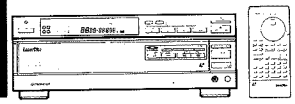
PIONEER®
The future of sound and vision.

Service Manual



ORDER NO.
ARP 1590

LD PLAYER
LD-W1

● **This service manual is applicable to the KU/CA type.**

CONTENTS

PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan
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PIONEER ELECTRONICS AUSTRALIA PTY. LTD. 178-184 Boundary Road, Braeside, Victoria 3195, Australia TEL: (03) 580-9911

Mark	Symbol & Description	Part No.
	C111	CEJANPR47M50
	C145, C165	CEJANP010M50
	C140	CEJANP2R2M35
	C142, C146, C318, C319, C475	CEJANP220M10
	C112, C456	CEJANP470M10
	C403, C503, C508	CEJAR47M50
	C114, C413, C515, C518	CEJA010M50
	C3, C22, C30, C107, C334, C337, C338, C349, C354 – C356, C361, C460, C469	CEJA100M16
	C4	CEJA100M35
	C663	CEJA100M50
	C7, C314, C315, C353, C493, C494, C522, C525	CEJA101M16
	C11, C148, C151, C357, C358, C443, C461, C462, C501, C505, C507, C511, C513, C516, C655, C656	CEJA220M16
	C480, C613	CEJA3R3M50
	C471	CEJA330M10
	C149, C313, C514, C519, C520	CEJA4R7M35
	C119, C133, C135, C154, C157, C158, C161, C163, C168, C169, C171, C177, C179, C180, C350, C402, C405, C421, C427, C437, C440, C446, C463, C476, C488, C490, C610, C612, C651	CEJA470M16
	C670	CEJA470M6R3
	C103, C141, C164, C184, C344, C352, C420	CFTXA104J50
	C139	CFTXA153J50
	C181	CFTXA393J50
	C19, C186, C466, C495, C509, C521, C526, C611, C657, C665, C669	CGCYX473M25
	C332, C333	CKCYB472K50
	C5, C8, C12, C21, C24, C123, C401, C404, C409, C410, C414, C416, C423 – C426, C431, C436, C438, C439, C441, C442, C464, C477, C487, C489, C491, C492, C502, C504, C506, C510, C512, C517, C524, C601 – C604, C652 – C654	CKCYF103Z50
	C459	CKPUYB101K50
	C127, C326, C327	CKPUYB102K50
	C187	CKPUYB151K50
	C26	CKPUYB391K50
	C130	CKPUYB681K50
	C605	CKPUYF103Z25
	C28, C118, C120, C132, C134, C153, C156, C159, C160, C162, C170, C172 – C176, C178, C182, C303 – C308, C359, C412, C606, C607, C660	CKPUYF223Z25
	C104, C105, C117	CQMA102J50
	C110, C113, C116, C137, C419	CQMA103J50
	C131	CQMA122J50
	C329, C331	CQMA152J50
	C101	CQMA182J50
	C183, C664	CQMA183J50
	C418	CQMA272J50
	C339, C340	CQMA393J50
	C102, C144	CQMA472J50
	C185	CQMA473J50
	C122	CQMA682J50
	C468	CQMA683J50
	C341, C342	CQMA822J50
	C121	CQSA181J50
	C479	CQSA821J50
	C6 (0.1F/5.5V)	VCH1013
	VC1 Ceramic trimmer	VCM-003

RESISTORS

Mark	Symbol & Description	Part No.
★	VR406 Semi-fixed (4.7kΩ)	VRTG6VS472
★	VR101, VR102, VR105 Semi-fixed (47kΩ)	VRTB6VS473
★	VR103, VR402 Semi-fixed (4.7kΩ)	VRTB6VS472
★	VR403 Semi-fixed (470Ω)	VRTB6VS471
★	VR405 Semi-fixed (220Ω)	VRTB6VS221
★	VR104 Semi-fixed (10kΩ)	VRTB6VS103
★	VR401 Semi-fixed (100Ω)	VRTB6VS102
	R408	RD1/2PM221J
	R84 – R92	RD1/4PM□□□J
	R205 – R207, R333, R334, R338, R339	RD1/4VM□□□J
	R163, R164, R234, R235, R401, R402, R405, R406, R409, R410, R413, R414, R426, R471, R479, R611, R161, R162	RN1/6PQ□□□□F
	Other resistors	RD1/6PM□□□J

OTHERS

Mark	Symbol & Description	Part No.
	28P IC socket	VKH1001
★	X1 Ceramic resonator	KBR-4.0MS
★	X2 Crystal resonator	VSS1005
★	X101 Crystal resonator (3.58MHz)	VSS1011

LPFB Assembly

COILS

Mark	Symbol & Description	Part No.
	L3 Axial inductor	LAU270J
	L1 Axial inductor	LAU330J
	L2 Axial inductor	LAU430J

1. SAFETY INFORMATION

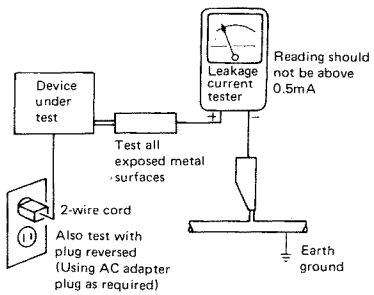
(FOR USA MODEL ONLY)

1. SAFETY PRECAUTIONS

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

LEAKAGE CURRENT CHECK

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



AC Leakage Test

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

2. PRODUCT SAFETY NOTICE

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

Electrical components having such features are identified by marking with a ⚠ 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.

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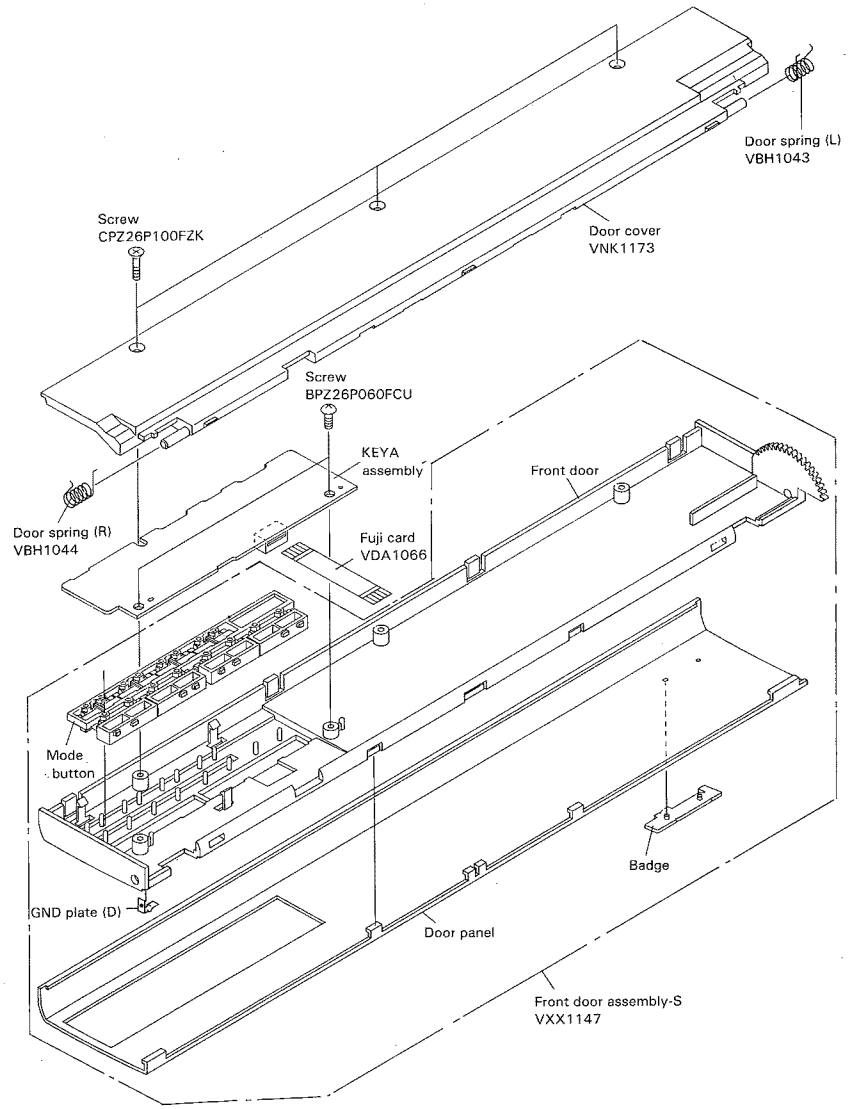
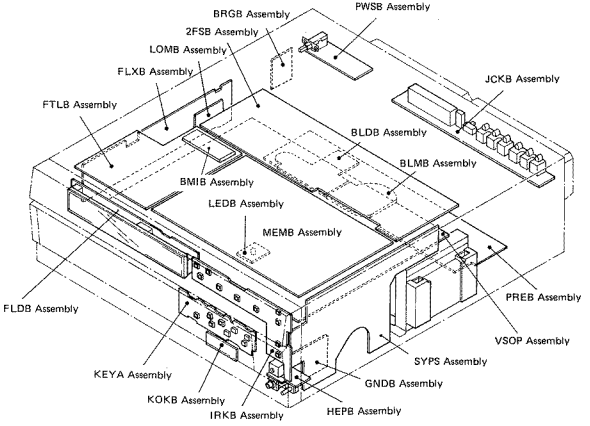
• **Front Door Assembly**

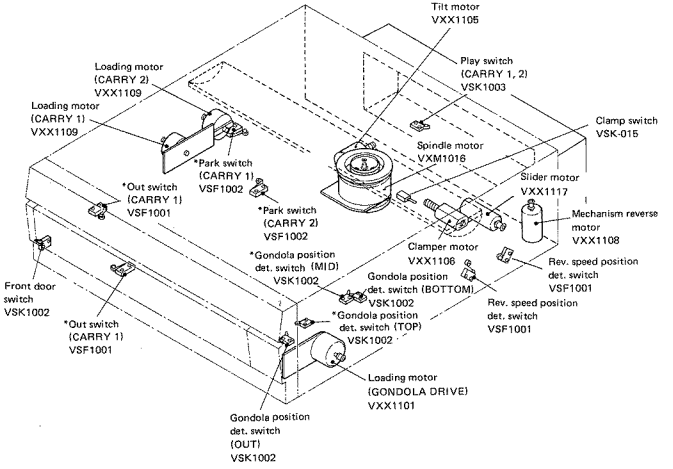


2. PARTS LOCATION

2.1 P.C. BOARDS LOCATION



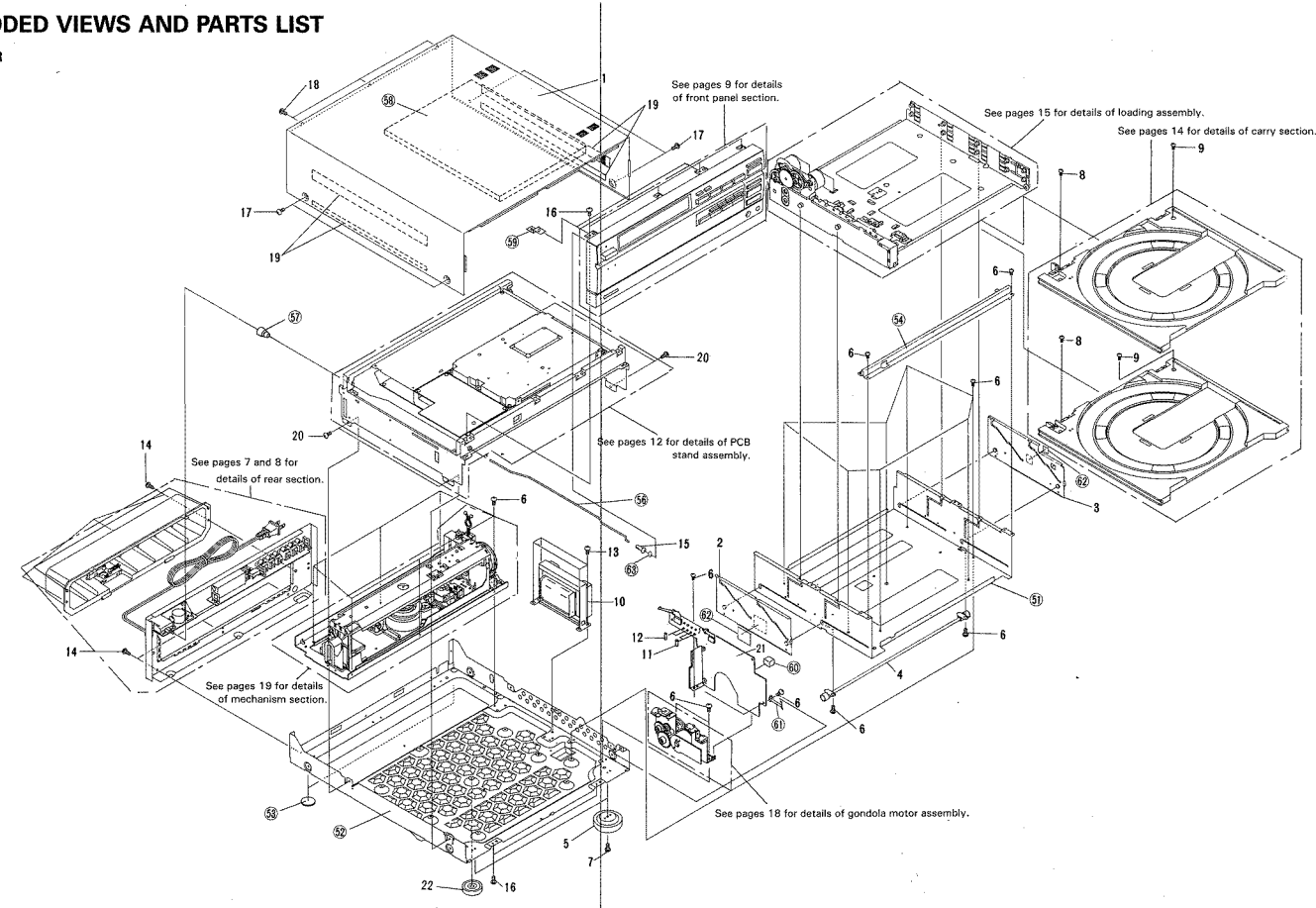
2.2 SWITCHES AND MOTORS LOCATION



*Note: *Marking switches are required position adjustment. (See page 83)*

3. EXPLODED VIEWS AND PARTS LIST

3.1 EXTERIOR



NOTES:

- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *Parts marked by "●" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

• Parts List of Exterior

Mark	No.	Part No.	Description
	1.	VXX1102	Bonnet-S
	2.	VXA1136	Rack gear (L) assembly
	3.	VXA1135	Rack gear (R) assembly
	4.	VXA1186	Synchro gear assembly
	5.	VXA1094	Insulator assembly
	6.	BBZ30P060FCC	Screw
	7.	BBZ30P080FCC	Screw
	8.	VEC1136	Plastic rivet
	9.	VEC1146	Plastic rivet
⚠ ★	10.	VTT1031	Power transformer
⚠ ★★	11.	VEK-018	Fuse (3A)
⚠ ★★	12.	VEK-022	Fuse (2A)
	13.	PMB40P070FCU	Screw
	14.	BBZ30P080FCU	Screw
	15.	VNL1084	PSW cap

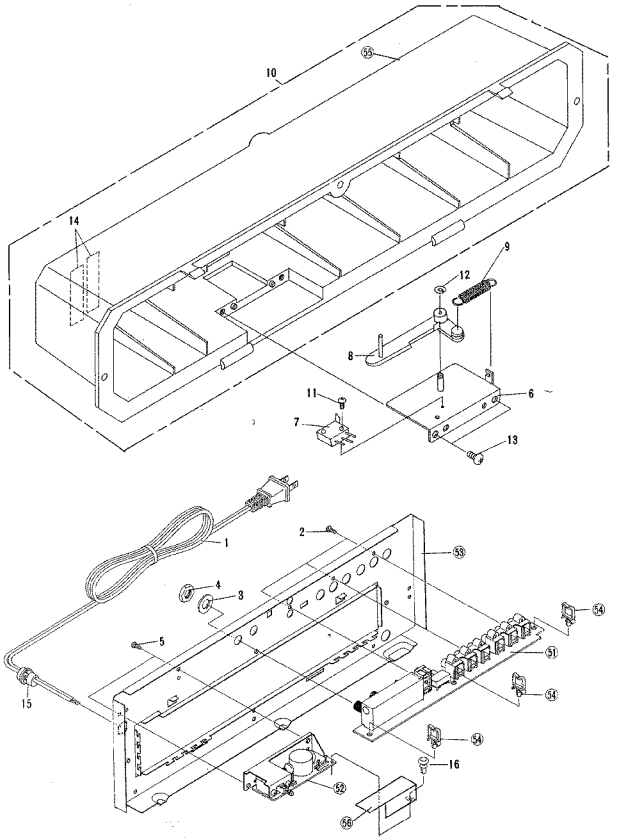
Mark	No.	Part No.	Description
	16.	IBZ30P060FCC	Screw
	17.	BBZ40P060FBR	Screw
	18.	BBT30P060FBR	Screw
	19.	VEC1011	Cushion
	20.	BBZ30P040FMC	Screw
	21.	VYR1045	SYPS assembly
	22.	VEC1157	Center leg
	51.		Loading base
	52.		Under base
	53.		Rubber foot
	54.		Bridge (A)
	55.		...
	56.		Rod
	57.		Joint cap
	58.		Bonnet cushion
	59.		Front plate
	60.		PREB caution
	61.		Cord retainer
	62.		Damp sheet
	63.		Motor spacer

3.2 REAR SECTION

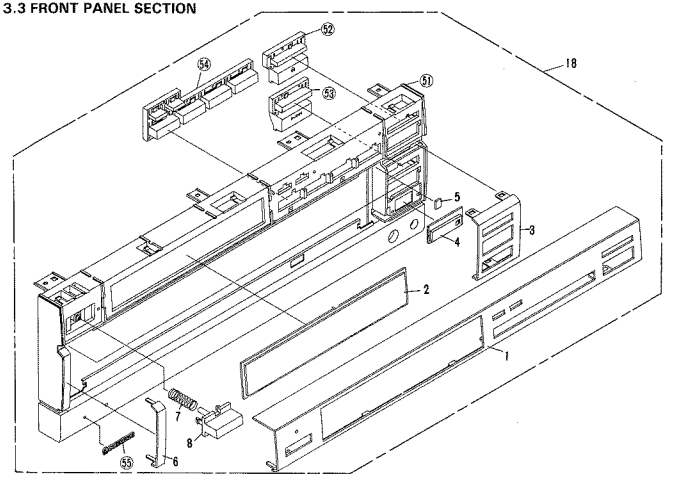
• Parts List of Rear Section

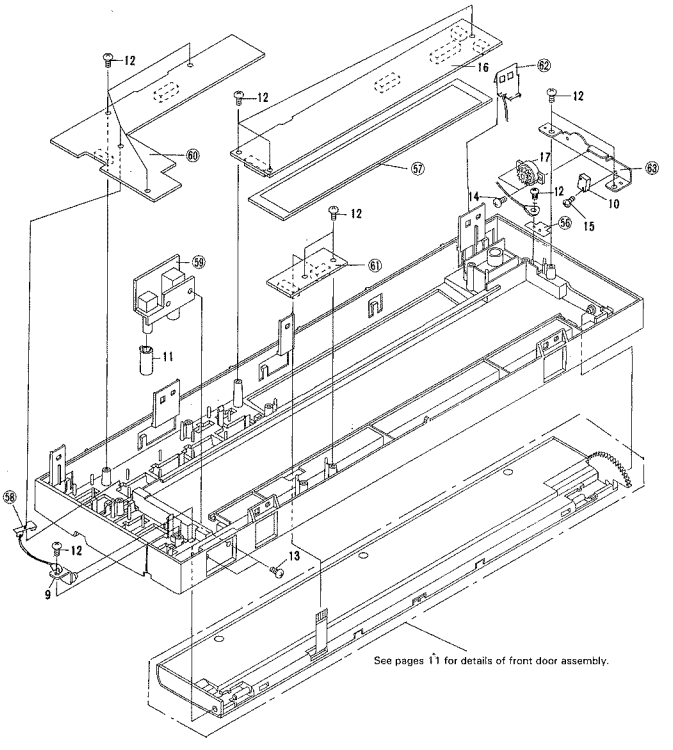
Mark	No.	Part No.	Description
⚠	1.	VDG1012	AC power cord
	2.	BPZ30P080FBR	Screw
	3.	VNE-270	F-washer
	4.	VLL-082	F-nut
	5.	AMZ30P060FBR	Screw
	6.	VXA1149	SW base assembly
★★	7.	VSK1003	Slide switch (CARRY 1, 2 PLAY)
	8.	VXA1193	SW lever assembly
	9.	VBH1039	SW spring
	10.	VXX1203	Rear cover assembly

No.	Part No.	Description
11.	BMZ20P080FCU	Screw
12.	WT26D060D025	Washer
13.	BPZ30P060FCU	Screw
14.	VEB1050	Cushion (A)
15.	CM-22C	Strain relief
16.	VEC-143	Plastic rivet
51.		JCKB assembly
52.		PWSB assembly
53.		Rear panel
54.		Cable clip (B)
55.		Rear cover
56.		Insulator cover



3.3 FRONT PANEL SECTION





See pages 11 for details of front door assembly.

• Parts List of Front Panel Section

Mark	No.	Part No.	Description	Mark	No.	Part No.	Description
	1.	VAH1073	Top panel		51.		Front panel
	2.	VNK1152	FL panel		52.		Open button
	3.	VAH1074	Key panel		53.		Play button
	4.	VNK1158	IR window		54.		Side button
	5.	VEB1046	Door dump rubber		55.		Name plate
	6.	VAH1053	Side panel		56.		GND plate (L)
	7.	VBH1019	Power spring		57.		FL filter
	8.	VNK1154	Power button		58.		GND plate (R)
	9.	VXA1186	Hinge assembly		59.		HEPB assembly
	10	VSK1002	Slide switch (FRONT DOOR)		60.		IRKB assembly
	11.	VNK1106	Volume knob		61.		KOKB assembly
	12.	BPZ30P080FCU	Screw		62.		GND plate (F)
	13.	BMZ30P060FZK	Screw		63.		Dumper setting plate
	14.	PMZ20P040FCU	Screw				
	15.	BMZ20P080FCU	Screw				
	16.	VYG1032	FLDB assembly				
	17.	VXA1053	Dumper assembly				
	18.	VXX1202	Front panel assembly-S				

JOG MODE key/Indicator
Turn on this key to use the remote control unit's JOG dial. The indicator will go on. The JOG dial will operate only when this indicator is on. When pressed again, it will turn off.

ONE-SHOT MEMORY key

PAUSE (❚❚) key
When this is pressed, the playback is temporarily interrupted. To release the pause mode, press the PAUSE key again.

DIGITAL EFFECT key

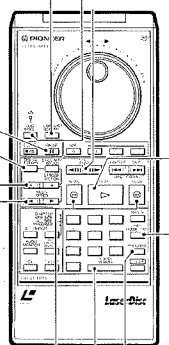
- This is used to select the degree of checkering result.

[−] and [+] key
Use this key to set the speed of multi-speed playback.

- The keys can be used to select the transposition speed of strobe motion playback.
- The keys can be used to select the transposition speed of digital effect playback.

Multi-speed (◀ , ▶) key
▶ : When this side is pressed, playback will progress forward at the previously set speed.
◀ : When this side is pressed, playback will progress reverse.(No sound is output.)
Set the speed with the − and + keys.

SCAN (⏪ , ⏩) keys
These keys are used during playback.
Fast forward or reverse operation is performed while the key is being depressed.
There are two speeds. For two seconds after pressing the key, the operation will be in low speed. After that, it will be in high speed.
⏩ : Fast forward operation
⏪ : Fast reverse operation



STILL/STEP key

- When either end of the key is pressed, the unit will enter frame-by-frame playback. Then, when the ❚▶ end is pressed, the picture will advance forward frame-by-frame. When the ◀❚ end is pressed, the picture will reverse frame-by-frame.
- While playing back a standard disc without going through digital memory, perfect stills of fast-moving subjects might not be obtained (parts of the still may be blurred). This is not due to any player or disc malfunction. If the player's DIGITAL MEMORY button is used to store the still picture in digital memory, there will be no blur.
- When frame-by-frame playback for extended-play discs is done, the progression of the inner and outer periphery may differ. Also, immediately after the frame-by-frame playback progresses, there may be blurring.

PLAY (▶) key

- Setting a disc on the disc table then pressing this key retracts the disc table into the player and begins play of the disc.
- Pressing this key when the disc is stopped starts playback.
- Pressing this key when player is paused restarts normal playback.
- Pressing this key after chapter programming starts play for that chapter program.

CHAP./FRAME·TIME key
This key is used to call up the part of the disc that you wish to see or listen to (search).

PROGRAM key
Use this key to change the playback sequence (programmed play) of chapters.

SEARCH/MEMORY key
Search key function:

- Execution of search operation.
- For memory repeat operation.

Memory key function: This key is also used to input programs for programmed play.

12. SPECIFICATIONS

1. General

System ..... LaserVision Disc system
Laser ..... Semiconductor laser wavelength 780 nm
Power requirements
U.S. and Canadian models ..... AC 120 V, 50/60 Hz
Power consumption
U.S. and Canadian models ..... 53 W
Weight ..... 15.9 kg (35 lb 1 oz)
Dimensions ..... 420(W) x 539(D) x 150(H) mm
16-9/16(W) x 21-3/16(D) x 5-7/8(H) in
Operating temperature ..... +5 °C — +35 °C (41°F — 95°F)
Operating humidity ..... 5% — 90%
(There should be no condensation of moisture.)

2. Disc

LaserVision Discs
*Maximum playing times
12-inch standard play disc ..... 1 hour/both sides
12-inch extended play disc ..... 2 hours/both sides
8-inch standard play disc ..... 28 min/both sides
8-inch extended play disc ..... 40 min/both sides
Spindle motor speed
Standard play disc ..... 1,800 rpm
Extended play disc
..... 1,800 rpm (inner circumference) to 600 rpm (outer circumference) (For a 12-inch disc)
Number of discs for continuous playback ..... 2 (4 sides)

Actual playback time differs for each disc.

3. Video characteristics

Format ..... NTSC specifications
Video output
Level ..... 1 Vp-p nominal, sync. negative, terminated
Impedance ..... 75 Ω unbalanced
Terminal ..... RCA jack
VHF output
Channel ..... CHannel 3 or 4 (switchable)
Impedance ..... 75 Ω unbalanced
Terminal ..... F-type jack

4. Audio characteristics

Digital audio output level ..... 200 mVrms (1kHz, −20dB)
Analog audio output level ..... 200 mVrms (1kHz, 40%)
Terminal ..... Both RCA jacks
Number of channels 2

Digital Audio Characteristics

Frequency response	4 Hz - 20 kHz ($^{+0.5}_{-1.0}$ dB) (EIAJ)
S/N ratio	98 dB (EIAJ)
Dynamic range	95 dB (EIAJ)
Channel separation	92 dB (EIAJ)
Total harmonic distortion	0.005% (EIAJ)
Wow and flutter	Limit of measurement (±0.001% W.PEAK) or less (EIAJ)

● LD is based on EIAJ.

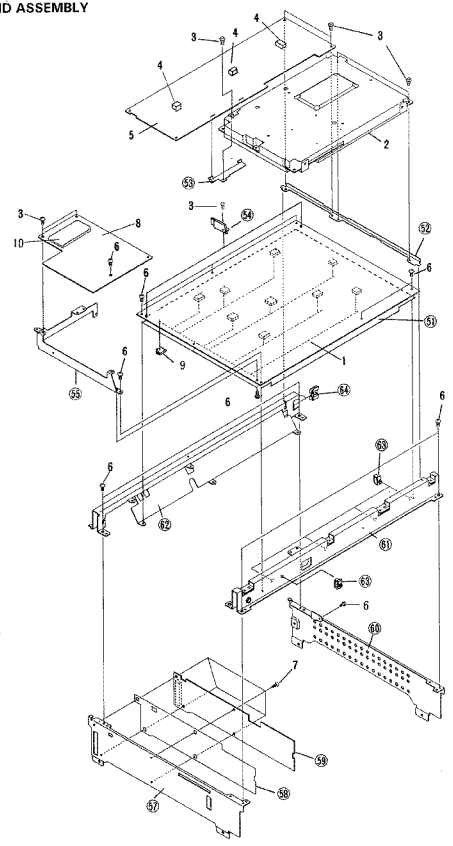
5. Other Terminals

Control input/output ..... Both miniature jacks

6. Accessories

Remote control unit (CU-LD015) 1
Size "AA" (IEC R6P) dry cell battery 2
RF antenna cable 1
Video connecting cord 1
Audio connecting cord 1
Antenna adaptor
(75 Ω/300 Ω → 75 Ω F-type plug) 1
Operating instructions 1
Warranty card 1

3.4 P.C.B. STAND ASSEMBLY



• Parts List of P.C.B. Stand Assembly

Mark	No.	Part No.	Description
	1.	VWS1030	VSOP assembly
	2.	VWW1060	MEMB assembly
	3.	VEC-143	Plastic rivet
	4.	VEC1025	Cushion
	5.	VWV1044	2FSB assembly
	6.	BBZ30P060FCC	Screw
	7.	CMZ26P040FCU	Screw
	8.	VYR1046	FTLB assembly
	9.	VEC1098	Spacer
	10.	VYM1021	BMIB assembly
	51.		VSOP sheet
	52.		PCB holder
	53.		PCB joint
	54.		PCB stand
	55.		FTLB holder
	56.		
	57.		Base joint (L)
	58.		Sheet
	59.		FLXB assembly
	60.		Base joint (R)
	61.		Panel stay (A)
	62.		Panel stay (B)
	63.		Wire clip
	64.		Cable clip

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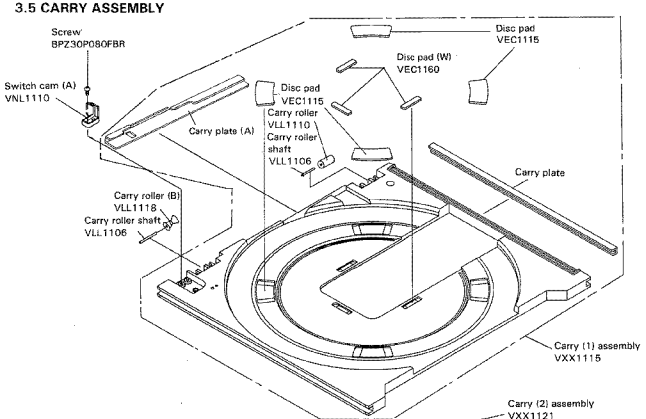
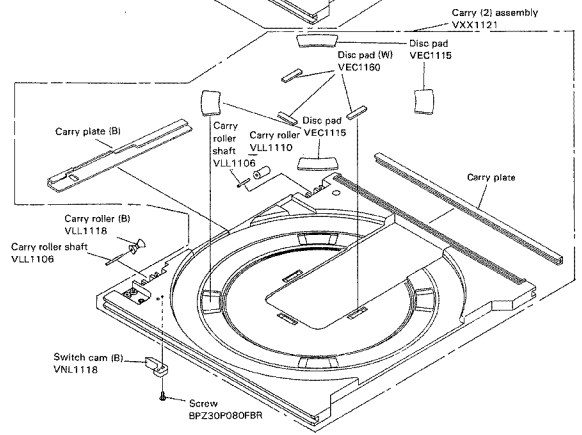
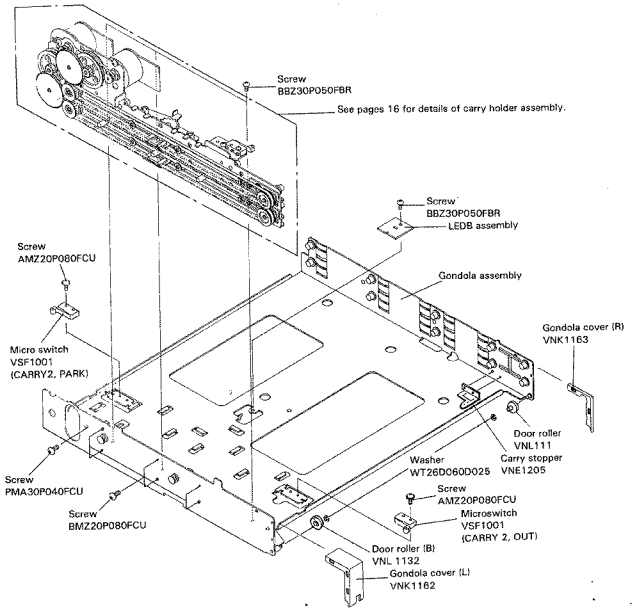
3.5 CARRY ASSEMBLY

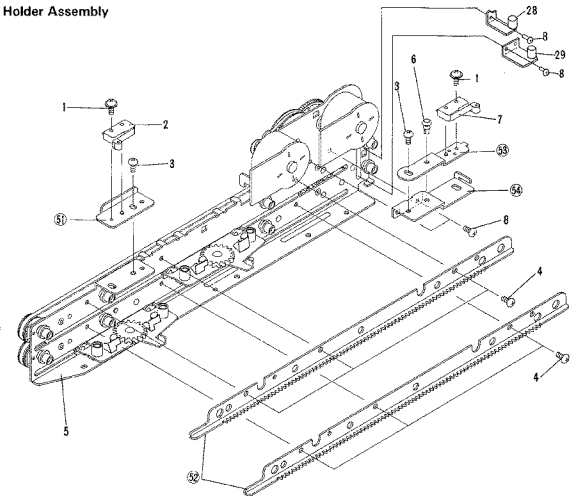




3.6 LOADING ASSEMBLY



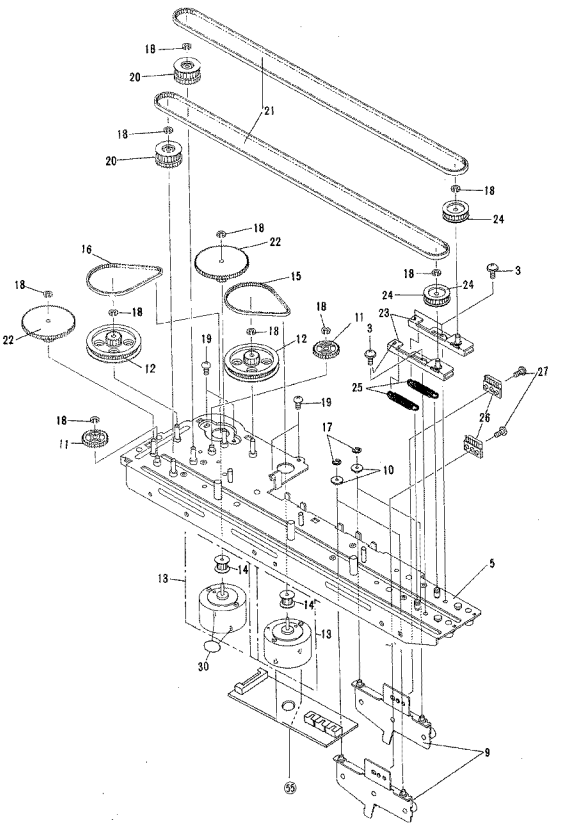
• **Carry Holder Assembly**



• **Parts List of Carry Holder Assembly**

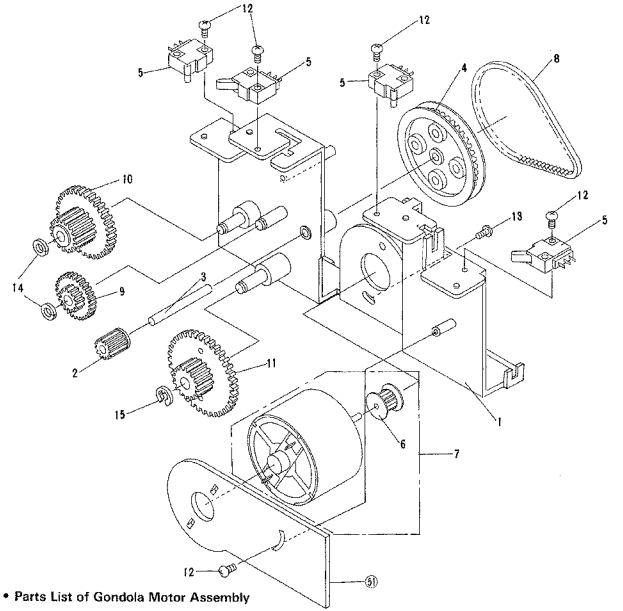
Mark	No.	Part No.	Description
	1.	AMZ20P080FCU	Screw
	2.	VSF1001	Micro switch (CARRY1 OUT POSITION DET.)
	3.	PMB30P050FCU	Screw
	4.	PMA30P040FCU	Screw
	5.	VXA1199	Carry holder assembly
	6.	VEC-.-43	Plastic rivet
	7.	VSF1002	Micro switch (CARRY 1)
	8.	PMA26P040FCU	Screw
	9.	VXA1206	Gear holder assembly
	10.	VLL1098	Slide spacer
	11.	VNL1107	Gear (E)
	12.	VXA1144	Timing pulley assembly
	13.	VXX1109	Loading motor assembly (CARRY 1, 2)
	14.	VNL1051	Motor pulley
	15.	VEB1052	Synchro belt L
	16.	VEB1038	Synchro belt
	17.	YE15FCU	Washer
	18.	WT26D060D025	Washer
	19.	PMB26P040FCU	Screw
	20.	VXA1145	Gear (F) assembly

Mark	No.	Part No.	Description
	21.	VEB1039	Loading belt
	22.	VNL1106	Gear (D)
	23.	VXA1200	Pulley holder assembly
	24.	VXA1146	Pulley assembly
	25.	VBH1050	Pulley spring
	26.	VNL1104	Belt holder
	27.	BMZ30P060FBR	Screw
	28.	VXA1204	Roller holder (A) assembly
	29.	VXA1205	Roller holder (B) assembly
	30.	CGDYX473M25	Ceramic capacitor
	51.		Switch holder (C)
	52.		Carry rack
	53.		Switch holder (B)
	54.		Switch holder (A)
	55.		LOMB assembly



LD-W1

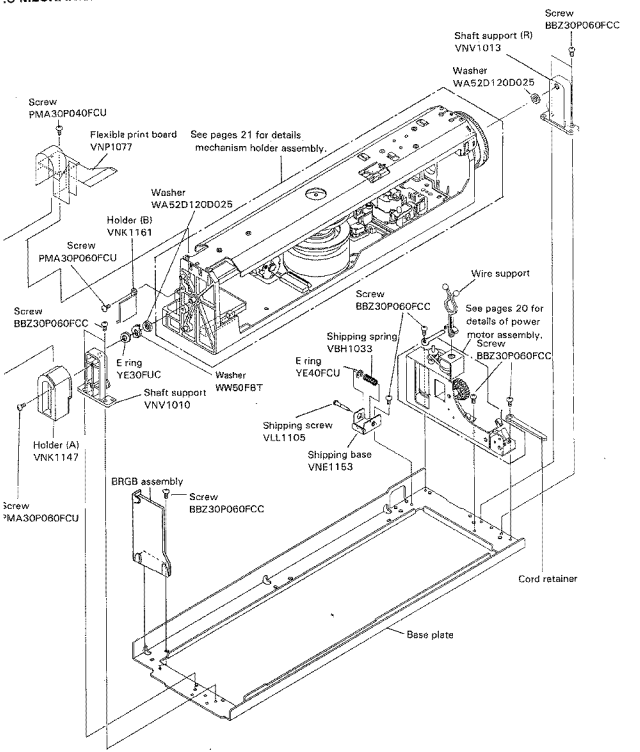
3.7 GONDOLA MOTOR ASSEMBLY



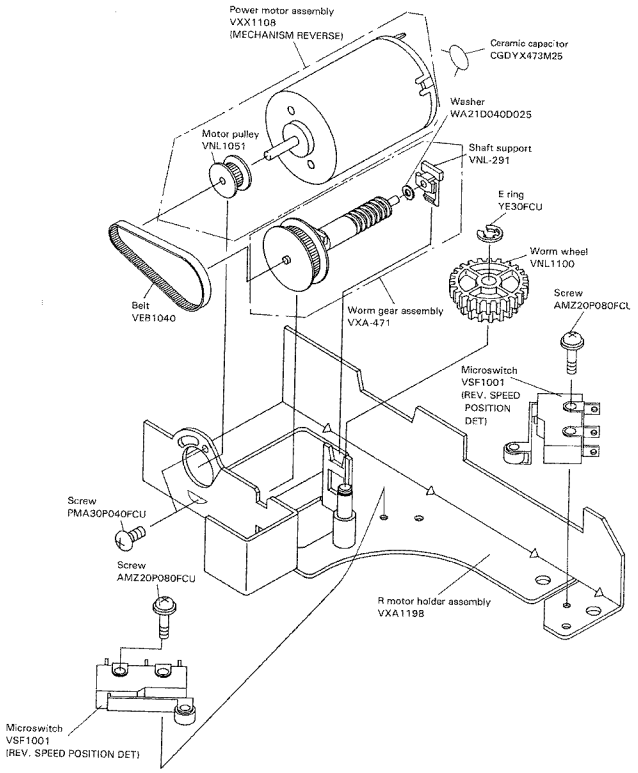
• Parts List of Gondola Motor Assembly

Mark	No.	Part No.	Description	Mark	No.	Part No.	Description
	1.	VXA1203	Motor holder assembly		10.	VNL-486	Gear (B)
	2.	VNL1020	Gear (A)		11.	VNL-497	Synchro gear
	3.	VLL1076	Gear (A) shaft		12.	BMZ20P080FCU	Screw
	4.	VXA-477	Pulley (L) assembly		13.	PMBZ6P060FCU	Screw
	5.	VSK1002	Slide switch (GONDOLA POSITION)		14.	WT32DU60D050	Washer
					15.	YE30FCU	E ring
	6.	VNL1051	Motor pulley				
	7.	VXX1101	Loading motor assembly (GONDOLA DRIVE)		51.		GNDB assembly
	8.	VEB1052	Synchro belt L				
	9.	VNL1010	Gear (C)				

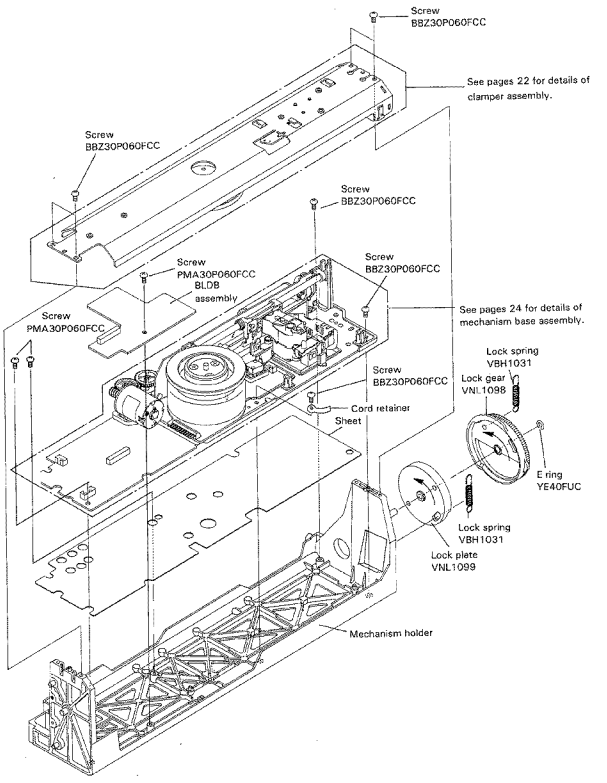
.8 MECHANISM SECTION



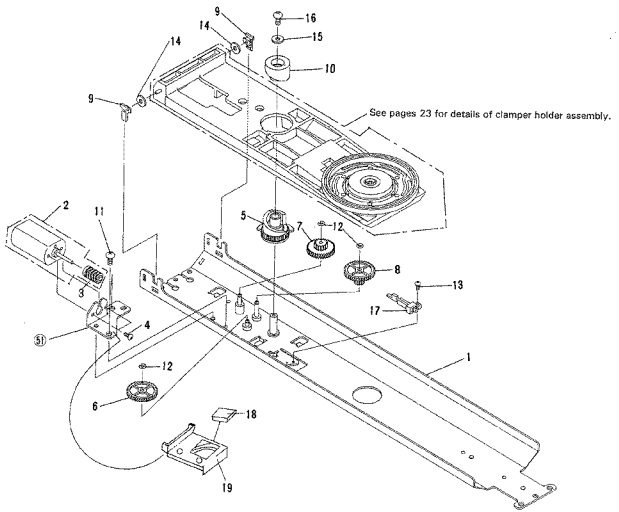
• Power Motor Assembly



• Mechanism Holder Assembly



• Clamper Assembly

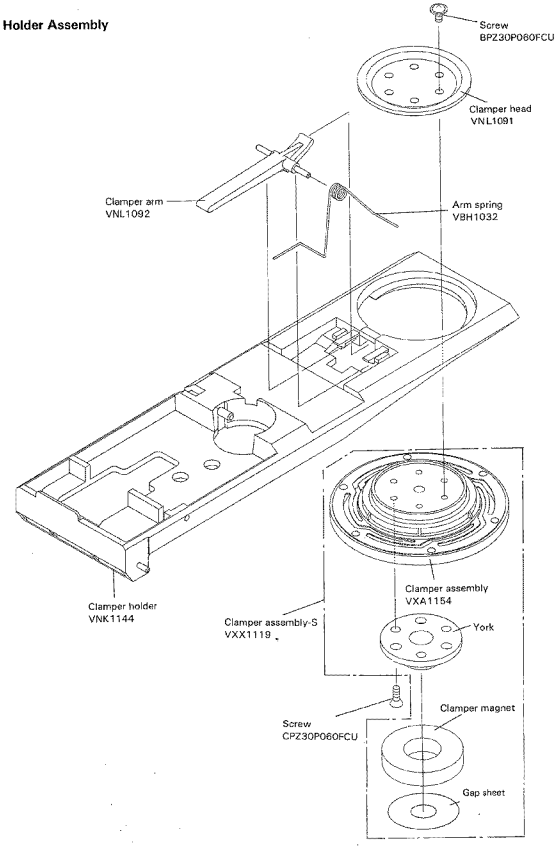


• Parts List of Clamper Assembly

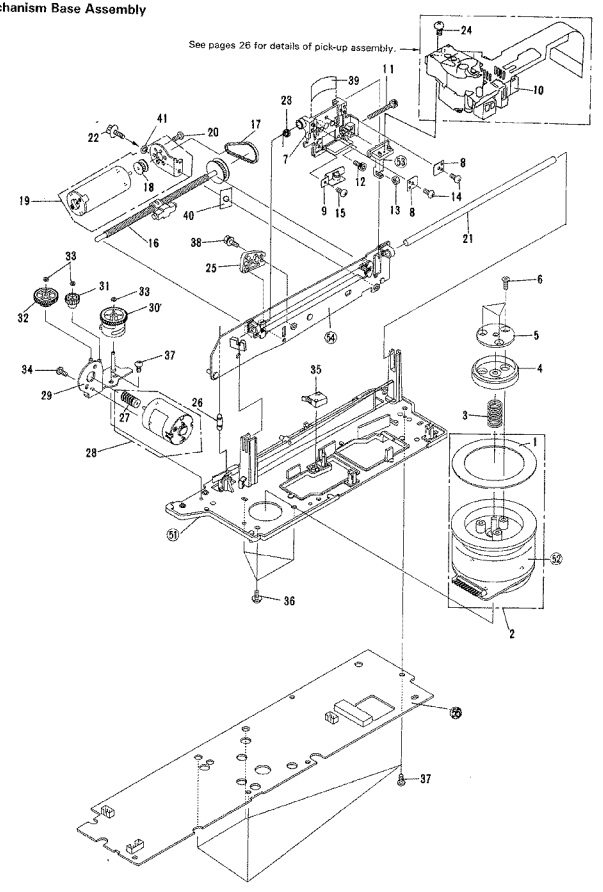
Mark	No.	Part No.	Description
	1.	VXA1130	Clamper bridge assembly
	2.	VXX1106	Clamper motor assembly
	3.	VNL1085	Worm
	4.	PMA20P40FCU	Screw
	5.	VNL1095	Pinion (C)
	6.	VNL1094	Pinion (B)
	7.	VNL1078	Gear
	8.	VNL1093	Pinion (A)
	9.	VNL-291	Shaft holder
	10.	VNL1096	Clamp cam

Mark	No.	Part No.	Description
	11.	BBZ30P060FCC	Screw
	12.	WT21D050D050	Washer
	13.	PMZ20P040FCU	Screw
	14.	WA21D085D025	Washer
	15.	WA32D080D050	Washer
	16.	PMB30P060FCU	Screw
	17.	VSK-015	Leaf switch (CLAMP)
	18.	VEC1145	Worm cushion
	19.	VBK1011	Worm plate
	51.		C motor holder

• Clamper Holder Assembly



• Mechanism Base Assembly

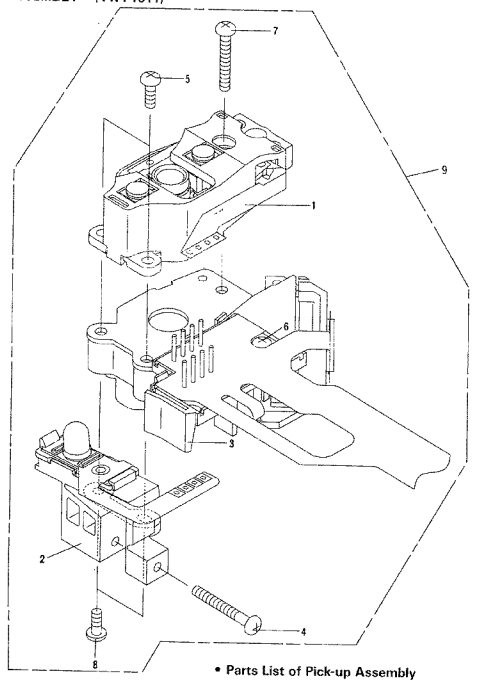


• Parts List of Mechanism Base Assembly

Mark	No.	Part No.	Description
	1.	VEB1008	Rubber spacer
	2.	VXX1116	Spindle motor assembly
	3.	VBH1025	Centering spring
	4.	VLA1002	Centering hav
	5.	VNE1103	Plate
	6.	C8Z30P080FCC	Screw
	7.	VNL1080	Slider
	8.	VNE1100	Lock plate
	9.	VXA1159	Roller assembly
	10.	VWY1011	Pick up assembly
	11.	SMZ30H250FBT	Screw
	12.	SMK30H080FBT	Screw
	13.	NC30FMC	Nut
	14.	PPZ20P050FCU	Screw
	15.	PMA20P040FCU	Screw
	16.	VXA1143	Screw nut assembly
	17.	VEB1037	Timing belt
	18.	VNL-635	Motor pulley
	19.	VXX1117	Slider motor assembly
	20.	PMA26P040FCU	Screw
	21.	VLL1066	Shaft
	22.	VLL-183	Bolt
	23.	VBH1037	SL spring
	24.	VLL1107	Bolt
	25.	VNL1077	Cam

Mark	No.	Part No.	Description
	26.	VBH1030	Tilt spring
	27.	VNL1085	Worm
	28.	VXX1105	Tilt motor assembly
	29.	VXA1133	T holder assembly
	30.	VNL1088	Cam gear
	31.	VNL1089	Gear (B)
	32.	VNL1078	Gear
	33.	WT21D050D050	Washer
	34.	PMA30P040FCU	Screw
	35.	VSK1003	Slide switch (PU PARK POSITION DET.)
	36.	PMB30P080FCU	Screw
	37.	PMB30P060FCU	Screw
	38.	VLL-378	Bolt
	39.	VBK1010	SN spring
	40.	VEB1051	Slider cushion
	41.	PEB1056	Rubbe washer
	51.		Mechanism base
	52.		Spindle motor
	53.		PU holder
	54.		Tilt base
	55.		PREB assembly

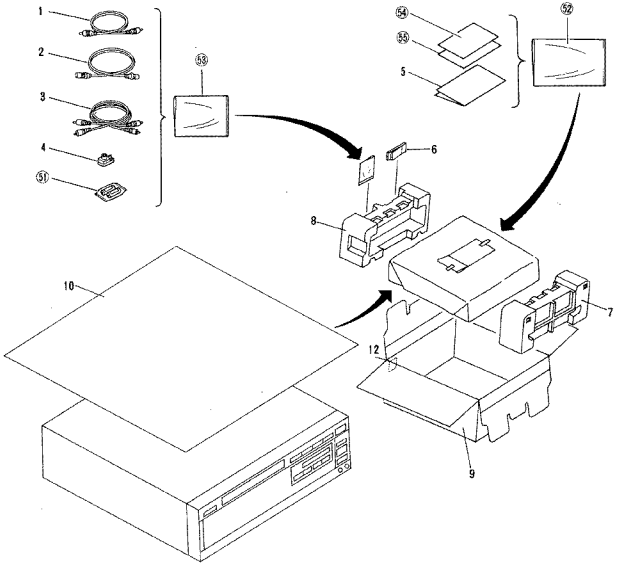
3.9 PICK-UP ASSEMBLY (VWY1011)



• Parts List of Pick-up Assembly

Mark	No.	Part No.	Description
	1.	VXX1056	Actuator assembly
	2.	VXX1094	Sensor assembly-S
	3.	VXX1095	Pre pick up assembly
	4.	PBZ20P160FMC	Screw
	5.	PMA20P060FMC	Screw
	6.	PMA20P080FMC	Screw
	7.	PMA20P140FMC	Screw
	8.	PMB20P050FMC	Screw
	9.	VWY1011	Pick-up assembly

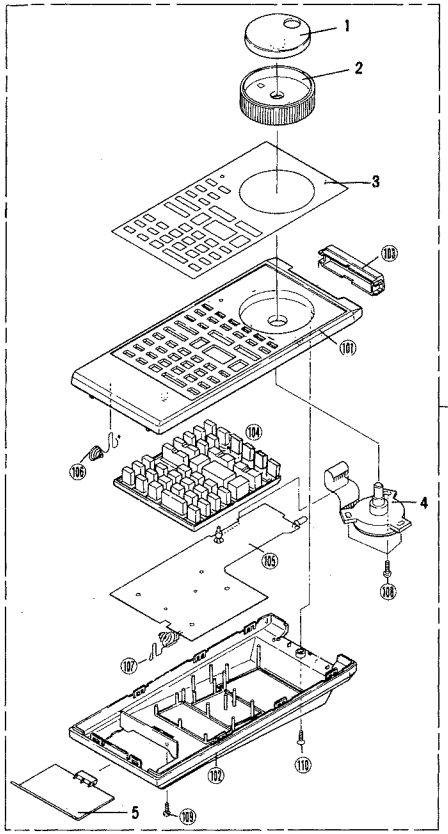
3.10 PACKING



• Parts List of Packing

Mark	No.	Part No.	Description	Mark	No.	Part No.	Description
	1.	VDE-056 (VDE1004)	Video cable		8.	VHA1030	Pad (R)
					9.	VHG1033	Packing case
	2.	VDE1001 (VDE-054)	RF antenna cable		10.	VHL1007	Mirror mat
	3.	VDE-055	Connection cord		51.		Battery (SUM-3)
					52.		Polyethylene bag
		(VDE1005)			53.		Polyethylene bag
	4.	VKX1001	Antenna adaptor		54.		Caution card
	5.	VRB1011	Operating instructions				
	6.	VXX1142	Remote control				
	7.	VHA1029	Pad (F)				

3.11 REMOTE CONTROL (VXX1142)



• Parts List of Remote Control

Mark	No.	Part No.	Description
	1.	VNK1114	Jog dial (Y)
	2.	VNK1108	Shuttle ring
	3.	VAH1067	Aluminium plate
	4.	VSD1002	Rotary encoder
	5.	VNK1133	Battery cover
	6.	VXX1142	Remote control
	101.		Case (A)
	102.		Case (B)
	103.		Filter
	104.		Rubber connector
	105.		

Mark	No.	Part No.	Description
	106.		Terminal (A)
	107.		Terminal (B)
	108.		Screw
	109.		Screw
	110.		Screw

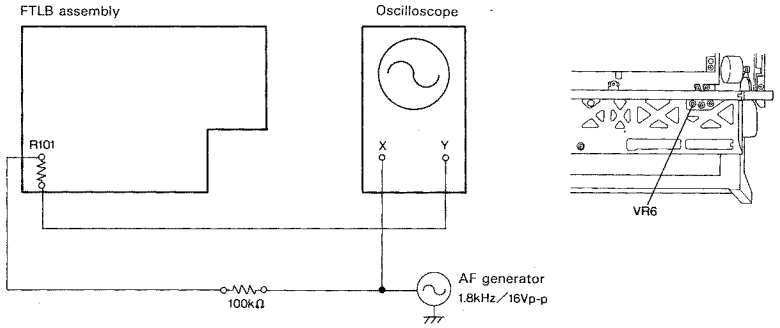
LD-W1

3. FOCUS SERVO LOOP GAIN ADJUSTMENT

- Purpose: To adjust the FOCS servo loop gain to the optimum value.
- When not properly adjusted: Poor playback performance

• Measuring instruments and jigs	• Oscilloscope • AF generator • Resistor (100kΩ)
• Measuring position	• Both pins of R101 on the FTLB assembly (FOCS error), (FOCS gain)
• Test disc and player mode	• LD test disc #16,000 (#15,000) • TRKG servo: closed
• Adjustment position	• Mechanism assembly in reverse position • PREB assembly VR6

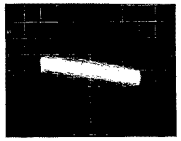
Connection diagram



Adjustment Procedure

1. Put the mechanism assembly in the reverse position.
2. Connect resistor, AF generator and oscilloscope to both leads of R101 on the FTLB assembly as shown in the diagram.
3. Set AF generator output to 1.8kHz/16Vp-p.
4. Switch the oscilloscope to X-Y mode and observe the Lissajous figures.
5. Adjust VR6 on the PREB assembly so that Lissajous figures symmetrical on both the X- and Y-axes of the oscilloscope. (Photo 8.)

Note: If the AF generator output does not exceed 16Vp-p, decrease the value of the resistor (100kΩ) in the above diagram, until the Lissajous figures become easily discernible. (33kΩ limit.)



Adjustment not complete

⇩

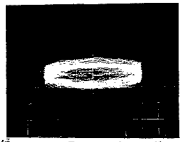
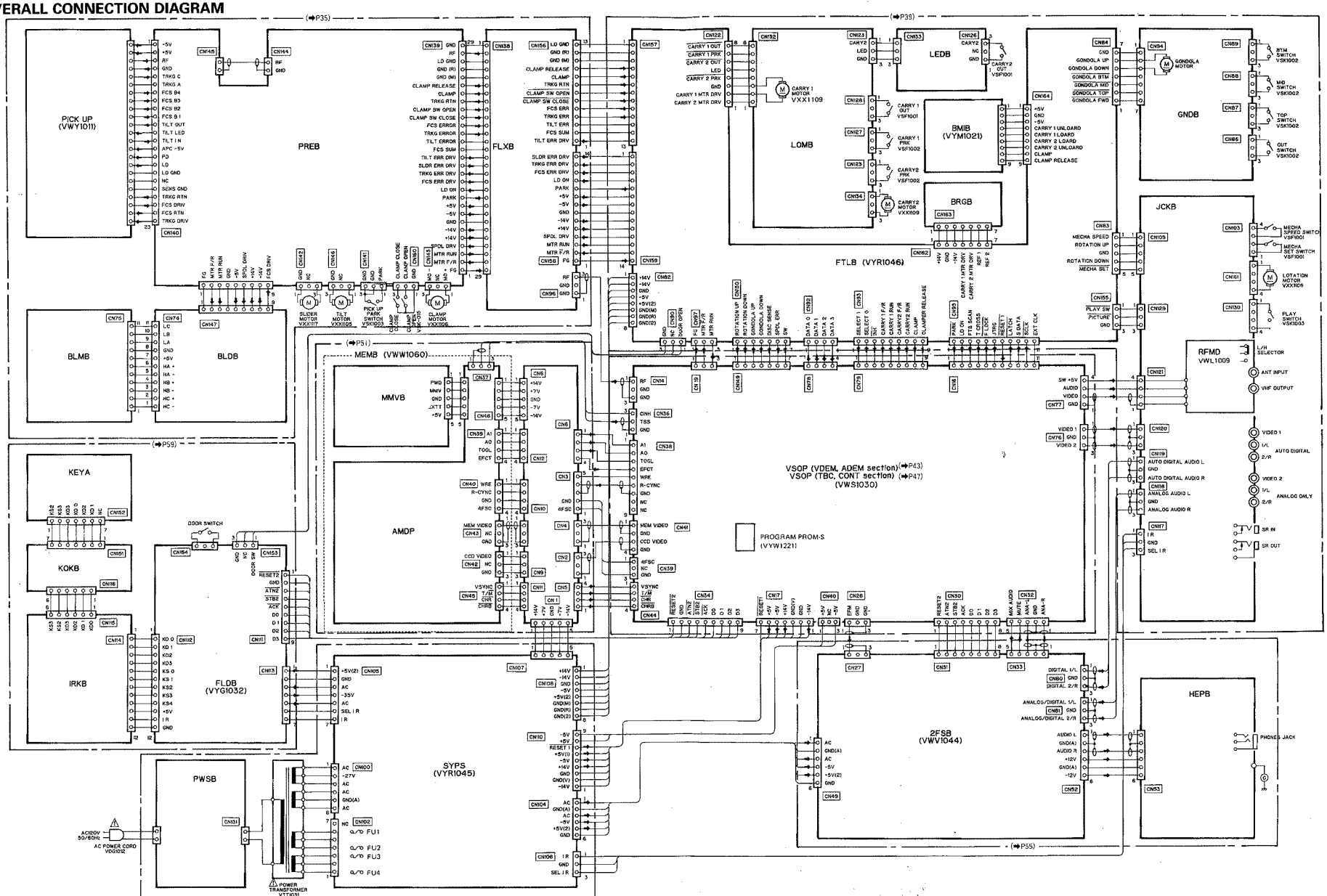


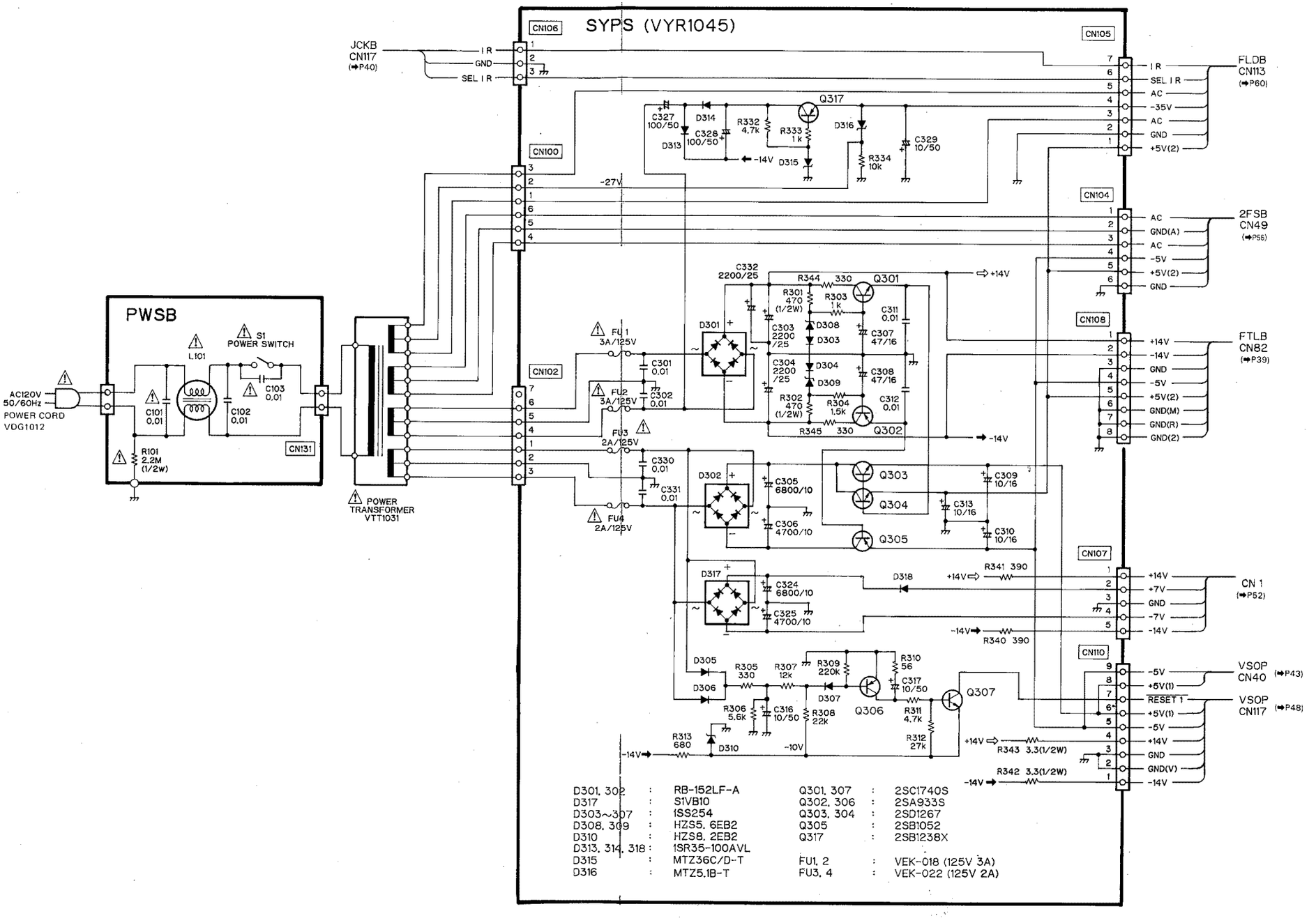
Photo 8. Properly adjusted

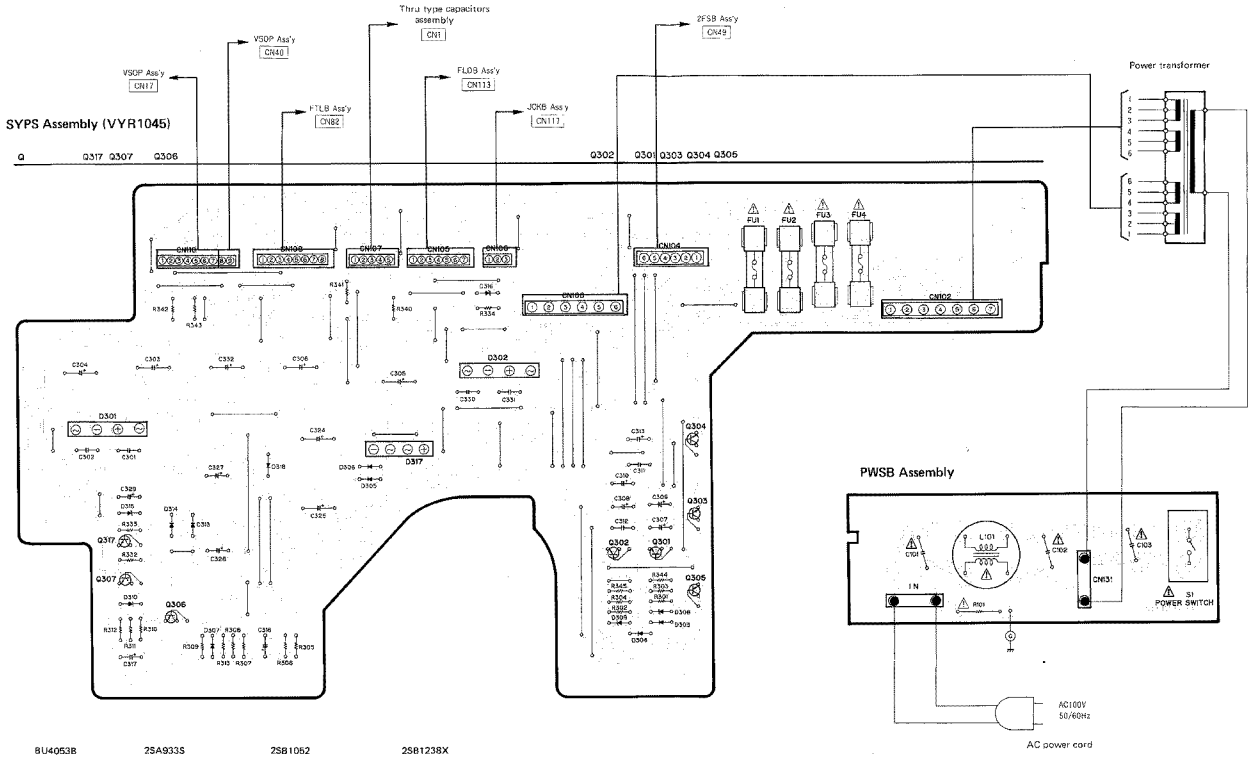
4. SCHEMATIC DIAGRAM AND P.C. BOARD PATTERNS

4.1 OVERALL CONNECTION DIAGRAM

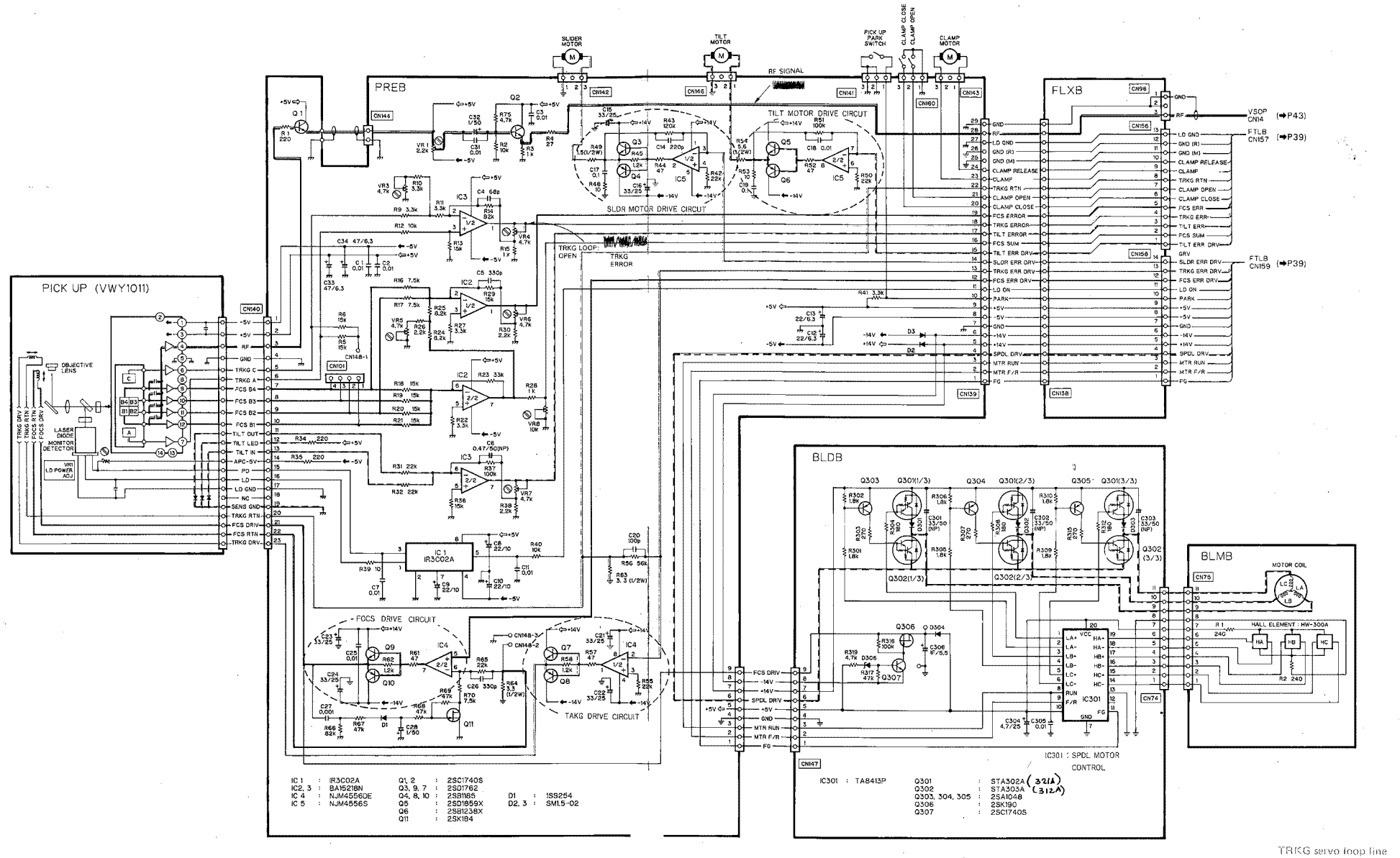


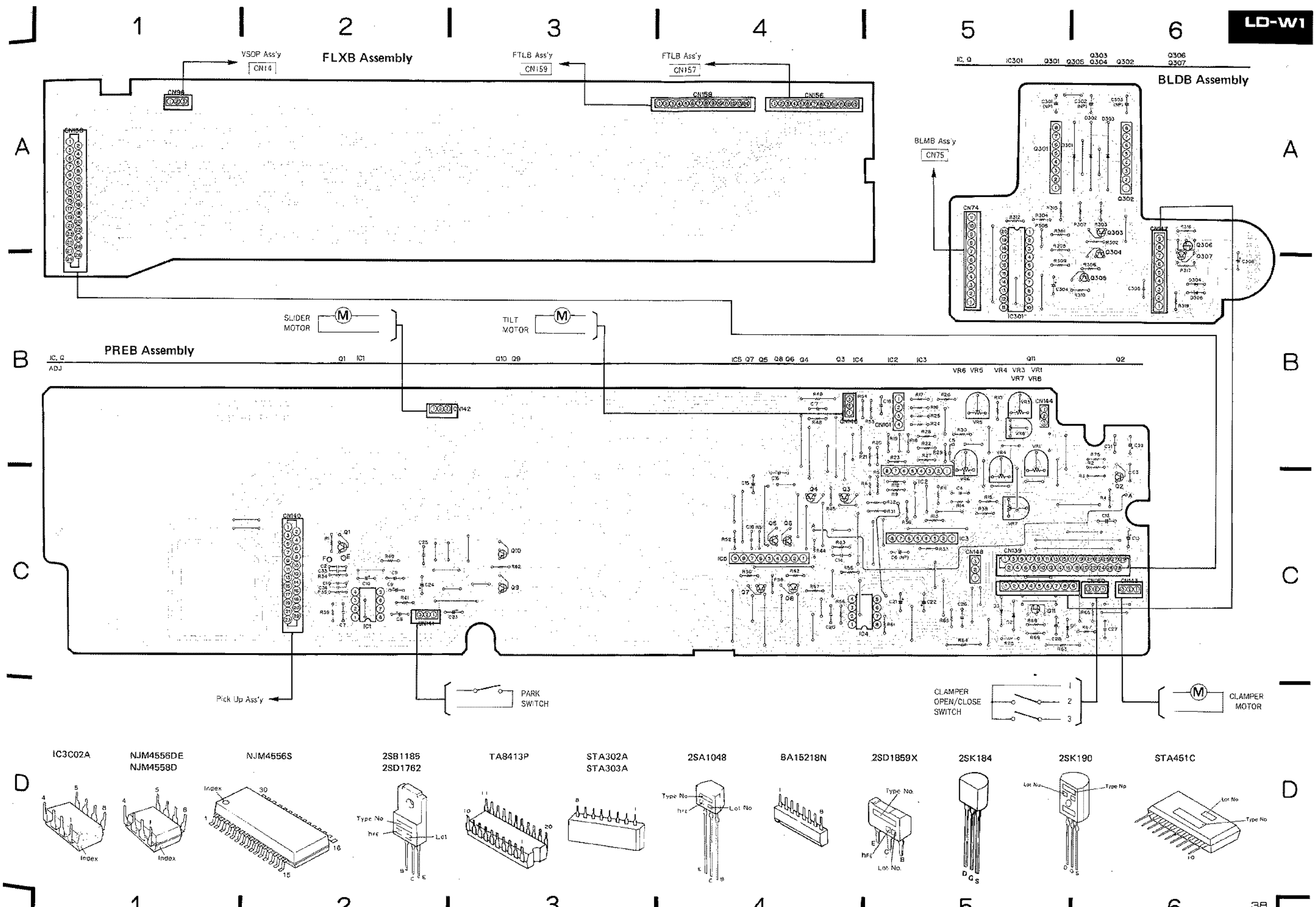
4.2 PWSB AND SYPS ASSEMBLY




SYPS Assembly (VYR1045)
Thru type capacitors assembly
CN1
VSOP Ass'y
CN40
VSOP Ass'y
CN17
FTLB Ass'y
CN82
FLDS Ass'y
CN113
JCKB Ass'y
CN117
2FSB Ass'y
CN49
Power transformer
Q317 Q307 Q306
Q302 Q301 Q303 Q304 Q305
CN110
CN109
CN107
CN105
CN106
CN104
CN103
CN102
FU1
FU2
FU3
FU4
D302
D301
D317
Q304
Q303
Q302
Q301
Q305
Q317
Q307
Q306
PWSB Assembly
L101
CN101
CN102
CN103
CN31
S1
POWER SWITCH
IN
AC100V
50/60Hz
AC power cord
8U4053B
2SA933S
2SC1740S
2SB1052
2SD1267
2SB1238X
Type No.
hFE
Lot No.

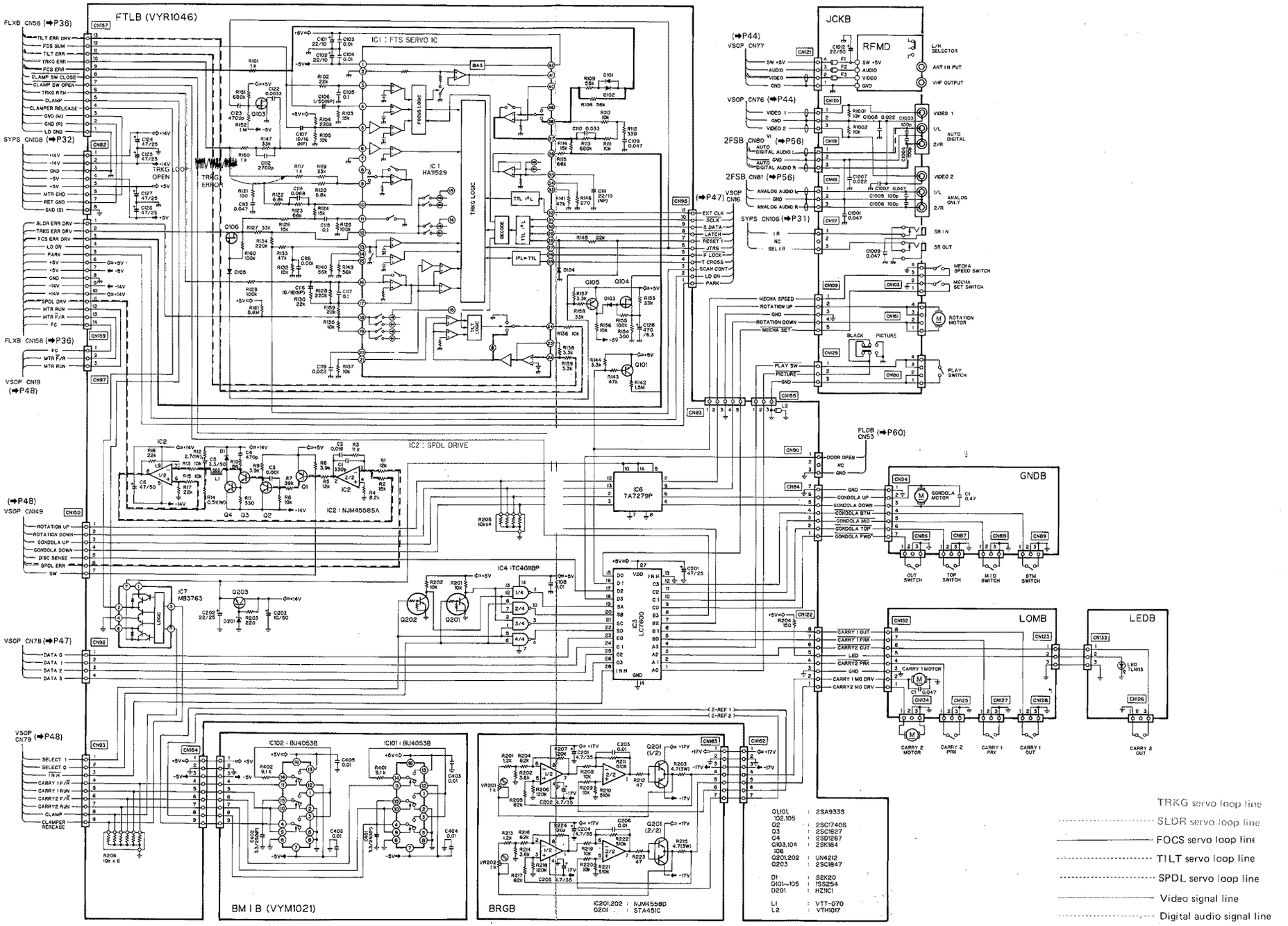
4.3 PICK UP, PREB, BLDB AND BLMB ASSEMBLY

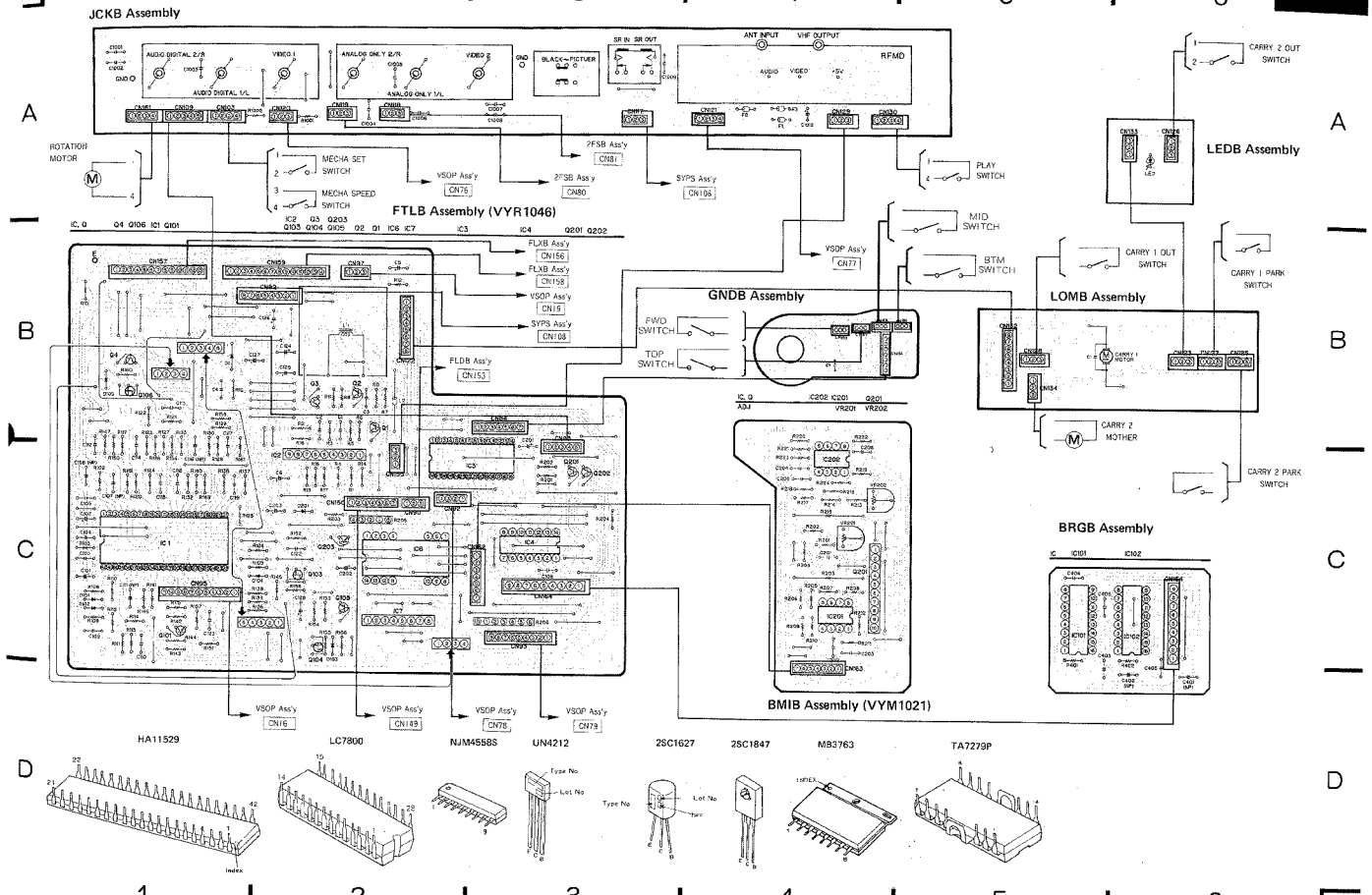




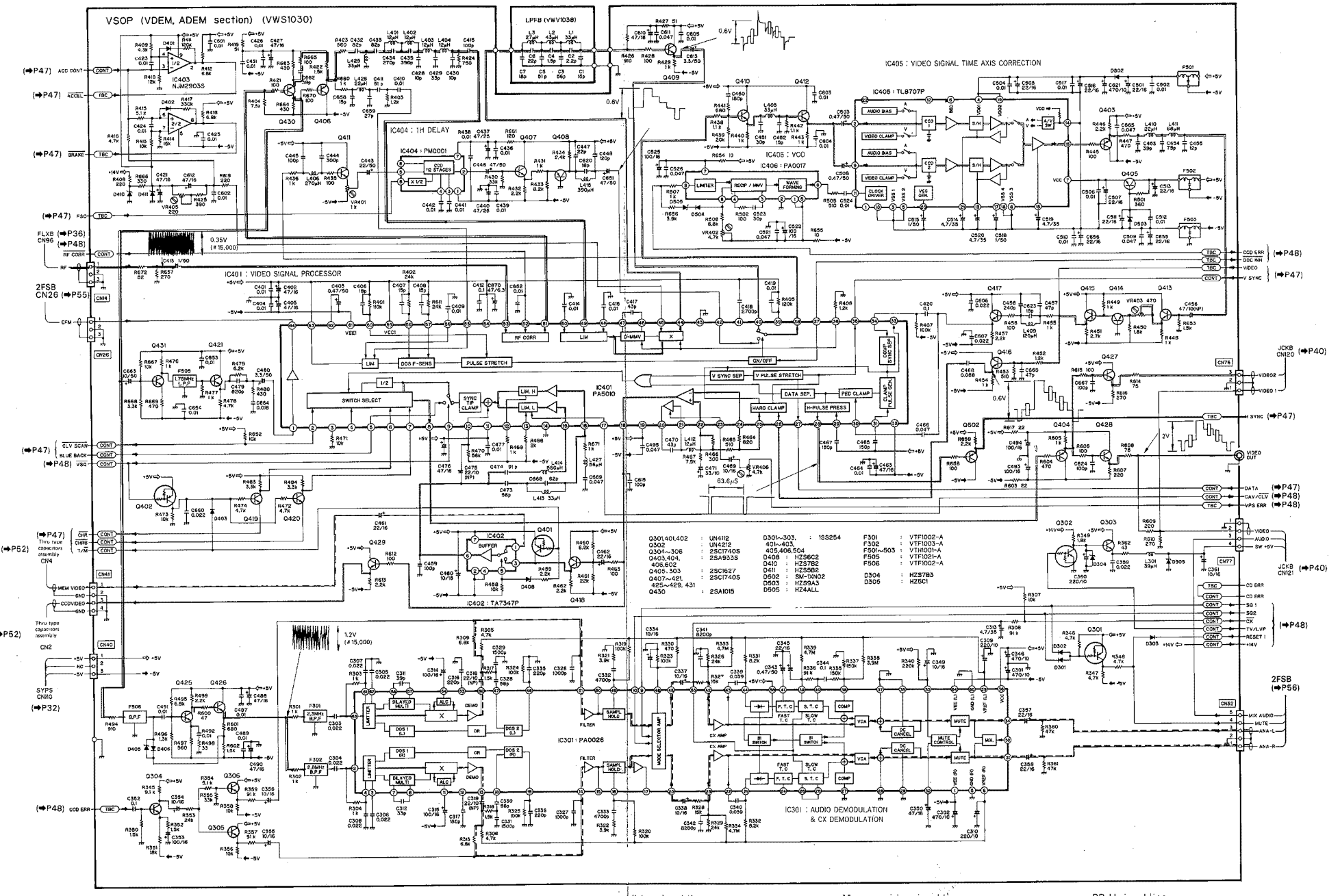
1 2 3 4 5 6
A B C D
FLXB Assembly
VSOP Ass'y
CN14
FTLB Ass'y
CN159
FTLB Ass'y
CN157
CN98
CN158
CN156
CN155
BLMB Ass'y
CN75
BLDB Assembly
IC, Q
IC301
Q301
Q305
Q303
Q304
Q302
Q306
Q307
CN74
SLIDER MOTOR
TILT MOTOR
PREB Assembly
IC, Q
ADJ
Q1 IC1
Q10 Q9
IC5 Q7 Q5 Q8 Q6 Q4
Q3 IC4
IC2
IC3
Q11
Q2
VR6 VR5
VR4 VR3 VR1
VR7 VR8
CN142
CN144
CN140
CN148
CN139
Pick Up Ass'y
PARK SWITCH
CLAMPER OPEN/CLOSE SWITCH
CLAMPER MOTOR
IC3C02A
NJM4556DE
NJM4558D
NJM4556S
2SB1185
2SD1762
TA8413P
STA302A
STA303A
2SA1048
BA15218N
2SD1859X
2SK184
2SK190
STA451C
Index
Type No
Lot No

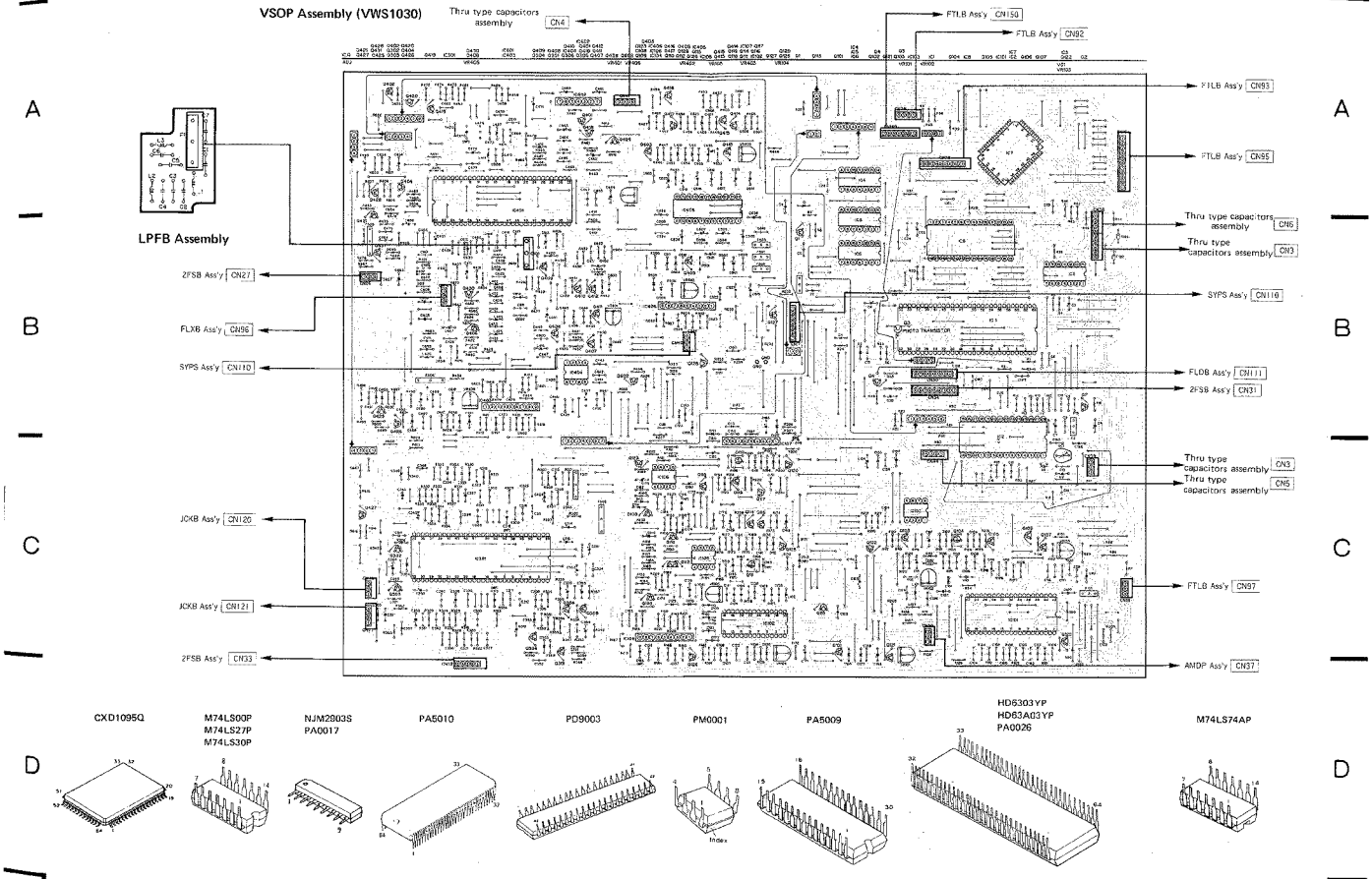
4.4 FTLB, JCKB, GNDB, LOMB, BMIB, BRGB AND LEDB ASSEMBLY



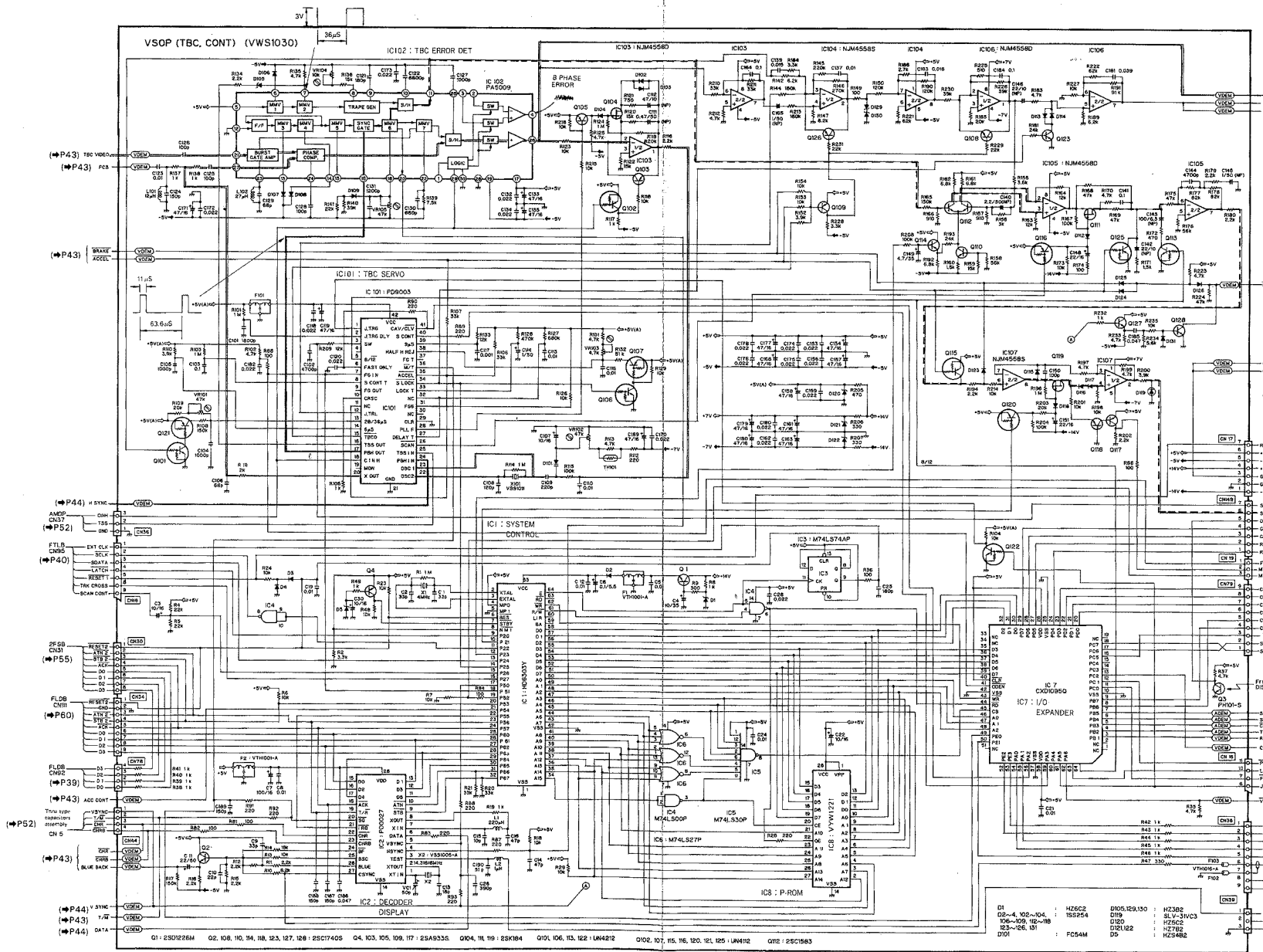

JCKB Assembly
FTLB Assembly (VYR1046)
GNDB Assembly
LEDB Assembly
LOMB Assembly
BRGB Assembly
BMIB Assembly (VYM1021)
ROTATION MOTOR
MECHA SET SWITCH
MECHA SPEED SWITCH
PLAY SWITCH
MID SWITCH
BTM SWITCH
FWD SWITCH
TOP SWITCH
CARRY 2 OUT SWITCH
CARRY 1 OUT SWITCH
CARRY 1 PARK SWITCH
CARRY 2 PARK SWITCH
CARRY 1 MOTOR
CARRY 2 MOTHER
HA11529
LC7800
NJM4558S
UN4212
2SC1627
2SC1847
MB3763
TA7279P

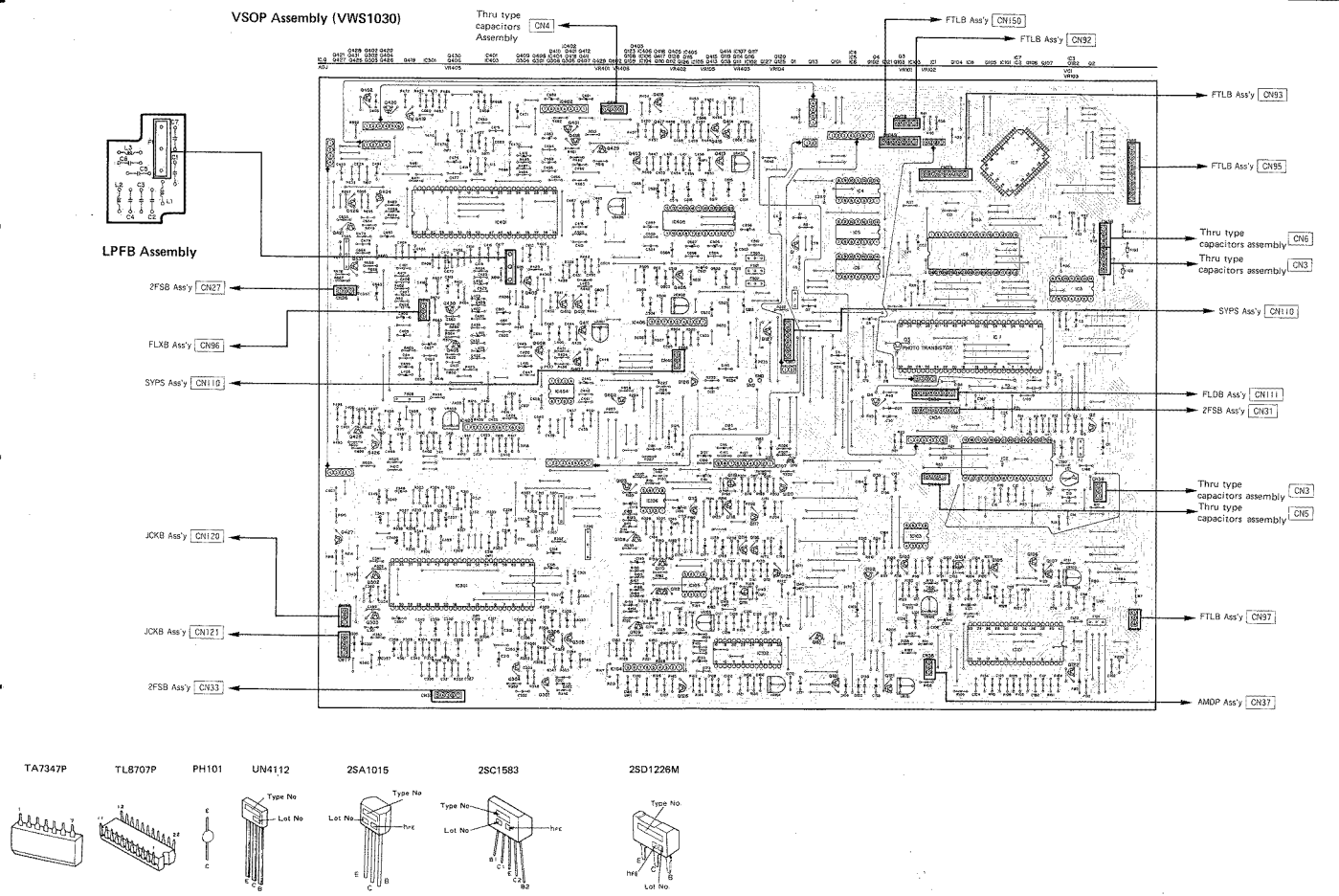
4.5 VSOP (VDEM, ADEM) AND LPFB ASSEMBLY



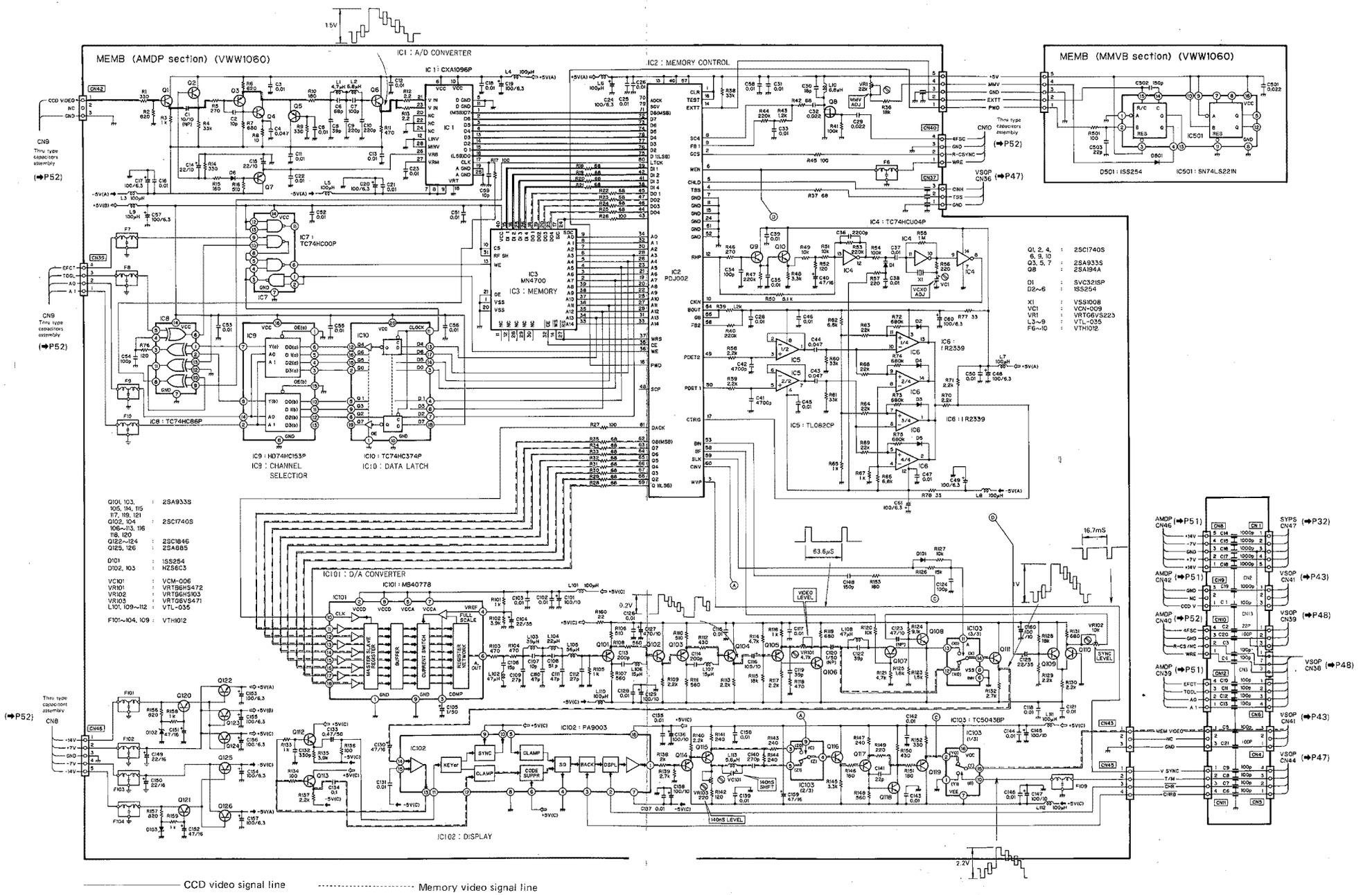

VSOP Assembly (VWS1030)
Thru type capacitors assembly CN4
FTLB Ass'y CN150
FTLB Ass'y CN92
FTLB Ass'y CN93
FTLB Ass'y CN95
Thru type capacitors assembly CN5
Thru type capacitors assembly CN3
SYPS Ass'y CN110
FLDB Ass'y CN111
2FSB Ass'y CN31
Thru type capacitors assembly CN3
Thru type capacitors assembly CN5
FTLB Ass'y CN97
ANDP Ass'y CN37
LPFB Assembly
2FSB Ass'y CN27
FLXB Ass'y CN96
SYPS Ass'y CN110
JCKB Ass'y CN120
JCKB Ass'y CN121
2FSB Ass'y CN33
CXD1095Q
M74LS00P
M74LS27P
M74LS30P
NJM2903S
PA0017
PA5010
PD9003
PM0001
PA5009
HD6303YP
HD63A03YP
PA0026
M74LS74AP

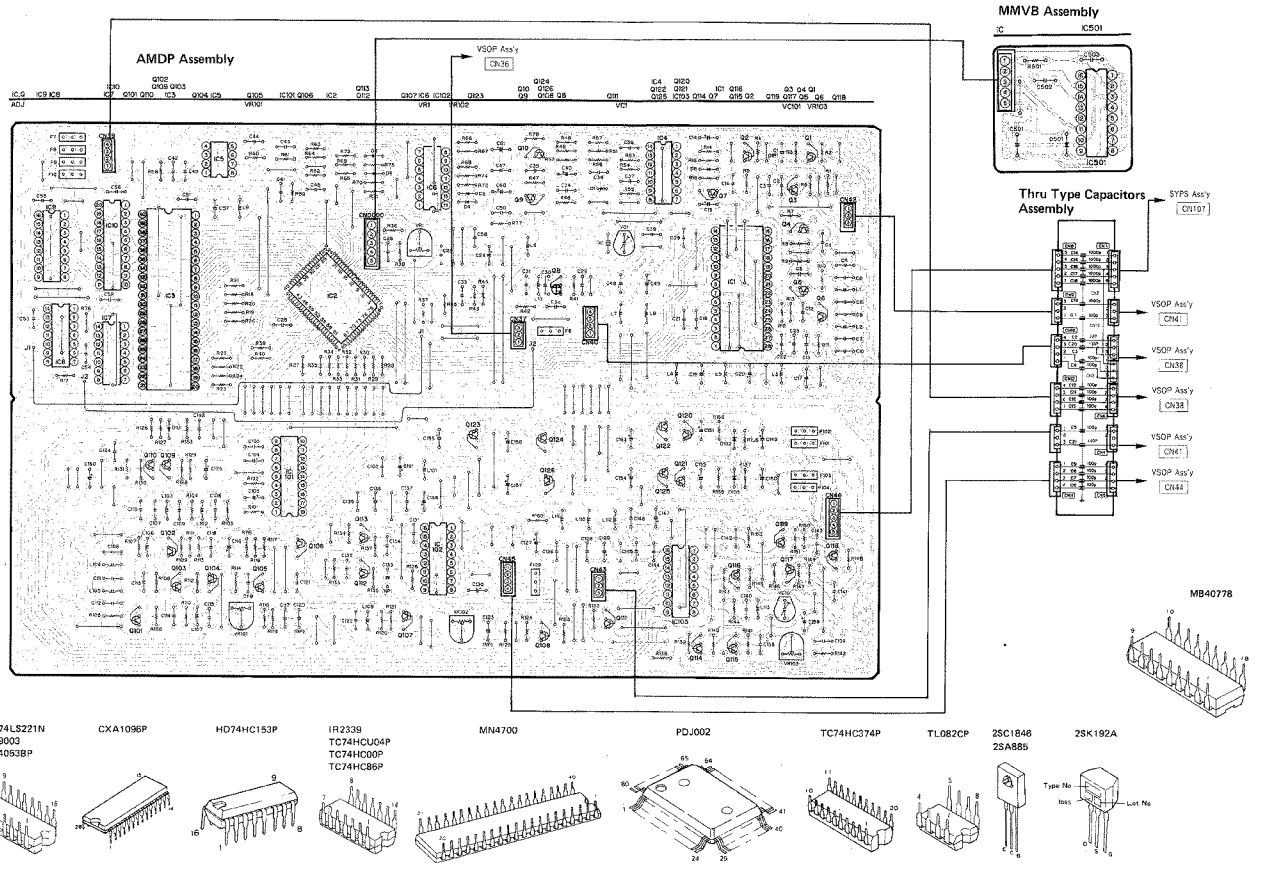
4.6 VSOP (TBC, CONT) ASSEMBLY



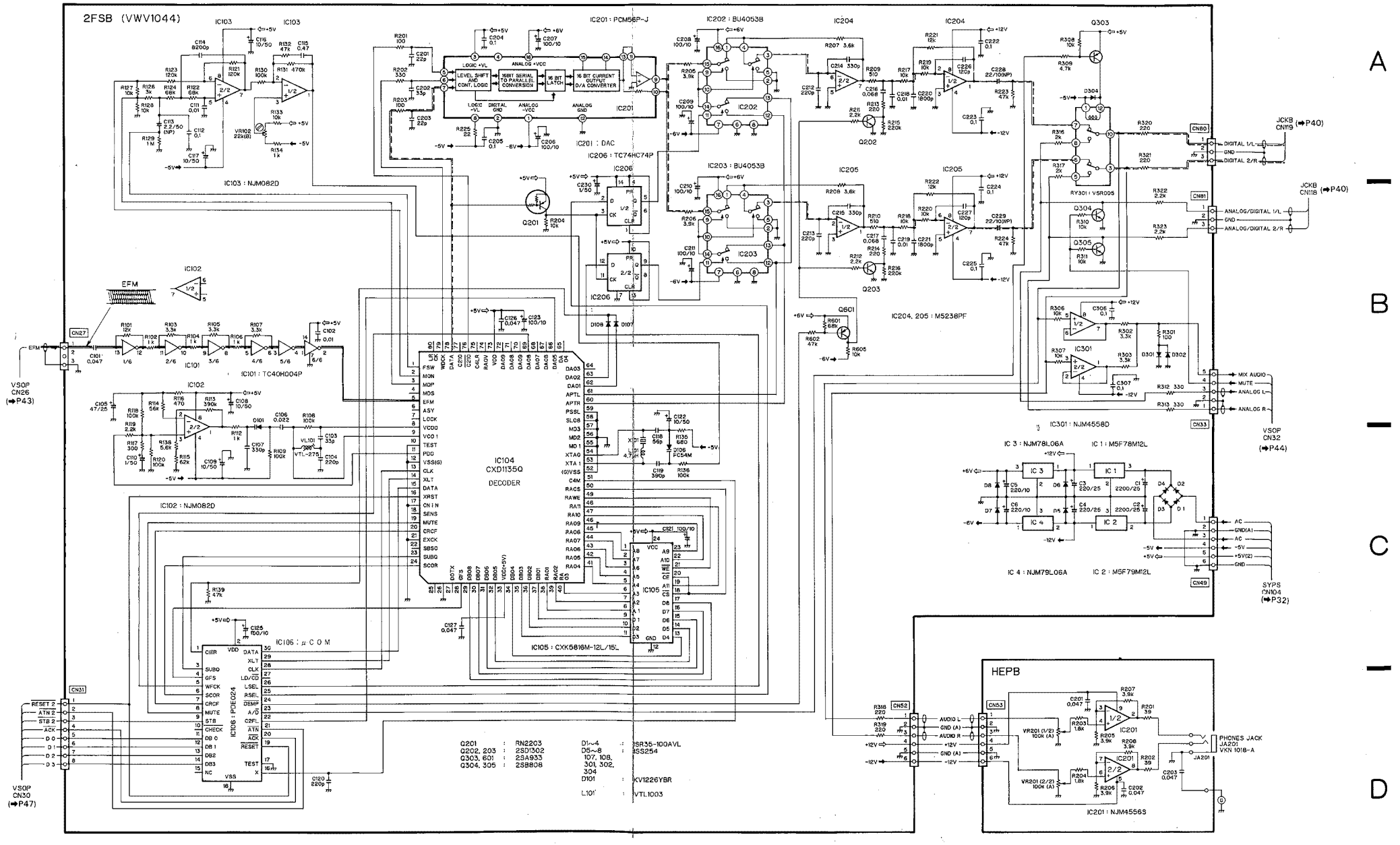

VSOP Assembly (VWS1030)
Thru type capacitors Assembly CN4
FTLB Ass'y CN150
FTLB Ass'y CN92
FTLB Ass'y CN93
FTLB Ass'y CN95
Thru type capacitors assembly CN6
Thru type capacitors assembly CN3
SYPS Ass'y CN110
FLDB Ass'y CN111
2FSB Ass'y CN31
Thru type capacitors assembly CN3
Thru type capacitors assembly CN5
FTLB Ass'y CN97
AMDP Ass'y CN37
LPFB Assembly
2FSB Ass'y CN27
FLXB Ass'y CN96
SYPS Ass'y CN110
JCKB Ass'y CN120
JCKB Ass'y CN121
2FSB Ass'y CN33
TA7347P
TL8707P
PH101
UN4112
2SA1015
2SC1583
2SD1226M
Type No
Lot No
hFE

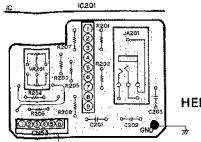
4.7 AMDP AND MMVB ASSEMBLY

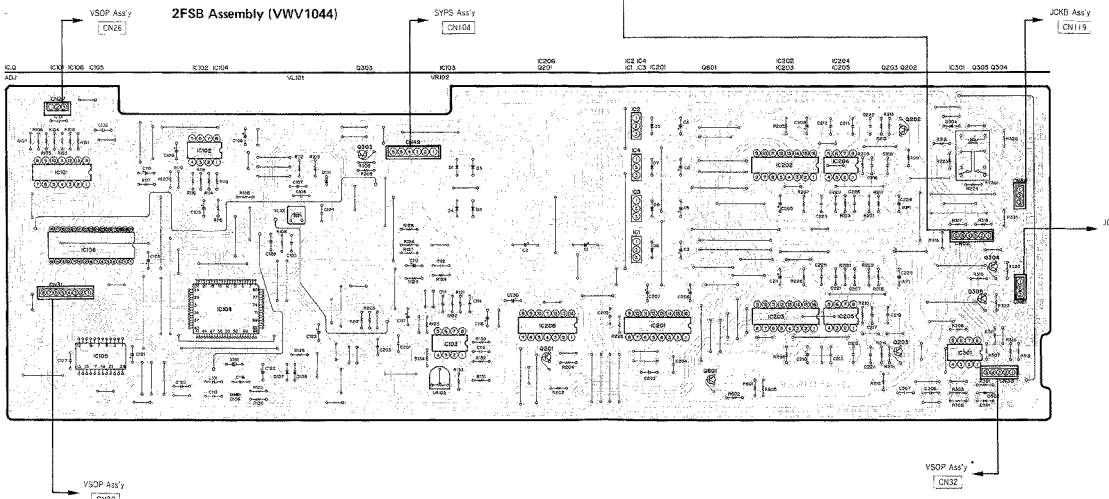



AMDP Assembly
VSOP Ass'y
CN36
MMVB Assembly
IC
IC501
Thru Type Capacitors Assembly
SYPS Ass'y
CN107
VSOP Ass'y
CN41
VSOP Ass'y
CN38
VSOP Ass'y
CN38
VSOP Ass'y
CN41
VSOP Ass'y
CN44
MB40778
SN74LS221N
PA9003
TC4053BP
CXA1096P
HD74HC153P
IR2339
TC74HCU04P
TC74HC00P
TC74HC86P
MN4700
PDJ002
TC74HC374P
TL082CP
2SC1846
2SA885
2SK192A
Type No.
Lot No.

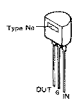
4.8 2FSB AND HEPB ASSEMBLY



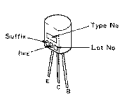




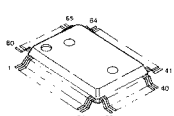
NJM78L06A



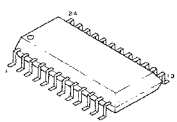
2SD1302



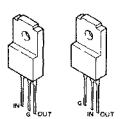
CXD1135Q



CXK5816M-12L
CXK5816M-15L



M5F78M12L M5F79M12L



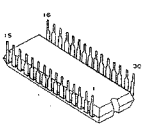
M5238PF

NJM082D

NJM79L06A

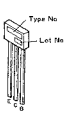
PCM56P-J

PDE024

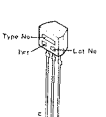


TC74HC74P
TC40H004P

RN2203

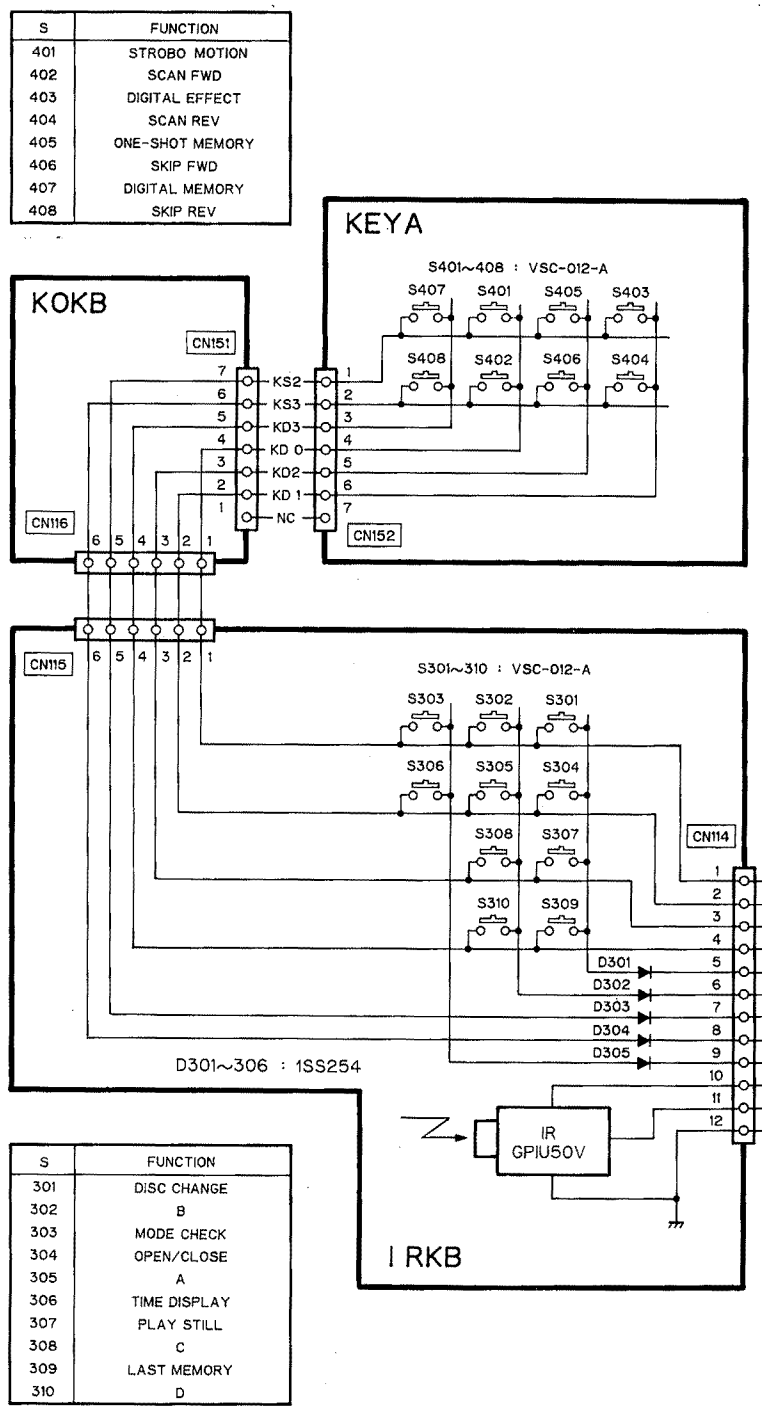


2SB808

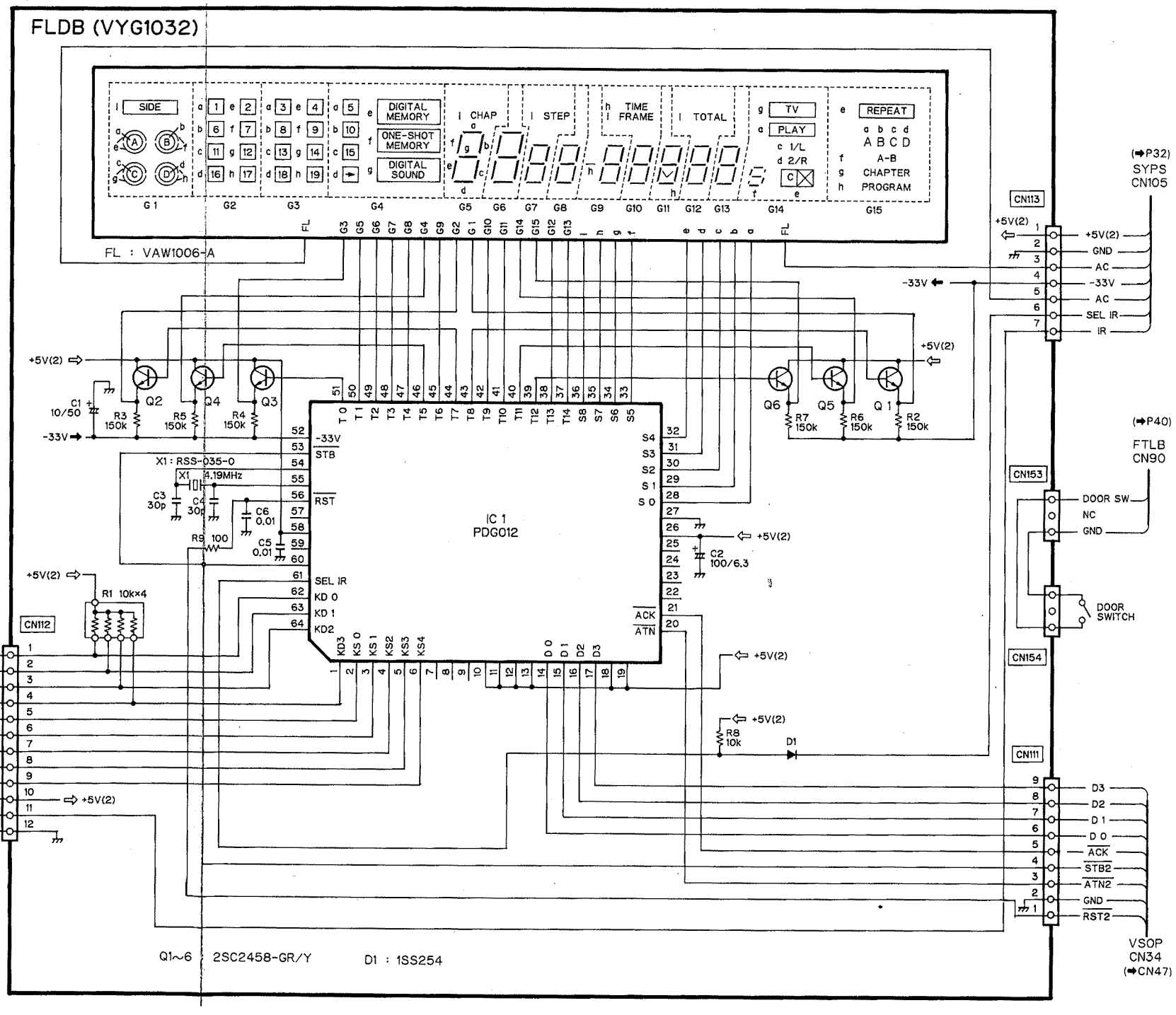


4.9 FLDB, KEYA, KOKB AND IRKB ASSEMBLY

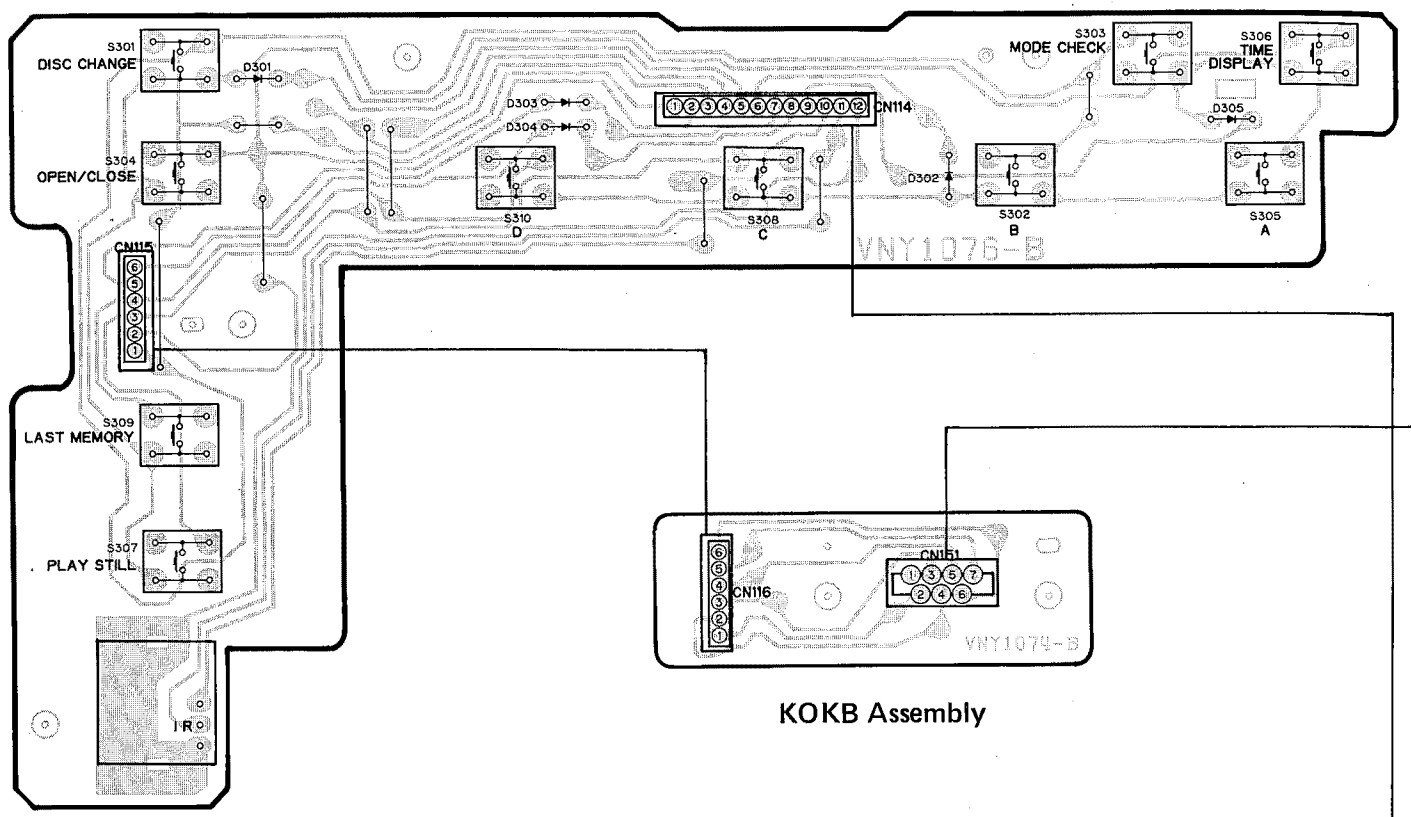
S	FUNCTION
401	STROBO MOTION
402	SCAN FWD
403	DIGITAL EFFECT
404	SCAN REV
405	ONE-SHOT MEMORY
406	SKIP FWD
407	DIGITAL MEMORY
408	SKIP REV



S	FUNCTION
301	DISC CHANGE
302	B
303	MODE CHECK
304	OPEN/CLOSE
305	A
306	TIME DISPLAY
307	PLAY STILL
308	C
309	LAST MEMORY
310	D

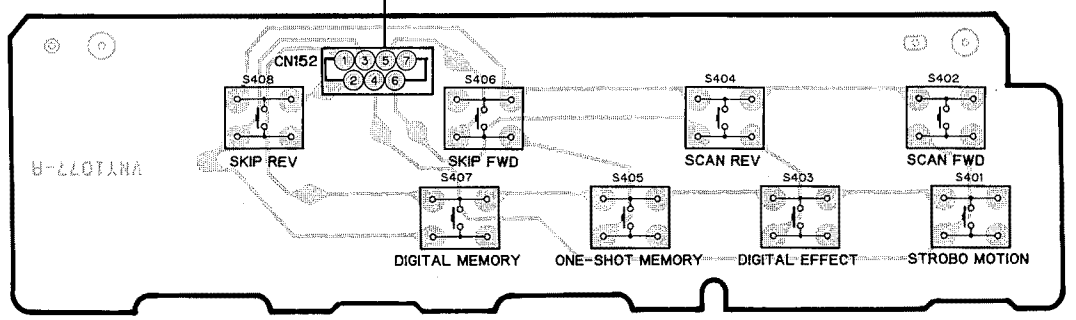


IRKB Assembly

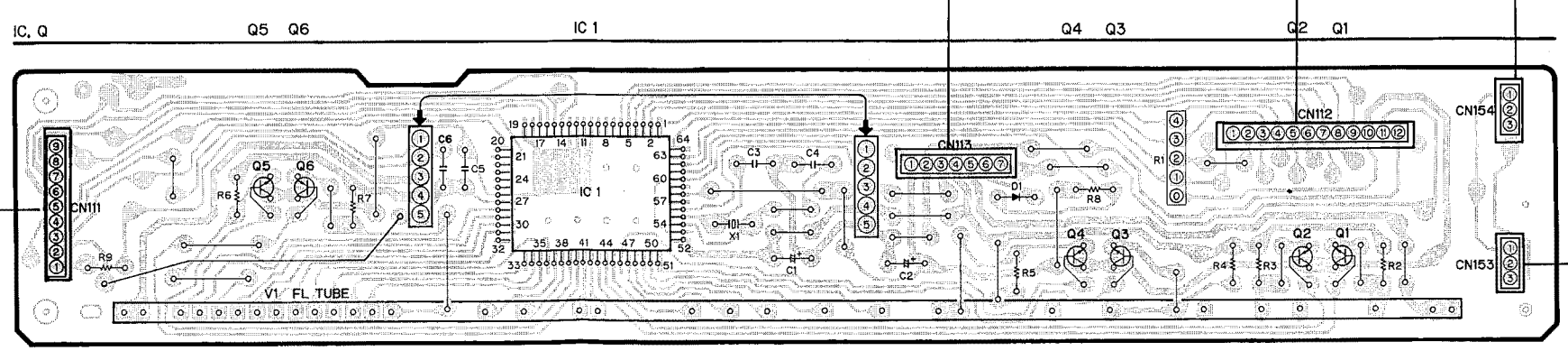


KOKB Assembly

KEYA Assembly



FLDB Assembly (VYG1032)



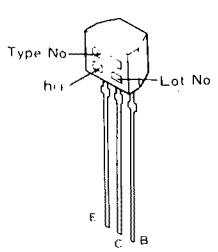
SYPS Ass'y
CN105

DOOR SWITCH

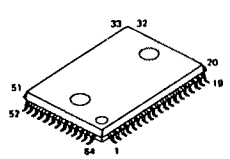
VSOP Ass'y
CN34

FTLB Ass'y
CN90

2SC2458



PDG012



5. ELECTRICAL PARTS LIST

NOTES:

- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*
  Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).

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

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

5.62kΩ	*562 × 10¹*	*5621*	*RN1/4SR 5 6 2 1 F*

- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *Parts marked by " ● " are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

Miscellaneous

P.C BOARD ASSEMBLIES

Mark	Symbol & Description	Part No.
◉	VSOP assembly	VWS1030
	LPFB assembly	
◉	MEMB assembly (AMDP assembly + MMVB assembly)	VWW1060
◉	2FSB assembly	VWV1044
◉	BMIB assembly	VYM1021
◉	SYPS assembly	VYR1045
◉	FTLB assembly	VYR1046
◉	FLDB assembly	VYG1032
	IRKB assembly	
	KEYA assembly	
	KOKB assembly	
	HEPB assembly	
	LEDB assembly	
	LOMB assembly	
	BLDB assembly	
	BRGB assembly	
	PREB assembly	
	FLXB assembly	
	JCKB assembly	
	PWSB assembly	
	BLMB assembly	
	GNDB assembly	

OTHERS

Mark	Symbol & Description	Part No.
★★	PROGRAM PROM-S	VYW1221
	C1 — C4 Ceramic capacitor	CGCYX473M25
	Fuji card	VDA1066
⚠	AC power cord	VDG1012
⚠	Strain relief	CM-22C
	C1, C3 — C13, C19 — C21 (100p) Thru type capacitor	VCG1006
	C14 — C18 (1000p)	VCG1007
	C2 (22p)	VCG1009

Mark	Symbol & Description	Part No.
⚠ ★★	FU Fuse (3A)	VEK-018
⚠ ★★	FU Fuse (2A)	VEK-022
⚠ ★	Power transformer	VTT1031
	Pick up assembly	VWY1011
	Flexible P.C. board	VNP1077
★★	Slide switch (GONDOLA POSITION, FRONT DOOR)	VSK1002
★★	Slide switch (PLAY POSITION)	VSK1003
★★	Micro switch (CARRY 1, 2 OUT, PARK, REVERSE SPEED DET.)	VSF1001
★★	Leaf switch (CLAMP)	VSK-015
★★	Loading motor assembly (GONDOLA)	VXX1101
★★	Loading motor assembly (CARRY1, 2)	VXX1109
★★	Tilt motor assembly	VXX1105
★★	Clamper motor assembly	VXX1106
★★	Power motor assembly (MECHANISM REVERSE)	VXX1108
★★	Spindle motor assembly	VXX1116
★★	Slider motor assembly	VXX1117

◉ VSOP Assembly (VWS1030)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	IC7	CXD1095Q
★★	IC1	HD6303YP (HD63A03YP)
★★	IC4	M74LS00P
★★	IC6	M74LS27P
★★	IC5	M74LS30P
★★	IC3	M74LS74AP
★★	IC403	NJM2903S
★★	IC103, IC105, IC106	NJM4558D
★★	IC104, IC107	NJM4558S

Mark	Symbol & Description	Part No.
★★	IC406	PA0017
★★	IC301	PA0026
★★	IC102	PA5009
★★	IC401	PA5010
★★	IC2	PD0027
★★	IC101	PD9003
★★	IC404	PM0001
★★	IC402	TA7347P
★★	IC405	TL8707P
★★	Q3	PH101-S
★★	Q102, Q107, Q116, Q115, Q120, Q121, Q125, Q301Q401, Q402	UN4112
★★	Q101, Q106, Q113, Q122, Q302	UN4212
★★	Q430	2SA1015
★★	Q4, Q103, Q105, Q109, Q117, Q403, Q404, Q406, Q602	2SA933S
★★	Q112	2SC1583
★★	Q303, Q405	2SC1627
★★	Q2, Q108, Q110, Q114, Q118, Q123, Q126 — Q128, Q304 — Q306, Q407 — Q421, Q425 — Q429, Q431	2SC1740S
★★	Q1	2SD1226M
★★	Q104, Q111, Q119	2SK184
★	D101	FC54M
★	D105, D129, D130	HZS3B2
★	D120	HZS5C2
★	D1, D408	HZS6C2
★	D121, D122, D410	HZS7B2
★	D304	HZS7B3
★	D503	HZS9A3
★	D505	HZ4ALL
★	D5	HZ4B2
★	D411	HZ5B2
★	D305	HZ5C1
★	D119	SLV-31VC3-F (SLV-31VC3-G)
★	D502	SM-1XN02
★	D2 — D4, D102 — D104, D106 — D109, D112 — D118, D123 — D126, D131, D301 — D303, D401 — D403, D405, D406, D504	1SS254
★	TH101	112252

COILS AND FILTERS

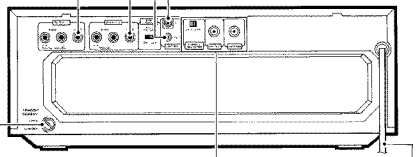
Mark	Symbol & Description	Part No.
	L2 Axial inductor	LAU010K
	L101, L401—L404, L412 Axial inductor	LAU120J
	L409 Axial inductor	LAU121J
	L410, L426 Axial inductor	LAU220J
	L1 Axial inductor	LAU221J
	L102 Axial inductor	LAU270J
	L405, L413, L425 Axial inductor	LAU330J
	L427 Axial inductor	LAU560J
	L411 Axial inductor	LAU680J
	L406 Radial inductor	LRA271K
	L301 Radial inductor	LRA390K
	L415 Radial inductor	LRA391K
	L414 Radial inductor	LRA561K
	F301 2.3MHz B.P.F.	VTF1002
	F302 2.8MHz B.P.F.	VTF1003
	F505 1.75MHz L.P.F	VTF1021 (VTF1024)
	F506 Audio B.P.F.	VTF1022 (VTF1025)
	F1, F2, F101, F501 — F503 3 terminal filter	VTH1001
	F102, F103	VTH1016

CAPACITORS

Mark	Symbol & Description	Part No.
	C125, C126, C128, C150, C415, C445, C615, C624, C667	CCCCH101J50
	C108, C448	CCCCH121J50
	C124, C465, C467	CCCCH151J50
	C13	CCCCH180J50
	C447	CCCCH220J50
	C659	CCCCH270J50
	C451, C523	CCCCH300J50
	C312, C429	CCCCH330J50
	C311, C453, C662	CCCCH390J50
	C417, C470	CCCCH430J50
	C457, C666	CCCCH470J50
	C411	CCCCH510J50
	C328, C330, C473	CCCCH560J50
	C106, C129	CCCCH680J50
	C454	CCCCH750J50
	C432, C433	CCCCH820J50
	C474	CCCCH910J50
	C188, C189	CCCSL151J50
	C25, C317, C450	CCCSL181J50
	C109, C316, C335, C336	CCCSL221J50
	C458	CCCSL241J50
	C434	CCCSL271J50
	C444	CCCSL301J50
	C1, C2, C9	CCCSL330J50
	C435	CCCSL391J50
	C190	CCCSL510J50
	C668	CCDCH620J50
	C671	CCDSL101J50
	C15, C428, C430, C452	CCPUCH100J50
	C455	CCPUCH120J50
	C407, C408, C628, C658	CCPUCH150J50
	C406, C620	CCPUCH180J50
	C10	CCPUSL220J50
	C14, C16	CCPUSL470J50
	C343	CEANLR47K50
	C345	CEANL220K16
	C143	CEANP101M6R3
	C309, C310, C360	CEAS221M10
	C301, C302, C346, C621	CEAS471M10

VIDEO OUTPUT 1, 2 terminals (RCA jack)
Connect these jacks to a TV monitor or a TV set which is equipped with a video input terminal.

CONTROL IN and OUT terminals (miniature phone jack)
These terminals are for control cords, when the player is used together with other Pioneer products with the Pioneer [CONTROL] mark.



Transit screw
The player's internal mechanism is secured with a transit screw.
Before using the player, loosen this screw. Using the player without loosening the screw will result in improper player operation. Before transporting the player again, be sure to tighten this screw to prevent vibration from affecting the internal mechanism.

Power cord
Connect this to a power outlet.

ANTENNA terminal (75 Ω F-type jack)
Connect the coaxial cable (75 Ω) from the VHF TV antenna to this terminal.

VHF OUT terminal (75 Ω F-type jack)
Connect this terminal to your TV set's VHF antenna terminal.

VHF CHANNEL SELECTOR (CH3/CH4)
This switch is for changing the channel of the internal VHF converter.
Set to the channel which is not used for TV broadcasts in your area.

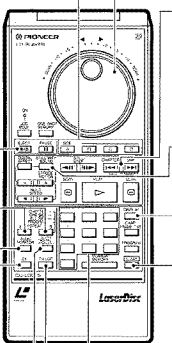
[REMOTE CONTROL UNIT]

Keys for which no special instructions are given correspond to the same functions as the buttons of the player. (Refer to the section [PLAYER FRONT PANEL].)

Disc side keys (SIDE A to D)
Use these keys to select the disc side to be played.

JOG dial/SHUTTLE ring

EJECT (■/⏏) key
Press this key to stop playback or to eject the disc.
Pressing the key a different number of times will give different results:
Once: The disc will stop spinning.
Twice: The upper disc table will open.
Three times: The upper disc table will close and the lower disc table will open.
Four times or more: The opened disc table will close and the closed disc table will eject.
If there is no disc inserted, the disc table will open when key is first pressed.



CHAPTER SKIP/(|◄◄, ►►|) PROGRAM CORRECT key
This key has the same functions as the SKIP button on the front of the player.

STILL WITH SOUND/STROBE MOTION key
- When pressed during playback, it will enter the still with sound playback mode.
- Used together with the + or - keys, strobe motion playback can also be done.

DISPLAY key
This displays or deletes the currently-playing chapter, frame, or time on the screen.

REPEAT (A, B) keys
These are used for repeat playback.

AUDIO MONITOR key
Switches the audio channel. When the player is first turned on, the audio is stereo and the 1/L and 2/R indicators both light.
Each time this key is pressed, the audio channel moves one step through the sequence: 1/L → 2/R → 1/L and 2/R (Stereo) → 1/L ...

CLEAR key
The CLEAR key is used in the following cases:
- To stop repeat playback, to interrupt a search, or to correct input mode with the DIGIT keys (Pressing the key twice will also clear the value entry mode.)
- To erase the last step of the program.
  (Pressing the key twice will also celar the program entry mode.)
- To terminate program playback.

CX key
This is the on/off key for the CX noise reduction system.

AUTO DIGITAL/ANALOG key
Pressing this key selects the audio output from the DIGITAL/ANALOG audio output terminals on the back of the player during playback of a LaserVision Disc with digital audio.

This key has no effect for playback of LaserVision Discs without digital audio.

DIGIT (0 - 9) keys

TV/LDP key
When the VHF antenna is connected to the TV set via the player, this key switches between disc playback and VHF TV broadcast reception.

CAPACITORS

Mark	Symbol & Description	Part No.
	C6	CCDCH220J50
	C5	CCDCH510J50
	C3	CCDCH560J50
	C4	CCPUCH1R5M50
	C1	CCPUCH150J50
	C7	CCPUCH180J50
	C2	CCPUCH2R2K50

AMDP Assembly

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	IC1	CXA1096P
★★	IC9	HD74HC153P
★★	IC6	IR2339
★★	IC101	MB40778
★★	IC3	MN4700
★★	IC102	PA9003
★★	IC2	PDJ002
★★	IC103	TC4053BP
★★	IC4	TC74HCU04P
★★	IC7	TC74HC00P
★★	IC10	TC74HC374P
★★	IC8	TC74HC86P
★★	IC5	TL082CP
★★	Q125, Q126	2SA1358
★★	Q3, Q5, Q7, Q101, Q103, Q105, Q114, Q115, Q117,Q119, Q121	2SA933S
★★	Q1, Q2, Q4, Q6, Q9, Q10, Q102, Q104, Q106 – Q113, Q116, Q118, Q120	2SC1740S
★★	Q122	2SC1846
★★	Q123, Q124	2SC3421
★★	Q8	2SK192
★	D102, D103	HZS6C3
★	D1	SVC321SP
★	D2 – D6, D101	1SS254

COILS AND FILTER

Mark	Symbol & Description		Part No.
	L106, L107	Axial inductor	LAU150J
	L104	Axial inductor	LAU220J
	L103	Axial inductor	LAU390J
	L1	Axial inductor	LAU4R7K
	L102, L108	Axial inductor	LAU470J
	L113	Axial inductor	LAU5R6K
	L105	Axial inductor	LAU560J
	L2, L10	Axial inductor	LAU6R8K
	L3 – L9, L101, L110 – L112 (100μH)		VTL-035 (VTL1006)
	F6 – F10, F101 – F104, F109 EMI filter		VTH1012

CAPACITORS

Mark	Symbol & Description		Part No.
	C2, C59, C107		CCCCH100D50
	C7, C34, C54, C124		CCCCH101J50
	C141		CCCCH220J50
	C109, C112		CCCCH270J50
	C8, C119, C122		CCCCH390J50
	C110, C111		CCCCH470J50
	C108		CCCCH510J50
	C6		CCCCH680J50
	C148		CCCSL151J50
	C113, C114		CCCSL201J50
	C9, C10		CCCSL221J50
	C140		CCCSL271J50
	C132		CCCSL331J50
	C106		CCPUCH150J50
	C30		CCPUCH180J50
	C133		CEJANPR47M50
	C120		CEJANP010M50
	C1		CEJANP100M10
	C123		CEJANP470M6R3
	C105		CEJA010M50
	C17, C19, C20, C24, C48, C49, C57, C60, C61, C101, C116, C129, C136, C138, C145, C147, C153 – C157, C160		CEJA101M6R3
	C14, C15, C149, C150		CEJA220M16
	C104, C125		CEJA220M6R3
	C40, C151, C152, C159		CEJA470M16
	C130		CEJA470M6R3
	C134		CFTXA104J50
	C4, C43, C44		CGCYX473K25
	C41, C42		CKCYB472K50
	C3, C5, C11 – C13, C16, C18, C21 – C23, C25, C26, C28, C31, C33, C35, C37 – C39, C45 – C47, C50 – C53, C55, C56, C58, C102, C103, C115, C117, C118, C121, C126, C128, C131, C135, C137, C139, C142 – C144, C146, C158		CKCYF103Z50
	C29, C32		CKPUYF223Z25
	C36		CQMA222J50
	C127	(470/6.3)	VCH1012
	TC101	Ceramic trimer	VCM-006
	VC1	Ceramic trimer (70pF)	VCM-009

RESISTORS

Mark	Symbol & Description		Part No.
★	VR1	Semi-fixed (22kΩ)	VRTG6VS223
★	VR103	Semi-fixed (220Ω)	VRTG6VS221
★	VR101	Semi-fixed (4.7kΩ)	VRTB6VS472
★	VR102	Semi-fixed (10kΩ)	VRTB6VS103
	R165		RD1/4VM680J
	R14 – R16		RN1/6PQ□□□□F
		Other resistors	RD1/6PM□□□J

OTHERS

Mark	Symbol & Description	Part No.
★	X1 Crystal resonator (18MHz)	VSS1008

MMVB Assembly

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	IC501	SN74LS221N
★	D501	1SS254

CAPACITORS

Mark	Symbol & Description	Part No.
	C502	CCCCH151J50
	C503	CCPUSL220J50
	C501	CKPUYF223Z25

RESISTORS

Mark	Symbol & Description	Part No.
	R501	RD1/6PM101J

◉2SFB Assembly (VWV1044)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	IC202, IC203	BU4053B
★★	IC104	CXD1135Q
★★	IC105	CXK5816M-12L (CXK5816M-15L)
★★	IC1	M5F78M12L
★★	IC2	M5F79M12L
★★	IC204, IC205	M5238PF
★★	IC102, IC103	NJM082D
★★	IC301	NJM4558D
★★	IC3	NJM78L06A
★★	IC4	NJM79L06A
★★	IC201	PCM56P-J
★★	IC106	PDE024
★★	IC101	TC40H004P
★★	IC206	TC74HC74P
★★	Q201	RN2203
★★	Q303, Q601	2SA933S
★★	Q304, Q305	2SB808
★★	Q202, Q203	2SD1302
★	D106	FC54M
★	D101	KV1226YBR
★	D1 – D4	1SR35-100AVL
★	D5 – D8, D107, D108, D301, D302, D304	1SS254

RELAY

Mark	Symbol & Description	Part No.
	RY301	VSR-005

COILS

Mark	Symbol & Description		Part No.
	VL101	Variable coil	VTL-275 (VTL1005)
	L101	Coil (4.7μH)	VTL1003

CAPACITORS

Mark	Symbol & Description	Part No.
	C201, C203	CCCCH220J50
	C118	CCCCH560J50
	C226, C227	CCCSL121J50
	C212, C213	CCCSL221J50
	C107, C214 , C215	CCCSL331J50
	C119	CCCSL391J50
	C104, C120	CCCUJ221J50
	C103, C202	CCCUJ330J50
	C228, C229	CEANP220M10
	C206 – C211	CEAS101M10
	C5, C6	CEAS221M10
	C3, C4	CEAS221M25
	C1, C2	CEAS222M25
	C113	CEJANP2R2M50
	C110, C230	CEJA010M50
	C108, C109, C116, C117, C122 C121, C123, C125	CEJA100M16 CEJA101M6R3
	C105	CEJA470M6R3
	C112, C204, C205, C222 – C225, C306, C307	CFTXA104J50
	C115	CFTXA474J50
	C216, C217	CFTXA683J50
	C101, C126, C127	CGCYX473M25
	C102	CKCYF103Z50
	C111, C218, C219	CQMA103J50
	C220, C221	CQMA182J50
	C106	CQMA223J50
	C114	CQMA822J50

RESISTORS

Mark	Symbol & Description		Part No.
★	VR102	Semi-fixed (22kΩ)	VRTB6VS223
	R114, R115, R118, R120, R127, R128, R138		RN1/6PQ□□□□F
		Other resistors	RD1/6PM□□□J

OTHERS

Mark	Symbol & Description	Part No.
★	X101 Crystal resonator (16MHz)	VSS1004

◉ BMIB Assembly (VYM1021)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	IC101, IC102	BU4053B

CAPACITORS

Mark	Symbol & Description	Part No.
	C401, C402	CEJANP3R3M25
	C403 – C406	CKCYF103Z50

RESISTORS

Mark	Symbol & Description	Part No.
	R401, R402	RD1/6PM912J

◉ SYPS Assembly (VYR1045)

Mark	Symbol & Description	Part No.
★★	Q305	2SB1052
★★	Q317	2SB1238X
★★	Q302, Q306	2SA933S
★★	Q301, Q307	2SC1740S
★★	Q303, Q304	2SD1267
★	D308, D309	HZS5.6EB2
★	D310	HZS8.2EB2
★	D315	MTZ36C (MTZ36D)
★	D316	MTZ5.1B
★	D301, D302	RB-152LF
★	D317	S1VB10
★	D313, D314, D318	1SR35-100AVL
★	D303 – D307	1SS254

CAPACITORS

Mark	Symbol & Description	Part No.
	C327, C328	CEAS101M50
	C303, C304	CEHAQ222M25
	C309, C310, C313	CEJA100M16
	C316, C318, C329	CEJA100M50
	C307, C308	CEJA470M16
	C301, C302, C311, C312, C330, C331	CKCYF103Z50
	C332 (2200μF/25V)	VCH-039
	C306, C325 (4700μF/10V)	VCH-040
	C305, C324 (6800μF/10V)	VCH1040

RESISTORS

Mark	Symbol & Description	Part No.
	R301, R302	RD1/2PMF□□□J
	R304	RD1/4VM152J
	Other resistors	RD1/6PM□□□J
	R342, R343	RD1/2PM□□□J

◉ FTLB Assembly (VYR1046)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	IC1	HA11529
★★	IC3	LC7800
★★	IC7	MB3763
★★	IC2	NJM4558SA
★★	IC6	TA7279P
★★	IC4	TC4011BP
★★	Q201, Q202	UN4212
★★	Q1, Q101, Q105	2SA933S
★★	Q3	2SC1627
★★	Q2	2SC1740S
★★	Q203	2SC1847
★★	Q4	2SD1267
★★	Q103, Q104, Q106	2SK184
★	D201	HZ11C1
★	D1	S2K20
★	D101 – D105	1SS254

COILS

Mark	Symbol & Description		Part No.
	L2	Ferrite bead	VTH1017
	L1	Choke coil	VTT-070

CAPACITORS

Mark	Symbol & Description	Part No.
	C1	CCCSL331J50
	C4	CCCSL471J50
	C124 – C127, C201	CEAS470M25
	C6	CEAS470M50
	C128	CEAS471M10
	C106	CEJANP010M50
	C107, C116	CEJANP100M16
	C111	CEJANP220M10
	C203	CEJA100M50
	C101, 102	CEJA220M16
	C202	CEJA220M35
	C5	CEJA3R3M50
	C105, C115, C117	CFTXA104J50
	C119	CFTXA223J50
	C122	CFTXA332J50
	C110	CFTXA333J50
	C109, C113	CFTXA473J50
	C114	CFTXA683J50
	C3	CKCYB102K50
	C103, C104, C108	CKCYF103Z50
	C118	CQMA102J50
	C2	CQMA183J50
	C112	CQMA272J50
	C123	CQMA472J50

RESISTORS

Mark	Symbol & Description	Part No.
	R161	VCN1015
	R12, R14	RS1PMF□□□J
	R13, R15, R16, R17, R149	RN1/6PQ□□□□F
	R205 Resistor array	RA4S103J
	R206 Resistor array	RA6S103J
	R4, R121, R123, R203, R204 Other resistors	RD1/4VM□□□J

◉ FLDB Assembly (VYG1032)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	IC1	PDG012
★★	Q1 – Q6	2SC2458
★	D1	1SS254

CAPACITORS

Mark	Symbol & Description	Part No.
	C3, C4	CCCCH300J50
	C1	CEAL100M50
	C2	CEAL101M6R3
	C5, C6	CKPUYF103Z25

RESISTORS

Mark	Symbol & Description		Part No.
	R1	Resistor array	RA4S103J
		Other resistors	RD1/6PM□□□J

OTHERS

Mark	Symbol & Description		Part No.
★	V1	Fluorescent tube	VAW1007
★	X1	Ceramic resonator	RSS-035

IRKB Assembly

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★	D301 – D305	1SS254

SWITCHES

Mark	Symbol & Description	Part No.
★★	S301 – S310 Tact switch	VSC-012

OTHER

Mark	Symbol & Description		Part No.
		IR sensor unit	GP1U50V

KEYA Assembly

SWITCHES

Mark	Symbol & Description	Part No.
★★	S401 – S408 Tact switch	VSC-012

KOKB Assembly

No electrical parts are supplied for this assembly.

HEPB Assembly

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	IC201	NJM4556S

CAPACITORS

Mark	Symbol & Description	Part No.
	C201 – C203	CGCYX473M25

RESISTORS

Mark	Symbol & Description		Part No.
★	VR201	Volume	VCS1010
		Other resistors	RD1/6PM□□□J

OTHER

Mark	Symbol & Description		Part No.
	JA201	Headphone jack	VKN1018

LEDB Assembly

SEMICONDUCTOR

Mark	Symbol & Description		Part No.
★	D1	LED	TLN113

LOMB Assembly

CAPACITOR

Mark	Symbol & Description	Part No.
	C1	CGCYX473M25

BLDB Assembly

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	IC301	TA8413P
★★	Q302	STA312A
★★	Q301	STA321A
★★	Q303 – Q305	2SA1048
★★	Q307	2SC1740S
★★	Q306	2SK190
★	D306	HZ12C2
★	D301 – D303	S2V10-4001

CAPACITORS

Mark	Symbol & Description	Part No.
	C304	CEAS4R7M50
	C305	CKCYF103Z50
	C306	VCH1039
	C301 – C303 (33/50 NP)	VCH1047

RESISTORS

Mark	Symbol & Description	Part No.
	R303, R304, R307, R308, R312, R315	RD1/2PM□□□J
	Other resistors	RD1/6PM□□□J

BRGB Assembly

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	IC201, IC202	NJM4558D
★★	Q201	STA451C

CAPACITORS

Mark	Symbol & Description	Part No.
	C201, C202, C204, C205	CEJA4R7M35
	C203, C206	CKCYF103Z50

RESISTORS

Mark	Symbol & Description	Part No.
★	VR201, VR202 Semi-fixed (1kΩ)	VRTB6VS102
	R203, R215	RS3PMF4R7J
	R204 – R207, R216 – R218, R224	RN1/6PQ□□□□F
	Other resistors	RD1/6PM□□□J

PREB Assembly

Mark	Symbol & Description	Part No.
★★	IC2, IC3	BA15218N
★★	IC1	IR3C02A
★★	IC4	NJM4556DE
★★	IC5	NJM4556S
★★	Q4, Q8, Q10	2SB1185
★★	Q6	2SB1238X
★★	Q1, Q2	2SC1740S
★★	Q3, Q7, Q9	2SD1762
★★	Q5	2SD1859X
★★	Q11	2SK184
★	D2, D3	SM1.5-02
★	D1	1SS254

CAPACITORS

Mark	Symbol & Description	Part No.
	C4	CCPUSL680J50
	C6	CEALNPR47M50
	C28, C32	CEAL010M50
	C12, C13	CEAL220M6R3
	C21 – C24	CEAL330M25
	C33, C34	CEAL470M6R3
	C8, C10	CEJA220M10
	C15, C16	CEJA330M25
	C17, C19	CFTXA104J50
	C25	CKCYF103Z50
	C20	CKPUYB101K50
	C27	CKPUYB102K50
	C14	CKPUYB221K50
	C5, C26	CKPUYB331K50
	C1 – C3, C7, C11, C18, C31	CKPUYF103Z25
	C9	CSZA220M10

RESISTORS

Mark	Symbol & Description	Part No.
★	VR3 – VR7 Semi-fixed (4.7kΩ)	VRTB6VS472
★	VR1 Semi-fixed (2.2kΩ)	VRTB6VS222
★	VR8 Semi-fixed (10kΩ)	VRTB6VS103
	R49, R54, R63, R64	RD1/2PMF□□□J
	Other resistors	

OTHER

Mark	Symbol & Description	Part No.
	CN140 23P Side connector	VKN1024

FLXB Assembly

No electrical parts are supplied for this assembly.

JCKB Assembly

SWITCH

Mark	Symbol & Description	Part No.
★★	S Slide switch	VSH-001

COILS

Mark	Symbol & Description	Part No.
	F1 – F3	VTH1016

CAPACITORS

Mark	Symbol & Description	Part No.
	C1003 – C1006	CCDSL101J50
	C1012	CEAS220M50
	C1001, C1002, C1007 – C1009	CGDYX473M25

LD-W1

RESISTORS

Mark	Symbol & Description	Part No.
	R1001, R1002	RD1/4VM103J

OTHERS

Mark	Symbol & Description	Part No.
	3P pin jack	DKB1003
	2P mini jack	VKN1034
	RFMD	VWL1009

PWSB Assembly

SWITCH

Mark	Symbol & Description	Part No.
⚠ ★★	S1 Power switch	VSA-010

COIL

Mark	Symbol & Description	Part No.
⚠	L101 Line filter	VTL-157 (VTL-004)

CAPACITORS

Mark	Symbol & Description	Part No.
⚠	C101 – C103	RCG-009

RESISTORS

Mark	Symbol & Description	Part No.
⚠	R101	RD1/2PM225J

BLMB Assembly

This assembly is incorporated in spindle motor.

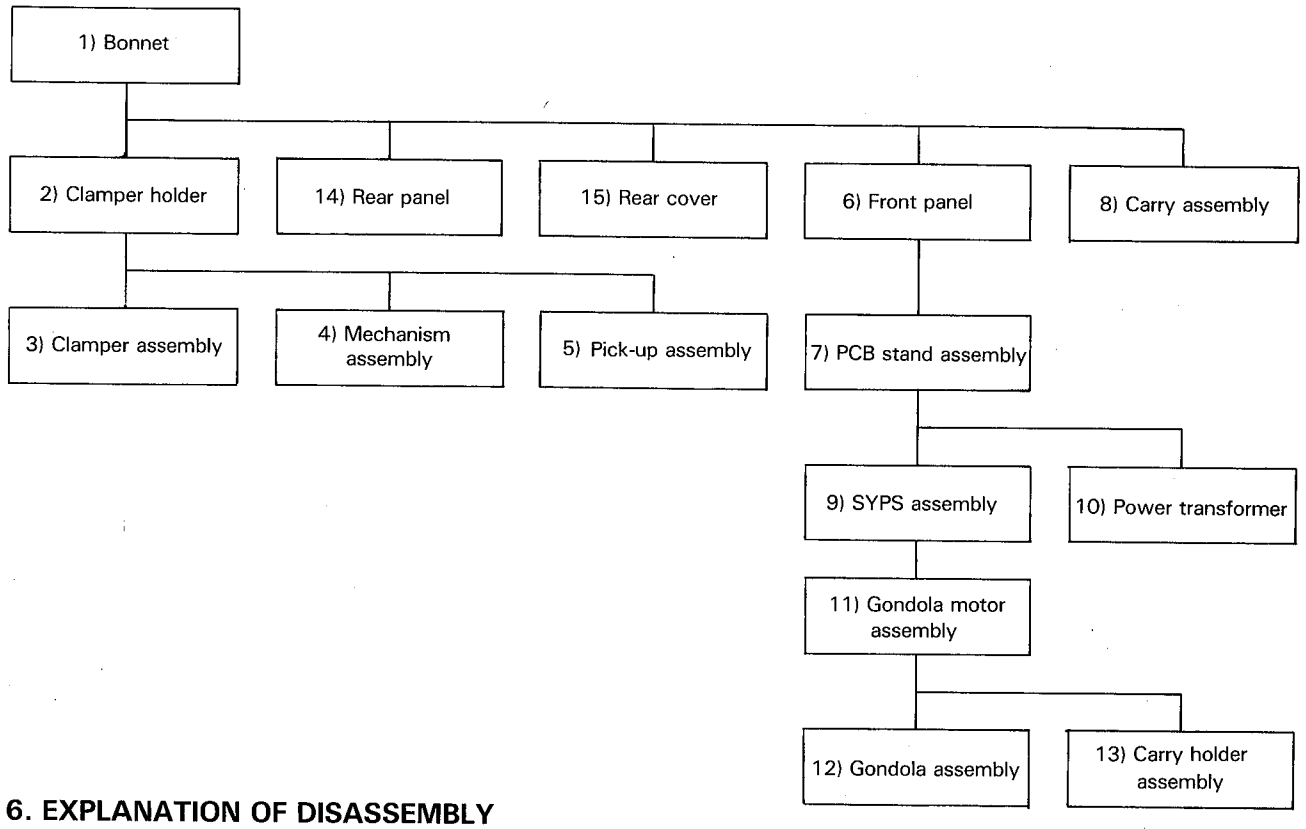
GNDB Assembly

This assembly is incorporated in gondola motor.

6. DISASSEMBLY

6.1. DISASSEMBLY FLOW CHART

Note: The numbers given in the flow chart correspond to the heading numbers in the explanatory text below.



6. EXPLANATION OF DISASSEMBLY PROCEDURES

1. Bonnet

Remove the two screws found on each side of the unit (left and right) and then the three screws at the rear of the unit.

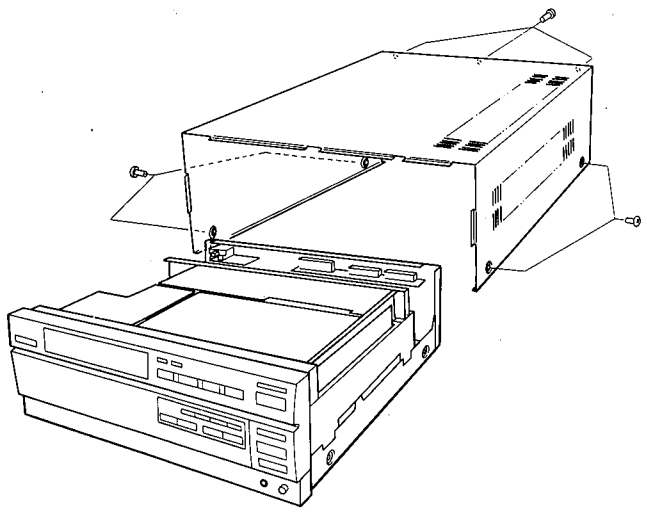


Fig. 1. Removing the bonnet

2. Clamper Holder Assembly

Remove the two locking screws and cut the binder in one place.

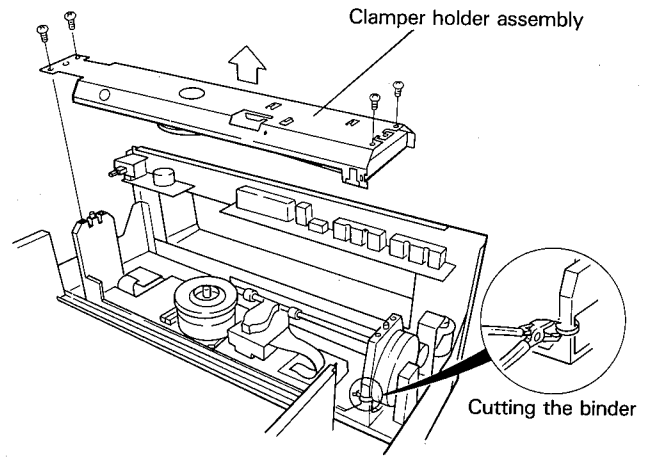


Fig. 2. Clamper holder assembly

3. Clamper Assembly

- Clamper holder
  Remove both the fastening screw and washer
- Clamper head
  Remove three screws.

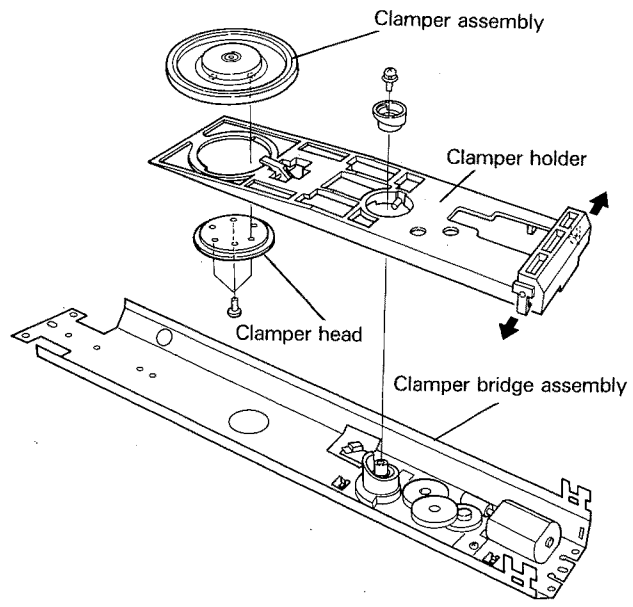


Fig. 3. Clamper assembly

4. Mechanism Assembly

Detach the flexible cable which connects PREB and FLXB assemblies from the PREB side. Remove seven screws.

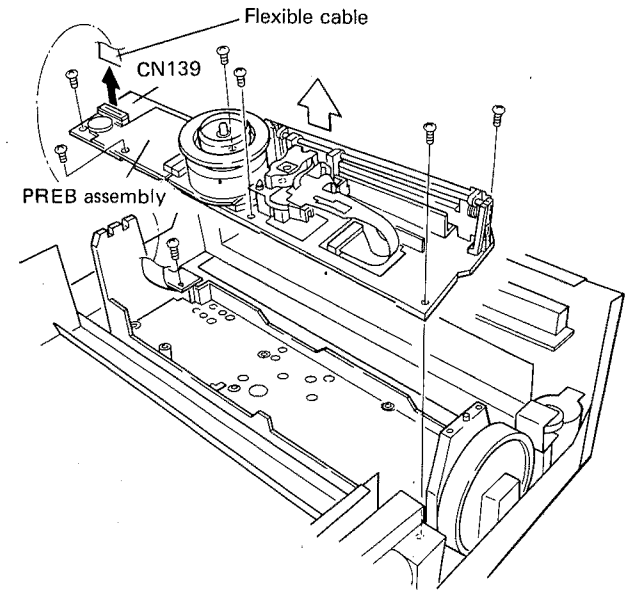


Fig. 4. Removing the mechanism assembly

5. Pick-up Assembly

Detach the flexible cable which connects pick-up and PREB assemblies from the PREB side (CN140) and removing the locking screw, the pick-up assembly can be lifted off.

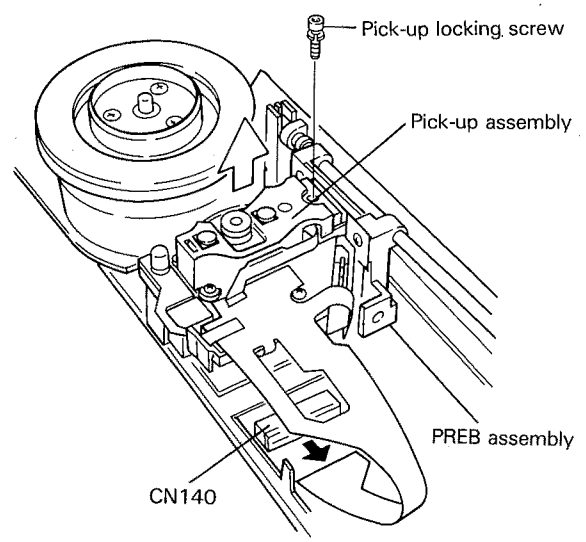


Fig. 5. Removing the pick-up assembly

6. Front Panel
Remove the four screws from the top and two screws from the bottom. Detach the following connectors from the P.C.B's inside of the front panel:
HEPB assembly..... CN53
FLDB assembly CN111,153
SYPS assembly..... CN105

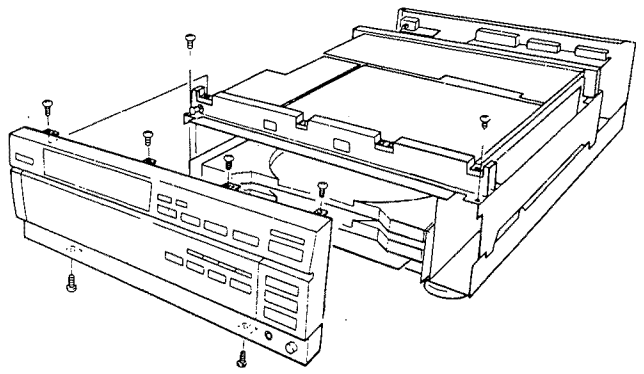


Fig. 6. Removing the locking screws for the front panel

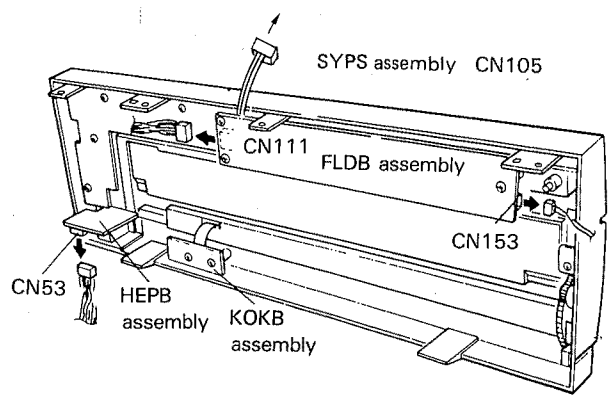


Fig. 7. Detaching connectors from the P.C.B's inside of the front panel

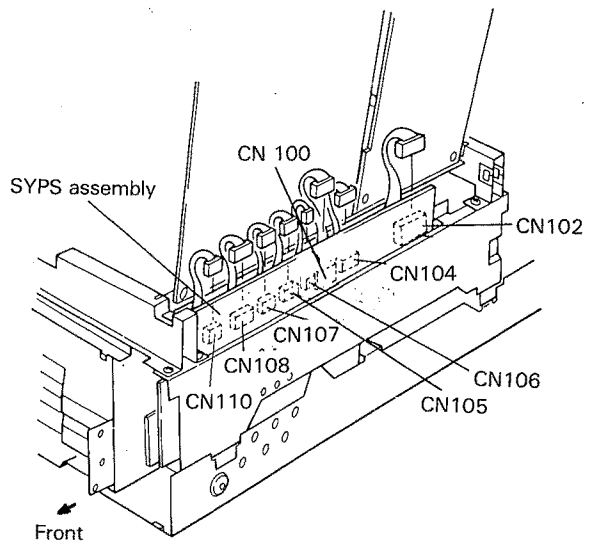


Fig. 8. SYPS connectors

7. PCB Stand Assembly
Remove the two earth lugs, two fastening screws each from the left and right sides of the base joint, and the locking screw for base joint and SYPS assembly.
Detach the following SYPS assembly connectors:
SYPS assembly.... CN107, CN108, CN110, CN104, CN106
- Detach the flexible cable that connects the mechanism and FLXB assemblies from the FLXB assembly side (CN138).
- Detach the connector which connects FTLB and LOMB assemblies from the LOMB assembly side (CN132).
- Detach CN94 of the GNDB assembly.

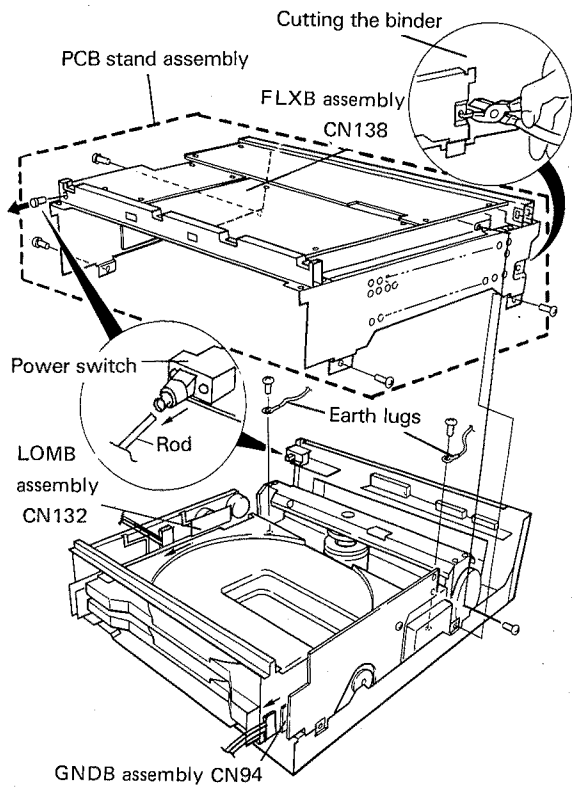


Fig. 9. Removing the PCB stand assembly and base joint

8. Carry (1), Carry (2)
Remove the plastic rivets, from the both sides of the carry (1) along with the switch cam (A). (one screw)
Pull Carry 1 straight out of the unit.
Remove the plastic rivets, from the both sides of the carry (2) and remove it in the same manner as you removed Carry 1.

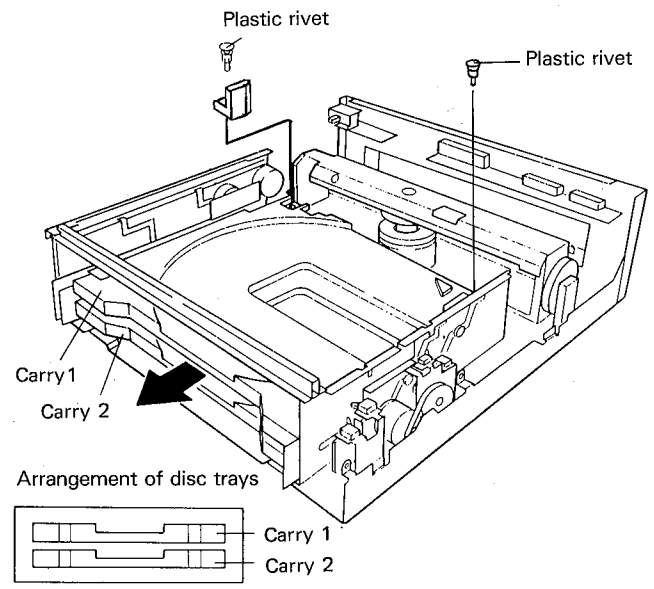


Fig. 10. Carry 1, 2

9. SYPS Assembly
Remove the two locking screws.
Note: The UL cord is held down by the same screws.

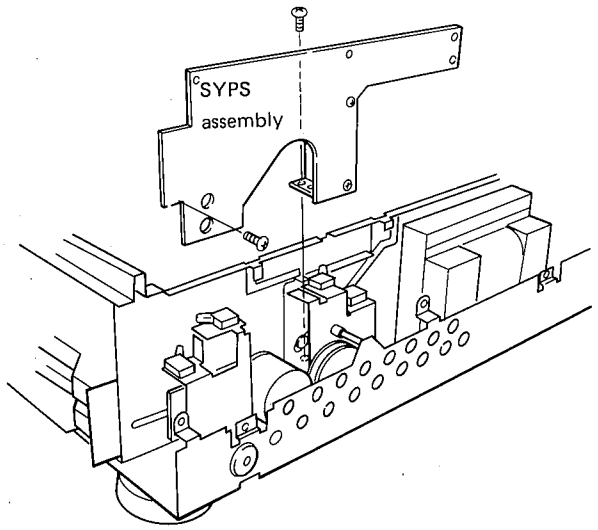


Fig. 11. Removing SYPS assembly

10. Power Transformer
Remove the four locking screws.

11. Gondola Motor Assembly
Remove the two locking screws for the base and gondola motor assembly as well as the side screw.

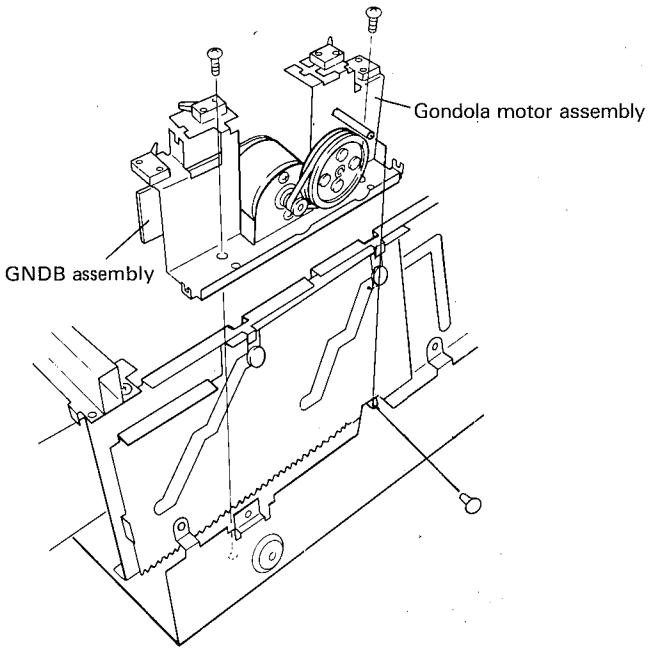


Fig. 12 Gondola motor assembly

12. Gondola Assembly
Line up the rack gear assembly and the notched section in the loading base, and then pull the gondola assembly straight up off the loading base.

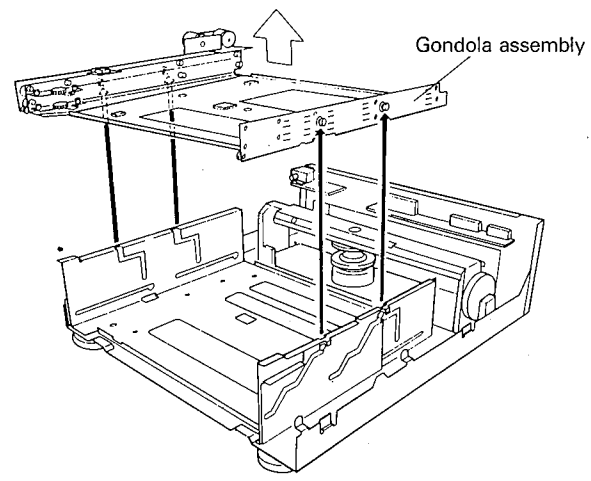


Fig. 13. Removing the gondola assembly

13. Carry Holder Assembly
Remove gondola cover (L).
Remove the three carry holder locking screws from above and another one from the bottom side of the gondola.

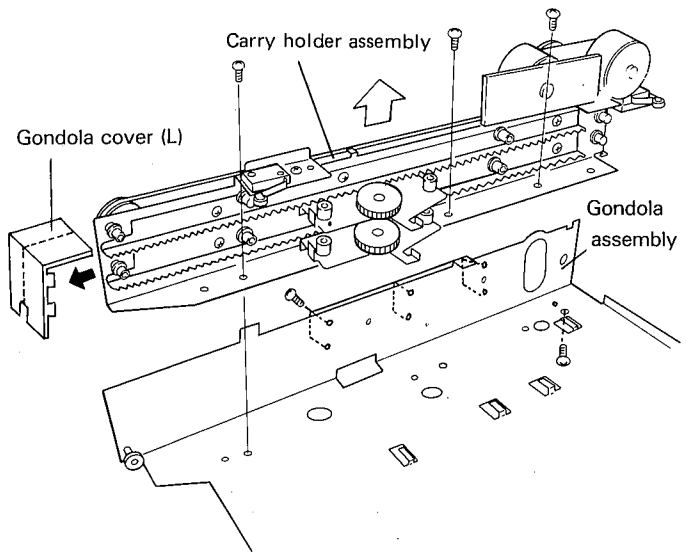


Fig. 14 Carry holder assembly

14. Rear Panel
Remove the five locking screws

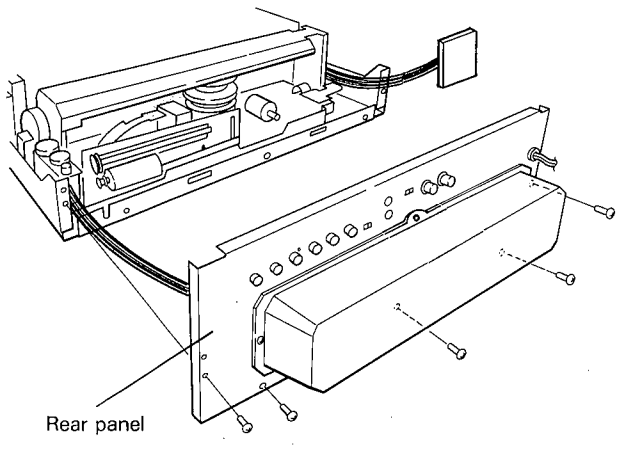


Fig. 15. Rear panel

15. Rear Cover
Undo the PLAY switch wire wrapped around the hooks on the inner side of the rear panel.
Detach JCKB assembly connector CN130 and remove five locking screws. Remove the two hooks from the top section.
Pull the rear cover back until it is at a 90 angle to the rear panel. In this position you can remove the rear cover from the unit.

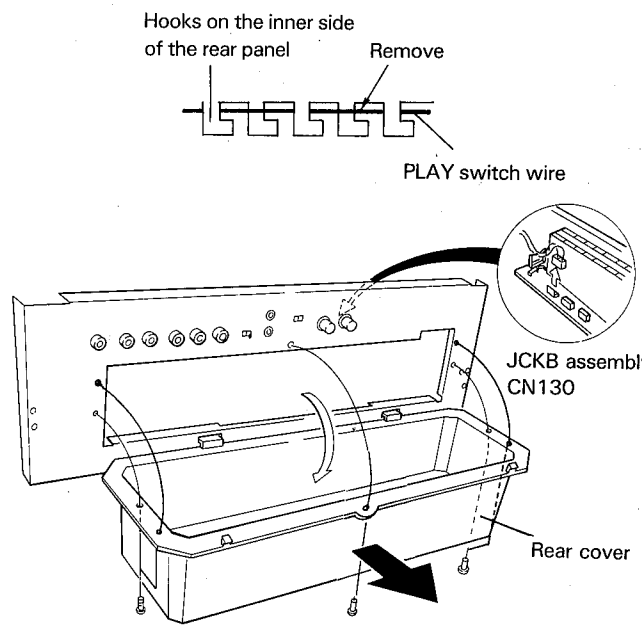


Fig. 16. Rear cover

7. TEST MODE AND MANUAL MODE

This unit has a built-in Test Mode and Manual Mode. In the Test Mode, operations like opening/closing the tracking servo loop and obtaining displays of motor and switch states can be easily performed. In the Manual Mode, motors can be operated independently.

7.1. ABOUT THE TEST MODE

(1) How to activate the Test Mode
There are two ways to activate the Test Mode:
① After pressing ESC (remote control code $5F_H$), press LED TEST (remote control code $5E_H$).
② With both Carry 1, 2 inside the unit and the power turned OFF, open the front door (not OPEN). Then, while pressing the (unopened) Carry 1 OUT SW (on the left side), turn power ON. (→ p.82)
Note: When method ② is used to activate the Test Mode, unit displays all lights up, and motor and switch states are displayed on the monitor. On the other hand, when method ① is used, there will be no change in any of the displays.

(2) The function of the Test Mode
Once the Test Mode is activated, the following functions can be obtained by pressing the CX and Number keys:
① [CX] + [0] : Unit displays all light up, motor and switch states are shown on the monitor (toggle)
② [CX] + [1] : Digital audio error rate measurement. Results of error rate measurements (interpolation numbers and C1, C2 errors) over a 15 second period are displayed on screen.
③ [CX] + [2] : Indicates the version of the software program employed in the unit.
④ [CX] + [3] : Opens/closes TRKG servo (toggle)
⑤ [CX] + [5] : CX Default/Default (toggle)
⑥ [CX] + [6] Compulsory OFF/normal for TILT servo (toggle)
⑦ [CX] + [8] : Compulsory memory-through/normal (toggle)

(3) A common operation when in the test mode
When DEEMPHASIS is ON, the screen will display a ***. This will go out when DEEMPHASIS is OFF.

(4) Exiting the Test Mode
① CX + 9
or
② Power OFF

(5) Description of the motor and switch states
① Display of motor and switch states
By pressing [CX] + [0] in the Test Mode, it is possible to check motor and switch states on a connected TV screen.
The displays shown below will appear on screen. (shipping mode)
The first line indicates whether motors are ON/OFF and the second line indicates whether switches are ON/OFF.

TR1	TR2	BMTO	P	C
010	10	1100	N	O

TV screen

TR1	TR2	BMTO	P	C
010	10	1100	N	O

Carry 1 — TR1 010
- When lit ..... motor stopped
- When blinking ... motor operating
  - Carry 1 OUT SW is OFF
  - Carry 1 PARK SW is ON
  - Carry 1 PLAY SW is OFF (Carry 2)

Carry 2 — TR2 10
- When lit ..... motor stopped
- When blinking ... motor operating
  - Carry 2 OUT SW is OFF
  - Carry 2 PARK SW is ON

Note: Tray 1 and Tray 2 both use the same PLAY SW.

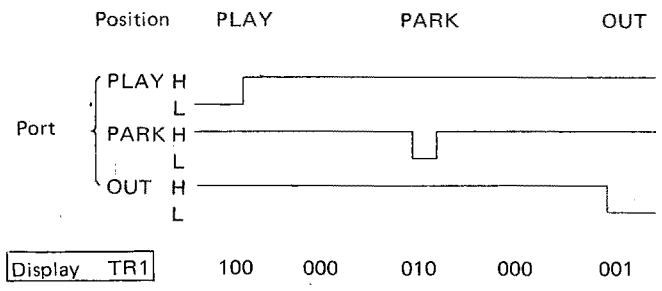
Gondola — BMTO 1100
- When lit ..... motor stopped
- When blinking ... motor operating
  - Gondola OUT SW is OFF
  - Gondola TOP SW is OFF
  - Gondola MID SW is ON
  - Gondola BOTTOM SW is ON

Reverse mechanism
P — When lit ..... motor stopped
N — When blinking ... motor operating
N ..... upright position
▨ ..... intermediate state
I ..... reverse position

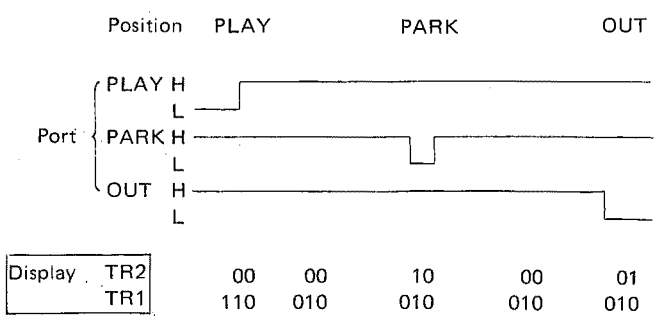
Clamper
C — When lit ..... motor stopped
O — When blinking ... motor operating
O ..... release complete
▨ ..... intermediate state
C ..... clamp complete

Switch State Display

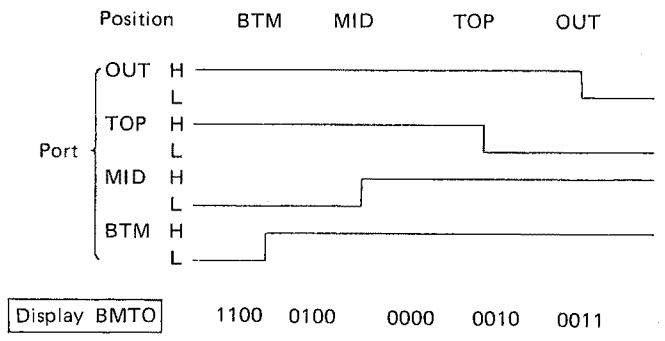
Carry 1



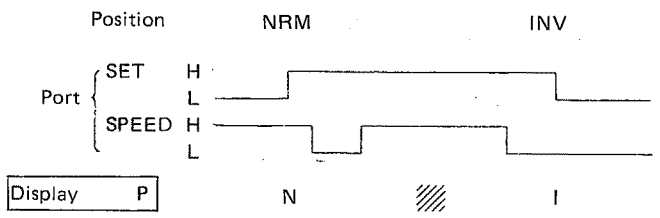
Carry 2



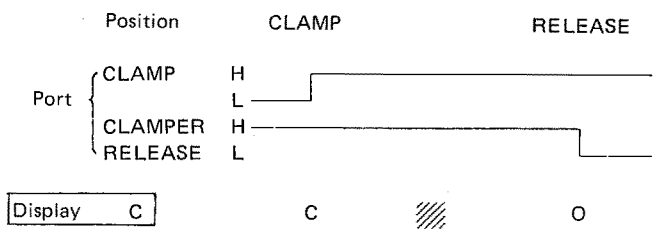
Gondola



Reverse mechanism

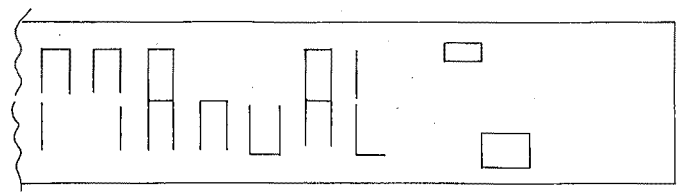


Clamper



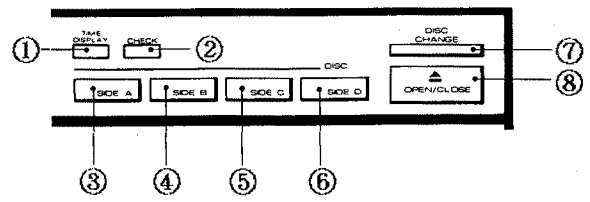
7.2. ABOUT THE MANUAL MODE

(1) How to activate the Manual Mode
With both Carry 1 and Carry 2 inside the unit, open the front door. Then, while pressing the Carry 1 OUT SW 8.2 Adjustment preparations and precautions, refer to Fig. 7) and the carry PLAY SW (inside the rear cover), turn the power ON.
When the Manual Mode is actvated the unit FL will light up as shown below.



(2) Exiting Manual Mode
Power OFF.

(3) Manual Mode functions
In the Manual Mode, the various motors in the player can be activated separately to push the each key on the front panel. The motor is started by pressing the key on the front panel, and is stopped by pressing the key again.



① TIME DISPLAY...Reverse mechanism (upright ↔ reverse position)
② CHECK ..... Clamper (clamp ↔ release)
③ SIDE A ..... Tray 1 (loading direction)
④ SIDE B ..... Tray 1 (eject direction)
⑤ SIDE C ..... Tray 2 (loading direction)
⑥ SIDE D ..... Tray 2 (eject direction)
⑦ DISC CHANGE ..... Gondola (up)
⑧ OPEN/CLOSE ..... Gondola (down)

Note 1: The slider, spindle and tilt motors cannot be activated in the Manual Mode.
Note 2: When activating the reverse mechanism (TIME DISPLAY key) in either upright or reverse positions, make sure that the gondola is in the MID position or lower.
Note 3: When activating either Tray 1 or 2 motors in the eject direction (SIDE B or SIDE D keys), make sure that the gondola is in the OUT position.
Note 4: Note that the PARK position of Carry 1, 2 cannot be set unless the Carry motors are in the loading direction. To set the PARK position after PLAY position has been set, press the eject direction SW (either SIDE B or SIDE D) twice to pass the PARK position and then press the load direction SW once to set PARK position.

LD-W1

8. ADJUSTMENT

8.1. JIGS AND INSTRUMENTS REQUIRED FOR ADJUSTMENTS

- Small screwdriver (about 7cm long axis)
- Small Philips head screwdriver (at least 15cm long axis)
- Hexagonal wrench (2.0mm and 2.5mm)
- 1.5V battery with lead wires
- Low-pass filter (100kΩ + 1μF)
- Dual-trace oscilloscope (with delay)
- AF generator
- Frequency counter
- LD test disc (N or F series)
- LDD test disc (local purchase)
- Shorting clips
- Digital voltmeter

8.2. ADJUSTMENT PREPARATIONS AND PRECAUTIONS

(1) Mechanical adjustments

① Readying player for adjustment
Mechanical adjustments are to be done with the bonnet and the rear panel removed. (Fig. 1.)

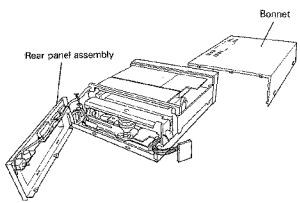


Fig. 1. Player unit with bonnet and rear panel removed

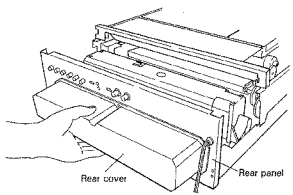


Fig. 2. Temporarily reposition the rear panel.

② How to play the unit with the rear panel removed
There is a PLAY SW in the rear cover. However, because the tray stop position is no longer set when the rear cover is removed, if you attempt to play a disc, the disc clamp will not work. Consequently, if you wish to play a disc with the rear cover removed, you must temporarily put the rear cover back in place and check to make sure that disc clamping is complete before removing the panel once again. (It is not necessary to refasten the screws for the rear panel during this procedure.) (Fig. 2)

③ How to reverse the mechanism assembly
Many of the mechanical adjustments must be performed with the mechanism assembly in reverse position.

Note:
Upright position ... the mechanism assembly is in this mode when disc sides A or C are played.
Reverse position ... the mechanism assembly is in this mode when disc sides B or D are played. (Fig. 3.)

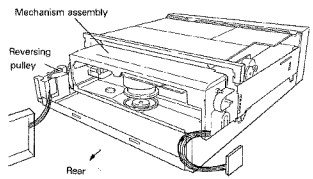


Fig. 3. The mechanism assembly in the reversed mode

To reverse the mechanism assembly when unit power is ON, press the SIDE B key on the front panel.
To reverse rotation of the mechanism assembly when unit power is OFF, turn the mechanism reversing pulley (shown in Fig. 4) with your finger.

④ PREB assembly Pot adjustment
By reversing the mechanism assembly position for the PREB assembly adjustments, the Pot adjustment holes in the mechanism chassis become accessible. (Fig. 5)

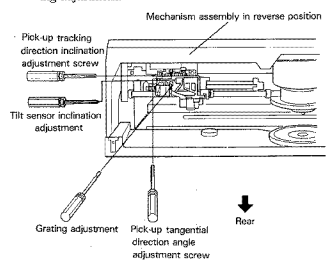
⑤ Proper positioning of the screwdriver when inserting it for adjustments on the pick-up assembly
For grating, pick-up assembly inclination and tilt inclination adjustments, insert the screwdriver for each separate adjustment in the direction shown in Fig. 6.

⑥ Precautions when handling flexible cables
The connections between pick-up assembly and PREB assembly, and between PREB assembly and FTLB assembly are made with flexible cables. Handle the cables with extreme care when detaching or attaching them and guard against electrostatic damage, as well.

⑦ Preventing malfunction of disc and tilt sensors
When playing a disc with the bonnet removed, take care not to expose the disc or tilt sensors to external light sources. If the disc sensor does not sense the presence of a disc in the unit, FL displays [A], [B], [C]. [D] will be extinguished.

⑧ When the light irradiates in the LEDB assembly, the disc will not be read and the mechanism assembly will not rotate anti-clockwise

⑨ Solder the lead wire to 2nd and 3rd pin of CN148 on the PREB assembly before adjustment. It will be easy for Pick-Up Tracking direction inclination adjustment, Pick-Up height adjustment and Fine grating adjustment.



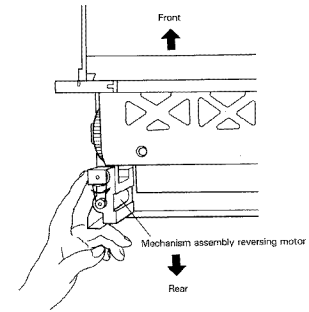


Fig. 4. Turning the reversing pulley with your finger

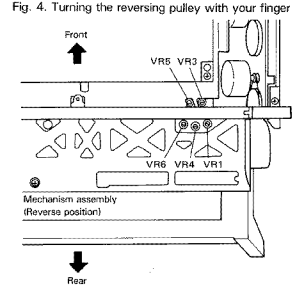


Fig. 5. Pots adjustment screws in the mechanism chassis adjustment

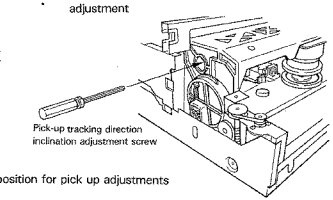


Fig. 6. Screwdriver insertion position for pick up adjustments

⑩ How to open the tracking servo
The tracking servo can be easily opened and closed when the unit is in the Test Mode. (See p.77 for further information on the Test Mode.)

- Activating the Test Mode

1. Check to make sure that the gondola is in its lowest position.
2. Turn power OFF.
3. Open by front door by hand.
4. While holding the Carry 1 OUT SW in the ON position, turn power ON. (Fig. 7)

- Opening the tracking servo in the Test Mode
The tracking servo is opened by pressing the key combination [CX] + [3] on the unit remote control. Pressing [CX] + [3] a second time will close the servo. (Every time the [CX] + [3] combination in Test Mode is pressed, the tracking servo will open or close.)
- Exiting the Test Mode
To exit the Test Mode, either use the remote control unit key combination, [CX] + [9], or turn unit power OFF.

(2) Electrical adjustments
① Electrical adjustments are given in table form on pp. XX and XX. For more details, please refer to the CLD-3030 Service Manual (ARP1559).
② Readying the player for adjustment
The MEMB and 2FSB assemblies can be opened by standing them up as shown in Fig. 8.
Remove locking screws and plastic rivets for the FTLB assembly in order to make adjustments on the parts side.
③ Heat sinking plates for IC
VSOP assembly IC401 (PA5010) and IC405 (TL8707P) are equipped with heat sinking plates. Take care not to allow the shield wire to touch the heat sinking plates while shield stying.
④ The Pots of the BRGB assembly
There are two VRs on the BRGB assembly, however these do not require any adjustments during servicing and should not be touched.

(3) Others
① The LD test disc for these adjustments may either be the N or F series. The frame numbers given in the text are N series numbers while those enclosed in parentheses are F series numbers.
② Unless specified otherwise, all oscilloscope settings shown in the connection diagrams are values obtained by using a 10:1 probe.

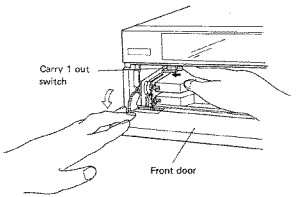


Fig. 7. Activating the Test Mode

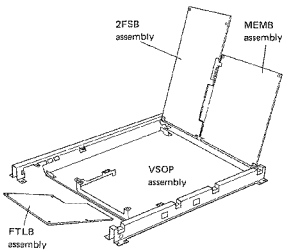


Fig. 8. Circuit boards for electrical adjustment

8.3 MECHANISM ADJUSTMENT

1. Adjustment of the Mechanism Position Detector Switch

1. The switches which require position adjustment are: The out switch and park switch for carries 1 and 2. (total 4 switches)
The TOP switch and the MID switch for the gondola. (total 2) (See page 4)
2. Checking the mount position

- The park position detector switches of carries 1 and 2
Open the front door by hand and make sure that the gap between the front edge of the gondola cover (L) and the front edges of carries 1 and 2 are within 3 to 6 mm. (Fig. 1)

- The TOP and MID positions detector switches for the gondola
An approx. 5 mm diameter hole is embedded in the rack gear. Check that this hole comes approximately to the center of the notch on the loading base by observing the hole from the notch position when the gondola is positioned at the TOP and MID positions.

3. Preparations for the adjustment of the switch position (Refer to Section 6 "Disassembly" on page 72.)
   1. Remove the bonnet.
   2. Open the front panel.
   3. Detach the SYPS assembly connectors and remove the PCB stand assembly.
   4. Remove the SYPS assembly. Set it upside down, then connect the connector (which was removed in step 3.) At this time, the GNDB assembly connector must also be connected.
   5. Connect the connector from the front panel. (The connector for the door switch doesn't need to be connected).
   Connect the LOMB assembly (CN32) and FTLB assembly (CN122) using the extension cord(GGF-175).

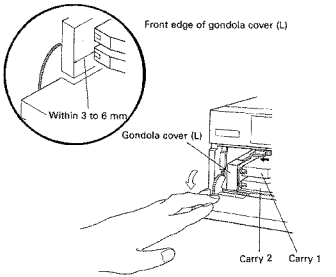


Fig. 1

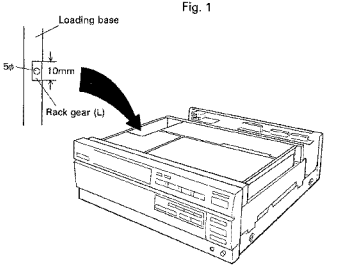


Fig. 2

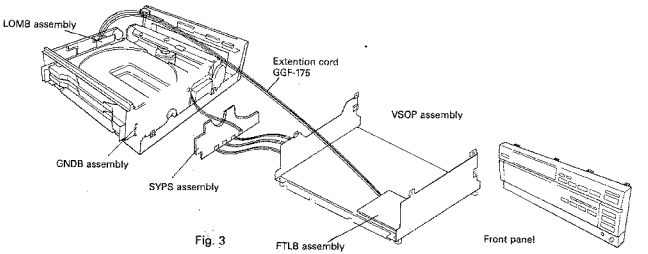
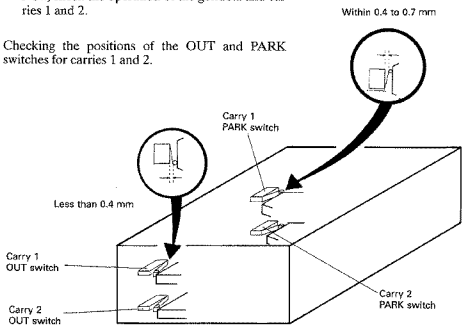


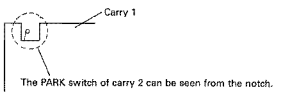
Fig. 3

6. Push the PLAY switch for carry 1 and carry 2 inside of the rear cover and OUT switch for carry 1, then turn the power switch to ON and set the unit for the manual mode. (See page 79)
Now, check the operation of the gondola and carries 1 and 2.

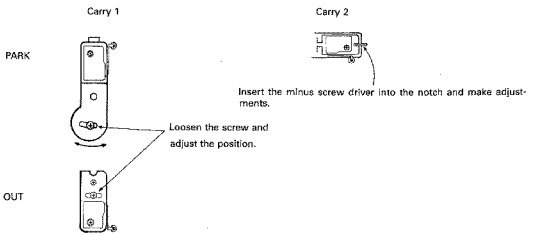
- Checking the positions of the OUT and PARK switches for carries 1 and 2.



- Carry 2



When the above conditions are not satisfied, adjust the position for each switch.

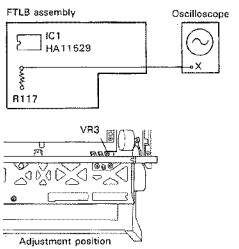


2. ROUGH GRATING AND TRACKING (TRKG) BALANCE ADJUSTMENTS 8.3 Mechanical Adjustment

- Purpose: To adjust the laser beam (divided into 3 beams by grating) to the optimal position on the playback tracks.
- When not properly adjusted: Disc playback will be impossible. Improper tracking (jumping, skipping, etc.)

• Measuring instruments and jigs	• Small screw driver • Oscilloscope
• Measuring position	• FTLB assembly R117 (TRKG error)
• Test disc and player mode	• LD test disc #16,000 (#15,000)
• Adjustment position	• Grating • PREB assembly VR3 (TRKG balance)

Connection diagrams



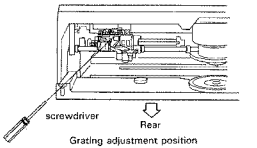



Photo 1. On-track position

Photo 2. Maximum amplitude a = a'

Adjustment Procedure

<Rough Grating Adjustment>

1. Put the mechanism assembly into reverse position.
2. Play an LD test disc.
3. Press the DISPLAY key to display the frame # on the TV screen.
4. Move the pick-up to frame #16,000 (#15,000) by scanning or searching.
5. Open the TRKG servo (See p. 81)
6. Connect the oscilloscope to R117 of the FTLB assembly and observe the waveform.
7. Insert a small screwdriver into the grating adjustment hole. Turning the grating will allow you to vary the amplitude of the TRKG error waveform. Find the position where waveform amplitude reaches a minimum with a smooth waveform envelope. (Photo 1.) (This condition indicates that the 3-way split laser beams are directed onto a play back track. This is called the "on-track" postiion.)
8. Slowly turn the grating counterclockwise from the on-track position until the waveform amplitude reaches a maximum. (Photo 2.)
9. Close the TRKG servo and check to make sure that a normal picture is being displayed on the TV screen.

<TRKG Balance Adjustment>

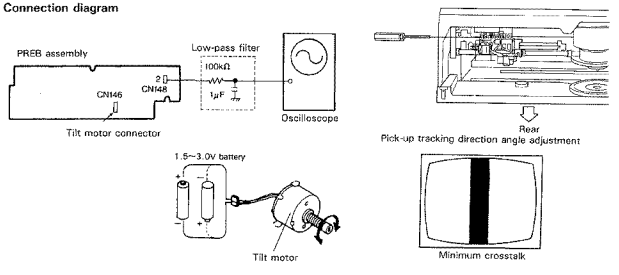
1. Align the oscilloscope GND with the center of the oscilloscope screen.
2. Adjust VR3 on the PREB assembly to the position where the positive and negative amplitude of the TRKG error waveform are equal. (Photo 2.)

3. PICK-UP TRACKING DIRECTION INCLINATION ADJUSTMENT

- Purpose: After adjusting slider shaft inclination so that the pick-up assembly moves parallel to the disc surface, adjust the pick-up tracking direction angle so that the laser beam is projected perpendicularly at the disc.
- When not properly adjusted: Crosstalk will be generated.

• Measuring instruments and jigs	• Oscilloscope • Battery with lead wires • Low-pass filter • 2.5mm hexagonal wrench
• Measuring position	• PREB assembly CN148-2 (FOCS return)
• Test disc and player mode	• LD test disc #4760 (#4760), #46,135 (#42,314), #115 (#104) • With PREB assembly CN146 (tilt motor) removed
• Adjustment position	• Mechanism assembly upright position → reverse position • Adjust slider shaft angle with tilt motor • Pick-up tracking direction angle adjustment screw

Connection diagram



Adjustment procedure

Note: Video memory must be OFF.

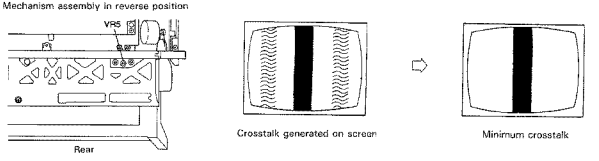
1. Stop disc rotation and put the assembly into the upright position.
2. Disconnect CN146 (tilt motor) of the PREB assembly and do not reconnect it until the "Tilt Sensor Angle Adjustment" has been completed.
3. Put the mechanism assembly into reverse position.
4. Play an LD test disc. Search to frame #4,760 (#4,760) where the tilt fulcrum is located.
5. Connect the oscilloscope to CN148-2 of the PREB assembly via a low-pass filter and observe the focus drive voltage.
6. Adjust the Y axis position adjustment knob on the oscilloscope to position the focus drive voltage waveform in the center of the oscilloscope screen.
7. If the focus drive voltage measured when searching for frame #46,135 (#42,314) differs from that obtained in step five above, connect a 1.5 to 3V battery to the tilt motor connector (CN146) and turn the motor until focus return voltage is within 10mV of the voltage in step 5.
8. Search to frame #115 (#104).
9. Adjust the pick-up tracking direction angle adjustment screw so that crosstalk on the left and right sides of the TV screen is reduced to a minimum.

4. LD FOCUS ERROR BALANCE ADJUSTMENT

- Purpose: To ensure that the FOCS servo maintains the objective lens at the optimum distance from the disc surface.
- When not properly adjusted: Crosstalk will be generated.

• Measuring instruments and jigs	• TV monitor
• Measuring position	• Video signal output terminal
• Test disc and player mode	• LD test disc #115 (#104)
• Adjustment position	• Mechanism assembly in reverse position • VR5 of PREB assembly

Connection diagram



Adjustment Procedure

Note: Video memory must be OFF.

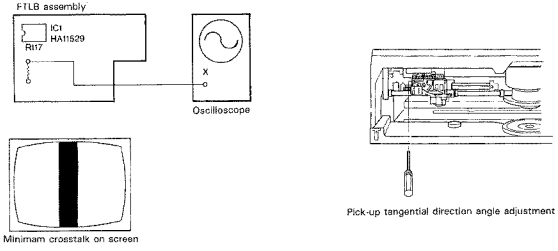
1. Put the mechanism assembly into reverse position.
2. Play an LD test disc and search to frame #115 (#104).
3. Adjust VR5 of the PREB assembly so that crosstalk is minimized on the left and right sides of the TV screen, and is about equal on both sides. If adjustment of VR5 fails to reduce crosstalk to allowable levels, perform the "Pick-up Tangential Direction Angle Adjustment".

5. PICK-UP TANGENTIAL DIRECTION ANGLE ADJUSTMENT

- Purpose: To adjust the pick-up tangential direction angle in order to minimize crosstalk.
- If not properly adjusted: Conspicuous crosstalk.

• Measuring instruments and jigs	• TV monitor
• Measuring position	• Crosstalk on screen
• Test disc and player mode	• LD test disc #22,855 (#18,914), #115 (#104)
• Adjustment position	• Test Mode (TRKG servo: open/close) • Mechanism assembly in reverse position • Pick-up tangential direction angle adjustment screw

Connection diagram



Adjustment Procedure

Note: This adjustment is only necessary if crosstalk remains conspicuous even after completing "Pick-up Tracking Direction Inclination Adjustment" and "LD FOCS Error Balance Adjustment".
Video memory must be OFF.

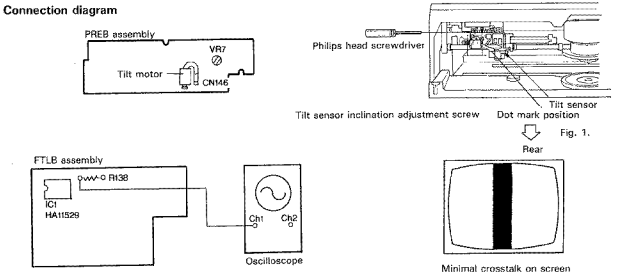
1. Put the mechanism assembly into reverse position.
2. Play an LD test disc and search to frame #22,855 (#18,914).
3. Insert a hexagonal wrench to the pick-up tangential direction angle adjustment screw.
4. Adjust the pick-up tangential direction angle adjustment screw to minimize crosstalk on the TV screen.
5. Search to frame #115 (#104) and check to make sure that crosstalk on the TV screen is at a minimum.

6. TILT SENSOR INCLINATION ADJUSTMENT

- Purpose: To adjust tilt sensor inclination so that TILT servo offset voltage is 0V.
  Adjust the tilt servo loop gain VR.
- When not properly adjusted: Crosstalk is generated.

• Measuring instruments and jigs	• Oscilloscope • Philips head screwdriver
• Measuring position	• FTLB assembly R138 (IC1, Pin 21 side) (Tilt error)
• Test disc and player mode	• LD test disc #4,760 (#4,760) • TRKG servo: closed
• Adjustment position	• Mechanism assembly upright → reverse position • Tilt sensor inclination adjustment screw • PREB assembly VR7 (tilt gain)

Connection diagram



Adjustment Procedure

Note: Video memory must be OFF.

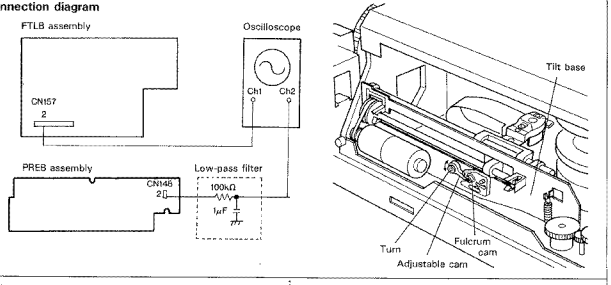
1. Put the mechanism assembly into upright position
2. Check to see the color of the dot mark located on the flexible cable for the tilt sensor. (Fig. 1.)
   There are three types of dots. Adjust VR7 on the PREB assembly according to the color as indicated below:
   Red dot ..... Turn VR7 fully clockwise.
   Blue dot ..... Turn VR7 fully counterclockwise.
   No dot (no mark) ... Adjust VR7 to center position.
3. Put the mechanical assembly into reverse position.
4. Play an LD test disc and search to frame #4,760.
5. Connect the oscilloscope to R138 of the FTLB assembly and observe the DC voltage of the tilt error.
6. Adjust the tilt sensor inclination adjustment screw until the DC voltage of the tilt error is 0V. (See Fig. 1.)
   When making this adjustment, it does not matter if the pick-up is displaced slightly from its designated position by the screwdriver.
7. Put the mechanical assembly into the upright position and reconnect PREB assembly CN146 (tilt motor connector) that was disconnected during the "Pick-up Tracking Direction Inclination Adjustment".
8. Search to frame #115 (#104) and check to make sure that crosstalk on the left and right sides of the TV screen has been minimized and that it is about equal on each side.

7. PICK-UP ASSEMBLY HEIGHT CHECK

- Purpose: To insure that FOCS servo tracking range is correct.
- When not adjusted properly: The lens may hit the disc.
  It is impossible to play a warped disc.

• Measuring instruments and jigs	• Oscilloscope • Hexagonal wrench • Screwdriver • Low-pass filter
• Measuring position	• PREB assembly CN148-2 (FOCS drive voltage), FTLB assembly CN157-2 (FOCS drive GND)
• Test disc and player mode	• LD test disc #4,760 (#4,760), in STILL mode at tilt fulcrum
• Adjustment position	• Mechanism assembly in upright position • Fulcrum cam position

Connection diagram



Adjustment Procedure

1. Put the mechanism assembly into upright position. Connect the CN157-2 FTLB assembly (ground for FOCS return) to oscilloscope CH-1, and connect CN148-2 of the PREB assembly via a low-pass filter to CH-2.
2. Put LD test disc, frame #4,760, into STILL mode.
3. Observe the voltage of FTLB assembly CN157-2 (ground for FOCS drive) and PREB assembly CN148-2 (FOCS drive) with the oscilloscope.
4. Check that FOCS drive voltage is −100mV ±20mV with respect to the ground voltage for FOCS drive. If FOCS drive voltage is not −100mV ±20mV, perform the pick-up assembly height adjustment as described in the procedure below.

<Pick-up Assembly Height Adjustment>

1. Search LD test disc, frame #4,760 (#4,760) into STILL mode.
2. Loosen the hexagonal screw on the fulcrum cam and turn the adjustable cam with a screwdriver until drive voltage is −100mV ±20mV with respect to the ground for FOCS drive.
3. After making this adjustment, search frame #115 (#104) into STILL mode and check to make sure that crosstalk on the TV screen has been minimized. If there is still considerable crosstalk, perform the "Pick-up Tracking Direction Inclination Adjustment" again.

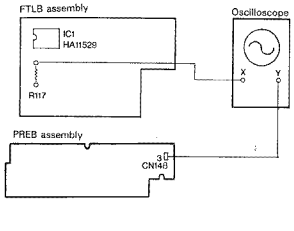
LD-W1

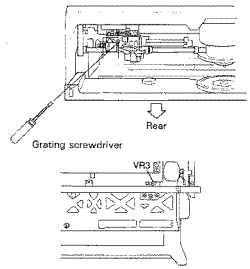
8. FINE GRATING ADJUSTMENT AND TRKG BALANCE ADJUSTMENT CHECK

- Purpose: To finely adjust the grating so that the two tracking beams for the TRKG servo are projected to the optimum positions on the play back drive.
  Adjust the offset voltage of the TRKG servo loop to 0V.
- To adjust the TRKG servo loop offset voltage to 0V.
- When not properly adjusted: Improper tracking (skip, jump, etc.)

• Measuring instruments and jigs	• Oscilloscope • Screwdriver
• Measuring position	• FTLB assembly R117 (TRKG error), PREB assembly CN148-3 (TRKG SUM)
• Test disc and player mode	• LD test disc #16,000 (#15,000) • Test Mode (TRKG servo: open)
• Adjustment position	• Mechanism assembly in reverse position • Grating • PREB assembly VR3

Connection diagram





Adjustment Procedure

1. Put the mechanism assembly into reverse position.
2. Play an LD test disc. After searching to frame #16,000 (#15,000), open the TRKG servo.
3. Connect the oscilloscope X input (CH-1) to R117 of the FTLB assembly, and the Y input (CH-2) to CN148-3 of the PREB assembly.
   Switch the oscilloscope to X-Y mode, and observe the Lissajous figures of the TRKG error and TRKG sum signals.
4. Insert a small screwdriver to the grating and fine adjust the grating until the amplitude along the Y axis of the TRKG Error signal become a minimum. (Photo 3.)
   If the grating is turned too far and the optimum position can no longer be found, repeat the "Rough Grating Adjustment."
5. Using oscilloscope X input (CH-1), check to make sure that the positive and negative amplitude of the TRKG error signal are equal. (Photo 4.) If they are not, repeat the "Tracking Balance Adjustment".
6. Close the TRKG servo and check to make sure that the image on the TV screen is normal.

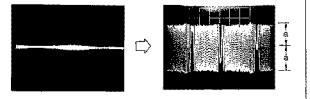


Photo 3. Photo 4.

7.4. PREB ASSEMBLY ADJUSTMENTS

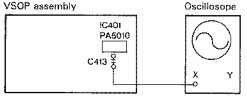
1. RF GAIN ADJUSTMENT

8.4 PREB Assembly Adjustment

- Purpose: Purpose: To adjust the RF signal amplitude to the optimum value.
- When not properly adjusted: Frequent dropouts.

• Measuring instruments and jigs	• Oscilloscope
• Measuring position	• PREB assembly, VSOP assembly (VDEM, ADEM) C413
• Test disc and player mode	• LD test disc #16,000 (#15,000) • TRKG servo: closed
• Adjustment position	• Mechanism assembly in reverse position • PREB assembly (RF gain)

Connection diagram



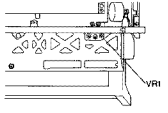


Photo 5. RF signal

Adjustment Procedure

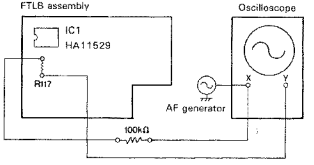
1. Put the mechanism assembly into reverse position
2. Play on LD test disc and search to frame #16,000 (#15,000).
3. Connect the oscilloscope to the lead of VSOP assembly C413 and observe the RF signal.
4. Adjust PREB assembly VR1 to obtain an RF signal amplitude of 300mV ±50mV. (Photo 5.)

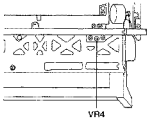
2. TRKG SERVO LOOP GAIN ADJUSTMENT

- Purpose: To adjust TRKG servo loop gain to the optimum value.
- When not adjusted properly: Poor playback performance

• Measuring instruments and jigs	• Oscilloscope • Resistor (100kΩ) • AF generator
• Measuring position	• Both pins of R117 on the FTLB assembly
• Test disc and player mode	• LD test disc #16,000 (#15,000) • TRKG servo: closed
• Adjustment position	• PREB assembly VR4

Connection diagram





Adjustment Procedure

1. Put the mechanism assembly into reverse postion.
2. Play an LD test disc and search to frame #16,000 (#15,000).
3. Connect resistor, AF generator and oscilloscope to R117 on the FTLB assembly as shown in the diagram.
4. Set AF generator output to 3kHz/16Vp-p.
5. Switch the oscilloscope to the X-Y mode and observe the Lissajous figures.
6. Adjust VR4 on the PREB assembly so that Lissajous figures symmetrical on both the X- and Y-axes of the oscilloscope. (Photo 7.)

Note: If the AF generator output does not exceed 16Vp-p, decrease the value of the resistor (100kΩ) in the above diagram, until the Lissajous figures become easily discernible. (33kΩ limit.)

Photo 6. Adjustment not complete

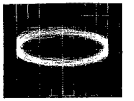


Photo 7. Properly adjusted

11. PANEL FACILITIES

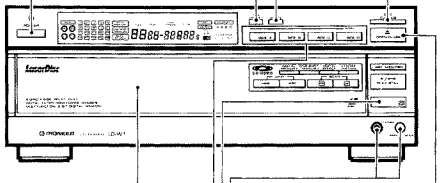
[PLAYER FRONT PANEL]

TIME DISPLAY button
This is used to change the indication, the on-screen display and the indicator display.
Pressing the button once will get the on-screen display. Each time the button is pressed, the indicator will switch to the next display.
With discs which do not feature a table of contents (TOC), this serves as the ON/OFF button for the monitor display. (Refer to the 'INDICATORS'.)

Program check button (CHECK)
Press this button to check the program contents of each disc side (A to D). Each time it is pressed, the program display will change from A → B → C → D.

DISC CHANGE button
Select either the upper or lower disc table for unloading. When a disc table is open, the disc can be changed. When this button is pressed, the open disc table will withdraw and the other disc table will open. Pressing this button will repeat this operation.

POWER button



DOOR
When power is switched on, and OPEN/CLOSE button is pressed, the door opens downward, and at the same time, the disc table is expelled outward.

OPEN/CLOSE (⏏) button
This button is used to open and close the disc table. Setting a disc on the disc table then pressing this button retracts the disc table into the player and begins play of the disc. Pressing this button during play stops play and extends the table from the player.

Disc side button (SIDE A, B, C, D)
Select the disc side to be played.
- SIDE A: The top side of the disc inserted in the upper disc table.
- SIDE B: The opposite side of Side A.
- SIDE C: The top side of the disc inserted in the lower disc table.
- SIDE D: The opposite side of Side C.

PHONES (headphones) jack
When you wish to use headphones, insert the plug for the headphones into the headphone jack.

PHONES LEVEL control knob
Use to adjust the level of sound when using headphones. Turning the knob to the right increases the sound level.

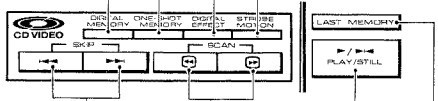
REMOTE SENSOR window

ONE-SHOT MEMORY button
When pressed during playback, that picture will be stored in memory. After playback ends, the picture stored in memory will be displayed. Even when discs are changed, the picture will remain on the TV screen. To view another disc, press the button again to clear the stored picture. If it is not cancelled, the stored picture will remain on the screen while only the audio of the inserted disc is played. You can select any picture to display on the TV screen and enjoy background video.

DIGITAL MEMORY button
During normal or still picture playback of a standard disc, either the picture stored in digital memory or the current picture can be selected.

DIGITAL EFFECT button
Playback with a checkered effect is obtained. By pressing the button, the checkered effect can be changed to be 4 x 4, 8 x 8, 16 x 16, or 256 x 1. Use the remote control unit's + and – keys to obtain specialized video effects.

STROBE MOTION button
Press to obtain the strobe motion effect. Use the remote control unit's + or – key to adjust the strobe motion speed.



SKIP (⏮, ⏭) buttons
- When a LaserVision Disc is played, these buttons are used to go to the beginning of a chapter.
- During program input of programmed playback, by using the CHAPTER SKIP ⏮ or ⏭ (also used as PGM CORRECT key) key, the contents of a program already input can be altered.

LAST MEMORY button

SCAN buttons
If one of these buttons is pressed during playback, the video image will be speeded up only while the button is pressed down.
⏩ — For fast forward scan
⏪ — For fast reverse scan
There are two scanning speeds. The scanning speed will be slower in the beginning when the button is pressed. However, when the button is held down long enough, scanning speed will increase.

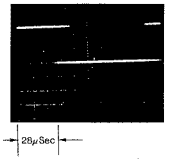
PLAY/STILL button
- When pressed with a disc set on the disc table, the disc table will close and playback will begin.
- When pressed while in stop mode, playback will begin.
- Press when a chapter program is to be started.

When pressed during a playback mode other than normal, the player will return to normal playback mode. When pressed while in normal playback mode, the player will enter still picture mode.

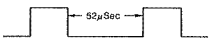
7.5 ELECTRICAL ADJUSTMENTS

Note: For details on electrical adjustments refer to the CLD-3030 Service Manual.

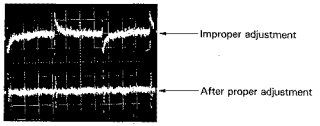
	Assembly Adjustment Name	Adjustment Position	Measurement Position	Adjustment Summary	Unit Mode During Adjustment	Oscilloscope	Comments (Symptoms indicating need for adjustment)
	VSOP Assembly						
1	REF shift	VR101	• IC101 (PD9003) Pin 18	Adjust until pulse waveform HIGH interval is 28μSec. (Waveform 1.)	Power ON only (PLAY is not necessary)	0.2V/Div 10μS/Div DC input	Spindle lock will not be completed.
2	PLL offset	VR102	• IC103 (NJM4558D) Pin 1	Adjust to obtain 0V offset voltage.	Play an LD test disc	0.2mV/Div 5mS/Div DC input	Screen disturbances (uneven color)
3	Half H rejection	VR103	• IC103 (PD9003) Pin 17	Adjust until pulse waveform LOW interval is 52μSec. (Waveform 2.)	Play an LD test disc.	0.2mV/Div 10μS/Div DC input	Non-functioning spindle lock causes screen disturbances
4	TRAPE inclination	VR104	• IC102 (PA5009) Pin 26	Adjust until VPS error waveform is flat (Waveform 3)	Digital memory OFF. Play an LD test disc or CAV disc, and set in the still mode.	0.2V/Div 10mS/Div DC input	Screen flicker when the CAV disc is in THROUGH or STILL modes. Displacement of memory screen position.
5	Burst gate timing	VR105	• X: Q415 emitter • X: IC102 (PA5009) Y: Pin 22	Adjust to delay the trailing edge of the MMV signal for 1μSec in relation to the leading edge of the video signal (Waveform 4)	Play an LD test disc. Expand the area of the burst waveform where the delay is employed.	X: 20mV/Div Y: 0.2V/Div 1μS/Div	Poor or inconsistent color reproduction. Conspicuous lines on screen.
6	14.31818MHz	VC1	• IC2 (PD0031) Pin 3	Adjust reference clock frequency to 14.31818 MHz.	Power ON only (PLAY is not necessary). However, to check that adjustment is OK, play an LD test disc.		Uneven color. Spindle servo will not lock.
7	1H delay video level	VR401	• X: IC401 (PA5010) Pin 42 • Y: same IC Pin 40	Adjust to obtain equal amplitudes for the 1H delay video signal and the main video signal. (Waveform 5.)	Play an LD test disc and search to frame #19801.	X: 50mV/Div DC input Y: 50mV/Div DC input 10μS/Div	If 1H level is too high: White dropouts become noticeable with H displacement (horizontal lines in the screen). If 1H level is too low: black dropouts become noticeable.
8	VCO central frequency	VR402	• X: Q413 emitter • Y: Q412 emitter	Adjust so that the time axis error-compensated video signal is delayed for 1H + 7.2μSec in relation to the uncompensated video signal. (Waveform 6)	Play an LD test disc and search to frame #19801.		Color lock operation becomes problematic. Color lock after search is slow.
9	Output video level adjustment	VR403	• Video output terminal	Adjust the playback video signal waveform amplitude to 0.71Vp-p. (Waveform 7)	There is 75Ω of impedance at the player video output terminal where it is connected to the TV monitor. Play frame #19801 of the LD test disc.		Data cannot be read and play will begin at random points on the disc. The screen is either too bright or too dark.
10	Hue error signal level	VR406	• TV monitor	Minimize unevenness in the magenta color	Play LD test disc frame #7201, (#6301).		A great deal of color unevenness
11	Detector level	VR405	• IC403 (NJM2903M) Pin 7 • same IC Pin 6	Adjust the voltage of Pin 6 until it is +330mV in relation to the voltage of Pin 7.	Play LD test disc frame #4801 (#5401). Measure voltage with a digital voltmeter.		Spindle servo lock will not be completed and there will be screen disturbances.
	MEMB Assembly						
1	VCXO	VC1	• IC4 (TC74HCU04P) IC Pin 12	Adjust voltage of Pin 12 to 2.5V ± 0.2V	Power ON (PLAY is not necessary)		Screen H level will be displaced.
2	Sync level	VR102	On VSOP assembly • CN41-1 (MEMV) • CN41-3 (TBCV)	Adjust the H-sync amplitude so that it is the same for both the video signal input to digital memory and the video signal output from digital memory.	Play LD test disc frame #4801 (#5401). Switch the digital memory button on the front panel to ON.		The memory video playback screen will be shifted out of position.
3	Memory video level	VR101	On VSOP assembly • CN41-1 (MEMV) • CN41-3 (TBCV)	Adjust the amplitude of the luminance signal to the same level in the video signal input to digital memory and the video signal output from digital memory.	Play LD test disc frame #3800 (#1000).		Screen brightness will vary between normal playback and digital memory ON modes.
4	MMV	VR1	• TV monitor	Compare images on screen which have passed through digital memory with those in normal playback. Then, adjust to minimize any left/right image blurring which may be occurring.	Play LD test disc frame #3900 or #1000. While viewing the TV monitor, switch the digital memory OFF/ON to see if there is any left/right blurring in the image. Adjust to minimize blurring.		There will be left/right image blurring when digital memory is ON.
5	140nS shift level	VC101	• IC5 (TL089CP) Pin 7 • same IC Pin 1	Adjust so that the two bright spots in the Lissajous figures are aligned on top of each other. (Waveforms 8, 9.)	Play LD test disc frame #7201 (#6301). Switch the oscilloscope to the X-Y mode and observe the Lissajous figures	X: 50mV/Div DC input Y: 50mV/Div DC input	
6	140nS level	VR103	VSOP assembly • CN41-1	Minimize vertical fluctuations in the chroma signal.	Play LD test disc frame #7201 (#6301). Observe the magenta image on the TV screen and adjust until there is no flicker.		Flicker in the TV screen
	2FSB Assembly						
1	PLL free run	VL101	• IC102 (NJM082D) Pin 1	Adjust the DC voltage of the VCO control signal to 150mV ±100mV.	Play any frame on an LDD disc. Measure voltage with a digital voltmeter.		There will be no sound or sound may be interrupted.
2	VCXO offset	VR102	• J170 (MDP)	Observe the waveform in the oscilloscope. Adjust the width of positive pulse and negative pulse is minimized and the waveform is continuous. (Waveform 10)	Play any frame of an LDD disc.	0.2V/Div 0.2mS/Div	Digital sound output will be interrupted during LDD play (periodic noise).



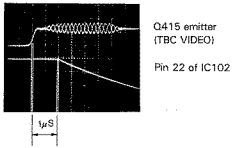
Waveform 1.



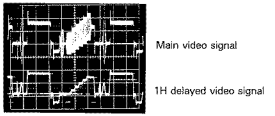
Waveform 2.



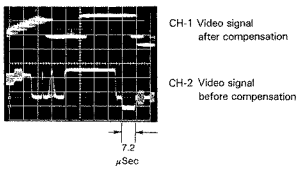
Waveform 3.



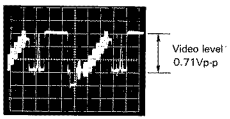
Waveform 4.



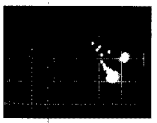
Waveform 5.



Waveform 6.

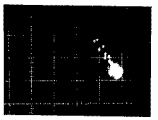


Waveform 7.



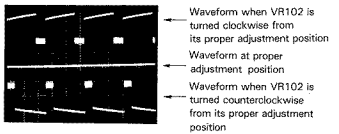
Improperly adjusted

Waveform 8.



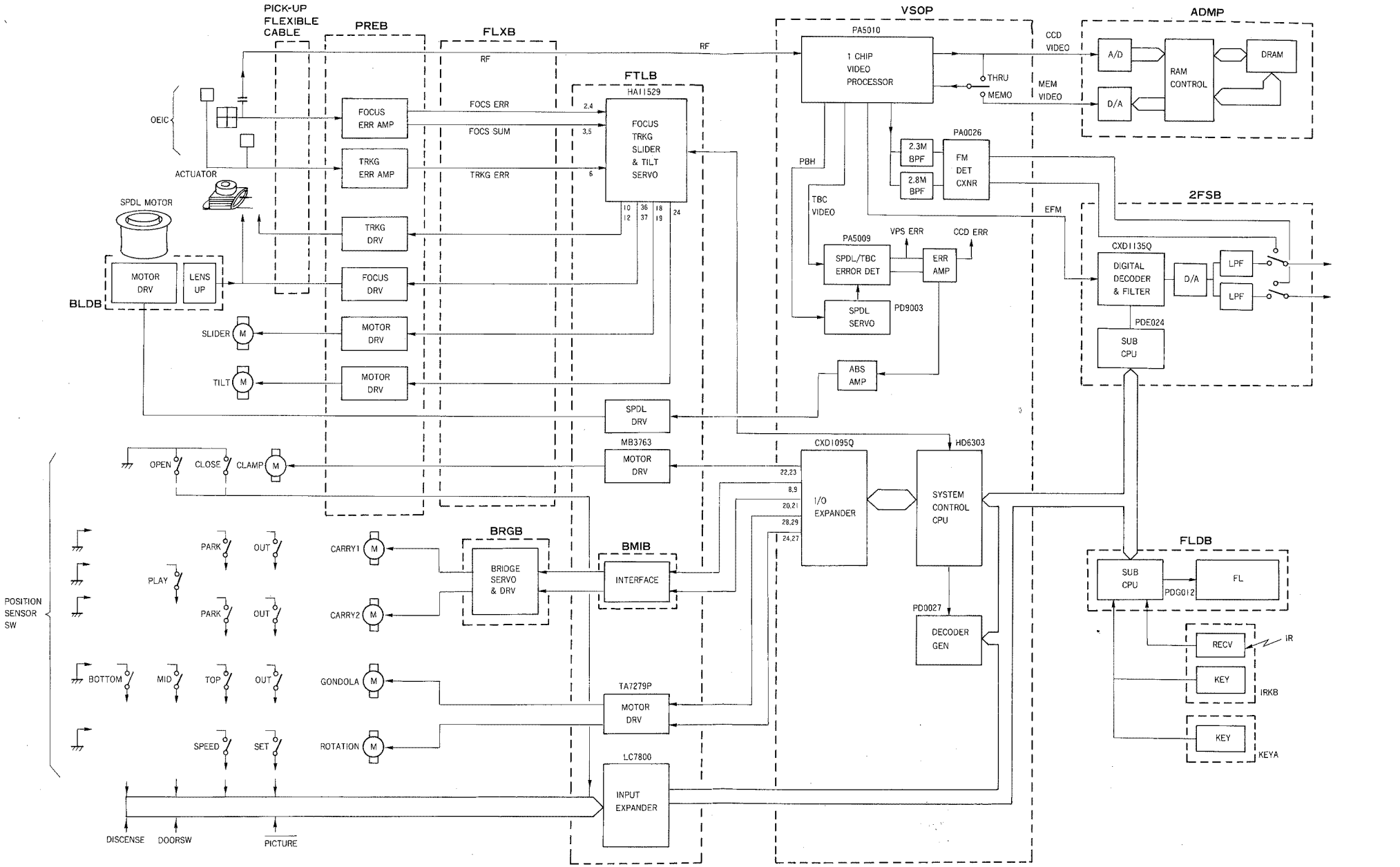
After proper adjustment

Waveform 9.



Waveform 10.

9. BLOCKDIAGRAM



10. MECHANISM DESCRIPTION

10.1 SUMMARY OF MECHANICAL OPERATIONS

In the LD-W1, a single pick-up handles the playback of sides A and B for two discs (total of 4 sides). To accomplish this requires separate motors and position detection switches for each mechanical operation up to clamping.

The table below compares the mechanical operations of the LD-W1 with those of the auto disc changer and tabulates the motors and position detection switches in the different units.

Operation/device name	LC-V12	LC-V30	LD-W1
Disc selection	Vertical arm operation	Vertical operation of VH base	Vertical operation of gondola (Carry 1, 2)
Disc retraction	Horizontal arm operation	Horizontal operation of tray	Horizontal operation of tray
Disc clamp	Clamper opening/closing operation	PU base opening/closing operation	Closing/opening operation of clampre
Disc A/B side changer	Arm reversing operation	Special mechanism assembly for A/B sides + Change motor	Reversing operation of mechanism assembly

Table 1. Comparison of LD-W1 and auto disc changer mechanical operations

To accomplish all the operations cited above, 5 sets of special motors and position detection switches are required.

Name of motor	Motor operation	Position detection switch	
		Posiiton	No. of switches
Tray 1	Horizontal operation (ssides A/B) of Carry 1	OUT, PARK PLAY (*)	3
Carry 2	Horizontal operation (sides C/D) of Carry 2	OUT, PARK, PLAY (*)	3
Gondola	Vertical operation of Carry 1, 2 operation of mechanism assmbly	OUT, TOP, MID, BOTTOM	4
Clamper	Opening/closing operation of clamper arm	CLAMP, CLAMP RELEASE	2
Rotation	Reverse operation of mechanism assembly	SET, SPEED	2

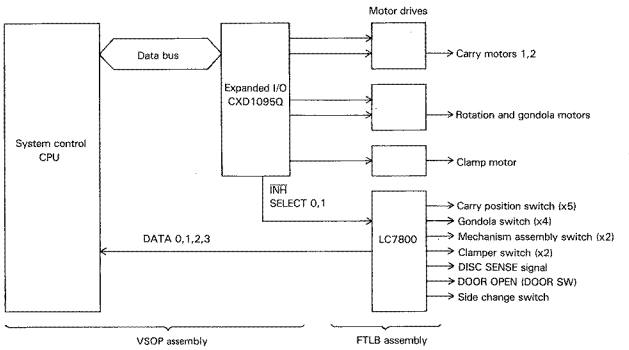
Table 2. Motors and position detection switches in the LD-W1.

All the motors are controlled by the system microprocessor CPU through the drive IC and IC 7 CXD1095Q (expanded I/O) of the VSOP assembly (TBC, CONT).

The necessary switch information for the position detection switches is selected at the input expansion IC (LC7800) according to the input modes shown below and input to the system microprocessor CPU.

SELECT 0 SELECT 1	0 0	1 0	0 1	1 1
Selection of data A-D (LM7800)	A ($A_0 - A_3$)	B ($B_0 - B_3$)	C ($C_0 - C_3$)	D ($D_0 - C_3$)

10.2 BLOCK DIAGRAM OF MECHANICAL OPERATIONS



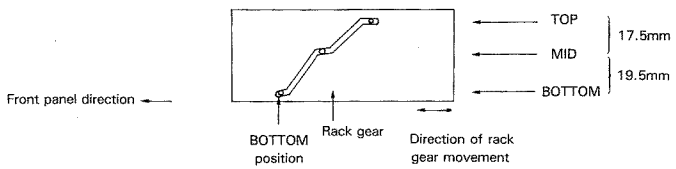
There are a total of 13 position detection switches (the PLAY switch is shared by both Carry 1 and 2) which are all input to LC7800. In addition, the DISC SENSE signal and door switch mode are also input to LC7800.

These 15 inputs are selected in groups of 3 or 4 and input to the CPU in the form of 2-bit signals generated by the system controller.

Furthermore, the mode of the screen switch in the rear panel during side changing is input to LC7800.

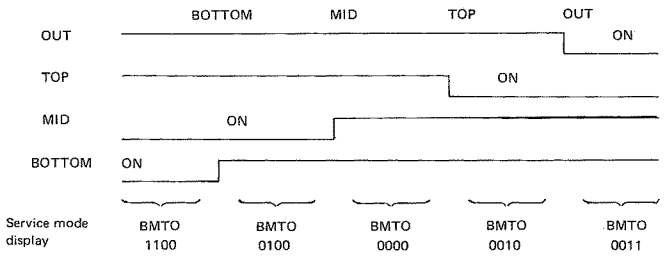
10.3 THE CORRELATION BETWEEN GONDOLA OPERATION AND POSITION DETECTION SWITCHES

Gondola movement is performed by means of a special motor that drives the left/right rack gear and the synchro gear. 4 position detection switches are required for these operations.



As the figure above shows, the operation of the rack gear in the left/right direction corresponds to three height positions of the gondola. In the figure, the movement left of the rack gear from the TOP position allows the front door to be opened. An additional gondola position is the OUT position which brings the number of positions to 4.

<The correlation between the position detection switches and the gondola>
Position Detection Switches



LD-W1

7. Functions

Function that can be operated with remote control unit (CU-LD015)

Functions	Standard Play Disc	Extended Play Disc
PLAY	YES	YES
EJECT	YES	YES
TV/LDP SELECTION	YES	YES
PAUSE	YES	YES
JOG/SHUTTLE OPERATION	YES	YES
SCAN (Forward, Reverse)	YES	YES
AUDIO CHANNEL SELECTION (Stereo, 1/L, 2/R)	YES	YES
AUTO DIGITAL/ANALOG SWITCH	YES(1)	YES(1)
CX SYSTEM ON/OFF	YES(2)	YES(2)
STILL/STEP (Forward, Reverse)	YES	YES
CHAPTER SKIP (Forward, Reverse)	YES(3)	YES(3)
MULTI-SPEED (Forward, Reverse: variable in 9 steps)	YES	YES
MULTI-SPEED DISPLAY	YES	YES
STILL AND SOUND PLAYBACK	YES	YES
STROBE MOTION PLAYBACK	YES	YES
CHAPTER/FRAME NUMBER DISPLAY	YES (3)	NO
CHAPTER/TIME NUMBER DISPLAY	NO	YES (3)
FRAME NUMBER SEARCH	YES	NO
TIME NUMBER SEARCH	NO	YES
CHAPTER NUMBER SEARCH	YES(3)	YES(3)
CHAPTER REPEAT	YES(3)	YES(3)
A–B (INTERVAL) REPEAT	YES	YES
MEMORY REPEAT	YES	YES
ALL REPEAT	YES	YES
ONE-SIDE REPEAT	YES	YES
SIDE REPEAT	YES	YES
PROGRAM PLAYBACK	YES(3)	YES(3)
PROGRAM DISPLAY	YES(3)	YES(3)
PROGRAM REPEAT	YES(3)	YES(3)
PROGRAM CORRECTION	YES(3)	YES(3)
ONE-SHOT MEMORY	YES	YES
DIGITAL EFFECT	YES	YES
TOTAL TRACKS.TOTAL TIME DISPLAY	YES (4)	YES (4)

NOTE:
(1) Can only be used with discs with digital sound.
(2) Valid for analog sound when playing a disc with the CX mark.
(3) Possible for playback of disc on which chapter numbers are recorded.
(4) Functions only during playback with discs featuring a table of contents.

Other Functions

- Automatic picture stop (Functions only for Laser-Vision Discs with a picture stop code recorded on them)

NOTE:
Specifications and design subject to possible modifications without notice, due to improvement.

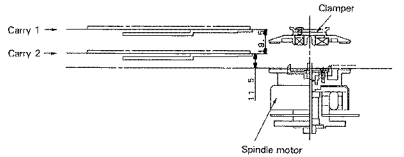
10.4 THE CORRELATION BETWEEN GONDOLA OPERATION AND CARRY HEIGHT

Carry 1 and Carry 2 ride on the base we commonly refer to as the gondola and their vertical positions will change whenever the gondola moves.

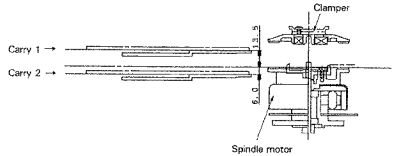
The gondola has four positions as shown below.

OUT... moves horizontally from TOP position, the front door is open

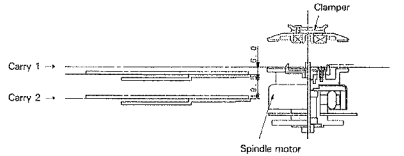
TOP... door is closed



The distance from Carry 1 to Carry 2 is 19.5mm. However, since this drops to 17.5mm at the TOP/MID positions, there is a 2mm height difference with relation to the spindle motor at the TOP position of Carry 2 and the MID position of Carry 1.

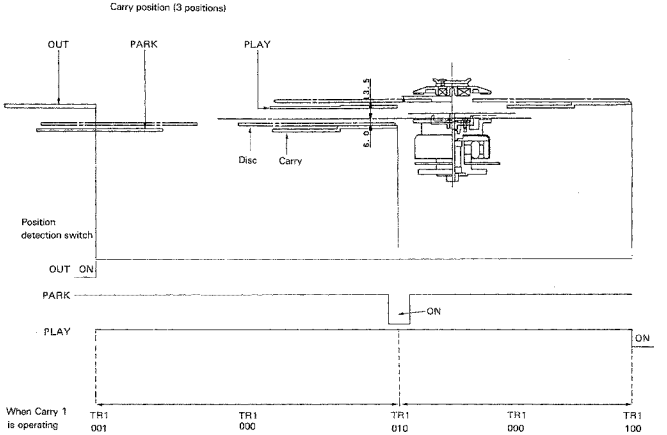


Since the carrys drop 19.5mm at the MID/BOTTOM positions, the MID position of Carry 2 and the BOTTOM position of Carry 1 are the same height with relation to the spindle motor.



This shows the shipping mode.

10.5. CORRELATION BETWEEN CARRY OPERATIONS AND POSITION DETECTION SWITCHES



In this range Carry 1 is operating and Carry 2 is in PARK position. The display shows TR2/10.

When Carry 2 is operating	TR2 01	TR2 00	TR2 10	TR2 00

Carry 2 is operating and Carry 1 is in PARK position. The display shows TR1/010.

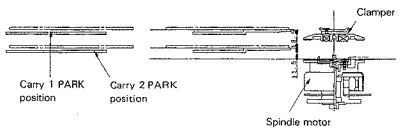
TR1 110

Since the PLAY switch is shared by both Carry 1 and Carry 2, this display is the same for the operations of either carry.

Example: Operation of Side C Play

1. The Side C PLAY button is pressed and the door closed. (Gondola goes from OUT to TOP position.)

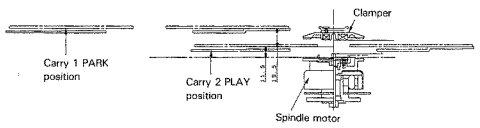
<Screen display in the Service Mode>



Gondola: TOP
Carry 1: PARK
Carry 2: PARK

TR1	TR2
010	10

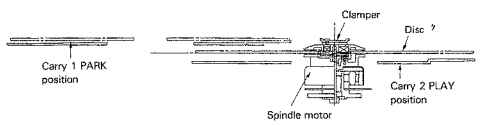
2. The gondola holds its position and Carry 2 goes from PARK to PLAY position.



Gondola: TOP
Carry 1: PARK
Carry 2: PLAY

TR1	TR2
110	00

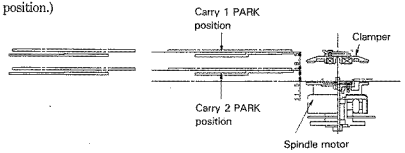
3. The gondola moves from TOP to MID. The clamper then is lowered to clamp position in preparation for PLAY.



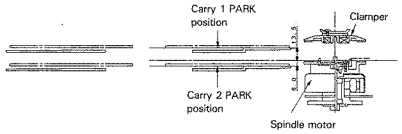
Gondola: MID
Carry:1: PARK
Carry 2: PLAY
Clamp: C

Actual Example: Operation of Side A Play

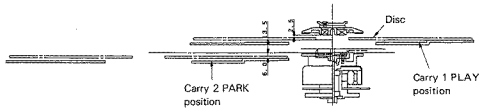
1. When the PLAY button has been pressed and the door closed. (Gondola moves from the OUT to the TOP position.)



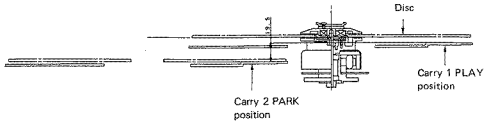
2. The gondola then drops from the TOP to the MID position.

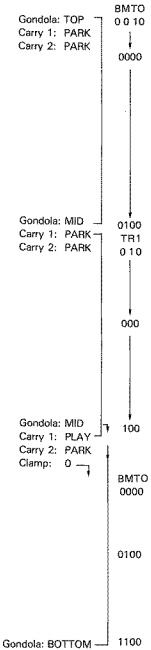


3. Next, Carry 1 moves from the PARK to the PLAY position.



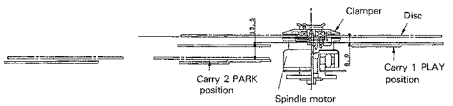
4. The gondola moves from the MID to the BOTTOM position and the clamper is lowered into clamp position. After this, the PLAY operation is the same as that for a normal LD.





Example: From Side A Play to Side D Play

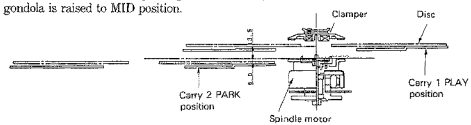
1. During Side A PLAY



Gondola: BOTTOM — BMTO 1100
Carry 1: PLAY
Carry 2: PARK
Clamp: C

0100

2. 0.5 seconds after the clamper begins to be raised, the gondola is raised to MID position.

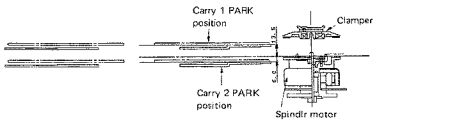


Gondola: MID — 0000 100
Carry 1: PLAY
Carry 2: PARK
Clamp: 0

000

010 *

3. Carry 1 moves from PLAY to PARK position.



Gondola: MID — 000 010
Carry 1: PARK
Carry 2: PARK
P: N

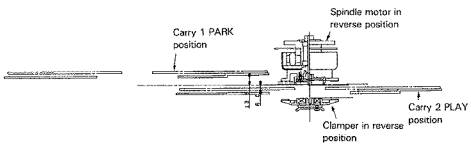
* Under these conditions, to insure that the tray is stopped in the precise PARK position, the unit goes beyond the PARK position and returns.

4. Put the mechanism assembly into reverse position. At the same time the gondola is lowered slightly.

Gondola: MID — 0000 0100
Carry 1: PARK
Carry 2: PARK
P: †

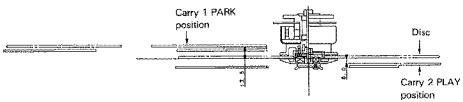
* In terms of gondola position, the gondola has been stopped since the MID switch moved from ON to OFF in step 2. It will drop slightly when the MID switch is moved from OFF to ON.

5. Next, Carry 2 moves from the PARK position to the PLAY position.



Gondola: MID
Carry 1: PARK
Carry 2: PLAY
C: 0

6. The clamper is raised, the disc is clamped in place and play operations can begin.



Gondola: MID
Carry 1: PARK
Carry 2: PLAY
C: 0

Screen display during Side D PLAY

TR1	TR2	BMTO	P	C
1 1 1	0 0	0 1 0 0	I	C

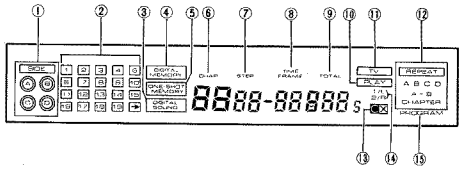
10. 6 GONDOLA AND CARRY MODE TRANSITION CHART

Gondola position	Carry 1 position			Carry 2 position		
	OUT	PARK	PLAY	OUT	PARK	PLAY
OUT	EJECT(1)		X	EJECT (1)		X
TOP	X		X	X		Side C play
MID	X		Side A play	X		During play
BTM	X		During play Side B play	X	X	Side D play X

Note:

1. *Carry 1 and Carry 2 are never in the OUT position at the same time.*
2. *During Side A or Side C play, the tray moves to PLAY position and the gondola to MID position, gondola and disc clamper are lowered simultaneously, and the disc is clamped.*
3. *For Side B or Side D play, the mechanism assembly is reversed while the tray is in the PARK position. Only after the reversing operation is complete does the tray move to the PLAY position.*

INDICATORS



① SIDE : Displays the disc side. The currently-playing disc side is lit with a red circle.

② ①~⑫ (Visual calendar)
: For discs with TOC*, only the recorded chapter numbers will light. For discs without TOC, only the chapter numbers currently playing will light. During programmed play, only the programmed chapter numbers will light. The numbers of chapters finished playing will go out according to the playback sequence.
For 20 and above, ⑫ will light.

③ DIGITAL SOUND
: Lights when a LaserVision disc with digital sound is played. Through the DIGITAL/ANALOG output terminal on the rear panel, digital audio will be output. (When switched to analog, the indicator will go out.)

④ DIGITAL MEMORY
: Lights when the video picture is output via the digital memory circuit.

⑤ ONE-SHOT MEMORY
: Blinks when the ONE-SHOT MEMORY key is pressed. Lights when a picture stored in memory is output when playback ends.

⑥ CHAP. : Displays the chapter number.

⑦ STEP : Displays the program steps during programming.

⑧ TIME FRAME : Displays the frame number (for standard play discs) or the time number (for long play discs).

⑨ TOTAL : Displays the total number of tracks and total playing time of the disc side being played.
● The total number of tracks do not include chapter 0. Also, when a disc without TOC* is played, the TOTAL will not be displayed.

TIME (FRAME)/TOTAL
For discs with TOC*, use the TIME DISPLAY button or the remote control unit's DISPLAY key to switchover between the two functions.

⑩ PLAY : Lights during playback. When it blinks, it indicates standby.

⑪ TV : With a TV set connected to the VHF output terminal on the player's rear panel, the indicator indicates whether a disc is being played or whether the TV is receiving a broadcast.
Indicator off
: Disc playback.
Indicator on
: Reception of TV broadcast.
When the power is turned on, the indicator will be off (disc playback).

⑫ REPEAT : Displays the type of repeat playback currently being executed. Repeat playback is set by the remote control unit's REPEAT A and B keys.
A-B : Indicates A-B repeat playback.
CHAPTER : Indicates chapter repeat playback.
A B C D : Indicates the disc side for which the repeat playback is being executed.

⑬ CX : Lights when the built-in CX system is operating. CX is a trademark of CBS Inc. This player meets the CX EXPANDING SPECIFICATION.

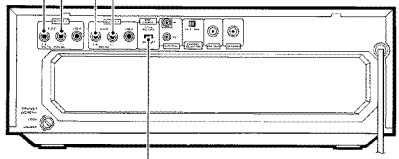
⑭ 1/L and 2/R : Indicates the audio output channel. 1/L is audio channel 1, or the left channel. 2/R is audio channel 2, or the right channel. When power is turned on, both 1/L and 2/R (stereo mode) will light.

⑮ PROGRAM : Lights during programmed play. Also, during programmed repeat play, the REPEAT indicator will also light.

*TOC (Table of Contents) is data, such as track numbers and playing time, recorded on the disc.

DIGITAL/ANALOG AUDIO OUT terminals (RCA jacks)
These terminals output LaserVision Disc audio (analog) and the audio for LaserVision with Digital Sound Discs. Selection of either digital or analog sound can be made by operating a key on the remote control unit.
Connect these terminals to the CD or AUX input terminals etc. of your stereo amplifier.
Do not connect them to your amplifier PHONO input.

ANALOG AUDIO OUT terminals (RCA jacks)
These terminals output the analog audio of LaserVision Discs only. Connect them to the AUX input terminals of your stereo amplifier.
Do not connect these terminals to your amplifier PHONO input.
These terminals do not output the digital sound from LaserVision with Digital Sound Discs.



ABOUT THE AUDIO OUTPUT TERMINALS
This player is equipped with two sets of audio output terminals.
As shown in the table below, the DIGITAL/ANALOG terminals are able to output all the audio signals that can be played back by the player.

Type of Disc	Playback Sound	Output Terminals	
LaserVision with Digital Sound Discs (Discs with the digital sound mark)	Digital	DIGITAL/ANALOG	Can be selected with the AUTO DIGITAL/ANALOG key on the remote control unit
	Analog	DIGITAL/ANALOG	
		ANALOG	
LaserVision Discs (Discs without the digital sound mark)	Analog	DIGITAL/ANALOG ANALOG	

SIDE CHANGE STILL PICTURE switch
While the disc side is being changed, a still picture before the disc change can be retained on the screen.
ON: A still picture will be displayed during the disc change.
OFF: The screen will be black during the disc change.

For ordinary operation, connect the DIGITAL/ANALOG terminals to your amplifier.
The ANALOG terminals are provided for developmental use. They do not need to be used for ordinary operation.