

TCM-16

SERVICE MANUAL

Ver 1.0 2000. 12



*E Model
East European Model*

Model Name Using Similar Mechanism	TCM-343
Tape Transport Mechanism Type	MT-323-118

SPECIFICATIONS

Recording system

2-track 1 channel monaural

Frequency range

250 - 6 300 Hz

Speaker

Approx. 3.6 cm (1 ⁷ / ₁₆ in.) dia.

Power output (at 10% harmonic distortion)

130 mW

Output

Earphone jack (minijack) for 8 - 300Ω earphone

Power requirements

- 3 V DC batteries R6 (AA) × 2

Dimensions (w/h/d) (incl. projecting parts and controls)

Approx. 112 × 36.6 × 90.3 mm
(4 ¹ / ₂ × 1 ¹ / ₂ × 3 ⁵ / ₈ in.)

Mass (not incl. batteries)

Approx. 180 g (6.4 oz.)

Design and specifications are subject to change without notice.

CASSETTE-CORDER

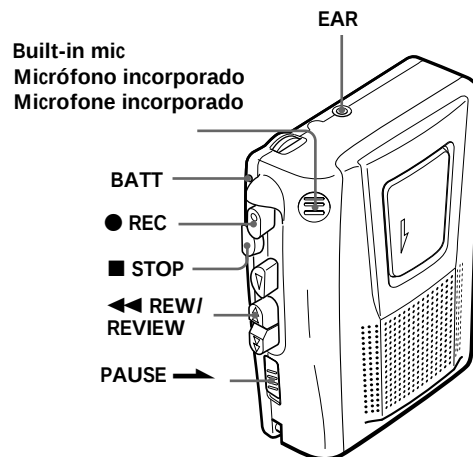
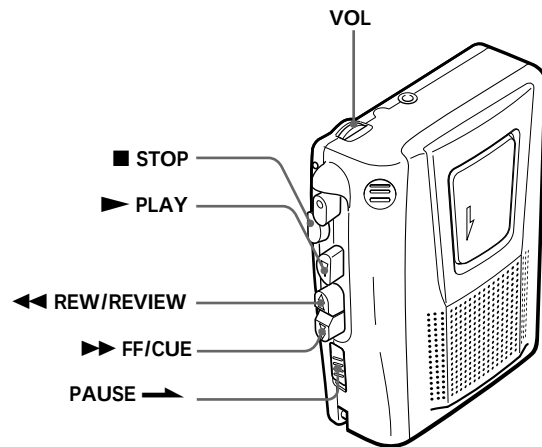
SONY®

SECTION 1 GENERAL

TABLE OF CONTENTS

1. GENERAL	2
2. DISASSEMBLY	
2-1. Lid Sub Assy, Cassette	3
2-2. Main Board, Mechanism Deck	3
2-3. Belt	4
2-4. "Head, Magnetic", Pinch Roller	4
3. MECHANICAL ADJUSTMENT	5
4. ELECTRICAL ADJUSTMENT	5
5. DIAGRAMS	
5-1. IC Block Diagram	6
5-2. Block Diagram	7
5-3. Schematic Diagram	9
5-4. Printed Wiring Board	11
6. EXPLODED VIEWS	
6-1. Cabinet Section	13
6-2. Mechanism Deck Section-1 (MT-323-118)	14
6-3. Mechanism Deck Section-2 (MT-323-118)	15
7. ELECTRICAL PARTS LIST	16

This section is extracted
from instruction manual.



Notes on chip component replacement

- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.

Flexible Circuit Board Repairing

- Keep the temperature of soldering iron around 270°C during repairing.
- Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
- Be careful not to apply force on the conductor when soldering or unsoldering.

SECTION 2 DISASSEMBLY

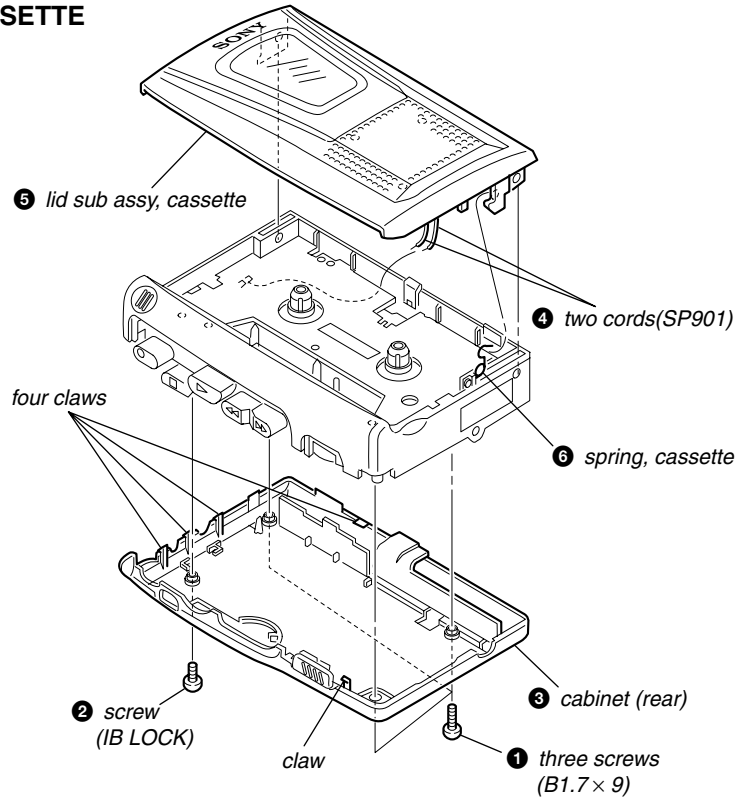
- The equipment can be removed using the following procedure.

Set ➡ Lid Sub Assy, Cassette ➡ Main Board, Mechanism Deck ➡ Belt

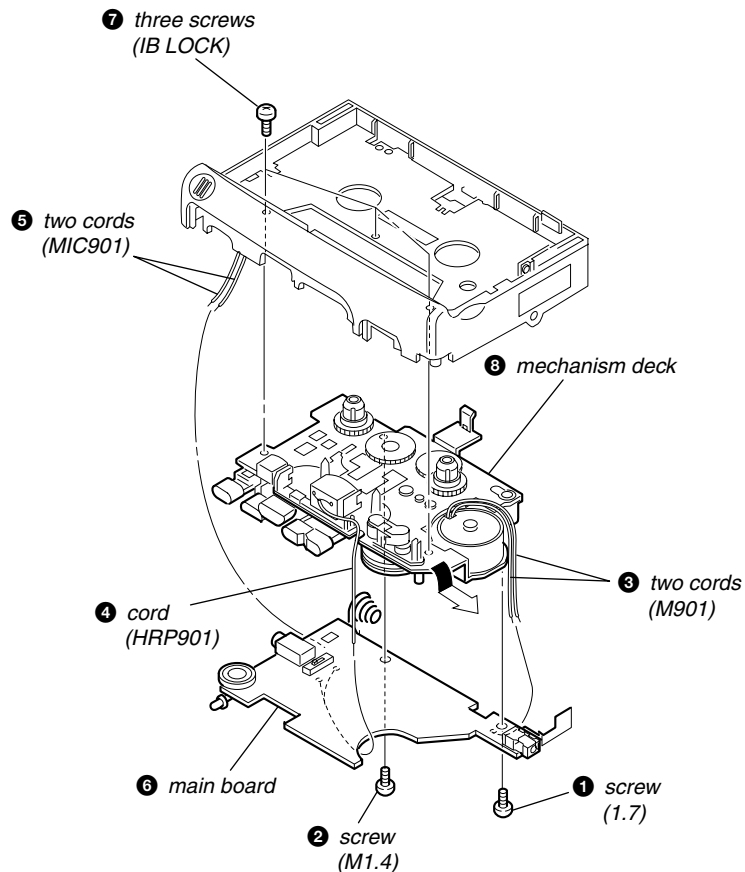
└─ "Head, Magnetic", Pinch Roller

Note : Follow the disassembly procedure in the numerical order given.

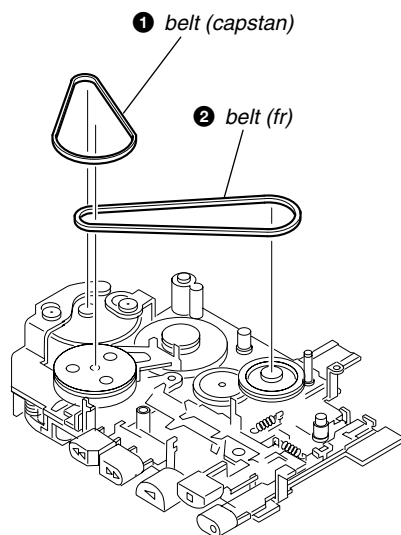
2-1. LID SUB ASSY, CASSETTE



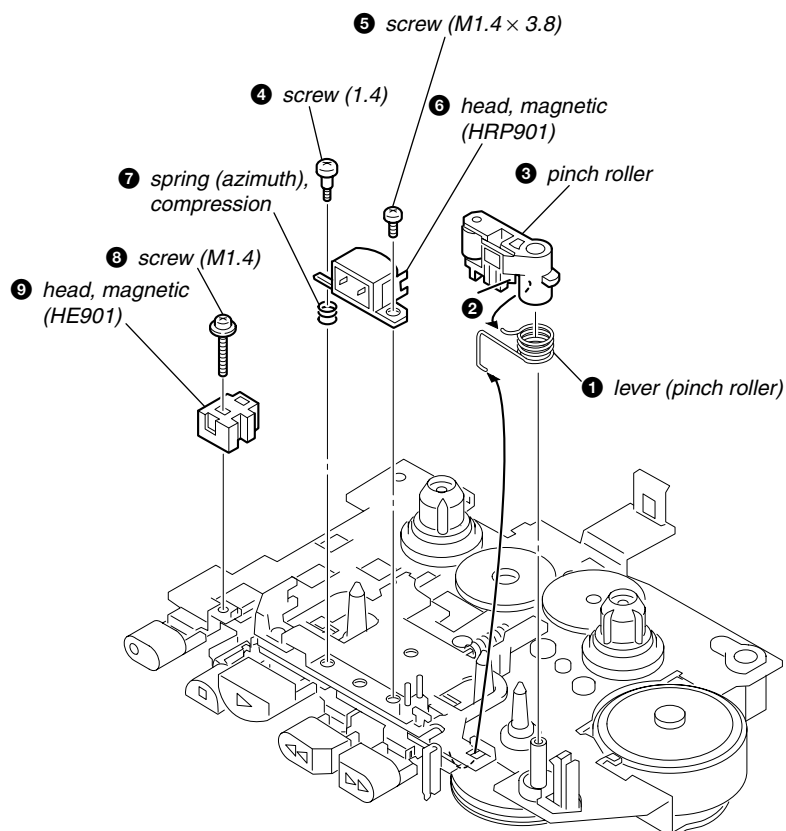
2-2. MAIN BOARD, MECHANISM DECK



2-3. BELT

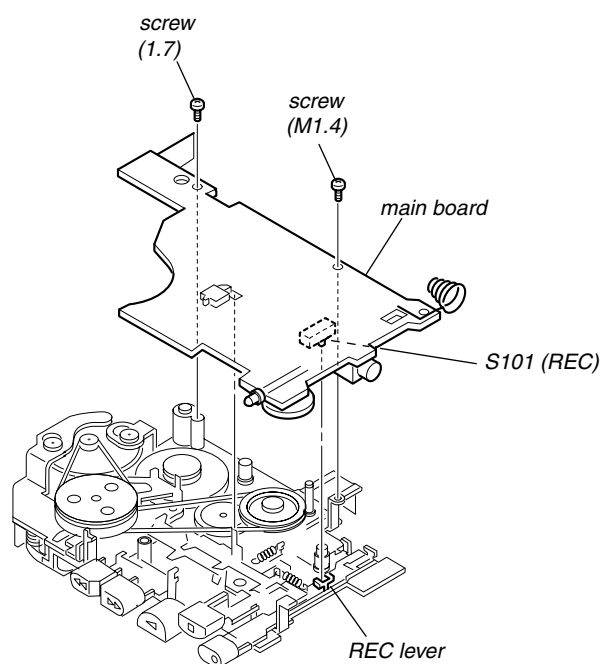


2-4. "HEAD, MAGNETIC", PINCH ROLLER



INSTALLATION MAIN BOARD

On installation MAIN board, adjust to the S101 and the REC lever.



SECTION 3 MECHANICAL ADJUSTMENT

PRECAUTION

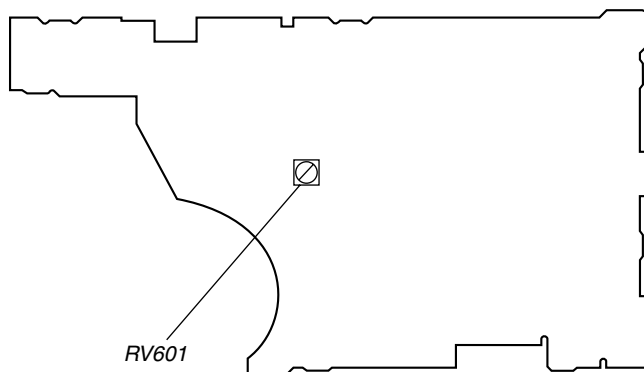
- Clean the following parts with a denatured-alcohol-moistened swab :

playback head	pinch roller
capstan	rubber belt
- Demagnetize the playback head with a head demagnetizer.
- Do not use a magnetized screwdriver for the adjustments.
- The adjustments should be performed with the rated power supply voltage (DC 3.0 V) unless otherwise noted.

Torque Measurement

Mode	Torque Meter	Meter Reading
FWD	CQ-102C	more than 1.96 mN • m (more than 20 g • cm) (more than 0.28 oz • inch)
FWD back tension		0.05 – 0.29 mN • m (0.5 – 3 g • cm) (0.007 – 0.04 oz • inch)
FF, REW	CQ-201B	more than 4.90 mN • m (more than 50 g • cm) (more than 0.69 oz • inch)

Adjustment Location : main board (conductor side)



SECTION 4 ELECTRICAL ADJUSTMENT

PRECAUTION

- Supplied voltage : 3.0 V
- Switch and control position

VOL control	: mechanical mid
PAUSE switch	: OFF

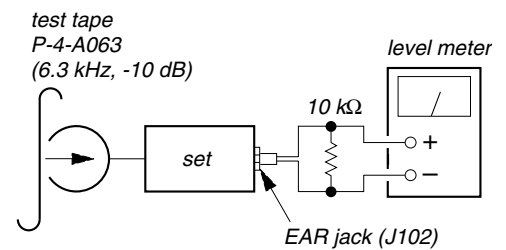
Test tape

Type	Signal	Used for
WS-48A	3 kHz, 0 dB	tape speed adjustment
P-4-A063	6.3 kHz, -10dB	head azimuth adjustment

REC/PB Head Azimuth Adjustment

Procedure :

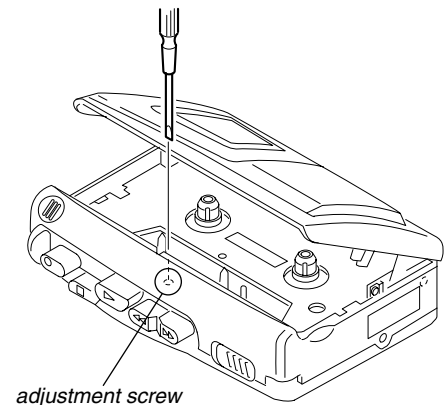
- Model : playback



- Turn the adjustment screw to obtain the maximum reading on level meter.

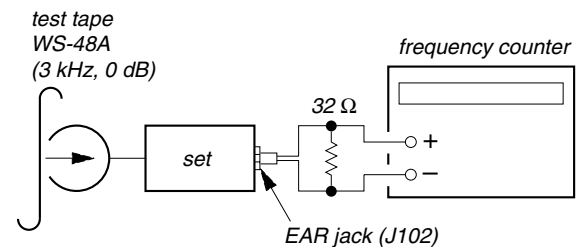
Note : Several peaks may appear, but take the maximum.

Adjustment Location :



Tape Speed Adjustment

Procedure :



- Playback WS-48A (tape center part) in the FWD state and adjust RV601 so that the frequency counter reading becomes 3,000 Hz.

Specification Value :

Digital frequency counter
2,970 to 3,030 Hz

- Check that frequency counter reading is within 2% of reading of step 1.

SECTION 5 DIAGRAMS

Note on Schematic Diagram:

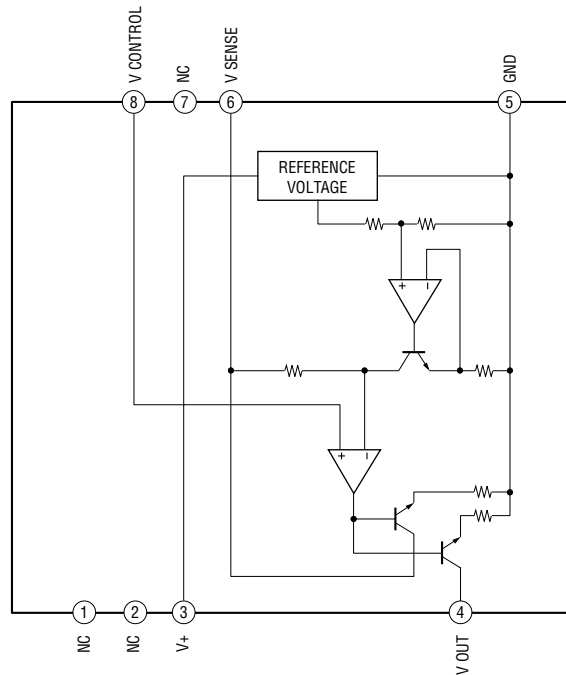
- All capacitors are in μF unless otherwise noted. pF: μF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and $\frac{1}{4}\text{W}$ or less unless otherwise specified.
- $\triangle$: internal component.
- $\square$: panel designation.
- --- : B+ Line.
- --- : adjustment for repair.
- Power voltage is dc 3 V and fed with regulated dc power supply from battery terminal.
- Voltages and waveforms are dc with respect to ground under no-signal (detuned) conditions.
no mark : PLAY
() : REC
- Voltages are taken with a VOM (Input impedance 10 $\text{M}\Omega$).
- Voltage variations may be noted due to normal production tolerances.
- Voltage variations may be noted due to normal production tolerances.
- Signal path.
 Σ : PB
 $\Sigma\Sigma$: REC
 $\Rightarrow$: MIC

Note on Printed Wiring Board:

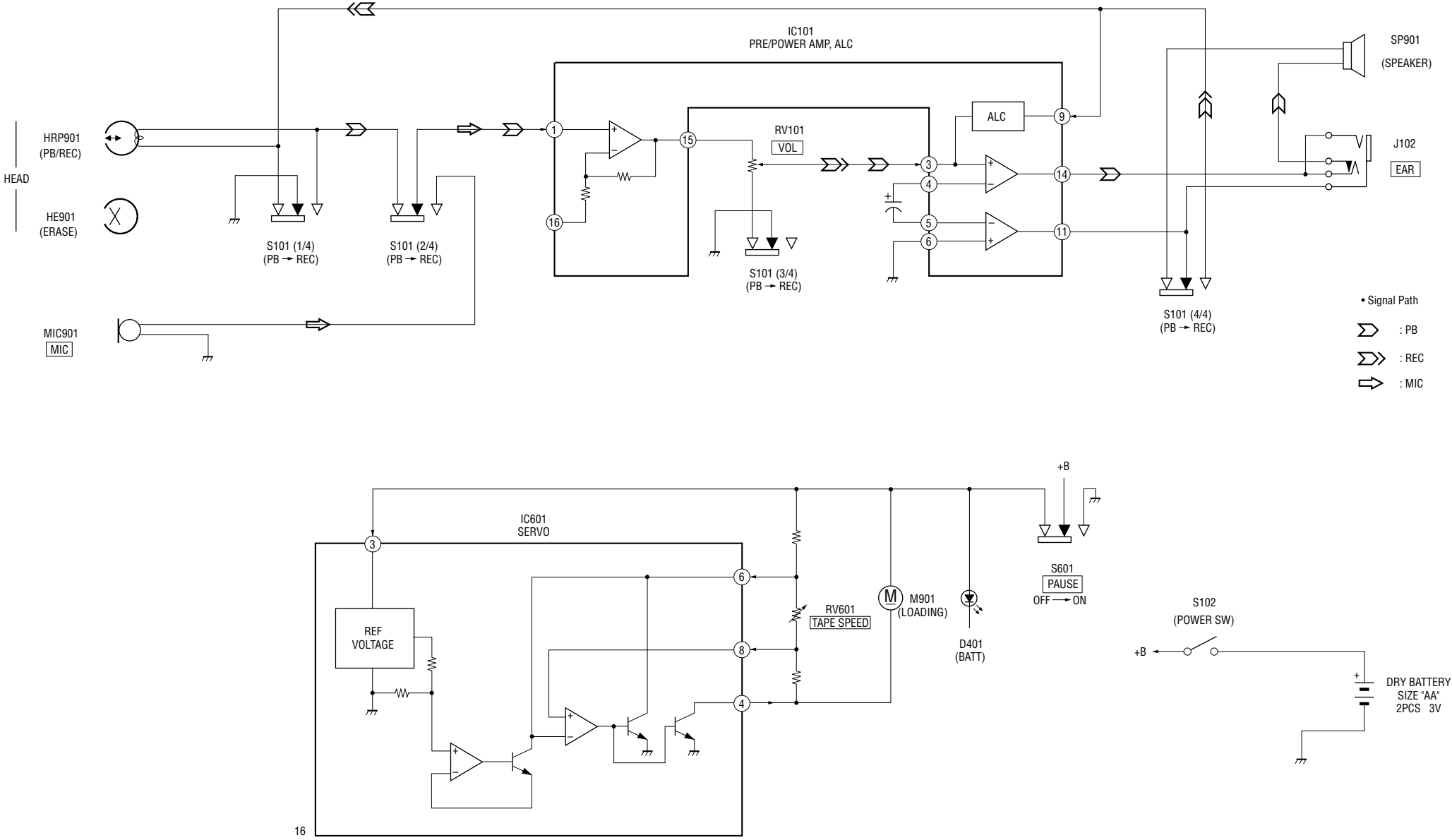
- --- : parts extracted from the conductor side.
- --- : Pattern from the side which enables seeing.

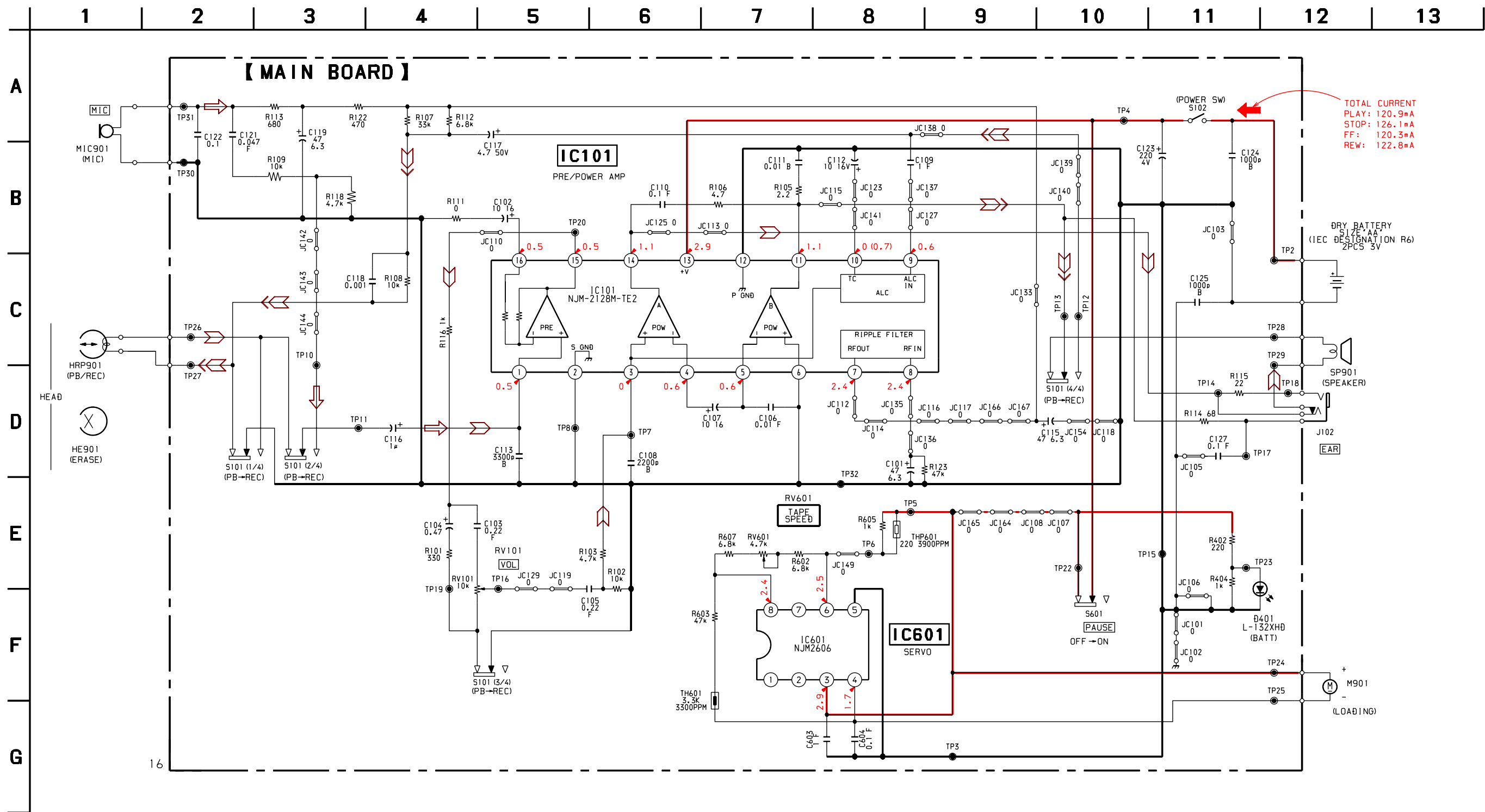
5-1. IC BLOCK DIAGRAM

IC601 NJM2606AM-TE2

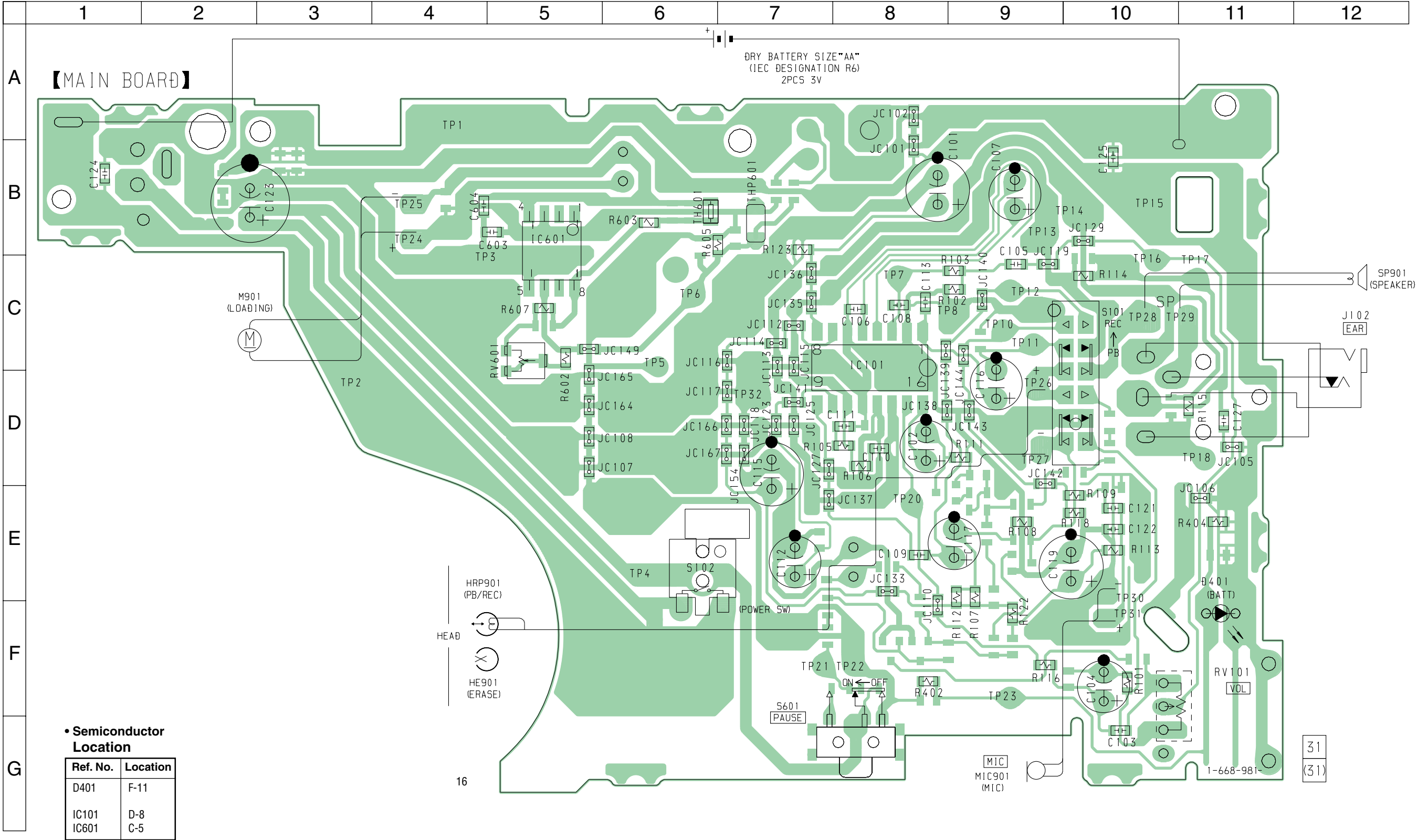


5-2. BLOCK DIAGRAM





5-4. PRINTED WIRING BOARD



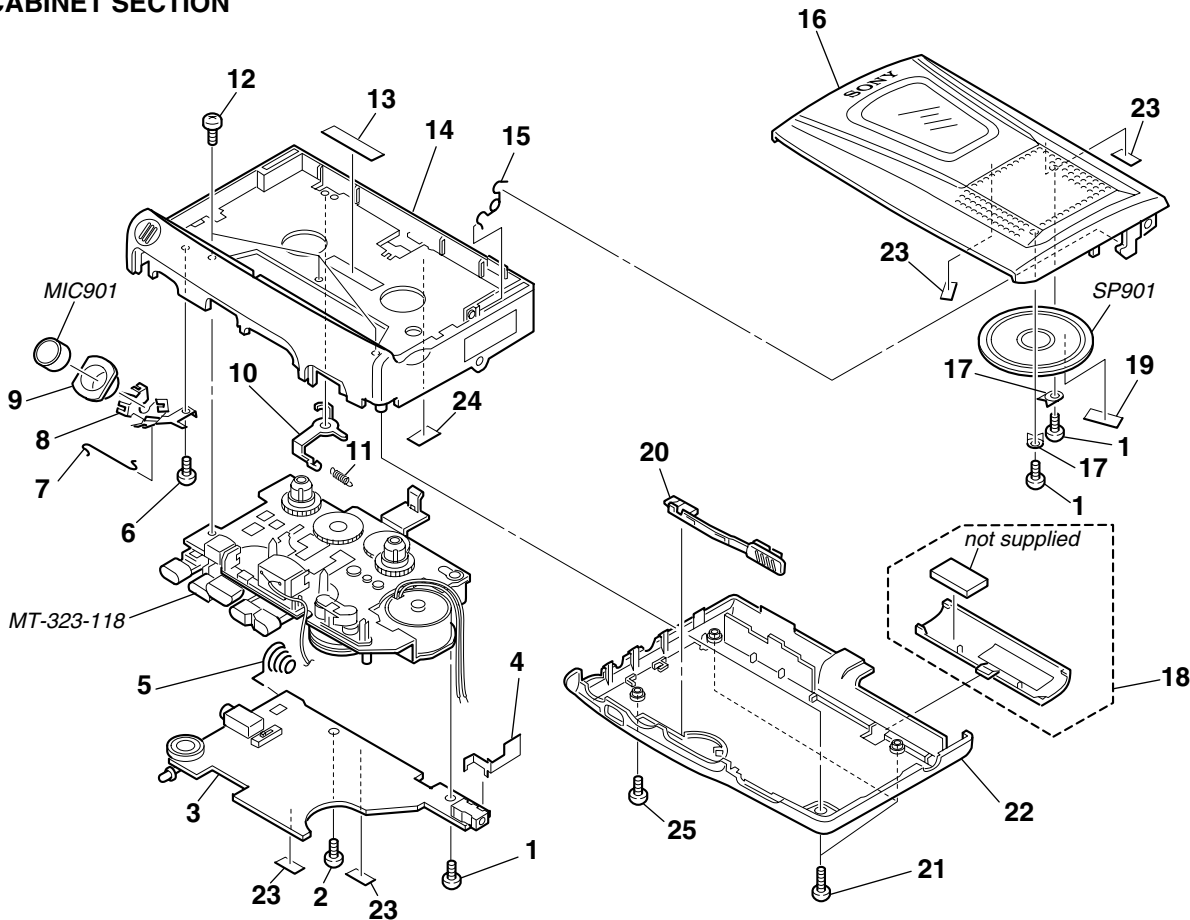
SECTION 6

EXPLODED VIEWS

NOTE:

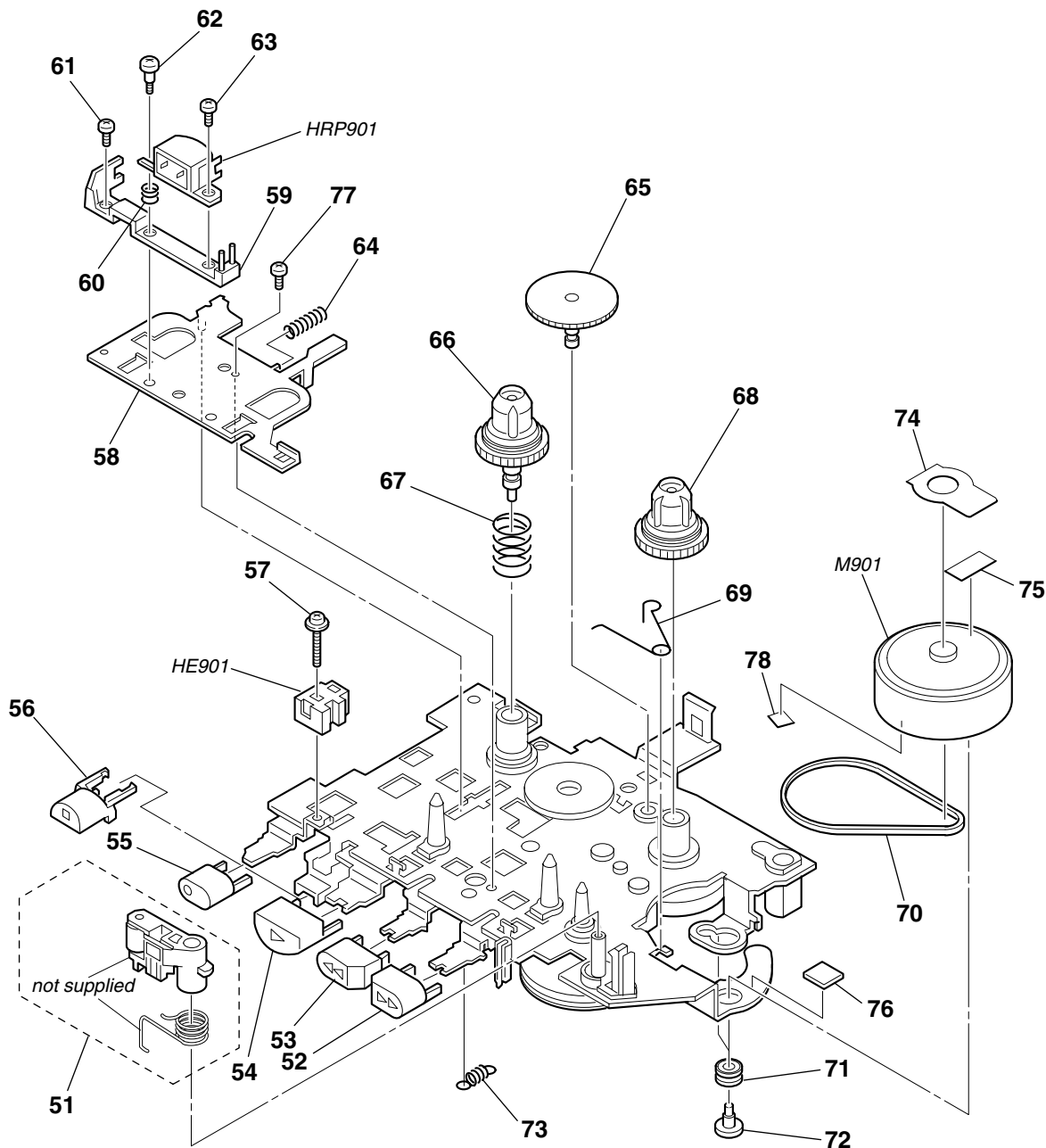
- -XX, -X mean standardized parts, so they may have some differences from the original one.
- Items marked “*” are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Accessories and packing materials are given in the last of this parts list.

6-1. CABINET SECTION



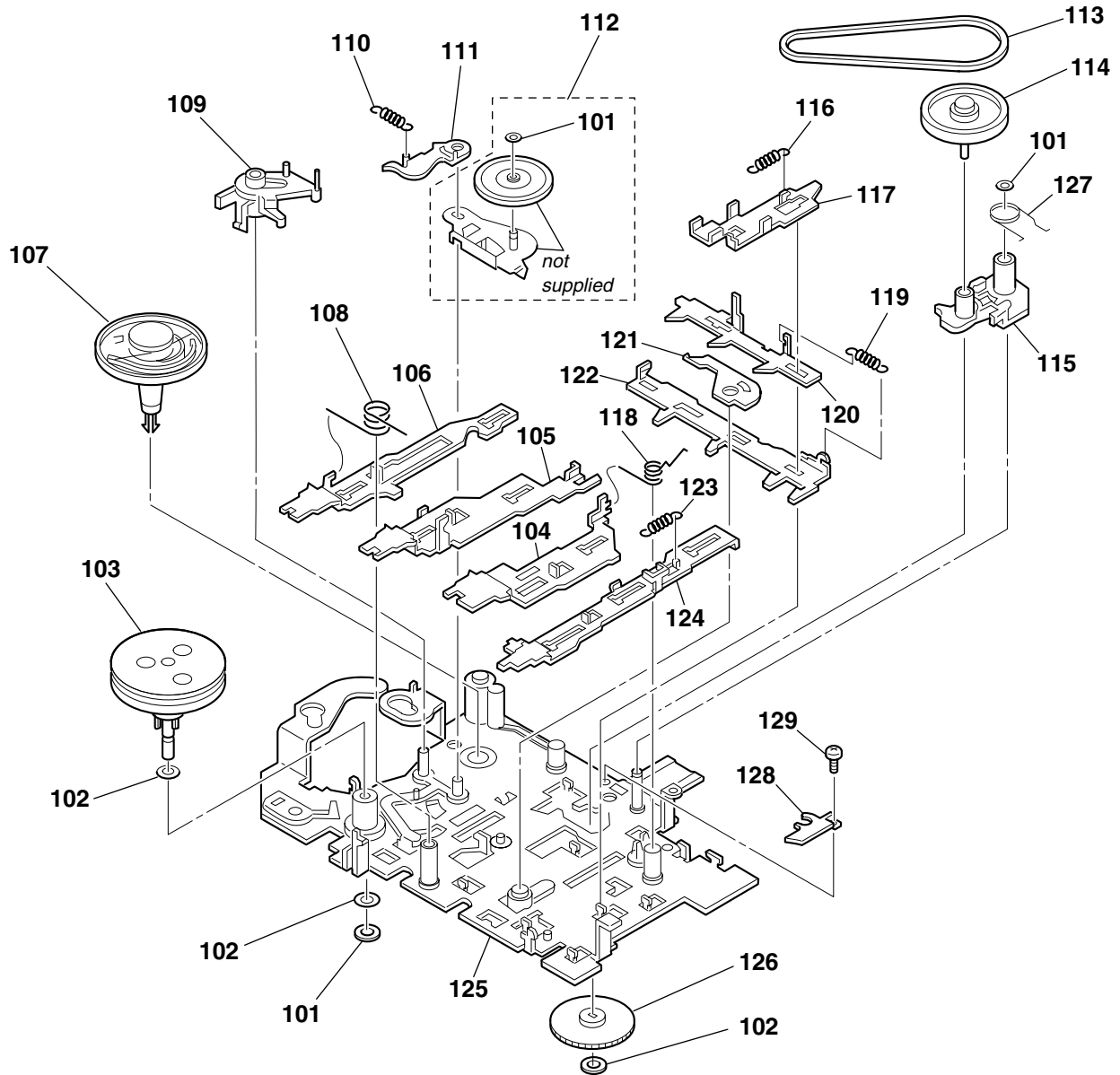
Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
1	3-318-382-31	SCREW (1.7), TAPPING		15	3-924-739-01	SPRING, CASSETTE	
2	3-345-648-01	SCREW (M1.4), TOOTHED LOCK		16	X-3379-561-1	LID SUB ASSY, CASSETTE	
* 3	A-3021-354-A	MAIN BOARD, COMPLETE		* 17	3-924-757-01	BRACKET (SPEAKER)	
4	3-924-741-01	TERMINAL, PLUS		18	X-3375-808-1	LID BLOCK ASSY, BATTERY CASE	
5	3-936-973-01	TERMINAL, MINUS		19	4-017-441-01	CUSHION (B)	
6	3-334-565-41	SCREW (B1.7), TAPPING		20	3-924-747-11	KNOB (PAUSE)	
7	3-924-745-01	BAR, GROUND		21	3-318-203-92	SCREW (B1.7X9), TAPPING	
8	3-924-740-01	HOLDER, MICROPHONE		22	3-019-442-01	CABINET (REAR)	
9	3-924-763-01	CUSHION (MICROPHONE)		23	3-831-441-99	SPACER, KNOB	
10	3-924-743-01	CLAW, ERASING PROTECTION		24	3-831-441-11	CUSHION (B)	
11	3-924-744-01	SPRING (CLAW DETECTION), TENSION		25	3-366-890-51	SCREW (IB LOCK)	
12	3-939-590-26	SCREW (IB LOCK)		MIC901	1-542-136-11	MICROPHONE, ELECTRET CONDEDSER	
13	3-578-101-31	PLATE, ORNAMENTAL		SP901	1-505-384-11	SPEAKER (3.6CM)	
14	3-019-363-41	CABINET (FRONT)					

6-2. MECHANISM DECK SECTION-1 (MT-323-118)



Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
51	X-3377-250-1	LEVER (2) ASSY, PINCH		67	3-924-674-01	SPRING (B.T), COMPRESSION	
52	3-925-146-11	BUTTON (FF)		68	3-924-641-01	GEAR (T REEL)	
53	3-925-147-01	BUTTON (REW)		69	3-924-726-01	SPRING (M GROUND), TORSION	
54	3-925-148-11	BUTTON (PLAY)		70	3-907-943-01	BELT (CAPSTAN)	
55	3-925-145-21	BUTTON (REC)		71	3-925-109-01	CUSHION (MOTOR)	
56	3-924-738-01	BUTTON (STOP)		72	3-925-108-01	SCREW (MOTOR)	
57	3-703-925-21	SCREW (M1.4)		73	3-924-644-01	SPRING (POWER TENSION),TENSION	
58	3-924-625-01	LEVER (HEAD)		74	3-030-766-12	SHEET (MOTOR)	
59	3-924-645-01	BRACKET (HEAD)		75	3-831-441-11	CUSHION,CABINET UPPER 10X7X0.5	
60	3-924-685-01	SPRING (AZIMUTH), COMPRESSION		76	3-927-754-11	CUSHION (M)	
61	3-704-197-91	SCREW (IB LOCK)		77	3-348-160-11	SCREW (M1.4X1.6),PRECISION PAN	
62	3-375-135-01	SCREW (1.4), SPECIAL		78	3-561-685-01	SHEET (C), INSULATING	
63	3-376-177-01	SCREW (M1.4X3.8)		HE901	1-500-232-11	HEAD, MAGNETIC (ERASE)	
64	3-925-107-01	SPRING (IDLER), COMPRESSION		M901	1-763-453-11	MOTOR, DC (LOADING)(WITH PULLY)	
65	3-924-637-01	GEAR (FF)		HRP901	1-500-073-51	HEAD,MAGNETIC (RECORD/PLAYBACK)	
66	3-924-673-01	GEAR (S REEL)					

6-3. MECHANISM DECK SECTION-2 (MT-323-118)



Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
101	3-321-483-11	RING, RETAINING		116	3-924-633-01	SPRING (STOP), TENSION	
102	3-701-437-51	WASHER		117	3-924-622-03	LEVER (STOP)	
103	X-3370-384-1	FLYWHEEL ASSY		118	3-045-541-01	SPRING (PR3), TORSION	
104	3-924-623-04	LEVER (PLAY)		119	3-924-684-01	SPRING (LOCK PLATE), TENSION	
105	3-924-621-03	LEVER (REW)		120	3-924-619-06	LEVER (SW)	
106	3-924-620-03	LEVER (FF)		121	3-924-639-01	LEVER (CR)	
107	X-3370-388-3	TABLE ASSY, FELT		122	3-924-618-02	LEVER (LOCK)	
108	3-924-642-03	SPRING (FR), TORSION		123	3-925-208-01	SPRING (REC), TENSION	
109	3-924-629-01	LEVER (DETECTION)		124	3-924-624-01	LEVER (REC)	
110	3-925-207-01	SPRING (S.OFF), TENSION		125	X-3370-227-9	CHASSIS ASSY	
111	3-924-630-01	LEVER (S.OFF)		126	3-924-613-03	GEAR (FR)	
112	X-3370-387-8	LEVER ASSY, IDLER		127	3-024-378-21	SPRING (FR LEVER), TORSION	
113	3-924-682-01	BELT (FR)		128	3-029-566-12	STOPPER (FF)	
114	X-3370-385-1	PULLEY (FR) ASSY		129	3-704-197-33	SCREW (IB LOCK)	
115	3-924-628-0	LEVER (FR)					

SECTION 7 ELECTRICAL PARTS LIST

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked “*” are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- CAPACITORS:
uF: μ F
- RESISTORS
All resistors are in ohms.
METAL: metal-film resistor
METAL OXIDE: Metal Oxide-film resistor
F: nonflammable
- COILS
uH: μ H
- Abbreviation
EE : East European model

- SEMICONDUCTORS
In each case, u: μ , for example:
uA...: μ A..., uPA..., μ PA...,
uPB..., μ PB..., uPC..., μ PC...,
uPD..., μ PD...

When indicating parts by reference number, please include the board name.

Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
*	A-3021-354-A	MAIN BOARD, COMPLETE *****				< JUMPER CHIP >	
	3-924-741-03	TERMINAL, PLUS		JC101	1-216-864-11	SHORT	0
		< CAPACITOR >		JC102	1-216-864-11	SHORT	0
C101	1-104-357-11	ELECT 47uF	20.00% 6.3V	JC103	1-216-864-11	SHORT	0
C102	1-104-396-11	ELECT 10uF	20.00% 16V	JC105	1-216-864-11	SHORT	0
C103	1-165-128-11	CERAMIC CHIP 0.22uF	16V	JC106	1-216-864-11	SHORT	0
C104	1-126-159-11	ELECT 0.47uF	20.00% 50V	JC107	1-216-864-11	SHORT	0
C105	1-165-128-11	CERAMIC CHIP 0.22uF	16V	JC108	1-216-864-11	SHORT	0
C106	1-162-974-11	CERAMIC CHIP 0.01uF	50V	JC110	1-216-864-11	SHORT	0
C107	1-104-396-11	ELECT 10uF	20.00% 16V	JC112	1-216-864-11	SHORT	0
C108	1-162-966-11	CERAMIC CHIP 0.0022uF	10% 50V	JC113	1-216-864-11	SHORT	0
C109	1-115-156-11	CERAMIC CHIP 1uF	10V	JC114	1-216-864-11	SHORT	0
C110	1-164-156-11	CERAMIC CHIP 0.1uF	25V	JC115	1-216-864-11	SHORT	0
C111	1-162-970-11	CERAMIC CHIP 0.01uF	10% 25V	JC116	1-216-864-11	SHORT	0
C112	1-104-396-11	ELECT 10uF	20.00% 16V	JC117	1-216-864-11	SHORT	0
C113	1-162-967-11	CERAMIC CHIP 0.0033uF	10% 50V	JC118	1-216-864-11	SHORT	0
C115	1-104-357-11	ELECT 47uF	20.00% 6.3V	JC119	1-216-864-11	SHORT	0
C116	1-104-411-11	ELECT 1uF	20.00% 50V	JC123	1-216-864-11	SHORT	0
C117	1-126-163-11	ELECT 4.7uF	20% 50V	JC125	1-216-864-11	SHORT	0
C118	1-162-964-11	CERAMIC CHIP 0.001uF	10% 50V	JC127	1-216-864-11	SHORT	0
C119	1-126-154-11	ELECT 47uF	20% 6.3V	JC129	1-216-864-11	SHORT	0
C121	1-164-361-11	CERAMIC CHIP 0.047uF	16V	JC133	1-216-864-11	SHORT	0
C122	1-164-156-11	CERAMIC CHIP 0.1uF	25V	JC135	1-216-864-11	SHORT	0
C123	1-124-434-00	ELECT 220uF	20.00% 4V	JC136	1-216-864-11	SHORT	0
C124	1-162-964-11	CERAMIC CHIP 0.001uF	10% 50V	JC137	1-216-864-11	SHORT	0
C125	1-162-964-11	CERAMIC CHIP 0.001uF	10% 50V	JC138	1-216-864-11	SHORT	0
C127	1-164-156-11	CERAMIC CHIP 0.1uF	25V	JC139	1-216-864-11	SHORT	0
C603	1-115-156-11	CERAMIC CHIP 1uF	10V	JC140	1-216-864-11	SHORT	0
C604	1-164-156-11	CERAMIC CHIP 0.1uF	25V	JC141	1-216-864-11	SHORT	0
		< DIODE >		JC142	1-216-864-11	SHORT	0
D401	8-719-057-27	DIODE L-132XHD (BATT)		JC143	1-216-864-11	SHORT	0
		< IC >		JC144	1-216-864-11	SHORT	0
IC101	8-759-339-54	IC NJM-2128M-TE2		JC149	1-216-864-11	SHORT	0
IC601	8-759-345-42	IC NJM2606AM-TE2		JC154	1-216-864-11	SHORT	0
		< JACK >		JC164	1-216-864-11	SHORT	0
J102	1-766-847-11	JACK (EAR)		JC165	1-216-864-11	SHORT	0
				JC166	1-216-864-11	SHORT	0
				JC167	1-216-864-11	SHORT	0
						< RESISTOR >	
				R101	1-216-815-11	METAL CHIP 330	5% 1/16W
				R102	1-216-833-11	METAL CHIP 10K	5% 1/16W
				R103	1-216-829-11	METAL CHIP 4.7K	5% 1/16W
				R105	1-216-789-11	METAL CHIP 2.2	5% 1/16W
				R106	1-216-793-11	RES-CHIP 4.7	5% 1/16W

Ref. No.	Part No.	Description				Remarks	Ref. No.	Part No.	Description	Remarks
R107	1-216-839-11	METAL CHIP	33K	5%	1/16W			MISCELLANEOUS		
R108	1-216-833-11	METAL CHIP	10K	5%	1/16W			*****		
R109	1-216-833-11	METAL CHIP	10K	5%	1/16W					
R111	1-216-864-11	SHORT	0			HE901	1-500-232-11	HEAD, MAGNETIC (ERASE)		
R112	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	HRP901	1-500-073-51	HEAD,MAGNETIC(RECORD/PLAYBACK)		
						MIC901	1-542-136-11	MICROPHONE, ELECTRET CONDEDSER		
R113	1-216-819-11	METAL CHIP	680	5%	1/16W	M901	1-763-453-11	MOTOR, DC (LOADING)(WITH PULLY)		
R114	1-216-807-11	METAL CHIP	68	5%	1/16W	SP901	1-505-384-11	SPEAKER (3.6CM)		
R115	1-216-801-11	METAL CHIP	22	5%	1/16W	*****				
R116	1-216-821-11	METAL CHIP	1K	5%	1/16W			ACCESSORIES & PACKING MATERIALS		
R118	1-216-829-11	METAL CHIP	4.7K	5%	1/16W			*****		
R122	1-216-817-11	METAL CHIP	470	5%	1/16W					
R123	1-216-841-11	METAL CHIP	47K	5%	1/16W	3-222-957-11	MANUAL, INSTRUCTION			
R402	1-216-813-11	METAL CHIP	220	5%	1/16W		(ENGLISH,SPANISH,PORTUGUESE,CHINESE)(E)			
R404	1-216-821-11	METAL CHIP	1K	5%	1/16W	3-222-957-41	MANUAL, INSTRUCTION			
R602	1-216-831-11	METAL CHIP	6.8K	5%	1/16W		(ENGLISH,GERMAN,RUSSIAN)(EE)			
						3-222-957-51	MANUAL, INSTRUCTION			
R603	1-216-841-11	METAL CHIP	47K	5%	1/16W		(POLISH,HUNGARIAN,CZECH,SLOVAK)(EE)			
R605	1-216-821-11	METAL CHIP	1K	5%	1/16W					
R607	1-216-831-11	METAL CHIP	6.8K	5%	1/16W					
		< VARIABLE RESISTOR >								
RV101	1-225-597-11	RES, VAR, CARBON 10K (VOL)								
RV601	1-238-663-11	RES, ADJ, CARBON 4.7K								
		< SWITCH >								
S102	1-572-688-11	SWITCH, PUSH (1 KEY)(POWER)								
S601	1-572-922-11	SWITCH, SLIDE (PAUSE)								
		< THERMISTOR >								
TH601	1-809-354-11	THERMISTOR, NTC (2125)								
		< THERMISTOR(POSITIVE) >								
THP601	1-810-007-11	THERMISTOR, POSITIVE								
