

TCM-323

SERVICE MANUAL

Ver 1.2 2004.03

*US Model
Canadian Model
AEP Model
E Model*



Model Name Using Similar Mechanism	NEW
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 (1³/₁₆ in.) dia.

Power output
130 mW (at 10 % harmonic distortion)

Output
Earphone jack (minijack) for 8 - 300 ohms earphone

Power requirements
• Two size R6 (AA) batteries (not supplied): 3V DC

Dimensions (w/h/d) (incl. projecting parts and controls)
Approx. 112 × 91 × 36.5 mm (4¹/₂ × 3⁵/₁₆ × 1³/₁₆ in.)

Mass (not incl. batteries)
Approx. 170g (6.0 oz)

Design and specifications are subject to change without notice.

CASSETTE-CORDER

9-923-304-12
2004C05-1
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Personal Audio Company
Published by Sony Engineering Corporation

SONY®

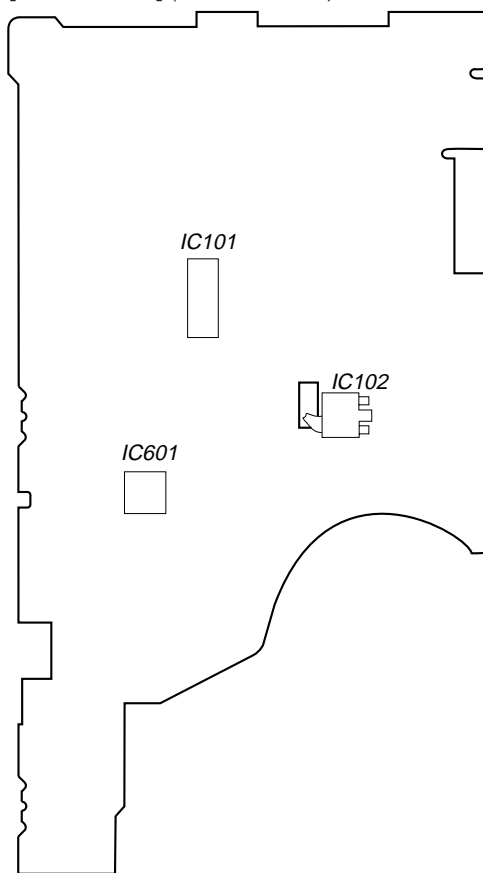
SECTION 1 SERVICING NOTES

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In this set, the S102 (power) detects REC/PLAYBACK on. It is mounted on the MAIN board, and therefore the REC/PLAYBACK on cannot be detected with the MAIN board removed. When making an operation check and voltage check of mechanical deck with the MAIN board removed, fix the S102 at turn on.

[MAIN BOARD] (Conductor Side)

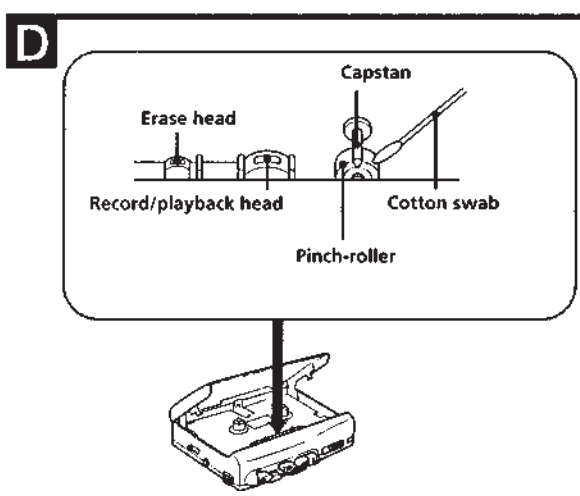
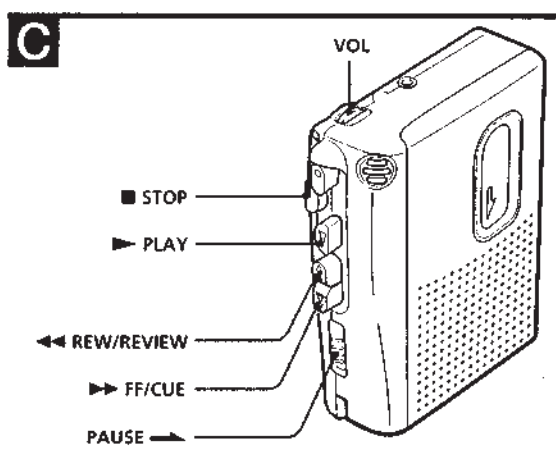
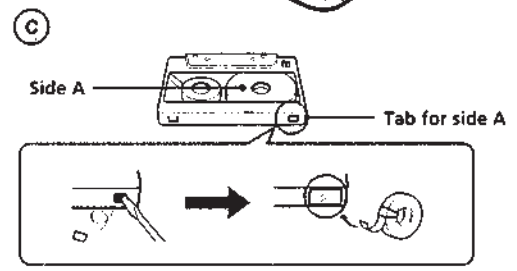
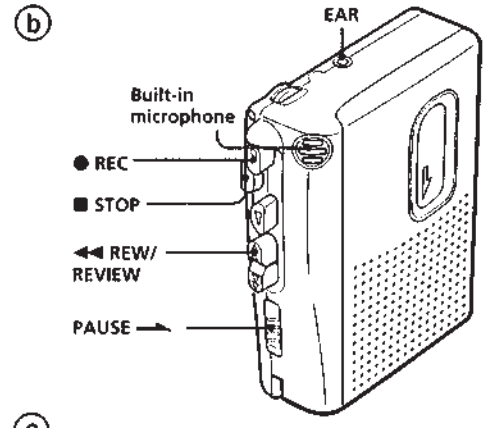
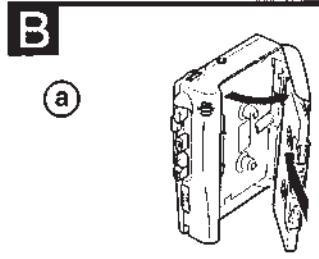
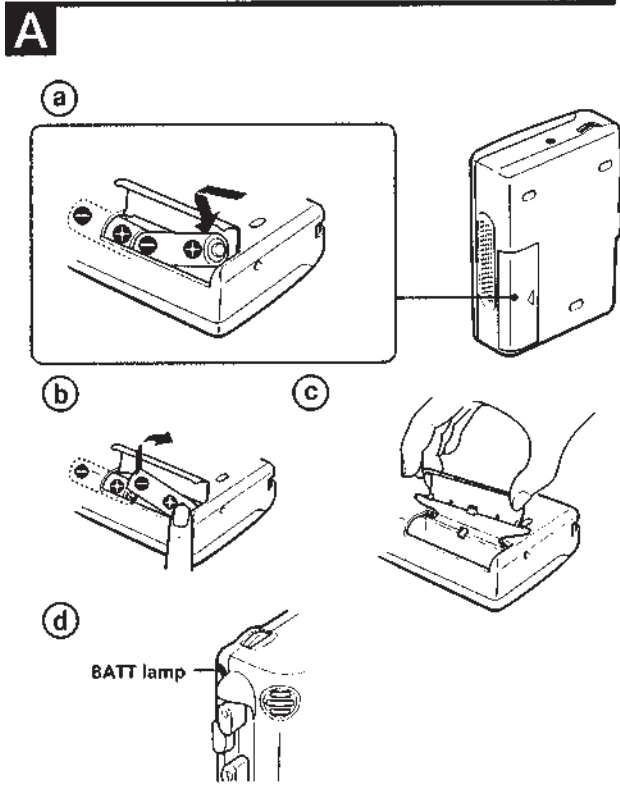


Notes on chip component replacement

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

SECTION 2 GENERAL

This section is extracted from instruction manual.



SECTION 3 DISASSEMBLY

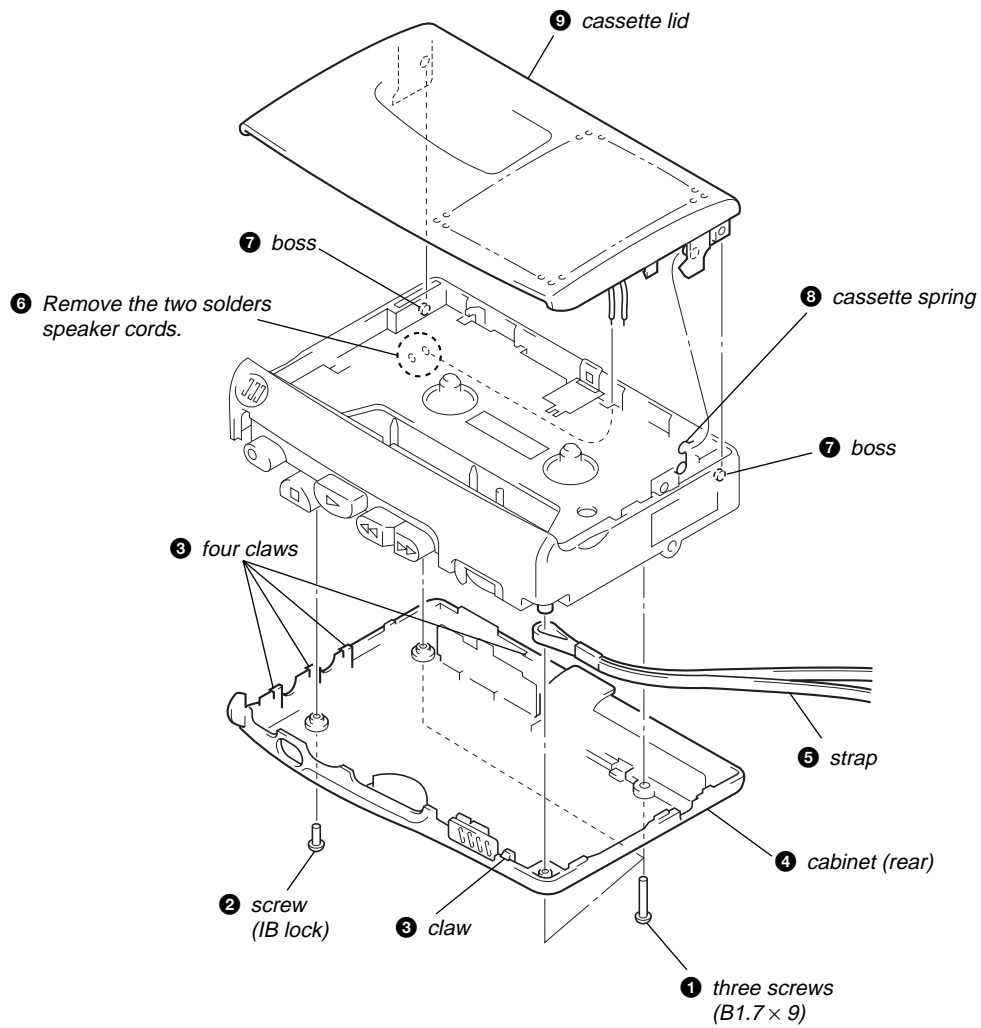
- This set can be disassembled in the order shown below.

SET → CABINET (REAR), CASSETTE LID → MAIN BOARD, MECHANISM DECK (MT-323-118)

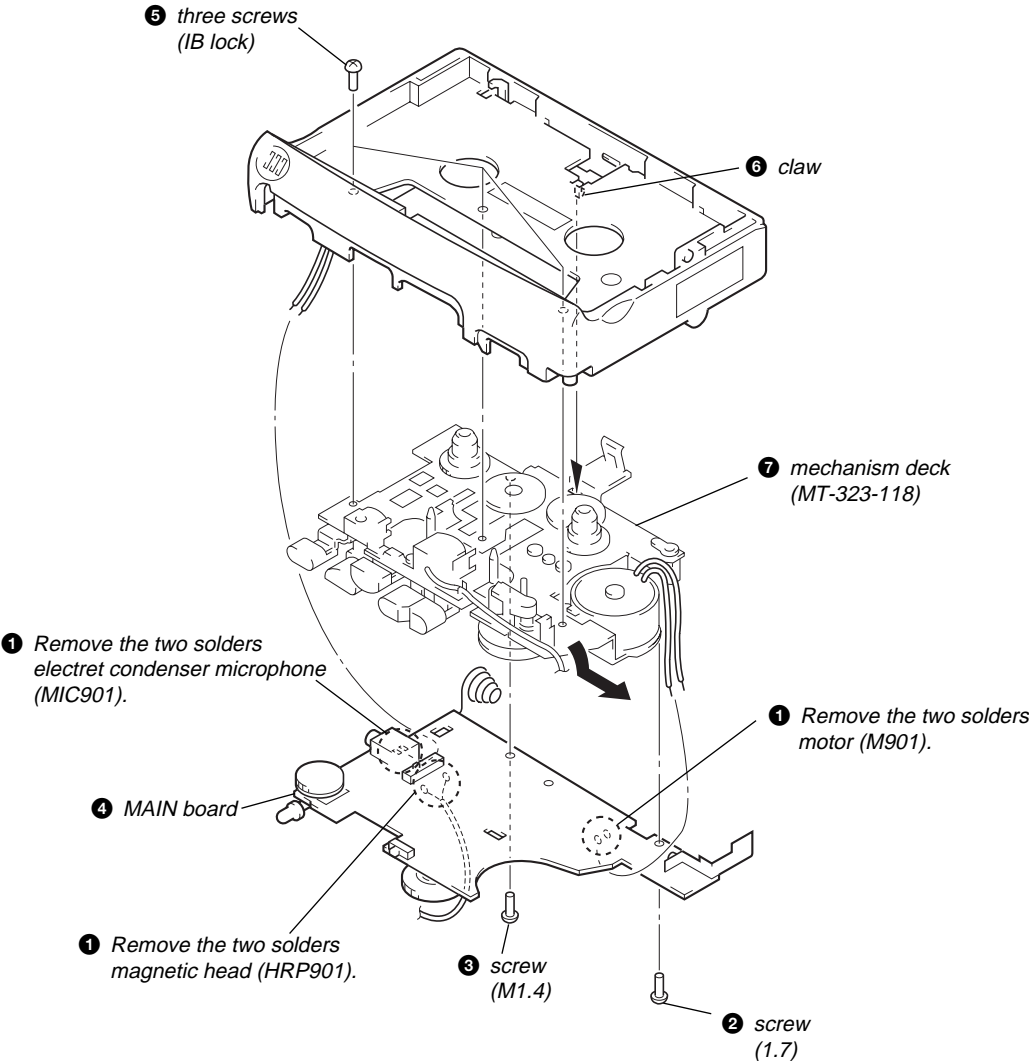
→ BELT

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

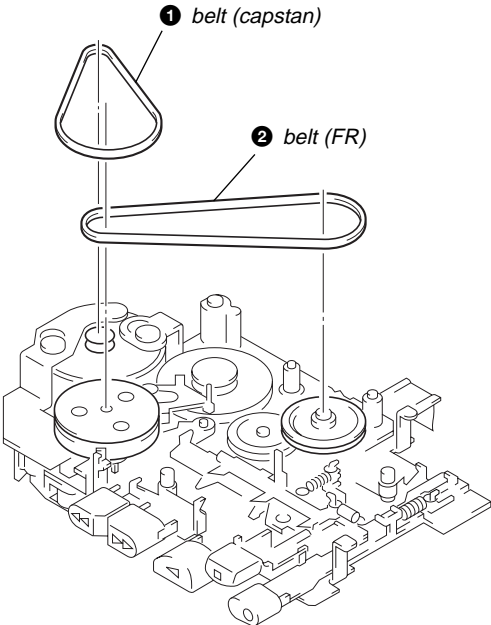
CABINET (REAR), CASSETTE LID



MAIN BOARD, MECHANISM DECK (MT-323-118)

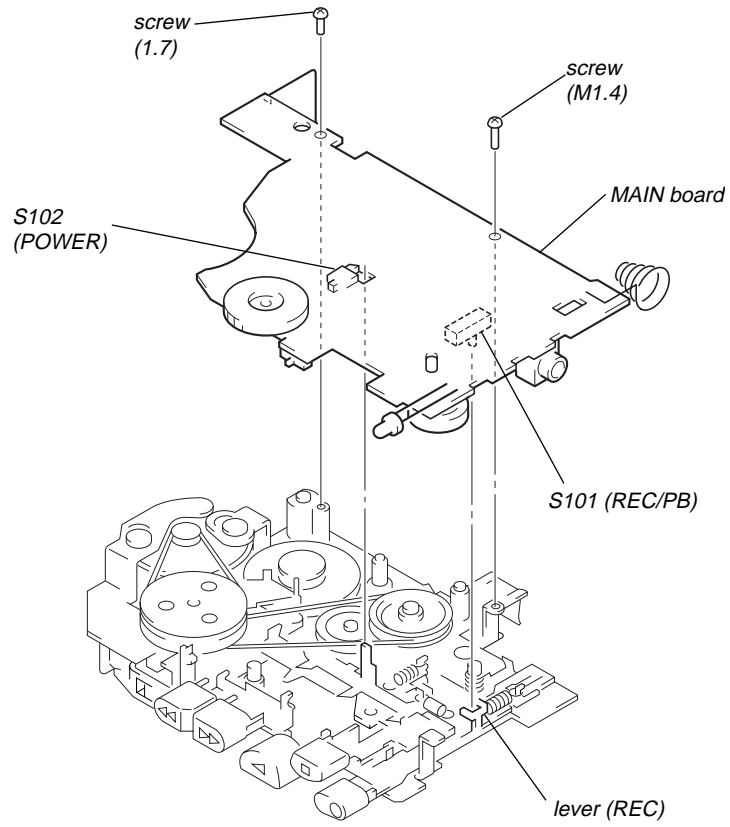


BELT



INSTALLATION MAIN BOARD

On installation MAIN board, adjust to the S101 and the S102.



SECTION 4 MECHANICAL ADJUSTMENTS

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

record/playback head	pinch roller
erase head	rubber belt
capstan	idlers
2. Demagnetize the record/playback head with a head demagnetizer. (Do not bring the head demagnetizer close to the erase head.)
3. Do not use a magnetized screwdriver for the adjustments.
4. After the adjustments, apply suitable locking compound to the parts adjusted.
5. The adjustments should be performed with the rated power supply voltage (2.5 V) unless otherwise noted.

Torque Measurement

Mode	Torque Meter	Meter Reading
FWD	CQ-102C	more than 20 g•cm (more than 0.28 oz•inch)
Forward Back Tension		0.5 - 3 g•cm (0.007 - 0.04 oz•inch)
FF	CQ-201B	more than 50 g•cm (more than 0.69 oz•inch)
REW		

Tape Tension Measurement

Mode	Tension Meter	Meter Reading
FWD	CQ-403C	more than 50 g (more than 1.76 oz)

SECTION 5 ELECTRICAL ADJUSTMENTS

Precaution

- Supplied voltage: 2.5 V
- Switch and control position
PAUSE switch (S105): OFF
VOL (RV101): mechanical mid

Test Tape

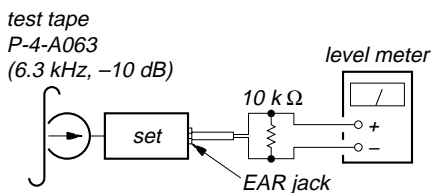
Type	Signal	Used for
P-4-A063	6.3 kHz, -10 dB	head azimuth adjustment
WS-48A	3 kHz, 0 dB	tape speed adjustment

0 dB=0.775 V

Record/Playback Head Azimuth Adjustment

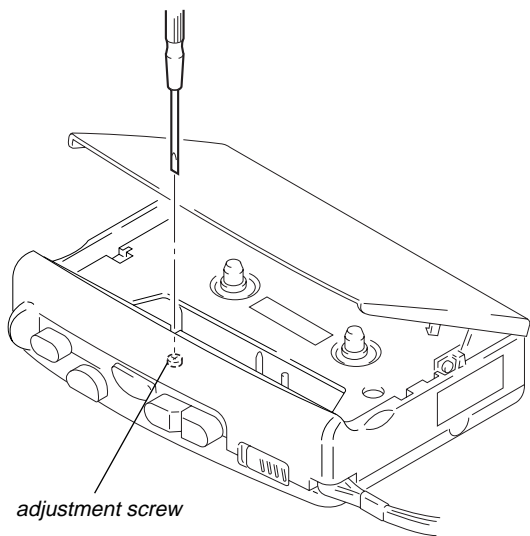
Procedure:

Mode: playback



1. Turn the adjustment screw to obtain the maximum reading on level meter.
Note: Several peaks may appear, but take the maximum.
2. After the adjustment, lock the adjustment screw with suitable locking compound.

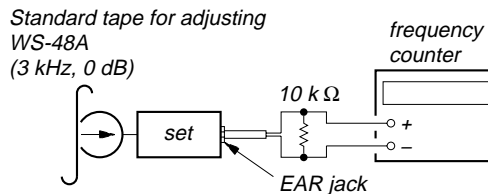
Adjustment Location:



Tape Speed Adjustment

Procedure:

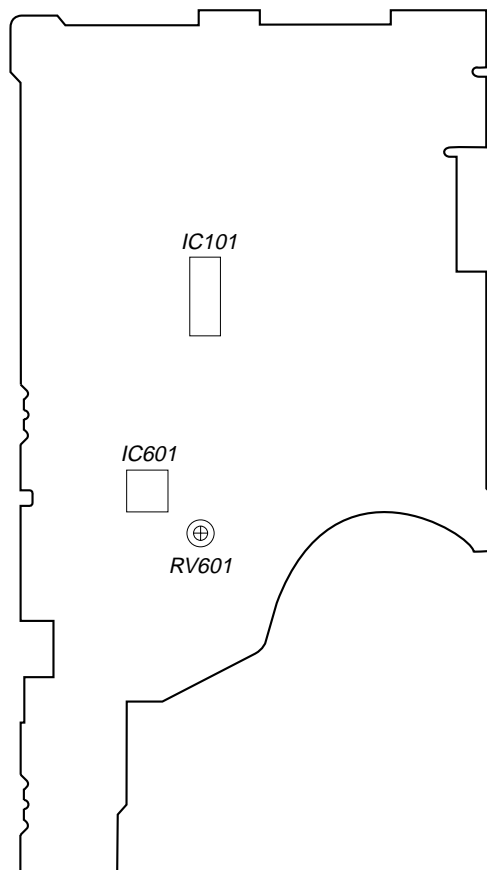
Mode: playback



1. Play back WS-48A (tape end part) and adjust RV601 so that the frequency counter reading becomes $3,000 \pm 15$ Hz.
2. Play back WS-48A tape the beginning and the end part, check that the frequency counter reading is within same standard of step1.

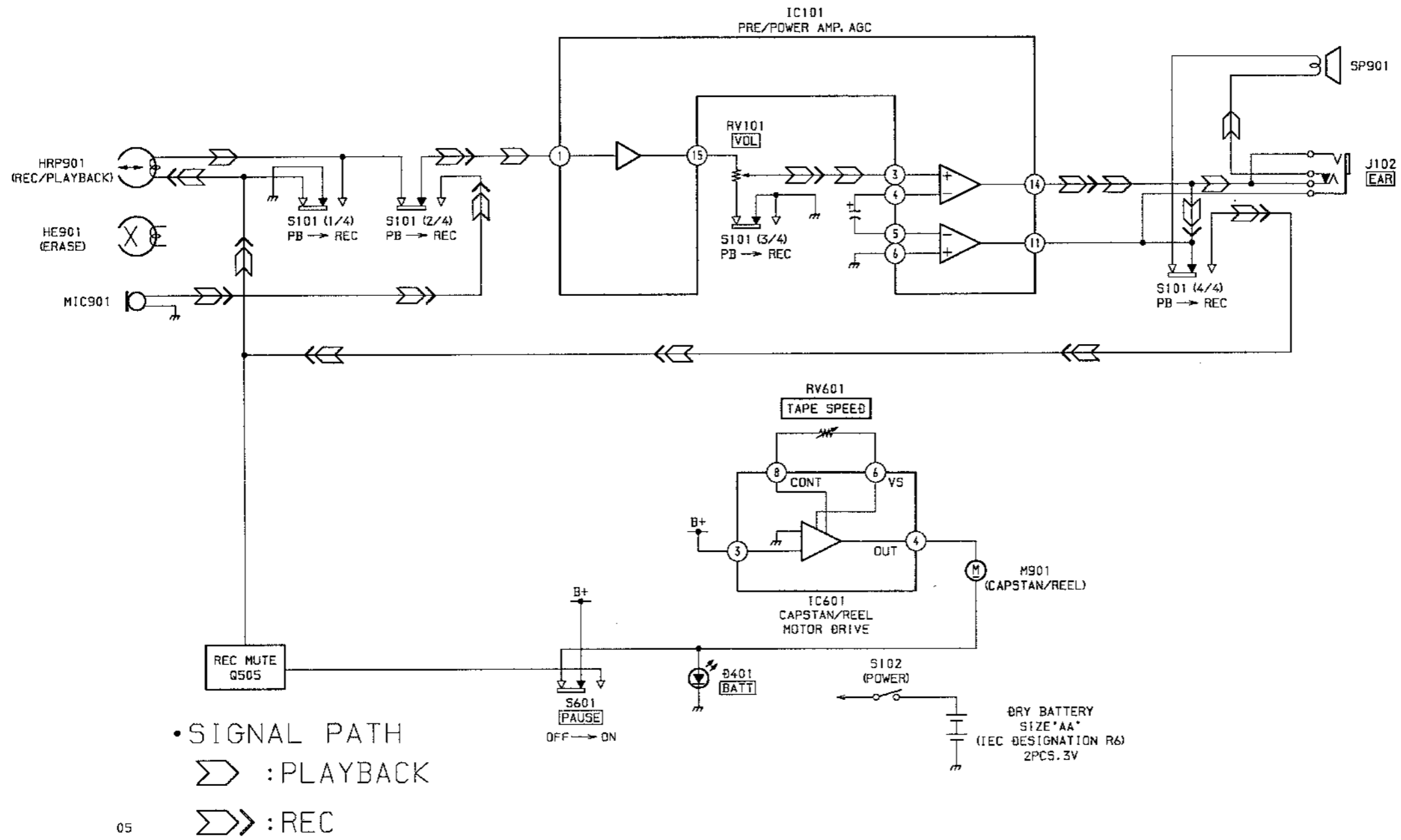
Adjustment Location:

[MAIN BOARD] (Conductor Side)

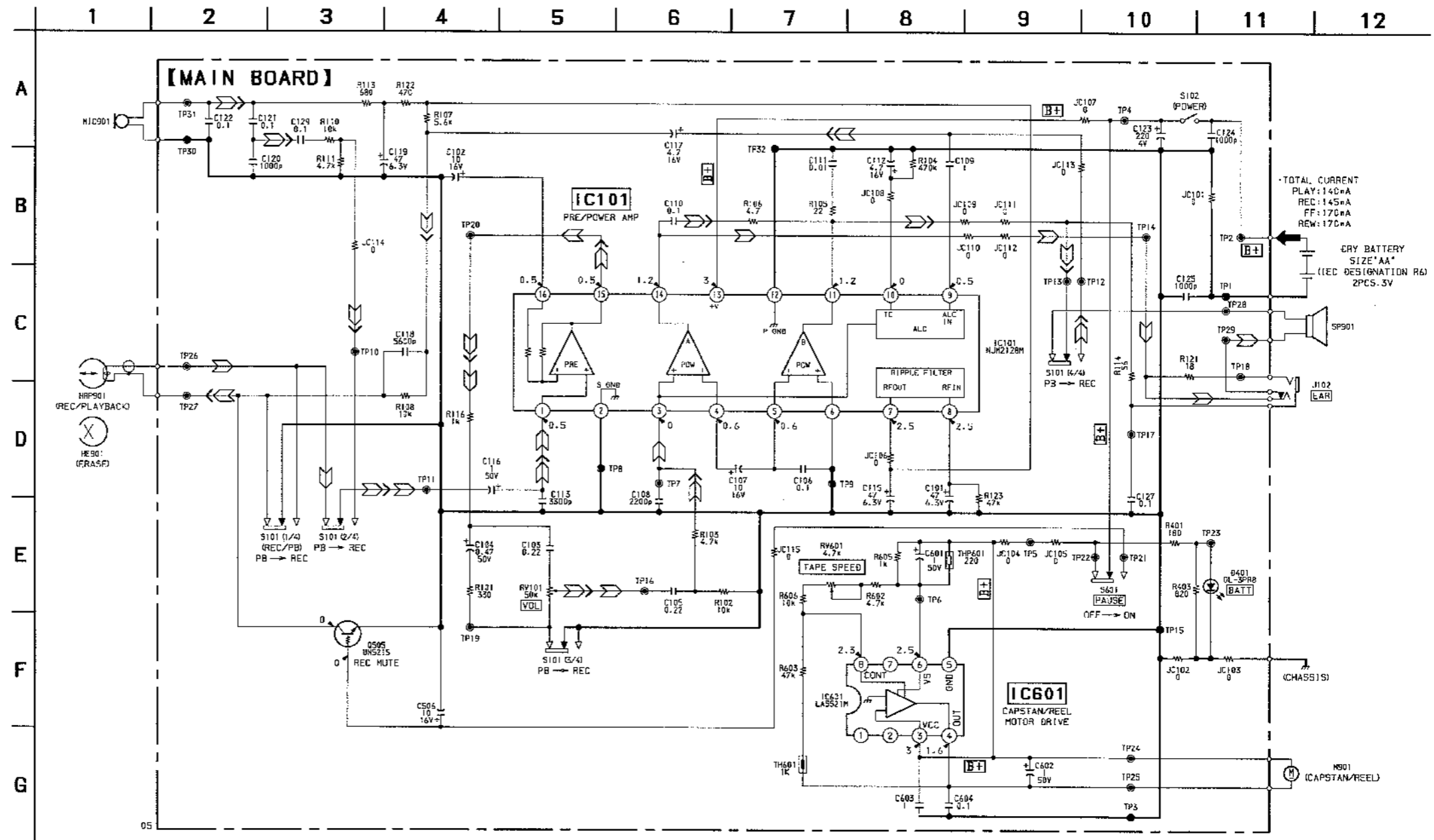


SECTION 6
DIAGRAMS

6-1. BLOCK DIAGRAM



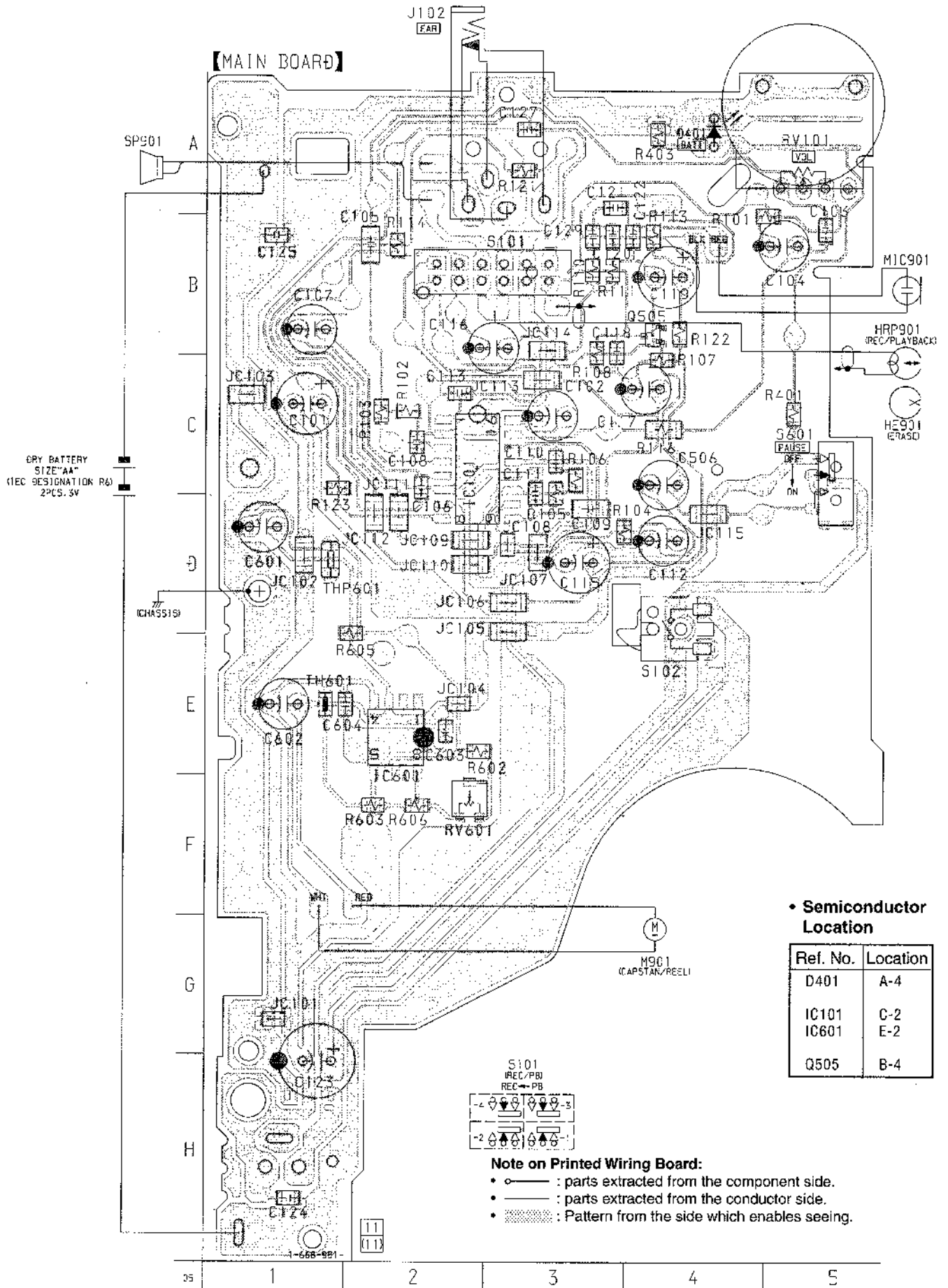
6-2. SCHEMATIC DIAGRAM



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 $1/4\text{W}$ or less unless otherwise specified.
- : panel designation.
- B+ : B+ Line.
- : adjustment for repair.
- Power voltage is dc 3 V and fed with regulated dc power supply from battery terminal.
- Voltages are dc with respect to ground under no-signal conditions.
no mark : PB
() : REC
- Voltages are taken with a VOM (Input impedance 10 M Ω).
Voltage variations may be noted due to normal production tolerances.
- Signal path.
 : PB
 : REC

6-3. PRINTED WIRING BOARD

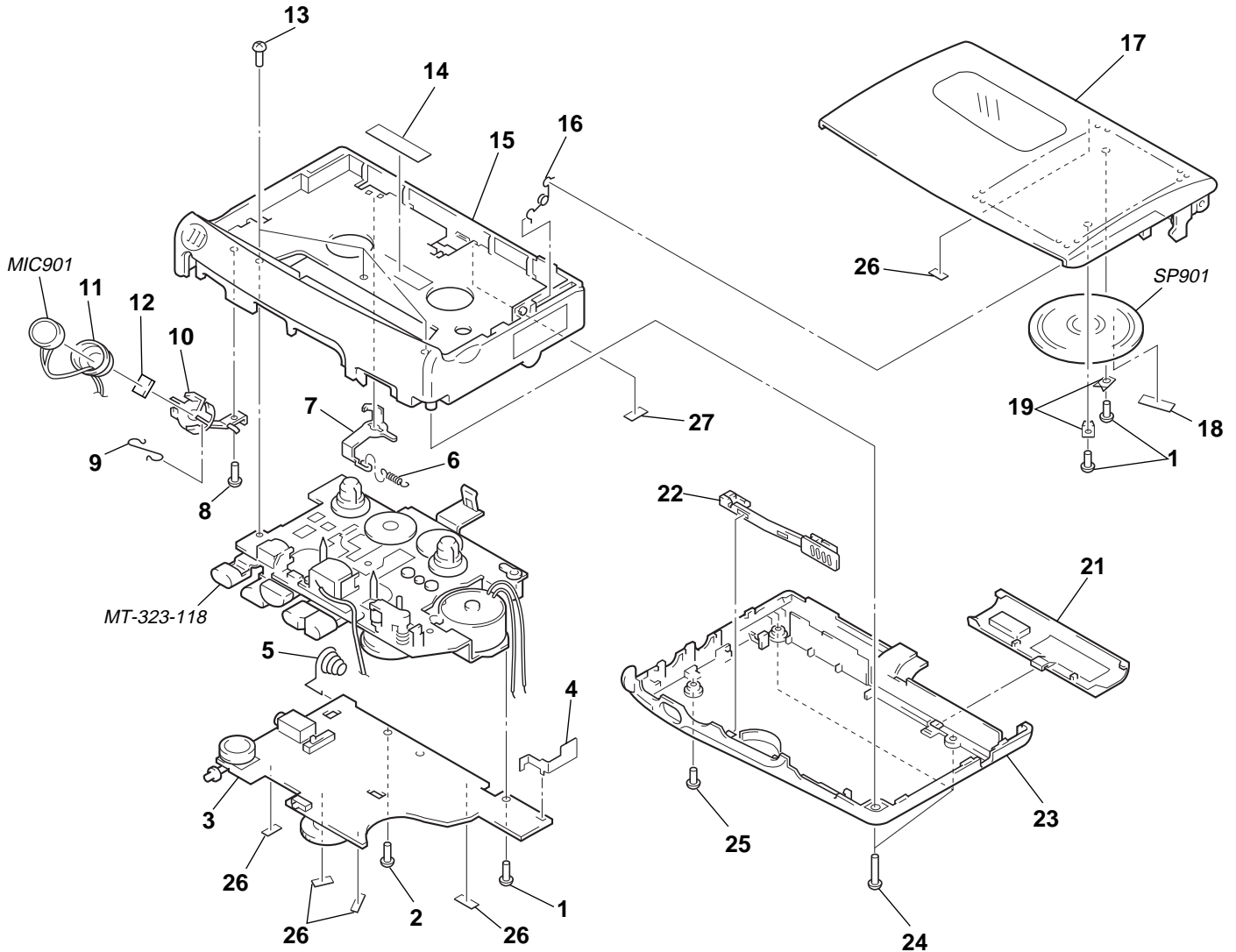


SECTION 7 EXPLODED VIEWS

NOTE:

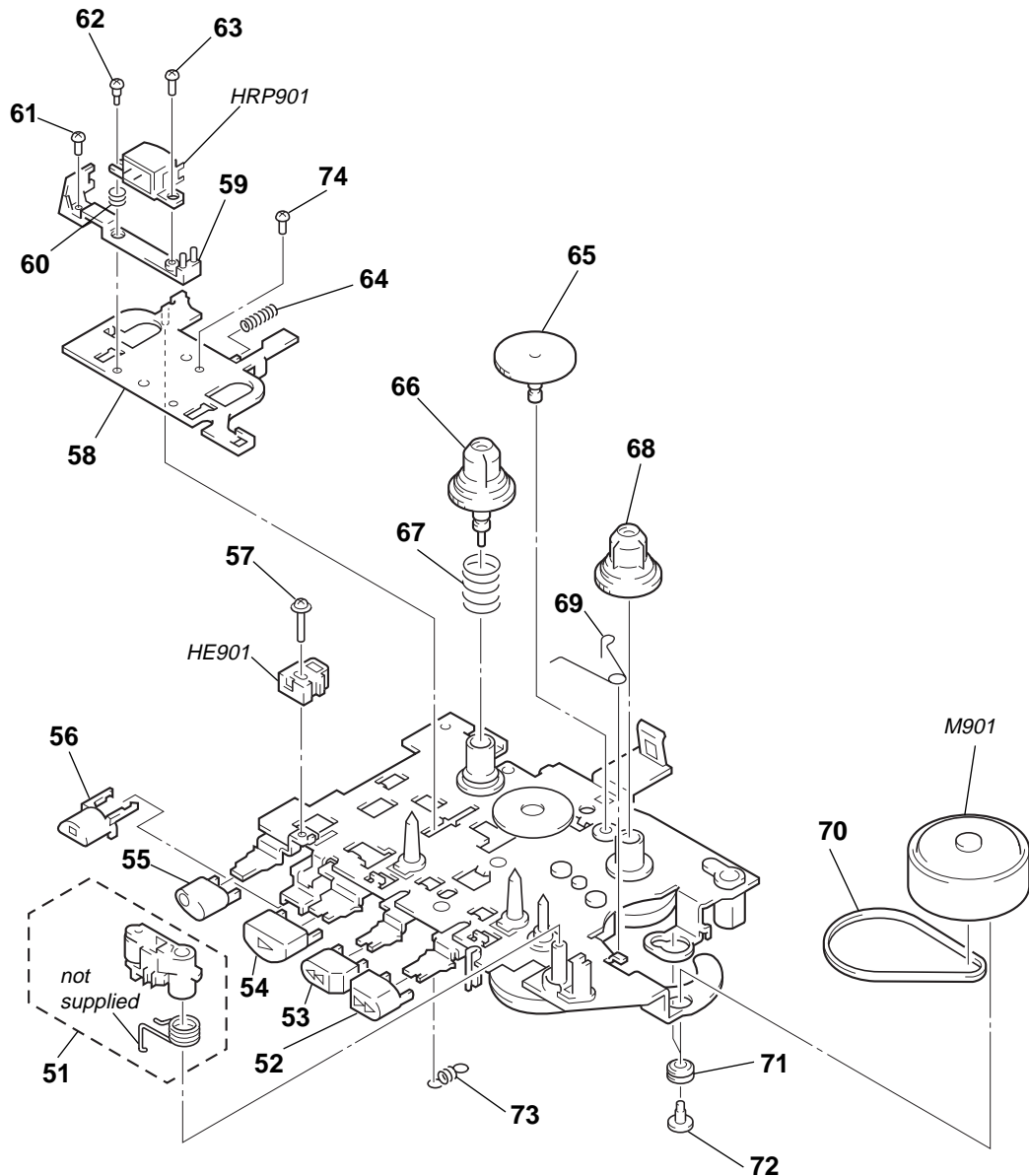
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- Color Indication of Appearance Parts
Example:
KNOB, BALANCE (WHITE) . . . (RED)
 ↑ ↑
 Parts Color Cabinet's Color

- 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 the electrical parts list.

(1) CABINET SECTION

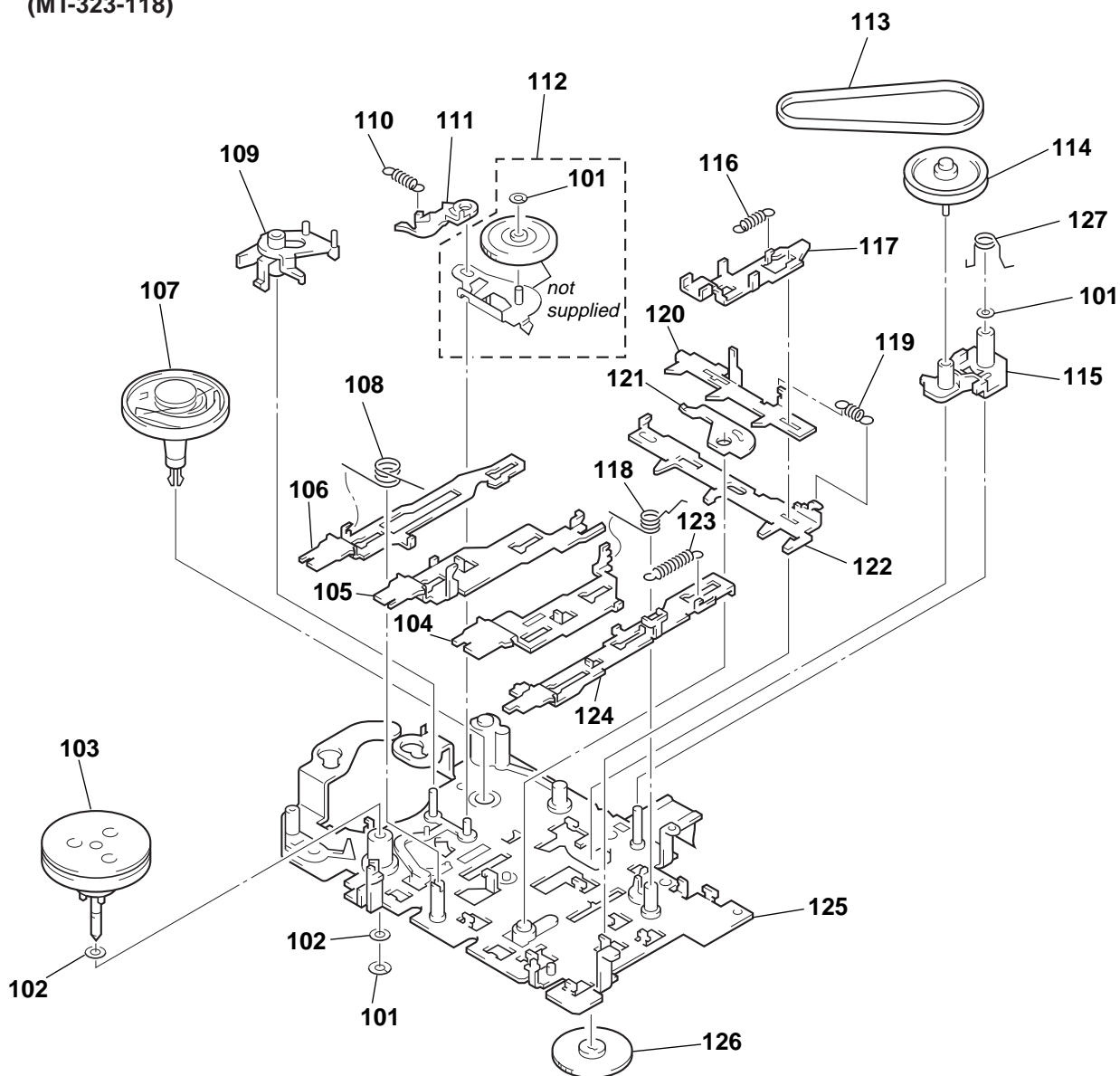
Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
1	3-318-382-31	SCREW (1.7), TAPPING		16	3-924-739-01	SPRING, CASSETTE	
2	3-345-648-01	SCREW (M1.4), TOOTHED LOCK		17	X-3375-536-1	LID SUB ASSY, CASSETTE	
* 3	A-3021-006-A	MAIN BOARD, COMPLETE		18	4-017-441-01	CUSHION (B)	
4	3-924-741-01	TERMINAL, PLUS		* 19	3-924-757-01	BRACKET (SPEAKER)	
5	3-936-973-01	TERMINAL, MINUS		21	X-3375-808-1	LID ASSY, BATTERY CASE	
6	3-924-744-01	SPRING(CLAW DETECTION), TENSION		22	3-924-747-11	KNOB (PAUSE)	
7	3-924-743-01	CLAW, ERASING PROTECTION		23	3-019-442-01	CABINET (REAR)	
8	3-334-565-41	SCREW (B1.7), TAPPING		24	3-318-203-92	SCREW (B1.7X9), TAPPING	
9	3-924-745-01	BAR, GROUND		25	3-366-890-51	SCREW (IB LOCK)	
10	3-924-740-01	HOLDER, MICROPHONE		26	3-831-441-99	SPACER, KNOB	
11	3-924-763-01	CUSHION (MICROPHONE)		* 27	3-592-351-01	PAPER, VIBRATION PROOF (B)	
12	3-831-441-11	CUSHION, CABINET UPPER 10X7X0.5		MIC901	1-542-136-11	MICROPHONE, ELECTRET CONDEDSER (MIC)	
13	4-969-980-21	SCREW (IB LOCK)		SP901	1-544-657-11	SPEAKER (3.6CM)	
14	3-578-101-31	PLATE, ORNAMENTAL					
15	3-019-363-01	CABINET (FRONT)					

**(2) MECHANISM DECK SECTION-1
(MT-323-118)**



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
51	X-3370-386-1	PINCH ROLLER ASSY		65	3-924-637-01	GEAR (FF)	
52	3-925-146-11	BUTTON (FF) (▶▶)		66	3-924-673-01	GEAR (S REEL)	
53	3-925-147-01	BUTTON (REW) (◀◀)		67	3-924-674-01	SPRING (B. T), COMPRESSION	
54	3-925-148-11	BUTTON (PLAY) (▶)		68	3-924-641-01	GEAR (T REEL)	
55	3-925-145-01	BUTTON (REC) (●)		69	3-924-726-01	SPRING (M GROUND), TORSION	
56	3-924-738-01	BUTTON (STOP) (■)		70	3-924-681-01	BELT (CAPSTAN)	
57	3-703-925-21	SCREW (M1.4)		71	3-925-109-01	CUSHION (MOTOR)	
58	3-924-625-01	LEVER (HEAD)		72	3-925-108-01	SCREW (MOTOR)	
59	3-924-645-01	BRACKET (HEAD)		73	3-924-644-01	SPRING (POWER TENSION), TENSION	
60	3-924-685-01	SPRING (AZIMUTH), COMPRESSION		74	3-348-160-11	SCREW (M1.4X1.6), PRECISION PAN	
61	3-704-197-91	SCREW (IB LOCK)		HE901	1-500-232-11	HEAD, MAGNETIC (ERASE)	
62	3-375-135-01	SCREW (1.4), SPECIAL		HRP901	1-500-073-51	HEAD, MAGNETIC (RECORD/PLAYBACK)	
63	3-376-177-01	SCREW (M1.4X3.8)		M901	1-698-588-11	MOTOR, DC (CAPSTAN/REEL)	
64	3-925-107-01	SPRING (IDLER), COMPRESSION					

**(3) MECHANISM DECK SECTION-2
(MT-323-118)**



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
101	3-321-483-11	RING, RETAINING (0.25)		115	3-924-628-01	LEVER (FR)	
102	3-315-495-31	WASHER		116	3-924-633-01	SPRING (STOP), TENSION	
103	X-3370-384-1	FLYWHEEL ASSY		117	3-924-622-01	LEVER (STOP)	
104	3-924-623-01	LEVER (PLAY)		118	3-924-643-01	SPRING (PR), TORSION	
105	3-924-621-01	LEVER (REW)		119	3-924-684-01	SPRING (LOCK PLATE), TENSION	
106	3-924-620-01	LEVER (FF)		120	3-924-619-01	LEVER (SW)	
107	X-3370-388-1	TABLE ASSY, FELT		121	3-924-639-01	LEVER (CR)	
108	3-924-642-01	SPRING (FR), TORSION		122	3-924-618-01	LEVER (LOCK)	
109	3-924-629-01	LEVER (DETECTION)		123	3-925-208-01	SPRING (REC), TENSION	
110	3-925-207-01	SPRING (S. OFF), TENSION		124	3-924-624-01	LEVER (REC)	
111	3-924-630-01	LEVER (S.OFF)		125	X-3370-227-1	CHASSIS ASSY	
112	X-3370-387-1	LEVER ASSY, IDLER		126	3-924-613-01	GEAR (FR)	
113	3-924-682-01	BELT (FR)		127	3-024-378-01	SPRING (FR LEVER), TORSION	
114	X-3370-385-1	PULLEY (FR) ASSY					

SECTION 8 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 and -X mean standardized parts, so they may have some difference from the original one.
- **RESISTORS**
All resistors are in ohms.
METAL: Metal-film resistor.
METAL OXIDE: Metal oxide-film resistor.
F: nonflammable

- Items marked “*” are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- **SEMICONDUCTORS**
In each case, μ : μ , for example:
uA. . . : μ A. . . uPA. . . : μ PA. . .
uPB. . . : μ PB. . . uPC. . . : μ PC. . .
uPD. . . : μ PD. . .
- **CAPACITORS**
uF: μ F
- **COILS**
uH: μ H

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

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
*	A-3021-006-A	MAIN BOARD, COMPLETE *****				< JACK >	
		< CAPACITOR >		J102	1-766-847-11	JACK (EAR)	
		< SHORT >				< SHORT >	
C101	1-104-357-11	ELECT	47uF 20% 6.3V	JC101	1-216-295-00	SHORT	0
C102	1-104-396-11	ELECT	10uF 20% 16V	JC102	1-216-296-00	SHORT	0
C103	1-164-222-11	CERAMIC CHIP	0.22uF 25V	JC103	1-216-296-00	SHORT	0
C104	1-126-159-11	ELECT	0.47uF 20% 50V	JC104	1-216-295-00	SHORT	0
C105	1-163-081-00	CERAMIC CHIP	0.22uF 25V	JC105	1-216-296-00	SHORT	0
C106	1-163-038-00	CERAMIC CHIP	0.1uF 25V	JC106	1-216-296-00	SHORT	0
C107	1-104-396-11	ELECT	10uF 20% 16V	JC107	1-216-296-00	SHORT	0
C108	1-164-161-11	CERAMIC CHIP	0.0022uF 10% 100V	JC108	1-216-295-00	SHORT	0
C109	1-162-638-11	CERAMIC CHIP	1uF 16V	JC109	1-216-296-00	SHORT	0
C110	1-163-038-00	CERAMIC CHIP	0.1uF 25V	JC110	1-216-296-00	SHORT	0
C111	1-164-232-11	CERAMIC CHIP	0.01uF 50V	JC111	1-216-296-00	SHORT	0
C112	1-126-163-11	ELECT	4.7uF 20% 50V	JC112	1-216-296-00	SHORT	0
C113	1-164-182-11	CERAMIC CHIP	0.0033uF 10% 50V	JC113	1-216-296-00	SHORT	0
C115	1-104-357-11	ELECT	47uF 20% 6.3V	JC114	1-216-296-00	SHORT	0
C116	1-104-411-11	ELECT	1uF 20% 50V	JC115	1-216-296-00	SHORT	0
C117	1-126-163-11	ELECT	4.7uF 20% 50V			< TRANSISTOR >	
C118	1-163-018-00	CERAMIC CHIP	0.0056uF 5% 50V	Q505	8-729-014-12	TRANSISTOR RN1311-TE85L	
C119	1-104-357-11	ELECT	47uF 20% 6.3V			< RESISTOR >	
C120	1-163-009-11	CERAMIC CHIP	0.001uF 10% 50V	R101	1-216-037-00	METAL CHIP 330 5% 1/10W	
C121	1-163-038-00	CERAMIC CHIP	0.1uF 25V	R102	1-216-073-00	METAL CHIP 10K 5% 1/10W	
C122	1-163-038-00	CERAMIC CHIP	0.1uF 25V	R103	1-216-065-00	RES,CHIP 4.7K 5% 1/10W	
C123	1-124-434-00	ELECT	220uF 20% 4V	R104	1-216-113-00	METAL CHIP 470K 5% 1/10W	
C124	1-163-009-11	CERAMIC CHIP	0.001uF 10% 50V	R105	1-216-009-00	METAL CHIP 22 5% 1/10W	
C125	1-163-009-11	CERAMIC CHIP	0.001uF 10% 50V	R106	1-216-308-00	METAL CHIP 4.7 5% 1/10W	
C127	1-163-038-00	CERAMIC CHIP	0.1uF 25V	R107	1-216-067-00	METAL CHIP 5.6K 5% 1/10W	
C129	1-163-038-00	CERAMIC CHIP	0.1uF 25V	R108	1-216-073-00	METAL CHIP 10K 5% 1/10W	
C506	1-104-396-11	ELECT	10uF 20% 16V	R110	1-216-073-00	METAL CHIP 10K 5% 1/10W	
C601	1-104-411-11	ELECT	1uF 20% 50V	R111	1-216-065-00	RES,CHIP 4.7K 5% 1/10W	
C602	1-104-411-11	ELECT	1uF 20% 50V	R113	1-216-045-00	METAL CHIP 680 5% 1/10W	
C603	1-164-346-11	CERAMIC CHIP	1uF 16V	R114	1-216-019-00	METAL CHIP 56 5% 1/10W	
C604	1-163-038-00	CERAMIC CHIP	0.1uF 25V	R116	1-216-198-00	RES,CHIP 1K 5% 1/8W	
		< DIODE >		R121	1-216-609-11	METAL CHIP 18 0.5% 1/10W	
D401	8-719-057-27	LED L-132XHD (BATT)		R122	1-216-041-00	METAL CHIP 470 5% 1/10W	
		< IC >		R123	1-216-089-00	RES,CHIP 47K 5% 1/10W	
IC101	8-759-339-54	IC NJM-2128M-TE2		R401	1-216-031-00	METAL CHIP 180 5% 1/10W	
IC601	8-759-804-43	IC LA5521M		R403	1-216-047-00	RES,CHIP 820 5% 1/10W	
				R602	1-216-065-00	RES,CHIP 4.7K 5% 1/10W	
				R603	1-216-089-00	RES,CHIP 47K 5% 1/10W	

TCM-323

MAIN

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>			<u>Remark</u>
R605	1-216-049-11	RES,CHIP	1K	5%	1/10W
R606	1-216-073-00	METAL CHIP	10K	5%	1/10W

< VARIABLE RESISTOR >

RV101	1-223-293-11	RES, VAR, CARBON 50K (VOL)
RV601	1-238-663-11	RES, ADJ, CARBON 4.7K

< SWITCH >

S101	1-572-964-11	SWITCH, SLIDE (REC/PB)
S102	1-771-092-21	SWITCH, PUSH (1 KEY) (POWER)
S601	1-572-922-11	SWITCH, SLIDE (PAUSE)

< THERMISTOR >

TH601	1-808-819-11	THERMISTOR, NTC (2125)
THP601	1-810-007-11	THERMISTOR, POSITIVE

MISCELLANEOUS

HE901	1-500-232-11	HEAD, MAGNETIC (ERASE)
HRP901	1-500-073-51	HEAD, MAGNETIC (RECORD/PLAYBACK)
M901	1-698-588-11	MOTOR, DC (CAPSTAN/REEL)
MIC901	1-542-136-11	MICROPHONE, ELECTRET CONDEDSER (MIC)
SP901	1-544-657-11	SPEAKER (3.6CM)

ACCESSORIES & PACKING MATERIALS

3-862-170-11	MANUAL, INSTRUCTION (ENGLISH, FRENCH)
3-862-170-21	MANUAL, INSTRUCTION (GERMAN, DUTCH, ITALIAN, SWEDISH, FINNISH) (AEP)
3-862-170-31	MANUAL, INSTRUCTION (SPANISH, PORTUGUESE) (AEP, East European)
3-862-170-41	MANUAL, INSTRUCTION (SPANISH, ITALIAN) (UK)
3-862-170-81	MANUAL, INSTRUCTION (ENGLISH, GERMAN, POLISH, RUSSIAN, HUNGARIAN, CZECH) (East European)

MEMO

