

TCM-20DV/21DV/ 22DV/23DV

SERVICE MANUAL

Ver 1.0 2000.02



Photo: TCM-20DV

US Model
TCM-20DV/21DV/22DV/23DV
Canadian Model
TCM-20DV/22DV
AEP Model
TCM-20DV/21DV
E Model
TCM-20DV/23DV
Chinese Model
TCM-20DV

| | |
|------------------------------------|-------------|
| Model Name Using Similar Mechanism | NEW |
| Tape Transport Mechanism Type | MT-20DV-118 |

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 normal (TYPE I) cassette (with REC TIME switch at "NORMAL")

Speaker
Approx. 3.6 cm (1 7/16 in.) dia.

Power output
250 mW (at 10 % harmonic distortion)

Input
Microphone input jack (minijack) sensitivity 0.2 mV for 3 kilohms or lower impedance microphone

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

Variable range of the tape speed
From approx. +30% to -15% (with REC TIME switch at "NORMAL")

Power requirements
3 V DC batteries R6 (AA) × 2 / External DC 3 V power sources

Dimensions (w/h/d) (incl. projecting parts and controls)
Approx. 112 × 36.6 × 90.3 mm (4 1/2 × 1 1/2 × 3 3/8 in.)

Mass
Approx. 175 g (6.2 oz.)

Supplied accessories

The instructions in this manual are for 4 models. The TCM-20DV is the model used for illustration purposes.

| TCM- | 23DV | 22DV | 21DV | 20DV |
|---|------|------|------|------|
| AC power adaptor (1) | — | ○ | — | — |
| Battery charger adaptor (1) | — | ○ | — | — |
| Rechargeable batteries (2) (NC-AA, 1.2V, 700mAh, Ni-Cd) | — | ○ | — | — |
| Cassette tape C-90 (1) | — | — | ○ | — |
| Battery LR6 (2) | — | — | ○ | — |
| Monaural microphone (1) | — | — | ○ | — |
| Super-directional microphone (1) | ○ | — | — | — |
| Carrying pouch (1) | — | — | ○ | — |
| Hand strap (1) (attached to the unit) | ○ | ○ | ○ | ○ |

Battery life (Approx. hours) (EIAJ*)

| | Playback | Recording |
|---|----------|-----------|
| Sony alkaline LR6 (SG) | 11 | 11 |
| Sony R6P (SR) | 3 | 3 |
| Sony rechargeable battery (NC-AA) fully charged (TCM-22DV only) | 3 | 3 |

* Measured value by the standard of EIAJ (Electronic Industries Association of Japan). (Using a Sony HF series cassette tape and playing back with speakers)

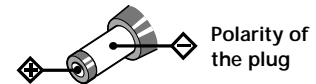
Note

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

For maximum performance we recommend that you use alkaline batteries.

House Current (see Fig. A-ⓐ)

Connect the AC power adaptor to DC IN 3V and to a wall outlet. The AC power adaptor is supplied only with the TCM-22DV. For other models, use 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 the plug before purchasing.

Design and specifications are subject to change without notice.

CASSETTE-CORDER

SONY®

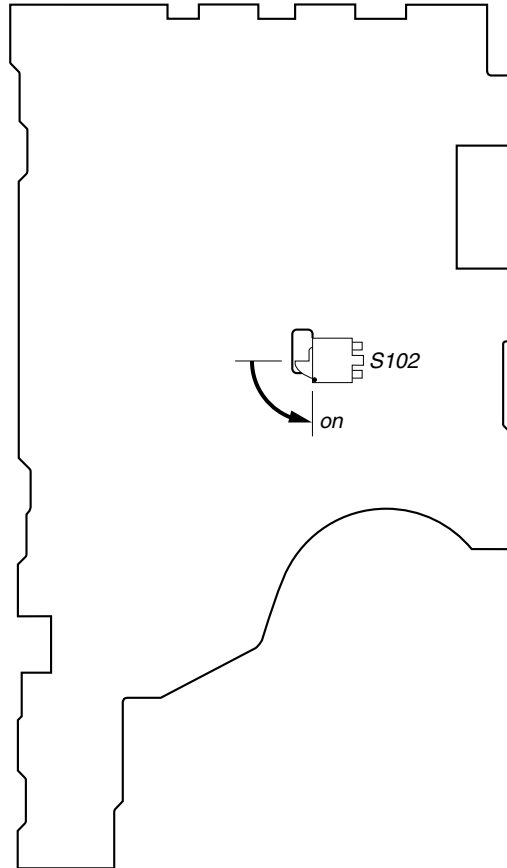
SECTION 1 SERVICING NOTES

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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) –



SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK \triangle OR DOTTED LINE WITH MARK \triangle 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.

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

LES COMPOSANTS IDENTIFIÉS PAR UNE MARQUE \triangle SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPLÉMENTS PUBLIÉS PAR SONY.

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.

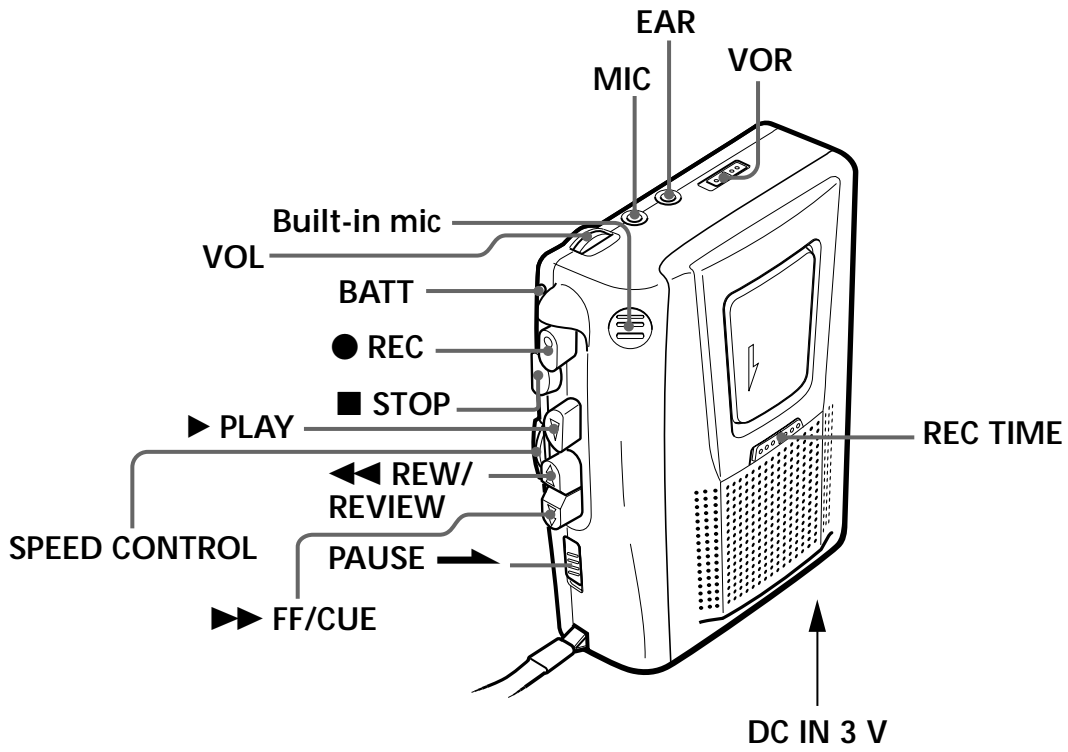
Notes on chip component replacement

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

SECTION 2 GENERAL

This section is extracted from instruction manual.

- Location of Controls



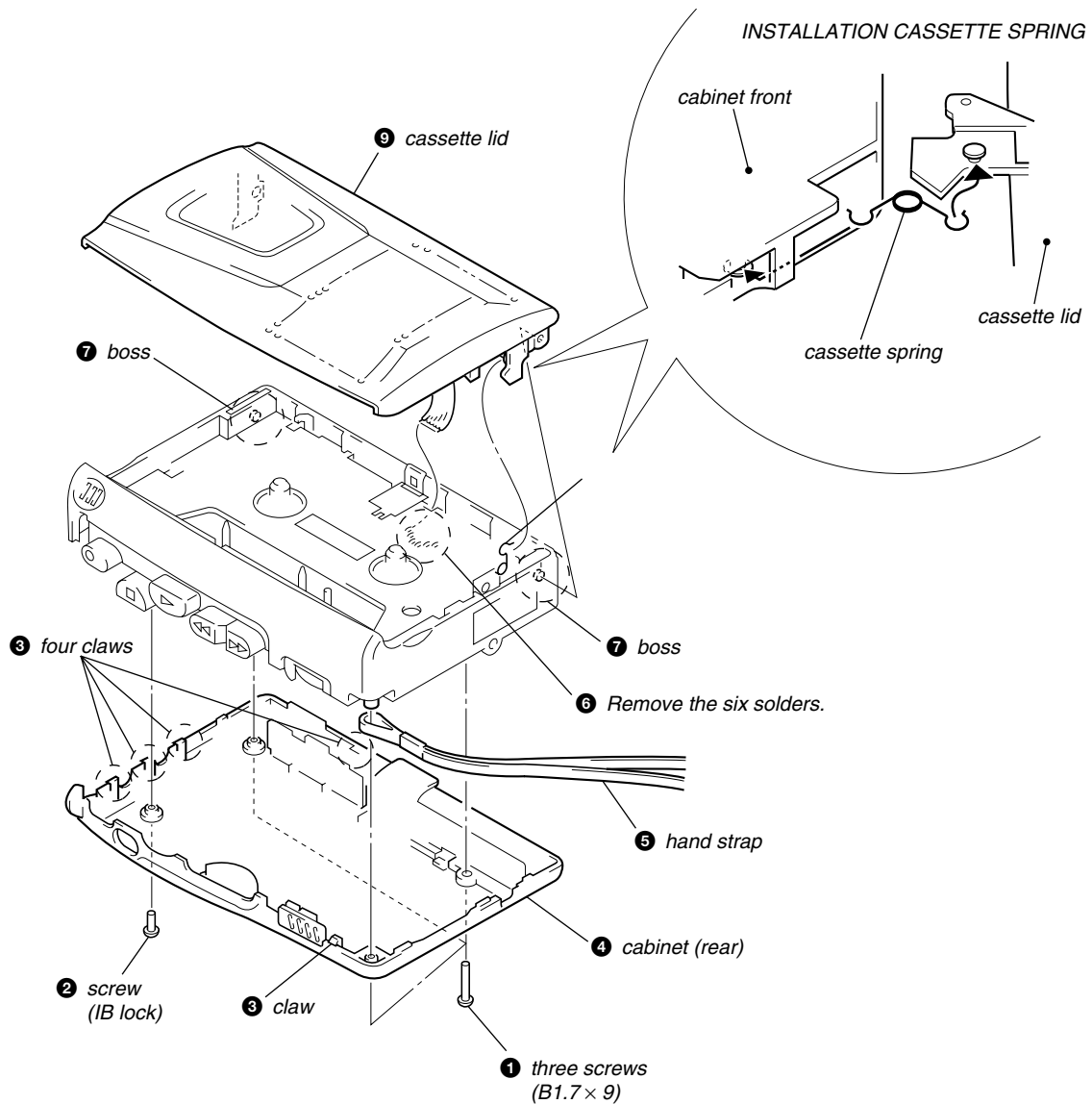
SECTION 3 DISASSEMBLY

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

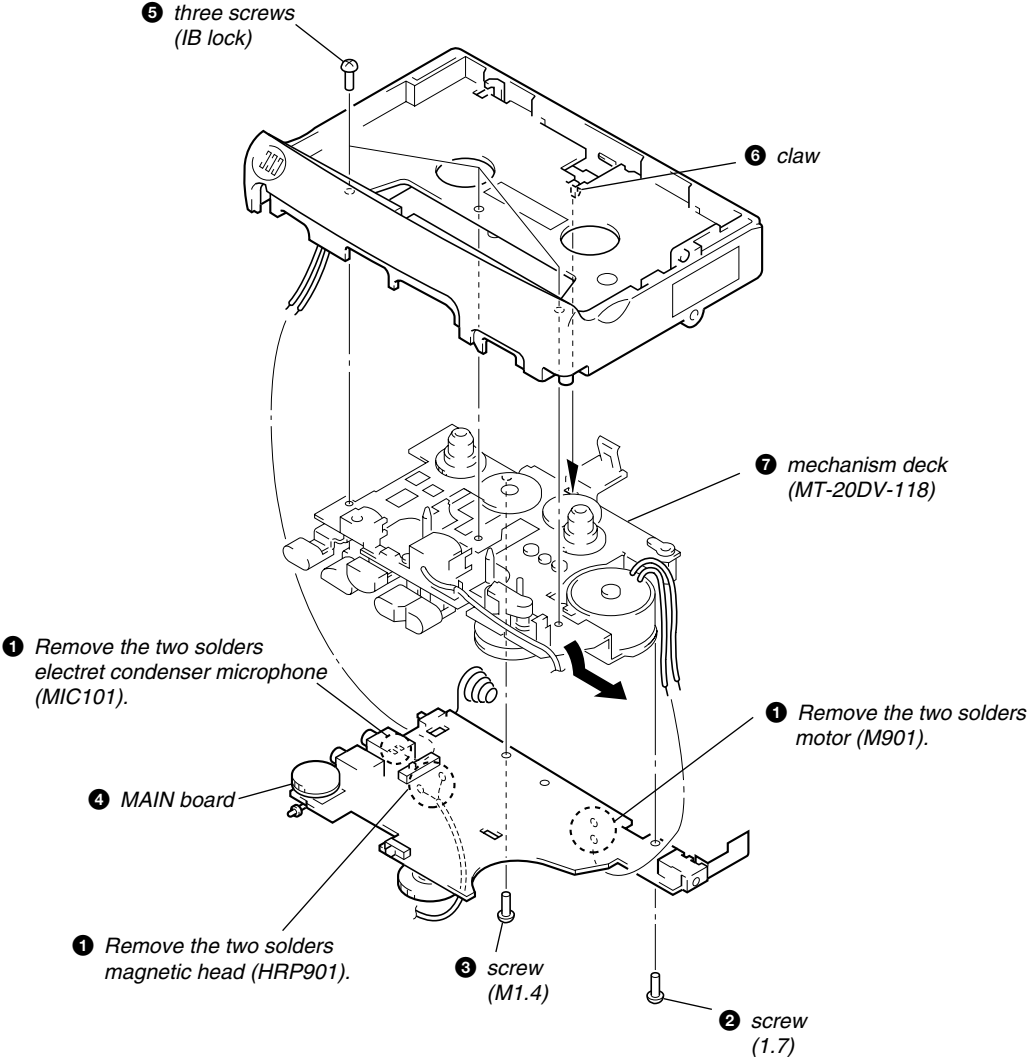
SET → CABINET (REAR), CASSETTE LID → MAIN BOARD, MECHANISM DECK (MT-20DV-118) → BELT

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

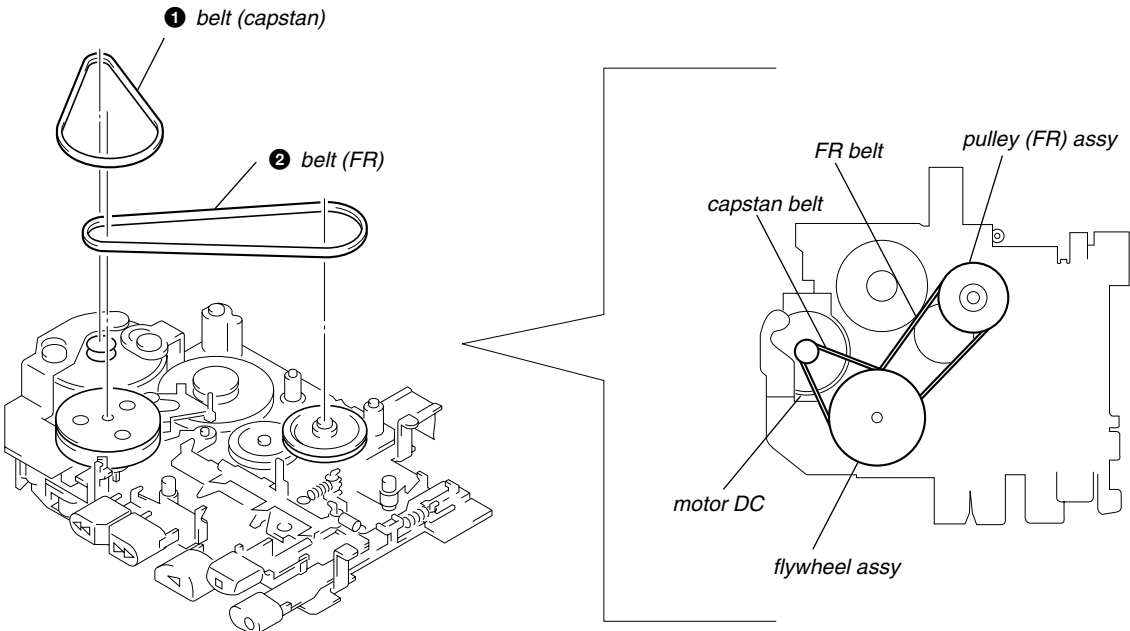
CABINET (REAR), CASSETTE LID



MAIN BOARD, MECHANISM DECK (MT-20DV-118)

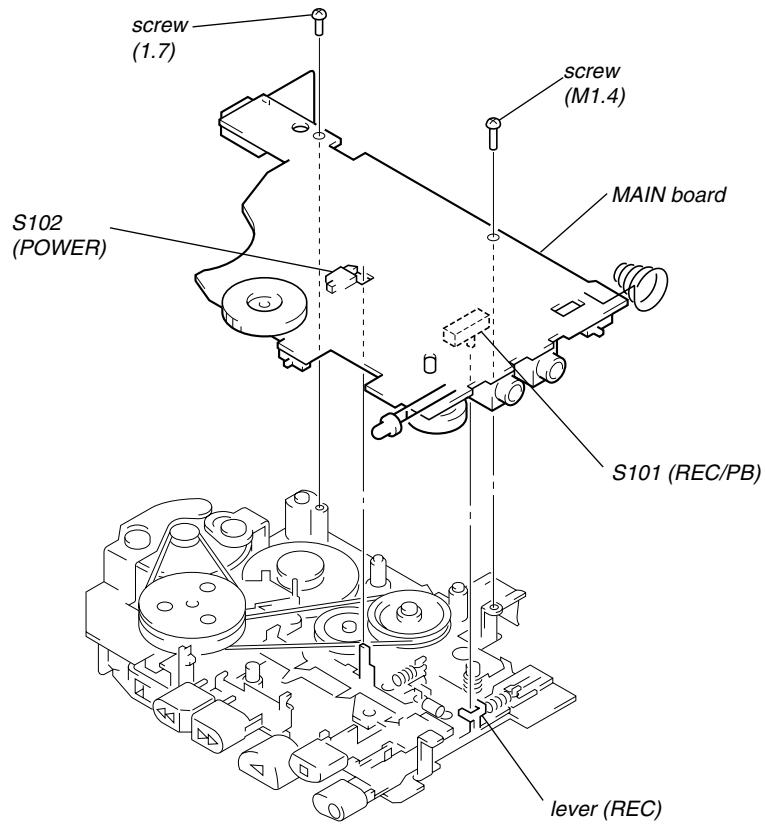


BELT



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 | 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 REW | CQ-201B | 4.90 mN•m (more than 50 g•cm) (more than 0.69 oz•inch) |

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 (S105) : OFF
SPEED CONTROL (RV602): center click
VOR switch (S104) : OFF

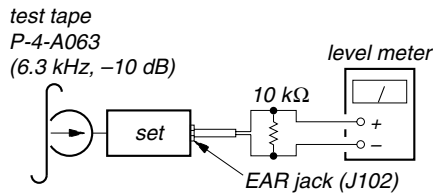
Test Tape

| 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

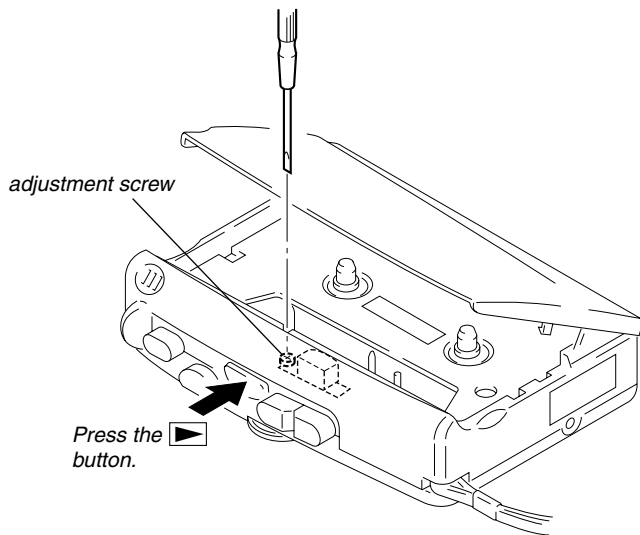
Mode: playback



Procedure:

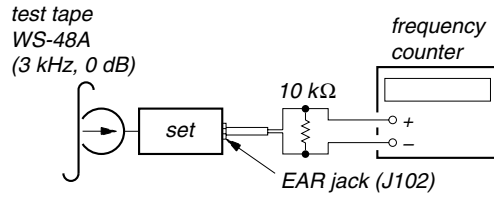
1. Turn the adjustment screw to obtain the maximum reading on level meter.
Note: Several peaks may appear, but take the maximum.
2. After the adjustment, lock the adjustment screw with suitable locking compound.

Adjustment Location:



Tape Speed Adjustment

Mode: playback



Procedure:

– Normal Speed –

1. Set REC TIME switch (S601) to NORMAL (4.8 cm/s) position, and 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

– Double Speed –

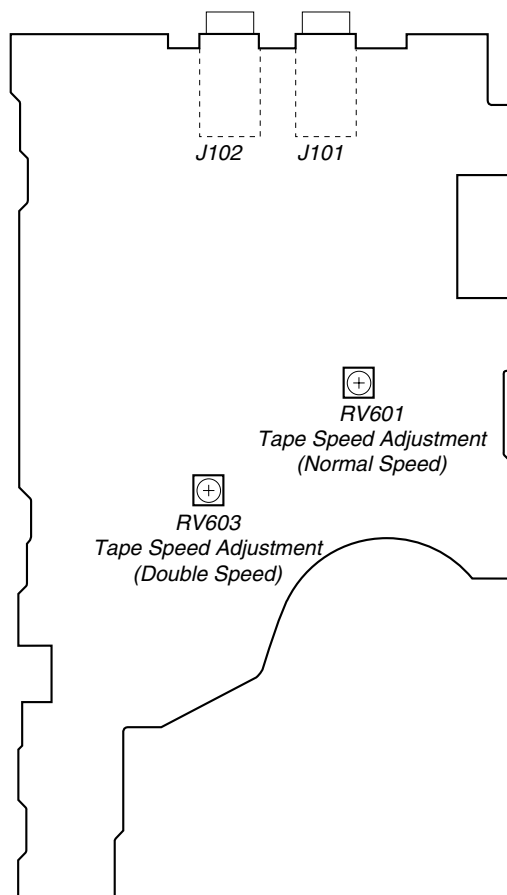
3. Set REC TIME switch (S601) to DOUBLE (2.4 cm/s) position.
4. Playback the tape from the beginning for two minutes, then adjust RV603 so that frequency counter reading becomes 1,540 Hz.

Specification values: 1,535 to 1,545 Hz

Confirm that deflection of the frequency counter reading between the beginning and the end of tape is within 1% (NORMAL: approx. 30.4 Hz, DOUBLE: approx. 15.4 Hz) .

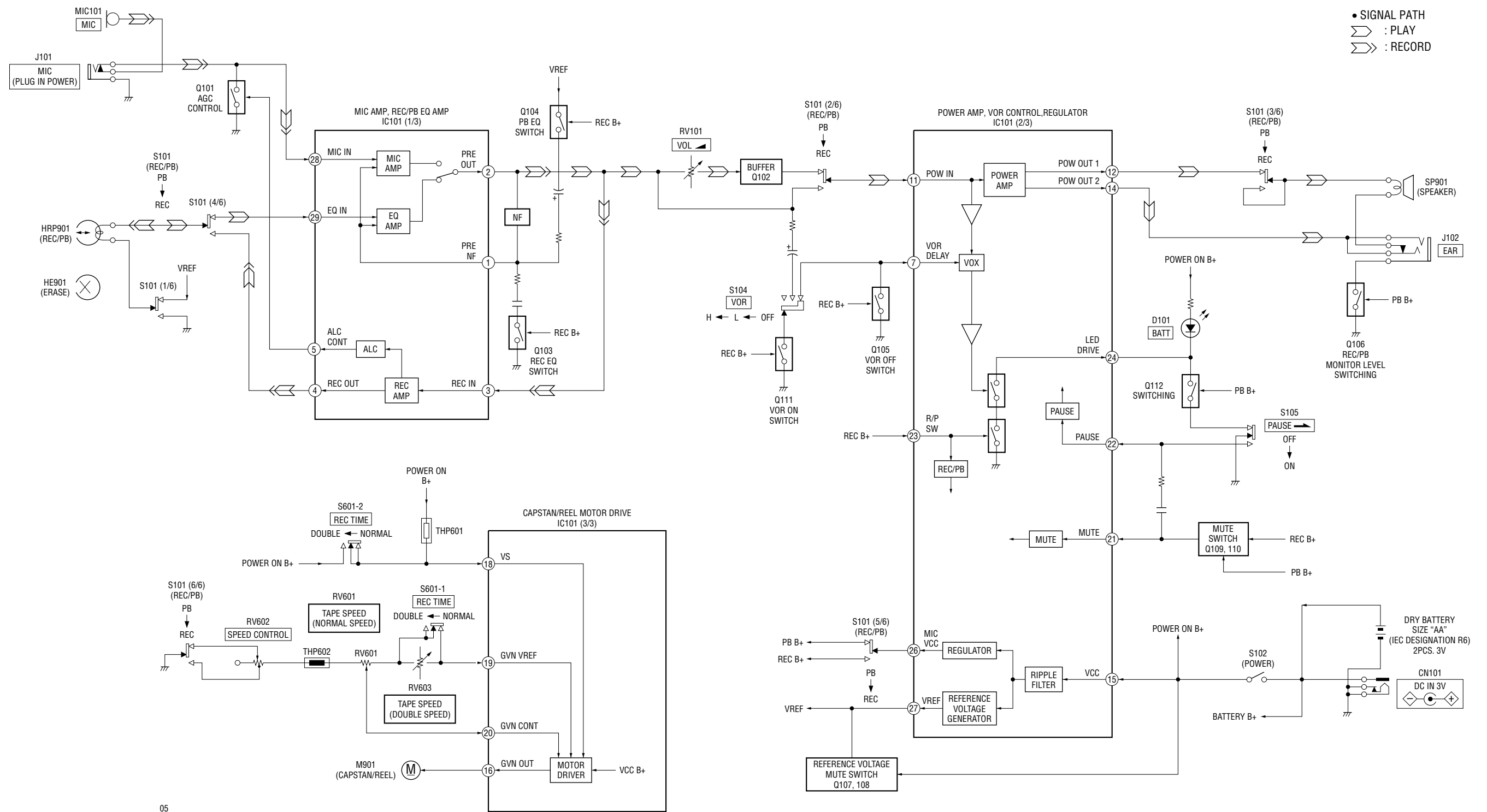
Adjustment Location:

– MAIN BOARD (Conductor Side) –



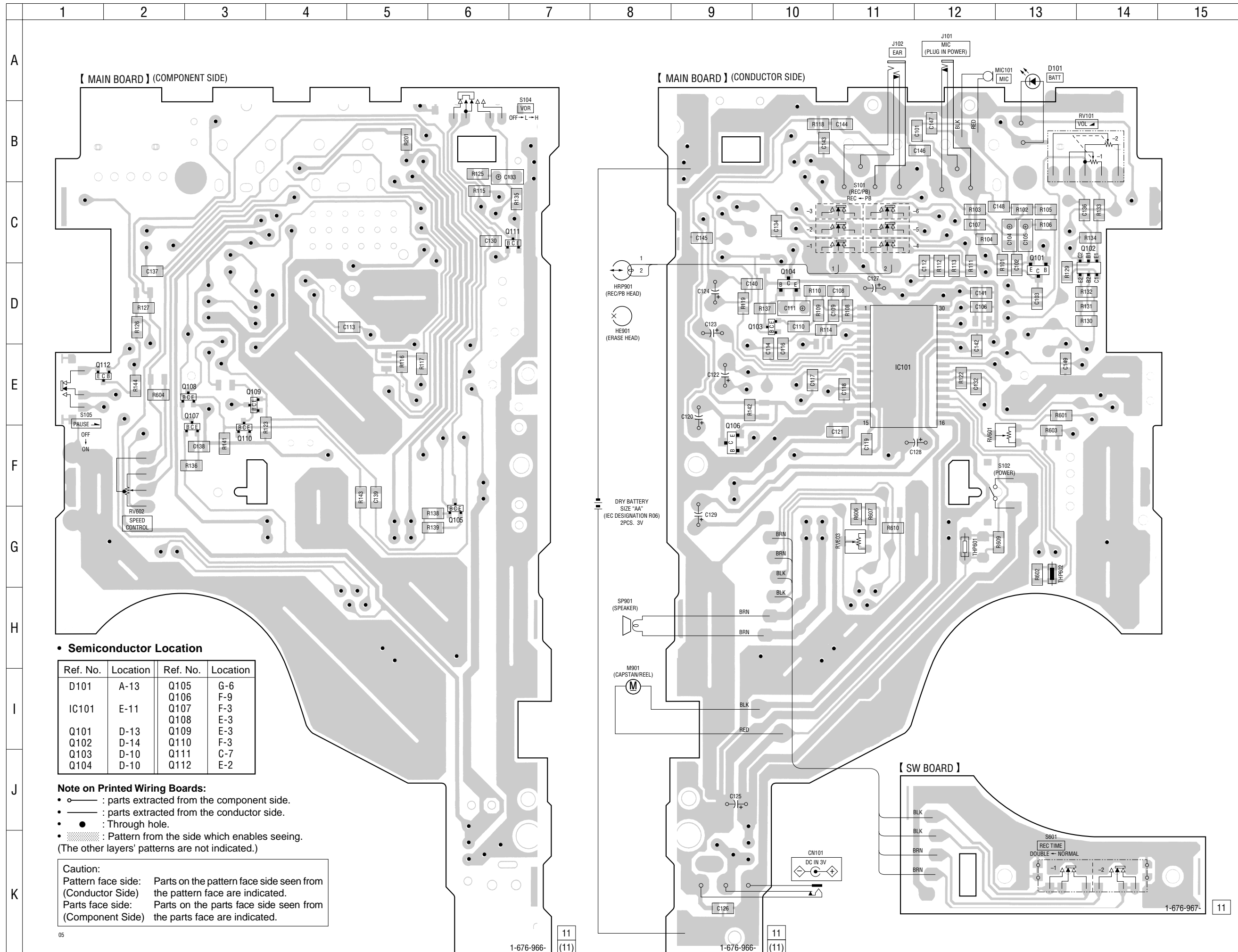
SECTION 6
DIAGRAMS

6-1. BLOCK DIAGRAM



05

6-2. PRINTED WIRING BOARDS



• Semiconductor Location

| Ref. No. | Location | Ref. No. | Location |
|----------|----------|----------|----------|
| D101 | A-13 | Q105 | G-6 |
| IC101 | E-11 | Q106 | F-9 |
| Q101 | D-13 | Q107 | F-3 |
| Q102 | D-14 | Q108 | E-3 |
| Q103 | D-10 | Q109 | E-3 |
| Q104 | D-10 | Q110 | F-3 |
| | | Q111 | C-7 |
| | | Q112 | E-2 |

Note on Printed Wiring Boards:
 • — : parts extracted from the component side.
 • — : parts extracted from the conductor side.
 • ● : Through hole.
 • [Pattern] : Pattern from the side which enables seeing.
 (The other layers' patterns are not indicated.)

Caution:
 Pattern face side: Parts on the pattern face side seen from the pattern face are indicated.
 Parts face side: Parts on the parts face side seen from the parts face are indicated.

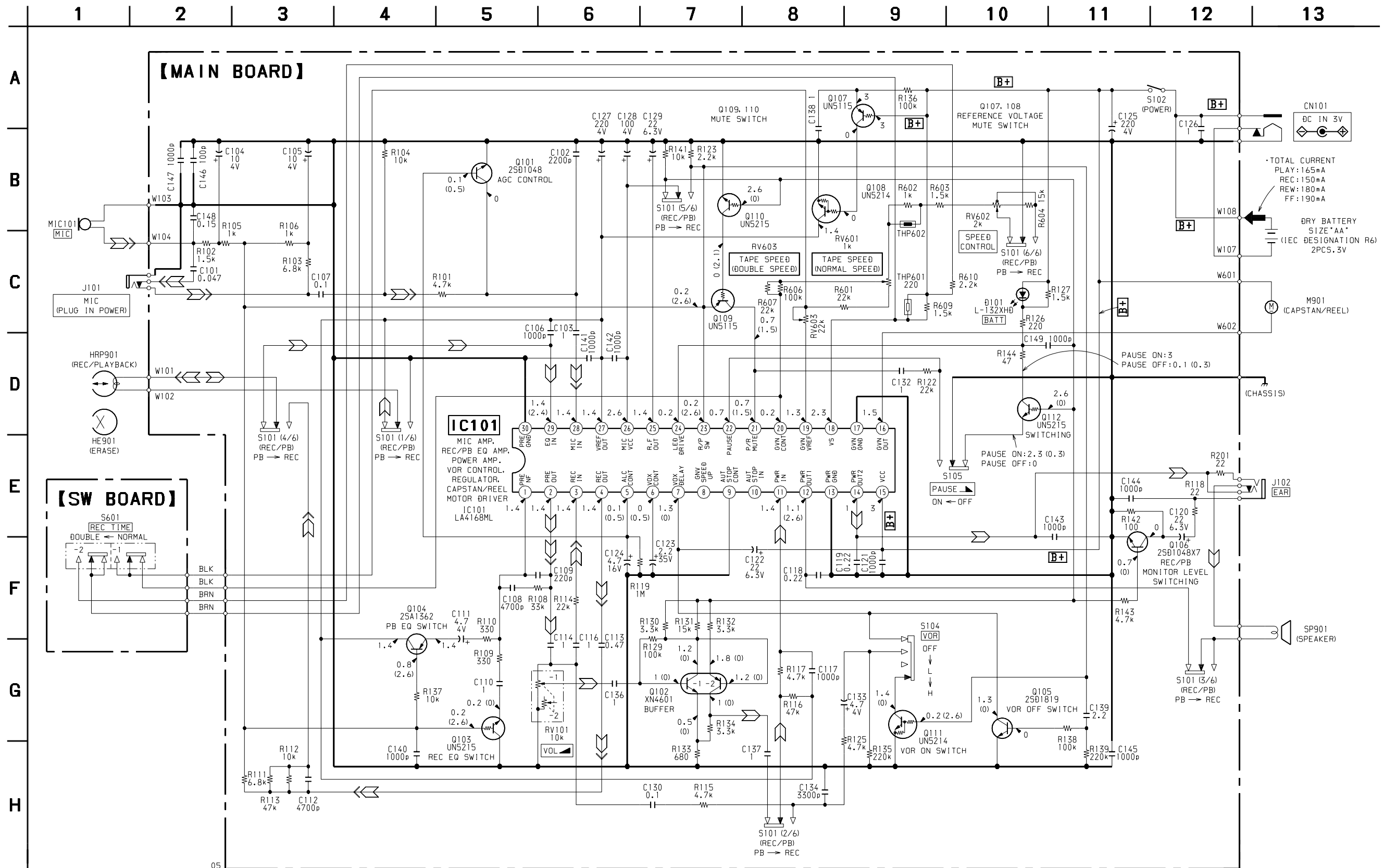
05

11
(11)

11
(11)

1-676-967- 11

6-3. SCHEMATIC DIAGRAM • See page 15 for IC Block Diagram.

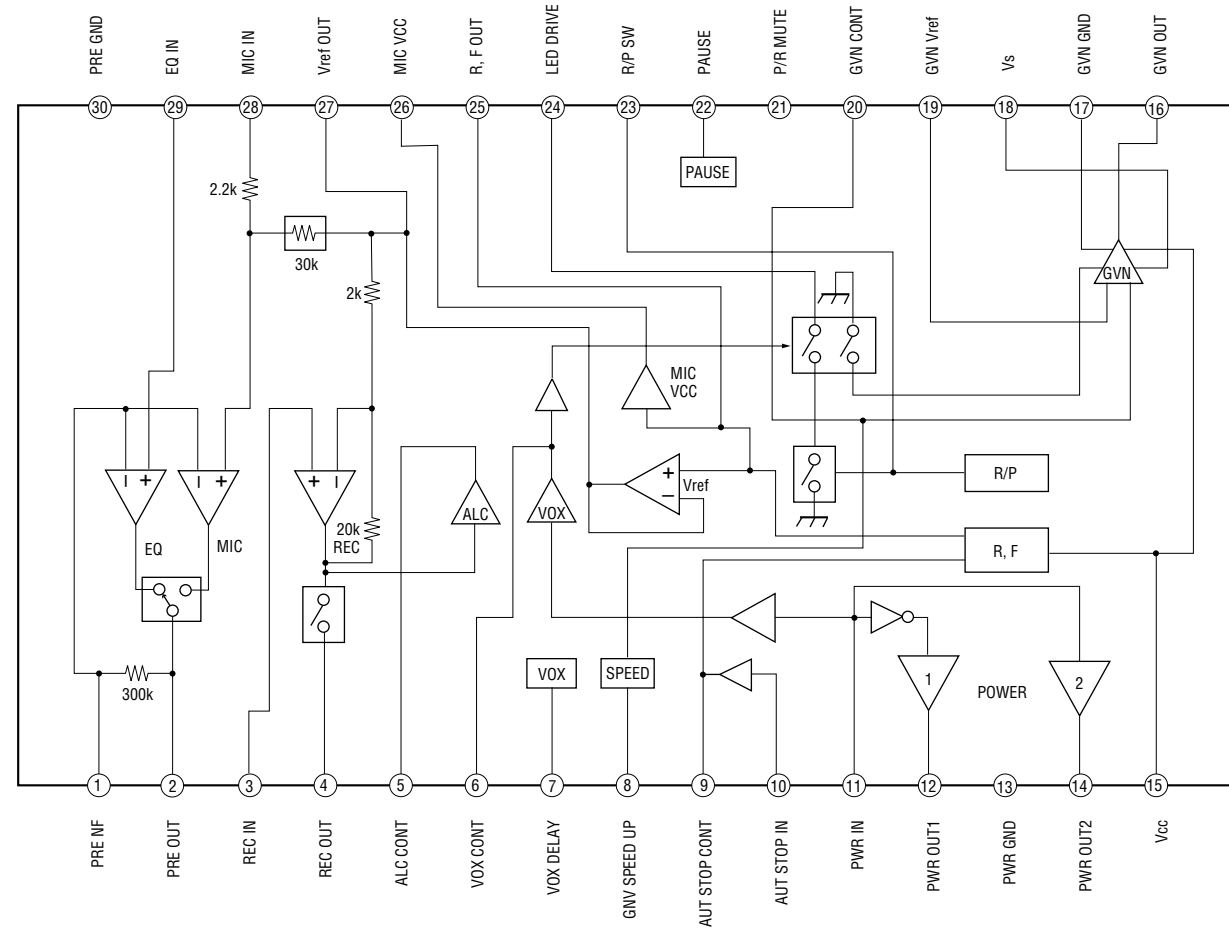


Note on Schematic Diagram:

- All capacitors are in μF unless otherwise noted. pF : μpF
- 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.
- Total current is measured with no cassette installed.
- Power voltage is dc 3 V and fed with regulated dc power supply from external power voltage jack.
- Voltages are dc with respect to ground under no-signal conditions.
- no mark : PLAY
- < : RECORD
- Voltages are taken with a VOM (Input impedance $10\text{M}\Omega$). Voltage variations may be noted due to normal production tolerances.
- Signal path.
- : PLAY
- : RECORD

• IC Block Diagram

IC101 LA4168ML-TE-L



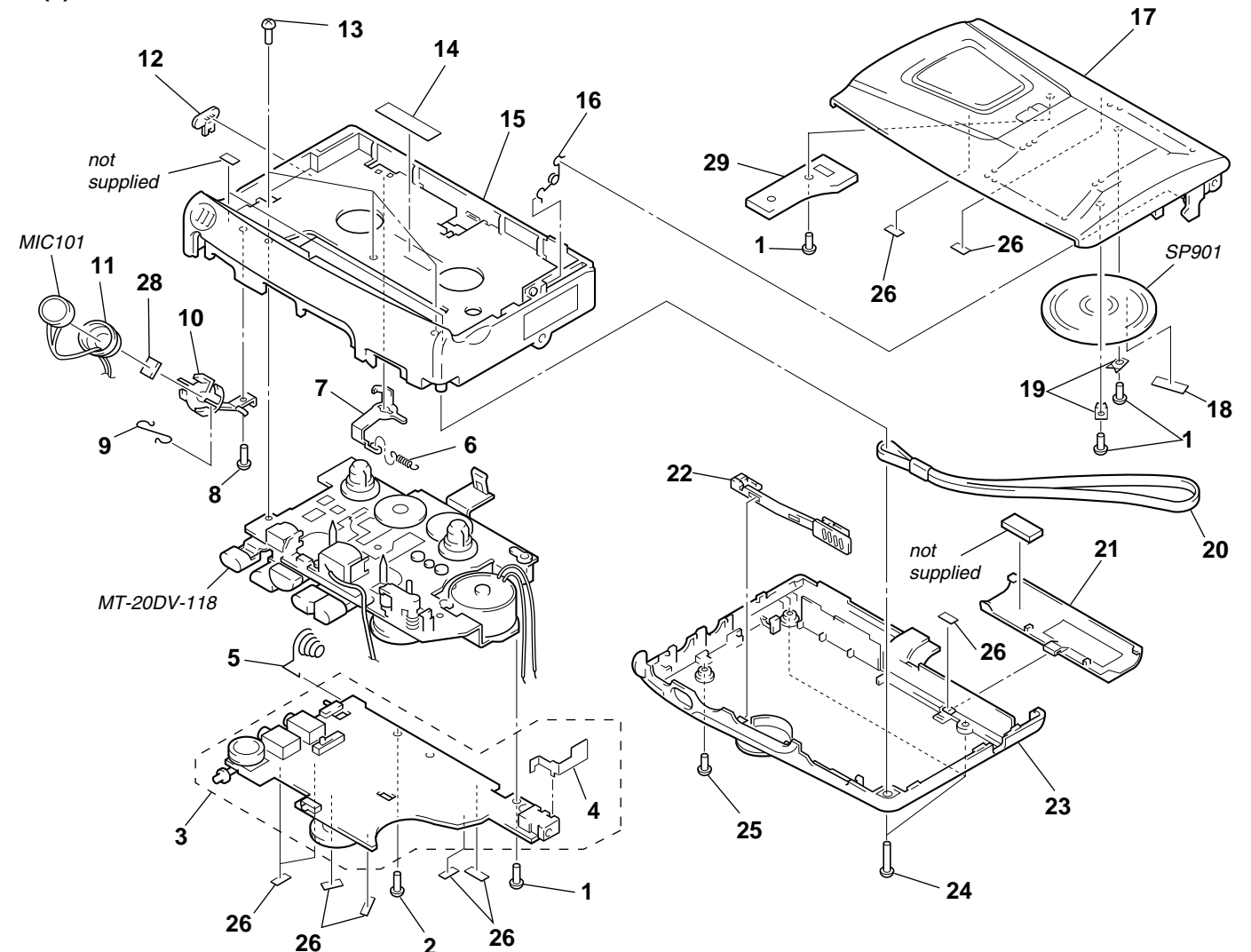
SECTION 7
EXPLODED VIEWS

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
- Abbreviation
1E: No indication of country of origin

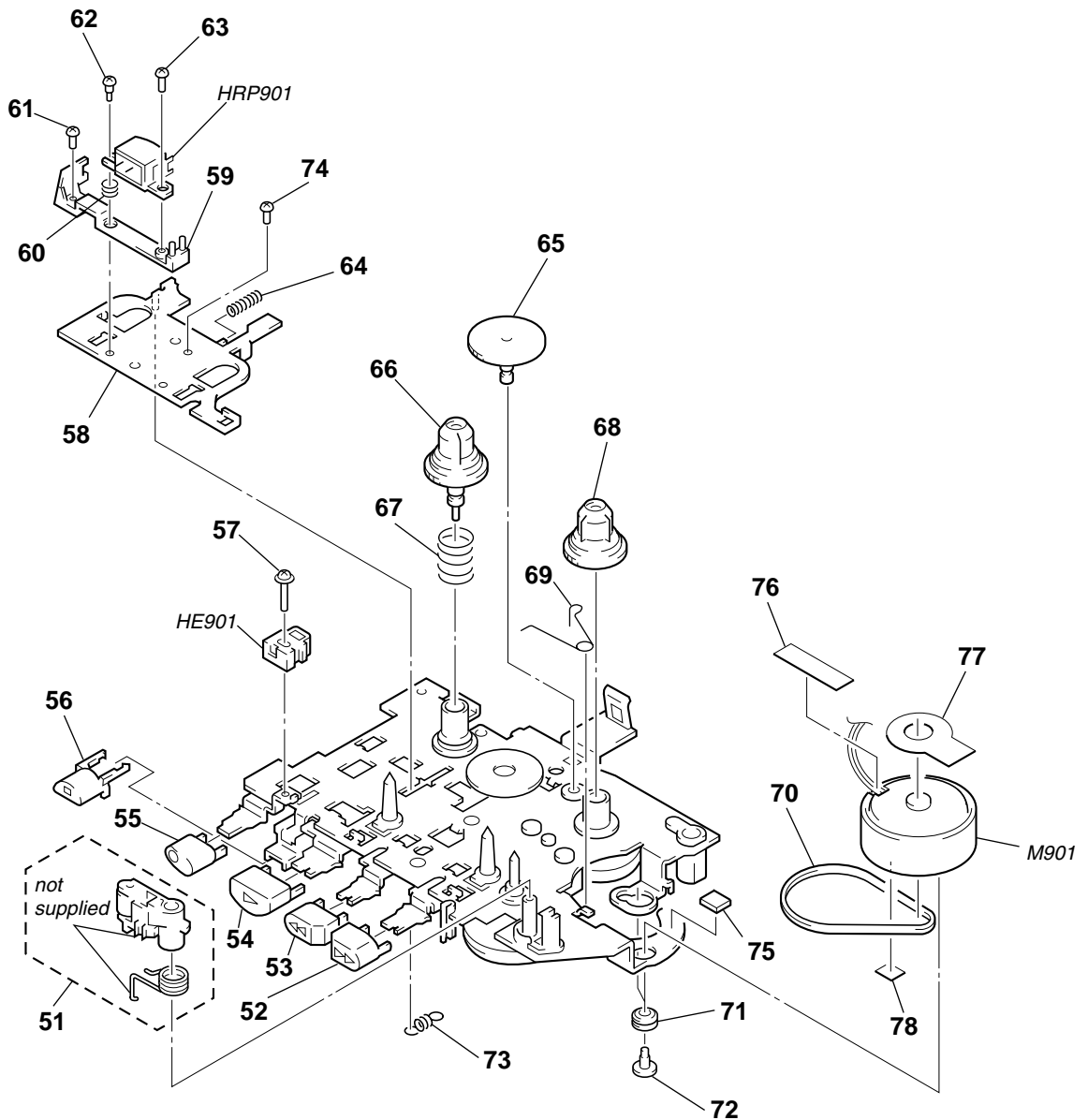
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Accessories and packing materials are given in the last of the electrical parts list.

(1) CABINET SECTION



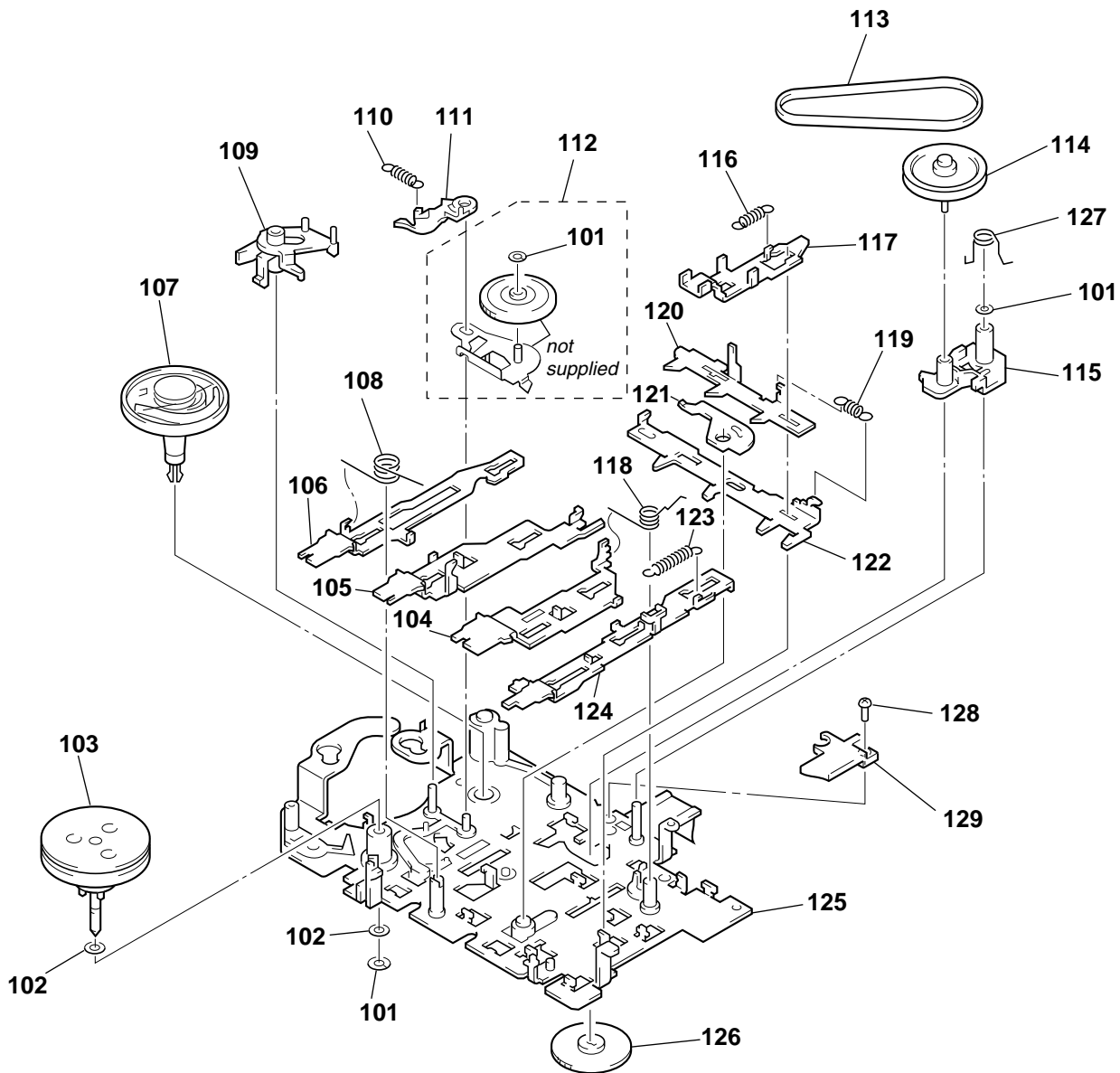
| Ref. No. | Part No. | Description | Remark | Ref. No. | Part No. | Description | Remark |
|----------|--------------|-------------------------------------|--------|----------|--------------|---------------------------------|--------|
| 1 | 3-318-382-31 | SCREW (1.7), TAPPING | | 16 | 3-924-739-01 | SPRING, CASSETTE | |
| 2 | 3-345-648-01 | SCREW (M1.4), TOOTHED LOCK | | 17 | X-4952-666-1 | LID ASSY, CASSETTE | |
| * 3 | A-3021-314-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 | | 20 | 3-328-319-01 | STRAP, HAND | |
| 6 | 3-924-744-01 | SPRING (CLAW DETECTION), TENSION | | 21 | 3-924-749-21 | LID, BATTERY CASE | |
| 7 | 3-924-743-01 | CLAW, ERASING PROTECTION | | 22 | 3-924-747-21 | KNOB (PAUSE) | |
| 8 | 3-334-565-41 | SCREW (B1.7), TAPPING | | 23 | 3-019-597-11 | CABINET (REAR) | |
| 9 | 3-924-745-01 | BAR, GROUND | | 24 | 3-318-203-92 | SCREW (B1.7X9), TAPPING | |
| 10 | 3-924-740-01 | HOLDER, MICROPHONE | | 25 | 3-366-890-51 | SCREW (IB LOCK) | |
| 11 | 3-924-763-01 | CUSHION (MICROPHONE) | | 26 | 3-831-441-99 | CUSHION | |
| 12 | 3-924-742-21 | KNOB (VOR) | | 28 | 3-831-441-11 | CUSHION, CABINET UPPER 10X7X0.5 | |
| 13 | 3-939-590-26 | SCREW (IB LOCK) | | * 29 | 1-676-967-11 | SW BOARD | |
| 14 | 3-578-101-31 | PLATE, ORNAMENTAL | | SP901 | 1-505-838-11 | SPEAKER (3.6cm) | |
| 15 | 3-019-364-33 | CABINET (FRONT) (20DV: 1E/23DV: 1E) | | MIC101 | 1-542-136-11 | MICROPHONE, ELECTRET CONDENSER | |
| 15 | 3-019-364-43 | CABINET (FRONT) (20DV: 1E/23DV: 1E) | | | | | |

(2) MECHANISM DECK SECTION-1
(MT-20DV-118)



| Ref. No. | Part No. | Description | Remark | Ref. No. | Part No. | Description | Remark |
|----------|--------------|-------------------------------|--------|----------|--------------|--|--------|
| 51 | X-3377-250-1 | LEVER, (2) ASSY, PINCH | | 67 | 3-924-674-01 | SPRING (B. T), COMPRESSION | |
| 52 | 3-925-146-01 | 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 | 3-925-148-01 | BUTTON (PLAY) (▶) | | 70 | 3-907-943-01 | BELT (CAPSTAN) | |
| 55 | 3-925-145-01 | 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 | 3-348-160-11 | SCREW (M1.4X1.6), PRECISION PAN | |
| 59 | 3-924-645-01 | BRACKET (HEAD) | | 75 | 3-927-754-11 | CUSHION (M) | |
| 60 | 3-924-685-01 | SPRING (AZIMUTH), COMPRESSION | | 76 | 3-831-441-99 | CUSHION | |
| 61 | 3-704-197-91 | SCREW (M1.4X1.8), LOCKING | | 77 | 3-030-766-12 | SHEET (MOTOR) | |
| 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 | 1-500-515-11 | HEAD, MAGNETIC (ERASE) | |
| 64 | 3-925-107-01 | SPRING (IDLER), COMPRESSION | | HRP901 | 1-500-073-51 | HEAD, MAGNETIC (RECORD/PLAYBACK) | |
| 65 | 3-924-637-01 | GEAR (FF) | | M901 | 1-763-453-21 | MOTOR, DC (CAPSTAN/REEL) (WITH PULLEY) | |
| 66 | 3-924-673-01 | GEAR (S REEL) | | | | | |

(3) MECHANISM DECK SECTION-2
(MT-20DV-118)



| Ref. No. | Part No. | Description | Remark | Ref. No. | Part No. | Description | Remark |
|----------|--------------|--------------------------|--------|----------|--------------|------------------------------|--------|
| 101 | 3-321-483-11 | RING, RETAINING (0.25) | | 116 | 3-924-633-01 | SPRING (STOP), TENSION | |
| 102 | 3-315-495-31 | WASHER | | 117 | 3-924-622-01 | LEVER (STOP) | |
| 103 | X-3370-384-1 | FLYWHEEL ASSY | | 118 | 3-924-643-01 | SPRING (PR), TORSION | |
| 104 | 3-924-623-01 | LEVER (PLAY) | | 119 | 3-924-684-01 | SPRING (LOCK PLATE), TENSION | |
| 105 | 3-924-621-01 | LEVER (REW) | | 120 | 3-924-619-01 | LEVER (SW) | |
| 106 | 3-924-620-01 | LEVER (FF) | | 121 | 3-924-639-01 | LEVER (CR) | |
| 107 | X-3370-388-1 | TABLE ASSY, FELT | | 122 | 3-924-618-01 | LEVER (LOCK) | |
| 108 | 3-924-642-01 | 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-3372-155-1 | CHASSIS ASSY | |
| 111 | 3-924-630-01 | LEVER (S.OFF) | | 126 | 3-924-613-01 | GEAR (FR) | |
| 112 | X-3370-387-1 | LEVER ASSY, IDLER | | 127 | 3-024-378-01 | SPRING (FR LEVER), TORSION | |
| 113 | 3-924-682-01 | BELT (FR) | | 128 | 3-939-590-26 | SCREW (IB LOCK) | |
| 114 | X-3370-385-1 | PULLEY (FR) ASSY | | 129 | 3-029-566-12 | STOPPER (FF) | |
| 115 | 3-924-628-01 | LEVER (FR) | | | | | |

SECTION 8 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
IE: No indication of country of origin

- 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. . . : μ A. . . uPA. . . : μ PA. . .
uPB. . . : μ PB. . . uPC. . . : μ PC. . .
uPD. . . : μ PD. . .
- CAPACITORS
uF: μ F
- COILS
uH: μ H

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

Les composants identifiés par une marque Δ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

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

| Ref. No. | Part No. | Description | Remark | Ref. No. | Part No. | Description | Remark |
|----------|--------------|-------------------------------------|--------|----------|--------------|--|--------|
| * | A-3021-314-A | MAIN BOARD, COMPLETE ***** | | C142 | 1-163-009-11 | CERAMIC CHIP 0.001uF 10% | 50V |
| | 3-924-741-01 | TERMINAL, PLUS < CAPACITOR > | | C143 | 1-163-009-11 | CERAMIC CHIP 0.001uF 10% | 50V |
| C101 | 1-163-809-11 | CERAMIC CHIP 0.047uF 10% | 25V | C144 | 1-163-009-11 | CERAMIC CHIP 0.001uF 10% | 50V |
| C102 | 1-164-161-11 | CERAMIC CHIP 0.0022uF 10% | 100V | C145 | 1-163-009-11 | CERAMIC CHIP 0.001uF 10% | 50V |
| C103 | 1-109-982-11 | CERAMIC CHIP 1uF 10% | 10V | C146 | 1-163-251-11 | CERAMIC CHIP 100PF 5% | 50V |
| C104 | 1-135-201-11 | TANTALUM CHIP 10uF 20% | 4V | C147 | 1-163-009-11 | CERAMIC CHIP 0.001uF 10% | 50V |
| C105 | 1-135-201-11 | TANTALUM CHIP 10uF 20% | 4V | C148 | 1-164-492-11 | CERAMIC CHIP 0.15uF 10% | 16V |
| C106 | 1-163-009-11 | CERAMIC CHIP 0.001uF 10% | 50V | | | < CONNECTOR > | |
| C107 | 1-107-725-11 | CERAMIC CHIP 0.1uF 10% | 16V | C149 | 1-163-009-11 | CERAMIC CHIP 0.001uF 10% | 50V |
| C108 | 1-163-017-00 | CERAMIC CHIP 0.0047uF 5% | 50V | | | < DIODE > | |
| C109 | 1-163-001-11 | CERAMIC CHIP 220PF 10% | 50V | CN101 | 1-580-919-11 | JACK, DC (POLARITY UNIFIED TYPE) (DC IN 3V) | |
| C110 | 1-109-982-11 | CERAMIC CHIP 1uF 10% | 10V | | | < IC > | |
| C111 | 1-135-151-21 | TANTALUM CHIP 4.7uF 20% | 4V | D101 | 8-719-057-27 | LED L-132XHD (BATT) | |
| C112 | 1-163-017-00 | CERAMIC CHIP 0.0047uF 5% | 50V | | | < IC > | |
| C113 | 1-164-005-11 | CERAMIC CHIP 0.47uF | 25V | IC101 | 8-759-492-49 | IC LA4168ML-TE-L | |
| C114 | 1-164-346-11 | CERAMIC CHIP 1uF | 16V | | | < JACK > | |
| C116 | 1-164-346-11 | CERAMIC CHIP 1uF | 16V | | | < TRANSISTOR > | |
| C117 | 1-163-009-11 | CERAMIC CHIP 0.001uF 10% | 50V | Q101 | 8-729-800-37 | TRANSISTOR 2SD1048-X7 | |
| C118 | 1-164-489-11 | CERAMIC CHIP 0.22uF 10% | 16V | Q102 | 8-729-402-84 | TRANSISTOR XN4601 | |
| C119 | 1-164-489-11 | CERAMIC CHIP 0.22uF 10% | 16V | Q103 | 8-729-420-50 | TRANSISTOR UN5215 | |
| C120 | 1-126-153-11 | ELECT 22uF 20% | 6.3V | Q104 | 8-729-230-72 | TRANSISTOR 2SA1362YG | |
| C121 | 1-163-009-11 | CERAMIC CHIP 0.001uF 10% | 50V | Q105 | 8-729-230-63 | TRANSISTOR 2SC4116-YG | |
| C122 | 1-126-153-11 | ELECT 22uF 20% | 6.3V | Q106 | 8-729-800-37 | TRANSISTOR 2SD1048-X7 | |
| C123 | 1-124-257-00 | ELECT 2.2uF 20% | 50V | Q107 | 8-729-420-53 | TRANSISTOR UN5115 | |
| C124 | 1-124-259-11 | ELECT 4.7uF 20% | 16V | Q108 | 8-729-402-93 | TRANSISTOR UN5214-TX | |
| C125 | 1-124-434-00 | ELECT 220uF 20% | 4V | Q109 | 8-729-420-53 | TRANSISTOR UN5115 | |
| C126 | 1-164-346-11 | CERAMIC CHIP 1uF | 16V | Q110 | 8-729-420-50 | TRANSISTOR UN5215 | |
| C127 | 1-124-434-00 | ELECT 220uF 20% | 4V | Q111 | 8-729-402-93 | TRANSISTOR UN5214-TX | |
| C128 | 1-124-433-00 | ELECT 100uF 20% | 4V | Q112 | 8-729-420-50 | TRANSISTOR UN5215 | |
| C129 | 1-126-153-11 | ELECT 22uF 20% | 6.3V | | | < RESISTOR > | |
| C130 | 1-163-038-00 | CERAMIC CHIP 0.1uF | 25V | R101 | 1-216-065-00 | RES-CHIP 4.7K 5% 1/10W | |
| C132 | 1-164-346-11 | CERAMIC CHIP 1uF | 16V | R102 | 1-216-053-00 | METAL CHIP 1.5K 5% 1/10W | |
| C133 | 1-135-151-21 | TANTALUM CHIP 4.7uF 20% | 4V | R103 | 1-216-069-00 | METAL CHIP 6.8K 5% 1/10W | |
| C134 | 1-164-182-11 | CERAMIC CHIP 0.0033uF 10% | 50V | R104 | 1-216-073-00 | METAL CHIP 10K 5% 1/10W | |
| C136 | 1-164-346-11 | CERAMIC CHIP 1uF | 16V | | | | |
| C137 | 1-164-346-11 | CERAMIC CHIP 1uF | 16V | | | | |
| C138 | 1-164-346-11 | CERAMIC CHIP 1uF | 16V | | | | |
| C139 | 1-164-505-11 | CERAMIC CHIP 2.2uF | 16V | | | | |
| C140 | 1-163-009-11 | CERAMIC CHIP 0.001uF 10% | 50V | | | | |
| C141 | 1-163-009-11 | CERAMIC CHIP 0.001uF 10% | 50V | | | | |

TCM-20DV/21DV/22DV/23DV

MAIN **SW**

| Ref. No. | Part No. | Description | Remark |
|-----------------------|--------------|-------------------------------------|--------|
| R105 | 1-216-049-11 | RES-CHIP 1K 5% | 1/10W |
| R106 | 1-216-049-11 | RES-CHIP 1K 5% | 1/10W |
| R108 | 1-216-085-00 | METAL CHIP 33K 5% | 1/10W |
| R109 | 1-216-037-00 | METAL CHIP 330 5% | 1/10W |
| R110 | 1-216-037-00 | METAL CHIP 330 5% | 1/10W |
| R111 | 1-216-069-00 | METAL CHIP 6.8K 5% | 1/10W |
| R112 | 1-216-073-00 | METAL CHIP 10K 5% | 1/10W |
| R113 | 1-216-089-00 | RES-CHIP 47K 5% | 1/10W |
| R114 | 1-216-081-00 | METAL CHIP 22K 5% | 1/10W |
| R115 | 1-216-065-00 | RES-CHIP 4.7K 5% | 1/10W |
| R116 | 1-216-089-00 | RES-CHIP 47K 5% | 1/10W |
| R117 | 1-216-065-00 | RES-CHIP 4.7K 5% | 1/10W |
| R118 | 1-216-009-00 | RES-CHIP 22 5% | 1/10W |
| R119 | 1-216-121-00 | RES-CHIP 1M 5% | 1/10W |
| R122 | 1-216-081-00 | METAL CHIP 22K 5% | 1/10W |
| R123 | 1-216-057-00 | METAL CHIP 2.2K 5% | 1/10W |
| R125 | 1-216-065-00 | RES-CHIP 4.7K 5% | 1/10W |
| R126 | 1-216-033-00 | METAL CHIP 220 5% | 1/10W |
| R127 | 1-216-053-00 | METAL CHIP 1.5K 5% | 1/10W |
| R129 | 1-216-097-00 | RES-CHIP 100K 5% | 1/10W |
| R130 | 1-216-061-00 | METAL CHIP 3.3K 5% | 1/10W |
| R131 | 1-216-077-00 | RES-CHIP 15K 5% | 1/10W |
| R132 | 1-216-061-00 | METAL CHIP 3.3K 5% | 1/10W |
| R133 | 1-216-045-00 | METAL CHIP 680 5% | 1/10W |
| R134 | 1-216-061-00 | METAL CHIP 3.3K 5% | 1/10W |
| R135 | 1-216-105-00 | RES-CHIP 220K 5% | 1/10W |
| R136 | 1-216-097-00 | RES-CHIP 100K 5% | 1/10W |
| R137 | 1-216-073-00 | METAL CHIP 10K 5% | 1/10W |
| R138 | 1-216-097-00 | RES-CHIP 100K 5% | 1/10W |
| R139 | 1-216-105-00 | RES-CHIP 220K 5% | 1/10W |
| R141 | 1-216-073-00 | METAL CHIP 10K 5% | 1/10W |
| R142 | 1-216-025-00 | RES-CHIP 100 5% | 1/10W |
| R143 | 1-216-065-00 | RES-CHIP 4.7K 5% | 1/10W |
| R144 | 1-216-017-00 | RES-CHIP 47 5% | 1/10W |
| R201 | 1-216-009-00 | RES-CHIP 22 5% | 1/10W |
| R601 | 1-216-081-00 | METAL CHIP 22K 5% | 1/10W |
| R602 | 1-216-049-11 | RES-CHIP 1K 5% | 1/10W |
| R603 | 1-216-053-00 | METAL CHIP 1.5K 5% | 1/10W |
| R604 | 1-216-077-00 | RES-CHIP 15K 5% | 1/10W |
| R606 | 1-216-097-00 | RES-CHIP 100K 5% | 1/10W |
| R607 | 1-216-081-00 | METAL CHIP 22K 5% | 1/10W |
| R609 | 1-216-053-00 | METAL CHIP 1.5K 5% | 1/10W |
| R610 | 1-216-057-00 | METAL CHIP 2.2K 5% | 1/10W |
| < VARIABLE RESISTOR > | | | |
| RV101 | 1-227-166-11 | RES, VAR, CARBON (VOL ▲) | |
| RV601 | 1-223-583-11 | RES, ADJ, CARBON 1K | |
| RV602 | 1-225-598-11 | RES, VAR, CARBON 2K (SPEED CONTROL) | |
| RV603 | 1-223-587-11 | RES, ADJ, CARBON 22K | |
| < SWITCH > | | | |
| S101 | 1-771-321-11 | SWITCH, SLIDE (REC/PB) | |
| S102 | 1-572-688-11 | SWITCH, PUSH (1 KEY) (POWER) | |
| S104 | 1-692-605-31 | SWITCH, SLIDE (VOR) | |
| S105 | 1-572-922-11 | SWITCH, SLIDE (PAUSE ►) | |

| Ref. No. | Part No. | Description | Remark |
|---------------------------------|--------------|--|---|
| < THERMISTOR > | | | |
| THP601 | 1-810-007-11 | THERMISTOR, POSITIVE | |
| THP602 | 1-809-350-21 | THERMISTOR, NTC (2125) | |
| ***** | | | |
| * | 1-676-967-11 | SW BOARD | |
| ***** | | | |
| < SWITCH > | | | |
| S601 | 1-571-277-51 | SWITCH, SLIDE (REC TIME) | |
| ***** | | | |
| MISCELLANEOUS | | | |
| ***** | | | |
| HE901 | 1-500-515-11 | HEAD, MAGNETIC (ERASE) | |
| HRP901 | 1-500-073-51 | HEAD, MAGNETIC (RECORD/PLAYBACK) | |
| M901 | 1-763-453-21 | MOTOR, DC (CAPSTAN/REEL) (WITH PULLEY) | |
| MIC101 | 1-542-136-11 | MICROPHONE, ELECTRET CONDENSER (MIC) | |
| SP901 | 1-505-838-11 | SPEAKER (3.6cm) | |
| ***** | | | |
| ACCESSORIES & PACKING MATERIALS | | | |
| ***** | | | |
| △ | 1-528-405-31 | ADAPTOR, BATTERY CHARGE | (BCA-35E) (22DV) |
| | 1-542-307-11 | MICROPHONE (ECM-J2SL) | (21DV) |
| △ | 1-693-073-21 | ADAPTOR, AC (AC-E350) | (22DV) |
| | 1-756-035-31 | BATTERY PACK (NC-WMAA) | (22DV) |
| | 3-044-622-01 | POUCH, CARRYING | (21DV) |
| | 3-868-083-11 | MANUAL, INSTRUCTION | (ENGLISH, FRENCH, SPANISH) (US, Canadian) |
| | 3-868-083-21 | MANUAL, INSTRUCTION | (ENGLISH, SPANISH, PORTUGUESE) (E) |
| | 3-868-083-31 | MANUAL, INSTRUCTION | (GERMAN, ITALIAN, HUNGARIAN) (21DV: E) |
| | 3-868-083-41 | MANUAL, INSTRUCTION | (FRENCH, GERMAN, ITALIAN) (20DV: E) |
| | 3-868-083-51 | MANUAL, INSTRUCTION | (DUTCH, SWEDISH, FINNISH) (20DV: E) |
| | 3-868-083-61 | MANUAL, INSTRUCTION (POLISH, CZECH, SLOVAKIAN) | (20DV: EE/21DV: E) |
| | 3-868-083-71 | MANUAL, INSTRUCTION (ENGLISH, CHINESE) | (20DV: 1E/23DV: 1E) |
| | 3-868-083-81 | MANUAL, INSTRUCTION (ENGLISH, CHINESE) | (20DV: CHINESE) |
| | 3-868-083-91 | MANUAL, INSTRUCTION | (ENGLISH, RUSSIAN, HUNGARIAN) (20DV: EE) |
| | 8-814-296-90 | MICROPHONE, CONDENSER ECM-TC60 | (23DV) |

| | |
|--|--|
| The components identified by mark △ or dotted line with mark ▲ are critical for safety. Replace only with part number specified. | Les composants identifiés par une marque △ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié. |
|--|--|