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 (1 7/16 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 (4 1/2 × 3 5/8 × 1 7/16 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

Sony Corporation
Personal Audio Company
Published by Sony Engineering Corporation

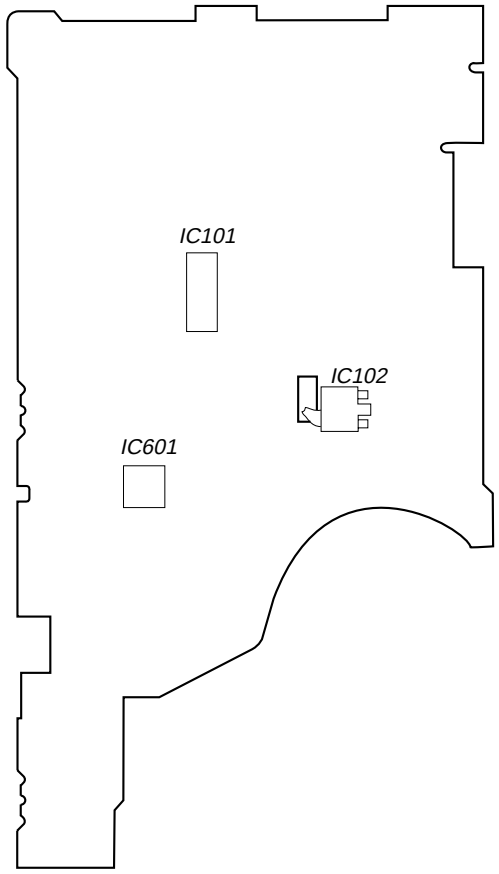
SONY®

SECTION 1
SERVICING NOTES

TABLE OF CONTENTS

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)



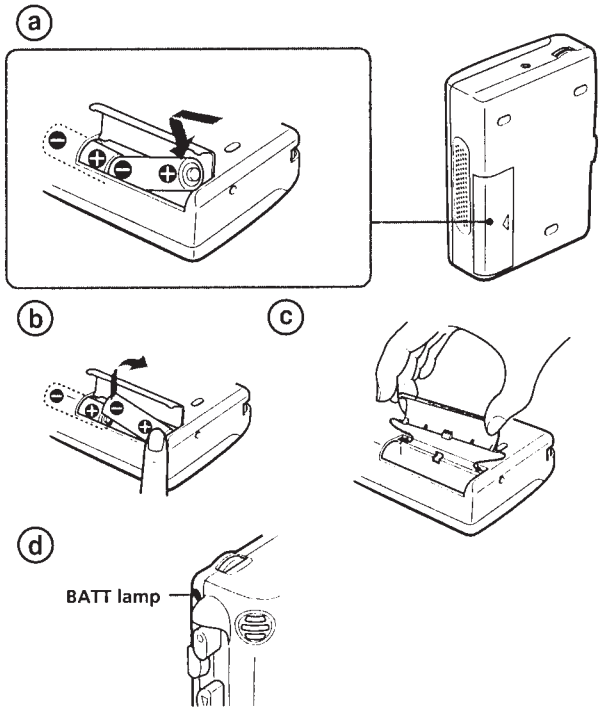
Notes on chip component replacement

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

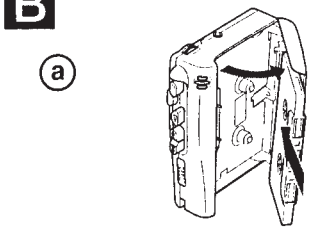
SECTION 2
GENERAL

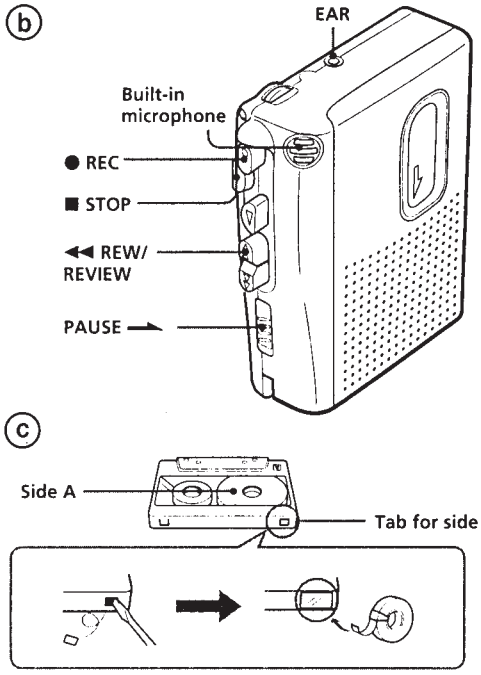
This section is extracted from instruction manual.

A

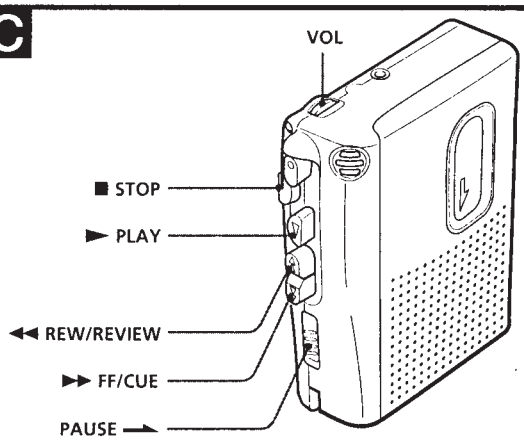


B

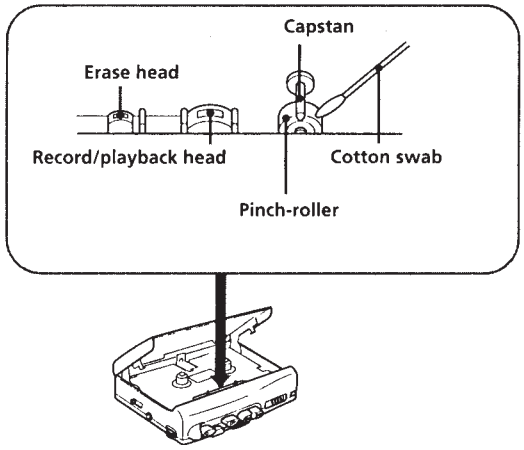




C

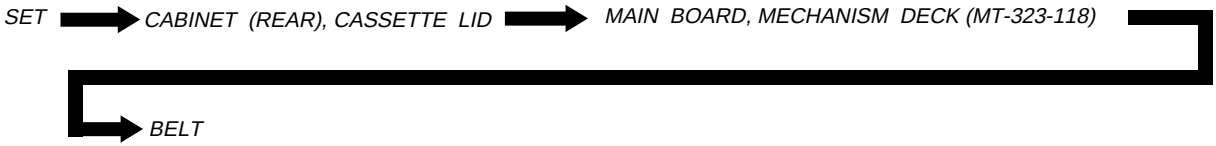


D



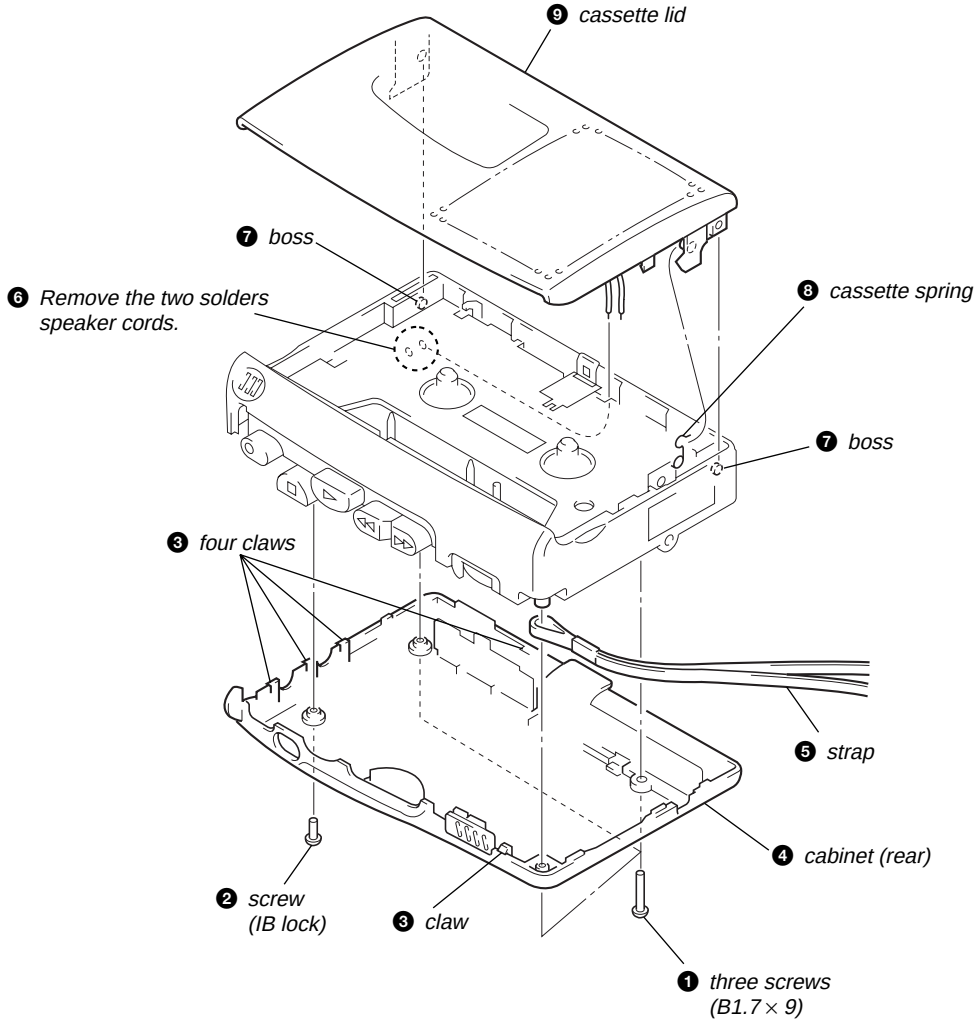
SECTION 3
DISASSEMBLY

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

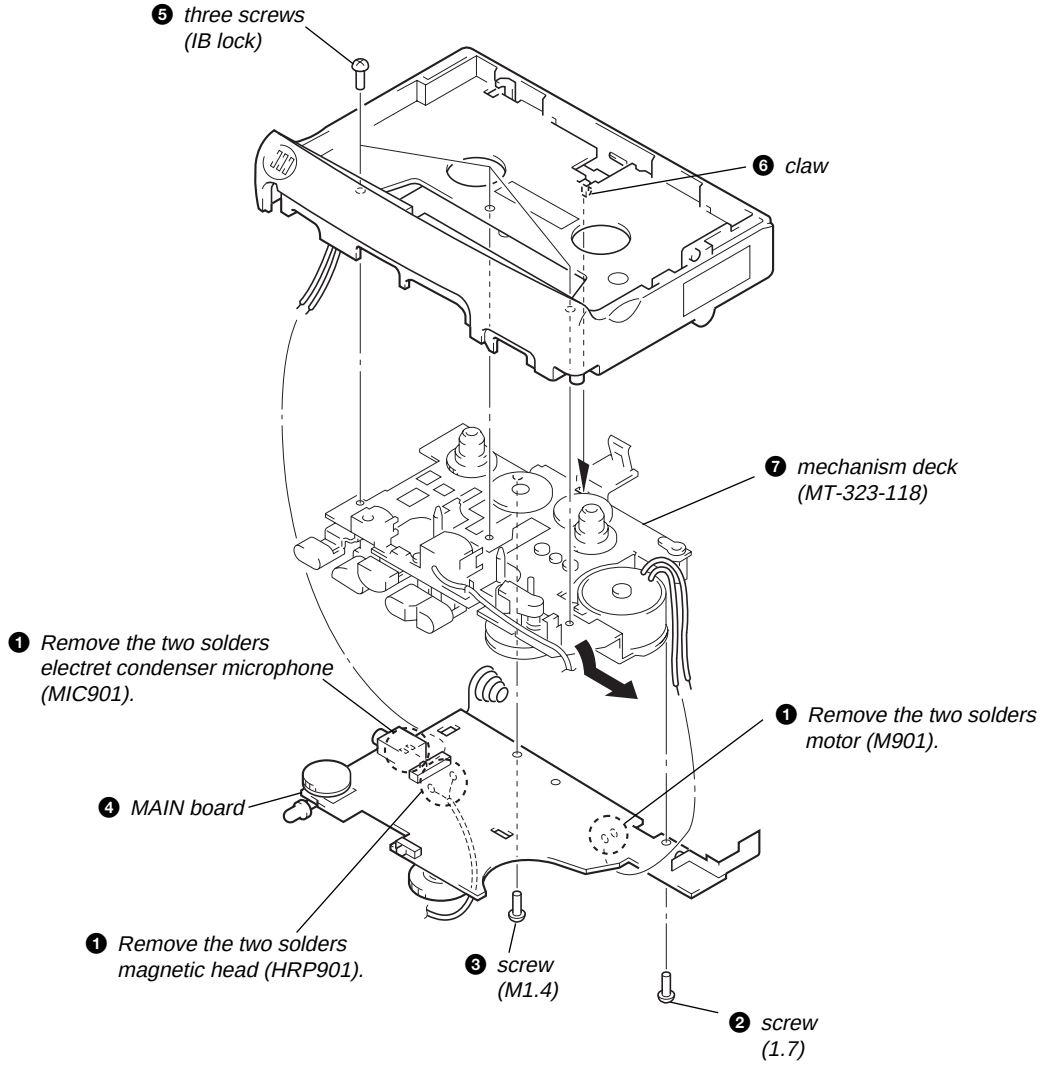


Note: Follow the disassembly procedure in the numerical order given.

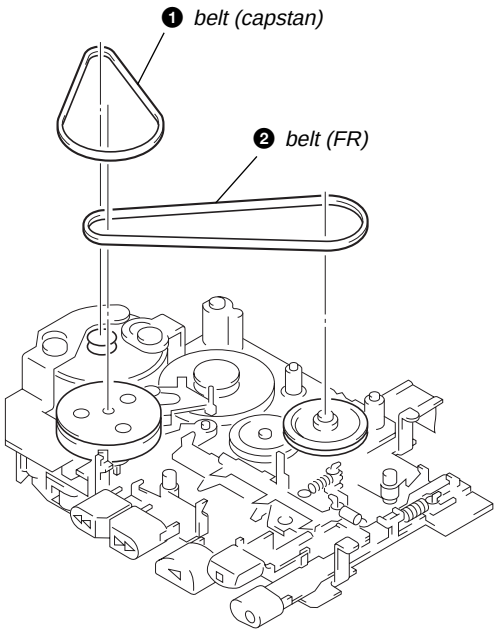
CABINET (REAR), CASSETTE LID



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

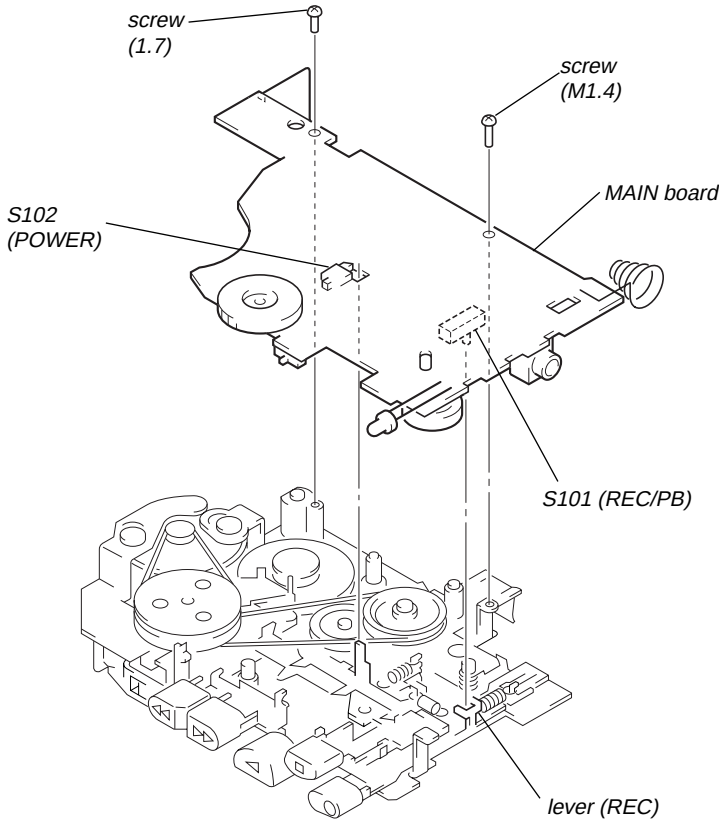


BELT



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

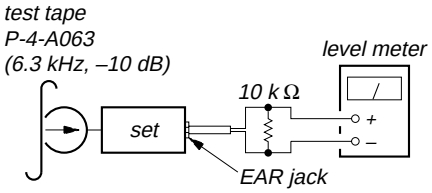
Test Tape

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

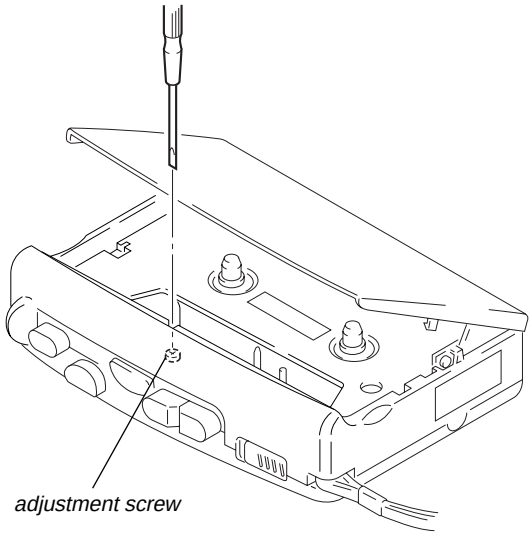
Record/Playback Head Azimuth Adjustment

Procedure:
Mode: playback



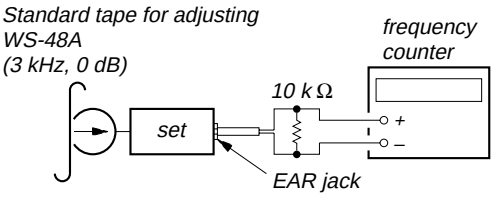
1. Turn the adjustment screw to obtain the maximum reading on level meter.
   Note: Several peaks may appear, but take the maximum.
2. After the adjustment, lock the adjustment screw with suitable locking compound.

Adjustment Location:



Tape Speed Adjustment

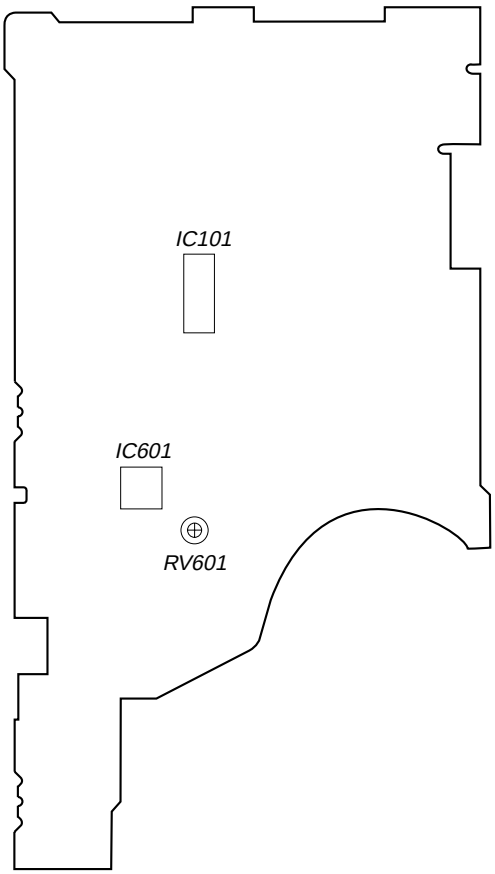
Procedure:
Mode: playback



1. Play back WS-48A (tape end part) and adjust RV601 so that the frequency counter reading becomes 3,000 ± 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.

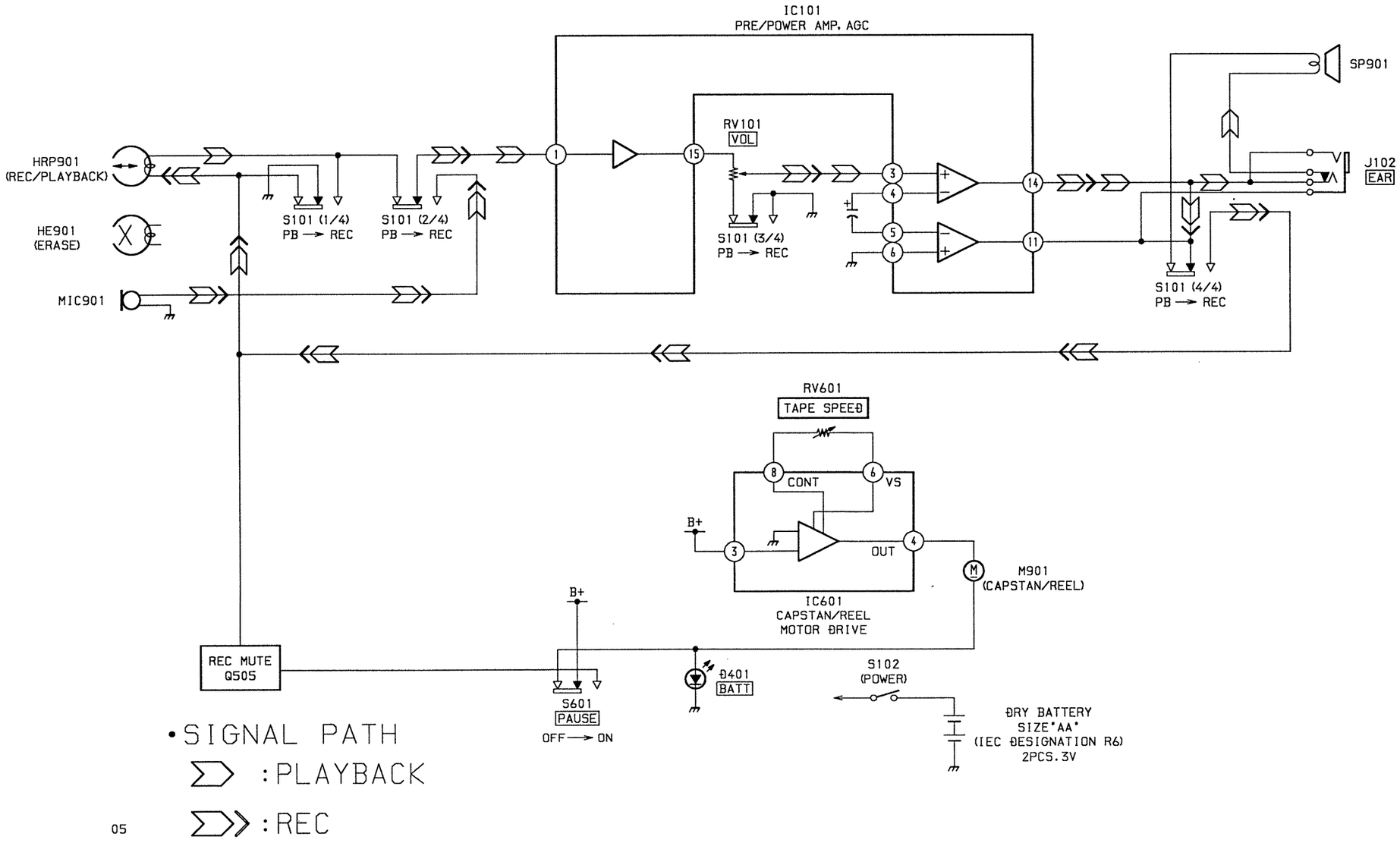
Adjustment Location:

[MAIN BOARD] (Conductor Side)



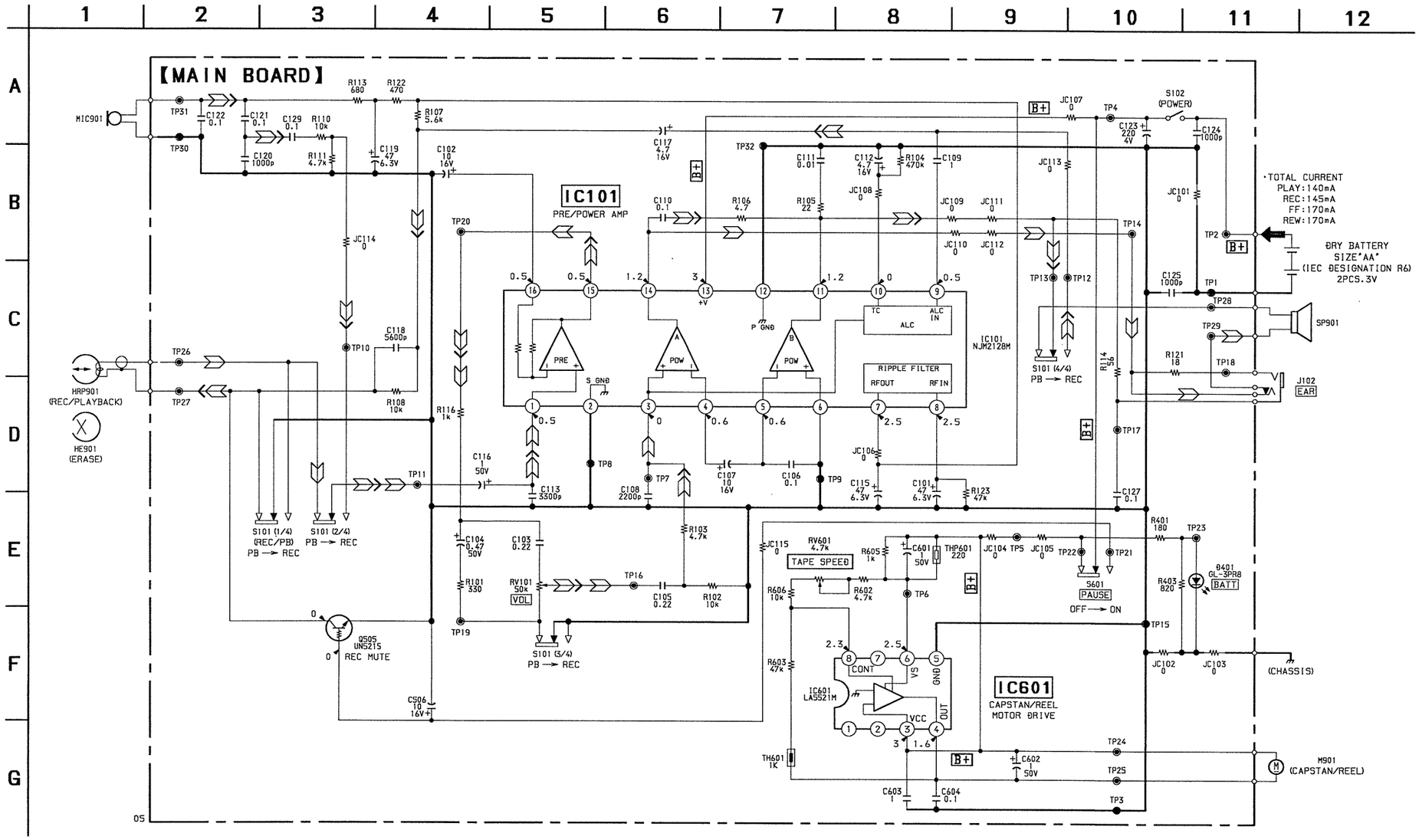
SECTION 6
DIAGRAMS

6-1. BLOCK DIAGRAM



05

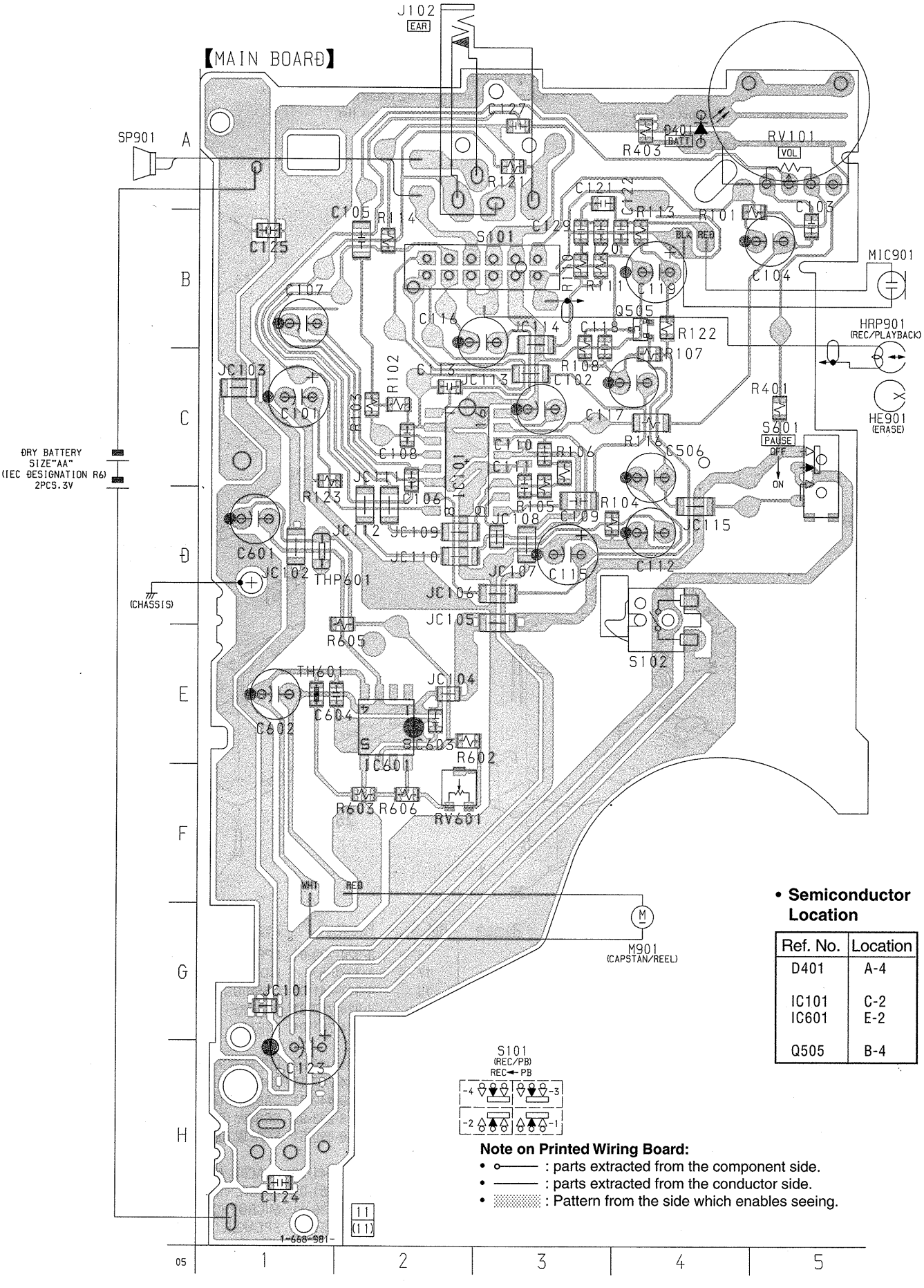
6-2. SCHEMATIC DIAGRAM



Note on Schematic Diagram:

- All capacitors are in µF unless otherwise noted. pF: µµF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4 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 MΩ). Voltage variations may be noted due to normal production tolerances.
- Signal path.
  ▷ : PB
  ▷▷ : REC

6-3. PRINTED WIRING BOARD



• **Semiconductor Location**

Ref. No.	Location
D401	A-4
IC101	C-2
IC601	E-2
Q505	B-4

Note on Printed Wiring Board:

- ○——— : parts extracted from the component side.
- ——— : parts extracted from the conductor side.
- ▒▒▒ : Pattern from the side which enables seeing.

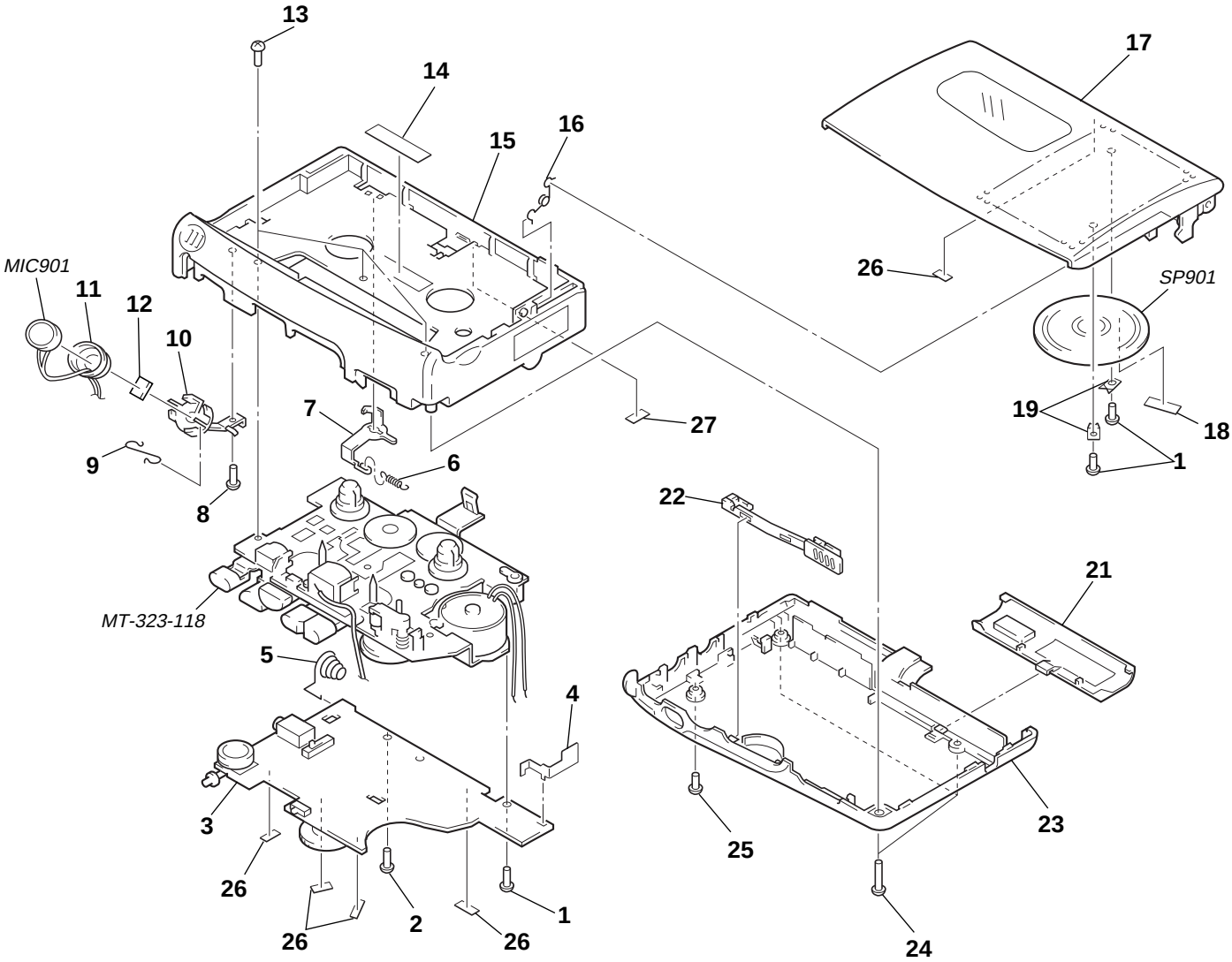
Ver 1.1

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.

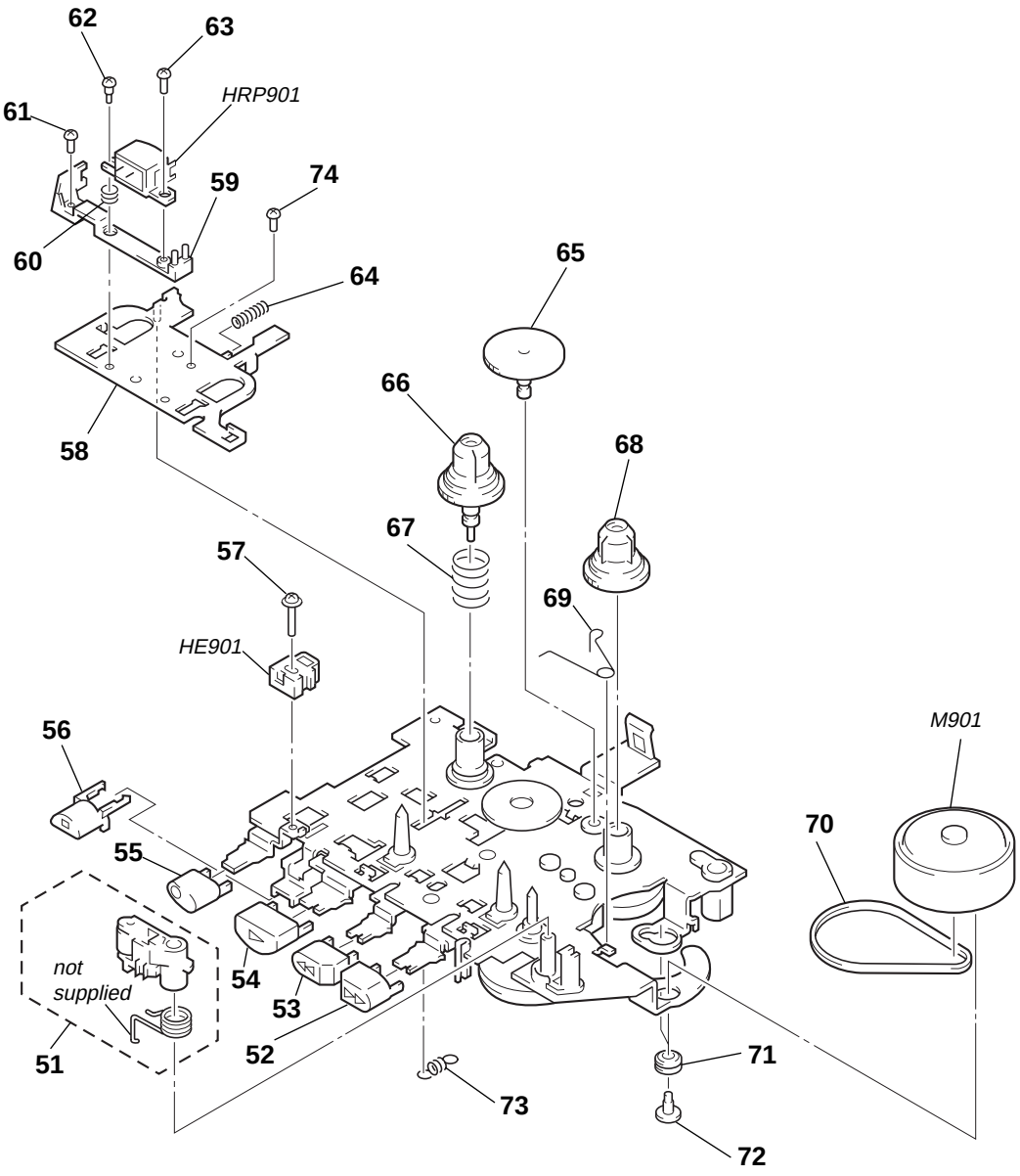
(1) CABINET SECTION



Ref. No.	Part No.	Description	Remark
1	3-318-382-31	SCREW (1.7), TAPPING	
2	3-345-648-01	SCREW (M1.4), TOOTHED LOCK	
* 3	A-3021-006-A	MAIN BOARD, COMPLETE	
4	3-924-741-01	TERMINAL, PLUS	
5	3-936-973-01	TERMINAL, MINUS	
6	3-924-744-01	SPRING(CLAW DETECTION), TENSION	
7	3-924-743-01	CLAW, ERASING PROTECTION	
8	3-334-565-41	SCREW (B1.7), TAPPING	
9	3-924-745-01	BAR, GROUND	
10	3-924-740-01	HOLDER, MICROPHONE	
11	3-924-763-01	CUSHION (MICROPHONE)	
12	3-831-441-11	CUSHION, CABINET UPPER 10X7X0.5	
13	4-969-980-21	SCREW (IB LOCK)	
14	3-578-101-31	PLATE, ORNAMENTAL	
15	3-019-363-01	CABINET (FRONT)	

Ref. No.	Part No.	Description	Remark
16	3-924-739-01	SPRING, CASSETTE	
17	X-3375-536-1	LID SUB ASSY, CASSETTE	
18	4-017-441-01	CUSHION (B)	
* 19	3-924-757-01	BRACKET (SPEAKER)	
21	X-3375-808-1	LID ASSY, BATTERY CASE	
22	3-924-747-11	KNOB (PAUSE)	
23	3-019-442-01	CABINET (REAR)	
24	3-318-203-92	SCREW (B1.7X9), TAPPING	
25	3-366-890-51	SCREW (IB LOCK)	
26	3-831-441-99	SPACER, KNOB	
* 27	3-592-351-01	PAPER, VIBRATION PROOF (B)	
MIC901	1-542-136-11	MICROPHONE, ELECTRET CONDEDSER (MIC)	
SP901	1-544-657-11	SPEAKER (3.6CM)	

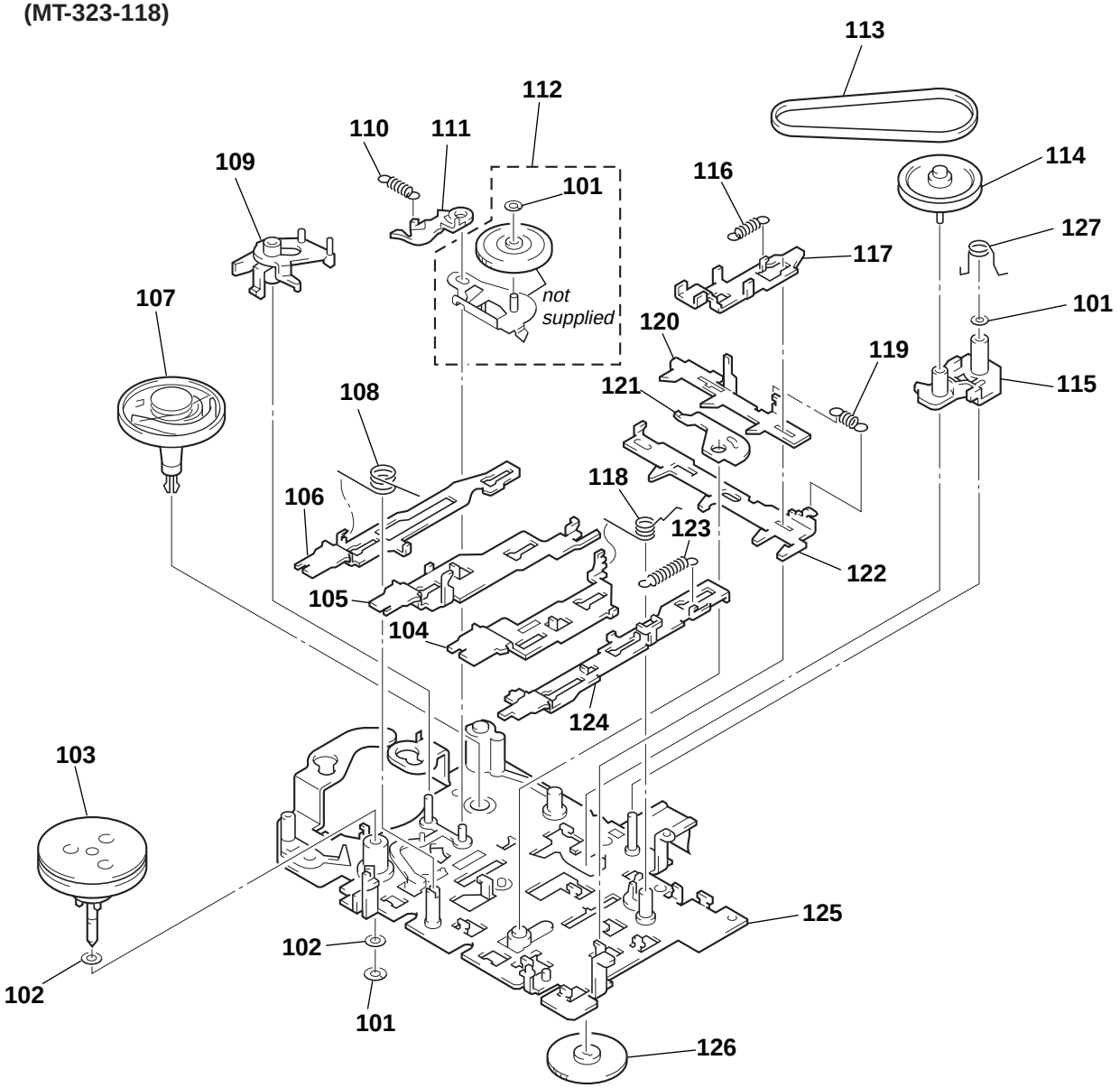
(2) MECHANISM DECK SECTION-1 (MT-323-118)



Ref. No.	Part No.	Description	Remark
51	X-3370-386-1	PINCH ROLLER ASSY	
52	3-925-146-11	BUTTON (FF) (▶▶)	
53	3-925-147-01	BUTTON (REW) (◀◀)	
54	3-925-148-11	BUTTON (PLAY) (▶)	
55	3-925-145-01	BUTTON (REC) (●)	
56	3-924-738-01	BUTTON (STOP) (■)	
57	3-703-925-21	SCREW (M1.4)	
58	3-924-625-01	LEVER (HEAD)	
59	3-924-645-01	BRACKET (HEAD)	
60	3-924-685-01	SPRING (AZIMUTH), COMPRESSION	
61	3-704-197-91	SCREW (IB LOCK)	
62	3-375-135-01	SCREW (1.4), SPECIAL	
63	3-376-177-01	SCREW (M1.4X3.8)	
64	3-925-107-01	SPRING (IDLER), COMPRESSION	

Ref. No.	Part No.	Description	Remark
65	3-924-637-01	GEAR (FF)	
66	3-924-673-01	GEAR (S REEL)	
67	3-924-674-01	SPRING (B. T), COMPRESSION	
68	3-924-641-01	GEAR (T REEL)	
69	3-924-726-01	SPRING (M GROUND), TORSION	
70	3-924-681-01	BELT (CAPSTAN)	
71	3-925-109-01	CUSHION (MOTOR)	
72	3-925-108-01	SCREW (MOTOR)	
73	3-924-644-01	SPRING (POWER TENSION), TENSION	
74	3-348-160-11	SCREW (M1.4X1.6), PRECISION PAN	
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)	

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



Ref. No.	Part No.	Description	Remark
101	3-321-483-11	RING, RETAINING (0.25)	
102	3-315-495-31	WASHER	
103	X-3370-384-1	FLYWHEEL ASSY	
104	3-924-623-01	LEVER (PLAY)	
105	3-924-621-01	LEVER (REW)	
106	3-924-620-01	LEVER (FF)	
107	X-3370-388-1	TABLE ASSY, FELT	
108	3-924-642-01	SPRING (FR), TORSION	
109	3-924-629-01	LEVER (DETECTION)	
110	3-925-207-01	SPRING (S. OFF), TENSION	
111	3-924-630-01	LEVER (S.OFF)	
112	X-3370-387-1	LEVER ASSY, IDLER	
113	3-924-682-01	BELT (FR)	
114	X-3370-385-1	PULLEY (FR) ASSY	

Ref. No.	Part No.	Description	Remark
115	3-924-628-01	LEVER (FR)	
116	3-924-633-01	SPRING (STOP), TENSION	
117	3-924-622-01	LEVER (STOP)	
118	3-924-643-01	SPRING (PR), TORSION	
119	3-924-684-01	SPRING (LOCK PLATE), TENSION	
120	3-924-619-01	LEVER (SW)	
121	3-924-639-01	LEVER (CR)	
122	3-924-618-01	LEVER (LOCK)	
123	3-925-208-01	SPRING (REC), TENSION	
124	3-924-624-01	LEVER (REC)	
125	X-3370-227-1	CHASSIS ASSY	
126	3-924-613-01	GEAR (FR)	
127	3-024-378-01	SPRING (FR LEVER), TORSION	

MAIN

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, u: µ, for example:
  uA. . : µA. . uPA. . : µPA. .
  uPB. . : µPB. . uPC. . : µPC. .
  uPD. . : µPD. .
- CAPACITORS
  uF: µF
- COILS
  uH: µH

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

Ref. No.	Part No.	Description			Remark
*	A-3021-006-A	MAIN BOARD, COMPLETE			
		**********			
		< CAPACITOR >			
C101	1-104-357-11	ELECT	47uF	20%	6.3V
C102	1-104-396-11	ELECT	10uF	20%	16V
C103	1-164-222-11	CERAMIC CHIP	0.22uF		25V
C104	1-126-159-11	ELECT	0.47uF	20%	50V
C105	1-163-081-00	CERAMIC CHIP	0.22uF		25V
C106	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C107	1-104-396-11	ELECT	10uF	20%	16V
C108	1-164-161-11	CERAMIC CHIP	0.0022uF	10%	100V
C109	1-162-638-11	CERAMIC CHIP	1uF		16V
C110	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C111	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C112	1-126-163-11	ELECT	4.7uF	20%	50V
C113	1-164-182-11	CERAMIC CHIP	0.0033uF	10%	50V
C115	1-104-357-11	ELECT	47uF	20%	6.3V
C116	1-104-411-11	ELECT	1uF	20%	50V
C117	1-126-163-11	ELECT	4.7uF	20%	50V
C118	1-163-018-00	CERAMIC CHIP	0.0056uF	5%	50V
C119	1-104-357-11	ELECT	47uF	20%	6.3V
C120	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C121	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C122	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C123	1-124-434-00	ELECT	220uF	20%	4V
C124	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C125	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C127	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C129	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C506	1-104-396-11	ELECT	10uF	20%	16V
C601	1-104-411-11	ELECT	1uF	20%	50V
C602	1-104-411-11	ELECT	1uF	20%	50V
C603	1-164-346-11	CERAMIC CHIP	1uF		16V
C604	1-163-038-00	CERAMIC CHIP	0.1uF		25V
		< DIODE >			
D401	8-719-057-27	LED L-132XHD (BATT)			
		< IC >			
IC101	8-759-339-54	IC NJM-2128M-TE2			
IC601	8-759-804-43	IC LA5521M			

Ref. No.	Part No.	Description			Remark
		< JACK >			
J102	1-766-847-11	JACK (EAR)			
		< SHORT >			
JC101	1-216-295-00	SHORT	0		
JC102	1-216-296-00	SHORT	0		
JC103	1-216-296-00	SHORT	0		
JC104	1-216-295-00	SHORT	0		
JC105	1-216-296-00	SHORT	0		
JC106	1-216-296-00	SHORT	0		
JC107	1-216-296-00	SHORT	0		
JC108	1-216-295-00	SHORT	0		
JC109	1-216-296-00	SHORT	0		
JC110	1-216-296-00	SHORT	0		
JC111	1-216-296-00	SHORT	0		
JC112	1-216-296-00	SHORT	0		
JC113	1-216-296-00	SHORT	0		
JC114	1-216-296-00	SHORT	0		
JC115	1-216-296-00	SHORT	0		
		< TRANSISTOR >			
Q505	8-729-014-12	TRANSISTOR RN1311-TE85L			
		< RESISTOR >			
R101	1-216-037-00	METAL CHIP	330	5%	1/10W
R102	1-216-073-00	METAL CHIP	10K	5%	1/10W
R103	1-216-065-00	RES,CHIP	4.7K	5%	1/10W
R104	1-216-113-00	METAL CHIP	470K	5%	1/10W
R105	1-216-009-00	METAL CHIP	22	5%	1/10W
R106	1-216-308-00	METAL CHIP	4.7	5%	1/10W
R107	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R108	1-216-073-00	METAL CHIP	10K	5%	1/10W
R110	1-216-073-00	METAL CHIP	10K	5%	1/10W
R111	1-216-065-00	RES,CHIP	4.7K	5%	1/10W
R113	1-216-045-00	METAL CHIP	680	5%	1/10W
R114	1-216-019-00	METAL CHIP	56	5%	1/10W
R116	1-216-198-00	RES,CHIP	1K	5%	1/8W
R121	1-216-609-11	METAL CHIP	18	0.5%	1/10W
R122	1-216-041-00	METAL CHIP	470	5%	1/10W
R123	1-216-089-00	RES,CHIP	47K	5%	1/10W
R401	1-216-031-00	METAL CHIP	180	5%	1/10W
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

MAIN

Ref. No.	Part No.	Description			Remark
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)			
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		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

REVISION HISTORY

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Ver.	Date	Description of Revision
1.0	1998.01 1998.02 1998.04	New CORRECTION-1 CORRECTION-2
1.1	1998.04	Reflection of the contents of CORRECTION-1, CORRECTION-2
1.2	2004.03	Addition of DIAGRAMS