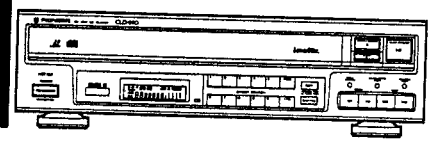
PIONEER®
The Art of Entertainment

3553

Service Manual



ORDER NO.
ARP2281

CD CDV LD PLAYER

CLD-990

- **This manual is applicable to the CLD–990/KUC type.**
- **As to the circuit descriptions, refer to the CLD–1090 service guide (ARP2234).**

CONTENTS

PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan
PIONEER ELECTRONICS SERVICE INC. P.O. Box 1760, Long Beach, California 90801 U.S.A.
PIONEER ELECTRONICS OF CANADA, INC. 505 Cochrane Drive, Markham, Ontario L3R 8E3 Canada
PIONEER ELECTRONIC [EUROPE] N.V. Keetberglaan 1, 9120 Beveren, Belgium
PIONEER ELECTRONICS AUSTRALIA PTY. LTD. 178-184 Boundary Road, Braeside, Victoria 3195, Australia TEL: [03] 580-9911

SJ JUNE 1991 Printed in Japan

3553

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

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

1. SAFETY INFORMATION

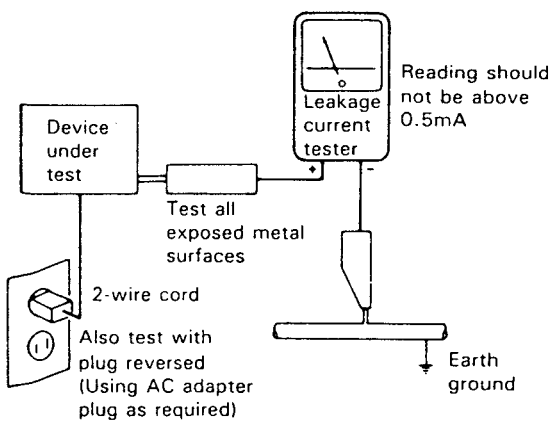
(FOR USA MODEL ONLY)

1. SAFETY PRECAUTIONS

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

LEAKAGE CURRENT CHECK

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



AC Leakage Test

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

2. PRODUCT SAFETY NOTICE

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

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

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

2. EXPLODED VIEWS AND PARTS LIST

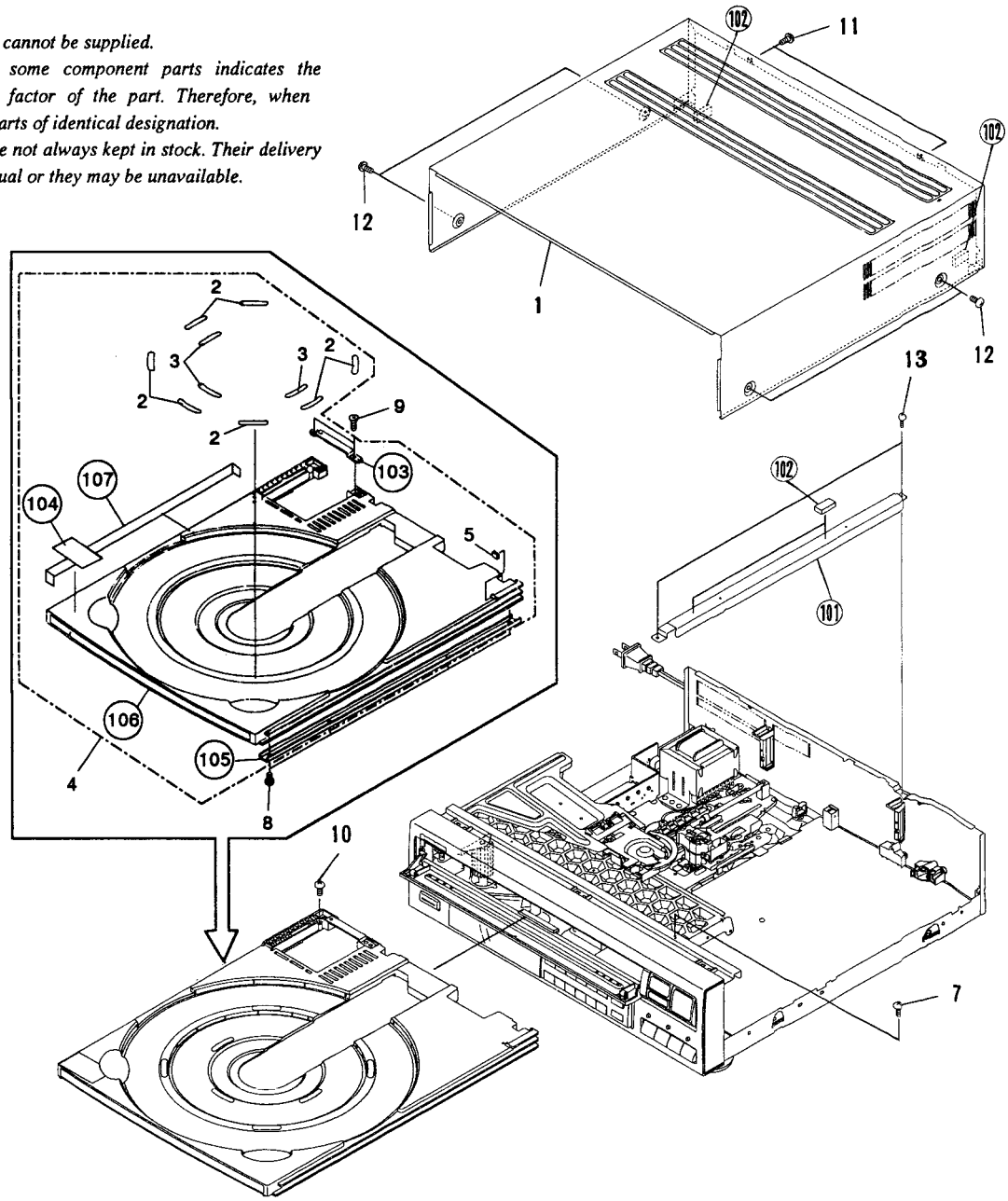
2.1 EXTERIOR SECTION

Parts List

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

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.*
- *Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*



2.2 FRONT PANEL SECTION

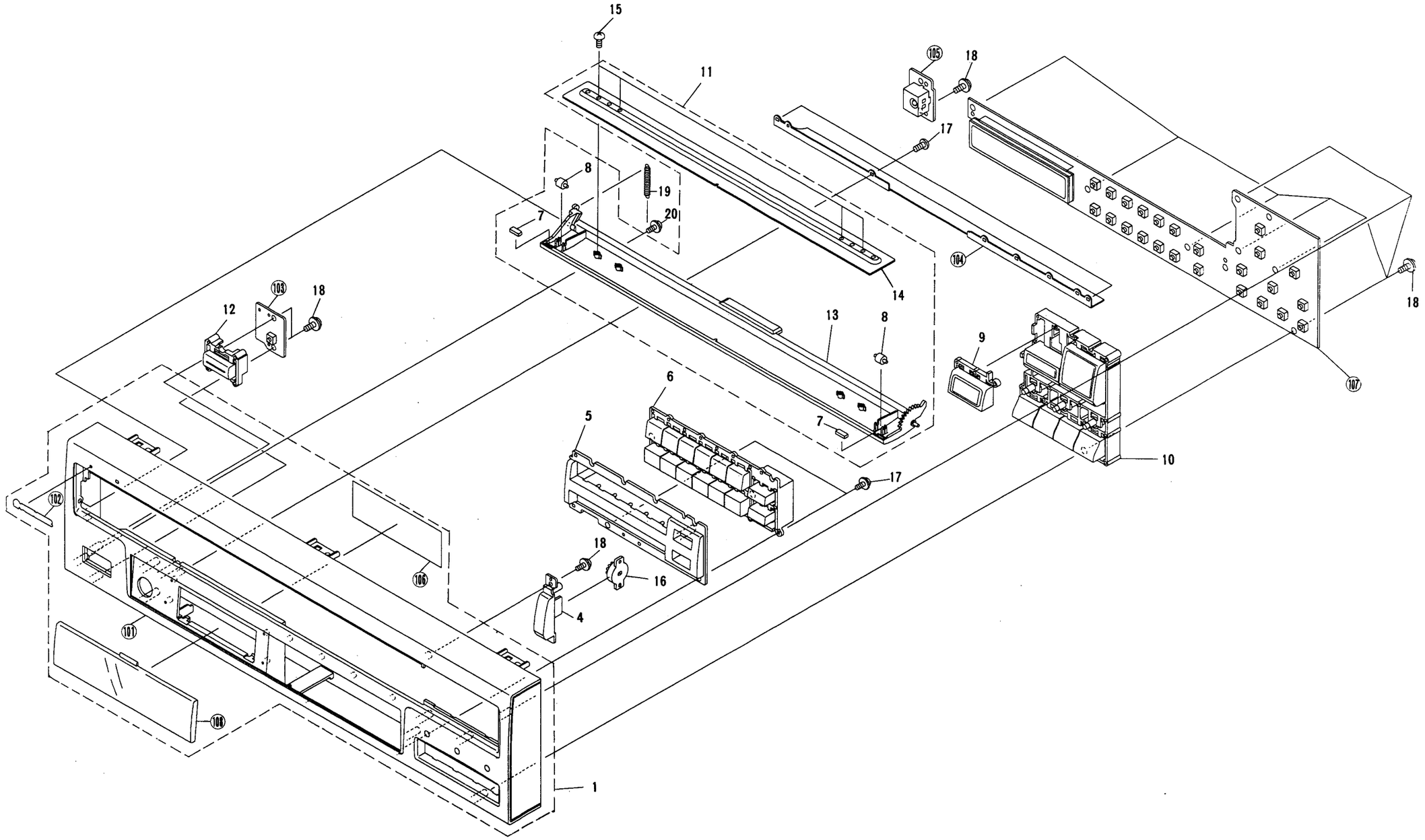
Parts List

Mark	No.	Description	Part No.
	1	Front panel assembly-S	VXX1576
	2	.....	
	3	.....	
	4	Side panel	VNK1667
	5	Sub panel	VNK1669
	6	Ten key	VNK1670
	7	Door dump rubber	VEB1033
	8	Roller	VNL1042
	9	O/C key	VNK1666
	10	Main key	VNK1665
	11	Door assembly - S	VXX1548
	12	Power key	VNK1668
	13	Front door assembly	VXA1572
	14	Door plate	VNE1482
	15	Screw	BPZ20P040FZK
	16	Dumper assembly	VXA1053
	17	Screw	BBZ20P050FMC
	18	Screw	BPZ26P060FCU
	19	Door spring	VBH1144
	20	Screw	IPZ26P060FCC

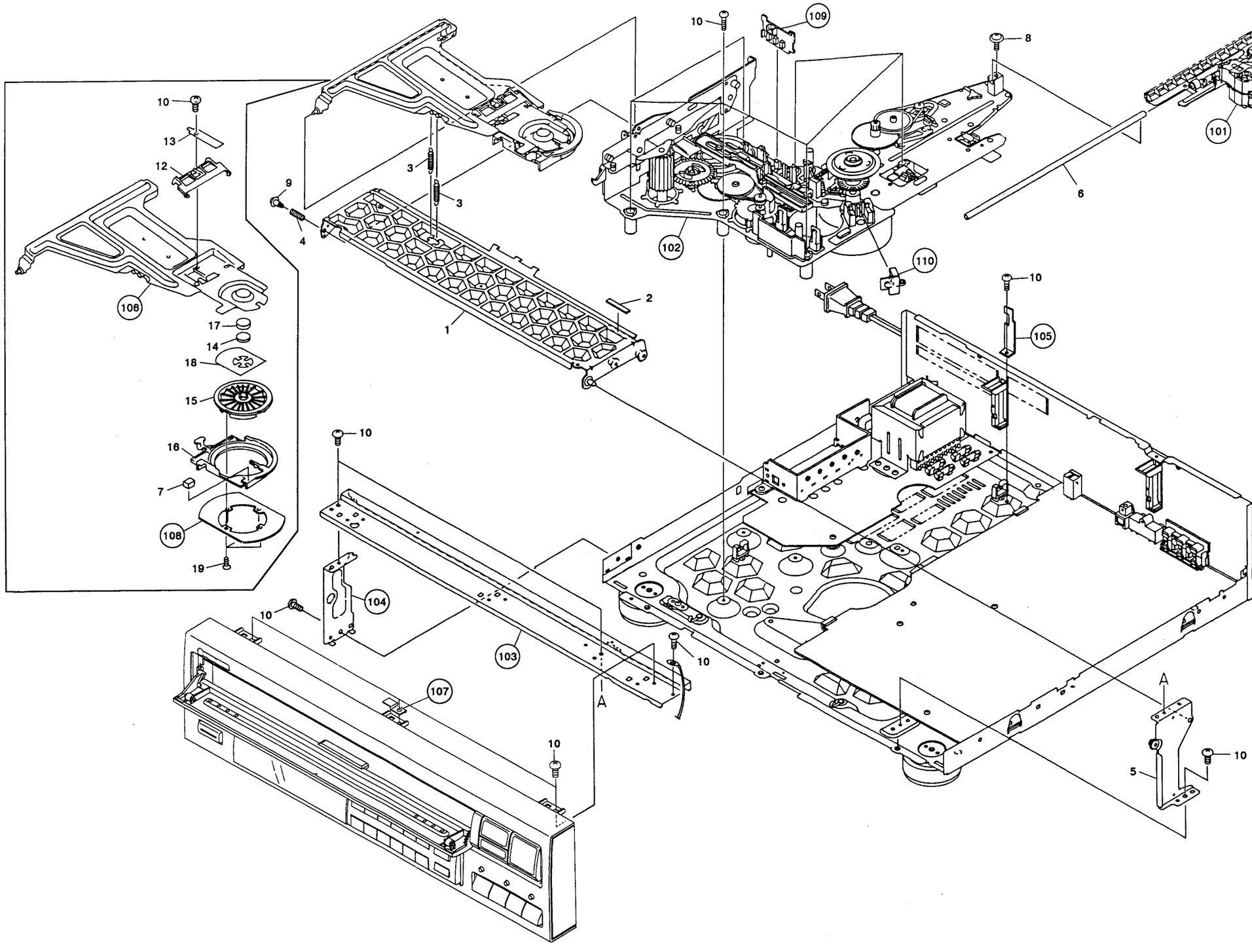
Mark	No.	Description	Part No.
	101	Front panel	
	102	Name plate	
	103	PWSB	
	104	Reinforced plate	
	105	IRAB	
	106	FL filter	
	107	FLKY	
	108	Display panel	

Note : 103. PWSB, 105. IRAB and 107. FLKY are supplied as VWM1180 FLKB.

Front panel section



2.3 TOP VIEW SECTION



2.3 TOP VIEW SECTION

Parts List

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

Note : 109. SW assembly and 110. FG assembly are supplied as VWM1179 mother board assembly.

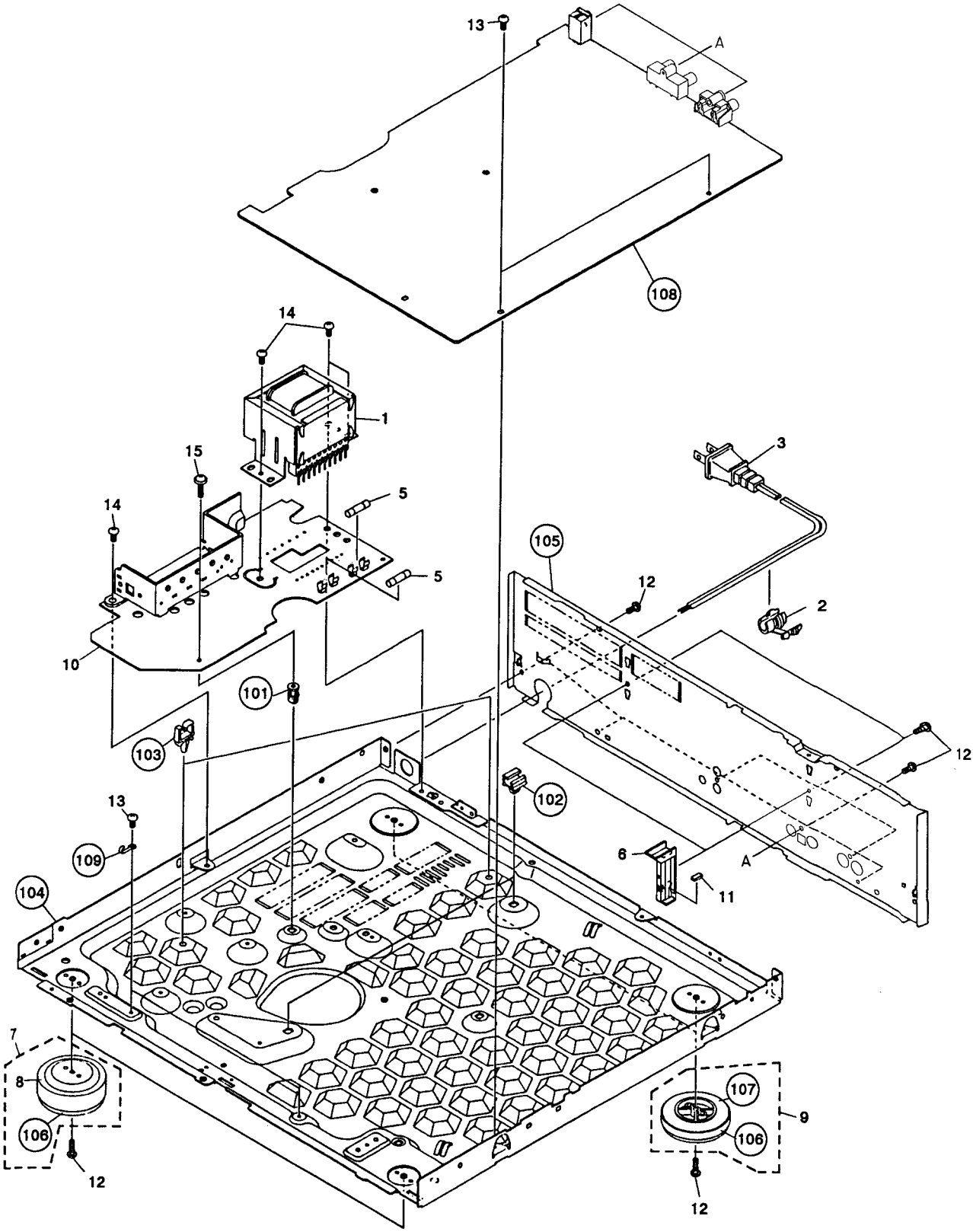
2.4 BASE SECTION

Parts List

Mark	No.	Description	Part No.
	1	Power transformer	VTT1099
	2	Strain relief	CM – 22C
	3	AC Power cord	PDG1015
	4	.....	
	5	Fuse (3A)	VEK – 018
	6	Tray stopper	VNL1202
	7	Insulator assembly	VXA1686
	8	Insulator	VNK1095
	9	Insulator assembly	VXA1687
	10	SYPS assembly	VWR1103
	11	Door clump rubber	VEB1033
	12	Screw	BBZ30P080FCC
	13	Screw	BBZ30P060FCC
	14	Screw	BCZ40P080FZK
	15	Screw	IPZ30P160FMC
	101	PCB spacer	
	102	P plate holder	
	103	Wire clip (B)	
	104	Base chassis	
	105	Rear panel	
	106	Stopper	
	107	Insulator	
	108	MAIN assembly	
	109	Cord holder	

Note : 108. MAIN assembly is supplied as VWM1179 mother board assembly.

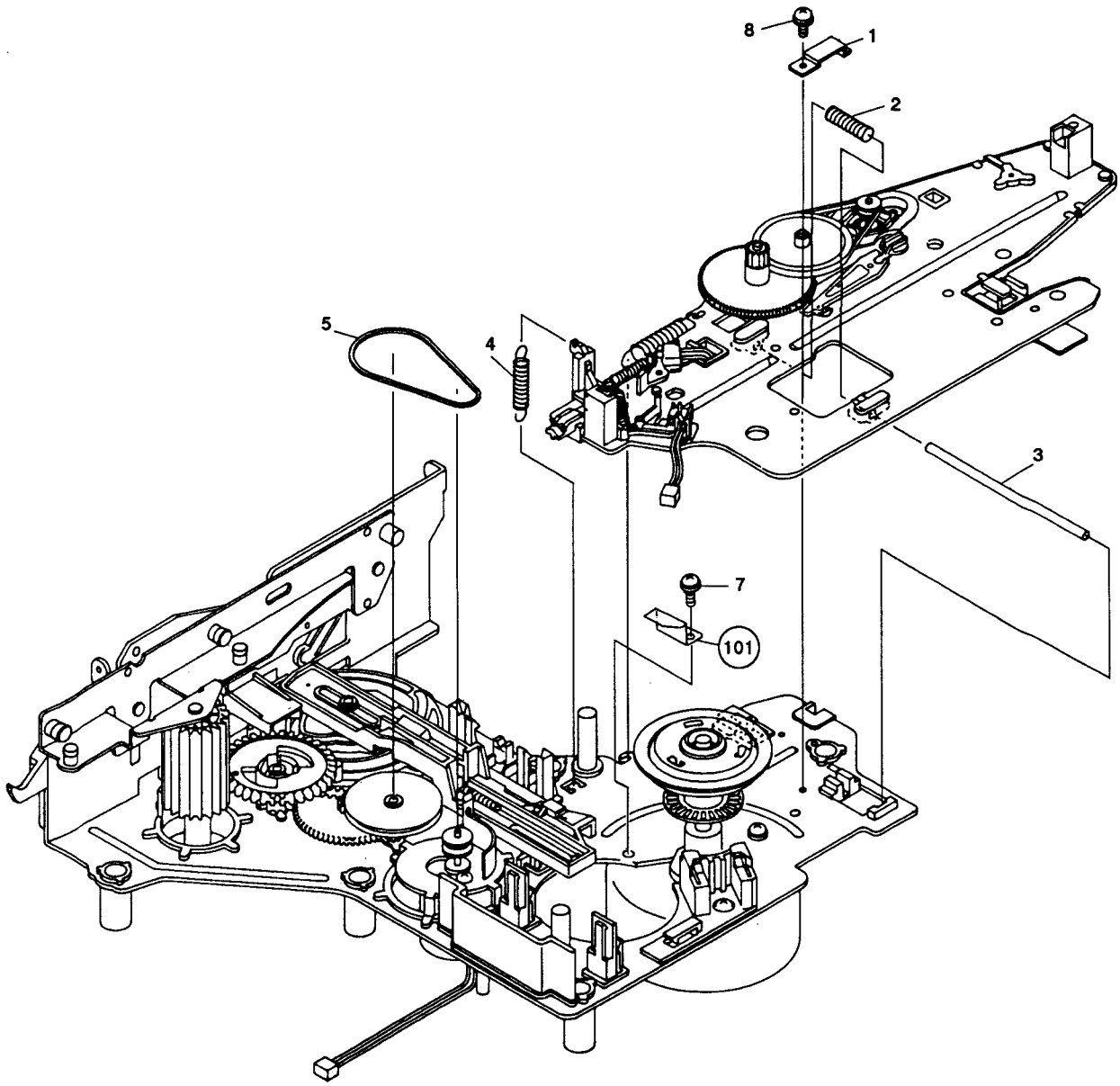
Bottom view section



2.5 MECHANISM ASSEMBLY (1)

Parts List

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



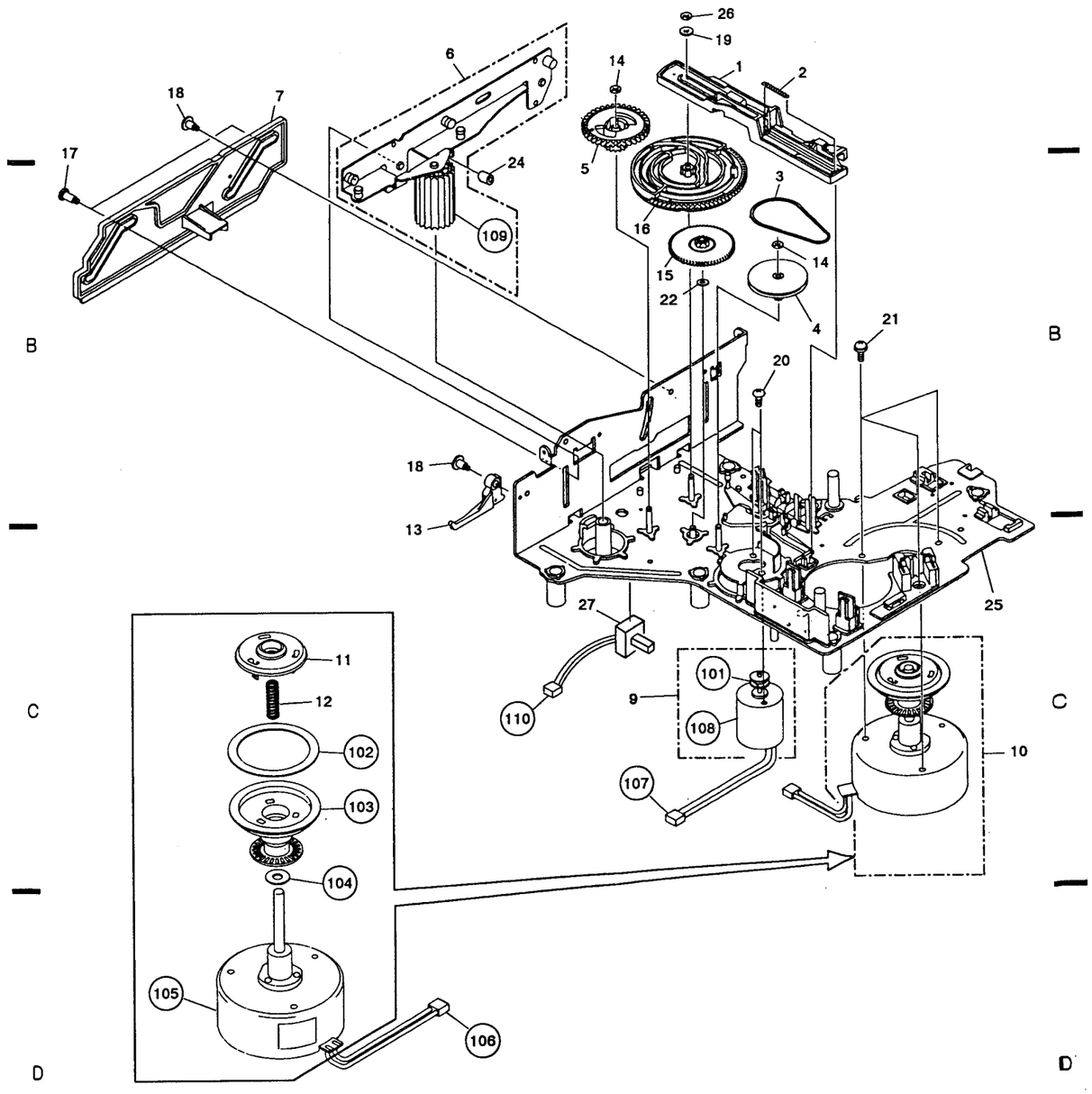
2.6 CHASSIS SECTION

Parts List

Mark	No.	Description	Part No.
	1	Spring slanting cam	VNL1191
	2	Cam spring	VBH1082
	3	Belt	PEB1013
	4	Gear pulley	VNL1249
	5	Follow gear	VNL1194
	6	Roller plate assembly	VXA1531
	7	Slide cam	VNL1188
	8	• • • • •	
	9	Loading motor assembly	VXX1262
	10	Spindle motor assembly	VXA1474
	11	Centering hab	VNL1174
	12	Centering spring	VBH1083
	13	Door lever	VNL1407
	14	Washer	WT26D047D025
	15	Two stair gear	VNL1193
	16	Cam gear	VNL1190
	17	Screw (C)	VBA1015
	18	Screw (B)	VBA1008
	19	Nylon washer	WA32N080W020
	20	Screw	PMZ30P040FMC
	21	Screw	PMA30P050FMC
	22	Washer	WA32D060D025
	23	• • • • •	
	24	Stop ring	VEB1091
◉	25	Chassis assembly	VXA1575
	26	E ring	YE23FUC
	27	Push switch	DSG1014

Mark	No.	Description	Part No.
	101	Motor pulley	
	102	Rubber sheet	
	103	Turn table assembly	
	104	Oil stopped washer	
	105	Spindle motor	
	106	Housing assembly	
	107	Housing assembly	
	108	Loading motor	
	109	Slider gear	
	110	Housing assembly	

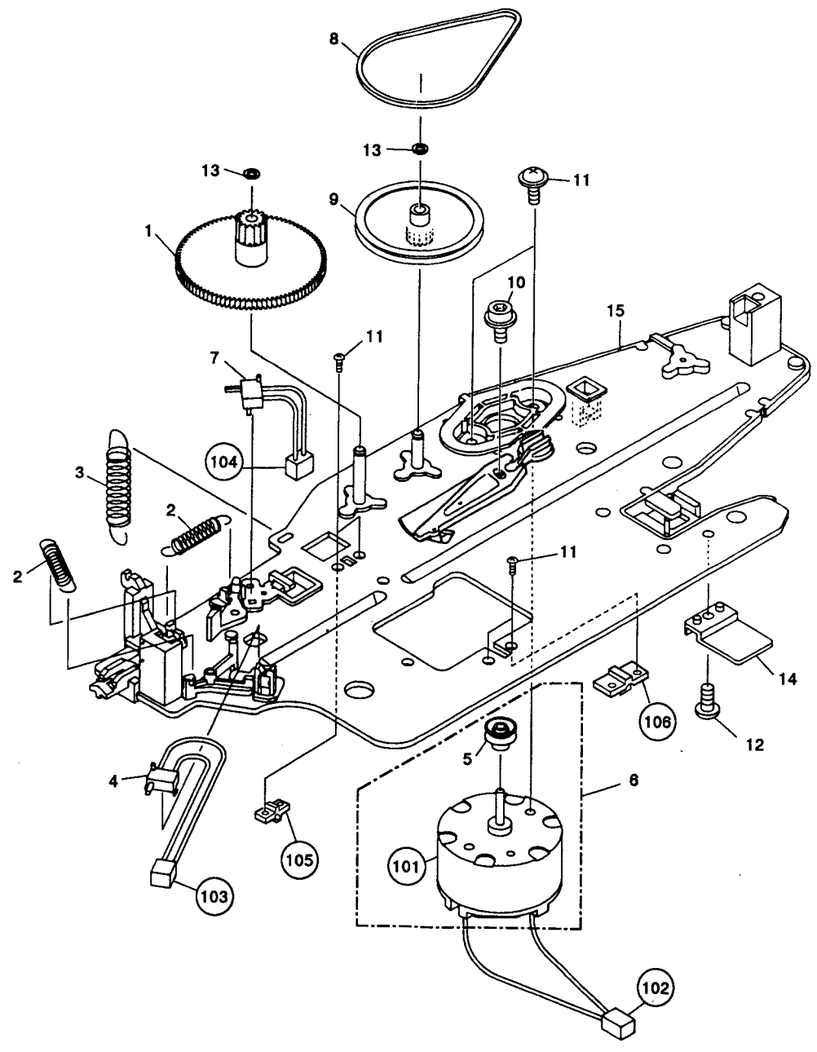
Chassis section



2.7 SERVO MECHANISM BASE SECTION

Parts List

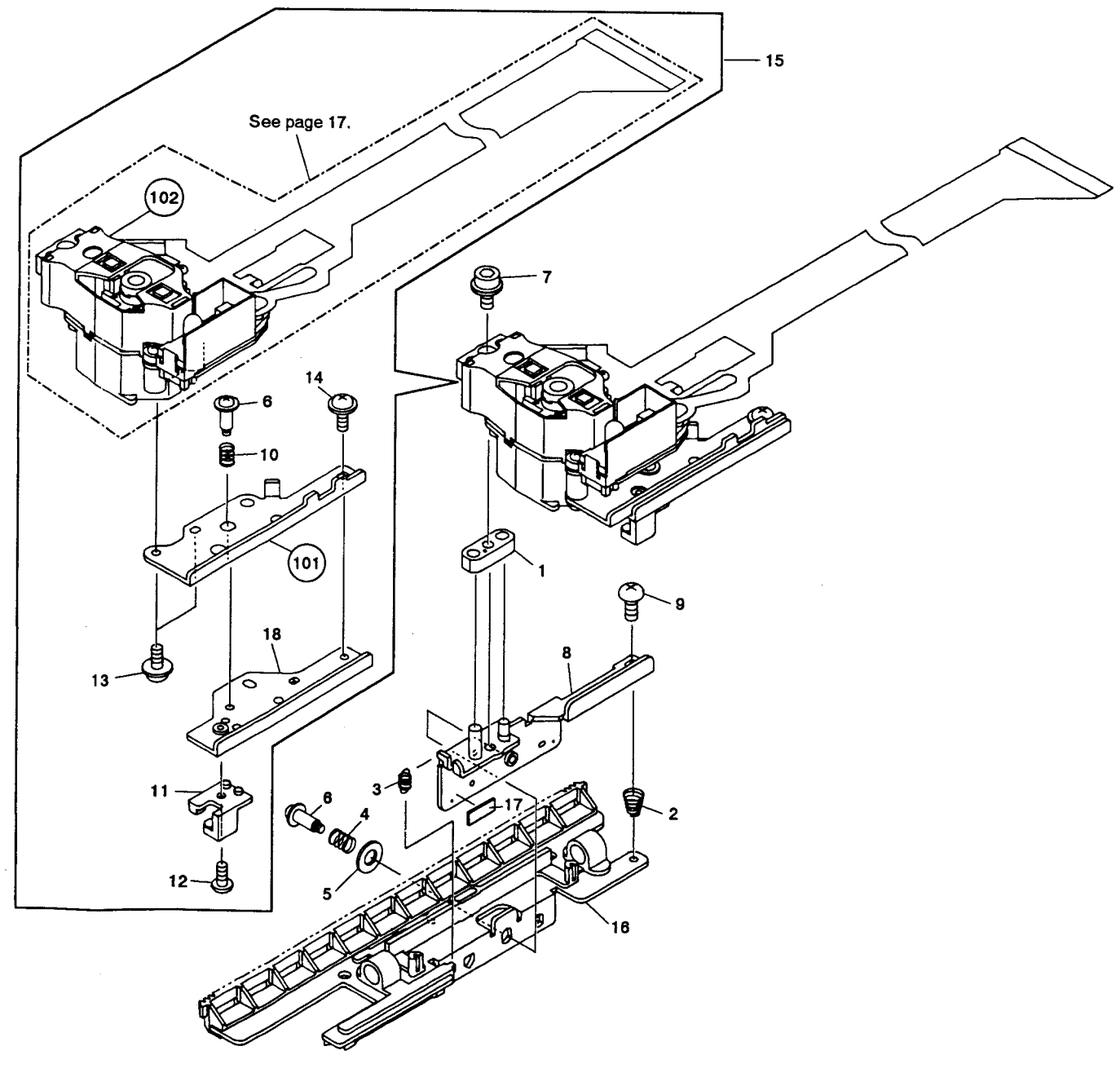
Mark	No.	Description	Part No.
	1	CA gear (3)	VNL1196
	2	Switch pulling spring	VBH1079
	3	TC pulling spring	VBH1080
	4	Push switch (S5:OUTER)	DSG1014
	5	CA pulley (1)	VNL1197
	6	Carriage motor assembly	VXX1261
	7	Push switch (S4:INNER)	DSG1014
	8	CA belt	VEB1077
	9	CA pulley (2)	VNL1198
	10	Screw	SMF30H080FBT
	11	Screw	PMM26P040FMC
	12	Screw	BPZ26P050FMC
	13	Washer	WT26D047D025
	14	FLE base	VNL1341
◉	15	Servo mechanism base assembly - S	VXA1583
	101	Carriage motor	
	102	Housing assembly	
	103	Housing assembly	
	104	Housing assembly	
	105	Holder (A)	
	106	Holder (B)	



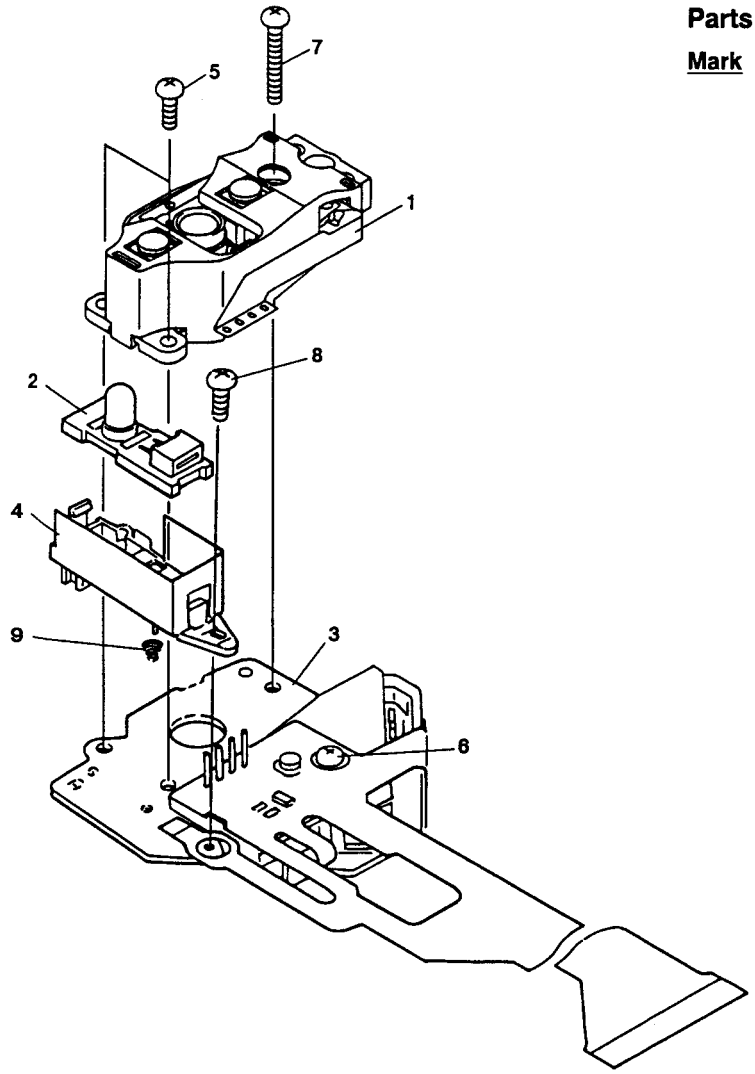
2.8 RACK SECTION

Parts List

Mark	No.	Description	Part No.
	1	PU base	VNL1209
	2	LP center spring	VBH1075
	3	PU pulling spring	VBH1089
	4	L-2 spring	VBH1090
	5	Washer	WA32F070M080
	6	Screw	VBA1007
	7	Screw (2.6 × 10)	VLL1192
◉	8	Rack	VNL1186
	9	Screw	BMZ26P080FMC
	10	TAN spring	VBH1081
	11	TAN base	VNL1199
	12	Screw	PMZ20P040FMC
	13	Screw	PMA20P040FMC
	14	Screw	AMZ20P050FMC
	15	Slider assembly	VWT1060
	16	PU mount base assembly	VXA1567
	17	Spacer (S)	VEC1284
	18	TAN plate (1)	VNE1606
	101	TAN plate (2)	
	102	Pickup assembly	



2.9 PICKUP ASSEMBLY



Parts List of Pickup assembly

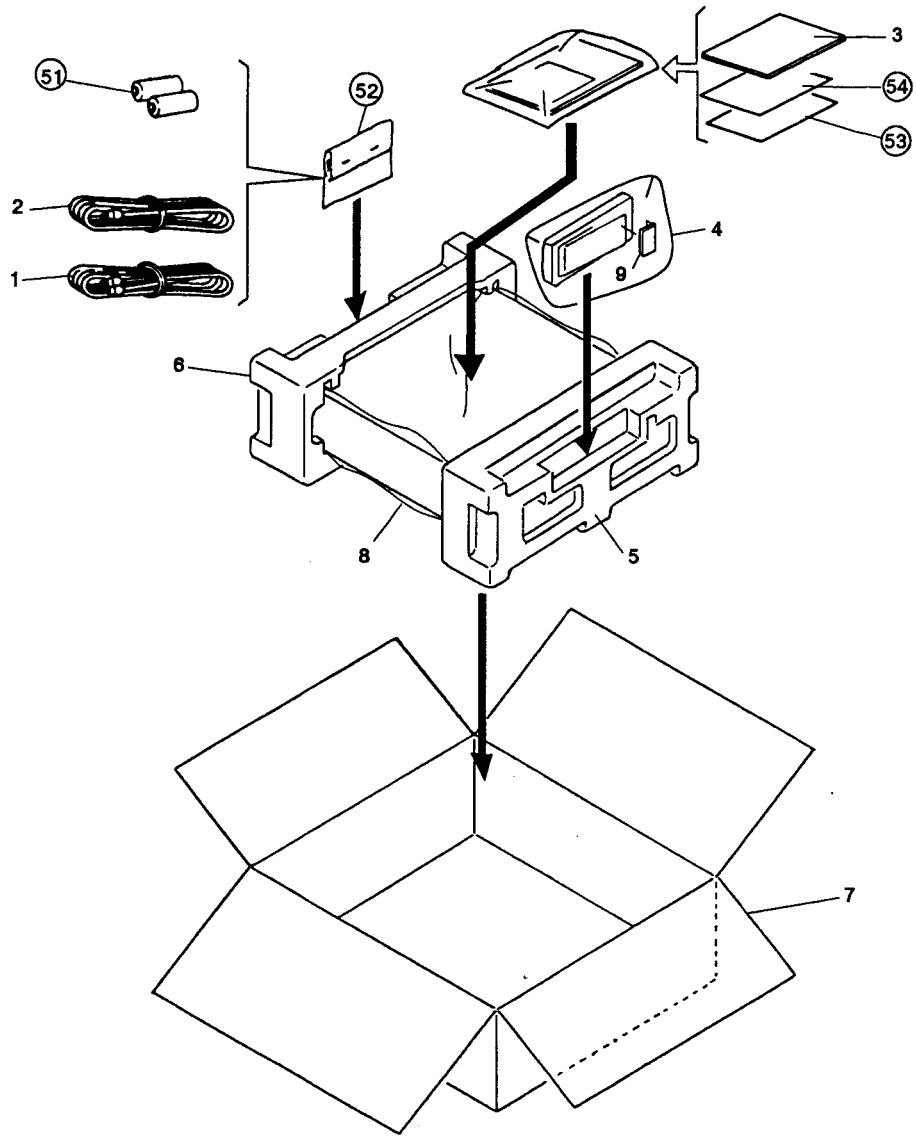
Mark	No.	Description	Part No.
	1	Actuator assembly	VXX1551
	2	Sensor assembly	VEX1018
	3	Pre-pickup assembly	VXX1413
	4	Sensor stay	VNH1024
	5	Screw	PMA20P060FMC
	6	Screw	PMA20P080FMC
	7	Screw	PMA20P140FMC
	8	Screw	BMZ20P060FMC
	9	Sensor spring	VBH1087

3. PACKING

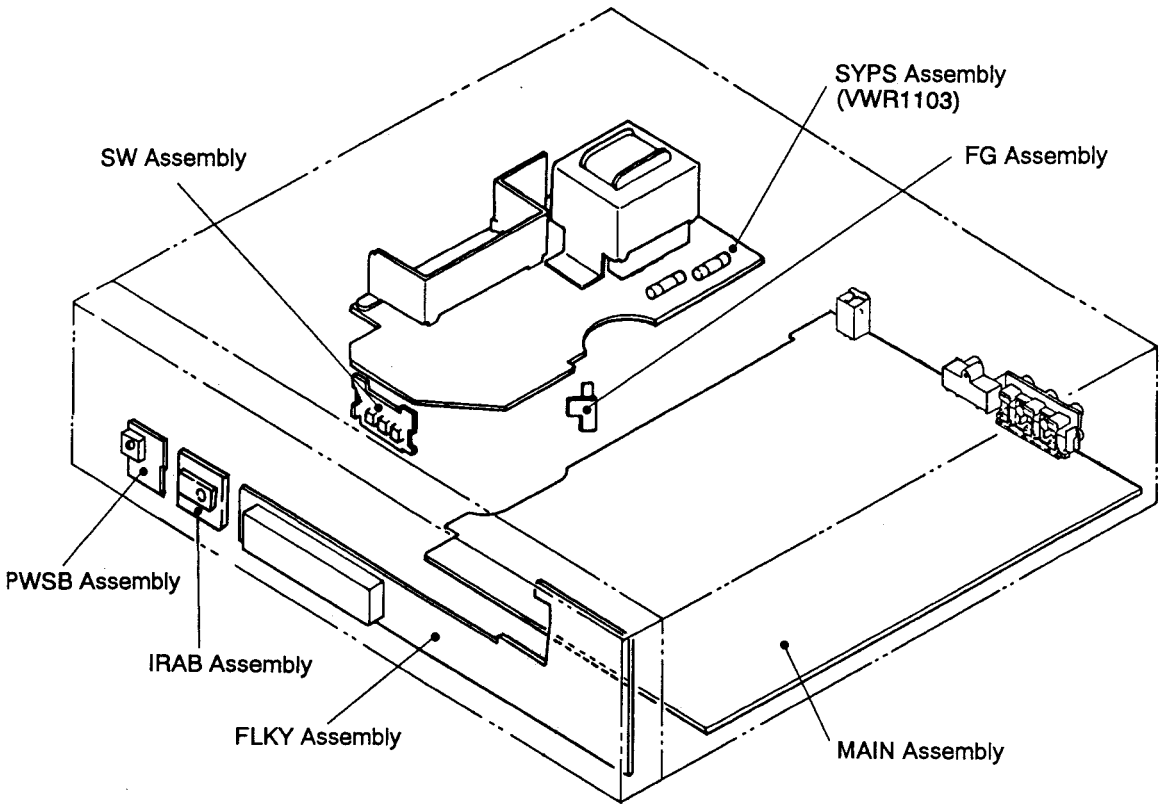
Parts List

Mark	No.	Description	Part No.
	1	Connection cord	VDE – 055
	2	Video cable	VDE – 056
	3	Operating instructions (English)	VRB1059
	4	Remote control unit (CU – CLD040)	VXX1541
	5	Pad (F)	VHA1076
	6	Pad (R)	VHA1077
	7	Packing case	VHG1144
	8	Mirror mat	VHL1006
	9	Battery cover	VNK1805

Mark	No.	Description	Part No.
	51	Dry cell battery (R03, AAA)	
	52	Polyethylene bag	
	53	Caution card	
	54	Caution card (UC)	



4. P. C. BOARDS LOCATION



MOTHER ASSEMBLY (VWM1179)

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

FLKB ASSEMBLY (VWM1180)

FLKB assembly is composed of FLKY, PSWB and IRAB assemblies.

MAIN : **MAIN** BOARD
FG : **FG** COUNTER BOARD
SW : **SW** BOARD
FLKY : **FL** TUBE AND **KEY** BOARD
PSWB : **P**OWER **SW**ITCH **B**OARD
IRAB : INFRA**R**ED **A**MPLIFIER **B**OARD
SYPS : **SY**STEM **P**OWER **S**UPPLY

5.SCHEMATIC AND P.C. BOARDS DIAGRAM

1. RESISTORS:
Indicated in Ω , 1/4W, 1/6W and 1/8W, ±5% tolerance unless otherwise noted k;k Ω , M;M Ω , (F); ± 1%, (G); ± 2%,(K); ± 10%, (M); ± 20% tolerance.

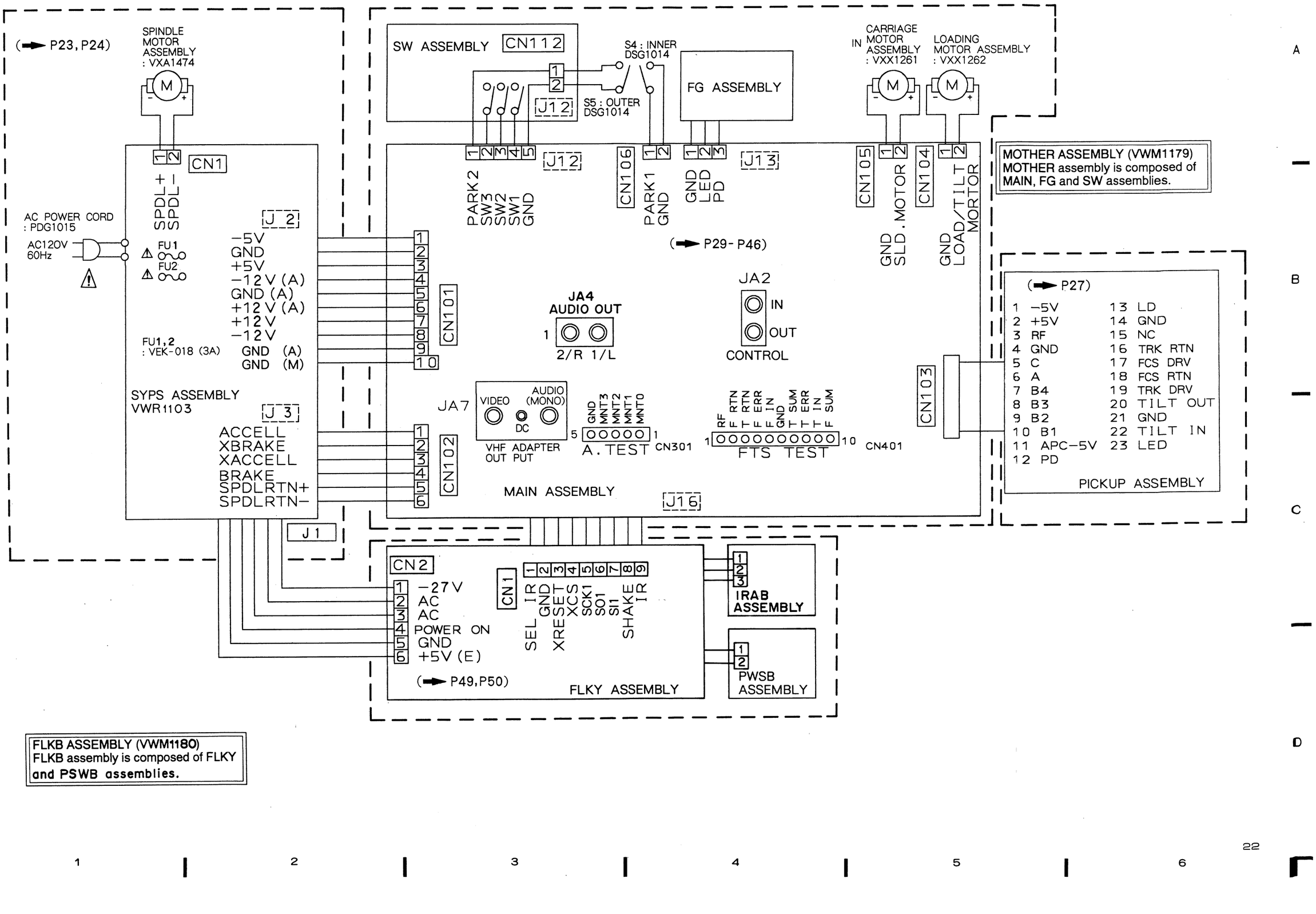
2. CAPACITORS:
Indicated in capacity (μF) /voltage(V)unless otherwise noted p;pF. Indication without voltage is 50V except electrolytic capacitor.

3. VOLTAGE, CURRENT:
⌐¬ ;DC voltage (V) at no input signal.
Value in ( ) is DC voltage at rated power.
⇦mA ;DC current at no input signal.

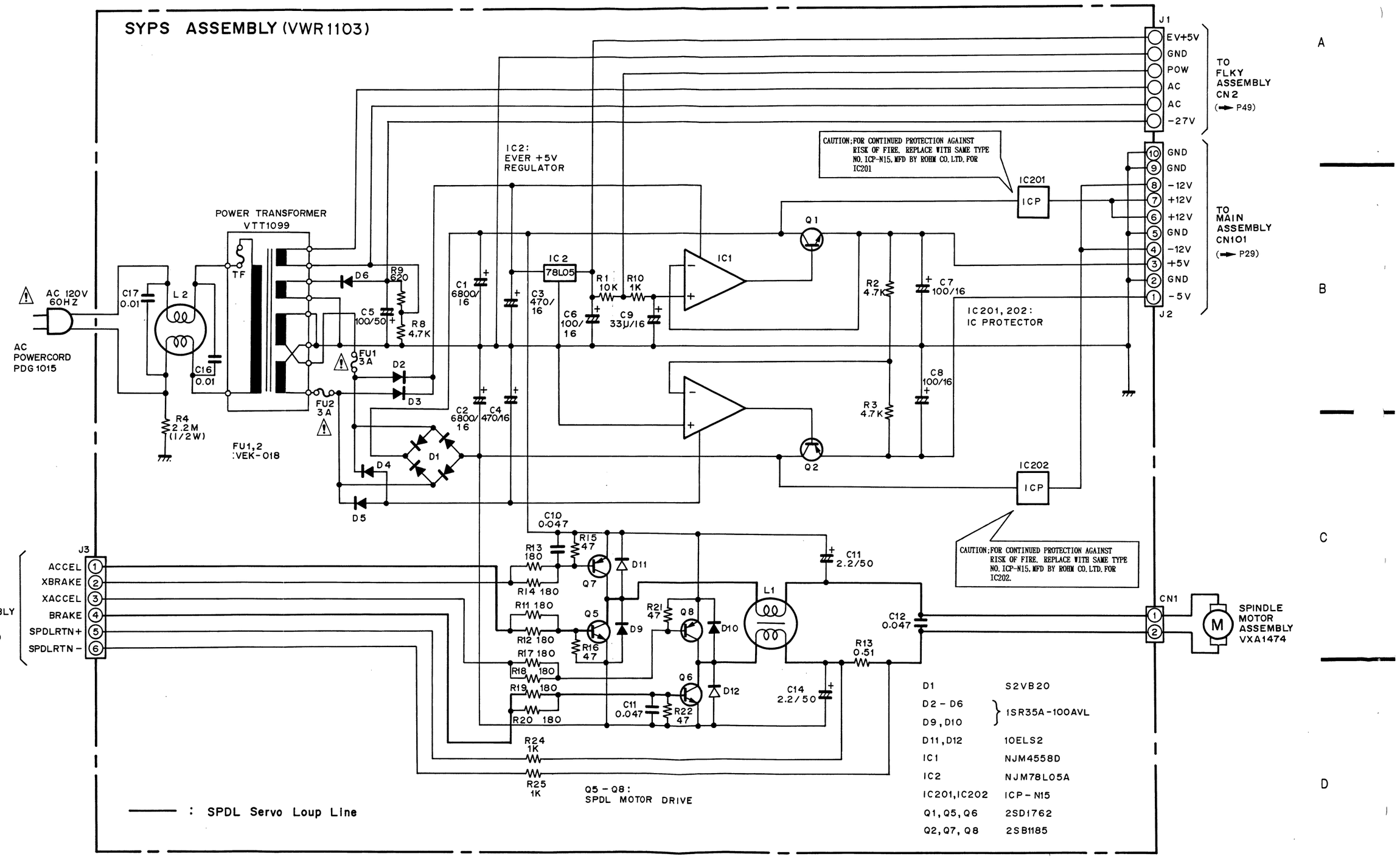
4. OTHERS:
➡ ;Signal route.
⊘ ;Adjusting point.
The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
※ marked capacitors and resistors have parts numbers.

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

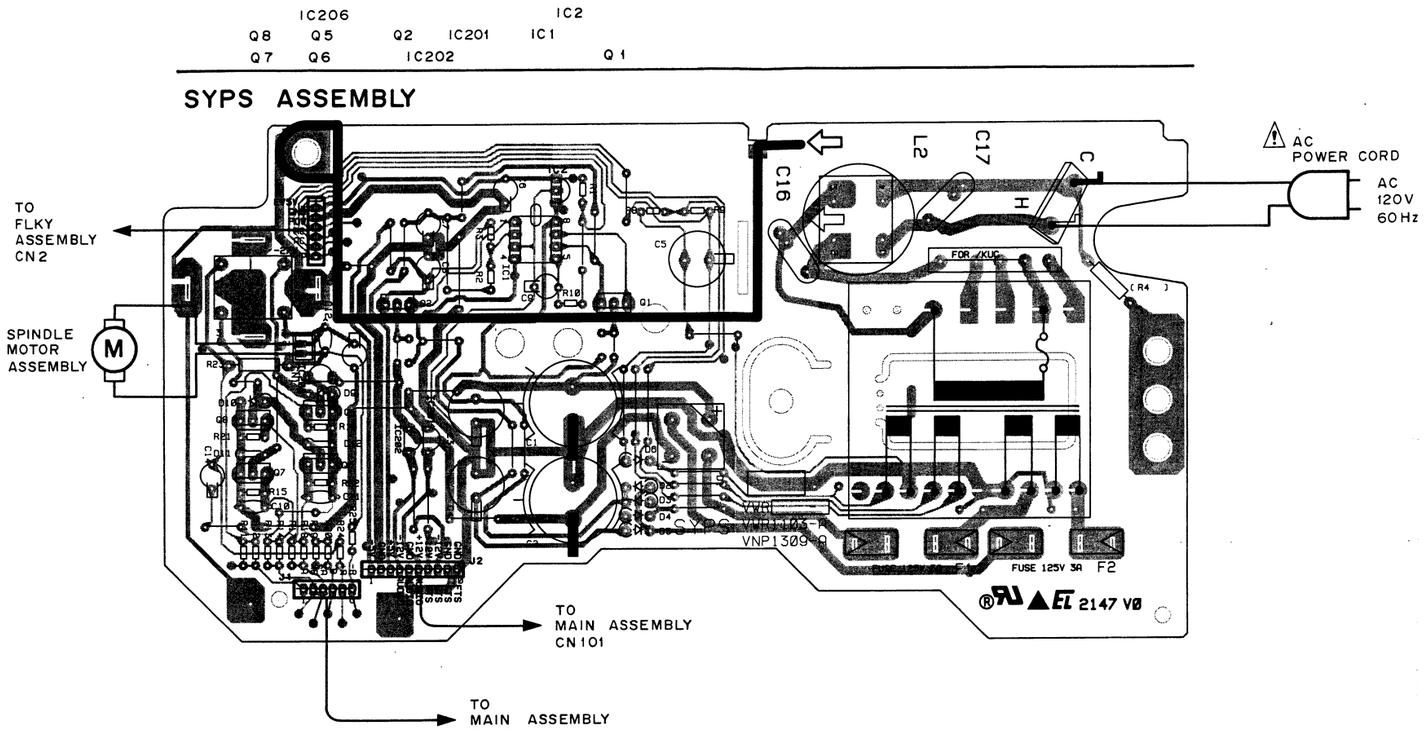
5.1 OVERALL CONNECTIONS



5.2 SYPS (VWR1103) ASSEMBLY

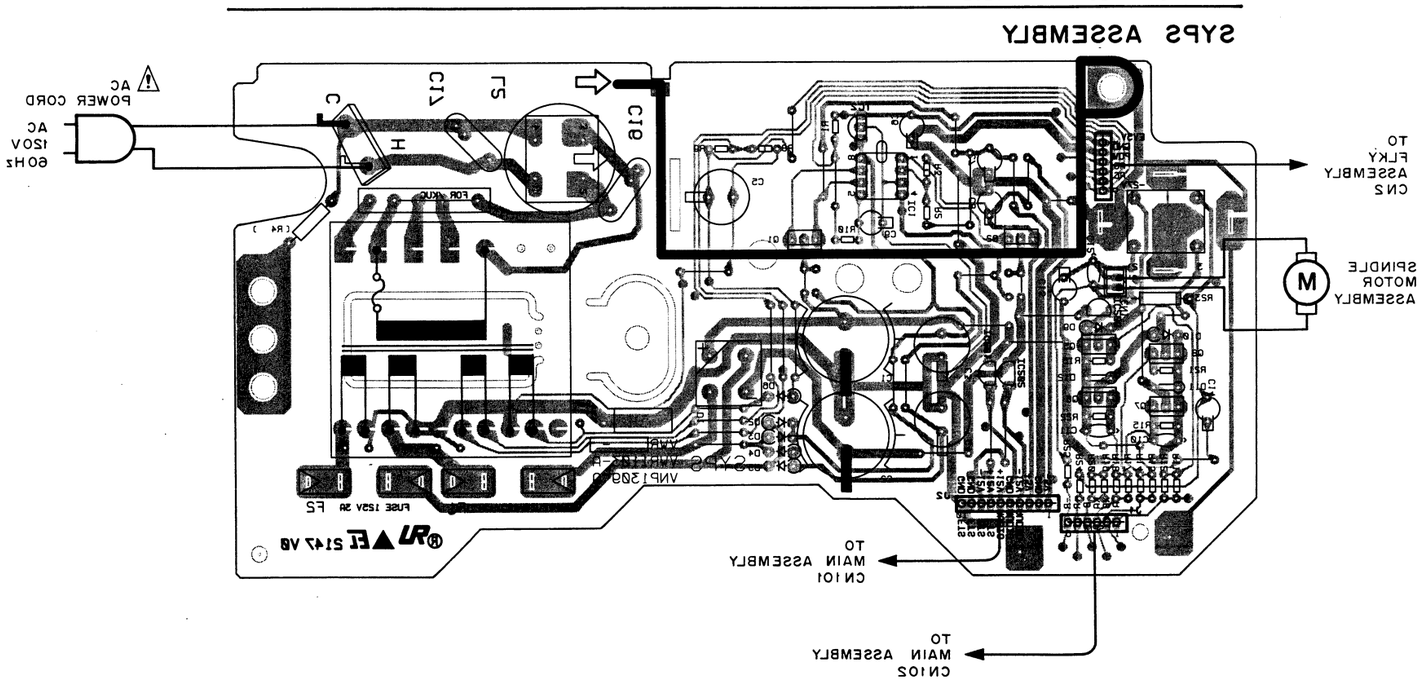


SYPS ASSEMBLY

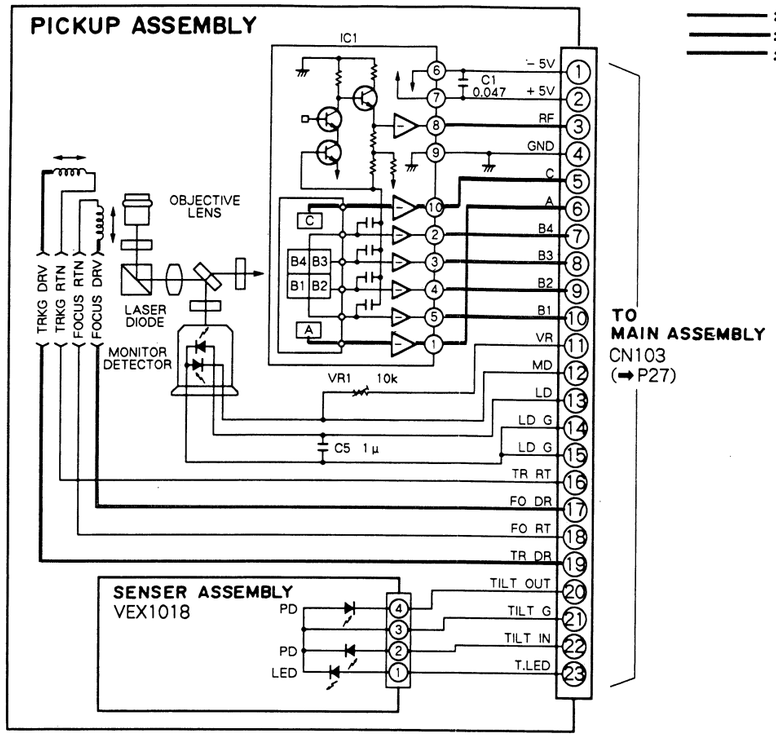


● View from component side

● View from soldering side



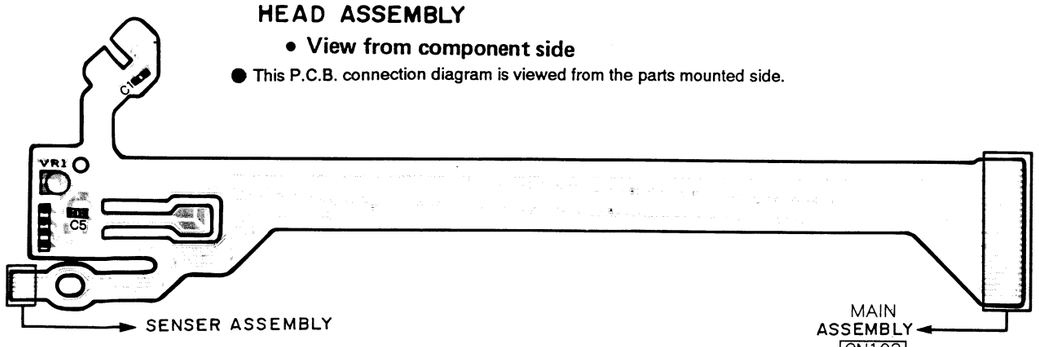
5.3 PICKUP ASSEMBLY

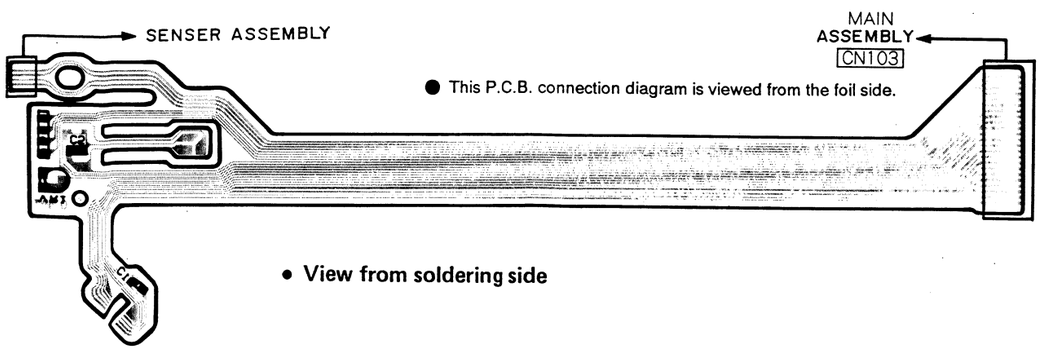


HEAD ASSEMBLY

• View from component side

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





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

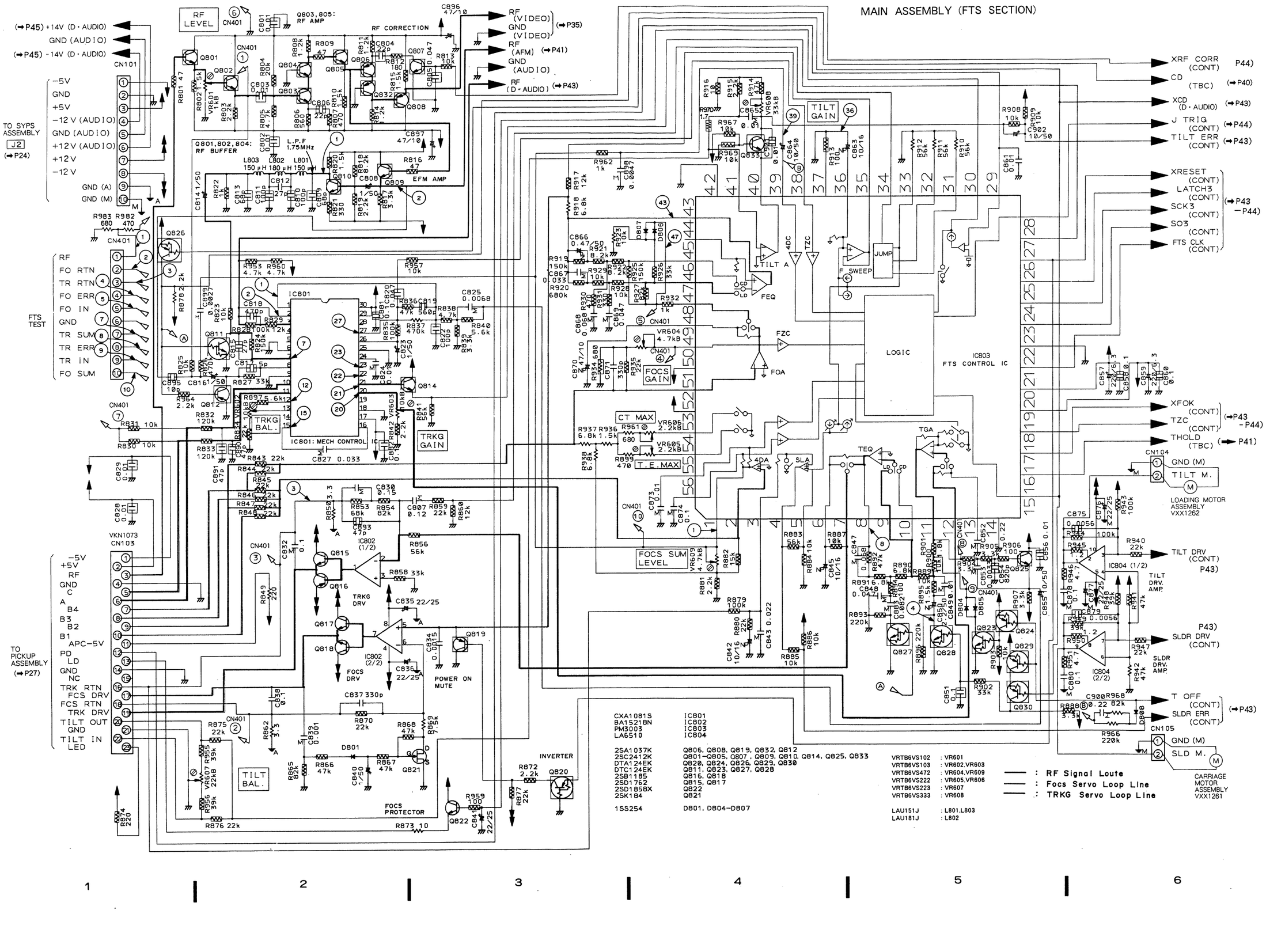
• View from soldering side

WAVEFORMS OF THE FTS SECTION

IC801 (CXA1081S)		CN401		IC803 (PM3003)	Other Points
① 1.5Vp-p	⑳ 400mVp-p	① 300mVp-p	⑦ 100mVp-p	① 300mVp-p	① Q810 collector 400mVp-p
② 300mVp-p	㉑ 700mVp-p	② 5Vp-p	⑧ 1.25Vp-p :at closed	⑧ 2Vp-p	② Q809 Emitter 2Vp-p
⑦ 40mVp-p	㉒ 7Vp-p	③ 4Vp-p	⑨ 1.25Vp-p	㊱ 2Vp-p	③ Betweem C830 and C832 200mVp-p
⑫ 350mVp-p	㉓ 2Vp-p	④ 1.5Vp-p	⑩ 2Vp-p	㊴ 1Vp-p	④ Q828 collector 400mVp-p
⑮ 400mVp-p	㉗ 3Vp-p	⑤ 1.5Vp-p		㊸ 500mVp-p	
				㊼ 150mVp-p	

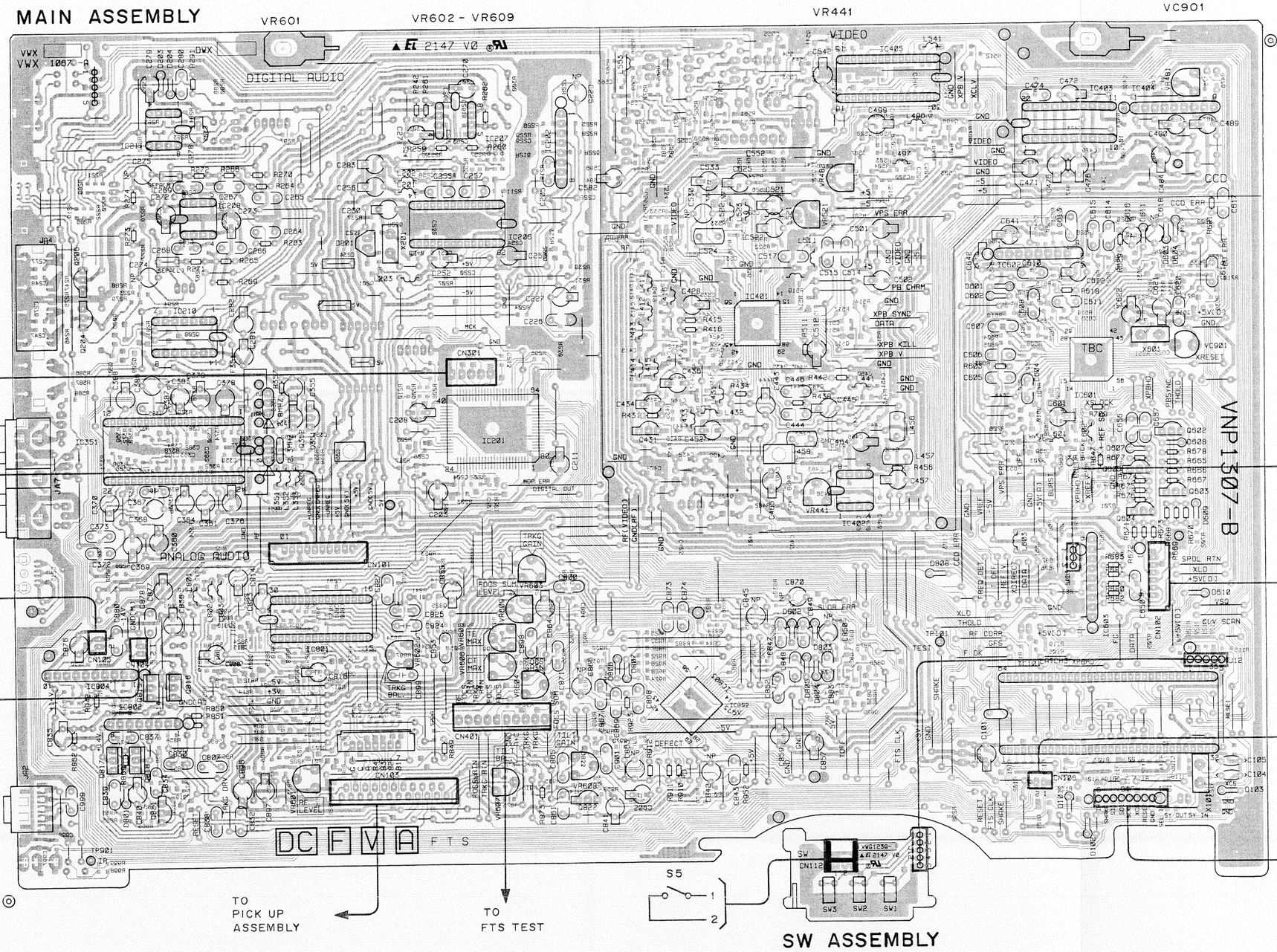
5.4 MAIN ASSEMBLY (FTS SECTION)

• View 1



• View from component side

MAIN ASSEMBLY

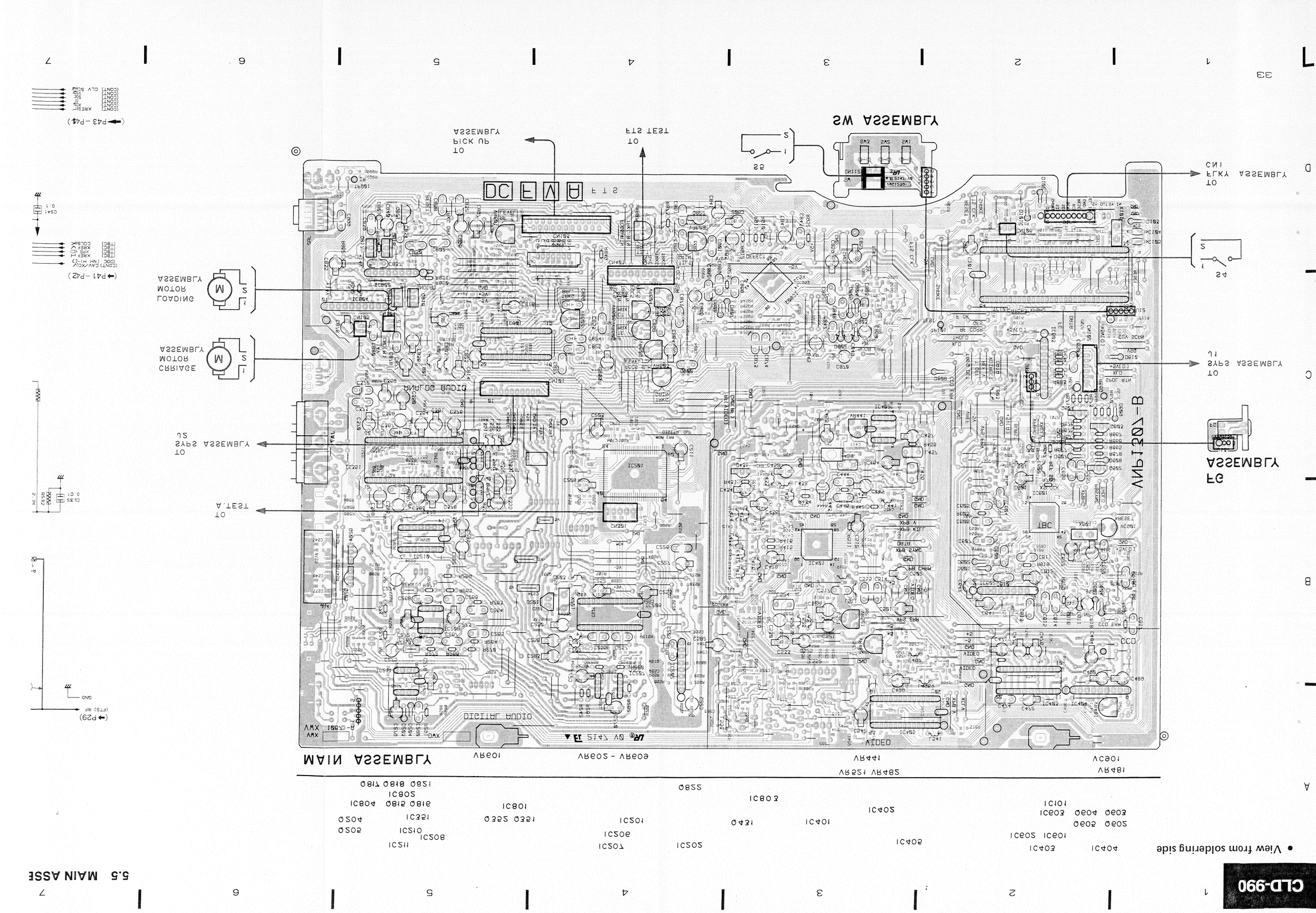


RF CORR (CONT) P44)
(TBC) (➡P40)
(D・AUDIO) (➡P43)
TRIG (CONT) (➡P44)
ILT ERR (CONT) (➡P43)
RESET (CONT)
LATCH3 (CONT) (➡P43 – P44)
CK3 (CONT)
O3 (CONT)
TS CLK (CONT)
FOK (CONT)
ZC (CONT) (➡P43 – P44)
HOLD (TBC) (➡P41)
GND (M)
TILT M.
OADING MOTOR SSEMBLY XX1262
TILT DRV (CONT) P43)
P43)
SLDR DRV (CONT)
T OFF (CONT)
SLDR ERR (CONT) (➡P43)
GND (M)
SLD M.
CARRIAGE MOTOR ASSEMBLY VXX1261

6 7 8 9 10 11 12

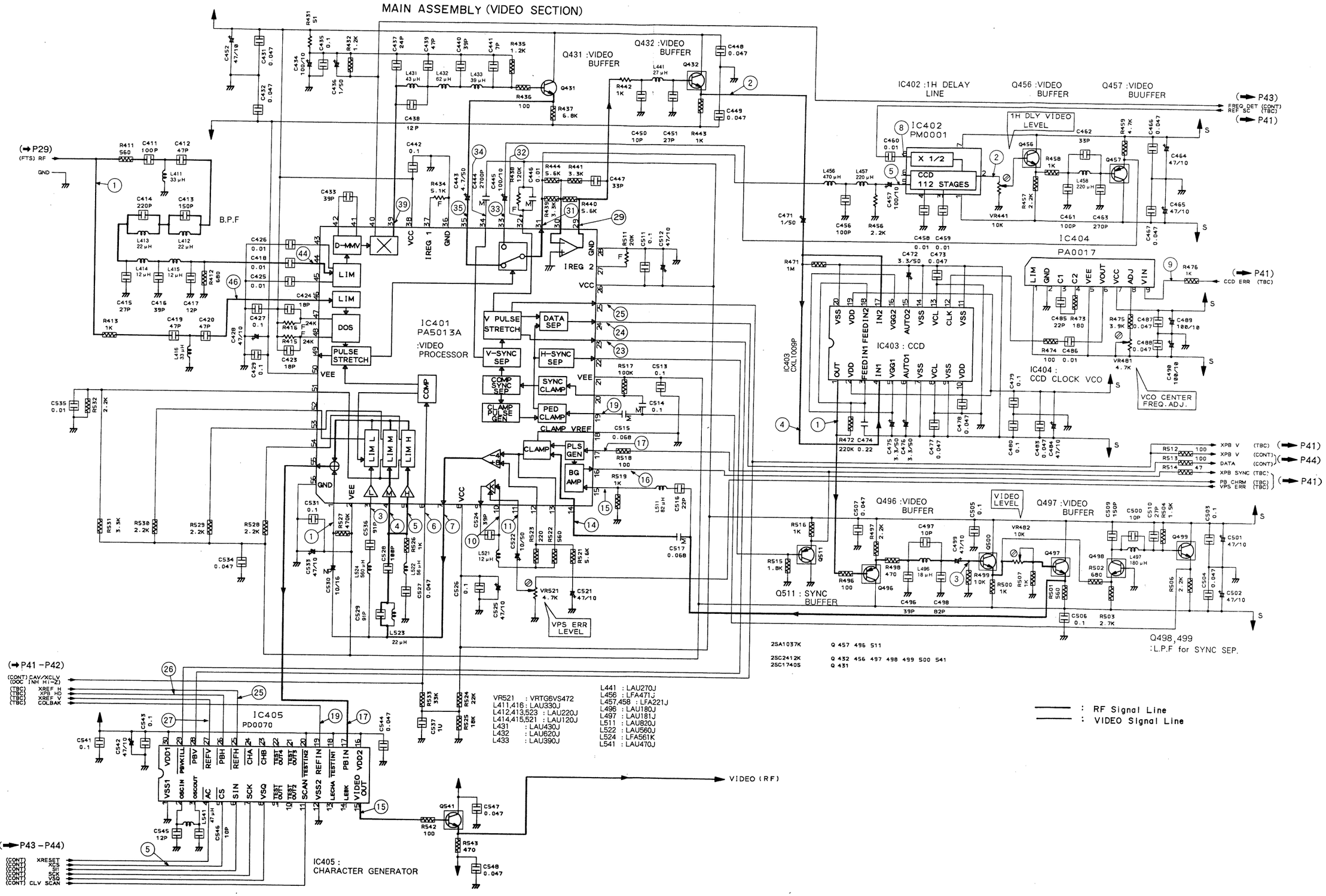
A B C D

MAIN ASSEMBLY



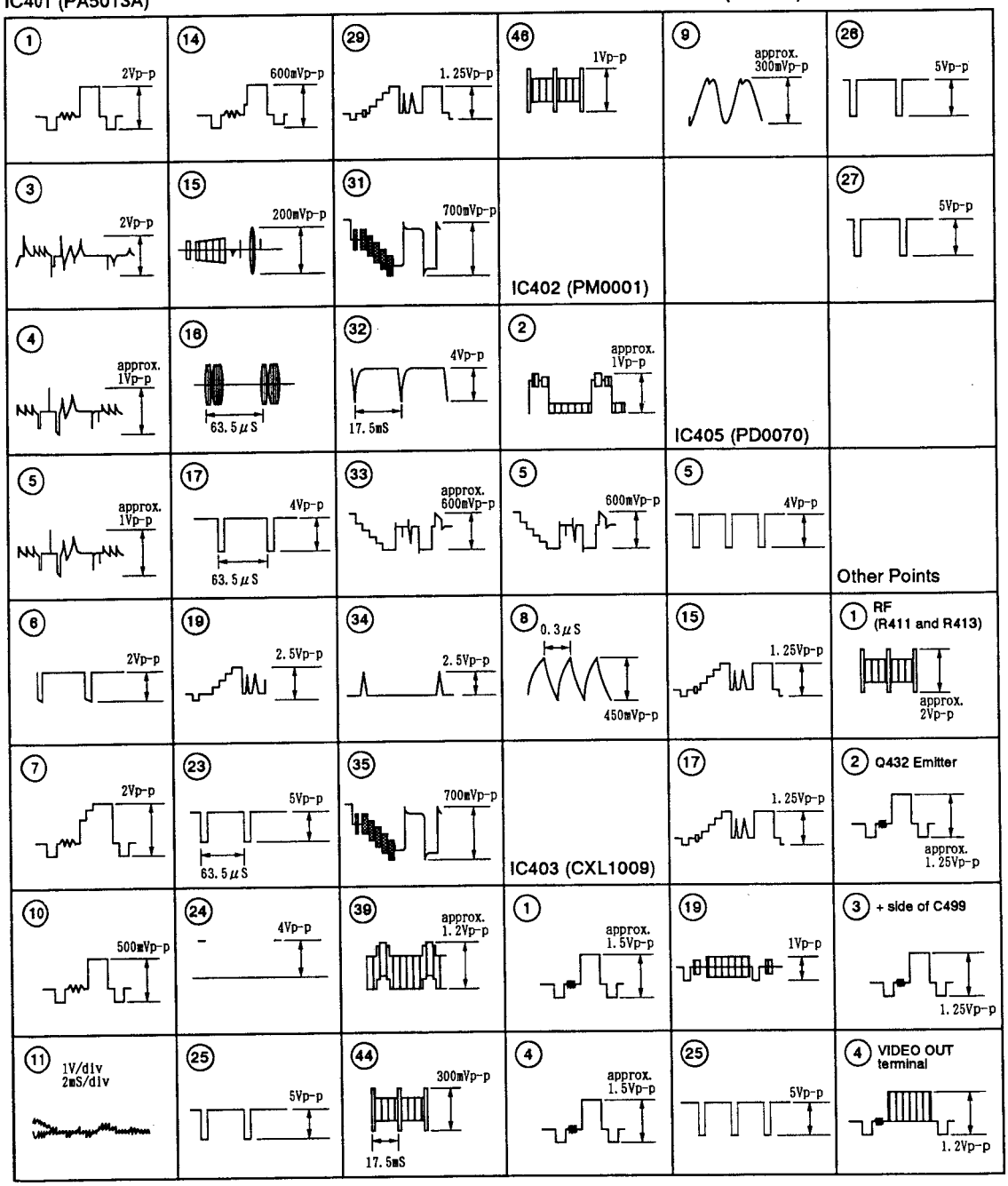
- View from soldering side

5.5 MAIN ASSEMBLY (VIDEO SECTION)



WAVEFORMS OF THE VIDEO SECTION

IC401 (PA5013A)



IC402 (PM0001)

IC404 (PA0017)

IC405 (PD0070)

Other Points

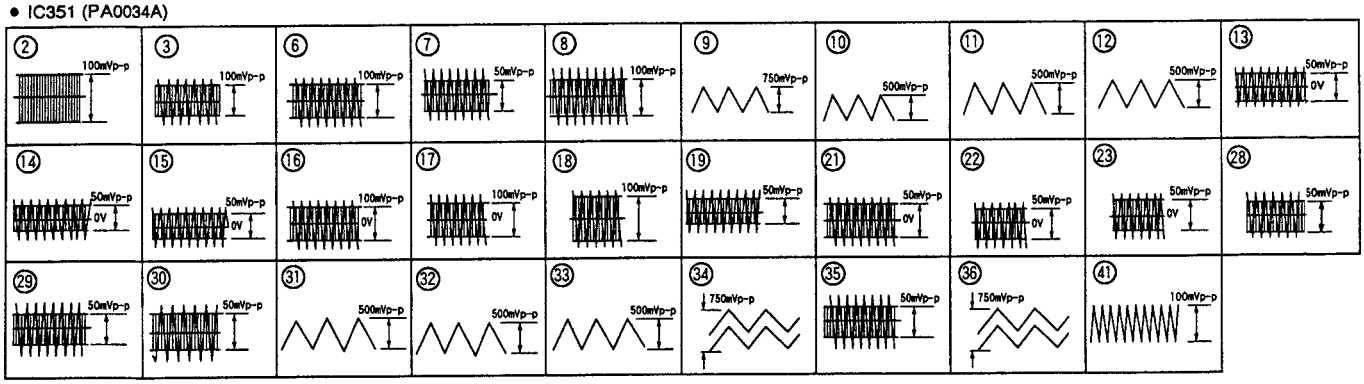
Note: Waveforms and voltages are at the PLAY state.

IC351 (PA0034A)

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

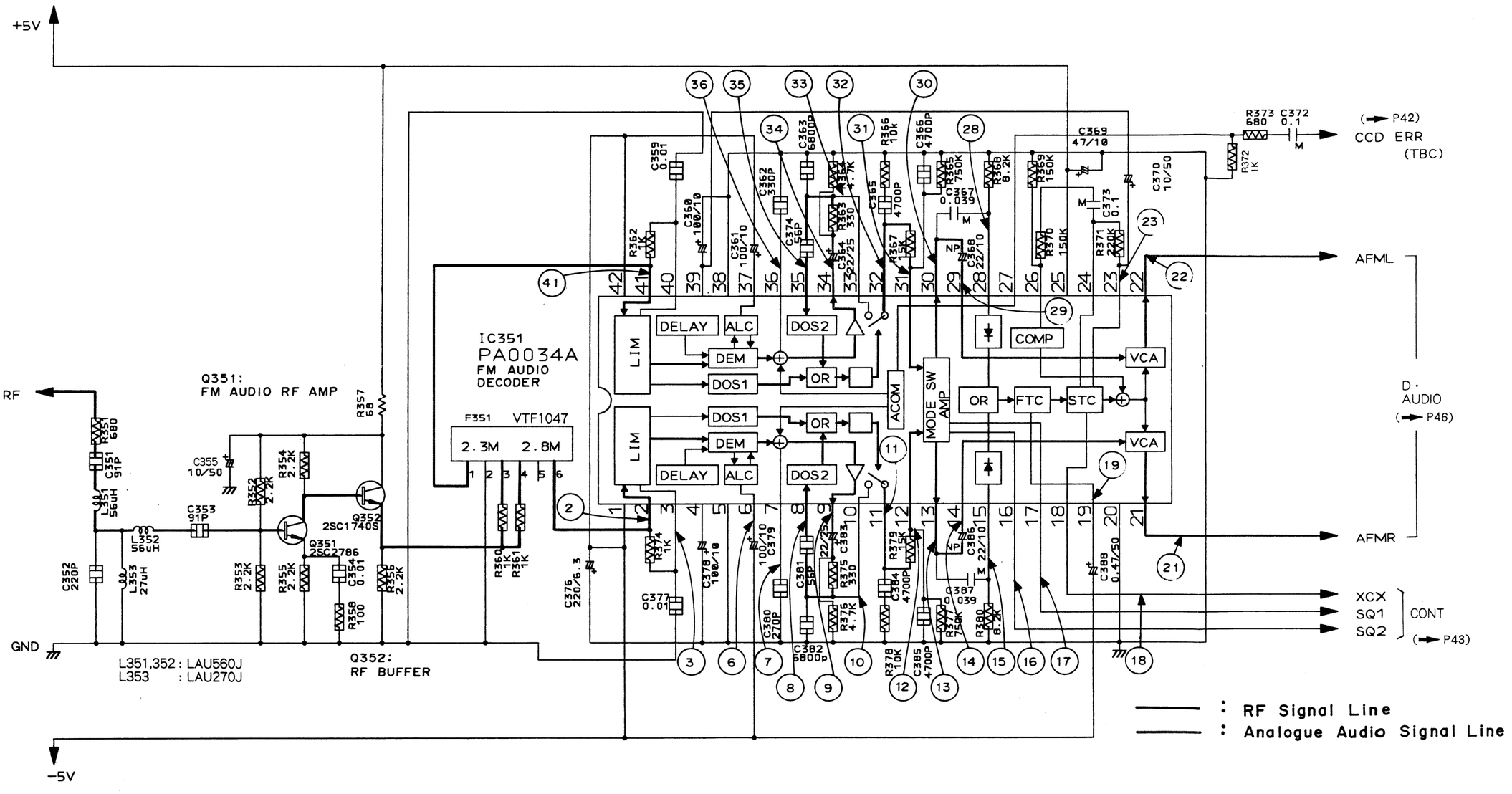
*: Refer to Waveforms

• IC351 (PA0034A)



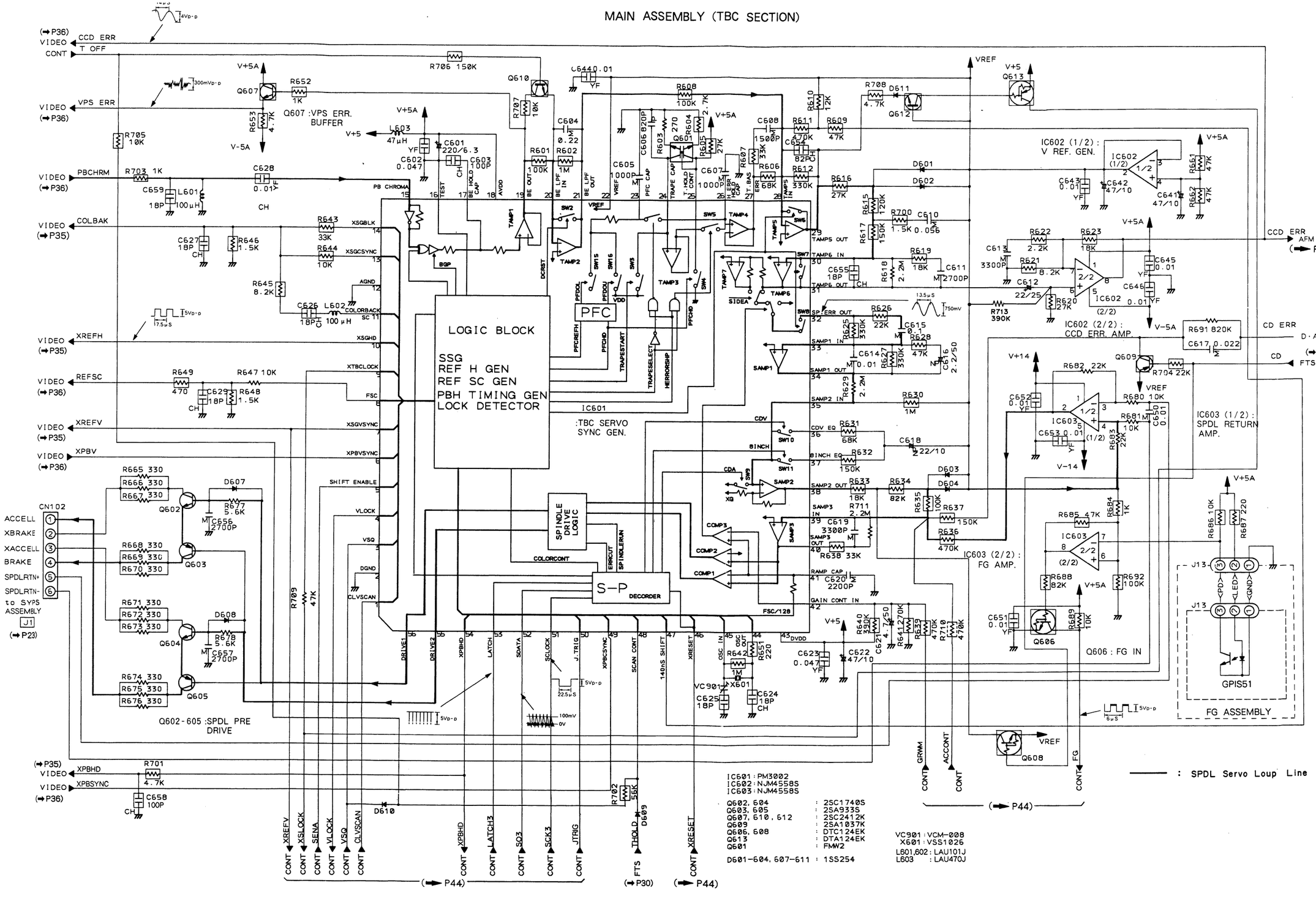
5.6 MAIN ASSEMBLY (AFM SECTION)

MAIN ASSEMBLY (AFM SECTION)

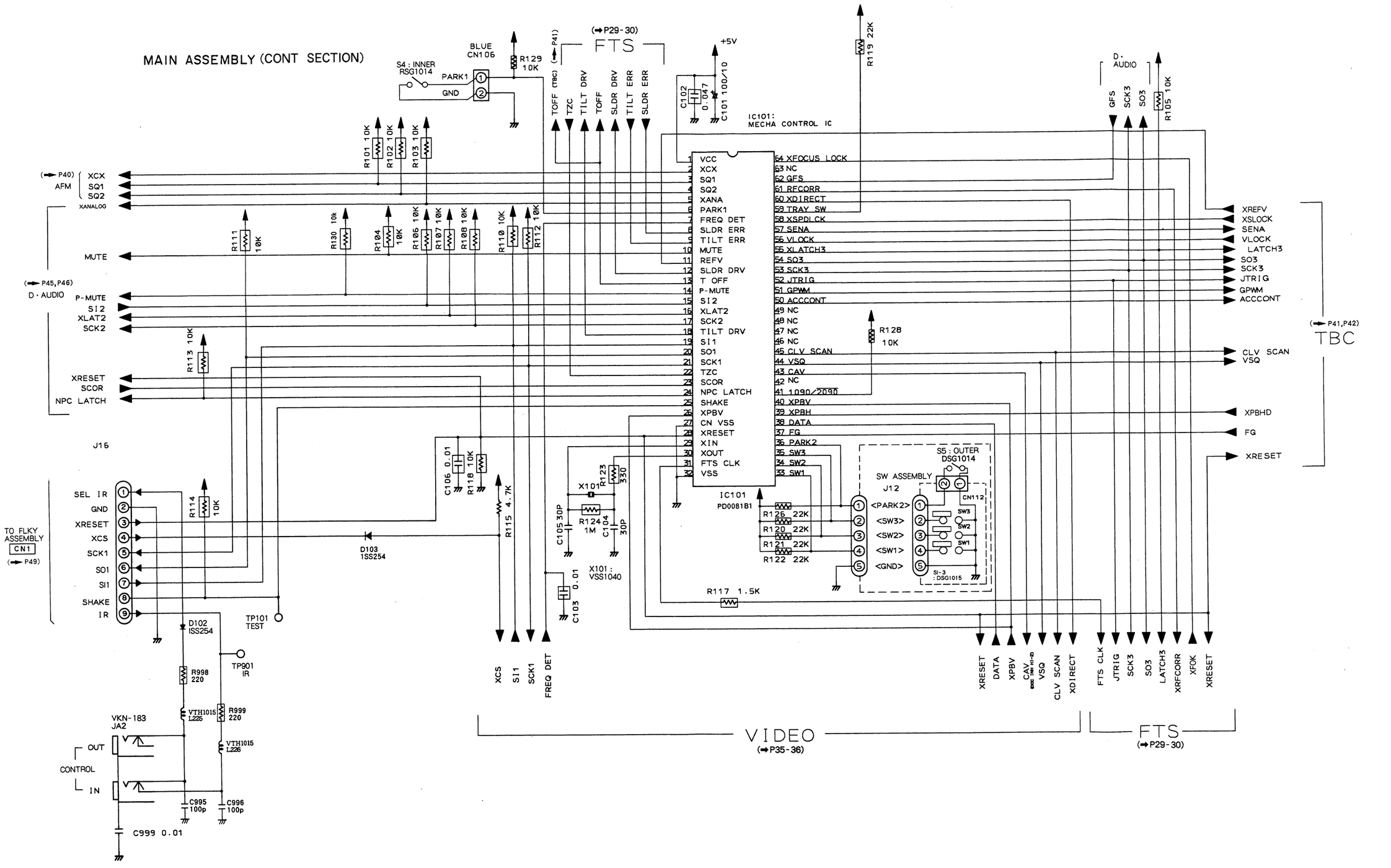


5.7 MAIN ASSEMBLY (TBC SECTION)

MAIN ASSEMBLY (TBC SECTION)

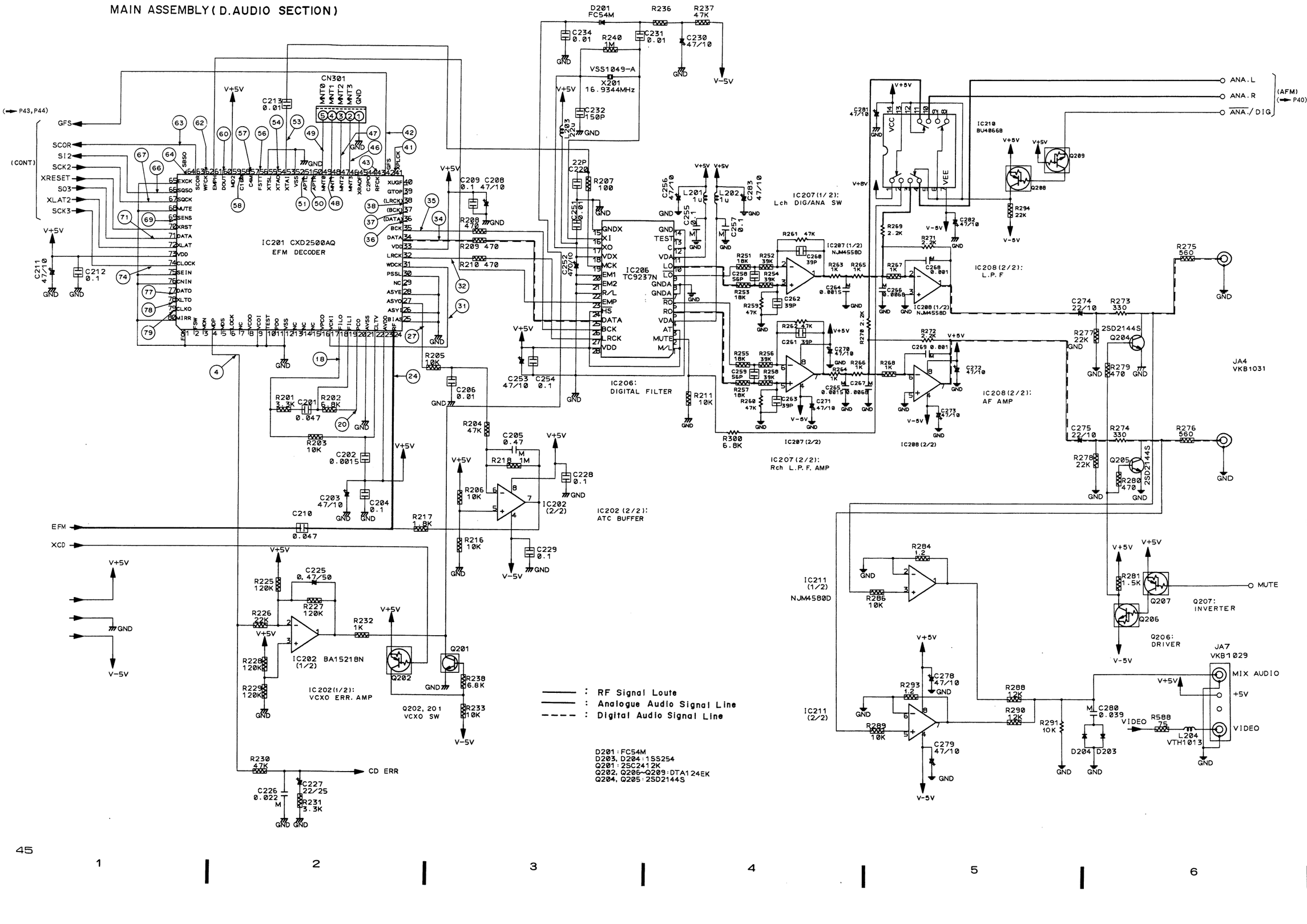


5.8 MAIN ASSEMBLY (CONT SECTION)



5.9 MAIN ASSEMBLY (D. AUDIO SECTION)

MAIN ASSEMBLY (D.AUDIO SECTION)



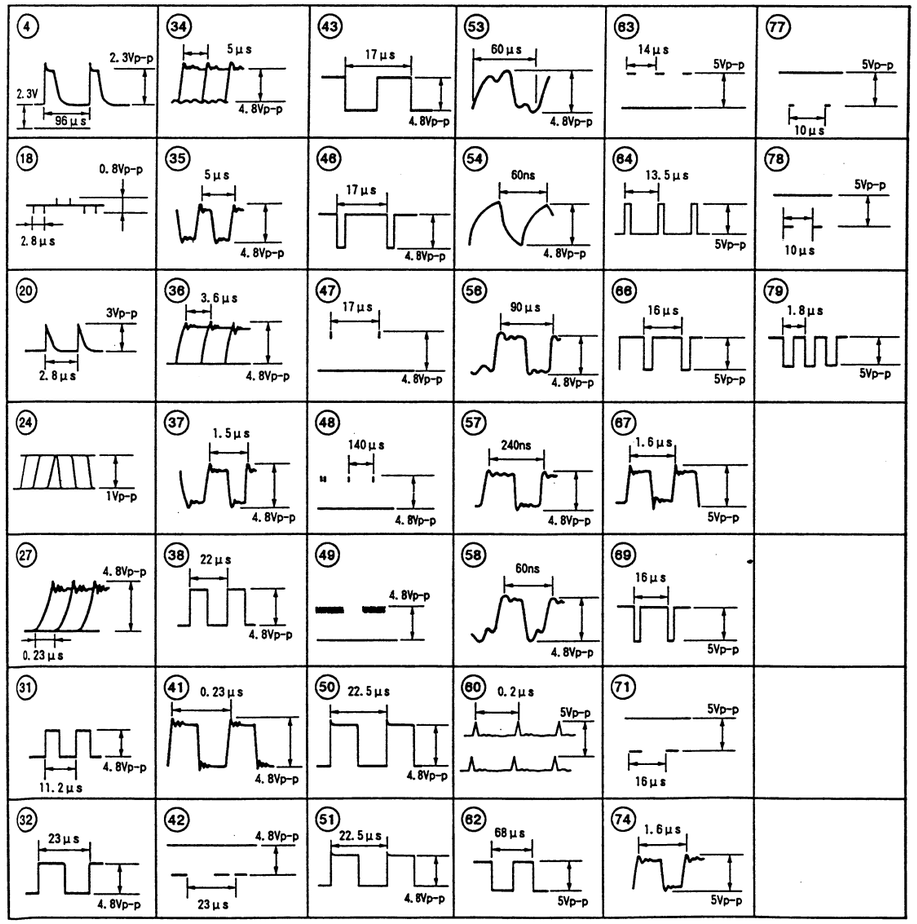
Note: Waveforms and voltages are at the PLAY

IC201 (CXD2500AQ)

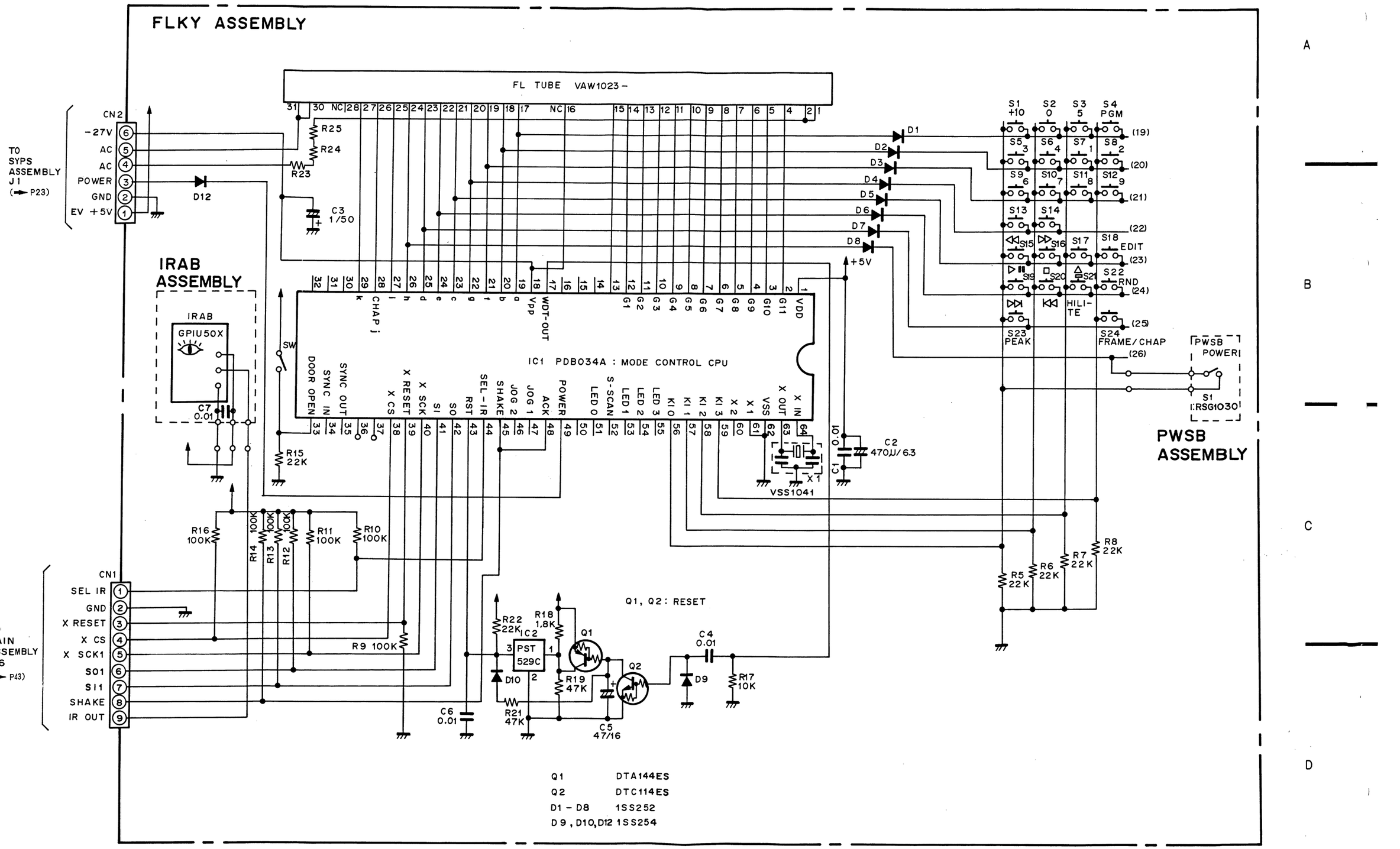
Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage
1	0	15	0	29	0	43	*	57	*	71	*
2	0	16	4.8	30	0	44	0	58	*	72	5
3	0	17	0	31	*	45	4.8	59	5	73	5
4	*	18	*	32	*	46	*	60	*	74	*
5	0	19	2.4	33	4.8	47	*	61	5	75	0
6	4.8	20	*	34	*	48	*	62	*	76	0
7	0	21	0	35	*	49	*	63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

*: Refer to Waveforms

IC201 (CXD2500AQ)



5.10 FLKY, PWSB AND IRAB ASSEMBLY

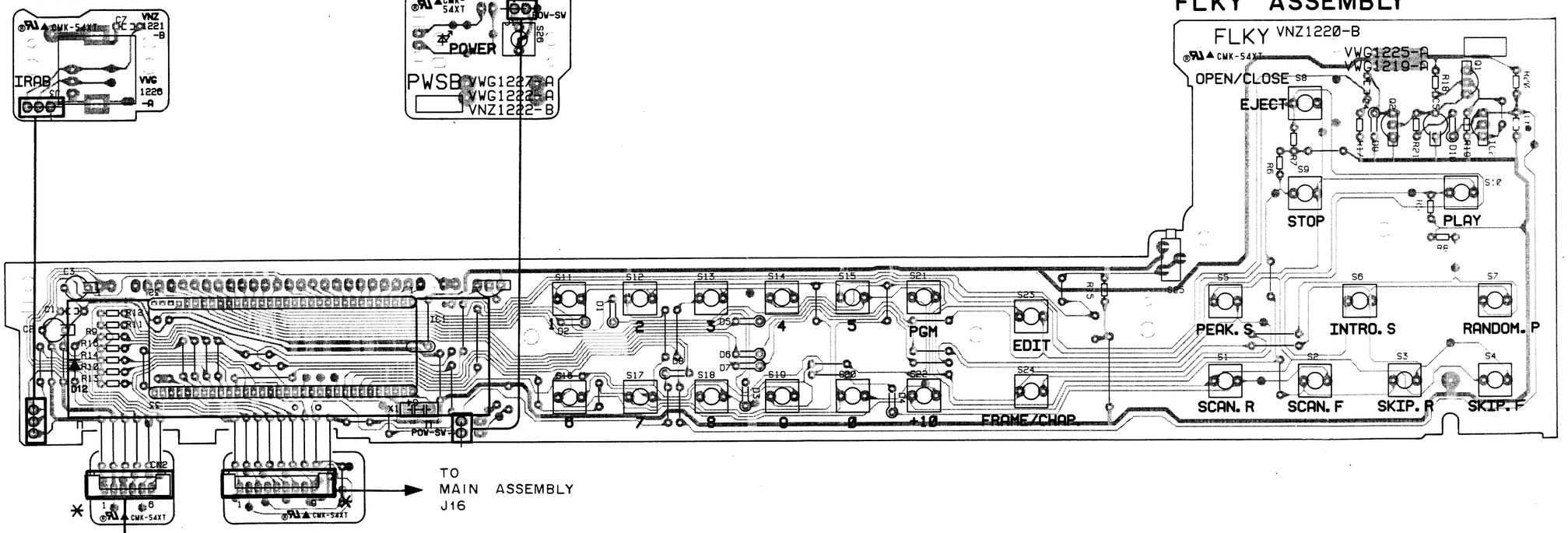


• View from component side

IRAB ASSEMBLY

PWSB ASSEMBLY

FLKY ASSEMBLY

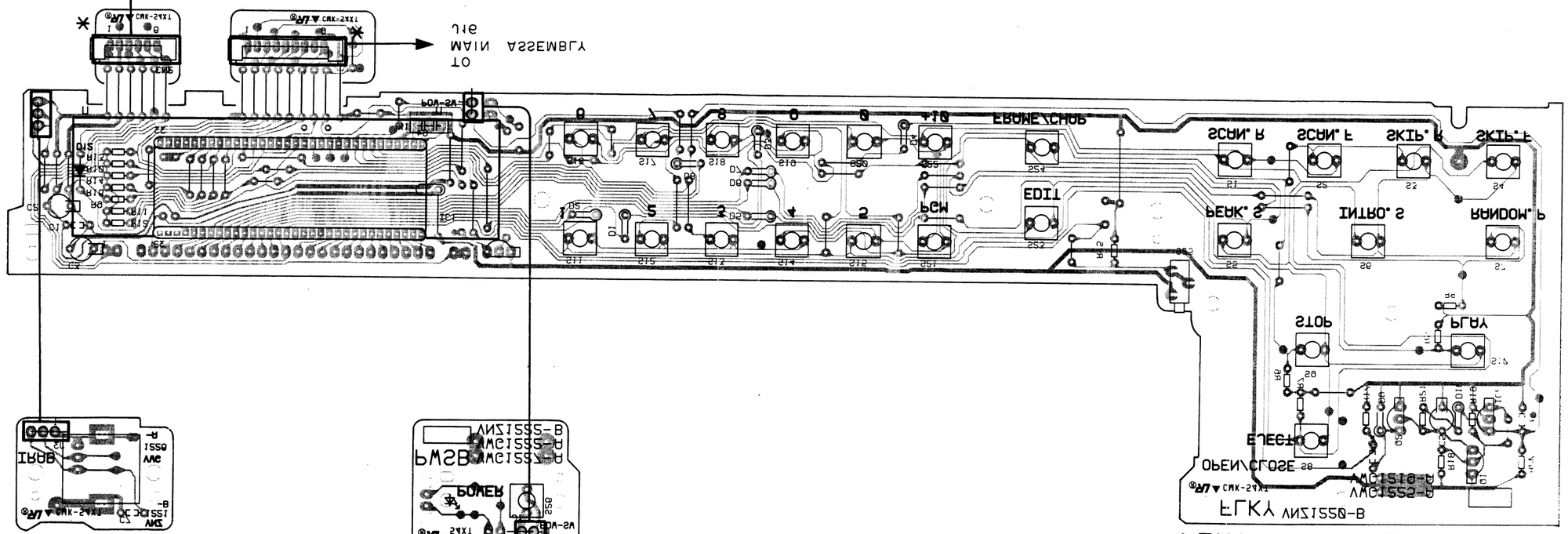


NOTE:
The marking line of the flat cable
Should be on the * Side.

NOTE:
The marking line of the flat cable
should be on the * side.

TO
CN52 ASSEMBLY
11

TO
MAIN ASSEMBLY
31P



FLKY ASSEMBLY

PWSB
ASSEMBLY

IRAB
ASSEMBLY

• View from soldering side

6. P.C.B's PARTS LIST

NOTES:

- Parts without part number cannot be supplied.
- Parts marked by "⊙" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- When ordering resistors, first convert resistance values into code form as shown in the following examples.

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

560 Ω → 56 × 10^1 → 561 ····· RD1/4PS 5 6 1 J
47k Ω → 47 × 10^3 → 473 ····· RD1/4PS 4 7 3 J
0.5 Ω → 0R5 ····· RN2H 0 R 5 K
1 Ω → 010 ····· RS1P 0 1 0 K

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

5.62k Ω → 562 × 10^1 → 5621 ····· RN1/4SR 5 6 2 1 F

Mark	No.	Description	Part No.
FLKY ASSEMBLY			
SEMICONDUCTORS			
	IC1		PDB034A
	IC2	RESET IC	PST529C
	Q1	TRANSISTOR	DTA144ES
	Q2	TRANSISTOR	DTC114ES
	D1-8	DIODE	1SS252
	D9, 10	DIODE	1SS254
	D12	DIODE	1SS254
SWITCHES			
	S1-24	SWITCH	RSG1030
	S25	DOOR SWITCH	VSK1015
CAPACITORS			
	C1	CERAMIC CAPACITOR	CKPUYY103N16
	C2	ELECTR. CAPACITOR	CEAL100M16
	C3	ELECTR. CAPACITOR	CEAL010M50
	C4	CERAMIC CAPACITOR	CKPUYY103N16
	C5	ELECTR. CAPACITOR	CEAL470M6R3
	C6	CERAMIC CAPACITOR	CKPUYY103N16
RESISTORS			
	R5-21	CARBONFILM RESISTOR	RD1/6PM□□□J
OTHERS			
	FL	SPACER	VEB1162
	V1	FL TUBE	VAW1023
	X1	CERAMIC RESONATOR	VSS1041
IRAB ASSEMBLY			
CAPACITORS			
	C7	CERAMIC CAPACITOR	CKPUYY103N16
OTHERS			
		REMOTE SENSOR	GP1U50X
PWSB ASSEMBLY			
SWITCHES			
	S26	SWITCH	RSG1030

Mark	No.	Description	Part No.
FG BOARD ASSEMBLY			
SEMICONDUCTORS			
	D1	OPT ISOLATOR	GP1S51
SW BOARD ASSEMBLY			
SWITCHES			
	S1-3	PUSH SWITCH	DSG1015
⊙ SYPS ASSEMBLY (VWR1103)			
SEMICONDUCTORS			
⚠	IC201, 202	IC PROTECTOR	ICP-N15
⚠	IC2	REGULATOR IC	NJM78M05FA
	IC1		NJM4558D
	Q1, 5, 6	TRANSISTOR	2SD1762
	Q2, 7, 8	TRANSISTOR	2SB1185
	D1		S2VB20-F
⚠	D2-6, 9, 10		1SR35-100AVL
⚠	D11, 12		10ELS2
COILS/TRANSFORMERS			
⚠	L1	FILTER	VTL1008
⚠	L2	FILTER	VTL-262
CAPACITORS			
	C1, 2	ELECTR. CAPACITOR(6800/10)	VCH1053
	C6-8	ELECTR. CAPACITOR	CEAS101M16
	C10-12	CERAMIC CAPACITOR	CGCYX473M25
	C3, 4	ELECTR. CAPACITOR	CEAS471M16
	C13, 14	ELECTR. CAPACITOR	CEAS2R2M50
⚠	C16, 17	CAPACITOR(0.01)	RCG-009
	C9	ELECTR. CAPACITOR	CEAS330M16
	C5	ELECTR. CAPACITOR	CEAS101M50
RESISTORS			
	R8-14	CARBONFILM RESISTOR	RD1/6PM□□□J
	R19, 20	CARBONFILM RESISTOR	RD1/6PM□□□J
	R4		RD1/2PM225J
⚠	R2, 3		RN16PQ4701F
⚠	R54		RS1PMFR51J

Mark	No.	Description	Part No.
	R15, 16, 21, 22(47Ω)		DCN1003

MAIN BOARD ASSEMBLY

SEMICONDUCTORS

	IC101	MECHANISM CONT. MCU	PD0081C
	IC201	EFM DEMODULATION IC	CXD2500AQ
	IC202	IC	BA15218N
	IC206		TC9237N
	IC207, 208	OP-AMP IC	BA15218
	IC210	ANALOG SWITCH	BU4066B
	IC211	LINEAR IC	NJM4558D
	IC351		PA0034A
	IC401	VIDEO IC	PA5013A
	IC402	CDD DELAY LINE	PM0001
	IC403	IC	CXL1009P
	IC404		PA0017
	IC405	CHARACTER GENE IC	PD0070
	IC601	TBC IC	PM3002
	IC602, 603	OP-AMP IC	NJM4558S
	IC801	PRE AMP IC	CXA1081S
	IC802	IC	BA15218N
	IC803	FTS IC	PM3003
	IC804	POWER OP AMP	LA6510
	Q201	CHIP TRANSISTOR	2SC2412K
	Q202	DIGITAL TRANSISTOR	DTA124EK
	Q204, 205	TRANSISTOR	2SD2144S
	Q206		DTC124EK
	Q207, 208	DIGITAL TRANSISTOR	DTA124EK
	Q209		DTC124EK
	Q351	TRANSISTOR	2SC2786
	Q352	TRANSISTOR	2SC1740S
	Q431	TRANSISTOR	2SC1740S
	Q432	CHIP TRANSISTOR	2SC2412K
	Q456	CHIP TRANSISTOR	2SC2412K
	Q457	CHIP TRANSISTOR	2SA1037K
	Q496	CHIP TRANSISTOR	2SA1037K
	Q497-500	CHIP TRANSISTOR	2SC2412K
	Q511	CHIP TRANSISTOR	2SA1037K
	Q541	CHIP TRANSISTOR	2SC2412K
	Q601		FMW2-TR
	Q602	TRANSISTOR	2SC1740S
	Q603	TRANSISTOR	2SA933S
	Q604	TRANSISTOR	2SC1740S
	Q605	TRANSISTOR	2SA933S
	Q606		DTC124EK
	Q607	CHIP TRANSISTOR	2SC2412K
	Q608		DTC124EK
	Q609	CHIP TRANSISTOR	2SA1037K
	Q610	CHIP TRANSISTOR	2SC2412K
	Q612	CHIP TRANSISTOR	2SC2412K
	Q613	DIGITAL TRANSISTOR	DTA124EK
	Q801-805	CHIP TRANSISTOR	2SC2412K
	Q806	CHIP TRANSISTOR	2SA1037K
	Q807	CHIP TRANSISTOR	2SC2412K
	Q808	CHIP TRANSISTOR	2SA1037K
	Q809, 810	CHIP TRANSISTOR	2SC2412K
	Q811		DTC124EK
	Q812	CHIP TRANSISTOR	2SA1037K
	Q814	CHIP TRANSISTOR	2SC2412K
	Q815	TRANSISTOR	2SD1762
	Q816	TRANSISTOR	2SB1185
	Q817	TRANSISTOR	2SD1762
	Q818	TRANSISTOR	2SB1185
	Q819	CHIP TRANSISTOR	2SA1037K
	Q820	DIGITAL TRANSISTOR	DTA124EK
	Q821	N-FET	2SK184
	Q822	TRANSISTOR	2SD1858X
	Q823		DTC124EK
	Q824	DIGITAL TRANSISTOR	DTA124EK
	Q825	CHIP TRANSISTOR	2SC2412K
	Q826	DIGITAL TRANSISTOR	DTA124EK
	Q827, 828		DTC124EK
	Q829, 830	DIGITAL TRANSISTOR	DTA124EK
	Q832	CHIP TRANSISTOR	2SA1037K
	Q833	CHIP TRANSISTOR	2SC2412K
	D102, 103	DIODE	1SS254
	D201	VARI-CAP	FC54M
	D203, 204	DIODE	1SS254
	D601-604	DIODE	1SS254
	D607-611	DIODE	1SS254
	D801	DIODE	1SS254
	D804-808	DIODE	1SS254

COILS/TRANSFORMERS

	L201, 202	AXIAL INDUCTOR	LAU010K
	L203	AXIAL INDUCTOR	LAU220J
	L204	FERRITE BEADS	VTH1013
	L351, 352	AXIAL INDUCTOR	LAU560J
	L353	AXIAL INDUCTOR	LAU270J
	L411	AXIAL INDUCTOR	LAU330J
	L412, 413	AXIAL INDUCTOR	LAU220J
	L414, 415	AXIAL INDUCTOR	LAU120J
	L416	AXIAL INDUCTOR	LAU430J
	L431	AXIAL INDUCTOR	LAU430J
	L432	AXIAL INDUCTOR	LAU620J
	L433	AXIAL INDUCTOR	LAU390J
	L441	AXIAL INDUCTOR	LAU270J
	L456	RADIAL INDUCTOR	LFA471J
	L457, 458	RADIAL INDUCTOR	LFA221J
	L496	AXIAL INDUCTOR	LAU180J
	L497	AXIAL INDUCTOR	LAU181J
	L511	AXIAL INDUCTOR	LAU820J
	L521	AXIAL INDUCTOR	LAU120J
	L522	AXIAL INDUCTOR	LAU560J
	L523	AXIAL INDUCTOR	LAU220J
	L524	RADIAL INDUCTOR	LFA561K
	L541	AXIAL INDUCTOR	LAU120J
	L601, 602	AXIAL INDUCTOR	LAU101J
	L603	AXIAL INDUCTOR	LAU470J

Mark	No.	Description	Part No.
	L801	AXIAL INDUCTOR	LAU151J
	L802	AXIAL INDUCTOR	LAU181J
	L803	AXIAL INDUCTOR	LAU151J
	F101	FILTER	VTH1033
	F291	FILTER	VTH1033
	F292	FILTER	VTH1032
	F351		VTF1047
CAPACITORS			
	C101	ELECTR. CAPACITOR	CEAS101M10
	C102	CERAMIC CAPACITOR	CKSQYF473Z25
	C103	CHIP CAPACITOR	CKSQYF103Z50
	C104, 105	CERAMIC CAPACITOR	CCCCH300J50
	C106	CHIP CAPACITOR	CKSQYF103Z50
	C201	CERAMIC CAPACITOR	CKSQYF473Z25
	C202	CERAMIC CAPACITOR	CKSQYB152K50
	C203	ELECTR. CAPACITOR	CEJA470M10
	C204	CERAMIC CAPACITOR	CKSQYF104Z25
	C205	FILM CAPACITOR	CFTNA474J50
	C206	CHIP CAPACITOR	CKSQYF103Z50
	C208	ELECTR. CAPACITOR	CEAS470M10
	C209	CERAMIC CAPACITOR	CKSQYF104Z25
	C210	CERAMIC CAPACITOR	CKSQYF473Z25
	C211	ELECTR. CAPACITOR	CEJA470M10
	C212	CERAMIC CAPACITOR	CKSQYF104Z25
	C213	CHIP CAPACITOR	CKSQYF103Z50
	C220	CHIP CERAMIC C.	CCSQCH220J50
	C225	ELECTR. CAPACITOR	CEANPR47M50
	C226	FILM CAPACITOR	CFTNA223J50
	C227	ELECTR. CAPACITOR	CEAS220M25
	C228, 229	CERAMIC CAPACITOR	CKSQYF104Z25
	C230	ELECTR. CAPACITOR	CEAS470M10
	C231	CHIP CAPACITOR	CKSQYF103Z50
	C232	CERAMIC CAPACITOR	CCSQCH151J50
	C234	CHIP CAPACITOR	CKSQYF103Z50
	C251	CHIP CAPACITOR	CKSQYF103Z50
	C252, 253	ELECTR. CAPACITOR	CEAS470M10
	C254	CERAMIC CAPACITOR	CKSQYF104Z25
	C255	FILM CAPACITOR	CFTNA104J50
	C256	ELECTR. CAPACITOR	CEAS470M10
	C257	FILM CAPACITOR	CFTNA104J50
	C258, 259	CERAMIC CAPACITOR	CCSQCH560J50
	C260-263	CERAMIC CAPACITOR	CCSQCH390J50
	C264, 265	MYLOR FILM CAPACITOR	CQMA152J50
	C266, 267	MYLOR FILM CAPACITOR	CQMA682J50
	C268, 269	MYLOR FILM CAPACITOR	CQMA102J50
	C270-273	ELECTR. CAPACITOR	CEAS470M10
	C274, 275	ELECTR. CAPACITOR	CEANP220M10
	C278, 279	ELECTR. CAPACITOR	CEAS470M10
	C280	FILM CAPACITOR	CFTNA393J50
	C281-283	ELECTR. CAPACITOR	CEAS470M10
	C351	CHIP CAPACITOR	CCSQCH910J50
	C352	CHIP CERAMIC C.	CCSQCH221J50
	C353	CHIP CAPACITOR	CCSQCH910J50
	C354	CHIP CAPACITOR	CKSQYF103Z50
	C355	ELECTR. CAPACITOR	CEAS100M50
	C359	CHIP CAPACITOR	CKSQYF103Z50
	C360, 361	ELECTR. CAPACITOR	CEAS101M10
	C362	CERAMIC CAPACITOR	CCSQSL331J50
	C363	CHIP CAPACITOR	CKSQYB682K50
	C364	ELECTR. CAPACITOR	CEAS220M25
	C365, 366	CERAMIC CAPACITOR	CKSQYB472K50
	C367	FILM CAPACITOR	CFTNA393J50
	C368	ELECTR. CAPACITOR	CEANP220M10
	C369	ELECTR. CAPACITOR	CEAS470M10
	C370	ELECTR. CAPACITOR	CEAS100M50
	C372, 373	FILM CAPACITOR	CFTNA104J50
	C374	CERAMIC CAPACITOR	CCSQCH560J50
	C376	ELECTR. CAPACITOR	CEAS221M6R3
	C377	CHIP CAPACITOR	CKSQYF103Z50
	C378, 379	ELECTR. CAPACITOR	CEAS101M10
	C380	CHIP CERAMIC C.	CCSQCH271J50
	C381	CERAMIC CAPACITOR	CCSQCH560J50
	C382	CHIP CAPACITOR	CKSQYB682K50
	C383	ELECTR. CAPACITOR	CEAS220M25
	C384, 385	CERAMIC CAPACITOR	CKSQYB472K50
	C386	ELECTR. CAPACITOR	CEANP220M10
	C387	FILM CAPACITOR	CFTNA393J50
	C388	ELECTR. CAPACITOR	CEASR47M50
	C407, 408	CERAMIC CAPACITOR	CKSQYF473Z25
	C411	CHIP CAPACITOR	CCSQCH101J50
	C412	CERAMIC CAPACITOR	CCSQCH470J50
	C413	CERAMIC CAPACITOR	CCSQCH151J50
	C414	CHIP CERAMIC C.	CCSQCH221J50
	C415	CERAMIC CAPACITOR	CCSQCH270J50
	C416	CERAMIC CAPACITOR	CCSQCH390J50
	C417, 418	CERAMIC CAPACITOR	CCSQCH120J50
	C419, 420	CERAMIC CAPACITOR	CCSQCH470J50
	C423, 424	CHIP CAPACITOR	CCSQCH180J50
	C425, 426	CHIP CAPACITOR	CKSQYF103Z50
	C427	CERAMIC CAPACITOR	CKSQYF104Z25
	C428	ELECTR. CAPACITOR	CEAS470M10
	C429	CERAMIC CAPACITOR	CKSQYF104Z25
	C431, 432	CERAMIC CAPACITOR	CKSQYF473Z25
	C433	CERAMIC CAPACITOR	CCSQCH390J50
	C434	ELECTR. CAPACITOR	CEAS101M10
	C435	CERAMIC CAPACITOR	CKSQYF104Z25
	C436	ELECTR. CAPACITOR	CEAS010M50
	C437	CHIP CERAMIC C.	CCSQCH240J50
	C438	CERAMIC CAPACITOR	CCSQCH120J50
	C439	CERAMIC CAPACITOR	CCSQCH470J50
	C440	CERAMIC CAPACITOR	CCSQCH390J50
	C441	CERAMIC CAPACITOR	CCSQCH070D50
	C442	CERAMIC CAPACITOR	CKSQYF104Z25
	C443	ELECTR. CAPACITOR	CEAS4R7M50
	C444	MYLOR FILM CAPACITOR	CQMA272J50
	C445	ELECTR. CAPACITOR	CEAS101M10
	C446	FILM CAPACITOR	CFTNA103J50
	C447	CHIP CAPACITOR	CCSQCH330J50

Mark	No.	Description	Part No.
	C448, 449	CERAMIC CAPACITOR	CKSQYF473Z25
	C450	CHIP CAPACITOR	CCSQCH100D50
	C451	CERAMIC CAPACITOR	CCSQCH270J50
	C452	ELECTR. CAPACITOR	CEAS470M10
	C456	CHIP CAPACITOR	CCSQCH101J50
	C457	ELECTR. CAPACITOR	CEAS101M10
	C458-460	CHIP CAPACITOR	CKSQYF103Z50
	C461	CHIP CAPACITOR	CCSQCH101J50
	C462	CHIP CAPACITOR	CCSQCH330J50
	C463	CHIP CERAMIC C.	CCSQCH271J50
	C464, 465	ELECTR. CAPACITOR	CEAS470M10
	C466, 467	CERAMIC CAPACITOR	CKSQYF473Z25
	C471	ELECTR. CAPACITOR	CEAS010M50
	C472	ELECTR. CAPACITOR	CEAS3R3M50
	C473	CERAMIC CAPACITOR	CKSQYF473Z25
	C474	FILM CAPACITOR	CFTNA224J50
	C475, 476	ELECTR. CAPACITOR	CEAS3R3M50
	C477, 478	CERAMIC CAPACITOR	CKSQYF473Z25
	C479, 480	CERAMIC CAPACITOR	CKSQYF104Z25
	C483	CERAMIC CAPACITOR	CKSQYF473Z25
	C484	ELECTR. CAPACITOR	CEAS470M25
	C485	CHIP CERAMIC C.	CCSQCH220J50
	C486	CHIP CAPACITOR	CKSQYF103Z50
	C487, 488	CERAMIC CAPACITOR	CKSQYF473Z25
	C489, 490	ELECTR. CAPACITOR	CEAS101M10
	C496	CERAMIC CAPACITOR	CCSQCH390J50
	C497	CHIP CAPACITOR	CCSQCH100D50
	C498	CERAMIC CAPACITOR	CCSQCH820J50
	C499	ELECTR. CAPACITOR	CEAS470M10
	C500	CHIP CAPACITOR	CCSQCH100D50
	C501, 502	ELECTR. CAPACITOR	CEAS470M10
	C503	CERAMIC CAPACITOR	CKSQYF104Z25
	C504	CERAMIC CAPACITOR	CKSQYF473Z25
	C505, 506	CERAMIC CAPACITOR	CKSQYF104Z25
	C507	CERAMIC CAPACITOR	CKSQYF473Z25
	C509	CERAMIC CAPACITOR	CCSQCH151J50
	C510	CERAMIC CAPACITOR	CCSQCH270J50
	C511	CERAMIC CAPACITOR	CKSQYF104Z25
	C512	ELECTR. CAPACITOR	CEAS470M10
	C513	CERAMIC CAPACITOR	CKSQYF104Z25
	C514	FILM CAPACITOR	CFTNA104J50
	C515	FILM CAPACITOR	CFTNA683J50
	C516	CHIP CERAMIC C.	CCSQCH220J50
	C517	FILM CAPACITOR	CFTNA683J50
	C521	ELECTR. CAPACITOR	CEAS470M10
	C522	ELECTR. CAPACITOR	CEAS100M50
	C524	CERAMIC CAPACITOR	CCSQCH390J50
	C525	ELECTR. CAPACITOR	CEAS470M10
	C526	CERAMIC CAPACITOR	CKSQYF104Z25
	C527	CERAMIC CAPACITOR	CKSQYF473Z25
	C528	CHIP CAPACITOR	CCSQCH101J50
	C529	CHIP CAPACITOR	CCSQCH910J50
	C530	ELECTR. CAPACITOR	CEANP100M16
	C531	CERAMIC CAPACITOR	CKSQYF104Z25
	C533	ELECTR. CAPACITOR	CEAS470M10
	C534	CERAMIC CAPACITOR	CKSQYF473Z25
	C535	CHIP CAPACITOR	CKSQYF103Z50
	C536	CHIP CAPACITOR	CCSQCH910J50
	C537	CAPACITOR(CERAMIC)	CKSYF105Z16
	C541	CERAMIC CAPACITOR	CKSQYF104Z25
	C542	ELECTR. CAPACITOR	CEAS470M10
	C543	CERAMIC CAPACITOR	CKSQYF104Z25
	C544	CERAMIC CAPACITOR	CKSQYF473Z25
	C545	CHIP CAPACITOR	CCSQCH680J50
	C546	CERAMIC CAPACITOR	CCSQCH470J50
	C547, 548	CERAMIC CAPACITOR	CKSQYF473Z25
	C567	CERAMIC CAPACITOR	CKSQYF473Z25
	C582	ELECTR. CAPACITOR	CEAS221M6R3
	C601	ELECTR. CAPACITOR	CEAS221M6R3
	C602	CERAMIC CAPACITOR	CKSQYF473Z25
	C603	CHIP CAPACITOR	CCSQCH101J50
	C604	FILM CAPACITOR	CFTNA224J50
	C605	MYLOR FILM CAPACITOR	CQMA102J50
	C606	CAPACITOR	CQPA821J100
	C607	MYLOR FILM CAPACITOR	CQMA102J50
	C608	MYLOR FILM CAPACITOR	CQMA152J50
	C610	FILM CAPACITOR	CFTNA563J50
	C611	MYLOR FILM CAPACITOR	CQMA272J50
	C612	ELECTR. CAPACITOR	CEAS220M25
	C613	MYLOR FILM CAPACITOR	CQMA332J50
	C614	FILM CAPACITOR	CFTNA103J50
	C615	FILM CAPACITOR	CFTNA563J50
	C616	ELECTR. CAPACITOR	CEANP2R2M50
	C617	FILM CAPACITOR	CFTNA223J50
	C618	ELECTR. CAPACITOR	CEANP220M10
	C619	MYLOR FILM CAPACITOR	CQMA332J50
	C620	MYLOR FILM CAPACITOR	CQMA222J50
	C621	ELECTR. CAPACITOR	CEAS4R7M50
	C622	ELECTR. CAPACITOR	CEAS470M10
	C623	CERAMIC CAPACITOR	CKSQYF473Z25
	C624-627	CHIP CAPACITOR	CCSQCH180J50
	C628	CHIP CAPACITOR	CKSQYF103Z50
	C629	CHIP CAPACITOR	CCSQCH180J50
	C641, 642	ELECTR. CAPACITOR	CEAS470M10
	C643-646	CHIP CAPACITOR	CKSQYF103Z50
	C650	FILM CAPACITOR	CFTNA103J50
	C651-653	CHIP CAPACITOR	CKSQYF103Z50
	C654	CERAMIC CAPACITOR	CCSQCH820J50
	C655	CHIP CAPACITOR	CCSQCH180J50
	C656, 657	MYLOR FILM CAPACITOR	CQMA272J50
	C658	CHIP CAPACITOR	CCSQCH101J50
	C659	CHIP CAPACITOR	CCSQCH180J50
	C801-803	CHIP CAPACITOR	CKSQYF103Z50
	C804	CERAMIC CAPACITOR	CCSQCH390J50
	C805	CERAMIC CAPACITOR	CKSQYF473Z25
	C806	CHIP CERAMIC C.	CCSQCH220J50
	C807	FILM CAPACITOR	CFTNA124J50
	C808	ELECTR. CAPACITOR	CEAS010M50
	C809	CHIP CAPACITOR	CCSQCH680J50
	C810, 811	CHIP CAPACITOR	CCSQCH101J50

Mark	No.	Description	Part No.
	C812	CERAMIC CAPACITOR	CCSQCH270J50
	C813	CHIP CAPACITOR	CCSQCH680J50
	C814	ELECTR. CAPACITOR	CEAS010M50
	C815	CERAMIC CAPACITOR	CCSQCH270J50
	C816	ELECTR. CAPACITOR	CEAS010M50
	C817	CHIP CAPACITOR	CCSQCH050C50
	C818	CHIP CAPACITOR	CCSQSL471J50
	C819	CHIP CAPACITOR	CCSQSL561J50
	C820	CERAMIC CAPACITOR	CKSQYF473Z25
	C822	CHIP CAPACITOR	CCSQCH101J50
	C823	ELECTR. CAPACITOR	CEAS010M50
	C824	FILM CAPACITOR	CFTNA103J50
	C825	MYLOR FILM CAPACITOR	CQMA682J50
	C827	FILM CAPACITOR	CFTNA333J50
	C828, 829	CHIP CAPACITOR	CKSQYF103Z50
	C830	FILM CAPACITOR	CFTNA154J50
	C832	FILM CAPACITOR	CFTNA104J50
	C834	MYLOR FILM CAPACITOR	CQMA152J50
	C835, 836	ELECTR. CAPACITOR	CEAS220M25
	C837	CERAMIC CAPACITOR	CCCSL331J50
	C838	FILM CAPACITOR	CFTNA104J50
	C839	MYLOR FILM CAPACITOR	CQMA102J50
	C840	ELECTR. CAPACITOR	CEAS010M50
	C841	ELECTR. CAPACITOR	CEAS220M25
	C842	ELECTR. CAPACITOR	CEJANP100M16
	C843	FILM CAPACITOR	CFTNA223J50
	C845	ELECTR. CAPACITOR	CEJANP100M16
	C847	FILM CAPACITOR	CFTNA683J50
	C848	FILM CAPACITOR	CFTNA473J50
	C849	FILM CAPACITOR	CFTNA103J50
	C850	ELECTR. CAPACITOR	CEANP2R2M50
	C851	CERAMIC CAPACITOR	CKSQYF104Z25
	C852	FILM CAPACITOR	CFTNA224J50
	C853	MYLOR FILM CAPACITOR	CQMA332J50
	C854	CERAMIC CAPACITOR	CKSQYB821K50
	C855	ELECTR. CAPACITOR	CEAS100M50
	C856	CHIP CAPACITOR	CKSQYF103Z50
	C857	ELECTR. CAPACITOR	CEAS221M6R3
	C858	CERAMIC CAPACITOR	CKSQYF104Z25
	C859	ELECTR. CAPACITOR	CEAS221M6R3
	C860	CERAMIC CAPACITOR	CKSQYF104Z25
	C861	FILM CAPACITOR	CFTNA103J50
	C863	ELECTR. CAPACITOR	CEANP100M16
	C864	ELECTR. CAPACITOR	CEAS100M50
	C865	FILM CAPACITOR	CFTNA103J50
	C866	ELECTR. CAPACITOR	CEANPR47M50
	C867	FILM CAPACITOR	CFTNA333J50
	C868	FILM CAPACITOR	CFTNA683J50
	C869	FILM CAPACITOR	CFTNA473J50
	C870	ELECTR. CAPACITOR	CEANP470M10
	C871	CERAMIC CAPACITOR	CCCSL331J50
	C873	FILM CAPACITOR	CFTNA103J50
	C874	FILM CAPACITOR	CFTNA104J50
	C875	CERAMIC CAPACITOR	CKSQYB562K50
	C876, 877	ELECTR. CAPACITOR	CEAS220M25
	C878	FILM CAPACITOR	CFTNA104J50
	C879	CERAMIC CAPACITOR	CKSQYB562K50
	C880	FILM CAPACITOR	CFTNA104J50
	C881, 882	CERAMIC CAPACITOR	CKSQYF104Z25
	C883	FILM CAPACITOR	CFTNA823J50
	C890, 891	CERAMIC CAPACITOR	CCSQCH470J50
	C893	CERAMIC CAPACITOR	CCSQCH470J50
	C895	CHIP CAPACITOR	CCSQCH100D50
	C896, 897	ELECTR. CAPACITOR	CEAS470M10
	C898	MYLOR FILM CAPACITOR	CQMA472J50
	C899	MYLOR FILM CAPACITOR	CQMA272J50
	C900	FILM CAPACITOR	CFTNA224J50
	C901	FILM CAPACITOR	CFTNA103J50
	C902	ELECTR. CAPACITOR	CEAS100M50
	C999	CERAMIC CAPACITOR	CKCYF103Z50
RESISTORS			
	R101-108	CHIP RESISTOR	RS1/10S□□□J
	R110-115	CHIP RESISTOR	RS1/10S□□□J
	R117-124	CHIP RESISTOR	RS1/10S□□□J
	R126	CHIP RESISTOR	RS1/10S□□□J
	R128, 129	CHIP RESISTOR	RS1/10S□□□J
	R201-211	CHIP RESISTOR	RS1/10S□□□J
	R216-218	CHIP RESISTOR	RS1/10S□□□J
	R225-233	CHIP RESISTOR	RS1/10S□□□J
	R236-238	CHIP RESISTOR	RS1/10S□□□J
	R240	CHIP RESISTOR	RS1/10S□□□J
	R251-258	CHIP RESISTOR	RS1/10S□□□J
	R259-266	CARBONFILM RESISTOR	RD1/6PM□□□J
	R267-270	CHIP RESISTOR	RS1/10S□□□J
	R271-274	CARBONFILM RESISTOR	RD1/6PM□□□J
	R275-281	CHIP RESISTOR	RS1/10S□□□J
	R284		RS1/10S□□□J
	R286	CHIP RESISTOR	RS1/10S□□□J
	R288-290	CHIP RESISTOR	RS1/10S□□□J
	R291	CARBONFILM RESISTOR	RD1/6PM□□□J
	R293, 294	CHIP RESISTOR	RS1/10S□□□J
	R351-356	CHIP RESISTOR	RS1/10S□□□J
	R357	CARBONFILM RESISTOR	RD1/6PM□□□J
	R358	CHIP RESISTOR	RS1/10S□□□J
	R360-380	CHIP RESISTOR	RS1/10S□□□J
	R411-413	CHIP RESISTOR	RS1/10S□□□J
	R415, 416	METALFILM RESISTOR	RN1/6PQ□□□□F
	R431	CARBONFILM RESISTOR	RD1/6PM□□□J
	R432	CHIP RESISTOR	RS1/10S□□□J
	R434	METALFILM RESISTOR	RN1/6PQ□□□□F
	R435-437	CHIP RESISTOR	RS1/10S□□□J
	R438	METALFILM RESISTOR	RN1/6PQ□□□□F
	R439-441	CHIP RESISTOR	RS1/10S□□□J
	R442	CARBONFILM RESISTOR	RD1/6PM□□□J
	R443, 444	CHIP RESISTOR	RS1/10S□□□J
	R456	CARBONFILM RESISTOR	RD1/6PM□□□J
	R457-459	CHIP RESISTOR	RS1/10S□□□J
	R471-476	CHIP RESISTOR	RS1/10S□□□J
	R496-504	CHIP RESISTOR	RS1/10S□□□J
	R506, 507	CHIP RESISTOR	RS1/10S□□□J

Mark	No.	Description	Part No.
	R511	METALFILM RESISTOR	RN1/6PQ□□□□F
	R512-519	CHIP RESISTOR	RS1/10S□□□J
	R521-533	CHIP RESISTOR	RS1/10S□□□J
	R542, 543	CHIP RESISTOR	RS1/10S□□□J
	R588		RS1/10S□□□J
	R601, 602	CHIP RESISTOR	RS1/10S□□□J
	R603	CARBONFILM RESISTOR	RD1/6PM□□□J
	R604-612		RS1/10S□□□J
	R615-617	CHIP RESISTOR	RS1/10S□□□J
	R618	CARBONFILM RESISTOR	RD1/6PM□□□J
	R619-623	CHIP RESISTOR	RS1/10S□□□J
	R625-628	CHIP RESISTOR	RS1/10S□□□J
	R629	CARBONFILM RESISTOR	RD1/6PM□□□J
	R630-646	CHIP RESISTOR	RS1/10S□□□J
	R647	CARBONFILM RESISTOR	RD1/6PM□□□J
	R648, 649	CHIP RESISTOR	RS1/10S□□□J
	R651-653	CHIP RESISTOR	RS1/10S□□□J
	R661, 662	CHIP RESISTOR	RS1/10S□□□J
	R665-678	CARBONFILM RESISTOR	RD1/6PM□□□J
	R680-683	METALFILM RESISTOR	RN1/6PQ□□□□F
	R684-689	CHIP RESISTOR	RS1/10S□□□J
	R691	CARBONFILM RESISTOR	RD1/6PM□□□J
	R692	CHIP RESISTOR	RS1/10S□□□J
	R700-708	CHIP RESISTOR	RS1/10S□□□J
	R709	CARBONFILM RESISTOR	RD1/6PM□□□J
	R710	CHIP RESISTOR	RS1/10S□□□J
	R713		RS1/10S□□□J
	R801-848	CHIP RESISTOR	RS1/10S□□□J
	R849	CARBONFILM RESISTOR	RD1/6PM□□□J
	R850	METAL OXIDE RESISTOR	RS1LMF□□□J
	R853, 854	CHIP RESISTOR	RS1/10S□□□J
	R856		RS1/10S□□□J
	R858-860	CHIP RESISTOR	RS1/10S□□□J
	R862	METAL OXIDE RESISTOR	RS1LMF□□□J
	R865-868	CHIP RESISTOR	RS1/10S□□□J
	R869	CARBONFILM RESISTOR	RD1/6PM□□□J
	R870	CHIP RESISTOR	RS1/10S□□□J
	R872	CHIP RESISTOR	RS1/10S□□□J
	R873	CARBONFILM RESISTOR	RD1/6PM□□□J
	R874-897	CHIP RESISTOR	RS1/10S□□□J
	R899-909	CHIP RESISTOR	RS1/10S□□□J
	R910-912	CARBONFILM RESISTOR	RD1/6PM□□□J
	R913-922	CHIP RESISTOR	RS1/10S□□□J
	R923	CARBONFILM RESISTOR	RD1/6PM□□□J
	R925-932	CHIP RESISTOR	RS1/10S□□□J
	R934-938	CHIP RESISTOR	RS1/10S□□□J
	R940, 941	CHIP RESISTOR	RS1/10S□□□J
	R942	CARBONFILM RESISTOR	RD1/6PM□□□J
	R943-951		RS1/10S□□□J
	R953	CHIP RESISTOR	RS1/10S□□□J
	R955-957	CHIP RESISTOR	RS1/10S□□□J
	R959-962	CHIP RESISTOR	RS1/10S□□□J
	R964	CHIP RESISTOR	RS1/10S□□□J
	R966-970		RS1/10S□□□J
	R982, 983	CHIP RESISTOR	RS1/10S□□□J
	R998, 999	CHIP RESISTOR	RS1/10S□□□J
	R980	CHIP RESISTOR	RS1/10S□□□J
	VR441	SEMI-FIXED RESISTOR	VRTB6VS103
	VR481	VR	VRTB6VS472
	VR482	SEMI-FIXED RESISTOR	VRTB6VS103
	VR521	VR	VRTG6VS472
	VR601	VR	VRTB6VS102
	VR602, 603	SEMI-FIXED RESISTOR	VRTB6VS103
	VR604	VR	VRTB6VS472
	VR605, 606	VR	VRTB6VS222
	VR607	VR	VRTB6VS223
	VR608	VARIABLE RESISTOR	VRTB6VS333
	VR609	VR	VRTB6VS472
OTHERS			
	CN103		VKN1073
	CN301		B5P-SHF-1AA
	JA2	JACK	VKN-183
	JA4	JACK	VKB1031
	JA7	JACK	VKB1029
	VC901	VARIABLE CAPACITOR	VCM-008
	X101	CERAMIC RESONATOR	VSS1040
	X201	CRYSTAL RESONATOR	VSS1049
	X601	CRYSTAL RESONATOR	VSS1026

HEAD ASSEMBLY

Mark	No.	Description	Part No.
CAPACITORS			
	C1		CKSQYF473Z50
	C5		CKSYF105Z16
RESISTORS			
	VR1	(10K)	VCP1040

7. DISASSEMBLY

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

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

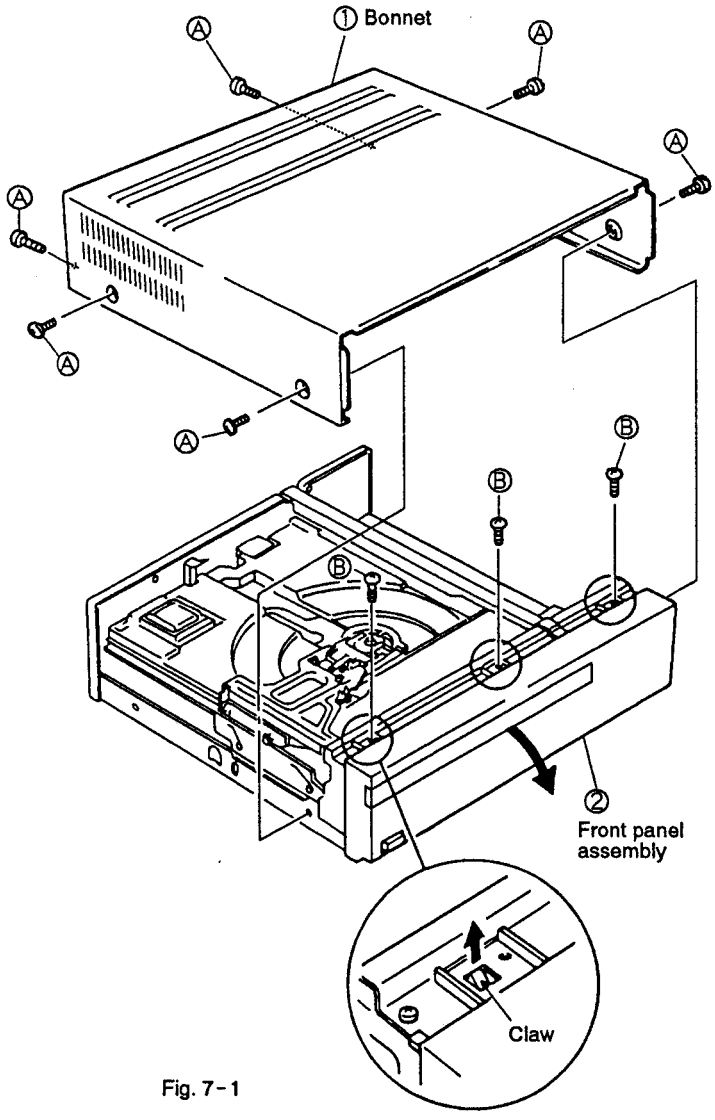


Fig. 7-1

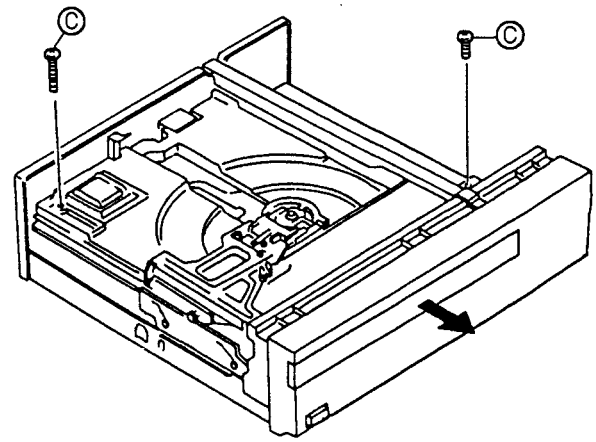


Fig. 7-2

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

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

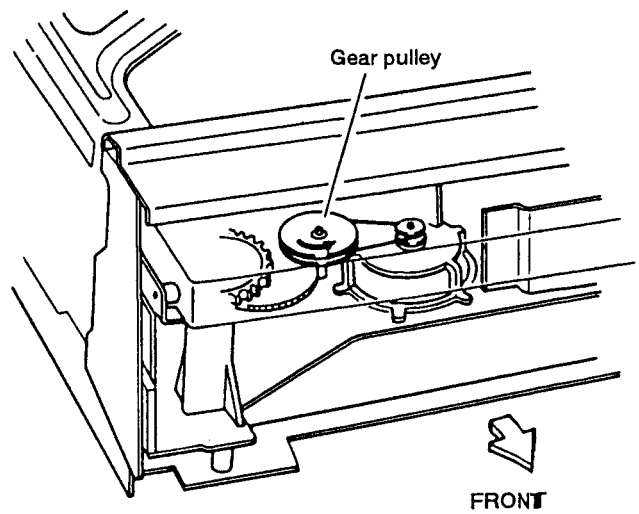


Fig. 7-3

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

- After removing the main binders, remove by the following procedure:

① Remove two screws Ⓐ to remove the center angle.
② Remove two screws Ⓑ holding the MAIN assembly, and remove seven screws Ⓒ on the sides of the rear panel.
③ Remove the flexible cable from the connector.
④ Pull the MAIN assembly in the direction of the arrow.
⑤ While sliding the MAIN assembly to the right, lift it upward in the direction of the arrow.

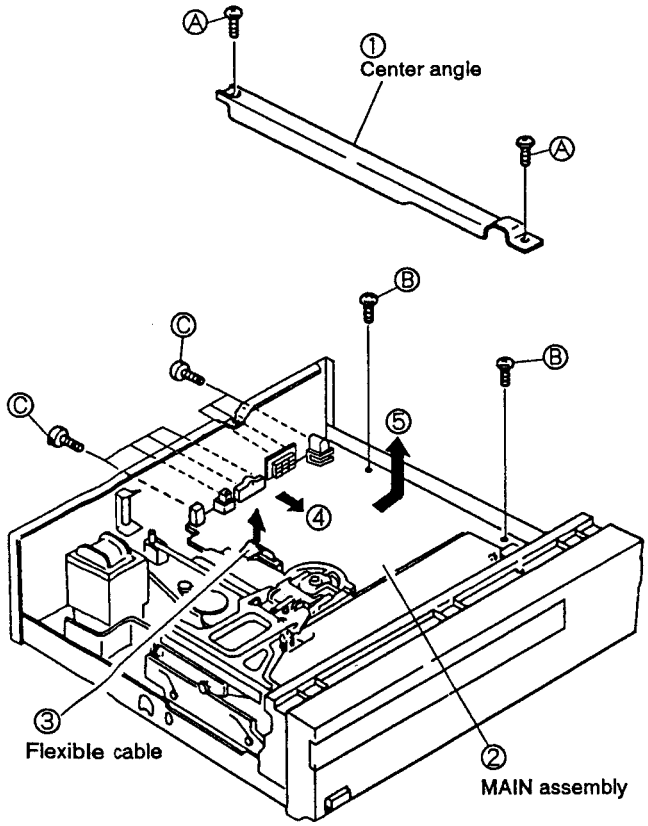


Fig. 7-4

● Diagnosis of the MAIN assembly

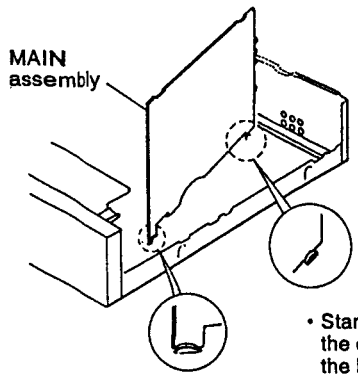


Fig. 7-5

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

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

Set the player with the tray moved up.

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

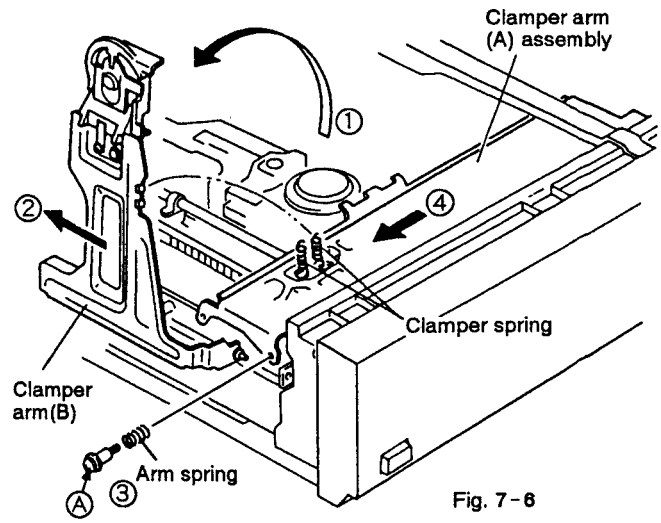


Fig. 7-6

7.5 REMOVING THE CLAMPER (Fig. 7-7)

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

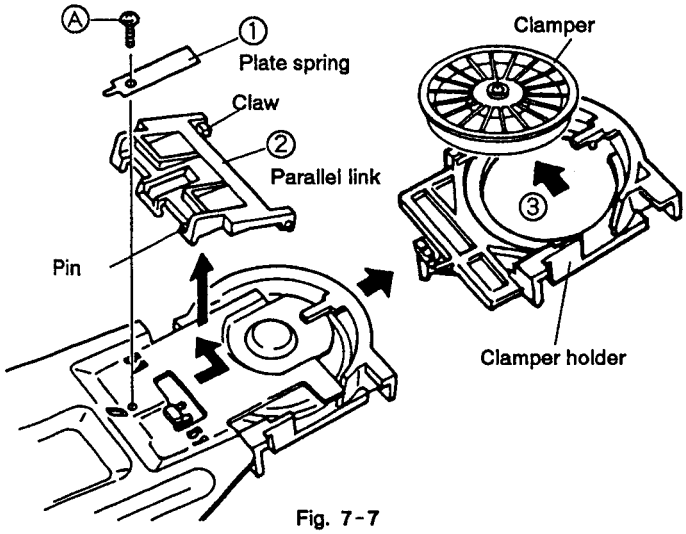


Fig. 7-7

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

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

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

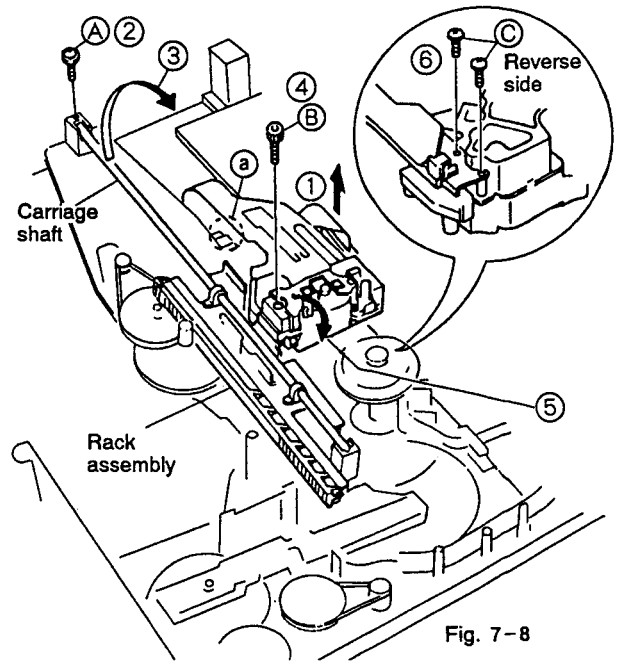


Fig. 7-8

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

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

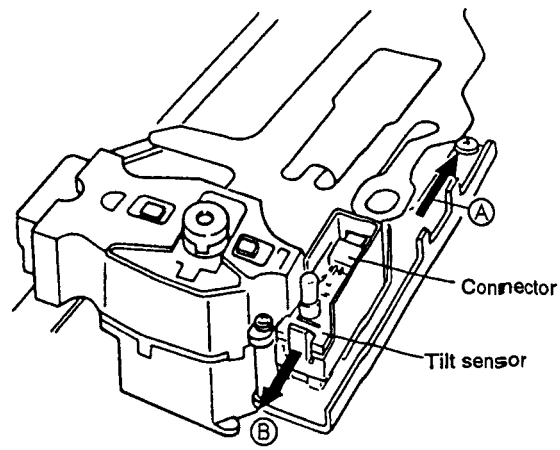


Fig. 7-9

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

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

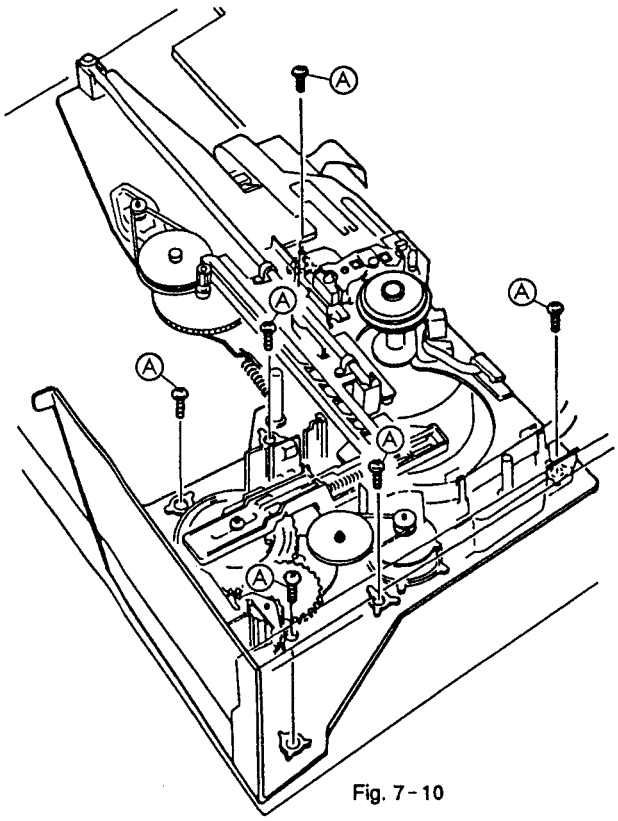


Fig. 7-10

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

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

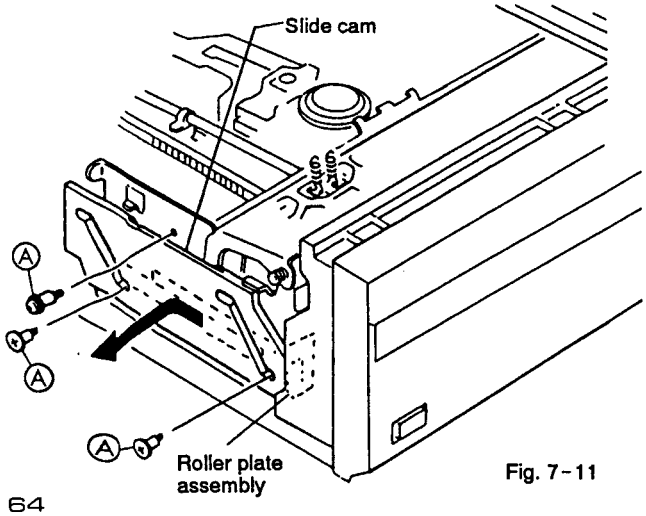


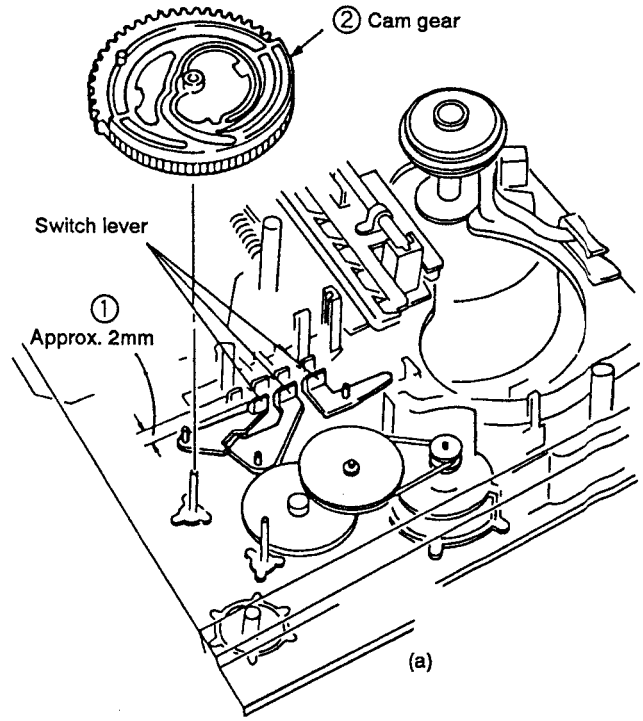
Fig. 7-11

7.10 ASSEMBLING THE MECHANISM SECTION

7.10.1. Positioning the gears

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

① Position three switch levers so that they are nearly parallel (approx. 2mm), as shown in Fig. 7-12 (a).
② Insert the cam gear so that the end of the spiral groove on the upper surface of the cam gear comes to the position nearest to the shaft located at the front, as shown in Fig. 7-12 (b).
(In this case, the cam gear should be set in the position where the angle between the center line of the cam gear and the pin on the cam gear is 45°, by visual checking.)



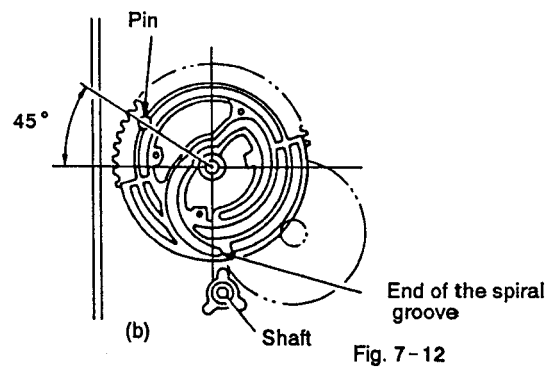


Fig. 7-12

③ Mount the spring slanting cam by raising the rack assembly in the direction of the arrow so that the tilt slide section comes under the rack assembly.Then, mount the cam spring. (Fig. 7-13 (a))

④ Insert the follow gear so that the "L"-shaped section of the follow gear comes to the end of the cam gear, as shown in Fig. 7-13 (b).

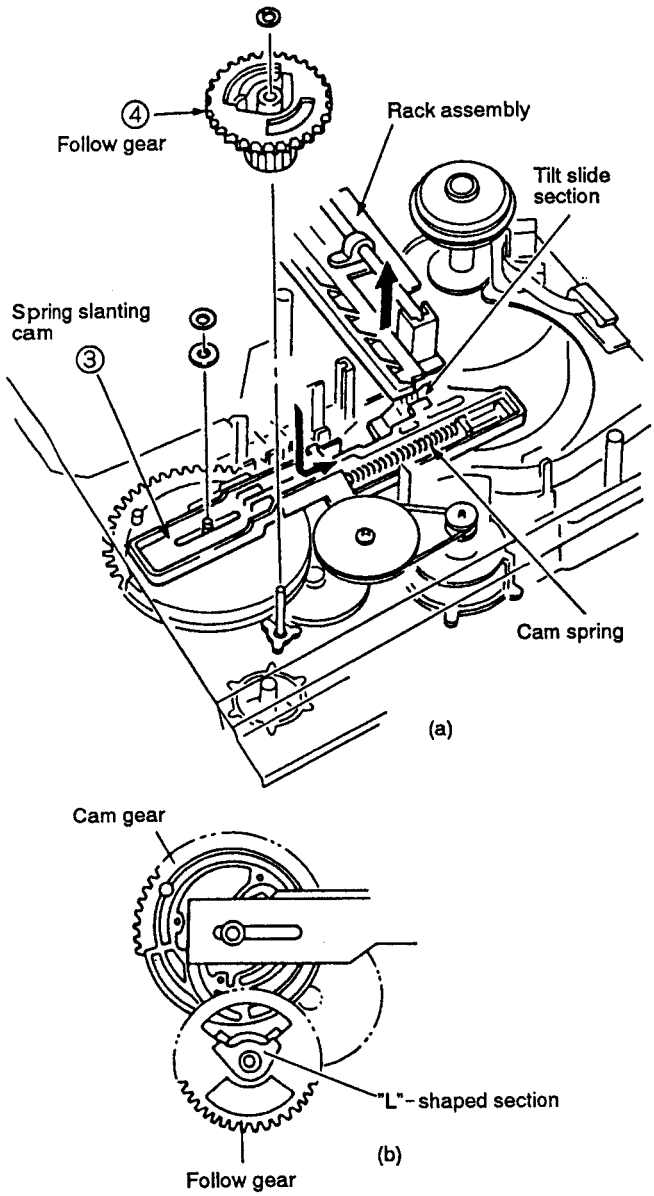


Fig. 7-13

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

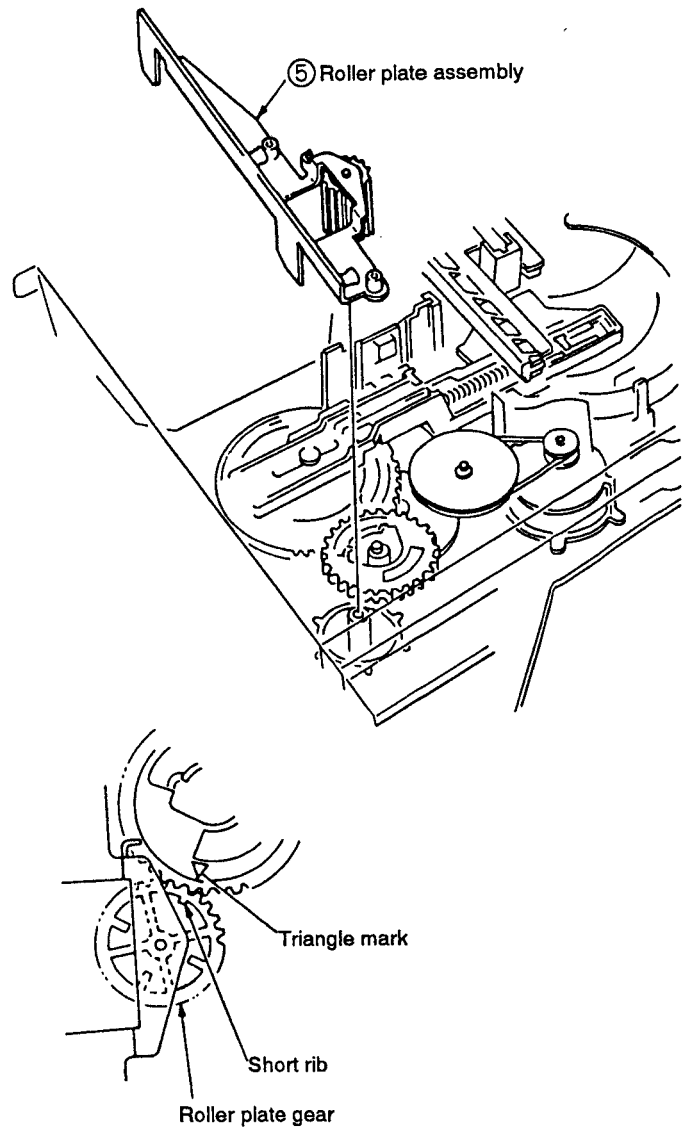


Fig. 7-14

7.10.2 Positioning the tray (Fig. 7-15)

① Set the player with the tray open.

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

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

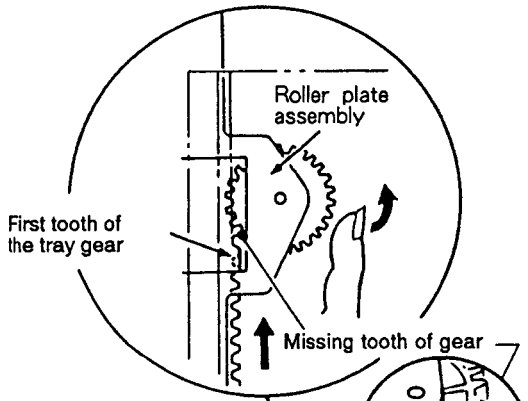


Fig. 7-15-1

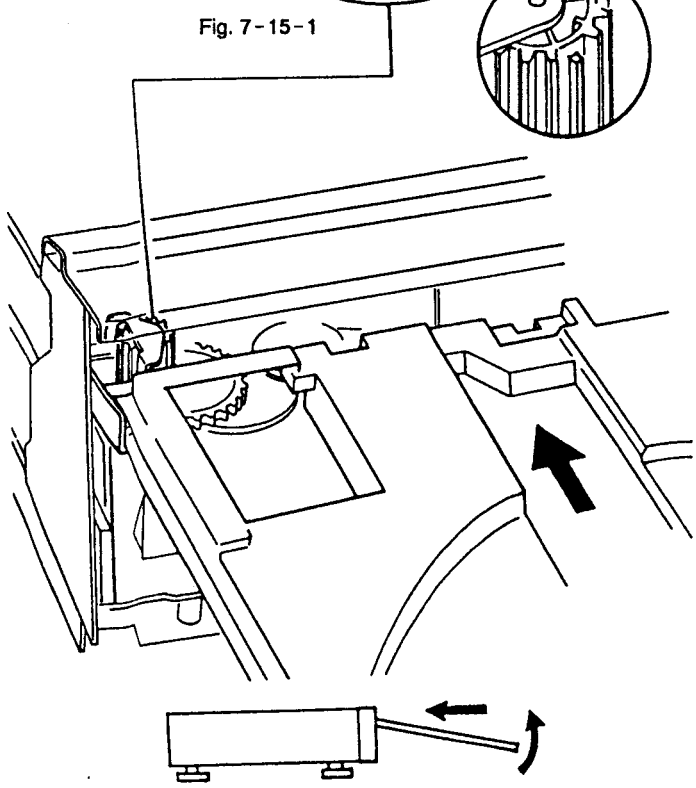


Fig. 7-15-2

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

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

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

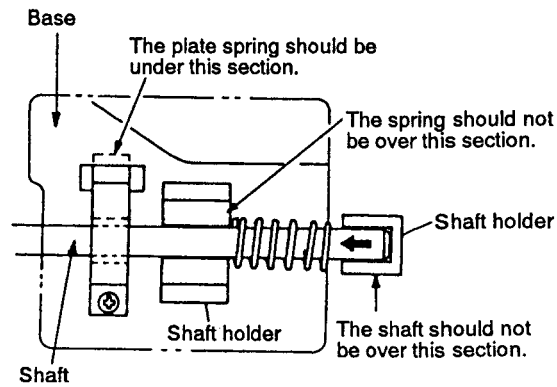


Fig 7-16-1

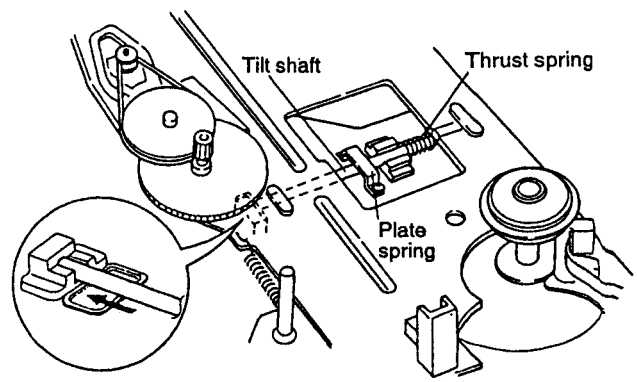


Fig. 7-16-2

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

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

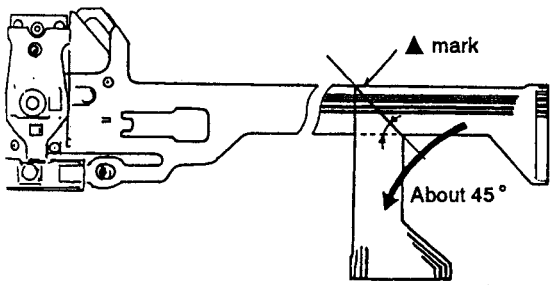


Fig. 7-17-1

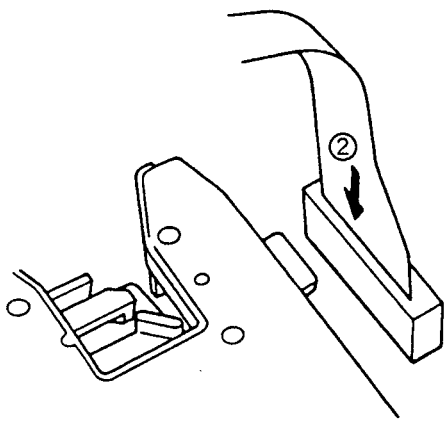


Fig. 7-17-2

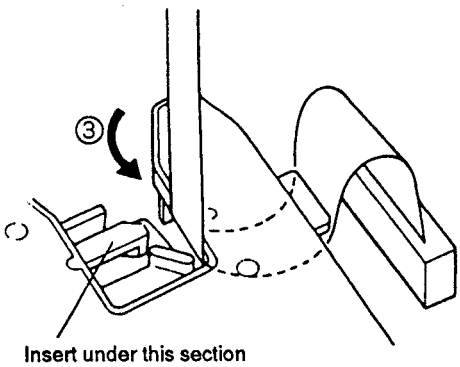


Fig. 7-17-3

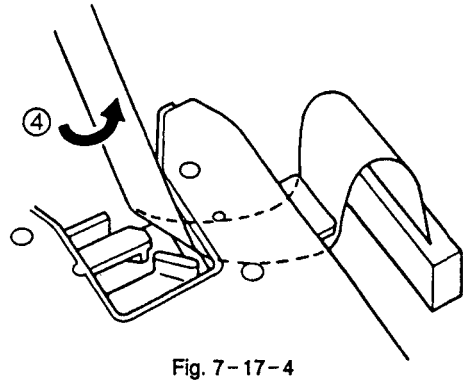


Fig. 7-17-4

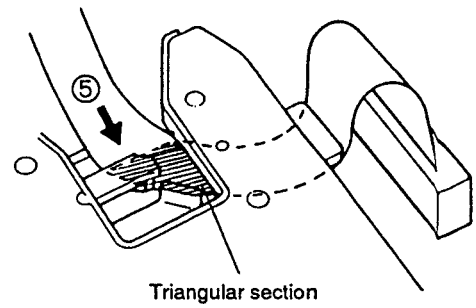


Fig. 7-17-5

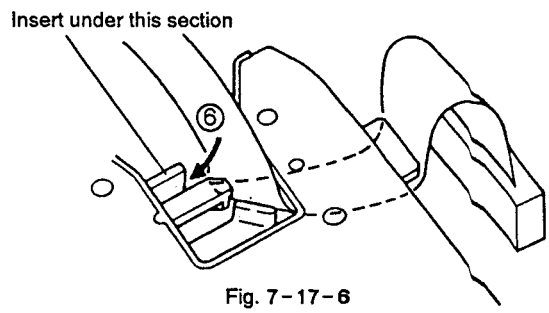


Fig. 7-17-6

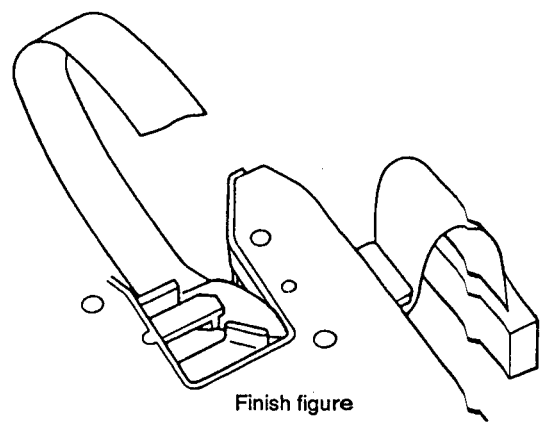


Fig. 7-17-7

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

Procedure-1

1. Remove the screw fixing the SYPS assembly and keep the SYPS assembly apart about 3cm from the base chassis (See Fig. 7-18-1).

2. Insert a soldering iron between the SYPS assembly and base chassis, alternately desolder the lapping pins of an AC power cord, and remove the lapping pins (See Fig. 7-18-1).

3. Solder the lapping pins through the foil side of the board with the SYPS assembly raised.
   The SYPS assembly can be diagnosed for component replacement through the foil side.
   (See Fig. 7-18-2).

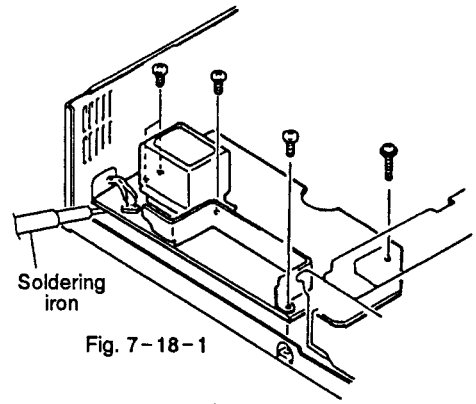


Fig. 7-18-1

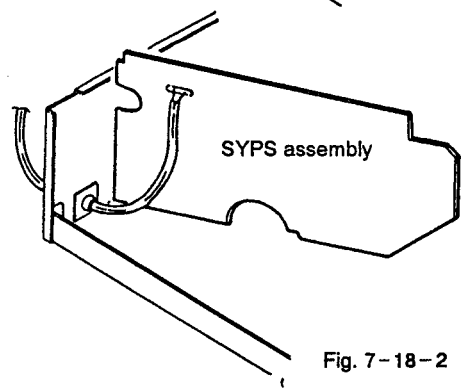


Fig. 7-18-2

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

Procedure-2

1. Insert a screwdriver into the chassis hole near a strain relief through the back of the base chassis and remove the strain relief stop ring.

2. Remove the strain relief and pull the AC power cord toward the main unit to set up the SYPS assembly.

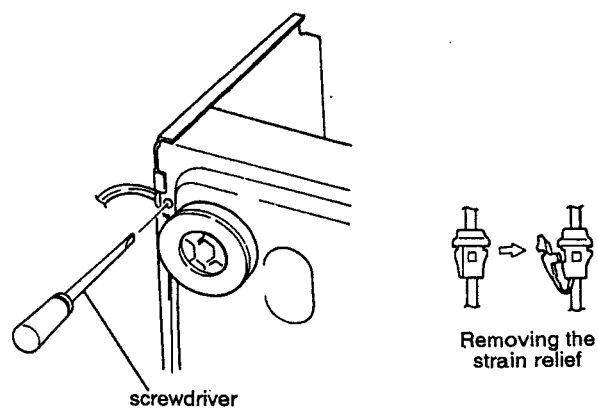


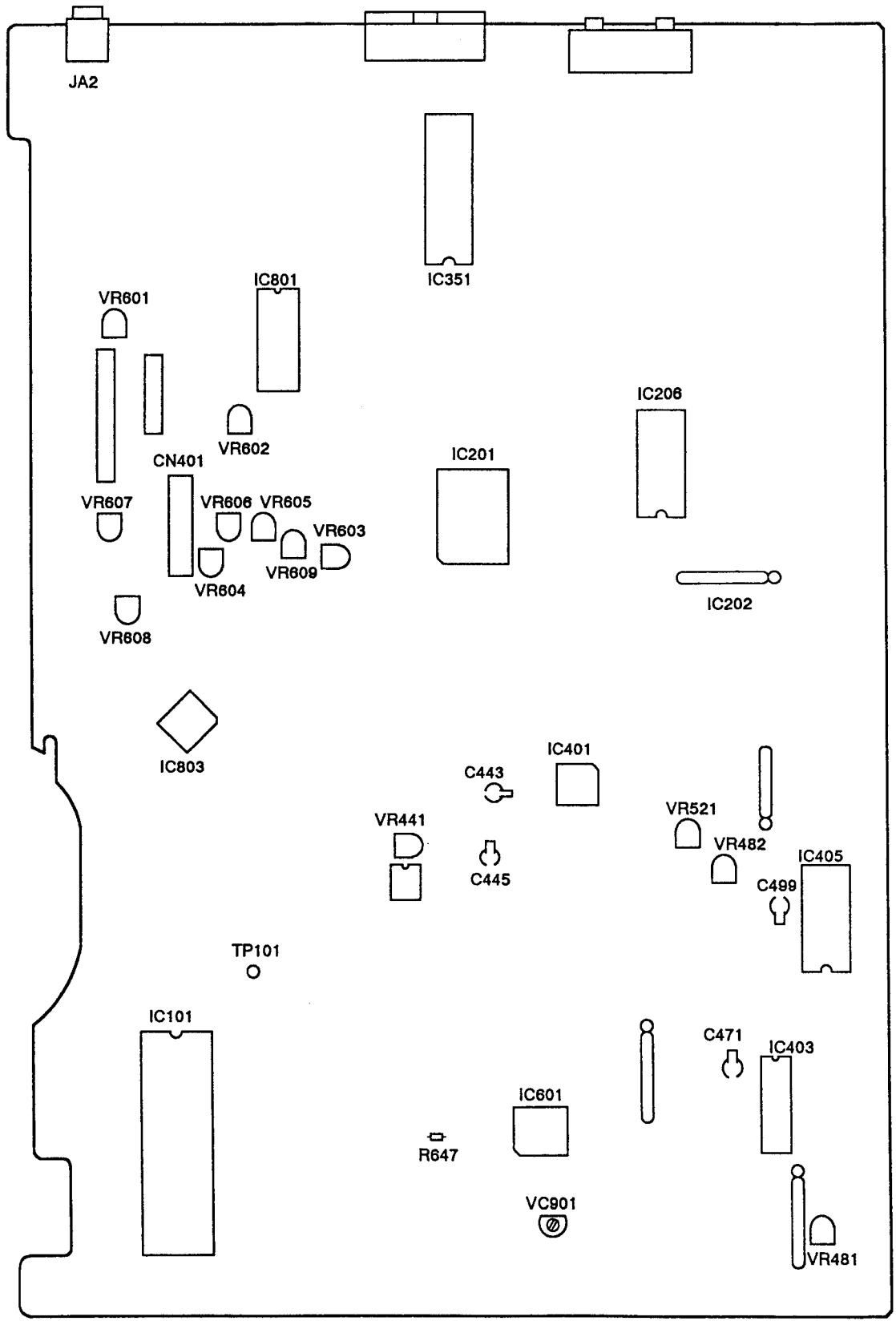
Fig. 7 - 19

8. ADJUSTMENT

8.1 MAIN ASSEMBLY ADJUSTMENT SUMMARY

	ADJUSTMENT	P	Adjusting Point	Measurement equipment Connecting Point	Player Condition	Adjusting Specification
1	Tilt Servo Gain Adjustment	75	VR608	None	Power off	• Making of Tilt GAIN VR position Red :Turn to Right Clear : Center Blue :Turn to Left
2	Coarse Adjustment of Grating and TRK Balance Adjustment	76	Grating/VR602	CN401-8 (TRK ERR)	• Test mode #15,000 TRK servo loop open	• Null point → TRK error MAX • Adjust VR602 so that the TRK error waveform amplitude's positive and negative level become equal.
3	Slider Shaft Horizontal Adjustment	77	Player SKIP key	CN401-2 (FCS RTN)	• Test mode Tilt servo loop off TRK servo loop open #5.200	• Use the SKIP key to adjust to 0V ± 20mV.
4	Pickup Inclination Adjustment	78	Pickup Assembly TAN / TRK inclination adjustment screw	CN401-1 (RF)	• Test mode #2,701 still TRK servo loop close /open Tilt servo loop open	• RF waveform's amplitude MAX (Pickup TAN / TRK adjustment screw) • Minimized crosstalk.
5	TRKG Error Best / Crosstalk Best Adjustment	79	VR605 (TE BEST) VR606 (CT BEST)	CN401-8 (TRK ERR) CN401-1(RF)	• Test mode TRK servo close / open Tilt servo loop off	• RF MAX (VR606) TRK error MAX (VR605)
6	FOCS SUM Level Adjustment	80	VR609	CN401-10 (FCS SUM)	• Play mode	• Adjust VR 609 so that the voltage becomes 1.5VDC.
7	Tilt Sensor Inclination / Tilt Balance Adjustment	81	Tilt sensor inclination adjustment screw VR607(TILT BAL)	TV monitor Test mode screen	• Test mode #16,200 / #115 still TRK servo loop close Tilt servo loop off	• Set VR 607 to the center. • Adjust the adjustment screw so that the tilt error display code is 6,7, or 8. • Adjust VR607 so that the tilt error display becomes 7.
8	Verification and Adjustment of Spindle Motor Centering	82	Spindle motor centering adjustment screw.	CH1:CN401-8 (TRK ERR) CH2:CN401-7 (TRK SUM) (X-Y mode)	• Test mode #25,000 / #1 TRK servo loop open Tilt servo loop on	• Adjust the centering adjustment screw so that the lissajous figures of #1 and #25,000 are the same.
9	Fine Adjustment of Grating and TRK Balance Adjustment	83	Grating / VR602	CH1:CN401-8 (TRK ERR) CH2:CN401-7 (TRK SUM) (X-Y mode)	• Test mode TRK servo loop open Tilt servo loop on	• Minimize the Y direction of the lissajous figure. • Level of the X direction of the lissajous figures are equal.
10	FCS Servo Loop Gain Adjustment	84	VR604	CH1:CN401-5 (FCS IN) CH2:CN401-4 (FCS ERR) (X-Y mode)	• Test mode #15,000 still TRK servo loop close Tilt servo loop on	• Adjust VR604 so that the lissajous figure is symmetric with respect to the X and Y axes.
11	TRK Servo Loop Gain Adjustment	85	VR603	CH1:CN401-9 (TRK IN) CH2:CN401-8 (TRK ERR) (X-Y mode)	• Test mode #15,000 still TRK servo loop close Tilt servo loop on	• Adjust VR603 so that the lissajous figure is symmetric with respect to the X and Y axes.
12	RF Gain Adjustment	86	VR601	CN401-1(RF)	• #15,000 still	• Adjust VR601 so that the RF level becomes 300mV ± 50mV.
13	Ref. Sub Carrier Adjustment	87	VC901	IC402 pin 8	• STOP	• Adjust VC901 so that the frequency becomes 3.579545 MHz.
14	VCO Center Frequency Adjustment	88	VR481	CH1:C471 + lead wire CH2:C499 + lead wire	• #5,100 still	• The center of CH1's video signal jitter is delayed by 71 μS with CH2's video signal.
15	Output Video Level Adjustment	89	VR482	VIDEO OUT terminal	• #19,900 still	• Adjust the VR482 so that the voltage between the sync tip and the white peak becomes 0.71V ± 5%.
16	1H Delay Video Level Adjustment	90	VR441	CH1:C443 – lead wire CH2:C445 – lead wire	• #3,800 still	• The 1H delay video level becomes the same as the main line video level.
17	VPS Error Adjustment	91	VR521	TV monitor	• #8,000 still	• Color irregularity on the magenta screen is minimized.

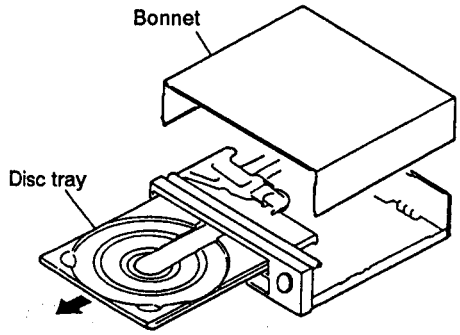
8.2 ADJUSTMENT POINTS OF THE MAIN ASSEMBLY



8.3 TEST MODE

8.3.1 TEST MODE

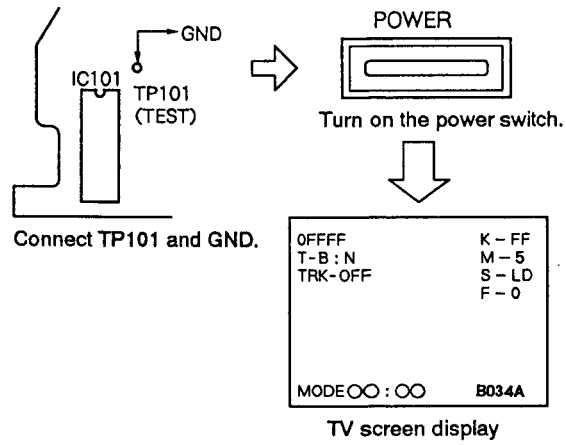
The player has a test mode function which allows the servicer to check the player's status on the TV screen by executing the respective key operation.
Also, since the TRK servo opens and closes easily, the test mode is especially useful for mechanical adjustments.



8.3.2 TEST MODE INITIATION

[Procedure]

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



TV screen display

8.3.3 TEST MODE CANCELLATION

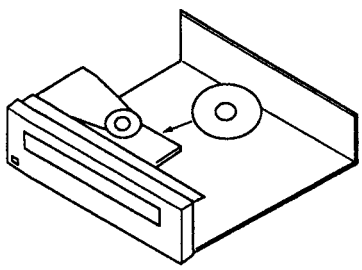
Turn off the power switch.

8.3.4 PLAYER OPERATION IN THE TEST MODE

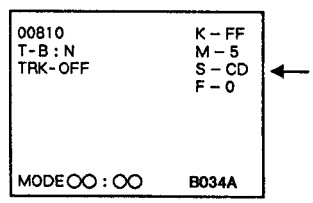
Operate the player by selecting a test mode function with the keys on the player or on the remote control unit.

- CD PLAYBACK

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



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

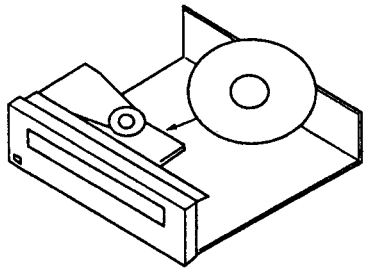


TV screen display

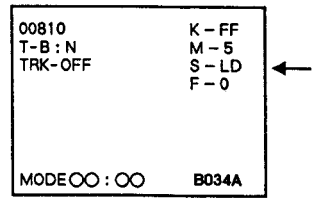
③Clamp the disc by pressing the PLAY (▶) key once. Then, press the PLAY (▶) key twice, disc will be normal playbacked.

- LD PLAYBACK

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



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



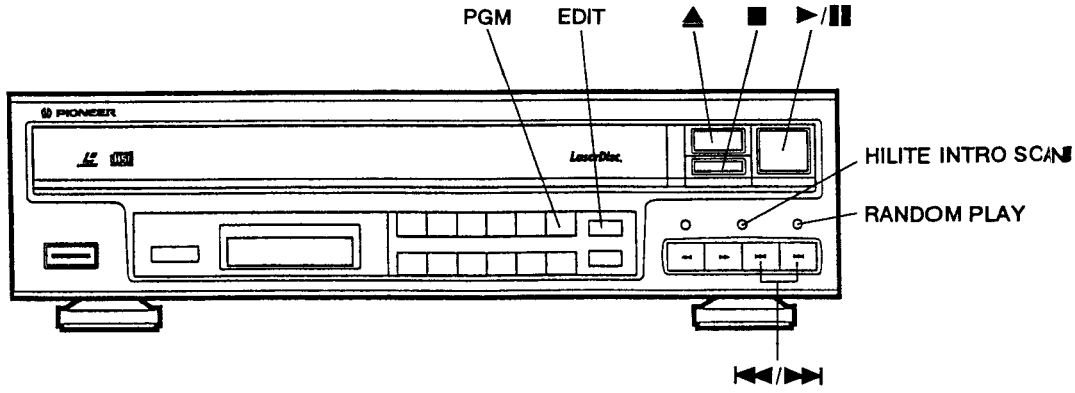
TV screen display

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

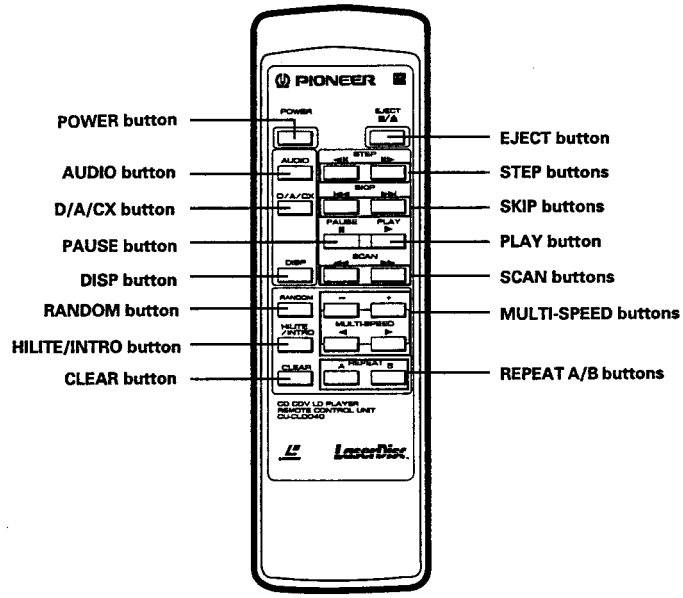
Table. Operation in the test mode by optional remote control unit.

Function	Player Status	Key Operation	Remarks
Open Tray	STOP mode	▲	
Close Tray	Tray open	▲	
Stop	PLAY mode	■	
Play	Disc placement and tray closed.	▶	• Start play with the TRK servo open. • Start play with tilt neutral. • The disc type (LD/CD/CDV) is determined when playback starts at the SLDR position during start play.
TRK Servo Open/Close	PLAY mode	▶	• Each time the PLAY button (▶) is pressed, the TRK servo will open or close alternately.
Still	PLAY mode TRK servo closed.	▮▮ (Remote control unit key)	• Each time the STILL button (▮▮) is pressed, the player will switch between the PLAY and STILL modes alternately.
TILT Neutral	POWER switch ON	EDIT	
TILT Servo ON	PLAY mode	RANDOM PLAY	
TILT Minus TILT Servo OFF	PLAY mode	⏮	• Press and hold down the keys.
TILT Plus TILT Servo OFF	PLAY mode	⏭	• Press and hold down the keys.
Screen Display ON/OFF	POWER switch ON	PGM key	
Frame search	PLAY mode	+10 key ↓ 0-9 key ↓ ▶	• In the PLAY mode, press the +10 key. (The player will standby for the frame No. entry.) • Use the numeric keys(0 – 9) to enter the frame No.. Then press the player's PLAY key to search. • After the search is completed, the player will return to the previous mode before the search was performed.
Loading Motor Rotation Clockwise Counterclockwise	Tray open	⏭ ⏮	• FWD:Unloading • REV :Loading
FOCS OFFSET (CT BEST) VR606 Check	PLAY mode (TRK servo OPEN)	(Remote control unit) MULTI-SPEED FWD →F-1 REV →F-0 (Player) HILITE INTRO SCAN	• For checking VR604 F-0 : Normal mode •When closing the TRK servo, VR606 (CT BEST) becomes effective. •When opening the TRK servo, VR605 (TE MAX) is effected. F-1 : When opening the TRK servo, VR606 (CT BEST) also becomes effective.

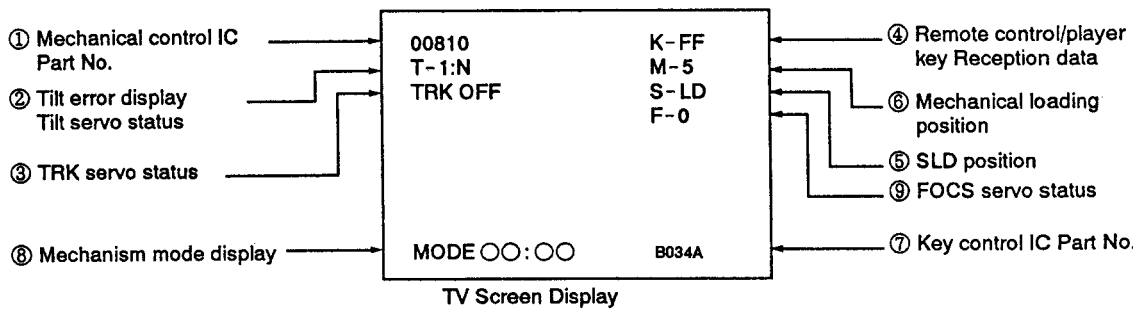
● Names of Front Panel



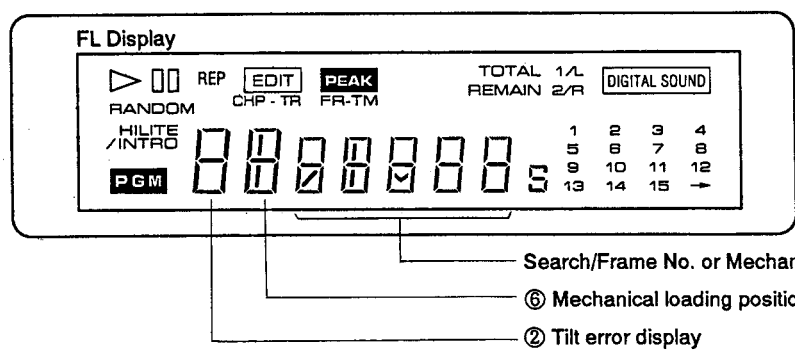
● Names of Remote Control Unit



8.3.5 TV SCREEN AND LED DISPLAYS IN THE TEST MODE



TV Screen Display



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

PD0081C→00810

② Tilt Servo Status / Tilt Error Display

T-○:○○

Tilt servo status : N...Tilt neutral
ON...Tilt servo ON
OFF...Tilt servo OFF

Tilt error display: 0 Tilt −
↕ Tilt neutral
F Tilt +

③ TRK Servo Status

TV screen display

TRK-○○○

└—ON...TRK servo close

OFF...TRK servo open

④ Remote Control / Player Key Reception Data

TV screen display

K-○○

└—See table below

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

⑤ SLD Position

TV screen display

S-○○○

└—IN ... CD inside SW ON

CD ... CD active area

CDV ... CDV active area

LD ... LD active area

⑥ Mechanical Loading Position

TV screen display

M-○

└—0 ... Tray open

1 ... Loading

2 ... Standby

3 ... Clamped

5 ... Tilt minus

6 ... Tilt neutral (one side)

7 ... Tilt plus

8 ... Tilt limit

9 ... B side clamped (two sides)

⑦ Focus Offset VR Status

TV screen display

F-○

└— 0 ... Normal mode

•When closing the TRK servo, VR606 (CT BEST) becomes effective.

•When opening the TRK servo, VR605 (TE MAX) becomes effective

1 ... When opening the TRK servo, VR606 (CT BEST) also becomes effective.

8.4 ADJUSTMENTS

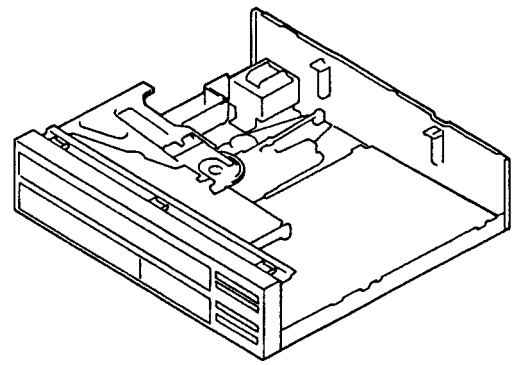
8.4.1 Required Instruments

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

8.4.2 Adjustment Preparation and Notes

1. Player Preparation

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



2. Disc Insertion

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

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

4. Only the MAIN Assembly Needs to be Adjusted.

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

5. Required adjustment after Replacement of major parts.

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

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

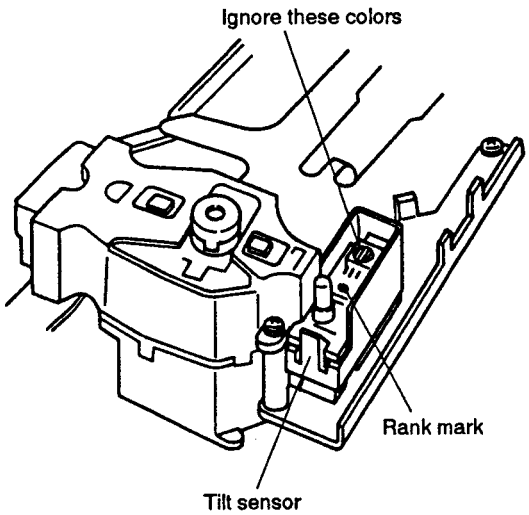
8.4.3 MECHANICAL ADJUSTMENTS

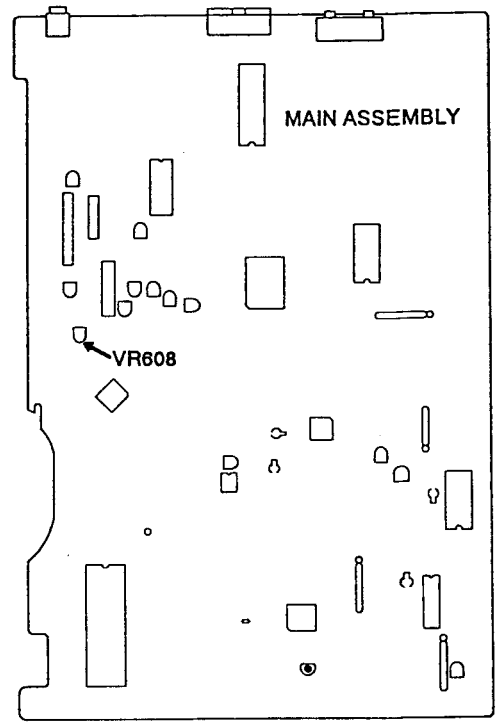
1. TILT SERVO GAIN ADJUSTMENT

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

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

Connection diagram





Adjustment Procedure

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

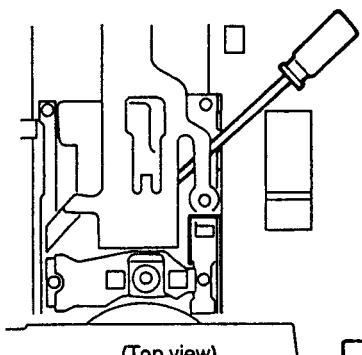
Rank	Color	VR Angle
A	Red	Clockwise all the way
B	Clear	Mechanical center
C	Blue	Counterclockwise all the way

2. COARSE ADJUSTMENT OF GRATING AND TRK BALANCE

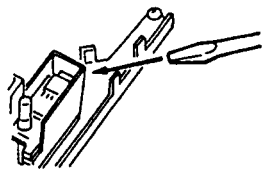
- Purpose: Adjustment of the grating angle to enable disc playback and trick playback.
- When not properly adjusted: The disc cannot be played back. Track skipping occurs.

• Measuring instruments and jigs:	● TV monitor ● Small screwdriver ● Oscilloscope
• Measuring point:	● CN401 - 8 (TRK ERR) and GND
• Test disc and player mode	● 8 - inch LD test disc (GGV1003) ● Test Mode (Disc playback, TRK servo open, Tilt servo OFF)
• Positions to be adjusted	● Pickup assembly grating ● VR602 (TRK BAL).

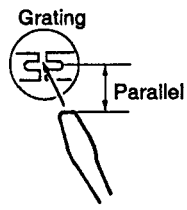
Connection diagram

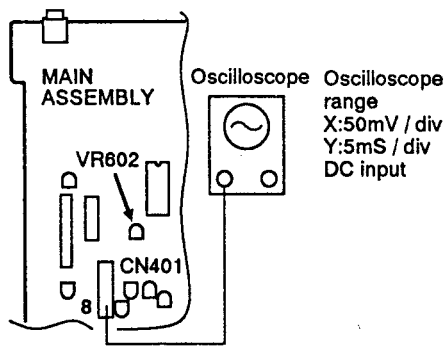


(Top view)
Screwdriver inserting direction



Insert the screwdriver to the slot horizontally for the base.





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

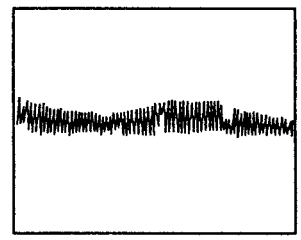


Fig.1 Null Point

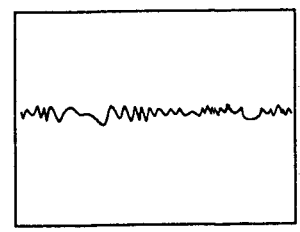


Fig.2 This is not the null point.

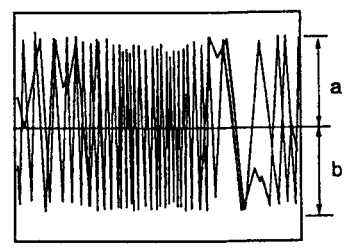


Fig.3 Maximum TRK error.

The positive and negative levels are equal.

Adjustment Procedure

Coarse grating adjustment

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

TRK balance adjustment

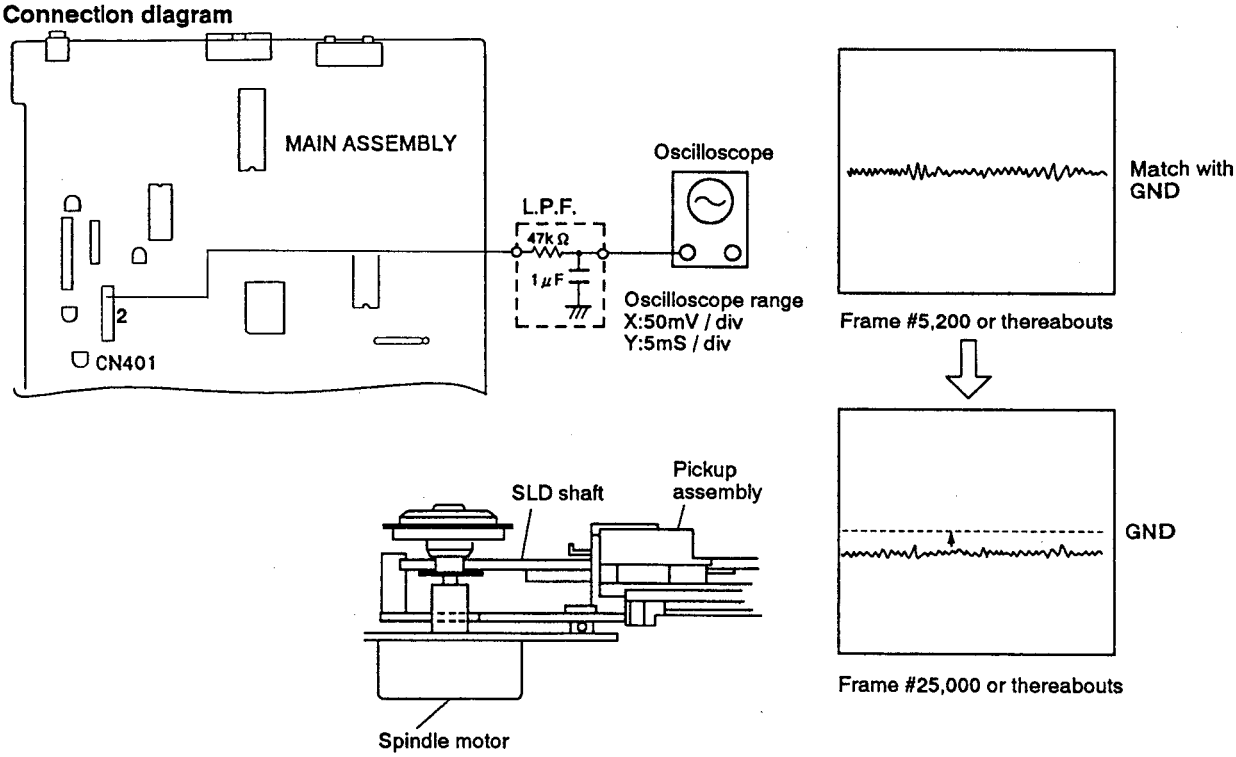
1. Adjust VR602 so that the TRK error waveform amplitude's positive and negative level become equal. (See Fig.3.)
2. Close the TRK servo and check if the image on the TV screen is normal.

3. SLIDER SHAFT HORIZONTAL ADJUSTMENT

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

• Measuring instruments and jigs:	• Oscilloscope • Low-pass filter (47k Ω + 1 μF)
• Measuring point:	• CN401 - 2 (FCS RTN) and GND
• Test disc and player mode	• 8 - inch LD test disc GGV1003 • Test mode (#5,200 still, TRK servo open, Tilt servo OFF)
• Positions to be adjusted	• Player SKIP key (In the test mode)

Connection diagram



Adjustment Procedure

1. Use the SCAN key to send the slider to frame #5,200 or thereabouts (tilt fulcrum) on the test disc. Open the TRK servo.
2. Connect the oscilloscope to CN401 - 2 through L.P.F. and match the center of the waveform with the oscilloscope's GND.
3. Search for frame #25,000 and use the SKIP key to adjust the center of the waveform to 0V ± 20mV.

Note : Regarding the test mode, see page 70.

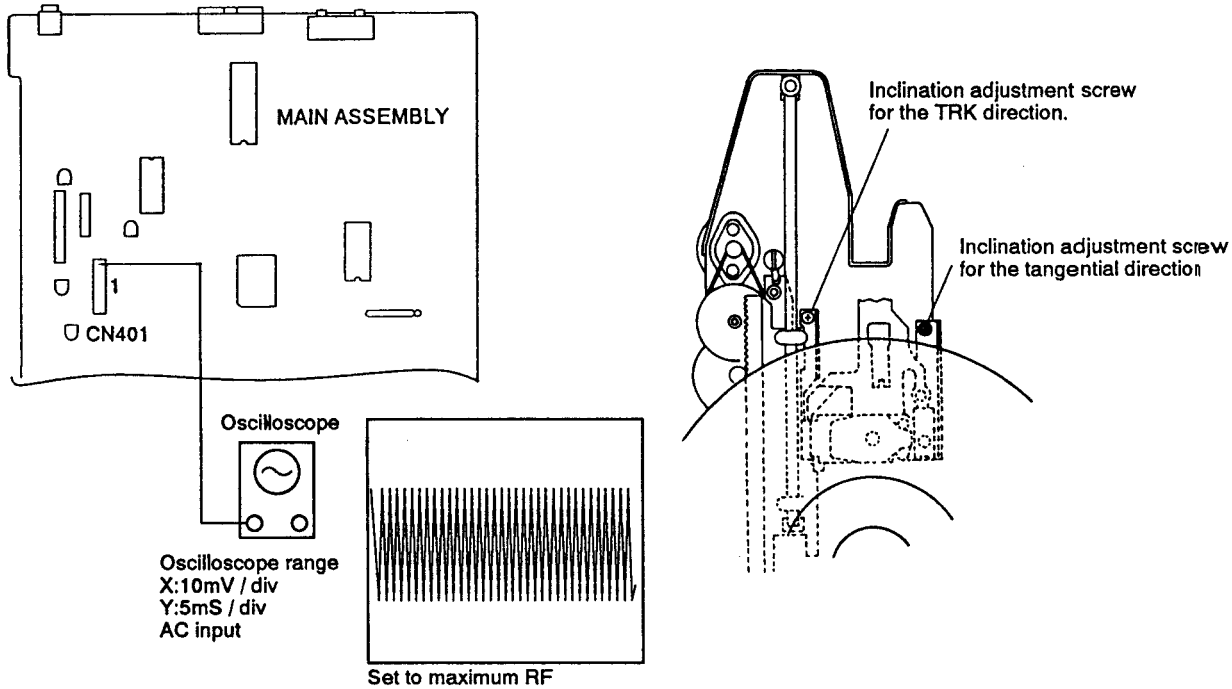
Note : This adjustment is critical in that it will affect the adjustments following.

4. PICKUP INCLINATION ADJUSTMENT

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

• Measuring instruments and jigs:	• TV monitor • Oscilloscope
• Measuring point:	• CN401 - 1 (RF)
• Test disc and player mode	• 8 - inch LD test disc (GGV1003) • Test Mode (#2,701 still (Black screen))
• Positions to be adjusted	• Pickup assembly TRK / Tangential direction inclination adjustment screws

Connection diagram



Adjustment Procedure

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

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

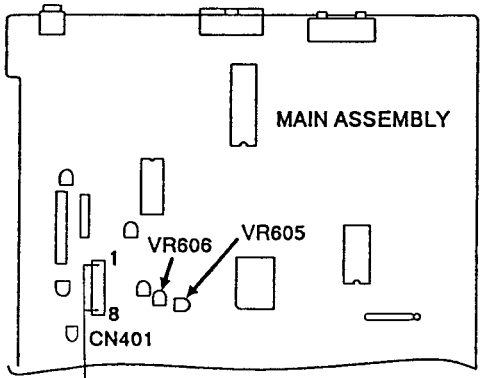
5. TRKG ERROR MAX / CROSSTALK BEST ADJUSTMENT

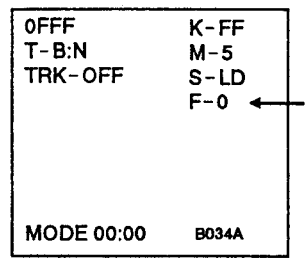
Mechanical Adjustment

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

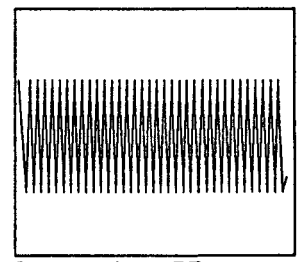
• Measuring instruments and jigs: • Measuring point: • Test disc and player mode	• TV monitor • Oscilloscope • CN401 - 1 (RF) • CN401 - 8 (TRK ERR) • Player's VIDEO OUT terminal • 8 - inch LD test disc (GGV1003) • Test Mode (TRK servo close / open, Tilt servo OFF)
• Positions to be adjusted	• VR605 (TE MAX) • VR606 (CT BEST)

Connection diagram





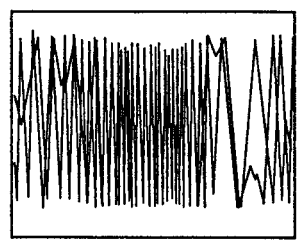
Screen display of test mode



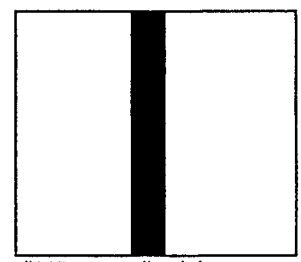
Set to maximum RF amplitude at frame #2,701.

Oscilloscope

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



Maximize the TRKG error.



#115 crosstalk minimum

Adjustment Procedure

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

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

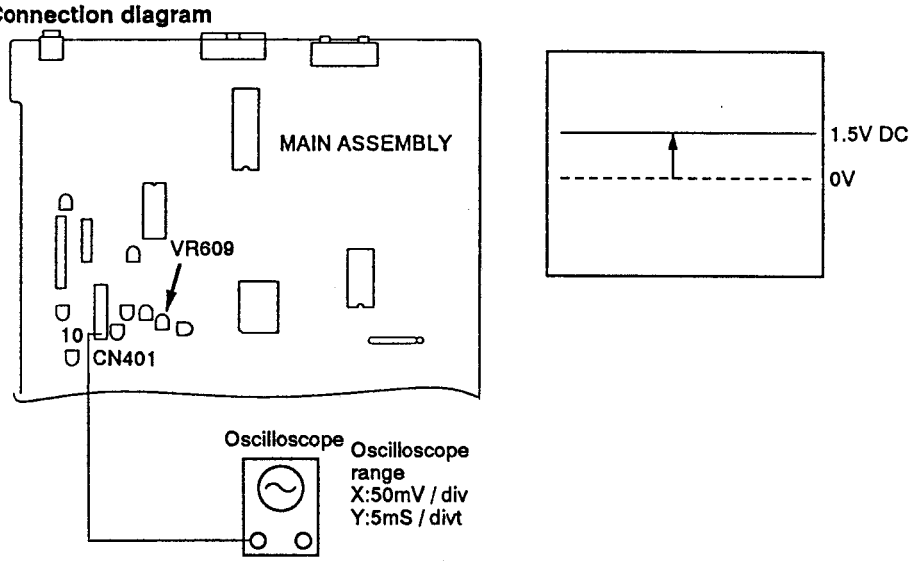
Note : After adjustment is complete, be sure to perform "6. FOCS SUM Level Adjustment".

6. FOCS SUM LEVEL ADJUSTMENT

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

• Measuring instruments and jigs:	• TV monitor • Oscilloscope
• Measuring point:	• CN401 - 10
• Test disc and player mode	• 8 - inch LD test disc (GGV1003) • Normal play mode
• Positions to be adjusted	• VR609

Connection diagram



Adjustment Procedure

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

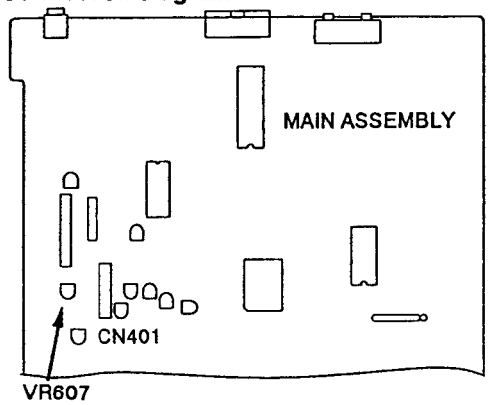
1. Connect the oscilloscope to CN401 - 10.
2. Adjust VR609 so that the voltage becomes 1.5V DC.

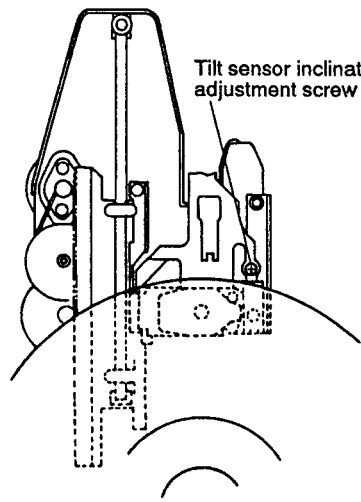
7. TILT SENSOR INCLINATION / TILT BALANCE ADJUSTMENT

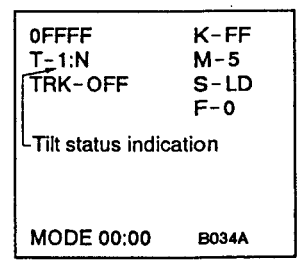
- Purpose: Adjustment of the tilt sensor's inclination to direct the tilt sensor's LED vertically with respect to the disc.
  Also, compensation for the sensitivity difference between the two sensors.
- When not properly adjusted: Crosstalk will be generated.

• Measuring instruments and jigs:	• TV monitor • Small Phillips screwdriver
• Measuring point:	• Player's VIDEO OUT terminal
• Test disc and player mode	• 8-inch LD test disc (GGV1003) • Test Mode (#16,200 still, TRK servo closed, Tilt servo OFF)
• Positions to be adjusted	• Tilt sensor inclination adjustment screw • VR607 (TILT BAL).

Connection diagram







TV screen display

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

Adjustment Procedure

1. Search for frame #16,200 on the test disc.
2. Set VR607 to the mechanical center.
3. Adjust the tilt sensor inclination adjustment screw so that the tilt status display code is 6, 7, or 8 on the TV monitor.

Note : Turn the tilt sensor inclination adjustment screw clockwise more than 1/4 turn to complete the adjustment.

4. Search for frame #115.
5. Adjust VR607 so that the tilt error display becomes 7.

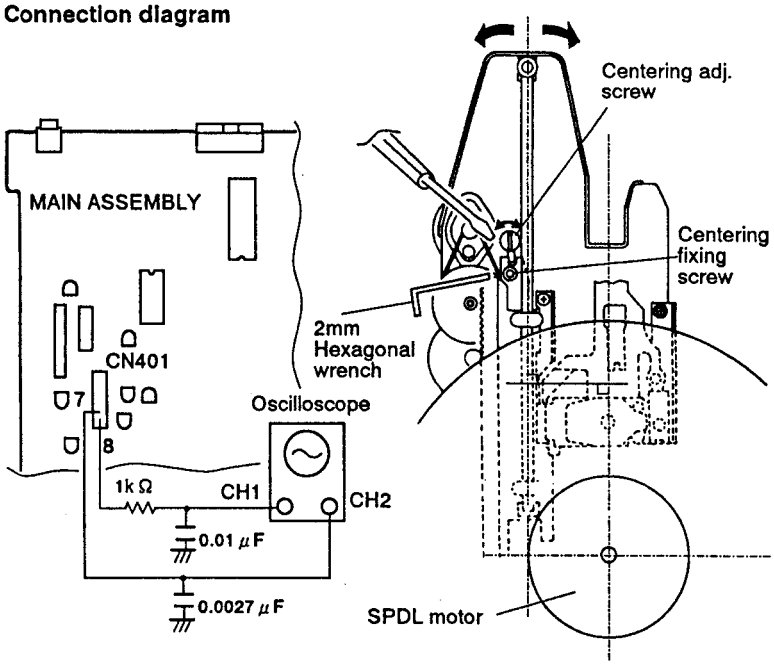
8. VERIFICATION AND ADJUSTMENT OF SPINDLE MOTOR CENTERING

Mechanical Adjustment

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

• Measuring instruments and jigs:	• Oscilloscope • Small screwdriver • L.P.F. (0.01 μF + 1k Ω), (0.0027 μF)
• Measuring point:	• 2mm Hexagonal wrench
• Test disc and player mode	• CH1 : CN401 - 8 (TRK ERR), CH2 : CN401 - 7 (TRK SUM) • 8 - inch LD test disc (GGV1003) • Test Mode (#25,000 still, #1 still, TRK servo open, TILT servo ON)
• Positions to be adjusted	• Spindle motor centering adjustment lever

Connection diagram



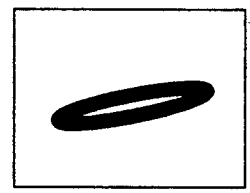


Fig. 1 Frame #25,000 lissajous

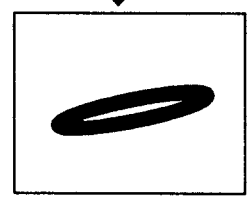


Fig. 2 Frame #1 lissajous

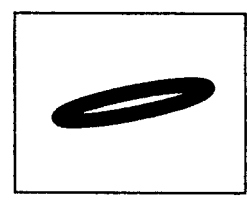


Fig. 3
CD inner periphery lissajous figure

X - Y mode
CH1: 50mV/div.
CH2: 5mV/div. AC

Adjustment Procedure

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

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

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

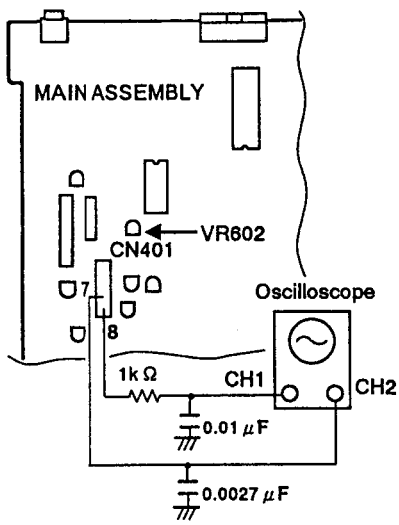
4. Search for frame #25,000 and #1 alternately. Loosen a centering fixing screw and adjust the spindle motor centering adjustment screw so that the bulge of the lissajous figures become identical.
5. Change to a compact disc and playback the inner periphery. Check if the lissajous figure is the same as the one shown in Fig. 3.
6. If the compact disc's inner periphery lissajous figure differs from the one shown in Fig. 3, repeat steps 4 to 5.
7. Fix the centering fixing screw.

9. FINE ADJUSTMENT OF GRATING AND TRK BALANCE ADJUSTMENT

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

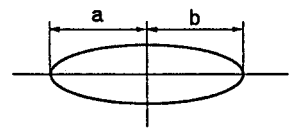
• Measuring instruments and jigs:	• Oscilloscope • Small screwdriver • L.P.F. (0.01 μF + 1k Ω), (0.0027 μF)
• Measuring point:	• CH1 (X) : CN401 - 8 (TRK ERR), CH2 (Y) : CN401 - 7 (TRK SUM)
• Test disc and player mode	• 8 - inch LD test disc (GGV1003) • Test Mode (Play mode, TRK servo loop open, TILT servo ON)
• Positions to be adjusted	• Grating slit in the pickup assembly • VR602

Connection diagram



Set the probe to × 1 only for Y.

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



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

Adjustment Procedure

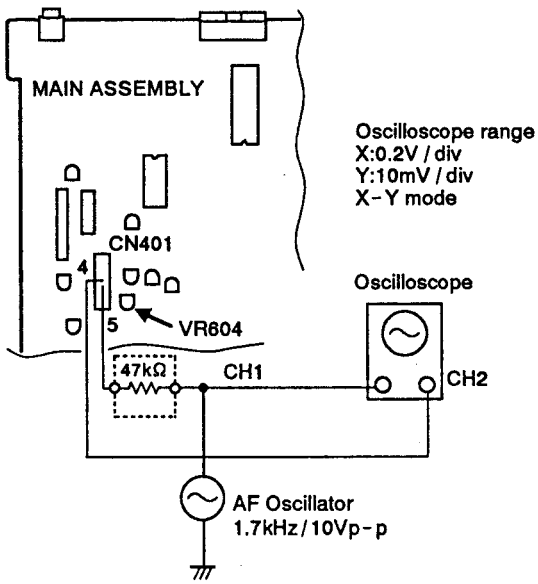
1. Playback the test disc at frame #3,000 (inner periphery) or thereabouts.
2. Set the oscilloscope to the X - Y mode, and connect CN401 - 8 (TRK ERR) and CN401 - 7 (TRK SUM) to the X input and the Y input respectively. Then observe the lissajous figure.
3. Insert the small screwdriver tip into the grating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

10. FCS SERVO LOOP GAIN ADJUSTMENT

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

• Measuring instruments and jigs:	• Oscilloscope • AF oscillator (1.7kHz / 10Vp-p) • Resistor (47k Ω)
• Measuring point:	• CH1 (X) : CN401 - 5 (FCS IN), CH2 (Y) : CN401 - 4 (FCS ERR)
• Test disc and player mode	• 8 - inch LD test disc (GGV1003) • Test Mode (Still mode, TRK servo loop close, TILT servo ON)
• Positions to be adjusted	• VR604

Connection diagram



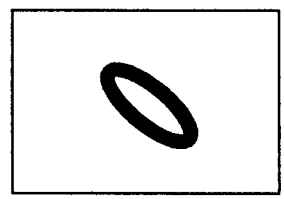


Fig. 1
Inadequate adjustment

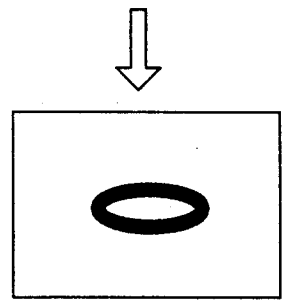


Fig. 2
After adjustment

Adjustment Procedure

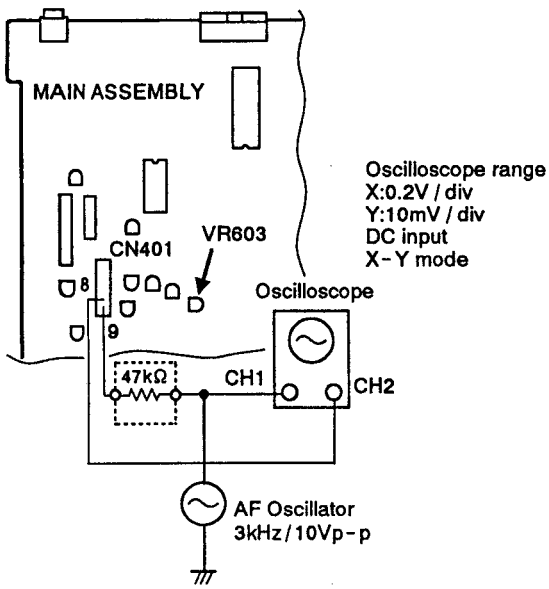
1. Search for frame #15,000 on the test disc.
2. Connect the oscilloscope to CN401 - 4 and CN401 - 5 as shown above.
3. Set the oscilloscope to the X - Y mode and observe the lissajous figure.
4. Adjust VR604 so that the lissajous figure is symmetric with respect to the X and Y axes. (See Fig. 1 and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

11. TRK SERVO LOOP ADJUSTMENT

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

• Measuring instruments and jigs:	• Oscilloscope • AF oscillator (3.0kHz / 10Vp-p) • Resistor (47k Ω)
• Measuring point:	• CH1 (X) : CN401-9 (TRK IN), CH2 (Y) : CN401-8 (TRK ERR)
• Test disc and player mode	• 8-inch LD test disc (GGV1003) • Test Mode (Still mode at #15,000 (Black screen), TRK servo closed, TILT servo ON)
• Positions to be adjusted	• VR603

Connection diagram



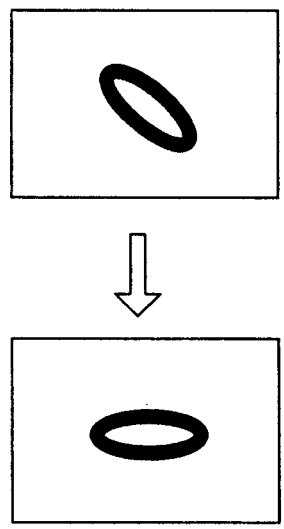


Fig. 1
Inadequate adjustment

Fig. 2
After adjustment

Adjustment Procedure

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

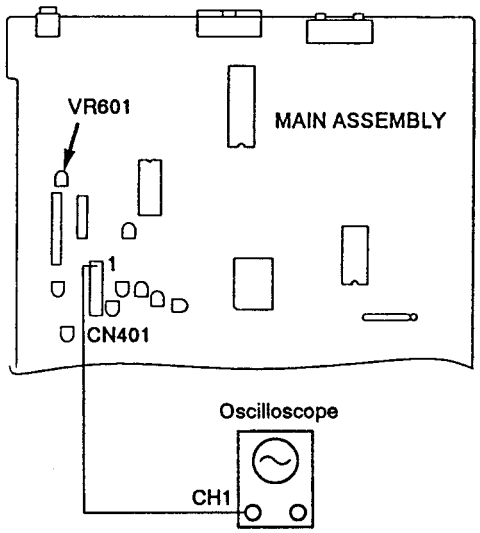
Note : If the waveform is not observable, either change the 47kΩ resitor to 33kΩ or increase the oscillator's output.

12. RF GAIN ADJUSTMENT

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

• Measuring instruments and jigs: • Measuring point: • Test disc and player mode	• Oscilloscope • CH1 : CN401 - 1 (RF) • 8-inch LD test disc (GGV1003) • Test Mode (Still mode, TRK servo loop close, TILT servo ON)
• Positions to be adjusted	• VR601

Connection diagram



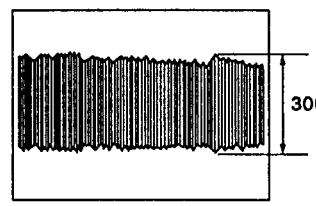


Fig. 1 RF signal

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

Adjustment Procedure

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

8.4.5 ELECTRICAL ADJUSTMENT

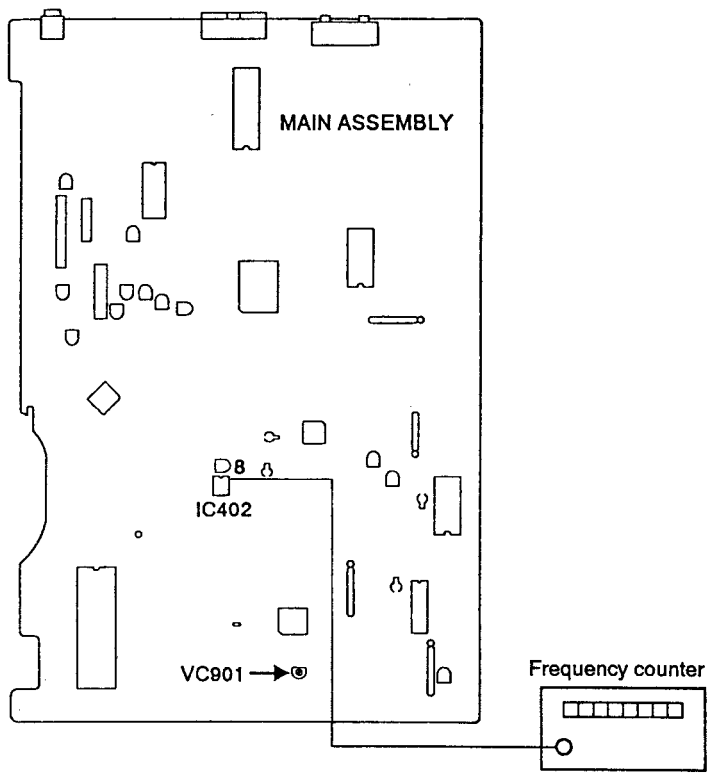
13. Ref. SUB CARRIER ADJUSTMENT

Electrical Adjustment

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

• Measuring instruments and jigs: • Measuring point: • Test disc and player mode	• Frequency counter • Oscilloscope 10:1 probe • IC402 (PM0001) pin 8 • Normal mode (Stop mode (Blueback screen))
• Positions to be adjusted	• VC901

Connection diagram



Adjustment Procedure

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

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

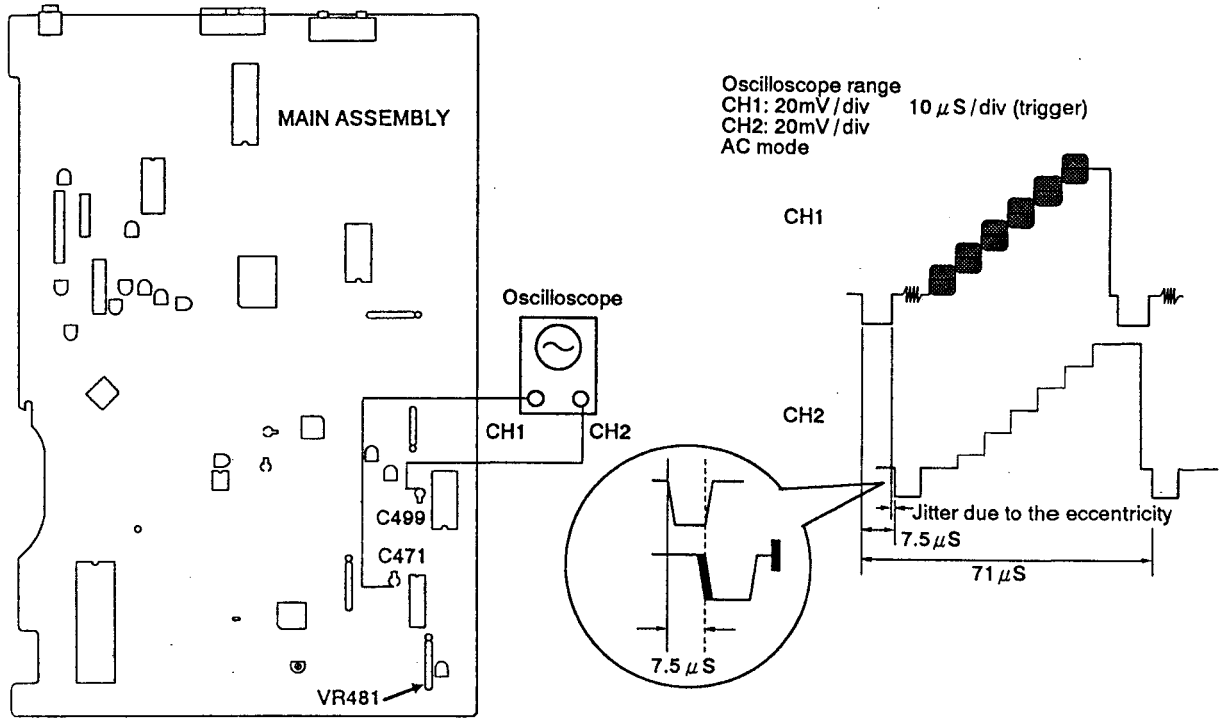
14. VCO FREE RUN ADJUSTMENT

Electrical Adjustment

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

• Measuring instruments and jigs:	• Oscilloscope
• Measuring point:	• CH 1 : + side lead wire of C471. • CH 2 : + side lead wire of C499.
• Test disc and player mode	• 8-inch LD test disc (GGV1003) • Normal mode (Still mode)
• Positions to be adjusted	• VR481

Connection diagram



Adjustment Procedure

1. Connect the + side lead wire of C471 and the + side lead wire of C499 to CH 1 and CH 2 of the oscilloscope respectively.
   CH 1 : Video signal before time axis error compensation.
   CH 2 : Video signal after time base error compensation.

2. Search for frame #5,100 on the test disc. Adjust VR481 so that the center of CH 1's video signal jitter is delayed by 71 μs (1H + 7.5 μs) with respect to the CH 2's video signal.

Note : Do not confuse CH 1 and CH 2.

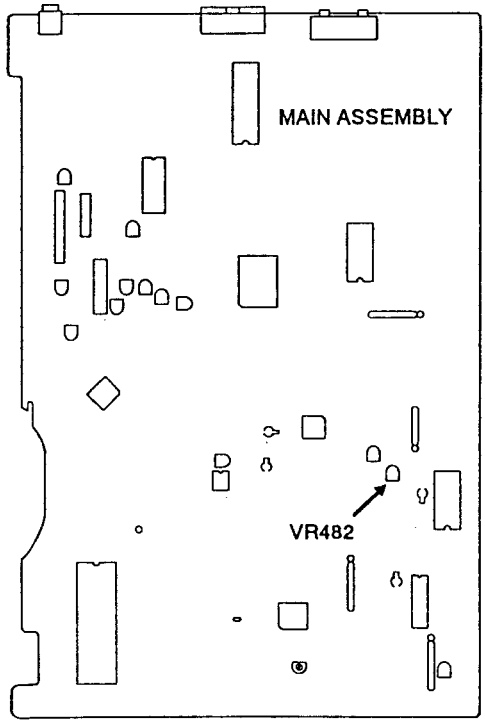
15. OUTPUT VIDEO LEVEL ADJUSTMENT

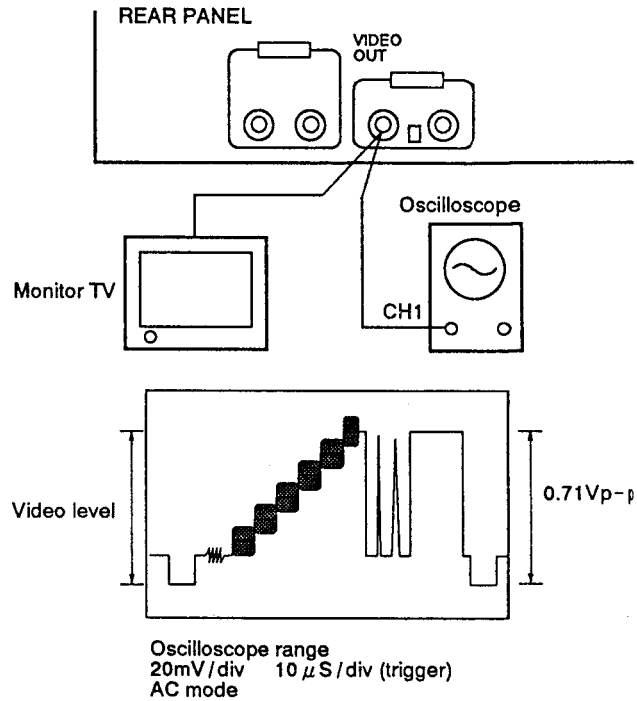
Electrical Adjustment

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

• Measuring instruments and jigs:	• Oscilloscope
• Measuring point:	• Player's VIDEO OUT terminal
• Test disc and player mode	• 8-inch LD test disc (GGV1003) • Normal mode (Still mode, #19,900)
• Positions to be adjusted	• VR482

Connection diagram





Adjustment Procedure

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

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

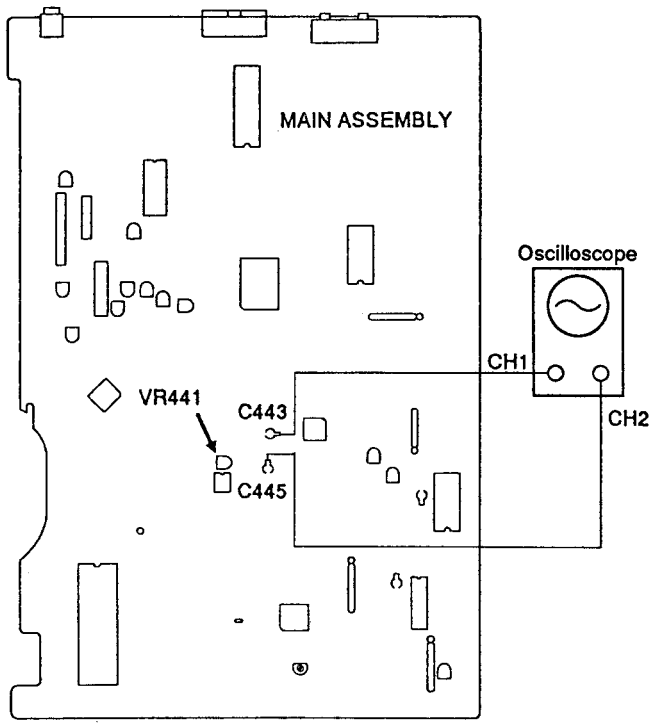
16. 1H DELAY VIDEO LEVEL ADJUSTMENT

Electrical Adjustment

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

• Measuring instruments and jigs:	• Oscilloscope
• Measuring point:	• CH 1 : – side lead wire of C443 • CH 2 : – side lead wire of C445
• Test disc and player mode	• 8-inch LD test disc (GGV1003) • Normal mode (Still mode)
• Positions to be adjusted	• VR441

Connection diagram



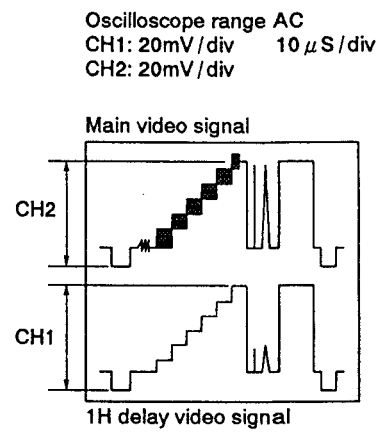


Fig. 1

Adjustment Procedure

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

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

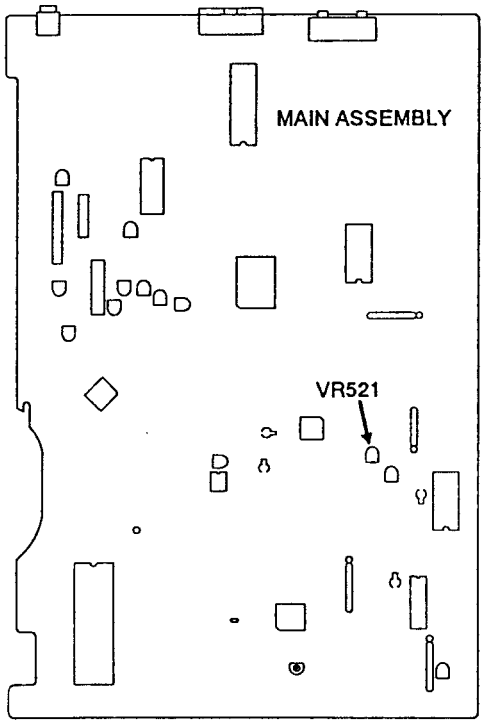
17. VPS ERROR ADJUSTMENT

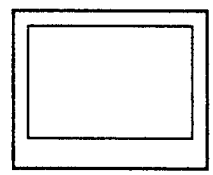
Electrical Adjustment

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

• Measuring instruments and jigs:	• TV monitor
• Measuring point:	
• Test disc and player mode	• 8-inch LD test disc (GGV1003) • Normal mode (Still mode)
• Positions to be adjusted	• VR521

Connection diagram





Color irregularity on the magenta screen is minimized.

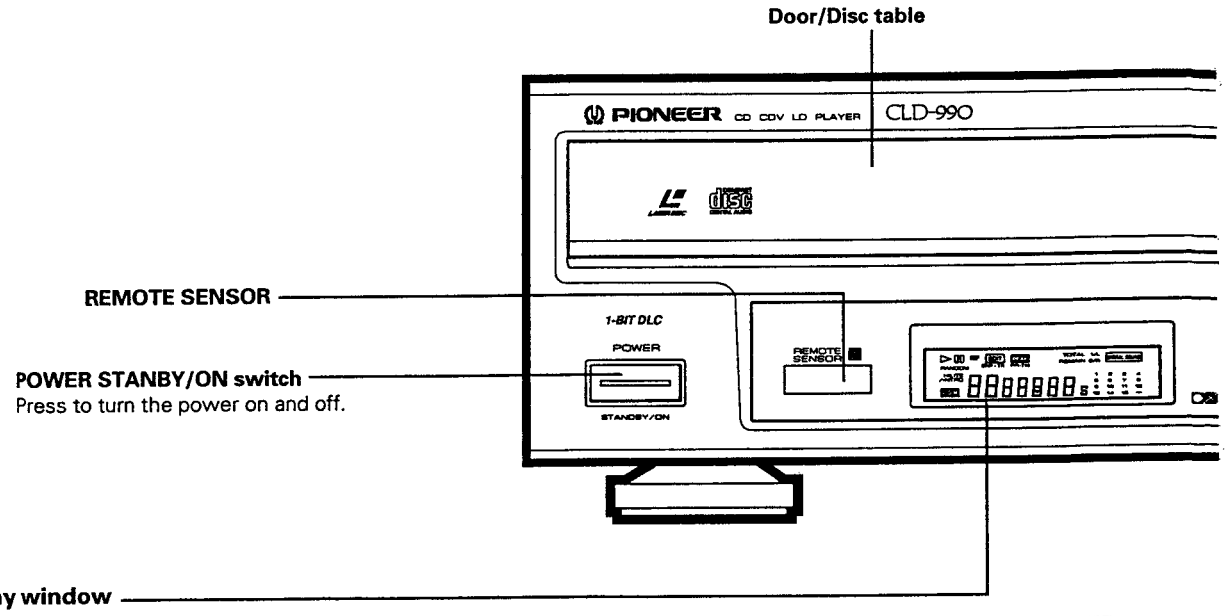
Adjustment Procedure

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

9. ABBREVIATIONS TABLE

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

10. PANEL FACILITIES



CHP-TR indicator
Indicates the TR (track) number or CHP (chapter) number.

REP indicator
Lights during repeat play.

II PAUSE indicator
Lights when the player is in pause mode.

► PLAY indicator
Lights during play. Blinks during search.

EDIT indicator
Lights when editing is performed.

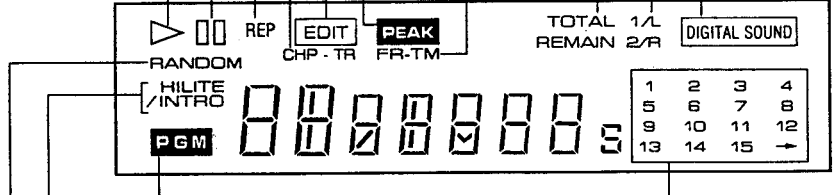
PEAK indicator
Lights while searching for the peak level.

FR-TM indicator
Indicates the FR (frame) number or TM (time).

REMAIN/TOTAL indicator
Indicates the REMAIN TIME (remaining play time) or TOTAL TIME (total play time).

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

DIGITAL SOUND indicator
Lights when the disc being played has a digital sound signal.
With LD discs, this indicator lights when the digital sound signal is selected.

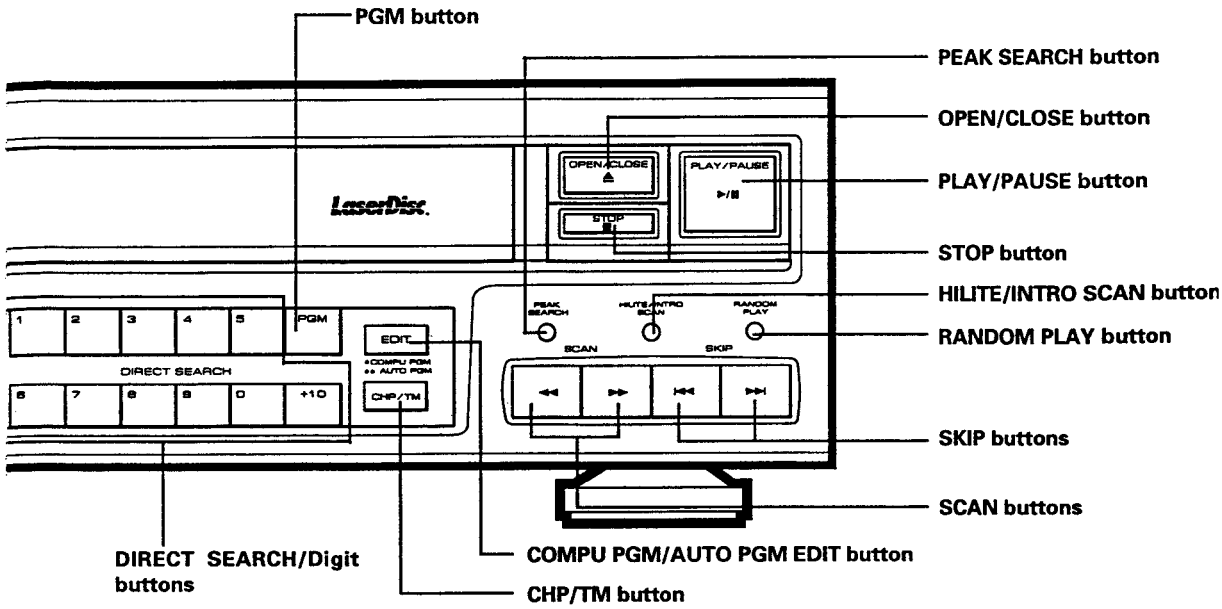


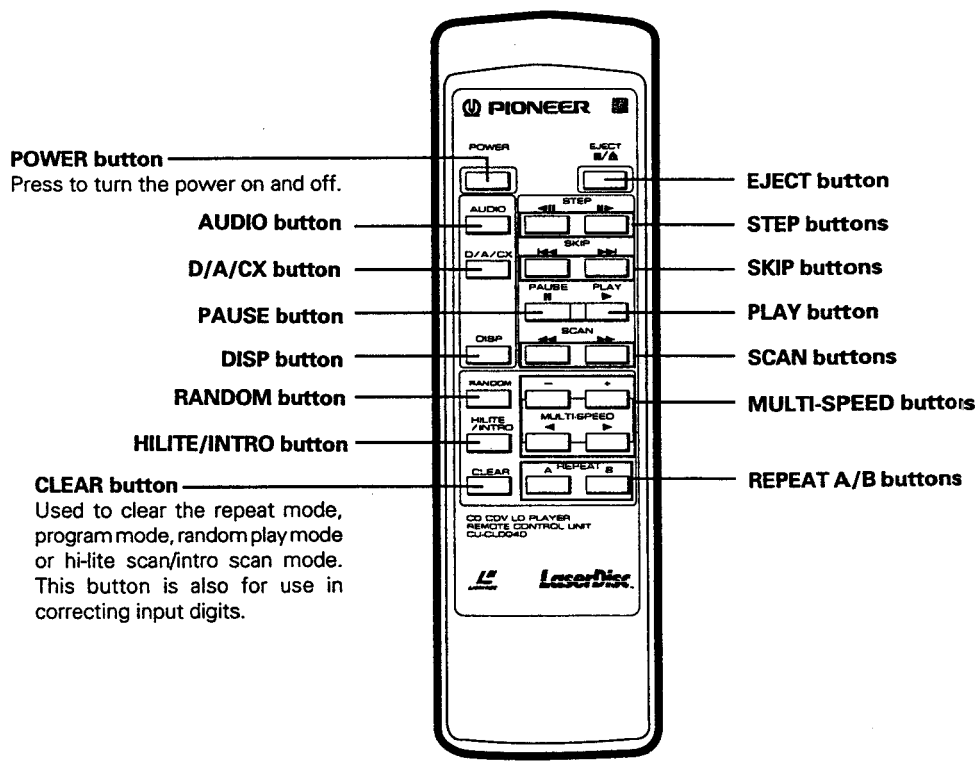
PGM indicator
Lights during program play.

HILITE/INTRO indicator
Lights during Hi Lite Scan or Intro Scan mode.

RANDOM indicator
Lights during random play.

Visual calendar
When a disc is loaded, all of the chapter/track numbers recorded on the disc light up on the display. If the disc contains more than 15 chapters/tracks, the → indicator lights.
During program play, only the programmed chapter/track numbers light. When a disc without a TOC section is played, only the selection number being played lights.
When a CDV disc is loaded, the track numbers of the video part light followed by the track numbers of the audio part.
After a chapter/track is finished playing, the corresponding number goes out.


PGM button
PEAK SEARCH button
OPEN/CLOSE button
PLAY/PAUSE button
STOP button
HILITE/INTRO SCAN button
RANDOM PLAY button
SKIP buttons
SCAN buttons
DIRECT SEARCH/Digit buttons
COMPU PGM/AUTO PGM EDIT button
CHP/TM button
LaserDisc
OPEN/CLOSE
PLAY/PAUSE
STOP
PEAK SEARCH
HILITE/INTRO SCAN
RANDOM PLAY
SCAN
SKIP
PGM
EDIT
CHP/TM
DIRECT SEARCH
+10


POWER button
Press to turn the power on and off.
AUDIO button
D/A/CX button
PAUSE button
DISP button
RANDOM button
HILITE/INTRO button
CLEAR button
Used to clear the repeat mode, program mode, random play mode or hi-lite scan/intro scan mode. This button is also for use in correcting input digits.
EJECT button
STEP buttons
SKIP buttons
PLAY button
SCAN buttons
MULTI-SPEED buttons
REPEAT A/B buttons
PIONEER
POWER
AUDIO
D/A/CX
DISP
RANDOM
HILITE /INTRO
CLEAR
STEP
SKIP
PAUSE
PLAY
SCAN
MULTI-SPEED
REPEAT
LaserDisc

11. SPECIFICATIONS

1. General

System ..... LaserVision Disc system and Compact Disc digital audio system
Laser ..... Semiconductor laser wavelength 780 nm
Power requirements ..... AC 120V, 60 Hz
Power consumption ..... 39 W
Weight ..... 7.6 kg (16 lbs 12 oz)
Dimensions ..... 420 (W) x 410 (D) x 122 (H) mm
16-9/16 (W) x 16-1/8 (D) x 4-13/16 (H) in
Operating temperature ..... +5°C ~ +35°C
(41°F - 95°F)
Operating humidity ..... 5% ~ 90%
(There should be no condensation of moisture.)

2. Disc

LaserVision Discs

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

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

Compact Discs

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

Compact Discs with Video

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

** Actual playback time differs for each disc.*

3. Video characteristics

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

4. Audio characteristics

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

Digital Audio Characteristics

Frequency response	4 Hz - 20 kHz (±0.5 dB) (EIAJ)
SN ratio	100 dB (EIAJ)
Dynamic range	96 dB (EIAJ)
Channel separation	96 dB (EIAJ)
Total harmonic distortion	0.006% (EIAJ)
Wow and flutter	Limit of measurement (EIAJ)

5. Other Terminals

Control input/output ..... Both miniature jacks
VHF adapter output
(Video:common to video
and audio/Audio) ..... Both RCA jacks with DC jack

6. Accessories

Remote control unit (CU-CLD040) 1
Size "AAA" (IEC R03) dry cell batteries 2
Video cord 1
Audio cord 1
Operating instructions 1
Warranty card 1