TCM-150

SERVICE MANUAL

E Model
Chinese Model

Ver 1.2 2003. 06

Model Name Using Similar Mechanism	NEW
Tape Transport Mechanism Type	MT-150-175

SPECIFICATIONS

Recording system
2-track 1 channel monaural
Tape speed
4.8 cm/s or 2.4 cm/s
Frequency range
250 - 6 300 Hz using nomal (TYPE I) cassette
Speaker
Approx. 5.0 cm (2 in.) dia.
Power output
250 mW (at 10% harmonic distortion)
Output
Earphone jack (minijack) for 8 - 300 Ω earphone
Power requirements
- 3 V DC batteries R6 (AA) x 2
- External DC 3 V power sources

Dimensions (w/h/d) (incl. projecting parts and controls)
Approx. 86.9 × 116.3 × 36.5 mm (3 1/2 × 4 5/8 × 1 7/16 in.)
Mass (main unit only)
Approx. 169 g (6.0 oz.)

Design and specifications are subject to change without notice.

Battery life* **(approx. hours)**

	Sony alkaline LR6 (SG)**	Sony R6P (SR)
Playback	16	4
Recording	25	6.5

* Measured value by the standard of JEITA (Japan Electronics and Information Technology Industries Association). (Using a Sony HF series cassette tape)
** When using a Sony LR6 (SG) "STAMINA" alkaline dry batteries (produced in Japan)

Note
The battery life may shorten depending on the operation of the unit.

For maximum performance we recommend that you use alkaline batteries.

House Current

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

Polarity of the plug

Notes
- Specifications for AC-E30HG vary for each area. Check your local voltage and the shape of the plug before purchasing.
- Do not touch the AC power adaptor with wet hands.
- Connect the AC power adaptor to an easily accessible AC outlet. Should you notice an abnormality in the AC power adaptor, disconnect it from the AC outlet immediately.

CASSETTE-CORDER

9-874-161-03
2003F16-1

Sony Corporation
Personal Audio Company
Published by Sony Engineering Corporation

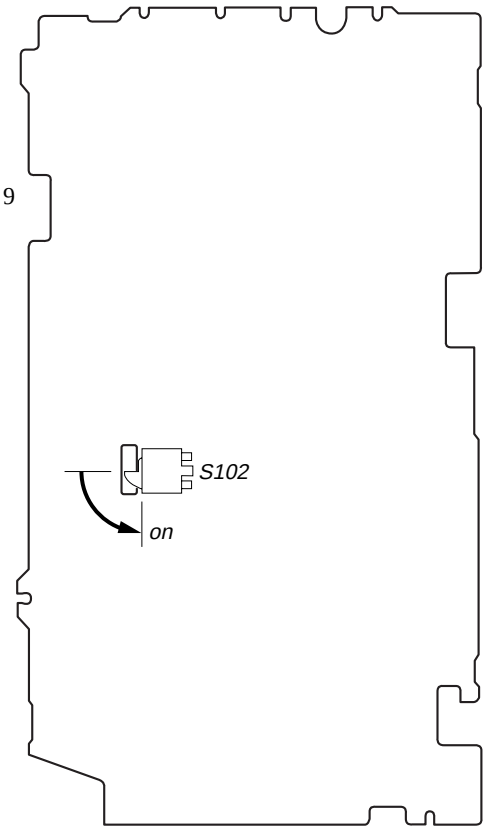
SONY®

SECTION 1
SERVICING NOTE

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 (Component Side) –

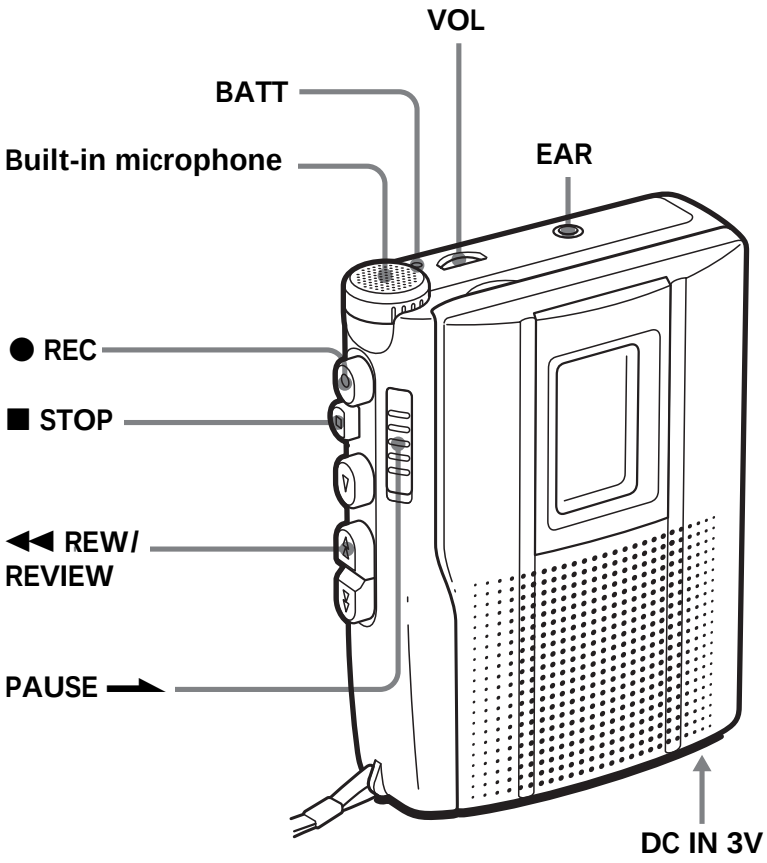


Flexible Circuit Board Repairing
- Keep the temperature of the soldering iron around 270 ˚C during repairing.
- Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
- Be careful not to apply force on the conductor when soldering or unsoldering.

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.

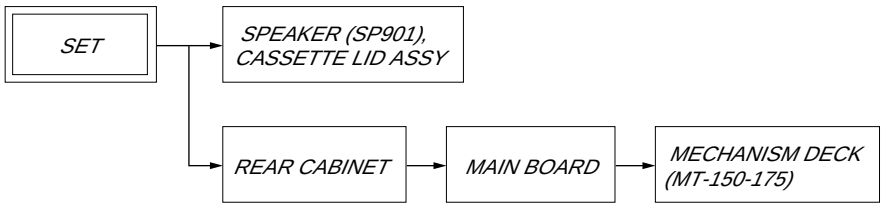
SECTION 2
GENERAL

- **Location of Controls**

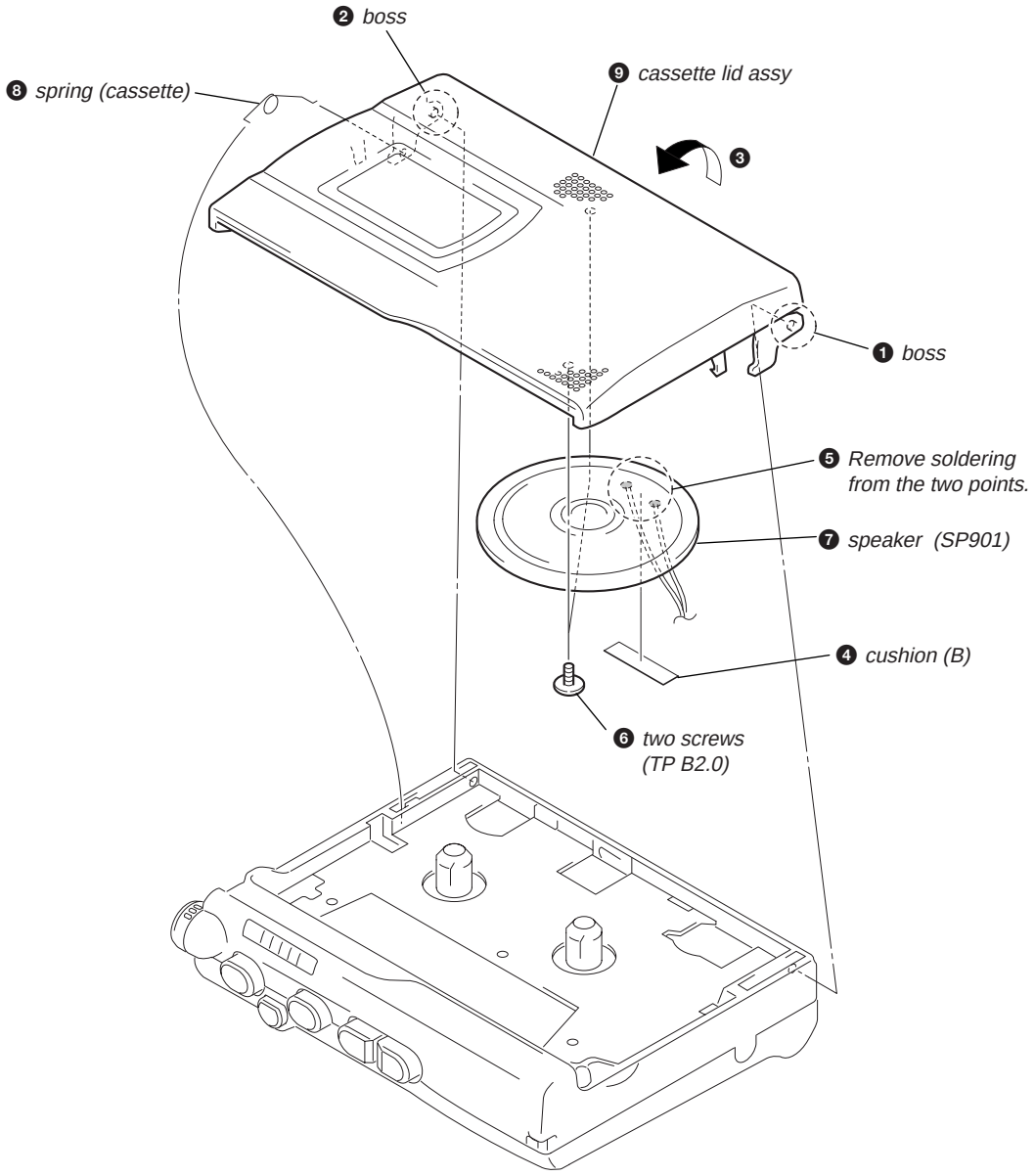


SECTION 3
DISASSEMBLY

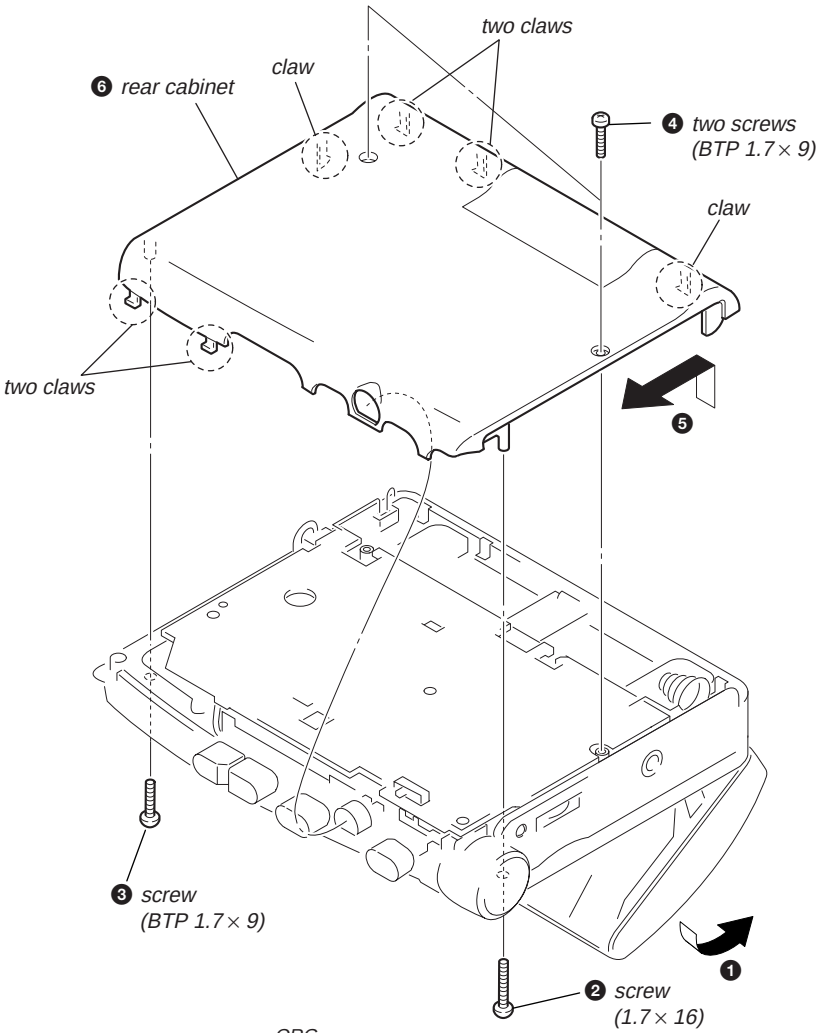
Note: Follow the disassembly procedure in the numerical order given.



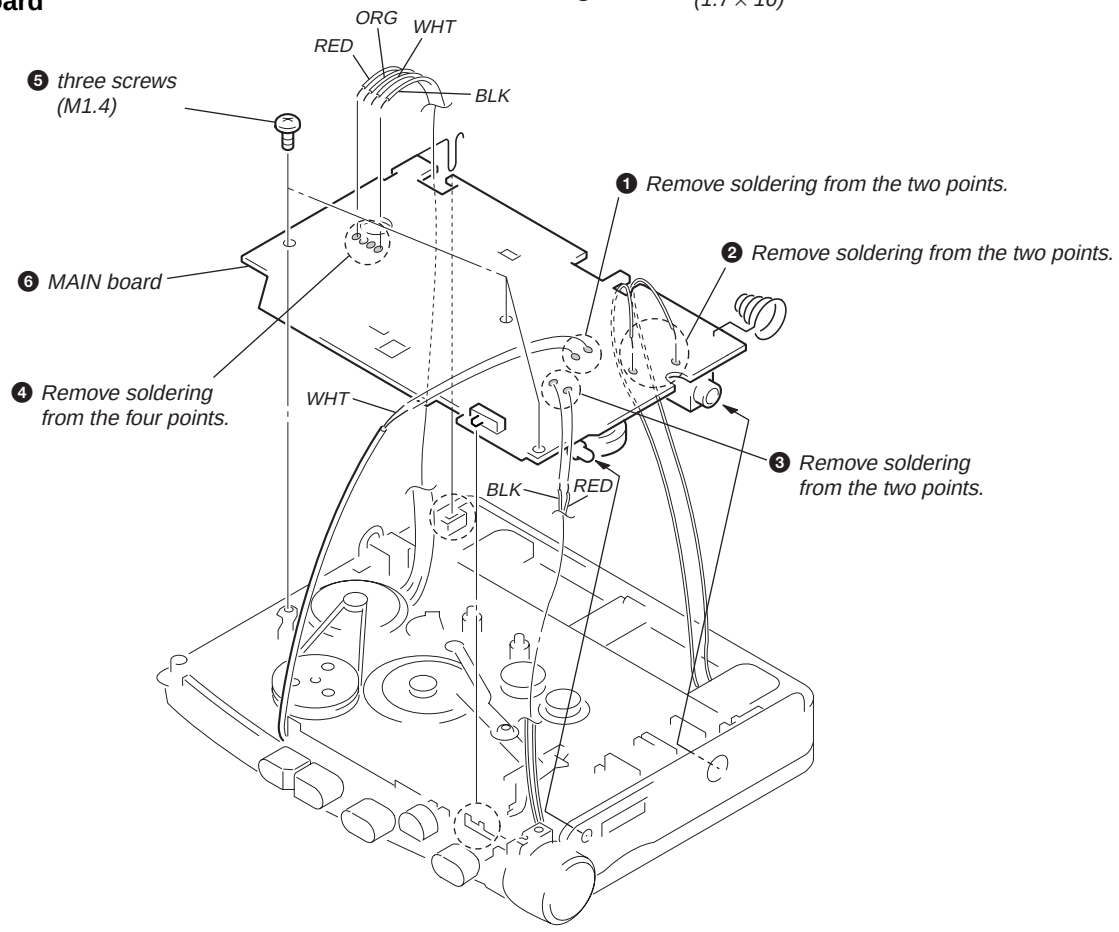
3-1. Speaker (SP901), Cassette Lid Assy



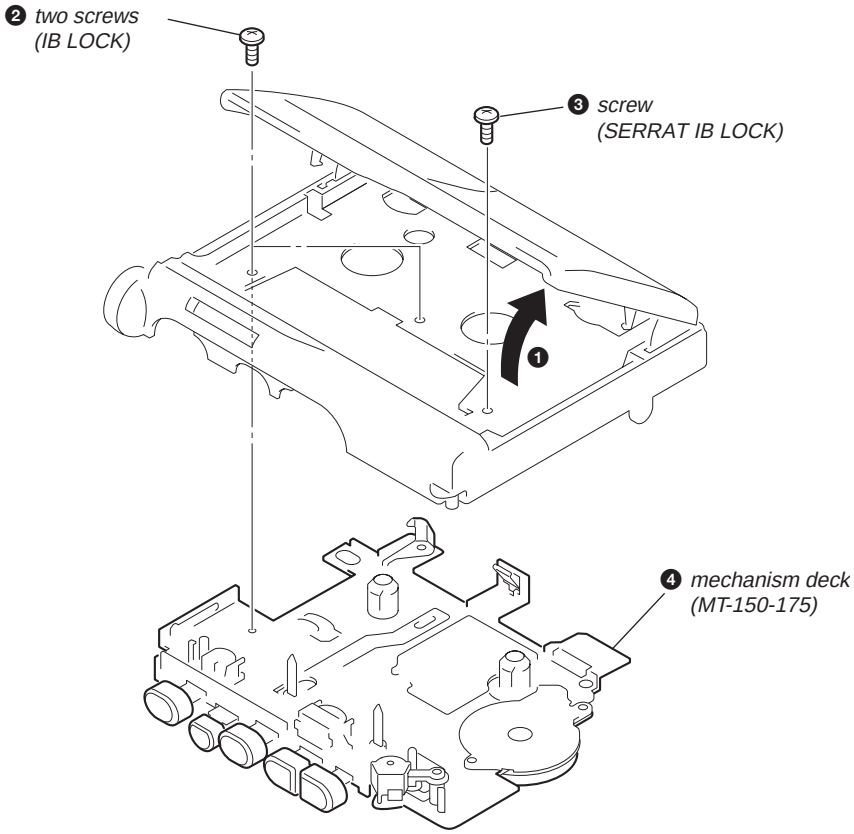
3-2. Rear Cabinet



3-3. MAIN Board



3-4. Mechanism Deck (MT-150-175)



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	2.16 - 4.7 mN•m (22 - 48 g•cm) (0.31 - 0.67 oz•inch)
FWD Back Tension		0.05 - 0.29 mN•m (0.5 - 3 g•cm) (0.007 - 0.04 oz•inch)
FF	CQ-201B	4.90 mN•m (more than 50 g•cm) (more than 0.69 oz•inch)
REW		

Tape Tension Measurement

Mode	Torque Meter	Meter Reading
FWD	CQ-403C	4.90 mN•m (more than 50 g) (more than 1.76 oz)

SECTION 5
ELECTRICAL ADJUSTMENTS

Setting:
- Supplied voltage: 2.5 V
- Switch and control position
  VOL control (RV101) : mechanical center
  PAUSE switch (S301) : OFF

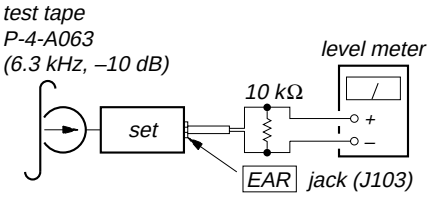
Test Tape

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

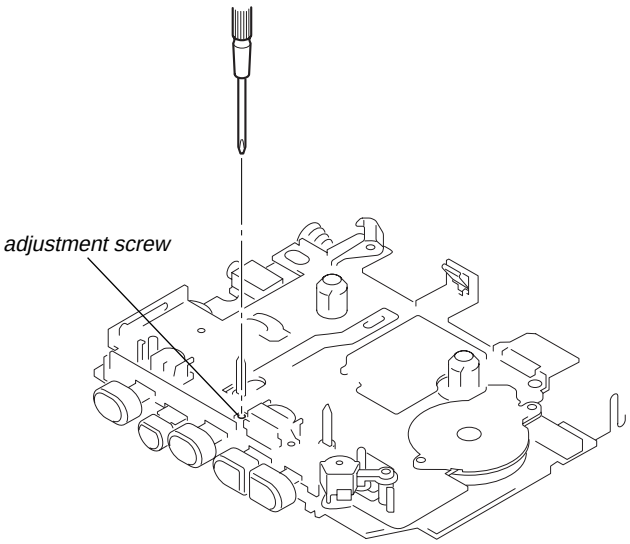
Record/Playback Head Azimuth Adjustment

Mode: playback



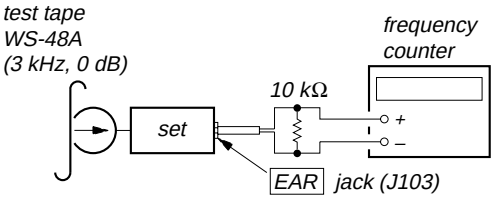
Procedure:
1. Turn the adjustment screw to obtain the maximum reading on level meter.
   Note: Several peaks may appear, but take the maximum.
2. After the adjustment, lock the adjustment screw with suitable locking compound.

Adjustment Location:



Tape Speed Adjustment

Mode: playback



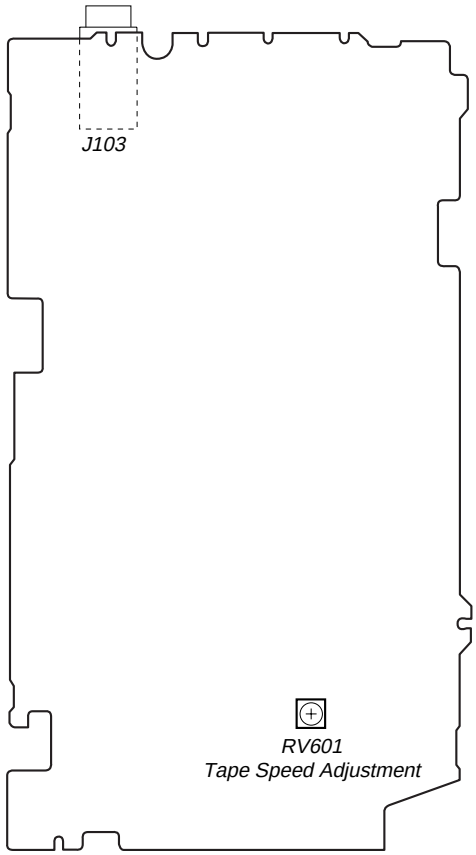
Procedure:
1. Playback the tape (WS-48A) .
2. Adjust RV601 so that frequency counter reading becomes 3,040 Hz.

Specification values: 3,030 to 3,050 Hz

Confirm that deflection of the frequency counter reading between the beginning and the end of tape is within 1% (approx. 30.4 Hz).

Adjustment Location:

– MAIN Board (Conductor Side) –



SECTION 6
DIAGRAMS

Note on Schematic Diagram

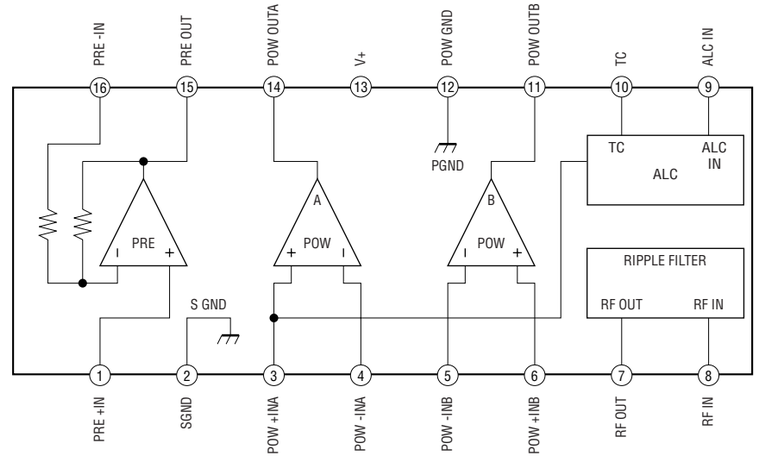
- All capacitors are in μF unless otherwise noted. pF: μμF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4 W or less unless otherwise specified.
- ▭ : panel designation.
- ▬ : B+ Line.
- ▭ : adjustment for repair.
- Power voltage is dc 3V and fed with regulated dc power supply from battery terminal.
- Voltages and waveforms 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.
- Voltage variations may be noted due to normal production tolerances.
- Signal path.
  : PB
  : REC

Note on Printed Wiring Boards:

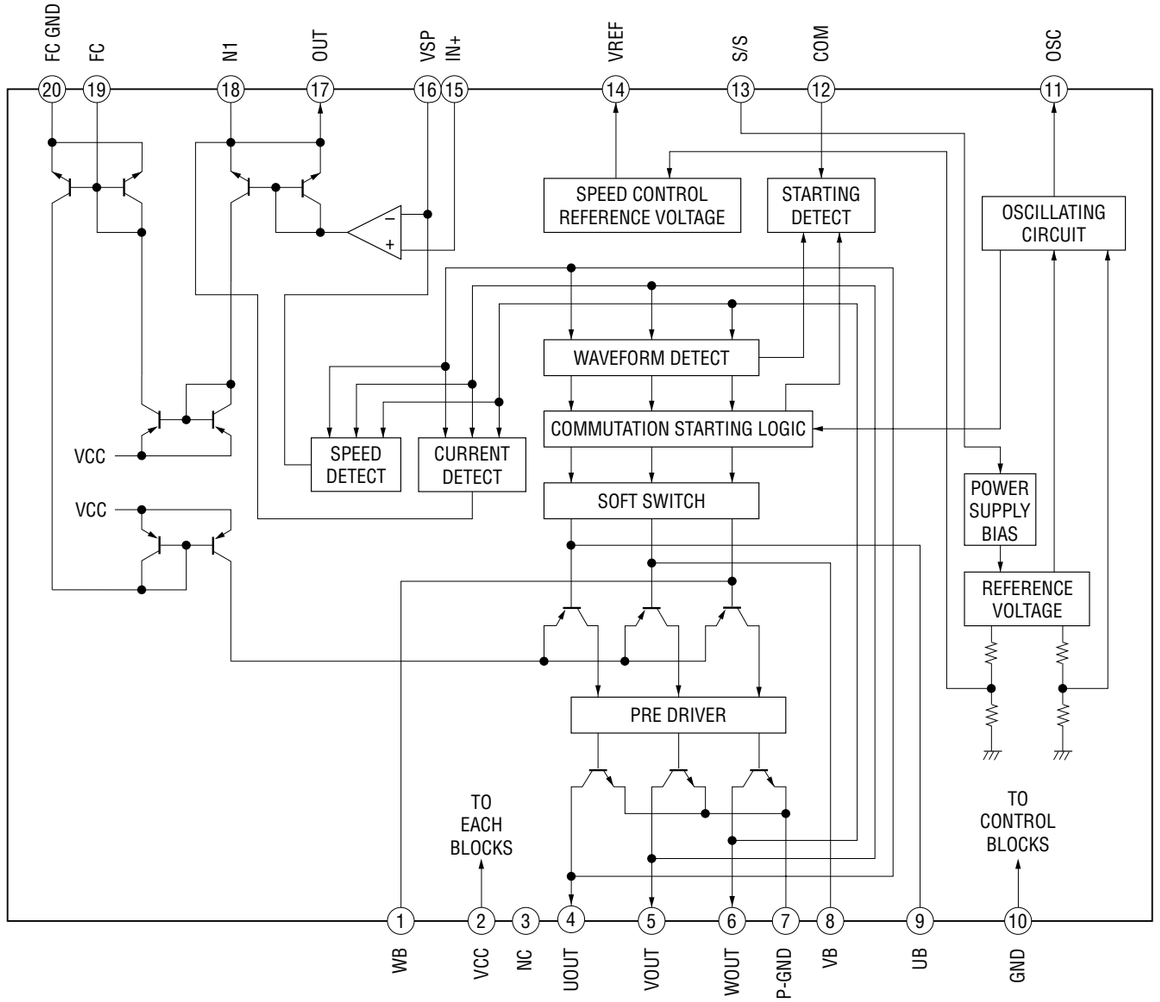
- ○——— : parts extracted from the component side.
- ▬ : Pattern from the side which enables seeing.

• IC Block Diagrams

IC101 NJM2775AM (TE2)

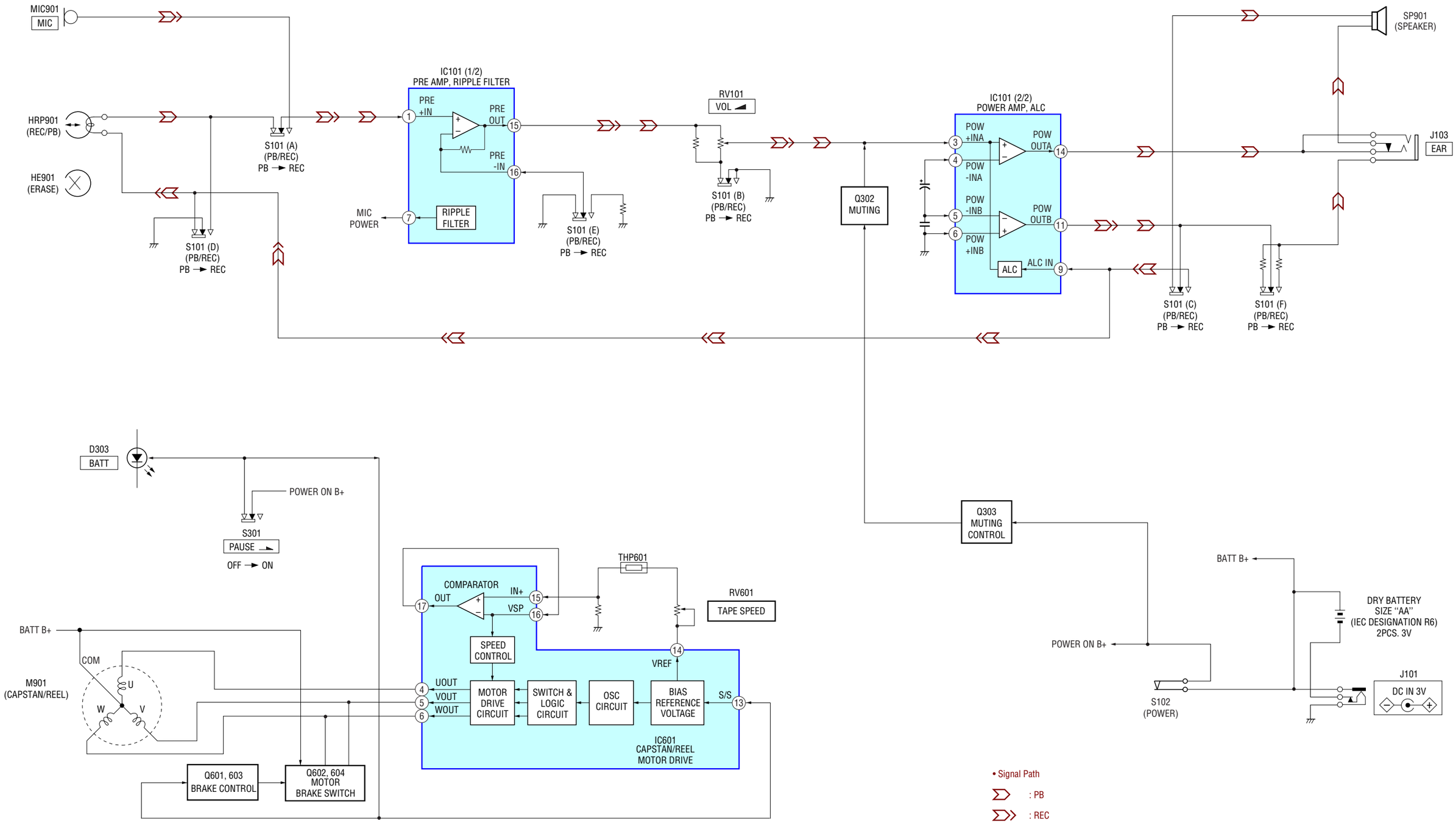


IC601 LB1979VS-TLM



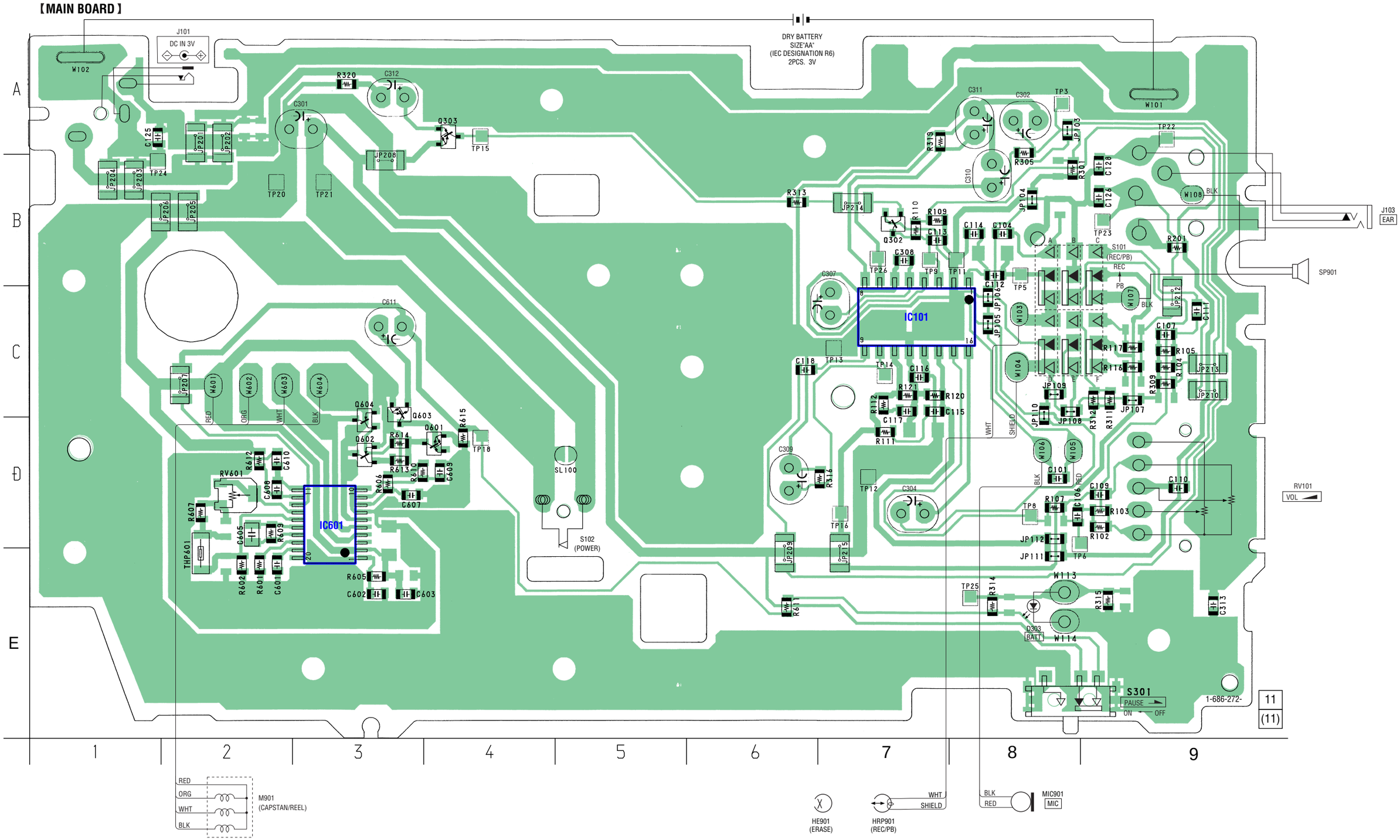
TCM-150

6-1. Block Diagram



6-2. Printed Wiring Board

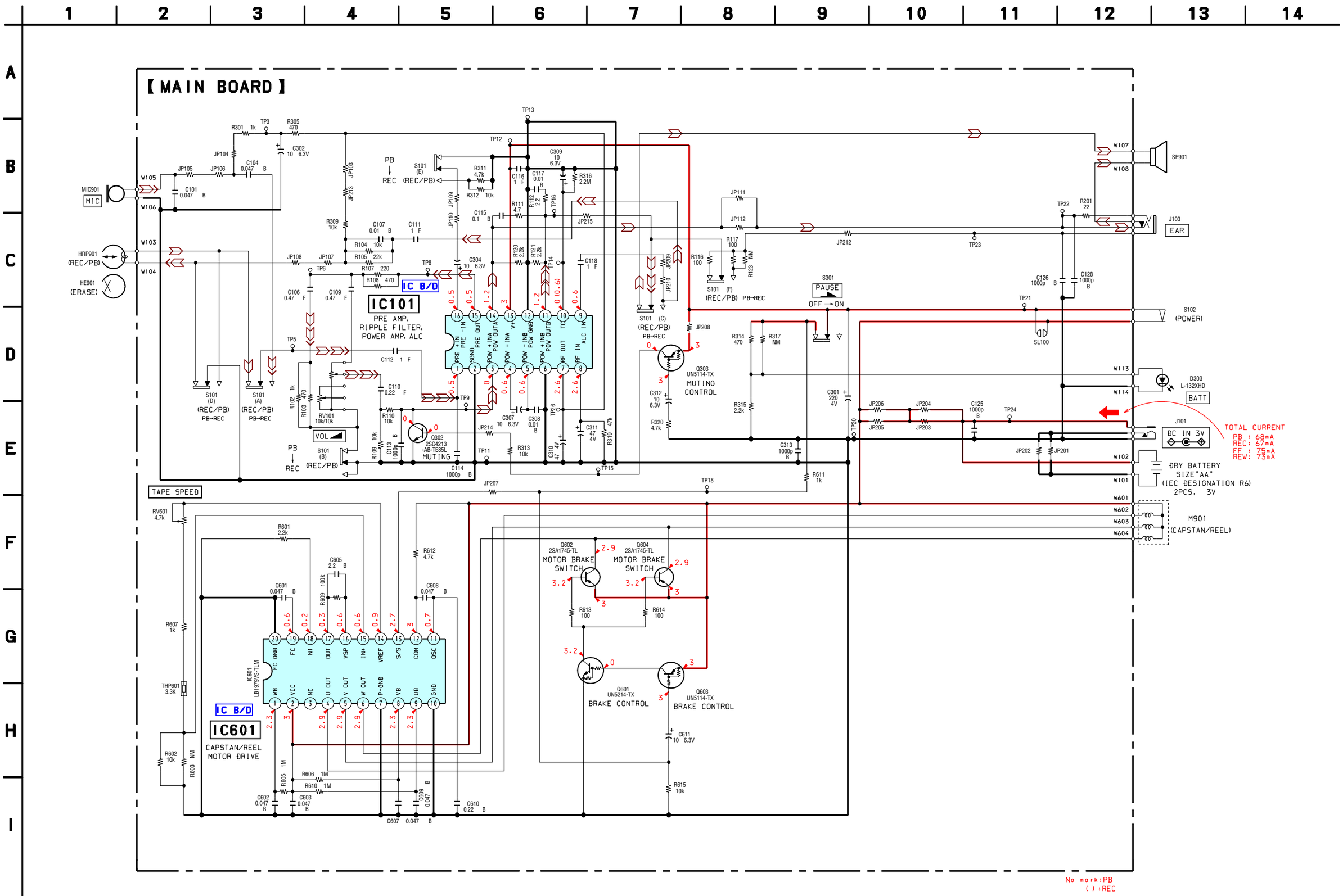
【MAIN BOARD】



• **Semiconductor Location**

Ref. No.	Location	Ref. No.	Location
D303	E-8	Q303	A-4
		Q601	D-4
IC101	C-7	Q602	D-3
IC601	D-3	Q603	C-3
		Q604	C-3
Q302	B-7		

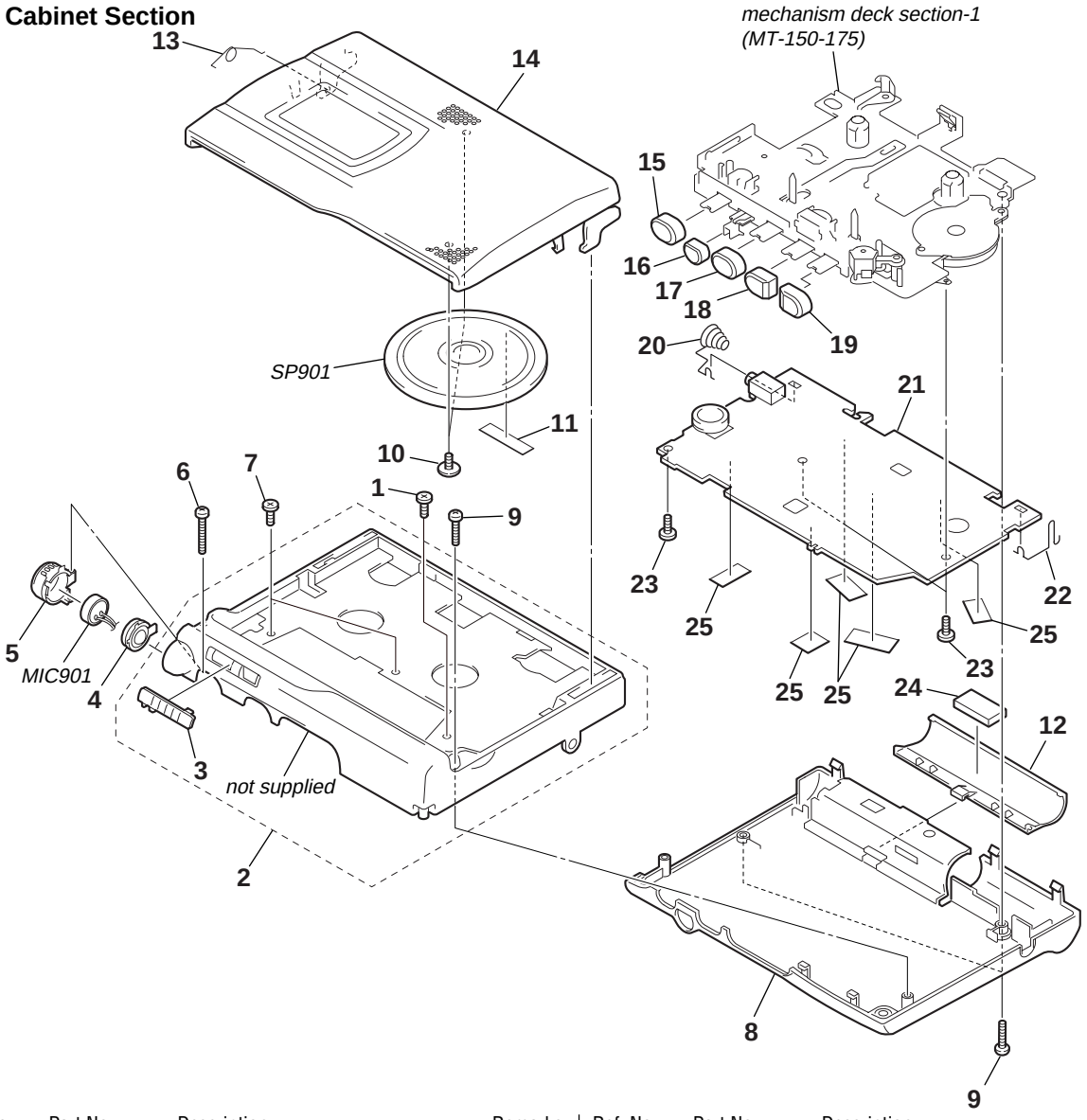
6-3. Schematic Diagram



SECTION 7
EXPLODED VIEWS

NOTE:
- -XX and -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.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Accessories are given in the last of the electrical parts list.
- Abbreviation
  1E : No indication of country of origin
  CH : Chinese model
  MX : Mexican model
  TW : Taiwan model
  EA : Saudi Arabia model

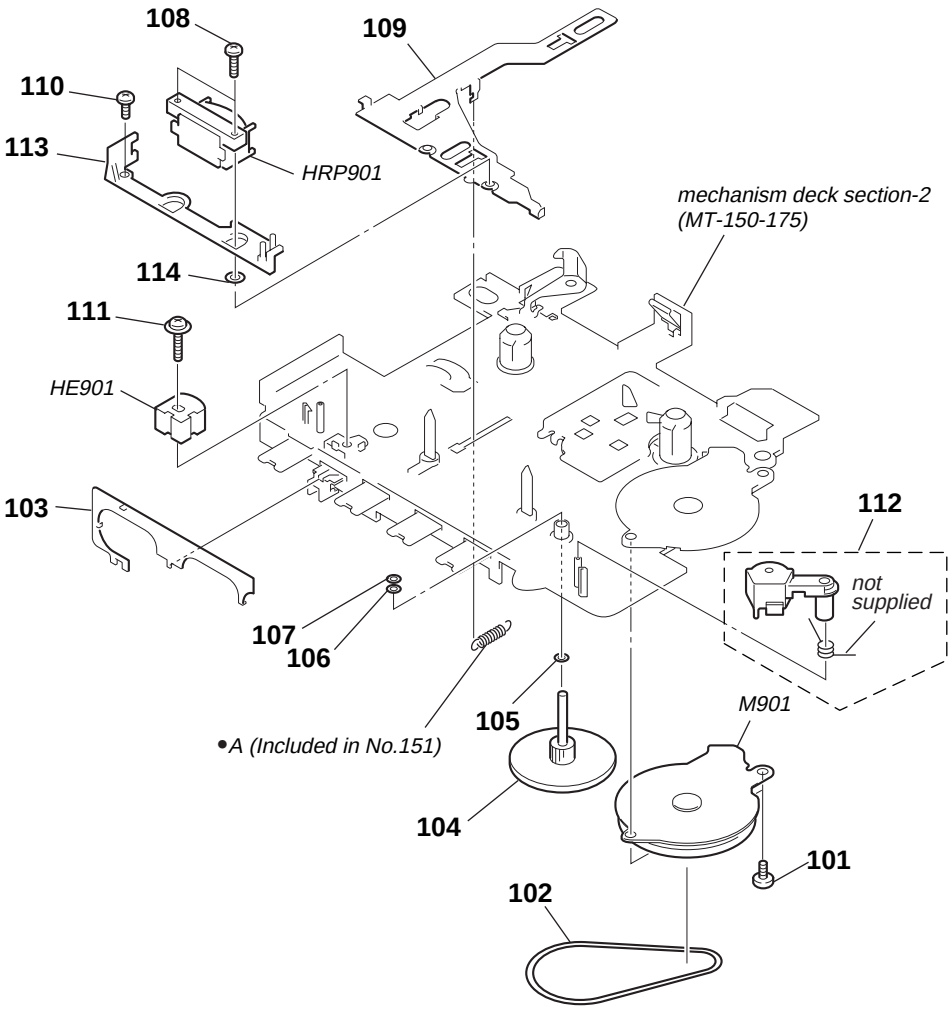
7-1. Cabinet Section



Ref. No.	Part No.	Description	Remarks
1	3-704-197-31	LOCK, SERRAT IB	
2	X-3382-605-1	FRONT ASSY, CABINET	
3	3-245-732-01	KNOB (PAUSE)	
4	3-245-735-01	CUSHION, MICROPHONE	
5	3-245-734-01	GRILLE, MICROPHONE	
6	3-035-255-01	SCREW (1.7X16)	
7	3-704-197-42	SCREW (IB LOCK)	
8	3-245-730-21	REAR, CABINET (CH, E, MX, TW)	
8	3-245-730-31	REAR, CABINET (1E)	
8	3-245-780-42	CABINET (REAR)(EA)	
9	3-318-203-92	SCREW (B1.7X9), TAPPING	
10	3-034-792-01	SCREW, TAPPING (B2.0)	
11	4-017-441-01	CUSHION (B)	
12	3-245-731-01	LID, BATTERY	
13	3-245-737-01	SPRING (CASSETTE)	

Ref. No.	Part No.	Description	Remarks
14	X-3382-533-1	LID ASSY, CASSETTE	
15	3-245-736-01	BUTTON (REC)	
16	3-235-589-01	BUTTON (STOP)	
17	3-234-568-01	BUTTON (PLAY)	
18	3-234-570-01	BUTTON (REW)	
19	3-234-569-01	BUTTON (FF)	
20	3-245-751-01	TERMINAL (-), BATTERY	
* 21	A-3178-938-A	MAIN BOARD, COMPLETE	
22	3-245-750-01	TERMINAL (+), BATTERY	
23	3-345-648-01	SCREW (M1.4), TOOTHED LOCK	
24	3-917-753-31	CUSHION	
25	3-831-441-99	SPEAKER, KNOB	
MIC901	1-542-502-11	DRIVER, MICROPHONE	
SP901	1-825-232-11	SPEAKER	

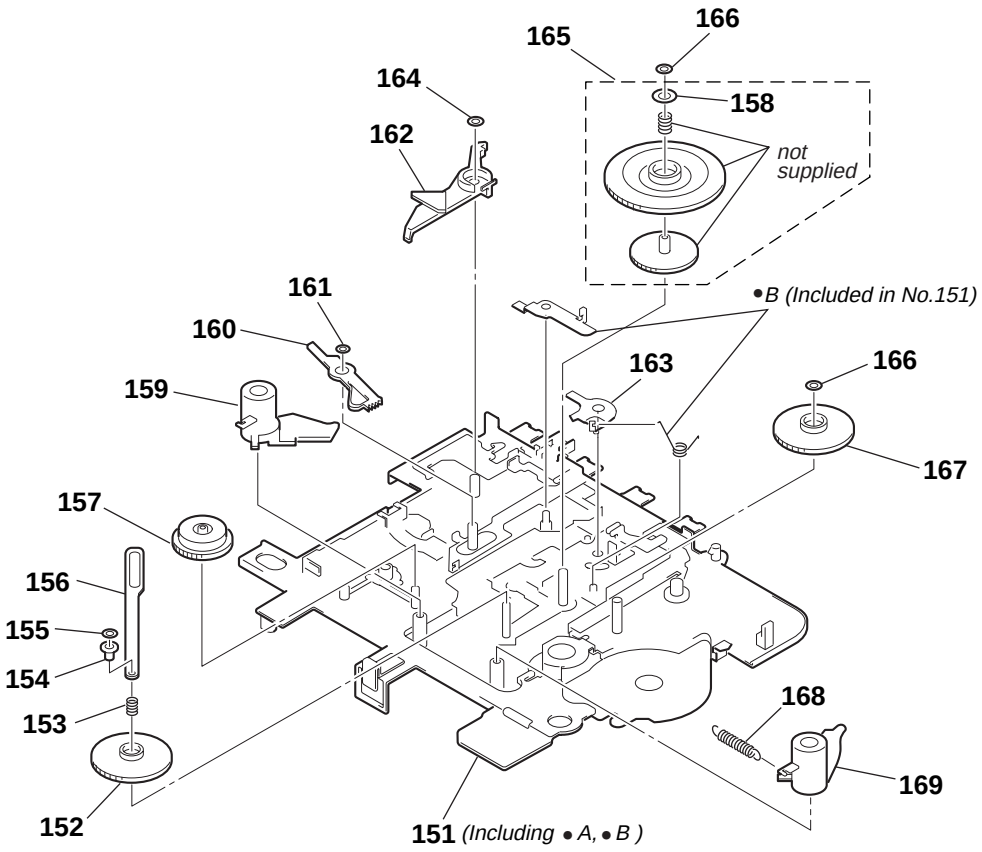
7-2. Mechanism Deck Section-1 (MT-150-175)



Ref. No.	Part No.	Description	Remarks
101	3-704-197-01	SCREW (M1.4), SPECIAL HEAD	
102	3-234-857-01	BELT (CAP)	
103	3-234-856-01	LEVER (PAUSE)	
104	X-3379-877-1	FLY ASSY (AR), CAPSTAN	
105	3-386-694-01	WASHER	
106	3-029-278-01	WASHER	
107	3-029-275-01	WASHER (STOPPER N)	
108	3-703-816-73	SCREW (M1.4), SPECIAL HEAD	
109	3-234-863-01	BRACKET (ARO), HEAD	

Ref. No.	Part No.	Description	Remarks
110	3-704-197-23	SCREW (M1.4X2.5), SPECIAL HEAD	
111	3-703-925-21	SCREW (M1.4)	
112	X-3379-882-1	PINCH (N) ASSY, ARM	
113	3-234-861-01	GUIDE (ARO), TAPE	
114	3-231-358-01	WASHER	
HE901	1-500-515-11	HEAD, MAGNETIC (ERASE)	
HRP901	1-500-717-11	HEAD,MAGNETIC(REC/PB)	
M901	1-763-772-11	MOTOR, DC (CAPSTAN/REEL)	

7-3. Mechanism Deck Section-2 (MT-150-175)



Ref. No.	Part No.	Description	Remarks
151	X-3381-206-1	CHASSIS ASSY (ARO)	
152	3-225-385-01	GEAR (B)	
153	3-229-063-01	SPRING (UD) (R), COMPRESSION	
154	3-019-778-01	SLEEVE (MS)	
155	3-728-091-01	WASHER, STOPPER	
156	3-225-427-01	WASHER, LEVER	
157	3-225-384-01	GEAR (A)	
158	3-344-901-01	WASHER, STOPPER	
159	3-225-395-01	LEVER (REW ROTARY)	
160	X-3380-677-1	LEVER (E DETECTION) ASSY	

Ref. No.	Part No.	Description	Remarks
161	3-229-064-01	WASHER, STOPPER	
162	3-225-393-01	LEVER (SHUT/OFF)	
163	X-3381-450-1	LEVER (EASY-N) ASSY	
164	3-321-813-71	WASHER, COTTER POLYETHYLENE	
165	X-3379-881-1	CLUTCH ASSY (AR)	
166	3-315-384-31	WASHER, STOPPER	
167	3-225-388-01	GEAR (D)	
168	3-225-444-01	SPRING (FR ROTARY), TENSION	
169	3-225-394-01	LEVER (FF ROTARY)	

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
- Abbreviation
  1E : No indication of country of origin
  CH : Chinese model
  MX : Mexican model
  TW : Taiwan model
  EA : Saudi Arabia model

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

Ref. No.	Part No.	Description			Remark
*	A-3178-938-A	MAIN BOARD, COMPLETE **********			
		< CAPACITOR >			
C101	1-165-176-11	CERAMIC CHIP	0.047uF	10.00%	16V
C104	1-165-176-11	CERAMIC CHIP	0.047uF	10.00%	16V
C106	1-113-619-11	CERAMIC CHIP	0.47uF		10V
C107	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C109	1-113-619-11	CERAMIC CHIP	0.47uF		10V
C110	1-115-467-11	CERAMIC CHIP	0.22uF	10.00%	10V
C111	1-115-156-11	CERAMIC CHIP	1uF		10V
C112	1-115-156-11	CERAMIC CHIP	1uF		10V
C113	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C114	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C115	1-107-826-11	CERAMIC CHIP	0.1uF	10.00%	16V
C116	1-115-156-11	CERAMIC CHIP	1uF		10V
C117	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C118	1-115-156-11	CERAMIC CHIP	1uF		10V
C125	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C126	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C128	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C301	1-124-434-00	ELECT	220uF	20.00%	4V
C302	1-124-435-61	ELECT	10uF	20%	6.3V
C304	1-124-435-61	ELECT	10uF	20%	6.3V
C307	1-124-435-61	ELECT	10uF	20%	6.3V
C308	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C309	1-124-435-61	ELECT	10uF	20%	6.3V
C310	1-107-794-71	ELECT	47uF	20%	4V
C311	1-107-794-71	ELECT	47uF	20%	4V
C312	1-124-435-61	ELECT	10uF	20%	6.3V
C313	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C601	1-117-863-11	CERAMIC CHIP	0.47uF	10.00%	6.3V
C602	1-165-176-11	CERAMIC CHIP	0.047uF	10.00%	16V
C603	1-165-176-11	CERAMIC CHIP	0.047uF	10.00%	16V
C605	1-125-838-11	CERAMIC CHIP	2.2uF	10%	6.3V
C607	1-165-176-11	CERAMIC CHIP	0.047uF	10.00%	16V
C608	1-165-176-11	CERAMIC CHIP	0.047uF	10.00%	16V
C609	1-165-176-11	CERAMIC CHIP	0.047uF	10.00%	16V
C610	1-115-467-11	CERAMIC CHIP	0.22uF	10.00%	10V
C611	1-124-435-61	ELECT	10uF	20%	6.3V
		< DIODE >			
D303	8-719-057-27	DIODE L-132XHD (BATT)			
		< IC >			
IC101	6-701-379-01	IC NJM2775AM (TE2)			
IC601	8-759-638-51	IC LB1979VS-TLM			
		< JACK >			
J101	1-794-615-11	JACK,DC (POLARITY UNIFIED TYPE)(DC IN 3V)			
J103	1-766-847-12	JACK (EAR)			
		< CONDUCTOR >			
JP103	1-216-864-11	METAL CHIP	0	5%	1/10W
JP104	1-216-864-11	METAL CHIP	0	5%	1/10W
JP105	1-216-864-11	METAL CHIP	0	5%	1/10W
JP106	1-216-864-11	METAL CHIP	0	5%	1/10W
JP107	1-216-864-11	METAL CHIP	0	5%	1/10W
JP108	1-216-864-11	METAL CHIP	0	5%	1/10W
JP109	1-216-864-11	METAL CHIP	0	5%	1/10W
JP110	1-216-864-11	METAL CHIP	0	5%	1/10W
JP111	1-216-864-11	METAL CHIP	0	5%	1/10W
JP112	1-216-864-11	METAL CHIP	0	5%	1/10W
JP201	1-216-296-11	SHORT CHIP	0		
JP202	1-216-296-11	SHORT CHIP	0		
JP203	1-216-296-11	SHORT CHIP	0		
JP204	1-216-296-11	SHORT CHIP	0		
JP205	1-216-296-11	SHORT CHIP	0		
JP206	1-216-296-11	SHORT CHIP	0		
JP207	1-216-296-11	SHORT CHIP	0		
JP208	1-216-296-11	SHORT CHIP	0		
JP209	1-216-296-11	SHORT CHIP	0		
JP210	1-216-296-11	SHORT CHIP	0		
JP212	1-216-296-11	SHORT CHIP	0		
JP213	1-216-296-11	SHORT CHIP	0		
JP214	1-216-296-11	SHORT CHIP	0		
JP215	1-216-296-11	SHORT CHIP	0		
		< TRANSISTOR >			
Q302	8-729-013-37	TRANSISTOR	2SC4213-AB-TE85L		
Q303	8-729-402-96	TRANSISTOR	UN5114-TX		
Q601	8-729-402-93	TRANSISTOR	UN5214-TX		
Q602	8-729-823-86	TRANSISTOR	2SA1745-TL		
Q603	8-729-402-96	TRANSISTOR	UN5114-TX		
Q604	8-729-823-86	TRANSISTOR	2SA1745-TL		
		< RESISTOR >			
R102	1-216-821-11	METAL CHIP	1K	5%	1/10W
R103	1-216-817-11	METAL CHIP	470	5%	1/10W
R104	1-216-833-11	METAL CHIP	10K	5%	1/10W
R105	1-216-837-11	METAL CHIP	22K	5%	1/10W
R107	1-216-813-11	METAL CHIP	220	5%	1/10W

Ref. No.	Part No.	Description			Remarks
R109	1-216-833-11	METAL CHIP	10K	5%	1/10W
R110	1-216-833-11	METAL CHIP	10K	5%	1/10W
R111	1-216-793-11	METAL CHIP	4.7	5%	1/10W
R112	1-216-789-11	METAL CHIP	2.2	5%	1/10W
R116	1-216-809-11	METAL CHIP	100	5%	1/10W
R117	1-216-809-11	METAL CHIP	100	5%	1/10W
R120	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R121	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R201	1-216-801-11	METAL CHIP	22	5%	1/10W
R301	1-216-821-11	METAL CHIP	1K	5%	1/10W
R305	1-216-817-11	METAL CHIP	470	5%	1/10W
R309	1-216-833-11	METAL CHIP	10K	5%	1/10W
R311	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R312	1-216-833-11	METAL CHIP	10K	5%	1/10W
R313	1-216-833-11	METAL CHIP	10K	5%	1/10W
R314	1-216-817-11	METAL CHIP	470	5%	1/10W
R315	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R316	1-216-861-11	METAL CHIP	2.2M	5%	1/10W
R319	1-216-841-11	METAL CHIP	47K	5%	1/10W
R320	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R601	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R602	1-216-833-11	METAL CHIP	10K	5%	1/10W
R605	1-216-857-11	METAL CHIP	1M	5%	1/10W
R606	1-216-857-11	METAL CHIP	1M	5%	1/10W
R607	1-216-821-11	METAL CHIP	1K	5%	1/10W
R609	1-216-845-11	METAL CHIP	100K	5%	1/10W
R610	1-216-857-11	METAL CHIP	1M	5%	1/10W
R611	1-216-821-11	METAL CHIP	1K	5%	1/10W
R612	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R613	1-216-809-11	METAL CHIP	100	5%	1/10W
R614	1-216-809-11	METAL CHIP	100	5%	1/10W
R615	1-216-833-11	METAL CHIP	10K	5%	1/10W

< VARIABLE RESISTOR >

RV101	1-225-362-11	RES, VAR, MAIN CARBON 10K/10K (VOL)
RV601	1-241-593-11	RES, ADJ, CERMET 4.7K

< SWITCH >

S101	1-786-282-11	SWITCH, SLIDE (REC/PB)
S102	1-762-302-11	SWITCH, DETECTION (SMALL TYPE)(POWER)
S301	1-572-922-11	SWITCH, SLIDE (PAUSE)

< THERMISTOR (POSITIVE) >

THP601	1-810-794-11	THERMISTOR, POSITIVE

****

Ref. No.	Part No.	Description	Remarks
		MISCELLANEOUS	
		**********	
HE901	1-500-515-12	HEAD, MAGNETIC (ERASE)	
HRP901	1-500-717-11	HEAD,MAGNETIC (REC/PB)	
M901	1-763-772-11	MOTOR, DC (CAPSTAN/REEL)	
MIC901	1-542-502-11	DRIVER, MICROPHONE	
SP901	1-825-232-11	SPEAKER	

****

		ACCESSORIES
		**********
	3-245-602-11	MANUAL, INSTRUCTION (ENGLISH,FRENCH,SPANISH)(E, MX)
	3-245-602-51	MANUAL, INSTRUCTION (ENGLISH,PORTUGUESE,CHINESE)(E, TW)
	3-245-602-71	MANUAL, INSTRUCTION (ENGLISH,CHINESE)(CH)
	3-245-602-81	MANUAL, INSTRUCTION (ENGLISH,PORTUGUESE,CHINESE)(1E)
	3-245-602-91	MANUAL, INSTRUCTION (ENGLISH,ARABIC)(EA)
	3-255-880-11	MANUAL, INSTRUCTION (SPANISH,PORTUGUESE)(E)