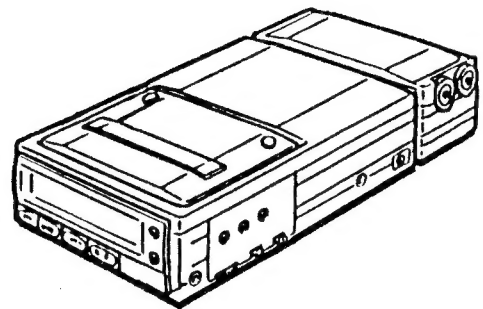


AIWA®**HD-S1**

SERVICE MANUAL



DIGITAL AUDIO TAPE RECORDER

• BASIC DAT MECHANISM : D - 3

• TYPE. AH,AK,AZ,AUH,AYE

SPECIFICATIONS

■ Tape Specifications

Tape	Digital audio tape
Head	Rotating head
Tape speed	8.15 mm/sec
Sampling frequencies	Recording: 48 kHz, 44.1 kHz, 32 kHz Playback: 48 kHz, 44.1 kHz, 32 kHz
Digitization	16-bit linear
Number of channels	2 (stereo)

■ Audio (attaching the A/D converter)

Frequency response	20 Hz - 22,000 Hz
S/N	85 dB (or better)
Dynamic range	85 dB (or better)
Total harmonic distortion	0.01% [or less (1 kHz)]
Wow & flutter	Measurable limit ($\pm 0.001\%$ W PEAK) or less

■ Input/Output Terminals

[On the DAT]	
PHONES	Stereo mini jack (max. 15 mW + 15 mW, EIAJ/ 32 Ω)
DIGITAL I/O (in/out)	Stereo mini jack (0.5 Vp-p, input/output impedance 75 Ω)
[On the A/D converter]	
ANALOG IN	Stereo mini jack LINE: 200 mV, input impedance 47 k Ω MIC: 1 mV (ATT 0 dB), 10 mV (ATT 20 dB), input impedance 10k Ω
ANALOG OUT	Stereo mini jack Maximum output level 1.2 V (RMS, 48 kHz), output impedance 47 k Ω

■ Power supply/Miscellaneous

Power supply	Rechargeable lead battery DC 6 V (PB-20) Local AC power (using the supplied AC adaptor, DC 7.4 V)
Battery life	Supplied rechargeable lead battery PB-20 (when not using the A/D converter) Approx. 55 minutes (EIAJ, playback/2 hours recharging) Approx. 55 minutes (EIAJ, digital recording/2 hours recharging)
Maximum External Dimensions	DAT: 95.0 (W) $\times$ 38.1 (H) $\times$ 146.4 (D) mm A/D converter: 94 (W) $\times$ 37.6 (H) $\times$ 50.1 (D) mm
Weight	DAT: Approx. 610 g (with rechargeable lead battery) A/D converter: Approx. 100 g (without rechargeable lead battery)

■ AC Adaptor

Rated voltage	AC-740U, H: AC 120 V-240 V
Rated input	18 VA, 50/60 Hz
Rated output	DC 7.4V, 1000 mA
Usable Batteries	AIWA rechargeable lead battery (PB-20)

• Design and specifications are subject to change without notice.

AIWA Co., Ltd.**Tokyo Japan**

Printed in Japan

TABLE OF CONTENTS

■ SERVICE JIG AND TOOLS	3
■ DISASSEMBLY-1	4~5
■ DISASSEMBLY-2 (MECHANISM SECTION)	6~10
■ ELECTRICAL MAIN PARTS LIST	11~13
■ IC BLOCK DIAGRAM-1	13
■ IC BLOCK DIAGRAM-2	14
■ IC BLOCK DIAGRAM-3	15
■ BLOCK DIAGRAM-1 (IC COMPOSITION)	16
■ BLOCK DIAGRAM-2 (REC/PB AUDIO)	17~18
■ BLOCK DIAGRAM-3 (SYSTEM CONTROL)	19
■ BLOCK DIAGRAM-4 (DRUM SERVO)	20
■ BLOCK DIAGRAM-5 (CAPSTAN SERVO)	21
■ BLOCK DIAGRAM-6 (ATF SERVO)	22
■ BLOCK DIAGRAM-7 (HDA-1 AUDIO)	23
■ SCHEMATIC DIAGRAM-1, WAVE FORM-1 (SERVO)	24~26
■ WIRING-1	27
■ SCHEMATIC DIAGRAM-2, (MECHA/FRONT)	28~29
■ SCHEMATIC DIAGRAM-3, WAVE FORM-2 (SYSTEM CONTROL)	30~32
■ WIRING-2	33~34
■ SCHEMATIC DIAGRAM-4, WAVE FORM-3 (PRE AMP)	35~36
■ WIRING-3	37~38
■ IC DESCRIPTION	39~45
• IC, HD49211BFS	39~40
• IC, HD49212	41~42
• IC, PD75108GF-J96	43~44
• IC, HA12062AMP	44
• IC, HA12133MP	45
■ ADJUSTMENT	46~52
• ADJUSTMENT POINTS	46~47
• MECHANISM SECTION	48~50
• ELECTRICAL SECTION	51~52
■ TRANSISTOR ILLUSTRATION	52
■ TEST MODE	53~55
■ EXPLODED VIEW, MECHANICAL PARTS LIST	56~63
• EXPLODED VIEW-1	56~57
• EXPLODED VIEW-2	58~59
• EXPLODED VIEW-3	60~61
• EXPLODED VIEW-4	62~63
■ SPRING APPLICATION POSITION	64
HDA-1 (A/D CONVERTER)	
■ ELECTRICAL MAIN PARTS LIST	65
■ LEVEL DIAGRAM	66
■ IC BLOCK DIAGRAM	66
■ SCHEMATIC DIAGRAM, WAVE FROM	67~68
■ WIRING	69~70
■ EXPLODED VIEW	71
■ MECHANICAL PARTS LIST	72
■ ACCESSORIES/PACKAGE LIST	73

SERVICE JIG AND TOOLS

Part Number of HD-S1 Jig Kit

09-054-017-010 X1 P.C.B EXT. KIT

1. Assembling the Jigs

1) Capstan Extension Connector (See Figure-1)

- ① Solder two "15-pin Capstan Connectors" to the "Capstan Circuit Board" and connect the "15-pin Extension Connector" to the "Capstan Connector".

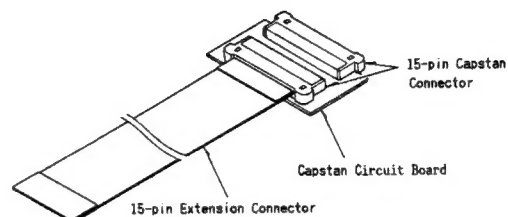


Fig-1

2) Front Extension Connector (See Figure-2)

- ① Solder two "16-pin Front Connectors" to the "Front Flexible Circuit Board".
- ② Solder two "20-pin Front Connectors" to the "Front Flexible Circuit Board".
- ③ Connect the "16-pin and 20-pin Extension Connectors" to each front connector.

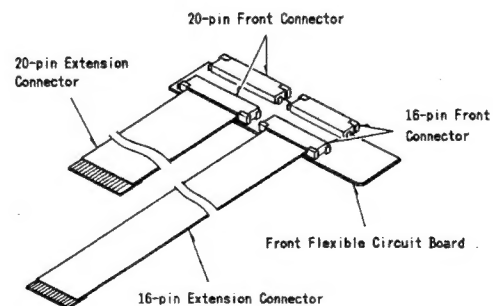


Fig-2

3) RF Extension Connector (See Figure-3)

- ① Attach "RF Connector 1" to "RF Extension Circuit Board 1".
- ② Attach "RF Connector 2" to "RF Extension Circuit Board 2".
- ③ Solder the wires to "RF Extension Circuit Boards 1 and 2".

Note 1) Attach "RF Connector 1" first, taking care of its direction.

Note 2) Solder the wires as shown in the figure below, taking care of the direction of the circuit boards.

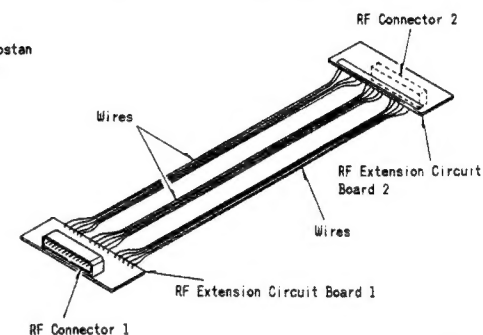


Fig-3

2. Use of the Jigs (See Figure-4)

- 1) Attach each jig as shown in the figure below.

Note: Bend each extension connector of the "Front Extension Connector" as shown in the figure below.

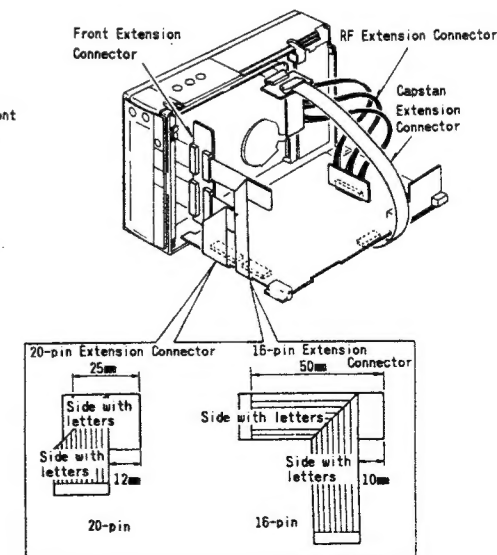


Fig-4

DISASSEMBLY INSTRUCTIONS - 1

1. "Panel, Top", "Panel, Bottom" and "Lid, Cassette" Removal (See Figure-1)

- 1) Remove 2 (C) screws and then the "Lid, Cassette" in the direction of the arrow.
- 2) Remove 4 (D) screws and then "Panel, Top".
- 3) Remove 6 (A) × 4, (B) × 2 screws and then the "Panel, Bottom".

Note) The rear of "Panel, Top" is fixed by double-sided adhesive tape. Be careful that "Panel, Top" is not bent when removing it.

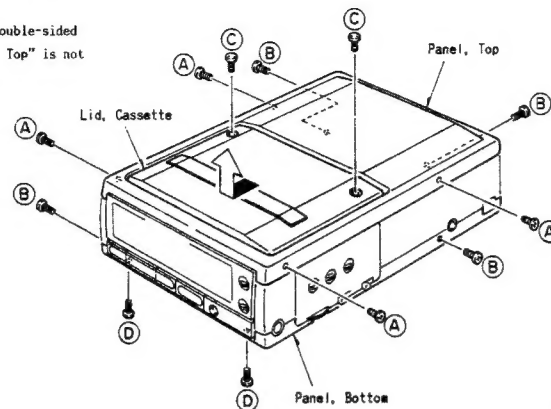


Fig-1

2. "MD ASSY" Removal (See Figure-2)

- 1) Remove 2 (A) screws.
- 2) Insert a "Sheet" as shown in the figure.
- 3) Remove the "MD ASSY" in the direction of the arrow while pushing the "Cassette Box ASSY" as shown in the figure.

Note) Be sure to insert the "Sheet" as shown in the figure when removing and reinstalling the "MD ASSY". Otherwise, the screen and the "LCD of the MD ASSY" come into contact, causing damage.

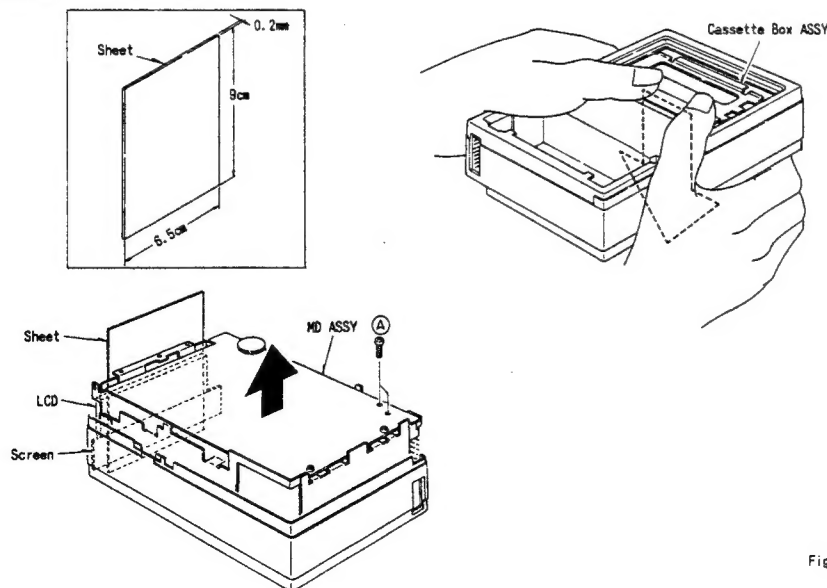


Fig-2

3. "Main Circuit Board" Removal (See Figure-3)

- 1) Unsolder point (a) of the "Connect Circuit Board".
- 2) Unsolder point (b) of the Shield Paper.
- 3) Remove 4 (A) × 3, (B) × 1 screws, disconnect 6 connectors and then remove the "Main Circuit Board".

Note 1) The "PREAMP and Main Circuit Boards" are connected via connectors. Disconnect the connectors, taking care of both boards.

Note 2) The "Flexible Circuit Board" is likely to be cut. Be sure to disconnect the 5 connectors first and then remove the "Main Circuit Board".

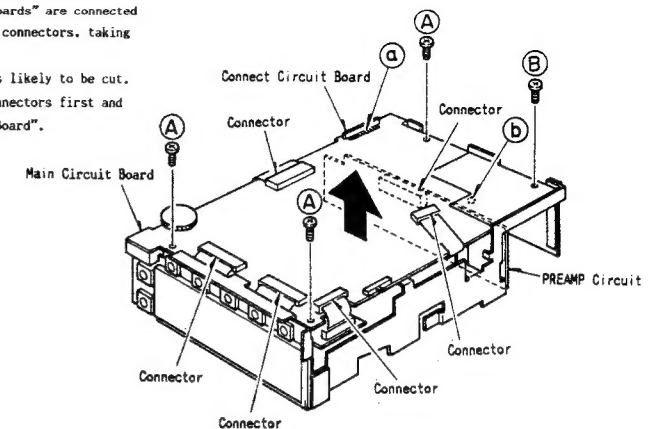


Fig-3

4. "Mechanism ASSY" Removal (See Figure-4)

- 1) Unsolder the "Shield Paper" and disconnect the connector from the "Drum".
- 2) Remove 2 (B) screws and the "PREAMP Circuit Board".
- 3) Remove 2 (A) screws and the "2 RECOG Switches".
- 4) Remove 4 (C) screws and then the "Mechanism ASSY" in the direction of the arrow.

Note) Be careful of the wires when removing the "Mechanism ASSY".

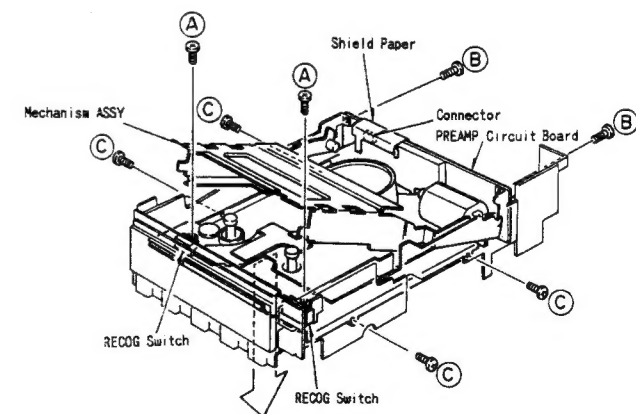
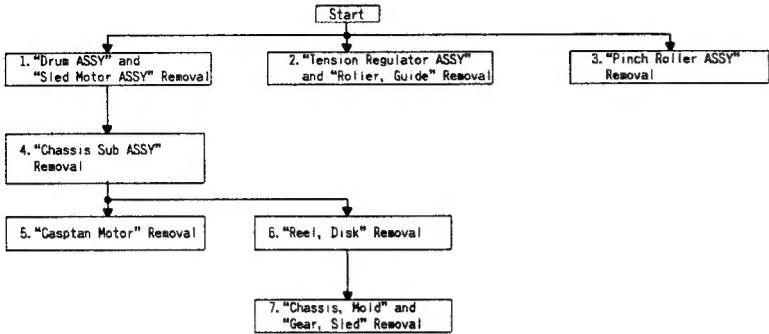


Fig-4

DISASSEMBLY INSTRUCTIONS - 2 (MECHANISM SECTION)



1. "Drum ASSY" and "Sled Motor ASSY" Removal (See Figure-1)

1) Remove 3 (A) screws and the "Drum ASSY".

Note) Align the components in sections A, B and C as shown in the figure when attaching the "Drum ASSY".

2) Remove (B) screw and the "Sled Motor ASSY".

Note) Fix the "Sled Motor ASSY" with bond.

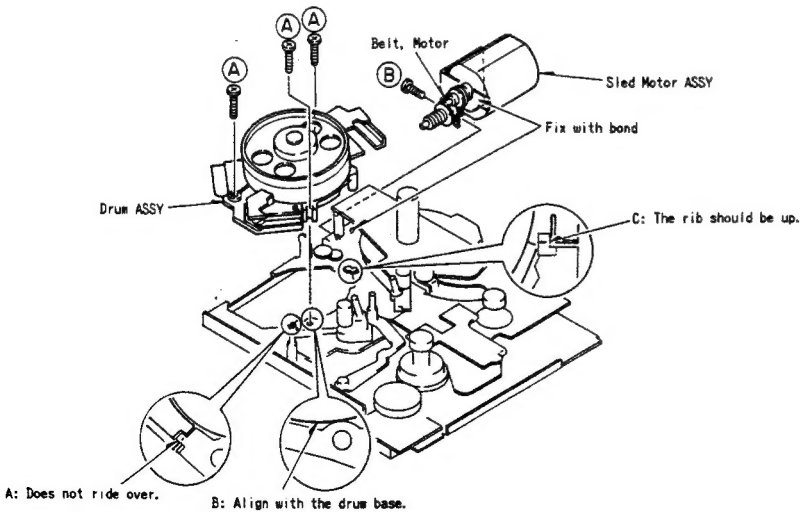


Fig-1

2. "Tension Regulator ASSY" and "Roller, Guide" Removal (See Figure-2)

- 1) Remove screw (A) and Poly washer (B), then remove the "Tension Regulator ASSY".

Note 1) Be careful that the "T-Spring, Tension Regulator" is also removed when the "Tension Regulator ASSY" is removed.

Note 2) Install the "T-Spring, Tension Regulator" as shown in Fig-2-1, release it from point (a), and then reinstall it as shown in Fig-2-2.

- 2) Remove the "Flanges, UL and LT Guide" using a screwdriver, etc. and then remove the "Roller, L Guide" and "Roller, Lever Guide".

- 3) Remove 2 (C) screws and use a screwdriver, etc. to remove the "Rollers, Guide" of the "Shuttle ASSY T and S".

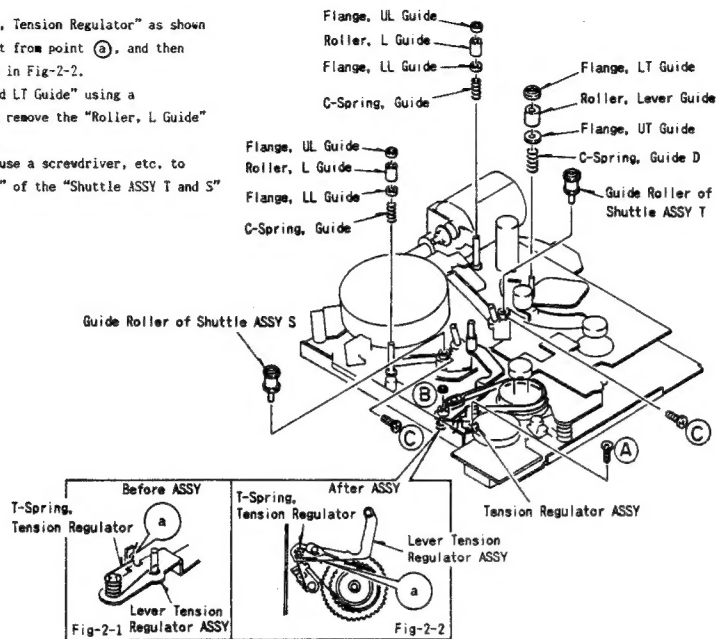


Fig-2

3. "Pinch Roller ASSY" Removal (See Figure-3)

- 1) Hold the "Pinch Lever ASSY" by one hand and pull out the "Pinch Roller ASSY" with the other hand in the direction of the arrow, then remove the "Pinch Roller ASSY" and "Collar, Pinch Roller B" at the same time.

Note 1) Be careful that the shaft of the "Pinch Roller ASSY" is not bent.

Note 2) Do not re-use "Collar, Pinch Roller B".

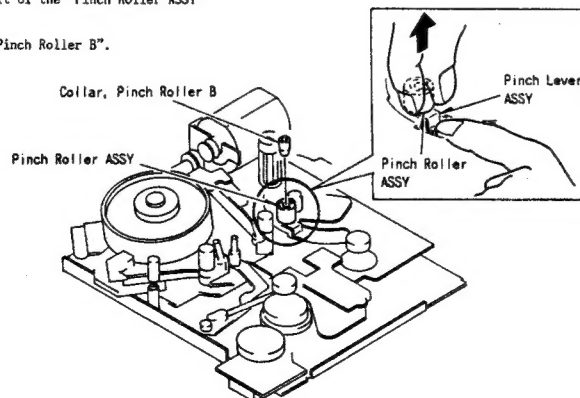


Fig-3

4. "Chassis Sub ASSY" Removal (See Figure-4)

- 1) Set the "Shuttle ASSY" to the Sleded end as shown in Figure-4.

- 2) Remove 4 (A) screws and the "Chassis Sub ASSY". Reinstall the "Chassis Sub ASSY", taking care of the following.

Note 1) Place the hook of the "Chassis, Mold" on the "Chassis Sub ASSY" as shown in Fig-4-1.

Note 2) Align the "Idle Lever ASSY" and the hook of the "Chassis Sub ASSY" as shown in Fig-4-2.

Note 3) Align the hook of the "FR Plate ASSY" and the "T Brake Lever ASSY" as shown in Fig-4-3.

Note 4) Make the hook of the "Pinch Lever ASSY" come into contact with chassis as shown in Fig-4-4.

Note 5) Align the "Lever Guide ASSY" and "Pinch Plate ASSY" at point (a) as shown in Fig-4-5.

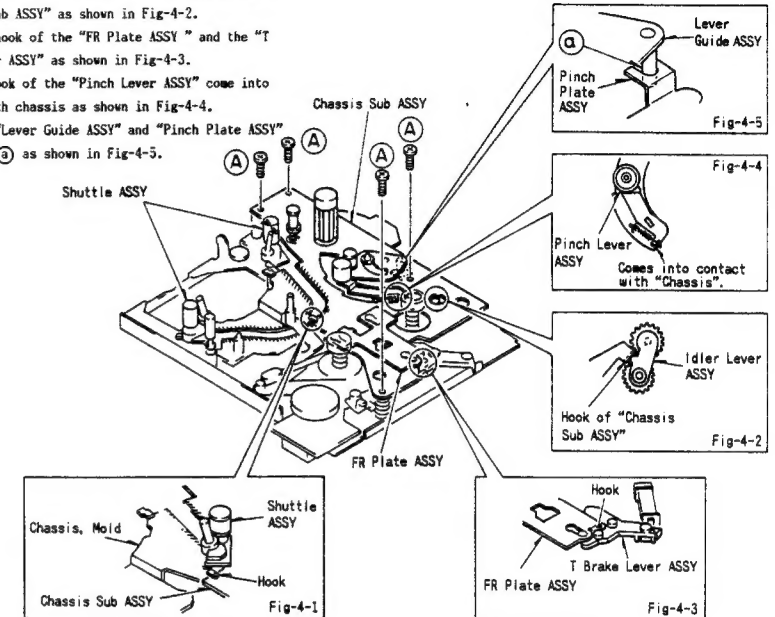


Fig-4

5. "Capstan Motor" Removal (See Figure-5)

- 1) Remove 3 (A) screws and the "Capstan Motor".
- 2) Remove plain washer (B) and the "Lever Guide ASSY".
- 3) Remove the "E-Spring, FR" and "FR Plate ASSY".
- 4) Remove the "T-Spring, Pinch", poly washer (C) and the "Pinch Lever ASSY".
- 5) Reinstall the "T-Spring, Pinch" while bending it in the direction of the arrow as shown in Fig-5-1.

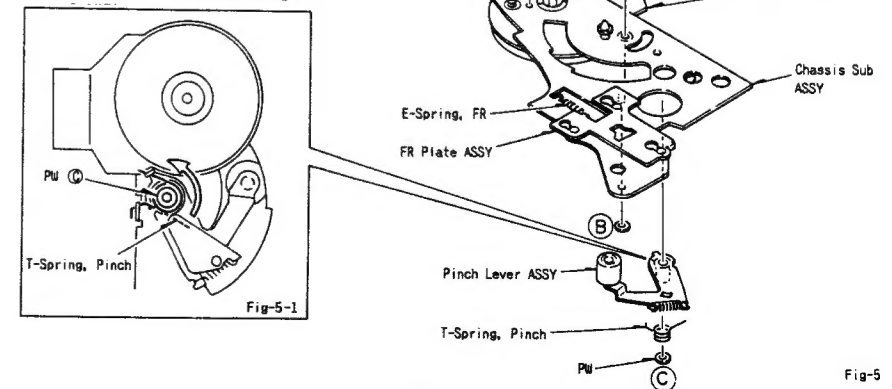


Fig-5

6. "Reel, Disk" Removal (See Figure-6)

- 1) Remove E-Ring (A) and poly washer (B), then remove the "Reel, Cap", "C-Spring, Reel" and "Reel Disk ASSY".
- 2) Remove poly washer (C), "E-Spring, Brake" and then the "S Brake Lever ASSY".
- 3) Remove the "T-Spring, Soft" and then the "Sled Brake Lever ASSY".

Note) Hook the "T-Spring, Soft" as shown in the figure when installing the "Sled Brake Lever ASSY".

- 4) Remove poly washer (D) and the "FR Gear ASSY".
- 5) Remove E-Ring (E) and poly washer (F), then remove the "Reel, Cap", "C-Spring, Reel" and "Reel, Disk S".
- 6) Remove poly washer (G) and then the "T Brake Lever ASSY" and "Gear, A FF".

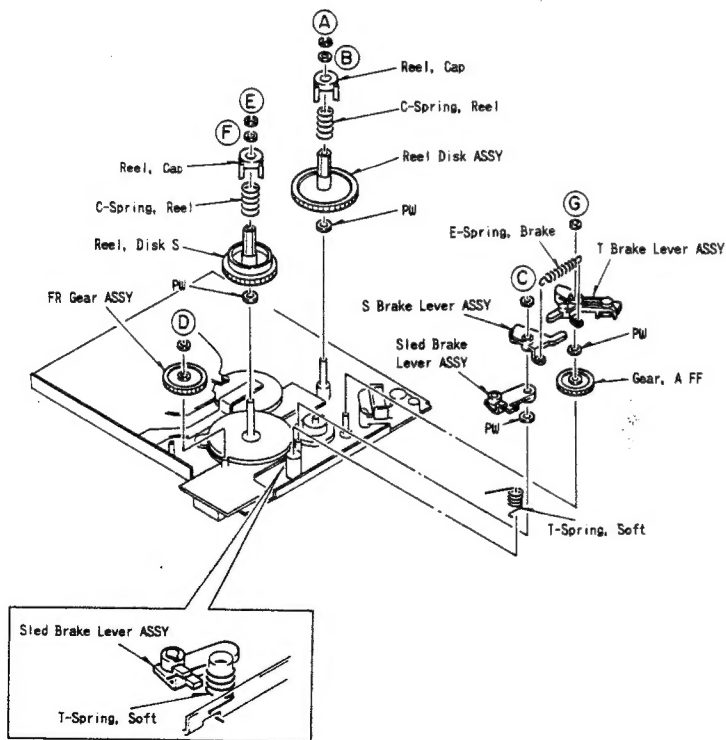


Fig-6

7. "Chassis, Mold" and "Gear, Sled" Removal (See Figure-7)

- 1) While turning the "Worm Wheel" with your fingers, move the "Shuttle ASSY S and T" in the direction of the arrow. (See Fig-7-1)
- 2) Remove screw (A) and poly washer (B), then remove the "Chassis, Mold".
- 3) Remove "Gear, Sled G".
- 4) Remove poly washer (C) and then "Gear, Sled H".

Note) When install "Gear, Sled H" and "Gear, Sled G" so that the marks on each gear are aligned as shown in Fig-7-2.

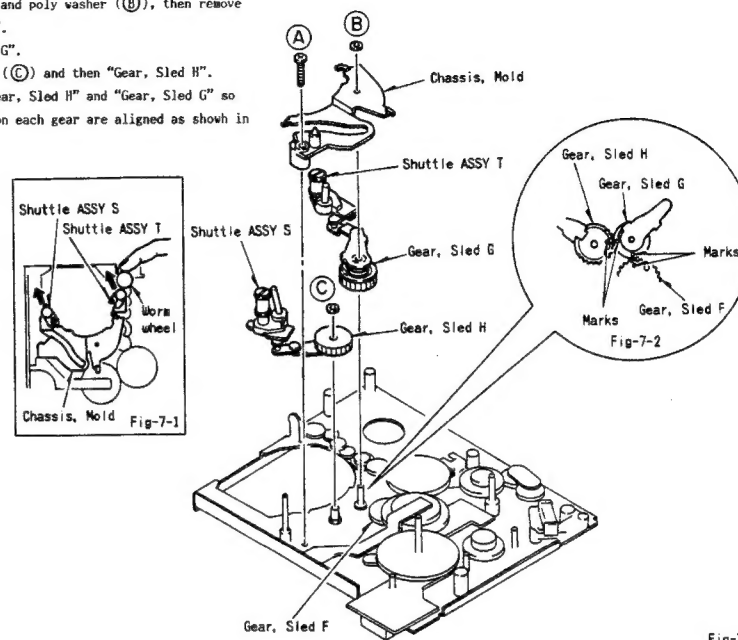


Fig-7

8. Position Alignment of Gears (See Figure-8)

- 1) Align the positions of "Gear, Sled H", "Gear, Sled G", "Gear, Sled F", "Cam, A", "Cam, B" and "Mode Switch ASSY" as shown in the figure.

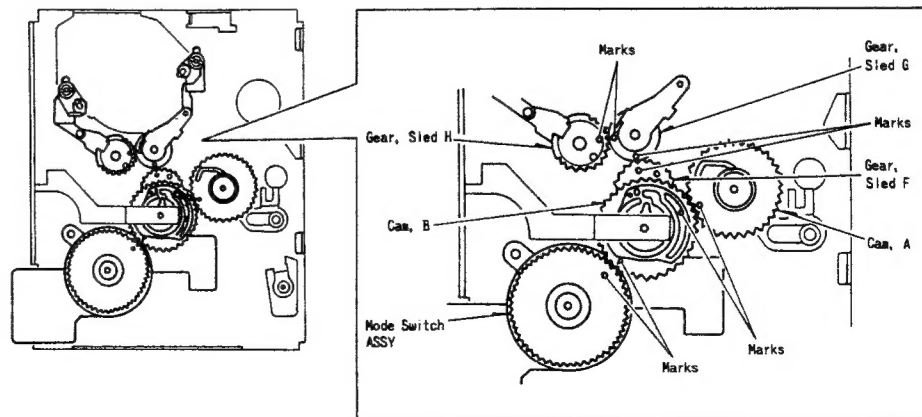


Fig-8

ELECTRICAL MAIN PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	REF. NO.	PART NO.	DESCRIPTION	REF. NO.	PART NO.	DESCRIPTION	REF. NO.	PART NO.	DESCRIPTION
--- IC ---			C28	*87-012-188-010	CAP,CHIP SS 47P-50 CH	C94	*87-012-274-010	CAP,CHIP SS 1000P-50	SW2	87-036-123-010	SLIDE SW(INPUT)
89-HD1-603-010	IC,HA12062AMP		C29	*87-012-286-010	CAP,CHIP SS 0.01-25	C95	*87-012-274-010	CAP,CHIP SS 1000P-50	SW3	87-036-123-010	SLIDE SW(KEY HOLD)
89-HD1-602-010	IC,HA12133MP		C30	*87-012-196-010	CAP,CHIP SS 120P-50 CH	C96	*87-012-195-010	CAP,CHIP SS 100P-50 CH	SW4	87-036-191-010	PUSH SW(CASSETTE DET.)
89-HD1-633-010	IC,HD49211BFS		C31	*87-010-772-010	CAP,CHIP MYLAR Z200P-25J	C97	*87-010-424-010	CAP,CHIP TANTALUM 4.7-4	VR1	89-HD1-601-010	VOLUME ZOKA(VOLUME)
89-HD1-604-010	IC,HD49212		C32	*87-012-274-010	CAP,CHIP SS 1000P-50	C98	*87-012-157-010	CAP,CHIP S 330P-50 CH	X1	*87-030-190-010	V18,XTAL 37.632MHZ
87-001-800-010	IC,HM65256BFP-15T		C33	*87-010-196-010	CAP,CHIP S 0.1-25	C99	*87-010-176-010	CAP,CHIP S 680P-50 SL	X2	*87-030-147-010	V18,XTAL 24.576MHZ
87-001-801-010	IC,LB1631M		C34	*87-010-424-010	CAP,CHIP TANTALUM 4.7-4	C100	*87-012-274-010	CAP,CHIP SS 1000P-50	X3	*87-030-146-010	V18,XTAL 22.5792MHZ
87-001-797-010	IC,LC7582A		C35	*87-010-789-010	CAP,CHIP MYLAR 0.022J	C101	*87-012-274-010	CAP,CHIP SS 1000P-50	X4	87-030-191-010	V18,CER 4.19MCM
87-001-798-010	IC,M5236ML		C36	*87-012-360-010	CAP,CHIP S 1-10	C102	*87-012-195-010	CAP,CHIP SS 100P-50 CH	--- PREAMP CIRCUIT BOARD SECTION ---		
87-001-802-010	IC,NJM2902M		C37	*87-010-196-010	CAP,CHIP S 0.1-25	C103	*87-010-424-010	CAP,CHIP TANTALUM 4.7-4	C1	*87-010-771-010	CAP,CHIP TANTALUM 47-6.3
87-001-834-010	IC,NJM3414M		C38	*87-012-188-010	CAP,CHIP SS 47P-50 CH	C104	*87-010-424-010	CAP,CHIP TANTALUM 4.7-4	C2	*87-010-771-010	CAP,CHIP TANTALUM 47-6.3
87-001-805-010	IC,SAAT320GP		C39	*87-012-286-010	CAP,CHIP SS 0.01-25	C105	*87-010-424-010	CAP,CHIP TANTALUM 4.7-4	C3	*87-010-196-010	CAP,CHIP S 0.1-25
87-001-799-010	IC,SN74LS624NS		C40	*87-010-424-010	CAP,CHIP TANTALUM 4.7-4	C106	*87-012-286-010	CAP,CHIP SS 0.01-25	C4	*87-010-196-010	CAP,CHIP S 0.1-25
87-001-803-010	IC,TA7745F		C41	*87-010-505-010	CAP,CHIP TANTALUM 1-16	C107	*87-010-770-010	CAP,CHIP TANTALUM 100-4	C5	*87-010-505-010	CAP,CHIP TANTALUM 1-16
87-001-796-010	IC,TC74HC163A		C42	*87-012-274-010	CAP,CHIP SS 1000P-50	C108	*87-010-196-010	CAP,CHIP S 0.1-25	C6	*87-010-505-010	CAP,CHIP TANTALUM 1-16
87-001-668-010	IC,TC74HC4053AF		C43	*87-010-772-010	CAP,CHIP MYLAR Z200P-25J	C109	*87-010-424-010	CAP,CHIP TANTALUM 4.7-4	C7	*87-015-785-010	CAP,CHIP SS 0.1-25
87-001-795-010	IC,TC74HC74A		C44	*87-010-774-010	CAP,CHIP MYLAR 0.047-25J	C110	*87-010-424-010	CAP,CHIP TANTALUM 4.7-4	C8	*87-015-785-010	CAP,CHIP SS 0.1-25
87-001-604-010	IC,TC74HC04		C45	*87-010-424-010	CAP,CHIP TANTALUM 4.7-4	C111	*87-012-286-010	CAP,CHIP SS 0.01-25	C9	*87-012-286-010	CAP,CHIP SS 0.01-25
87-001-550-010	IC,TC7504F		C46	*87-012-278-010	CAP,CHIP SS Z200P-50	C112	*87-010-770-010	CAP,CHIP TANTALUM 100-4	C10	*87-010-515-010	CAP,CHIP TANTALUM 22-6.3
89-HD1-634-010	IC,UPD75108GF-J96		C47	*87-010-775-010	CAP,CHIP MYLAR 0.068-25J	C113	*87-010-196-010	CAP,CHIP S 0.1-25	C11	*87-012-193-010	CAP,CHIP SS 82P-50 CH
--- TRANSISTOR ---			C48	*87-012-360-010	CAP,CHIP S 1-10	C114	*87-010-522-010	CAP,CHIP TANTALUM 2.2-10	C12	*87-012-193-010	CAP,CHIP SS 82P-50 CH
89-113-142-010	TRANSISTOR,2SA1314B		C49	*87-010-781-010	CAP,CHIP ELECT 3.3-6.3 BP	C115	*87-010-196-010	CAP,CHIP S 0.1-25	C13	*87-012-282-010	CAP,CHIP SS 4700P-50
89-211-821-010	TRANSISTOR,2SB1182Q		C50	*87-012-286-010	CAP,CHIP SS 0.01-25	C116	*87-010-522-010	CAP,CHIP TANTALUM 2.2-10	C14	*87-012-282-010	CAP,CHIP SS 4700P-50
89-327-125-010	TRANSISTOR,2SC2712GR		C51	*87-012-282-010	CAP,CHIP SS 4700P-50	C117	*87-010-505-010	CAP,CHIP TANTALUM 1-16	C15	*87-012-280-010	CAP,CHIP SS 3300P-50
89-341-164-010	TRANSISTOR,2SC4116Y		C52	*87-010-194-010	CAP,CHIP S 0.047-25	C118	*87-010-505-010	CAP,CHIP TANTALUM 1-16	C16	*87-012-280-010	CAP,CHIP SS 3300P-50
89-342-132-010	TRANSISTOR,2SC4213B		C53	*87-010-196-010	CAP,CHIP S 0.1-25	C119	*87-012-142-010	CAP,CHIP SS 0.33-16	C17	*87-012-280-010	CAP,CHIP SS 3300P-50
87-026-331-010	TRANSISTOR,DTA114YU		C54	*87-012-286-010	CAP,CHIP SS 0.01-25	C120	*87-012-274-010	CAP,CHIP SS 1000P-50	C18	*87-012-280-010	CAP,CHIP SS 3300P-50
87-026-342-010	TRANSISTOR,DTC144EU		C55	*87-010-196-010	CAP,CHIP S 0.1-25	C121	*87-010-716-010	CAP,CHIP ELECT 100-6.3	C19	*87-012-286-010	CAP,CHIP SS 0.01-25
87-026-355-010	TRANSISTOR,FMA2		C56	*87-010-510-010	CAP,CHIP TANTALUM 4.7-10	C122	*87-012-142-010	CAP,CHIP S 0.33-16	C20	*87-012-286-010	CAP,CHIP SS 0.01-25
87-026-419-010	TRANSISTOR,RN2301		C57	*87-012-360-010	CAP,CHIP S 1-10	C123	*87-012-274-010	CAP,CHIP SS 1000P-50	C21	*87-010-198-010	CAP,CHIP S 0.022-25
--- DIODE ---			C58	*87-012-286-010	CAP,CHIP SS 0.01-25	C126	*87-012-286-010	CAP,CHIP SS 0.01-25	C22	*87-010-198-010	CAP,CHIP S 0.022-25
87-001-166-010	DIODE,CHIP 1SS301		C59	*87-010-776-010	CAP,CHIP MYLAR 0.15-25J	C127	*87-010-771-010	CAP,CHIP TANTALUM 47-6.3	C23	*87-015-785-010	CAP,CHIP SS 0.1-25
87-001-813-010	DIODE,CHIP U1GKJ49		C60	*87-012-360-010	CAP,CHIP S 1-10	C128	*87-012-286-010	CAP,CHIP SS 0.01-25	C24	*87-015-785-010	CAP,CHIP SS 0.1-25
87-020-583-010	DIODE,ZENER CHIP 02C25.1Y		C61	*87-010-730-010	CAP,CHIP ELECT 10-6.3	C130	*87-012-141-010	CAP,CHIP S 0.22	C25	*87-012-286-010	CAP,CHIP SS 0.01-25
--- MAIN CIRCUIT BOARD SECTION ---			C62	*87-010-730-010	CAP,CHIP ELECT 10-6.3	C132	*87-010-505-010	CAP,CHIP TANTALUM 1-16	C26	*87-012-195-010	CAP,CHIP SS 100P-50 CH
C1	*87-012-274-010	CAP,CHIP SS 1000P-50	C63	*87-010-730-010	CAP,CHIP ELECT 10-6.3	C133	*87-012-157-010	CAP,CHIP S 330P-50 CH	C27	*87-012-286-010	CAP,CHIP SS 0.01-25
C2	*87-010-505-010	CAP,CHIP TANTALUM 1-16	C64	*87-012-195-010	CAP,CHIP SS 100P-50 CH	C134	*87-012-157-010	CAP,CHIP S 330P-50 CH	C28	*87-012-199-010	CAP,CHIP SS Z20P-50 CH
C3	*87-012-285-010	CAP,CHIP SS 8200P-50	C65	*87-012-360-010	CAP,CHIP S 1-10	C135	*87-012-157-010	CAP,CHIP S 330P-50 CH	C29	*87-012-286-010	CAP,CHIP SS 0.01-25
C4	*87-012-176-010	CAP,CHIP SS 15P-50 CH	C66	*87-012-274-010	CAP,CHIP SS 1000P-50	J1	87-009-284-010	JACK 3.5BK(PHONES)	C30	*87-012-286-010	CAP,CHIP SS 0.01-25
C5	*87-010-196-010	CAP,CHIP S 0.1-25	C67	*87-012-360-010	CAP,CHIP S 1-10	J2	87-049-724-010	JACK 01A3.5(BLK)(DIGITAL I/O)	C31	*87-012-286-010	CAP,CHIP SS 0.01-25
C6	*87-010-515-010	CAP,CHIP TANTALUM 22-6.3	C68	*87-012-360-010	CAP,CHIP S 1-10	J3	87-049-859-010	JACK DC REFLOW BLK(DC7.4V)	C32	*87-012-275-010	CAP,CHIP SS 1200P-50
C7	*87-012-172-010	CAP,CHIP SS 10P-50 CH	C69	*87-012-286-010	CAP,CHIP SS 0.01-25	L1	*87-005-298-010	COIL 10UH	C33	*87-012-182-010	CAP,CHIP SS 27P-50 CH
C8	*87-012-274-010	CAP,CHIP SS 1000P-50	C71	*87-012-182-010	CAP,CHIP SS 27P-50 CH	L2	*87-005-298-010	COIL 10UH	C34	*87-012-286-010	CAP,CHIP SS 0.01-25
C9	*87-012-172-010	CAP,CHIP SS 10P-50 CH	C72	*87-012-182-010	CAP,CHIP SS 27P-50 CH	L3	*87-005-298-010	COIL 1UH	C35	*87-012-286-010	CAP,CHIP SS 0.01-25
C10	*87-010-196-010	CAP,CHIP S 0.1-25	C73	*87-010-196-010	CAP,CHIP S 0.1-25	L4	*89-HD1-612-010	COIL SSCQLN-1410AN	C36	*87-012-286-010	CAP,CHIP SS 0.01-25
C11	*87-012-174-010	CAP,CHIP SS 12P-50 CH	C75	*87-010-522-010	CAP,CHIP TANTALUM 2.2-10	L5	*87-005-407-010	COIL BLMA1A04	C37	*87-010-196-010	CAP,CHIP S 0.1-25
C12	*87-012-174-010	CAP,CHIP SS 12P-50 CH	C76	*87-012-286-010	CAP,CHIP SS 0.01-25	L6	*89-HD1-608-010	COIL BLMA1A04	C38	*87-010-196-010	CAP,CHIP S 0.1-25
C13	*87-012-174-010	CAP,CHIP SS 12P-50 CH	C77	*87-012-286-010	CAP,CHIP SS 0.01-25	L7	*89-HD1-609-010	FILTER H366BNJ-123YPD	C39	*87-010-771-010	CAP,CHIP TANTALUM 47-6.3
C14	*87-012-174-010	CAP,CHIP SS 12P-50 CH	C78	*87-010-769-010	CAP,CHIP TANTALUM 6.8-10	L8	*87-005-294-010	COIL 4.7UH	C40	*87-010-771-010	CAP,CHIP TANTALUM 47-6.3
C15	*87-010-196-010	CAP,CHIP S 0.1-25	C79	*87-010-196-010	CAP,CHIP S 0.1-25	L9	*87-003-234-010	COIL S 0.22UH	C41	*87-012-286-010	CAP,CHIP SS 0.01-25
C17	*87-010-196-010	CAP,CHIP S 0.1-25	C80	*87-010-522-010	CAP,CHIP TANTALUM 2.2-10	L10	*87-003-234-010	COIL S 0.22UH	C42	*87-012-286-010	CAP,CHIP SS 0.01-25
C18	*87-010-746-010	CAP,CHIP TANTALUM 10-4	C81	*87-010-196-010	CAP,CHIP S 0.1-25	L11	*87-003-241-010	COIL S 4.7UH	C43	*87-010-505-010	CAP,CHIP TANTALUM 1-16
C19	*87-010-746-010	CAP,CHIP TANTALUM 10-4	C82	*87-010-522-010	CAP,CHIP TANTALUM 2.2-10	L12	*87-003-234-010	COIL S 0.22UH	C44	*87-015-835-010	CAP,CHIP 0.047
C20	*87-012-188-010	CAP,CHIP SS 47P-50 CH	C83	*87-010-196-010	CAP,CHIP S 0.1-25	L13	*87-003-234-010	COIL S 0.22UH	C45	*87-012-286-010	CAP,CHIP SS 0.01-25
C21	*87-012-188-010	CAP,CHIP SS 47P-50 CH	C84	*87-010-522-010	CAP,CHIP TANTALUM 2.2-10	L14	*87-003-234-010	COIL S 0.22UH	C46	*87-012-286-010	CAP,CHIP SS 0.01-25
C22	*87-010-196-010	CAP,CHIP S 0.1-25	C85	*87-010-196-010	CAP,CHIP S 0.1-25	L15	*87-003-234-010	COIL S 0.22UH	C47	*87-012-180-010	CAP,CHIP SS 22P-50 CH
C23	*87-010-515-010	CAP,CHIP SS 3900P-50	C86	*87-010-522-010	CAP,CHIP TANTALUM 2.2-10	L16	*87-005-319-010	COIL S 100UH	C48	*87-012-286-010	CAP,CHIP SS 0.01-25
C25	*87-012-281-010	CAP,CHIP SS 3900P-50	C87	*87-010-196-010	CAP,CHIP S 0.1-25	L17	*87-005-319-010	COIL S 100UH	C49	*87-012-286-010	CAP,CHIP SS 0.01-25
C26	*87-012-285-010	CAP,CHIP SS 8200P-50	C88	*87-010-522-010	CAP,CHIP TANTALUM 2.2-10	L18	*87-005-407-010	COIL BLMA1A04	C50	*87-012-286-010	CAP,CHIP SS 0.01-25
C27	*87-012-281-010	CAP,CHIP SS 3900P-50	C89	*87-010-196-010	CAP,CHIP S 0.1-25	L19	*87-005-407-010	COIL BLMA1A04	C51	*87-012-286-010	CAP,CHIP SS 0.01-25
			C90	*87-010-522-010	CAP,CHIP TANTALUM 2.2-10	SFR1	*87-024-293-010	SFR 100K	C52	*87-012-286-010	CAP,CHIP SS 0.01-25
			C91	*87-010-196-010	CAP,CHIP S 0.1-25	SFR2	*87-024-298-010	SFR 10K	C53	*87-012-286-010	CAP,CHIP SS 0.01-25
			C92	*87-012-157-010	CAP,CHIP S 330P-50 CH	SFR3	*87-024-286-010	SFR 3K	C54	*87-012-286-010	CAP,CHIP SS 0.01-25
			C93	*87-010-176-010	CAP,CHIP S 680P-50 SL	SW1	87-036-124-010	SLIDE SW(POWER)			

REF.NO. PART NO. DESCRIPTION

L1 *87-005-310-010 COIL 100UH
L2 *87-005-310-010 COIL 100UH
L3 *87-005-310-010 COIL 100UH
L4 *89-HD1-607-010 COIL 303AN-1531AQVCO

SFR1 *87-024-286-010 SFR 3K
SFR2 *87-024-286-010 SFR 3K
SFR5 *87-024-221-010 SFR 1K
SFR6 *87-001-587-010 SFR 10K

FRONT CIRCUIT BOARD SECTION

C1 *87-012-272-010 CAP,CHIP SS 680P-50
C2 *87-010-196-010 CAP,CHIP S 0.1-25
LCD1 *89-HD1-611-010 LCD LTP7L9011A(DISPLAY)
SW1 87-030-152-010 TACT SW(DISPLAY)

SW2 87-036-192-010 TACT SW(STOP/EJECT)
SW3 87-036-192-010 TACT SW(PLAY/PAUSE)
SW4 87-030-152-010 TACT SW(AARS,RESET)
SW5 87-036-192-010 TACT SW(REC)
SW6 87-036-192-010 TACT SW(FFWD/F SKIP)
SW7 87-036-192-010 TACT SW(REW/B SKIP)

SUB-1 CIRCUIT BOARD SECTION

REF.NO. PART NO. DESCRIPTION

SW8 87-030-152-010 TACT SW(RENUMBER)
SW9 87-030-152-010 TACT SW(ID ERASE)
SW10 87-030-152-010 TACT SW(ID MARK)

MECHA. CIRCUIT BOARD SECTION

PCB-E 89-HD1-629-010 MECHANICAL FLEX. CIRCUIT BOARD
CP1 89-HD1-613-110 PHOTO SENSOR GP2L20L
CP2 89-HD1-613-110 PHOTO SENSOR GP2L20L
S1 86-544-606-010 PUSH SW(RECOG SW L)

S2 86-571-605-010 PUSH SW(RECOG SW R)

CONNECT CIRCUIT BOARD SECTION

J4 87-009-222-010 CONNECTOR 10P RF-H10(TO HDA-1)

MISCELLANEOUS

86-544-610-010 POSITION SENSOR
86-571-603-010 DRUM ASSY(DOU-02F)
86-571-606-010 MODE SWITCH ASSY
86-571-601-010 CAPSTAN MOTOR ASSY
M1 86-571-601-010 SLED MOTOR ASSY
M2 86-571-384-010 SOLENOID(BRAKE)
SOL1 86-571-609-010

チップ抵抗部品コード/CHIP RESISTOR PART CODE

チップ抵抗部品コードの成り立ち

Chip resistor part coding

8 8 - □ □ □ □ □ □ □ □

A
抵抗コード
Resistor code

桁表示
Figure

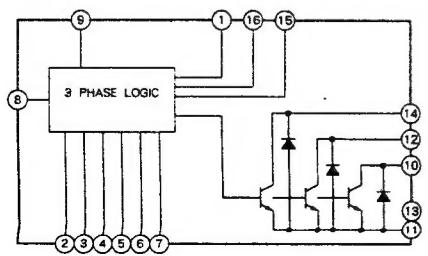
抵抗値
Value of resistor

チップ抵抗
Chip resistor

Wattage 容量	Type 種類	Tolerance 許容誤差	Symbol 記号	Dimensions/寸法(mm) Form/外形	Resistor Code : A 抵抗コード : A
1/32W	1608	±5%	CJ	L 1.6 W 0.8 t 0.35	108
1/10W	2125	±5%	CJ	L 2 W 1.25 t 1.45	118
1/8W	3216	±5%	CJ	L 3.2 W 1.6 t 0.5 ~0.7	128

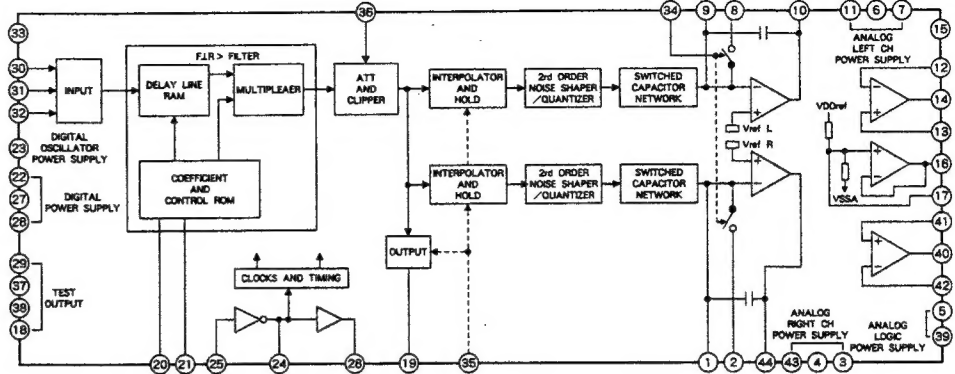
IC BLOCK DIAGRAM - 1

IC,TA7745F

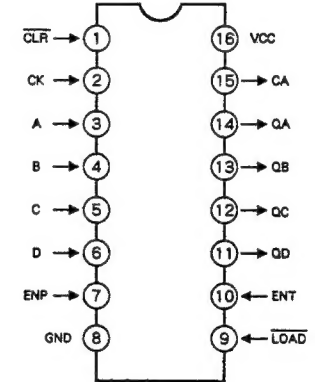


IC BLOCK DIAGRAM - 2

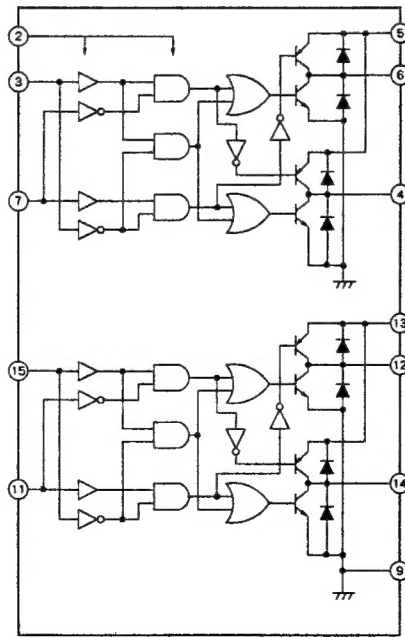
IC,SAA7320GP



IC,TC74HC163A



IC,LB1631M



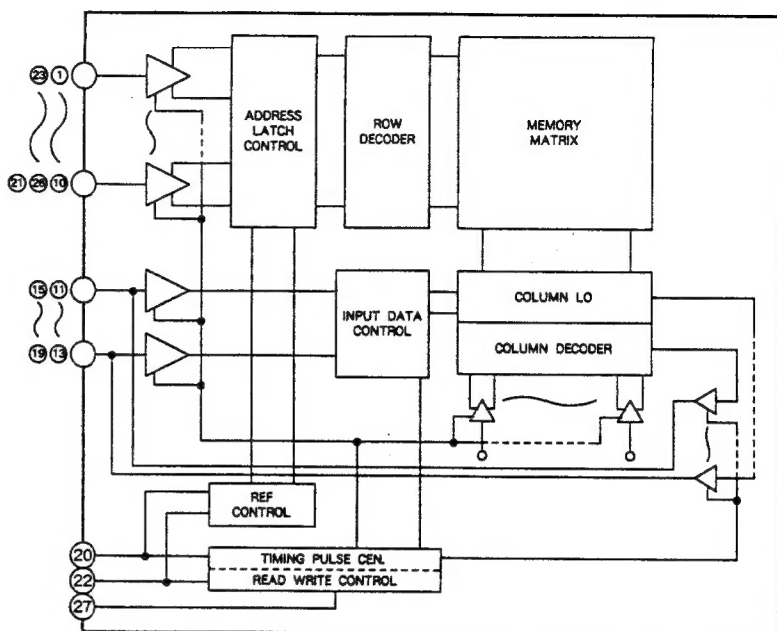
TRUTH TABLE

INPUT					OUTPUT				
CLR	LOAD	ENT	ENP	CK	QA	QB	QC	QD	CA
L	X	X	X	↑	L	L	L	L	L
H	L	L	X	↑	A	B	C	D	L
H	L	H	X	↑					
H	H	H	H	↑	COUNT				L
H	H	L	X	X	COUNT INHIBIT				L
H	H	H	L	X	COUNT INHIBIT				L

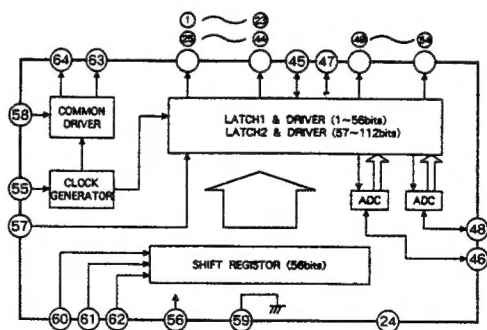
↑ : Shows that "L" changes to "H".
X : Normally, CA is "L", but it goes "H" when QA, QB, QC, QD and ENT are "H".
X : "H" or "L"

IC BLOCK DIAGRAM - 3

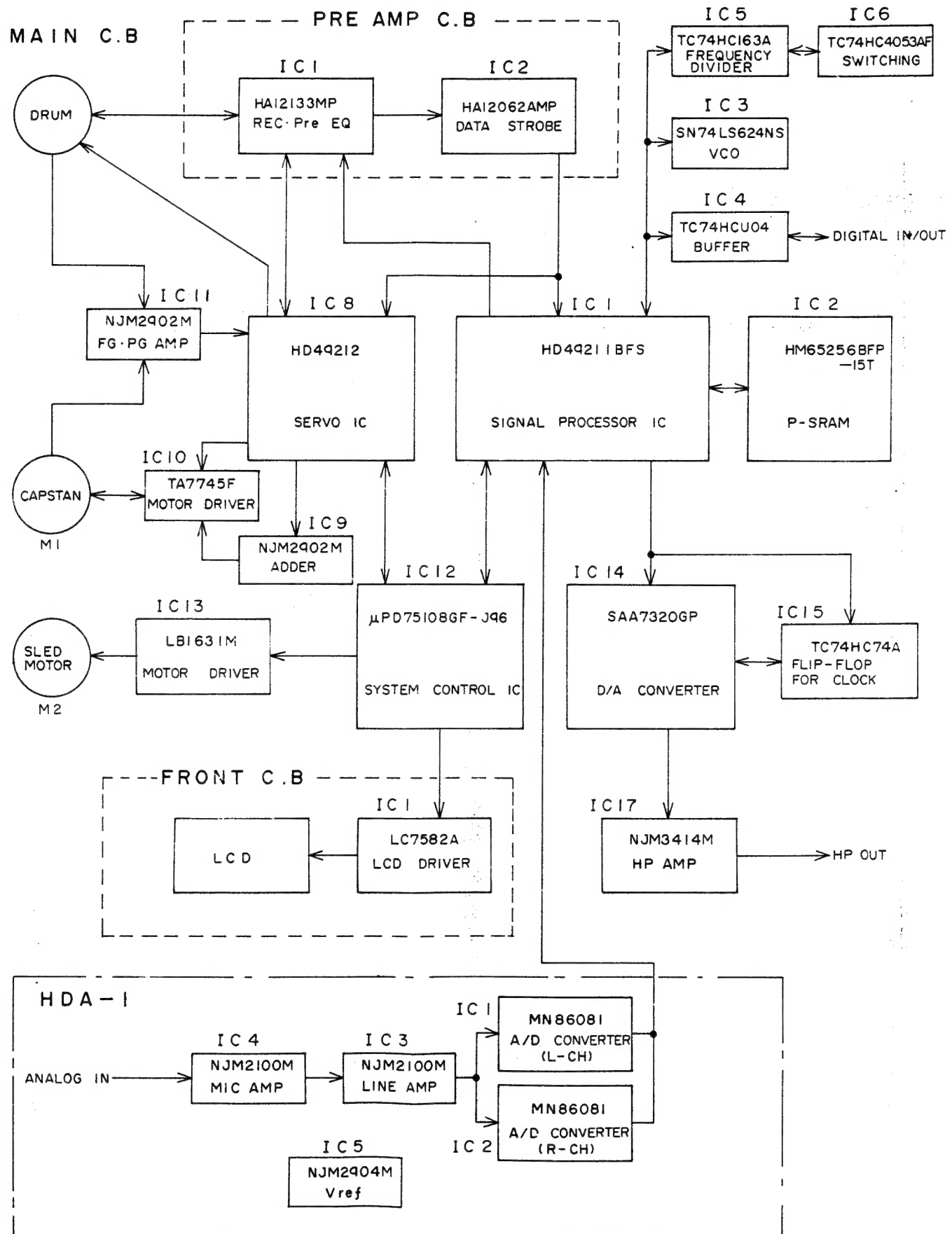
IC, HM65256BFP



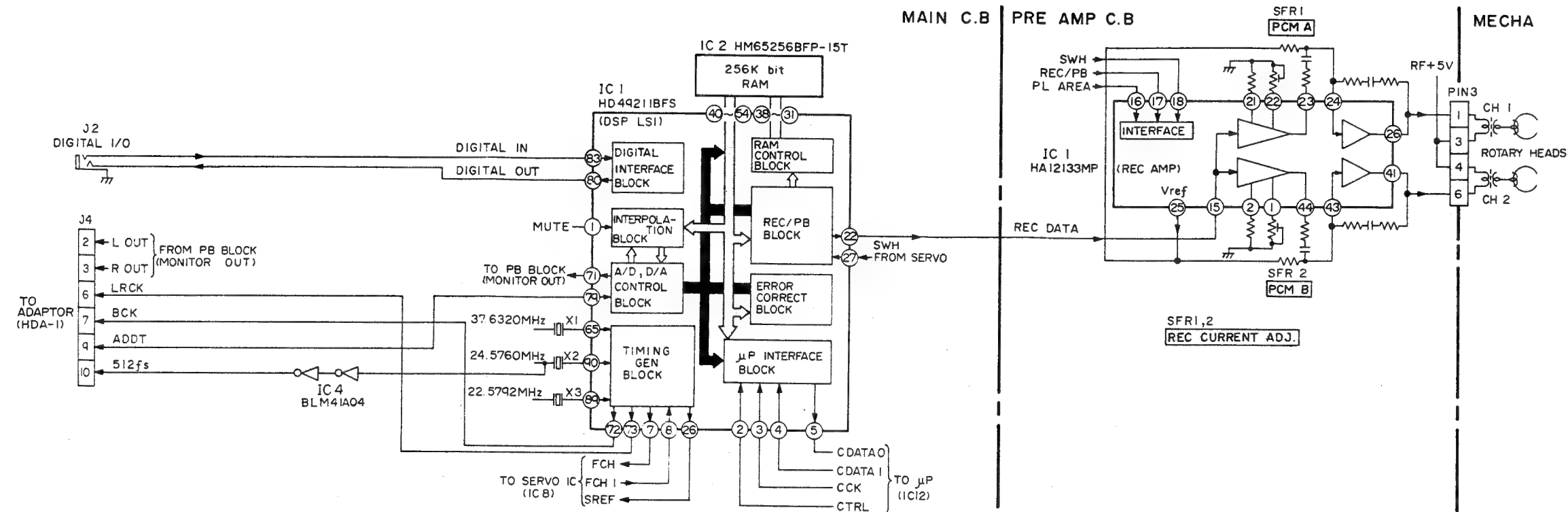
IC, LC7582A



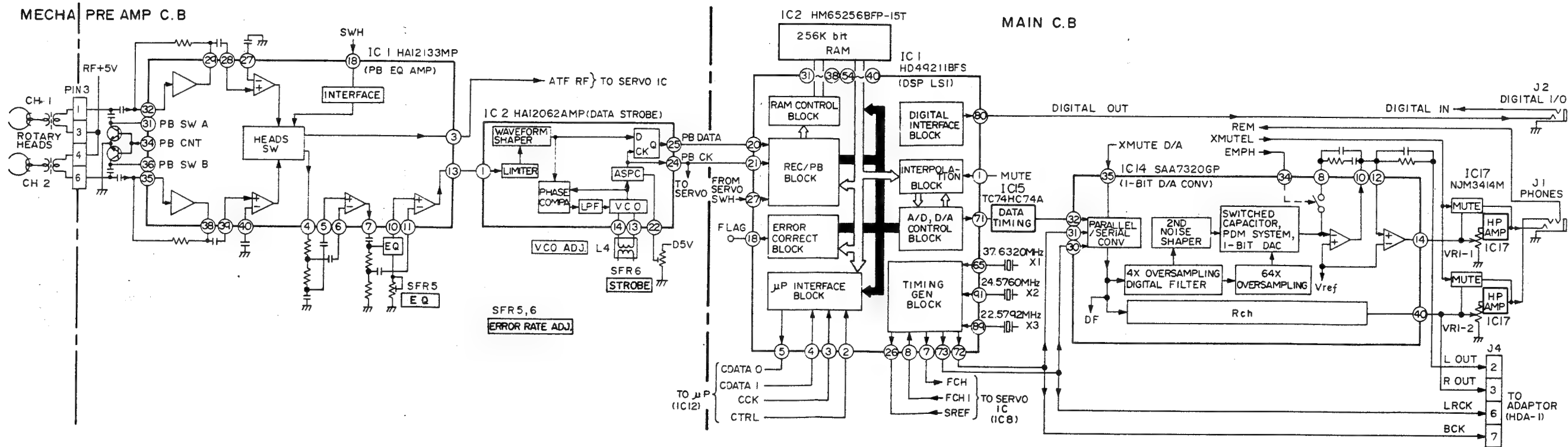
BLOCK DIAGRAM - 1 (IC COMPOSITION)



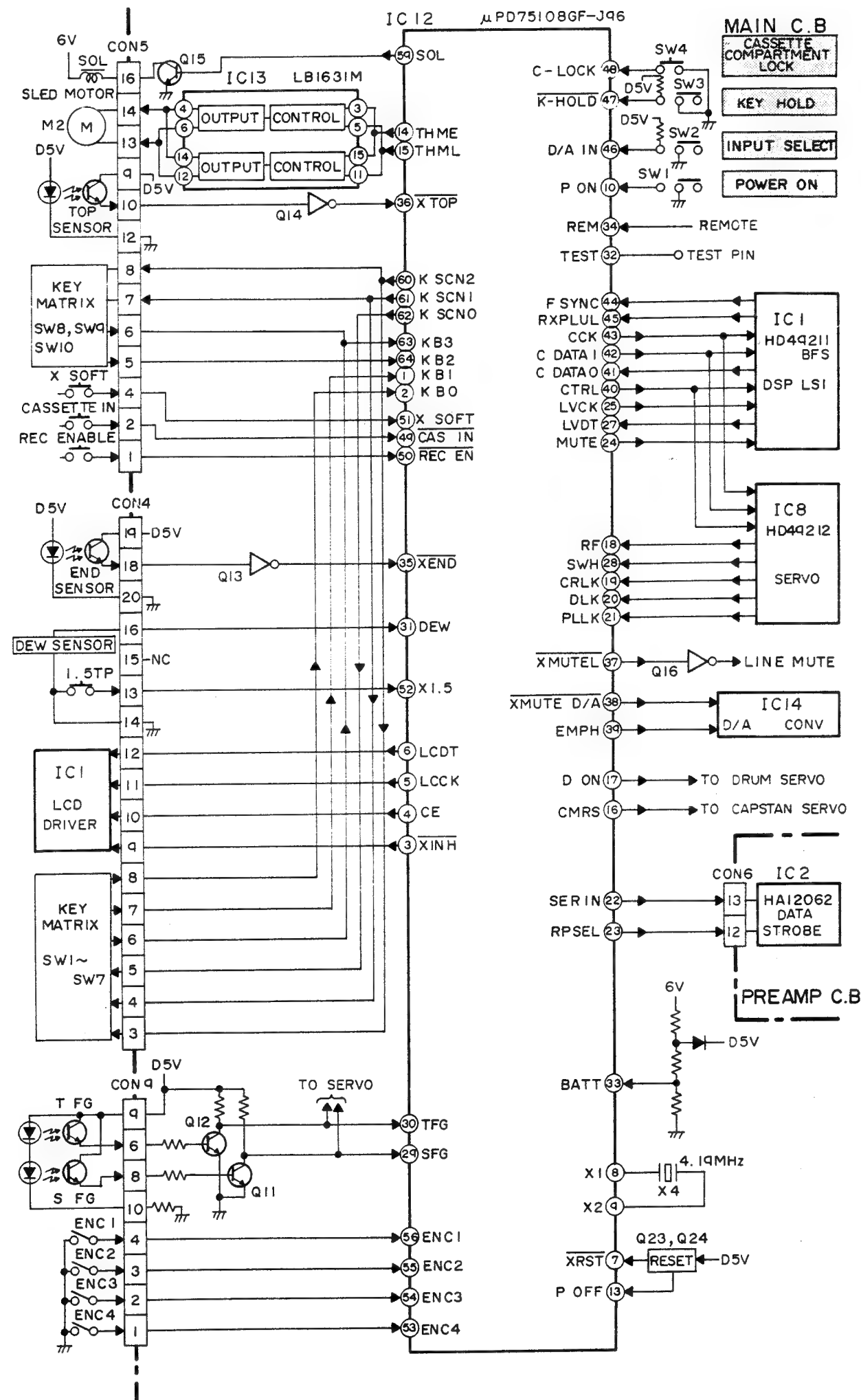
< REC AUDIO BLOCK >



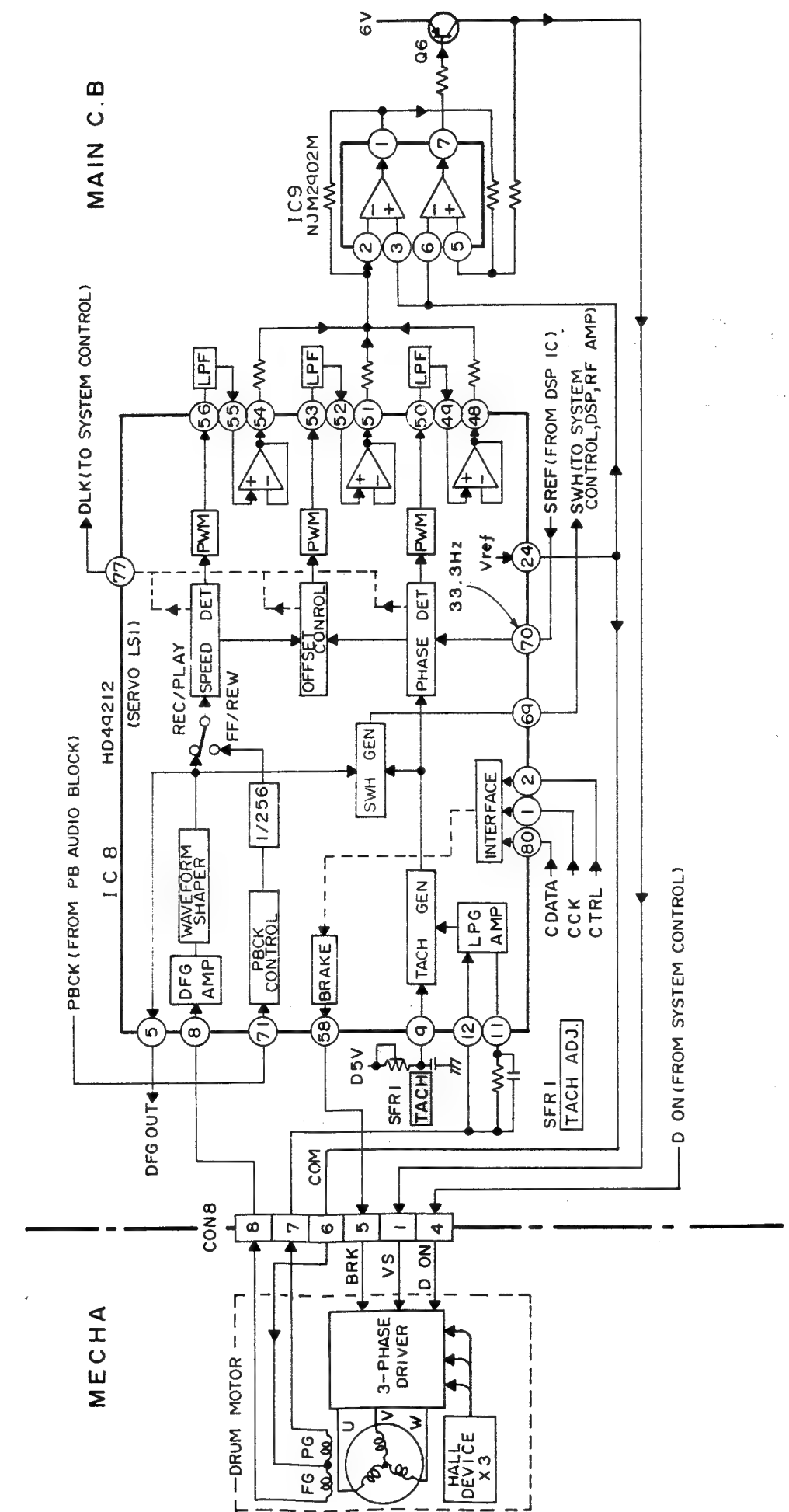
< PB AUDIO BLOCK >



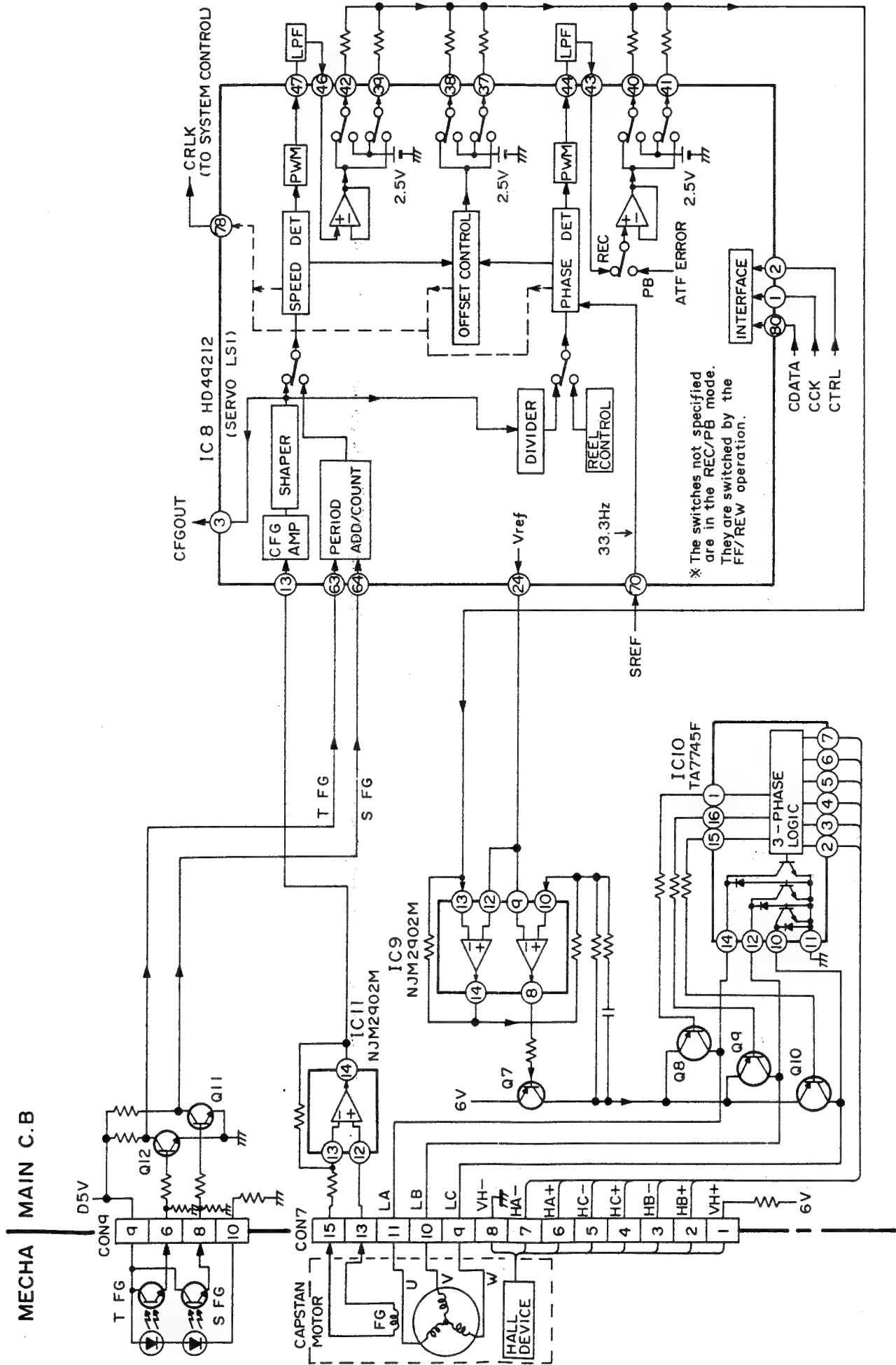
BLOCK DIAGRAM - 3 (SYSTEM CONTROL)



BLOCK DIAGRAM - 4 (DRUM SERVO)

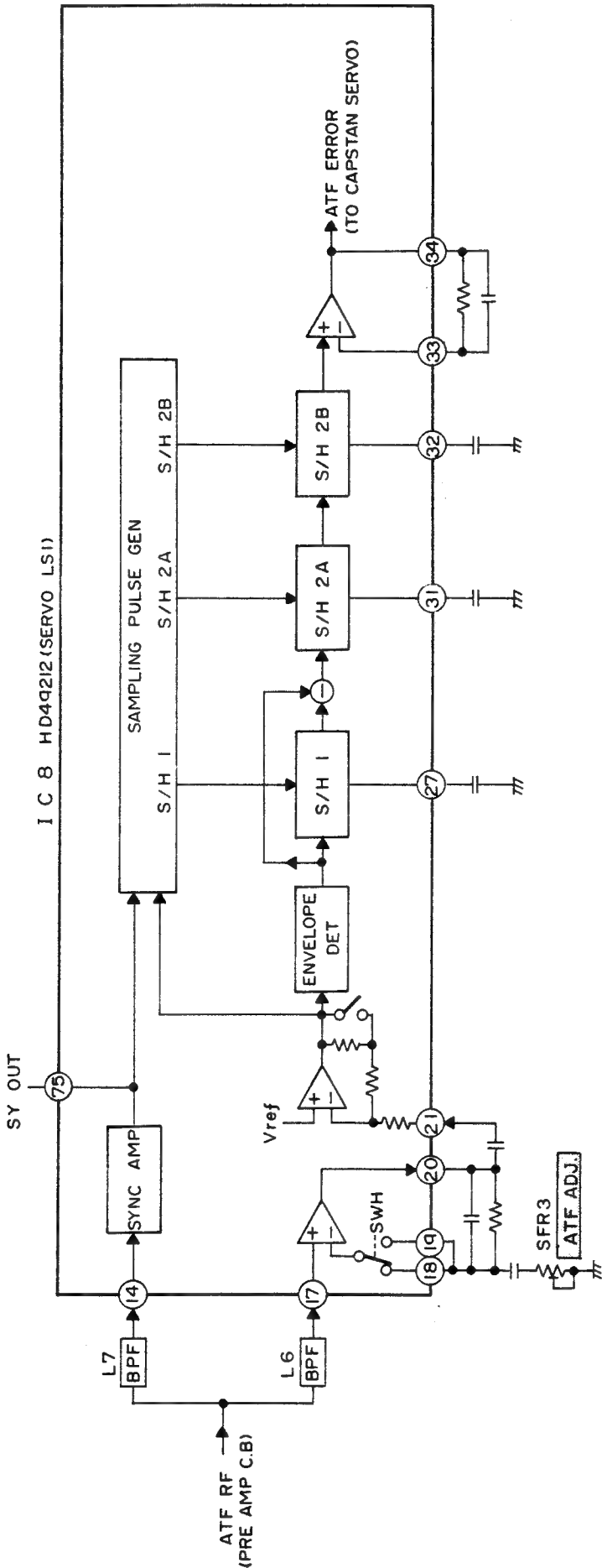


BLOCK DIAGRAM – 5 (CAPSTAN SERVO)

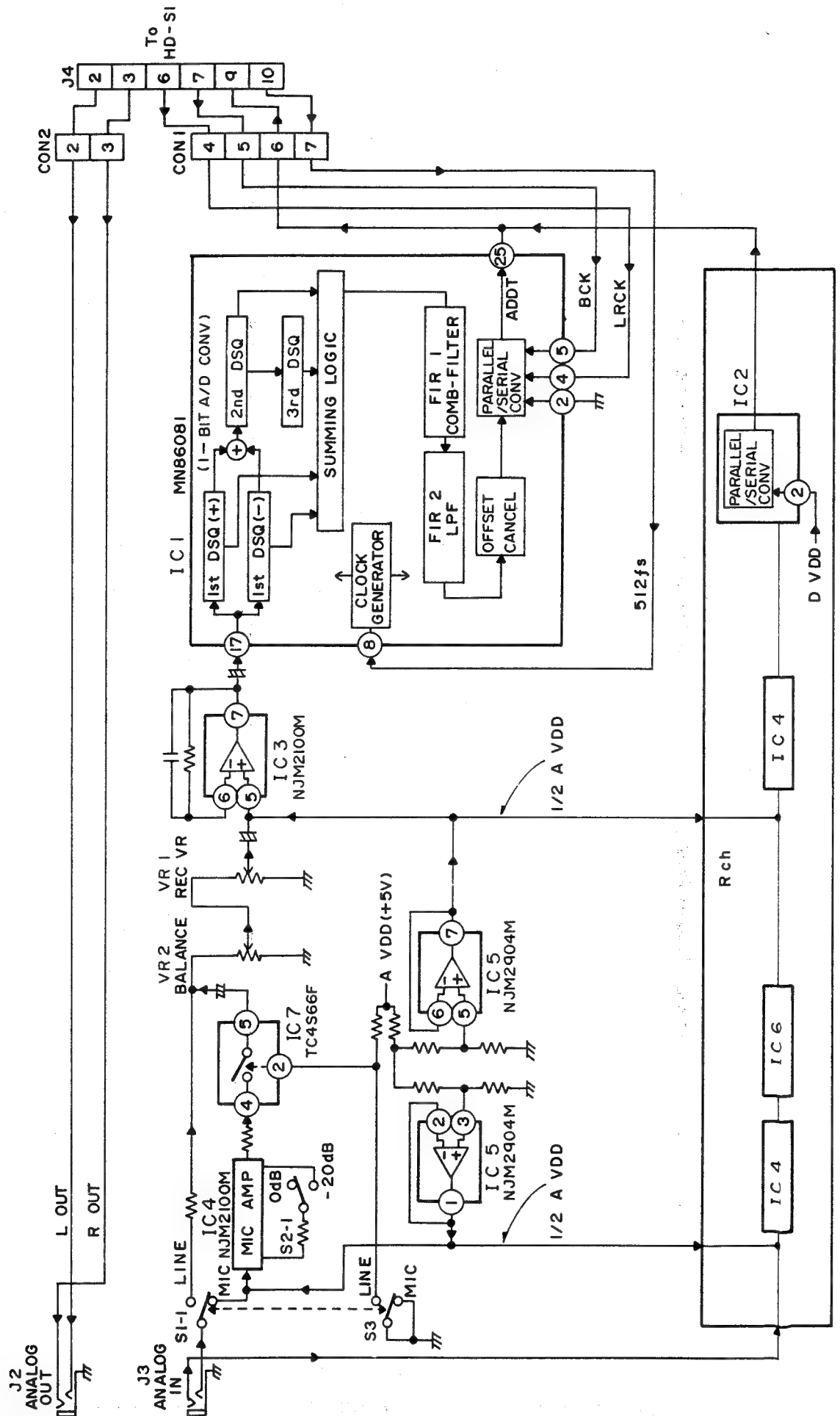


BLOCK DIAGRAM – 6 (ATF SERVO)

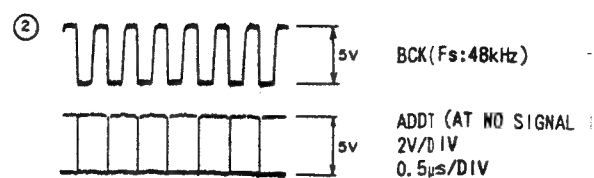
MAIN C.B



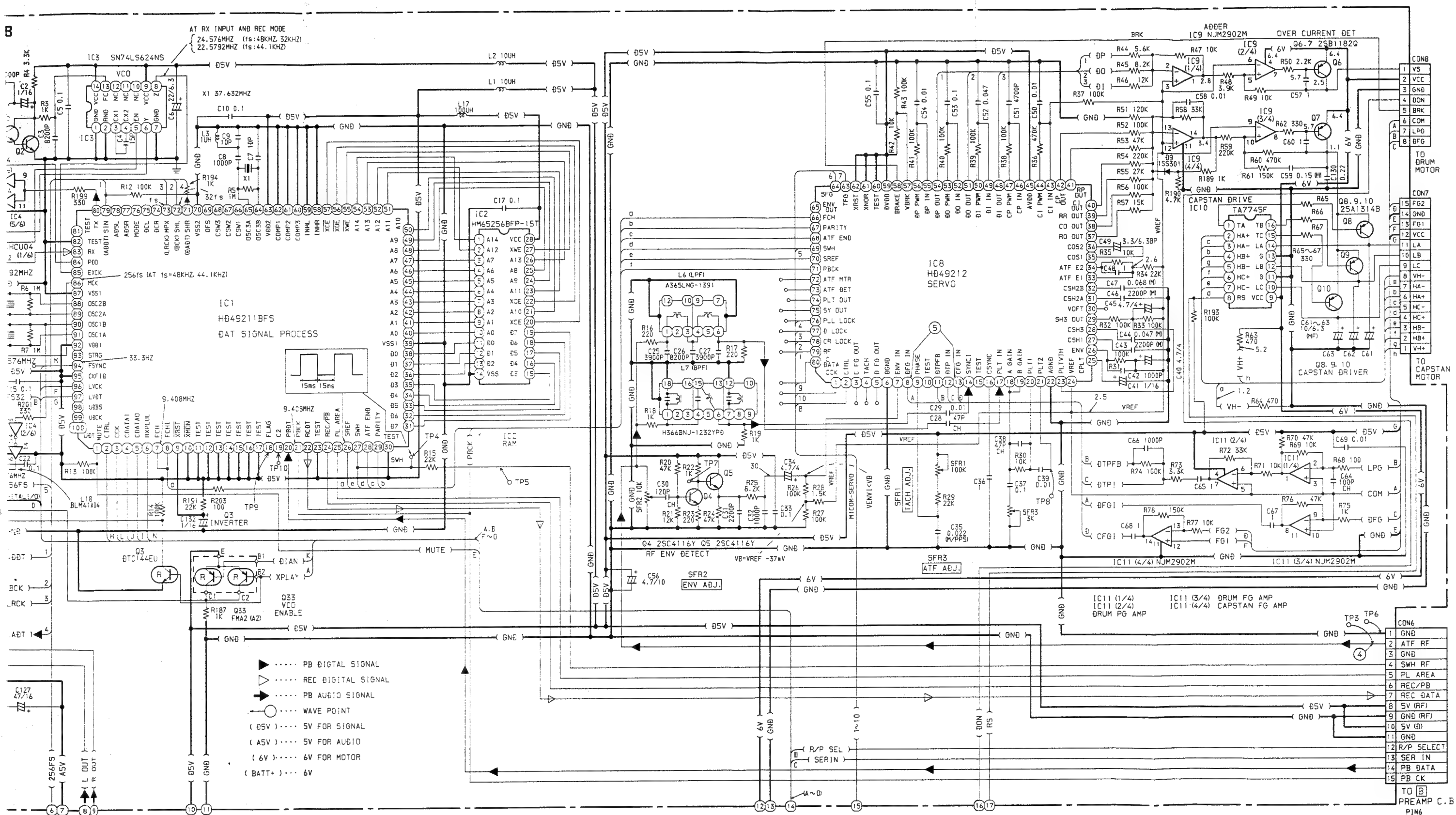
BLOCK DIAGRAM - 7 (HDA -1 AUDIO)



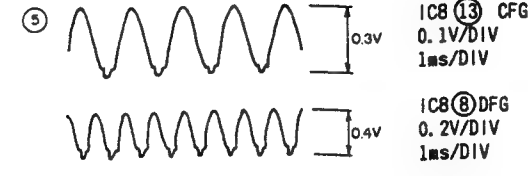
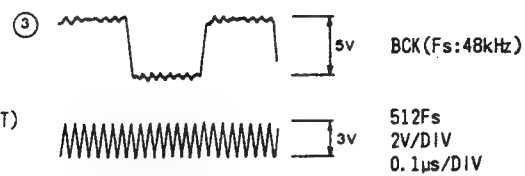
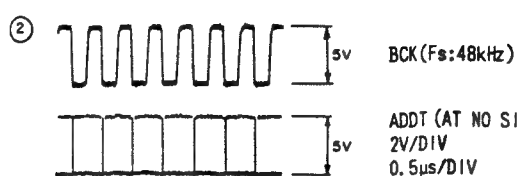
A MAIN (1/2) C.B

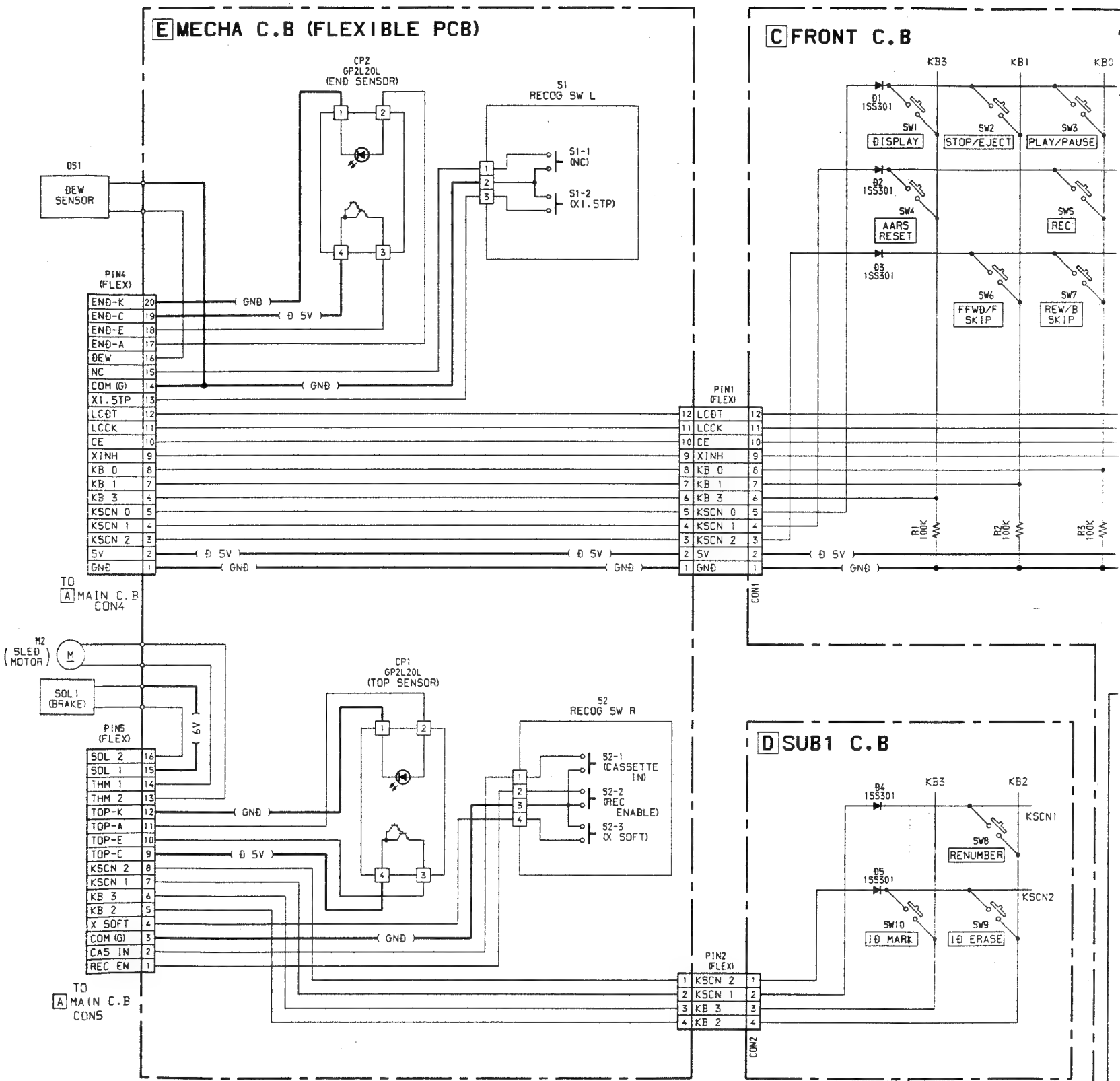
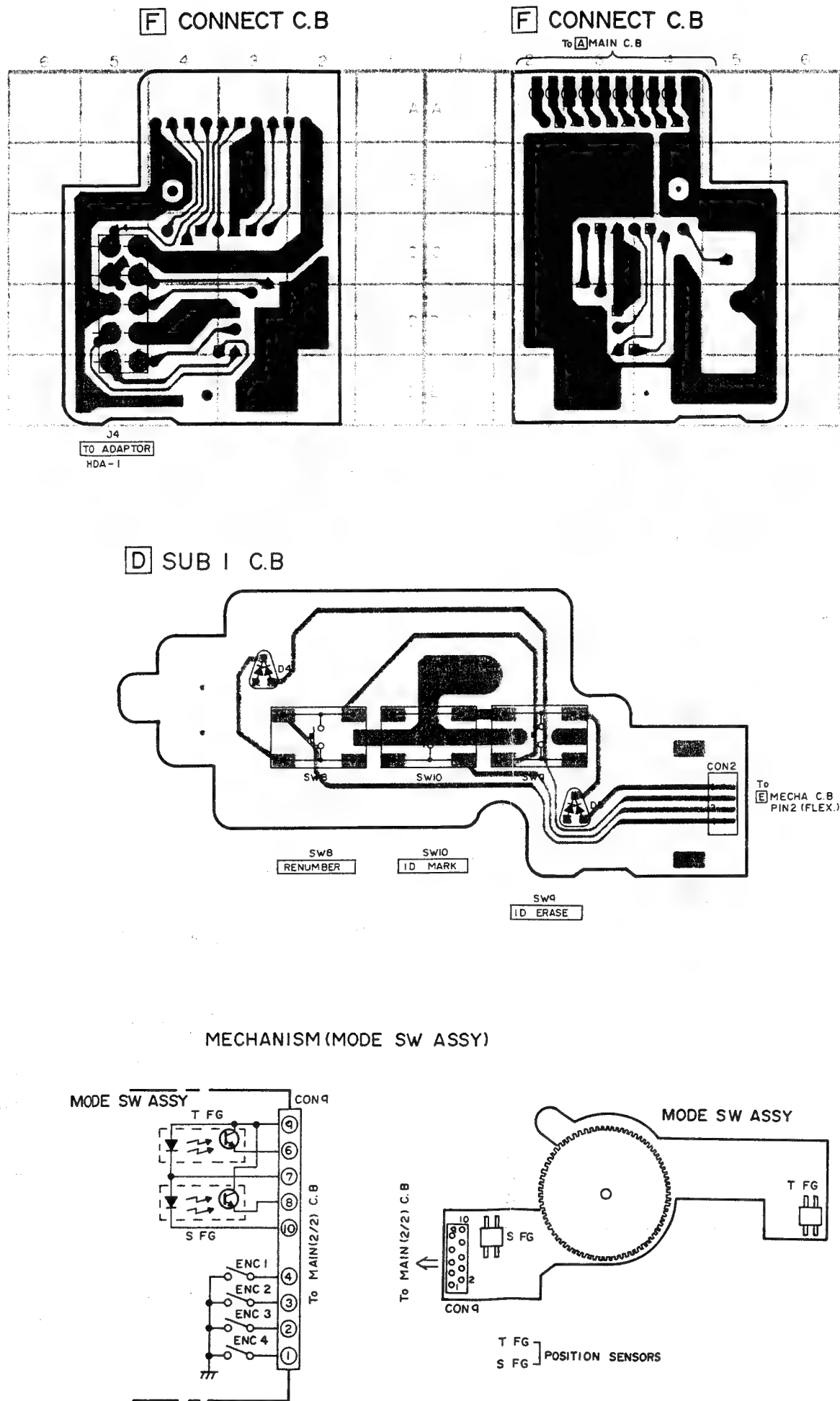


B

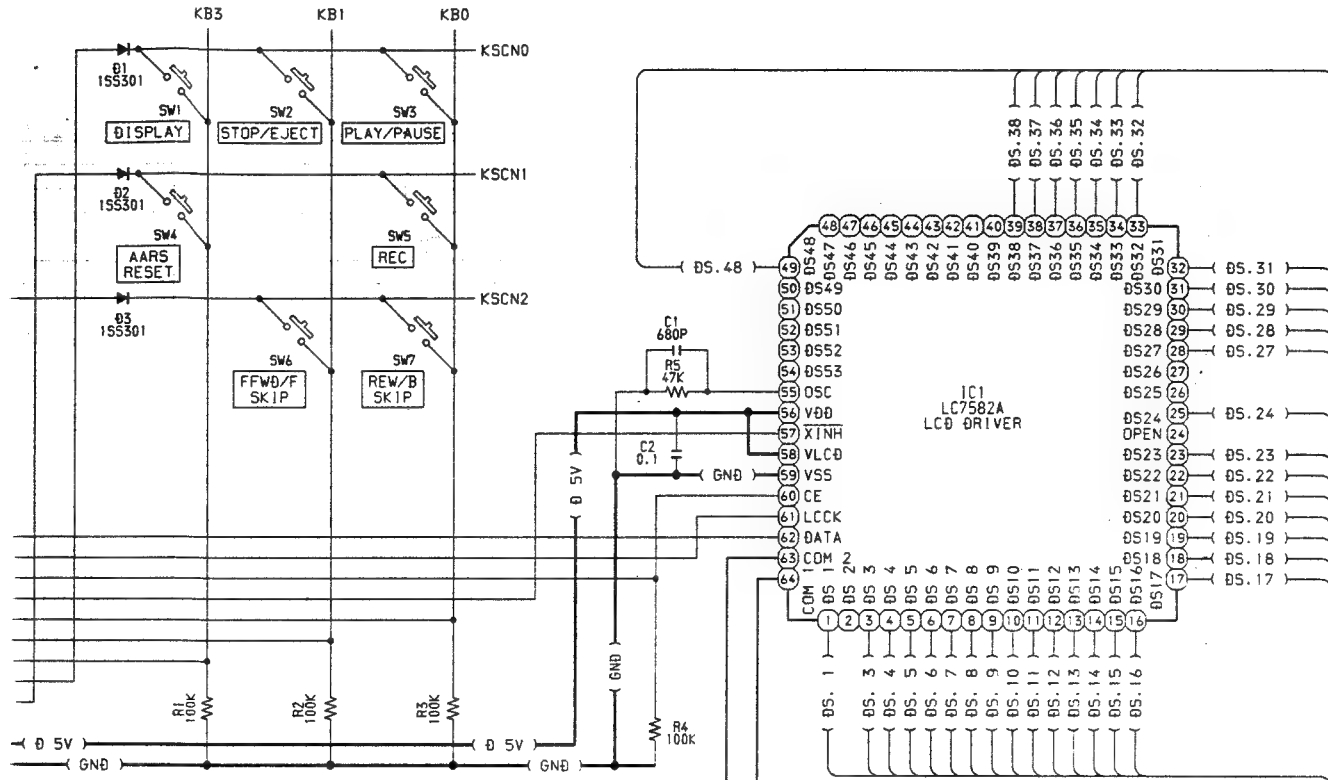


Fs:48kHz
48kHz

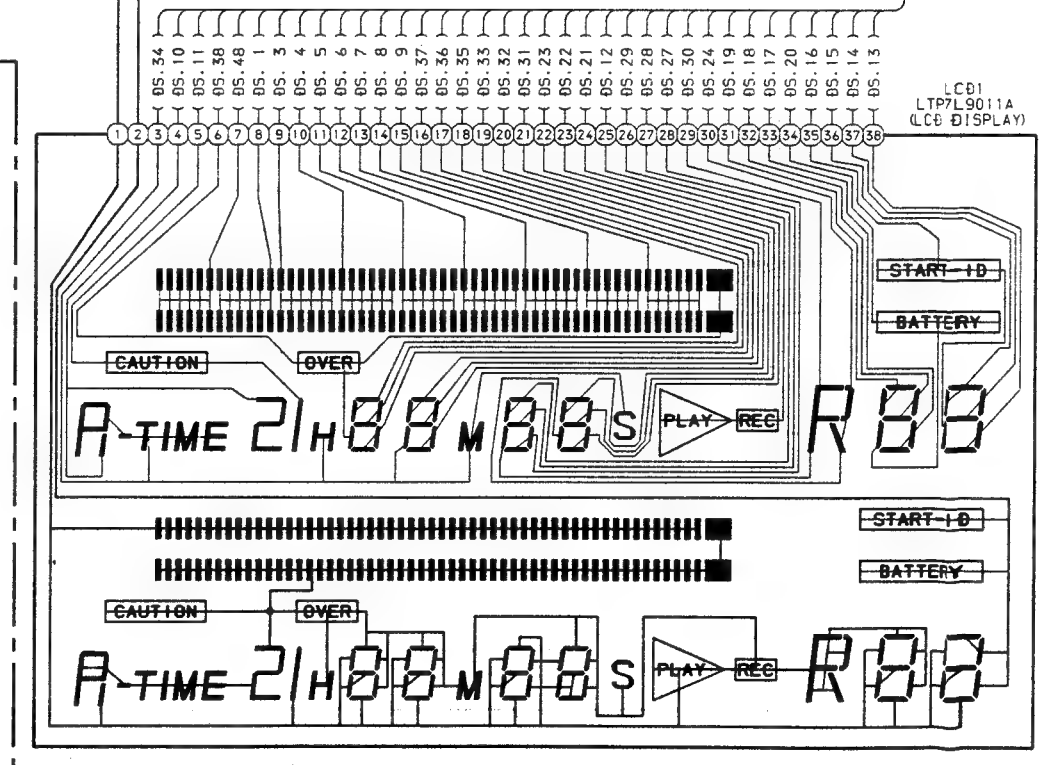
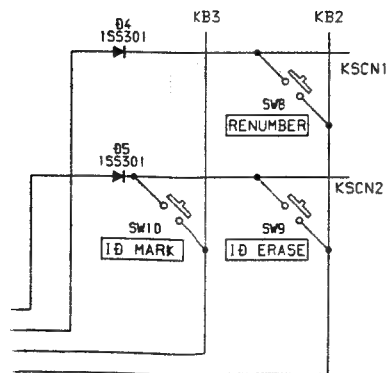




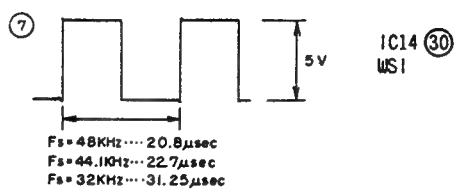
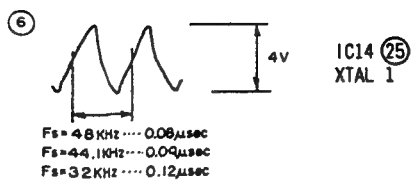
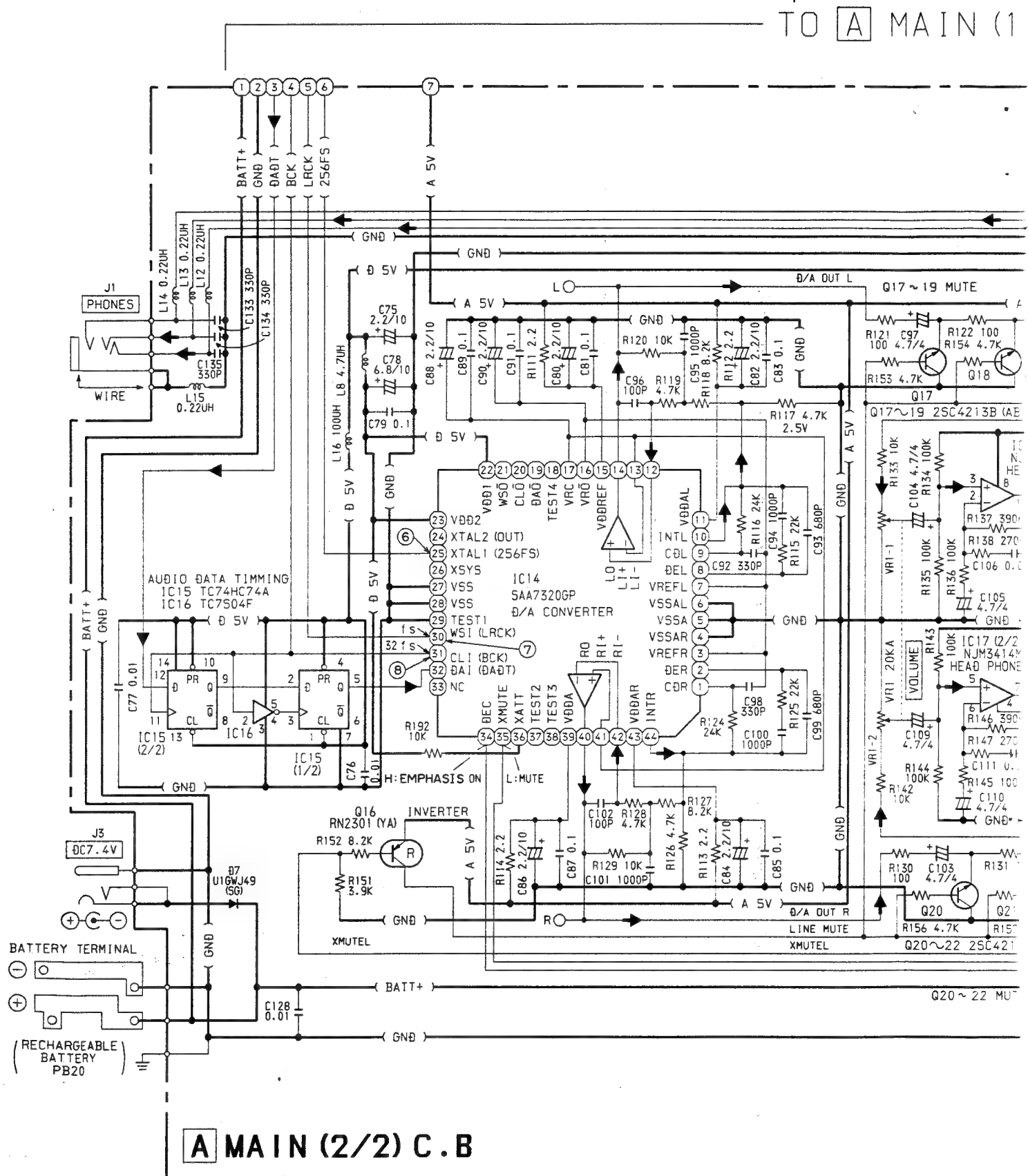
FRONT C.B



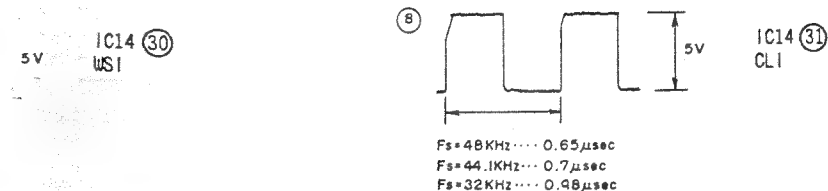
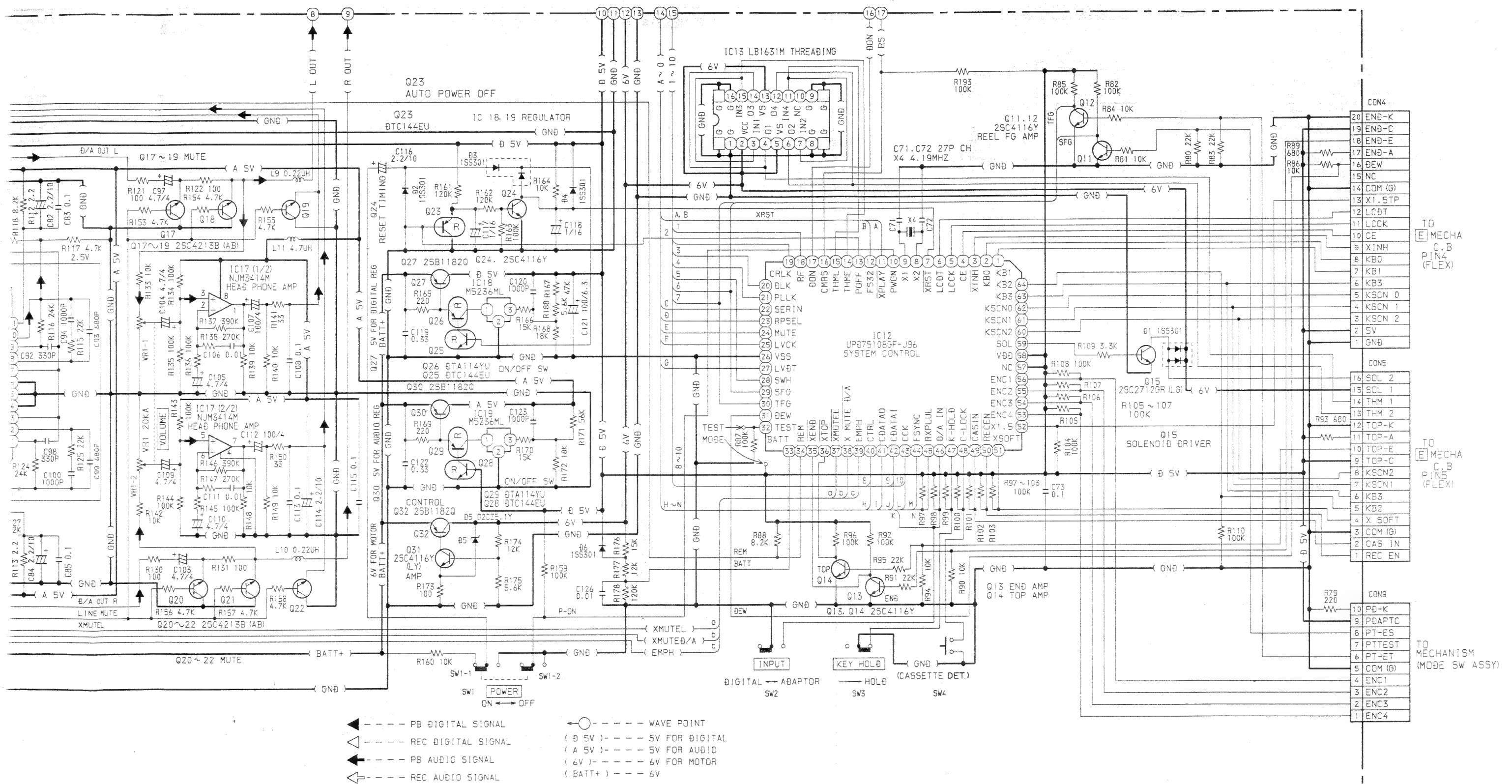
JB1 C.B



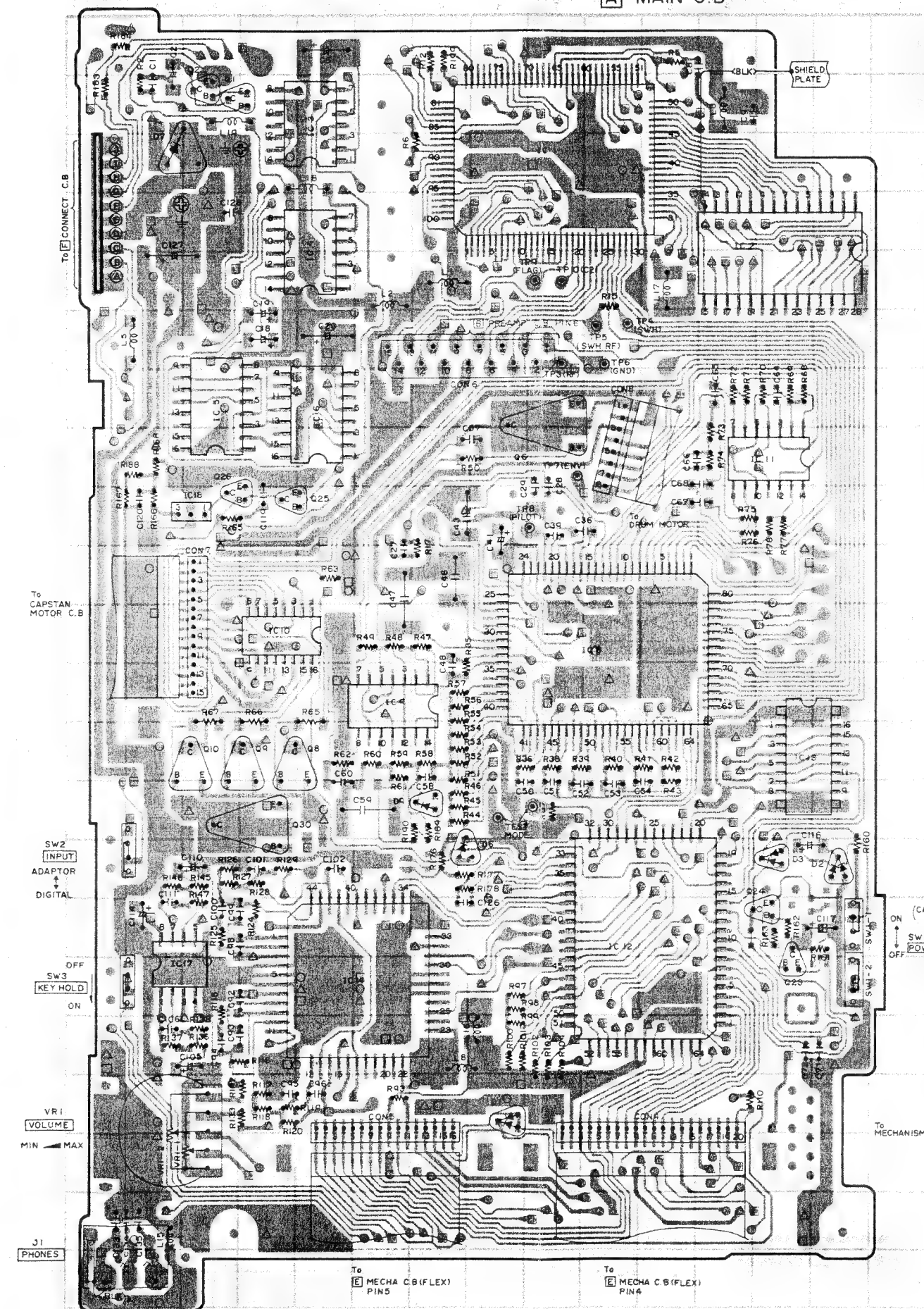
SCHEMATIC DIAGRAM - 3, WAVE FORM - 2 (SYSTEM CONTROL)



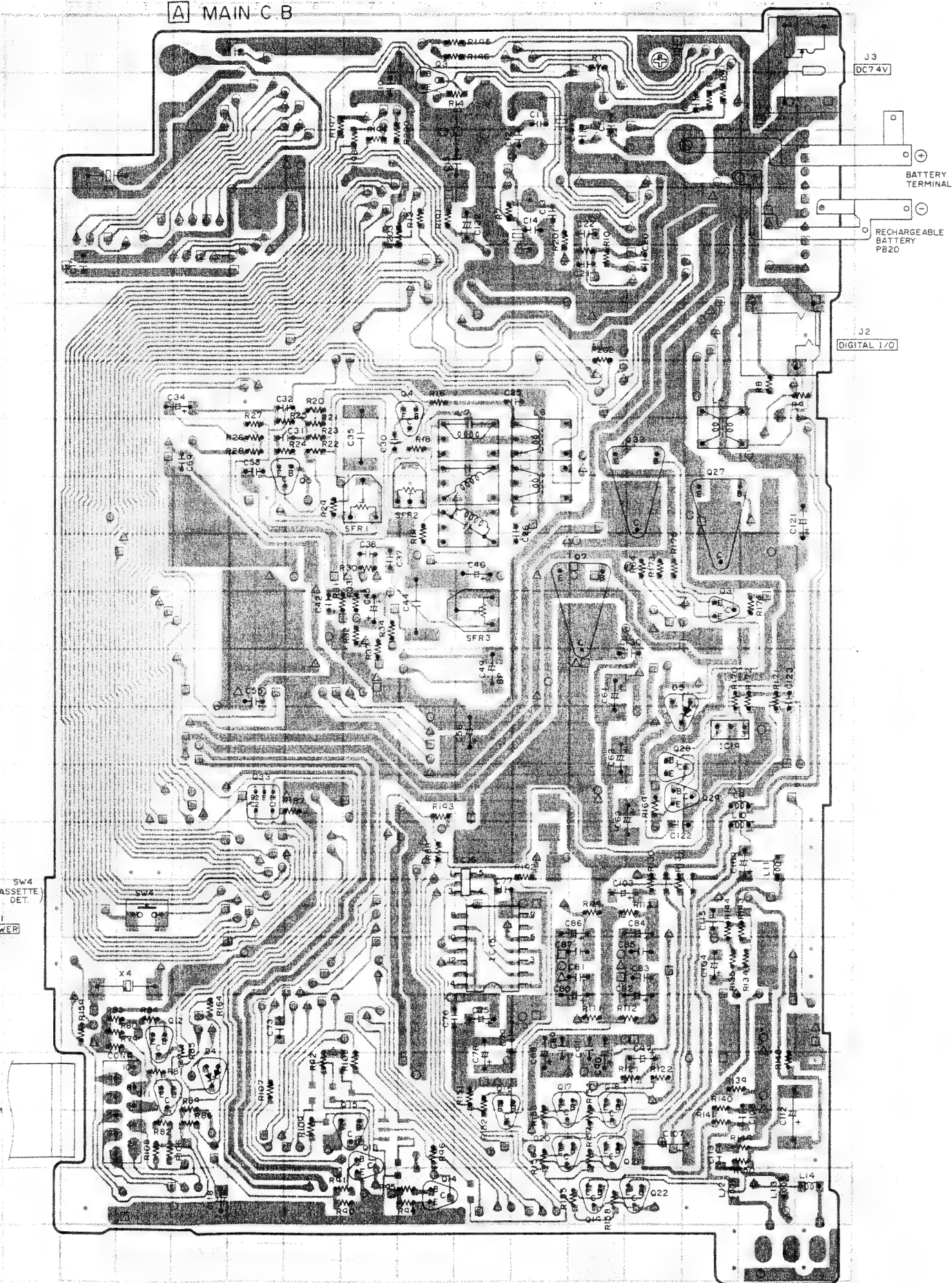
TO [A] MAIN (1/2) C.B SECTION



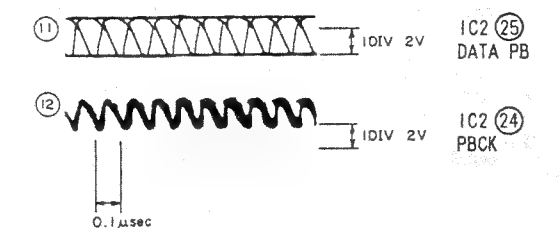
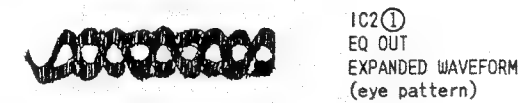
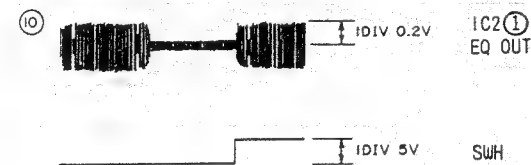
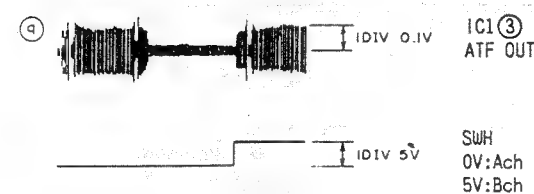
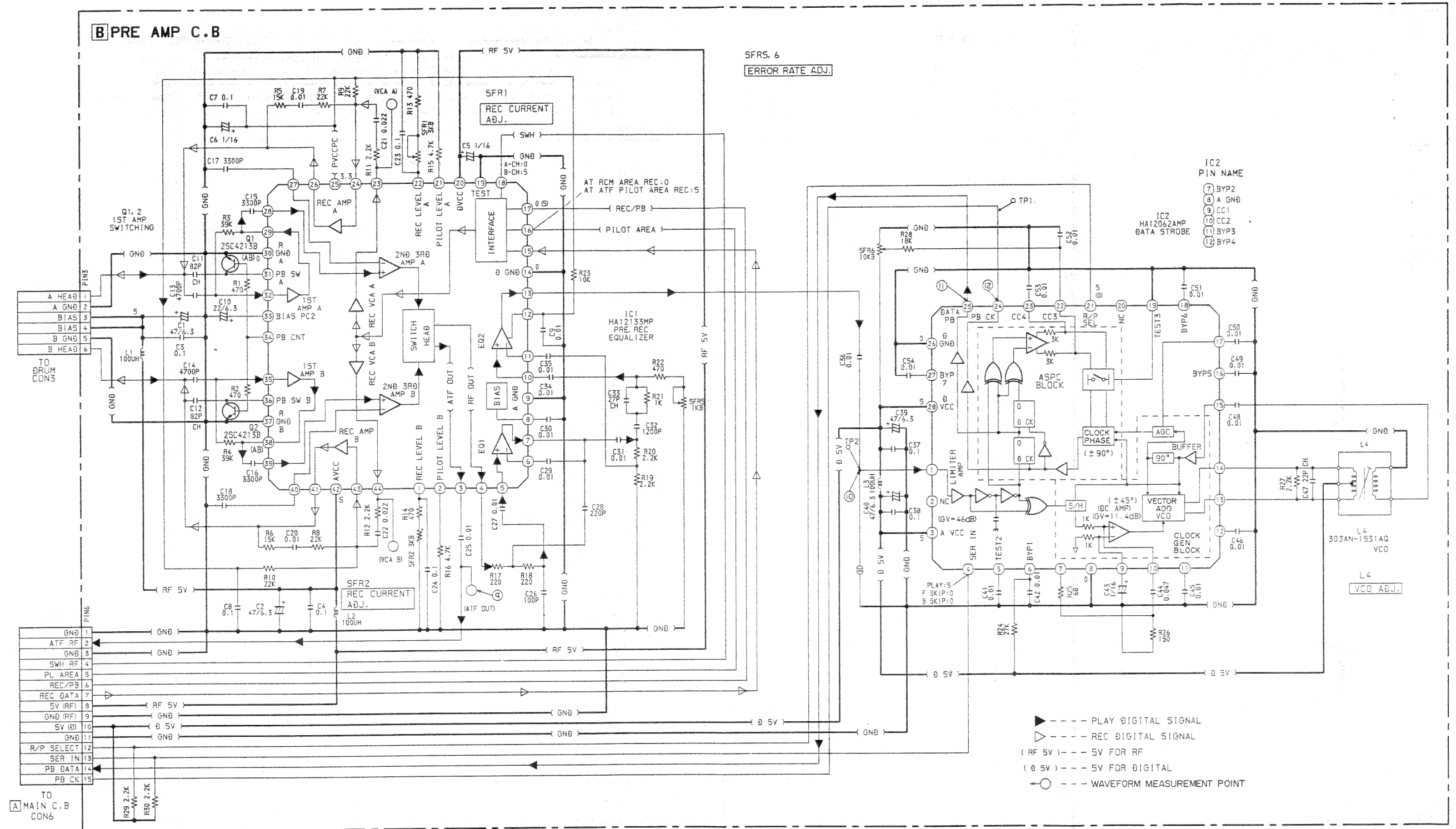
A MAIN C.B



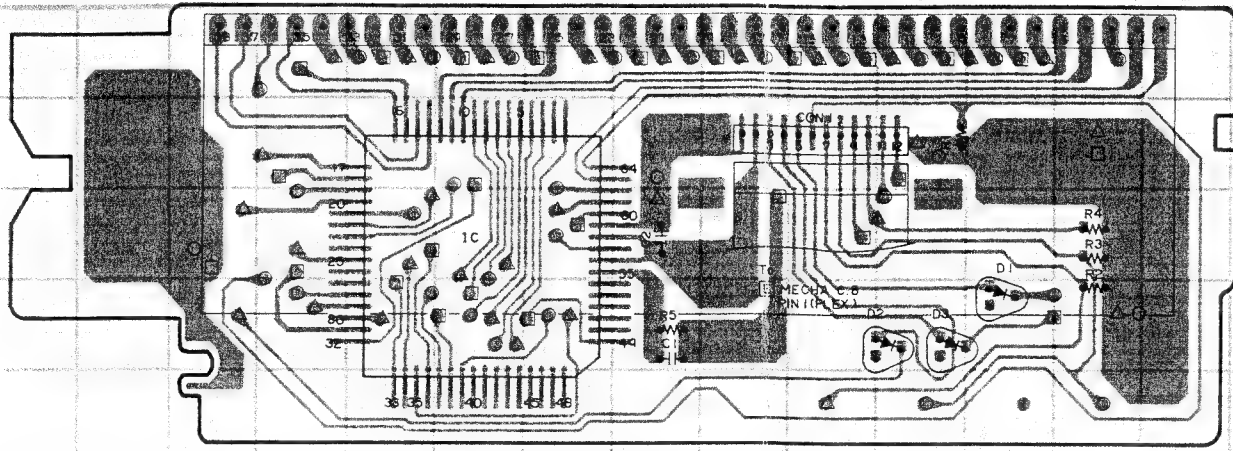
A MAIN C.B



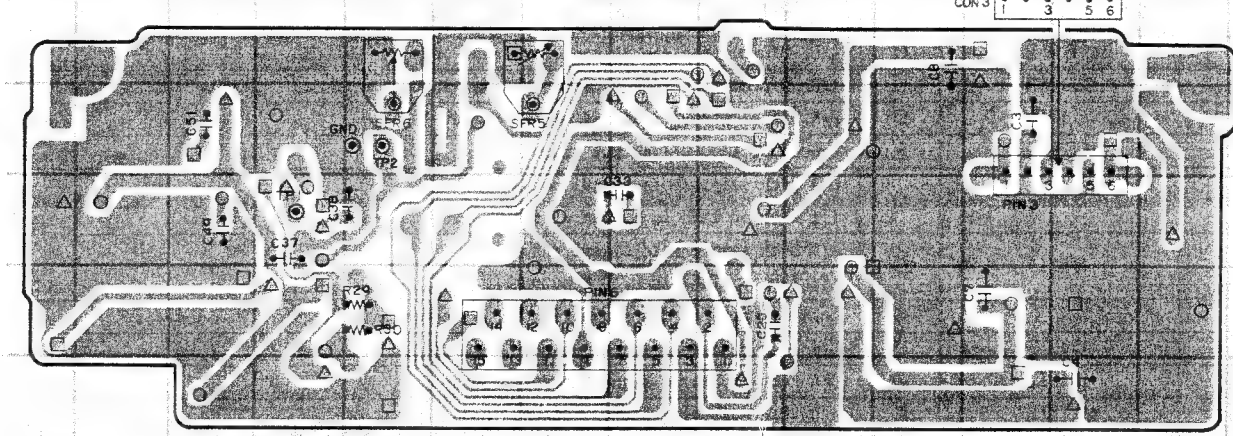
SCHEMATIC DIAGRAM - 4, WAVE FORM - 3 (PRE AMP)



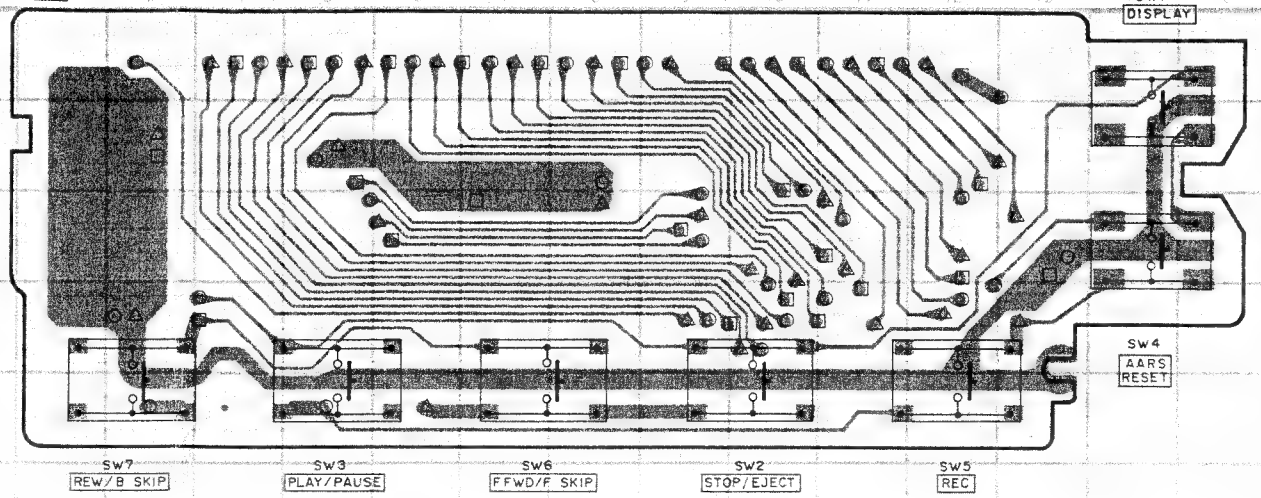
☒ FRONT C.B



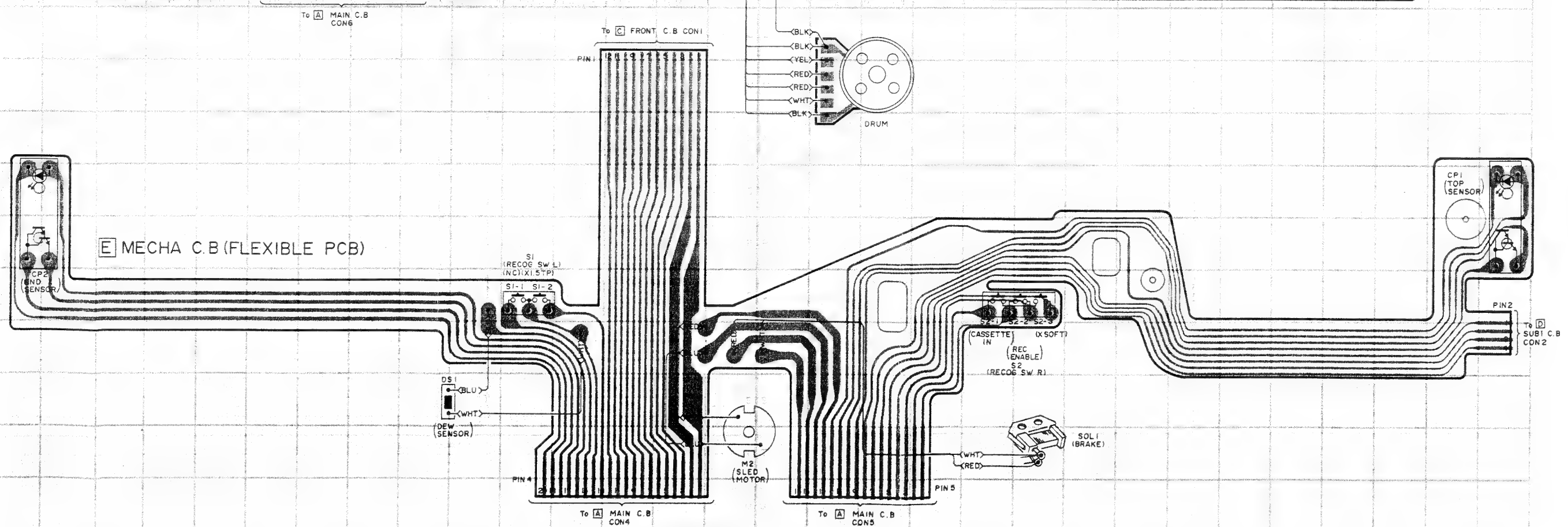
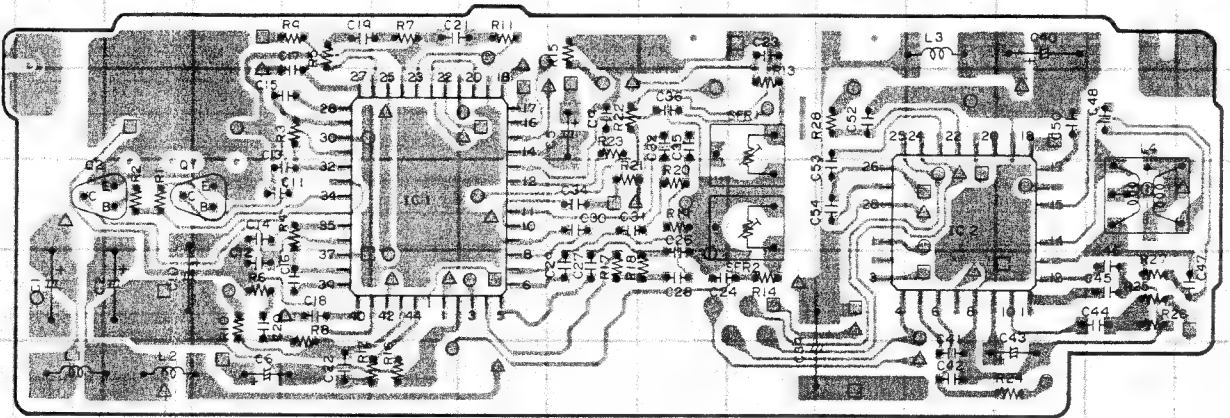
B PREAMP C.B



☒ FRONT C.B



☒ PREAMP C.B



IC DESCRIPTION

IC. HD49211BFS

Pin No.	Pin Name	I/O	Description
1	MUTE	I	MUTE control signal. ("H": Mutes monitor output)
2	CTRL	I	Microprocessor data transfer mode input control signal.
3	CCK	I	Microprocessor transfer data synchronizing clock input.
4	CDATA I	I	Microprocessor transfer data input.
5	CDATA O	O	Microprocessor transfer data output.
6	RXPUL	O	Output to lock or unlock the PLL in the digital input mode. ("H" = Unlock, "L": Lock)
7	FCH	O	Channel clock output. (9.408MHz)
8	FCHI	I	Channel clock input.
9	XRST	I	Master reset signal. (connected to D+5V)
10	XMON	I	Internal signal monitor control signal. (connected to D+5V)
11	TEST	I	Connected to D+5V.
12	TEST	I	
13	TEST	I	
14	TEST	I	
15	TEST	I	
16	TEST	I	
17	TEST	I	
18	FLAG	O	Error flag output.
19	C2	O	C correction area output.
20	PBDT	I	Playback signal input.
21	PBCK	I	Playback signal synchronizing clock input.
22	RCDT	O	Recording signal output.
23	TEST	I	Connected to D+5V.
24	REC/PB	O	Recording/playback control signal output. ("H": REC, "L": PB)
25	PL AREA	O	ATF Pilot signal recording area output.
26	SREF	O	Servo reference signal output.
27	SWH	I	Head switching signal input.
28	ATF END	I	ATF area detection signal input.
29	PARITY	O	Parity detection result output.
30	TEST	I	Connected to D+5V.
31	D7	I/O	RAM data inputs/outputs. (connected to IC2 on the Main C.B.)
32	D6	I/O	
33	D5	I/O	
34	D4	I/O	
35	D3	I/O	
36	D2	I/O	
37	D1	I/O	
38	D0	I/O	
39	VSS1	-	Ground of signal processor block.
40	A0	O	RAM address outputs. (connected to IC2 on the Main C.B.)
41	A1	O	
42	A2	O	
43	A3	O	
44	A4	O	
45	A5	O	
46	A6	O	
47	A7	O	
48	A8	O	
49	A9	O	
50	A10	O	

Pin N.	Pin Name	I/O	Description
51	A11	O	RAM address outputs. (connected to IC2 on the Main C.B.)
52	A12	O	
53	A13	O	
54	A14	O	
55	XWE	O	RAM write enable signal. ("L": write enable)
56	XOE	O	RAM output enable signal. ("L": output enable)
57	XCE	O	RAM chip select. (If MONITOR is L, SLOT signal is monitored.)
58	INHR	I	A/D R-ch operation stop control signal. (connected to ground)
59	INHL	I	A/D L-ch operation stop control signal. (connected to ground)
60	COMP3	I	A/D converter signal input. (connected to ground)
61	COMP2	I	A/D converter signal input. (connected to ground)
62	COMP1	I	A/D converter signal input. (connected to ground)
63	VDD2	-	Power supply of A/D and D/A output signals. (connected to D+5V)
64	OSC3B	O	37.632MHz oscillator output.
65	OSC3A	I	37.632MHz oscillator input.
66	CSW1	O	A/D, D/A current source control signal output. (unused)
67	CSW2	O	A/D, D/A current source control signal output. (unused)
68	CSW3	O	A/D, D/A current source control signal output. (unused)
69	OFS	O	D/A offset circuit control signal output. (unused)
70	VSS2	-	Ground of A/D, D/A output signals.
71	SHR	O	D/A R-ch sample/hold signal output. (If INHL or INHR is L, serial output is obtained.)
72	SHL	O	D/A L-ch sample/hold signal output. (If INHL or INHR is L, BCK output is obtained.)
73	MPX	O	Input/output L/R discrimination signal output. ("H": R-ch, "L": L-ch)
74	DCR	O	D/A R-ch discharge signal output. (unused)
75	DCL	O	D/A L-ch discharge signal output. (unused)
76	MODE	O	A/D, D/A switching signal output. (unused)
77	ADSR	O	PWM signal output for A/D R-ch offset servo. (unused)
78	ADSL	O	PWM signal output for A/D L-ch offset servo. (unused)
79	SIN	I	Serial signal input from HDA-SI.
80	TX	O	Digital interface output.
81	TEST	-	Unused.
82	TEST	I	Vss (connected to ground)
83	RX	I	Digital interface input.
84	PDO	O	PLL phase comparator output.
85	EXCK	I	External clock input. (Fe48kHz+32kHz=24.576MHz, Fs=44.1kHz=22.5792MHz)
86	MCK	O	Master clock output. (256Fs output)
87	VSS1	-	Ground of signal processing block.
88	OSC2B	O	11.2896MHz/22.5792MHz oscillator output.
89	OSC2A	I	11.2896MHz/22.5792MHz oscillator input.
90	OSC1B	O	12.288MHz/24.576MHz oscillator output.
91	OSC1A	I	12.288MHz/24.576MHz oscillator input.
92	VDD1	-	Power supply of signal processing block. (connected to D+5V)
93	STRG	I	Frame sync signal input. (unused)
94	FSYNC	O	Frame sync signal output. (100/3Hz)
95	CKFID	I	TX clock accuracy control input. (connected to D+5V)
96	LVCK	I	Level meter data clock input.
97	LVDT	O	Level meter data output.
98	UDBS	O	Sync output of RX input U bit data. (unused)
99	UDCK	O	Sync clock output of RX input U bit data. (unused)
100	UDT	O	RX input bit data output. (unused)

IC: HD49212

Pin No.	Pin Name	I/O	Description
1	CCK	I	Microprocessor transfer data sync clock input.
2	CTRL	I	Microprocessor data transfer mode input control signal.
3	CFGOUT	O	Capstan FG output. Monitors the C FG signal input via pin 13.
4	TACH	O	TACH output. The trailing edge of this signal is used as a reference position during recording.
5	DFGOUT	O	Drum FG output. Monitors the D FG signal input via pin 8.
6	DGND	-	Ground of digital circuit.
7	ENVIN	I	RF signal envelope input.
8	DFGIN	I	Drum FG input.
9	PHASE	I	Connected to the resistors and capacitors of a monostable multivibrator which generates TACH pulses.
10	TEST	I	Test input pin. (unused)
11	DTPFB	O	Drum TACH amp output.
12	DTPIN	I	Drum TACH amp inverted input.
13	CFGIN	I	Capstan FG amp input.
14	SYNCl	I	Sync input during playback. ATF sync signal derived from the RF signal through a BPF.
15	TEST	I	Test input pin. (unused)
16	CSYNC	I	Connected a capacitor which holds the threshold voltage of the sync comparator.
17	PLTIN	I	Pilot amp 1 positive-phase input.
18	AGAIN	I	Inverted input to adjust the gain of A-head pilot amp 1.
19	BGAIN	I	Inverted input to adjust the gain of B-head pilot amp 1.
20	PLT1	O	Pilot amp 1 output.
21	PLT2	I	Pilot amp 2 output.
22	AGND	-	Ground of analog circuit.
23	PLTVTH	I	Pilot comparator threshold voltage input.
24	VREF	O	VDD/2 output. (2.5V)
25	CPLT	I	Connected a capacitor which holds the threshold voltage of the pilot detector.
26	ENV	O	Pilot detector output.
27	CSH1	I/O	Connected a capacitor for sample/hold 1.
28	CSH3	I/O	Connected a capacitor for sample/hold 3.
29	SH3OUT	O	Sample/hold 3 output.
30	VOFT	I	ATF offset voltage input. (unused)
31	CSH2A	I/O	Connected a capacitor for sample/hold 2A.
32	CSH2B	I/O	Connected a capacitor for sample/hold 2B.
33	ATFE1	I	ATF error amp inverted input.
34	ATFE2	O	ATF error amp output.
35	COS1	I/O	Capstan offset servo integrator inverted input.
36	COS2	O	Capstan offset servo integrator output.
37	ROOUT	O	Reel offset servo control voltage buffer output.
38	COOUT	O	Capstan offset servo control voltage buffer output.
39	RROUT	O	Reel rising ramp voltage output.
40	CIOUT	O	Capstan I system control voltage buffer output.
41	RPOUT	O	Reel P system control voltage buffer output.
42	CPOUT	O	Capstan P system control voltage buffer output.
43	CIIN	I	Capstan I system PWM input passing through an LPF.
44	CIPWM	O	Capstan I system PWM output.
45	AVDD	-	Power supply of analog circuit. (D+5V)
46	CPIN	I	Capstan P system PWM input passing through an LPF.
47	CPPWM	O	Capstan P system PWM output.
48	DIOUT	O	Drum I system control voltage buffer output.

Pin No.	Pin Name	I/O	Description
49	DIIN	I	Drum I system PWM input passing through an LPF.
50	DIPWM	O	Drum I system PWM output.
51	DOOUT	O	Drum offset servo control voltage buffer output.
52	DOIN	I	Drum offset servo PWM input passing through an LPF.
53	DOPWM	O	Drum offset servo PWM output.
54	DPOUT	O	Drum P system control voltage buffer output.
55	DPIN	I	Drum P system PWM input passing through an LPF.
56	DPPWM	O	Drum P system PWM output.
57	VBRK	I	Drum brake voltage input. (fixed at 4.5V)
58	BRAKE	O	Drum brake control output. ("H": brake, "L": normal)
59	DVDD	-	Power supply of digital circuit. (D+5V)
60	TEST	I	Test input pin. (connected to D+5V)
61	XNOR	I	Normal mode input. (connected to D+5V)
62	XRST	I	Reset input. (connected to D+5V)
63	TFG	I	I reel FG input.
64	SFG	I	S reel FG input.
65	ENVOU	O	Envelope comparator output.
66	FCH	I	Channel clock input.
67	PARITY	I	Parity signal input.
68	ATFEND	O	ATF END output.
69	SWH	O	Head switching output.
70	SREF	I	Servo reference input.
71	PBCK	I	Playback signal sync clock input.
72	ATFMTR	O	ATF monitor during play and HUNT monitor during search.
73	ATFDET	O	ATF DET monitor during play and HOLD monitor during search.
74	PLTOUT	O	PILOT monitor during play and DIOM monitor during search.
75	SYOUT	O	SYNC monitor during play and CK (PACK divided by 2) monitor during search.
76	PLLLOCK	O	PLL lock monitor. ("H": lock)
77	DLOCK	O	Drum lock output. ("H": lock)
78	CRLOCK	O	Capstan/reel lock output. ("H": lock)
79	RF	O	RF signal presence/absence status output. ("H": present)
80	CDATA	I	Microprocessor transfer data input.

IC, #PD75108GF-J96

Pin No.	Pin Name	I/O	Description
1	KB1	I	Key matrix inputs from the FRONT and SUB1 C.Bs.
2	KBO	I	
3	XINH	O	LCD display inhibit. ("H": lights, "L": goes off)
4	CE	O	LCD driver interface. Chip select (CE) output.
5	LCLK	O	LCD driver interface. Clock (CLK) output.
6	LCDT	O	LCD driver interface. Data output.
7	XRST	I	Microprocessor reset pin. ("H": normal, "L": reset)
8	X2	-	Connected a 44.19MHz crystal oscillator.
9	X1	-	Connected a 44.19MHz crystal oscillator.
10	PWON	I	Power switch input. ("H": ON, "L": OFF)
11	XPLAY	O	DA data enable, etc. ("L": PLAY, PLAY PAUSE)
12	FS32	O	Switches Fs to 256Hz when it is 32kHz. ("H": Fs32kHz)
13	PWOFF	O	Auto power off output.
14	THME	O	Sled motor control pins.
15	THML	O	
16	CMRS	O	Capstan reverse control signal. ("H": reverse, "L": forward)
17	DON	O	Drum motor on signal. ("H": on, "L": off)
18	RF	I	Presence/absence of RF signal. ("H": present, "L": absent)
19	CRLK	I	Capstan/reel lock signal. ("H": lock, "L": unlock)
20	DLK	I	Drum lock signal. ("H": lock, "L": unlock)
21	PLLK	I	PLL lock signal. ("H": lock, "L": unlock)
22	SERIN	O	Search/normal mode. ("H": search, "L": normal)
23	RPSEL	O	PB/REC. ("H": PB, "L": REC)
24	MUTE	O	DSP LSI (Main C.B. IC1) motor output muting. ("H": mute)
25	LVCK	O	Level data transfer clock.
26	VSS	-	Connected to ground.
27	LVDT	I	Level data input.
28	SWH	I	Drum switching pulse input.
29	SFG	I	S reel FG input. 1 rotation: 16 pulses.
30	TFG	I	T reel FG input.
31	DEW	I	Dev sensor input. ("H": dev, "L": normal)
32	TEST	I	TEST mode setting. (see TEST MODE)
33	BATT	I	Battery voltage detection.
34	REM	I	Remote control voltage detection.
35	XEND	I	Supply end sensor input. ("H": normal, "L": end)
36	XTOP	I	Take-up end sensor input. ("H": normal, "L": top)
37	XMUTEL	O	Line mute. ("H": normal, "L": mute)
38	XMUTED/A	O	D/A mute. ("H": normal, "L": mute)
39	EMPH	O	Emphasis on/OFF. ("H": ON, "L": OFF)
40	CTRL	O	DSP/SERVO LSI (Main C.B. IC1/IC8) data transfer mode input control signal.
41	CDATAO	I	DSP LSI (Main C.B. IC1) interface. (Data IN)
42	CDATAI	O	DSP/SERVO LSI (Main C.B. IC1/IC8) interface. (Data OUT)
43	CCLK	O	DSP/SERVO LSI (Main C.B. IC1/IC8) interface. (Clock OUT)
44	FSYNC	I	DSP frame sync signal input. (100/3Hz)
45	RXPUL	I	Digital in PLL unlock signal input. ("H": unlock, "L": lock)
46	D/AIN	I	DIGITAL/ADAPTOR switch input. ("H": digital input, "L": adaptor input)
47	K-HOLD	I	Key hold switch input. ("H": normal, "L": key hold)
48	C-LOCK	I	Cassette compartment lock detection switch. ("H": locked position, "L": normal)
49	CASIN	I	Cassette-in detection. ("H": no cassette, "L": cassette)
50	RECEN	I	REC enable. ("H": REC disable, "L": REC enable)

	LOAD	EJECT	BRAKE	OFF
THME	0	1	1	0
THML	1	0	1	0

Pin No.	Pin Name	I/O	Description
51	XSOFT	I	Recorded tape detection. ("H": recorded tape, "L": normal)
52	X1.5	I	1.5-times tape width detection. ("H": 1.5-times pitch, "L": normal)
53	ENC4	I	Rotary encoder inputs. (to detect the mechanism mode)
54	ENC3	I	
55	ENC2	I	
56	ENC1	I	
57	NC	-	Unused. (D+5V)
58	VDD	-	Power supply. (D+5V)
59	SOL	O	Solenoid ON/OFF. ("H": ON, "L": OFF)
60	KSCN2	O	Key scan outputs to the FRONT and SUB1 C.Bs.
61	KSCN1	O	
62	KSCN0	O	
63	KB3	I	Key matrix inputs from FRONT and SUB1 C.Bs.
64	KB2	I	

IC, HA12062AMP

Pin No.	Pin Name	I/O	Description
1	LMI	I	Limiter amp input.
2	NC	-	Unused.
3	AVCC	-	Power supply of analog system. (D+5V)
4	SERIN	-	Search/normal mode. (H=search, L=normal)
5	TEST2	-	Test pin. (connected to ground through a capacitor)
6	BYP1	-	Connected to a bypass capacitor of the bias source.
7	BYP2	-	Connected to a bypass capacitor of the limiter amp.
8	AGND	-	Ground of analog system.
9	CC1	-	Connected to a bypass capacitor of the DC amp.
10	CC2	-	Connected to the resistors and capacitors of a loop filter.
11	BYP3	-	Connected to a bypass capacitor of the bias source.
12	BYP4	-	Connected to a bypass capacitor of the VCO.
13	VCO1	O	Connected to a tank coil of the VCO.
14	VCO2	O	Connected to a tank coil of the VCO.
15	VC1	I	Connected to a tank coil (Secondary circuit) of the VCO.
16	BYP5	-	Connected to a bypass capacitor of the bias source.
17	AGC	-	Connected to a capacitor of AGC detector.
18	BYP6	-	Connected to a bypass capacitor of the AGC circuit.
19	TEST3	-	Test pin. (connected to ground)
20	NC	-	Unused.
21	R/PSEL	I	REC/PB switching signal input. (H=PB, L=REC)

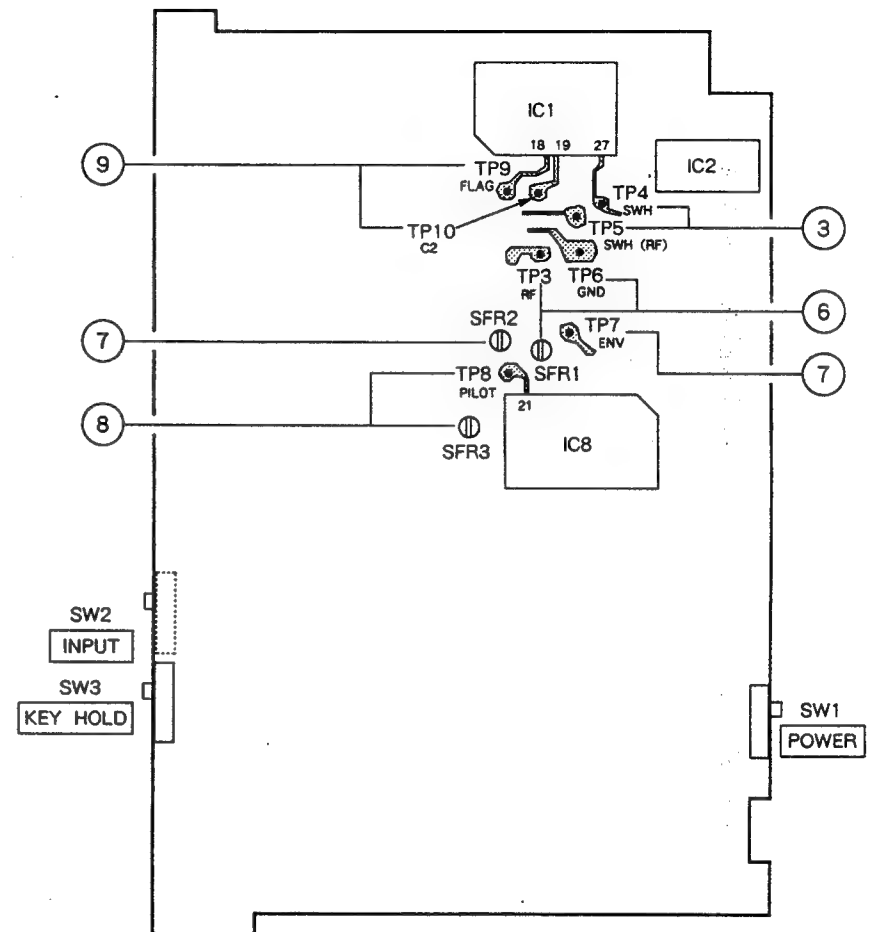
Pin No.	Pin Name	I/O	Description
22	CC3	-	Connected to a capacitor of the ASPC filter.
23	CC4	-	Connected to a capacitor of the ASPC filter.
24	PBCK	O	Clock output.
25	PDATA	O	Playback data output.
26	DGND	-	Ground of digital system.
27	BYP7	-	Connected to bypass of the bias source.
28	DVCC	-	Power supply of digital system. (D+5V)

IC. HA12133MP

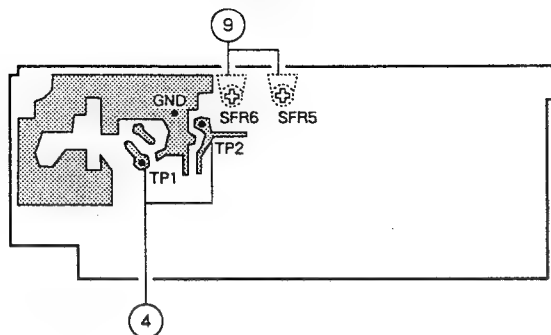
Pin No.	Pin Name	I/O	Description
1	RECLVB	-	Connected to a resistor which sets the B-ch PCM area recording level.
2	PLTLVB	-	Connected to a resistor which sets the B-ch ATF pilot area recording level.
3	ATFOUT	0	ATF servo preamp output.
4	RFOUT	0	Preamp output.
5	EQ1INP	I	EQ1 amp positive input.
6	EQ1INN	I	EQ1 amp negative input.
7	EQ1OUT	0	EQ1 amp output.
8	BIASPC1	-	Connected to a bypass capacitor of the bias circuit.
9	AGND	-	Ground of analog system.
10	EQ2INP	I	EQ2 amp positive input.
11	EQ2INN	I	EQ2 amp negative input.
12	EQ2GAN	-	Connected to the resistors which set the gain of the EQ2 amp.
13	EQ2OUT	0	EQ2 amp output.
14	DGND	-	Ground of digital system.
15	RDATA	I	Recording data input.
16	PLAREA	I	Signal to switch the ATF pilot area recording level. "High": ATF pilot area "Low": other
17	REC/PB	I	Recording/playback switching signal input. "High": recording "Low": playback
18	SWH	I	Head switching signal input. "High": B-ch "Low": A-ch
19	TEST	-	Test pin. (connected to ground)
20	DVCC	-	Power supply of digital system. (RF+5V)
21	PLTLVA	-	Connected to a resistor which sets the A-ch ATF pilot area recording level.
22	RECLVA	-	Connected to a resistor which sets the A-ch PCM area recording level.
23	VCAOTA	0	A-ch REC VCA output.
24	RECINA	I	A-ch REC amp input.
25	PVCCPC	0	Reference bias output.
26	RECOTA	0	A-ch REC amp output.
27	SNDPCA	-	Connected to a bypass capacitor of the A-ch 2nd amp.
28	SNDINA	I	A-ch 2nd amp input.
29	FSTOTA	0	A-ch 1st amp output.
30	RGND	-	Ground.

Pin No.	Pin Name	I/O	Description
31	PBSWA	-	Connected to the collector of the A-ch 1st amp switching transistor.
32	FSTINA	I	A-ch 1st amp input.
33	BIASPC2	-	Connected to a bypass capacitor of the bias circuit.
34	PBCNT	-	Connected to the base of the A-ch 1st amp switching transistor.
35	FSTINB	I	B-ch 1st amp input.
36	PBSWB	-	Connected to the collector of the B-ch 1st amp switching transistor.
37	RGND	-	Ground.
38	FSTOTB	0	B-ch 1st amp output.
39	SNDINB	I	B-ch 2nd amp input.
40	SNDPCB	-	Connected to a bypass capacitor of the B-ch 2nd amp.
41	RECOTB	0	B-ch REC amp output.
42	AVCC	-	Power supply of analog system. (RF+5V)
43	RECINB	I	A-ch REC amp input.
44	VCAOTB	0	B-ch REC VCA output.

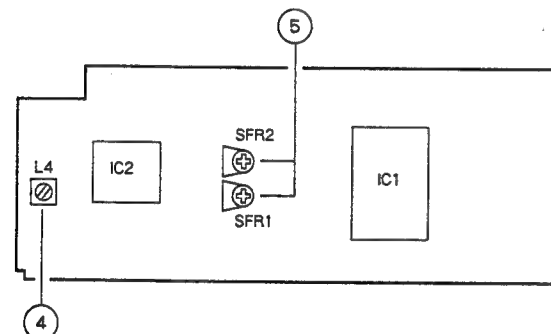
A MAIN C.B



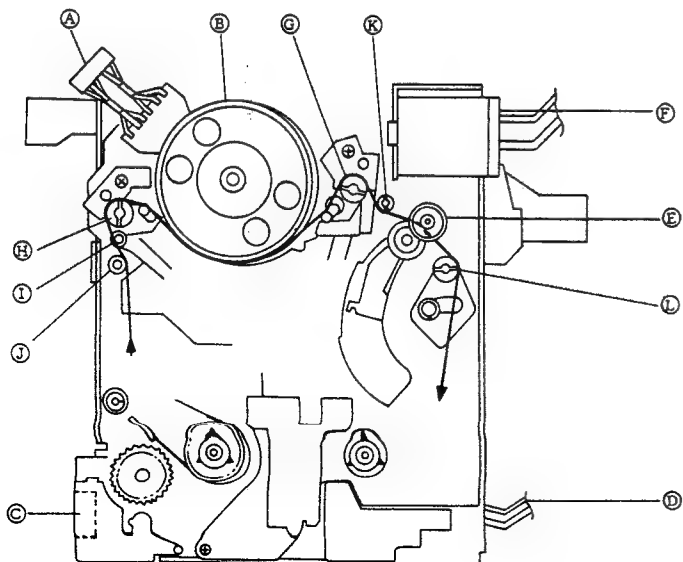
B PRE AMP C.B (BOTTOM VIEW)



B PRE AMP C.B (TOP VIEW)



Tape Path Adjustment Locations



- A Drum Input Terminal
- B Drum
- C Mode Switch
- D Plunger
- E Capstan Motor
- F Sled Motor
- G Take-up Shuttle
- H Supply Shuttle
- I Tension Regulator
- J Guide Roller S
- K Guide Roller T
- L Guide Roller Pinch

Fig-1

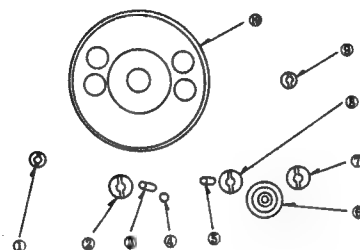
MECHANISM SECTION

Mechanism Adjustment

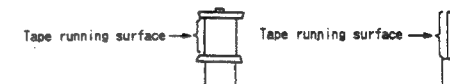
1. Cleaning (See Figure-2)

- 1) Use chamois leather to clean dust and dirt adhering to the shafts and "Guide Rollers" which come into contact with the tape.

※ Set the mechanism to the unsledded state and clean each section.



- ① Guide Roller S
- ② Supply Roller
- ③ Shuttle Shaft S
- ④ Tension Regulator
- ⑤ Shuttle Shaft T
- ⑥ Pinch Roller
- ⑦ Guide Roller Pinch
- ⑧ Take-up Roller
- ⑨ Guide Roller
- ⑩ Drum



Cleaning points

Fig-2

2. Back-tension Adjustment (See Figure-3)

- 1) Supply power from the AC adapter.
- 2) Load a tape and set the HD-S1 to the PLAY mode.
- 3) Loosen the screw and adjust so that the "Tension Regulator" is between the "Supply Roller" and "Guide Roller S"
- 4) Load the torque tape (TV-7111) and set the HD-S1 to the PLAY mode.
- 5) Check that the back-tension is 5 ± 1 g.
- 6) After adjustment is complete, tighten the screws and coat it with screw locking compound from the back of chassis.

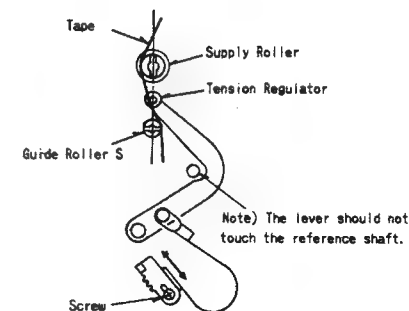


Fig-3

3. Tape Path Adjustment

- 1) Connection of oscilloscope
CH-1: TP RF (on Main C.B)
CH-2: TP SW H (on Main C.B)
* Trigger with CH-2.
- 2) Play the alignment tape (TY-7251).
- 3) Observing the oscilloscope, adjust the waveform so that it becomes square. (See Figure-4)
- 3-1. Turn "Take-up Shuttle" (G) to adjust the waveform on the take-up side.
- 3-2. Turn "Supply Shuttle" (H) to adjust the waveform on the supply side.
- 3-3. Finally, adjust so that the waveform becomes as shown in Figure-4.

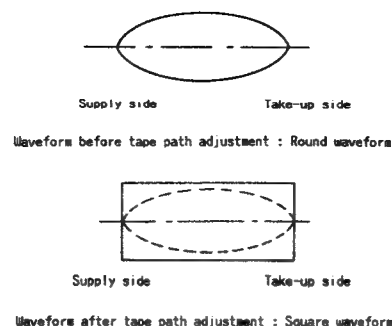


Fig-4

Cautions on adjustment

- ① If the waveform on the oscilloscope is as shown in Figures-5 and 6, adjust the tape path as follows. (See Figures-5 and 6)

If the waveform becomes as shown in Figure-5, turn shuttles (G) and (H) counterclockwise (See Figure-1).

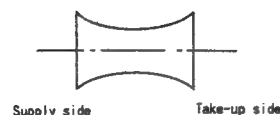


Fig-5

If the waveform becomes as shown in Figure-6, turn shuttles (G) and (H) clockwise (See Figure-1).

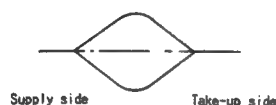


Fig-6

- ② Check that the following specifications are satisfied. (See Figures-7 and 8)

Linearity of drum :
Value a should be 1/10 or less value A as shown in the waveform in Figure-7.

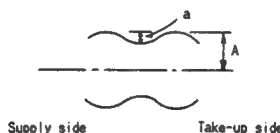


Fig-7

Tape transport characteristic :
If the amplitude of the waveform on the supply side is assumed as B, the amplitude on the take-up side should be 0.9B as shown by the waveform in Figure-8.

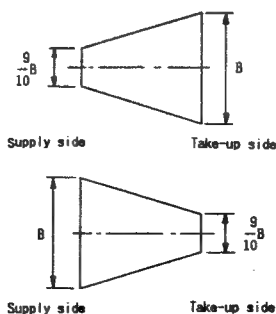


Fig-8

- 4) Supply side free waveform adjustment (See Figure-9)
Turn shuttle (G) counterclockwise (see Figure-1) to separate the tape from the upper flange and adjust (G) so that the number of peaks in the waveform on the oscilloscope is 1.5~5.

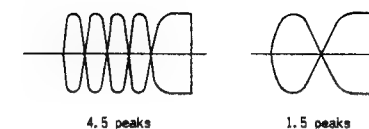
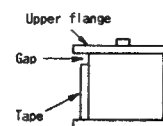


Fig-9

- 5) Perform step 3) again to adjust the tape path.
- 6) Take-up side free waveform adjustment.
Turn shuttle (H) counterclockwise (see Figure-1), step 4) and adjust (H) in the same way so that the number of peaks in the waveform on the oscilloscope is 3 or more.
- 7) Perform step 3) again to adjust the tape path.
- 8) Tape transport adjustment
① Adjust rollers (J) and (K) (see Figure-1) so that the tape touches the lower flanges of the rollers. (See Figure-10)

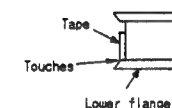


Fig-10

- ② Adjust "Guide Roller Pinch" (L) (see Figure-1) so that the tape is positioned between the upper and lower flanges and does not touch them. (See Figure-11)

Tape should be positioned between the upper and lower flanges.

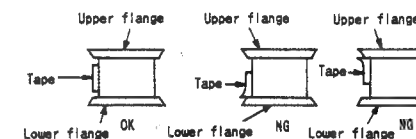


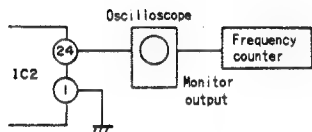
Fig-11

- 9) Enter the play mode from the fast forward, rewind and stop modes and check that the RF waveform rises from the take-up side.
● If this rise is defective, readjust from step 1).
- 10) Fast forward and rewind a C-120 tape and check that the tape does not come off rollers (J), (K) and (L) (see Figure-1). Also check that the tape runs, touching the upper flanges of rollers (G) and (H) as shown in Figure-11.
- 11) Play the tape and check that it does not come off rollers (G), (H), (J), (K) and (L) (see Figure-1).

ELECTRICAL SECTION

4. VCO Adjustment

- 1) Connect a frequency counter to TP1 (IC2 pin 24) on [B] PRE AMP C.B.) via an oscilloscope.
- 2) Connect TP2 (IC2 pin 1) to ground and adjust L4 so that the frequency counter reads 8.35 ± 0.01 MHz.
- 3) After adjustment is completed, disconnect TP2 from ground.



5. Recording Current Adjustment

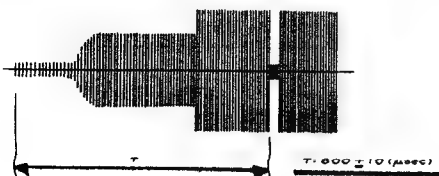
Adjustment points : SFR1 and SFR2
Do not perform this adjustment.

6. TACH Adjustment

Conditions : • Alignment tape: TY-7251

- Test points: TP3(RF), TP4(SWH), TP5(SWH, RF), TP6(GND)
- Adjustment point: SFR 1 ([A] MAIN C.B.)
- Settings of oscilloscope: V axis (0.1V/div.)
T axis (2~5msec)
External trigger
- Setting of test mode: Test mode 2
(Test tape mode)
See TEST MODE.

- 1) Connect an oscilloscope to test points TP3 (RF) and TP4 (SWH).
- 2) Connect TP5 (SWH, RF) to TP6 (GND).
- 3) Play the alignment tape and adjustment SFR1 so that the period is $800 \pm 10 \mu s$ at TP3.
- 4) After adjustment is completed, turn the power switch off. (The test mode is released).
- 5) Disconnect TP5 from TP6.



7. ENV Adjustment

Conditions : • Alignment tape: TY-7551

- Test points: TP4(SWH), TP7(ENV)
- Adjustment point: SFR2
- Settings of oscilloscope: V axis (0.1V/div.)
T axis (2~5msec)
External trigger

- 1) Connect an oscilloscope to TP7 (ENV) and TP4 (SWH).
- 2) Play the first track on the alignment tape and adjust SFR2 so that the voltage at TP7 is 600mV.



If values VA and VB are different, adjust to the higher voltage.

(Caution)

If the RF waveform is as shown in the figure below, perform tape path adjustment again.

(OK)



(NG)



(NG)



8. ATF Adjustment

Conditions : • Alignment tape: TY-7111

- Test points: TP4(SWH), TP8(PILOT)
- Adjustment point: SFR3
- Settings of oscilloscope: V axis (50mV/div.)
T axis (2~5msec)
External trigger

- 1) Connect an oscilloscope to TP8 (PILOT) and TP4 (SWH).
- 2) Play the alignment tape and adjust SFR3 so that the voltage at TP8 is 200mV.



If values VA and VB are different, adjust to the center value (VC) between them.

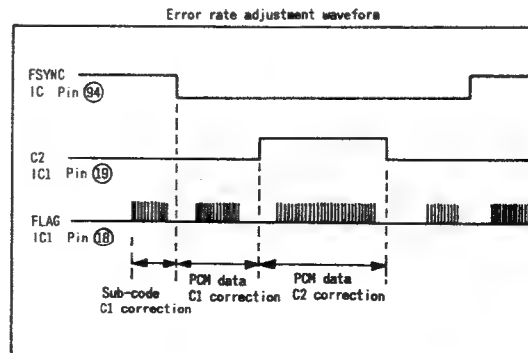
VC : 200mV

9. Error Rate Adjustment

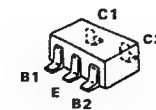
Conditions : • Alignment tape: TY-7551

- Test points: TP9(IC1 pin 18) FLAG)
TP10(IC1 pin 19) C2)
- Adjustment points: SFR5, SFR6

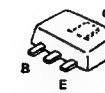
- 1) Connect CH-1 of the oscilloscope to TP9.
- 2) Connect CH-2 of the oscilloscope to TP10.
- 3) Trigger the oscilloscope with CH-2.
- 4) Adjust SFR5 to decrease the flags at TP9 (IC1 pin 18) FLAG).
- 5) Adjust SFR6 to further decrease the flags in the C1 correction section.
- 6) Perform steps 4) and 5) a few times to minimize the flags.



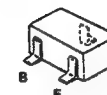
TRANSISTOR ILLUSTRATION



FMA2



2SA1314



2SC2712
2SC4116
2SC4213
RN2301
DTA114
DTC144



2SB1182

TEST MODE

The HD-S1 has test modes for adjustment and operation check.

1) Starting Test Mode

The HD-S1 enters the test mode by the following procedure.

- (1) Turn the power on.
- (2) Set to the stop mode.
- (3) Set the KEY HOLD switch to the HOLD position.
- (4) Short the TEST terminal (IC12 pin ③②) of the microprocessor on the Main C.B. to the SV pattern (round) using tweezers, etc.

When steps (1)~(4) above are held for one second or more, the HD-S1 enters the test mode and all segments of the LCD light.

*The TEST pin is not involved after test mode has been entered.

2) Types of Test Mode

There are five test modes which are switched as follows.

Test Mode	Display	Mode Switching Method
0	All LCD segments light	↓ Press the PLAY, STOP or DISPLAY key.
1	Tact key switch check	↓ Set the KEY HOLD switch to OFF.
2	Alignment tape mode (path adjustment)	↓ Press the DISPLAY key.
3	Error rate display	↓ Press the DISPLAY key.
4	Microprocessor mode display	↓ Press the DISPLAY key.

*Test modes 2~4 are switched when the DISPLAY key is pressed.

When the KEY HOLD switch is set to OFF in test mode 0, test mode 2 is entered.

*Test mode is released when the power is turned off.

*The P-NO. and test mode No. (C1~C4) is displayed in test modes 1~4.

3) Description of Test Modes

(1) Test mode 0

This mode is used to check the lighting of the LCD. All segments of the LCD light as shown in Figure-1.

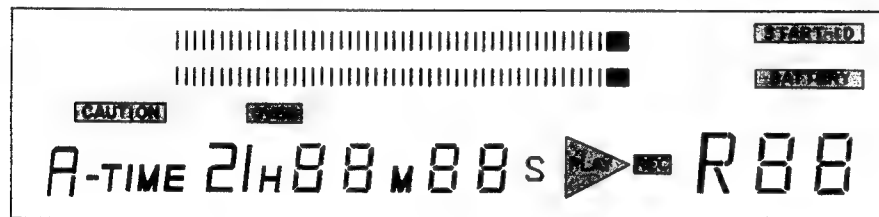


Fig-1 State when All LCD Segments Light

(2) Test mode 1 (C1)

This mode is used to check the operation (contact) of tact key switches. When a tact key switch is pressed, the name of the switch pressed is displayed in the level meter as shown in Figure-2. If no display appears when a tact key switch is pressed, the tact switch is defective or the pattern between the microprocessor and the tact key switch is cut.

*Simultaneous pressing of two or more tact key switches is not checked in this mode.

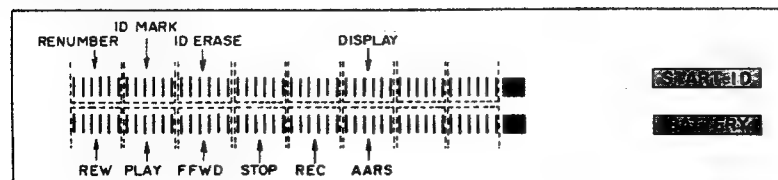


Fig-2 Display Position in Test Mode 1

(3) Test mode 2 (C2)

This is a tape path adjustment mode for in the PLAY mode.

(4) Test mode 3 (C3)

This mode is used to check the error rate in the play mode. The error rate is displayed in the counter. Table 1 shows the error rate values. Normally, "0500" is displayed, but "9900" is displayed when the heads are dirty, etc. This mode also allows the checking of the wear of tape to some extent.

Display	Block error rate per track	Display	Block error rate per track
0500	0.00~0.05	3500	0.50~0.55
1200	0.06~0.12	6200	0.56~0.62
1800	0.13~0.18	6800	0.63~0.68
2400	0.19~0.24	7400	0.69~0.74
3000	0.25~0.30	8000	0.75~0.80
3700	0.31~0.37	8700	0.81~0.87
4300	0.38~0.43	9300	0.88~0.93
4900	0.44~0.49	9900	0.94~1.00

Table 1 Error Rate

(5) Test mode 4 (C4)

This mode is used when servicing and displays the internal microprocessor mode and mechanism switch state necessary for servicing.

Information on mechanism switches

The state of each switch is displayed in the L-ch level meter as shown in Figure-3.

- ① Cassette compartment lock detection switch (SW4 on Main C.B) ----- ON/OFF
- ② Tape width detection switch (S1-2 in mechanism) ----- Normal/1.5X speed
- ③ Cassette-in detection switch (S2-1 in mechanism) ----- Cassette Yes/No
- ④ REC ENABLE detection switch (S2-2 in mechanism) ----- REC enable/Inhibit
- ⑤ Recorded tape detection switch (S2-3 in mechanism) ----- Normal/Recorded tape
- ⑥ KEY HOLD detection switch (SW3 on Main C.B) ----- FREE/HOLD
- ⑦ INPUT SELECT switch (SW2 on Main C.B) ----- DIGITAL/ADAPTER

Internal microprocessor mode

The internal microprocessor data is displayed in the counter as shown in Figure-4. (See Table 2)

- ① Command ----- Displays the command accepted by the key input (see Table 3).
- ② Mechanism mode -- Displays the mode in which the mechanism is set and changes when the mode shift is completed (see Table 3).
- ③ Mechanism position ----- Displays the position of the MODE switch (rotary encoder)(see Table 4).
- ④ CAUTION ----- Displays the abnormal point during CAUTION (see Table 5).
- ⑤ End sensor ----- Displays the detection status of start or end of tape (see Table 5).

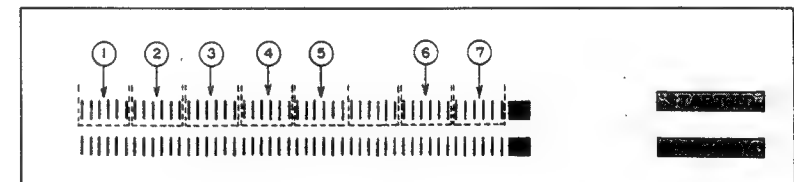


Fig-3 Display Positions in Test Mode 4
(Information on Mechanism Switches)

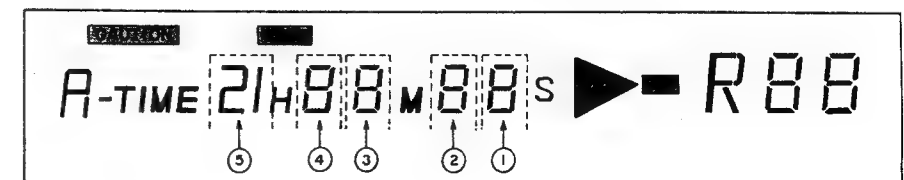


Fig-4 Display Positions in Test Mode 4
(Internal Microprocessor Mode)

State/Display Position	④	③	②	①
Cassette lid opened	0	5	1	1
Sledding (cassette in)	0	0	0	1
Unsledding (EJECT)	0	0	0	0
STOP	0	2	1	1
PLAY	0	8	2	2
FFWD	0	2	3	3
REV	0	2	4	4
F/SKIP	0	2	3	5
B/SKIP	0	2	4	6

Table 2 Example of Display of Internal Microprocessor Mode

Code	Display	Command	Mechanism Mode
0	0	EJECT	LOAD/EJECT
1	1	STOP	STOP
2	2	PLAY	FWD×1
3	3	FFWD	FFWD
4	4	REV	REV
5	5	F-SKIP	
6	6	B-SKIP	
7	7	END SEARCH	
8	8		PAUSE
9	9		FWD×16 FWD×2
A	-		SLOW-REV
C	C	ID ERASE	
D	d	RENUMBER	
E	e	REC	
F	F	REC PLAY	

Table 3 Display of Commands and Mechanism Mode (①, ②)

Code	Display	Mechanism Position	Mechanism Operation
8	8	PLAY	FWD/ PAUSE
2	2	STOP	STOP, FF/REV
9	9	LOADEND	SOLENOID ON
5	5	UNLOAD	CASSETTE COMPARTMENT LOCK
3	3	EJECT	CASSETTE COMPARTMENT UP
0	0	—	INTERMEDIATE POSITION

Table 4 Display of Mechanism Mode (③)

Code	Display	Cause of Abnormally Stop
0	0	No abnormally
1	1	Reel rotation abnormally
2	2	Drum rotation abnormally or DEV sensor detection abnormally
3	3	Sledding operation abnormally

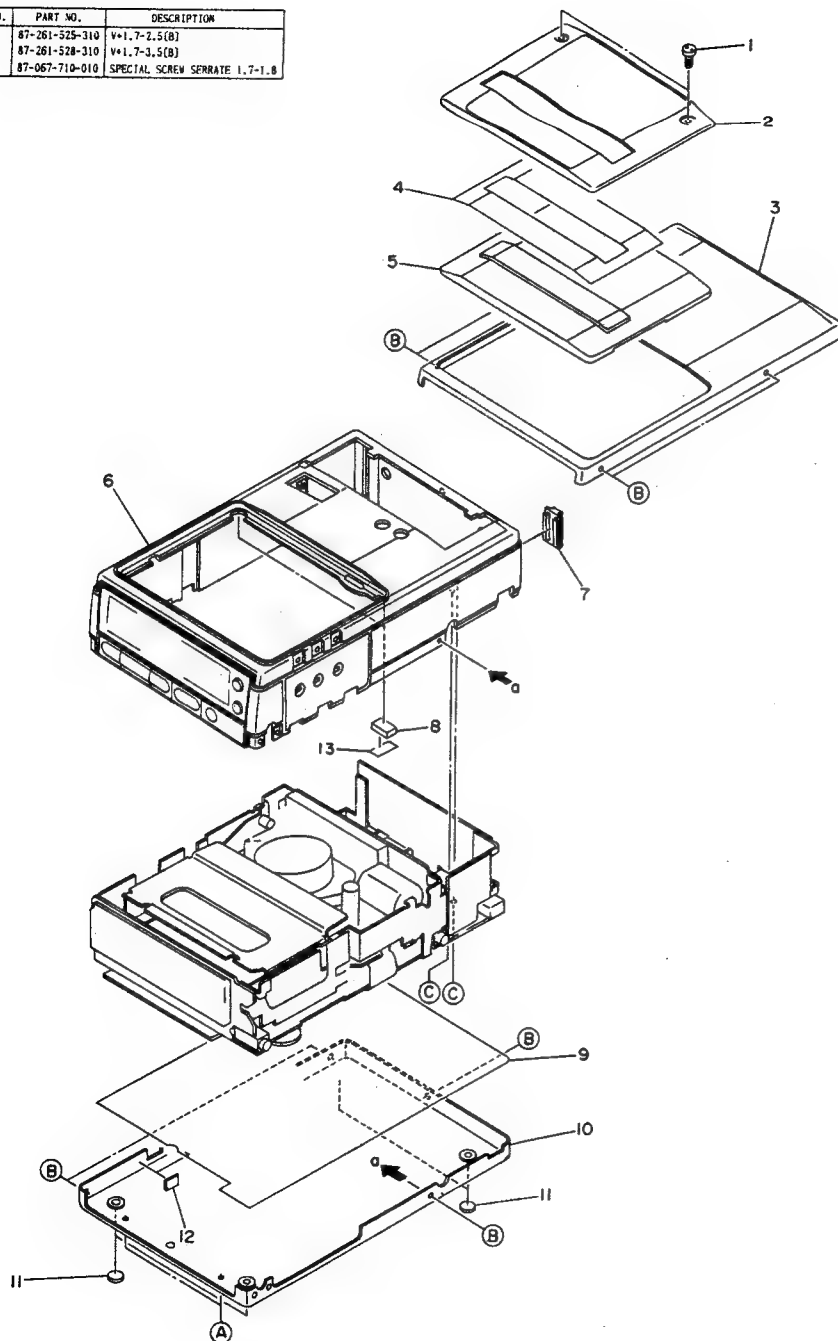
Table 5 Display of CAUTION (④)

Code	Display	Detection
1	1	Tape start detection
2	2	Tape end detection

Table 6 Display of End Sensors (⑤)

EXPLODED VIEW - 1

REF. NO.	PART NO.	DESCRIPTION
A	87-261-525-310	V+1, 7-2.5(8)
B	87-261-528-310	V+1, 7-3.5(8)
C	87-067-719-010	SPECIAL SCREW SERRATE 1, 7-1.8

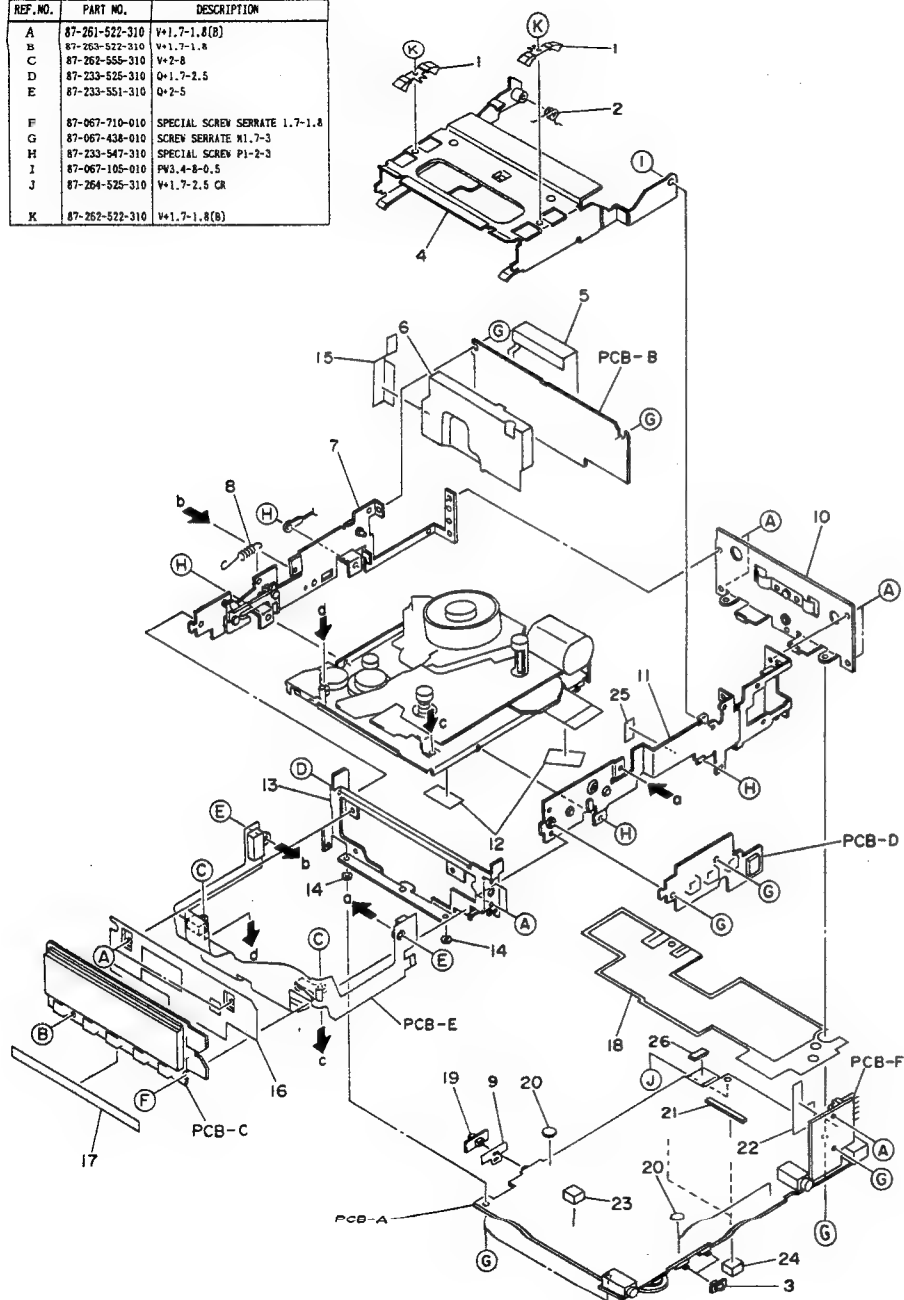


MECHANICAL PARTS LIST

PART NO. CHANGED TO	REF. NO.	PART NO.	DESCRIPTION	COMMON MODEL	Q, TY
	1-1	*89-HD1-018-110	S-SCREW, DECORATIVE	•	2
	1-2	89-HD1-036-010	LID, CASSETTE	•	1
	1-3	*89-HD1-023-010	PANEL, TOP	•	1
	1-4	*89-HD1-250-210	ADHESIVE-SHEET, CASSETTE	•	1
	1-5	*89-HD1-016-010	WINDOW, CASSETTE	•	1
	1-6	*09-057-066-010	CABINET MAIN ASSY	•	1
	1-7	*89-HD1-019-010	COVER, CONNECT	•	1
	1-8	*89-HD1-263-210	S-CUSHION, CABINET	•	2
	1-9	*89-HD1-235-010	SHEET, PANEL	•	1
	1-10	*89-HD1-026-010	PANEL, BOTTOM	•	1
	1-11	*89-HD1-034-010	FOOT, DIA 5.5-1	•	4
	1-12	*89-HD1-255-010	SHEET, 5.5-4	•	2
	1-13	*89-HD1-270-010	CLOTH, 5-11	•	2

EXPLODED VIEW - 2

REF. NO.	PART NO.	DESCRIPTION
A	87-261-522-310	V+1.7-1.8(B)
B	87-263-522-310	V+1.7-1.8
C	87-262-525-310	V+2-8
D	87-233-525-310	Q+1.7-2.5
E	87-233-551-310	Q+2-5
F	87-067-710-010	SPECIAL SCREW SERRATE 1.7-1.8
G	87-067-438-010	SCREW SERRATE M1.7-3
H	87-233-547-310	SPECIAL SCREW P1-2-3
I	87-067-105-010	FW3.4-8-0.5
J	87-264-525-310	V+1.7-2.5 CR
K	87-262-522-310	V+1.7-1.8(B)

PART NO.
CHANGED TOREF.
NO.

PART NO.

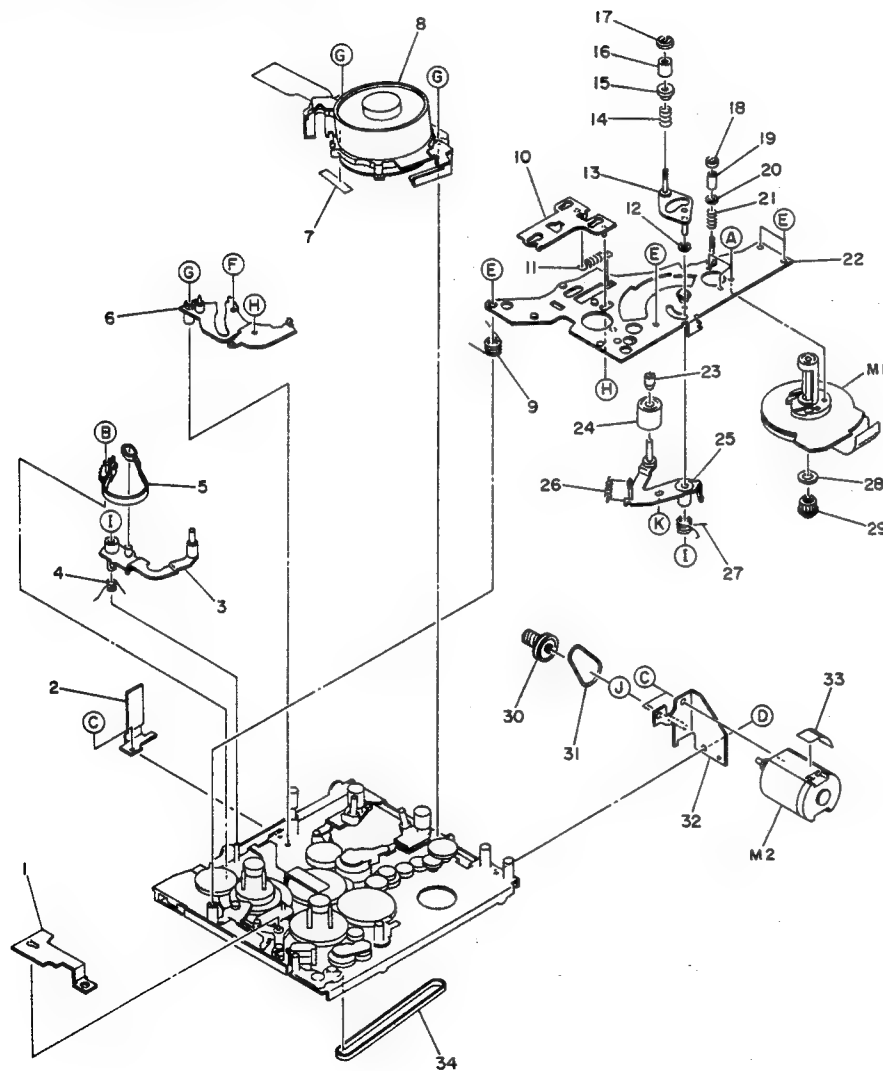
DESCRIPTION

COMMON
MODELQ.
TY

2-1	*89-HD1-217-110	P-SPRING CASSETTE ASSY	*	2
2-2	*89-HD1-219-110	T-SPRING CASSETTE BOX	*	1
2-3	*84-502-009-010	KNOB, SLIDE B	*	2
2-4	*89-HD1-201-010	CASSETTE BOX ASSY	*	1
2-5	*89-HD1-242-310	SHEET, RF III	*	1
2-6	*89-HD1-229-010	COVER, SHIELD	*	1
2-7	*89-HD1-205-510	CHASSIS FRAME ASSY L	*	1
2-8	*89-HD1-220-010	E-SPRING, LEVER LOCK	*	1
2-9	*89-HD1-271-010	SHEET, SLIDE PW	*	1
2-10	*89-HD1-231-010	REAR CHASSIS FRAME ASSY	*	1
2-11	*89-HD1-214-310	CHASSIS FRAME ASSY R	*	1
2-12	---	HIMELON	*	2
2-13	*89-HD1-221-010	FRAME, CHASSIS FR	*	1
2-14	*89-HD1-267-010	SHEET, PVC 1.73-3.5-0.5	*	2
2-15	*89-HD1-264-110	SHEET, RF D	*	1
2-16	*89-HD1-243-110	SHEET, FRONT	*	1
2-17	*89-HD1-251-010	CLOTH, LCD	*	1
2-18	*89-HD1-241-110	SHEET, RF A	*	1
2-19	*84-502-008-010	KNOB, SLIDE A	*	1
2-20	*89-HD1-244-010	SHEET, DIA 5-0.3	*	3
2-21	*89-HD1-259-010	G-CUSHION, 2-20-0.5	*	1
2-22	*89-HD1-254-010	SHEET, CONNECT	*	1
2-23	*89-HD1-247-010	G-CUSHION, 6-6-4	*	1
2-24	*89-HD1-260-010	G-CUSHION, 5-5-3	*	2
2-25	*89-HD1-269-010	SHEET, RF F	*	1
2-26	*89-HD1-266-010	S-CUSHION, 3-8.5-3	*	1

EXPLODED VIEW - 3

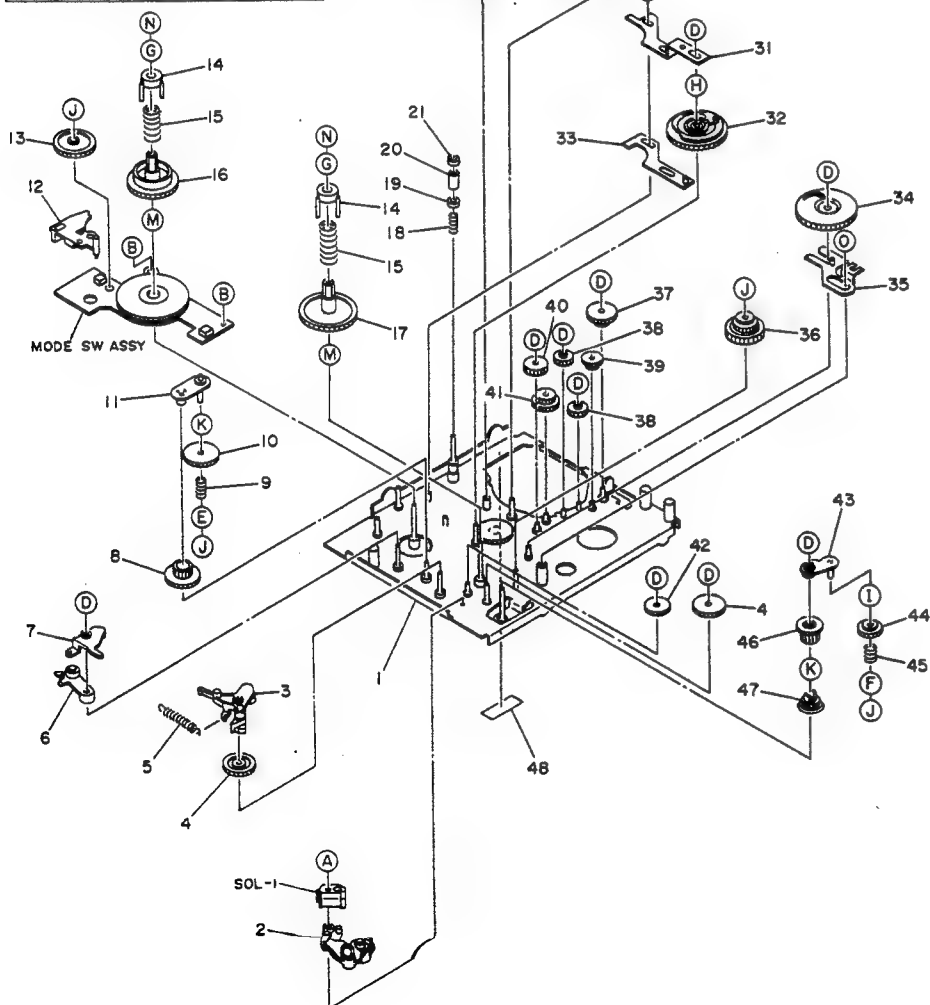
REF. NO.	PART NO.	DESCRIPTION
A	87-263-503-310	V+1.4-2.0
B	87-262-505-310	V+1.4-2.5(B)
C	87-263-522-310	V+1.7-1.8
D	87-263-527-310	V+1.7-3
E	87-067-708-010	V+1.7-3.5(B)
F	87-067-092-010	V+1.7-7(B)
G	87-267-555-310	V+2-8(B)
H	87-081-945-010	PW1.2-3-0.25
I	86-544-440-010	PW1.2-4-0.25 SLT
J	87-067-697-010	PW1.7-3-0.3
K	87-067-709-010	PW2.2-3.5-0.25C



PART NO. CHANGED TO	REF. NO.	PART NO.	DESCRIPTION	COMMON MODEL	Q. TY
	3-1	*86-571-275-010	PLATE, SOLENOID		1
	3-2	*86-571-440-010	LID, OPENER S		1
	3-3	*86-571-282-010	LEVER TENSION REGULATOR ASSY		1
	3-4	*86-571-419-010	T-SPRING, TENSION REGULATOR		1
	3-5	*86-571-397-010	BAND BRAKE ASSY		1
	3-6	*86-571-210-010	CHASSIS, MOLD		1
	3-7	*86-571-402-010	SHEET, DRUM		1
	3-8	*86-571-603-010	DRUM ASSY		1
	3-9	*86-571-418-010	T-SPRING, SOFT		1
	3-10	*86-571-205-010	FR PLATE ASSY		1
	3-11	*86-571-421-010	E-SPRING, FR		1
	3-12	*86-067-715-010	SHEET, 2.15-5-0.35		1
	3-13	*86-571-284-010	LEVER GUIDE ASSY		1
	3-14	*86-571-416-010	C-SPRING, GUIDE D		1
	3-15	*86-571-299-010	FLANGE, UT GUIDE		1
	3-16	*86-571-312-010	ROLLER, LEVER GUIDE		1
	3-17	*86-571-300-010	FLANGE, LT GUIDE		1
	3-18	*86-571-293-010	FLANGE, UL GUIDE		1
	3-19	*86-571-295-010	ROLLER, L GUIDE		1
	3-20	*86-571-294-010	FRANGE, LL GUIDE		1
	3-21	*86-571-413-010	C-SPRING, GUIDE		1
	3-22	*86-571-203-010	CHASSIS SUB ASSY		1
	3-23	*86-544-288-010	COLLAR, PINCH ROLLER B		1
	3-24	*86-544-289-010	PINCH ROLLER ASSY		1
	3-25	*86-571-271-010	PINCH LEVER ASSY		1
	3-26	*86-571-410-010	E-SPRING, PINCH		1
	3-27	*86-571-417-010	T-SPRING, PINCH		1
	3-28	*86-571-446-010	FLANGE, CAPSTAN		1
	3-29	*86-571-250-010	PULLEY, CAPSTAN		1
	3-30	*86-571-215-010	WORM, SLED		1
	3-31	*86-571-396-010	BELT, MOTOR		1
	3-32	*86-571-298-010	HOLDER, MOTOR ASSY		1
	3-33	*86-550-404-010	CLOTH, 6-15		1
	3-34	*86-571-399-010	BELT, TIMING		1

EXPLODED VIEW - 4

REF. NO.	PART NO.	DESCRIPTION
A	87-264-514-310	V+1,4-7
B	87-263-525-010	V+1,7-2,5
C	87-263-529-310	V+1,7-4(B)
D	87-081-945-010	PW1,2-3-0,25
E	87-067-714-010	PW1,25-3,2-0,25
F	87-067-720-010	PW1,5-3,5-0,3
G	87-067-522-010	PW1,6-5-0,13
H	87-067-719-010	PW1,65-4,4-0,5
I	86-513-320-010	PW2,5-4,5-0,5
J	87-067-693-010	PW3,0-8-0,25 SLT
K	87-081-569-010	PW3,6-7-0,5
L	87-067-695-010	PW3,8-2,15-0,25 SLT
M	87-067-694-010	PW4,4-1,65-0,25
N	87-067-713-010	STE 1,2(B)
O	87-441-004-010	STE 2

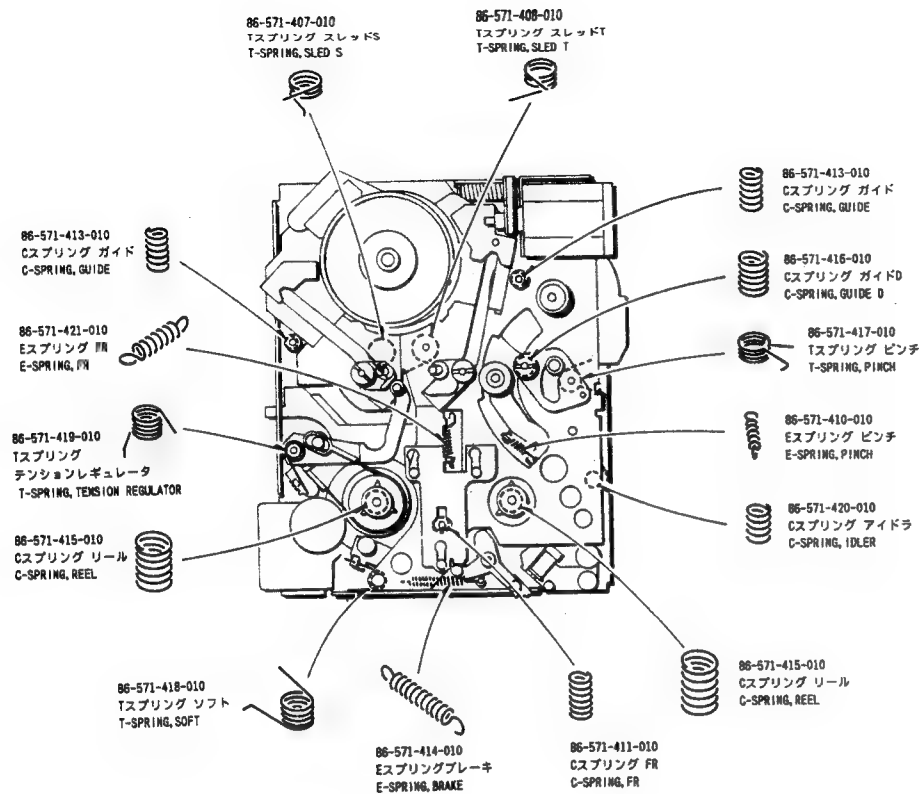
PART NO.
CHANGED TOREF.
NO.

PART NO.

DESCRIPTION

COMMON
MODELQ.
TY

4-1	*86-571-201-010	CHASSIS MAIN ASSY	1
4-2	*86-571-259-010	HOLDER, T SW	1
4-3	*86-571-309-010	T BRAKE LEVER ASSY	1
4-4	*86-571-236-010	GEAR, A FF	2
4-5	*86-571-414-010	E-SPRING, BRAKE	1
4-6	*86-571-297-010	SLED BRAKE LEVER ASSY	1
4-7	*86-571-310-010	S BRAKE LEVER ASSY	1
4-8	*86-571-232-010	GEAR, A FR	1
4-9	*86-571-411-010	C-SPRING, FR	1
4-10	*86-571-233-010	GEAR, B FR	1
4-11	*86-571-296-010	FR LEVER ASSY	1
4-12	*86-571-258-010	HOLDER, SW S	1
4-13	*86-571-392-010	FR GEAR ASSY	1
4-14	*86-571-253-010	REEL, CAP	2
4-15	*86-571-415-010	C-SPRING, REEL	2
4-16	86-571-230-010	REEL, DISK S	1
4-17	*86-571-391-010	REEL DISK ASSY	1
4-18	*86-571-413-010	C-SPRING, GUIDE	1
4-19	*86-571-294-010	FLANGE, LL GUIDE	1
4-20	*86-571-295-010	ROLLER, L GUIDE	1
4-21	*86-571-293-010	FLANGE, UL GUIDE	1
4-22	*86-571-281-010	SLED ARM ASSY S	1
4-23	*86-571-407-010	T-SPRING, SLED S	1
4-24	*86-571-223-010	GEAR, SLED H	1
4-25	*86-571-265-010	SHUTTLE PLATE ASSY	2
4-26	*86-571-243-010	SHUTTLE ASSY S	1
4-27	*86-571-244-110	SHUTTLE ASSY T	1
4-28	*86-571-280-010	SLED ARM ASSY T	1
4-29	*86-571-408-010	T-SPRING, SLED T	1
4-30	*86-571-222-010	GEAR, SLED G	1
4-31	*86-571-283-010	CASSETTE PLATE ASSY	1
4-32	*86-571-235-010	CAM, B	1
4-33	*86-571-207-010	TENSION R PLATE ASSY	1
4-34	*86-571-234-010	CAM, A	1
4-35	*86-571-211-010	PINCH PLATE ASSY	1
4-36	*86-571-214-010	TUP GEAR ASSY	1
4-37	*86-571-216-010	WORM WHEEL, SLED	1
4-38	*86-571-217-010	GEAR, SLED B	2
4-39	*86-571-238-010	GEAR, SLED A	1
4-40	*86-571-220-010	GEAR, SLED E	1
4-41	*86-571-219-010	GEAR, SLED D	1
4-42	*86-571-237-110	GEAR, B FF	1
4-43	*86-571-256-010	IDLER LEVER ASSY	1
4-44	*86-571-227-010	GEAR, IDLER A	1
4-45	*86-571-420-010	C-SPRING, IDLER	1
4-46	*86-571-228-010	GEAR, B IDLER	1
4-47	*86-571-242-010	PULLEY, IDLER	1
4-48	*86-571-402-010	SHEET, DRUM	1

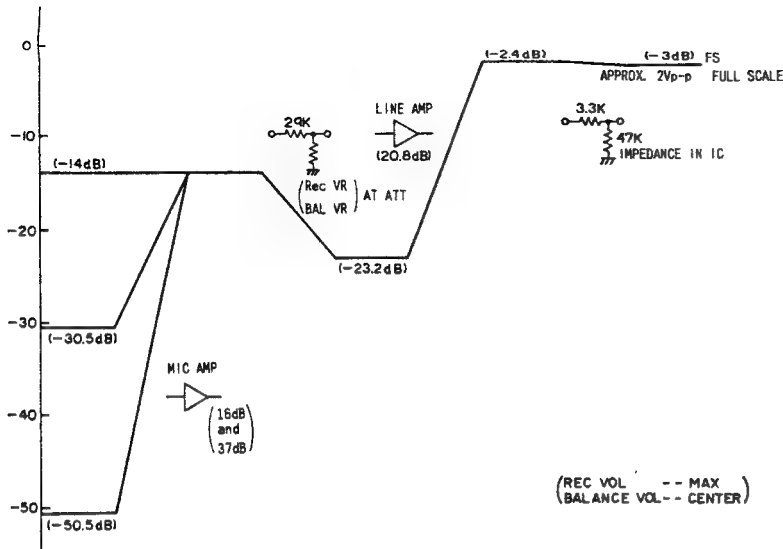


HDA - 1 (A/D CONVERTER)

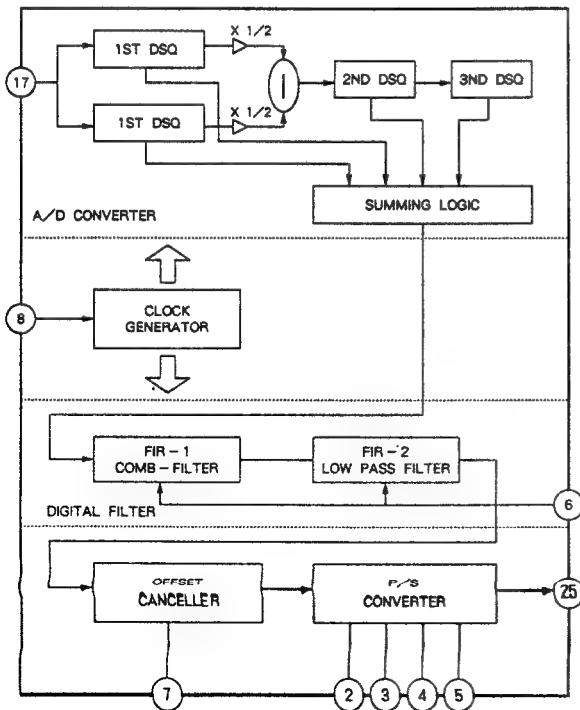
ELECTRICAL MAIN PARTS LIST (HDA - 1)

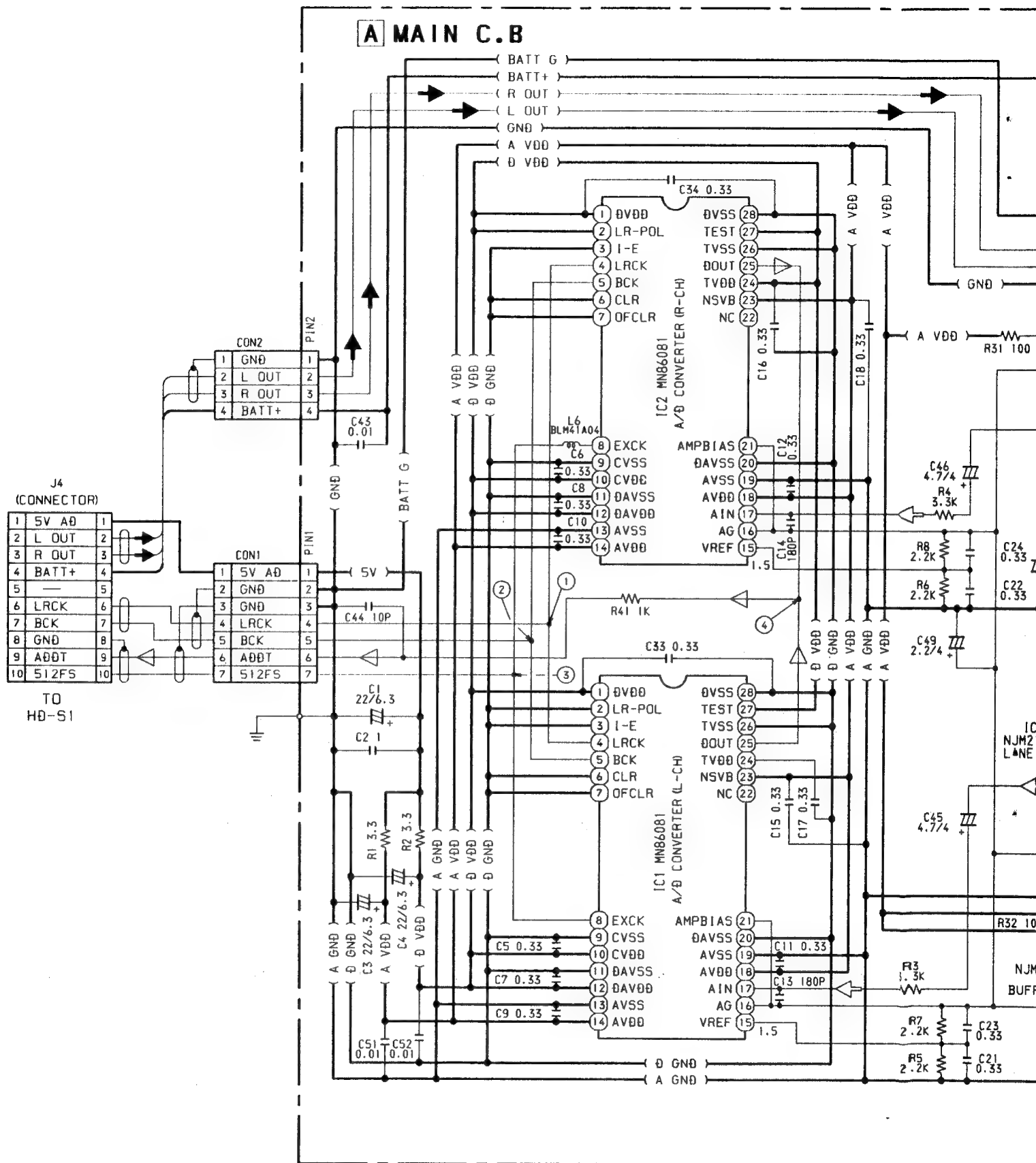
REF. NO.	PART NO.	DESCRIPTION	REF. NO.	PART NO.	DESCRIPTION
--- IC ---					
	87-001-793-010	IC, MN86081	C35	*87-010-243-010	CAP, CHIP TANTALUM 10-4
	87-001-792-010	IC, NJM2100M	C36	*87-010-243-010	CAP, CHIP TANTALUM 10-4
	87-027-842-010	IC, NJM2904M	C37	*87-012-142-010	CAP, CHIP S 0.33-16
	87-001-683-010	IC, TC4566F	C38	*87-010-769-010	CAP, CHIP TANTALUM 6.8-10
--- DIODE ---					
	87-001-836-010	DIODE, CHIP U1GWJ49	C39	*87-010-771-010	CAP, CHIP TANTALUM 47-6.3
--- MAIN CIRCUIT BOARD SECTION ---					
C1	*87-010-515-010	CAP, CHIP TANTALUM 22-6.3	C40	*87-010-522-010	CAP, CHIP TANTALUM 2.2-10
C2	*87-012-360-010	CAP, CHIP S 1-10	C41	*87-010-424-010	CAP, CHIP TANTALUM 4.7-4
C3	*87-010-515-010	CAP, CHIP TANTALUM 22-6.3	C42	*87-010-424-010	CAP, CHIP TANTALUM 4.7-4
C4	*87-010-515-010	CAP, CHIP TANTALUM 22-6.3	C43	*87-012-286-010	CAP, CHIP SS 0.01-25B
C5	*87-012-142-010	CAP, CHIP S 0.33-16	C44	*87-012-172-010	CAP, CHIP SS 10P-50CH
C6	*87-012-142-010	CAP, CHIP S 0.33-16	C45	*87-010-424-010	CAP, CHIP TANTALUM 4.7-4
C7	*87-012-142-010	CAP, CHIP S 0.33-16	C46	*87-010-424-010	CAP, CHIP TANTALUM 4.7-4
C8	*87-012-142-010	CAP, CHIP S 0.33-16	C47	*87-010-424-010	CAP, CHIP TANTALUM 4.7-4
C9	*87-012-142-010	CAP, CHIP S 0.33-16	C48	*87-010-424-010	CAP, CHIP TANTALUM 4.7-4
C10	*87-012-142-010	CAP, CHIP S 0.33-16	C49	*87-010-802-010	CAP, CHIP TANTALUM 2.2-4
C11	*87-012-142-010	CAP, CHIP S 0.33-16	C50	*87-012-286-010	CAP, CHIP SS 0.01-25B
C12	*87-012-142-010	CAP, CHIP S 0.33-16	C51	*87-012-286-010	CAP, CHIP SS 0.01-25B
C13	*87-012-198-010	CAP, CHIP SS 180P-50 CH	C52	*87-012-286-010	CAP, CHIP SS 0.01-25B
C14	*87-012-198-010	CAP, CHIP SS 180P-50 CH	C53	*87-012-195-010	CAP, CHIP SS 100P-50CH
C15	*87-012-142-010	CAP, CHIP S 0.33-16	C54	*87-012-195-010	CAP, CHIP SS 100P-50CH
C16	*87-012-142-010	CAP, CHIP S 0.33-16	L1	*87-003-234-010	COIL S 0.22UH
C17	*87-012-142-010	CAP, CHIP S 0.33-16	L2	*87-003-234-010	COIL S 0.22UH
C18	*87-012-142-010	CAP, CHIP S 0.33-16	L3	*87-003-234-010	COIL S 0.22UH
C19	*87-012-195-010	CAP, CHIP SS 100P-50 CH	L4	*87-003-234-010	COIL S 0.22UH
C20	*87-012-195-010	CAP, CHIP SS 100P-50 CH	L5	*87-003-241-010	COIL S 4.7UH
C21	*87-012-142-010	CAP, CHIP S 0.33-16	L6	*87-005-407-010	COIL, BLM41A04
C22	*87-012-142-010	CAP, CHIP S 0.33-16	S1	87-036-124-010	SLIDE SW(LINE/MIC)
C23	*87-012-142-010	CAP, CHIP S 0.33-16	S2	87-036-124-010	SLIDE SW(MIC ATT)
C24	*87-012-142-010	CAP, CHIP S 0.33-16	S3	87-036-123-010	SLIDE SW(LINE/MIC)
C27	*87-012-165-010	CAP, CHIP SS 3P-50 CH	--- SUB CIRCUIT BOARD SECTION ---		
C28	*87-012-165-010	CAP, CHIP SS 3P-50 CH	C25	*87-010-424-010	CAP, CHIP TANTALUM 4.7-4
C29	*87-010-424-010	CAP, CHIP TANTALUM 4.7-4	C26	*87-010-424-010	CAP, CHIP TANTALUM 4.7-4
C30	*87-010-424-010	CAP, CHIP TANTALUM 4.7-4	J1	87-049-859-010	JACK DC REFLOW BLK(DC7.4V)
C31	*87-010-424-010	CAP, CHIP TANTALUM 4.7-4	J2	87-049-724-010	JACK DIA3.5 BLK(ANALOG OUT)
C32	*87-010-424-010	CAP, CHIP TANTALUM 4.7-4	J3	87-049-725-010	JACK DIA3.5 RED(LINE/MIC)
C33	*87-012-142-010	CAP, CHIP S 0.33-16	VR1	87-024-089-010	VOLUME 20KA(REC LEVEL)
C34	*87-012-142-010	CAP, CHIP S 0.33-16	VR2	89-HD2-603-010	VOLUME 100K(BALANCE)
--- MISCELLANEOUS ---					
			J4	89-HD2-607-110	CONNECTOR ASSY 10P(CONNECTOR)

LEVEL DIAGRAM (HDA-1)

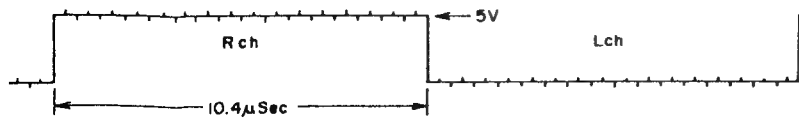


IC BLOCK DIAGRAM (HDA-1)
IC,MN86081

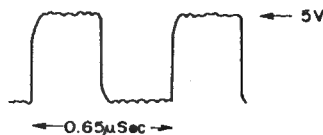




- ① IC1, IC2 ④ LRCK at the operation mode 48kHz, DUTY 50%



- ② IC1, IC2 ⑤ BCK at the operation mode
1.536MHz, DUTY 50%

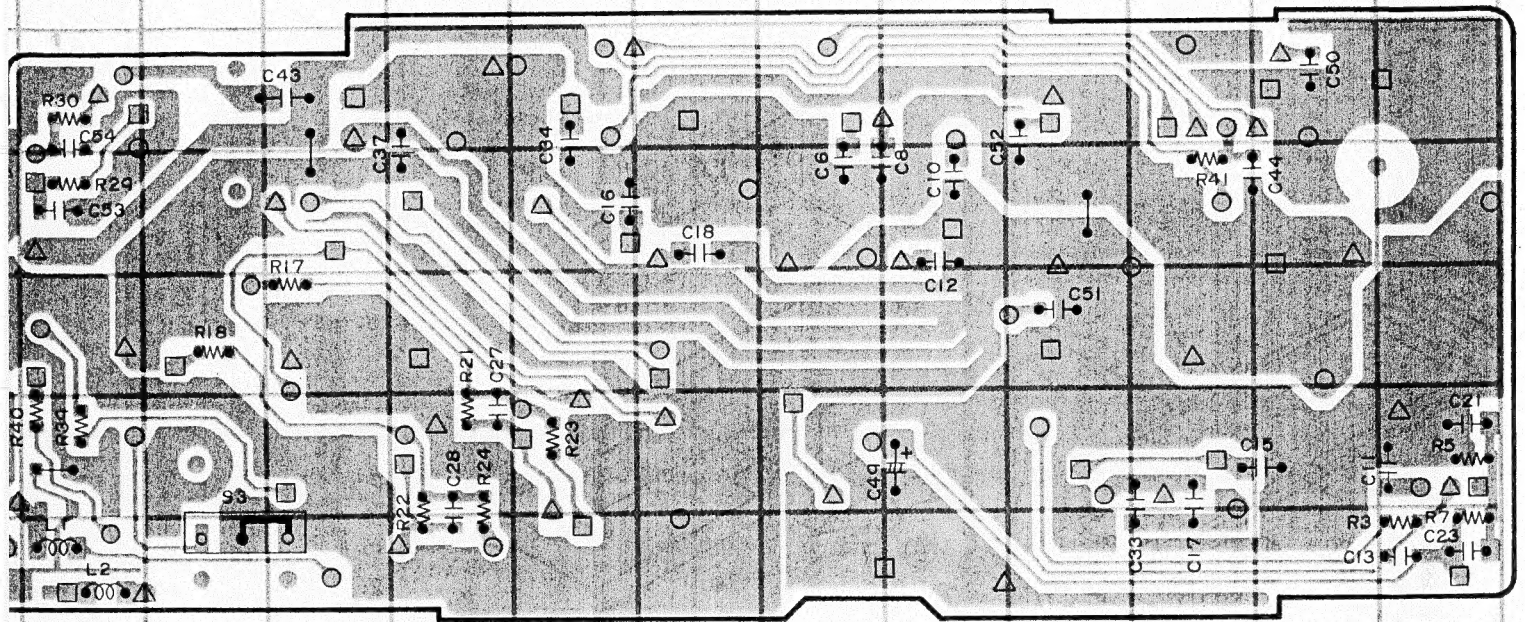


- ③ IC1, IC2 ⑧ EXCK at the approx 2.5Vp-p





A MAIN C.B

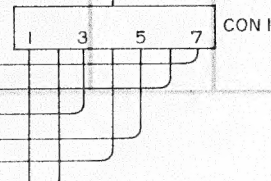
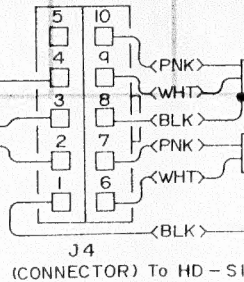
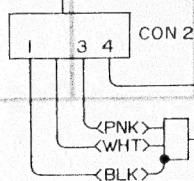
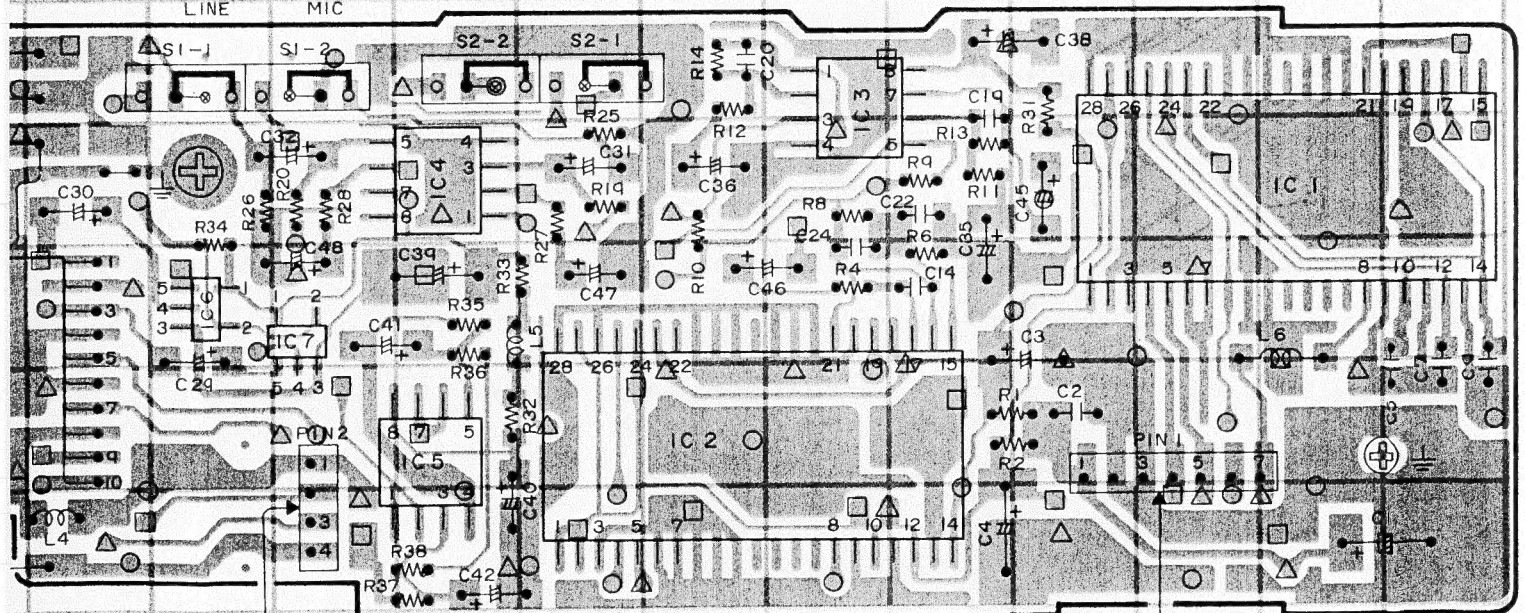


S3
LINE / MIC
LINE ↔ MIC

S2
MIC ATT
20 dB ↔ 0 dB

S1
LINE MIC

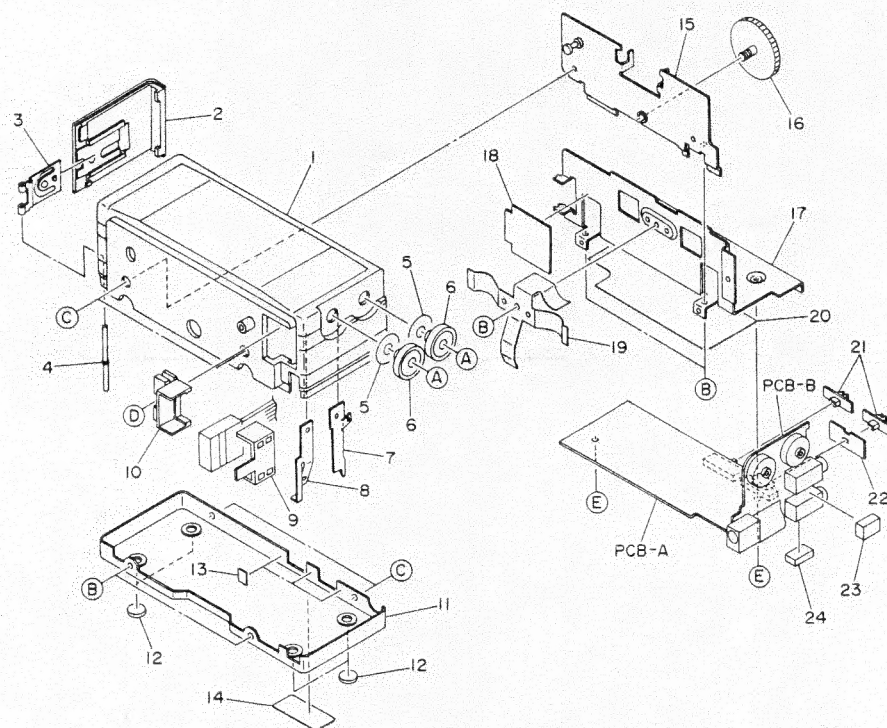
A MAIN C.B



J4
(CONNECTOR) To HD - S1

EXPLODED VIEW (HDA - 1)

REF. NO.	PART NO.	DESCRIPTION
A	87-262-510-31	V+1.4-4.5(B)
B	87-261-522-31	V+1.7-1.8(B)
C	87-261-525-31	V+1.7-2.5(B)
D	87-262-547-31	V+2-3(B)
E	87-067-710-01	SPECIAL SCREW SERRATE 1.7-1.8



MECHANICAL PARTS LIST (HDA - 1)

PART NO. CHANGED TO	REF. NO.	PART NO.	DESCRIPTION	COMMON MODEL	Q. TY
	1	*89-HD2-001-110	CABINET, MAIN	*	1
	2	*89-HD1-017-010	LID, BATTERY	*	1
	3	*89-HD1-224-010	LEVER, LID	*	1
	4	*89-HD1-225-010	SHAFT, LID	*	1
	5	*89-HD2-213-010	CLOTH, DIA 5-10	*	2
	6	*89-HD2-003-010	KNOB, ROTARY VOLUME	*	2
	7	*89-HD2-208-110	BATTERY-CONTACT +	*	1
	8	*89-HD2-209-110	BATTERY-CONTACT -	*	1
	9	*89-HD2-203-010	HOLDER, CONNECT R	*	1
	10	*89-HD2-202-010	HOLDER, CONNECT L	*	1
	11	*89-HD2-002-010	COVER, BOTTOM	*	1
	12	*89-HD1-034-010	FOOT, DIA 5.5-1	*	4
	13	*89-HD1-255-010	SHEET, 5.5-4	*	3
	14	*89-HD2-214-010	RUBBER, 8-4-2	*	1
	15	*89-HD2-206-010	PLATE SUB ASSY	*	1
	16	*89-HD2-005-110	S-SCREW, MAIN 4-6.6	*	1
	17	*89-HD2-201-110	CHASSIS, MAIN UNIT	*	1
	18	*89-HD2-210-010	SHEET, BLIND	*	1
	19	*89-HD2-205-210	P-SPRING, SCREW	*	1
	20	*89-HD2-212-010	SHEET, PCB	*	1
	21	*84-502-008-010	KNOB, SLIDE A	*	2
	22	*89-HD2-211-110	SHEET, SLIDE	*	1
	23	*89-HD2-215-010	RUBBER, 8-5-4	*	1
	24	*89-HD2-214-010	RUBBER, 8-4-2	*	1

■ ACCESSORIES/PACKAGE LIST

PART NO. CHANGED TO	REF. NO.	PART NO.	DESCRIPTION	COMMON MODEL	Q.TY
	1	★89-HD1-913-010	INSTRUCTION BOOKLET, EX (AK,AZ,AYE)	※	1
	2	★89-HD1-914-010	INSTRUCTION BOOKLET, AUH (AH,AUH)	※	1
	3	★89-HD1-627-010	BATTERY,PB-20	※	1
	4	★89-HD1-637-010	AC ADAPTOR,AC-740H (AH)	※	1
	5	★89-HD1-638-010	AC ADAPTOR,AC-740U (AUH)	※	1
	6	★89-HD1-639-010	AC ADAPTOR,AC-740K (AK)	※	1
	7	★89-HD1-640-010	AC ADAPTOR,AC-740E (AZ,AYE)	※	1
	8	★89-HD1-953-110	BAG,CARRING EX	※	1
	9	★89-HD1-954-010	REMOTE CONTROLLER,RC-A1Y	※	1
	10	★87-032-845-010	PLUG,ADAPTOR (AUH)		1
	11	★83-137-620-010	CORD,PIN		2
	12	★- - - - -	A/D CONVERTER,HDA-S1 YB	※	1