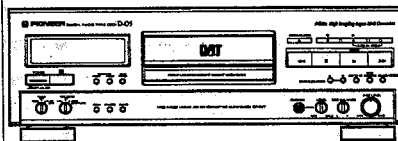


# Service Manual



ORDER NO.  
**RRV1201**

The chapter 1 of this Service Manual will not be reprinted. On your additional orders, we may supply only the chapter 2. For the chapter 1, please make copies and attach to the chapter 2 at your side if necessary.

## DIGITAL AUDIO TAPE DECK

# D-05

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-05		
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

### CHAPTER 1

1.1 SPECIFICATIONS .....	1-2
1.2 PANEL FACILITIES .....	1-3
1.3 DISASSEMBLY .....	1-5
1.4 FL INFORMATION .....	1-6
1.5 IC INFORMATION .....	1-7
1.6 ADJUSTMENTS .....	1-17
1.7 PARTS LIST FOR PACKING AND EXPLODED VIEWS .....	1-30
1.8 PCB PARTS LIST .....	1-33

### CHAPTER 2

2.1 PACKING AND EXPLODED VIEWS ...	2-3
2.2 SCHEMATIC AND PCB CONNECTION DIAGRAMS .....	2-9
2.3 BLOCK DIAGRAM .....	2-31

# CHAPTER 1

## 1.1 SPECIFICATIONS

Type .....	Rotating head digital audio tape recorder
Tape speed .....	HIGH SAMPLING: 16.3 mm/sec SP: 8.15 mm/sec LP: 4.075 mm/sec
Recording time .....	HIGH SAMPLING: 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) 96kHz (HIGH SAMPLING: 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: 5Hz - 44kHz SP: 5Hz - 22kHz LP: 5Hz - 14.5kHz
Signal-to-Noise ratio .....	91 dB or greater
Dynamic range .....	91 dB or greater
Total harmonic distortion .....	0.0045 % 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 k $\Omega$ )
Line output jacks .....	RCA PIN; reference output level 500mV (output impedance 1k $\Omega$ )
Headphone output jack .....	Stereo standard jack, 6 mm diameter (1.0mW volume max., load impedance 8 $\Omega$ )

### ■ Digital Input/Output Terminals

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

### ■ Provided Functions

- Wide Range (HIGH SAMPLING) 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
- Renumbering with TOC recording
- 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

### ■ Power Supply and Other Specifications

Power source .....	AC 220 - 230 V, 50/60Hz
Power consumption .....	21W
Dimensions .....	420(W) X 140(H) X 383(D) mm
Weight .....	6.4 kg

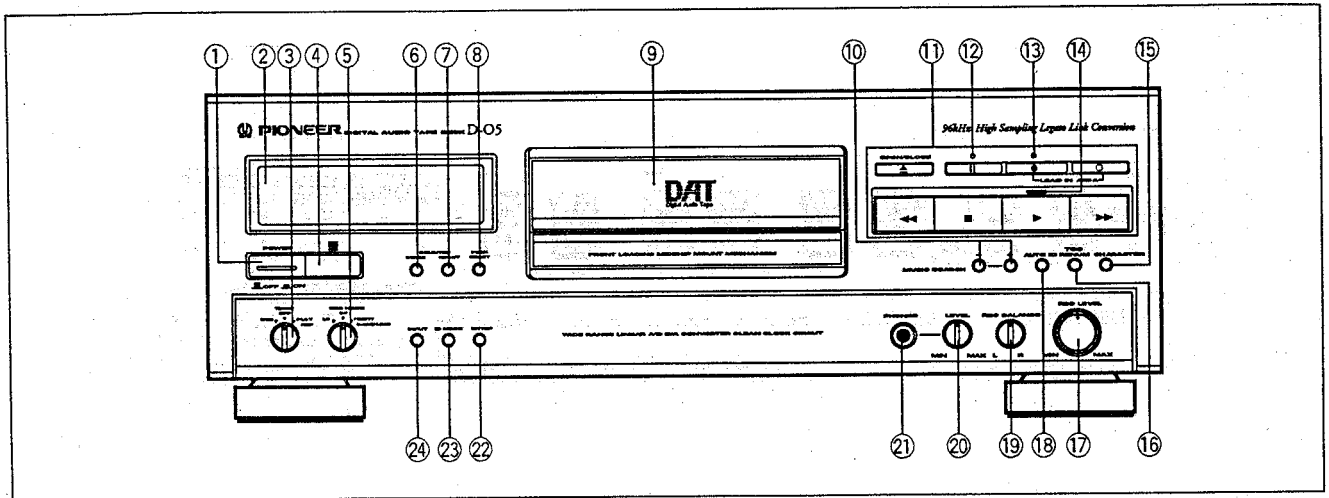
### ■ Accessories

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:

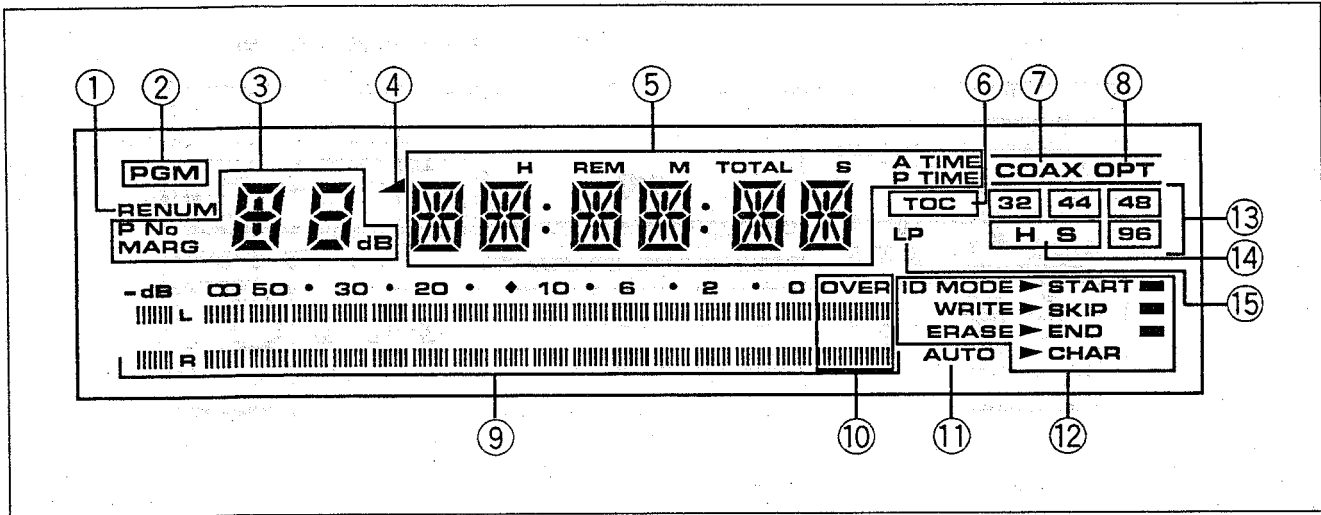
The specifications and design of this product are subject to change without notice, due to improvement.

## 1.2 PANEL FACILITIES



### Front panel

- ① **POWER switch**  
Operation of the unit becomes possible approximately 4 seconds after the power is turned on.
- ② **Display window**
- ③ **TIMER switch (REC/OFF/PLAY/REP)**  
Be sure to set this switch to OFF when not using the timer function.
- ④ **Remote sensor window**
- ⑤ **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.  
HIGH SAMPLING: 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.
- ⑥ **COUNTER MODE button**
- ⑦ **COUNTER RESET button**
- ⑧ **PEAK RESET button**
- ⑨ **Cassette tray**
- ⑩ **MS +/- buttons**  
Press in Music Search or skip search operation.
- ⑪ **▲: 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**
- ⑫ **Pause indicator**  
Indicates that the unit is in pause condition.
- ⑬ **Recording indicator**  
Indicates that the unit is in recording mode.
- ⑭ **Playback indicator**  
Indicates that the unit is in playback mode.
- ⑮ **CHARACTER button**  
Press to record or display character data.
- ⑯ **TOC RENUM button**
- ⑰ **REC LEVEL control**  
Turn the knob to set the recording level when analog signal are input.
- ⑱ **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.)  
● The set condition remains memorized even when the power is switched OFF.
- ⑲ **REC BALANCE control**
- ⑳ **PHONES LEVEL knob**
- ㉑ **PHONES jack**
- ㉒ **ENTER button**  
Press to record or erase subcodes.
- ㉓ **ID MODE button**  
Press to select an ID mode.
- ㉔ **INPUT selector button**  
Set to select the recording input source.  
● The set condition remains memorized even when the power is switched OFF.



### Display

- ① **RENUM (renumber) indicator**
- ② **PGM indicator**
- ③ **Tune number/peak margin display**
- 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 (HIGH SAMPLING) 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 **TOC indicator**
- ⑦ **COAX indicator**  
Indicates that coaxial digital input has been selected with the INPUT selector button.
- ⑧ **OPT indicator**  
Indicates that optical digital input has been selected with the INPUT selector button.
- ⑨ **Digital-drive level meter**
- ⑩ **OVER level indicator**
- ⑪ **AUTO indicator**
- ⑫ **ID MODE indicators**
- ⑬ **Sampling frequency indicator**
- ⑭ **HS indicator**  
Indicates that the unit is in wide range (HIGH SAMPLING) mode.
- ⑮ **LP indicator**

# 1.3 DISASSEMBLY

## ● DAT MECHANISM ASSEMBLY

1. Remove the bonnet case.
2. Remove the flexible P.C.Board of the CN03, CN04, and CN05 and the connectors CN06, CN07, and CN08 of the MAIN unit and the connector CN02 of the RF unit.
3. Remove the five screws ① and remove the loading mechanism section. (Refer to Fig. 1.)
4. Remove the two flexible P.C.Board and the connector wires from the slot of section A. (Refer to Fig. 2.)
5. Remove the four screws ② and the four mechanism mounting springs, and remove the DAT mechanism assembly from the cassette installation unit. (Refer to Fig. 2.)

### Preparations Before Adjustment (at the time of pull guide adjustment)

1. Remove the cassette installation unit from the product and remove the wiring material of the DAT mechanism assembly from the MAIN unit.
2. Remove the DAT mechanism assembly from the cassette installation unit.
3. Place the DAT mechanism assembly so onto the mechanism stay that the motor pulley at the lower surface is not in contact with anything, and fix the shield case of the DAT mechanism assembly with a screw. (Refer to Fig. 3.)
4. Insert the wire material of the DAT mechanism assembly into the MAIN unit. (Adjustment of the DAT mechanism assembly is done in this condition.)

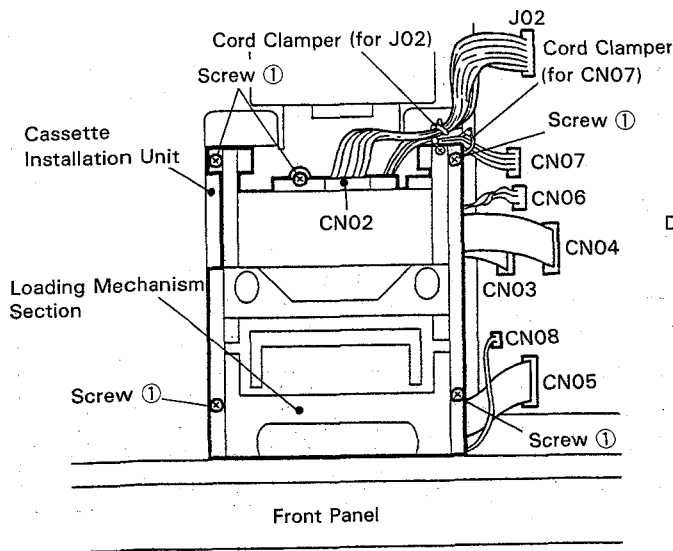


Fig. 1

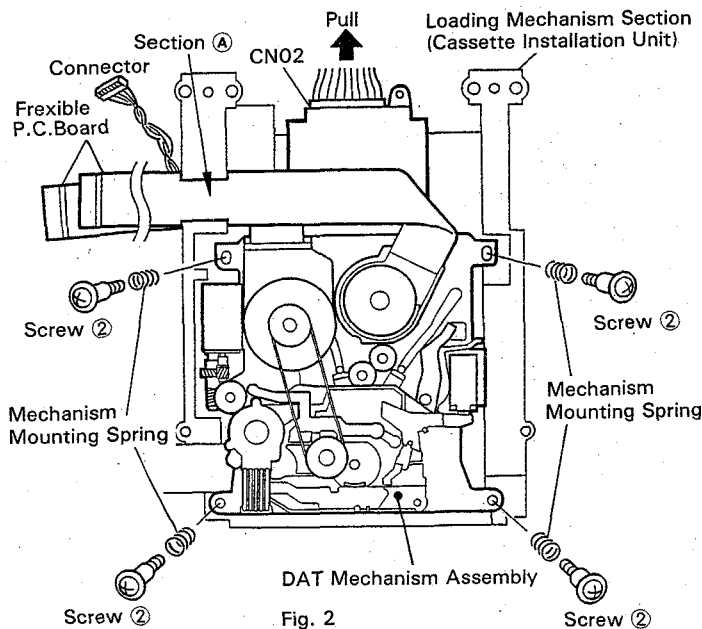


Fig. 2

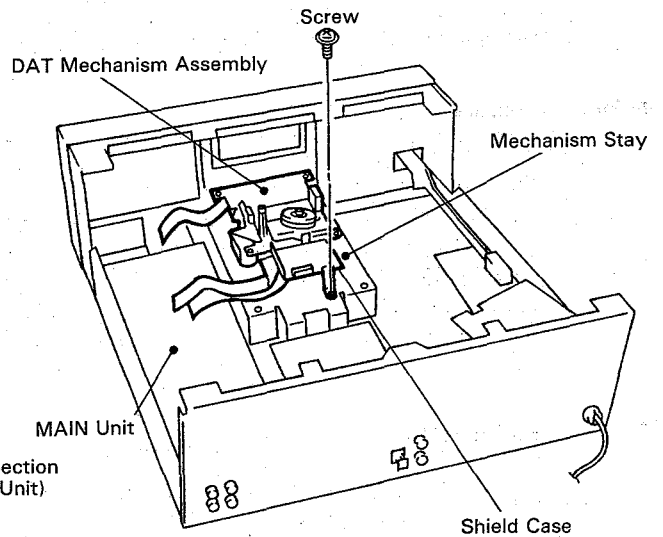
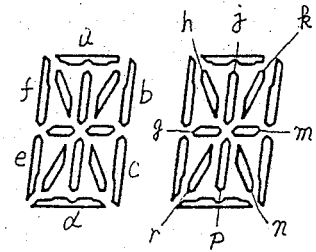
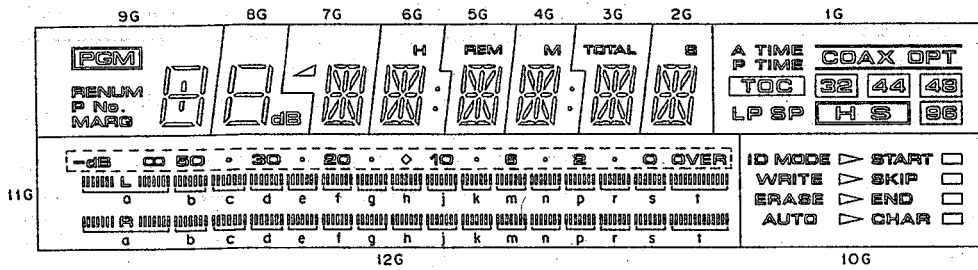


Fig. 3

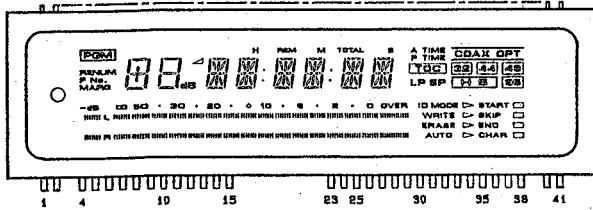
# 1.4 FL INFORMATION

## RAW1135 (V1601 : DISPLAY A UNIT)

- FL Tube
- Grid Assignment



- Pin Assignment



- Pin Connection

TERMINAL NO.	1	2	3	4	5	6	7	8	9	10	11										
ELECTRODE	F1	F1	NP	12G	11G	10G	9G	8G	7G	6G	5G										
TERMINAL NO.	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
ELECTRODE	4G	3G	2G	1G	NP	NP	NP	NP	NP	NP	NP	P s15	P s15	P s14	P s13	P s12	P s11	P s10	P s9	P s8	
TERMINAL NO.												32	33	34	35	36	37	38	39	40	41
ELECTRODE												P s7	P s6	P s5	P s4	P s3	P s2	P s1	NP	F2	F2

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

- Anode Connection

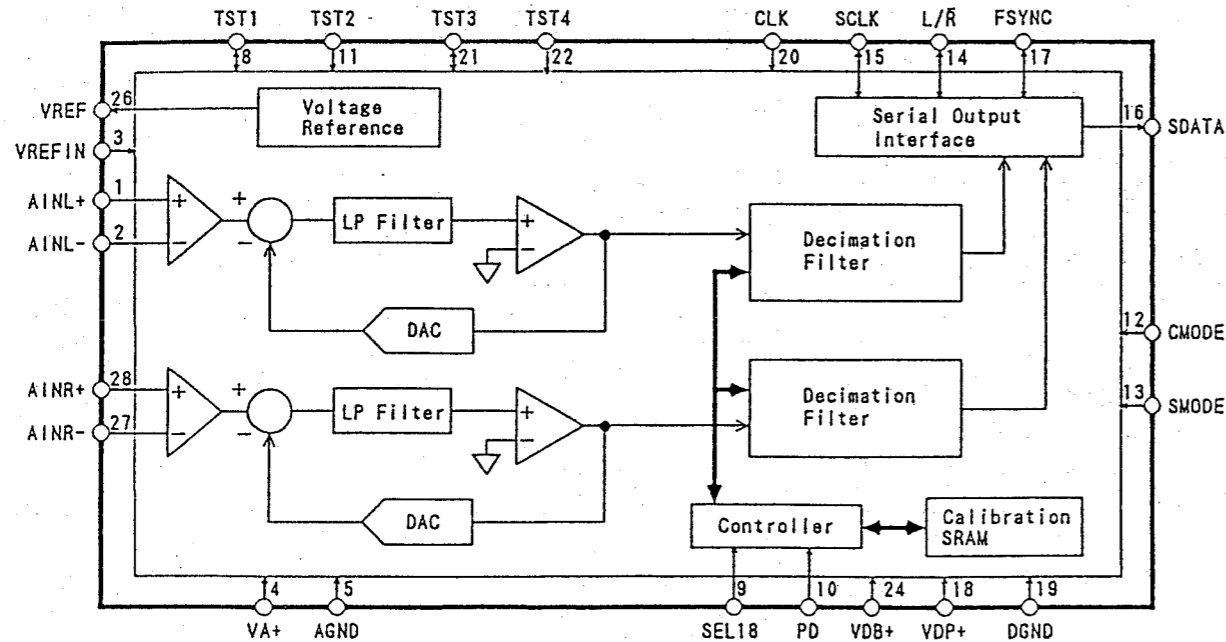
	12G	11G	10G	9G	8G	7G	6G	5G	4G	3G	2G	1G
S1	a	a	□ (CHAR)	a	a	a	a	a	a	a	a	A TIME
S2	b	b	□ (END)	b	b	b	b	b	b	b	b	P TIME
S3	c	c	□ (START)	PGM		j	j	j	j	j	j	—
S4	d	d	CHAR	RENUM		k	k	k	k	k	k	OPT
S5	e	e	□ (SKIP)	h	h	h	h	h	h	h	h	COAX
S6	f	f	▷ (SKIP)	f	f	f	f	f	f	f	f	H S
S7	g	g	▷ (END)	g	g	g	g	g	g	g	g	32
S8	h	h	▷ (CHAR)	P No.		m	m	m	m	m	m	44
S9	j	j	▷ (START)	c	c	c	c	c	c	c	c	TOC
S10	k	k	AUTO	MARG	dB	n	n	n	n	n	n	48
S11	m	m	ERASE			p	p	p	p	p	p	96
S12	n	n	WRITE	e	e	e	e	e	e	e	e	SP
S13	p	p	ID MODE	d	d	d	d	d	d	d	d	LP
S14	r	r				r	r	r	r	r	r	
S15	s	s				△	H :	REM	M :	TOTAL	s	
S16	t	t	START SKIP END									

### 1.5 IC INFORMATION

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

#### AK5340A – VS (IC902 : MAIN UNIT)

- A/D Converter
- Block Diagram



#### Pin Function

No.	Pin Name	I/O	Function
1	AINL+	I	Lch analog non-inverting input pin
2	AINL-	I	Lch analog inverting input pin
3	VREFIN	I	Reference voltage input pin Normally, connection is made to the VREF pin. 1.6 times of the voltage difference entered between VA+ and this pin becomes the input range.
4	VA+	-	Analog part Analog power supply pin, +5V
5	AGND	-	Analog part Analog ground pin
6			NC*
7			NC*
8	TST1		Test pin Open or connect to the DGND pin.
9	SEL18	I	Output data length selection pin (with pull-down resistance) L: 16 bits, H: 18 bits
10	PD	I	Power-down pin Power-down mode is reached at the time of "H". Offset calibration is started from the drop. At the time of power ON and when the clock frequency has been changed, calibration must be executed once.
11	TST2		Test pin Open or connected to the DGND pin

No.	Pin Name	I/O	Function
12	CMODE	I	Master clock selection pin "L": CLK=256fs (fs=~98kHz) "H": CLK=384fs (fs=~50kHz)
13	SMODE	I	Interface clock selection pin The input and output for each clock pin of L/R, SCLK, FSYNC is set. "L": Slave mode (all pins are input pins.) "H": Master mode (all pins are output pins.)
14	L/R	I/O	Input channel selection pin Slave mode: Input of the fs clock. The MSB data of Lch are put out with the rise edge, and the MSB data of Rch are put out with the drop edge. Master mode: Output of the fs clock. 1 SCLK after the L/R edge, SDAT is put out. "H" at the time of power-down (PD="H").
15	SCLK	I/O	Serial data clock pin 1 bit output of the output data with the drop of the voltage at this pin. Slave mode: Normal. 32 fs to 64 fs clock input. Master mode: 64 fs clock output. "L" at the time of power-down (PD="H").
16	SDATA	O	Serial data output pin The data are put out from MSB in 2's complements. After 16/18 bit output, this becomes "L". "L" at the time of power-down (PD="H").
17	FSYNC	I/O	Frame sync clock pin Slave mode: SDATA output is enabled at the time of "H". Master mode: Output of a 2 fs clock. "H" during output of 16 bit data output. Accordingly, when 18 bit output is selected, the two least significant bits become "L". "L" at the time of power-down (PD="H").
18	VDP+	-	Digital part Power supply pin, +5V
19	DGND	-	Digital part Ground pin
20	CLK	I	Master clock input pin CMODE="H": 384fs CMODE="L": 256fs
21	TST3		Test pin Open or connected to the DGND pin
22	TST4		
23			NC*
24	VDB+	-	Digital part Power supply pin, +5V (silicon P. C. Board potential)
25			NC*
26	VREF	O	Reference voltage output pin, (VA+) -2.6V Output is made with VA+ as reference. Normally, this output is connected to the VREFIN pin.
27	AINR-	I	Rch Analog inverting input pin
28	AINR+	I	Rch Analog non-inverting input pin

\*: NC pins are not bonded internally.

## PDG119A (IC503 : MAIN UNIT)

### ● System Controller IC

#### ● Pin Function

No.	Pin Name	I/O	Function	CPU
1	ENC3	I	Mechanism encoder output BIT3 input terminal	PF3
2	ENC0	I	Mechanism encoder output BIT0 input terminal	PF4
3	x256	O	256/384 Fs clock selection control output terminal. "H" at the time of Fs=32 (kHz) recording/playback (when ID2 of PCM ID is "10"). (It also becomes "H" at the time of Fs=64 (kHz) WSP/WLP mode.)	PF5
4	x44PB	O	Master clock selection control output terminal. The master clock at the time of Fs=44.1 (kHz) recording/playback is selected and oscillated. Clock oscillation with "L". (This also becomes "H" at the time of Fs=88.2 (kHz) WSP mode.)	PF6
5	x4832PB	O	Master clock selection control output terminal. The master clock at the time of Fs=48/32 (kHz) recording/playback is selected and oscillated. Clock oscillation with "L". (This also becomes "H" at the time of Fs=96/64 (kHz) WSP/WLP mode.)	PF7
6	D IN	O	Digital input recording mode monitor output terminal. "H" with digital input recording mode. It is used for mute processing at the time of RX PLL unlocking.	PD0
7	OCSL	O	Digital input optical/coaxial selection output terminal. "H" at the time of selection of optical.	PD1
8	xDARST	O	Audio block reset output terminal. "L" at the time of power ON, Fs, REC/PB switching, the audio block (A/D converter, D/A converter) is reset.	PD2
9	MLE	O	D/A converter mode set latch output terminal. Connected to the LATCH terminal (20 pins) of PD2029A (IC903). The transmission data from the microcomputer are latched with the rising edge (↑).	PD3
10	WSMODE	O	Audio block double-speed switching output. A/D, D/A block switching is executed according to the operation mode. "H" at the time of WSP, WLP mode.	PD4
11	PBMUTE	O	Playback mute control output terminal. Connected to the mute terminal (1 pin) of the signal processing LSI (HD49226AFS: IC501). Mute (digital mute) ON/OFF control for the playback output signal. Mute ON with "H".	PD5
12	LV DATA	I	Level meter data input terminal. Connected to the LVDATA terminal (97 pins) of the signal processing LSI (HD49226AFS: IC501).	PD6
13	LVCK	O	Level meter data clock output terminal. Connected to LVCK terminal (96 pins) of the signal processing LSI (HD49226AFS: IC501). The shift clock for level data reading each half frame is generated by 8 pulses each in the sequence of L (ch), R (ch). (One frame each in WSP mode.)	PD7
14	Q DATA	I	CD Q data input terminal. Connected to the QDATA terminal (68 pins) of the signal processing LSI (HD49226AFS: IC501).	PC0
15	QDCK	O	CD Q data shift clock output terminal. Connected to the QDCK terminal (67 pins) of the signal processing LSI (HD49226AFS: IC501). The shift clock for reading of CD Q data each frame is generated by 8 pulses each in the sequence of TNO, INDEX.	PC1

No.	Pin Name	I/O	Function	CPU
16	LPMODE	O	LP mode selection output terminal. Connected to the LP terminal (60 pins) of the signal processing LSI (HD49226AFS: IC501). Selection of the operation mode of the signal processing LSI at the time of LP playback mode. "H" at the time of WSP mode. (Half speed LP playback is executed at the time of WLP mode.) "L" in the other modes: LP, SP, WSP. (LP mode executes double scan LP playback. In SP and WSP mode, the status of this terminal has no influence onto the operation.)	PC2
17	PLTL	I	Pilot level status monitor input terminal.	PC3
18	RF	I	RF signal Yes/No monitor input terminal.	PC4
19	CRLOCK	I	Capstan reel lock monitor input terminal.	PC5
20	DLOCK	I	Drum lock monitor input terminal.	PC6
21	PLLLOCK	I	DPLOCK monitor at the time of PLAY, PLLLOCK monitor input terminal at the time of high-speed search.	PC7
22	ATFDET	I	ATFDET monitor at the time of PLAY, HOLD monitor input terminal at the time of high-speed search.	PH0
23	ATFM	I	ATF monitor at the time of PLAY, HUNT monitor input terminal at the time of high-speed search.	PH1
24	xSRVRST	O	Servo LSI reset output terminal. Connected to the RESET terminal (61 pins) of the servo LSI (HD49228FS: IC601). Resets the servo LSI at the time of power ON/OFF and with switching from search mode to any other mode.	PH2
25	BRAKE	I	Drum brake control monitor input terminal.	PH3
26	RFMODE	O	RF amplifier operation mode switching output terminal. Connected to the MODE1 terminal (42 pins) of the RF amplifier IC (HA12154MA: IC301). "H" at the time of WSP mode. Control of the second amplifier and the equalizer of the RF amplifier.	PH4
27	TEST	O	Data strobe LSI test mode control output terminal. Connected to the TEST terminal (54 pins) of the data strobe LSI (HD49229: IC504). "H" at the time of VCO free run adjustment mode (at the time of test mode). At this time, the xSER terminal must be "H".	PH5
28	xSER	O	Data strobe LSI search mode control output terminal. Connected to the SEARCH terminal (1 pin) of the data strobe LSI (HD49229). "L" at the time of search run mode like FF, REW, etc. At this time, the TEST terminal must be "L".	PH6
29	RP	O	RF amplifier recording/playback mode switching output terminal. The AND output with the RECPB terminal (24 pins) output of the signal processing LSI (HD49226AFS: IC501) is connected to the RECPB terminal (39 pins) of the RF amplifier IC (HA12154MA: IC301). RF amplifier IC recording and playback mode switching is executed. The output from this microcomputer is for protection.	PH7
30	xRST	I/O	System reset terminal. "L" level active. Connected to the output terminal (5 pins) of the reset IC (M51957: IC505).	$\overline{\text{RST}}$
31	EXTAL	I	System clock oscillation ceramic resonator connection terminal. (Input.) An 8.38 (MHz) ceramic resonator is connected to the 40 pins.	
32	XTAL	O	Ceramic resonator connection terminal for system clock oscillation. (Output.)	XTAL



No.	Pin Name	I/O	Function	CPU
33	V <sub>ss</sub>	—	GND terminal. Connected to GND.	V <sub>ss</sub>
34	NC	O	Not used	TX
35	NC	O		TEX
36	AV <sub>ss</sub>	—	A/D converter GND terminal. Connected to GND.	AV <sub>ss</sub>
37	AVREF	—	A/D converter reference voltage output terminal. Connected to the 5 (V) line.	AV <sub>REF</sub>
38	LMUTE	O	Line mute control output terminal. Line mute (analog mute) ON/OFF is executed. Mute ON with "H".	PA0/AN0
39	xOPRST	O	Operation controller reset output terminal. Operation controller reset with "L". Output of "L" at the time of power ON.	PA1/AN1
40	xOPREQ	O	Communication request output terminal to operation controller. Operation controller starts communication with system control at the dropping edge (↓) of xOPREQ. "L" during communication with operation controller.	PA2/AN2
41	LPRUN	O	LP run mode monitor output terminal. "H" in LP run mode (tape speed=4.075 mm). ("L" in SP, WSP, and WLP run mode.)	PA3/AN3
42	OPACK	I	Communication permission input terminal from operation controller. System control starts communication with operation controller at the edge of xOPACK. Inversion is executed upon completion of each 1 byte communication.	PA4/AN4
43	xADJ	O	TACH adjustment mode output terminal. "L" output at the time of adjustment mode.	PA5/AN5
44	T TOP	I	Input terminal for tape top sensor output. Used as AN6 (analog input).	PA6/AN6
45	T END	I	Input terminal for tape end sensor output. Used as AN7 (analog input).	PA7/AN7
46	FGS	I	Supply-side FG input terminal. Used as interrupt terminal (CINT).	PB0/CINT
47	CTRL	I	Microcomputer data transmission mode input control signal/microcomputer command control signal output terminal. Connected to the CTRL terminal (2 pin) of the signal processing LSI (HD49226AFS: IC501) and the CTRL terminal (3 pin) of the servo LSI (HD49228FS: IC601).	PB1/ $\overline{\text{CS0}}$
48	CCK	O	Serial data transmission clock output terminal. Used as SCK0 terminal. Connected to the shift clock input terminal of the device (signal processing LSI, servo LSI, operation controller, D/A converter) controlled by serial communication from the microcomputer. The serial clock period is 1.95 ( $\mu\text{s}$ ) for the signal processing LSI and the servo LSI, while it is 3.8 ( $\mu\text{s}$ ) for operation controller and D/A converter and the interval clock period is 30.5 ( $\mu\text{s}$ ) for the signal processing LSI and the servo LSI, while it is 61 ( $\mu\text{s}$ ) for operation controller and D/A converter.	PB2/ $\overline{\text{SCK0}}$
49	CDATAO	I	Serial data input terminal. (Matched to the terminal names on the side of the signal processing LSI. The data input/output direction is opposite to the name.) Used as SIO terminal. Connected to the serial data output terminal of the device (signal processing LSI, operation controller) controlled by serial communication from the microcomputer.	PB3/SIO
50	CDATAI	O	Serial data output terminal. (Matched to the terminal names on the side of the signal processing LSI. The data input/output direction is opposite to the name.) Used as SO0 terminal. Connected to the serial data input terminal of the device (signal processing LSI, servo LSI, operation controller, D/A converter) controlled by serial communication from the microcomputer.	PB4/SO0

No.	Pin Name	I/O	Function	CPU
51	NC	O	Not used	PB5/SCK $\bar{1}$
52	HUNT	O	Encoder hunting prevention output terminal. Output of xOR for LDM ON and MDM ON.	PB6/SI1
53	xDMUTE	O	Double speed digital out control output terminal. Digital out prohibition with "L".	PB7/SO1
54	FSYNC	I	Frame sync signal input. Connected to the FSYNC terminal (94 pins) of the signal processing LSI (HD49226AFS: IC501). Pulse signal with a duty of 50 (%) with a cycle of 30 (ms) in SP mode, 60 (ms) at the time of LP mode, and 15 (ms) at the time of WSP mode.	PE0/ $\overline{EC0}$
55	P OFF	I	Power OFF signal input terminal. Drops ( $\downarrow$ ) from "H" to "L" at the time of power OFF. Monitors the drop of the timer interrupt processing every 1.95 (ms) and starts the power OFF processing routine.	PE1/ $\overline{EC1}$
56	xHEM	I	Destination information input terminal. "L" for overseas destination.	PE2/RMC
57	xTEST	I	Test mode input terminal. Test mode with "L".	PE3/ $\overline{NMI}$
58	PADJ	O	Voltage output terminal for TACH adjustment. Used as PWM output terminal.	PE4/PWM
59	xEMP	O	De-emphasis control output terminal. De-emphasis ON with "L".	PE5/T0
60	MONS	O	Monitor switching output terminal at the time of playback. This terminal is used to join recordings, but it is fixed to "H" for D-05.	PI0/INT0
61	CFG	I	Capstan FG input terminal. Monitors the rise edge of the timer interrupt processing every 1.95 (ms), used for capstan emergency checking.	PI1/INT1
62	HSWP	I	Head switching pulse input terminal. Used as interrupt terminal (INT2).	PI2/INT2
63	FGT	I	Take-up side reel FG input terminal. Used as interrupt terminal (INT3).	PI3/INT3
64	LDM ON	O	Cassette compartment loading motor control output terminal. ON/OFF control is executed for the cassette compartment loading motor. Loading motor ON with "H".	PI4
65	MLM CW	O	Mode motor, cassette compartment loading motor rotation direction control output terminal. Rotation direction control is executed for the mode motor of the D4 mechanism and the cassette compartment loading motor. Rotation in clockwise direction with "H".	PI5
66	MDM ON	O	Mode motor control output terminal. Execution of ON/OFF control for the D4 mechanism. Mode motor ON with "H".	PI6
67	LDSTART	I	Cassette compartment loading start detection SW input terminal. Loading start with "H".	PI7
68	xLDEND	I	Cassette compartment loading end detection SW input terminal. Loading completion with "L".	PG0
69	T LED	O	Tape top/end sensor LED control output terminal. Execution of ON/OFF control for the LED of the tape top/end sensor of the D4 mechanism. Flashing at a period of 3.9 (ms).	PG1
70	SOL ON	O	Brake solenoid control output terminal. Execution of ON/OFF control for the brake solenoid of the D4 mechanism. Brake ON with "H".	PG2

No.	Pin Name	I/O	Function	CPU
71	xDM ON	O	Drum motor control output terminal. Execution of ON/OFF control for the drum motor of the D4 mechanism. Drum motor ON with "L".	PG3
72	VDD	-	Positive power supply terminal. Connected to the 5 (V) line.	VDD
73	NC	O	Not used	NC
74	xCM ON	O	Capstan motor control output terminal. Execution of ON/OFF control for the capstan motor of the D4 mechanism. Capstan motor ON with "L".	PG4
75	CM CW	O	Capstan motor rotation direction control output terminal. Execution of rotation direction control for the capstan motor of the D4 mechanism. Rotation in clockwise direction (forward direction) with "H".	PG5
76	THIN SW	I	Thin (9 $\mu$ m) tape detection SW input terminal. Connected to the tape thickness confirmation hole detection SW. "H" at the time of thin tape. (HOLE OPEN)	PG6
77	RECINH	I	Recording prohibition confirmation hole detection SW input terminal. Recording prohibition with "H".	PG7
78	xHALFIN	I	Cassette half detection SW input terminal. Cassette half present with "L".	PF0
79	ENC1	I	Mechanism encoder output BIT1 input terminal.	PF1
80	ENC2	I	Mechanism encoder output BIT2 input terminal.	PF2

## ■ PDG120A (IC1601 : DISPLAY A UNIT)

### ● FL Control IC

#### ● Pin Function

No.	Pin Name	I/O	Function	CPU
1	S4	O	FL segment signal output terminal 4	S4/PG0
2	S5	O	FL segment signal output terminal 5	S5/PG1
3	S6	O	FL segment signal output terminal 6	S6/PG2
4	S7	O	FL segment signal output terminal 7	S7/PG3
5	S8	O	FL segment signal output terminal 8	S8
6	S9	O	FL segment signal output terminal 9	S9
7	S10	O	FL segment signal output terminal 10	S10
8	S11	O	FL segment signal output terminal 11	S11
9	S12	O	FL segment signal output terminal 12	S12
10	S13	O	FL segment signal output terminal 13	S13
11	S14	O	FL segment signal output terminal 14	S14
12	S15	O	FL segment signal output terminal 15	S15
13	NC	O	Not used	S16/T15
14	NC	O		S17/T14
15	NC	O		S18/T13
16	NC	O		S19/T12
17	T11	O	FL timing signal output terminal 11	S20/T11
18	T10	O	FL timing signal output terminal 10	S21/T10
19	T9	O	FL timing signal output terminal 9	S22/T9
20	T8	O	FL timing signal output terminal 8	S23/T8
21	T7	O	FL timing signal output terminal 7	T7
22	T6	O	FL timing signal output terminal 6	T6
23	T5	O	FL timing signal output terminal 5	T5
24	T4	O	FL timing signal output terminal 4	T4
25	T3	O	FL timing signal output terminal 3	T3
26	T2	O	FL timing signal output terminal 2	T2
27	T1	O	FL timing signal output terminal 1	T1
28	T0	O	FL timing signal output terminal 0	T0
29	xOPREQ	I	Input terminal for the communication request signal from the system controller. Interrupt terminal.	INT

No.	Pin Name	I/O	Function	CPU
30	XTAL	O	Ceramic resonator connection terminal for system clock oscillation. (Output)	XTAL
31	EXTAL	I	Ceramic resonator connection terminal for system clock oscillation. (Input) 4.19 (MHz) ceramic resonator connection to the 30 pin connector.	EXTAL
32	xRST	I/O	System reset terminal. "L" level active.	$\overline{\text{RST}}$
33	NC	-	Not used	NC
34	VDD	-	Positive power supply terminal. Connected to the 5 (V) line.	VDD
35	KEY0	I	Tact key input terminal 0. Used as AD0 (analog input).	AD0/PI0
36	KEY1	I	Tact key input terminal 1. Used as AD1 (analog input).	AD1/PI1
37	KEY2	I	Tact key input terminal 2. Used as AD2 (analog input).	AD2/PI2
38	SW0	I	Rotary switch input terminal 0. Used as AD3 (analog input).	AD3/PI3
39	SW1	I	Rotary switch input terminal 1. Used as AD4 (analog input).	AD4/PB0
40	KEY3	I	Tact key input terminal 3. Used as AD5 (analog input).	AD5/PB1
41	KEY4	I	Tact key input terminal 4. Used as AD6 (analog input).	AD6/PB2
42	NC	I	Not used	AD7/PB3
43	NC			NC
44	CCK	I	Serial data transmission clock input terminal. Used as SC terminal. Connected to the shift clock output terminal of system control. The serial clock period is 3.8 ( $\mu\text{s}$ ) and the interval clock period is 61 ( $\mu\text{s}$ ).	PX0/ $\overline{\text{SC}}$
45	CDATAO	O	Serial data output terminal. Used as SO terminal. Connected to the system controller serial data input terminal.	PX1/SO
46	CDATAI	I	Serial data input terminal. Used as SI terminal. Connected to the system controller serial data output terminal.	PX2/SI
47	MCK	O	Memory communication shift clock output terminal.	PA0
48	MDA	I/O	Memory communication data I/O terminal.	PA1
49	OPACK	O	Output terminal for communication permission signals to system controller.	PA2
50	NC	I/O	Not used	PA3
51	NC	I/O		PF0
52	NC	I/O		PF1
53	NC	I/O		PF2
54	NC	I/O		PF3
55	NC	I/O		PE0
56	NC	I/O		PE1
57	NC	I/O		PE2

No.	Pin Name	I/O	Function	CPU
58	NC	I/O	Not used	PE3
59	NC	O		PY0
60	NC	O		PY1/ $\overline{\text{PWM}}$
61	NC	I		PY2/WP
62	RMSIG	I	Remote control signal input terminal. Used as RMC terminal.	PY3/ $\overline{\text{EC}}$ /RMC
63	NC	I/O	Not used	PD0
64	NC	I/O		PD1
65	NC	I/O		PD2
66	NC	I/O		PD3
67	NC	I/O		PC0
68	PAUSE	O	PAUSE LED display output terminal.	PC1
69	REC	O	REC LED display output terminal.	PC2
70	PLAY	O	PLAY LED display output terminal.	PC3
71	Vss	—	GND terminal. Connected to GND.	Vss
72	NC		Not used	TX
73	NC			NC
74	NC	I		TEX
75	VREF	—	A/D converter reference voltage input terminal. Connected to the 5 (V) line.	VREF
76	VFDP	—	Negative power supply terminal for FL. Not connect	VFDP
77	S0	O	FL segment signal output terminal 0	S0/PH0
78	S1	O	FL segment signal output terminal 1	S1/PH1
79	S2	O	FL segment signal output terminal 2	S2/PH2
80	S3	O	FL segment signal output terminal 3	S3/PH3

## 1.6 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. 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

## ■ SETTING THE TEST MODE

### ● 1.5 TP Test Mode

1. Short-circuit the connectors CN23-7 (XTEST) and CN23-1 (GNDA) of the MAIN unit (refer to Fig. 2 on page 1-19). At this time, "PGM" on the FL tube flashes.
2. Press the counter reset key (C-RESET). At this time, confirm that the counter display part of the FL tube becomes "TACH". (TACH adjustment mode)

### ● Test mode cancellation

Open the XTEST terminal to cancel this test mode.

### ● 2/3 waveform setting method

1. Enter into 1.5TP test mode.
2. Connect a stabilized power supply between CN23-6 (VOFT) and CN23-1 (GNDA) and apply +2.5 V.
3. Play back the tracking tape (SDA-101) and execute fine adjustment of the stabilized power supply (around +2.5 V) so that the level close to the center of the RF waveform (Ach) becomes a maximum.
4. Execute fine adjustment of the stabilized power supply voltage so that the level close to the center of the RF waveform (Ach) becomes about 2/3 of the level in item 3. (Around +2.0 V).

### ● Test Mode for Recording Current Adjustment

1. Short-circuit the connectors CN23-7 (XTEST) and CN23-1 (GNDA) of the MAIN unit. At this time, "PGM" on the FL tube flashes.
2. Press the counter mode key (C-MODE). At this time, confirm that the P-NO display part of the FL tube becomes "db".

### ● Test mode cancellation

Open the XTEST terminal to cancel this test mode.

#### Note:

At the time of exchange of the memory IC (IC1602), TACH adjustment must be executed after initialization of the memory IC in initialization mode.

### ● Initialization mode

1. Short-circuit the connectors CN23-7 (XTEST) and CN23-1 (GNDA) of the MAIN unit. At this time, "PGM" on the FL tube flashes.
2. Press the ID mode key (ID-MODE).

## MECHANICAL SYSTEM ADJUSTMENT

### 1. Back Tension Torque Adjustment

<ul style="list-style-type: none"> <li>● Purpose : To stabilize the tape's contact with the rotating drum.</li> <li>● Symptoms of Improper Adjustment : Small torque ⇒ Tape transit is unstable. Large torque ⇒ Tape or head is damaged.</li> </ul>			
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> </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).
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

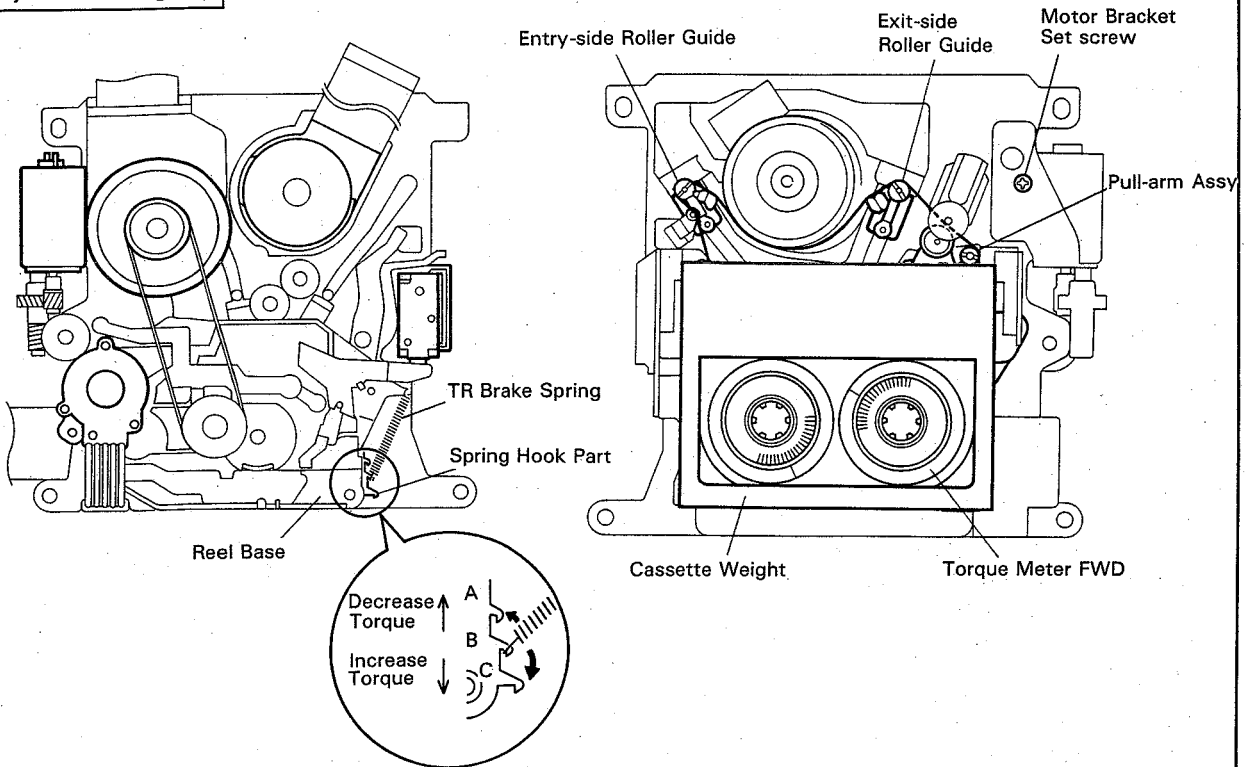


Fig. 1-1

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> </ul>	<ul style="list-style-type: none"> <li>● Oscilloscope MAIN unit interior : CH1 : Between ENV (CN23-3) and GND A (CN23-1) CH2 : Between HSWP (CN23-5) and GND A (CN23-1)</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).
  - After setting the 1.5 TP test mode, produce the 2/3 waveform and play the tape. (Refer to Page 1-17.)
1. Check the waveform at this time on the oscilloscope and make sure that the degree of flatness is at least 75%.

2. If the degree of flatness is less than 75%, perform the procedures described in "3. Tape Pass Adjustment" on Page 1-21.

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

#### Adjustment Diagram

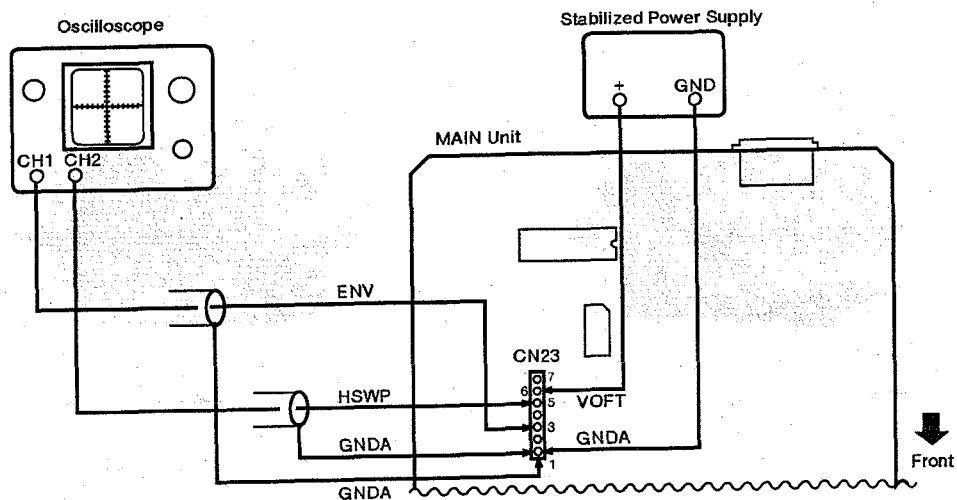


Fig. 2

Waveform

Oscilloscope Range : 50mV/div., 1ms/div.

Normal

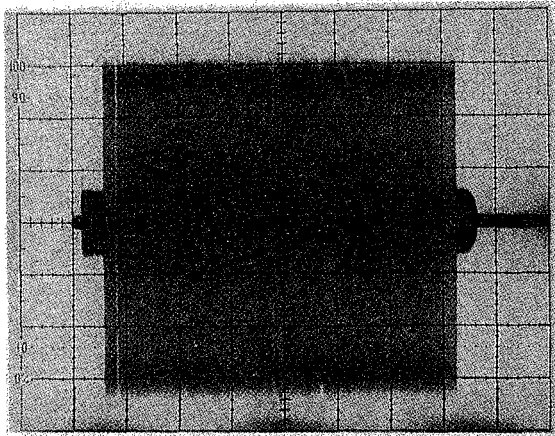


Photo 1-1

Fault on the Entry Side

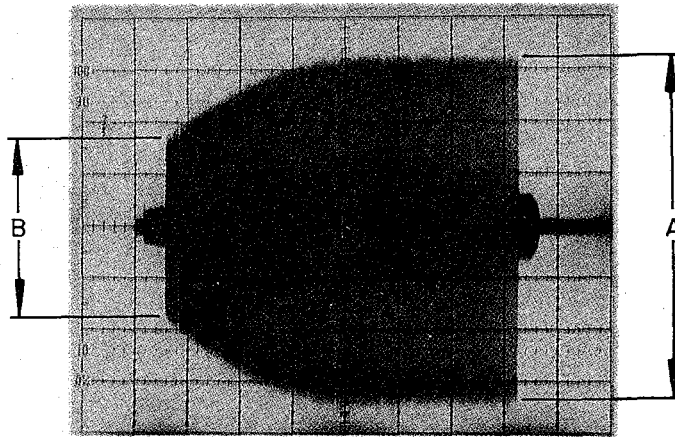


Photo 1-2

Fault on the Exit Side

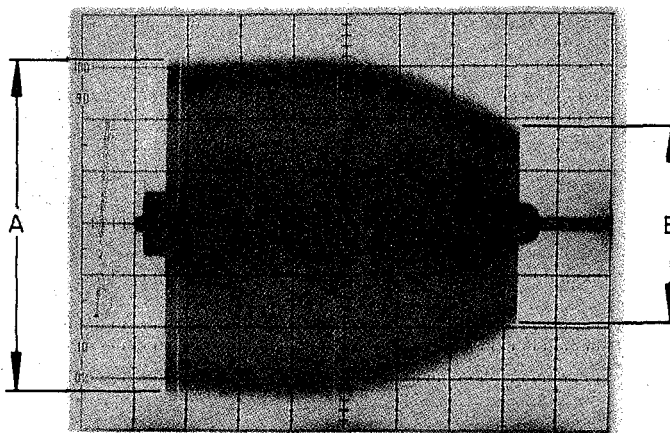


Photo 1-3

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

#### Preparation

- Refer to pages 1-5 and remove the DAT mechanism assembly from the cassette installation unit.
- Place the cassette weight onto a commercial 120 min. tape and set it into the mechanism.

#### Adjustment

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. 3-3.
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. 3-4.
6. After confirming that the tape is not twisted at Point C in Fig. 3-5, 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.

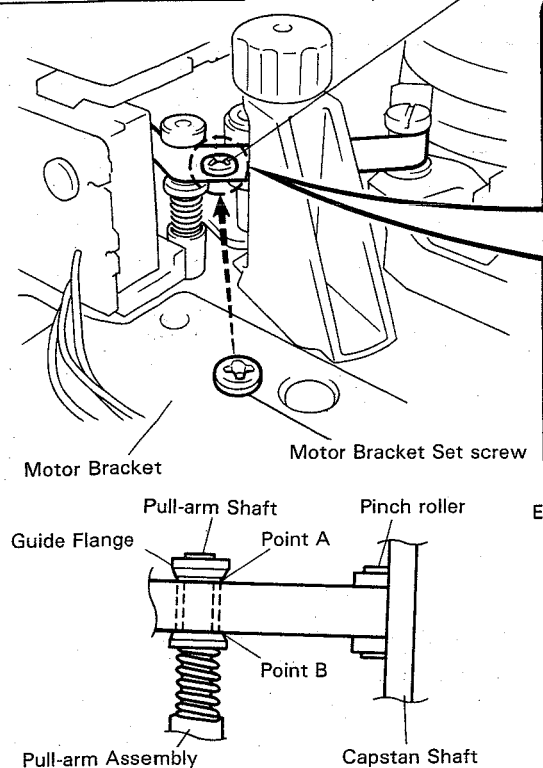


Fig. 3-4

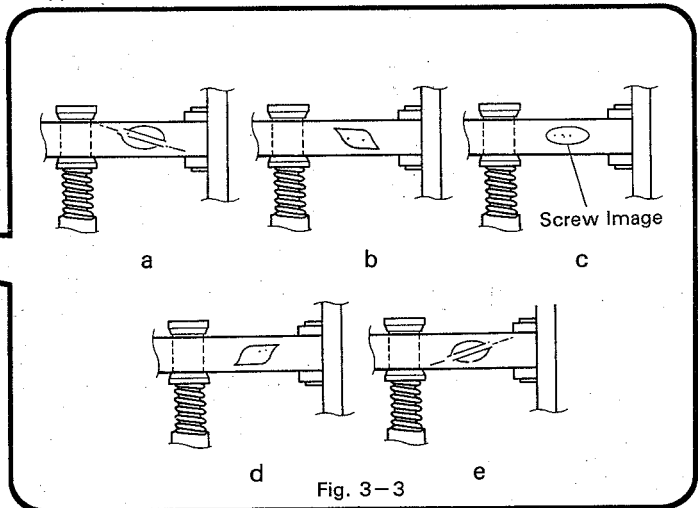


Fig. 3-3

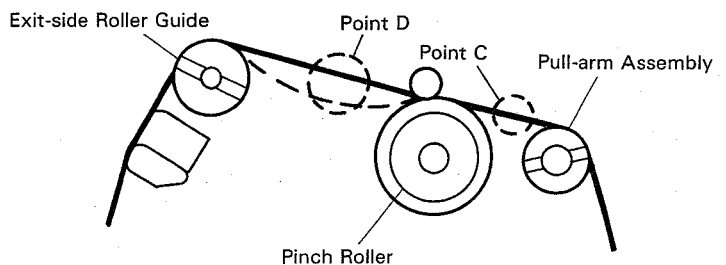


Fig. 3-5

## ELECTRICAL SYSTEM ADJUSTMENT

### 1. PLL Adjustment

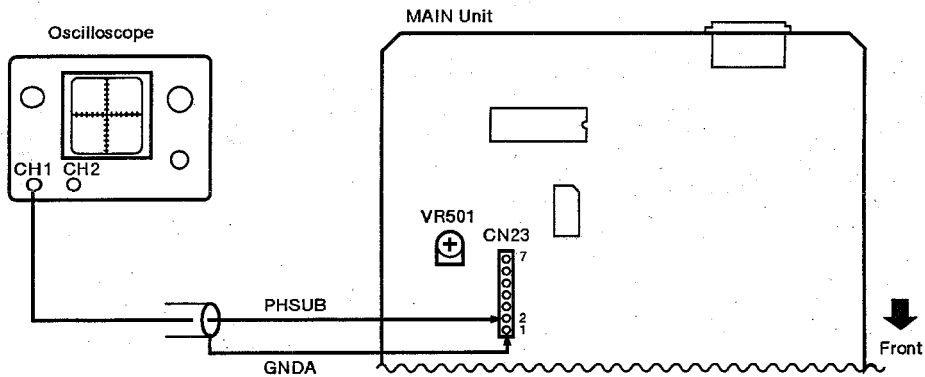
- Purpose : To correctly access digital signals stored in the tape.
- Symptoms of Improper Adjustment : Sound is intermittent, unit does not playback, noise is generated, or meter fails to oscillate.

Measuring Device/Jig	Measuring Device Connection	DAT State	Part to be Adjusted
<ul style="list-style-type: none"> <li>● Oscilloscope</li> <li>● Test Tape</li> <li>Blank Tape : SDA-301</li> </ul>	<ul style="list-style-type: none"> <li>● Oscilloscope</li> <li>MAIN unit interior : CH1 : Between PHSUB (CN23-2) 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</li> <li>VR501</li> <li>(VCO RANGE ADJ.)</li> </ul>

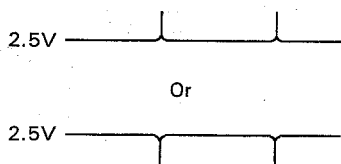
#### Adjustment Procedure

1. Insert the test tape.
2. Adjust the output voltage of the CN23-2 (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 ENV (CN23-3) and GND A (CN23-1) CH2 : Between HSWP (CN23-5) and GND A (CN23-1)</li> </ul>	<ul style="list-style-type: none"> <li>● PLAY mode (Test mode)</li> </ul>	<ul style="list-style-type: none"> <li>● MS key "+", "-"</li> </ul>

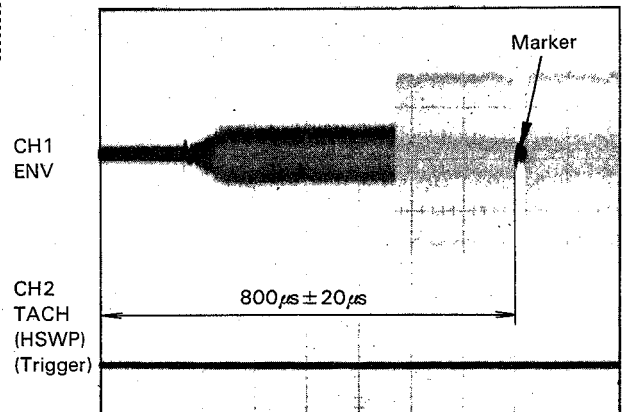
### Adjustment Procedure

#### Preparation

- Set the 1.5 TP test mode. (Refer to Page 1-17.)
1. Press the MS keys "+" or "-" to adjust so that the RF waveform marker position becomes  $800\mu\text{s} \pm 20\mu\text{s}$  from the drop of the HSWP waveform.

#### Waveform

- Oscilloscope Range :  
CH1 : AC500mV/div., 0.1ms/div.  
CH2 : DC5V/div. (Trigger)



#### Note

The TACH adjustment is adjustment by means of the microcomputer, where the adjustment data are stored in the memory, and as the adjusted data are stored in the memory at the time of test mode cancellation, do not switch off the power supply while in test mode.

#### Adjustment Diagram

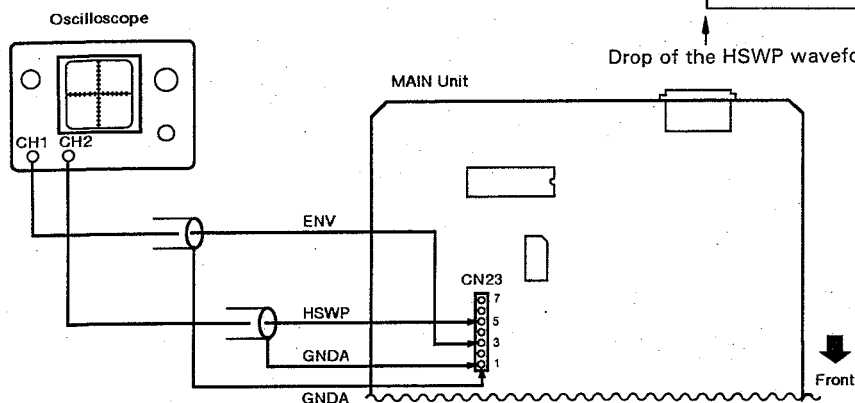


Fig. 5

### 3. ATF Recording Current Adjustment.

- Purpose : To obtain the ideal recording current value.
- Symptoms of Improper Adjustment : Sound is intermittent (tracking cannot be obtained) or noise is generated.

Measuring Device/Jig	Measuring Device Connection	DAT State	Part to be Adjusted
<ul style="list-style-type: none"> <li>● Oscilloscope</li> <li>● Test Tape Level : SDA-102 (TY-7111) 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 MAIN Unit interior : CH1 : Between PLT2 (CN23-4) and GND A (CN23-1) CH2 : Between HSWP (CN23-5) and GND A (CN23-1)</li> </ul>	<ul style="list-style-type: none"> <li>● PLAY and REC modes</li> </ul>	<ul style="list-style-type: none"> <li>● RF unit VR305 (A head) VR302 (B head)</li> </ul>

#### Adjustment Procedure

- Preparation
- Set the test mode for adjustment of recording current. (Refer to Page 1-17.)
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.)
  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.
  3. Stop the recording and rewind the recorded portion of the tape. Confirm that the levels of the reproduced waveform are within  $\pm 20\%$  of levels (a) and (b) recorded according to the procedure described in Step 1. (Refer to Photo 4-2.)
  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.
  5. Repeat Steps 3 and 4 and make adjustments until the values are within the standard.

#### Adjustment Diagram

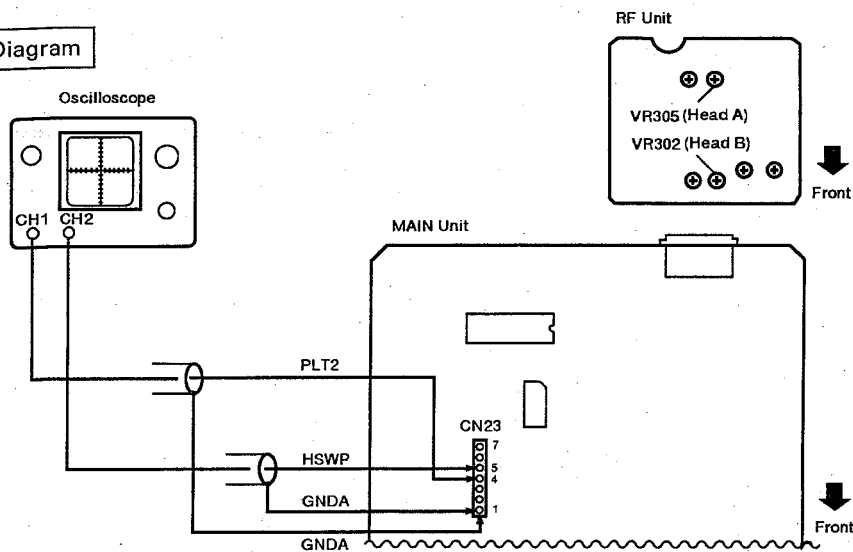


Fig. 6

Waveform [ ]: Reference

During Playback of Level Tape (SDA-102)

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

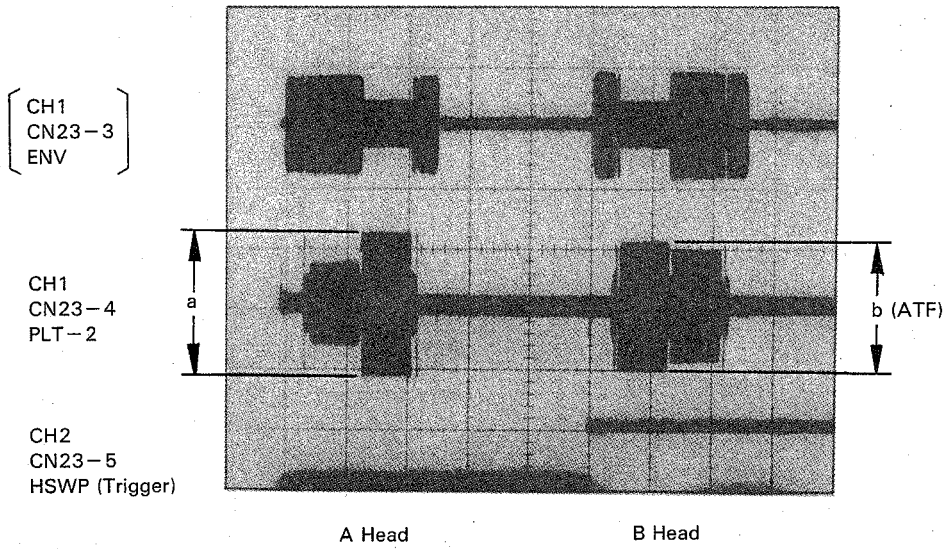


Photo 4-1

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.

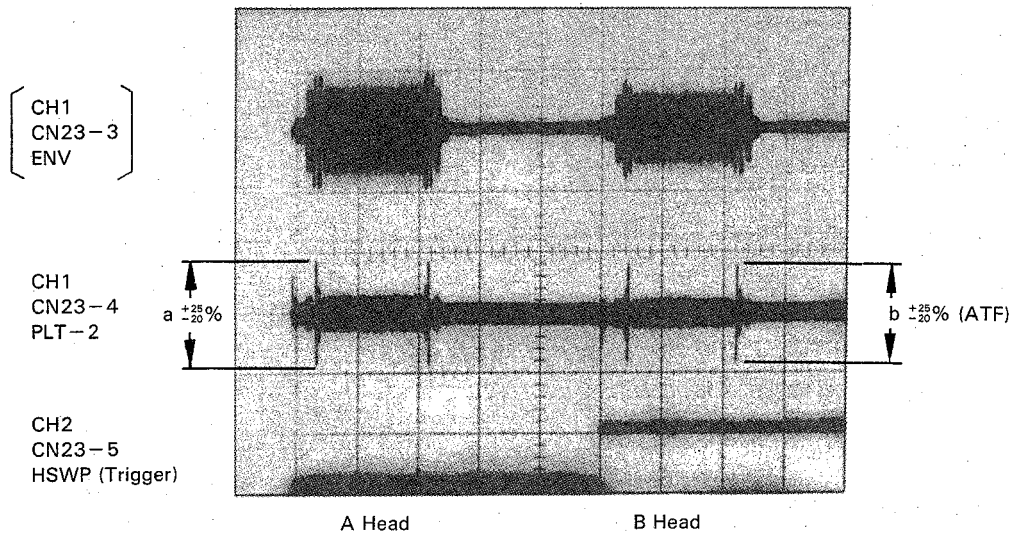


Photo 4-2

#### 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

##### Preparation

- Connect the error rate counter connector to CN24 inside the signal processing unit and set the error rate counter timer at 10sec.
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.

##### [If the error rate counter is not used]

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.)

##### Adjustment Drawing

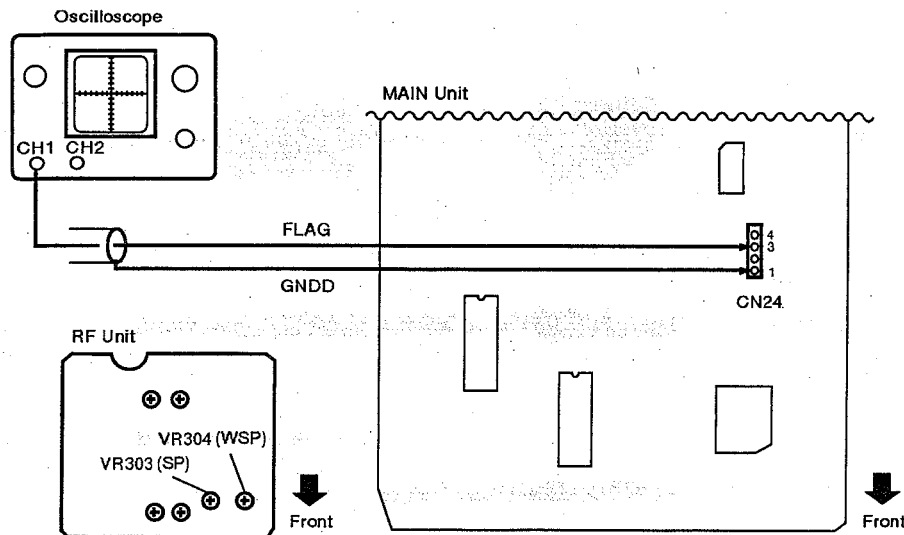


Fig. 7



Waveform

- Oscilloscope Range : 50mV/div., 1ms/div.  
[During SP]

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

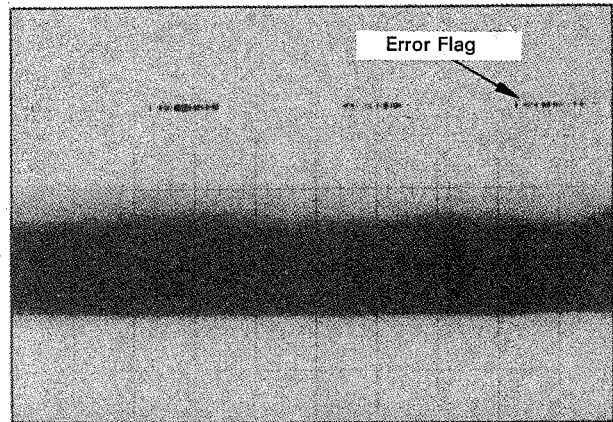


Photo 5-1

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

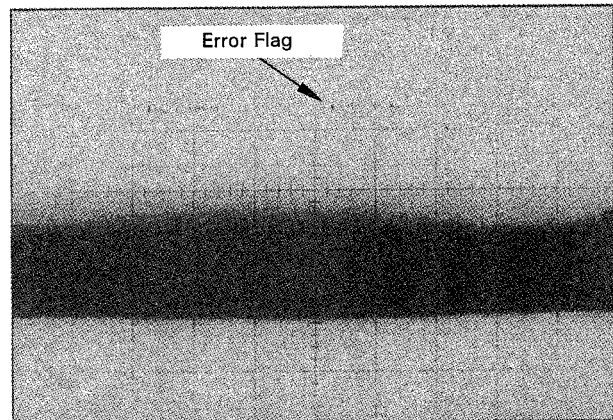


Photo 5-2

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

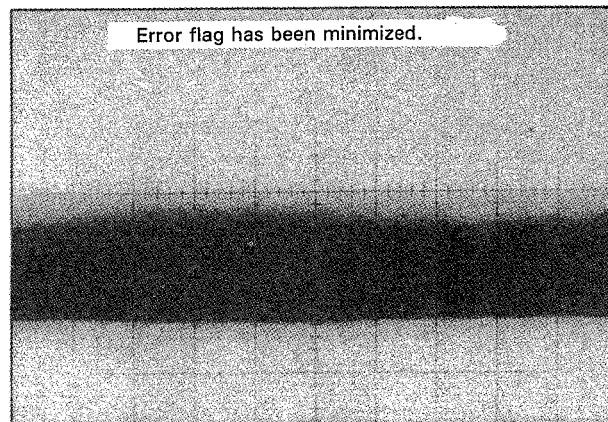


Photo 5-3

## 1.7 PARTS LIST FOR PACKING AND EXPLODED VIEWS

### 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. PACKING

Mark	No.	Description	Parts No.
	1	PACKING CASE	RHG1608
	2	PAD (F)	RHA1145
	3	PAD (R)	RHA1146
	4	OPERATING INSTRUCTIONS (English/French/German/Italian)	RRE1113
	5	REMOTE CONTROL UNIT	RPX1075
	6	.....	
NSP	7	BATTERIES (R03, AAA)	VEM-022
	8	.....	
	9	BATTERY COVER	PZN1010
10	10	SHEET	RHX1007
	11	CONNECTION CORD ASSY	RDE1036

### 2. EXTERIOR

Mark	No.	Description	Parts No.
	1	MAIN UNIT	RWZ3493
NSP	2	HEADPHONE UNIT	RWZ3497
	3	POWER SW UNIT	RWZ3501
	4	RF ENV UNIT	RWZ3494
	5	.....	
NSP	6	VR UNIT	RWZ3498
	7	DISPLAY A UNIT	RWZ3495
	8	DISPLAY B UNIT	RWZ3496
	9	POWER UNIT	RWZ3499
	10	TRANS UNIT	RWZ3500
	$\Delta$ 11	FUSE (T2.5AL250V, FU2)	REK1026
	$\Delta$ 12	FUSE (T1.6AL250V, FU3)	REK1024
	13	CONNECTOR ASSY (5P)	RKP1703
NSP	14	DAT MECHA ASSY	EXK2507
	$\Delta$ 15	STRAIN RELIEF	CM-22B
	$\Delta$ 16	AC POWER CORD HE	PDG1003
	$\Delta$ 17	FUSE (T2.5AH250V, FU1)	REK1093
	$\Delta$ 18	POWER TRANSFORMER (T1) (AC220-230V/230-240V)	RTT1274
	19	SPRING	RBH1397
	20	SCREW	RBA1099
NSP	21	SPACER	REB1124
NSP	22	CUSHION R	REB1142
	23	CUSHION	REB1168
NSP	24	MAIN CHASSIS	RNB1102
NSP	25	MECHA STAY	RNC1073
NSP	26	PCB BASE	RNE1221
	27	HP HOLDER	RNE1776
	28	CORD CLAMPER	RNH-184
	29	PANEL STAY	RNT1199
	30	.....	
	31	INSULATOR	PNW1912
	32	VR KNOB	RAC1902
	33	ROTARY KNOB	RAC1903
	34	POWER BUTTON	RAC1904
	35	FUNCTION KNOB	RAC1921
	36	.....	
	37	FL LENS	RAH2541
	38	UNDER PANEL	RAH2526
	39	FRONT PANEL	RAH2527
	40	DOOR STABILIZER	REB1264
	41	BONNET ASSY	REA1131
	42	REAR PANEL	RNA1865
	43	LED LENS 1	RNK2066
	44	DOOR ESCUTCHEON	RNK2084
	45	SENSOR LENS	RNK2085

## 3. CASSETTE INSTALLATION UNIT

Mark	No.	Description	Parts No.	Mark	No.	Description	Parts No.
	46	UNDER MOLD	RNK2144		1	MOTOR PULLEY	PNW1634
NSP	47	CAUTION SEAL	RRW1079		2	SPRING	RBH1279
	48	NAME PLATE	VAM1032		3	HALF DAMPER	REB1033
	49	SCREW	BBT30P060FCC		4	BELT	REB1140
	50	SCREW	BBT30P080FCC		5	GEAR STOPPER	RNE1394
	51	SCREW	BBT30P100FZK		6	CONTAINER PLATE	RNE1395
	52	SCREW	BBZ26P080FZK		7	GEAR	RNK1272
	53	SCREW	IBZ30P060FCC		8	TRAY	RNK2122
	54	.....			9	FLAP	RNK1649
	55	SCREW	FBT40P080FZK		10	CONTAINER	RNK1650
	56	WASHER	WH40FUC		11	MAIN RACK PLATE L	RNK1653
NSP	57	CASSETTE INSTALLATION UNIT	RXA1647		12	.....	
	58	.....			13	GEAR	RNK1658
NSP	59	EARTH PLATE	VNE1164		14	GEAR A	RNK1659
NSP	60	EARTH LEAD UNIT	PDF1150		15	PULLEY GEAR	RNK1660
	61	BINDER	ZCA-SKB90BK		16	COLLAR	RNK1661
	62	LENS L	RNK2067		17	MAIN RACK PLATE R	RNK1664
	63	CUSHION (21×2×10)	REB1276		18	HALF HOLDER	RNK1711
	64	CUSHION (9.5×6.4×10)	REB1277		19	SIDE PLATE L ASSY	RXA1356
	65	SPACER L	REB1278		20	SIDE PLATE R ASSY	RXA1357
	66	EARTH HOLDER	RNE1835		21	PUSH SWITCH (S201, S202)	RSF1008
	67	EARTH PLATE	RNE1836		22	SCREW	BBZ20P040FMC
	68	COPPER FOIL TAPE (L)	RNE1837		23	SCREW	BBZ20P060FZK
	69	COPPER FOIL TAPE (R)	RNE1838		24	SCREW	BBZ20P080FMC
	70	NUT	RBN-006		25	SCREW	BBZ26P060FMC
					26	SCREW	BMZ30P040FMC
					27	SCREW	PBA1035
					28	WASHER	WT21D050D025
					29	WASHER	WT26D047D050
					30	.....	
					31	SCREW	PBA1002
					32	SPRING	RBH1125
					33	LOADING MOTOR	VXM1034
					34	.....	
					35	CORD CLAMPER	RNH-184
					36	BINDER	Z09-056
NSP	101	SPRING					
NSP	102	SPRING (TRAY)					
NSP	103	SHAFT					
NSP	104	TOP PLATE					
NSP	105	REAR STAY					
NSP	106	CONNECTOR ASSY 6P					
	107	.....					
NSP	108	TAPE					
NSP	109	DAT MECHA ASSY					
NSP	110	EARTH LEAD UNIT					

## 4. 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 (Q101, Q102) (REEL SENSOR)	GP2S24C	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	EXH9006	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	WASHER	EBE1002	
	44	INTERVAL GEAR	ENV1238	94	RF UNIT	EFW9001	
	45	MODE PLATE	ENV1239	NSP 101	JUMPER WIRE 5P (J101)	EDD1004	
	46	HARD BRAKE	ENV1240	NSP 102	CONNECTOR ASSY 5P (J6)	EDE1011	
	47	DRIVE ARM	ENV1241	NSP 103	LEAD CARD 13P (J5)	EDD1006	
	48	THREADING GEAR	ENV1242	NSP 104	REEL SENSOR BOARD	ENP1027	
	49	THREADING ARM L	ENV1243	NSP 105	CHASSIS ASSY	EXA1183	
	50	THREADING ARM R	ENV1244	NSP 106	MOTOR BRACKET ASSY	EXA1130	
				NSP 107	DRIVE LEVER	ENR1014	
				NSP 108	SHIELD CASE	RNE1566	

# 1.8 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  $\begin{bmatrix} 5 & 6 & 1 \end{bmatrix}$  J  
 47k $\Omega$   $\rightarrow$  47  $\times$  10<sup>3</sup>  $\rightarrow$  473 ..... RD1/4PS  $\begin{bmatrix} 4 & 7 & 3 \end{bmatrix}$  J  
 0.5 $\Omega$   $\rightarrow$  0R5 ..... RN2H  $\begin{bmatrix} 0 & R & 5 \end{bmatrix}$  K  
 1 $\Omega$   $\rightarrow$  010 ..... RS1P  $\begin{bmatrix} 0 & 1 & 0 \end{bmatrix}$  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  $\begin{bmatrix} 5 & 6 & 2 & 1 \end{bmatrix}$  F

Mark	No.	Description	Parts No.	Mark	No.	Description	Parts No.
<b>LIST OF ASSEMBLIES</b>							
NSP	MOTHER UNIT		RWM1799		Q501, Q508, Q509, Q601, Q602		DTA114EK
	└─ MAIN UNIT		RWZ3493		Q904		DTA114EK
	└─ RF ENV UNIT		RWZ3494		Q610, Q611, Q613-Q615		DTC114EK
					Q901-Q903		DTC114EK
					D605, D606, D901, D902		1SR35-100AVL
NSP	SUB UNIT		RWM1800		D502, D506, D601, D603		DA119
	└─ DISPLAY A UNIT		RWZ3495		D701, D801		DAN202K
	└─ DISPLAY B UNIT		RWZ3496		D503-D505, D702, D802		DAP202K
NSP	└─ HEADPHONE UNIT		RWZ3497		D501		FC63M-4/5
NSP	└─ VR UNIT		RWZ3498		D604		MTZJ2.0AX
	└─ POWER UNIT		RWZ3499				
	└─ TRANS UNIT		RWZ3500				
	└─ POWER SW UNIT		RWZ3501				
NSP	DAT MECHA ASSY		EXK2507		<b>COILS AND FILTERS</b>		
	└─ RF UNIT		EWF9001		F901, F902		DTF1064
					L901-L903, L905		LFA010J
					L515		LFA151J
					L501		LFA1R5J
					L510		LFA3R3J
					L505, L507-L509, L512, L514		RTF1171
					L601		RTF1171
<b>MAIN UNIT SEMICONDUCTORS</b>				<b>CAPACITORS</b>			
	IC902		AK5340A-VS		C560		CCSQCH030C50
	IC501		HD49226AFS		C712, C713, C812, C813		CCSQCH050C50
	IC601		HD49228FS		C557		CCSQCH060D50
	IC504		HD49229		C556		CCSQCH080D50
	IC605, IC606		LB1687		C543, C550, C925, C926		CCSQCH100D50
	IC505		M51957AL		C541		CCSQCH101J50
	IC502 (MS62256CLL-10FC)		GGC1029		C702, C802		CCSQCH121J50
	IC603		NJM2902M		C927, C928		CCSQCH200J50
	IC602		NJM2904M		C542		CCSQCH220J50
	IC701, IC801		NJM4565D-D		C634		CCSQCH221J50
	IC702, IC802		NJM5532DD		C711, C811		CCSQCH390J50
	IC903		PD2029A (S)		C604, C605		CCSQCH470J50
	IC503		PDG119A		C506		CCSQCH560J50
	IC607		TA7288P		C715, C815		CCSLSL561J50
	IC604		TC4053BF		C654		CEANP010M50
	IC508		TC74HC08AF		C639		CEANP3R3M50
	IC904		TC74HC10AF		C653		CEANP4R7M50
	IC906		TC74HC74AF		C661-C663, C665, C668		CEAS010M50
	IC507, IC509, IC905		TC74HCU04AF		C641, C707, C807, C904, C908		CEAS100M50
	Q502, Q607		2SA1037K		C911		CEAS101M16
	Q503-Q505, Q603-Q606, Q609		2SC2412K		C708, C709, C718, C719		CEAS220M50
	Q612		2SC2412K		C808, C809, C818, C819		CEAS220M50
	Q608		2SC3246		C502, C503		CEAS331M16
	Q705, Q805		2SC3326		C509, C524, C529, C533, C537		CEAS470M16
	Q704, Q804		2SD2114K		C539, C544, C549, C561, C608		CEAS470M16

Mark	No.	Description	Parts No.
	C617, C621, C625, C630, C633 C635, C636, C669, C919, C921 C923 C511, C657, C906 C565		CEAS470M16 CEAS470M16 CEAS470M16 CEAS4R7M50 CEASR33M50
	C686 C701, C703, C704, C716, C801 C803, C804, C816 C678 C640, C660, C667		CEASR47M50 CENA220M50 CENA220M50 CFTXA332J50 CKSQYB102K50
	C652 C646 C551, C620, C656, C659 C559 C552, C642, C651, C714, C814		CKSQYB123K50 CKSQYB153K50 CKSQYB222K50 CKSQYB223K50 CKSQYB472K50
	C655, C720, C820 C705, C805 C505, C507, C508, C535, C536 C553, C555, C558, C601, C606 C614-C616, C619, C627-C629		CKSQYB683K25 CKSQYB821K50 CKSQYF103Z50 CKSQYF103Z50 CKSQYF103Z50
	C632, C643, C664, C666, C903 C920, C922, C924 C501, C512, C546, C554, C563 C647, C706, C710, C806, C810 C905, C907, C909, C910		CKSQYF103Z50 CKSQYF103Z50 CKSQYF104Z25 CKSQYF104Z25 CKSQYF104Z25
	C912, C913, C915-C917, C929 C918 C510, C525, C528, C532, C538 C540, C545, C547, C548, C562 C564, C566, C567, C602, C603		CKSQYF104Z25 CKSQYF104Z50 CKSQYF473Z50 CKSQYF473Z50 CKSQYF473Z50
	C607, C609-C611, C618 C622-C624, C631, C637, C638 C644, C645, C648-C650, C658 C731, C732, C831, C832		CKSQYF473Z50 CKSQYF473Z50 CKSQYF473Z50 CKSQYF473Z50
<b>RESISTORS</b>			
	VR501 (47K) △ R638 (1Ω, 1/2W) R631 (10K, 1W) R716, R717, R816, R817 △ R646, R653		RCP1047 RCN1059 RCX1048 RN1/10SE104D RS1/2LMFR47J
	Other Resistors		RS1/10S□□□□
<b>OTHERS</b>			
	CN5 CN3, CN4 CN15 CN10, CN11, CN25 CN14  CN12 CN8 CN24 CN6 CN7  JA901 X902 (22.5792MHZ) X501 (37.632MHZ) X502 (8.389MHZ) X901 (24.5760MHZ)  CN19 PCB BINDER		1-177644-3 1-177644-5 173981-5 52147-0510 52147-0610  52147-0810 B2B-PH-K B4B-PH-K B5B-PH-K B6B-PH-K  RKB1034 RSS1035 RSS1041 RSS1042 RSS1043  TUC-P08P-B1 VEF1040

Mark	No.	Description	Parts No.
		<b>RF ENV UNIT</b>	
		<b>SEMICONDUCTORS</b>	
		Q1401, Q1402	2SC2412K
		<b>COILS AND FILTERS</b>	
		L1404, L1405 L1401, L1403 L1402	LFA331J LFA471J LFA680J
		<b>CAPACITORS</b>	
		C1406, C1408 C1407 C1401, C1405 C1410, C1412 C1404	CCSQCH560J50 CCSQSL331J50 CCSQSL471J50 CCSQSL561J50 CEAS4R7M50
		C1403 C1402, C1409, C1411	CKSQYB102K50 CKSQYB222K50
		<b>RESISTORS</b>	
		All Resistors	RS1/10S□□□□
		<b>OTHERS</b>	
		CN20	TUC-P08X-B1
		<b>DISPLAY A UNIT</b>	
		<b>SEMICONDUCTORS</b>	
		IC1602 IC1601	AT24C01-10PC PDG120A
		<b>SWITCHES AND RELAYS</b>	
		S1601, S1612 S1602-S1605, S1607, S1608	RSB1011 RSG1039
		<b>CAPACITORS</b>	
		C1605 C1601, C1603 C1602, C1604 C1606	CEAL220M16 CEAL470M16 CGCYF473Z25 CKCYF103Z50
		<b>RESISTORS</b>	
		R1615 (47K) R1611-R1614 (47K) Other Resistors	RCX1045 RCX1047 RD1/6PM□□□□
		<b>OTHERS</b>	
		REMOTE SENSOR UNIT V1601 X1601 (4.19MHZ)	HC-177 RAW1135 VSS1014
		<b>DISPLAY B UNIT</b>	
		<b>SEMICONDUCTORS</b>	
		D1501 D1503 D1502	SEL6410E GL3HY43 SEL6C10R
		<b>SWITCHES AND RELAYS</b>	
		S1501-S1513	RSG1030
		<b>RESISTORS</b>	
		All Resistors	RD1/6PM□□□□

Mark	No.	Description	Parts No.	Mark	No.	Description	Parts No.
<b>HEADPHONE UNIT</b>							
<b>SEMICONDUCTORS</b>							
	IC1001		M5216L		C1808, C1813 C1802, C1804 C404 C408, C409 C411		CEAS330M35 CEAS470M16 CEAS470M35 CEAS471M10 CEAS472M16
<b>COILS AND FILTERS</b>							
	L1001, L1003-L1005 L1002		RTF1167 RTF1216		C405 C1801, C1811, C1815, C412 C1807, C1812, C413 C1803, C1805, C1814 C414		CEAS4R7M50 CGCYF104Z25 CKCYF103Z50 CKCYF473Z50 CQMA103J50
<b>CAPACITORS</b>							
	C1007, C1008 C1001, C1005, C1006 C1002, C1003		CCCCH470J50 CEAS330M35 CKCYF103Z50		C1806 C401 (6800UF/25V)		OCG1014 RCH1033
<b>RESISTORS</b>							
	VR1001 (20KB) △ R1007, R1008 (22Ω) Other Resistors		PCS1002 VCN1029 RD1/6PM□□□J	<b>RESISTORS</b>	△ R401 (4.7Ω) △ R402 (47Ω) △ R403 Other Resistors		DCN1001 DCN1006 RD1/2PMF222J RD1/6PM□□□J
<b>OTHERS</b>							
	CN13 JA1001		173981-5 RKN1023	<b>OTHERS</b>	CN16 JA1802 FUSE HOLDER JA1801 EARTH PLATE		52147-0710 RKB1031 RKR1002 TORX178A VNF-091
<b>VR UNIT</b>							
<b>RESISTORS</b>							
	VR1101 (50KA) VR1102 (50KMN) Other Resistors		RCV1104 RCV1105 RD1/6PM□□□J	<b>TRANS UNIT</b>			
<b>OTHERS</b>							
	J14		RDD1302	<b>COILS AND FILTERS</b>	L1301		RTF1167
<b>POWER UNIT</b>							
<b>SEMICONDUCTORS</b>							
	△ IC406, IC407 △ IC402 △ IC404 △ IC401 △ IC405		ICP-N20 NJM7805A NJM7805FA NJM7809A NJM7905FA	<b>CAPACITORS</b>	△ C1301, C1302, C1306, C1307		CKCYF103Z50
	IC1802 IC1801 △ Q401 Q1801 △ D402, D403, D415-D417		TC74HC00AP TC74HCU04AP 2SA1283 XDC114ES 11ES2	<b>POWER SW UNIT</b>			
	D1801 D406, D407 △ D408-D411 △ D404 △ D405		1SR35-100A ISS254 EL1Z-LFG1 MTZJ33A RD15FB	<b>COILS AND FILTERS</b>	△ L1201		VTL-262
	△ D401		S2VB20	<b>SWITCHES AND RELAYS</b>	△ S1201		RSA1001
<b>COILS AND FILTERS</b>							
	L1801 L1805 L1804, L1807 L1803, L1806, L403 L1802		LFA151J PTL1003 RTF1164 RTF1167 RTF1171	<b>CAPACITORS</b>	△ C1201-C1203 (10000PF)		RCG-009
<b>CAPACITORS</b>							
	C1809, C1816 C1810 C407 C403 C406		CCCCH220J50 CCCCH470J50 CEAS102M50 CEAS221M50 CEAS222M25	<b>OTHERS</b>	△ CAPACITOR COVER TERMINAL FUSE HOLDER		REC-150 RKC-061 RKR1002
<b>OTHERS</b>							
				<b>RF UNIT</b>			
				<b>SEMICONDUCTORS</b>	IC301 Q303, Q304 Q301, Q302		HA12154MA 2SD1328 2SK932
				<b>COILS AND FILTERS</b>	L301		ETF9001
				<b>CAPACITORS</b>	C320 C327 C329 C328 C330		CCSQCH101J50 CCSQCH121J50 CCSQCH150J50 CCSQCH271J50 CCSQCH330J50

Mark	No.	Description	Parts No.
	C323		CCSQCH391J50
	C319		CCSQCH471J50
	C324		CCSQCH820J50
	C335, C337		CEV101M6
	C309		CEV220M6
	C333		CEV470M6
	C339		CEV4R7M25
	C301-C304, C307, C308		CKSQYB103K50
	C310-C318, C321, C322		CKSQYB103K50
	C325, C326, C331, C332, C340		CKSQYB103K50
	C334, C336, C338, C341		CKSQYB104K25
	C305, C306		CKSQYB472K50
	C342 (22UF/6.3V)		ECX9001
<b>RESISTORS</b>			
	VR303, VR304		ECP9001
	VR301, VR306		ECP9002
	VR302, VR305		ECP9003
	Other Resistors		RS1/10S□□□□
<b>OTHERS</b>			
	CN1		EKS9001
	CN2		EKS9002





# Service Manual

ORDER NO.  
**RRZ1201**

The chapter 1 of this Service Manual will not be reprinted. On your additional orders, we may supply only the chapter 2. For the chapter 1, please make copies and attach to the chapter 2 at your side if necessary.

## DIGITAL AUDIO TAPE DECK **D-05**

---

---

### CHAPTER 2

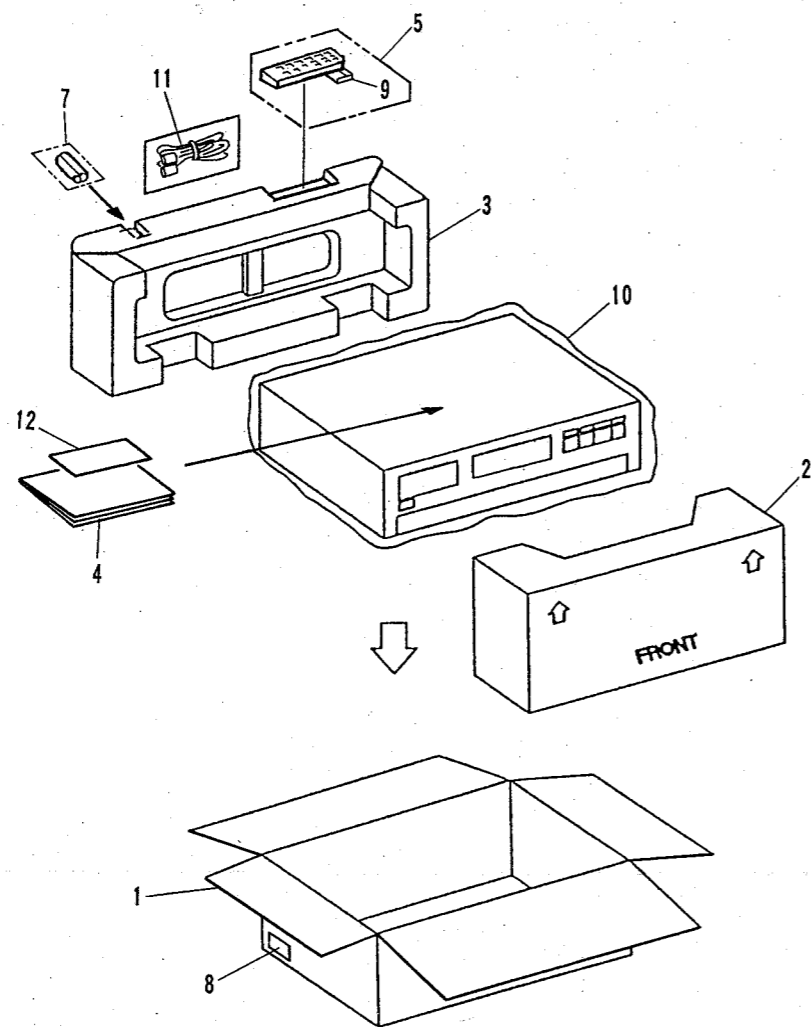
---

---

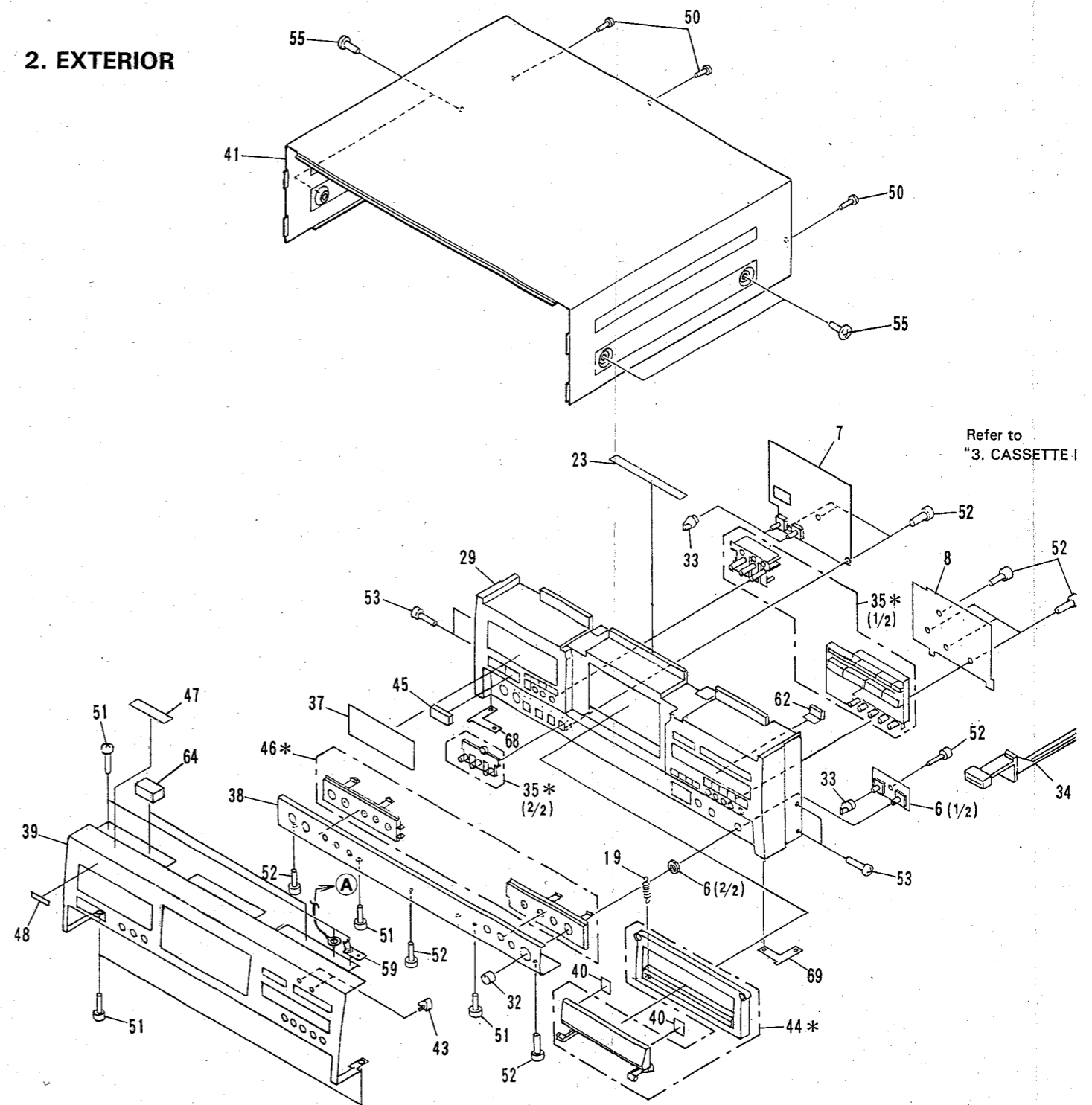
#### CONTENTS

CHAPTER 2	
2.1 PACKING AND EXPLODED VIEWS	2-3
2.2 SCHEMATIC AND PCB CONNECTION DIAGRAMS	2-9
2.3 BLOCK DIAGRAM	2-31

2.1 PACKING AND EXPLODED VIEWS  
1. PACKING

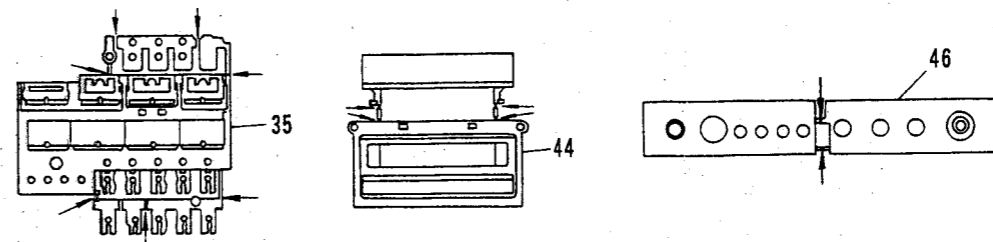


2. EXTERIOR

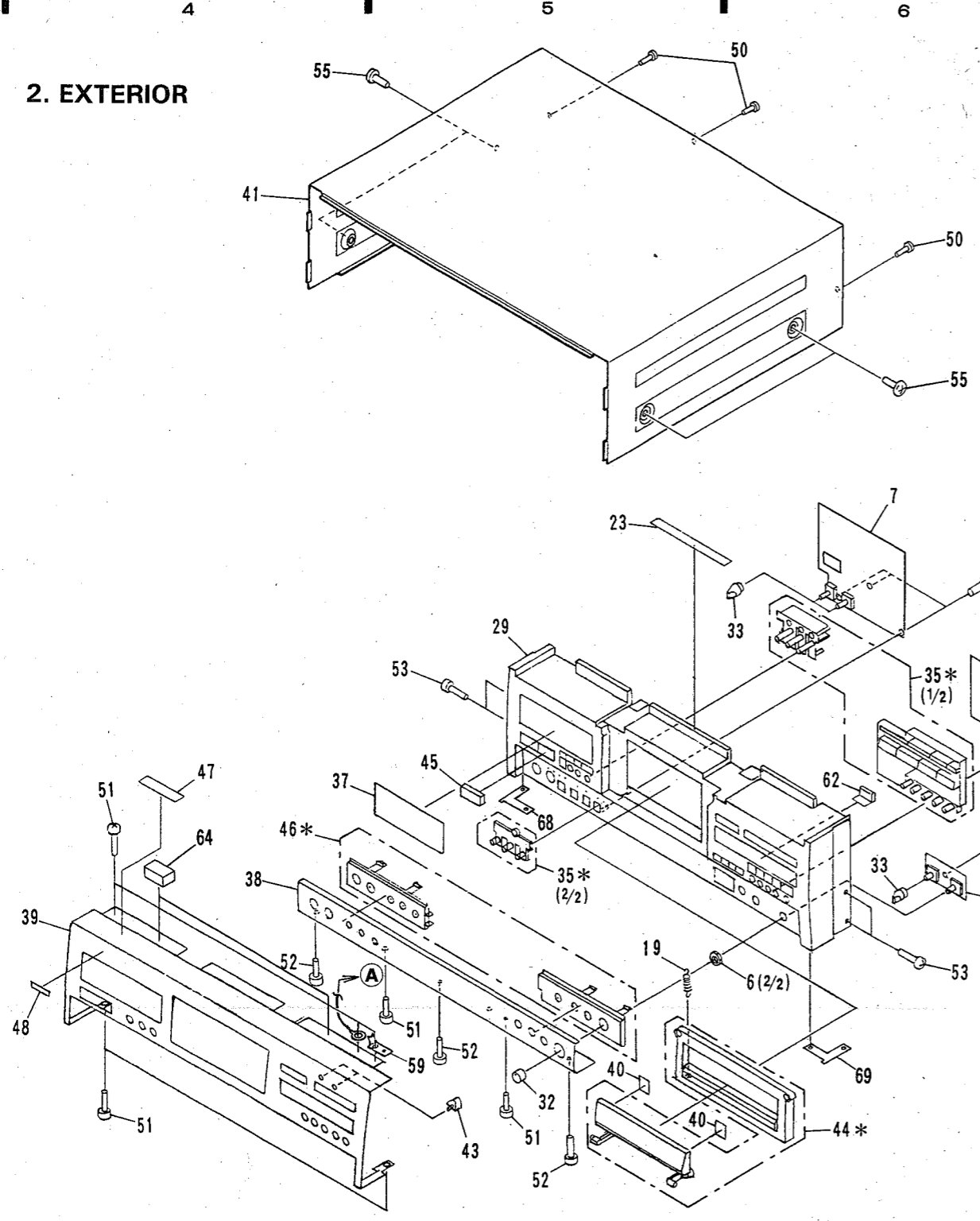


Refer to  
"3. CASSETTE I"

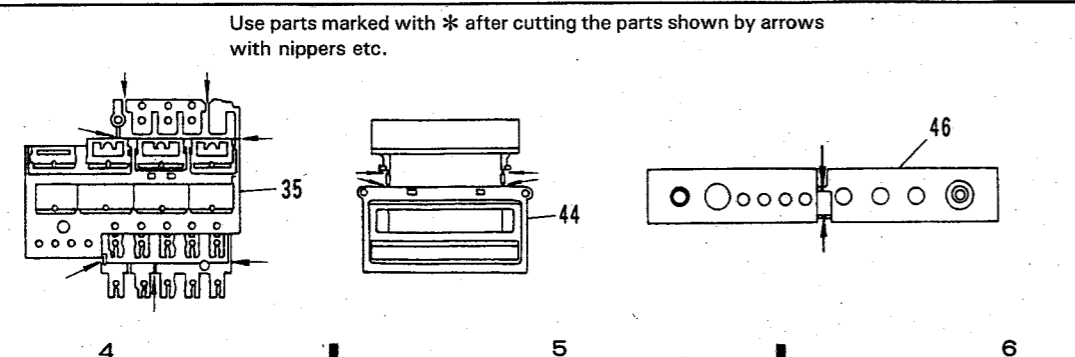
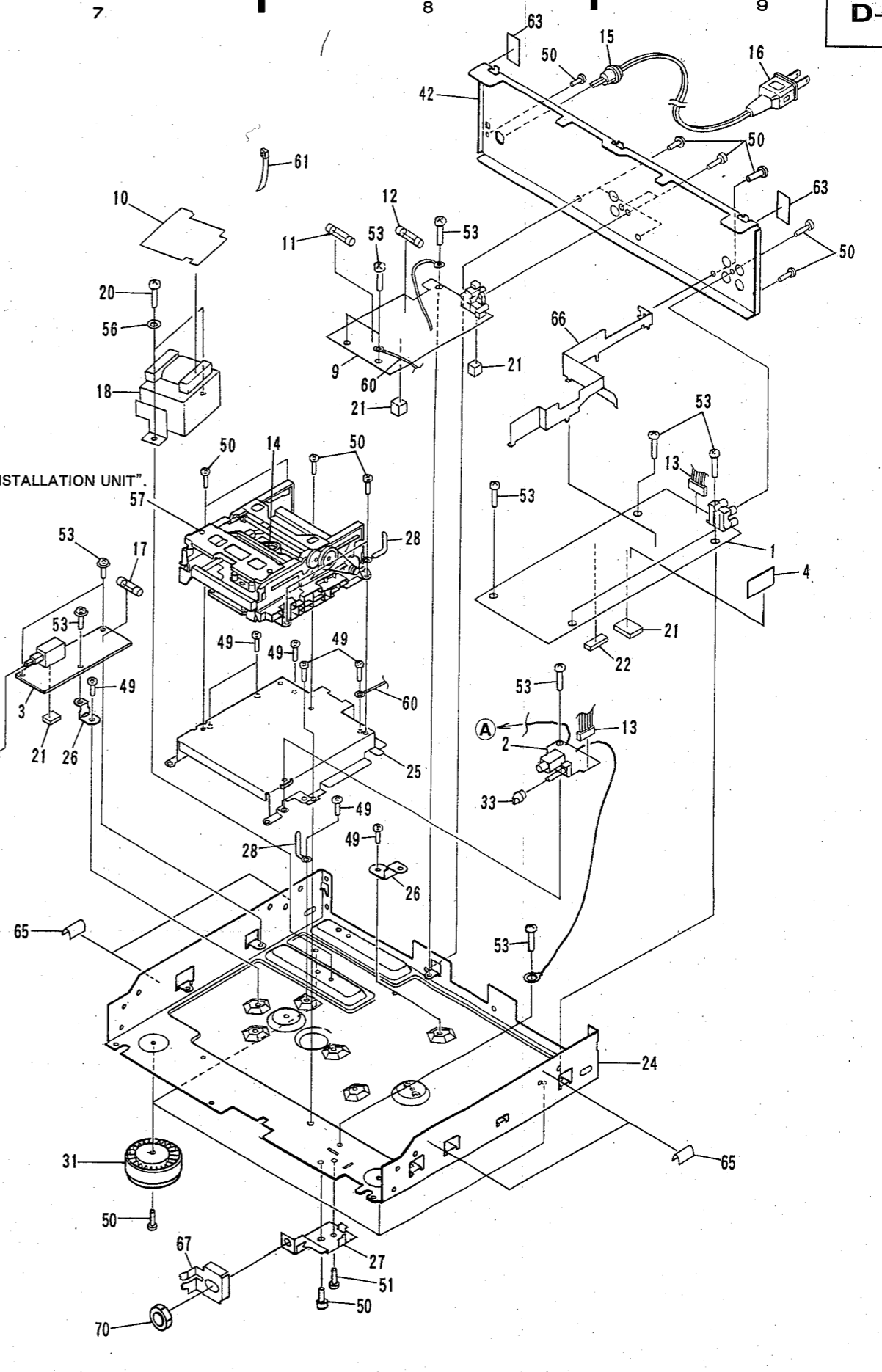
Use parts marked with \* after cutting the parts shown by arrows with nippers etc.



2. EXTERIOR



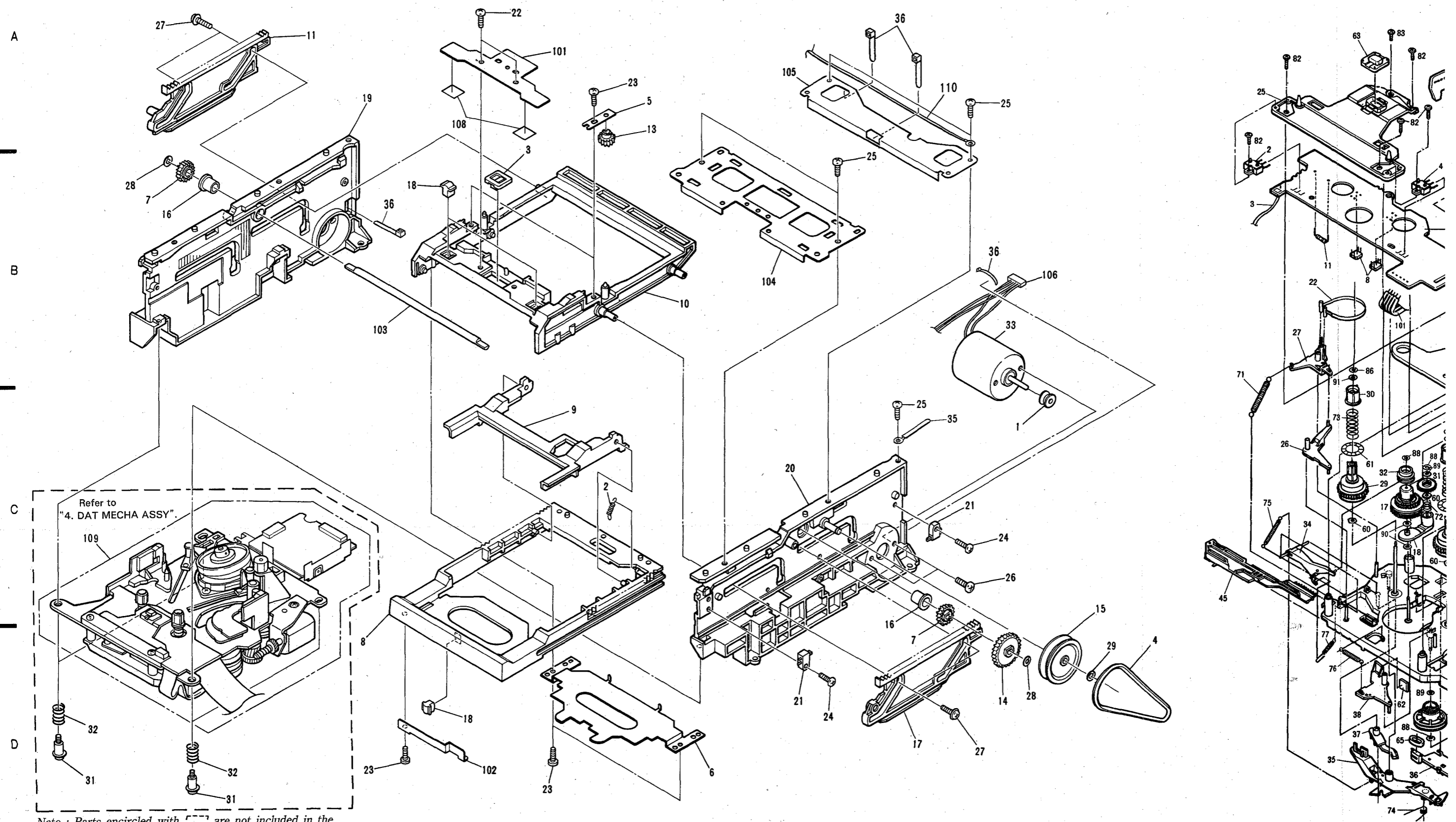
Refer to "3. CASSETTE INSTALLATION UNIT".



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

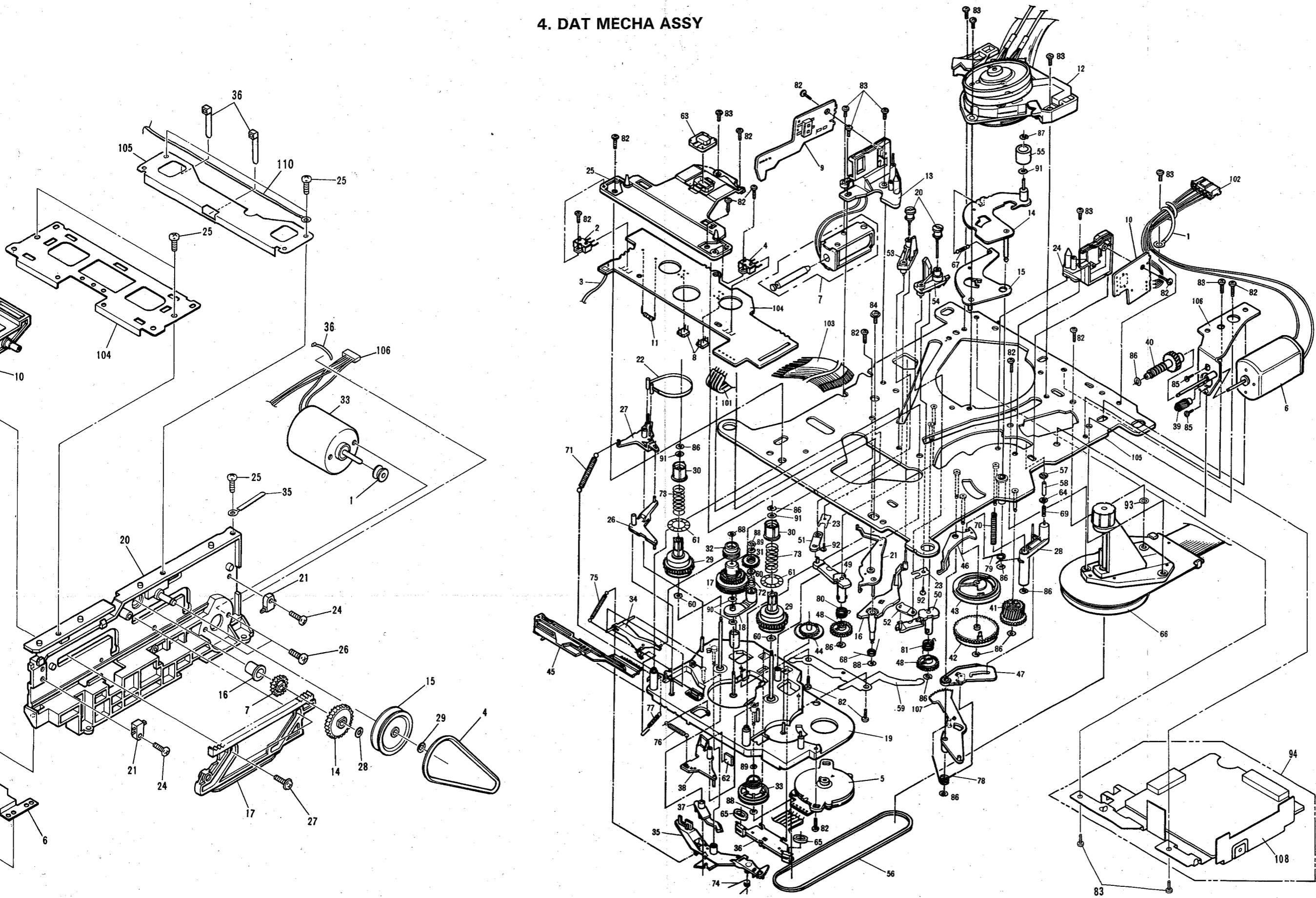
### 3. CASSETTE INSTALLATION UNIT

### 4. DAT MECHA ASSY



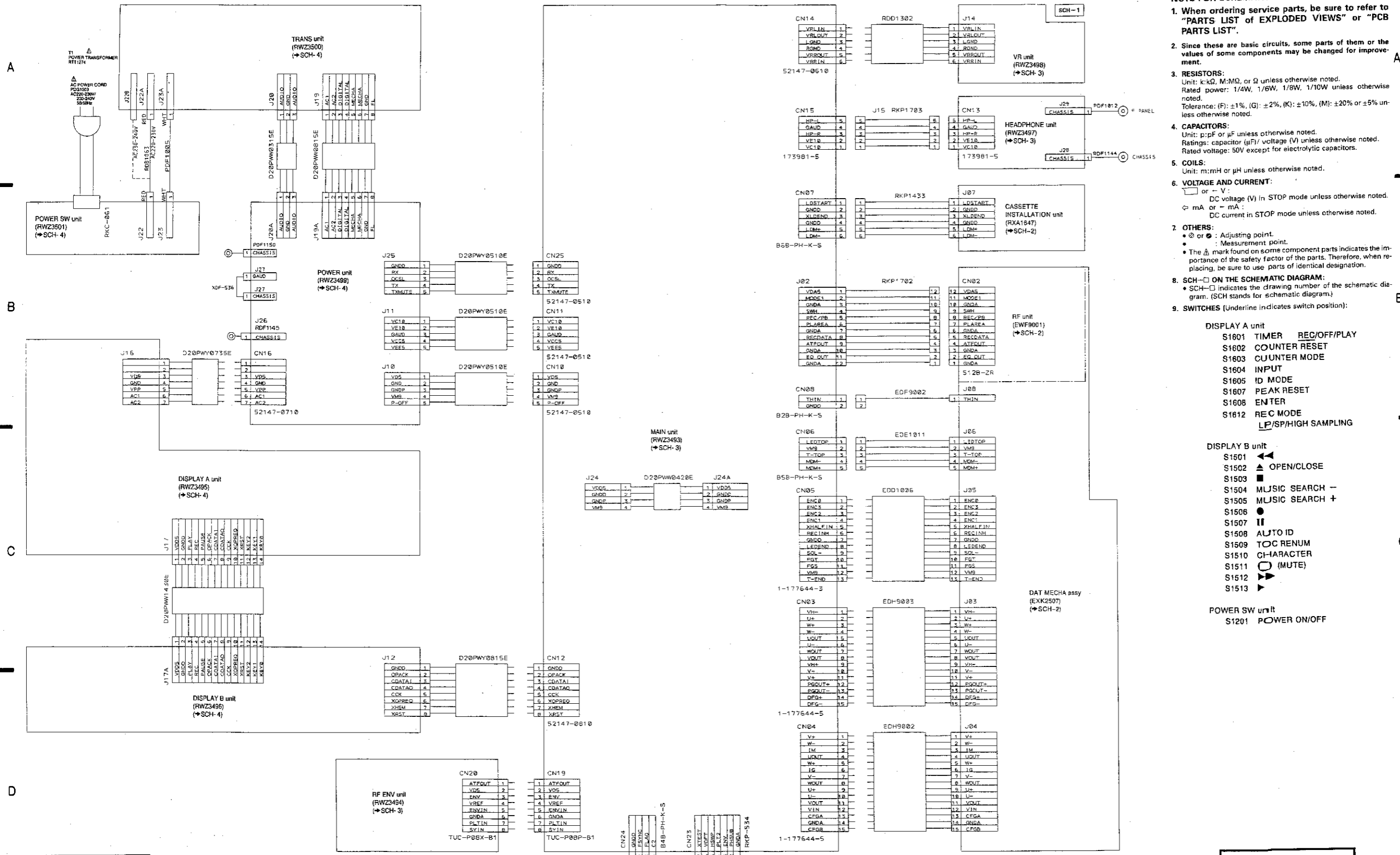
Note : Parts encircled with [ ] are not included in the Cassette installation unit.

4. DAT MECHA ASSY



# 2.2 SCHEMATIC AND PCB CONNECTION DIAGRAMS

## 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 $\Omega$ , M $\Omega$ , or  $\Omega$  unless otherwise noted.  
Rated power: 1/4W, 1/6W, 1/8W, 1/10W unless otherwise noted.  
Tolerance: (F)  $\pm 1\%$ , (G)  $\pm 2\%$ , (K)  $\pm 10\%$ , (M)  $\pm 20\%$  or  $\pm 5\%$  unless otherwise noted.
- CAPACITORS:**  
Unit: p $\mu$ F or  $\mu$ F unless otherwise noted.  
Ratings: capacitor ( $\mu$ F) / voltage (V) unless otherwise noted.  
Rated voltage: 50V except for electrolytic capacitors.
- COILS:**  
Unit: mH or  $\mu$ H 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):

- DISPLAY A unit**
- S1601 TIMER REC/OFF/PLAY
  - S1602 COUNTER RESET
  - S1603 COUNTER MODE
  - S1604 INPUT
  - S1605 ID MODE
  - S1607 PEAK RESET
  - S1608 ENTER
  - S1612 REC MODE LP/SP/HIGH SAMPLING
- DISPLAY B unit**
- S1501 ◀
  - S1502 ▲ OPEN/CLOSE
  - S1503 ■
  - S1504 MUSIC SEARCH -
  - S1505 MUSIC SEARCH +
  - S1506 ●
  - S1507 II
  - S1508 AUTO ID
  - S1509 TOC RENUM
  - S1510 CHARACTER
  - S1511 (MUTE)
  - S1512 ▶
  - S1513 ▼
- POWER SW unit**
- S1201 POWER ON/OFF

SCH-1

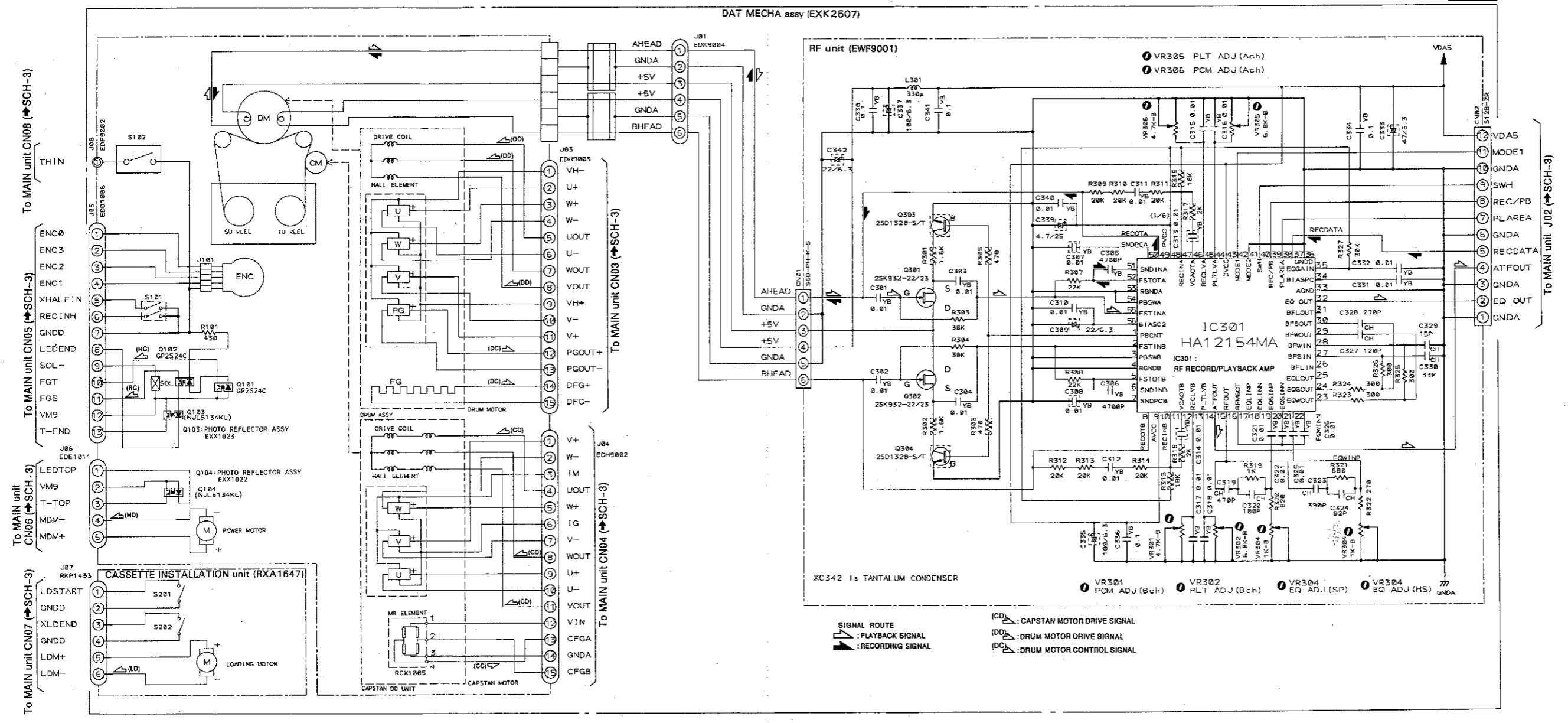
OVERALL SCHEMATIC DIAGRAM

SCH-1

OVERALL SCHEMATIC DIAGRAM

2. DAT MECHA ASSY, RF UNIT

SCH-2



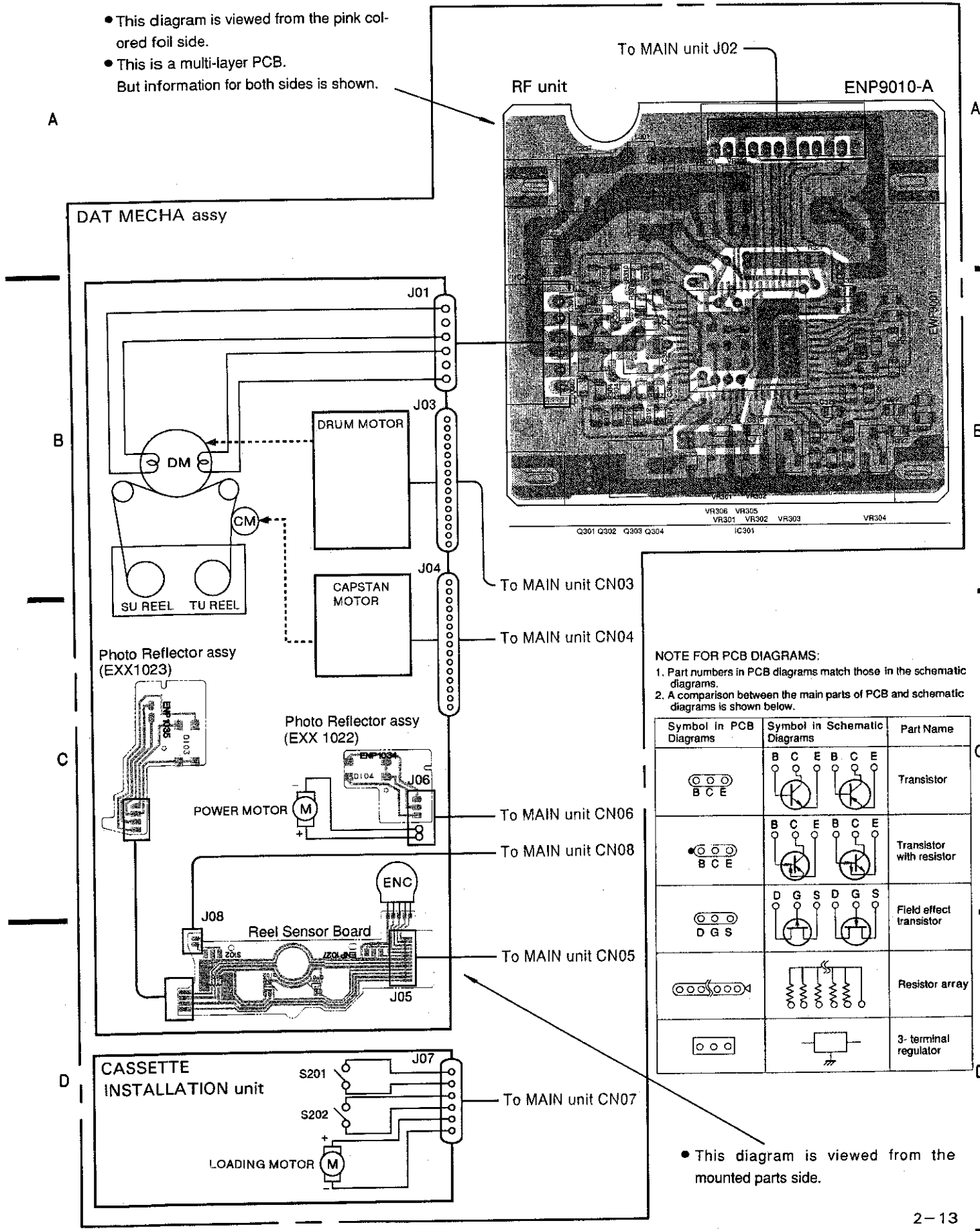
SCH-2

DAT MECHA ASSY, RF UNIT (CASSETTE INSTALLATION UNIT)

SCH-2

DAT MECHA ASSY, RF UNIT (CASSETTE INSTALLATION UNIT)

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



**NOTE FOR PCB DIAGRAMS:**

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

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

- This diagram is viewed from the mounted parts side.

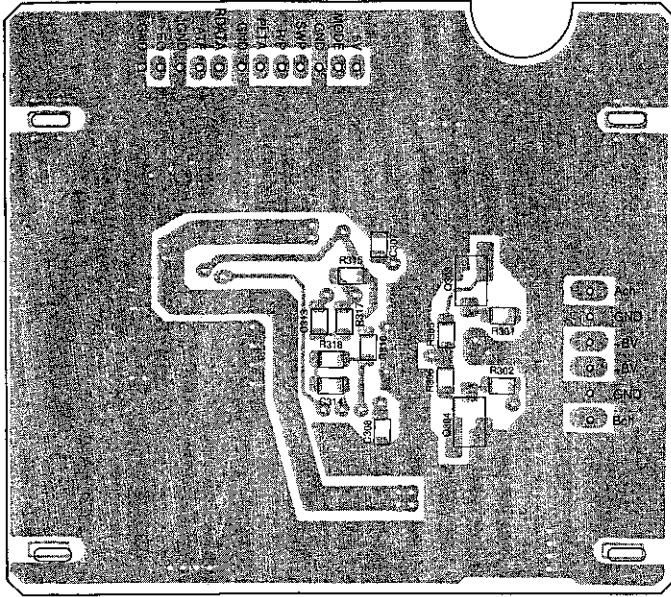




- This diagram is viewed from the gray colored foil side.
- This is a multi-layer PCB. But information for both sides is shown.

A-01009PNE

RF unit



A

B

C

D

Photo Reflector assy (EXX1023)

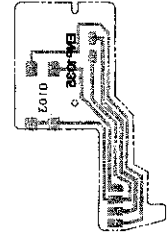
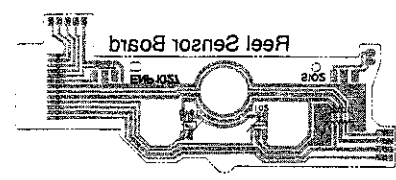
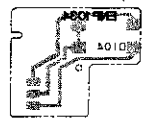


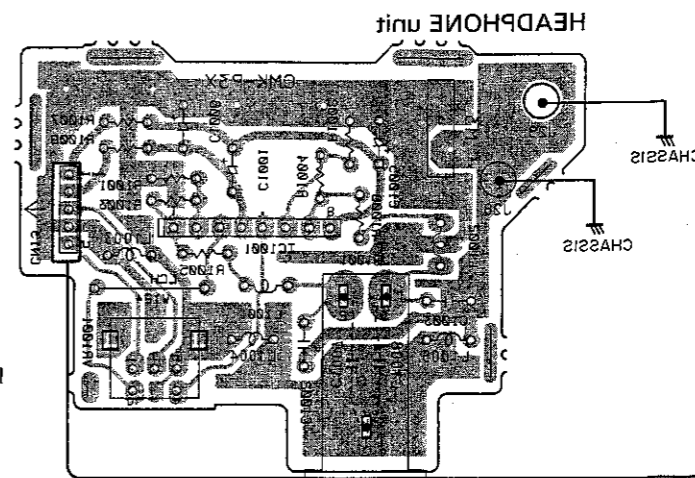
Photo Reflector assy (EXX1022)



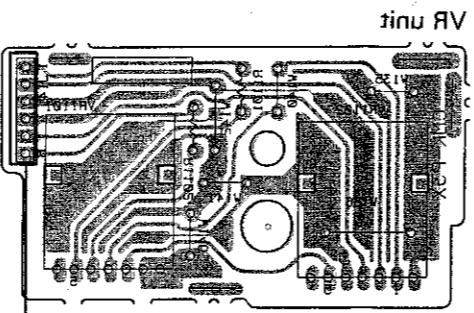
- This diagram is viewed from the foil side.



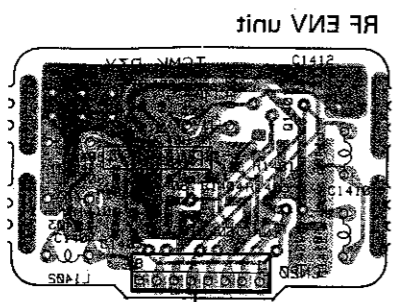
3. MAIN UNIT, VR UNIT, HEADPHONE UNIT, RF ENV UNIT



HEADPHONE unit



VR unit



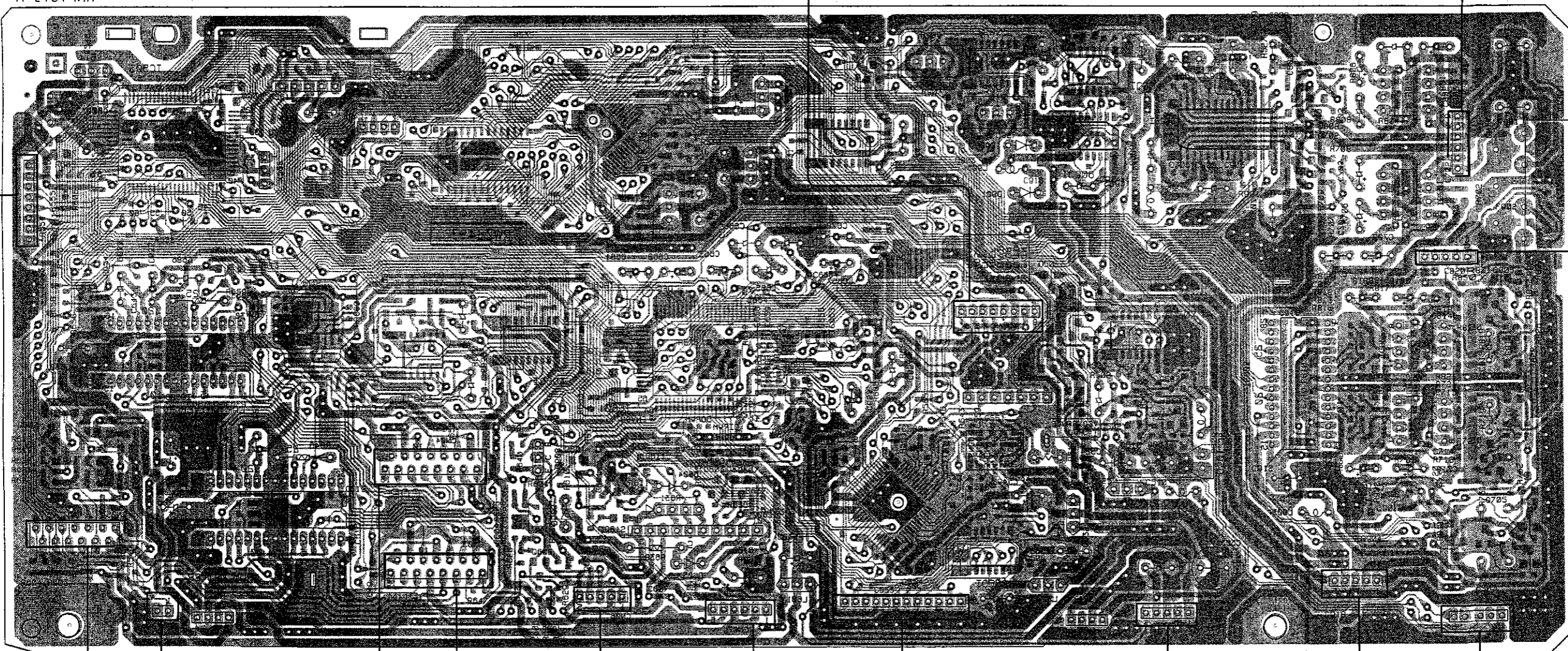
RF ENV unit

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

- This diagram is viewed from the foil side.

To DISPLAY B unit J15

IC802 0813 0814 IC808 0804 0801 0802 0805  
 IC801 IC803 IC804 IC805  
 0803 0804 0805 0806 0807 0808 0809 0810 0811 0812 0813 0814 0815 0816 0817 0818 0819 0820 0821 0822 0823 0824 0825 0826 0827 0828 0829 0830 0831 0832 0833 0834 0835 0836 0837 0838 0839 0840 0841 0842 0843 0844 0845 0846 0847 0848 0849 0850 0851 0852 0853 0854 0855 0856 0857 0858 0859 0860 0861 0862 0863 0864 0865 0866 0867 0868 0869 0870 0871 0872 0873 0874 0875 0876 0877 0878 0879 0880 0881 0882 0883 0884 0885 0886 0887 0888 0889 0890 0891 0892 0893 0894 0895 0896 0897 0898 0899 0900

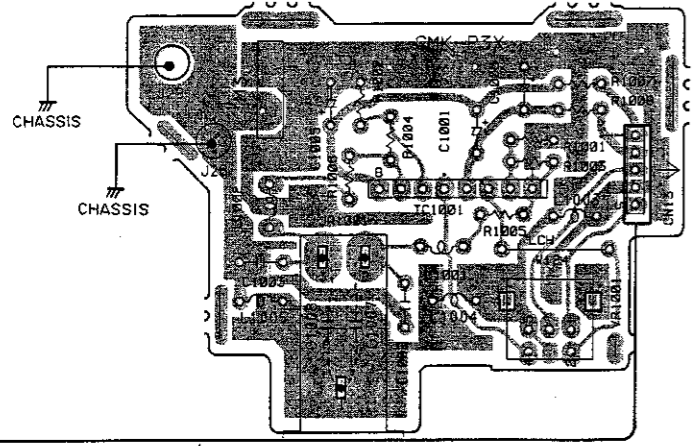


MAIN unit

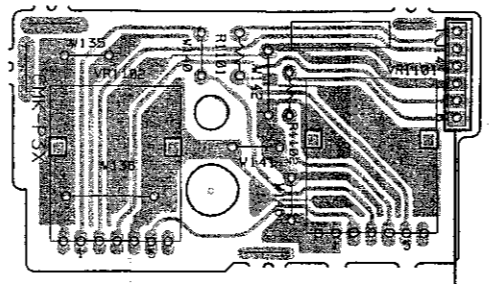
- To DAT MECHA Assy 102
- To DAT MECHA Assy 108
- To DAT MECHA Assy 103
- To DAT MECHA Assy 104
- To DAT MECHA Assy 108
- To CASSETTE INSTALLATION unit 107
- To POWER unit 125
- To POWER unit 111
- To RF unit C105
- To POWER unit 110

### 3. MAIN UNIT, VR UNIT, HEADPHONE UNIT, RF ENV UNIT

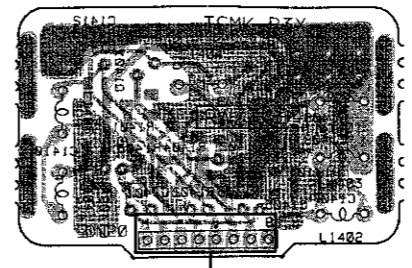
HEADPHONE unit



VR unit



RF ENV unit



• This diagram is viewed from the mounted parts side.

• This diagram is viewed from the pink colored foil side.  
• This PCB is double sided.

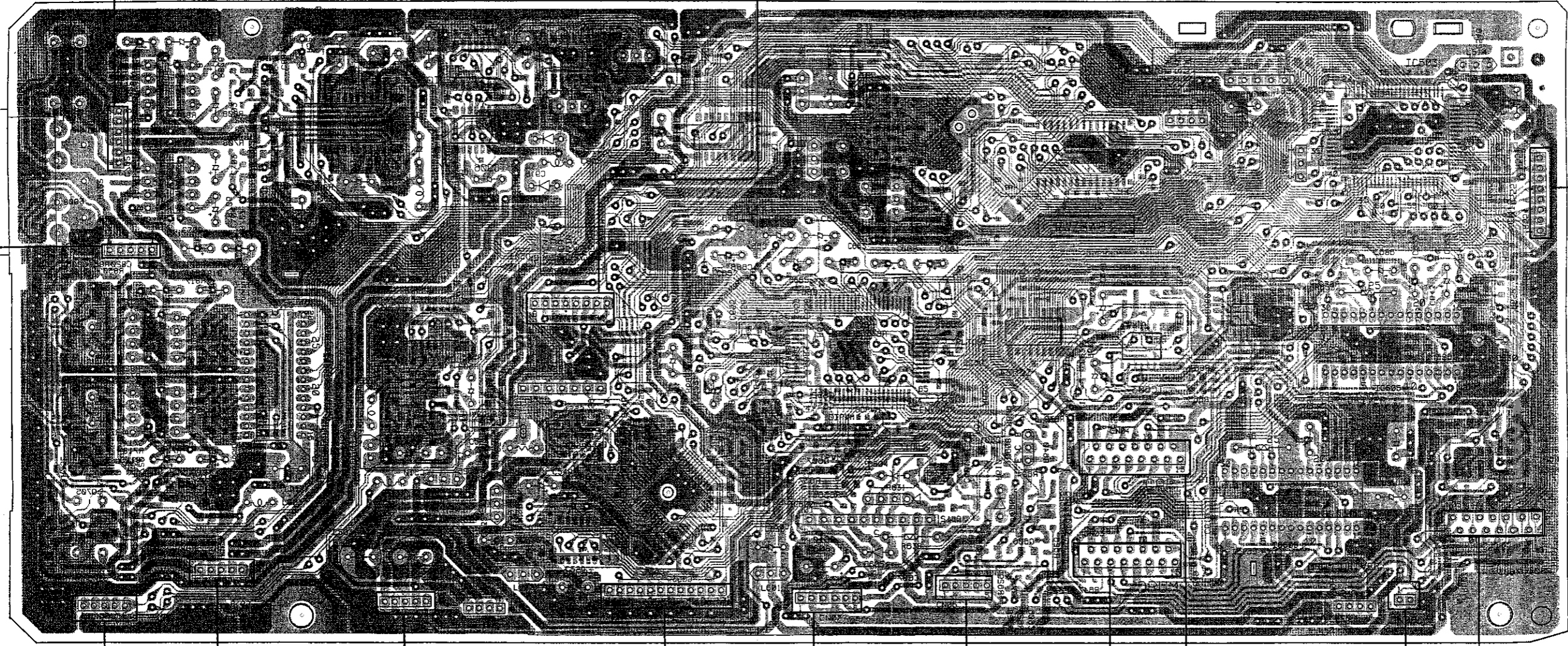
To DISPLAY B unit J12

- Q704 Q804 Q805 Q705
- IC801 IC701 IC702 IC802 Q901 Q904
- IC903
- IC902
- IC904 IC905 IC507 Q501-Q505
- IC905 Q903 IC508
- Q902 IC509 Q609 IC504
- IC501 Q615 IC504 IC502 IC603
- IC505 Q509 Q508 IC503 IC602 Q613 Q614 IC605
- Q607 Q610 IC607 Q611 Q603 Q612 Q606 Q608
- Q604 Q601 Q605 Q602

MAIN unit

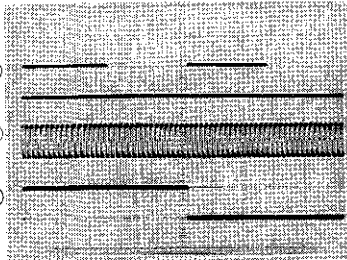
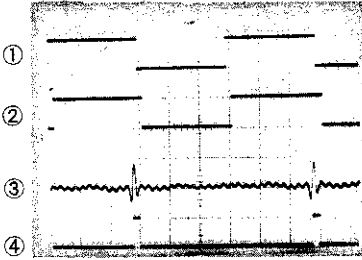
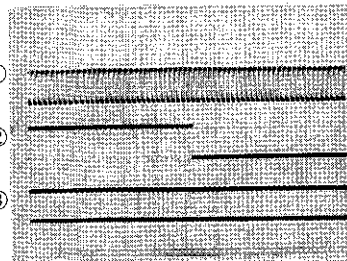
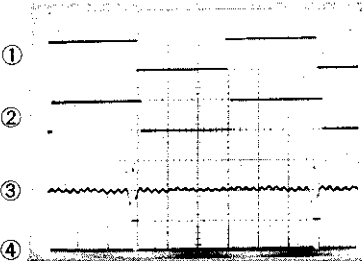
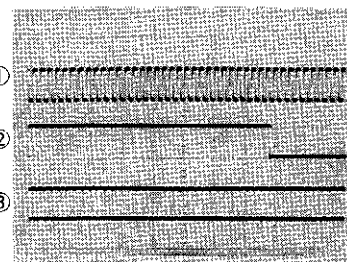
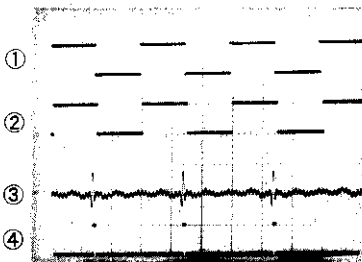
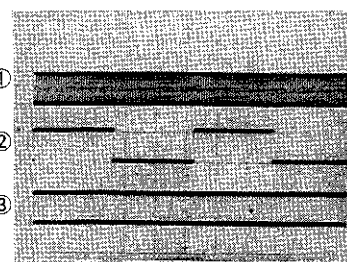
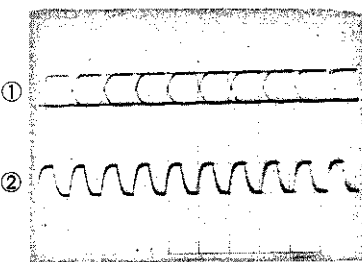
VR501

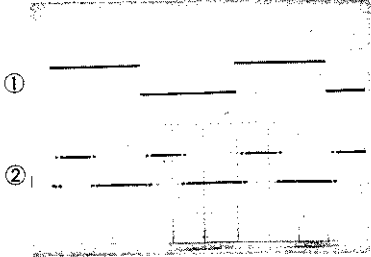
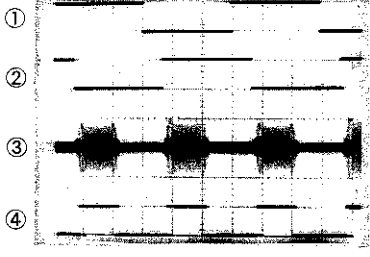
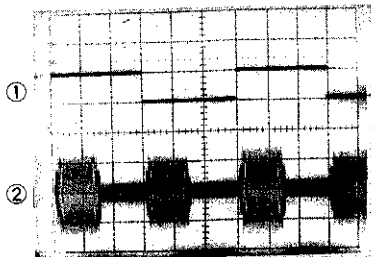
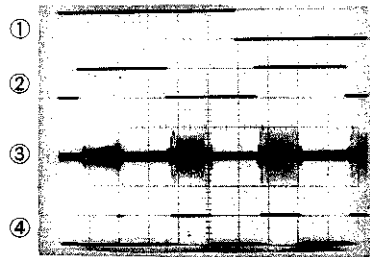
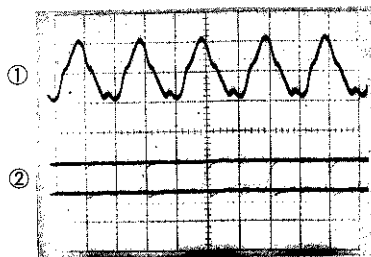
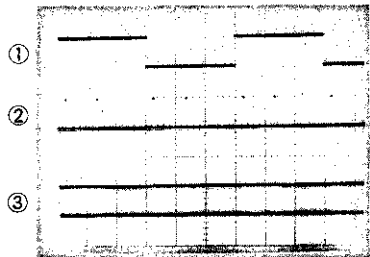
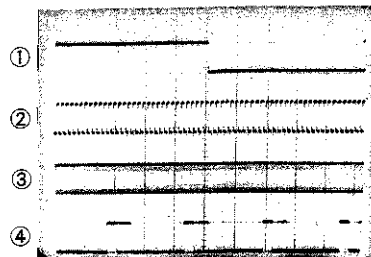
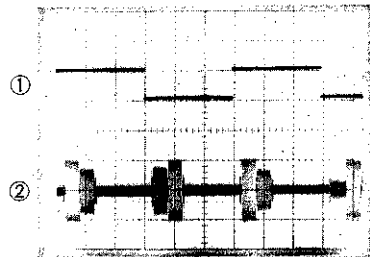
RNP1613-A



- To POWER unit J11
- To POWER unit J25
- To POWER unit J10
- To RF unit CN02
- To CASSETTE INSTALLATION unit J07
- To DAT MECHA assy J06
- To DAT MECHA assy J04
- To DAT MECHA assy J03
- To DAT MECHA assy J08
- To DAT MECHA assy J05

● Waveforms

<p><b>A1 : ADC</b></p>  <p>Mode: SP (REC) Input: 1kHz, 0dB 5Vdiv., 2<math>\mu</math>S/div.</p> <p>① SDATA (IC902-Pin16) ② SCLK (IC902-Pin15) ③ L/R (IC902-Pin14)</p>	<p><b>D1</b></p>  <p>Mode: SP (PLAY) 5Vdiv., 5mS/div. (DPG: 0.5V/div.)</p> <p>① SWH (IC601-Pin70) ② SREF (IC601-Pin71) ③ DPG (IC603-Pin1) ④ TACH (IC601-Pin7)</p>
<p><b>A2 : DAC</b></p>  <p>Mode: SP (REC) Input: 1kHz, 0dB 5Vdiv., 2<math>\mu</math>S/div.</p> <p>① BCK (IC903-Pin26) ② LRCK (IC903-Pin27) ③ DATA (IC903-Pin25)</p>	<p><b>D2</b></p>  <p>Mode: LP (REC-PLAY) 5Vdiv., 10mS/div. (DPG: 0.5V/div.)</p> <p>① SWH (IC601-Pin70) ② SREF (IC601-Pin71) ③ DPG (IC603-Pin1) ④ TACH (IC601-Pin7)</p>
<p><b>A3 : DAC</b></p>  <p>Mode: LP (REC) Input: 1kHz, 0dB 5Vdiv., 2<math>\mu</math>S/div.</p> <p>① BCK (IC903-Pin26) ② LRCK (IC903-Pin27) ③ DATA (IC903-Pin25)</p>	<p><b>D3</b></p>  <p>Mode: WSP (PLAY) 5Vdiv., 5mS/div. (DPG: 0.5V/div.)</p> <p>① SWH (IC601-Pin70) ② SREF (IC601-Pin71) ③ DPG (IC603-Pin1) ④ TACH (IC601-Pin7)</p>
<p><b>A4 : DAC</b></p>  <p>Mode: WSP (REC) Input: 1kHz, 0dB 5Vdiv., 2<math>\mu</math>S/div.</p> <p>① BCK (IC903-Pin26) ② LRCK (IC903-Pin27) ③ DATA (IC903-Pin25)</p>	<p><b>D4</b></p>  <p>Mode: SP (PLAY) 5Vdiv., 0.1<math>\mu</math>S/div.</p> <p>① PDATA (IC504-Pin52) ② PDCK (IC504-Pin51)</p>

<p><b>D5</b></p>  <p>Mode: SP (PLAY) 5Vdiv., 5mS/div.</p> <ul style="list-style-type: none"> <li>① SWH (IC601 - Pin70)</li> <li>② PARITY (IC601 - Pin67)</li> </ul>	<p><b>D10</b></p>  <p>Mode: SP (PLAY) 5Vdiv., 5mS/div. (ENVIN: 0.5V/div.)</p> <ul style="list-style-type: none"> <li>① FSYNC (CN24 - Pin2)</li> <li>② HSWP (CN23 - Pin5)</li> <li>③ ENV (CN23 - Pin3)</li> <li>④ ENVOUT (IC601 - Pin64)</li> </ul>
<p><b>D6</b></p>  <p>Mode: SP (PLAY)</p> <ul style="list-style-type: none"> <li>① HSWP (CN23 - Pin5) 5Vdiv., 5mS/div.</li> <li>② EQ OUT (J02 - Pin11) 0.2Vdiv., 5mS/div.</li> </ul>	<p><b>D11</b></p>  <p>Mode: LP (PLAY) 5Vdiv., 5mS/div. (ENVIN: 0.5V/div.)</p> <ul style="list-style-type: none"> <li>① FSYNC (CN24 - Pin2)</li> <li>② HSWP (CN23 - Pin5)</li> <li>③ ENV (CN23 - Pin3)</li> <li>④ ENVOUT (IC601 - Pin64)</li> </ul>
<p><b>D7</b></p>  <p>Mode: D-IN (REC) Fs=48kHz</p> <ul style="list-style-type: none"> <li>① EXCK (IC501 - Pin85) 2Vdiv., 20nS/div.</li> <li>② RX (IC501 - Pin83) 5Vdiv., 20nS/div.</li> </ul>	<p><b>D12</b></p>  <p>Mode: SP (REC) 5Vdiv., 5mS/div.</p> <ul style="list-style-type: none"> <li>① HSWP (CN23 - Pin5)</li> <li>② PLAREA (J02 - Pin6)</li> <li>③ RECDATA (J02 - Pin8)</li> </ul>
<p><b>D9</b></p>  <p>Mode: SP (REC) Input: No input 5Vdiv., 2μS/div.</p> <ul style="list-style-type: none"> <li>① MPX (IC501 - Pin73)</li> <li>② BCK (IC501 - Pin72)</li> <li>③ FS256 (IC501 - Pin70)</li> <li>④ SOUT (IC501 - Pin71)</li> </ul>	<p><b>D13</b></p>  <p>Mode: SP (PLAY) Test Tape: TY7111</p> <ul style="list-style-type: none"> <li>① HSWP (CN23 - Pin5) 5Vdiv., 5mS/div.</li> <li>② PLT2 (CN23 - Pin4) 0.1Vdiv., 5mS/div.</li> </ul>

The waveforms D8 and D14 are shown on page 2-25 and page 2-26.

A

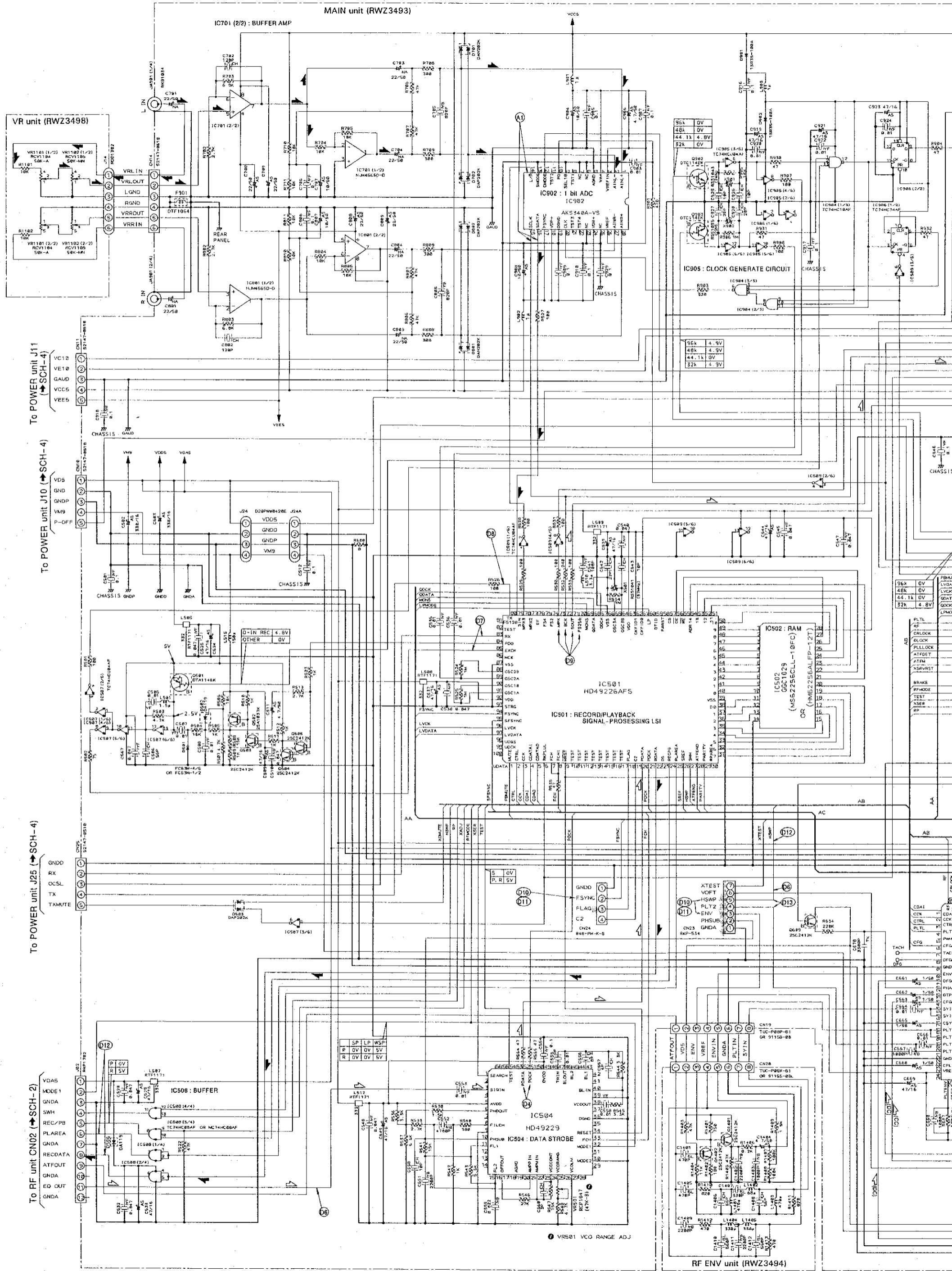
B

C

D

E

F

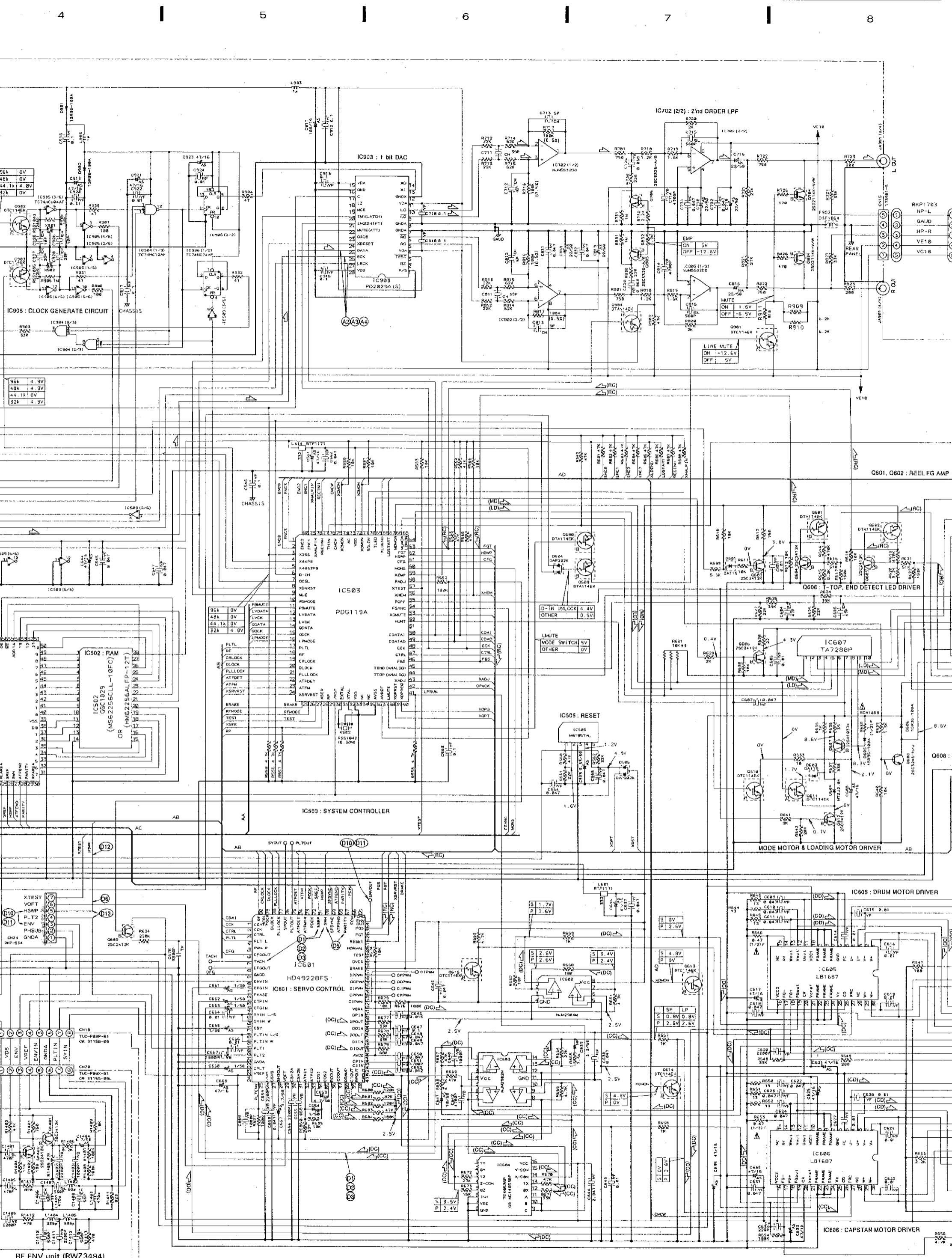


**SCH-3**

MAIN UNIT, VR UNIT, HEADPHONE UNIT,  
RF ENV UNIT

NOTE)  
S: STOP  
P: PLAY  
R: REC

SIGNAL ROUTE  
▶: PLAYBACK SIGNAL  
◀: RECORDING SIGNAL

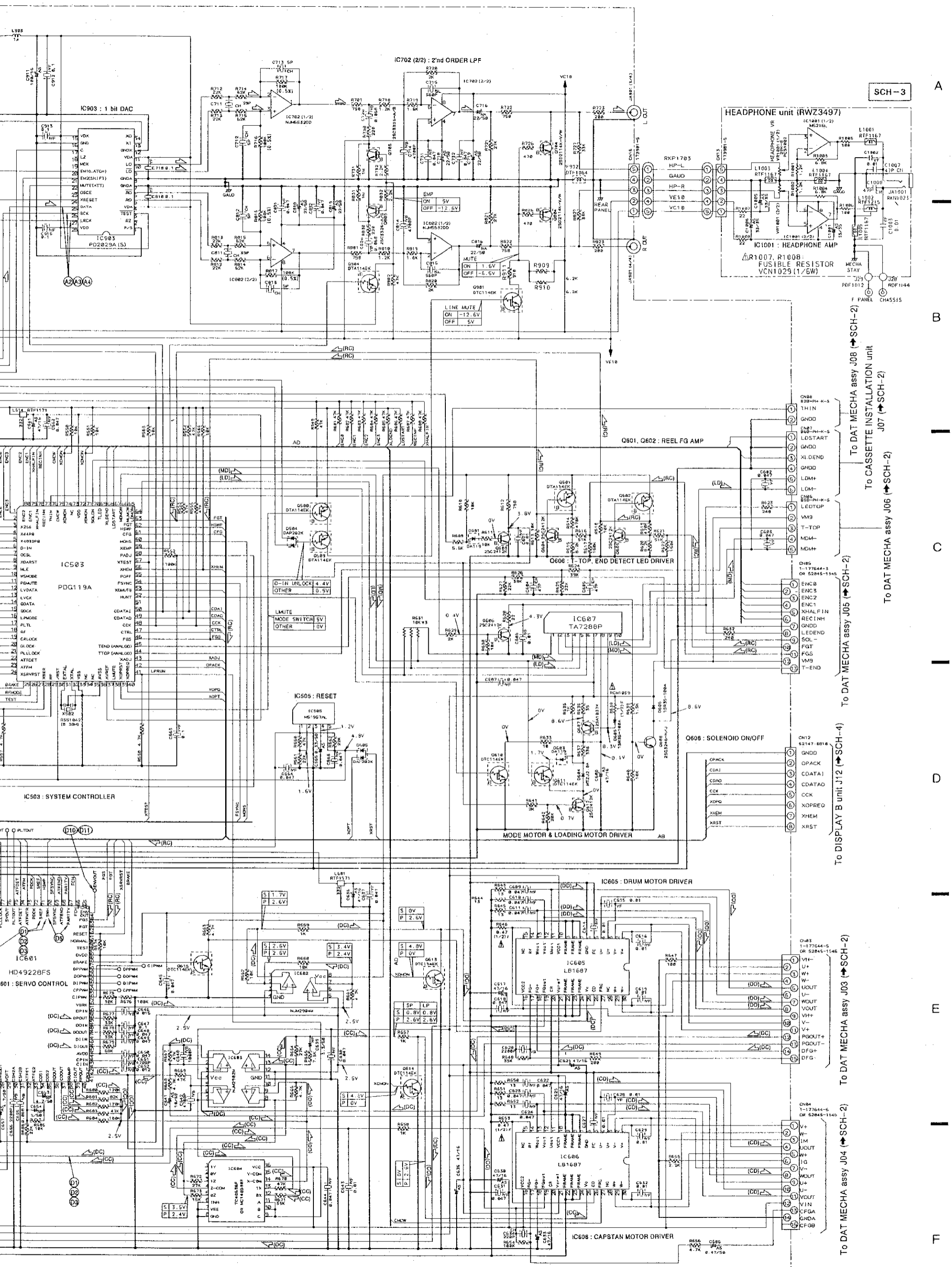


NOTE: S: STOP  
 P: PLAY  
 R: REC

(S) : SIGNAL ROUTE  
 (P) : PLAYBACK SIGNAL ROUTE  
 (R) : RECORDING SIGNAL ROUTE

(DC) : CAPSTAN MOTOR DRIVE SIGNAL  
 (LD) : DRUM MOTOR CONTROL SIGNAL  
 (MD) : CAPSTAN MOTOR CONTROL SIGNAL  
 (RD) : LOADING MOTOR DRIVE SIGNAL  
 (DD) : DRUM MOTOR DRIVE SIGNAL  
 (RC) : REEL CONTROL SIGNAL

MAIN UNIT, VR UNIT, HEADPHONE UNIT, RF ENV UNIT



SCH-3

To DAT MECHA assy J08 (SCH-2)

To CASSETTE INSTALLATION unit J07 (SCH-2)

To DAT MECHA assy J06 (SCH-2)

To DAT MECHA assy J05 (SCH-2)

To DISPLAY B unit J12 (SCH-4)

To DAT MECHA assy J03 (SCH-2)

To DAT MECHA assy J04 (SCH-2)

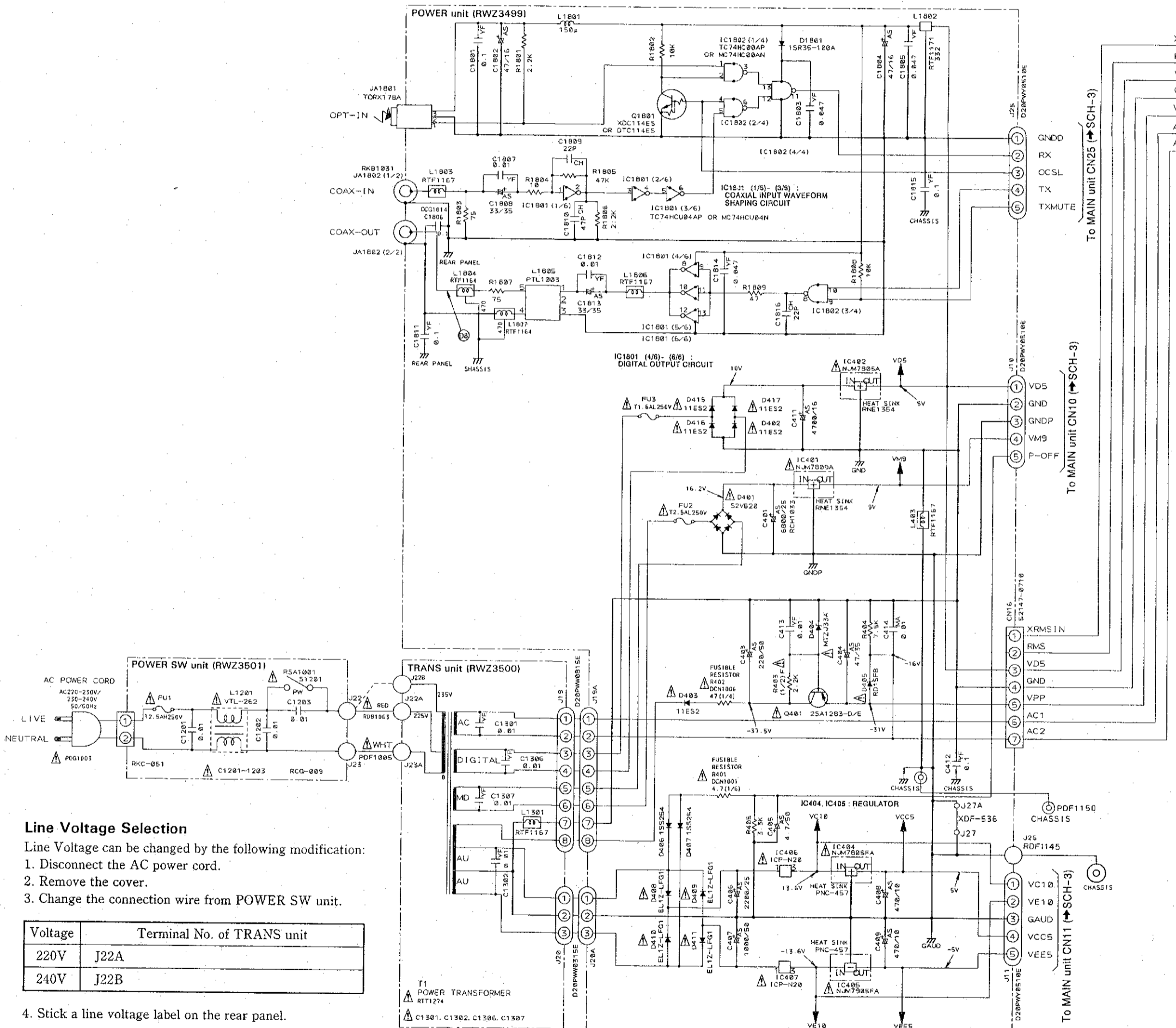
(CD) : CAPSTAN MOTOR DRIVE SIGNAL  
 (CC) : CAPSTAN MOTOR CONTROL SIGNAL  
 (DC) : DRUM MOTOR DRIVE SIGNAL  
 (DD) : DRUM MOTOR CONTROL SIGNAL  
 (LD) : LOADING MOTOR DRIVE SIGNAL  
 (MD) : MODE MOTOR DRIVE SIGNAL  
 (RC) : REEL CONTROL SIGNAL

MAIN UNIT, VR UNIT, HEADPHONE UNIT, RF ENV UNIT

SCH-3



### 4. DISPLAY A UNIT, DISPLAY B UNIT, POWER UNIT, TRANS UNIT, POWER SW UNIT



#### Line Voltage Selection

Line Voltage can be changed by the following modification:

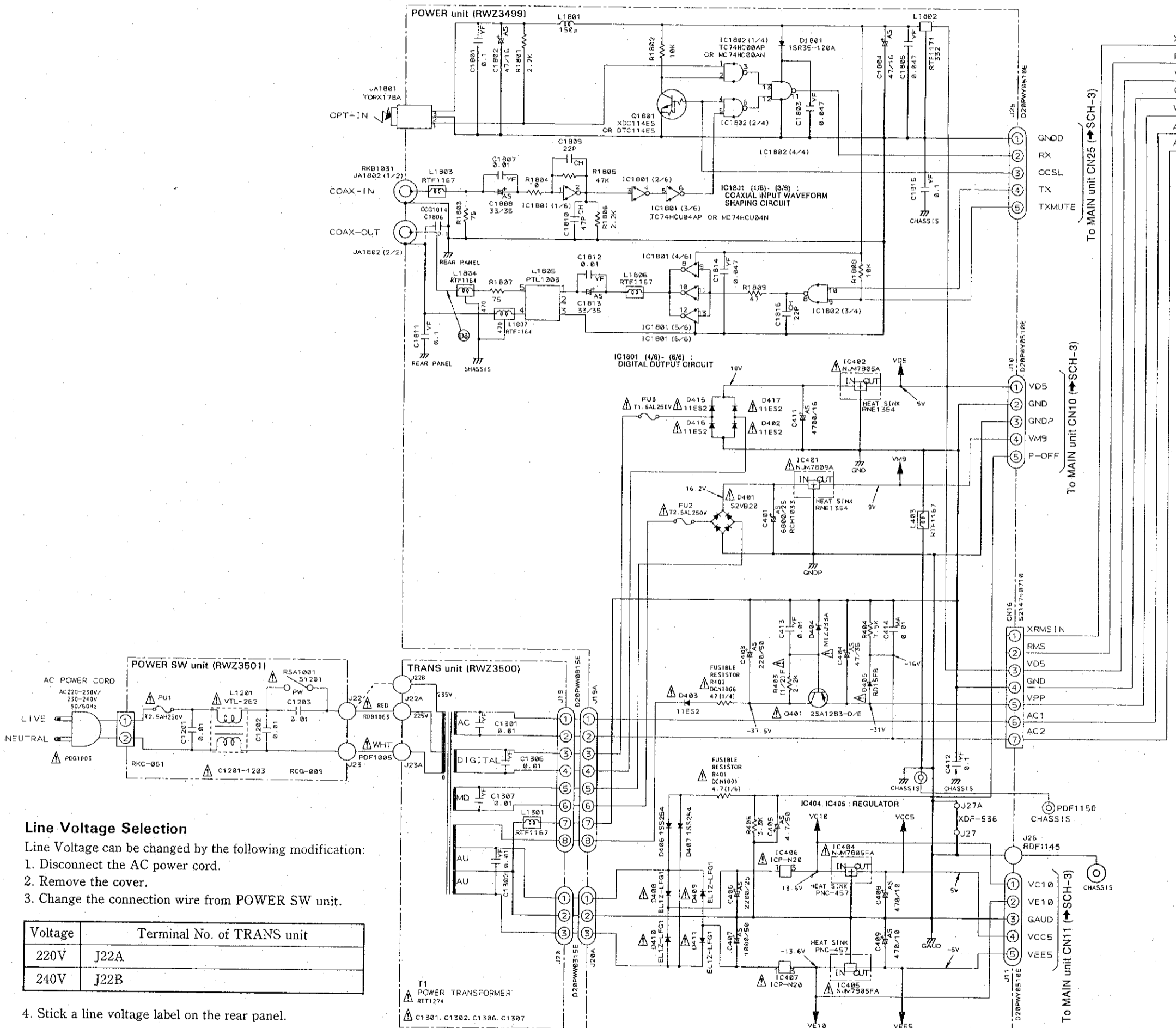
1. Disconnect the AC power cord.
2. Remove the cover.
3. Change the connection wire from POWER SW unit.

Voltage	Terminal No. of TRANS unit
220V	J22A
240V	J22B

4. Stick a line voltage label on the rear panel.

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

### 4. DISPLAY A UNIT, DISPLAY B UNIT, POWER UNIT, TRANS UNIT, POWER SW UNIT



#### Line Voltage Selection

Line Voltage can be changed by the following modification:

1. Disconnect the AC power cord.
2. Remove the cover.
3. Change the connection wire from POWER SW unit.

Voltage	Terminal No. of TRANS unit
220V	J22A
240V	J22B

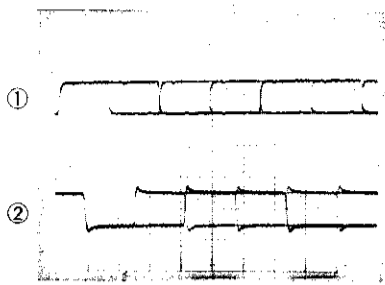
4. Stick a line voltage label on the rear panel.

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

# SCH-4

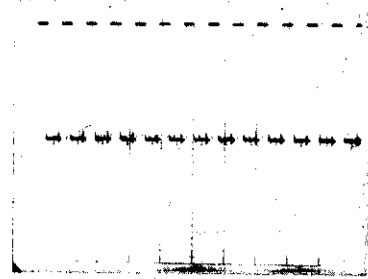
DISPLAY A UNIT, DISPLAY B UNIT, POWER UNIT, TRANS UNIT, POWER SW UNIT

D8



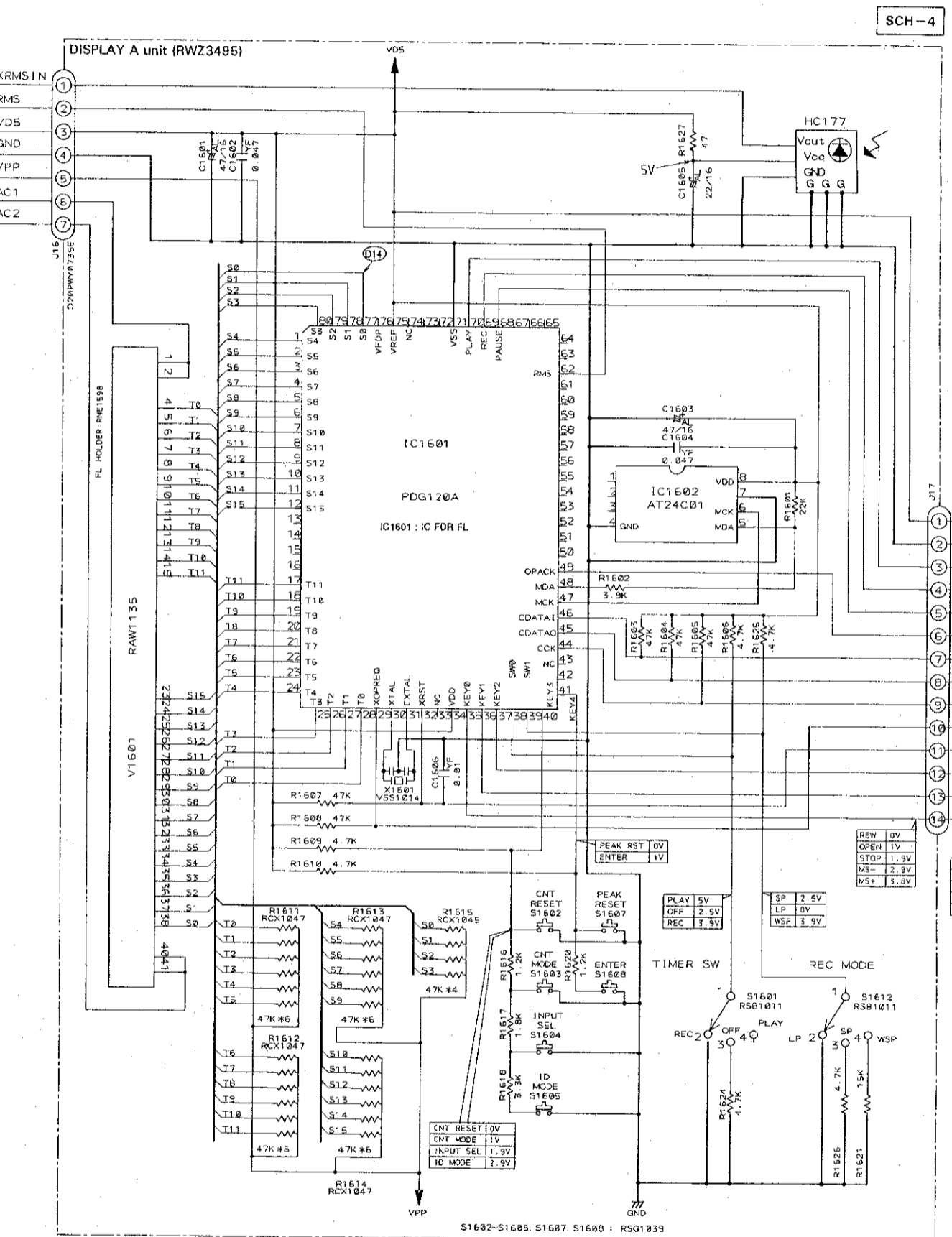
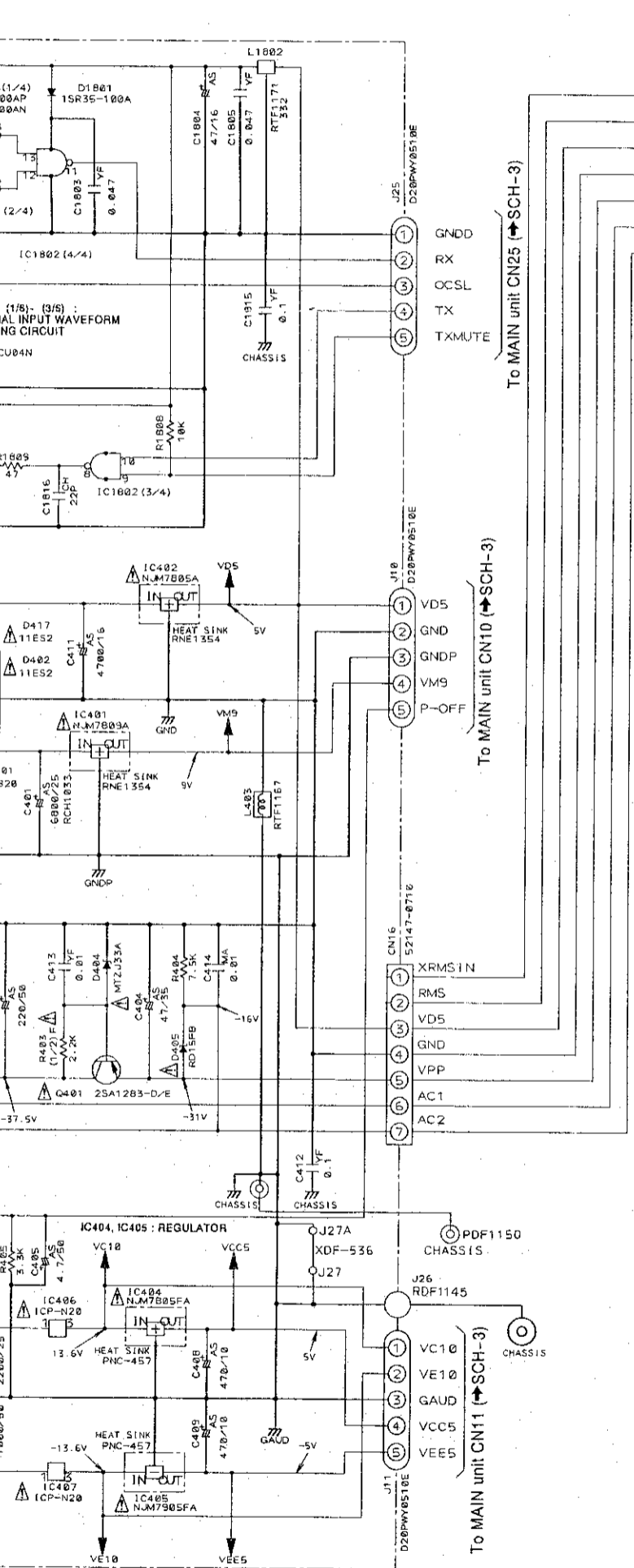
Mode: D-IN (REC)

D14



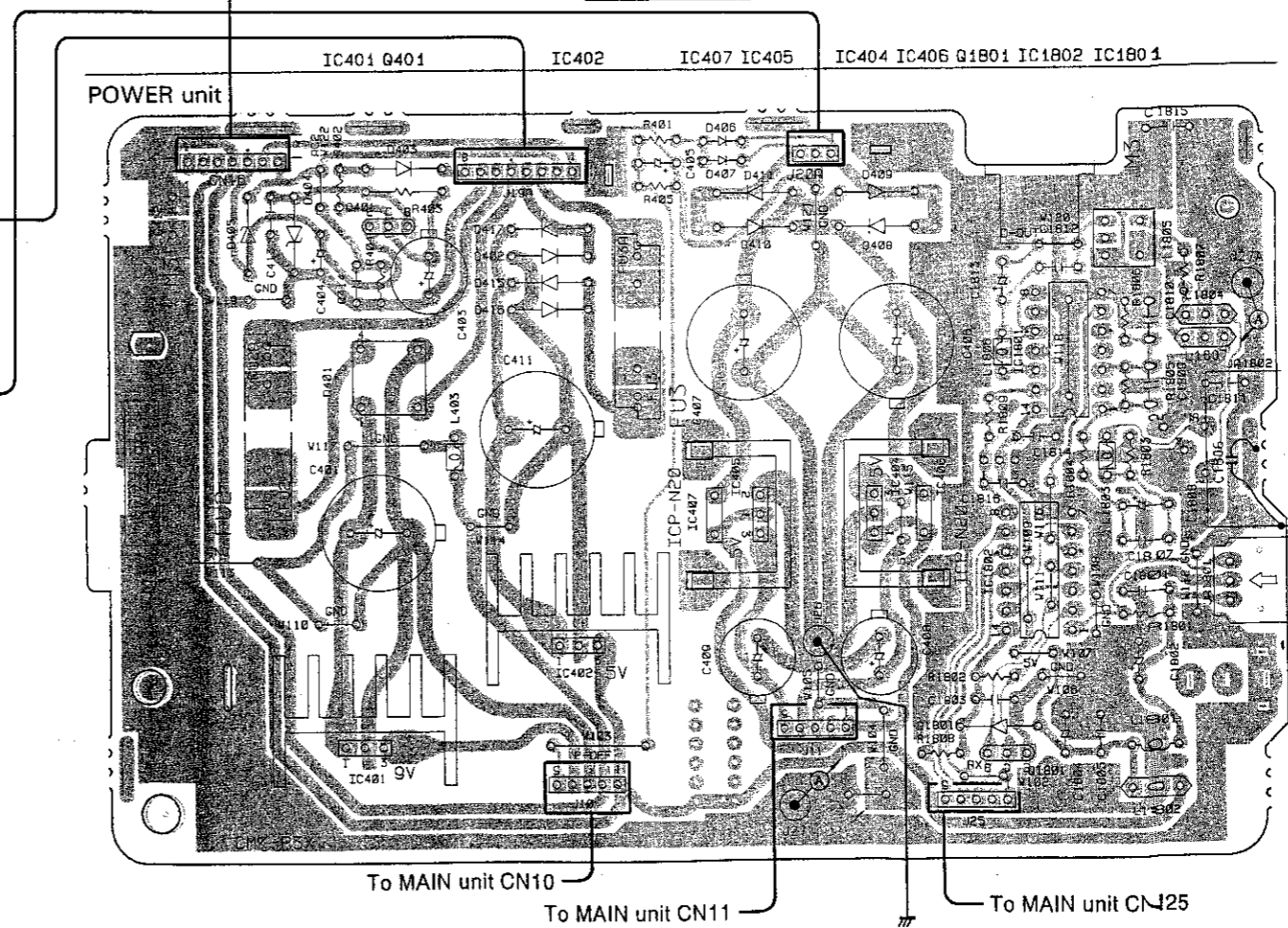
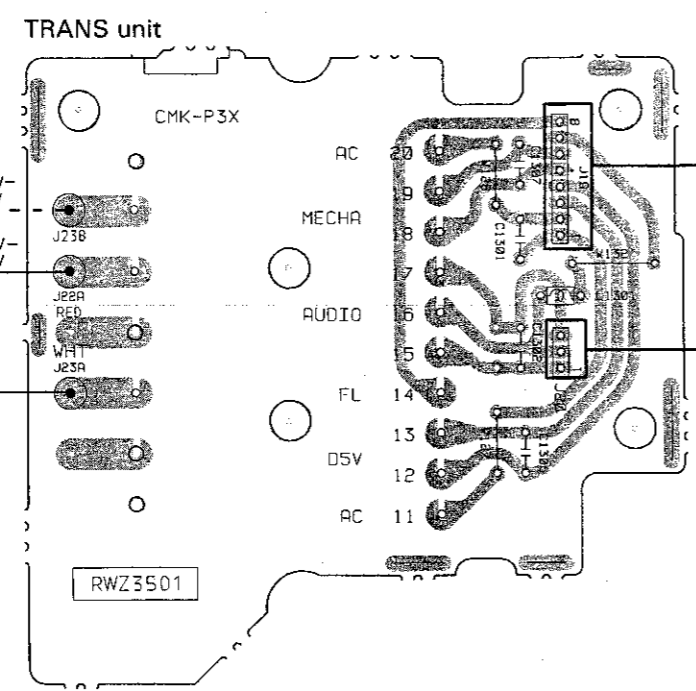
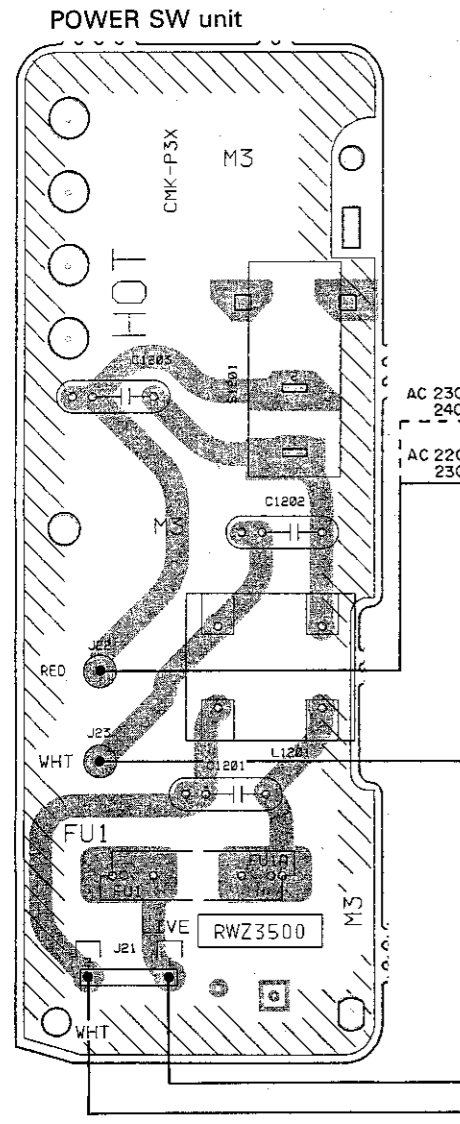
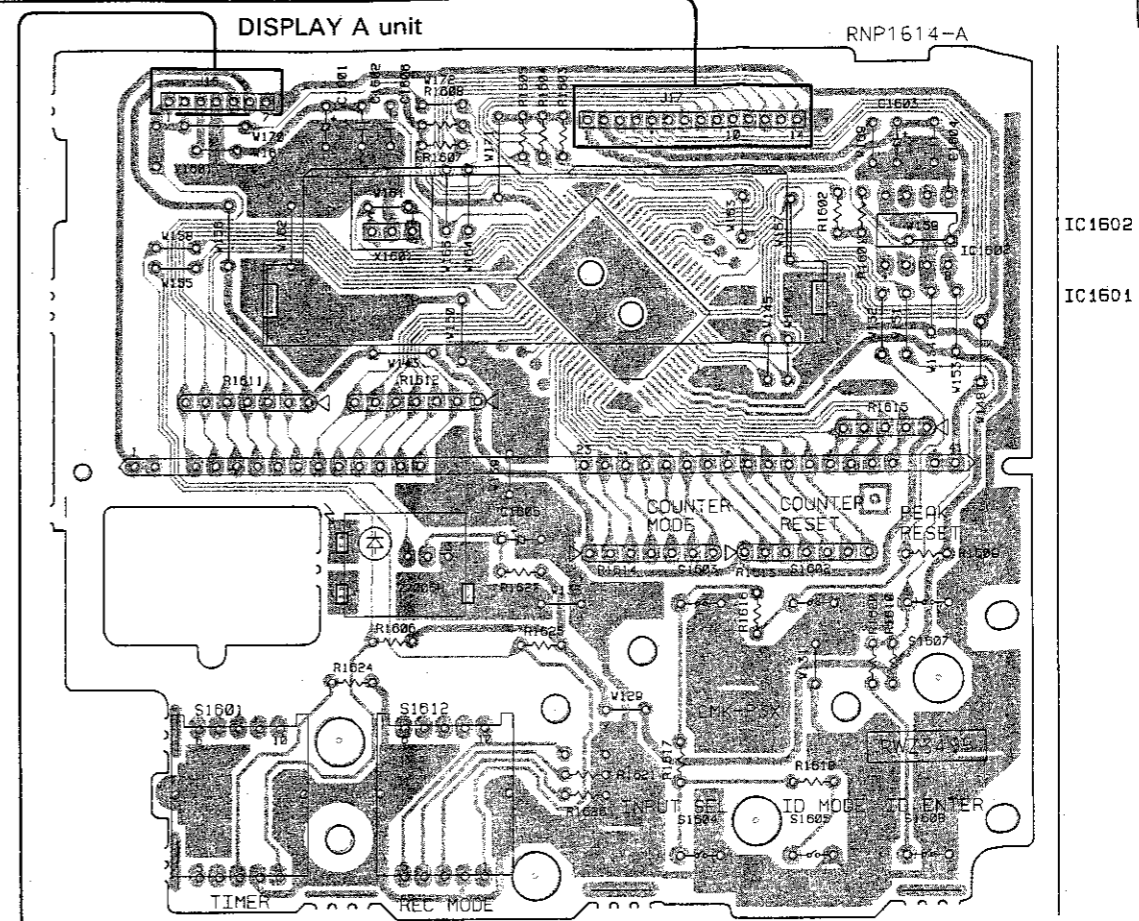
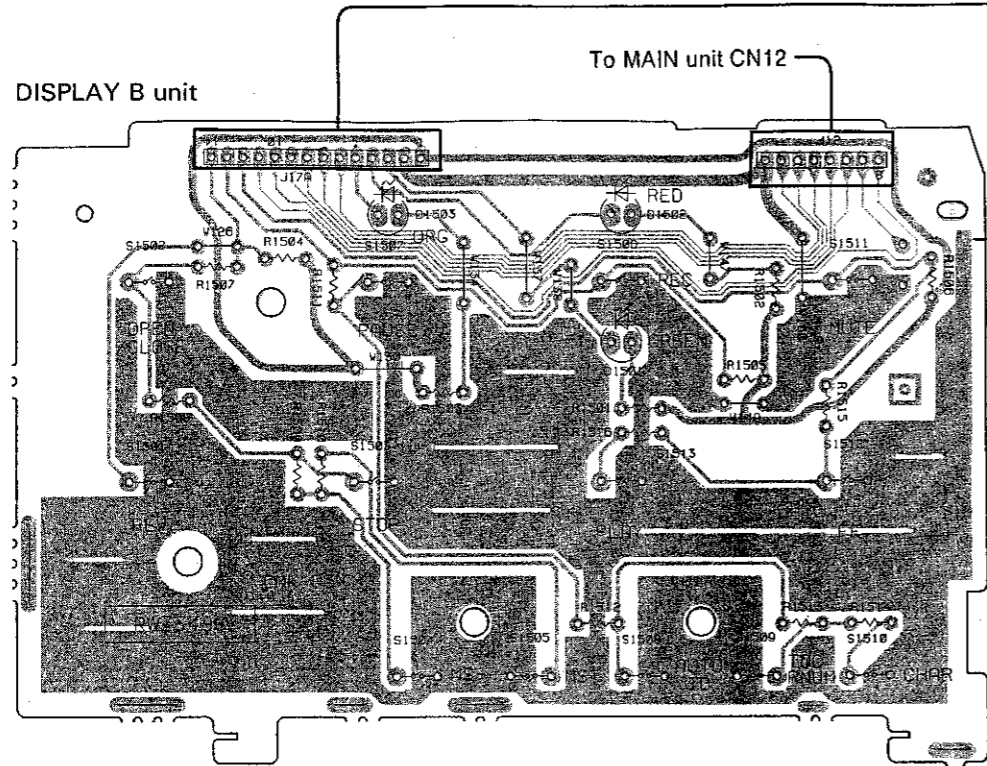
Mode: STOP  
10V/div., 2mS/div.

SO (Segment)  
(IC1601-Pin50)



SCH-4





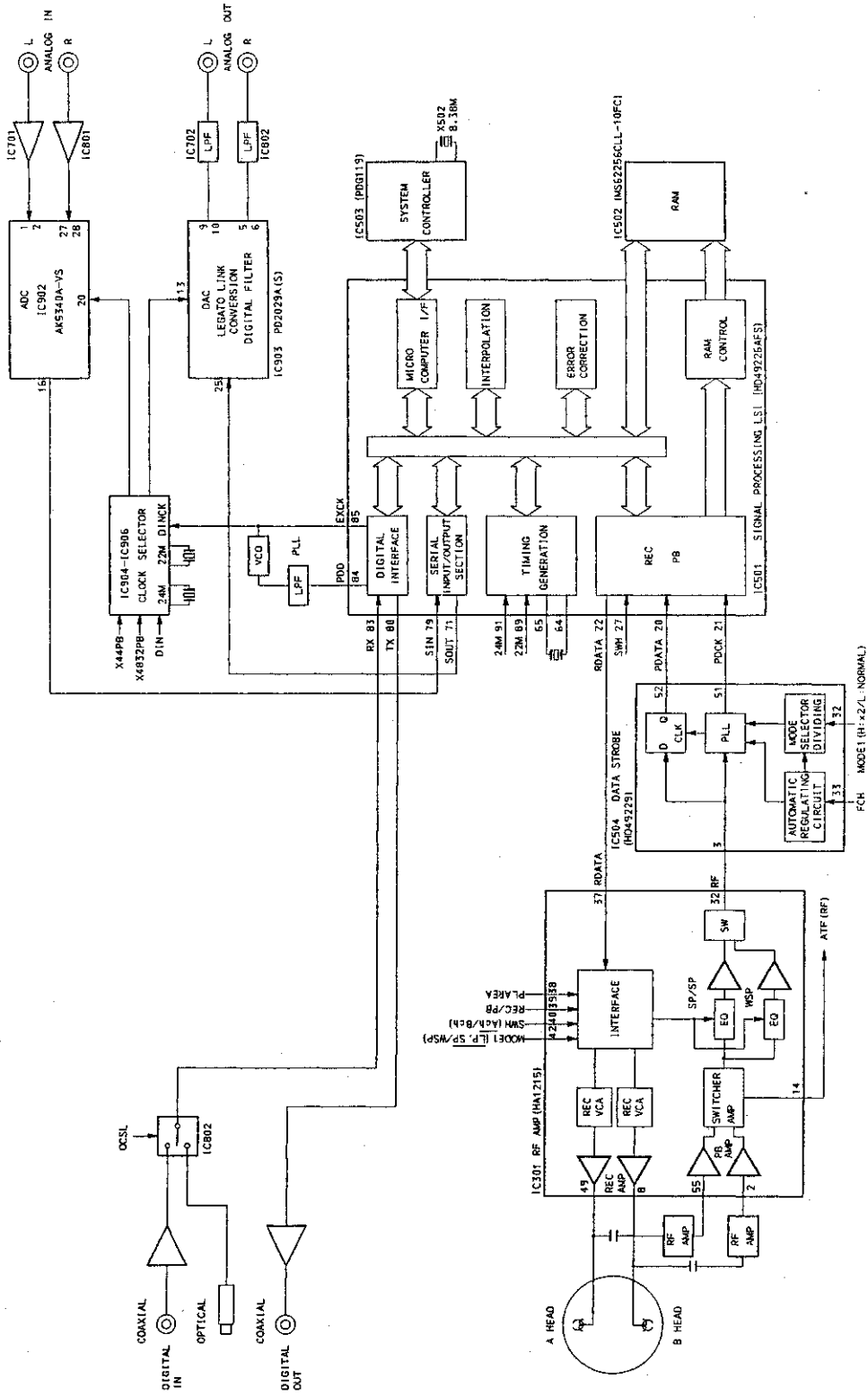
• This diagram is viewed from the mounted parts side.

PCB-3

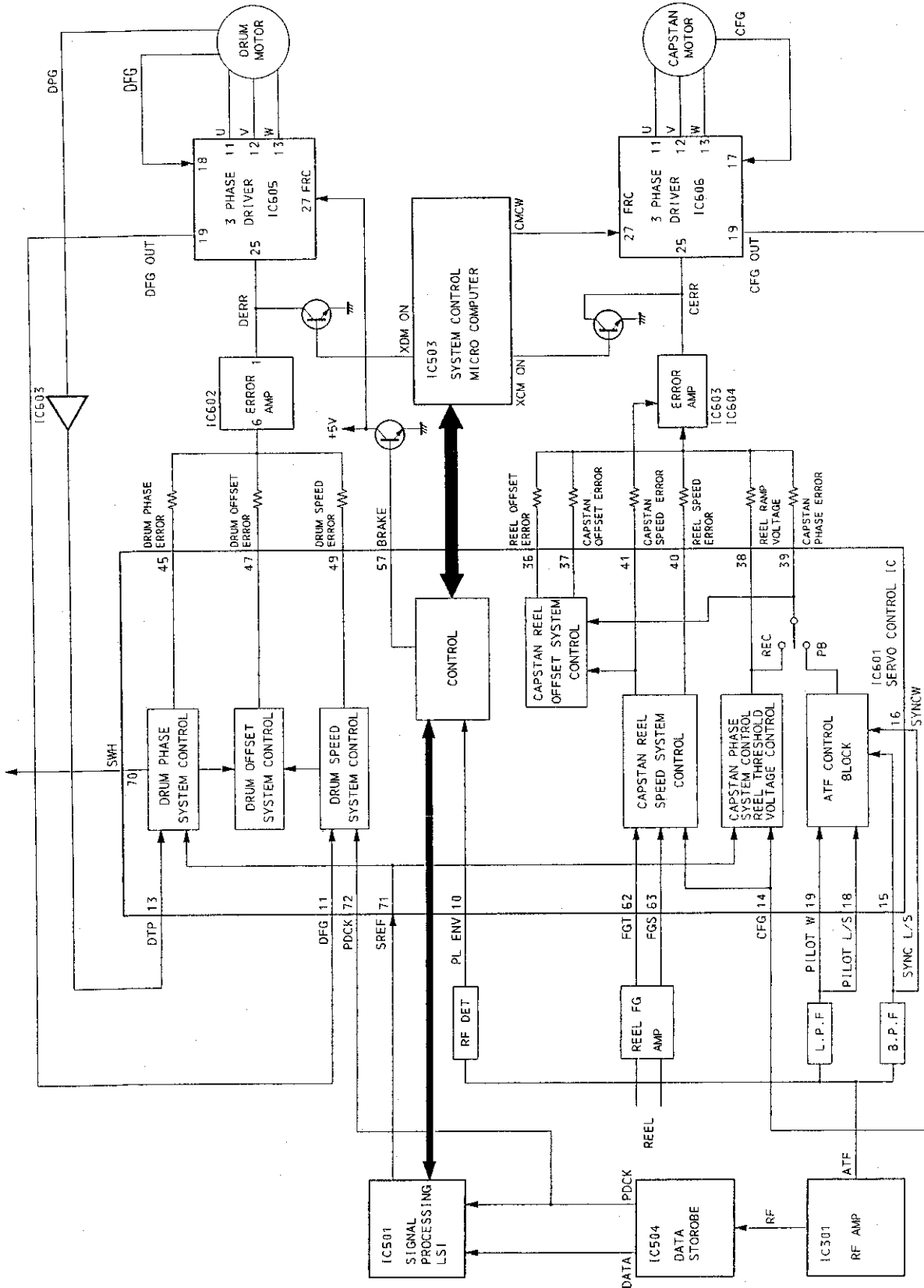


## 2.3 BLOCK DIAGRAM

### 1. SIGNAL PROCESSING SECTION



## 2. SERVO SECTION





### 3. SYSTEM CONTROL SECTION

