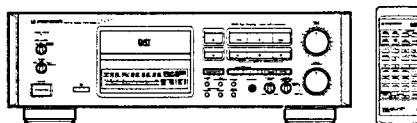


# Service Manual

**PIONEER**  
The Art of Entertainment



ORDER NO.  
ARP2823

## DIGITAL AUDIO TAPE DECK

# D-07

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

Type	Model	Power Requirement	The voltage can be converted by the following method.
	D-07		
HEM	○	AC220-230V	AC230-240V, *

\*: Alter the wiring of the Power-supply block at the primary winding of Power transformer referring to the "Line Voltage Selection" described in Service Manual.

## CONTENTS

1. EXPLODED VIEWS AND PARTS LIST .....	2	6. ADJUSTMENTS .....	41
2. PACKING .....	10	7. IC INFORMATION .....	56
3. SCHEMATIC AND PCB CONNECTION DIAGRAMS .....	11	8. BLOCK DIAGRAM .....	78
4. PCB PARTS LIST .....	35	9. PANEL FACILITIES .....	79
5. DISASSEMBLY .....	40	10. SPECIFICATIONS .....	81

**PIONEER ELECTRONIC CORPORATION** 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan  
**PIONEER ELECTRONICS SERVICE INC.** P.O. Box 1760, Long Beach, California 90801 U.S.A.  
**PIONEER ELECTRONICS OF CANADA, INC.** 300 Allstate Parkway Markham, Ontario L3R 0P2 Canada  
**PIONEER ELECTRONIC [EUROPE] N.V.** Haven 1087 Keetberglaan 1, 9120 Melsele, Belgium  
**PIONEER ELECTRONICS AUSTRALIA PTY. LTD.** 178-184 Boundary Road, Braeside, Victoria 3195 Australia TEL: [03] 580-9911  
 © **PIONEER ELECTRONIC CORPORATION 1993**

DFI AUG. 1993 Printed in Japan

# 1. EXPLODED VIEWS AND PARTS LIST

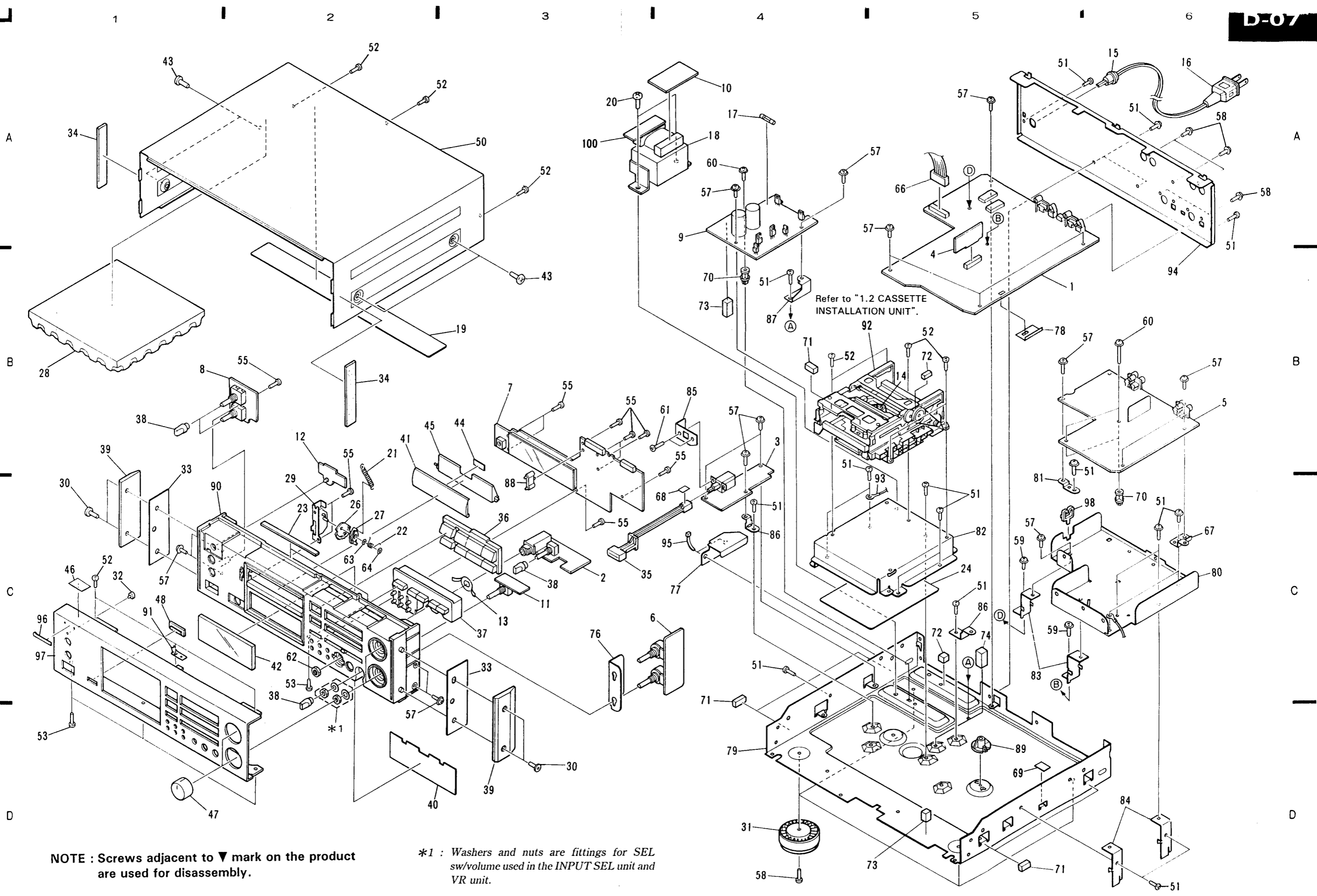
**NOTES :**

- Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.
- The  $\Delta$  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.

## 1.1 EXTERIOR

### Parts List of Exterior

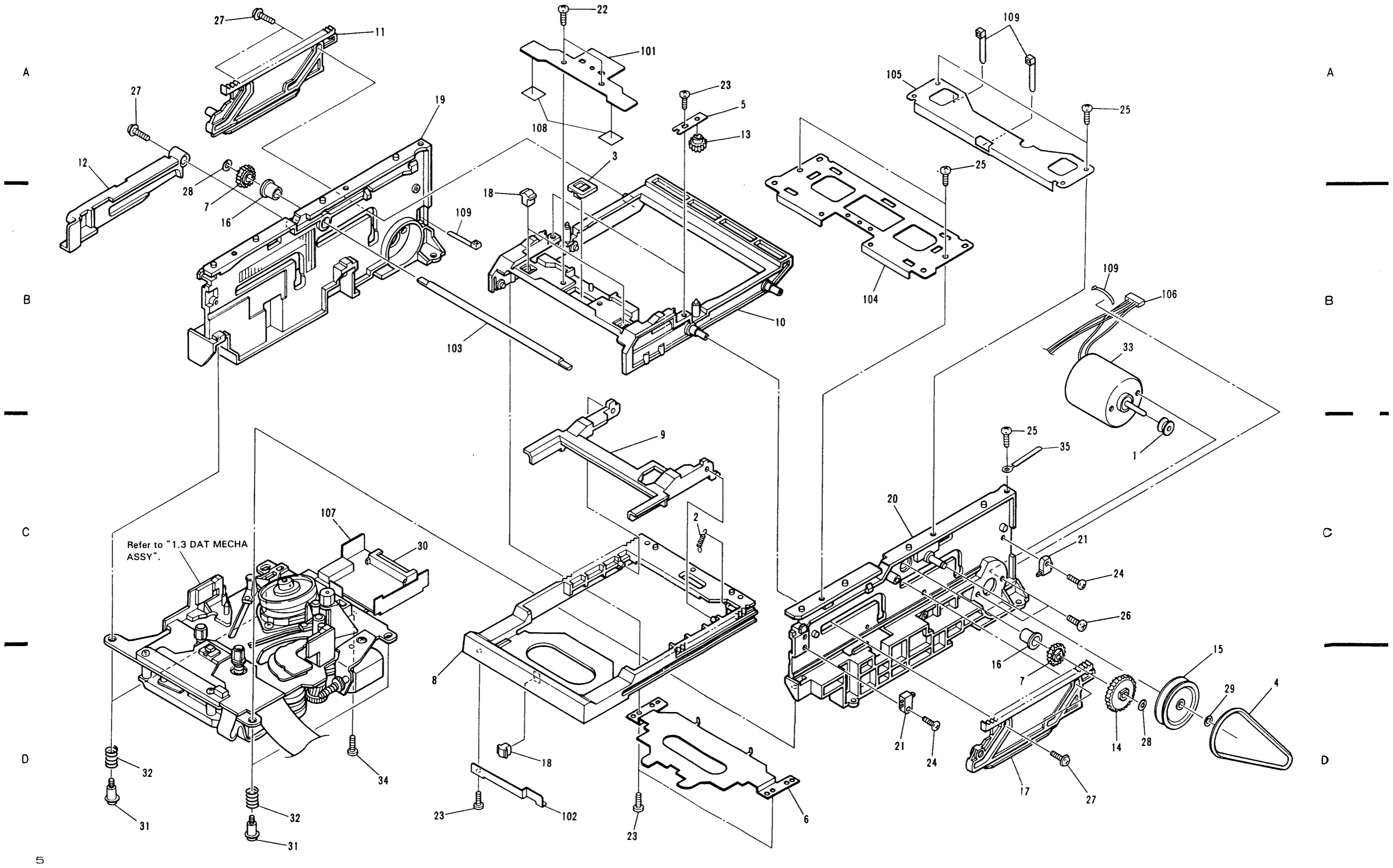
Mark	No.	Description	Parts No.	Mark	No.	Description	Parts No.
	1	MAIN UNIT	RWZ3081		53	SCREW	BBT30P100FZK
	2	HEADPHONE UNIT	RWZ3082		54	.....	
NSP	3	POWER SW UNIT	RWZ3083		55	SCREW	BBZ26P080FZK
	4	CAP PRE-DRIVE UNIT	RWZ3084				
	5	AUDIO UNIT	RWZ3085		56	.....	
	6	VR UNIT	RWZ3087		57	SCREW	IBZ30P060FCC
	7	DISPLAY UNIT	RWZ3086		58	SCREW	IBZ30P080FCC
NSP	8	SW UNIT	RWZ3088		59	SCREW	IBZ30P100FCC
	9	POWER UNIT	RWZ3089		60	SCREW	IBZ30P150FCC
	10	TRANS B UNIT	RWZ3090				
NSP	11	INPUT SEL UNIT	RWZ3091		61	SCREW	PMA30P060FCU
NSP	12	LED UNIT	RWZ3092		62	NUT	RBN-006
NSP	13	PLATE (EARTH)	RNE1717		63	WASHER	WT21D050D050
NSP	14	DAT MECHA ASSY	EXK2505		64	WASHER	WT21D070D050
$\Delta$	15	STRAIN RELIEF	CM-22B		65	.....	
	16	AC POWER CORD	PDG1003	NSP	66	CONNECTOR ASSY 13P (J41)	RKP1518
$\Delta$	17	FUSE (T2.5AL250V, FU1)	REK-104	NSP	67	ANGLE B	PNB1169
$\Delta$	18	POWER TRANSFORMER (T1)	RTT1240	NSP	68	TAPE	PNM-044
	19	DAMPER PLATE B	PNB1109	NSP	69	SPACER (PVC)	REC1078
	20	SCREW (FE)	RBA1099	NSP	70	PCB SPACER	PNY-404
	21	SPRING	RBH1143	NSP	71	SPACER (A)	REB1057
	22	SPRING	RBH1191	NSP	72	FL SPACER	REB1171
	23	CUSHION	REB1193	NSP	73	SPACER (RUBBER)	REB1187
	24	DAMPER PLATE C	RNC1070	NSP	74	SPACER (RUBBER)	REB1192
	25	.....			75	.....	
	26	GEAR	RNK1289	NSP	76	VR SHIELD PLATE (PVC)	REC1162
	27	ARM	RNK1290	NSP	77	COVER (PVC)	REC1163
	28	ABSORBING MATERIAL A	RNM1049	NSP	78	INSULATION SHEET (PVC)	REC1165
	29	DOOR PLATE ASSY	RXA1383	NSP	79	MAIN CHASSIS	RNB1042
	30	SCREW	VBA1028	NSP	80	SHIELD PLATE (FE)	RNB1081
	31	FOOT	AMR1159	NSP	81	PCB ANGLE A (FE)	RNB1083
	32	INDICATING LENS	AMR1160	NSP	82	MECHA STAY (FE)	RNC1065
	33	SIDE SPACER	PEB1197	NSP	83	SHIELD ANGLE A (FE)	RNC1066
	34	SIDE SHEET	PNM1150	NSP	84	SHIELD ANGLE B (FE)	RNC1067
	35	POWER BUTTON	RAC1657	NSP	85	PS HOLDER	RNE1185
	36	FUNCTION KNOB	RAC1658	NSP	86	PCB BASE	RNE1221
	37	SUB FUNCTION KNOB	RAC1740	NSP	87	PCB HOLDER	RNE1330
	38	BALANCE KNOB	RAC1742	NSP	88	DOOR STOPPER	RNK1855
	39	SIDE PANEL	RAH1931	NSP	89	STUD	RNL-792
	40	FL FILTER (PVC)	RAH2125	NSP	90	PANEL STAY	RNT1149
	41	DOOR PANEL	RAH2126	NSP	91	PLATE (EARTH)	VNE1164
	42	FL LENS	RAH2127	NSP	92	CASSETTE INSTALLATION UNIT	RXA1470
	43	SCREW (FE)	RBA1088				
	44	DOOR STABILIZER	REB1177	NSP	93	LEAD WIRE UNIT (EARTH)	XDF-506
	45	DOOR MOLD	RNK1854	NSP	94	REAR PANEL (FE)	RNA1752
NSP	46	CAUTION SEAL	RRW1079	NSP	95	BINDER	PEC-107
	47	VR KNOB ASSY (A)	RXA1562				
	48	SENSOR WINDOW	VNK1566		96	NAME PLATE	PAN1262
	49	.....		NSP	97	FRONT PANEL (AL)	RAH2343
	50	BONNET	REA1017	NSP	98	WIRE CLAMPER	PEC-097
	51	SCREW	BBT30P060FCC		99	.....	
	52	SCREW	BBT30P080FCC	NSP	100	TRANS A BOARD	RNZ2545



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

\*1 : Washers and nuts are fittings for SEL sw/volume used in the INPUT SEL unit and VR unit.

1.2 CASSETTE INSTALLATION UNIT



**Parts List of Cassette Installation Unit**

Mark	No.	Description	Parts No.	Mark	No.	Description	Parts No.
	1	MOTOR PULLEY	PNW1634	NSP	101	SPRING	RBK1035
	2	SPRING	RBH1279	NSP	102	SPRING (TRAY)	RBK1036
	3	HALF DAMPER	REB1033	NSP	103	SHAFT	RLA1152
	4	BELT	REB1140	NSP	104	TOP PLATE	RNE1396
	5	GEAR STOPPER	RNE1394	NSP	105	REAR STAY	RNE1397
	6	CONTAINER PLATE	RNE1395	NSP	106	CONNECTOR ASSY 6P	RKP1433
	7	GEAR	RNK1272	NSP	107	SHIELD CASE (LOWER)	RNE1566
	8	TRAY	RNK1876	NSP	108	TAPE	PNM1017
	9	FLAP	RNK1649	NSP	109	BINDER	PEC-107
	10	CONTAINER	RNK1650				
	11	MAIN RACK PLATE L	RNK1653				
	12	LEVER	RNK1657				
	13	GEAR	RNK1658				
	14	GEAR A	RNK1659				
	15	PULLEY GEAR	RNK1660				
	16	COLLAR	RNK1661				
	17	MAIN RACK PLATE R	RNK1664				
	18	HALF HOLDER	RNK1711				
	19	SIDE PLATE L ASSY	RXA1356				
	20	SIDE PLATE R ASSY	RXA1357				
	21	PUSH SWITCH (S2001, S2002)	RSF1008				
	22	SCREW	BBZ20P040FMC				
	23	SCREW	BBZ20P060FZK				
	24	SCREW	BBZ20P080FMC				
	25	SCREW	BBZ26P060FMC				
	26	SCREW	BMZ30P040FMC				
	27	SCREW	PBA1035				
	28	WASHER	WT21D050D025				
	29	WASHER	WT26D047D050				
	30	RF UNIT	RWX1076				
	31	SCREW	PBA1002				
	32	SPRING	RBH1125				
	33	LOADING MOTOR	VXM1034				
	34	SCREW	BMZ20P040FMC				
	35	CORD CLAMPER	RNH-184				

**1.3 DAT MECHA ASSY**

**Parts List of DAT Mecha Assy**

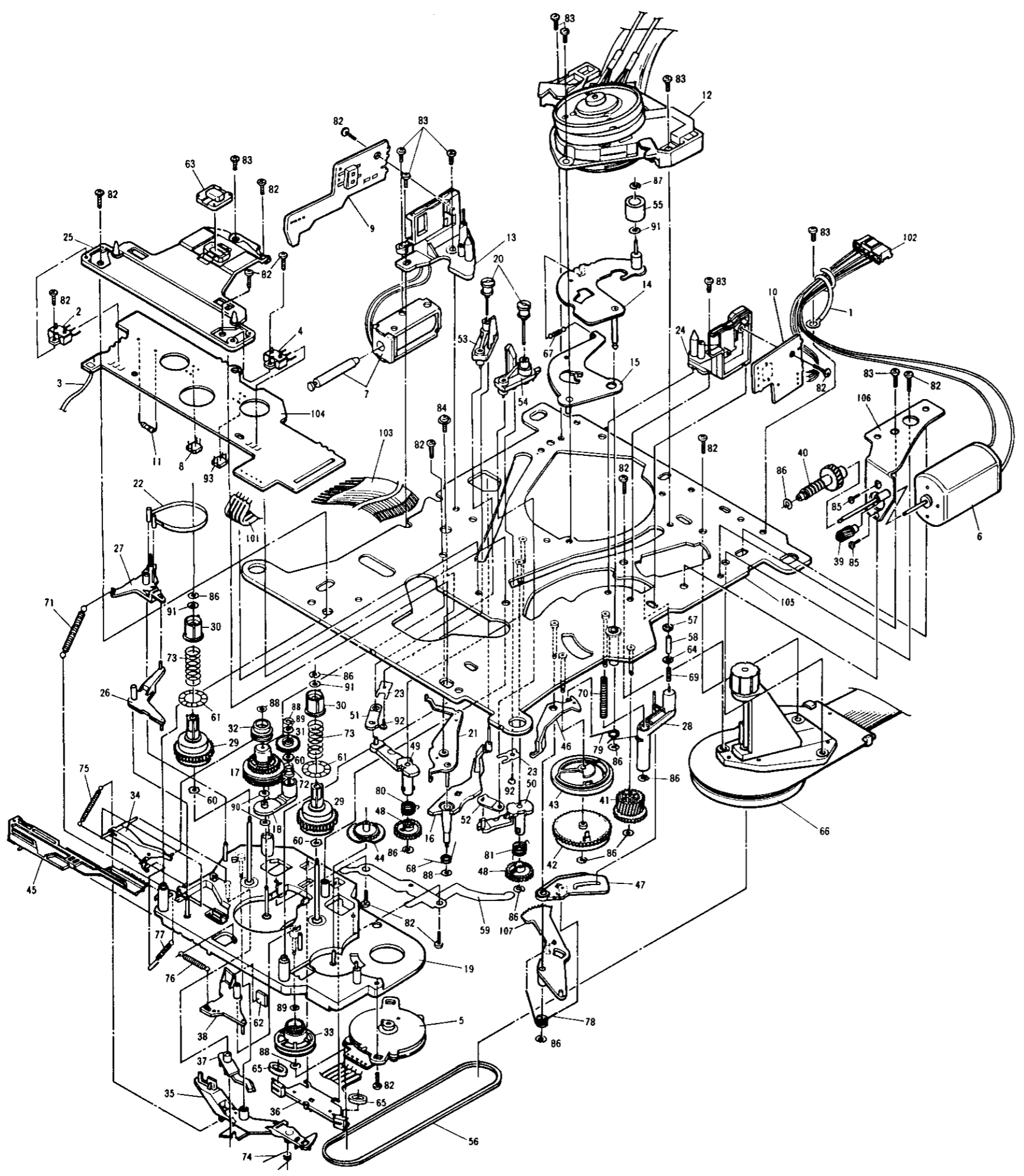
Mark	No.	Description	Parts No.	Mark	No.	Description	Parts No.
NSP	1	CLAMPER	HEF-102	51	THREADING LINK L	ENV1245	
	2	SWITCH (S102)	ESG9001	52	THREADING LINK R	ENV1246	
	3	CONNECTOR (J8)	EDF9002	53	SLIDER L	ENV1247	
	4	SWITCH (S101)	ESG1001	54	SLIDER R	ENV1248	
	5	ENCODER ASSY	ESX1001	55	PINCH ROLLER	ENT1016	
	6	POWER MOTOR	CXM1020	56	BELT	ENT1017	
	7	SOLENOID	EXP1007	57	PULL GUIDE FLANGE	ELA2025	
	8	PHOTO REFLECTOR (Q102) (REEL SENSOR)	GP2S04	58	TAPE GUIDE	ELA2022	
	9	PHOTO REFLECTOR ASSY (Q103) (END SENSOR)	EXX1023	59	EARTH SPRING	EBL1004	
	10	PHOTO REFLECTOR ASSY (Q104) (TOP SENSOR)	EXX1022	60	REEL WASHER	EBF1014	
	11	RESISTOR (R101)	RD1/4PM431J	61	SENSOR SHEET	EEF1001	
	12	DRUM ASSY	EXH9004	62	BRAKE FELT	ENM1019	
	13	BRACKET L ASSY	EXA1117	63	DAMPER	ENT1021	
	14	PINCH ARM ASSY	EXA1118	64	TAPE GUIDE	ENV1282	
	15	PINCH DRIVE ARM ASSY	EXA1119	65	BRAKE SHOE	ENT1022	
	16	TR ARM ASSY	EXA1122	66	CAPSTAN DD UNIT	EXH9002	
	17	DRIVE GEAR ASSY	EXA1123	67	PINCH-ARM SPRING	EBH1236	
	18	SWING ARM ASSY	EXA1124	68	TR ARM SPRING	EBH1237	
	19	REEL BASE ASSY	EXA1125	69	PULL-GUIDE SPRING	EBH1222	
	20	ROLLER GUIDE	EXA1129	70	SPRING	EBH1223	
	21	TR ARM BRACKET ASSY	EXA1184	71	TR BRAKE SPRING	EBH1224	
	22	TR BAND ASSY	EXA1185	72	IDLER GEAR SPRING	EBH1226	
	23	SLIDER PLATE	ENE1006	73	REEL HUB SPRING	EBH1227	
	24	SENSOR BRACKET R	ENV1236	74	BRAKE PLATE SPRING	EBH1228	
	25	STABILIZER	ENV1192	75	BRAKE LEVER SPRING	EBH1229	
	26	TR LEVER	ENV1194	76	REV BRAKE SPRING	EBH1382	
	27	TR BRAKE	ENV1195	77	CHANGE ARM SPRING	EBH1231	
	28	PULL ARM	ENV1197	78	DRIVE ARM SPRING	EBH1232	
	29	REEL GEAR	ENV1251	79	HARD BRAKE SPRING	EBH1233	
	30	REEL HUB	ENV1252	80	THREADING ARM SPRING (L)	EBH1238	
	31	IDLER GEAR	ENV1253	81	THREADING ARM SPRING (R)	EBH1239	
	32	CLUTCH DRUM	ENV1254	82	SCREW	BBZ20P060FZK	
	33	PULLEY GEAR	ENV1255	83	SCREW	BMZ20P040FMC	
	34	CHANGE ARM	ENV1256	84	SCREW	PMS20P025FMC	
	35	BRAKE LEVER	ENV1257	85	SCREW	JGZ20P030FMC	
	36	BRAKE PLATE	ENV1258	86	WASHER	WT16D040D050	
	37	CHANGE LEVER	ENV1259	87	WASHER	WT16D032D025	
	38	REV BRAKE	ENV1260	88	WASHER	WT10D035D025	
	39	MOTOR GEAR	ENV1231	89	WASHER	WA16D032D025	
	40	WORM GEAR	ENV1232	90	WASHER	WA16D032D013	
	41	WORM WHEEL	ENV1233	91	WASHER	WA20D040D050	
	42	DRIVE GEAR	ENV1234	92	SCREW	EBA1025	
	43	CAM	ENV1235	93	PHOTO REFLECTOR (Q101) (REEL SENSOR)	GP2S24C	
	44	INTERVAL GEAR	ENV1238	NSP 101	JUMPER WIRE 5P (J101)	EDD1004	
	45	MODE PLATE	ENV1239	NSP 102	CONNECTOR ASSY 5P (J6)	EDE1011	
	46	HARD BRAKE	ENV1240	NSP 103	LEAD CARD 13P (J5)	EDD1006	
	47	DRIVE ARM	ENV1241	NSP 104	REEL SENSOR BOARD	ENP1027	
	48	THREADING GEAR	ENV1242	NSP 105	CHASSIS ASSY	EXA1183	
	49	THREADING ARM L	ENV1243	NSP 106	MOTOR BRACKET ASSY	EXA1130	
	50	THREADING ARM R	ENV1244	NSP 107	DRIVE LEVER	ENR1014	

A

B

C

D



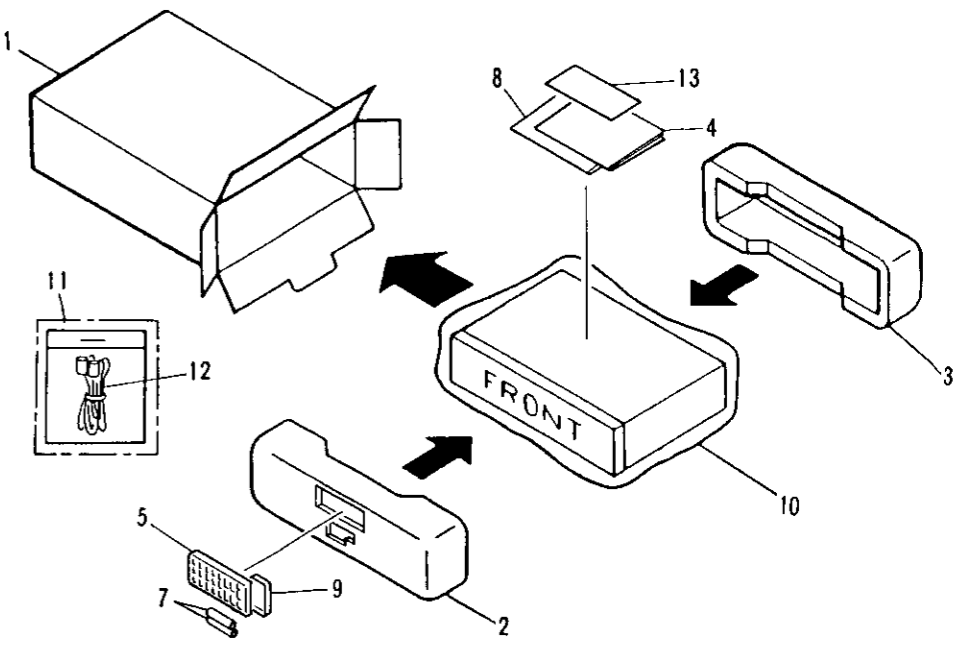
## 2. PACKING

**NOTES :**

- Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.
- The  $\Delta$  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.

**Parts List of Packing**

Mark	No.	Description	Parts No.
	1	PACKING CASE	RHG1510
	2	PAD (F)	RHA1073
	3	PAD (R)	RHA1074
	4	OPERATING INSTRUCTIONS (Dutch/Swedish/Spanish/Danish)	RRD1142
	5	REMOTE CONTROL UNIT	RPX1061
	6	.....	
NSP	7	BATTERY (R03, AAA)	VEM-022
	8	INSTRUCTION MANUAL (English/French/German/Italian)	RRE1080
	9	BATTERY LID	PZN1009
	10	SHEET	RHX1007
	11	CONNECTION CORD ASSY	RDE1002
	12	CONNECTION CORD ASSY	RDE1036
NSP	13	WARRANTY CARD	ARW-088



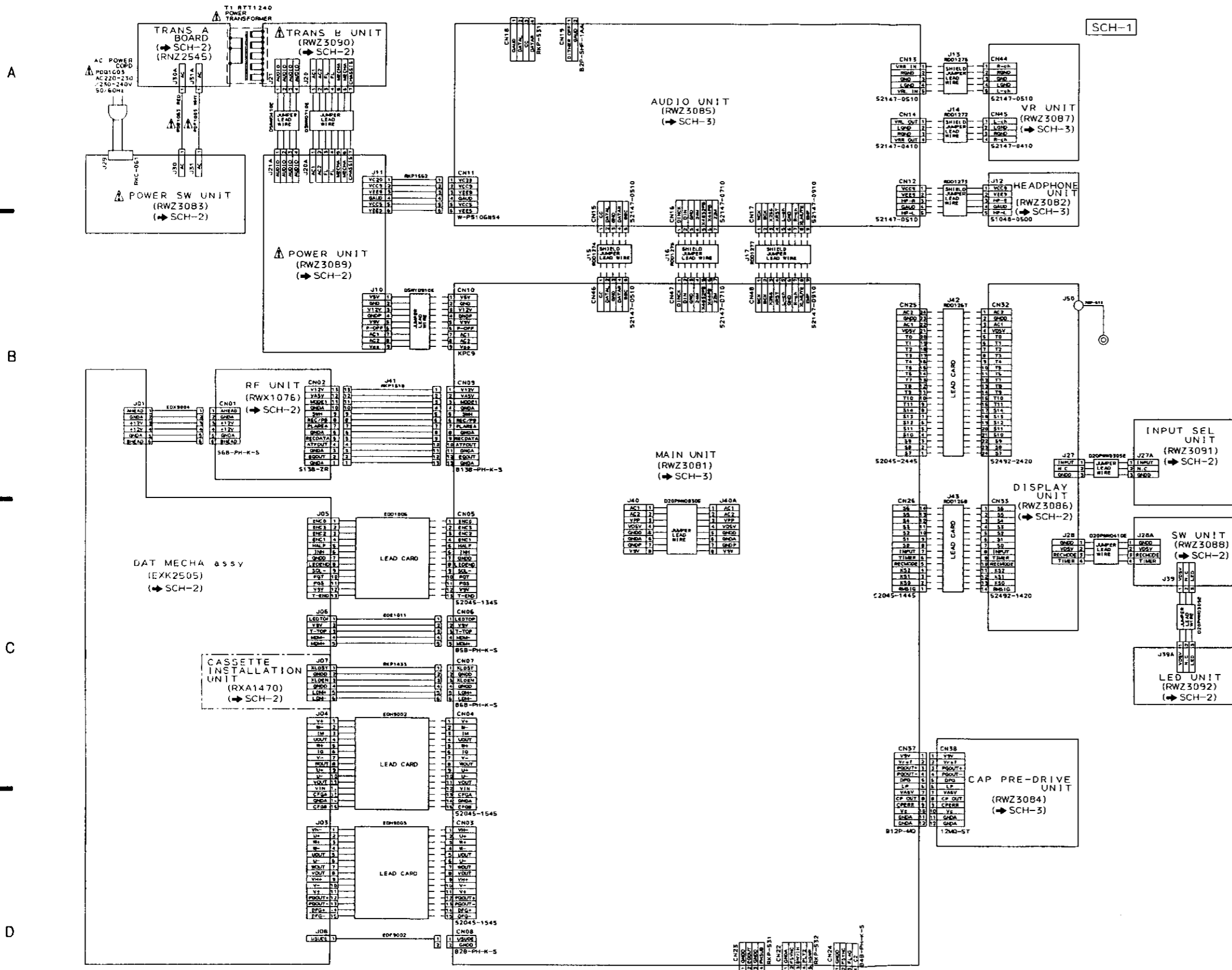
A

B

C

D

### 3. SCHEMATIC AND PCB CONNECTION DIAGRAMS 3.1 OVERALL SCHEMATIC DIAGRAM



#### NOTE FOR SCHEMATIC DIAGRAMS (Type 6A)

- When ordering service parts, be sure to refer to "PARTS LIST of EXPLODED VIEWS" or "PCB PARTS LIST".
- Since these are basic circuits, some parts of them or the values of some components may be changed for improvement.
- RESISTORS:**  
Unit: k: kΩ, M: MΩ, or Ω unless otherwise noted.  
Rated power: 1/4W, 1/8W, 1/10W unless otherwise noted.  
Tolerance: (F): ±1%, (G): ±2%, (K): ±10%, (M): ±20% or ±5% unless otherwise noted.
- CAPACITORS:**  
Unit: p: pF or μF unless otherwise noted.  
Ratings: capacitor (μF)/ voltage (V) unless otherwise noted.  
Rated voltage: 50V except for electrolytic capacitors.
- COILS:**  
Unit: m: mH or μH unless otherwise noted.
- VOLTAGE AND CURRENT:**  
⊖ or - V : DC voltage (V) in STOP mode unless otherwise noted.  
⊖ mA or - mA : DC current in STOP mode unless otherwise noted.
- OTHERS:**
  - ⊗ or ⊙ : Adjusting point.
  - ⊘ : Measurement point.
  - The  $\Delta$  mark found on some component parts indicates the importance of the safety factor of the parts. Therefore, when replacing, be sure to use parts of identical designation.
- SCH-□ ON THE SCHEMATIC DIAGRAM:**
  - SCH-□ indicates the drawing number of the schematic diagram. (SCH stands for schematic diagram.)
- SWITCHES (Underline indicates switch position):**

**MAIN UNIT**  
S501 DIGITAL OUT ON-OFF

**DISPLAY UNIT**  
S1601 MUTE  
S1602 ENTER  
S1603 ID MODE  
S1604 FF  
S1605 PLAY  
S1606 PAUSE  
S1607 MS +  
S1608 MS -  
S1609 FADER  
S1610 CHARACTER  
S1611 REW  
S1612 REC  
S1613 TOC RENUMBER  
S1614 PEAK RESET  
S1615 COUNTER RESET  
S1616 COUNTER MODE  
S1617 AUTO ID  
S1618 STOP  
S1619 O/C

**SW UNIT**  
S1701 REC MODE LP-SP-WIDE  
S1702 TIMER REC-OFF-PLAY REPEAT

**POWER SW UNIT**  
S1201 POWER

**INPUT SEL UNIT**  
S1801 INPUT SELECTOR ANALOG-COAX-OPT



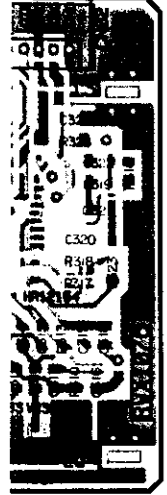






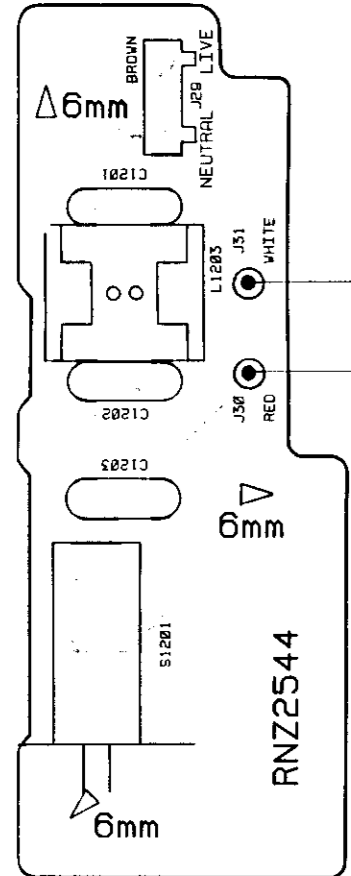
4 5 6 7 8 9

NP1461-C

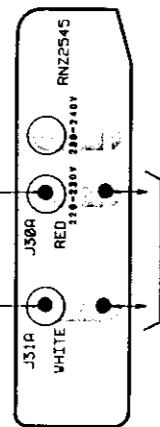


- This diagram is viewed from the pink colored foil side.
- This is a multi-layer PCB. But information for both sides is shown.

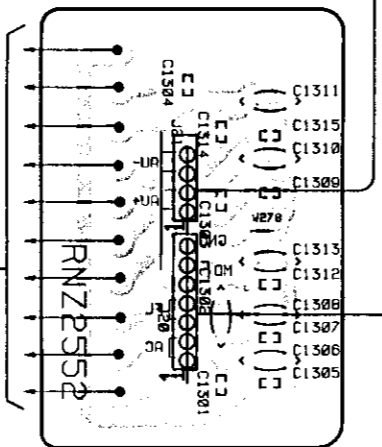
POWER SW unit



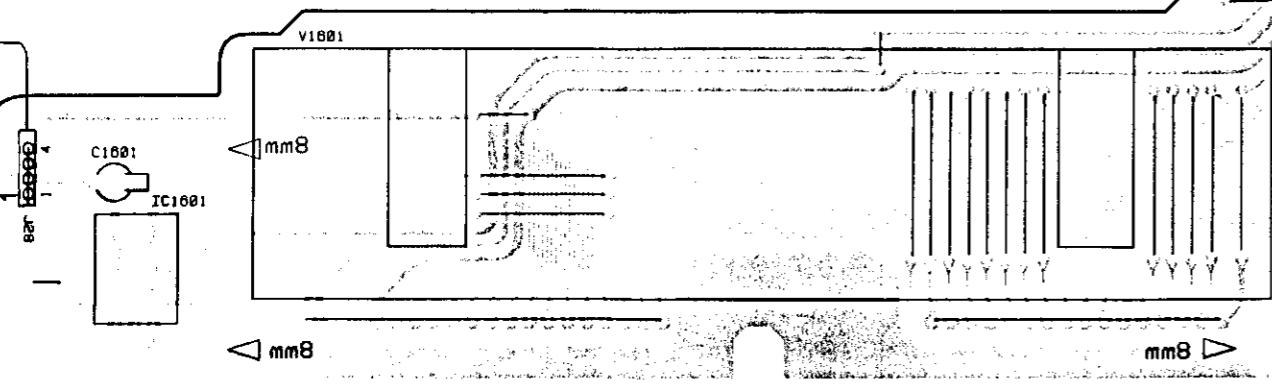
TRANS A board



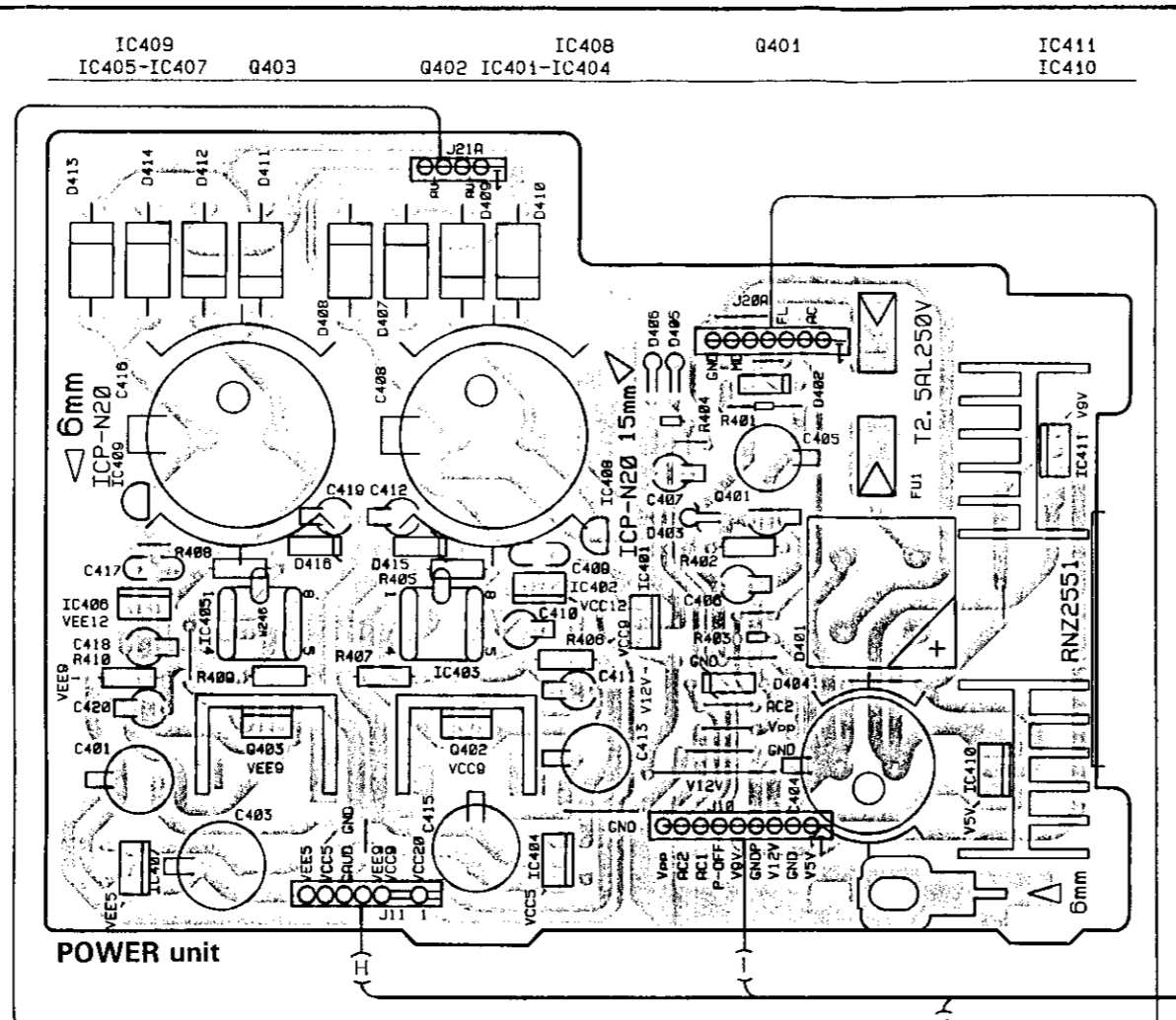
TRANS B unit



DISPLAY unit



To POWER TRANSFORMER T1

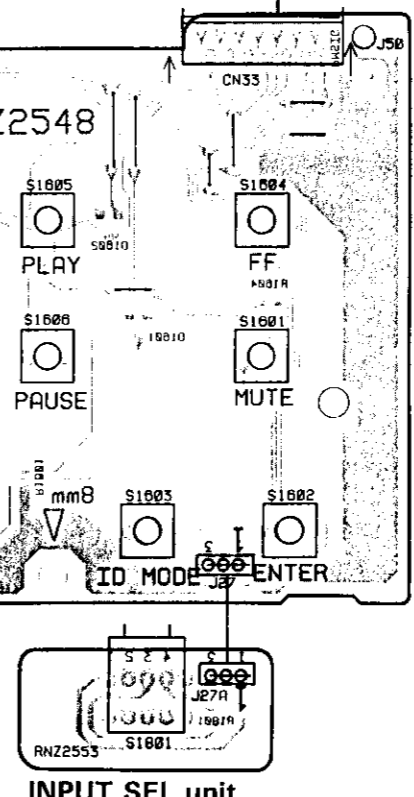


- (A) To MAIN UNIT CN07
- (B) To MAIN UNIT CN05
- (C) To MAIN UNIT CN08
- (D) To MAIN UNIT CN06
- (E) To MAIN UNIT CN04
- (F) To MAIN UNIT CN03
- (G) To MAIN UNIT CN09
- (H) To AUDIO UNIT CN11
- (I) To MAIN UNIT CN10
- (J) To MAIN UNIT CN25
- (K) To MAIN UNIT CN26

• This diagram is viewed from the mounted parts side.

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

A  
B  
C  
D



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

4 5 6 7 8 9

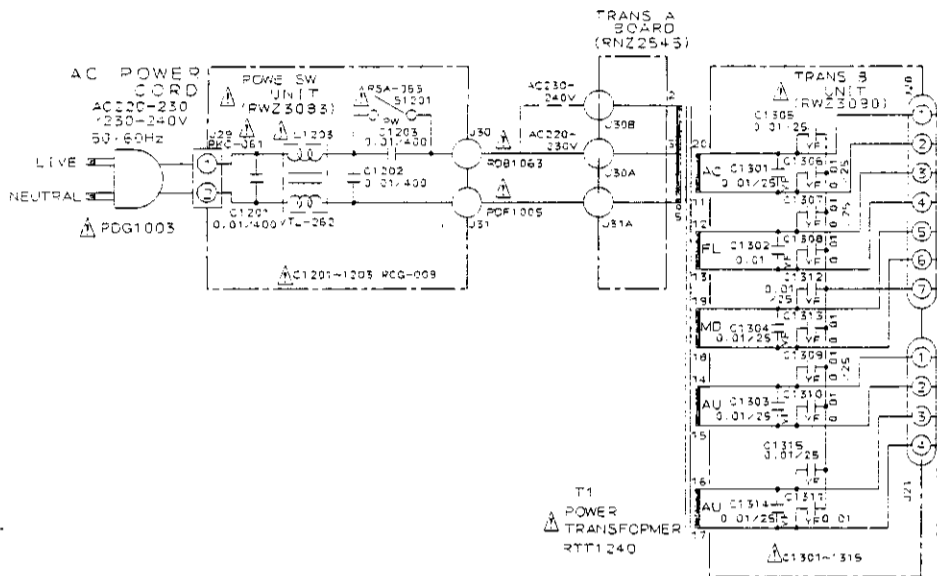
**A Line Voltage Selection**

Line voltage can be changed with the following steps.

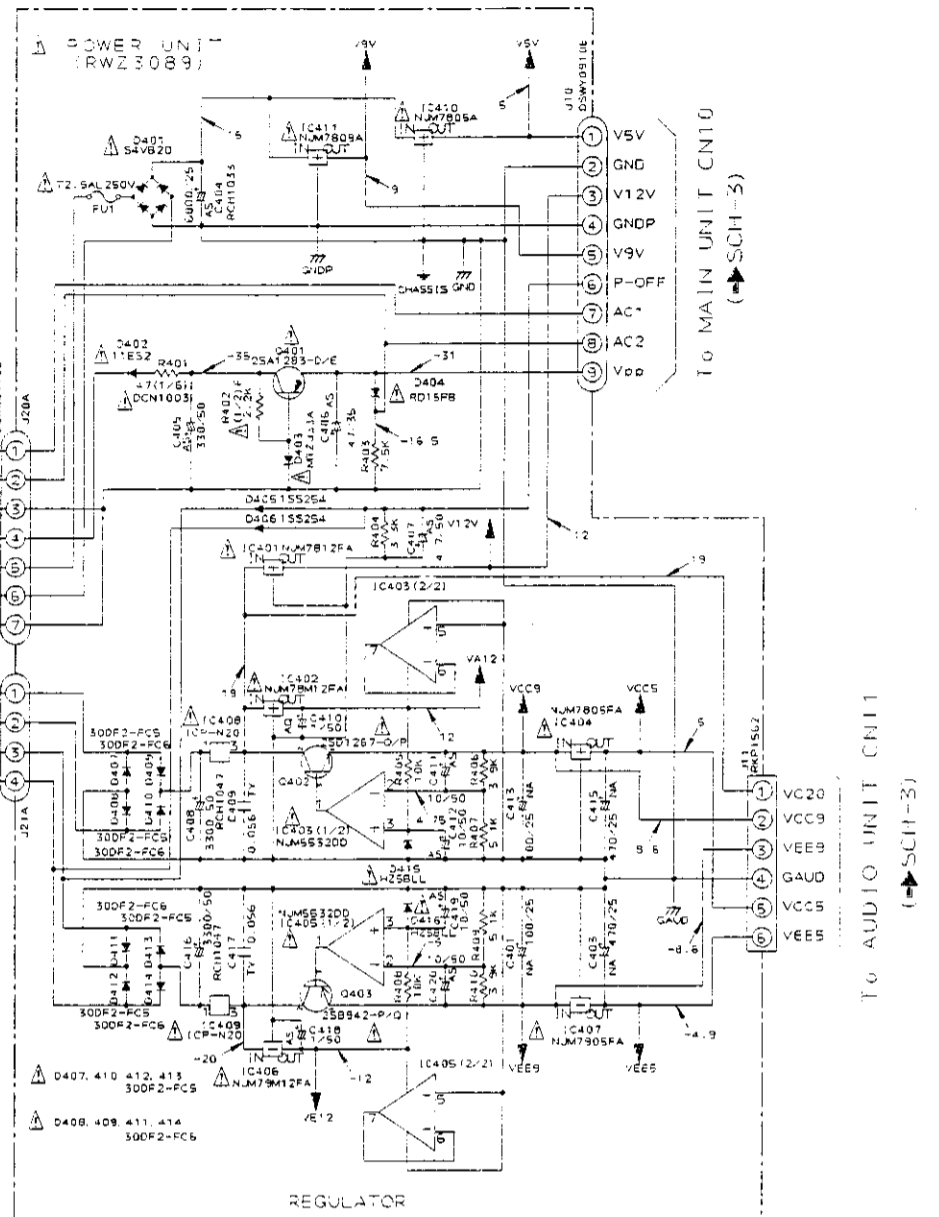
1. Disconnect the AC power cord.
2. Remove the top cover.
3. Change the connection with the power transformer primary taps (T1).
4. Stick the line voltage label on the rear panel.

Part No.	Description
AAX-193	220V label
AAX-192	240V label

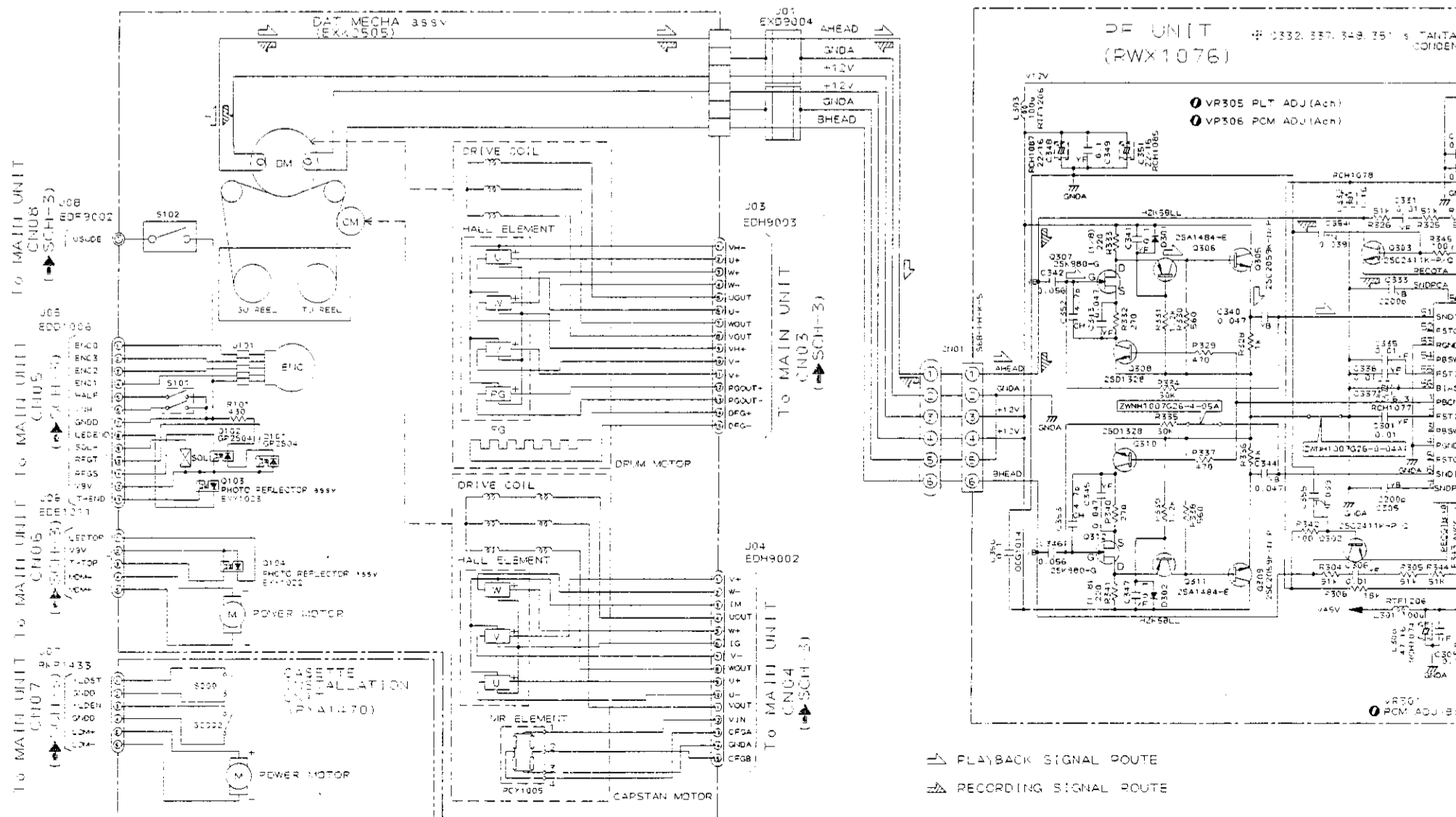
**B**



**C**



**D**

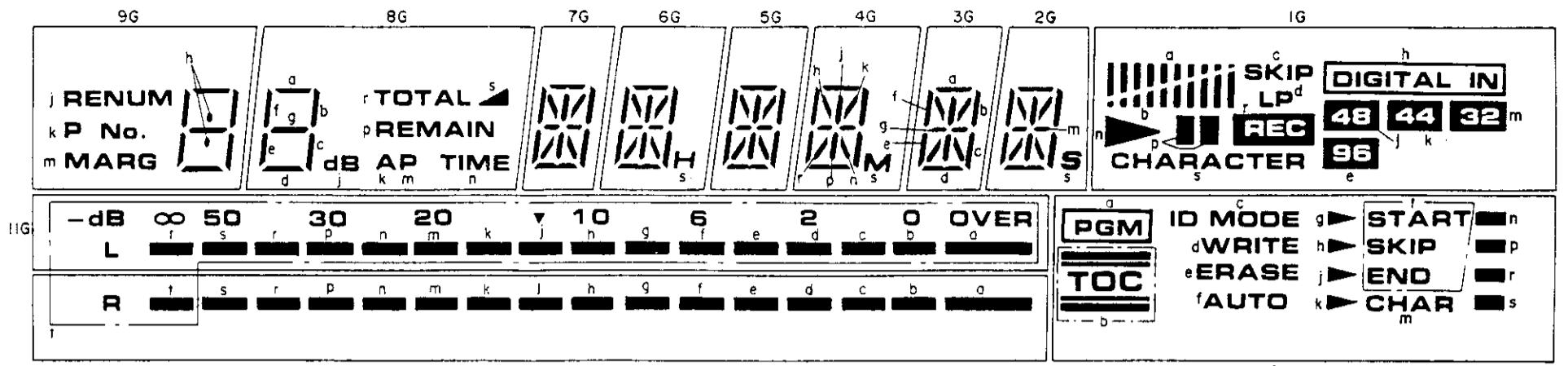


**SCH-2**

DAT MECHA Assy, RF UNIT, DISPLAY UNIT, SW UNIT, LED UNIT, INPUT SEL UNIT, POWER UNIT, POWER SW UNIT, TRANS B UNIT, TRANS A BOARD

RAW1117 (V1601 : DISPLAY UNIT)

● FL Tube

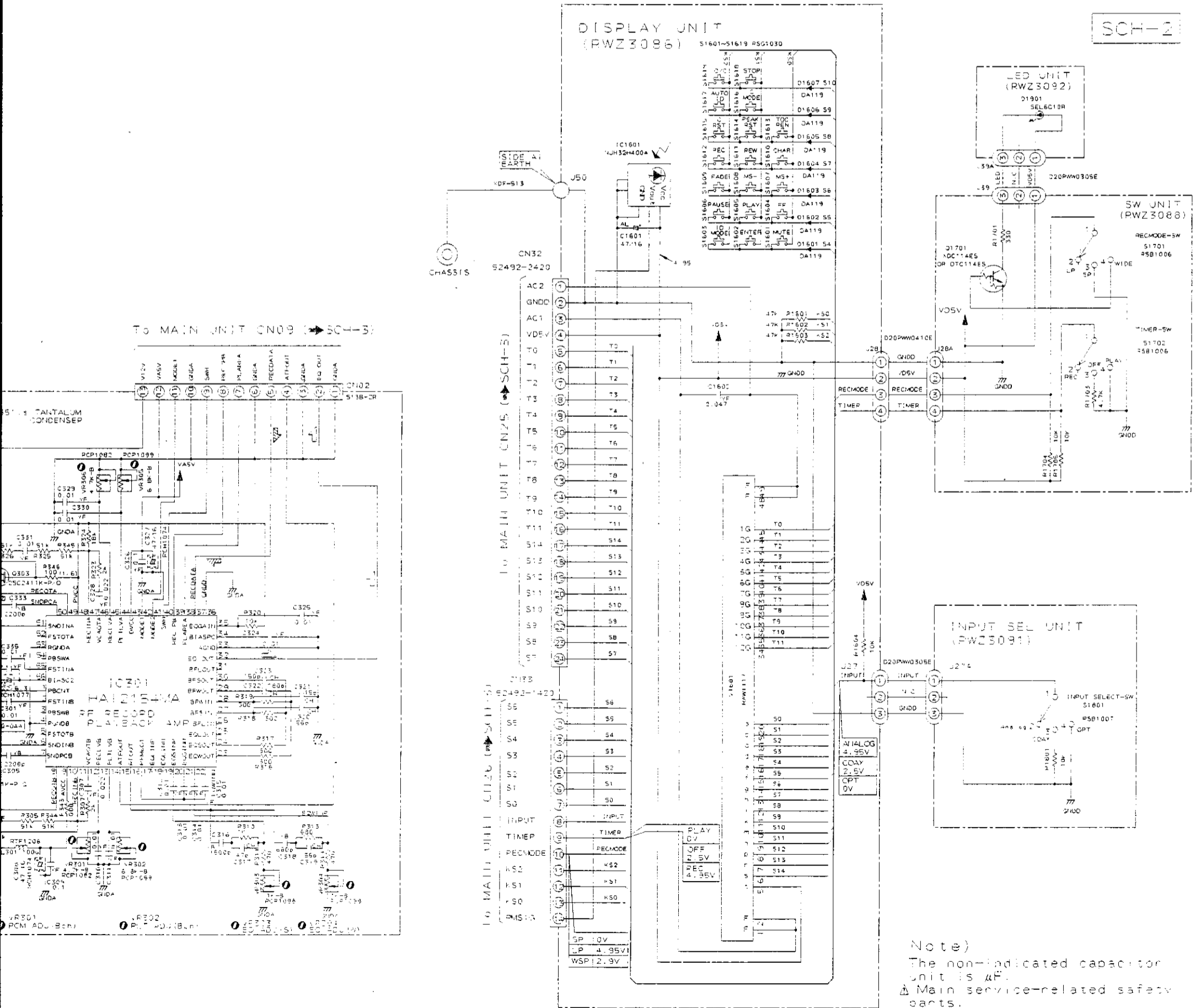


TERMINAL CONNECTION

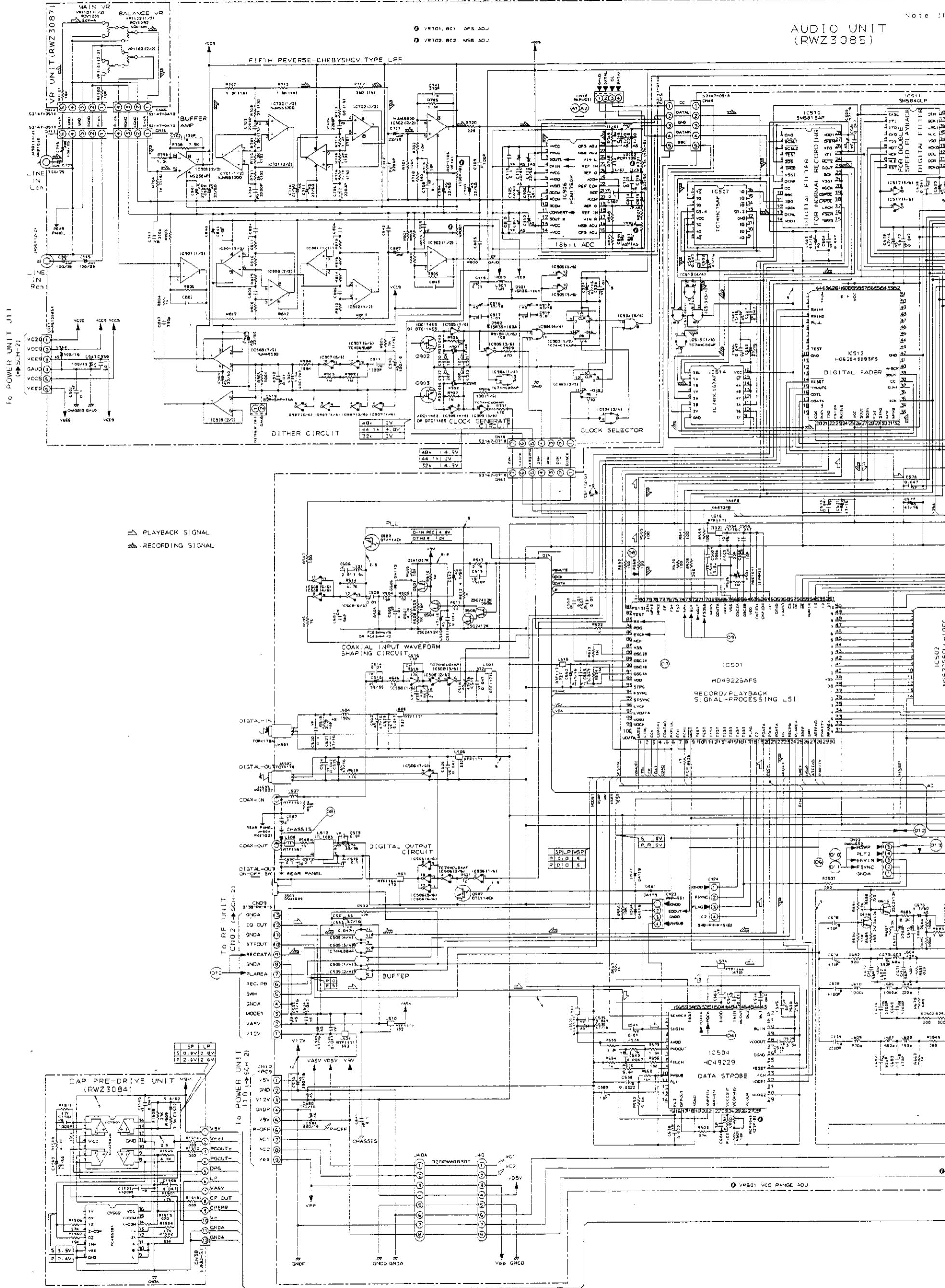
TERMINAL NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15							
ELECTRODE	F1	F1	NP	NP	P	P	P	P	P	P	P	P	P	P	P							
TERMINAL NO.	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35		
ELECTRODE	P	P	P	P	P	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	12G	11G		
TERMINAL NO.									36	37	38	39	40	41	42	43	44	45	46	47	48	49
ELECTRODE									10G	9G	8G	7G	6G	5G	4G	3G	2G	1G	NP	NP	F2	F2

Notes F: Filament NP: No Pin  
 G: Grid P: Anode

DISPLAY UNIT (RWZ3086)



3.3 MAIN UNIT, HEADPHONE UNIT, CAP PRE-DRIVE UNIT, AUDIO UNIT AND VR UNIT



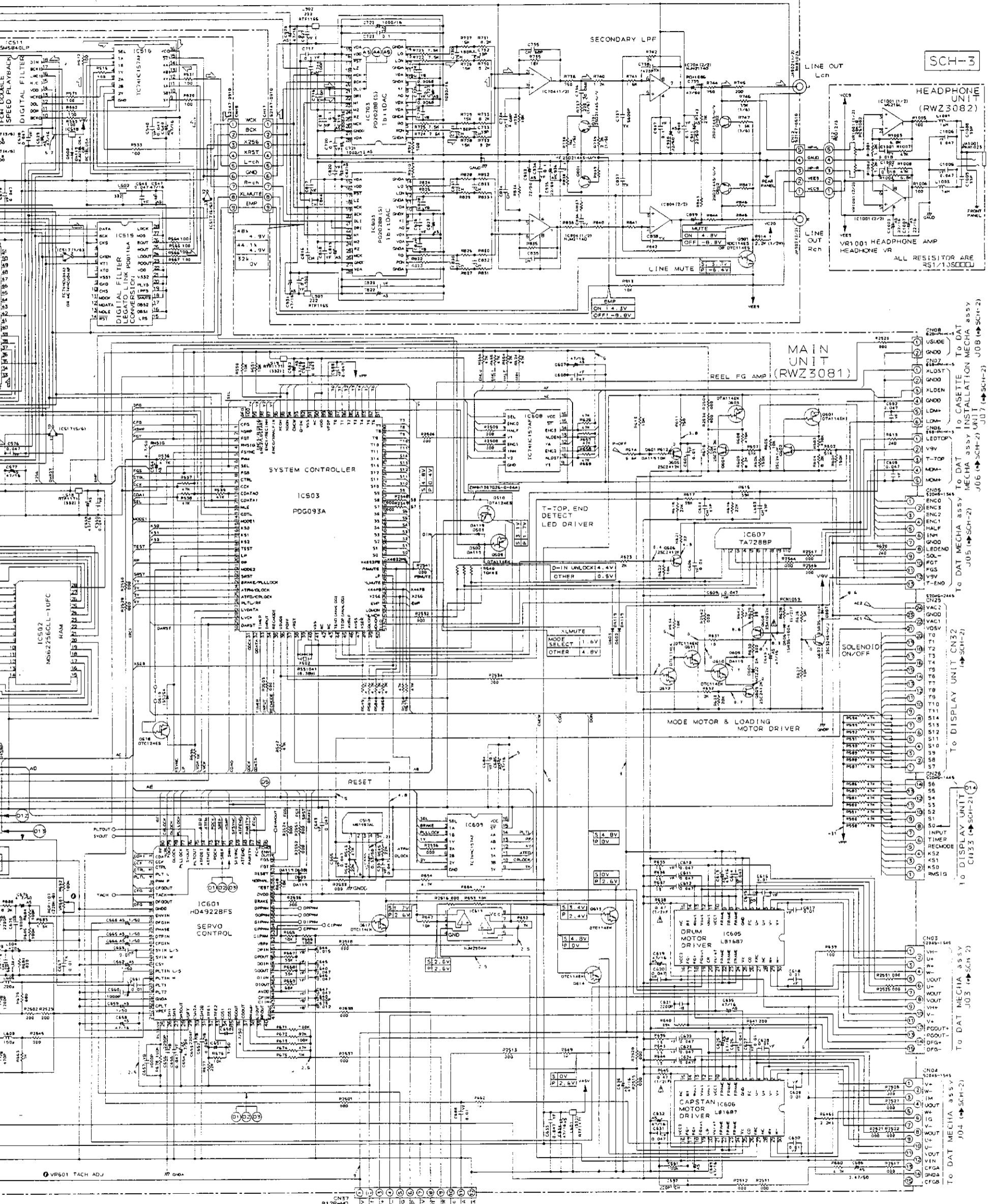
AUDIO UNIT (RWZ3085)

△ PLAYBACK SIGNAL  
□ RECORDING SIGNAL

SCH-3

MAIN UNIT, HEADPHONE UNIT, CAP PRE-DRIVE UNIT, AUDIO UNIT, VR UNIT

Note: The non-indicated resistor is RDP1/4PM000J  
(1/2) RDR1/4PM000J  
(1/4) RS1/10S000J  
(1/6) RD1/6PM000J



SCH-3

HEADPHONE UNIT (RW3082)  
VR1001 HEADPHONE AMP  
HEADPHONE VR  
ALL RESISTOR ARE RS1/10S000J

MAIN UNIT (RW3081)  
REEL FG AMP

SYSTEM CONTROLLER  
IC503  
PDG093A

SERVO CONTROL  
IC601  
HD4922BFS

NOTE)  
S STOP  
P PLAY  
R REC

Note: R2505, R2519, R2540, R2543, R2510, R2514, R2539, and R2553 are 2125-jumper ch os (guard color green or blue).  
▲ Main serv. ce-related safety parts.

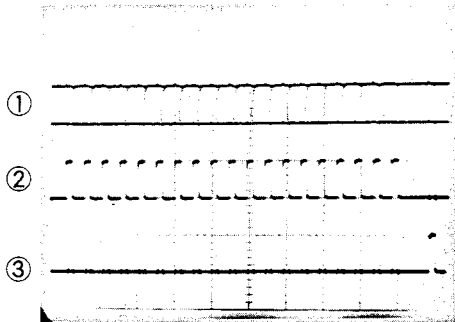
MAIN UNIT, HEADPHONE UNIT, CAP PRE-DRIVE UNIT, AUDIO UNIT, VR UNIT

SCH-3



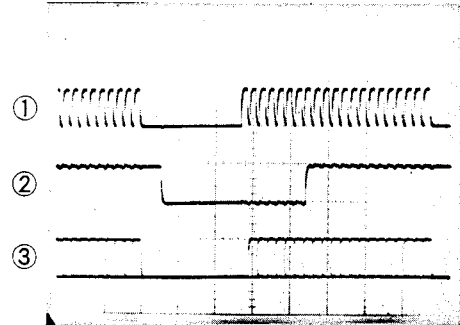
● Waveforms

**A1 : ADC**



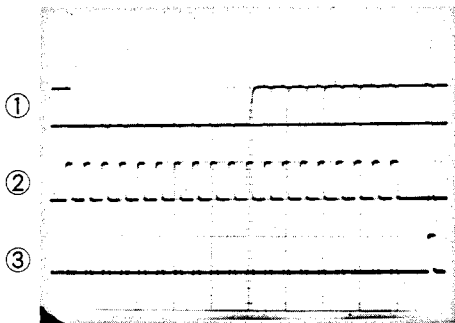
Mode : SP (REC)      ① SOUTL (IC906 - Pin3)  
 Input : 1kHz - 0dB    ② CKIN (IC906 - Pin4)  
 5V/div., 0.5 $\mu$ S/div.    ③ CONVERT (IC906 - Pin11)

**A4 : DAC**



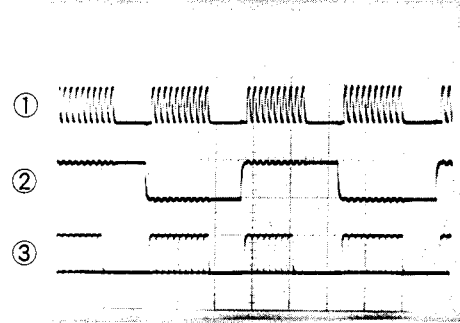
Mode : LP (REC)      ① BCK (IC703 - 20Pin)  
 Input : 1kHz - 0dB    ② WCK (IC703 - Pin19)  
 5V/div., 0.5 $\mu$ S/div.    ③ DLI (IC703 - Pin21)

**A2 : ADC**



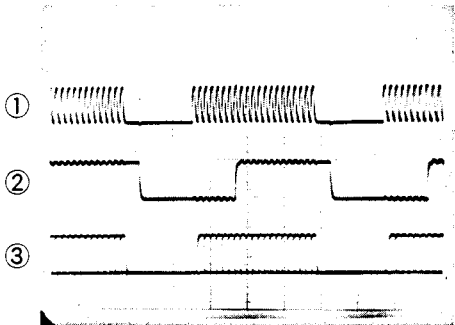
Mode : SP (REC)      ① SOUTL (IC906 - Pin3)  
 Input : No input      ② CKIN (IC906 - Pin4)  
 5V/div., 0.5 $\mu$ S/div.    ③ CONVERT (IC906 - Pin11)

**A5 : DAC**



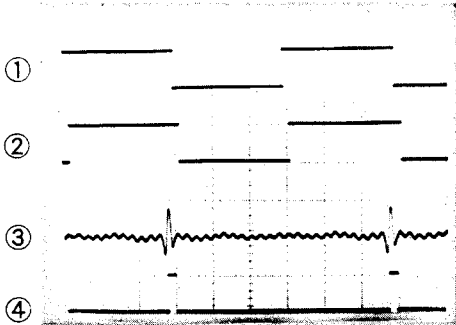
Mode : WSP (REC)    ① BCK (IC703 - Pin20)  
 Input : 1kHz - 0dB    ② WCK (IC703 - Pin19)  
 5V/div., 0.5 $\mu$ S/div.    ③ DLI (IC703 - Pin21)

**A3 : DAC**



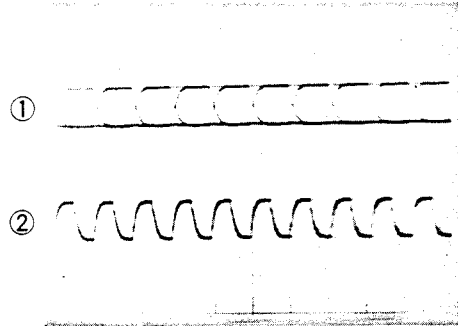
Mode : SP (REC)      ① BCK (IC703 - Pin20)  
 Input : 1kHz - 0dB    ② WCK (IC703 - Pin19)  
 5V/div., 0.5 $\mu$ S/div.    ③ DLI (IC703 - Pin21)

D1



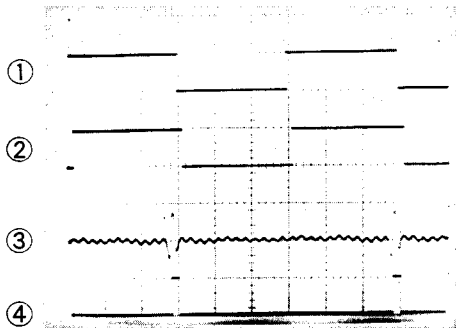
Mode : SP (PLAY) ① SWP (IC601 - Pin70)  
 5V/div., 5mS/div. ② SREF (IC601 - Pin71)  
 (DPG : 0.5V/div.) ③ DPG (CN37 - Pin5)  
 ④ TACH (IC601 - Pin7)

D4



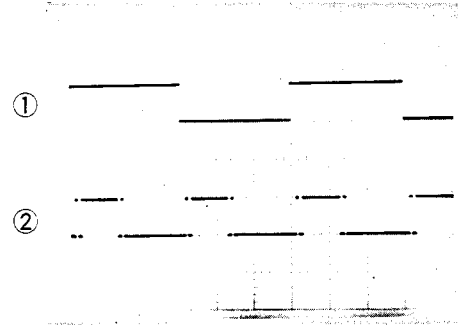
Mode : SP (PLAY) ① PDATA (IC504 - Pin52)  
 5V/div., 0.1μS/div. ② PDCK (IC504 - Pin51)

D2



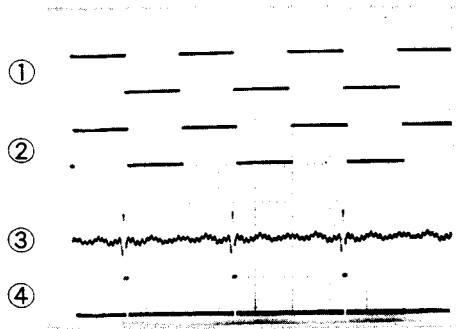
Mode : LP (REC-PLAY) ① SWP (IC601 - Pin70)  
 5V/div., 10mS/div. ② SREF (IC601 - Pin71)  
 (DPG : 0.5V/div.) ③ DPG (CN37 - Pin5)  
 ④ TACH (IC601 - Pin7)

D5



Mode : SP (PLAY) ① SWP (IC601 - Pin70)  
 5V/div., 5mS/div. ② PARITY (IC601 - Pin67)

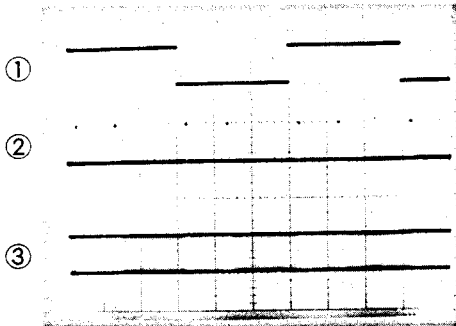
D3



Mode : WSP (PLAY) ① SWP (IC601 - Pin70)  
 5V/div., 5mS/div. ② SREF (IC601 - Pin71)  
 (DPG : 0.5V/div.) ③ DPG (CN37 - Pin5)  
 ④ TACH (IC601 - Pin7)



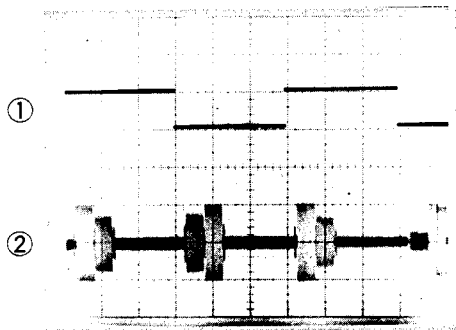
## D12



Mode : SP (REC)  
5V/div., 5mS/div.

- ① SWP (CN22 - Pin5)
- ② PLAREA (CN09 - Pin7)
- ③ RECDATA (CN09 - Pin9)

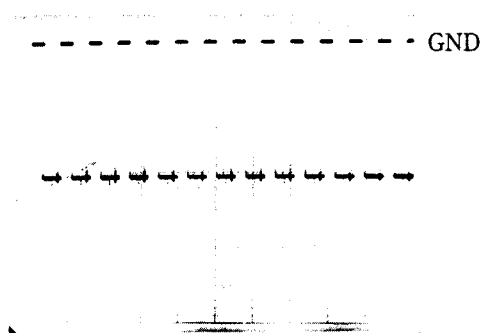
## D13



Mode : SP (PLAY)  
Test Tape : TY7111

- ① SWP (CN22 - Pin5)  
5V/div., 5mS/div.
- ② PLY2 (CN22 - Pin4)  
0.1V/div., 5mS/div.

## D14

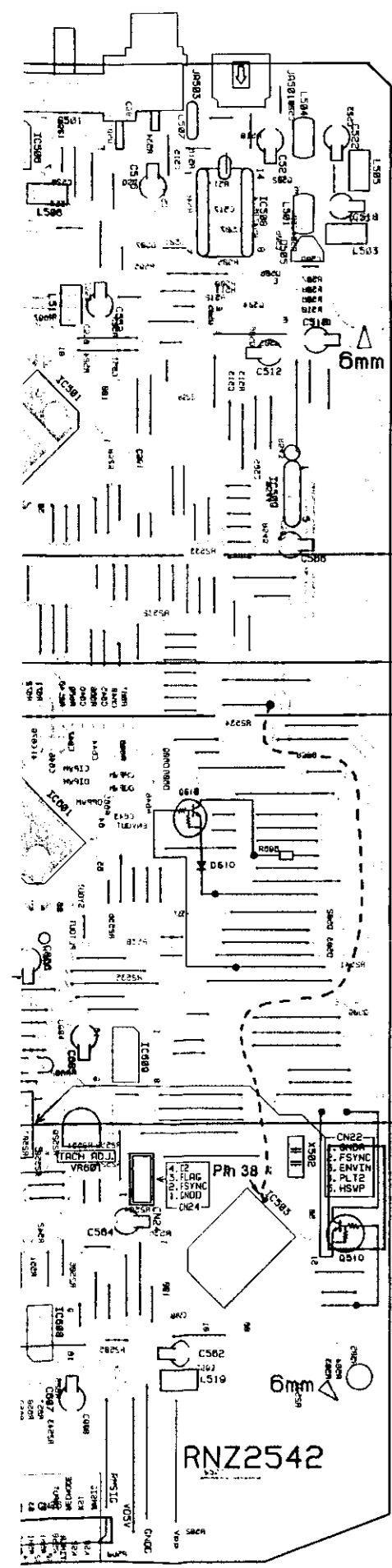


Mode : STOP  
10V/div., 2mS/div.

- SO (Segment)  
(CN26 - Pin8)



• This diagram is viewed from the mounted parts side.



- Q507
- IC506
- Q502
- IC508
- IC515
- IC512
- IC510
- Q503
- Q506
- IC518
- IC514
- IC516
- IC507
- IC501
- IC511
- IC517
- IC513
- IC509
- IC505
- IC502

VR501

IC504

Q605

Q608

Q612

Q618

IC601

IC607

VR602

Q615

Q616

Q607

Q606

Q509

IC609

Q510

IC611

IC503

Q613

IC605

Q617

Q614

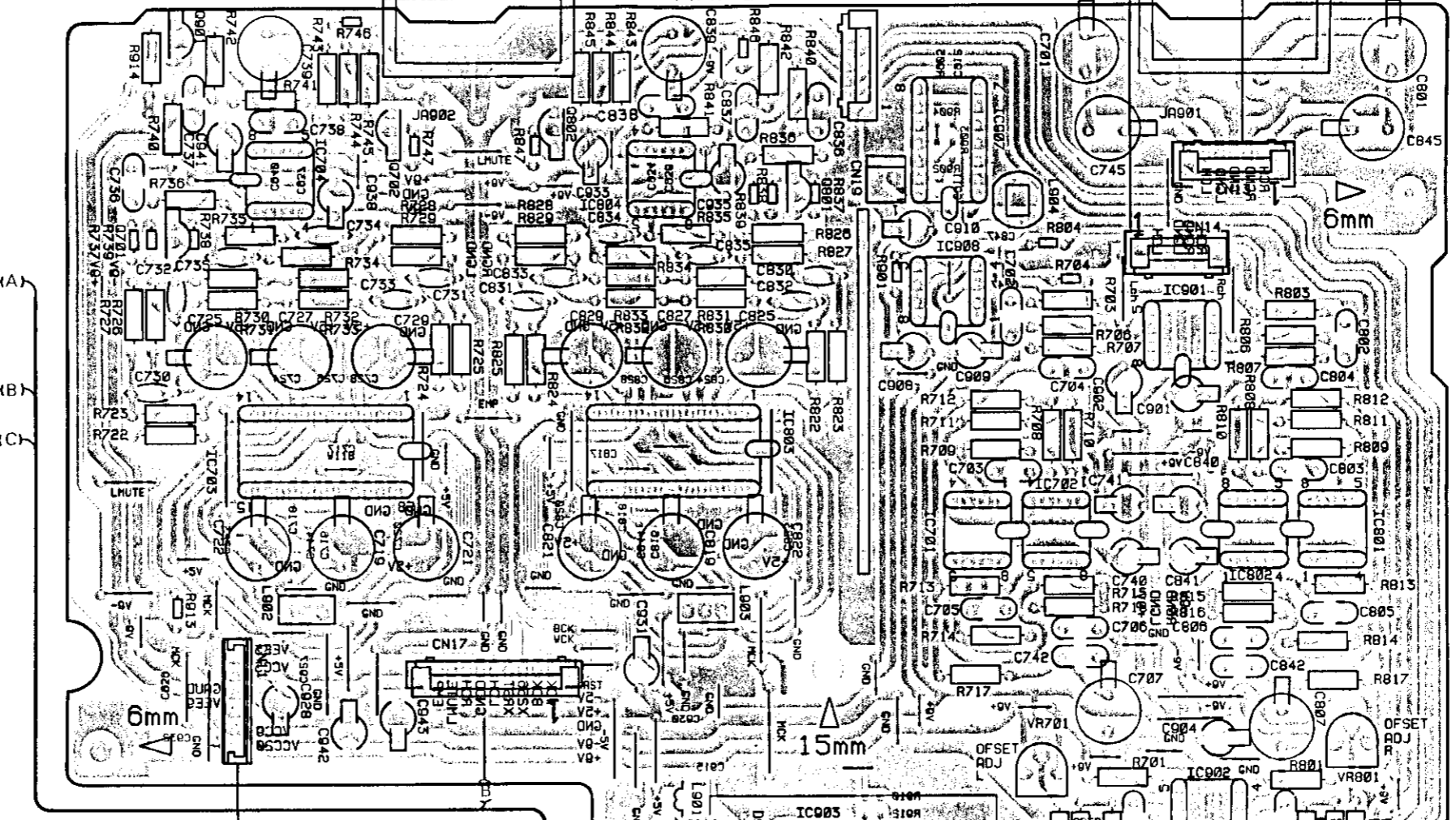
IC606

Q601

Q604

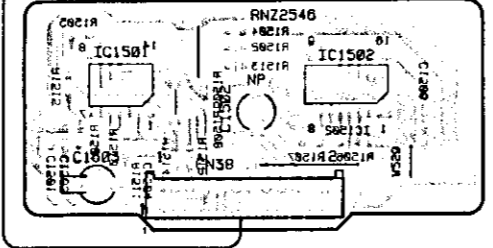
**AUDIO unit**

**RNP 1539A**

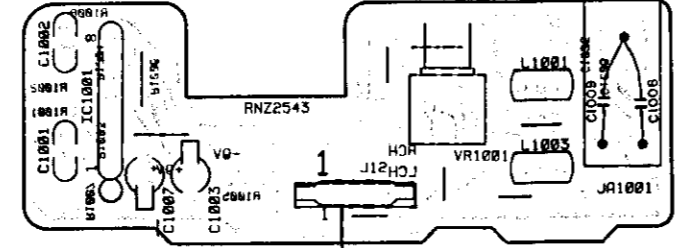


To POWER UNIT J11

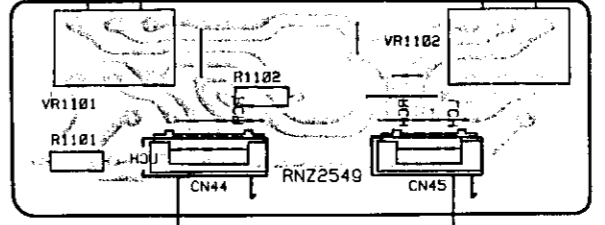
**CAP PRE-DRIVE unit**



**HEADPHONE unit**



**VR unit**



- Q901
- IC907
- Q802
- IC804
- Q801
- IC908
- IC901
- IC703
- IC803
- IC701
- IC801
- IC702
- IC802
- VR801
- VR701
- IC902
- VR802
- VR702
- Q903
- IC905
- Q902
- IC906

To DISPLAY UNIT CN33

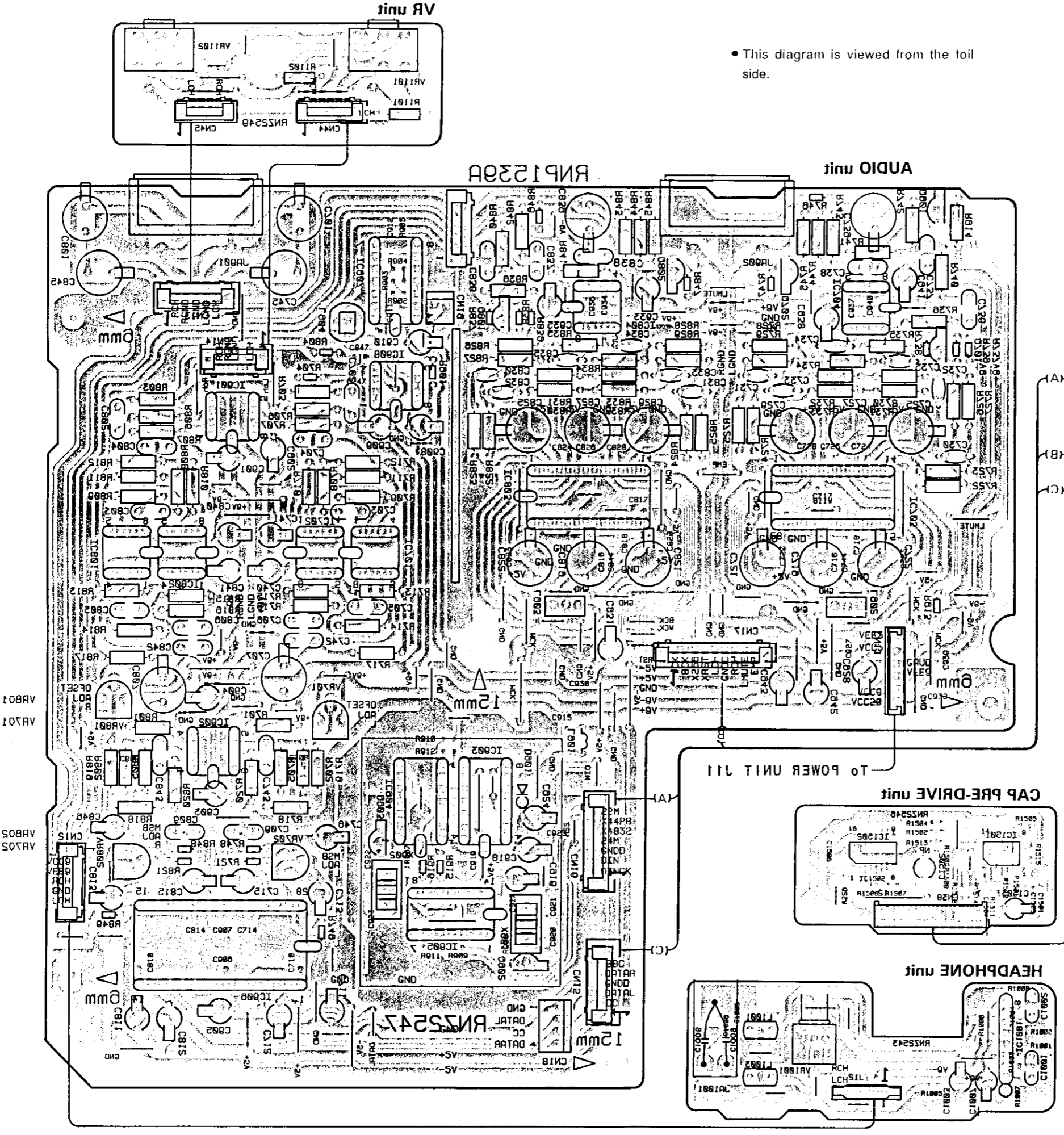
A

B

C

D

IC901  
IC902  
IC903  
IC904  
IC905  
IC906  
IC907  
IC908  
IC909  
IC910  
IC911  
IC912  
IC913  
IC914  
IC915  
IC916  
IC917  
IC918  
IC919  
IC920  
IC921  
IC922  
IC923  
IC924  
IC925  
IC926  
IC927  
IC928  
IC929  
IC930  
IC931  
IC932  
IC933  
IC934  
IC935  
IC936  
IC937  
IC938  
IC939  
IC940  
IC941  
IC942  
IC943  
IC944  
IC945  
IC946  
IC947  
IC948  
IC949  
IC950  
IC951  
IC952  
IC953  
IC954  
IC955  
IC956  
IC957  
IC958  
IC959  
IC960  
IC961  
IC962  
IC963  
IC964  
IC965  
IC966  
IC967  
IC968  
IC969  
IC970  
IC971  
IC972  
IC973  
IC974  
IC975  
IC976  
IC977  
IC978  
IC979  
IC980  
IC981  
IC982  
IC983  
IC984  
IC985  
IC986  
IC987  
IC988  
IC989  
IC990  
IC991  
IC992  
IC993  
IC994  
IC995  
IC996  
IC997  
IC998  
IC999  
IC1000

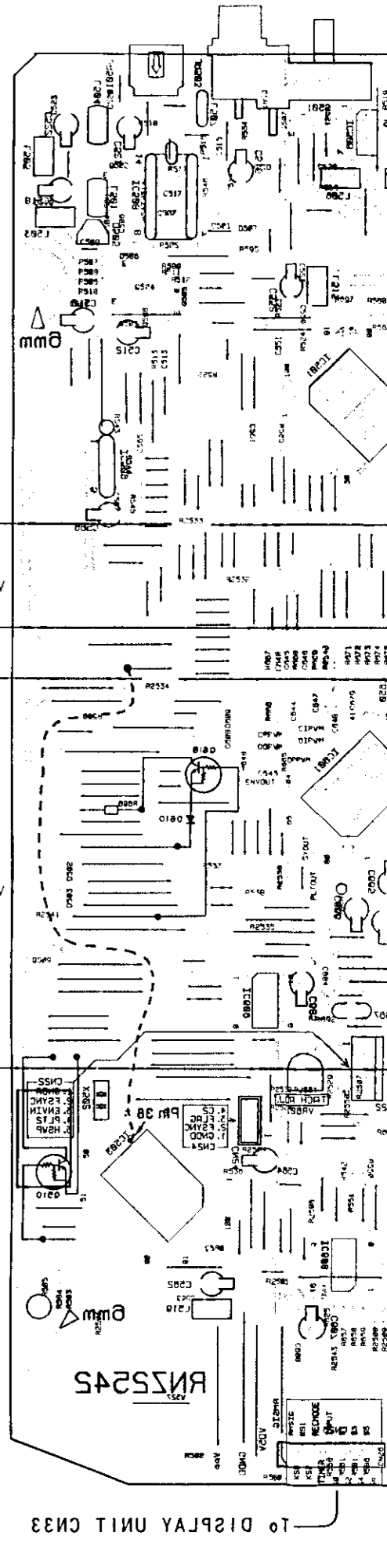


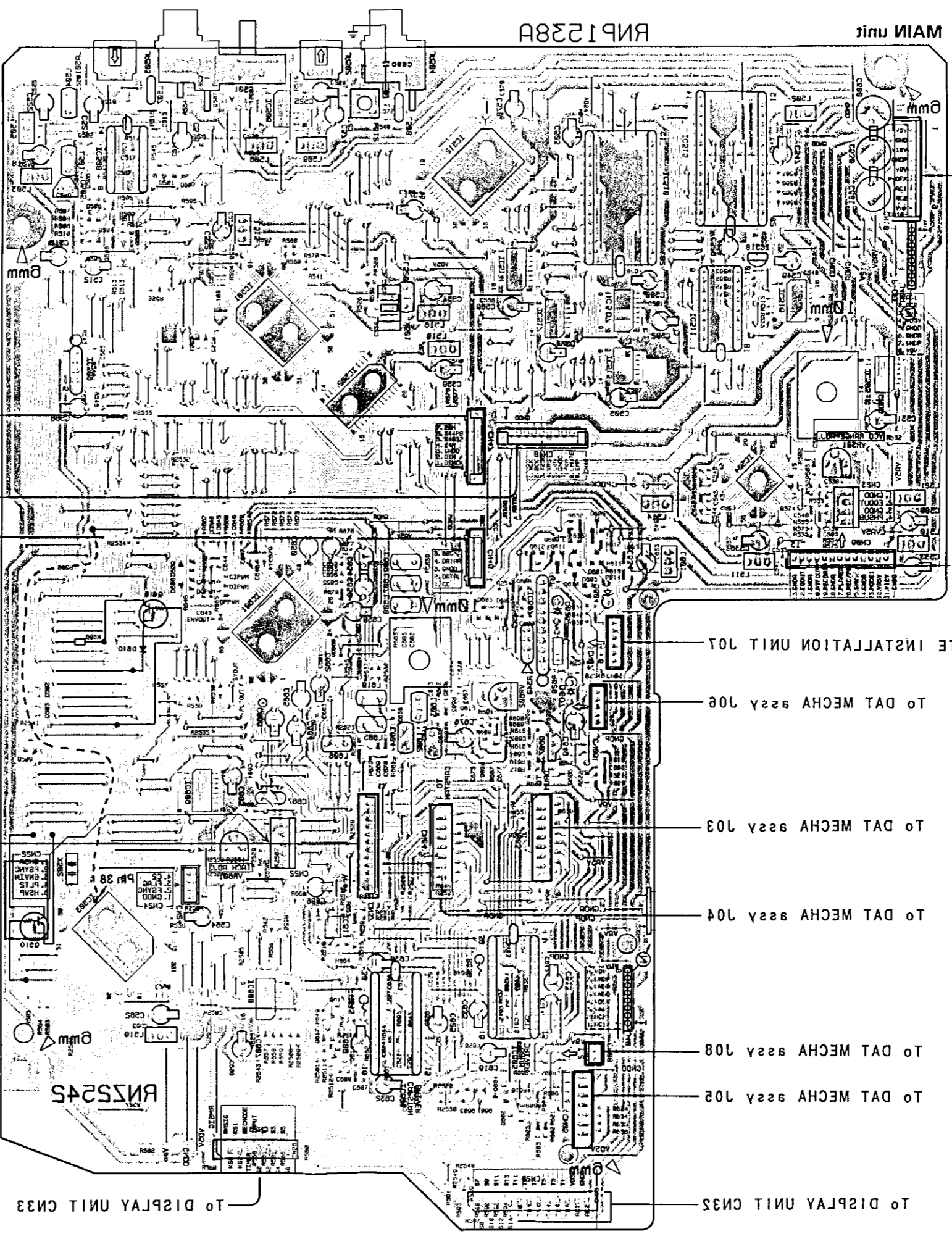
• This diagram is viewed from the foil side.

IC201  
IC202  
IC203  
IC204  
IC205  
IC206  
IC207  
IC208  
IC209  
IC210  
IC211  
IC212  
IC213  
IC214  
IC215  
IC216  
IC217  
IC218  
IC219  
IC220  
IC221  
IC222  
IC223  
IC224  
IC225  
IC226  
IC227  
IC228  
IC229  
IC230  
IC231  
IC232  
IC233  
IC234  
IC235  
IC236  
IC237  
IC238  
IC239  
IC240  
IC241  
IC242  
IC243  
IC244  
IC245  
IC246  
IC247  
IC248  
IC249  
IC250  
IC251  
IC252  
IC253  
IC254  
IC255  
IC256  
IC257  
IC258  
IC259  
IC260  
IC261  
IC262  
IC263  
IC264  
IC265  
IC266  
IC267  
IC268  
IC269  
IC270  
IC271  
IC272  
IC273  
IC274  
IC275  
IC276  
IC277  
IC278  
IC279  
IC280  
IC281  
IC282  
IC283  
IC284  
IC285  
IC286  
IC287  
IC288  
IC289  
IC290  
IC291  
IC292  
IC293  
IC294  
IC295  
IC296  
IC297  
IC298  
IC299  
IC300

IC301  
IC302  
IC303  
IC304  
IC305  
IC306  
IC307  
IC308  
IC309  
IC310  
IC311  
IC312  
IC313  
IC314  
IC315  
IC316  
IC317  
IC318  
IC319  
IC320  
IC321  
IC322  
IC323  
IC324  
IC325  
IC326  
IC327  
IC328  
IC329  
IC330  
IC331  
IC332  
IC333  
IC334  
IC335  
IC336  
IC337  
IC338  
IC339  
IC340  
IC341  
IC342  
IC343  
IC344  
IC345  
IC346  
IC347  
IC348  
IC349  
IC350  
IC351  
IC352  
IC353  
IC354  
IC355  
IC356  
IC357  
IC358  
IC359  
IC360  
IC361  
IC362  
IC363  
IC364  
IC365  
IC366  
IC367  
IC368  
IC369  
IC370  
IC371  
IC372  
IC373  
IC374  
IC375  
IC376  
IC377  
IC378  
IC379  
IC380  
IC381  
IC382  
IC383  
IC384  
IC385  
IC386  
IC387  
IC388  
IC389  
IC390  
IC391  
IC392  
IC393  
IC394  
IC395  
IC396  
IC397  
IC398  
IC399  
IC400

IC401  
IC402  
IC403  
IC404  
IC405  
IC406  
IC407  
IC408  
IC409  
IC410  
IC411  
IC412  
IC413  
IC414  
IC415  
IC416  
IC417  
IC418  
IC419  
IC420  
IC421  
IC422  
IC423  
IC424  
IC425  
IC426  
IC427  
IC428  
IC429  
IC430  
IC431  
IC432  
IC433  
IC434  
IC435  
IC436  
IC437  
IC438  
IC439  
IC440  
IC441  
IC442  
IC443  
IC444  
IC445  
IC446  
IC447  
IC448  
IC449  
IC450  
IC451  
IC452  
IC453  
IC454  
IC455  
IC456  
IC457  
IC458  
IC459  
IC460  
IC461  
IC462  
IC463  
IC464  
IC465  
IC466  
IC467  
IC468  
IC469  
IC470  
IC471  
IC472  
IC473  
IC474  
IC475  
IC476  
IC477  
IC478  
IC479  
IC480  
IC481  
IC482  
IC483  
IC484  
IC485  
IC486  
IC487  
IC488  
IC489  
IC490  
IC491  
IC492  
IC493  
IC494  
IC495  
IC496  
IC497  
IC498  
IC499  
IC500





TO POWER UNIT  
710

TO RF UNIT CM05

TO CASSETTE INSTALLATION UNIT 101

TO DAT MECHA Assy 106

TO DAT MECHA Assy 103

TO DAT MECHA Assy 104

TO DAT MECHA Assy 108

TO DAT MECHA Assy 102

TO DISPLAY UNIT CM33

A

B

C

D

IC207  
IC205  
IC208  
IC215  
IC218  
IC219  
IC214  
IC218  
IC217  
IC201  
IC213  
IC205  
IC208

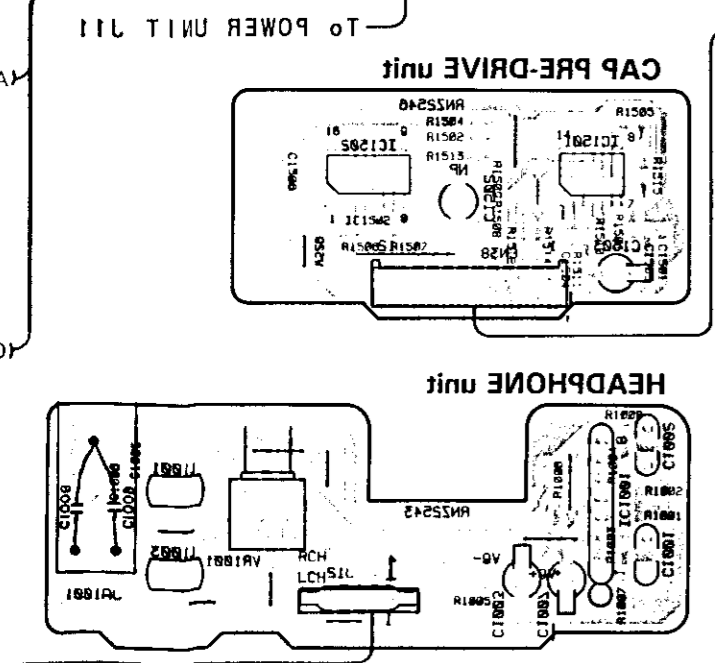
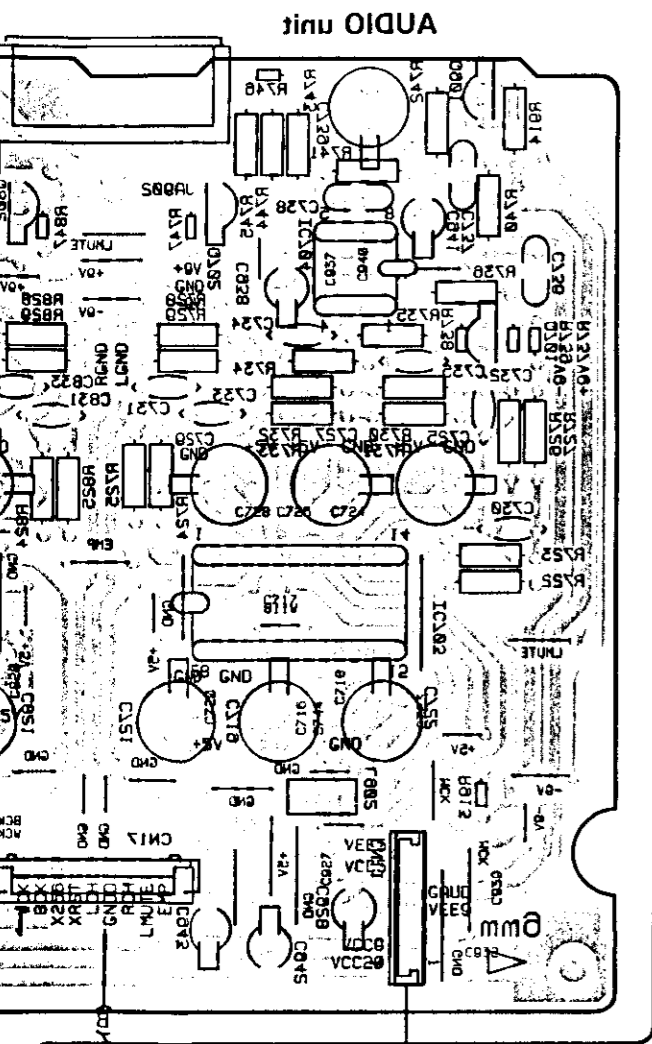
VRB01  
IC204

0802  
0808  
0815  
0818  
IC803  
IC801

IC808  
0812  
0818  
0801  
0808

IC811  
IC803  
0810

0813  
IC802  
IC808  
0817  
0814  
IC806  
0801  
0804



This diagram is viewed from the foil side.

e

2

4

3

5

1

e

2

4

3

5

1



## 4. PCB PARTS LIST

### NOTES :

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

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

560 $\Omega$   $\rightarrow$  56  $\times$  10<sup>1</sup>  $\rightarrow$  561 ..... RD1/8PM  $\begin{matrix} 5 & 6 & 1 \\ \hline \end{matrix}$  J  
 47k $\Omega$   $\rightarrow$  47  $\times$  10<sup>3</sup>  $\rightarrow$  473 ..... RD1/4PS  $\begin{matrix} 4 & 7 & 3 \\ \hline \end{matrix}$  J  
 0.5 $\Omega$   $\rightarrow$  0R5 ..... RN2H  $\begin{matrix} 0 & R & 5 \\ \hline \end{matrix}$  K  
 1 $\Omega$   $\rightarrow$  010 ..... RS1P  $\begin{matrix} 0 & 1 & 0 \\ \hline \end{matrix}$  K

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

5.62k $\Omega$   $\rightarrow$  562  $\times$  10<sup>1</sup>  $\rightarrow$  5621 ..... RM1/4PC  $\begin{matrix} 5 & 6 & 2 & 1 \\ \hline \end{matrix}$  F

Mark	No.	Description	Parts No.	Mark	No.	Description	Parts No.
<b>LIST OF ASSEMBLIES</b>				<b>COILS</b>			
NSP		RF UNIT	RWX1076			L301, L303 (100 $\mu$ H)	RTF1206
NSP		MOTHER UNIT	RWM1659	<b>CAPACITORS</b>			
		├ MAIN UNIT	RWZ3081			C352, C353	CCPUCH4R7K50
		├ HEADPHONE UNIT	RWZ3082			C321	CCSQCH150J50
NSP		├ POWER SW UNIT	RWZ3083			C323	CCSQCH151J50
		├ CAP PRE-DRIVE UNIT	RWZ3084			C322	CCSQCH181J50
NSP		└ TRANS A BOARD	RNZ2545			C317	CCSQCH470J50
NSP		SUB UNIT	RWM1660			C319, C320	CCSQCH560J50
		├ AUDIO UNIT	RWZ3085			C354, C355	CFTNA393J50
		├ DISPLAY UNIT	RWZ3086			C316	CKSQYB152K50
NSP		├ VR UNIT	RWZ3087			C305, C333	CKSQYB222K50
		├ SW UNIT	RWZ3088			C340, C344	CKSQYB473K50
		├ POWER UNIT	RWZ3089			C342, C346	CKSQYB563K25
NSP		├ TRANS B UNIT	RWZ3090			C318	CKSQYB681K50
NSP		├ INPUT SEL UNIT	RWZ3091			C301, C306, C310-C315, C324, C325,	CKSQYF103Z50
NSP		└ LED UNIT	RWZ3092			C329-C331, C335, C336	CKSQYF104Z25
NSP		DAT MECHA ASSY	EXK2505			C309, C326, C341, C347, C349	CKSQYF223Z50
NSP		├ P. C. BOARD	ENX1011			C307, C328	
NSP		├ REEL SENSOR BOARD	ENP1027			C343, C345	CKSQYF473Z25
		├ PHOTO REFLECTOR	EXX1022			C356 (0.1/50)	OCG1014
		├ ASSY				C308, C327 (47/16)	RCH1074
		├ PHOTO REFLECTOR	EXX1023			C337 (22/6.3)	RCH1077
		├ ASSY				C332 (1/16)	RCH1078
						C351 (22/16)	RCH1085
						C348 (22/16)	RCH1087
<b>RF UNIT</b>				<b>RESISTORS</b>			
<b>SEMICONDUCTORS</b>						VR301, VR306 (4.7k-B)	RCP1082
		IC301	HA12154MA			VR303, VR304 (1k-B)	RCP1098
		Q306, Q311	2SA1484			VR302, VR305 (6.8k-B)	RCP1099
		Q305, Q309	2SC2059K			R346	RD1/6PM101J
		Q302, Q303	2SC2411K			R333, R341	RS1/8S221J
		Q308, Q310	2SD1328			Other Resistors	RS1/10S□□□J
		Q307, Q312	2SK980				
		D301, D302	HZK5BLL				

Mark	No.	Description	Parts No.	Mark	No.	Description	Parts No.
<b>MAIN UNIT</b>				<b>CAPACITORS</b>			
<b>SEMICONDUCTORS</b>							
	IC501		HD49226AFS		C584		CCSQCH030C50
	IC601		HD49228FS		C545		CCSQCH060D50
	IC504		HD49229		C544		CCSQCH080D50
	IC512		HG62E43B93FS		C558, C583		CCSQCH100D50
	IC605, IC606		LB1687		C568		CCSQCH101J50
	IC509		M51957AL		C557		CCSQCH220J50
	IC502		MS62256CLL-10FC		C687		CCSQCH221J50
	IC611		NJM2904M		C515, C517, C603, C604		CCSQCH470J50
	IC518		NJM78L05A		C507, C671, C672		CCSQCH560J50
	IC515		PD0116A		C673		CCSQSL331J50
	IC503		PDG093A		C674, C678		CCSQSL471J50
	IC510		SM5815AP		C682		CCSQSL821J50
	IC511		SM5840LP		C651		CEANP010M50
	IC607		TA7288P		C650		CEANP4R7M50
	IC513		TC74HC00AF		C659, C662, C664-C666		CEAS010M50
	IC505		TC74HC08AF		C516, C574		CEAS330M35
	IC514, IC516, IC608, IC609		TC74HC157AF		C530, C680, C681		CEAS331M16
	IC507		TC74HC75AF		C502, C503, C505, C510, C518, C521,		CEAS470M16
	IC506, IC517		TC74HCU04AF		C522, C525, C529, C531, C533, C536,		
	IC508		TC74HCU04AP		C547, C549, C552, C554, C559, C562,		
	Q503, Q608		2SA1037K		C569, C571, C577, C578, C580, C585,		
	Q504-Q506, Q602, Q604-Q606,		2SC2412K		C607, C613, C619, C625, C632,		
	Q609, Q615, Q616		2SC3246		C634-C636, C649, C658, C685, C689		
	Q607		DTA114EK		C512, C564, C654, C676		CEAS4R7M50
	Q502, Q509, Q601, Q603		DTA124ES		C566		CEASR33M50
	Q510		DTC114EK		C686		CEASR47M50
	Q507, Q610-Q614, Q617		DTC124ES		C667		CFTXA103J50
	Q618		1SR35-100AVL		C657, C660, C675		CKSQYB102K50
	D606, D607		1SS254		C669		CKSQYB122K50
	D610		DA119		C679		CKSQYB123K50
	D501-D504, D506-D508,		FC63M-4/5		C513		CKSQYB152K50
	D601-D603, D605, D608, D609		MTZJ2.0AX		C644		CKSQYB153K50
	D505				C539, C621, C639, C653, C656, C670,		CKSQYB222K50
	D604				C677		CKSQYB223K50
					C538		CKSQYB471K50
					C683		
					C540, C638, C648		CKSQYB472K50
<b>SWITCH</b>					C652		CKSQYB683K25
	S501		RSH1009		C506, C508, C509, C514, C541, C542,		CKSQYF103Z50
<b>COILS</b>					C546, C550, C551, C573, C601, C606,		
	L605, L610		LFA102J		C615-C618, C627-C630, C661,		
	L504, L608		LFA151J		C663, C688		
	L501		LFA1R5J		C520, C572, C575, C582, C587, C641,		CKSQYF104Z25
	L606		LFA221J		C645, C684		
	L520		LFA3R3J		C501, C504, C511, C519, C523, C524,		CKSQYF473Z50
	L602, L604		LFA471J		C526-C528, C532, C534, C535, C543,		
	L603		LFA680J		C548, C553, C555, C556, C560, C563,		
	L607		LFA681J		C565, C567, C570, C576, C579, C581,		
	L609		LFA821J		C586, C588, C602, C605, C608-C612,		
	L512		PTL1003		C614, C620, C622-C624, C626, C631,		
	L509, L514		RTF1164		C633, C640, C643, C646, C647, C655		
	L507, L508		RTF1167		C690 (0.1/50)		OCG1014
	L502, L503, L505, L506, L510, L511,		RTF1171				
	L515, L516, L518, L519, L521, L601						

Mark	No.	Description	Parts No.
<b>RESISTORS</b>			
	VR501	(22k-B)	RCP1046
	VR601	(220k-B)	RCP1107
	R628	(1Ω, 1/2W)	RCN1059
	R540	(10k, 3S)	RCX1048
	R638, R645		RD1/2PMFR47J
	R696		RD1/6PM102J
	Other Resistors		RS1/10S□□□J
<b>OTHERS</b>			
	CN5	13P FFC CONNECTOR	52045-1345
	CN26	14P FFC CONNECTOR	52045-1445
	CN3, CN4	15P FFC CONNECTOR	52045-1545
	CN25	24P FFC CONNECTOR	52045-2445
	CN37	MQ CONNECTOR (12P)	B12P-MQ
	CN10	9P JUMPER CONNECTOR	KPC9
	JA504	1P PIN JACK (COAX-OUT)	RKB1021
	JA503	1P PIN JACK WITH SHIELD PLATE (COAX-IN)	RKB1027
	JA501	OPTICAL SENSOR MODULE (DIGITAL-IN)	TORX178A
	JA502	OPTICAL OUTPUT MODULE (DIGITAL-OUT)	TOTX178
	X501	(37.632MHz)	RSS1041
	X502	(8.389MHz)	RSS1042
<b>HEADPHONE UNIT</b>			
<b>SEMICONDUCTORS</b>			
	IC1001		M5216L
<b>COILS</b>			
	L1001, L1003		LFA010K
<b>CAPACITORS</b>			
	C1008, C1009		CCCCH330J50
	C1003, C1007		CEAL220M16
	C1001, C1002		CFTYA183J50
	C1005, C1006		CKSQYF473Z50
<b>RESISTORS</b>			
	VR1001	(20k-B)	PCS1002
	Other Resistors		RS1/10S□□□J
<b>OTHERS</b>			
	JA1001	HEADPHONE JACK	RKN1023

Mark	No.	Description	Parts No.
<b>POWER SW UNIT</b>			
<b>SWITCH</b>			
△	S1201		RSA-063
<b>COIL</b>			
△	L1203		VTL-262
<b>CAPACITORS</b>			
△	C1201-C1203	(0.01/400)	RCG-009
<b>OTHERS</b>			
△	WRAPPING TERMINAL		RKC-061
<b>CAP PRE DRIVE UNIT</b>			
<b>SEMICONDUCTORS</b>			
	IC1501		NJM2902M
	IC1502		TC4053BF
<b>CAPACITORS</b>			
	C1502		CEANP3R3M50
	C1503		CEAS100M50
	C1504		CKSQYB102K50
	C1501		CKSQYB472K50
	C1505, C1506		CKSQYF473Z50
<b>RESISTORS</b>			
	All Resistors		RS1/10S□□□J
<b>OTHERS</b>			
	CN38	12P SOCKET	12MQ-ST
<b>TRANS A BOARD</b>			
TRANS A board has no service part.			
<b>AUDIO UNIT</b>			
<b>SEMICONDUCTORS</b>			
	IC901		M5238AP
	IC704, IC804		NJM2114D
	IC908		NJM4558D
	IC902		NJM4580D
	IC701, IC702, IC801, IC802		NJM5532DD
	IC906		PCM1750P
	IC703, IC803		PD2028B (S)
	IC907		TC4069UBP
	IC904		TC74HC00AP
	IC903		TC74HC74AP
	IC905		TC74HCU04AP
	Q701, Q702, Q801, Q802		2SD2144S
	Q901-Q903		XDC114ES

Mark	No.	Description	Parts No.	Mark	No.	Description	Parts No.
	D901, D902		1SR35-100AVL		R721, R748, R821, R848		RD1/6PM473J
<b>COILS</b>					R702, R719, R802, R819		RDR1/4PM103J
	L901		LFA010K		R701, R801		RDR1/4PM104J
	L902, L903		RTF1165		R716, R816		RDR1/4PM112F
	L904		RTF1207		R709, R710, R714, R715, R809, R810, R814, R815		RDR1/4PM122F
<b>CAPACITORS</b>					R703, R740, R803, R840		RDR1/4PM122J
	C730, C731, C830, C831		CCCCH181J50		R726-R729, R826-R829		RDR1/4PM153J
	C732, C733, C832, C833		CCCCH330J50		R712, R812		RDR1/4PM162F
	C734, C735, C834, C835		CCCCH680J50		R741, R841		RDR1/4PM162J
	C716, C816, C920, C921		CCSQCH100D50		R707, R807		RDR1/4PM182F
	C744, C844		CCSQCH101J50		R734, R735, R834, R835		RDR1/4PM183J
	C922, C923		CCSQCH200J50		R745, R845		RDR1/4PM201J
	C713, C746, C813, C846		CEAS010M50		R711, R811		RDR1/4PM202F
	C910		CEAS101M10		R742, R842		RDR1/4PM202J
	C942, C943		CEAS101M16		R720, R820		RDR1/4PM221J
	C719, C721, C722, C727, C819, C821, C822, C827		CEAS102M16		R743, R843		RDR1/4PM273J
	C711, C712, C715, C740, C741, C811, C812, C815, C840, C841, C901-C905, C908, C909, C933, C935, C938, C941		CEAS220M50		R705, R805		RDR1/4PM332J
	C916, C918, C924, C928, C931		CEAS470M16		R717, R817		RDR1/4PM361F
	C738, C838		CFTXA471J50		R718, R818		RDR1/4PM391J
	C737, C837		CFTXA562J50		R713, R813		RDR1/4PM680F
	C736, C836		CFTYA683J50		R736, R744, R836, R844		RDR1/4PM751J
	C911		CKSQYB122K50		R706, R722-R725, R806, R822-R825		RDR1/4PM752J
	C747, C847		CKSQYB331K50		R730-R733, R830-R833		RDR1/4PM822J
	C724, C728, C824, C828		CKSQYB682K50		R708, R808		RDR1/4PM910F
	C714, C814, C912, C915, C917, C919, C925		CKSQYF103Z50		Other Resistors		RS1/10S□□□J
	C708, C710, C717, C718, C720, C723, C726, C808, C810, C817, C818, C820, C823, C826, C906, C907, C927, C930, C932, C934, C936, C937, C939, C940		CKSQYF104Z25	<b>OTHERS</b>	JA901, JA902 (LINE-IN/OUT)		RKB1026
	C709, C809		CQPA101J100		X902 (22.5792MHz)		RSS1035
	C702, C802		CQPA121J100		X901 (24.5760MHz)		RSS1043
	C743, C843		CQPA271J100	<b>DISPLAY UNIT</b>			
	C703-C706, C742, C803-C806, C842		CQPXA222J2A	<b>SEMICONDUCTORS</b>			
	C701, C745, C801, C845 (100/25)		PCH1084		D1601-D1607		DA119
	C707, C807 (22/50)		RCH1043	<b>SWITCHES</b>			
	C739, C839 (47/50)		RCH1086		S1601-S1619		RSG1030
<b>RESISTORS</b>				<b>CAPACITORS</b>			
	VR702, VR802 (47k-B)		RCP1105		C1601		CEAL470M16
	VR701, VR801 (100k-B)		RCP1106		C1602		CKSQYF473Z50
	R914		RD1/2PMF222J	<b>RESISTORS</b>			
	R915, R916		RD1/6PM101J		All Resistors		RS1/10S□□□J
	R704, R804, R901		RD1/6PM102J	<b>OTHERS</b>			
	R913		RD1/6PM103J		CN33 14P FFC BOTTOM CONNECTOR		52492-1420
	R738, R838		RD1/6PM105J		CN32 24P FFC BOTTOM CONNECTOR		52492-2420
	R747, R847		RD1/6PM152J				
	R737, R837		RD1/6PM221J				
	R739, R839		RD1/6PM222J				
	R749, R849		RD1/6PM392J				
	R746, R846		RD1/6PM393J				

Mark	No.	Description	Parts No.
	V1601	FL TUBE REMOTE CONTROL RECEIVER UNIT	RAW1117 NJH32H400A

**VR UNIT**

**RESISTORS**

VR1101	(50k-A)	RCV1091
VR1102	(50k-MN)	RCV1092
R1101, R1102		RDR1/4PM103J

**SW UNIT**

**SEMICONDUCTORS**

Q1701	XDC114ES
-------	----------

**SWITCHES**

S1701, S1702	RSB1006
--------------	---------

**RESISTORS**

All Resistors	RS1/10S□□□J
---------------	-------------

**POWER UNIT**

**SEMICONDUCTORS**

△ IC408, IC409	ICP-N20
△ IC403, IC405	NJM5532DD
△ IC410	NJM7805A
△ IC404	NJM7805FA
△ IC411	NJM7809A
△ IC401	NJM7812FA
△ IC402	NJM78M12FA
△ IC407	NJM7905FA
△ IC406	NJM79M12FA
△ Q401	2SA1283
△ Q403	2SB942
△ Q402	2SD1267
△ D402	11ES2
D405, D406	1SS254
△ D407, D410, D412, D413	30DF2-FC5
△ D408, D409, D411, D414	30DF2-FC6
△ D415, D416	HZ5BLL
△ D403	MTZJ33A
△ D404	RD15FB
△ D401	S4VB20F

**CAPACITORS**

C418	CEAS010M50
C411, C412, C419, C420	CEAS100M50
C405	CEAS331M50
C406	CEAS470M35
C407	CEAS4R7M50

Mark	No.	Description	Parts No.
	C410		CEHAQ010M50
	C401, C413		CENA101M25
	C403, C415		CENA471M25
	C409, C417		CFTYA563J50
	C404 (6800/25)		RCH1033
	C408, C416 (3300/50)		RCH1047

**RESISTORS**

△ R401 (47Ω, 1/6W)	DCN1003
△ R402	RD1/2PMF222J
R404	RD1/6PM332J
R403	RD1/6PM752J
Other Resistors	RDR1/4PM□□□J

**OTHERS**

EARTH PLATE	VNF-091
-------------	---------

**TRANS B UNIT**

**CAPACITORS**

△ C1302, C1308, C1310, C1311, C1313	CKCYF103Z50
△ C1301, C1303-C1306, C1307, C1309, C1312, C1314, C1315	CKPUYF103Z25

**INPUT SEL UNIT**

**SWITCH**

S1801	RSB1007
-------	---------

**RESISTORS**

All Resistors	RS1/10S□□□J
---------------	-------------

**LED UNIT**

**SEMICONDUCTOR**

D1901	SEL6C10R
-------	----------

**REEL SENSOR BOARD**

REEL SENSOR board has no service part.

**PHOTO REFLECTOR ASSY**

**SEMICONDUCTOR**

Q104 TOP SENSOR	NJL5134KL
-----------------	-----------

**PHOTO REFLECTOR ASSY**

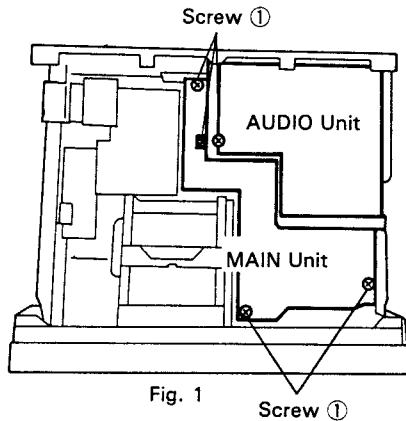
**SEMICONDUCTOR**

Q103 END SENSOR	NJL5134KL
-----------------	-----------

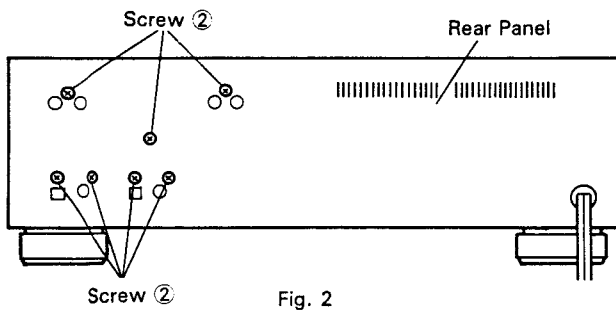
## 5. DISASSEMBLY

### ● Removal of Each Unit

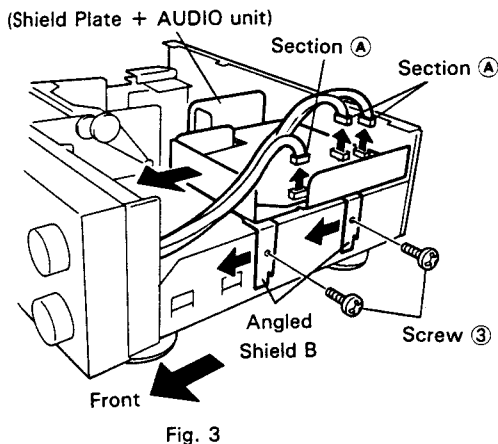
1. Remove the bonnet.
2. Cut the ties holding the various wiring and undo the cord clamps.
3. Remove screw ① (5 screws). (Refer to Fig. 1.)



4. Remove screw ② (7 screws) marked ▼ on the rear panel. (Refer to Fig. 2.)

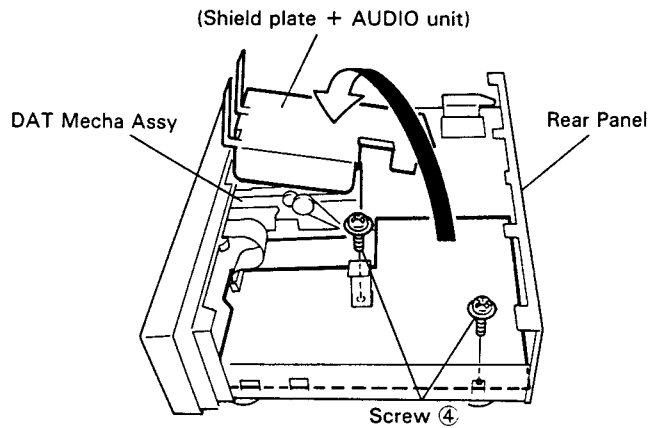


5. Remove the 3 connectors (Section A) in AUDIO unit.
6. Remove screw ③ (2 screws) and slide angled shield B toward the front of the unit and remove it (shield plate + AUDIO unit). (Refer to Fig. 3.)



7. Remove screw ④ (2 screws) on the MAIN unit.
8. While holding up the front of the MAIN unit, press down on the pin jacks from the back side and remove them from the rear panel. Then, lift out the MAIN unit.
9. While holding up the MAIN unit again, place the (shield plate + AUDIO unit) removed in Step 6 on the DAT Mecha Assy. (Refer to Fig. 4.)

When holding up the MAIN unit, make sure you push it firmly toward the DAT Mecha Assy to avoid bumping it against the rear panel.



10. Stand the MAIN unit up and stabilize the base against the base holder (Section B) on the panel stay, the chassis honeycomb section, and the rear panel. (Refer to Fig. 5.)

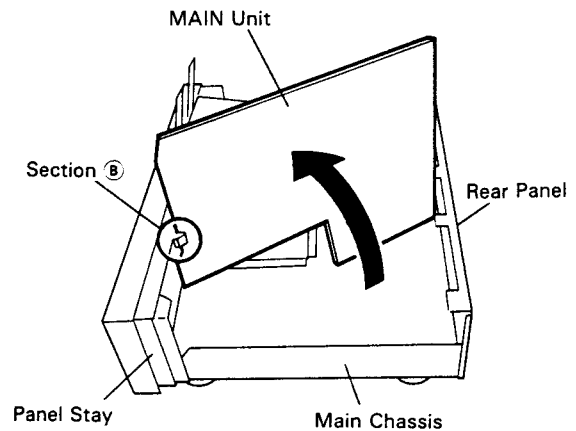


Fig. 5

## 6. ADJUSTMENTS

### ● Adjustment Conditions

1. Clean the head and tape transit surfaces (tape guide, drum, capstan shaft, and pinch roller).
2. Before making adjustments, warm up the set for a few minutes.
3. Set the signal level at  $0\text{dBV} = 1\text{Vrms}$ .
4. Connect a  $10\text{k}\Omega$  load resistance to the audio-system line output terminal.
5. Use an oscilloscope with a 10 : 1 probe.

### ● Test Tapes

- Tracking tape : SDA-101 (TY-7251)  
 Level tape : SDA-102 (TY-7111)  
 Torque meter FWD : SDA-104 (TY-7131)  
 Blank tape : SDA-301  
                   SDA-302  
                   (TY-30B)  
 Error-rate adjustment tape : SDA-111 (SP)  
                                   SDA-112 (WSP)

### ● Adjustment Items

#### Mechanical system

1. Back Tension Torque Adjustment
2. Tape Pass Confirmation
3. Tape Pass Adjustment

#### Electrical system

1. PLL Adjustment
2. TACH Adjustment
3. ATF Recording Current Adjustment
4. Error Rate Adjustment
5. A/D MSB Adjustment
6. A/D OFFSET Adjustment

### ● Setting the Test Mode

#### (1) 1.5 TP Test Mode

1. With the POWER SW ON, set the TIMER SW on PLAY.
  2. Press the COUNTER RESET key while holding down the MUTE key.
  3. At this time confirm that the counter display in the FL tube indicates "Adj".
- To cancel this test mode, press the ID MODE key or the EJECT key.

#### (2) Setting the 2/3 waveform

1. Enter the 1.5 TP test mode.
2. Confirm that the tracking is stable, then press the MS + (plus) key until the reproduced waveform is about 2/3. If you have gone past this value, press the MS - (minus) key and stabilize the waveform. If at this time tracking conditions are worse than what they were at the start of adjustment, press the PEAK RESET key and readjust the tracking using the MS + (plus) and - (minus) keys.

#### (3) Test Mode for Recording Current Adjustment

1. With the POWER SW ON, set the TIMER SW on PLAY.
  2. Press the COUNTER MODE key while holding down the MUTE key.
  3. At this time confirm that the P-NO display in the FL tube indicates "db".
- To cancel this test mode, press the ID MODE key.

**MECHANICAL SYSTEM ADJUSTMENT**

**1. Back Tension Torque Adjustment**

- Purpose : To stabilize the tape's contact with the rotating drum.
- Symptoms of Improper Adjustment : Small torque ⇨ Tape transit is unstable.  
 Large torque ⇨ Tape or head is damaged.

Measuring Device/Jig	Measuring Device Connection	DAT State	Part to be Adjusted
<ul style="list-style-type: none"> <li>● Torque Meter FWD : SDA-104 (TW-7131)</li> <li>● Cassette Weight : R-2606</li> </ul>		<ul style="list-style-type: none"> <li>● PLAY mode</li> </ul>	<ul style="list-style-type: none"> <li>● Spring hook part on the reel base</li> </ul>

**Adjustment Procedure**

**Preparation**

- Mount the torque meter (SDA-104). (At this time, place the cassette weight on the tape to prevent the tape from lifting up.)

1. Press the PLAY key and confirm that the center of the back tension torque value on the torque meter FWD is between 6.5 to 9.5g • cm.

2. If the value is not within this standard, adjust positions A to C on the reel base spring hook part.

**Adjustment Diagram**

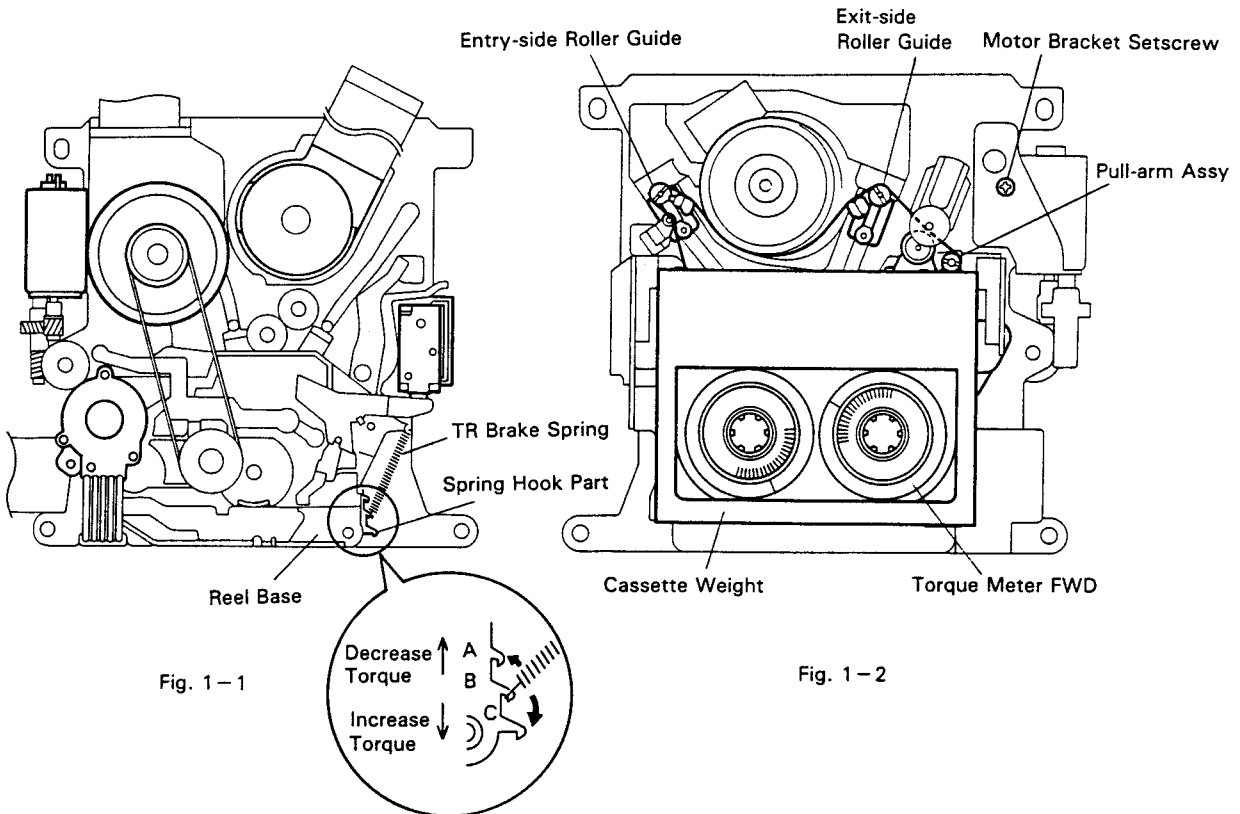


Fig. 1-1

Fig. 1-2



2. Tape Pass Confirmation

- Purpose : To confirm that the tape is correctly aligned with the drum assembly lead. (Tape transit adjustment)
- Symptoms of Improper Adjustment : Sound is interrupted, noise is generated, or sound quality is poor.

Measuring Device/Jig	Measuring Device Connection	DAT State	Part to be Adjusted
<ul style="list-style-type: none"> <li>● Oscilloscope</li> <li>● Test Tape : Tracking/ SDA-101 (TY-7251)</li> <li>● Cassette Weight : R-2606</li> </ul>	<ul style="list-style-type: none"> <li>● Oscilloscope</li> <li>● MAIN unit interior : CH1 : Between ENVIN (CN22-3) and GND A (CN22-1)</li> <li>CH2 : Between HSWP (CN22-5) and GND A (CN22-1)</li> </ul>	<ul style="list-style-type: none"> <li>● PLAY mode (Test mode)</li> </ul>	<ul style="list-style-type: none"> <li>● Waveform check</li> </ul>

Adjustment Procedure

Preparation

- Mount the tracking tape (SDA-101). (At this time, place the cassette weight on the tape.)
  - After setting the 1.5 TP test mode, produce the 2/3 waveform and play the tape. (Refer to Page 41.)
1. Check the waveform at this time on the oscilloscope and make sure that the degree of flatness is at least 75%. (Before starting playback, confirm that the RECG3 hole on the test tape is open.)

2. If the degree of flatness is less than 75%, perform the procedures described in Sec. 3, "Tape Pass Adjustment," on Page 45.

- Degree of flatness =  $B/A \times 100$  [%]  
(Refer to Photo 1-1 to photo 1-3)

Adjustment Diagram

NOTE :  
Confirm that the hole is open.  
(RECG3: 1.5 TP tape)

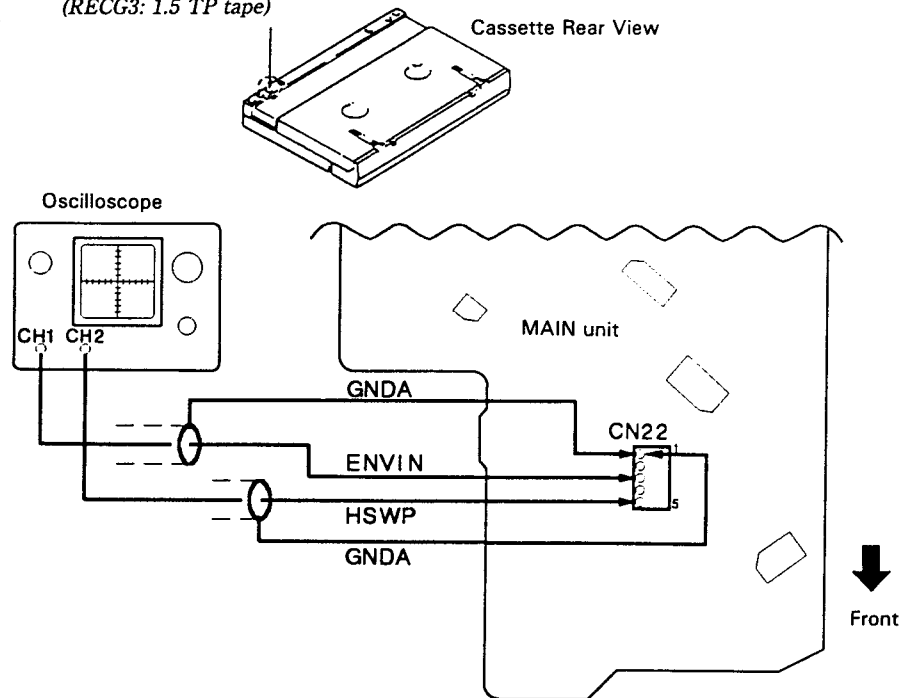


Fig. 2

Waveform

- Oscilloscope Range : 50mv/div., 1ms/div.

Normal

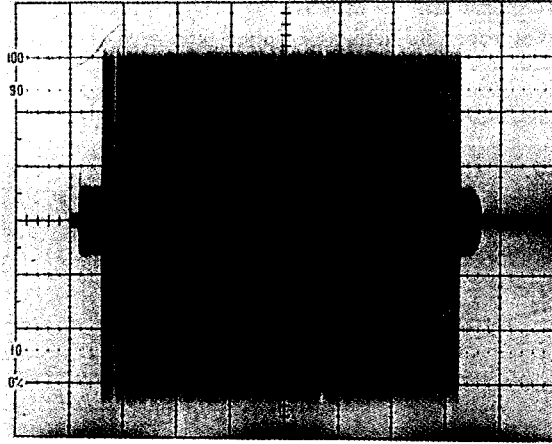


Photo 1-1

Fault on the Entry Side

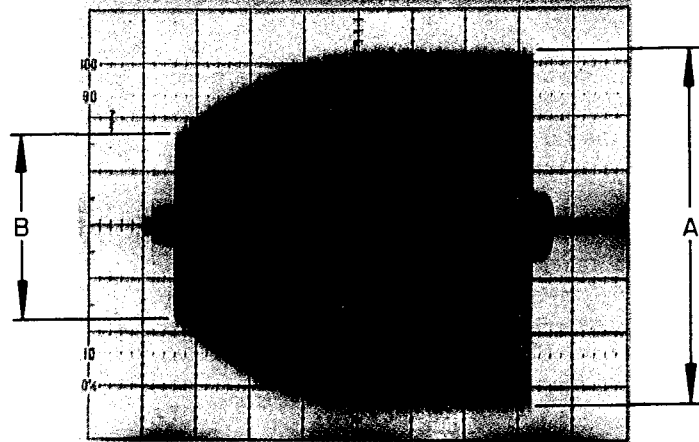


Photo 1-2

Fault on the Exit Side

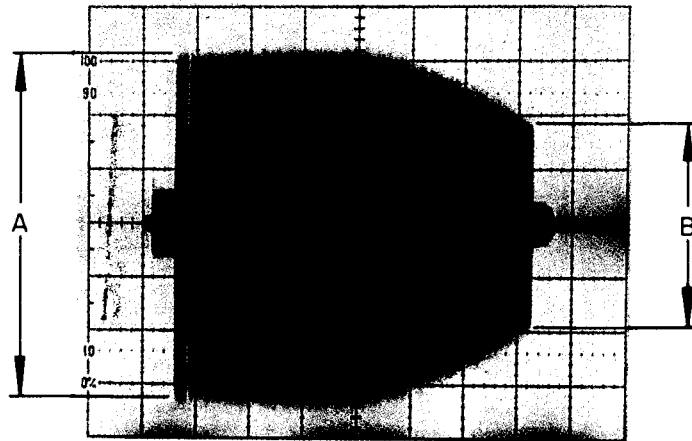


Photo 1-3

**3. Tape Pass Adjustment**

- Purpose : To confirm that the tape is correctly aligned with the drum assembly lead. (Tape transit adjustment)
- Symptoms of Improper Adjustment : Sound is interrupted, noise is generated, or sound quality is poor.

Measuring Device/Jig	Measuring Device Connection	DAT State	Part to be Adjusted
<ul style="list-style-type: none"> <li>● Oscilloscope</li> <li>● Test Tape : Tracking/ SDA-101 (TY-7251)</li> <li>● Pin-face Screwdriver : R-1784</li> <li>● 0-bit Phillips Screwdriver</li> <li>● Cassette Weight : R-2606</li> </ul>	<ul style="list-style-type: none"> <li>● Oscilloscope</li> <li>● MAIN unit interior: CH1 : Between ENVIN (CN22-3) and GND A (CN22-1)</li> <li>CH2 : Between HSWP (CN22-5) and GND A (CN22-1).</li> </ul>	<ul style="list-style-type: none"> <li>● PLAY mode</li> </ul>	<ul style="list-style-type: none"> <li>● Roller guide (entry and exit sides)</li> <li>● Pull guide</li> </ul>

**Adjustment Procedure**

- 3-1. Rough adjustment of guides**
1. Turn the entry-side / exit-side roller guides clockwise using the pin-face screwdriver (R-1784) until they lightly touch the end, and then turn them back about one rotation.
  2. Turn the guide flange on the pull-arm assy until the top surface of the flange is aligned with the top of the pull-arm shaft. (Refer to Fig. 3-1.)
- 3-2. Fine adjustment of roller guide height**
- Preparation**
- Mount the tracking tape (SDA-101). (At this time, place the cassette weight on the tape.)
  - After setting the 1.5 TP test mode, produce the 2/3 waveform and play the tape. (Refer to Page 41.)
  - At this time, confirm that the RECG3 hole on the cassette tape is open. (Refer to Fig. 3-2.)
- [Exit-Side Adjustment]**
1. Inspect the RF waveform. If it resembles the waveform shown in Photo 2-4, tighten the exit-side roller guide (about 1/8 rotation). If it resembles the waveform shown in Photo 2-6, loosen the exit-side roller guide (about 1/8 rotation).
- [Entry-Side Adjustment]**
2. Inspect the RF waveform. If it resembles the waveform shown in Photo 2-3, tighten the entry-side roller guide (about 1/4 rotation). If it resembles the waveform shown in Photo 2-5, loosen the entry-side roller guide (about 1/4 rotation).
  3. Observe the RF waveform and repeat Steps 1 and 2 above until the waveform looks like the one shown in Photo 2-2.
  4. Securely tighten the roller guide lock screw, locking the guide in place.
  5. Press the OPEN/CLOSE key, and once the tape has been ejected, repeat the procedures described in Sec. 2, "Tape Pass Confirmation". (Refer to Page 43.)

**Adjustment Diagram**

- The oscilloscope connections and other connections are as indicated in Sec. 2, "Tape Pass Confirmation" (Page 43).

**NOTE :**  
Confirm that the hole is open. (RECG3: 1.5TP tape)

**Fig. 3-1**

**Fig. 3-2**

**Fig. 3-3**

Waveform

- Oscilloscope Range : 50mv/div., 1ms/div.

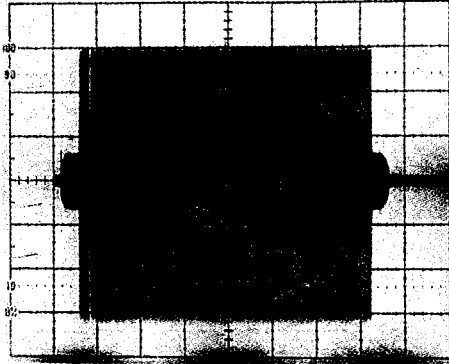


Photo 2-1  
Maximum RF Output Level

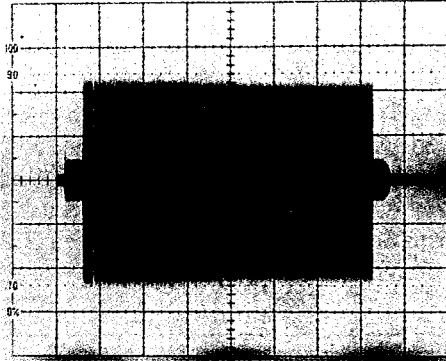


Photo 2-2  
2/3 RF Output Level

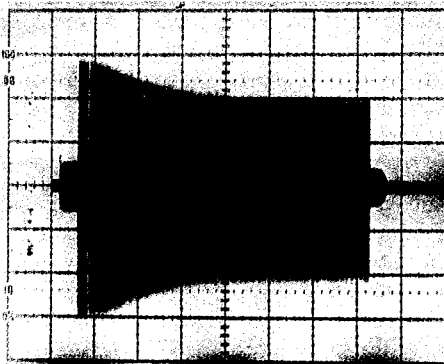


Photo 2-3  
Entry-Side Guide Roller Too High

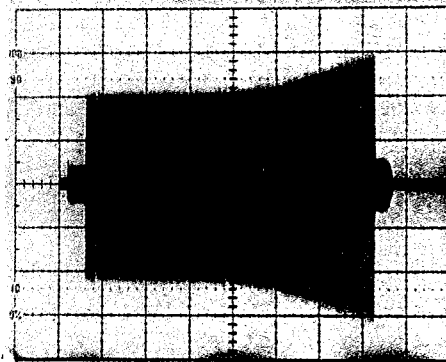


Photo 2-4  
Exit-Side Guide Roller Too High

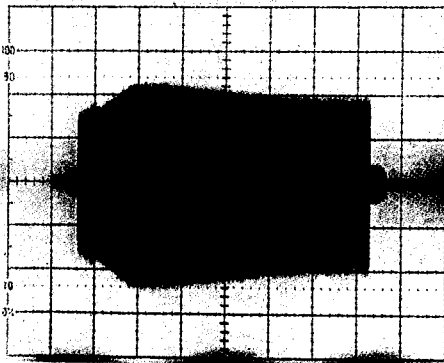


Photo 2-5  
Entry-Side Guide Roller Too Low

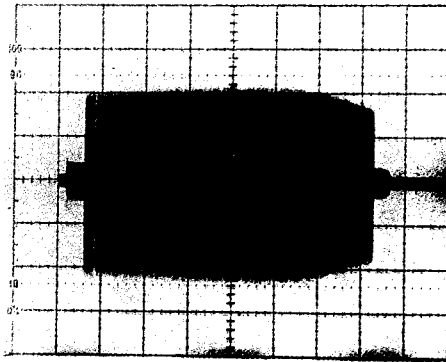


Photo 2-6  
Exit-Side Guide Roller Too Low

### 3-3. Fine Adjustment of Pull Guide

1. Play the tape and set the CUE mode by holding down the FF/CUE key when the tape starts winding. Check for twisting of the tape between the pinch roller and the pull guide by observing the image of the motor bracket setscrew head reflected on the magnetic surface of the tape. The relationship between the reflected image of the screw head and the height of the pull-guide flange is shown in Fig. 3-4.
2. Slowly tighten the pull-guide flange, turning it 180 degrees from its rough-adjusted position, and confirm that the appearance of the reflected image continuously changes from (c) to (a) during this process.
3. Then, while loosening the pull-guide flange 180 degrees, confirm that the appearance of the reflected image continuously changes from (a) to (c).
4. Tighten the pull-guide flange until the top edge of the tape curls slightly and the screw image resembles the shape shown in (b), and then loosen the flange 90 degrees.
5. Set the REW mode by pressing and holding down the REW/REV key. Confirm that the tape does not curl at Points A and B in Fig. 3-5.
6. After confirming that the tape is not twisted at Point C in Fig. 3-6, check the tape for twisting or bulging at Point D. (Normal bulge : no more than 0.5mm)
7. Press the OPEN/CLOSE key and eject the tape. Replay the tape, and keeping the FF/CUE key pressed down, observe the reflected image of the screw head and confirm that it has the same appearance as that shown in (c).
8. Press and hold down the REW/REV key and confirm that curling and twisting at Points A to D are the same.
9. Apply a locking adhesive to the screw on top of the pull-guide flange and lock the screw.

#### Adjustment Diagram

When light is reflected off the screw, the image of the screw appears on the tape.

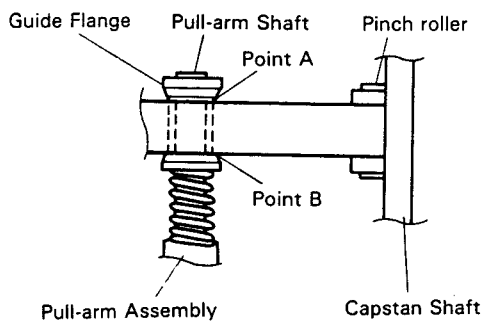
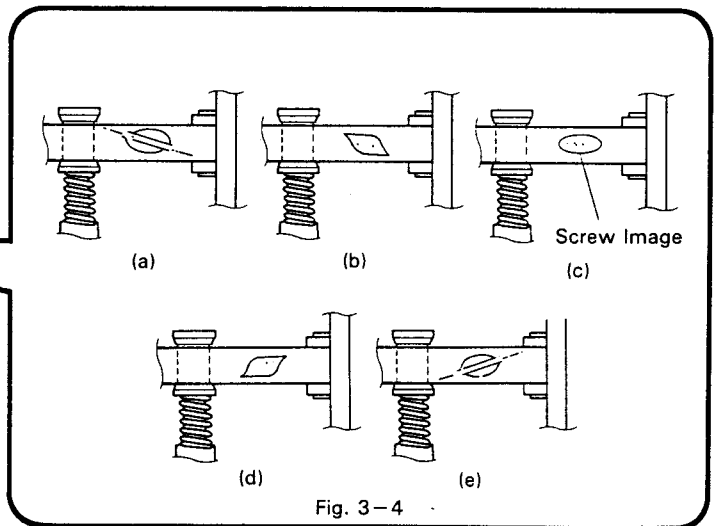
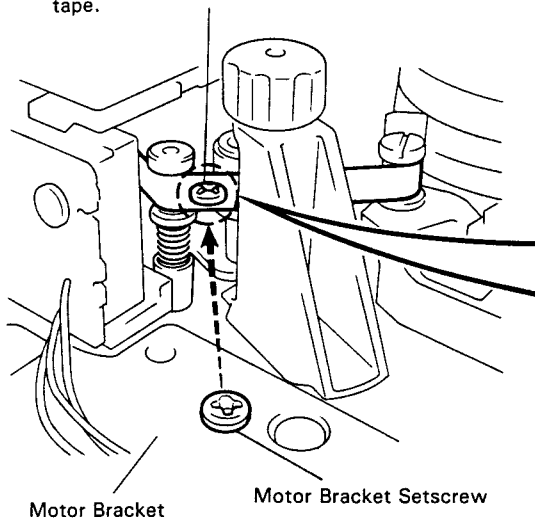


Fig. 3-5

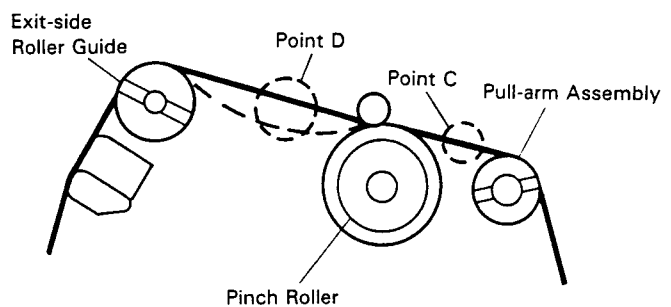


Fig. 3-6

**ELECTRICAL SYSTEM ADJUSTMENT**

**1. PLL Adjustment**

- Purpose : To correctly access digital signals stored in the tape.
- Symptoms of Improper Adjustment : Sound is intermittent, unit does not playback, noise is generated, or meter fails to oscillate.

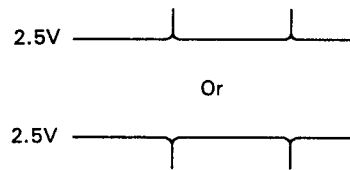
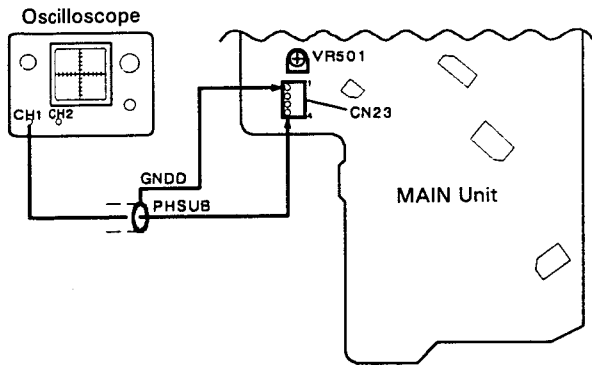
Measuring Device/Jig	Measuring Device Connection	DAT State	Part to be Adjusted
<ul style="list-style-type: none"> <li>● Oscilloscope</li> <li>● Test Tape Blank Tape : SDA-301</li> </ul>	<ul style="list-style-type: none"> <li>● Oscilloscope MAIN unit interior : CH1 : Between PHSUB (CN23-4) and GND D (CN23-1)</li> </ul>	<ul style="list-style-type: none"> <li>● STOP mode</li> </ul>	<ul style="list-style-type: none"> <li>● MAIN unit VR501</li> </ul>

**Adjustment Procedure**

1. Insert the test tape.
2. Adjust the output voltage of the CN23-4 (PHSUB) to 2.5V. (At this time, if the beard-shaped pulses in the waveform are just slightly visible or disappear completely, adjust the voltage above or below 2.5V.)

**Adjustment Diagram**

**Waveform**



- If the beard-shaped pulses in the waveform are just slightly visible or disappear completely, adjust the voltage above or below 2.5V.

Fig. 4

## 2. TACH Adjustment

- Purpose : To match the recording position with the tape format.
- Symptoms of Improper Adjustment : Tapes recorded on other machines have intermittent sound or noise increases and the MUTE comes on. (Tapes recorded on this unit perform without problems.)

Measuring Device/Jig	Measuring Device Connection	DAT State	Part to be Adjusted
<ul style="list-style-type: none"> <li>● Oscilloscope</li> <li>● Test tape Tracking : SDA-101 (TY-7251)</li> </ul>	<ul style="list-style-type: none"> <li>● Oscilloscope MAIN unit interior : CH1 : Between ENVIN (CN22-3) and GND A (CN22-1) CH2 : Between HSWP (CN22-5) and GND A (CN22-1)</li> </ul>	<ul style="list-style-type: none"> <li>● PLAY mode (Test mode)</li> </ul>	<ul style="list-style-type: none"> <li>● MAIN unit VR601</li> </ul>

### Adjustment Procedure

#### Preparation

- Set the SP mode.
- Set the 1.5 TP test mode. (Refer to Page 41.)

1. Adjust the position of the RF waveform marker so that it is  $800\mu\text{s} \pm 20\mu\text{s}$  from the start of the TACH waveform.

#### Waveform

- Oscilloscope Range :  
CH1 : 500mV/div., 200 $\mu\text{s}$ /div.  
CH2 : 2V/div. (Trigger)

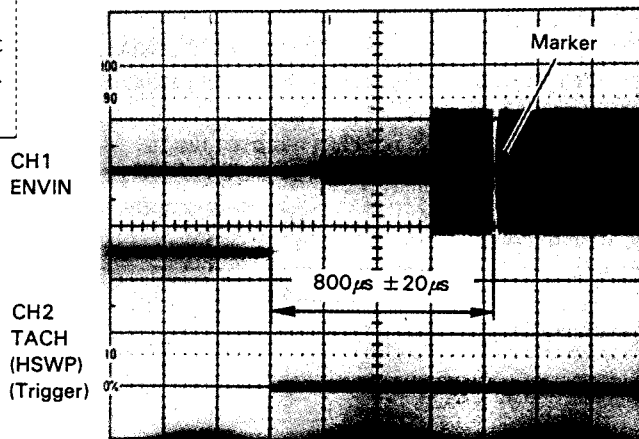


Photo 3-1

#### Adjustment Diagram

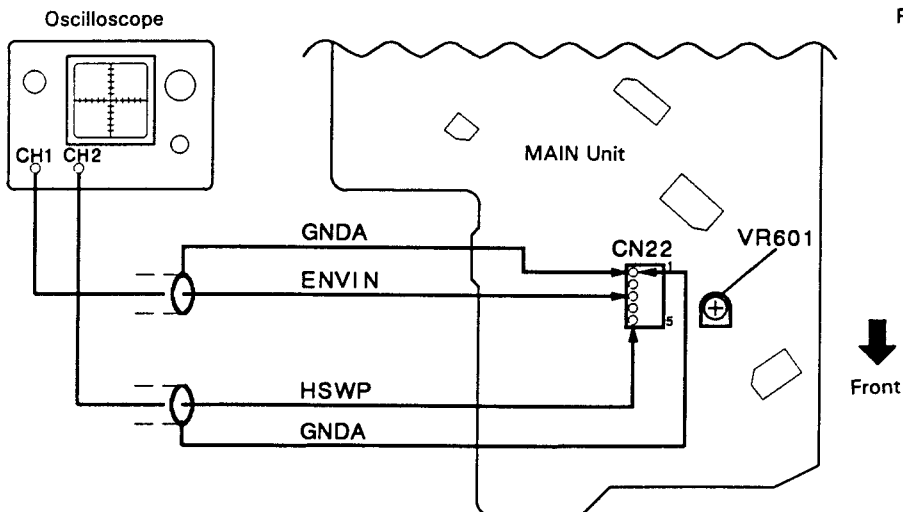


Fig. 5

### 3. ATF Recording Current Adjustment.

<ul style="list-style-type: none"> <li>● Purpose : To obtain the ideal recording current value.</li> <li>● Symptoms of Improper Adjustment : Sound is intermittent (tracking cannot be obtained) or noise is generated.</li> </ul>			
Measuring Device/Jig	Measuring Device Connection	DAT State	Part to be Adjusted
<ul style="list-style-type: none"> <li>● Oscilloscope</li> <li>● Test Tape</li> <li>Level : SDA-102 (TY-7111)</li> <li>Blank : SDA-302 (TY-30B)</li> </ul> <p><i>NOTE :</i> Use an unused portion of tape where RF signals have not been recorded.</p>	<ul style="list-style-type: none"> <li>● Oscilloscope</li> <li>MAIN Unit interior :</li> <li>CH1 : Between PLT2 (CN22-4) and GND A (CN22-1)</li> <li>CH2 : Between HSWP (CN22-5) and GND A (CN22-1)</li> </ul>	<ul style="list-style-type: none"> <li>● PLAY and REC modes</li> </ul>	<ul style="list-style-type: none"> <li>● RF unit</li> <li>VR305 (A head)</li> <li>VR302 (B head)</li> </ul>
<h4>Adjustment Procedure</h4>			
<p><b>Preparation</b></p> <ul style="list-style-type: none"> <li>● Set the test mode for adjustment of recording current. (Refer to Page 41.)</li> </ul> <ol style="list-style-type: none"> <li>1. Play the level-use test tape (SDA-102) and record the voltage value at Points (a) and (b) on the waveform. (Refer to Photo 4-1.)</li> <li>2. Confirm that the blank tape has not been used or has an unused portion. Press the REC key and then the PAUSE key. Record the signal from the unit's built-in transmitter on the tape for 30 to 60 seconds.</li> </ol>		<ol style="list-style-type: none"> <li>3. Stop the recording and rewind the recorded portion of the tape. Confirm that the levels of the reproduced waveform are within <math>\pm 25\%</math> of levels (a) and (b) recorded according to the procedure described in Step 1. (Refer to Photo 4-2.)</li> <li>4. When the values are outside the standard, slightly turn VR305 for A head or VR302 for B head, and record the signal again on an unused portion of tape. Confirm the levels as described in Step 3.</li> <li>5. Repeat Steps 3 and 4 and make adjustments until the values are within the standard.</li> </ol>	
<p><b>Adjustment Diagram</b></p> <p>The diagram illustrates the setup for adjusting the recording current. An oscilloscope is connected to the MAIN Unit's internal components. The CH1 input is connected to the PLT2 terminal (pin 4 of connector CN22), and the CH2 input is connected to the HSWP terminal (pin 5 of connector CN22). Both channels are referenced to the GND A terminal (pin 1 of connector CN22). The RF Unit, which is shown in a separate view, contains two potentiometers: VR305 for the A head and VR302 for the B head. Arrows indicate the front orientation of both the MAIN Unit and the RF Unit.</p>			
<p>Fig. 6</p>			



Waveform

- Oscilloscope Range : CH1: 0.5V/div., 2.5mS/div.  
CH2 : 5V/div.

[ ] : Reference

During Playback of Level Tape (SDA-102)

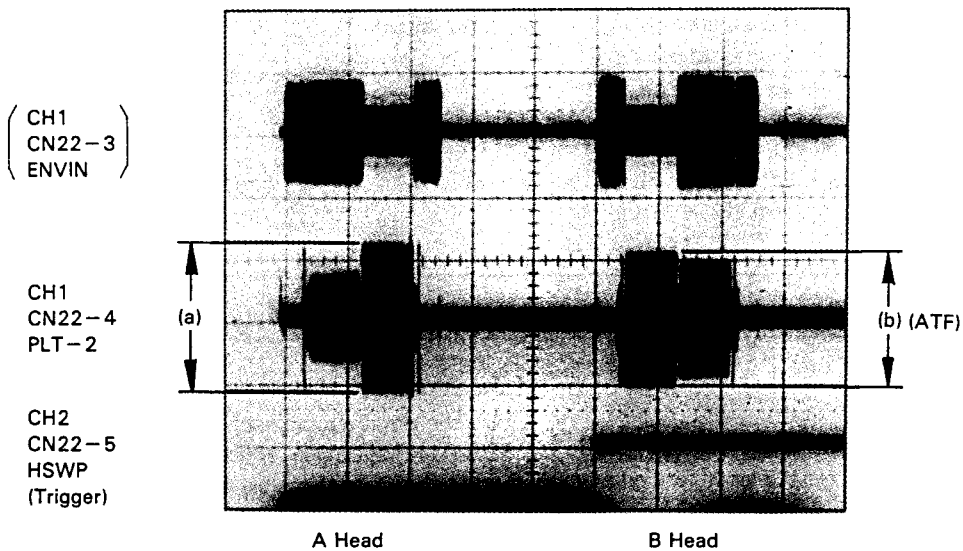


Photo 4-1

During Playback of Self-recorded Blank Tape

- Oscilloscope Range : CH1 : 0.5V/div., 3mS/div. (PCM)  
[CH1 : 100mV/div., 3mS/div.] (ATF)  
CH2 : 5V/div.

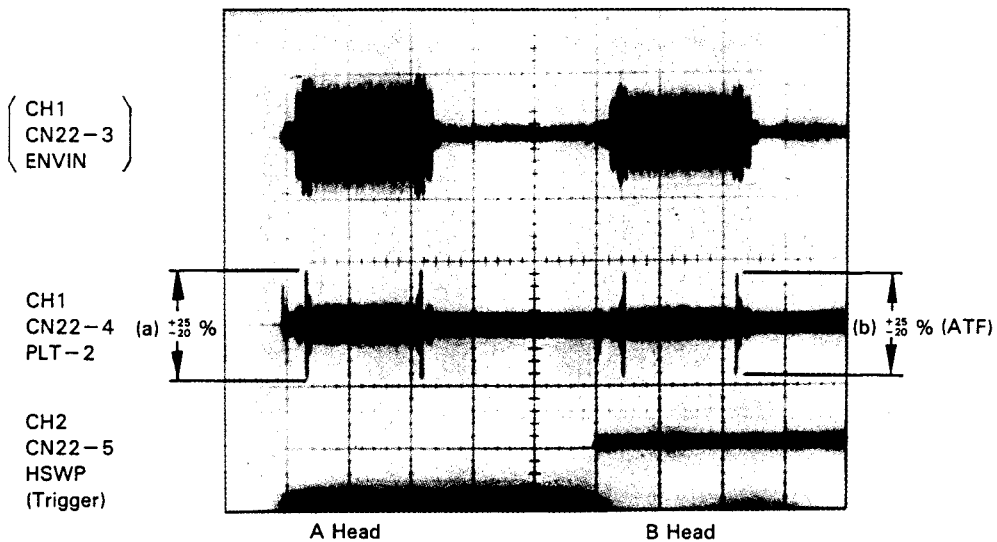


Photo 4-2

**4. Error Rate Adjustment**

- Purpose : To reproduce the correct data.
- Symptoms of Improper Adjustment : Units skips during playback, noise is generated, or meter does not oscillate.

Measuring Device/Jig	Measuring Device Connection	DAT State	Part to be Adjusted
<ul style="list-style-type: none"> <li>● Test Tape Error Rate Adjustment Tape : SDA-111 (SP) : SDA-112 (WSP)</li> <li>● Error Rate Counter [● Oscilloscope]</li> </ul>	<ul style="list-style-type: none"> <li>● Error rate counter MAIN unit interior Connector : CN24</li> <li>● Oscilloscope MAIN Unit interior : CH1 : Between FLAG (CN24-3) and GND D (CN24-1)</li> </ul>	<ul style="list-style-type: none"> <li>● PLAY mode</li> </ul>	<ul style="list-style-type: none"> <li>● RF unit VR303 (SP) VR304 (WSP)</li> </ul>

**Adjustment Procedure**

- |   |  |
|---|--|
| <p><b>Preparation</b></p> <ul style="list-style-type: none"> <li>● Connect the error rate counter connector to CN24 inside the signal processing unit and set the error rate counter timer at 10sec.</li> </ul> <p>1. Play the error rate adjustment tapes (SDA-111 and SDA-112) and make adjustments so that the error rate is as small as possible.</p> | <p>[If the error rate counter is not used]</p> <p>1. Play the error rate adjustment tapes (SDA-111 and SDA-112) and make adjustments so that the oscilloscope waveform error flag is the same as that shown in Photo 5. (Adjust until the error rate is as small as possible.)</p> |
|---|--|

**Adjustment Drawing**

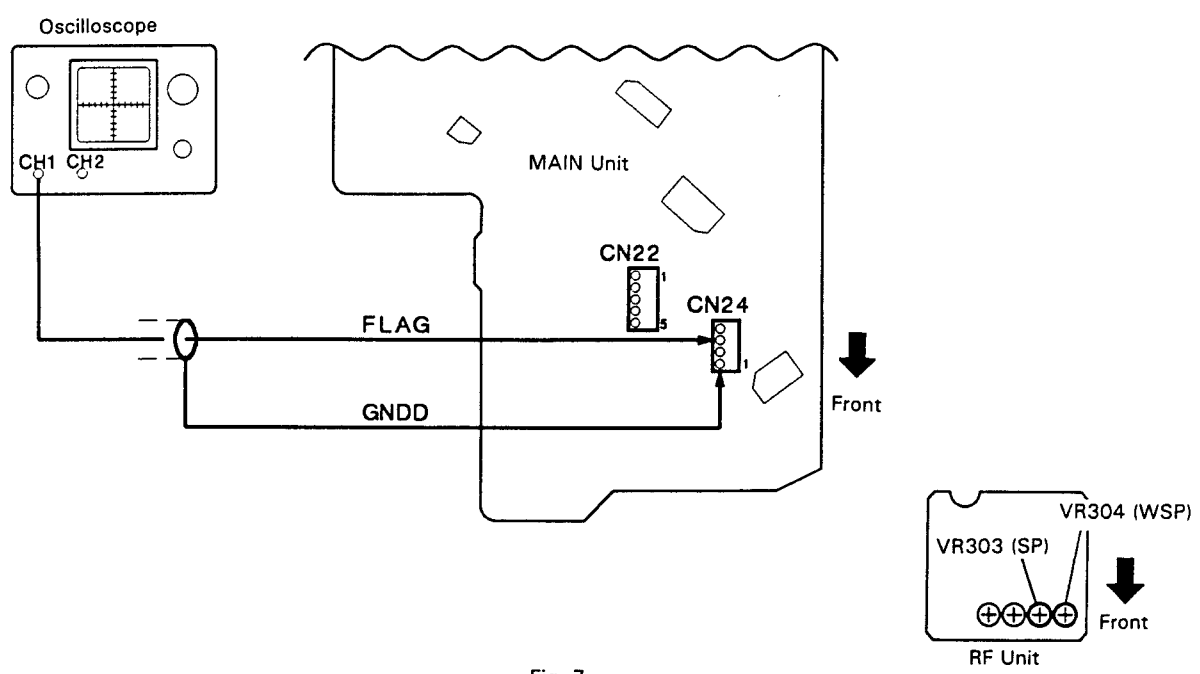


Fig. 7

Waveform

- Oscilloscope Range : 2v/div., 5ms/div.  
[During SP]

When error rate  
is  $1 \times 10^{-1}$

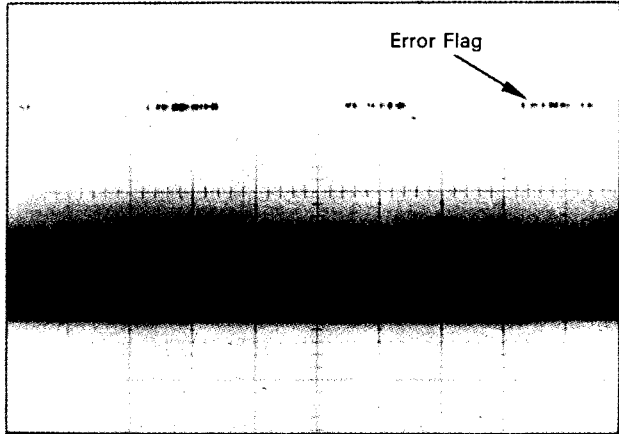


Photo 5-1

When error rate  
is  $2 \times 10^{-2}$

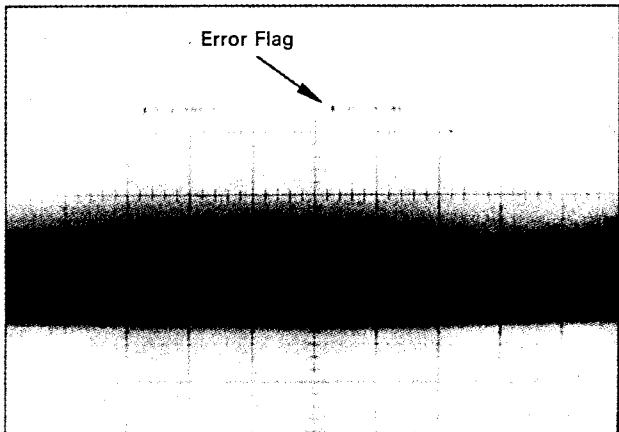


Photo 5-2

When error rate  
is  $5 \times 10^{-4}$

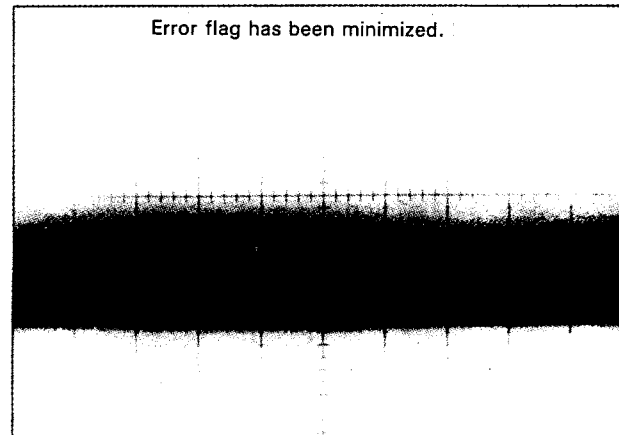


Photo 5-3

5. A/D MSB Adjustment

- Purpose : To adjust MSB produced at 60dB on the A/D converter. (Zero-cross adjustment)
- Symptoms of Improper Adjustment : Distortion rate and dynamic range deteriorate.

Measuring Device/Jig	Measuring Device Connection	DAT State	Part to be Adjusted
<ul style="list-style-type: none"> <li>● Test Tape Blank : SDA-301</li> <li>● Oscillator</li> <li>● AC Voltmeter</li> <li>● Oscilloscope</li> <li>● Distortion Meter (400Hz HPF, 20kHzLPF = ON)</li> </ul>	<ul style="list-style-type: none"> <li>● LINE OUT (Lch, Rch)</li> <li>● Oscilloscope AUDIO unit interior: CH1 : Between DATAL (CN18-2) and GND (CN18-1) [CH1 : Between DATAR (CN18-4) and GND (CN18-1)] CH2 : Between CC (CN18-3) and GND (CN18-1)</li> </ul>	<ul style="list-style-type: none"> <li>● REC/PAUSE mode</li> </ul>	<ul style="list-style-type: none"> <li>● AUDIO Unit VR701 (Lch) VR702 (Lch) VR801 (Rch) VR802 (Rch)</li> </ul>

Adjustment Procedure

Preparation

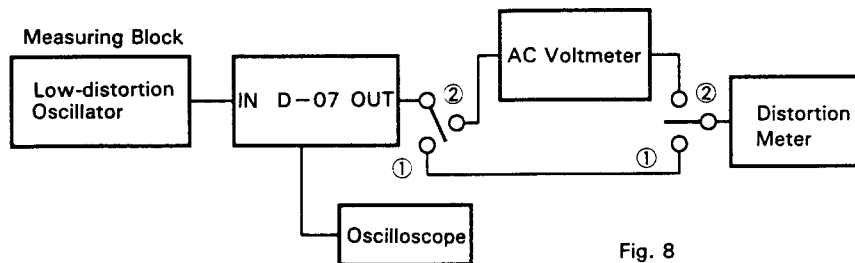
- Set the SP mode and short-circuit CN19.
- Connect components as shown in Fig. 8 and set the switch on ①.

NOTE : Start at Step 1 for Lch and Rch separately.

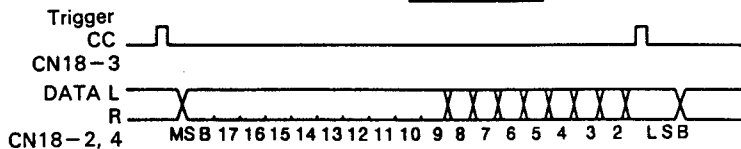
1. With the unit in REC/PAUSE mode, input a 1kHz : +6dBV signal from the oscillator, and using the INPUT volume, adjust the level meter on the set so that 0dB is illuminated. (At this time, increase the volume until just before the LINE OUT waveform starts to clip.)

2. Short-circuit CN19 and lower the oscillator output to 60dB. Activate the VR701 (Lch) and VR801 (Rch) and adjust them to the offset value at which MSB will invert without fail.
3. Set the switch on ② in Fig. 8 and the AC voltmeter at -60dB. Set the distortion meter to DISTORTION mode. (Used by the amp in the AC voltmeter.)
4. Adjust VR702 (Lch) and VR802 (Rch) so that the LINE OUT distortion at this time is as small as possible (no larger than 4.5%).
5. After adjusting in Sec 6, "A/D OFFSET Adjustment", recheck the distortion; repeat adjustments until the distortion value is within the above standard.

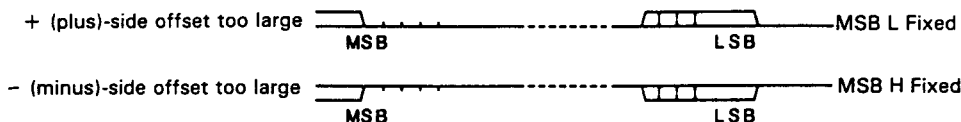
Adjustment Drawing



Waveform



Set the MSB so that it outputs both L and H as shown above. When conditions similar to those shown below occur, adjust VR701 and VR801 so that the conditions shown above are obtained.



6. A/D OFFSET Adjustment

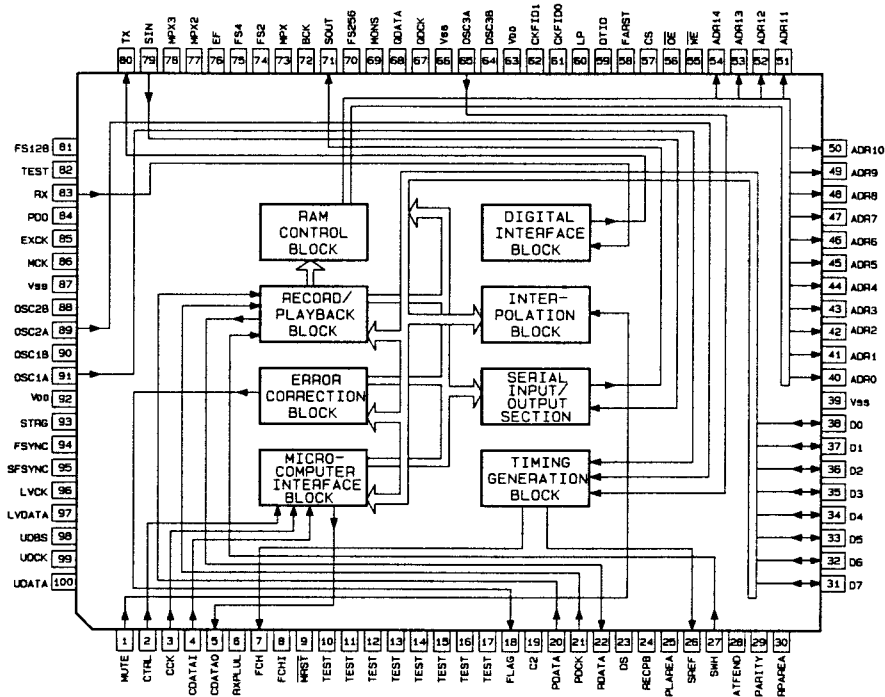
<ul style="list-style-type: none"> <li>● Purpose : To adjust the A/D converter offset.</li> <li>● Symptoms of Improper Adjustment : S/N is lost or level meter lights up during signalless recording.</li> </ul>			
Measuring Device/Jig	Measuring Device Connection	DAT State	Part to be Adjusted
<ul style="list-style-type: none"> <li>● Test Tape Blank : SDA-301</li> <li>● Oscilloscope</li> </ul>	<ul style="list-style-type: none"> <li>● Oscilloscope AUDIO unit interior : CH1 : Between DATAL (CN18-2) and GND (CN18-1) [CH1 : Between DATAR (CN18-4) and GND (CN18-1)] CH2 : Between CC (CN18-3) and GND (CN18-1)</li> </ul>	<ul style="list-style-type: none"> <li>● REC/PAUSE mode</li> </ul>	<ul style="list-style-type: none"> <li>● AUDIO Unit VR701 (Lch) VR801 (Rch)</li> </ul>
<p><b>Adjustment Procedure</b></p>			
<p><b>Preparation</b></p> <ul style="list-style-type: none"> <li>● Set the SP mode.</li> <li>● Terminate the LINE IN terminal on the set at 600Ω.</li> </ul> <p>1. After inserting the test tape (blank : SDA-301) and setting the REC/PAUSE mode, adjust the Lch by setting the balance VR Rch to MAX. To adjust the Rch, set the Lch on the balance VR to MAX.</p>		<p>2. Observe the waveform produced at this time and adjust both the Lch and Rch so that the waveform low-order 8-bit division starts to move from "L" to "H" that is, until the waveform of the 8-bit division is faintly visible. (At this time, set the "L" level between 18-bit MSB and the 9-bit division ; the range below 7-bits can be either "L" or "H".)</p> <p>3. After completing adjustments, confirm the A/D MSB adjustment distortion rate (maximum 4.5%) and make sure that the distortion rate variation is within ±1dB.</p>	
<p><b>Adjustment Drawing</b></p>		<p><b>Waveform</b></p>	
<p>Fig. 9</p>			

## 7. IC INFORMATION

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

### ■ HD49226AFS (MAIN UNIT : IC501)

- One Chip Signal Processing LSI for R-DAT
- BLOCK DIAGRAM



### ● Pin Function

No.	Symbol	Pin Name	I/O	Function	Polarity	
					H	L
1	MUTE	Mute	I	MUTE control signal	Enable	Norm
2	CTRL	Control	I	Microcomputer data transmission mode input control signal		
3	CCK	Microcomputer Data Clock	I	Microcomputer transmission data synchronous clock input		
4	CDATAI	Microcomputer Data Input	I	Microcomputer transmission data input		
5	CDATAO	Microcomputer Data Output	O	Microcomputer transmission data output		
6	RXPLUL	RX PLL Unlock	O	LOCK/UNLOCK output during RX input	UN LOCK	LOCK
7	FCH	Channel Frequency	O	Channel clock output (18.816/9.408/4.704MHz)		
8	FCHI	Channel Frequency Input	I	Channel clock input		
9	MRST	Master Reset	I	Master reset	Norm	RST
10	TEST	-	I			
11	TEST	-	I			

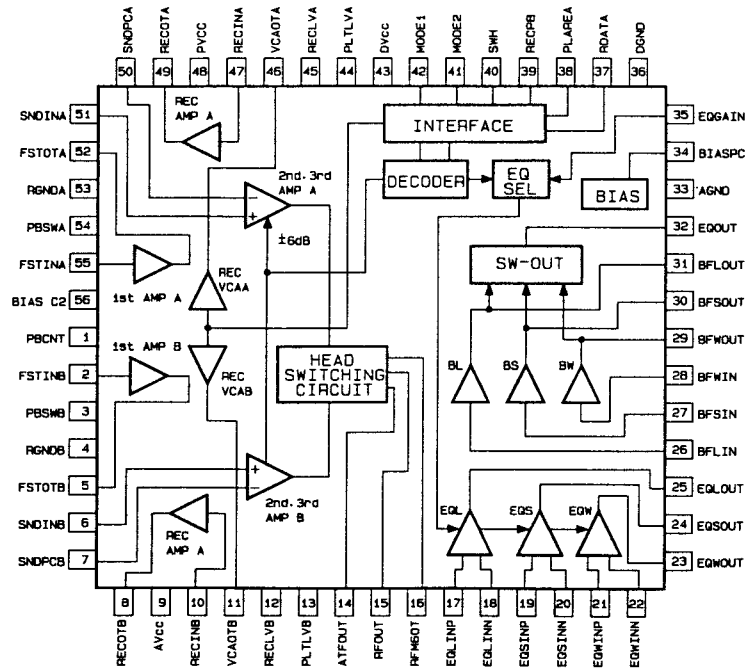
No.	Symbol	Pin Name	I/O	Function	Polarity	
					H	L
12   17	TEST	—	—	—		
18	FLAG	Error Flag	O	Correction flag output		
19	C2	C2 Area	O	C2 correction area output		
20	PDATA	Playback Data	I	Playback signal input		
21	PDCK	Playback Data Clock	I	Playback signal synchronous clock input		
22	RDATA	Rec Data	O	Record signal output		
23	DS	Drum Select	I	Drum diameter select	Standard	Small diameter
24	RECPB	Rec Playback Select	O	Record/playback control signal output	REC	PB
25	PLAREA	Pilot Area	O	ATF pilot signal record area output	AREA	
26	SREF	Servo Reference	O	Servo reference signal		
27	SWH	Switch Head	I	Head switch signal input		
28	ATFEND	ATF End	I	ATF area detector signal input		
29	PARITY	Parity	O	Parity detection results output	OK	
30	RPAREA	REC PLAY AREA	O	Record/playback area		
31   38	D7   D0	Data7   Data0	I/O	RAM data input/output		
39	Vss	Vss	—	GND		
40   54	ADR0   ADR14	Address0   Address14	O	RAM address output		
55	$\overline{\text{WE}}$	$\overline{\text{Write Enable}}$	O	Ram write-enable signal	INH	EN
56	$\overline{\text{OE}}$	$\overline{\text{Output Enable}}$	O	RAM output-enable signal		
57	CS	Chip Select	O	RAM chip select	INH	EN
58	FARST	Frame Address Reset	I	Frame address reset	Norm	RST
59	DTID	Data ID Select	I	Data ID select	0	8
60	LP	LP Mode Select	O	LP mode select when DS = H	Half speed	W
				Small-diameter drum select when DS = L	15mm $\phi$	20mm $\phi$
61	CKFID0	Clock Fidelity 0	I	TX clock fidelity control input		
62	CKFID1	Clock Fidelity 1	I			
63	VDD	VDD	—	Power supply		
64	OSC3B	Oscillator 3B	O	37. 632MHz/18. 816MHz oscillator circuit		
65	OSC3A	Oscillator 3A	I			
66	Vss	Vss	—	GND		
67	QDCK	Q DATA Clock	I	CD Q data clock input		

No.	Symbol	Pin Name	I/O	Function	Polarity	
					H	L
68	QDATA	Q DATA Out	O	CD Q data output		
69	MONS	MONITOR Select	I	Monitor select during playback	PB	REC
70	FS256	FS256	O	fs clock × 256		
71	SOUT	Serial Out	O	Serial signal output		
72	BCK	bit clock	O	Serial input/output bit synchronous clock		
73	MPX	Multiplexer	O	Input/output L/R discriminating signal output	R	L
74	FS2	FS2	O	FS × 2 output		
75	FS4	FS4	O	FS × 4 output		
76	EF	Error Flag	O	Interpolation flag output	NG	OK
77	MPX2	MPX2	O	Input/output L/R discriminating signal output (I <sup>2</sup> S equivalent)	R	L
78	MPX3	MPX3	O	Input/output L/R discriminating signal output (front padded equivalent)		
79	SIN	Serial Input	I	Serial signal input		
80	TX	TX	O	Digital interface output		
81	FS128	FS128	O	fs clock × 128 (digital interface synchronous clock)		
82	TEST	—	I	—		
83	RX	RX	I	Digital interface input		
84	PDO	Phase Detector Output	O	Phase comparator output		
85	EXCK	External Clock	I	External master clock input		
86	MCK	Master Clock	O	Master clock output		
87	Vss	Vss	—	GND		
88	OSC2B	Oscillator 2B	O	11. 2896MHz/22. 5792MHz oscillator output		
89	OSC2A	Oscillator 2A	I			
90	OSC1B	Oscillator 1B	O	12. 288MHz/24. 576MHz oscillator output		
91	OSC1A	Oscillator 1A	I			
92	VDD	VDD	—	Power source		
93	STRG	Sync Trigger	I	Frame synchronous signal input		
94	FSYNC	Frame Sync	O	Frame synchronous signal output		
95	SFSYNC	SERVO Frame Sync	O	Servo frame synchronous signal		
96	LVCK	Level Meter Clock	I	Level meter data clock input		
97	LVDATA	Level Meter Data	O	Level meter data output		
98	UDBS	U Data Block Sync	O	RX input U-bit data synchronous output		
99	UDCK	U Data Clock	O	RX input U-bit data synchronous clock output		
100	UDATA	U Data	O	RX input U-bit data output		



■ HA12154MA (RF UNIT : IC301)

- RF Record/Playback AMP
- Block Diagram



● Pin Function

No.	Pin Name	I/O	Function
1	PBCNT	—	1st amp ON/OFF transistor base terminal
2	FSTINB	I	Bch 1st amp input terminal
3	PBSWB	—	Bch 1st amp ON/OFF transistor collector terminal
4	RGNDB	—	GND terminal
5	FSTOTB	O	Bch 1st amp output terminal
6	SNDINB	I	Bch 2nd amp input terminal
7	SNDPCB	—	Bch 2nd amp bypass capacitor connection terminal
8	RECOTB	O	Bch REC amp output terminal
9	AVcc	—	Analog system power terminal
10	RECINB	I	Ach REC amp input terminal

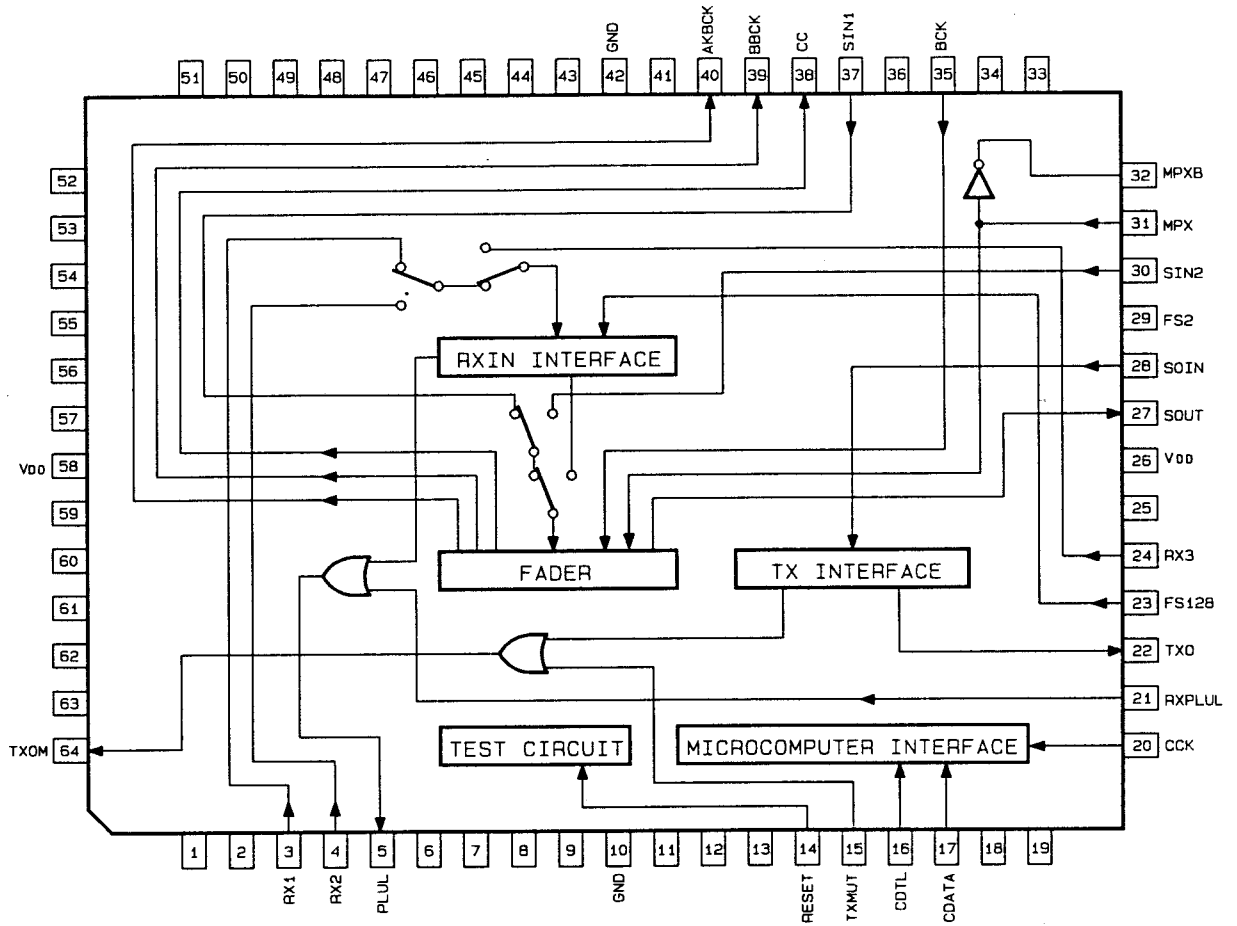
No.	Pin Name	I/O	Function
11	VCAOTB	O	Bch REC VCA output terminal
12	RECLVB	—	Resistor connection terminal for setting Bch PCM area record level
13	PLTLVB	—	Resistor connection terminal for setting Bch ATF PILOT area record level
14	ATFOUT	O	Preamp output terminal for ATF servo
15	RFOUT	O	Preamp output terminal
16	RFM6OT	O	1/2 divider output terminal for equalizer
17	EQLINP	I	EQL amp positive-side input terminal
18	EQLINN	I	EQL amp negative-side input terminal
19	EQSINP	I	EQS amp positive-side input terminal

No.	Pin Name	I/O	Function		
20	EQSINN	I	EQS amp negative-side input terminal		
21	EQWINP	I	EQW amp positive-side input terminal		
22	EQWINN	I	EQW amp negative-side input terminal		
23	EQWOUT	O	EQW amp output terminal		
24	EQSOUT	O	EQS amp output terminal		
25	EQLOUT	O	EQL amp output terminal		
26	BFLIN	I	Buffer amp input terminal		
27	BFSIN	I			
28	BFWIN	I			
29	BFWOUT	O			
30	BFSOUT	O	Buffer amp output terminal		
31	BFLOUT	O			
32	EQOUT	O	SWOUT output terminal		
33	AGND	—	Analog system GND terminal		
34	BIASPC	—	Bypass capacitor connection terminal for bias circuit		
35	EQGAIN	—	Resistor connection terminal for setting EQ amp gain		
36	DGND	—	Digital system GND terminal		
37	RDATA	I	Record data input terminal		
38	PLAREA	I	Record level select signal input terminal for ATF PILOT area "High": ATF PILOT area "Low": other		
39	RECPB	I	Record/playback select signal input terminal "High": Record "Low": Playback		
40	SWH	I	Head select signal input "High": Bch "Low": Ach		
41	MODE2	I	LP/SP/WSP mode select		
42	MODE1	I		MODE1	
				MODE2	
				LP	O
			SP	O	O
			WSP	I	O

No.	Pin Name	I/O	Function
43	DVcc	—	Digital system power terminal
44	PLTLVA	—	Resistor connection terminal for setting Ach ATF PILOT area record level
45	RECLVA	—	Resistor connection terminal for setting Ach PCM area record level
46	VCAOTA	O	Ach REC VCA output terminal
47	RECINA	I	Ach REC amp input terminal
48	PVCC	O	Base bypass output terminal
49	RECOTA	O	Ach REC amp output terminal
50	SNDPCA	—	Ach 2nd amp bypass capacitor connection terminal
51	SNDINA	I	Ach 2nd amp input terminal
52	FSTOTA	O	Ach 1st amp output terminal
53	RGND	—	GND terminal
54	PBSWA	—	Ach 1st amp ON/OFF transistor corrector terminal
55	FSTINA	I	Ach 1st amp input terminal
56	BIAS C2	—	Bypass capacitor connection terminal for bias circuit

■ HG62E43B93FS (MAIN UNIT : IC512)

- Digital Fader IC
- Block Diagram



● Pin Function

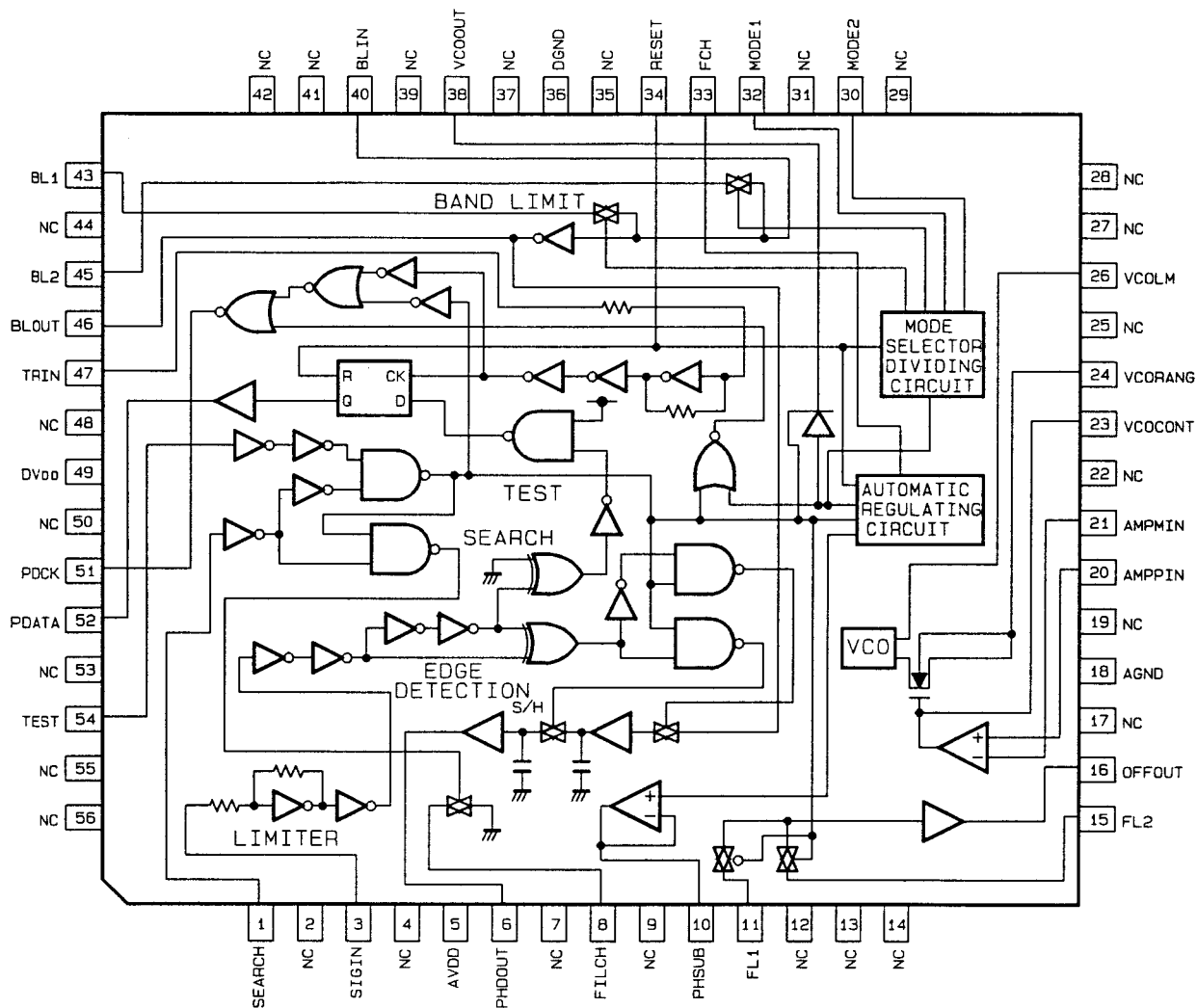
No.	Pin Name	I/O	Function	Polarity	
				H	L
1	—	—	NC		
2	—	—	NC		
3	RX1	I	Digital audio interface input, CH1		
4	RX2	I	Digital audio interface input, CH2		
5	PLUL	O	PLL unlock detector output	Unlock	Lock
6	—	—	NC		

No.	Pin Name	I/O	Function	Polarity	
				H	L
7   9	—	—	NC		
10	GND	—	Ground		
11   13	—	—	NC		
14	RESET	I	Reset input	Normal	Reset
15	TXMUTE	I	Mutes: TXOM terminal (Pin64)	Mute	Normal
16	CDTL	I	Latch signal input for microcomputer interface		
17	CDATA	I	DATA input for microcomputer interface	"1"	"0"
18	—	—	NC		
19	—	—	NC		
20	CCK	I	Transmission clock input for microcomputer interface		
21	RXPLUL	I	PLL unlock detector input	Unlock	Lock
22	TXO	O	Digital audio output		
23	FS128	I	Digital audio interface transmission clock input		
24	RX3	I	Digital audio interface input, CH3		
25	—	—	NC		
26	VDD	—	Power supply		
27	SOUT	O	Serial output		
28	SOIN	I	Serial output return input		
29	FS2	I	FS double frequency clock		
30	SIN2	I	Serial input, CH3		
31	MPX	I	Multiplex input	RCH	LCH
32	MPXB	O	MPX inversion signal output	LCH	RCH
33	—	—	NC		
34	—	—	NC		
35	BCK	I	Serial transmission clock input		
36	—	—	NC		
37	SIN1	I	Serial input, CH1		

No.	Pin Name	I/O	Function	Polarity	
				H	L
38	CC	O	Control output for PCM1750		
39	BBCK	O	Clock output for PCM1750		
40	AKBCK	O	Serial input clock for AK5328/9		
41	—	—	NC		
42	GND	—	Ground		
43   57	—	—	NC		
58	VDD		Power supply		
59   63	—		NC		
64	TXOM	O	Digital audio interface, monitor output		

HD49229 (MAIN UNIT : IC504)

- Data Strobe IC
- Block Diagram



● Pin Function

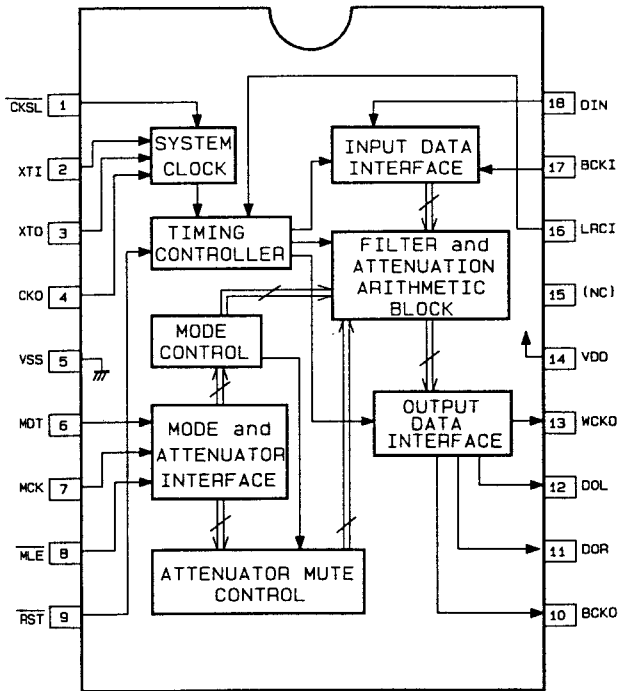
No.	Symbol	Pin Name	I/O	Function	Polarity	
					H	L
1	SEARCH	Search Input	I	Search control input (TEST terminal parallel use)	Normal test	Search -
2	NC	-	-	No connection		
3	SIGIN	Signal Input	I	Playback signal input		
4	NC	-	-	No connection		
5	AVDD	Analog VDD	-	Analog power supply		
6	PHDOUT	Phase Detector Output	O	Phase comparison output		

No.	Symbol	Pin Name	I/O	Function	Polarity	
					H	L
7	NC	—	—	No connection		
8	FILCH	Filter Change	I	Loop filter changeover switch		
9	NC	—	—	No connection		
10	PHSUB	Subloop Phase Detector	O	Subloop phase comparison output		
11	FL1	Subloop Filter Input 1	I	Loop filter changeover switch for subloop		
12   14	NC	—	—	No connection		
15	FL2	Subloop Filter Input 2	I	Loop filter changeover switch for subloop		
16	OFFOUT	Offset Output	O	Subloop filter changeover output		
17	NC	—	—	No connection		
18	AGND	Analog GND	—	Analog GND		
19	NC	—	—	No connection		
20	AMPPIN	Amp Plus Input	I	Amp non-inverting input		
21	AMPMIN	Amp Minus Input	I	Amp inverting input		
22	NC	—	—	No connection		
23	VCOCONT	VCO Control	O	Amp output terminal VCO control terminal		
24	VCORANG	VCO Range	O	VCO range		
25	NC	—	—	No connection		
26	VCOLM	VCO Limiter	I	VCO oscillating frequency lower-limit limiter		
27   29	NC	—	—	No connection		
30	MODE2	PB Mode	I	Playback mode control input	Half speed	Standard
					—	double speed
31	NC	—	—	No connection		
32	MODE1	PB Mode	I	Playback mode control input	Double speed	Standard
					—	half speed
33	FCH	Channel Freq	I	Reference signal input		
34	RESET	RESET Input	I	Test-use control input (RESET input)	Normal	RESET
35	NC	—	—	No connection		

No.	Symbol	Pin Name	I/O	Function	Polarity	
					H	L
36	DGND	Digital GND	–	Digital GND		
37	NC	–	–	No connection		
38	VCOOUT	VCO Output	O	VCO output		
39	NC	–	–	No connection		
40	BLIN	Band Limit Input	I	Band limit circuit input		
41, 42	NC	–	–	No connection		
43	BL1	Band Limit Control 1	I	Band changeover switch for band control circuit		
44	NC	–	–	No connection		
45	BL2	Band Limit Control 2	I	Band changeover switch for band control circuit		
46	BLOUT	Band Limit Output	O	Band limit circuit output		
47	TRIN	Triangle wave Input	I	Triangle wave input for $\pi/2$ phase-shifting CK		
48	NC	–	–	No connection		
49	DVDD	Digital VDD	–	Digital power supply		
50	NC	–	–	No connection		
51	PDCK	PDCK	O	Playback clock output		
52	PDATA	PBDATA	O	Playback data output		
53	NC	–	–	No connection		
54	TEST	TEST Input	I	Test control input (SEARCH terminal parallel use)	Test –	Search normal
55, 56	NC	–	–	No connection		



**SM5840LP (MAIN UNIT : IC511)**  
 ● Digital Filter for Double-Speed Playback  
 ● Block Diagram



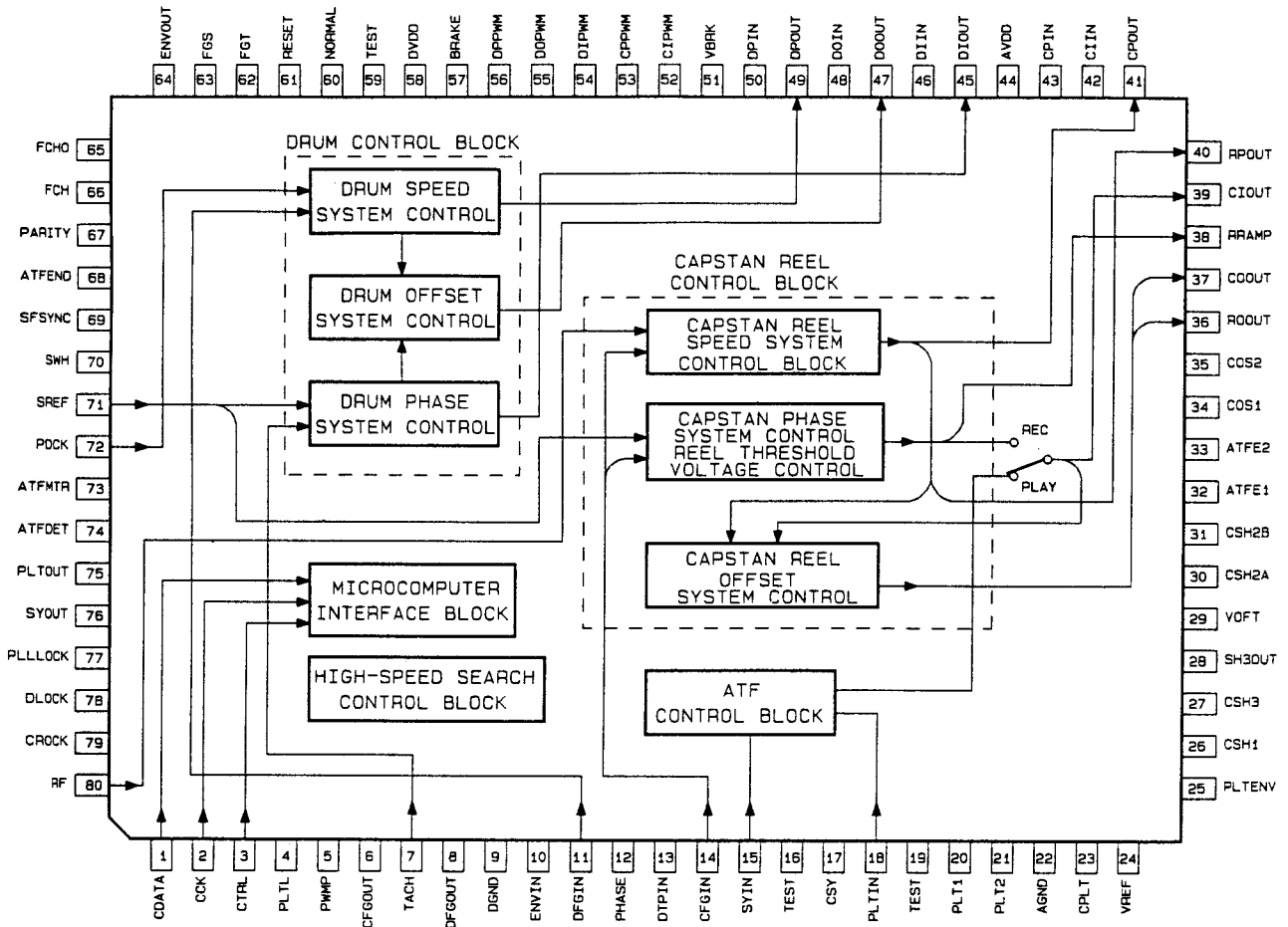
● Pin Function

No.	Pin Name	I/O	Function
1	CKSL	I	Normal/double-speed mode selection (When CKSL = H: normal mode) (When CKSL = L: double-speed mode)
2	XTI	I	Oscillator input terminal: system clock (When CKSL = H, 512fs = 24.576MHz @ fs = 48kHz) (When CKSL = L, 256fs = 24.576MHz @ fs = 96kHz)
3	XTO	O	Oscillator output terminal
4	CKO	O	Oscillator output clock (Frequency same as XTI terminal)
5	Vss	-	GND terminal

No.	Pin Name	I/O	Function
6	MDT	I	Mode set data
7	MCK	I	Mode set clock
8	MLE	I	Mode set latch enable
Sets digital attenuator and mode flag register			
9	RST	I	System set (Initialization)
10	BCKO	O	Output bit clock
11	DOR	O	Rch data output (When OMOD flag = L: 8fs data output) (When OMOD flag = H: 4fs data output)
12	DOL	O	Lch data output (When OMOD flag = L: 8fs data output) (When OMOD flag = L: 4fs data output)
13	WCKO	O	Output word clock
14	VDD	-	Power supply (5V)
15	(NC)	-	
16	LRCI	I	Input data sample rate (fs) clock (Example: 48kHz at normal speed; 96kHz at double speed)
17	BCKI	I	Input bit clock
18	DIN	I	Input data

**HD49228FS (MAIN UNIT : IC601)**

- One Chip Digital Servo-LSI for R-DAT
- Block Diagram



● Pin Function

No.	Symbol	Pin Name	I/O	Function	Polarity	
					H	L
1	CDATA	$\mu$ -COM Data Input	I	Microcomputer command input		
2	CCK	$\mu$ -COM Data Clock	I	Microcomputer command synchronous clock input		
3	CTRL	Control	I	Microcomputer command control signal		
4	PLTL	Pilot Level	O	PILOT-level condition output		
5	PWMP	PWM Polarity	I	PWM polarity selection	Positive phase	Negative phase
6	CFGOUT	Capstan FG Output	O	CFG binarized output		
7	TACH	TACH	O	TACH output		
8	DFGOUT	Drum FG Output	O	DFG binarized output		

No.	Symbol	Pin Name	I/O	Function	Polarity	
					H	L
9	DGND	Digital GND	—	Digital circuit ground		
10	ENVIN	Envelope Input	I	RF signal envelope input		
11	DFGIN	Drum FG Input	I	DFG amp input		
12	PHASE	Phase Adjust	I	C/R connection terminal for TACH generation monomulti		
13	DTPIN	Drum TACH Pulse Input	I	DTP amp input		
14	CFGIN	Capstan FG Input	I	CFG amp input		
15	SYIN	Sync Input	I	SYNC input during playback		
16	TEST	Test	I	Test input		
17	CSY	C Sync Comparator	I	SYNC comparator threshold voltage hold-capacitor connection terminal		
18	PLTIN	Pilot Input	I	PILOT amp 1 input		
19	TEST	Test	I	Test input		
20	PLT1	Pilot Amp 2 Output	O	PILOT amp 2 output		
21	PLT2	Pilot Amp 3 Output	I	PILOT amp 3 input		
22	AGND	Analog GND	—	Analog circuit GND		
23	CPLT	C Pilot Detector	I	Hold-capacitor connection terminal for PILOT detector circuit threshold voltage		
24	VREF	Reference Voltage	O	Outputs VDD/2		
25	PLTENV	Pilot Envelope	O	PILOT detector circuit output		
26	CSH1	C Sample Hold 1	I/O	Sample/hold 1 capacitor connection terminal		
27	CSH3	C Sample Hold 3	I/O	Sample/hold 3 capacitor connection terminal		
28	SH3OUT	Sample Hold 3 Output	O	Outputs intermediate voltage for sample/hold 3 and VREF		
29	VOFT	ATF Offset Voltage	I	Inputs error summing voltage		
30	CSH2A	C Sample Hold 2A	I/O	Sample/hold 2A capacitor connection terminal		
31	CSH2B	C Sample Hold 2B	I/O	Sample/hold 2B capacitor connection terminal		
32	ATFE1	ATF Error Amp 1 Input	I	ATF error 1 amp inversion terminal		
33	ATFE2	ATF Error Amp 1 Output	O	ATF error 1 amp output		
34	COS1	C Capstan Offset Servo 1	I/O	Capstan/reel offset system control integrator inversion input		
35	COS2	C Capstan Offset Servo 2	O	Capstan/reel offset system control integrator output		

No.	Symbol	Pin Name	I/O	Function	Polarity	
					H	L
36	ROOUT	Reel Offset Servo Output	O	Reel offset system control voltage buffer output		
37	COOUT	Capstan Offset Servo Output	O	Capstan offset system control voltage buffer output		
38	RRAMP	Reel Ramp Voltage	O	Reel threshold voltage output		
39	CIOUT	Capstan I Control Output	O	Capstan phase system control voltage buffer output		
40	RPOUT	Reel P Control Output	O	Reel speed system control voltage buffer output		
41	CPOUT	Capstan P Control Output	O	Capstan speed system control voltage buffer output		
42	CIIN	Capstan I Control Input	I	Capcitor connection terminal for LPF use in capstan phase system PWM		
43	CPIN	Capstan P Control Input	I	Capcitor connection terminal for LPF use in capstan speed system PWM		
44	AVDD	Analog VDD	—	Analog circuit power supply		
45	DIOUT	Drum I Control Output	O	Buffer output of drum phase system control voltage		
46	DIIN	Drum I Control Input	I	Capcitor connection terminal for LPF use in drum phase system PWM		
47	DOOUT	Drum Offset Servo Output	O	Buffer output of drum offset system control voltage		
48	DOIN	Drum Offset Servo Input	I	Capcitor connection terminal for LPF use in drum offset system PWM		
49	DPOUT	Drum P Control Output	O	Buffer output of drum speed system control voltage		
50	DPIN	Drum P Control Input	I	Capcitor connection for LPF use in drum speed system PWM		
51	VBRK	Drum BRAKE Voltage	I	Drum brake voltage input		
52	CIPWM	Capstan I Control PWM Output	O	Capstan phase system PWM output		
53	CPPWM	Capstan P Control PWM Output	O	Capstan speed system PWM output		
54	DIPWM	Drum I Control PWM Output	O	Drum phase system PWM output		
55	DOPWM	Drum Offset Servo PWM Output	O	Drum offset system PWM output		
56	DPPWM	Drum P Control PWM Output	O	Drum speed system PWM output		
57	BREKE	Brake Control	O	Drum brake control output	Brake	Norm
58	DVDD	Digital VDD	—	Digital circuit power supply		

No.	Symbol	Pin Name	I/O	Function	Polarity	
					H	L
59	TEST	Test	I	Test input	Norm	Test
60	NORMAL	Normal	I	Normal input	Norm	Test
61	RESET	Reset	I	Reset input	Norm	RST
62	FGT	Takeup FG	I	Reel FG input (takeup side)		
63	FGS	Supply FG	I	Reel FG input (supply side)		
64	ENVOUT	Envelope Output	O	RF signal envelope binarized output		
65	FCHO	ATF Channel Frequency	O	Small-diameter drum ATF channel clock output		
66	FCH	Channel Frequency	I	Channel clock input		
67	PARITY	Parity	I	Parity signal input		
68	ATFEND	ATF End	O	ATF END output		
69	SFSYNC	Servo Frame Sync	I	Servo frame synchronous signal during LP2 (double-scan) mode		
70	SWH	Switch Head	O	Head changeover signal output		
71	SREF	Servo Reference	I	Servo reference input		
72	PDCK	Playback Data Clock	I	Playback signal synchronous clock input		
73	ATFMTR	ATF Monitor	O	HOLD monitor during high-speed search, ATF monitor during PLAY		
74	ATFDET	ATF DETECTION	O	HOLD monitor during high-speed search, ATFDET monitor during PLAY		
75	PLTOUT	Pilot Output	O	DION monitor during high-speed search, PILOT monitor during PLAY		
76	SYOUT	SYNC Output	O	PDCK2 divider CK monitor during high-speed search, SYNC monitor during PLAY		
77	PLLLOCK	PLL Lock	O	PLL LOCK monitor during high-speed search, DPLOCK output during PLAY		
78	DLOCK	Drum Lock	O	Drum lock output		
79	CRLOCK	Capstan Reel Lock	O	Capstan reel lock output		
80	RF	RF	O	RF signal exist/nonexist output		

## ■ PDG093A (MAIN UNIT : IC503)

- Microcomputer
- Function of Terminals

No.	Pin Name	I/O	Function
1	CFG	I	Capstan FG input terminal. Used as interruption terminal (INT1)
2	HSWP	I	Head-switching pulse input terminal. Used as interruption terminal (INT2).
3	FGT	I	Takeup-side reel FG input terminal. Used as interruption terminal (INT3).
4	REMOSIG	I	Remote control signal input terminal. Used as RMC terminal; automatically sets remote control signal pulse frequency (from pulse rise to pulse fall) using remote control receiving circuit.
5	FSYNC	I	Frame synchronous signal input 50%-duty pulse signal connected to FSYNC terminal (pin 94) on signal receiving LSI (HD49226FS); has frequencies of 30 (ms) in SP mode, 60 (ms) in LP mode, and 15 (ms) in WSP mode.
6	VOFT	O	ATF error summing voltage output terminal. Used as PWM output terminal; connects externally installed low-pass filter output to VOFT terminal (pin 29) on servo LSI (HD49228FS); added to ATF error voltage during 1.5Tp test mode; voltage variable range: 0.5 (V) to 4.5 (V).
7	SEL	O	Input extension-IC-input select output terminal. Connected to SEL (pin 1) on input extension IC (74HC157); selects either of 2 groups of 4-bit input; 1A to 4A input terminals are selected with "L".
8	FGS	I	Supply-side reel FG input terminal. Used as interruption terminal (CINT).
9	CTRL	O	Microcomputer data transmission mode input control signal/microcomputer command control signal output terminal. Connected to CTRL terminal (pin 2) on signal-processing LSI (HD49226FS) and CTRL terminal (pin 3) on servo LSI (HD49228FSA).
10	CCK	O	Serial data transmission clock output terminal. Used as SCK0 terminal; connected to shift clock input terminals of devices (signal-processing LSI, servo LSI, fader LSI, and D/A-side digital filter) controlled by serial transmission from microcomputer; serial clock frequency is 1.95 ( $\mu$ s) and interval clock frequency is 30.5 ( $\mu$ s).
11	CDATAO	I	Serial data input terminal. (Conforms to terminal names on the signal-processing LSI side; data input/output direction is opposite to terminal names); used as S10 terminal and is connected to CDATAO terminal (pin 5) on signal-processing LSI (HD49226FS).
12	CDATAI	O	Serial data output terminal. Used as SCK0 terminal; (conforms to terminal names on the signal-processing LSI side; data input/output direction is opposite to terminal names); connected to serial data input terminals of devices (signal-processing LSI, servo LSI, fader LSI, and D/A-side digital filter) controlled by serial transmission from microcomputer.
13	XMLE	O	Mode set latch enable output terminal. Connected to MLE terminal (pin 8) on D/A-side digital filter (SM5840LP) used for WSP mode; transmission data from microcomputer are latched at leading edge ( $\uparrow$ ).
14	CDTL	O	Latch signal output terminal for microcomputer interface use. Connected to CDTL terminal (pin 16) on fader LSI (HG62E43B85-FS); transmission data from microcomputer are latched at leading edge ( $\uparrow$ ).
15	RFMODE	O	RF amp operating mode switching output terminal. Connected to MODE1 terminal (pin 42) on RF amp IC (HA12154MA); switches to "H" in WSP mode; controls RF amp 2nd amp and equalizer.

No.	Pin Name	I/O	Function
16	KS0	I	Key scan data input terminal 0. Used as KR0 terminal; automatically inputs key scan data from terminals KS0, KS1, and KS2 into microcomputer's internal RAM using hardware key scan functions.
17	KS1	I	Key scan data input terminal 1 used as KR1 terminal.
18	KS2	I	Key scan data input terminal 2 used as KR2 terminal.
19	TEST	O	Data strobe LSI test mode control output terminal. Connected to TEST terminal (pin 54) on data strobe LSI (HD9229); switches to "H" during VCO free-run adjustment mode (in test mode); at this time XSER terminal must turn to "H".
20	LPMODE	O	LP mode select output terminal. Connected to LP terminal (pin 60) on signal-processing LSI (HD49226FS); selects signal-processing LSI operating mode in LP playback mode; switches to "H" in WLP mode (which performs half-speed LP playback); switches to "L" in LP/SP/WSP modes (LP mode performs W-scan LP playback; SP and WSP modes do not affect operating conditions of these terminals).
21	RP	O	RF amp record/playback mode switching output terminal. Connects output and AND output of RECPB terminal (pin 24) on signal-processing LSI (HD49226FS) to RECPB terminal (pin 39) on FR amp IC (HA12154MA); switches RF amp IC record and playback modes; serves to protect output from the microcomputer.
22	WSMODE	O	Audio block double-speed switching output. Switches A/D and D/A blocks according to operating mode; switches to "H" in WSP and WLP modes.
23	XSRVRST	O	Servo LSI reset output. Connected to RESET terminal (pin 61) on servo LSI (HD49228FS); resets LSI during power ON/OFF operation and when shifting from search mode to other modes.
24	Y1	I	Input terminal 1 of input extension IC output. SEL=H: PLLLOCK (DPLOCK monitor during PLAY; PLL LOCK monitor during high-speed search) SEL=L: BRAKE (drum brake control monitor)
25	Y2	I	Input terminal 2 of input extension IC output. SEL=H: DLOCK (drum lock monitor) SEL=L: ATFM (ATF monitor during PLAY; HUNT monitor during high-speed search)
26	Y3	I	Input terminal 3 of input extension IC output. SEL=H: CRLOCK (capstan/reel lock monitor) SEL=L: ATFD (ATFDET monitor during PLAY; HOLD monitor during high-speed search)
27	Y4	I	Input terminal 4 of input extension IC output. SEL=H: RF (RF signal exist/nonexist monitor) SEL=L: PLTL (PILOT level condition monitor)
28	LV DATA	I	Level meter input terminal. Connected to LVDATA terminal (pin 97) on signal-processing LSI (HD49226FS)
29	LVCK	O	Level meter data clock output terminal. Connected to LVCK terminal (pin 96) on signal-processing LSI (HD49226FS); generates 8 pulses in shift clock L (ch)-R (ch) sequence for each half frame (for every frame in the case of WSP mode) of level data retrieval.
30	DARST	O	Audio block reset output terminal. Switches to "H" during Fs and REC/PB changeover with power ON; resets audio block (digital filter and D/A converter).

No.	Pin Name	I/O	Function
31	QDCK	O	CD Q-data shift clock output terminal. Connected to QDCK terminal (pin 67) on signal-processing LSI (HD49226FS); generates 8 pulses in shift clock TNO-INDEX sequence for each frame of CD Q-data retrieval.
32	Q DATA	I	CD Q-data input terminal. Connected to DATA terminal (pin 68) on signal-processing LSI (HD49226FS).
33	TIMER SW	I	Timer SW position input terminal. Used as AN1 (analog input); switches to timer playback On at 0 to 1.25 (V), timer OFF at 1.25 to 3.75 (V), and timer record ON at 3.75 to 5 (V). [All voltages are standard values during VDD5 (V).]
34	INPUT SW	I	Record input changeover SW position input terminal. Used as AN2 (analog input); switches to OPT (optical) input at 0 to 1.25 (V), COAX (coaxial) input at 1.25 to 3.75 (V), and analog input at 3.75 to 5 (V). [All voltages are standard values during VDD5 (V).]
35	RECMODE SW	I	Record mode changeover SW position input terminal. Used as AN3 (analog input); switches to SP mode at 0 to 1 (V), WLP mode at 1 to 2 (V), WSP mode at 2 to 4 (V), and LP mode at 4 to 5 (V). [All voltages are standard values during VDD5 (V).] In the actual product, however, there is no SW position in WLP mode, so this position cannot be selected.
36	THIN SW	I	SW input terminal for thin (9 $\mu$ m) tape detector use. Connected to tape thickness recognition hole detector SW on D-4 mechanism; switches to "H" when tape is thin (HOLE OPEN).
37	P OFF	I	Power OFF signal input terminal. Falls from "H" to "L" ( $\overline{L}$ ) when power is OFF; monitors fall time with timer interruption processing for each 1.95(ms); initiates power-OFF processing routine.
38	XRST	I/O	System reset terminal. Connected to output terminal (pin 5) on "L"-level active reset IC (M51957AL).
39	EXTAL	I	Ceramic resonator connection terminal (input) for system clock oscillator. Connects terminal and pin 40 with 8.38 (MHz) ceramic lock.
40	XTAL	O	Ceramic resonator connection terminal (output) for system clock oscillator.
41	Vss	-	GND terminal. Connects to GND.
42	NC	O	No connection terminal. Treated as open circuit. ("H"-level terminal).
43	NC	I	No connection terminal. Treated as open circuit. ("L"-level terminal).
44	T END	I	Input terminal of tape end sensor output. Used as AN6 (analog input).
45	T TOP	I	Input terminal of tape top sensor output. Used as AN7 (analog input).
46	AVREF	-	A/D converter standard voltage input terminal. Connected to 5 (V) line.
47	AVss	-	A/D converter GND terminal. Connected to GND.
48	XSER	O	Data strobe LSI search mode control output terminal. Connected to SEARCH terminal (pin 1) in data strobe LSI (HD49229); changes to "L" in search run mode in FF, REW, etc. ; at this time the TEST terminal must be "L".
49	SOL ON	O	Brake solenoid control output terminal. Performs ON/OFF control of brake solenoid in D-4 mechanism; during "H," brake is ON.
50	MDM ON	O	Mode motor control output terminal. Performs ON/OFF control of mode motor in D-4 mechanism; during "H," mode motor is ON.

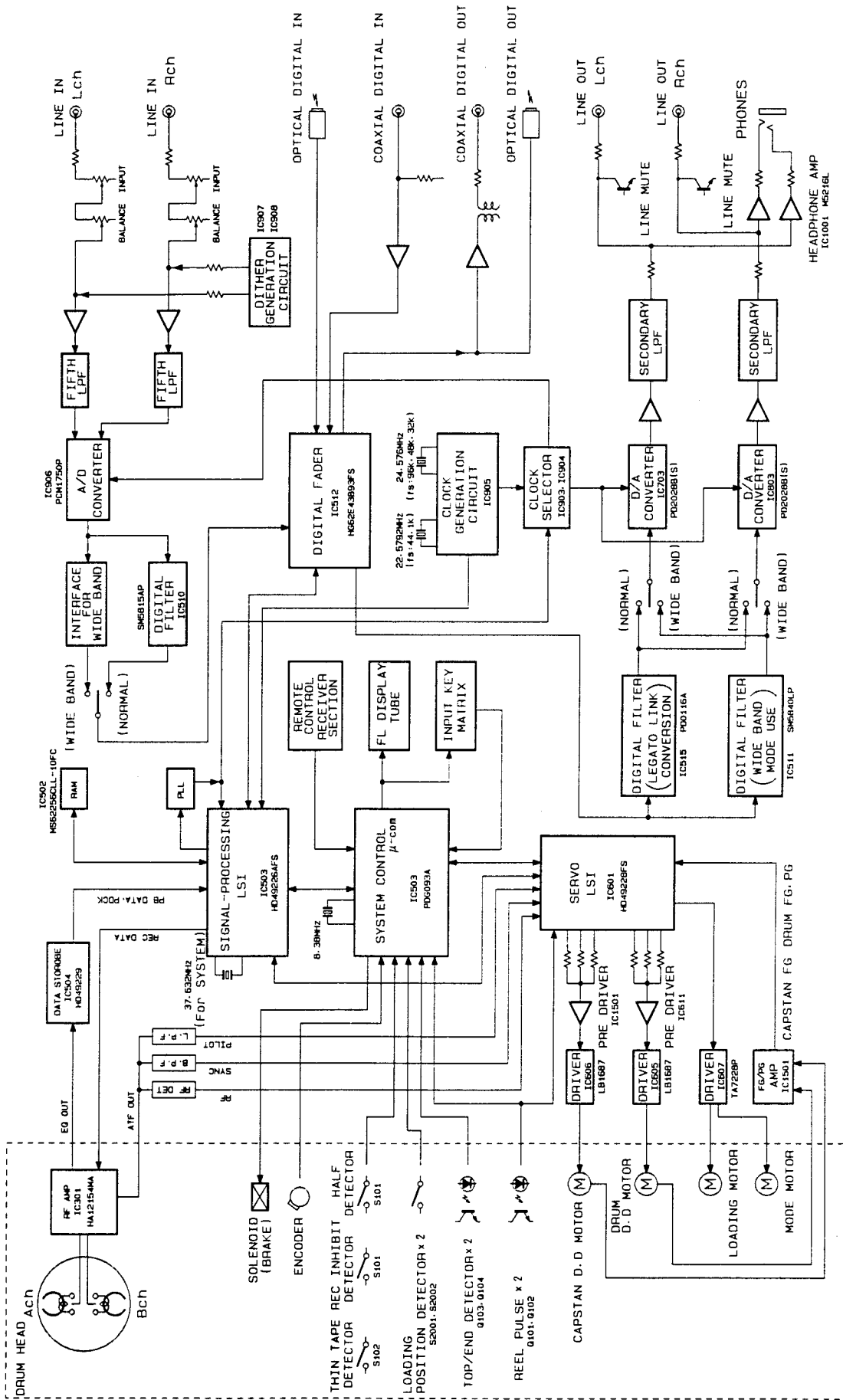


No.	Pin Name	I/O	Function
51	T LED	O	Tape top/end sensor LED control output terminal. Performs ON/OFF control of tape top/end sensor LED in D-4 mechanism; flashes at 3.9 (ms) frequency.
52	MLM CW	O	Rotating direction control output terminal for mode motor and cassette console loading motor. Controls rotating direction of mode motor and cassette console loading motor in D-4 mechanism; during "H", rotates in clockwise direction.
53	LDM ON	O	Cassette console loading motor control output terminal. Controls ON/OFF operation of loading motor; during "H", loading motor is ON.
54	EMP	O	De-emphasis filter control output terminal. Controls ON/OFF operation of de-emphasis filter in D/A block; during "H", de-emphasis is ON; changes to "H" when ID1 in PCM-ID is "01".
55	X256	O	256/384Fs clock select control output terminal. Changes to "H" when Fs=32(kHz) during record/playback (when ID2 in PCM-ID is "10"). (Also changes to "H" when Fs=64(kHz) in WSP/WLP modes.)
56	44PB	O	Master clock select control output terminal. Selects and oscillates master clock when Fs=44.1 (kHz) during record/playback; during "H", clock is oscillated. (Also changes to "H" when Fs=88.2 (kHz) in WSP mode.)
57	XMLMUTE	O	Line mute control output terminal. Controls ON/OFF operation of line mute (analog mute); during "L", mute is ON.
58	LPRUN	O	LP run mode monitor output. Changes to "H" in LP run mode (tape speed=4.075mm). (Changes to "L" in SP/WSP/WLP run modes.)
59	PBMUTE	O	Playback mute control output terminal. Connected to MUTE terminal (pin 1) in signal-processing LSI (HD49226FS); controls ON/OFF operation of playback output signal mute (digital mute); during "H", mute is ON.
60	4832PB	O	Master clock select control output terminal. Selects and oscillates master clock when Fs=48/32 (kHz) during record/playback; during "H", clock is oscillated. (Also changes to "H" when Fs=96/64 (kHz) in WSP/WLP modes.)
61	S0	O	Segment signal output terminal 0 for FL tube.
62	S1	O	Segment signal output terminal 1 for FL tube.
63	S2	O	Segment signal output terminal 2 for FL tube.
64	S3	O	Segment signal output terminal 3 for FL tube.
65	S4	O	Segment signal output terminal 4 for FL tube.
66	S5	O	Segment signal output terminal 5 for FL tube.
67	S6	O	Segment signal output terminal 6 for FL tube.
68	S7	O	Segment signal output terminal 7 for FL tube.
69	S8	O	Segment signal output terminal 8 for FL tube.
70	S9	O	Segment signal output terminal 9 for FL tube.
71	S10	O	Segment signal output terminal 10 for FL tube.

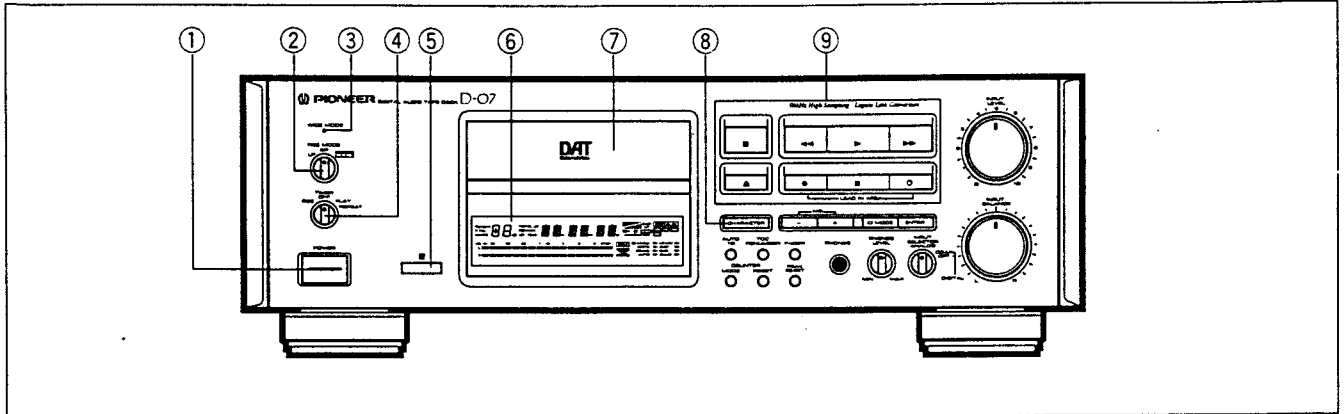
No.	Pin Name	I/O	Function
72	S11	O	Segment signal output terminal 11 for FL tube.
73	S12	O	Segment signal output terminal 12 for FL tube.
74	S13	O	Segment signal output terminal 13 for FL tube.
75	S14	O	Segment signal output terminal 14 for FL tube.
76	T11	O	Segment signal timing terminal 11 for FL tube.
77	T10	O	Segment signal timing terminal 10 for FL tube.
78	T9	O	Segment signal timing terminal 9 for FL tube.
79	T8	O	Segment signal timing terminal 8 for FL tube.
80	T7	O	Segment signal timing terminal 7 for FL tube.
81	T6	O	Segment signal timing terminal 6 for FL tube.
82	T5	O	Segment signal timing terminal 5 for FL tube.
83	T4	O	Segment signal timing terminal 4 for FL tube.
84	T3	O	Segment signal timing terminal 3 for FL tube.
85	T2	O	Segment signal timing terminal 2 for FL tube.
86	T1	O	Segment signal timing terminal 1 for FL tube.
87	T0	O	Segment signal timing terminal 0 for FL tube.
88	VFDP	—	Negative voltage supply terminal for FL tube.
89	VDD	—	Positive power supply terminal. Connected to 5 (V) line.
90	NC	—	NC terminal. Connected to 5 (V) line.
91	VSS	—	GND terminal. Connected to GND terminal.
92	D IN	O	Digital input record mode monitor output. Changes to "H" in digital input record mode; used for mute process during RX-PLL analog.
93	CM CW	O	Capstan motor rotating direction control output terminal. Controls rotating direction of capstan motor in D-4 mechanism; during "H", rotates in clockwise (FWD) direction.
94	XDM ON	O	Drum motor control output terminal. Controls ON/OFF operation of drum motor in D-4 mechanism; during "L", motor is ON.
95	XCM ON	O	Capstan motor control output terminal. Controls ON/OFF operation of capstan motor in D-4 mechanism; during "L", motor is ON.
96	Y1	I	Input terminal 1 of input extension IC output. SEL = H: XHALFIN (SW input for cassette half detector use; during "L", cassette half is detected.) SEL = L: ENC0 (mechanism encoder output BIT0)
97	Y2	I	Input terminal 2 of input extension IC output. SEL = H: RECINH (SW input for record inhibit recognition hole detector use; during "H", recording is inhibited.) SEL = L: ENC1 (mechanism encoder output BIT1)

No.	Pin Name	I/O	Function
98	Y3	I	Input terminal 3 of input extension IC output. SEL=H: LDSTART (SW input for cassette console loading start detector use; during "H", loading is started.) SEL=L: ENC2 (mechanism encoder output BIT2)
99	Y4	I	Input terminal 1 of input extension IC output. SEL=H: XLDEND (SW input for cassette console loading end detector use; during "L", loading is completed.) SEL=L: ENC3 (mechanism encoder output BIT3)
100	DFG	I	Drum FG input terminal. Used as interruption terminal (INT0).

8. BLOCK DIAGRAM

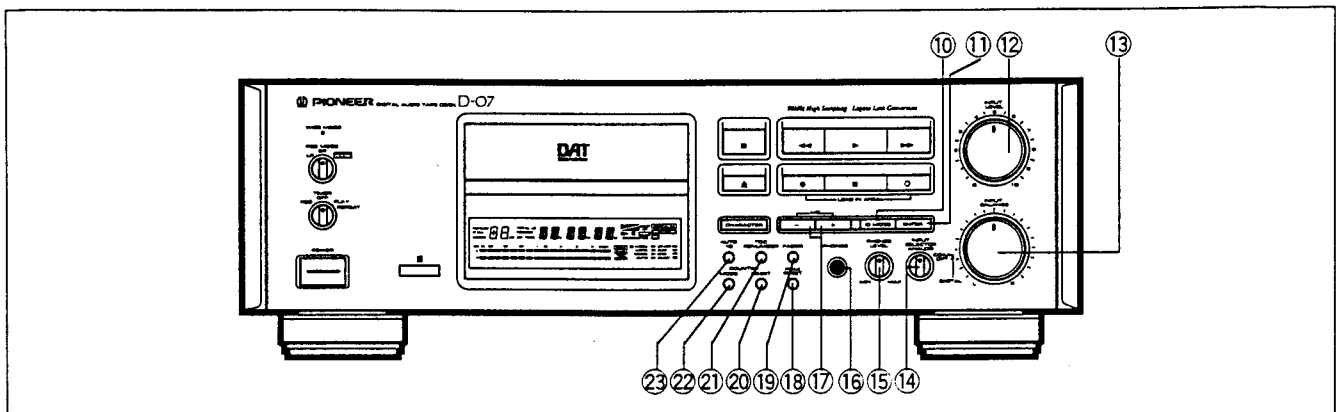


## 9. PANEL FACILITIES

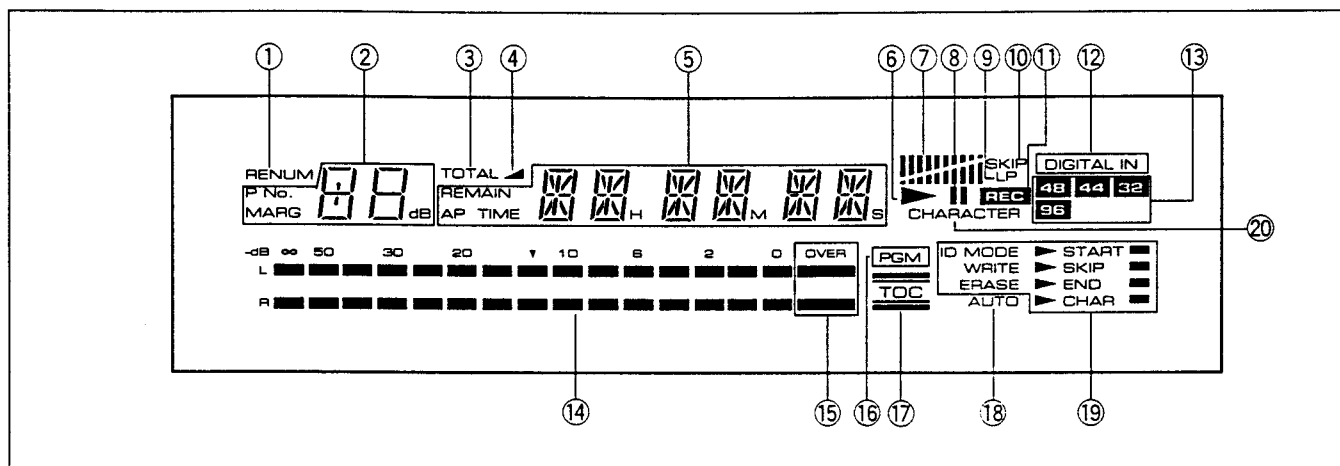


### Front panel

- ① **POWER switch**  
Operation of the unit becomes possible approximately 4 seconds after the power is turned on.
- ② **REC MODE switch**  
LP: Long Play mode. Set to this position for long-hour recording of analog signal and digital signal with a sampling frequency of 32 kHz.  
SP: Standard Play mode. Usually set this switch to this position.  
WIDE: Wide range mode. With this position, only analog signals can be recorded. A wide range recording beyond 40 kHz is possible, but the recording time is halved from the SP mode.
- ③ **WIDE MODE indicator**  
Lights when the WIDE mode is selected.
- ④ **TIMER switch (REC/OFF/PLAY/REPEAT)**  
Be sure to set this switch to OFF when not using the timer function.
- ⑤ **Remote sensor window**
- ⑥ **Display window**
- ⑦ **Cassette tray**
- ⑧ **CHARACTER button**  
Press to record or display character data.
- ⑨ **▲ : Open/close button**  
**■ : Stop button**  
Press to stop tape transport or to clear the program memory.  
**◀ : Rewind button**  
Pressing this button during playback starts review operation.  
**▶ : Fast Forward button**  
Pressing this button during playback starts cue operation.  
**▶ : Play button**  
**● : Rec button**  
**|| : Pause button**  
Tape transport cannot be paused during fast forward or rewind operation.  
**○ : Mute button**



- ⑩ **ID MODE button**  
Press to select an ID mode.
- ⑪ **ENTER button**  
Press to record or erase subcodes.
- ⑫ **INPUT LEVEL control**  
Turn the knob to set the recording level when analog signals are input.
- ⑬ **INPUT BALANCE control**
- ⑭ **INPUT SELECTOR switch**  
Set to select the recording input source.
- ⑮ **PHONES LEVEL knob**
- ⑯ **PHONES jack**
- ⑰ **MS +/- buttons**  
Press in Music Search or skip search operation.
- ⑱ **PEAK RESET button**
- ⑲ **FADER button**  
Press to fade in or fade out the recording or playback.
- ⑳ **COUNTER RESET button**
- ㉑ **TOC RENUMBER button**
- ㉒ **COUNTER MODE button**
- ㉓ **AUTO ID button**  
During recording:  
Press for automatic recording of start-IDs. (This function is turned off automatically in case of timer recording.)  
During playback:  
Press to skip unwanted tunes. (Skipping occurs from a skip-ID until the next start-ID.)



**Display**

- ① **RENUM (renumber) indicator**
- ② **Tune number/peak margin display**
- ③ **TOTAL indicator**
- ④ **Left More character indicator (▲)**  
In the character entry mode, indicates the presence of one or more characters hidden to the left of the display.
- ⑤ **Counter indicators**  
In the long play (LP) mode and the wide range (WIDE) mode, absolute time (A-TIME), remaining play time (REMAIN) and total play time (TOTAL) are displayed, based on those in the standard mode. To obtain the actual time, double each value in the long play mode, and half each value in the wide range mode.
- ⑥ **Play (▶) indicator**
- ⑦ **Fader indicators**  
■■■■■■■■... Indicates that fade-out is taking place.  
.....■■■■■■■■... Indicates that fade-in is taking place.
- ⑧ **Pause (||) indicator**
- ⑨ **LP indicator**
- ⑩ **SKIP indicator**
- ⑪ **REC indicator**
- ⑫ **DIGITAL IN indicator**
- ⑬ **Sampling frequency indicator**
- ⑭ **Digital-drive level meter**
- ⑮ **OVER level indicator**
- ⑯ **PGM indicator**
- ⑰ **TOC indicator**
- ⑱ **AUTO ID indicator**
- ⑲ **ID MODE indicators**
- ⑳ **CHARACTER indicator**

## 10. SPECIFICATIONS

Type .....	Rotating head digital audio tape recorder
Tape speed .....	WIDE: 16.3 mm/sec SP: 8.15 mm/sec LP: 4.075 mm/sec
Recording time .....	WIDE: 60 minutes max. SP: 120 minutes max. LP: 240 minutes max.
Number of channels .....	2 channels, stereo
Number of quantization bits .....	16 bits, linear 12 bits, nonlinear
Sampling frequencies .....	48kHz (recording, playback)
(Provided SCMS)	44.1kHz (digital recording only, playback) 96 kHz (WIDE: analog input recording only, playback) 32kHz (SP: digital recording only, playback) 32kHz (LP: recording, playback)
Error correction method .....	Double encoded, Reed-Solomon code
Modulation system .....	8-10 conversion
Emphasis .....	Recording: Fixed at OFF Playback: Switched automatically
Head .....	AT-construction Sendust head
Recording/playback frequency response .....	WIDE: 2 Hz - 44 kHz SP: 2 Hz - 22 kHz LP: 2 Hz - 14.5 kHz
Signal-to-Noise ratio .....	92 dB or greater
Dynamic range .....	92 dB or greater
Total harmonic distortion .....	0.0043% or less (1 kHz)
Wow and flutter .....	Below measurable limit (± 0.001% W.PEAK)

### ■ Analog Input/Output Terminals

Line input jacks .....	RCA PIN; reference input level 500mV (input impedance 27 kΩ)
Line output jacks .....	RCA PIN; reference output level 500mV (output impedance 1 kΩ)
Headphone output jack .....	Stereo standard jack, 6 mm diameter (1.0mW volume max., load impedance 8 Ω)

### ■ Digital Input/Output Terminals

Coaxial input terminal .....	RCA PIN; 0.5 Vp-p (input impedance 75 Ω)
Coaxial output terminal .....	RCA PIN; 0.5 Vp-p (output impedance 75 Ω)
Optical input terminal .....	x 1
Optical output terminal .....	x 1

### ■ Provided Functions

- Wide Range (WIDE) mode
- Long Play (LP) mode
- Character Pack function
- High-speed AI search
- Program selection
- Skip tune selection and Music Search
- Direct tune selection
- Music repeat
- Skip play
- Random play
- One-point memory
- Time skipping
- Renumbering with TOC recording
- Fade-in/fade-out
- End mark recording, end search, blank search
- Auto ID recording
- 7-mode counter
- Automatic tape thickness computing type remaining tape display
- Digital peak margin display
- Timer recording/playback
- Cue/review (with fine cue/review)
- REC muting (auto spacing)
- Display OFF
- Intro Scan

### ■ Power Supply and Other Specifications

Power source .....	AC 220 - 230 V, 50/60Hz
Power consumption .....	36 W
Dimensions .....	440 (W) x 141 (H) x 375 (D) mm
Weight .....	7.6 kg

### ■ Accessories

Wireless remote control unit .....	1
Remote control unit batteries (IEC R03) .....	2
Connection cords (RCA pin-plug, stereo) .....	2
Operating instructions .....	1
Warranty card .....	1

### NOTE:

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

