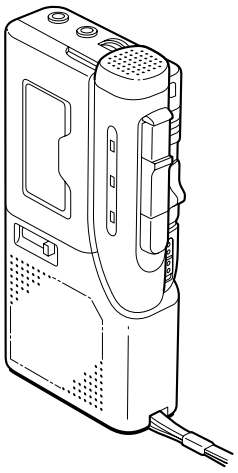
M-640V/645V/647V

SERVICE MANUAL

Ver 1.0 2001.02



US Model
M-645V/647V
East European Model
E Model
Chinese Model
Tourist Model
M-640V

Model Name Using Similar Mechanism	M-530V
Tape Transport Mechanism Type	MZ-530V-99

SPECIFICATIONS

Tape
MICROCASSETTE™ (normal position type)
Recording system
2-track 1-channel monaural
Speaker
Approx. 3.6 cm (1 7/16 in.) dia.
Tape speed
2.4 cm/s (15/16 ips), 1.2 cm/s (15/32 ips)
Frequency range
300 – 4,000 Hz (with TAPE SPEED switch at 2.4 cm/s)
Input
Microphone input jack (minijack/PLUG IN POWER)
sensitivity 0.24 mV for 3 kilohms or lower impedance microphone
Output
Earphone jack (minijack) for 8 – 300 ohms earphone
Power output (at 10% harmonic distortion)
250 mW
Power requirements
3 V DC batteries size AA (R6) × 2/External DC 3V power sources

Battery life (Approx. hours) ***(EIAJ*)***

Batteries	Recording
Sony manganese R6P (SR)	7
Sony alkaline LR6 (SG)	24
NC-AA (M-645V only)	6.5

* Measured valued by the standard of EIAJ (Electronic Industries Association of Japan) (Using a Sony Microcassette)

Dimensions (w/h/d)
Approx. 62.2 × 121.5 × 24.3 mm (2 1/2 × 4 7/8 × 31/32 in.) incl. projecting parts and controls
Mass
Approx. 125 g (4.5 oz)
Supplied accessories
AC power adaptor (1) (M-645V for the United States only)
Battery charge adaptor (1) (M-645V for the United States only)
Rechargeable batteries NC-AA, 1.2 V, 700 mAh, Ni-Cd (2) (M-645V for the United States only)
Microcassette tape MC-30 (1) (M-647V for the United States and M-640V for Europe only)
Batteries R6P (SR) (2) (M-640V for Europe only)
Alkaline batteries LR6 (SG) (2) (M-647V for the United States only)
Microphone (1) (M-647V for the United States only)
Carrying pouch (1) (M-647V for the United States and M-640V for Europe and "Sony World Model" only)

Design and specifications are subject to change without notice.

MICROCASSETTE™-CORDER

9-873-059-11
2001B0500-1

Sony Corporation
Audio Entertainment Group
General Engineering Dept.

SONY®

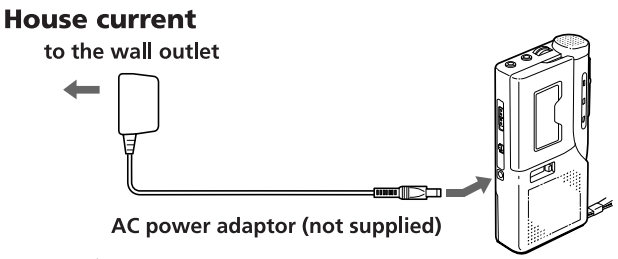
TABLE OF CONTENTS

Flexible Circuit Board Repairing

- Keep the temperature of the 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.

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.



Connect the AC power adaptor to DC IN 3V and to a wall outlet. Use the AC power adaptor (supplied with M-645V only) or the AC-E30HG AC power adaptor (not supplied). Do not use any other AC power adaptor.

Note

Specifications for AC-E30HG vary for each area.
Check your local voltage and the shape of plug before purchasing.

SAFETY-RELATED COMPONENT WARNING!!

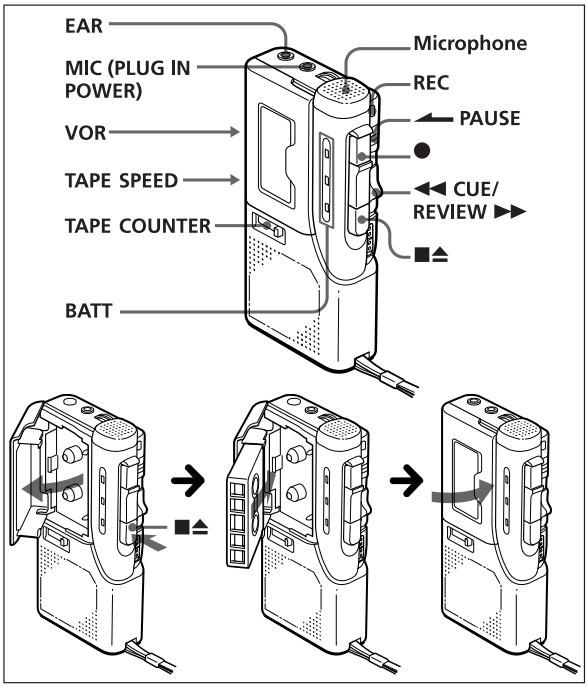
COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

SECTION 1
GENERAL

This section is extracted from instruction manual.

Recording

Make sure that nothing is connected to MIC.



1 Press the reset button of the TAPE COUNTER.
2 Press ■⏏ and insert a standard microcassette with the side to start recording facing the lid
3 Select the desired tape speed.
2.4 cm for optimum sound (recommended for normal use): A 30-minute recording can be made using both sides of the MC-30 microcassette.
1.2 cm for longer recording time: A 60-minute recording can be made using both sides of the MC-30 microcassette.
4 Set VOR to H, L or OFF.
If you set VOR to H or L, the unit automatically starts recording the sound and pauses when there is no sound (you can save tapes and batteries).
H : To record at meeting or in a quiet and/or spacious place.
L : To record for dictation or in a noisy place.
When the sound is not loud enough, set it to OFF, or the unit may not start recording.
5 Press ●.
◀ is pressed simultaneously and recording starts. While the tape runs, the REC lamp or REC/BATT lamp lights and flashes depending on the strength of the sound.
Recording level is fixed.

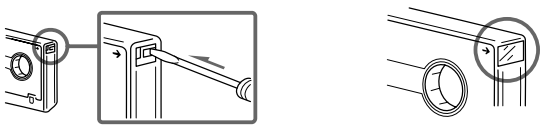
To	Press or slide
Stop recording	■⏏
Start recording during playback	● during playback (the unit becomes in the recording mode)
Review the portion just recorded	Push up ◀◀CUE/▶▶REVIEW toward ▶▶REVIEW during the recording. Release the button at the point to start playback.
Pause recording	Slide ▬PAUSE in the direction of the arrow. The REC lamp goes off.
Take out a cassette	■⏏

Note
Select the 2.4 cm tape speed for recording, if you play back the recorded tape with another unit. Otherwise, the sound quality may be changed.

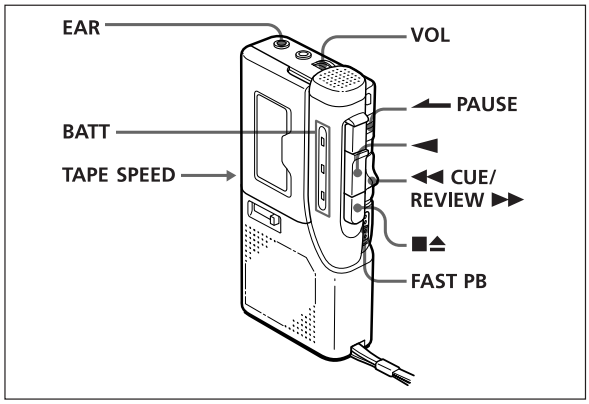
Notes on VOR (Voice Operated Recording)
- The VOR system depends on the environmental conditions. If you cannot get the desired results, set VOR to OFF.
- When you use the system in a noisy place, the unit will stay in the recording mode. If the sound is too soft, on the contrary, the unit will not start recording. Set VOR to H (high) or L (low) depending on the conditions.

To monitor the sound
Connect an earphone (not supplied) to EAR jack. The monitor volume cannot be adjusted by VOL.

To prevent a cassette from being accidentally recorded over
Break out and remove the cassette tabs. To reuse the cassette for recording, cover the tab hole with adhesive tape.



Playing a Tape



1 Insert a cassette with the side to start playing facing the lid.
2 Select the tape speed to the same speed as that used for recording.
3 Press ◀.
4 Adjust the volume.

To	Press or slide
Stop playback/stop fast forward or rewind*	■⏏
Pause playback	Slide ▬PAUSE in the direction of the arrow. The BATT lamps go off.
Fast forward	Slide ◀◀CUE/▶▶REVIEW toward ◀◀CUE during stop.
Rewind	Slide ◀◀CUE/▶▶REVIEW toward ▶▶REVIEW during stop.
Search forward during playback (CUE)	Keep ◀◀CUE/▶▶REVIEW pushed down during playback and release it at the point you want.
Search backward during playback (REVIEW)	Keep ◀◀CUE/▶▶REVIEW pushed up during playback and release it at the point you want.

* If you leave the unit after the tape has been wound or rewound, the batteries will be consumed rapidly. Be sure to depress ■⏏.

Note
If the tape is completely wound or rewound while searching forward/backward during playback (CUE/REVIEW), the ◀◀CUE/▶▶REVIEW switch may not return to the center position when you release the switch. In this case, push back the switch to the center to start playback.

If you plug in headphones (not supplied) to the EAR jack, you will get monaural output from both left and right channels.

To increase the playback speed
Slide the FAST PB switch in the direction of the arrow. The playback speed will be increased.
To return to the original speed, slide the FAST PB switch to the original position.

At the end of the tape
In the recording or playback mode, the tape stops at the end of the tape and the locked buttons will be released automatically (Automatic shut-off mechanism).
After fast forward or rewind, be sure to set ◀◀CUE/▶▶REVIEW back to the center.

Recording/Playback with the Connected Equipment

Recording from another tape recorder

Connect another tape recorder to the MIC jack using the RK-G64HG connecting cord (not supplied).
Set this unit to the recording mode and another tape recorder to the playback mode. In this case set VOR to OFF.

Recording with an External Microphone

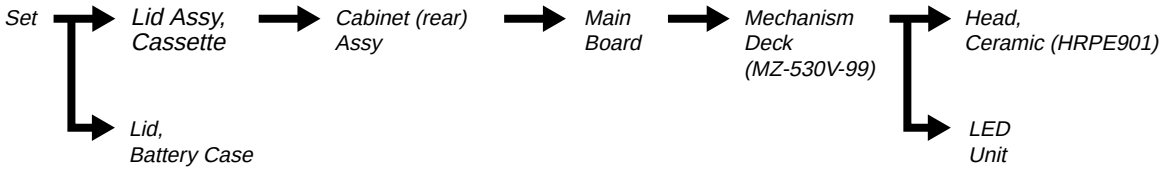
Connect a microphone to the MIC jack.
M-647V for the United States : use the supplied microphone.
Other models : use a microphone of low impedance (less than 3 kilohms) such as ECM-T6 (not supplied). When using a plug-in-power system microphone, the power to the microphone is supplied from this unit.

Note
When recording with an external microphone, the VOR system may not work properly because of the difference in sensitivity.

SECTION 2
DISASSEMBLY

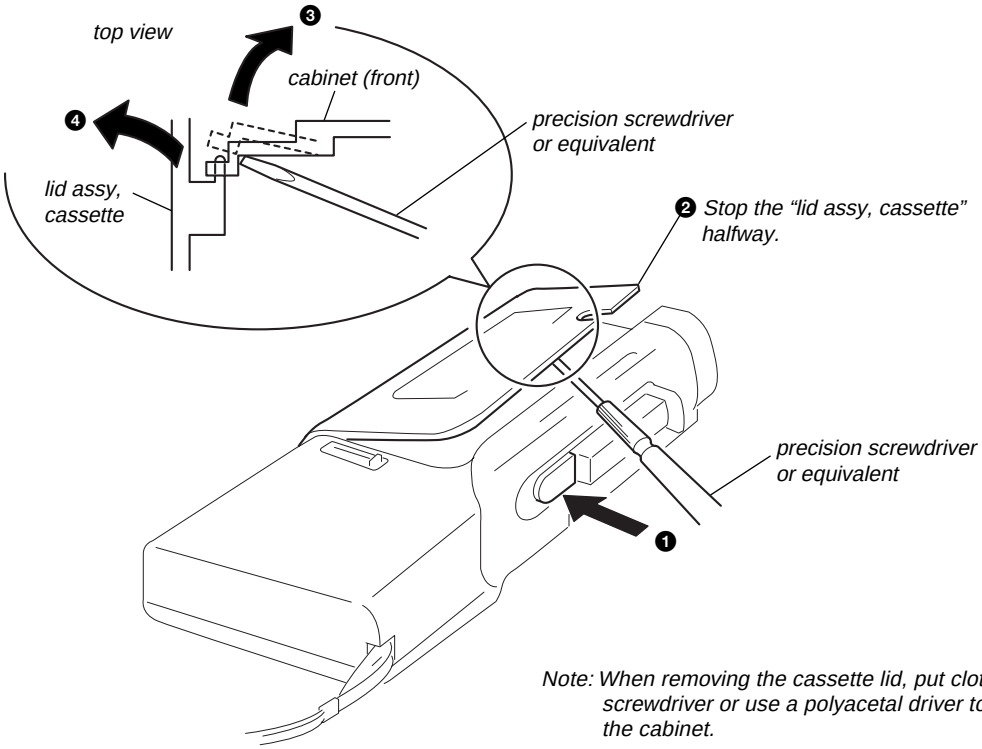
• This set can be disassembled in the order shown below.

2-1. DISASSEMBLY FLOW

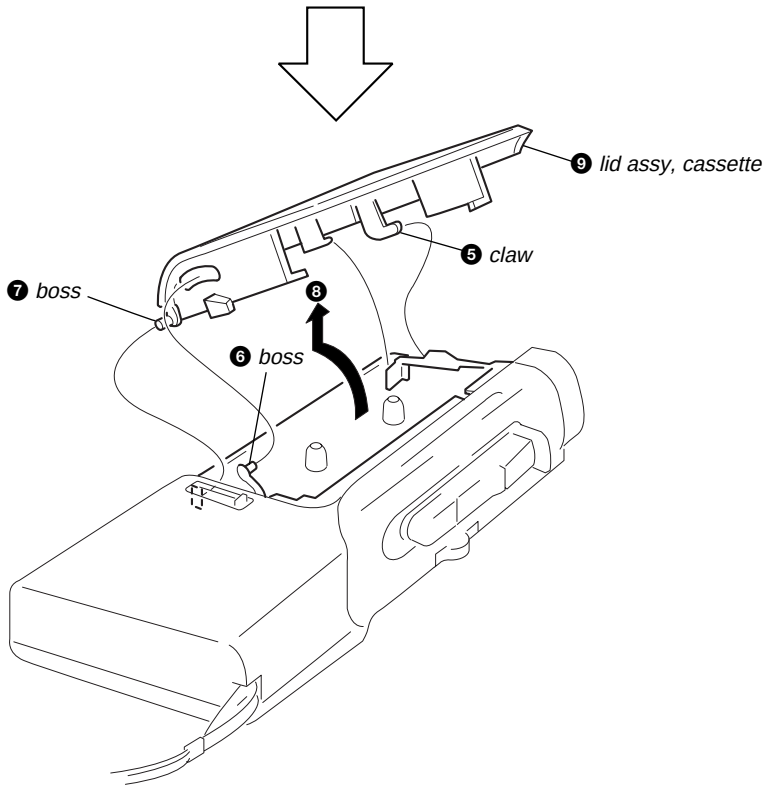


Note: Follow the disassembly procedure in the numerical order given.

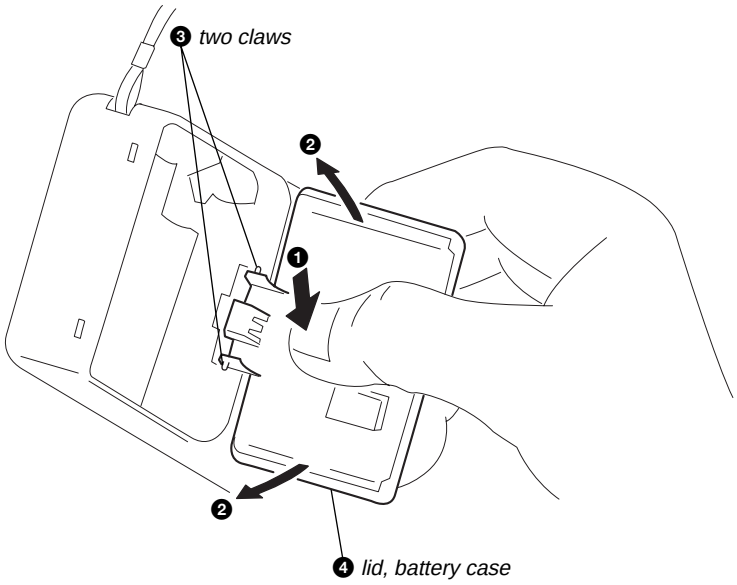
2-2. LID ASSY, CASSETTE



Note: When removing the cassette lid, put cloth on the end of a screwdriver or use a polyacetal driver to avoid damage to the cabinet.

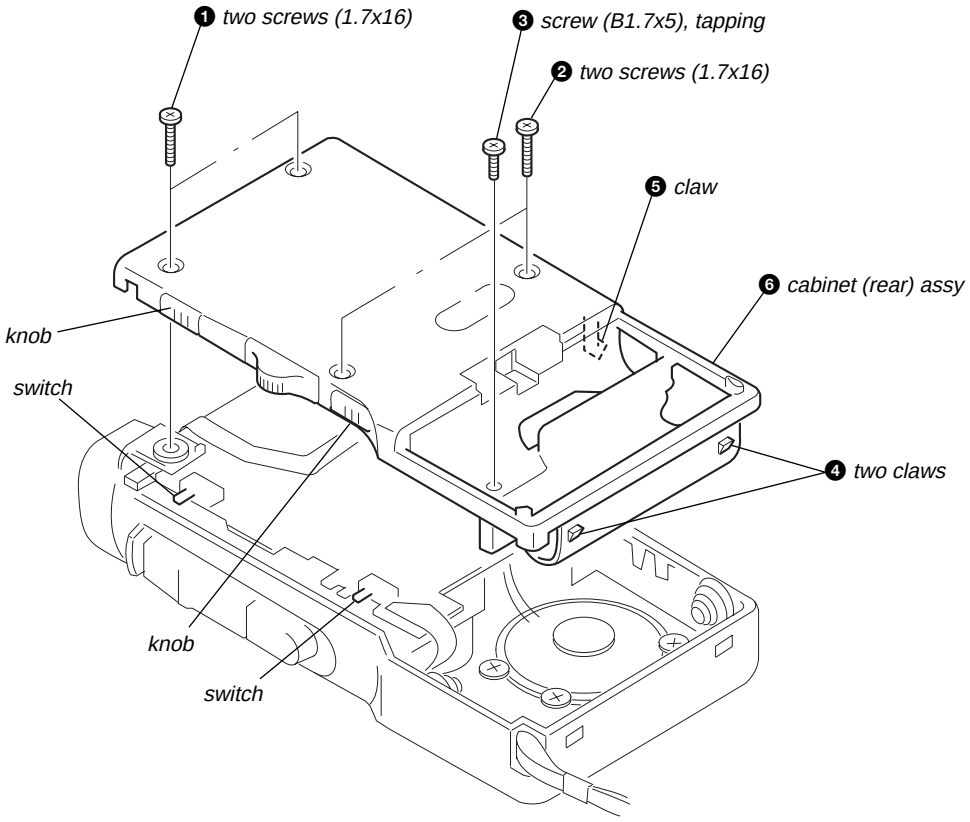


2-3. LID, BATTERY CASE

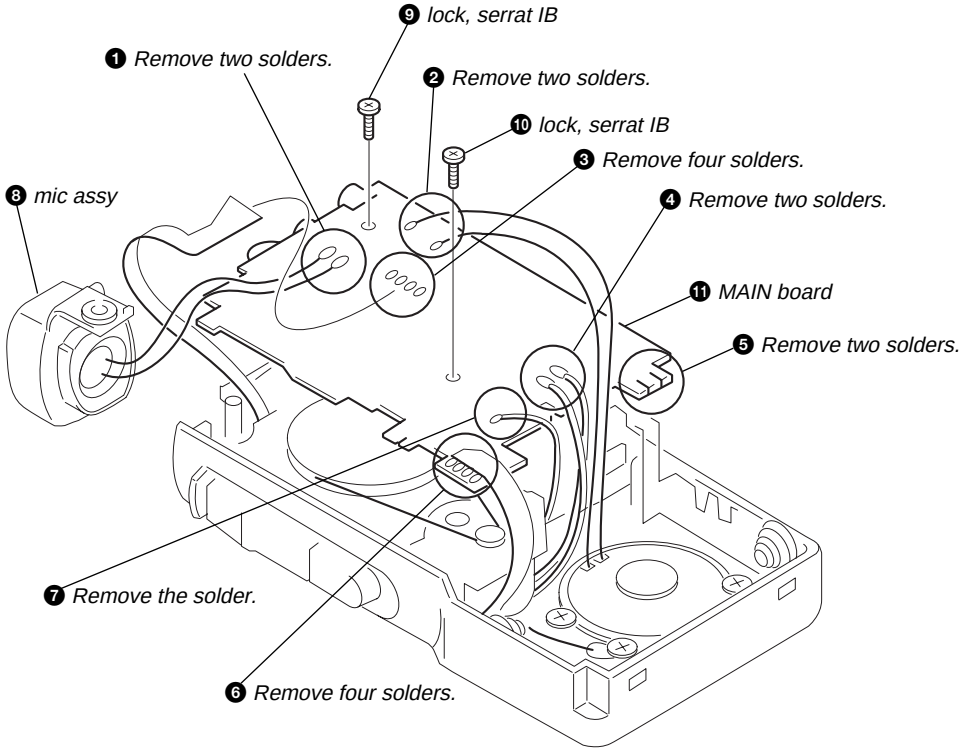


2-4. CABINET (REAR) ASSY

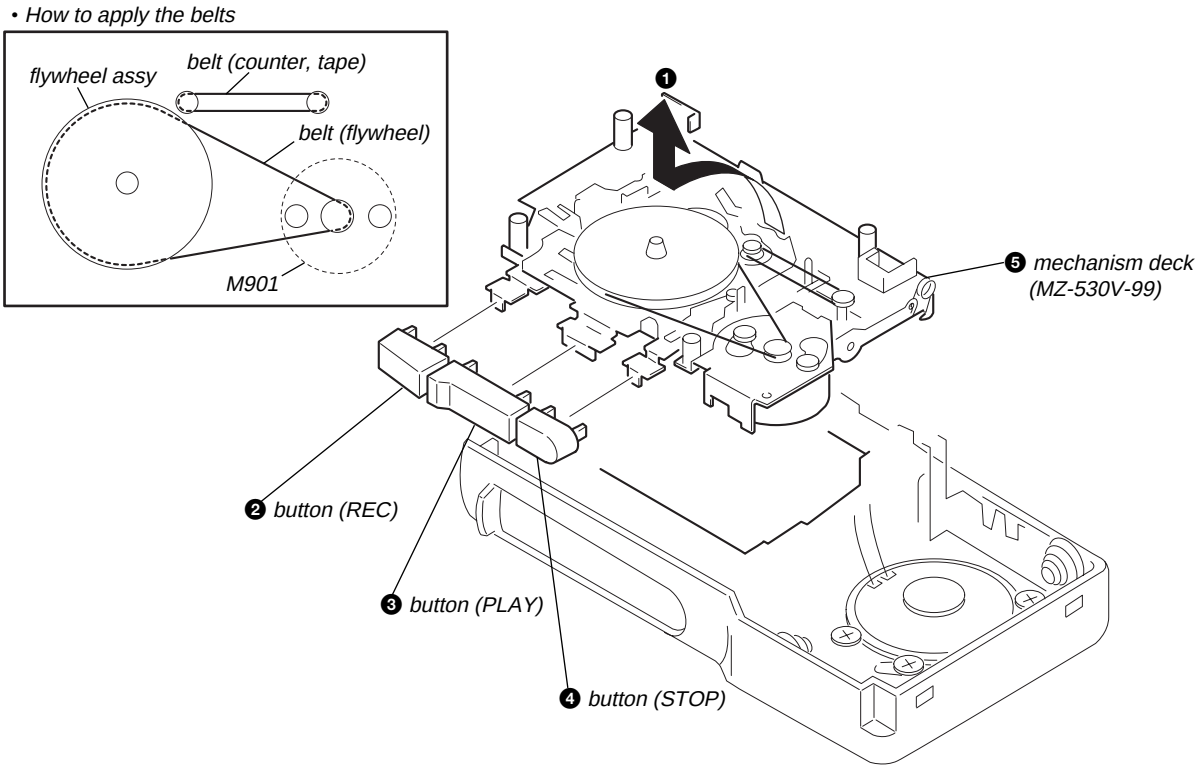
Note: When installing, fit the knobs and switches.



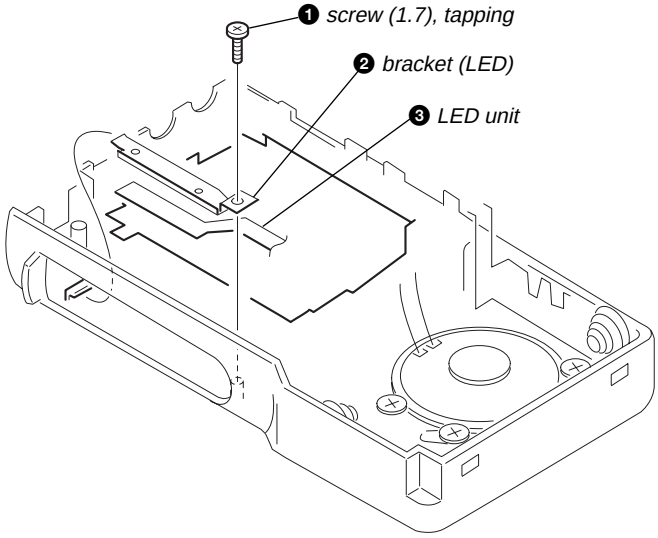
2-5. MAIN BOARD



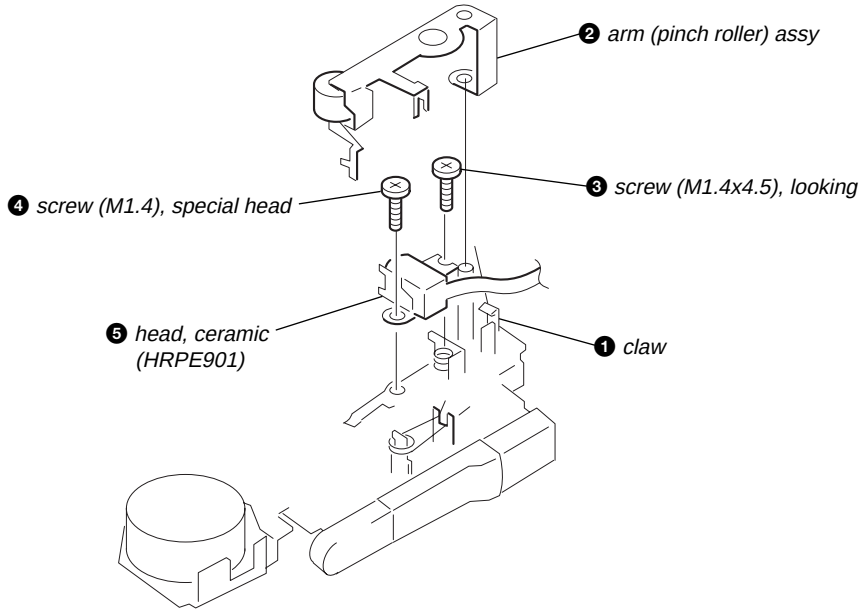
2-6. MECHANISM DECK (MZ-530V-99)



2-7. LED UNIT



2-8. HEAD, CERAMIC (HRPE901)



SECTION 3
MECHANICAL ADJUSTMENTS

PRECAUTION

1. Clean the following parts with a denatured-alcohol-moistened swab :
   record/playback/erase head pinch roller
   rubber belts capstan
2. Demagnetize the record/playback/erase head with a head demagnetizer.
3. Do not use a magnetized screwdriver for the adjustments.
4. The adjustments should be performed with the rated power supply voltage unless otherwise noted.
   Power supply voltage: 3 Vdc
   TAPE SPEED switch: 2.4 cm

Torque Measurement

Mode	Torque Meter	Meter Reading
Forward	CQ-103M	0.49 – 1.27 mN • m (5 – 13 g • cm) (0.07 – 0.180 oz • inch)
Fast Forward	CQ-201M	more than 2.95 mN • m (more than 30 g • cm) (more than 0.42 oz • inch)
Rewind	CQ-201M	more than 2.95 mN • m (more than 30 g • cm) (more than 0.42 oz • inch)

Tape Tension Measurement

Mode	Tension Meter	Meter Reading
Forward	CQ-403M	more than 20 g (more than 0.28 oz)

SECTION 4
ELECTRICAL ADJUSTMENTS

Specified voltage: 3 V (DC)

Test Tape

Type	Signal	Used for	Tape Speed (cm/s)
S-2-A030	3 kHz, – 20 dB	Head Azimuth Adjustment	2.4
WS-24	3 kHz, – 10 dB	Tape Speed Adjustment	2.4
WS-12			1.2

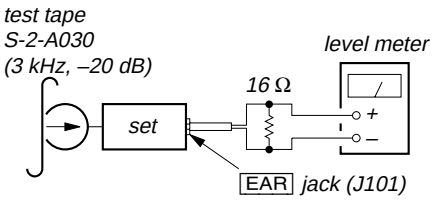
Record/Playback/Erase Head Azimuth Adjustment

Setting:

VOL control : mechanical mid
TAPE SPEED switch: 2.4 cm/s
VOR switch : OFF

Procedure:

1. Mode: Playback

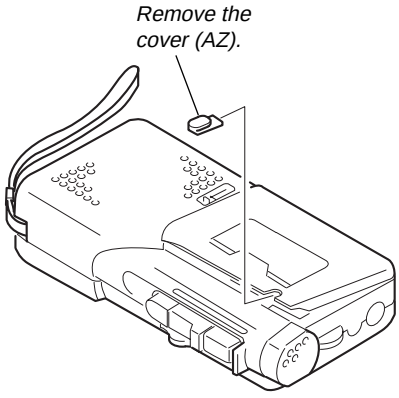


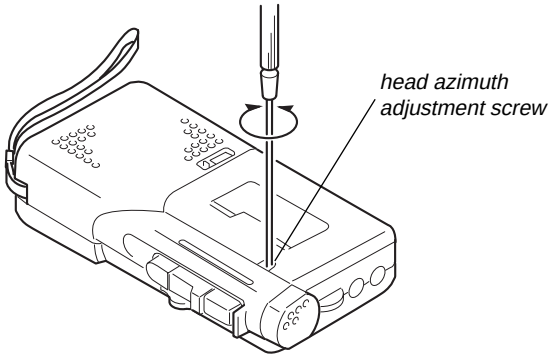
2. Turn the head azimuth adjustment screw to obtain the maximum reading on level meter.

Note: Several peaks may appear, but the maximum.

Adjustment Location:

First remove the cover (AZ).



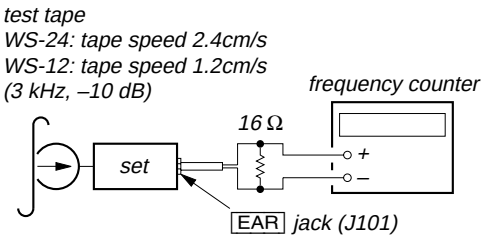


Tape Speed Adjustment

Setting:

VOL control: mechanical mid
VOR switch: OFF

Procedure:
Note: Reform 1.2 cm/s speed adjustment before 2.4 cm/s speed.



Adjustment mode: Playback

1. Tape Speed: 2.4 cm/s
   Playback WS-24 (tape center part) and adjust RV601 so that reading on the frequency counter becomes 3,000 Hz.

2. Tape Speed: 1.2 cm/s
   Playback WS-12 (tape center part) and adjust RV602 so that reading on the frequency counter becomes 3,000 Hz.

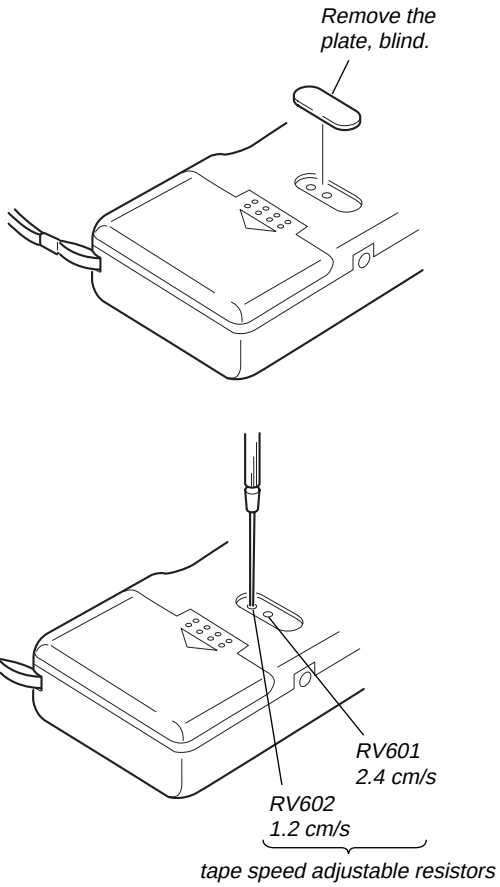
Specified Value:

Tape Speed	Frequency counter
2.4 cm/s	2,880 to 3,120 Hz
1.2 cm/s	2,850 to 3,150 Hz

3. Check frequency difference between the beginning and the end of the tape should be within ±0.5%.
   2.4 cm/s: 15 Hz
   1.2 cm/s: 15 Hz

Adjustment Location:

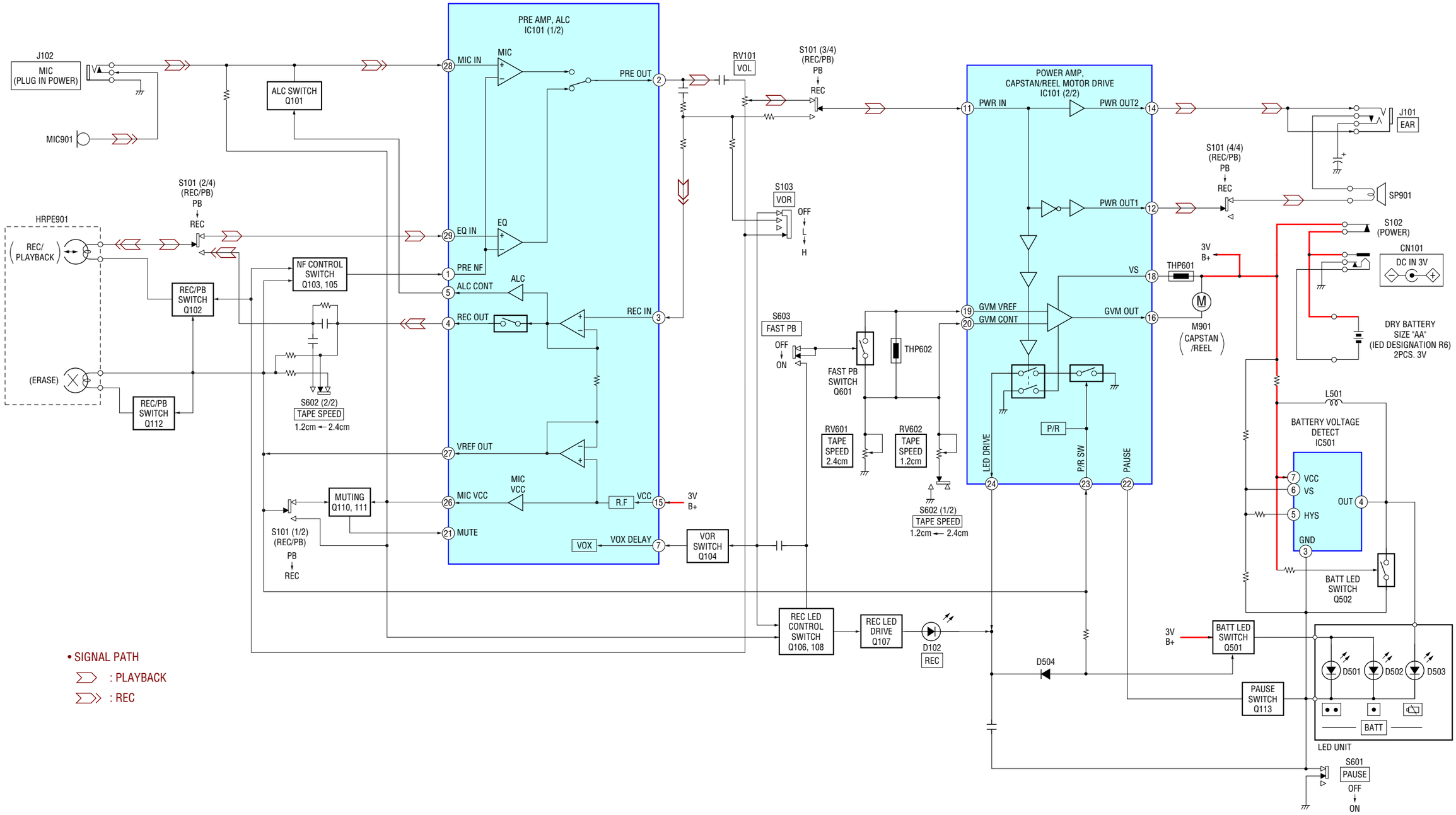
First remove the plate, blind.



MEMO

SECTION 5
DIAGRAMS

5-1. BLOCK DIAGRAM

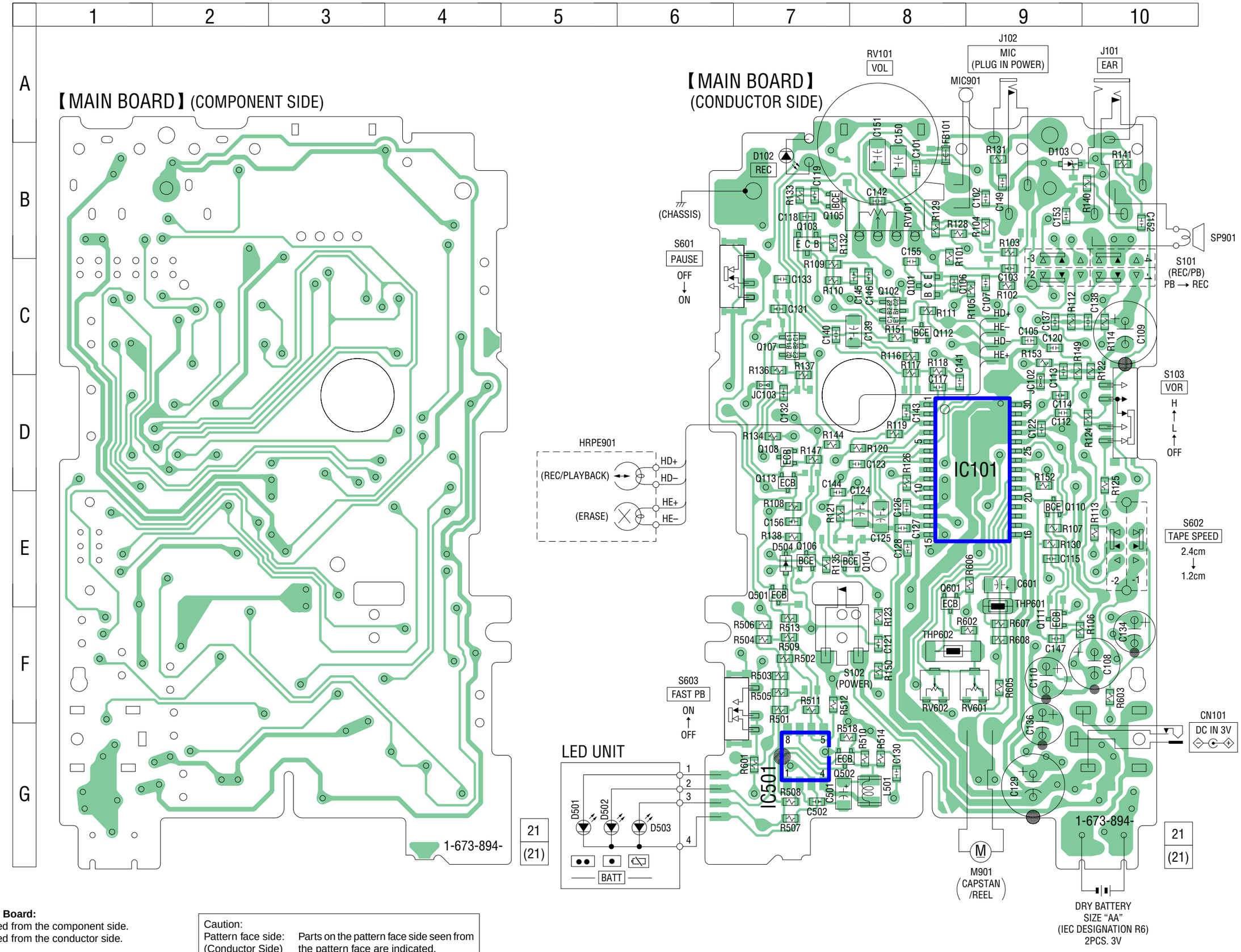


• SIGNAL PATH
: PLAYBACK
: REC

5-2. PRINTED WIRING BOARD

- **Semiconductor Location**

Ref. No.	Location
D102	B-7
D103	B-9
D504	E-7
IC101	D-9
IC501	G-7
Q101	C-8
Q102	C-8
Q103	B-7
Q104	E-8
Q105	B-7
Q106	E-7
Q107	C-7
Q108	D-7
Q110	E-9
Q111	F-9
Q112	C-8
Q113	D-7
Q501	E-7
Q502	G-7
Q601	E-8

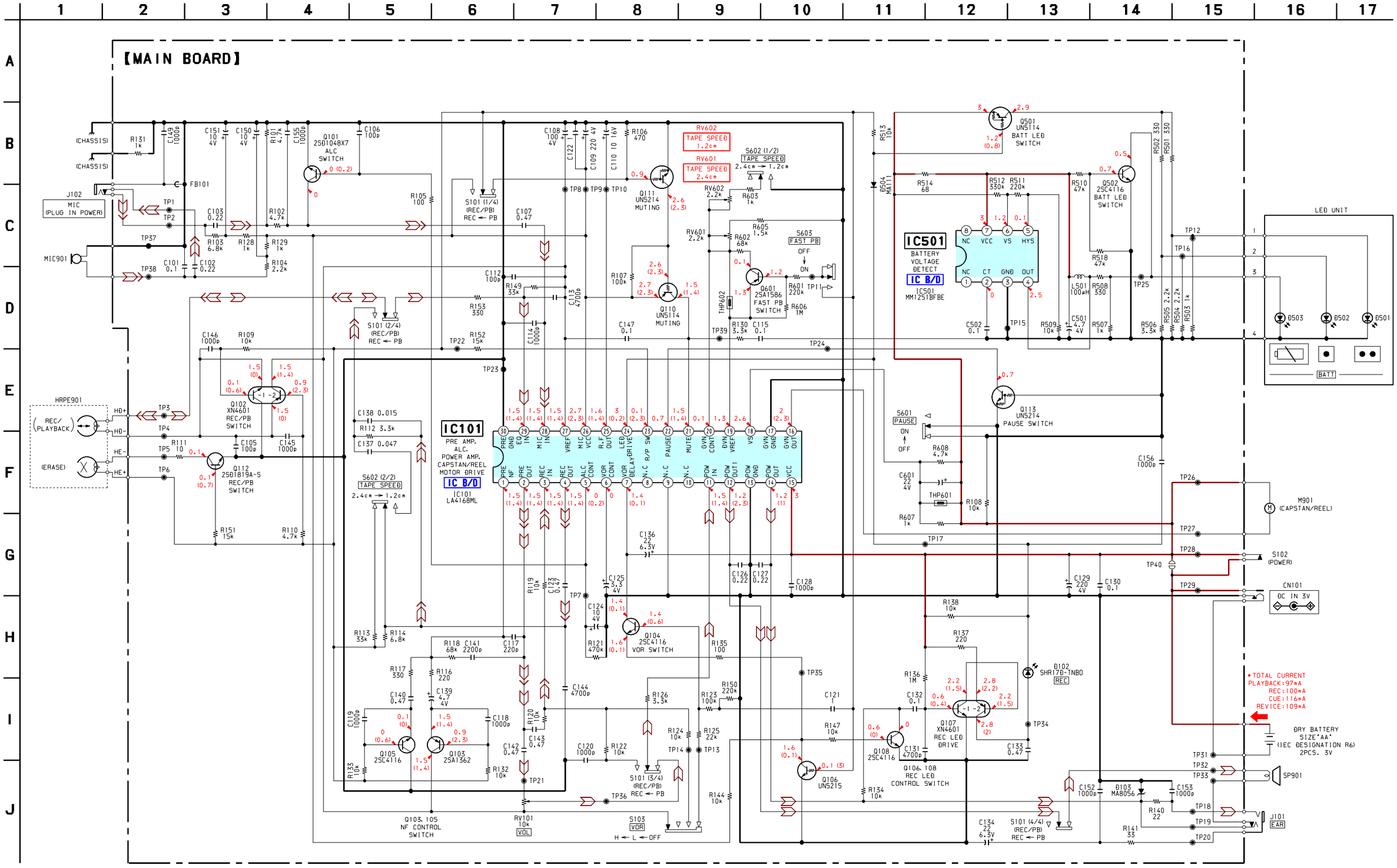


Note on Printed Wiring Board:
- ○——○ : parts extracted from the component side.
- ——— : parts extracted from the conductor side.
- ○ : Through hole.
- ▬ : Pattern from the side which enables seeing.

(The other layers' patterns are not indicated.)

Caution:
Pattern face side: (Conductor Side) Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component Side) Parts on the parts face side seen from the parts face are indicated.

5-3. SCHEMATIC DIAGRAM • See page 14 for IC Block Diagrams.

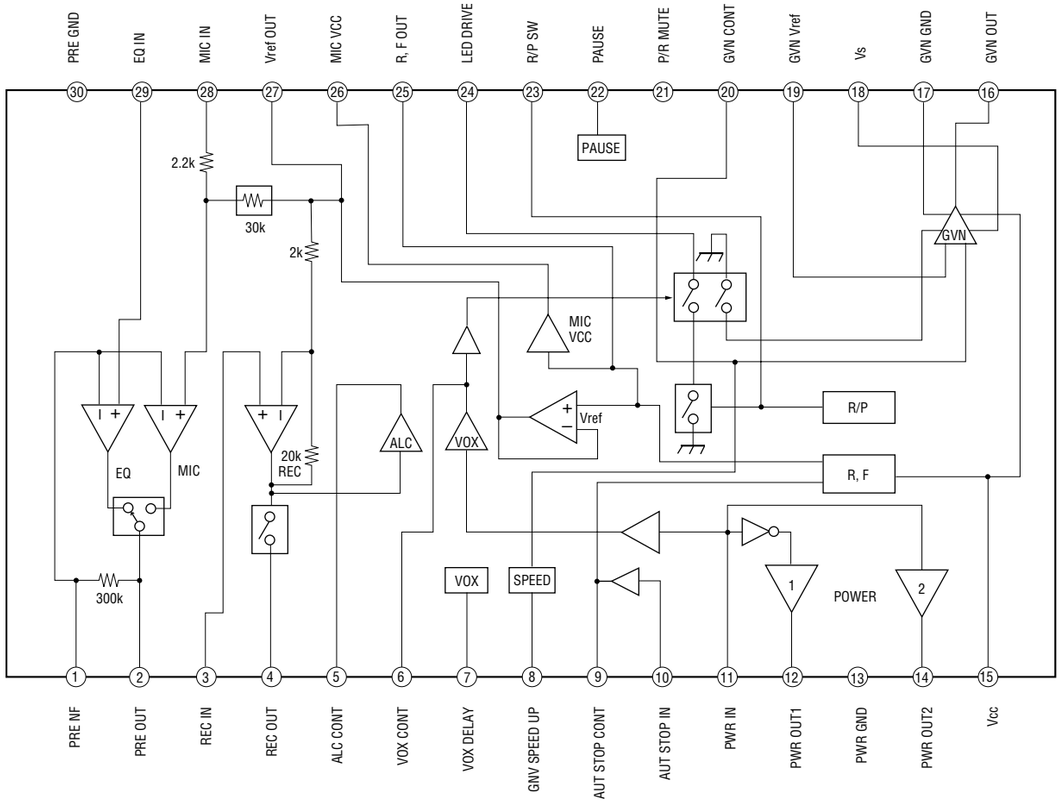


Note on Schematic Diagram:

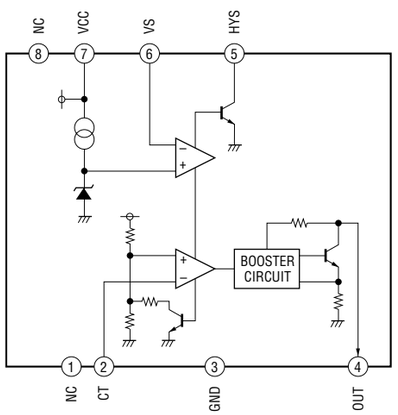
- All capacitors are in µF unless otherwise noted. pF: µµF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4 W or less unless otherwise specified.
- ▭ : panel designation.
- ▬ : B+ Line.
- ▭ : adjustment for repair.
- Total current is measured with no cassette installed.
- Power voltage is dc 3 V and fed with regulated dc power supply from battery terminal.
- Voltages are dc with respect to ground in playback mode. no mark : PLAYBACK ( ) :REC
- Voltages are taken with a VOM (Input impedance 10 MΩ). Voltage variations may be noted due to normal production tolerances.
- Signal path.
  - ▷ : PLAYBACK
  - ▷▷ : REC

- **IC Block Diagrams**

IC101 LA4168ML-TE-L



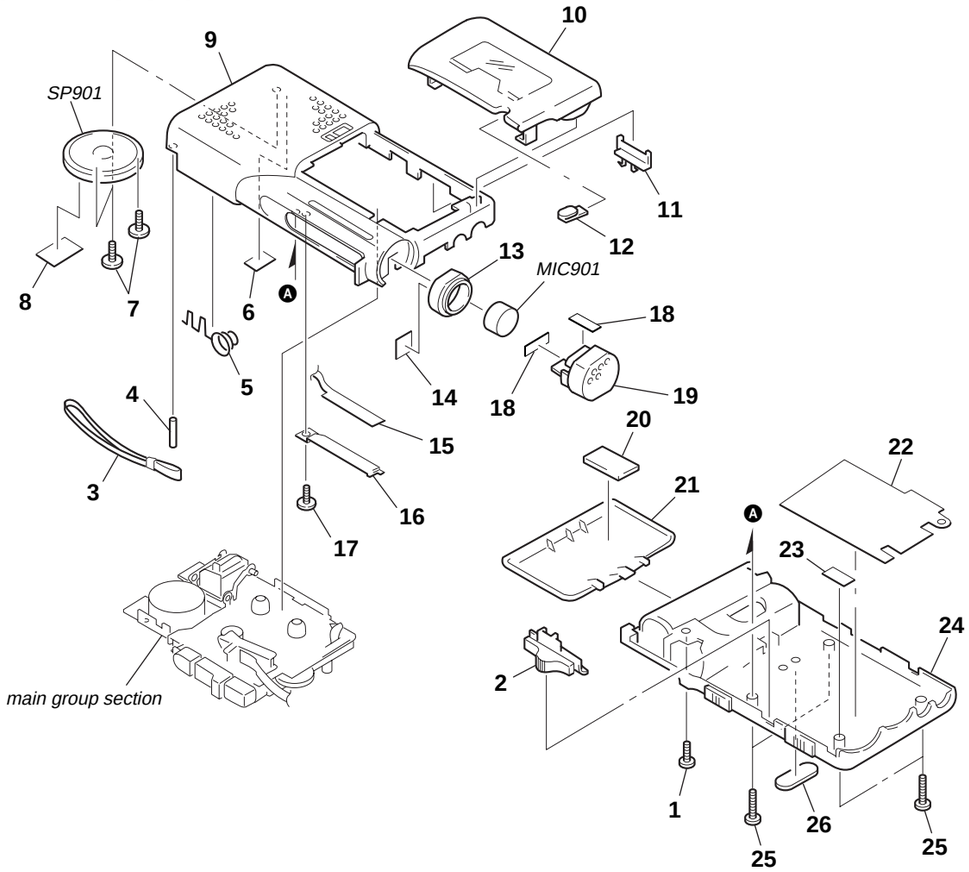
IC501 MM1251BFBE



SECTION 6
EXPLODED VIEWS

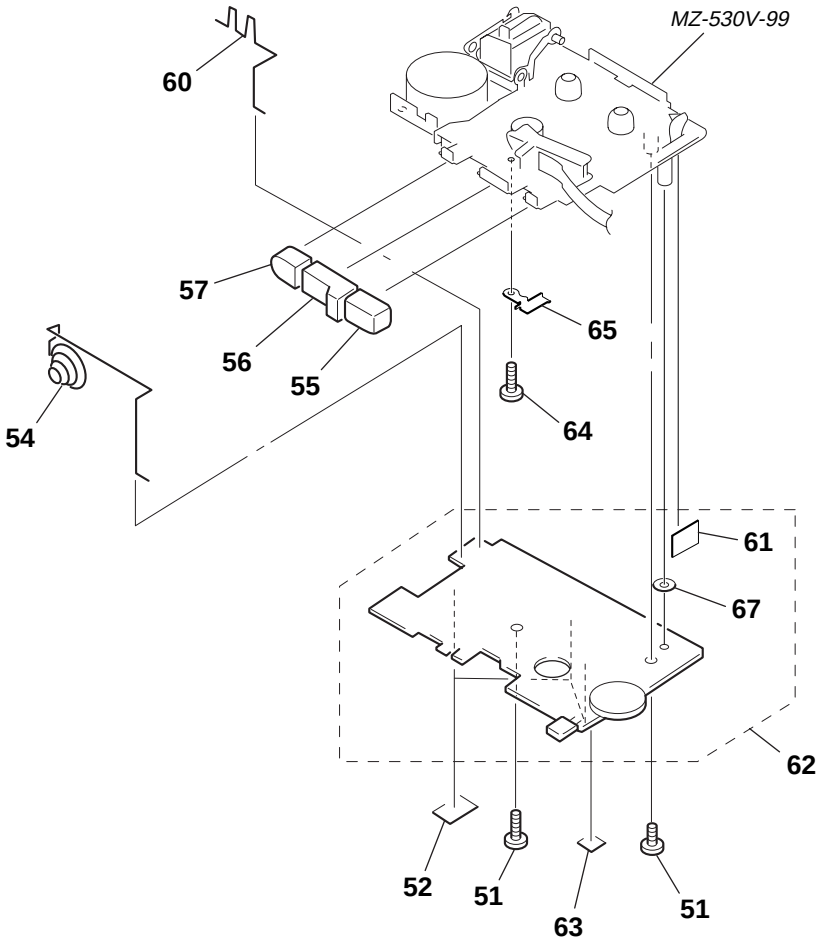
NOTE:
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- Color Indication of Appearance Parts
  Example:
  KNOB, BALANCE (WHITE) . . . (RED)
  ↑ ↑
  Parts Color Cabinet's Color
- Items marked "*" are not stocked since they are seldom required for routine service. 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.
- Abbreviation
  E1 : 220 VAC area in E model
  JE : Tourist model

6-1. CABINET SECTION



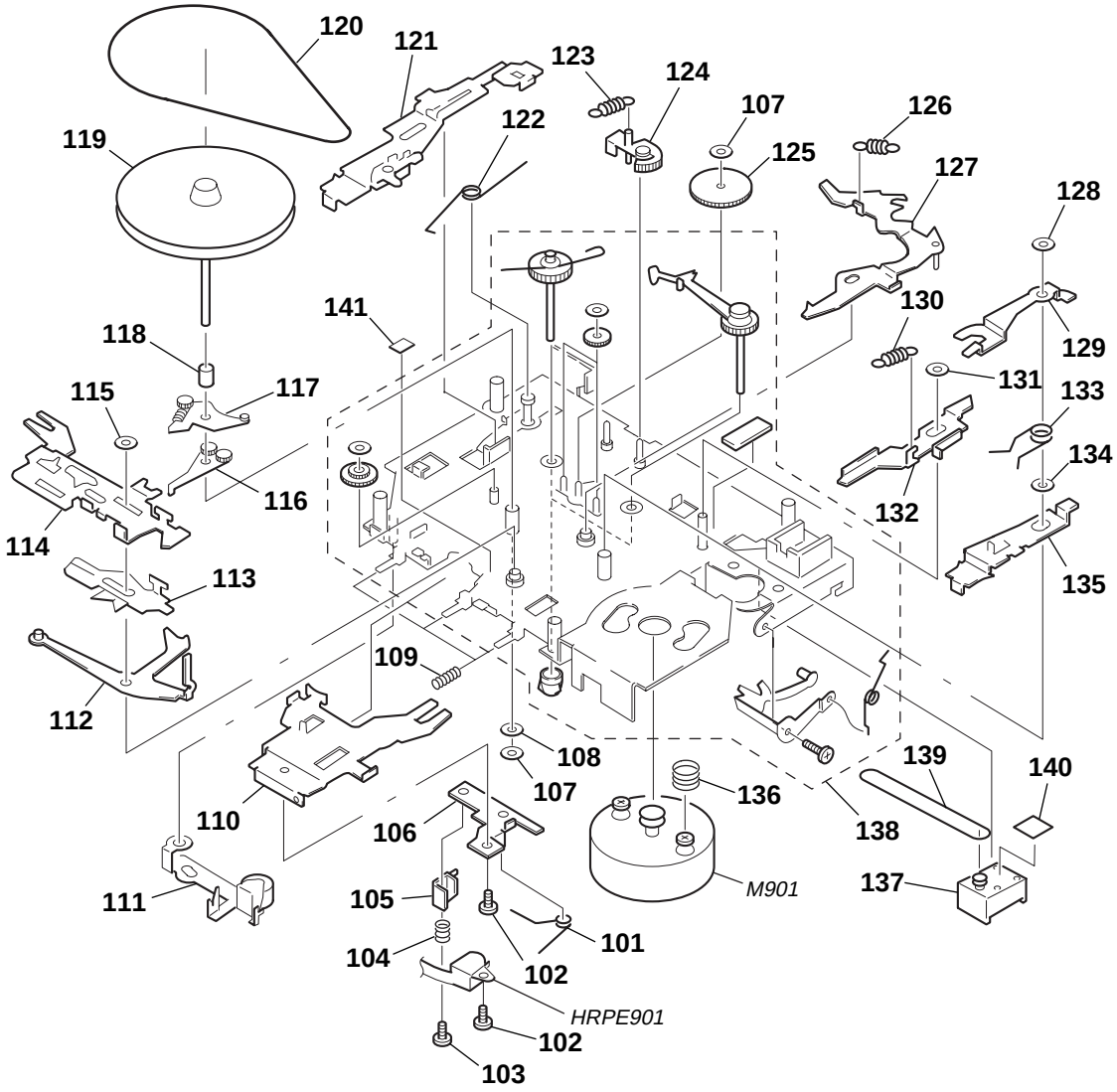
Ref. No.	Part No.	Description	Remark
1	3-318-203-72	SCREW (B1.7X5), TAPPING	
2	3-036-668-11	KNOB (FR)	
3	3-328-319-01	STRAP, HAND	
4	3-669-481-07	PIN (DIA.1X10), PARALLEL	
5	3-010-503-01	SPRING (B), BATTERY COIL	
6	3-831-441-99	SPACER, KNOB	
7	3-034-792-01	SCREW, TAPPING (B2.0)	
8	3-037-193-01	CUSHION (SP)	
9	X-3380-088-2	CABINET (FRONT) SUB ASSY (EXCEPT 640V: E1)	
9	X-3380-089-2	CABINET (FRONT) SUB ASSY (640V: E1)	
10	X-3380-065-1	LID ASSY, CASSETTE (640V)	
10	X-3380-067-1	LID ASSY, CASSETTE (645V)	
10	X-3380-068-1	LID ASSY, CASSETTE (647V)	
11	3-033-358-01	KNOB (VOR)	
* 12	3-033-185-21	COVER (AZ)	
13	3-031-382-01	CUSHION (MIC)	
14	3-039-027-01	SPACER (MIC)	
15	1-468-399-11	LED UNIT	
16	3-031-395-01	BRACKET (LED)	
17	3-318-382-31	SCREW (1.7), TAPPING	
18	3-037-192-01	SPACER (MIC)	
19	3-031-372-01	CASE, MICROPHONE	
20	3-914-930-11	CUSHION (BATTERY CASE LID)	
21	3-031-371-21	LID, BATTERY CASE	
22	3-037-004-01	PAPER (A), SHIELD	
* 23	3-037-556-01	SHEET (A), GROUND	
24	X-3380-085-2	CABINET (REAR) ASSY (EXCEPT 640V: JE)	
24	X-3380-087-2	CABINET (REAR) ASSY (640V: JE)	
25	3-035-255-11	SCREW (1.7X16)	
26	3-358-363-71	PLATE, BLIND	
MIC901	1-542-386-11	MICROPHONE, ELECTRET CONDENSER	
SP901	1-529-188-11	SPEAKER (3.6cm)	

6-2. MAIN GROUP SECTION



Ref. No.	Part No.	Description	Remark
51	3-704-197-31	LOCK, SERRAT IB	
52	3-831-441-99	SPACER, KNOB	
54	3-034-687-01	TERMINAL (-), BATTERY	
55	3-031-376-21	BUTTON (REC)	
56	3-031-375-11	BUTTON (PLAY)	
57	3-031-374-11	BUTTON (STOP)	
60	3-034-686-01	TERMINAL (+), BATTERY	
61	3-036-882-01	SPACER (JACK)	
62	A-3021-217-A	MAIN BOARD, COMPLETE	
* 63	3-037-557-01	SHEET (B), GROUND	
64	4-963-883-61	SCREW (M1.4), PRECISION PAN	
65	3-037-211-01	REINFORCEMENT (MJ)	
67	4-935-749-11	SPACER (S)	

6-3. MECHANISM DECK SECTION (MZ-530V-99)



Ref. No.	Part No.	Description	Remark
101	3-028-965-01	SPRING (PINCH ARM), TORSION	
102	3-704-197-01	SCREW (M1.4), SPECIAL HEAD	
103	3-704-197-71	SCREW (M1.4X4.5), LOCKING	
104	3-028-960-01	SPRING (AZIMUTH), COMPRESSION	
105	3-028-909-01	GUIDE (N), TAPE	
* 106	3-029-640-01	BRACKET (OW), HEAD	
107	3-331-007-21	WASHER	
108	3-350-989-01	WASHER	
109	3-028-961-01	SPRING (BUTTON), COMPRESSION	
110	3-028-924-01	LEVER (PLAY)	
111	X-3376-235-1	ARM (PINCH ROLLER) ASSY	
112	3-046-281-01	LEVER (POWER SW) (B)	
113	3-028-940-01	LEVER (SRS)	
114	3-028-938-01	LEVER (SLIDE)	
115	3-578-224-00	WASHER	
116	X-3376-227-1	LEVER (F/R) ASSY	
117	X-3376-228-1	LEVER (TU) ASSY	
118	3-029-634-01	BEARING	
119	X-3376-231-1	FLYWHEEL ASSY	
120	3-377-420-11	BELT	
121	X-3376-224-1	LEVER (REC) ASSY	
122	3-029-641-01	SPRING, TORSION	

Ref. No.	Part No.	Description	Remark
123	3-028-957-01	SPRING (CAM GEAR),TENSION	
124	3-028-966-01	GEAR (S-OFF-OW), CAM	
125	X-3376-230-1	LIMITTER ASSY	
126	3-028-955-01	SPRING (LOCK), TENSION	
127	X-3377-535-1	LEVER (LOCK) ASSY	
128	4-992-239-01	WASHER (A)	
* 129	3-028-967-01	LEVER (PAUSE RELEASE)	
130	3-028-954-01	SPRING (SW LEVER), TENSION	
131	3-321-813-71	WASHER, COTTER POLYETHYLENE	
132	3-028-928-01	LEVER (EJECT)	
133	3-028-964-01	SPRING (SLIDE), TORSION	
134	4-926-562-01	WASHER, STOPPER	
135	3-028-927-01	LEVER (STOP)	
136	3-028-917-01	SPRING (GROND), COMPRESSION	
137	1-548-579-41	COUNTER, TAPE (SMALL TYPE)	
138	X-3380-218-1	CHASSIS COMP ASSY	
139	3-343-948-01	BELT (COUNTER, TAPE)	
140	3-365-053-01	SHEET (BA), ADHESIVE	
141	3-378-078-11	SPACER (END DETECTION)	
HRPE901	1-500-593-11	HEAD, CERAMIC (REC/PB/ERASE)	
M901	1-698-533-11	MOTOR, DC (CAPSTAN/REEL) (WITH PULLEY)	

SECTION 7
ELECTRICAL PARTS LIST

MAIN

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
- Abbreviation
  CH : Chinese model
  E1 : 220 VAC area in E model
  EE : East European model
  JE : Tourist model
- 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

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

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

Ref. No.	Part No.	Description			Remark
	A-3021-217-A	MAIN BOARD, COMPLETE			
		**********			
	3-036-882-02	SPACER (JACK)			
	4-935-749-11	SPACER (S)			
		< CAPACITOR >			
C101	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C102	1-115-467-11	CERAMIC CHIP	0.22uF	10%	10V
C103	1-115-467-11	CERAMIC CHIP	0.22uF	10%	10V
C105	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C106	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C107	1-125-891-11	CERAMIC CHIP	0.47uF	10%	10V
C108	1-124-433-00	ELECT	100uF	20%	4V
C109	1-124-434-00	ELECT	220uF	20%	4V
C110	1-104-396-11	ELECT	10uF	20%	16V
C112	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C113	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C114	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C115	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C117	1-162-960-11	CERAMIC CHIP	220PF	10%	50V
C118	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C119	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C120	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C121	1-115-156-11	CERAMIC CHIP	1uF		10V
C122	1-125-837-11	CERAMIC CHIP	1uF	10%	6.3V
C123	1-113-619-11	CERAMIC CHIP	0.47uF		10V
C124	1-135-201-11	TANTALUM CHIP	10uF	20%	4V
C125	1-104-912-11	TANTALUM CHIP	3.3uF	20%	4V
C126	1-115-467-11	CERAMIC CHIP	0.22uF	10%	10V
C127	1-115-467-11	CERAMIC CHIP	0.22uF	10%	10V
C128	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C129	1-124-434-00	ELECT	220uF	20%	4V
C130	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C131	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C132	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C133	1-113-619-11	CERAMIC CHIP	0.47uF		10V
C134	1-126-153-11	ELECT	22uF	20%	6.3V
C136	1-126-153-11	ELECT	22uF	20%	6.3V
C137	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C138	1-164-245-11	CERAMIC CHIP	0.015uF	10%	25V
C139	1-135-151-21	TANTALUM CHIP	4.7uF	20%	4V
C140	1-125-891-11	CERAMIC CHIP	0.47uF	10%	10V
C141	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C142	1-113-619-11	CERAMIC CHIP	0.47uF		10V
C143	1-113-619-11	CERAMIC CHIP	0.47uF		10V
C144	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C145	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C146	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C147	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C149	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C150	1-135-201-11	TANTALUM CHIP	10uF	20%	4V
C151	1-135-201-11	TANTALUM CHIP	10uF	20%	4V
C152	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C153	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C155	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C156	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C501	1-135-151-21	TANTALUM CHIP	4.7uF	20%	4V
C502	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C601	1-104-847-11	TANTALUM CHIP	22uF	20%	4V
		< JACK >			
CN101	1-580-372-43	JACK, DC (POLARITY UNIFIED TYPE)			(DC IN 3V)
		< DIODE >			
D102	8-719-062-18	LED SHR17D-TNBO (REC)			
D103	8-719-977-03	DIODE MA8056-H-TX			
D504	8-719-073-01	DIODE MA111-TX			
		< FERRITE BEAD >			
FB101	1-414-760-21	FERRITE			
		< IC >			
IC101	8-759-492-49	IC LA4168ML-TE-L			
IC501	8-759-399-49	IC MM1251BFBE			
		< JACK >			
J101	1-785-791-11	JACK (EAR)			
J102	1-785-790-11	JACK (MIC (PLUG IN POWER))			
		< COIL >			
L501	1-412-032-11	INDUCTOR CHIP 100uH			

MAIN

Ref. No.	Part No.	Description			Remark
		< TRANSISTOR >			
Q101	8-729-800-37	TRANSISTOR	2SD1048X7-TB		
Q102	8-729-402-84	TRANSISTOR	XN4601-TX		
Q103	8-729-230-72	TRANSISTOR	2SA1362-YG-EL		
Q104	8-729-230-63	TRANSISTOR	2SC4116YG-TE85L		
Q105	8-729-230-63	TRANSISTOR	2SC4116YG-TE85L		
Q106	8-729-420-50	TRANSISTOR	UN5215-(TX)		
Q107	8-729-402-84	TRANSISTOR	XN4601-TX		
Q108	8-729-230-63	TRANSISTOR	2SC4116YG-TE85L		
Q110	8-729-402-96	TRANSISTOR	UN5114-TX		
Q111	8-729-402-93	TRANSISTOR	UN5214-TX		
Q112	8-729-402-33	TRANSISTOR	2SD1819A-S-TX		
Q113	8-729-402-93	TRANSISTOR	UN5214-TX		
Q501	8-729-402-96	TRANSISTOR	UN5114-TX		
Q502	8-729-230-63	TRANSISTOR	2SC4116YG-TE85L		
Q601	8-729-230-60	TRANSISTOR	2SA1586YG-TE85L		
		< RESISTOR >			
R101	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R102	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R103	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R104	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R105	1-216-809-11	METAL CHIP	100	5%	1/16W
R106	1-216-817-11	METAL CHIP	470	5%	1/16W
R107	1-216-845-11	METAL CHIP	100K	5%	1/16W
R108	1-216-833-11	METAL CHIP	10K	5%	1/16W
R109	1-216-833-11	METAL CHIP	10K	5%	1/16W
R110	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R111	1-216-797-11	METAL CHIP	10	5%	1/16W
R112	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R113	1-216-839-11	METAL CHIP	33K	5%	1/16W
R114	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R116	1-216-813-11	METAL CHIP	220	5%	1/16W
R117	1-216-815-11	METAL CHIP	330	5%	1/16W
R118	1-216-843-11	METAL CHIP	68K	5%	1/16W
R119	1-216-833-11	METAL CHIP	10K	5%	1/16W
R120	1-216-833-11	METAL CHIP	10K	5%	1/16W
R121	1-216-853-11	METAL CHIP	470K	5%	1/16W
R122	1-216-833-11	METAL CHIP	10K	5%	1/16W
R123	1-216-845-11	METAL CHIP	100K	5%	1/16W
R124	1-216-833-11	METAL CHIP	10K	5%	1/16W
R125	1-216-837-11	METAL CHIP	22K	5%	1/16W
R126	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R128	1-216-821-11	METAL CHIP	1K	5%	1/16W
R129	1-216-821-11	METAL CHIP	1K	5%	1/16W
R130	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R131	1-216-821-11	METAL CHIP	1K	5%	1/16W
R132	1-216-833-11	METAL CHIP	10K	5%	1/16W
R133	1-216-833-11	METAL CHIP	10K	5%	1/16W
R134	1-216-833-11	METAL CHIP	10K	5%	1/16W
R135	1-216-809-11	METAL CHIP	100	5%	1/16W
R136	1-216-857-11	METAL CHIP	1M	5%	1/16W
R137	1-216-813-11	METAL CHIP	220	5%	1/16W
R138	1-216-833-11	METAL CHIP	10K	5%	1/16W
R140	1-216-801-11	METAL CHIP	22	5%	1/16W
R141	1-216-803-11	METAL CHIP	33	5%	1/16W
R144	1-216-833-11	METAL CHIP	10K	5%	1/16W
R147	1-216-833-11	METAL CHIP	10K	5%	1/16W

Ref. No.	Part No.	Description			Remark
R149	1-216-839-11	METAL CHIP	33K	5%	1/16W
R150	1-216-849-11	METAL CHIP	220K	5%	1/16W
R151	1-216-835-11	METAL CHIP	15K	5%	1/16W
R152	1-216-835-11	METAL CHIP	15K	5%	1/16W
R153	1-216-815-11	METAL CHIP	330	5%	1/16W
R501	1-216-815-11	METAL CHIP	330	5%	1/16W
R502	1-216-815-11	METAL CHIP	330	5%	1/16W
R503	1-216-821-11	METAL CHIP	1K	5%	1/16W
R504	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R505	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R506	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R507	1-216-821-11	METAL CHIP	1K	5%	1/16W
R508	1-216-815-11	METAL CHIP	330	5%	1/16W
R509	1-216-833-11	METAL CHIP	10K	5%	1/16W
R510	1-216-841-11	METAL CHIP	47K	5%	1/16W
R511	1-216-849-11	METAL CHIP	220K	5%	1/16W
R512	1-216-851-11	METAL CHIP	330K	5%	1/16W
R513	1-216-833-11	METAL CHIP	10K	5%	1/16W
R514	1-216-807-11	METAL CHIP	68	5%	1/16W
R518	1-216-841-11	METAL CHIP	47K	5%	1/16W
R601	1-216-849-11	METAL CHIP	220K	5%	1/16W
R602	1-216-843-11	METAL CHIP	68K	5%	1/16W
R603	1-216-821-11	METAL CHIP	1K	5%	1/16W
R605	1-216-823-11	METAL CHIP	1.5K	5%	1/16W
R606	1-216-857-11	METAL CHIP	1M	5%	1/16W
R607	1-216-821-11	METAL CHIP	1K	5%	1/16W
R608	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
		< VARIABLE RESISTOR >			
RV101	1-237-731-21	RES, VAR, CARBON 10K (VOL)			
RV601	1-223-584-11	RES, ADJ, CARBON 2.2K			
RV602	1-223-584-11	RES, ADJ, CARBON 2.2K			
		< SWITCH >			
S101	1-572-964-11	SWITCH, SLIDE (REC/PB)			
S102	1-572-688-11	SWITCH, PUSH (1 KEY) (POWER)			
S103	1-692-605-31	SWITCH, SLIDE (VOR)			
S601	1-572-922-11	SWITCH, SLIDE (PAUSE)			
S602	1-692-298-11	SWITCH, SLIDE (TAPE SPEED)			
S603	1-572-922-11	SWITCH, SLIDE (FAST PB)			
		< THERMISTOR (POSITIVE) >			
THP601	1-810-552-11	THERMISTOR, POSITIVE			
THP602	1-803-117-11	THERMISTOR, POSITIVE			
**********					
		MISCELLANEOUS			
		**********			
15	1-468-399-11	LED UNIT			
137	1-548-579-41	COUNTER, TAPE (SMALL TYPE)			
HRPE901	1-500-593-11	HEAD, CERAMIC (REC/PB/ERASE)			
M901	1-698-533-11	MOTOR, DC (CAPSTAN/REEL) (WITH PULLEY)			
MIC901	1-542-386-11	MICROPHONE, ELECTRET CONDENSER			
SP901	1-529-188-11	SPEAKER (3.6cm)			
**********					

Ref. No.	Part No.	Description	Remark
		ACCESSORIES & PACKING MATERIALS	
		**********	
⚠	1-528-405-51	ADAPTOR, BATTERY CHARGE (645V)	
	1-542-307-31	MICROPHONE (647V)	
⚠	1-693-073-21	ADAPTOR, AC (AC-E351) (645V)	
	1-756-035-31	BATTERY PACK (NC-WMAA) (645V)	
	3-035-588-01	POUCH, CARRYING (640V: EE, JE/647V)	
	3-229-705-01	MANUAL, INSTRUCTION (JAPANESE) (640V: JE)	
	3-229-705-11	MANUAL, INSTRUCTION (ENGLISH, SIMPLEFEID CHINESE, HUNGARIAN, RUSSIAN) (640V: EE, CH, JE)	
	3-229-705-21	MANUAL, INSTRUCTION (TRADITIONAL CHINESE, KOREAN, POLISH, CZECK) (640V: EE, JE)	
	3-229-705-31	MANUAL, INSTRUCTION (ENGLISH, SLOVAKIAN) (640V: EE)	
	3-229-705-41	MANUAL, INSTRUCTION (ENGLISH, SPANISH) (645V/647V)	
	3-229-705-71	MANUAL, INSTRUCTION (ENGLISH, SPANISH, PORTUGUESE, ITALIAN) (640V: E)	
	3-229-705-91	MANUAL, INSTRUCTION (ENGLISH, TRADITIONAL CHINESE) (640V: E1)	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

REVISION HISTORY

Clicking the version allows you to jump to the revised page.
Also, clicking the version at the upper right on the revised page allows you to jump to the next revised page.

Ver.	Date	Description of Revision
1.0	2001.02	New