCH101J50
C692, C695	CCSQCH150J50
C542, C554, C579, C640, C746	CCSQCH220J50
C749, C760, C763	CCSQCH220J50
C544, C591	CCSQCH221J50
C696	CCSQCH270J50
C563	CCSQCH330J50
C694	CCSQCH390J50
C540	CCSQCH430J50
C543, C580, C750, C764	CCSQCH470J50
C748, C762	CCSQCH560J50
C553, C561	CCSQCH680J50
C799	CEANP2R2M50
C534, C535, C9632	CEAS101M10
C550, C585	CEAS221M10
C530, C538, C588, C601, C603	CEAS470M10

Mark	No.	Description	Part No.
		C605, C607, C609, C611, C613	CEAS470M10
		C621, C670, C681, C683, C703	CEAS470M10
		C720, C730, C735, C780, C782	CEAS470M10
		C785, C786	CEAS470M10
		C701	CKSQYB102K50
		C699	CKSQYB222K50
		C570-C573, C577, C578, C581	CKSQYF103Z50
		C698, C704, C707	CKSQYF103Z50
		C531-C533, C539, C541, C551	CKSQYF104Z25
		C575, C582, C589, C592, C593	CKSQYF104Z25
		C602, C604, C606, C608, C610	CKSQYF104Z25
		C612, C614, C616, C620, C671	CKSQYF104Z25
		C680, C682, C684-C687, C689	CKSQYF104Z25
		C691, C702, C708, C712	CKSQYF104Z25
		C714-C716, C719, C723, C725	CKSQYF104Z25
		C734, C736, C737, C740, C742	CKSQYF104Z25
		C759, C766, C768, C781, C783	CKSQYF104Z25
		C789, C794, C795, C9611, C9615	CKSQYF104Z25
		VC901 (20pF)	VCM-008

RESISTORS

VR651, VR652, VR705	VRTB6VS102
VR653, VR704	VRTB6VS222
VR702, VR703	VRTB6VS472
Other Resistors	RS1/10S□□□J

OTHERS

		3P CABLE HOLDER	51048-0300
CN52		KR CONNECTOR	B13B-PH-K-S
CN51		KR CONNECTOR	B5B-PH-K-S
CN54		KR CONNECTOR	B5B-PH-K-R
CN53		KR CONNECTOR	B6B-PH-K-S
		PCB BINDER	VEF1040
JA1		2P PIN JACK	VKB1061
		4P MINI DIN SOCKET	VKN1078
		SCREW TERMINAL	VNE1948
		SHIELD CASE A	VNE1956
		SHIELD CASE B	VNE1957
		SHIELD CASE C	VNE1958
X550		CRYSTAL RESONATOR(14. 31MHz)	VSS1026

TDYC ASSY(CLD- 99/KU/CA ONLY)

SEMICONDUCTORS

IC155, IC156	CXD1171M
IC153, IC154 (UPD42280GU-30)	GGC1067
IC151 (UPD6480GF-3BA)	GGC1019
IC152 (UPD6481GC-3B6)	GGC1064
Q150, Q151	2SC2412K

COILS

L151-L162	LFA101J
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CAPACITORS

C151, C152, C154, C155, C158	CEAL101M6R3
C160, C161, C163, C164	CEAL101M6R3
C166-C168, C170, C171	CEAL101M6R3
C173, C174, C176, C177, C181	CEAL101M6R3
C183, C189, C191	CEAL101M6R3

Mark	No.	Description	Part No.
		C179, C180	CKSQYF103Z50
		C153, C156, C157, C159, C162	CKSQYF104Z25
		C165, C169, C172, C175, C178	CKSQYF104Z25
		C182, C184-C188, C190	CKSQYF104Z25
		C192-C196	CKSQYF104Z25

RESISTORS

VR101, VR102 (1kΩ)	RCP1044
Other Resistors	RS1/10S□□□J

OTHERS

SCREW TERMINAL	VNE1841
SHIELD CASE D	VNE1959
SHIELD CASE E	VNE1960

FLKB ASSY

OTHERS

PC board FLKB	VNP1486
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FLKY ASSY

FLKY assy of CLD-79/KU/CA is the same as that of CLD-99/KU/CA.

SEMICONDUCTORS

IC101	PD3295B
IC102	S-806D
Q102	DTA144ES
Q101	DTC114ES
Q104-Q106	DTC124ES
D101-D104	1SS252
D108-D110	1SS254
D105	SEL2415ETP6
D106	SEL2915AYTP6
D107	SLR-342MC3F

COIL

L101	LAU220J
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SWITCHES

S101-S103, S106-S108	RSG1030
S104, S105	RSG1034

CAPACITORS

C106	CEAL100M16
C101	CEAL101M6R3
C102, C105	CKPUYF223Z25
C104	CKPUYX472M16

RESISTORS

R102	RA4T103J
R101	RA5T104J
R116, R117	RD1/2VM5R6J
Other Resistors	RD1/6PM□□□J

OTHERS

6P CABLE HOLDER	51048-0600
J101 2mm PITCH JUMPER 6P	D20PDD0620E
V101 FL TUBE	VAW1037
FL HOLDER	VNK2854
X101 CERAMIC RESONATOR(8MHz)	VSS1031

Mark	No.	Description	Part No.
		PONS ASSY	

SEMICONDUCTORS

Q201, Q202	DTC124ES
D201	SLH34VCF04

COIL

L201	LAU220J
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SWITCH

S201	RSG1030
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CAPACITORS

C201	CEJA221M6R3
C202	CKPUYF223Z25

RESISTORS

All Resistors	RD1/6PM□□□J
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OTHERS

6P CABLE HOLDER	51048-0600
REMOTE SENSOR	GP1U58X

MACB ASSY

OTHERS

PC board MACB	VNP1429
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CNNB ASSY

RESISTORS

All Resistors	RD1/6PM□□□J
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OTHERS

CN205 KR CONNECTOR 3P	B3B-PH-K-S
CN203 24P CONNECTOR	SLEM24S-2
CN204 25P FFC CONNECTOR(SIDE)	SLEM25R-2

LOMB ASSY

OTHERS

4P CABLE HOLDER	51048-0400
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LOSB ASSY

SWITCHES

S1-S3	DSG1015
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FG ASSY

OTHERS

D1 PHOTO DIODE	GP1S51V
J64 HOUSING ASSY(3P)	VKP2024

5. SELF-DIAGNOSTIC FUNCTIONS

5.1 SELF-DIAGNOSTIC FUNCTIONS

The self-diagnostic functions automatically display an error code on the TV screen and front panel fluorescent display section when there is an error. The customer checks the error code and conveys it to the service personnel to make repairs more efficient.

After an error occurs, even if the error code goes off, you can display the error code again by holding down the **CLEAR** key for 10 seconds (except a loading error **L *** display). At that time, partial error is displayed with the mechanism switch information. However, if the power cord is unplugged, the error code information is lost.

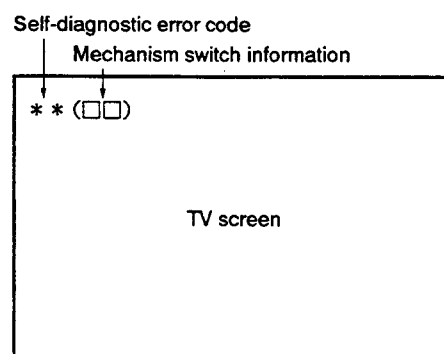


Fig. 1 TV screen display

This table explains the information for analyzing the cause when an error occurs with the CLD player.

Self-diagnostic error code	Contents	Conditions	Probable cause
H0	Spindle overcurrent detection error.	In the play state, overcurrent was detected in the spindle motor. Monitoring starts 5 seconds after the start of play or special playback mode, this error is detected if the overcurrent port is "L" for 4 seconds.	• Motor NG • Clamper rubbing
U0	FG abnormality error	① At LD start-up, the rate of rotation calculated from the FG was less than 15 rpm for 5 consecutive seconds from the spindle run command. ② At CD start-up, there was less than 1/8th rotation even after 5 seconds had passed since the end of acceleration. ③ During play search, CD : subcodes are being read/LD : Phillips codes are being read and the spindle is locked, but a state in which the rate of rotation calculated from the FG was less than 15 rpm continued for 5 seconds or more. In the above case, it is judged that an abnormality has occurred in the FG sensor and that accurate rotation rate calculation has become impossible.	• FG sensor abnormality, FG signal not coming to mechanism controller • FG sensor clogged • Rubbing between FG sensor and slit • Turntable dropped • FG slit deposition NG
H1	Partial short error	① At LD start-up, the speed did not reach 1200 rpm within a certain time (12 seconds) after the spindle run command. ② At CD start-up, a certain speed (313 rpm) was not reached within 6 seconds from the end of spindle acceleration.	• Spindle motor NG • Commutator NG • Bearing too tight • Power supply NG
H2	Power supply abnormality error	- 5V power supply abnormality detected. The power supply abnormality port is constantly monitored and if its signal stays high for about 1 second consecutively, the power supply is judged to be abnormal.	• - 5V not fed from SYPS assy • Parts shorted
A *	R plate error	When abnormality condition is detected for 80 ms consecutively between the slider switch and the turn switch for 4 seconds after the power on.	
L *	Loading error	① When loading operation goes over time (approx. 10 sec.). ② When assist at disc sense entry ends and is not tilt neutral. ③ When assist at set up entry ends and is not tilt neutral.	• Tilt switch 1, 2, 3 abnormal, so tilt/loading state not read in correctly • Tilt/loading mechanism mechanically locked • Drive IC NG • Power supply NG
E *	Slider error	During slider movement, a time over-run occurred (track count search 20 seconds, mandatory movement 10 seconds)	• Slider ceased being able to run • The slider mechanism is mechanically locked and can no longer move to its target. • Slider position switch NG • Flexible cable pulled out • Drive IC NG • Power supply abnormal

Self-diagnostic error code	Contents	Conditions	Probable cause
U1	Miss clamp error	① During LD setup, after 1/8th rotation, the track count during 1/8 rotation exceeded 511. ② During start-up, the focus was lost once and refocusing was attempted, but the focus could not be locked. ③ When spindle is not stopped within 2 seconds before CDV changes A to V (or V to A), clamp error is set by judging the double disc. ④ The FG pulse did not come for three times or more within 800 ms from the start of LD start-up. ⑤ When the disc clamp operation did not end within 5 seconds.	• Disc sandwiched • Disc shifted • Spindle motor NG • Disc scratched or dirty defocused during start-up • Two discs loaded • PU actuator NG • Tilt sensor NG • Tilt neutral NG (tilt base NG)
P *	Spindle error	① During TOC reading with an LD, the spindle servo was not locked within 60 seconds from the start of the spindle run. ② When CAV/CLV determination is not finished within 60 seconds from spindle servo lock. ③ The codes could not be read for 10 – 15 seconds consecutively for an LD or 7 – 10 seconds for a CD/CDV and the spindle servo was not locked. ④ The speed exceeded 2100 rpm during LD start-up.	P0: • PH code, SUB - Q code can not be read • VCO, PLL offset out of adjustment • Disc defect P5: • PAL disc, mirror disc, etc. PLAY • No RF P6: • Spindle servo does not lock • Spindle motor NG
F *	Focus error	① In the "no disc" state, a setup command was received from the mode controller. ② When LD is out of focus when slider is moved to starting position during set up. In case of CD/CDV is NG even after three focus tries. ③ During start-up, the maximum slider servo duty continued for 3 loops or more.	F5: • CD, LD on top of each other • LD scratched or dirty defocused during slider movement • Disc NG • Slider position switch NG F6: • Inner edge of disc scratched or dirty • Slider ran into inner edge mechanical stopper

* Besides the above errors, there is the "U2" communications error (the mode controller could not communicate normally with the mechanism controller)
The probable cause is a defective mechanism controller, disconnected cable, etc..

* After an error occurs, even if the error code goes off, you can display the error code again by holding down the CLEAR key for 10 seconds. At that time, partial error is displayed with the mechanism switch information.

Mechanism mode contents (meaning of * for L * etc.)

0 : Play	4 : Disc sense	8 : Search
1 : Open	5 : Setup (rotation start)	9 : Side A → Side B
2 : Standby	6 : TOC read	A : Side B → Side A
3 : Clamp	7 : Play	

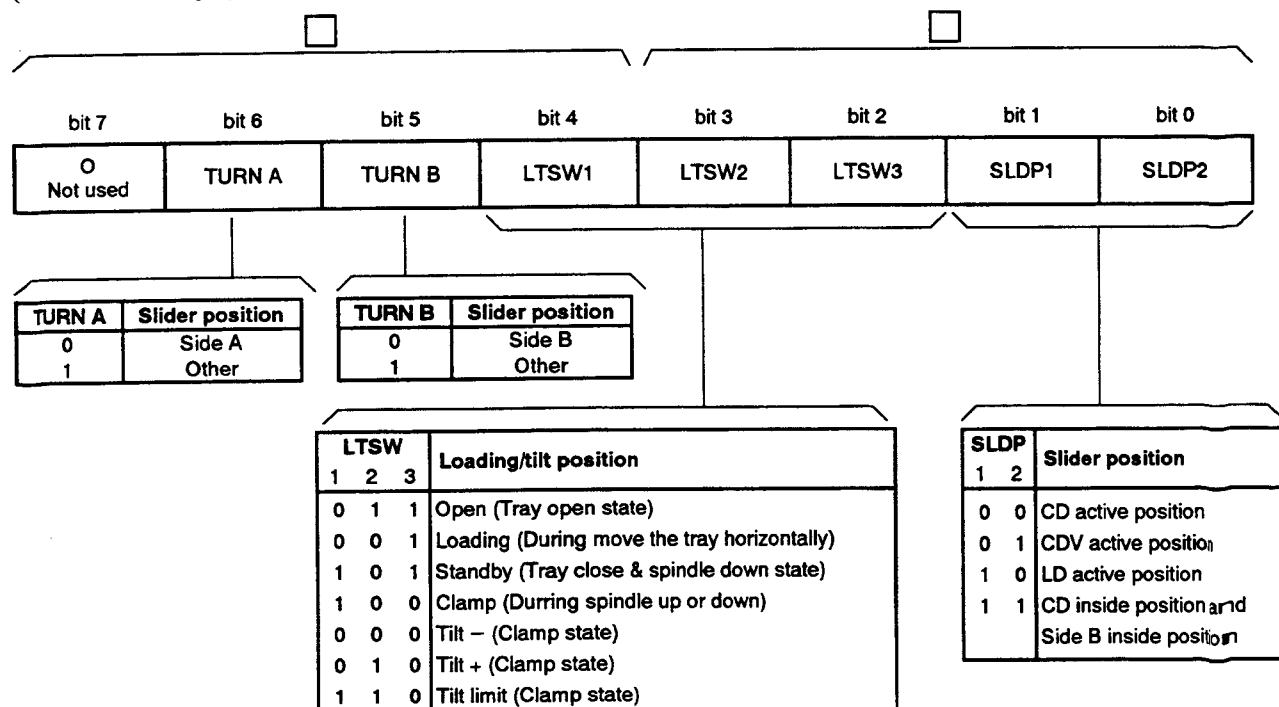
5.2 FORMAT OF THE MECHANISM SWITCH INFORMATION WHICH IS TRANSMITTED TO THE MODE CONTROL IN THE ERROR OCCURRENCE

• Mechanism switch information (□□)

Mechanism control → Mode control

Communication byte address 6 (COMBUF5)

(Mode control displays this value as it is.)



6. ADJUSTMENTS

6.1 TEST MODE

1) How to start the test mode

On the SACB assy, Short circuit the test mode JP and GND JP, the test mode is started by pressing the power switch ON. (Fig. 1)

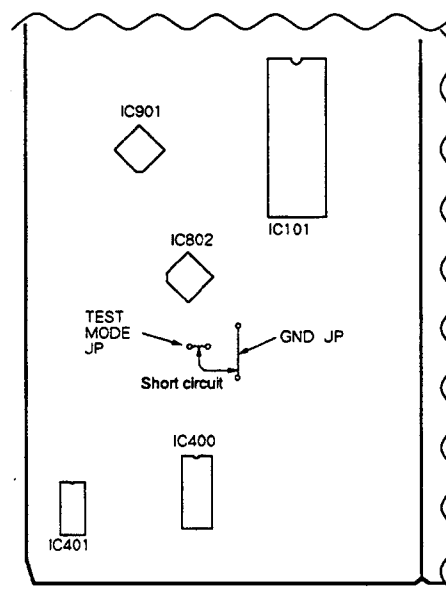
After confirming that all FL indicators are lit, remove test mode JP and GND JP connection. If you have test mode remote control unit (GGF1067), press **ESC** key and **TEST** key in order with power switch ON.

2) How to cancel the test mode

Turn power switch OFF. Or, press test mode remote control **ESC** key.

3) Functions and key control when in test mode

Note : For keys not on player or on accompanying remote control, use test mode remote control unit (GGF1067).



SACB ASSY
Fig. 1

• Key Operation in the Test Mode

Player Status	Key Operation	Function	TV Screen Display
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 OFF	▶ PLAY	TRK Servo ON	TRK - ON
TRK Servo ON	▶ PLAY	TRK Servo OFF	TRK - OFF
TRK Servo ON	◀ / ▶ (STEP)	FOCS balance select	F-0/F-1
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	Set 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 is to set to clamp state and SKIP (⏮/⏭) keys can not function properly.

Table 1

• **Player Operation in the Test Mode**
(Disc tray is removed)

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.

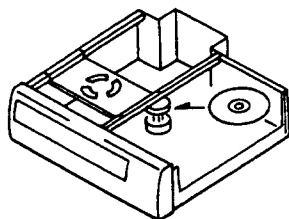


Fig. 2

- ② Press the PLAY (▶) key once.
(Twin gear starts to move.)
③ Push the cam plate (Fig.3) in the direction of the arrow and wait until the CD disc is clamped.

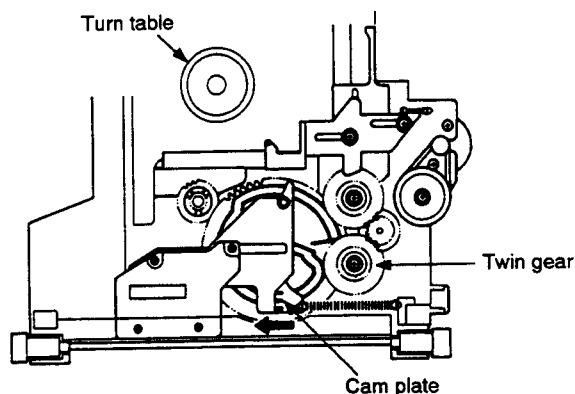
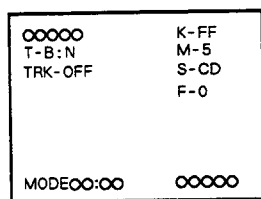


Fig. 3

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



TV screen display

Fig. 4

- ⑤ After pressing the PLAY (▶) key once to clamp the disc, press the PLAY (▶) key twice, disc will be normally playbacked.

• **LD PLAYBACK**

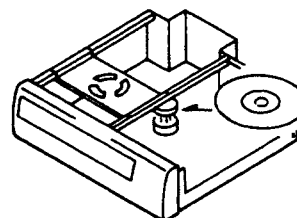
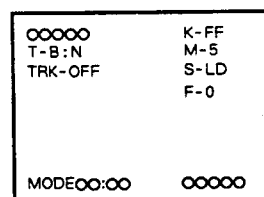


Fig. 5

- ① Press the PLAY (▶) key once.
(Twin gear starts to move.)
② Press the SKIP REV (◀◀) key to raise the turn table (spindle motor section) while pressing the cam plate (Fig. 3) 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.
③ Place the LD disc on the turn table and press the PLAY (▶) key once to clamp the disc.
④ Press the ◀◀ or ▶▶ keys to appear "S - LD" on the TV screen display.



TV screen display

Fig. 6

- ⑤ After pressing the PLAY (▶) key once to clamp the disc, press the PLAY (▶) key twice, disc will be normally playbacked.

6.2 ADJUSTMENT PRECAUTIONS

• Equipment and Jigs Needed for Adjustment

- CD test disc (STD - 901 or STD - 902)
- LD test disc (GGV1003)
- (-) Phillips screwdriver (Large)
- (-) Phillips screwdriver (Medium)
- (-) Phillips screwdriver (Small)
- (+) screwdriver (Large)
- (+) screwdriver (Medium)
- Hexagonal wrench (straight type, size : 3mm)
- Resistor ($10k\Omega \times 2$, $47k\Omega \times 1$)
- Two-channel oscilloscope (with delay)
- AF oscillator
- Frequency counter
- Digital voltmeter
- TV monitor
- Low-pass filter

• Preparation for Adjustment

1. Remove the seven screws ① that stabilize the bonnet and take off the bonnet. (Fig. 7)
2. Remove the two tray stopper screws ② and press the OPEN/CLOSE button to put the tray unit in the open position. (Fig. 7)
3. While pushing the hook ③ on the right rear of the disc tray to the left, pull out the tray unit. (Fig. 7)

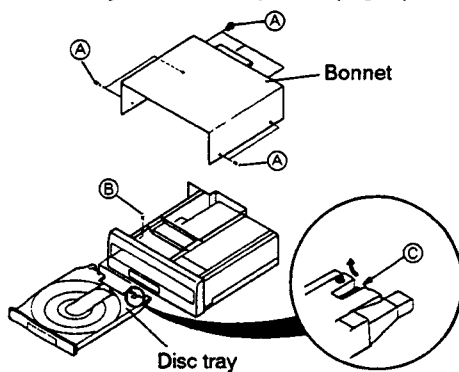


Fig. 7

4. Remove the six screws ④ stabilize the DVDB assy. (Fig. 8)
5. Remove the four screws ⑤ on the rear panel. (Fig. 8)

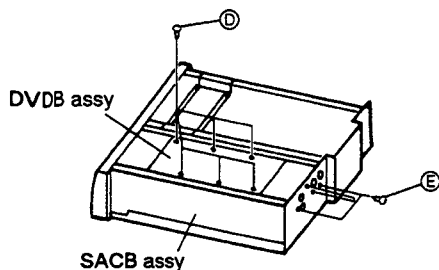


Fig. 8

6. Set the DVDB and TDYC assemblies to the open state. (Fig. 9)

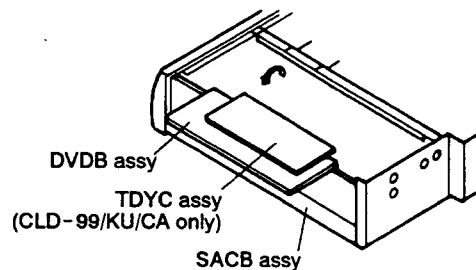


Fig. 9

- As shown in Fig. 10, fit the SACB assy between PCB spacer and PCB support on the chassis and standing it against the inside of the chassis, the back of the PCB (pattern side) can be diagnosed.

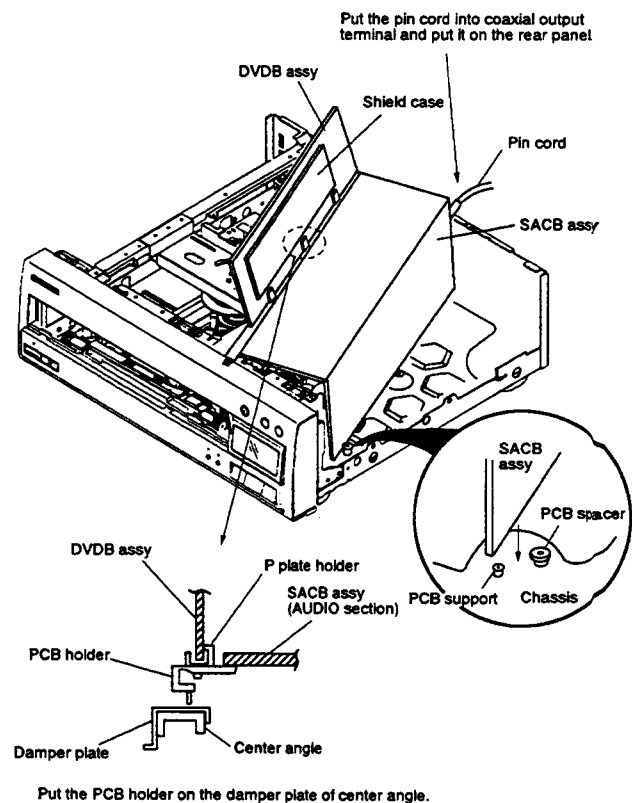


Fig. 10

• Before Adjusting Mechanism System

Note: Be careful not to turn centering adjustment screw and TAN adjustment screw past their adjustment range.

- Adjustment Range of Centering Adjustment Screw -

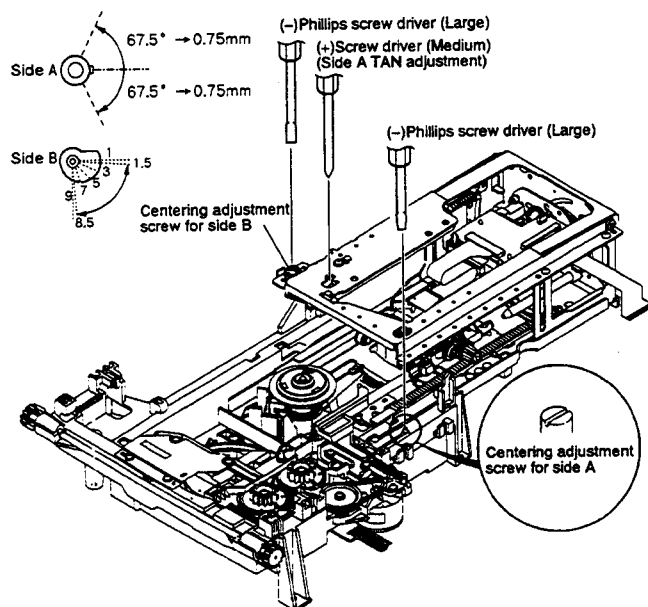


Fig. 11 Mechanism assy adjustment

- Adjustment Range of TAN Adjustment Screw -

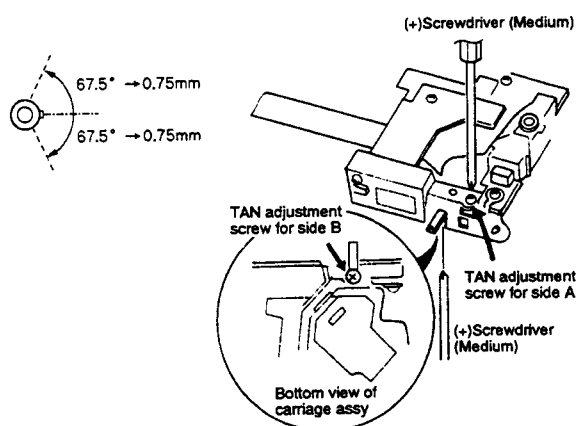


Fig. 12 Carriage assy adjustment

• Notes When Adjusting Centering

For both side A and B, if the amplitude of the error waveform of the disc's innermost and outermost tracks at TRK - OFF are about the same, then course adjustment is not necessary.

If waveform S/N is bad and difficult to observe in "2. Coarse centering adjustment for side A" and "6. Fine centering adjustment for side A" use the low-pass filter in diagram. (Fig. 13)

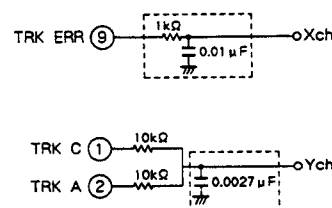


Fig. 13 Low-pass filter

• RACK Assy Position When Adjusting Centering

When moving slider to inner position to adjust the innermost track of disc during centering adjustment, be careful not to keep the mechanism stopper and RACK assy from bumping each other. (Fig. 14)

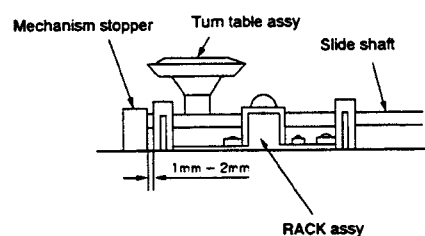


Fig. 14 Rack assy position when adjusting centering

• Notes When Adjusting Pickup Assy

Please clean lens first when readjusting the PICKUP assy that is on this product. Also, when changing PICKUP assy, change whole CARRIAGE assy (VWT1100).

6.3 ADJUSTMENT LOCATIONS

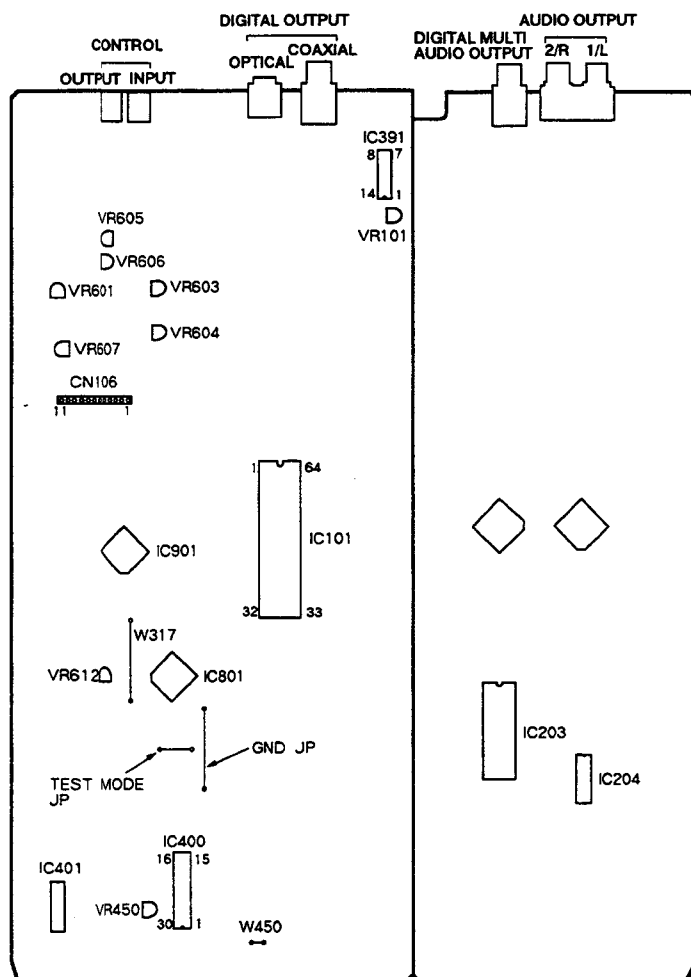


Fig. 15 Adjustment diagram of SACB assy

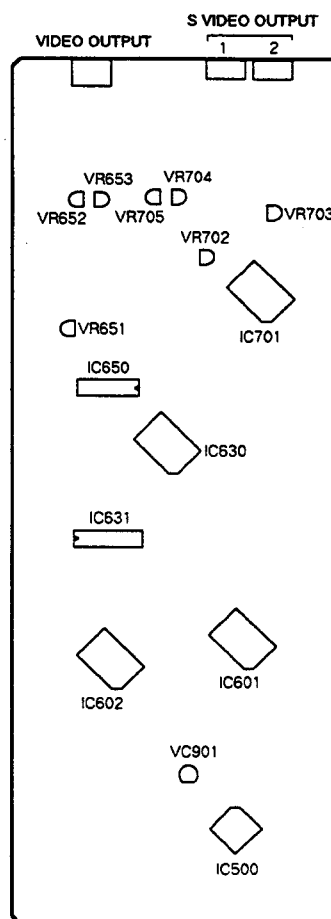


Fig. 16 Adjustment diagram of DVDB assy

• CLD-99/KU/CA only

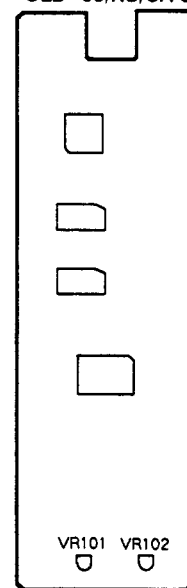


Fig. 17 Adjustment diagram of TDYC assy

6.4 ADJUSTMENT METHOD

1) MECHANICAL ADJUSTMENT

Note : All VRs and CNs (connectors) in the tables are parts of SACB assy.

Step	Adjustment name	Adjustment point	Measuring equipment and jigs	Measurement point	Player condition	Adjustment procedure	Waveform and connection diagram
1	Tilt offset check and adjustment	VR607	• 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 VR607 until the tilt indication reaches T-6 to T-8.	
2	Coarse centering adjustment for side A	Mechanism assy Centering adjustment screw for side A	• Screwdriver(Large) • Oscilloscope • CD test disc • MIX resistor 	CN106 X : pin 9 (TRK ERR) Y : pin 1+2 (TRK SUM)	• Test mode TRK servo OFF, Tilt servo ON • Innermost track of CD test disc which does not come in contact with the mechanical stopper.	Note : Be careful not to turn the centering adjustment screw past its limit. 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 (X ch) and TRK SUM (Y ch) at the X-Y mode during TRK servo OFF. 3. Adjust centering adjustment screw for side A until the Lissajous figure is horizontal.	
3	FCS balance adjustment (1) TRK ERR MAX	VR605	• Oscilloscope • CD test disc	CN106 pin 9 (TRK ERR)	• Test mode TRK servo OFF, Tilt servo ON • Inner track of CD test disc	1. Observe TRK ERR at CH 1 of the oscilloscope during TRK servo OFF. 2. Adjust VR605 until the amplitude of the waveform reaches its maximum and the envelope is very clear.	
4	FCS balance adjustment (2) RF level MAX	VR606	• Oscilloscope • CD test disc	CN106 pin 3 (RF)	• Test mode TRK servo ON, Tilt servo ON • Inner track of CD test disc	1. Observe RF at CH 1 of the oscilloscope during TRK servo ON. 2. Adjust VR606 until the amplitude of the waveform reaches its maximum and the envelope is very clear.	
5	Tangential direction angle adjustment for side A	Carriage assy TAN adjustment screw for side A	• Oscilloscope • CD test disc • Screwdriver (Medium)	CN106 pin 3 (RF)	• Test mode TRK servo ON, Tilt servo ON • Outermost track of CD test disc (position where TAN adjustment screw can be seen)	Note : Be careful not to turn the centering adjustment screw past its limit. 1. Observe RF at CH 1 of the oscilloscope during TRK servo ON. 2. Turn TAN adjustment screw for side A until the amplitude of the waveform reaches its maximum and the envelope is clear. After adjustment, stabilize the screw with an adhesive.	
6	Fine centering adjustment for side A	Mechanism assy centering adjustment screw for side A	• Oscilloscope • CD test disc • MIX resistor 	CN106 X : pin 9 (TRK ERR) Y : pin 1+2 (TRK SUM)	• Test mode TRK servo OFF, Tilt servo ON • Innermost track of CD test disc which does not come in contact with the mechanical stopper.	Note : Be careful not to turn the centering adjustment screw past its limit. Perform fine centering adjustment again by following the same procedure as in step 2. After adjustment, stabilize the screw with an adhesive.	
7	Crosstalk and tilt offset adjustment	VR607	• TV monitor • LD test disc	Crosstalk check screen	• Test mode TRK servo ON, Tilt servo ON • LD test disc #115 STILL	1. Search for address #115 of LD test disc and still the address. 2. Check the crosstalk. If the crosstalk is pronounced, adjust VR607 until the crosstalk is not noticeable.	
	When the crosstalk is still noticeable in spite of the adjustment in step 7, after carrying out the adjustment in step 1 and bringing the tilt indication to T-6 to T-8, use a hexagonal wrench (straight type, size : 3mm) to adjust the TAN adjustment screw on the bottom side of the player through the LD test disc #115 STILL screen. Afterwards, perform the adjustment procedure from step 6.						

Step	Adjustment name	Adjustment point	Measuring equipment and jigs	Measurement point	Player condition	Adjustment procedure	Waveform and connection diagram
8	FCS servo loop gain adjustment (Perform with either method A or B)	A VR604	• Oscilloscope • LD test disc • AF oscillator • Resistor (47k Ω)	CN106 X: pin 7 (FCS IN) Y: pin 6 (FCS ERR)	• Test mode TRK servo ON, Tilt servo ON • LD test disc #15,000 STILL	1. Xch : Connect to pin 7 with 47k Ω . Ych : Connect to pin 6. 2. Search #15,000 of LD test disc and still the address. 3. Connect AF oscillator between X ch and 47k Ω and adjust VR604 until Lissajous figure is circle.	
		B VR604	• Oscilloscope • LD test disc • Clip etc. (short circuit GND and pin 7)	CN106 X: — Y: pin 6 (FCS ERR) pin 7 GND (short circuit pins 7 and 8.)	• Test mode • Stop mode • F - 1	1. Ych : Connect to pin 6. Short circuit pin 7 to GND(pin 8). 2. Put in LD test disc, press reverse side of skip key bring F - 0 to F - 1. 3. Press PLAY key and adjust VR604 until the waveform level is 2.6Vp-p $\pm$ 0.1V.	
9	TRK servo loop gain adjustment (Perform with either method A or B)	A VR603	• Oscilloscope • LD test disc • AF oscillator • Resistor (47k Ω)	CN106 X: pin 10 (TRK IN) Y: pin 9 (TRK ERR)	• Test mode TRK servo ON, Tilt servo ON • LD test disc #15,000 STILL	1. Xch : Connect to pin 10 with 47k Ω . Ych : Connect to pin 9. 2. Search #15,000 of LD test disc and still the address. 3. Connect AF oscillator between X ch and 47k Ω and adjust VR603 until Lissajous figure is circle.	
		B VR603	• Oscilloscope • LD test disc	CN106 X: — Y: pin 9 (TRK ERR)	• Test mode TRK servo ON, Tilt servo ON • F - 1 • LD test disc #15,000 STILL	1. Ych : Connect to pin 9. 2. Search #15,000 of LD test disc and still the address. 3. Adjust VR603 until the waveform level is 1.6Vp-p $\pm$ 0.1V.	
10	RF level adjustment	VR601	• Oscilloscope • LD test disc	CN106 pin 3 (RF)	• Test mode TRK servo ON, Tilt servo ON • LD test disc #15,000 STILL	1. Search for address #15,000 of LD test disc, still the address, and observe RF at CH 1. 2. Adjust VR601 until RF amplitude is 300mVp-p $\pm$ 50mV.	
11	Coarse centering adjustment for side B play	Centering adjustment screw for side B play	• Oscilloscope • LD test disc • MIX resistor 10k 10k • ⊖ Screwdriver (Large)	CN106 X: pin 9 (TRK ERR) Y: pin 1+2 (TRK SUM) (X-Y mode)	• Test mode TRK servo ON/OFF, Tilt servo ON • LD test disc #100 STILL	Note : Be careful not to turn the centering adjustment screw past its limit. 1. Move the carriage assy toward side B and still with test disc #100. (TRK servo ON) 2. Observe TRK ERR (Xch) and TRK SUM (Ych) at the X-Y mode during TRK servo OFF. 3. Turn centering adjustment screw for side B until the Lissajous figure is horizontal.	
12	Tangential direction angle adjustment for side B play	TAN adjustment screw for side B play	• Oscilloscope • LD test disc • ⊕ Screddriver (Medium)	Video output terminal (TV monitor)	• Test mode TRK servo ON, Tilt servo ON • LD test disc #115 STILL	Note : Be careful not to turn the TAN adjustment screw past its limit. 1. Move the carriage assy toward side B and still with test disc #115. (TRK servo ON) 2. Turn TAN adjustment screw for side B until RF waveform amplitude becomes maximum. 3. Check to see that crosstalk on monitor screen is at its minimum.	
13	Fine centering adjustment for side B play	Centering adjustment screw for side B play	• Oscilloscope • LD test disc • MIX resistor 10k 10k • ⊖ Screwdriver (Large)	CN106 X: pin 9 (TRK ERR) Y: pin 1+2 (TRK SUM) (X-Y mode)	• Test mode TRK servo ON/OFF, Tilt servo ON • LD test disc #100 STILL	Perform fine adjustment again following same steps as in procedure "11. Coarse centering adjustment for side B play".	

2) ELECTRICAL ADJUSTMENT

Note : Be careful of Step No. because of adjustment procedure of CLD-99/KU/CA is different from CLD-79/KU/CA.

Step 99 79	Adjustment name	Adjustment point	Measuring equipment and jigs	Measurement point	Player condition	Adjustment procedure	Waveform and connection diagram
1	PLL offset adjustment	VR612 (SACB assy)	• DC voltmeter • CD test disc	W317 (Jumper) (SACB assy)	• Test mode/Normal mode Tilt servo ON, TRK servo OFF • Digital sound play	• Place tape on the inner track of CD test disc to create eccentricity. • At track servo OFF, play the innermost track of the above CD. At that time, observe PLL OFFSET voltage (W317 jumper). • Next, take off tape from CD, and play the innermost track again in the normal play. Adjust VR612 until PLL OFFSET voltage value is same as at the time of eccentricity.	
2	Phase adjustment	VR101 (SACB assy)	• Oscilloscope • CD test disc	IC391 - pin4, 10 (SACB assy)	• Normal mode • Digital sound play	Connect CH1 of oscilloscope and pin 4 of IC391 to CH2 and pin 10 respectively. When CH2 has been inverted, adjust VR101 so that the waveform phase of CH1 and CH2 match each other ($\pm 5\%$).	
3	Video level adjustment before A/D	VR450 (VIDEO LEV.1) (SACB assy)	• Oscilloscope • LD test disc	IC400 (PA0058A) - pin 12 or W450 (Jumper) (SACB assy)	• Normal mode • LD test disc #19,900 STILL	Connect pin 12 of IC400 and oscilloscope. Observe the video signal during still playback LD test disc #19,900 (composite). Adjust VR450 until level from sync tip to 100% white becomes 1.633Vp-p $\pm 3\%$.	
4	Master clock adjustment	VC901 (DVDB assy)	• Frequency counter	IC601 - pin 74 (contact needle land) (DVDB ASSY)	• POWER ON • STOP	Connect pin 74 of IC601 (contact needle land) and frequency counter. Adjust VC901 so that the frequency becomes 14.31818MHz ± 10 Hz in the power ON (stop).	
5	Video level adjustment	VR651 (DVDB assy)	• TV monitor • Oscilloscope • LD test disc	Video output terminal (75 Ω terminated)	• Normal mode • LD test disc #19,900 STILL	Connect video output terminal and oscilloscope. (video output terminal is terminated with 75 Ω .) (It is possible to terminate video output terminal with 75 Ω by connecting TV monitor.) Observe the video signal during still playback LD test disc #19,900 and adjust VR651 until level from pedestal to 100% white becomes 0.714Vp-p $\pm 5\%$.	
6	V - SYNC level adjustment	VR652 (DVDB assy)	• TV monitor • Oscilloscope • LD test disc	Video output terminal (75 Ω terminated)	• Normal mode • LD test disc #19,900 STILL	Connect video output terminal and oscilloscope. (video output terminal is terminated with 75 Ω .) (It is possible to terminate video output terminal with 75 Ω by connecting TV monitor.) During still playback #19,900 of LD test disc, observe video signal with trigger by V rate. Adjust VR652 until V sector's later period parity pulse pedestal (a) and preceding period parity pulse pedestal (b) are equal ($\pm 5\%$).	
7	SYNC level adjustment	VR653 (DVDB assy)	• TV monitor • Oscilloscope • LD test disc	Video output terminal (75 Ω terminated)	• Normal mode • LD test disc #19,900 STILL	Connect video output terminal and oscilloscope. (video output terminal is terminated with 75 Ω .) (It is possible to terminate video output terminal with 75 Ω by connecting TV monitor.) Observe the video signal during still playback LD test disc #19,900 and adjust VR653 until level from sync tip to pedestal becomes 0.286Vp-p $\pm 5\%$.	
8	S - C SYNC level adjustment	VR704 (DVDB assy)	• TV monitor • Oscilloscope • LD test disc	Leg of C output pin of S terminal	• Normal mode • LD test disc #19,900 STILL • S terminal is 75 Ω terminated	Connect C output pin of S terminal and oscilloscope. (S terminal is terminated with 75 Ω .) Observe the video signal during still playback LD test disc #19,900 and adjust VR704 until level from sync tip to pedestal becomes 0.286Vp-p $\pm 5\%$.	
9	S - V SYNC level adjustment	VR705 (DVDB assy)	• TV monitor • Oscilloscope • LD test disc	Leg of Y output pin of S terminal	• Normal mode • LD test disc #19,900 STILL • S terminal is 75 Ω terminated	Connect Y output pin of S terminal and oscilloscope. (S terminal is terminated with 75 Ω .) During still playback #19,900 of LD test disc, observe Y signal with trigger by V rate. Adjust VR705 until V sector's later period parity pulse pedestal (a) and preceding period parity pulse pedestal (b) are equal ($\pm 5\%$).	
10	C output level adjustment	CLD-99/KU/CA: VR101 (TDYC assy) CLD-79/KU/CA: VR703 (DVDB assy)	• TV monitor • Oscilloscope • LD test disc	Leg of C output pin of S terminal	• Normal mode • LD test disc #19,900 STILL • S terminal is 75 Ω terminated	Connect C output pin of S terminal and oscilloscope. (S terminal is terminated with 75 Ω .) Observe the video signal during still playback LD test disc #19,900 and adjust VR101 until the burst level becomes 0.286Vp-p $\pm 5\%$.	
11	Y output level adjustment	CLD-99/KU/CA: VR102 (TDYC assy) CLD-79/KU/CA: VR702 (DVDB assy)	• TV monitor • Oscilloscope • LD test disc	Leg of Y output pin of S terminal	• Normal mode • LD test disc #19,900 STILL • S terminal is 75 Ω terminated	Connect Y output pin of S terminal and oscilloscope. (S terminal is terminated with 75 Ω .) Observe the video signal during still playback LD test disc #19,900 and adjust VR102 until level from sync tip to 100% white becomes 0.714Vp-p $\pm 5\%$.	

7. IC INFORMATION

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

■ PD0205D (IC101 : SACB assy) •Mechanism Control Microcomputer

• Pin Function

No.	Pin name	I/O	Function
1	VCC	I	Power connection pin. . Apply 5V $\pm$ 10%.
2	FBAL	O	Focus balance control . "L"=RFMAX, "H"=TEMAX
3	XCD	O	LD/CD switch signal output. "L"=CD, "H"=LD
4	DIRECT	O	Power OFF signal output of CD direct video section. "L"=Normal, "H"=Video PW OFF
5	SRDDISC	O	AC3 pin OFF signal output. "L"=Normal, "H"=AC3 disc
6	SLDPOS	I A/D	Pickup position detection switch input. Divides the resistance among the switches, reads the value of the A/D input, and detects the position.
7	TILTERR	I A/D	The signal is A/D converted and is input as the tilt servo control. Controls the tilt motor until the signal is 2.5V.
8	TBALERR	I A/D	Tracking balance error signal input. The signal is A/D converted and is input as the tracking offset control.
9	SLDERR	I A/D	The signal is A/D converted and is input as the slider servo control. Controls the slider motor until the signal is 2.5V.
10	THOLD	I	Track jump during accelerating/decelerating signal input. "L"=other, "H"=during accelerating/decelerating
11	FSEQ	I	Subcode sync. conformity detection signal input. "L"=Not conformity, "H"=Conformity
12	SLDRV	O PWM	Slider control signal output. 5V=FWD, 0V=REV, 2.5V=STOP Cycle:910 μ sec, 3-value control H, L, Z
13	WRQ	I	Subcode Q reading OK signal input. "L"=NG, "H"=OK If the subcode Q data is passed for CRC check, this pin becomes H.
14	RWC	O	DSP reading/writing command signal signal output. "L"=READ, "H"=WRITE
15	SQOUT	I	Command data input from DSP. SUBQ is read out.
16	COIN	O	Command data output to DSP.
17	CQCK	O	DSP reading/writing command clock output. Read at start-up.
18	TBALDRV	O PWM	Outputs the tracking offset after PWM and is used in auto tracking offset. Cycle:910 μ sec, 3-value control H, L, Z
19	SI1	I	Data input from mode control IC.
20	SO1	O	Serial data output to mode control IC.
21	SCK1	I/O	Clock for serial communication with mode control IC. In the input mode except during serial communication with mode control IC.
22	TZC	I INT	Tracking error zero cross signal input. In the miss clamp detection, monitor this signal in track count search.
23	CDG	O	Output pin during CD- G playback. "L"=other, "H"=during CD- G playback
24	TILTDRV	I/O	LOAD/TILT control output. 0.5V:Tray IN, OUT/Tilt DOWN, UP, 2.5V:STOP Outputs the tilt drive after PWM and is used in tilt servo.
25	SHAKE	I/O	Hand shake signal for data communication with 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 vertical sync. signal input . "L"=V- SYNC ongoing
27	CN/ss	I	GND for A/D conversion.
28	XRESET	I	Reset signal input. "L"=Reset, "H"=Cancel reset by controlling mode control IC.
29	XIN	I	9MHz clock oscillation input.
30	XOUT	O	9MHz clock oscillation output.
31	N.C.	O	Not used.
32	GND	I	Ground.

No.	Pin name	I/O	Function
33	XFOK	I	Focus servo lock signal input. "L"=Lock, "H"=Unlock Use for detecting the focus servo lock.
34	XO9	I	Model switch port. "L"=CLD- D99, CLD- 99, "H"=CLD- 79
35	XFORE	I	Model switch port. "H"=Japan, "L"=Others
36	WFM	I	DVP odd/even number field determination signal input. "L"=Even, "H"=Odd
37	FG	I	Spindle motor FG signal input. 24 pulses per signal, divided into thirds and used inside the microcomputer.
38	DATA	I	Input pin for Phillips code decoder with built in mechanism controller.
39	XPBH	I	Playback H- SYNC input for Phillips code decode.
40	XPBV	I	Playback V- SYNC input for Phillips code decode.
41	SQ2	O	Analog audio switch signal output. 2/R "L"=Normal, "H"=Mute
42	SQ1	O	Analog audio switch signal output. 1/L "L"=Normal, "H"=Mute
43	XCX	O	Analog audio CX noise reduction switch signal output. "L"=CX ON, "H"=CX OFF
44	MUTE	O	Audio mute control signal output of audio section.. "L"=Cancel MUTE, "H"=MUTE
45	XANA	O	Digital/analog audio switch signal output. "L"=Analog, "H"=Digital
46	MCNTLAT	O	PD3212A serial latch signal output. Latches at falling edge.
47	TDLAT	O	GGC1019 (UPD6480GF- 3BA) and GGC1064 (UPD6481GC- 3B6) serial latch signal output. "L"=during communication, "H"=other
48	DGFLAT	O	PD0116A serial latch output. Latches at falling edge.
49	RFCORR	O	RF correction switch signal output. "H"=Gain up, CAV inner circuit gain up
50	XLDG	O	Graphic code detection output. "L"=other, "H"=Detects the graphic code and selects the graphic mode.
51	DVPLAT	O	PD0146A serial latch signal output. Latches at falling edge.
52	SCK3	O	Serial 3 clock signal output.
53	SO3	O	Serial 3 data signal output. With the serial signal as the common signal, divides the signals into three types of latch signals (DVPLAT, TDLAT and DGFLAT).
54	SLOCK	I	Spindle lock signal input. "L"=Unlock, "H"=Lock
55	DATAINH	O	Output pin that carries out Phillips code data inhibit. "L"=Inhibit, "H"=Permit
56	XCLV	O	CAV/CLV switch signal output. "H"=CAV, "L"=CLV
57	NRINH	O	NR control pin. "L"=Normal, "H"=no NR
58	XPLAY	O	Output pin during spindle servo. "L"=During servo, "H"=Acceleration, brake, during STOP
59	SW1	I	Switch input for loading /tilt position detection.
60	SW2		
61	SW3		
62	DETAMP	I	Spindle overcurrent detection signal input. "L"=Overcurrent, "H"=Normal
63	XTURNB	I	γ turn position detection signal input. "L"=Side B, "H"=Side A, during turn
64	XTURNA	I	γ turn position detection signal input. "L"=Side A, "H"=Side B, during turn

■ PD3295B (IC101 : FLKY assy)

• Mode Control Microcomputer

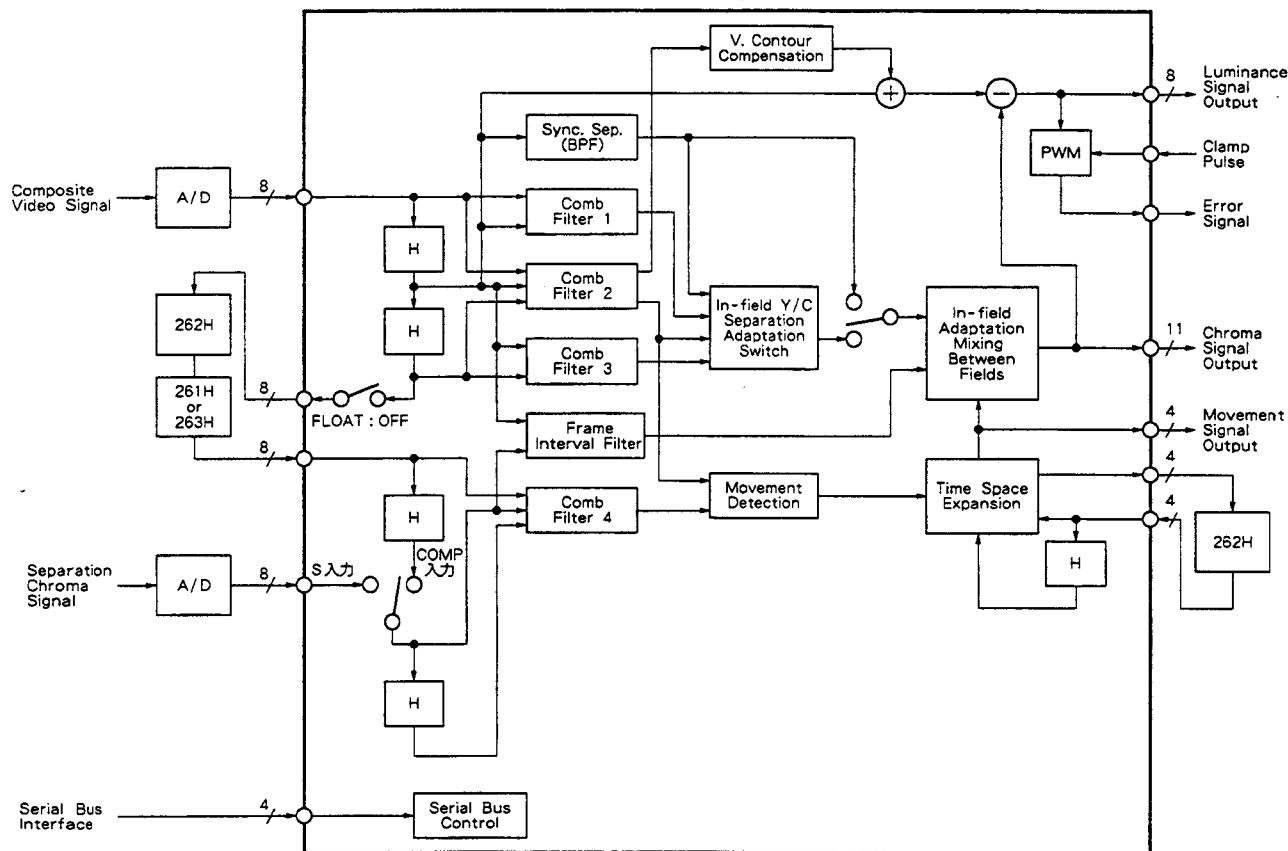
● Pin Function

No.	Pin name	I/O	Function	No.	Pin name	I/O	Function
1	VCC	I	Power supply voltage (+5V).	31	J/KU	I	Destination switch port (L : Japan, H : Others).
2	G-CS	O	Graphics decoder communication requirement output.	32	LED1	O	LED output : FL OFF
3	XSCK	I/O	Serial communication clock.	33	A	O	Display segment output.
4	S-MTOF	I	Serial communication data input.	34	B		
5	S-FTOM	O	Serial communication data output.	35	C		
6	XRESET (OUT)	O	Reset output of the SACB assy.	36	D		
7	XCS	O	Character generator (PD0154A) communication requirement output.	37	E		
				38	F		
8	SYNCHRO	I	CD deck synchro input.	39	G	O	Display segment output / Key scan output.
9	SYNCHRO	O	CD deck synchro output.	40	H (Ks0)		
10	AVCC	I	+5V.	41	I (Ks1)		
11	KIN0	I	Key data input.	42	J (Ks2)		
12	KIN1			43	K (Ks3)	O	Display segment output.
13	KIN2			44	L		
14	KIN3			45	M		
15	KIN4			46	N		
				47	O		
16	CDGM	I	Graphics decoder and graphics mode input.	48	Vdisp	I	FL power supply voltage (- 27V).
17	PO6	I	Not used (GND).	49	P	O	Display segment output.
18	7G/9G	I	Model switch port. (L:CLD-79, H:CLD-D99, CLD-99)	50	Q		
19	AVss	I	GND.	51	R		
20	TEST	I	GND.	52	G9	O	Display grid output.
21	X2	O	Not used (N.C.).	53	G8		
22	X1	I	+5V.	54	G7		
23	Vss	I	GND.	55	G6		
24	OSC1	I	Oscillator (8MHz).	56	G5		
25	OSC2	O		57	G4		
26	XRESET(IN)	I	CPU reset (L : Reset).	58	G3		
27	SHAKE (ACK)	I/O	Mecha. control communication requirement input. (Mode control communication permission output).	59	G2		
28	SEL IR	I	Remote control input.	60	G1		
				61	LED2	O	LED output : Direct CD.
				62	LED3	O	LED output : Theater mode
29	P. ON	O	Power supply source switch output of the SACB assy.	63	AC-3	I	AC-3 switch port (L : Uncorrespondence, H:Correspondence).
30	W.D.F	O	Pulse output for WATCH DOG.	64	MUTE	O	Graphics decoder and data mute output.

■ GGC1019 (UPD6480GF-3BA)(IC151 : TDYC assy)(CLD- 99 ONLY)

•Y/C Separation and Movement Detection for EDTV

● Block Diagram



● Pin Function

No.	Pin	Pin Name	I/O	Function
1	VDD	Power supply	—	Supplies a 5V (typical) operating power voltage.
2	CLPO	Clamp D/A output	O	Outputs the difference between the clamp level and the video (pedestal) level in PWM. The pulse width changes between 1/16 and 15/16 in a 4.4 μ s cycle.
3 10	V0H7 V0H0	Video input (0H delay) /Luminance input	I (SB)	Input an 8-bit signal which is obtained through A/D conversion of the video signal. In S-terminal mode, these pins accept the luminance signal. The pedestal level is of 64 levels. (V0H7 : MSB, V0H0 : LSB)
11 18	V2H7 V2H0	Video output (2H delay) /Burst-added main signal output	O (SB)	Output a signal which is obtained by delaying the video signal by 2H. In S-terminal mode, these pins output the signal which is obtained by adding the burst of the chroma signal, which is supplied to pins 92 to 99 (CS), to the main signal. (V2H7 : MSB, V2H0 : LSB)
19 26	F0H7 F0H0	Video input (1-frame delay)	I (SB)	Input a signal which is obtained by delaying the video signal by 1 frame. In S-terminal mode, these pins accept the signal which is obtained by delaying the main signal by 1 frame, for ΔY detection between frames. (F0H7 : MSB, F0H0 : LSB)
27, 28	MD2, MD1	S-terminal mode output	O	Output a signal to control the delay of memory connected to an external device or the output enable in S-terminal mode. S-terminal mode : MD2="H", MD1="L"
29	CKA	Clock output	O	Used as the clock for memory connected to an external device or for A/D conversion. It has a delay of 10 ns (typical) with respect to the input at pin 33 (CLK).
30	VDD	Power supply	—	Supplies a 5V (typical) operating power voltage.
31	GND	Ground	—	0V potential for ground.
32	CKB	Clock output	O	Used as the clock for memory banks connected to an external device or for A/D conversion. It has a delay of 10 ns (typical) with respect to the input at pin 33 (CLK).

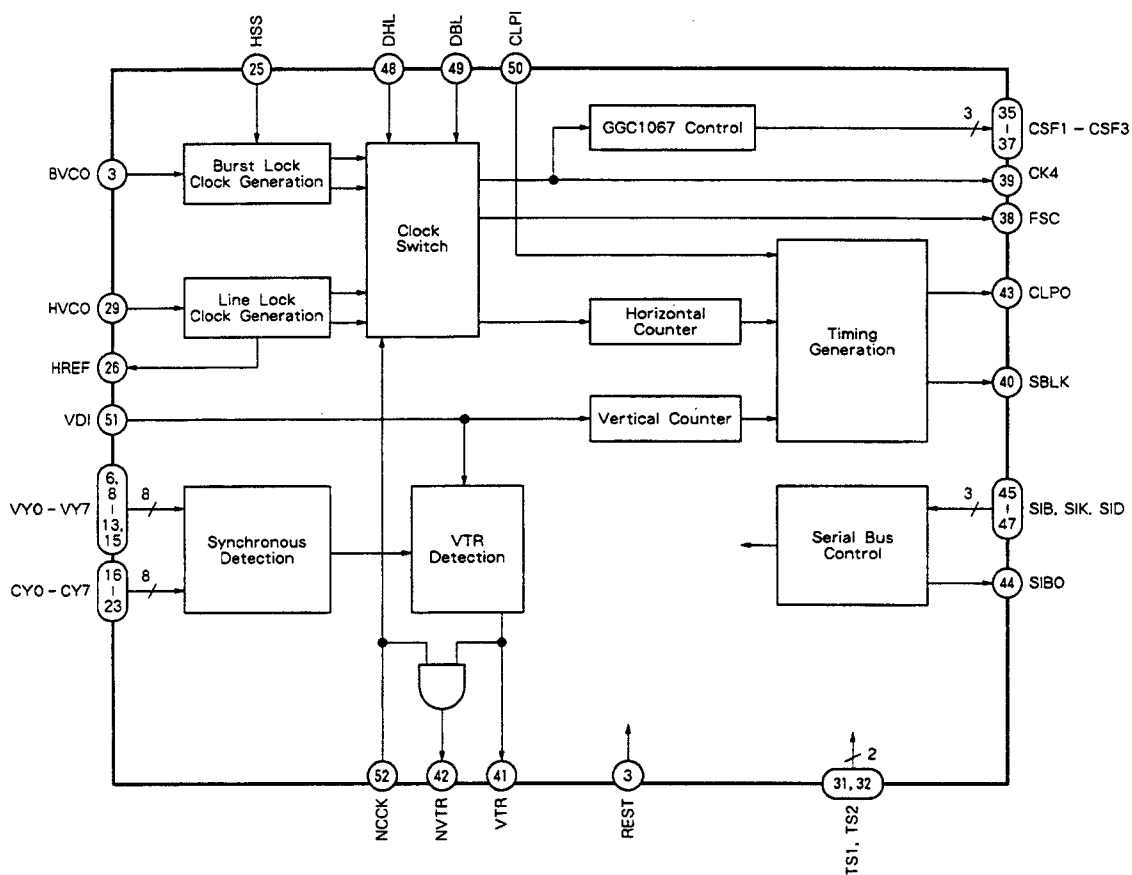
No.	Pin	Pin Name	I/O	Function
33	CLK	Clock input	I	Input a clock of 4 fsc (14.31818 MHz).
34	CLPI	Clamp pulse input	I	Reads the video signal 13 clock pulses before at the falling edge of an active "H" clamp pulse and compares it with the clamp level (64 levels).
35	TMR	Test input	I	Input pin for testing. To be connected to VDD or open.
36	BLK	Blanking input	I	Input a signal which is "H" for blanking, three clock pulses after the main signal. During blanking, the vertical contour compensation and synchronization protection are turned off, and Y/C separation is set to Frequency Separation mode.
37	LINE	Y/C separation forced line input	I	Set it to "H" to fix the Y/C separation to In-field Y/C Separation mode.
38	MIL	Forced movement input of movement output	I	Set it to "H" to forcibly set movement detection output at pins 46 to 49 (MI) to "H".
39	SIBO	Serial bus busy output	O	Supplies a busy signal for serial bus acknowledge return. Wire-connected with pin 40 (SIBI), this pin outputs "L" for the return.
40	SIBI	Serial bus busy input	I	Input a busy signal for serial bus data reception. Data reading starts when the signal at this pin is "L", and the initial status of data reading is resumed when "H".
41	SIK	Serial bus clock input	I	Input the clock signal for serial bus data reception. The input data at pin 42 (SID) are read at the rising edge of this clock.
42	SID	Serial bus data input	I	Input serial bus data. It reads data in synchronization with the input clock at pin 41 (SIK).
43	FIL3	Filter selection 3	I	Switches the filters for ΔY detection between frames. Normally to be connected to GND or open.
44	FIL1	Filter selection 1	I	Set to "H" to switch from In-field Y/C Separation mode to Frequency Separation mode. Normally connect this pin to TIG interleave detection output.
45	FIL2	Filter selection 2	I	Switches the bandwidth of the chroma signal for in-field Y/C separation. Narrow bandwidth is selected when the signal at this pin is "H". Normally to set it to "L".
46 49	MI0 MI3	Movement detection output	O (SB)	Expand the movement signal and output it with a delay of 13 clock pulses with respect to the main signal. (MI3 : MSB, MI0 : LSB)
50	GND	Ground	-	0V potential for ground.
51	VDD	Power supply	-	Supplies a 5V (typical) operating power voltage.
52	KIL	Killer input	I	Set this pin to "H" to output the luminance without subtracting the chroma from the main signal.
53 63	Co CA	Chroma output	O (2'S)	Outputs the chroma which is obtained through Y/C separation of the video signal, with a delay of 17 clock pulses with respect to the main signal. The gain is $\times 2$ for composite inputs or $\times 1$ in S-terminal mode. The gain in each case can be halved by the serial bus. (CA : MSB [SIGN], Co : LSB)
64	CVA	Chroma inverse output	O	Outputs the inverse of the MSB of the chroma output at pin 63 (CA). Use this pin for the MSB when connecting D/A to the chroma outputs.
65 72	Y0 Y7	Luminance output	O (SB)	Output the luminance which is obtained through Y/C separation of the video signal, with a delay of 17 clock pulses with respect to the main signal. (Y7 : MSB, Y0 : LSB)
73 75	TES1 TES3	Test input	I	Input pins for testing. To be connected to GND or open.
74 79	TES4 TES7	Test output	O	Output pins for testing.
80	VDD	Power supply	-	Supplies a 5V (typical) operating power voltage.
81	GND	Ground	-	0V potential for ground.
82	TES8	Test output	O	Output pin for testing.
83	TES9	Test input	I	Input pin for testing. To be connected to GND or open.
84 87	LB0 LB3	Movement expansion input	I (SB)	Accept the output for movement expansion being supplied from pins 88 to 91 (LA) with a delay of 262H. (LB3 : MSB, LB0 : LSB)
88 91	LA0 LA3	Movement expansion output	O (SB)	Output pins to expand the movement signal. (LA3 : MSB, LA0 : LSB)
92 99	CS7 CS0	Chroma input	I (SB)	Accept the chroma signal in S-terminal mode. Connect them to GND when S-terminal mode is not used. (CS7 : MSB, CS0 : LSB)
100	GND	Ground	-	0V potential for ground.

Notes : (SB) : Data are in the form of straight binary codes.
(2'S) : Data are in the form of two's complement codes.

■ GGC1064 (UPD6481GC-3B6)(IC152 : TDYC assy)(CLD- 99 ONLY)

•Timing Generation for Three-dimensional Y/C Separation

• Block Diagram

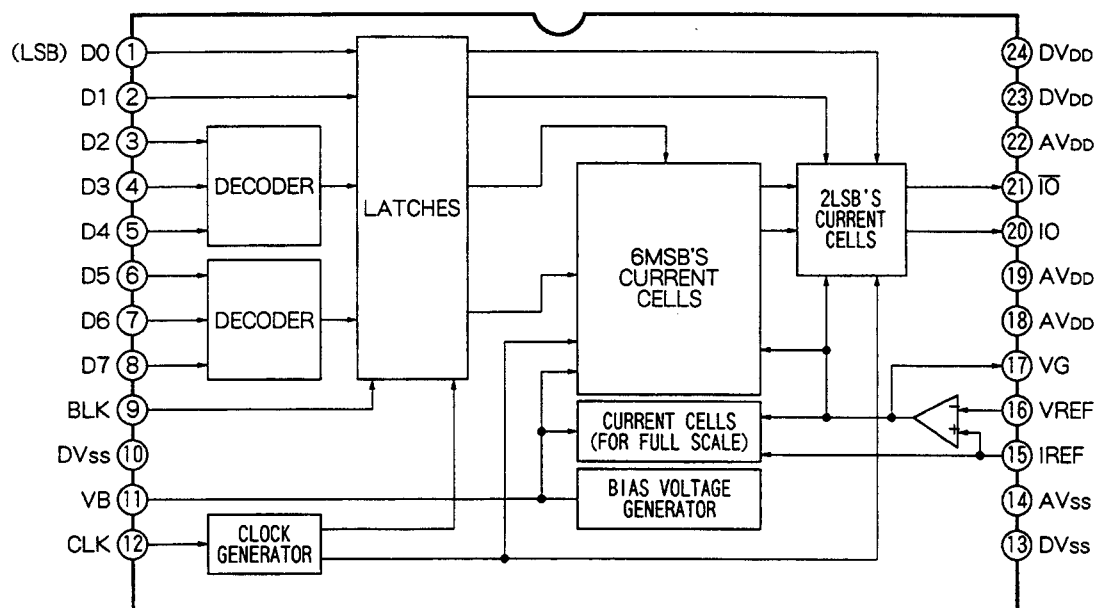


• Pin Function

No.	Pin name	I/O	Function
1	GND	—	0V : potential for ground
2	BXT	O	Output for testing. 4fsc is output.
3	BVCO	I	Input the VCO oscillation clock of burst lock PLL. 4fsc (14.3MHz) is input.
4	Vdd	—	+5V (TYP.) Apply a power voltage.
5	REST	I	Input pin for forced reset. Normally, to be connected GND or open.
6	VY0	I	Input the Y signal with burst signal. Output from YCS III. (VY0 : LSB)
7	GND	—	0V : potential for ground
8 13	VY1 VY6	I	Input the Y signal with burst signal. Output from YCS III.
14	N.C.	—	No connection.
15	VY7	I	Input the Y signal with burst signal. Output from YCS III. (VY7 : MSB)
16 23	CY0 CY7	I	Input the signal with a delay of 1 field (262H) with respect to VY inputs. (CY0 : LSB, CY7 : MSB)
24	HOEB	I	Input for testing.
25	HSS	I	Input the horizontal frequency for AFC loop.
26	HREF	O	Output the reference signal to line lock PLL. 910fH (14.3MHz) signal which is input from HVCO pin divide into 910 and fH (15.734kHz) is output.
27	GND	—	0V : potential for ground
28	HXT	O	Output for testing. 910fH is output.
29	HVCO	I	Input the VCO oscillation clock of line lock PLL. 910fH (14.3MHz) is input.
30	Vdd	—	+5V (TYP.) Apply a power voltage.
31	TS2	I	Input for testing. Normally, to be connected GND or open.
32	TS1	I	Input for testing. Normally, to be connected GND or open.
33	GND	—	0V : potential for ground
34	Vdd	—	+5V (TYP.) Apply a power voltage.
35 37	CSF1 CSF3	O	Memory control output for GGC1019 (UPD6480GF-3BA).
38	FSC	O	Output to FSC pin of YCP II. Reference phase output of fsc (3.58MHz).
39	CK4	O	4fsc (14.3MHz) clock for system.
40	SBLK	O	Input the signal (for sync protection of YCS III) to BLK pin of YCS III. (Active is High.)
41	VTR	O	Hi-level is output by detecting the non standard signal. Input to line pin of YCS III.
42	NVTR	O	Hi-level is output when detecting the non standard signal in the three-dimensional Y/C separation mode. Low-level is always output in the luminance signal NR mode.
43	CLPO	O	Pulse output for clamping the video signal of A/D immediately. (Active is High.)
44	SIBO	O	Busy output for ACK answer of serial bus.
45	SIB	I	Busy input of serial bus.
46	SIK	I	Clock input of serial bus.
47	SID	I	Data input of serial bus.
48	DHL	I	System clock is forced became line lock clock in the Hi-level. It becomes auto switch in the Low-level.
49	DBL	I	System clock is forced became burst lock clock in the Hi-level. It becomes auto switch in the Low-level.
50	CLPI	I	Input the clamp pulse. (Active is High.)
51	VDI	I	Input the vertical synchronizing pulse which is sync. separated fro the video signal. (Active is Low.)
52	NCKK	I	H : Three-dimensional Y/C separation mode, L : Luminance signal NR mode

■ CXD1171M (IC604 : DVDB assy)
•8-bit 40 MSPS D/A Converter

• Block Diagram



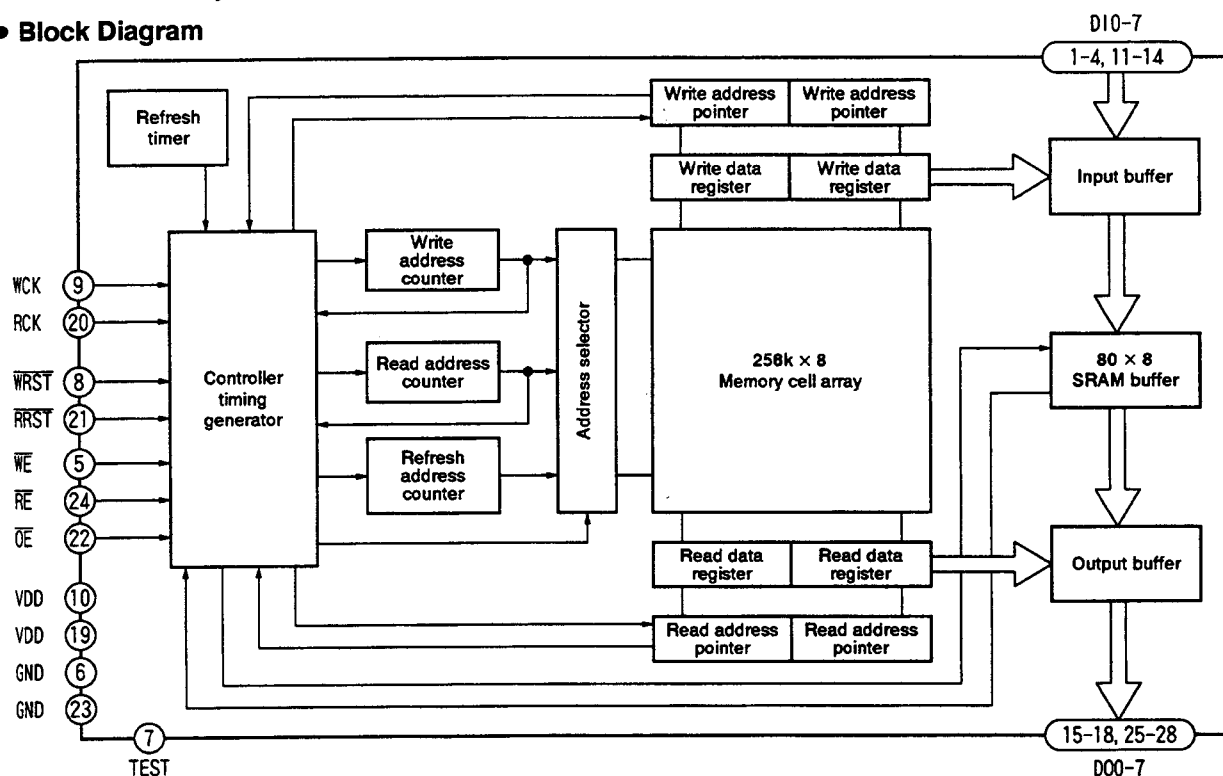
• Pin Function

No.	Pin name	Function
1~8	D0~D7	Digital input.
9	BLK	Blanking pin. "H" for no signal (output 0V), "L" for output.
11	VB	Connect a 0.1 μ F degrees of capacitor.
12	CLK	Clock pin. Input pins are all compatible with TTL - CMOS.
10, 13	DVss	Digital GND.
14	AVss	Analog GND.
15	IREF	Connect a "16R" (16 times) resistor against to output resistance value "R".
16	VREF	Set the output full scale value.
17	VG	Connect a 0.1 μ F degrees of capacitor.
18, 19, 22	AVDD	Analog VDD
20	IO	Current output pin. Produce the output by connecting resistor.
21	IO-bar	Inversion current output pin. Normally, connect to analog GND.
23, 24	DVDD	Digital VDD

■ UPD42280GU - 30 (IC153, IC154 : TDYC assy)(CLD- 99 ONLY)

·2M Fieldmemory IC

● Block Diagram



● Pin Function

No.	Pin Name	I/O	Function	No.	Pin Name	I/O	Function
1	DI0	I	Write data inputs. Data acceptance is done at the rising edge after the WCK input cycle, and setup and hold time (t _{DS} , t _{DH}) are defined.	15	DO7	O	Read data outputs. The access time is determined from the rising edge before the RCK cycle and defined as t _{AC} . These are 3-state outputs.
2	DI1			16	DO6		
3	DI2			17	DO5		
4	DI3			18	DO4		
5	WE	I	Write operation control input. When at the high level, internal write operations are inhibited and the write address pointer stops and remains at the current location.	19	VDD	—	+5V power supply
6	GND	—	Ground	20	RCK	I	Read clock input. A read operation is done in synchronization with read clock and, when RE is at the low level, the read address pointer is simultaneously incremented.
7	TEST	I	For testing. To be fixed at the low level.	21	RRST	I	Reset input to initialize the read address. Reset signal acceptance is done at the rising edge before the RCK input cycle, and setup and hold time (t _{RS} , t _{RH}) are defined.
8	WRST	I	Reset input to initialize the write address. Reset signal acceptance is done at the rising edge before the WCK input cycle, and setup and hold time (t _{RS} , t _{RH}) are defined.	22	OE	I	Read data control input. When at the high level, DO0 - 7 are set to high impedance. Regardless of the input level of the OE signal, the read address pointer is incremented in synchronization with RCK.
9	WCK	I	Write clock input. A write operation is done in synchronization with write clock when WE is at the low level, and the write address pointer is incremented at the same time.	23	GND	—	Ground
10	VDD	—	+5V power supply	24	RE	I	Read operation control input. When at the high level, internal read operations are enabled, but the read address pointer stops and remains at the current location.
11	DI4	I	Write data inputs. Data acceptance is done at the rising edge after the WCK input cycle, and setup and hold time (t _{DS} , t _{DH}) are defined.	25	DO3	O	Read data outputs. The access time is determined from the rising edge before the RCK cycle and defined as t _{AC} . These are 3-state outputs.
12	DI5			26	DO2		
13	DI6			27	DO1		
14	DI7			28	DO0		

8. CIRCUIT DESCRIPTION

8.1 MODE CONTROL

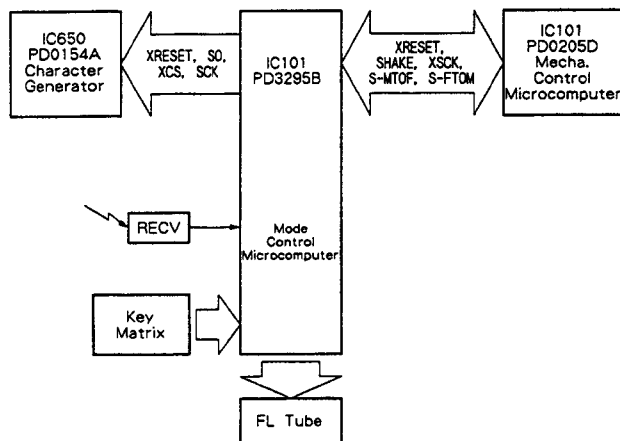


Fig. 1 Mode control block diagram

8.1.1 Microcomputer Interface

The microcomputer system of this model consists of two chips, an 8-bit microcomputer (IC101 : PD0205D) which controls the mechanism and an 8-bit microcomputer (IC101 : PD3295B) 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 (IC650 : PD0154A).

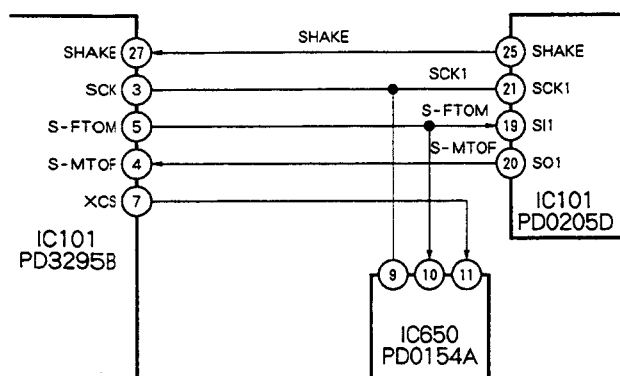


Fig. 2 Serial interface connection diagram

8.1.2 Microcomputer Communication Sequence

1. The PD0205D sets the SHAKE terminal (pin 25) to "L" for several microseconds as a request to the PD3295B for the start of a communication.
 2. When the PD3295B receives the communication start request, it sets the SHAKE terminal (pin 27) to "L" and informs the PD0205D that it is ready for communication.
 3. The PD0205D then sets SCK1 (pin 21), which has been used as an input port, to output mode. The PD3295B sets SCK (pin 3) to the input mode, connecting the communication lines between the microcomputers.
 4. The PD0205D sends the transfer clock (562.5kHz) in 8 bits. The data are then sent and received in synchronization with this clock.
 5. When PD3295B receives data of 8 bits, it sets the SHAKE terminal (pin 27) to "H" and reports that a single communication is completed.
 6. The PD0205D sets SCK1 (pin 21) to input mode, and the PD3295B sets SCK (pin 3) to output mode. The communication line is thereby disconnected and a single communication is completed.
- The communication takes place within a cycle between 10 and 30 ms. Twelve bytes of data are transmitted at one time.

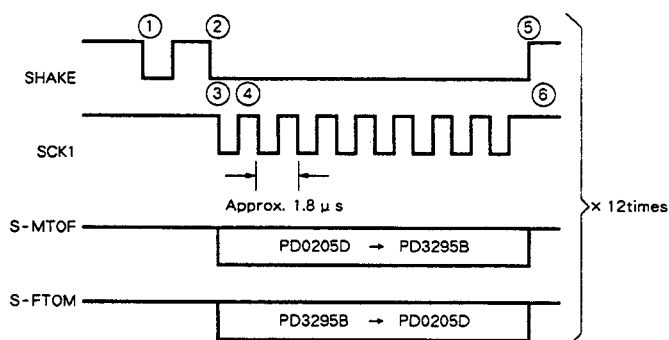


Fig. 3 Timing chart of the microcomputer interface

- The handshake is done on a single line. Both the PD0205D and PD3295B 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 PD3295B will send the reset signal to the PD0205D to reset it to its initial state. This will also happen when the communication is not executed for 300 ms or longer.

8.1.3 Direct CD

When playing a compact disc, the following operations are executed by setting the Direct CD switch to ON.

(Microcomputer control)

- ① The switch incorporated with a lamp lights up and Direct CD mode is initiated.
- ② Power to certain blocks of the video system that are not used for CD playback is turned off.
(No indication is issued.)
- ③ The slider park position is set to the position to start a CD.
- ④ The small tray for CDs is extruded when Tray-Close status is switched to Open status.

These operations decrease the time until the CD play starts after the PLAY button is pressed to approx. two-third. In addition, turning off the unnecessary blocks enables pure audio playback.

If you set the Direct CD switch to ON when the tray is open, the switch incorporated with a lamp flashes from the time the tray begins to close until disc distinguishing finishes. When disc distinguishing is completed, the switch lights for a CD, a CLD or no disc. For an LD, the switch goes dark and Direct CD mode is automatically released. The Direct CD switch cannot be turned ON during LD playback.

When playing a CDV disc, the video system is temporarily turned on for the video portion, without releasing Direct CD mode. The normal Direct CD mode is retrieved when the playback of the video portion is finished.

8.1.4 Outline of the Mode-Control System

(1) Description of the Mode Microcomputer

The mode microcomputer performs the following operations.

- ① Main unit key/remote control signal processing
Reading the key switch signal from the main unit and remote control signals, it executes the specified operations.
- ② FL display
It performs display on the FL tubes (VAW1037).
- ③ Screen display
It controls the character generator IC (PD0154A) and superimposes characters on the screen.
- ④ Control of the mechanism-control microcomputer
It directs the mechanism-control microcomputer (PD0205D) for operations and simultaneously accepts some information, including the time and level data.
- ⑤ Management of system reset
If any trouble occurs in communication with the mechanism-control microcomputer, it resets the system to the default condition.

(2) Film Mode

This is a mode specially designed for playing back a movie program from an LD. By setting the Film Mode switch to ON while an open/stop or play operation is being executed, the following operations are executed.

- ① The Film Mode LED lights and Film Mode is initiated.
- ② The FL-OFF LED simultaneously lights and the FL display is turned off.
- ③ The screen displays other than the input displays (program, search, etc.) go out in 2 seconds after the key is pressed.
- ④ One-shot memory in the reverse operation is deactivated.
- ⑤ TOC reading at the playback beginning and reverse operation is deactivated.

These operations decrease the reverse time, enabling smooth reverse operation of movie programs. The time to switch from stop status to playback is also decreased, making this mode effective also as a quick start mode. Film mode is automatically released when a CD is played.

(3) V-DNR (picture-quality control)

The mode-control IC (PD3295B) sends the NR-control steps to the mechanism-control IC (PD0205D).

The control values can be changed in a total of 10 steps from 0 to 9 individually for Y and C of the video signal.

The relationships between the steps and NR values are shown below.

Step	Y-NR	C-NR
0	OFF	OFF
1	Minimum value	Minimum value
...	...	...
5	Standard value	Standard value
...	...	...
9	Maximum value	Maximum value

The mode-control IC sends step 0 for both Y and C in OFF mode and sends step 5 both for Y and C in STANDARD mode.

In Select mode, any step from 0 to 9 can be selected with the shuttle ring and sent to the mechanism-control IC.

(4) V-DNR, 3D

The mode-control IC (PD3295B) sends the three-dimensional Y/C control steps to the mechanism-control IC (PD0205D).

The settings of the three-dimensional Y/C and the contour compensation can be changed in a total of 10 steps from 0 to 9.

The mechanism-control IC determines the three-dimensional Y/C setting according to these steps.

The relationships between the steps and settings are shown below.

Step	3D. Y/C	SHARPNESS
0	OFF	OFF
1	Minimum value	Minimum value
...	...	...
5	Standard value	Standard value
...	...	...
9	Maximum value	Maximum value

The mode-control IC sends step 5 both for the three-dimensional Y/C and contour compensation in OFF and STANDARD mode.

In Select mode, both three-dimensional Y/C and contour compensation can be set to any step from 0 to 9 with the shuttle ring and sent to the mechanism-control IC.

8.2 Movement-adaptable three-dimensional Y/C separation

The digital video signal supplied to pins 3 to 10 of the three-dimensional IC [IC151: GGC1019 (UPD6480GF-3BA)] is directly output from pins 11 to 18, is delayed for 1 frame by two field buffers and becomes a C signal after accepting an arithmetic operation with a newly supplied signal (Fig. 4).

The input signal is simultaneously separated by the line comb filter into Y and C signals before and after a delay of 1 frame (Figs. 6 and 7).

The differences before and after the delay are used to switch three-dimensional and two-dimensional mixing modes as the reference for movement detection.

The Y and C signals before the delay are also used as the 3-line Y/C separation signals in 2-dimensional operations.

In three-dimensional operations, the Y signal passes through the vertical contour compensation circuit in the form of a composite signal, and is output after the C signal is subtracted by three-dimensional separation.

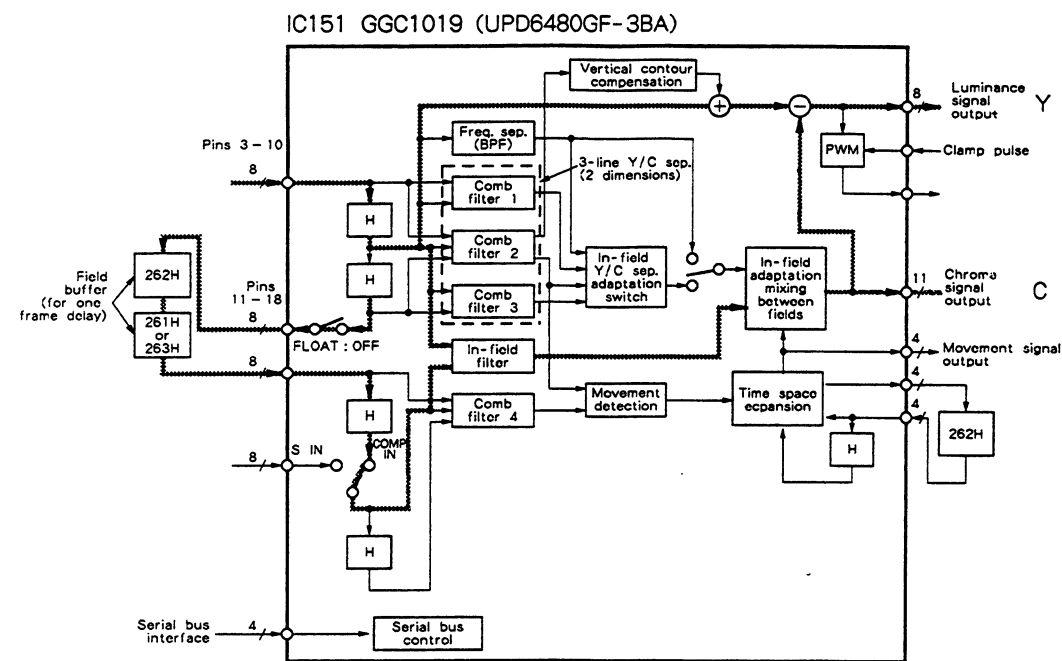


Fig. 4

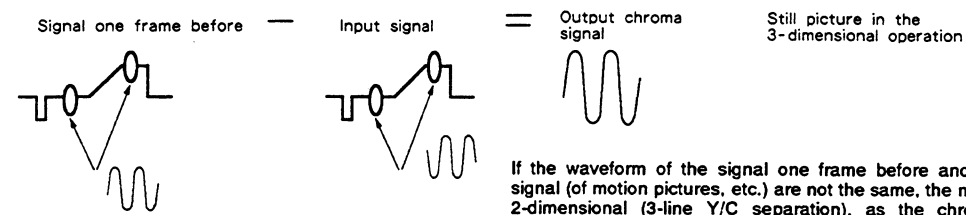


Fig. 5

If the waveform of the signal one frame before and that of the input signal (of motion pictures, etc.) are not the same, the mode is switched to 2-dimensional (3-line Y/C separation), as the chroma may not be accurately be separated in 3-dimensional mode.

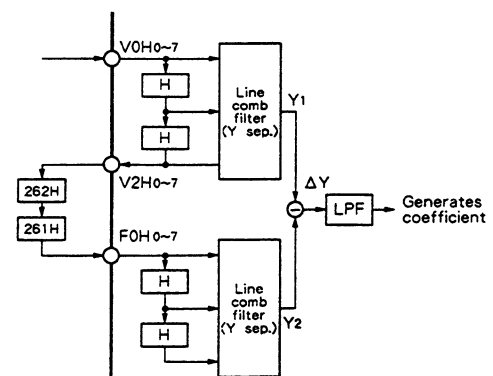


Fig. 6 Y difference detection circuit

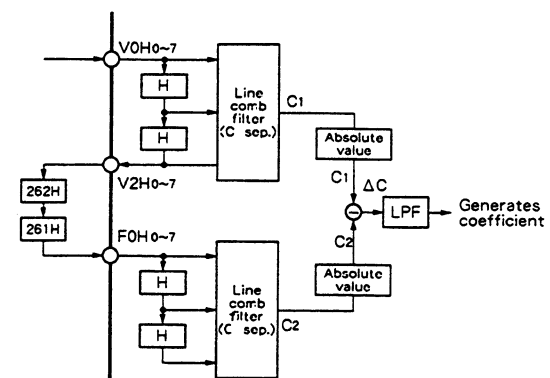
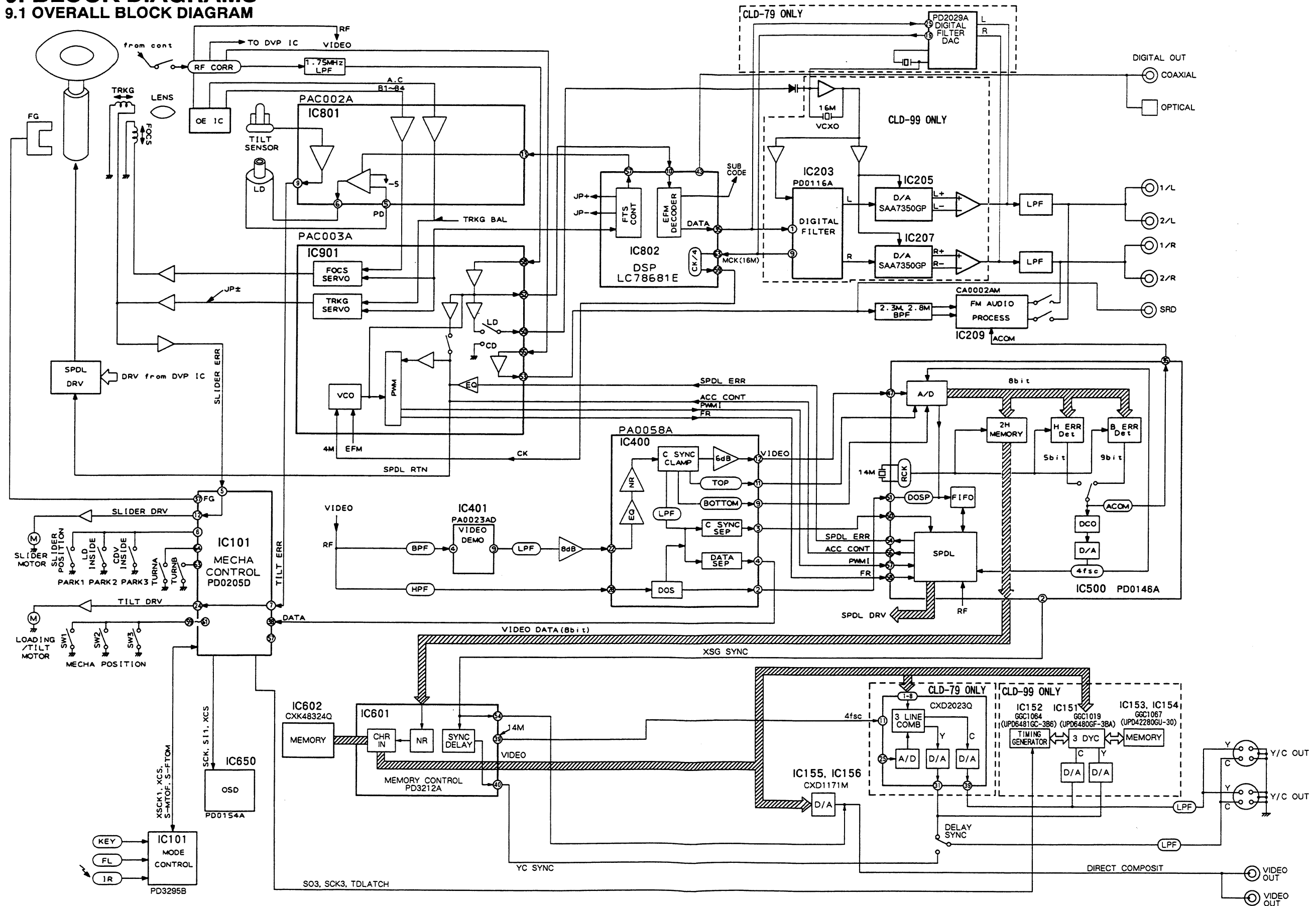


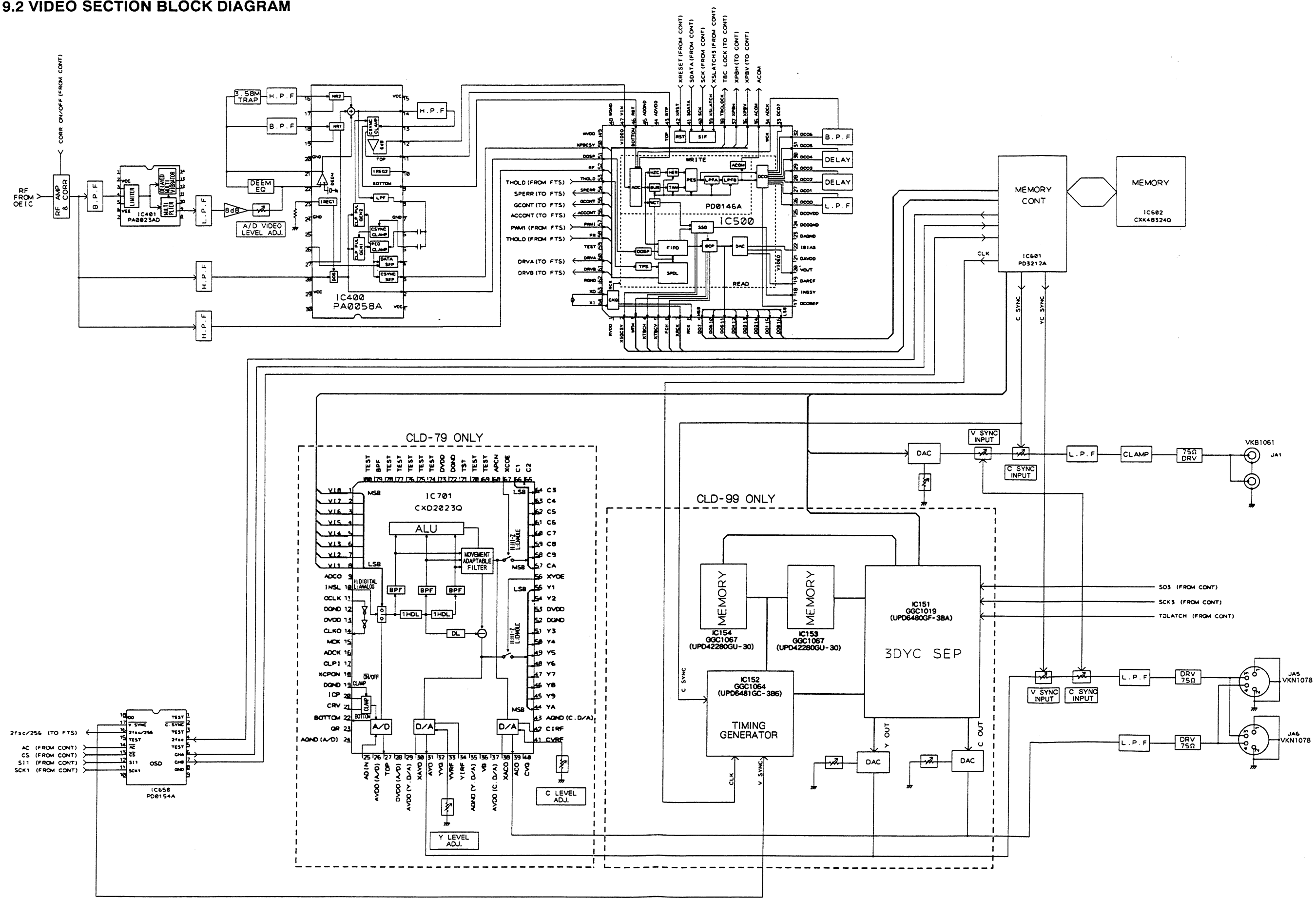
Fig. 7 C difference detection circuit

9. BLOCK DIAGRAMS

9.1 OVERALL BLOCK DIAGRAM

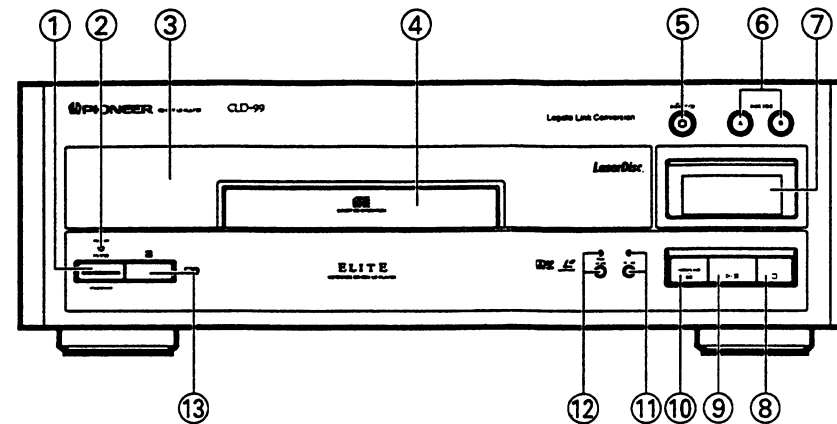


9.2 VIDEO SECTION BLOCK DIAGRAM



10. PANEL FACILITIES

FRONT PANEL



① POWER STANDBY/ON switch
Press to switch power ON/OFF (STANDBY).

② STANDBY indicator
This lights to indicate power standby.
When power is switched ON, it goes out.

③ Disc table

④ CD disc table

⑤ DIRECT CD button/indicator

⑥ DISC SIDE A/B button

⑦ Display window

⑧ Stop button (■)

⑨ Play/Pause button (▶/⏸)
Press when power is OFF, and if there is a disc in the table, power is switched on and play starts.

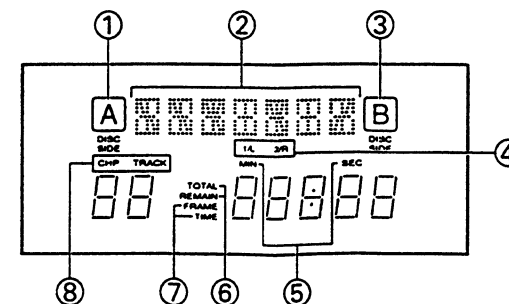
⑩ OPEN/CLOSE button (▲)
Press when power is OFF, and power is switched ON and the disc table opens.

⑪ FL OFF display button/indicator
When you press the button, the indicator on top of the button lights and the display window switches OFF. Switching off the display prevents low level noise from adversely affecting sound quality. Press again to switch the display ON.

⑫ FILM MODE button/indicator
Switch ON if desired when watching a movie disc.
When you switch it ON:
• The display window turns OFF. You can switch it ON/OFF with the FL OFF display button ⑪.
• Screen display switches OFF.
• When changing disc sides, the picture is usually the memorized picture, but when using the Film mode, the screen is black.

⑬ Remote control sensor

DISPLAY



① Side A indicator

② Function operation indicator
Indicates functions and operations. Refer to function explanations for details concerning indications.

③ Side B indicator

④ 1/L channel, 2/R channel indicator
Indicates audio output channel.

⑤ MIN/SEC indicator
Indicates play time in minutes and seconds.

⑥ TOTAL/REMAIN indicator
Indicates remaining play time (REMAIN) and the total play time of the side (TOTAL).

⑦ FRAME/TIME indicator
Indicates frame number and elapsed play time.

⑧ Chapter/Track indicator
Indicates chapter number and track number.

11. SPECIFICATIONS

11.1 CLD-99

1. General

System LaserVision Disc system and
Compact Disc digital audio system
Laser Semiconductor laser wavelength 780 nm
Power requirements AC 120V, 60 Hz
Power consumption 48 W
Weight 10.6kg (23lb 6oz)
Dimensions 459 (W) x 432 (D) x 145 (H) mm
17-5/16 (W) x 17 (D) x 15-11/16 (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

LaserVision Discs

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

Spindle motor speed

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

Compact Discs

DISC Diameter: 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. 12 cm discs
20 min. 8 cm discs
(For stereo playback)

Compact Discs with Video

DISC Diameter: 12 cm, Thickness: 1.2 mm
Rotation direction (pickup side) Counterclockwise
Linear speed Audio portion : 1.2 ~ 1.4 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. S-Video output (two pairs)

Y (luminance) - Output level 1 Vp-p (75 Ω)
C (color) - Output level 286 mVp-p (75 Ω)
Jack S-VIDEO jack
Number of channels 2

5. Audio characteristics (two pairs)

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

Digital Audio Characteristics

Frequency response	4 Hz - 20 kHz
SN ratio	117 dB (EIAJ)
Dynamic range	99 dB (EIAJ)
Total harmonic distortion	0.0017 %
Wow and flutter	Limit of measurement (EIAJ)

6. Other Terminals

Control input/output Both miniature jacks
Optical digital output Optical digital jack
Coaxial digital output RCA jack
AC-3 • RF output RCA jack

7. Accessories

Remote control unit 1
Size "AAA" (IEC R03) dry cell batteries 2
Video cord 1
S-VIDEO cable 1
Audio cord 1
Operating instructions 1
Warranty card 1

11.2 CLD-79

1. General

System LaserVision Disc system and
Compact Disc digital audio system
Laser Semiconductor laser wavelength 780 nm
Power requirements AC 120 V, 60Hz
Power consumption 46 W
Weight 8.7 kg (19lb 3oz)
Dimensions 420 (W) x 432 (D) x 140 (H) mm
16-9/16 (W) x 17 (D) x 5-8/16 (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

LaserVision Discs

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

Spindle motor speed

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

Compact Discs

DISC Diameter: 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. 12 cm discs
20 min. 8 cm discs
(For stereo playback)

Compact Discs with Video

DISC Diameter: 12 cm, Thickness: 1.2 mm
Rotation direction (pickup side) Counterclockwise
Linear speed Audio portion : 1.2 ~ 1.4 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 W unbalanced
Jacks Both RCA jacks

4. S-Video output (two pairs)

Y (luminance) - Output level 1 Vp-p (75 Ω)
C (color) - Output level 286 mVp-p (75 Ω)
Jack S-VIDEO jack
Number of channels 2

5. Audio characteristics (two pairs)

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

Digital Audio Characteristics

Frequency response	4 Hz - 20 kHz
SN ratio	115 dB (EIAJ)
Dynamic range	98 dB (EIAJ)
Total harmonic distortion	0.0025 %
Wow and flutter	Limit of measurement (EIAJ)

6. Other Terminals

Control input/output Both miniature jacks
Optical digital output Optical digital jack
Coaxial digital output RCA jack
AC-3 - RF output RCA jack

7. Accessories

Remote control unit 1
Size "AAA" (IEC R03) dry cell batteries 2
Video cord 1
S-VIDEO cable 1
Audio cord 1
Operating instructions 1
Warranty card 1