

BM-21/23

SERVICE MANUAL



Photo : BM-23

US Model
BM-21/23
Canadian Model
AEP Model
UK Model
BM-23

| | |
|------------------------------------|-----------|
| Model Name Using Similer Mechanism | NEW |
| Tape Transport Mechanism Type | MB-23-101 |

SPECIFICATIONS

Track system

4-track 2-channel monaural

Tape

Normal position type

Tape speeds

BM-23: 4.8 cm/sec. (1 7/8 ips), 2.4 cm/sec. (1⁵/₁₆ ips)

BM-21: 4.8 cm/sec. (1 7/8 ips)

Speaker

Approx. 3.6 cm (1¹/₃₂ inches) dia.

Frequency response

200 - 8,000 Hz at 4.8 cm/sec.

Input

Microphone input jack [PLUG IN POWER] (minijack)

Sensitivity 0.3 mV for 3 kilohms or lower impedance

Output

Earphone jack (minijack) for 8-ohm earphone or load impedance

10 kilohms or higher

Battery life

See *Preparing a Power Source*

Power output

240 mW (at 10 % harmonic distortion)

Power requirements

- Two size AA (R6) batteries (not supplied): 3V DC
- Sony AC-E30M power adaptor (not supplied): 120V AC, 60 Hz
- Sony DCC-E130L car battery cord (not supplied): 12 V car battery

Dimensions (w/h/d)

Approx. 88.1 × 129.2 × 32.3 mm (3 1/2 × 5 1/8 × 1 5/16 in.)

incl. projecting parts and controls

Mass

Approx. 300 g (10 oz) incl. batteries

Supplied accessory

Carrying case (1) (BM-23 only)

Design and specifications subject to change without notice.



PORTABLE DICTATOR
SONY®

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.

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.

TABLE OF CONTENTS

| <u>Section</u> | <u>Title</u> | <u>Page</u> |
|----------------|---|-------------|
| 1. | SERVICING NOTE | 3 |
| 2. | GENERAL | |
| | Preparing a Power Source | 4 |
| | Dictating | 4 |
| | Listening to the Dictation | 5 |
| 3. | DISASSEMBLY | |
| 3-1. | Control Panel Block Assembly Removal | 6 |
| 3-2. | Audio Board Complete Removal | 6 |
| 3-3. | Mechanism Deck (MB-23-101) Removal | 7 |
| 3-4. | Holder Panel Assembly Installation | 7 |
| 4. | ADJUSTMENT | |
| 4-1. | Mechanical Adjustments | 8 |
| 4-2. | Electrical Adjustments | 8 |
| 5. | DIAGRAMS | |
| 5-1. | IC Pin Functions | |
| | • IC701 System Controller (BU2456-23) | 10 |
| 5-2. | Block Diagram | 11 |
| 5-3. | Printed Wiring Board | 13 |
| 5-4. | Schematic Diagram | 19 |
| 5-5. | Semiconductor Lead Layouts | 21 |
| 6. | EXPLODED VIEWS | |
| 6-1. | Cabinet Section | 22 |
| 6-2. | PC Board Section | 23 |
| 6-3. | Mechanism Deck Section-1 (MB-23-101) | 24 |
| 6-4. | Mechanism Deck Section-2 (MB-23-101) | 25 |
| 7. | ELECTRICAL PARTS LIST | 26 |

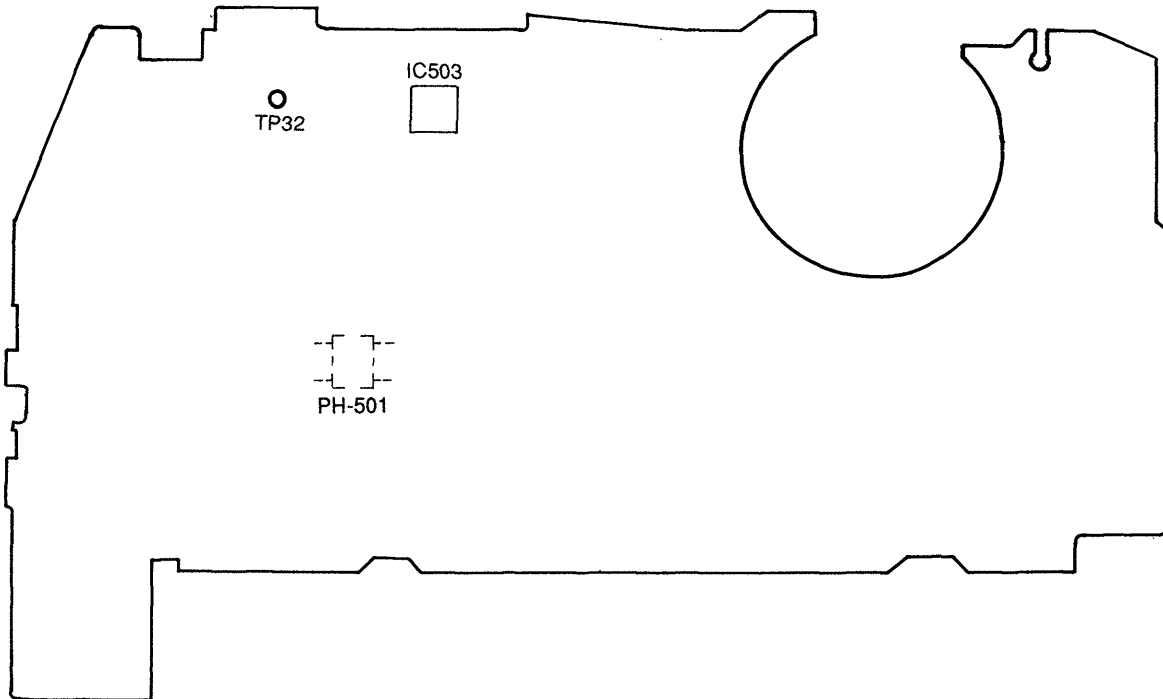
SECTION 1 SERVICING NOTE

This unit uses PH501 (photo coupler) to detect reel rotation.
As PH501 is mounted on the audio board, reel rotation will not be detected if the audio board has been removed.
When performing mechanism deck operation and voltage checks with the audio board removed, perform them using the following method.

Method :

Connect TP32 of the audio board and GND with a jumper wire.

AUDIO BOARD (SIDE B)



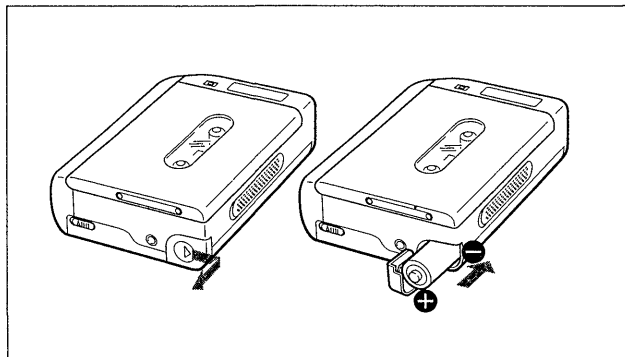
SECTION 2 GENERAL

This section is extracted from instruction manual.

Preparing a Power Source

Choose one of the following three power sources.

Dry Batteries




- 1 Open the battery compartment lid.
- 2 Insert two size AA (R6) batteries (not supplied) with correct polarity and close the lid.

When to replace the batteries

Replace both batteries with new ones when the DICT/BATT (dictation/battery) indicator becomes faint and the sound is distorted.

For BM-23 only

You can check the approximate battery condition with the battery indication () displayed while using the dictator.

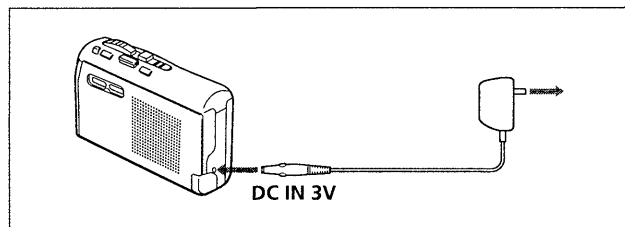
Battery life (Approx. hours)

| | Sony alkaline AM3(N) | Sony SUM-3(NS) |
|-----------|----------------------|----------------|
| Dictating | 12 | 3 |

Notes

- When replacing the batteries, all the indications in the LCD display light up in a moment and the tape counter will return to "000".
- If the unit is not to be used for a long period of time or is to be operated extensively with other power sources, remove the batteries to avoid damage caused by battery leakage and corrosion.

House Current



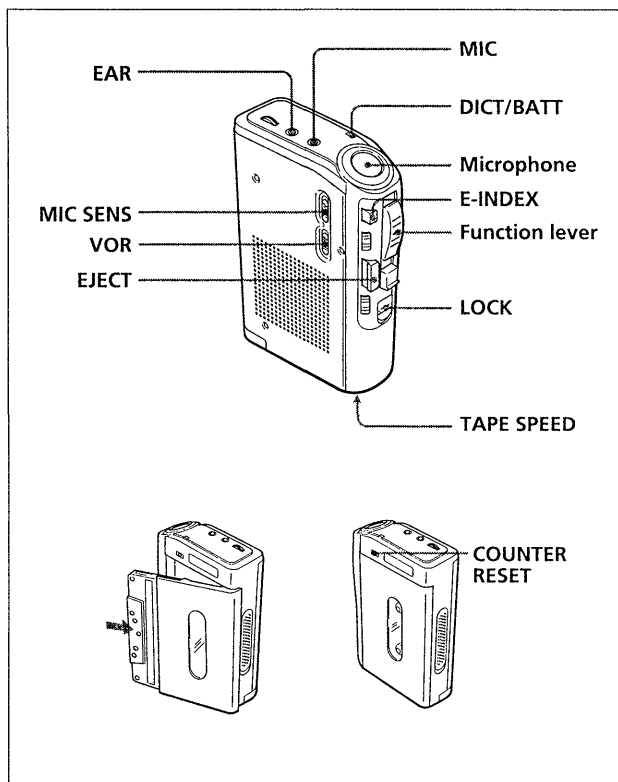
Use the AC-E30M power adaptor (not supplied). First connect the adaptor to the DC IN 3V jack, then to a wall outlet.



Car Battery

Use the DCC-E130L car battery cord (not supplied).

Dictating



Before operating, make sure the following points.

- The LOCK switch is set to the opposite direction of the arrow.
- Nothing is connected to the MIC (microphone) jack.
- Set the VOR (voice operated recording) switch to ON, if necessary.

- 1 Press EJECT to open the cassette compartment lid.
- 2 Insert a cassette with the side to start dictating facing the lid.
- 3 BM-23 only: Set the TAPE SPEED selector to the desired tape speed.

| Recording time* | Set to |
|-----------------|----------|
| 60 minutes | 4.8 cm** |
| 120 minutes | 2.4 cm |

* Using both sides of a DC-60 cassette.

** For optimum sound (recommended for normal use), set to 4.8 cm.

- 4 Set the MIC SENS (microphone sensitivity) selector to the desired position.

| Use for | Set to |
|------------|------------------|
| normal use | DICT (dictation) |

recording a conference or telephone conversation CONF (conference)

- 5 Slide up the function lever to DICT (dictation).
- 6 Speak into the microphone. The DICT/BATT indicator flashes during recording.
- 7 To stop dictating, slide down the function lever to STOP. To eject a cassette, press EJECT.

Note

Do not use a CrO₂ (TYPE II) or metal (TYPE IV) tape, otherwise the sound may be distorted when you play back the tape, or the previous recording may not be erased completely.

To economize the tapes and batteries

Set the VOR switch to ON. The tape moves only when sound is picked up, and stops automatically when sound is no longer detected (DICT/BATT indicator goes out.), thus the minimum amount of tape is used.

To index the tape contents

Press COUNTER RESET before you start dictating. "000" appears in the LCD display.

To monitor the recording

Connect an earphone to the EAR (earphone) jack.

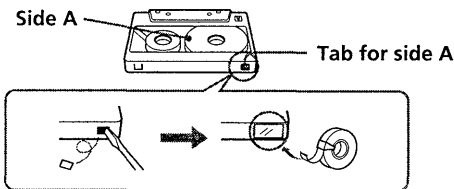
To listen to the just-recorded contents while dictating

Slide down the function lever to BACK SPACE, and release it at the desired point.

When the tape reaches the end and DICT/BATT indicator goes out

Slide the function lever to STOP.

To prevent a tape from being accidentally erased



Break off the cassette tabs from side A and/or B. To reuse the tape for recording, cover the tab hole with adhesive tape.

To erase the entire tape contents

Use the BE-9H cassette eraser (not supplied).

Recording with an external microphone

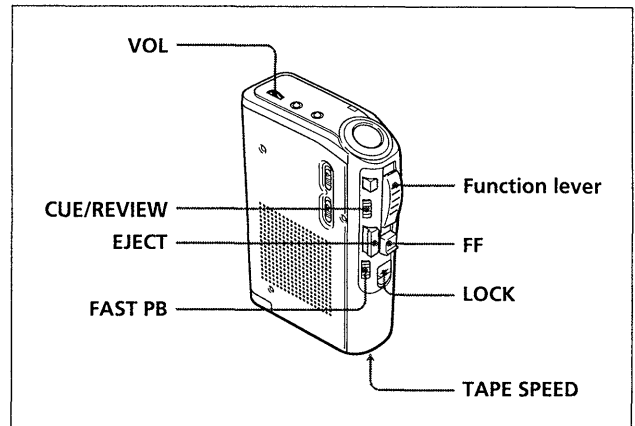
Connect the microphone to the MIC jack. When connecting the electret condenser microphone with "plug-in power" system, the power of the microphone is supplied from this unit.

Putting Marks during Recording for Easy Access (BM-23 only)

Press E-INDEX lightly when you have special instructions for your secretary about the material or mark the end of the letter. An electronic index signal will be recorded on the tape while the letter L (=LTR) appears in the LCD display. When the recording ends, stop the tape after the "L" indication disappears.

This signal is the same as the LTR signal of the Sony transcriber. When your secretary uses the Sony transcriber equipped with auto-stop function, the tape automatically stops at each index signal when it is rewound or rapidly advanced. Your secretary will be able to search a necessary dictation easily.

Listening to the Dictation



Make sure that the LOCK switch is set to the opposite direction of the arrow.

- 1 Press EJECT, then insert a cassette with the side to start listening facing the lid.
- 2 BM-23 only: Set the TAPE SPEED selector to the same position as that in recording.
- 3 Slide down the function lever to LISTEN.
- 4 Adjust VOL (volume).
- 5 To stop playback, slide up the function lever to STOP.

To listen to the tape at a faster speed than normal

Slide FAST PB (fast playback) up while listening to the tape.

To rewind the tape

Slide down the function lever at the BACK SPACE and release it at the desired point.

To rapidly advance the tape

Set the function lever to STOP, then keep pressing FF (fast forward) and release it at the desired point.

Searching an index signal or a desired portion (BM-23 only)

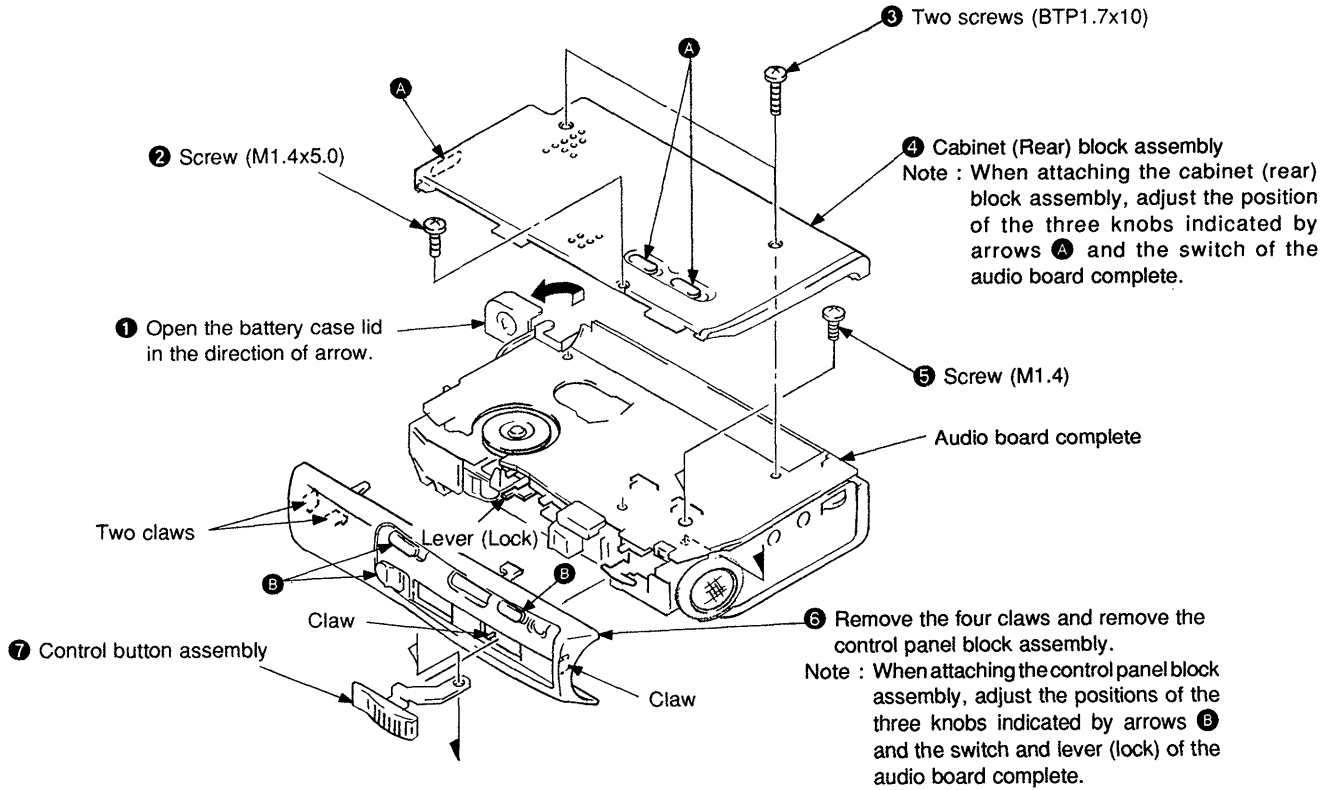
Set the CUE/REVIEW switch to ON. You can hear the recording including an index signal rapidly in the fast forward or rewind (back space) mode. A beep tone (index signal) will make it easier to access at that position. When it is not necessary to hear the recording including an index signal, set the CUE/REVIEW switch to OFF.

Searching a desired portion (BM-21 only)

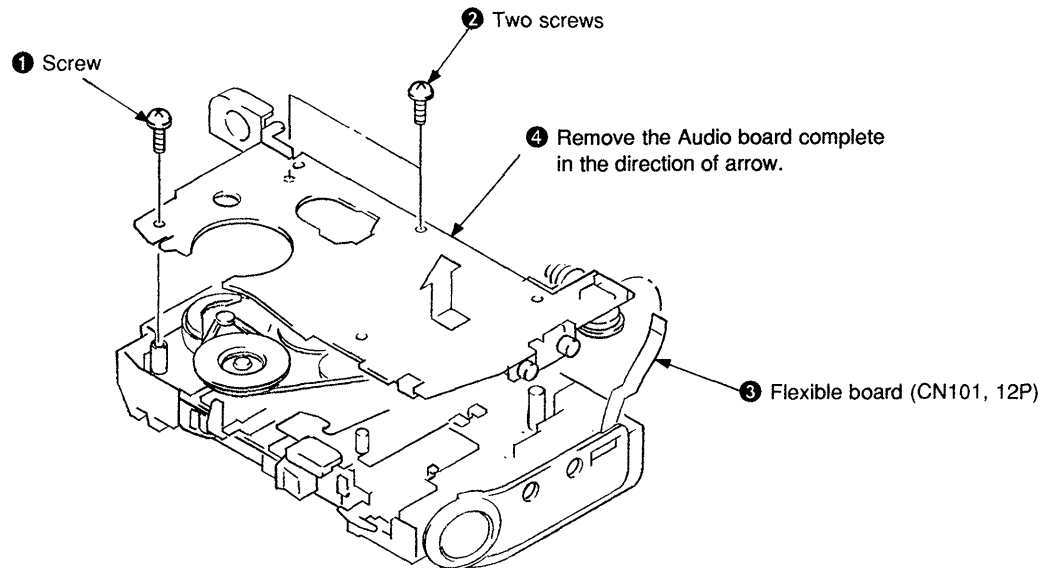
Set the CUE/REVIEW switch to ON. You can hear the recording rapidly in the fast forward or rewind (back space) mode. When it is not necessary to hear the recording, set the CUE/REVIEW switch to OFF.

SECTION 3 DISASSEMBLY

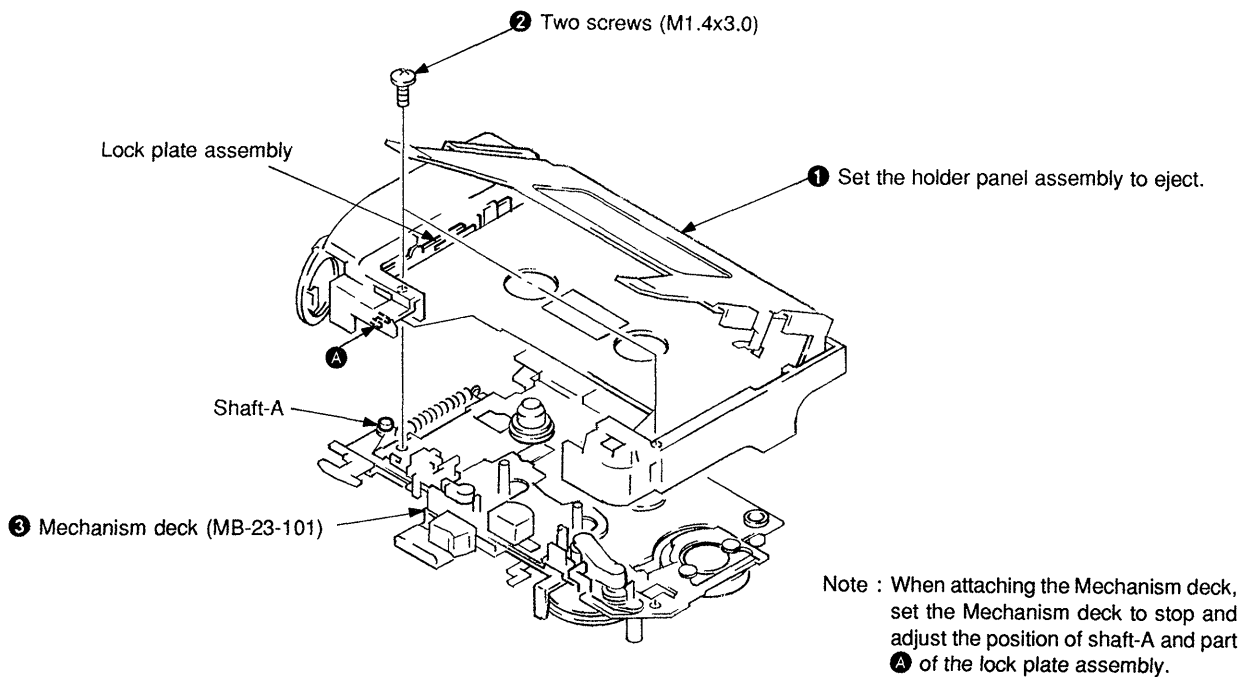
3-1. CONTROL PANEL BLOCK ASSEMBLY REMOVAL



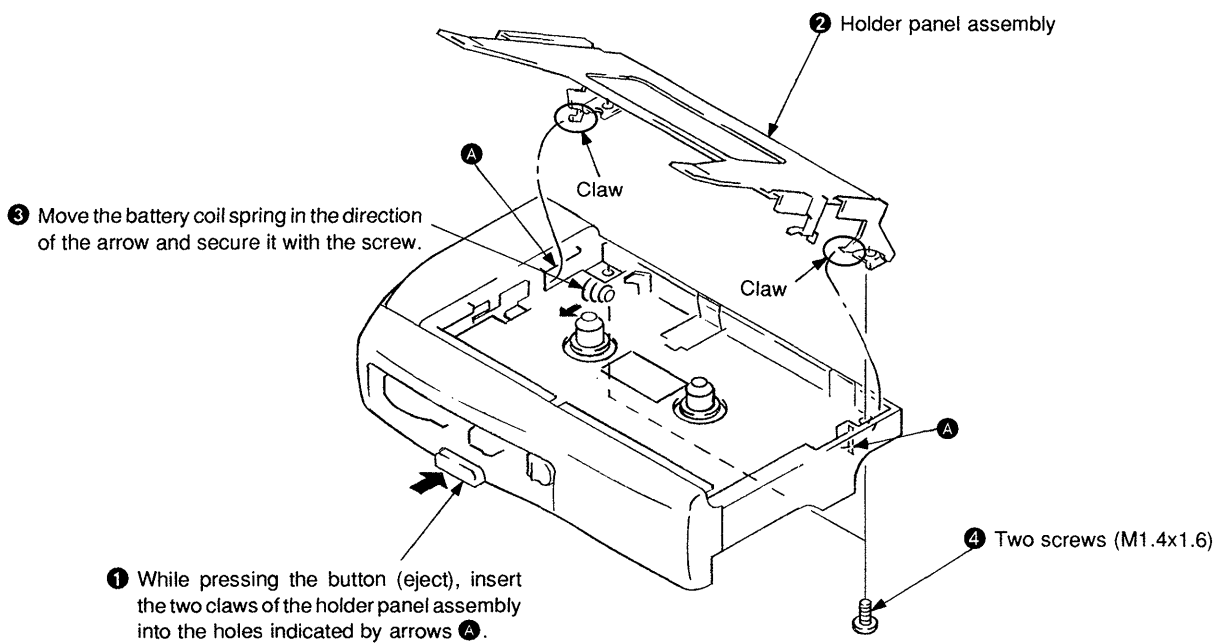
3-2. AUDIO BOARD COMPLETE REMOVAL



3-3. MECHANISM DECK (MB-23-101) REMOVAL



3-4. HOLDER PANEL ASSEMBLY INSTALLATION



SECTION 4 ADJUSTMENTS

4-1. MECHANICAL ADJUSTMENTS

PRECAUTION

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

| | |
|---------------|--------------|
| playback head | rubber belts |
| capstan | idlers |
| pinch roller | |
2. Demagnetize the playback head with a head demagnetizer.
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 (3V) unless otherwise noted.

Torque Measurement

| Mode | Torque meter | Meter reading |
|---------------------|--------------|---|
| FWD | CQ-102C | 21 — 38 g • cm (0.30 — 0.52 oz • inch) |
| FWD Back Tension | | 0.5 — 3 g • cm (0.01 — 0.04 oz • inch) |
| REV | CQ-102RC | 21 — 38 g • cm (0.30 — 0.52 oz • inch) |
| REV Back Tension | | 0.5 — 3 g • cm (0.01 — 0.04 oz • inch) |
| FF | CQ-201B | more than 60 g • cm (more than 0.84 oz • inch) |
| REW | | |

Tape Pulling Force Measurement

| Mode | Torque meter | Meter reading |
|------|--------------|---------------------------------------|
| FF | CQ-403A | more than 40 g (more than 1.42 oz) |
| REW | CQ-403R | |

4-2. ELECTRICAL ADJUSTMENTS

PRECAUTION

1. Power supply voltage : 3V

Test Tape

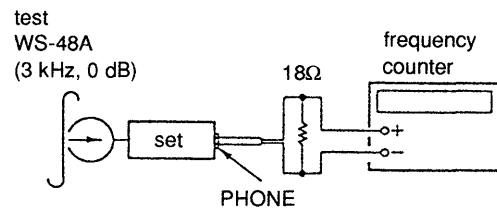
| Type | Signal | Used for |
|--------|-------------|-----------------------|
| WS-48A | 3 kHz, 0 db | Tape Speed Adjustment |

TAPE SPEED 4.8 cm/s ADJUSTMENT

Switch position (BM-23)

TAPE SPEED Switch : 4.8 cm

Procedure :



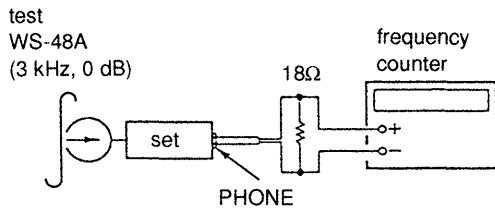
1. Play back WS-48A (tape center portion) in FWD mode. Adjust the RV601 so that the frequency counter reads $3,000 \pm 30$ Hz.
2. Play back WS-48A (tape center portion) in REV mode. Confirm that the reading of frequency counter is within 2.5% from the reading in step 1.

TAPE SPEED 2.4 cm/s ADJUSTMENT (BM-23 ONLY)

Switch position

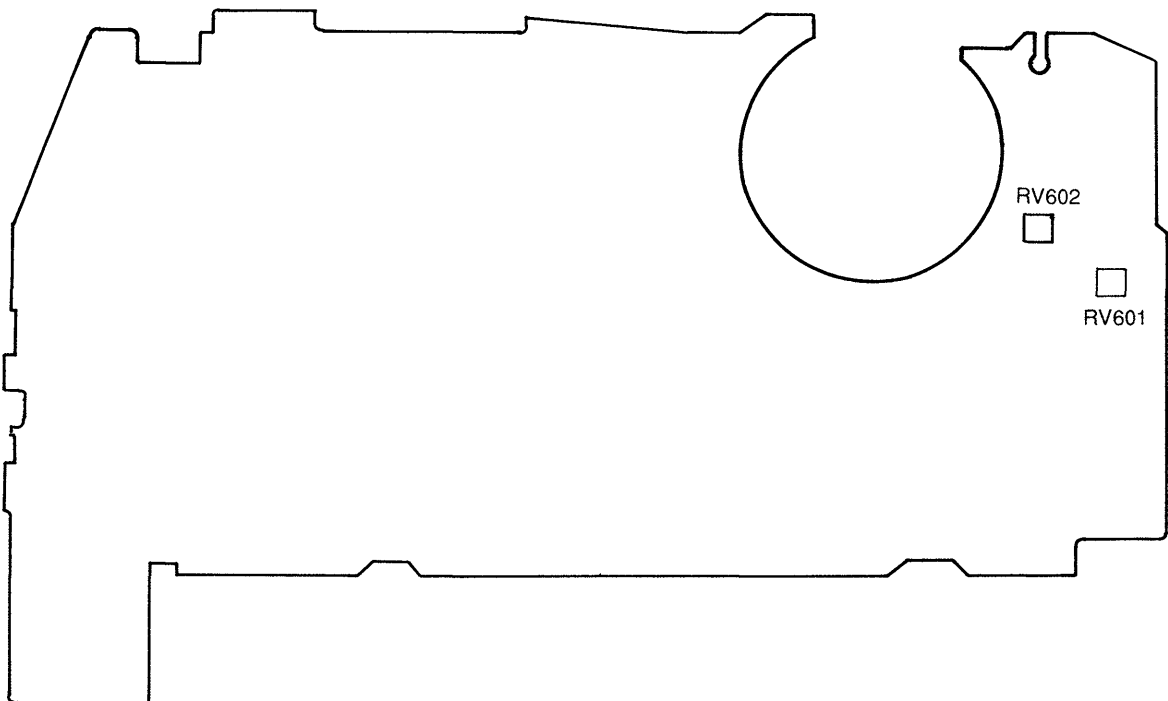
TAPE SPEED Switch : 2.4 cm

Procedure :



1. Play back WS-48A (tape center portion) in FWD mode. Adjust the RV602 so that the frequency counter reads $1,500 \pm 15$ Hz.
2. Play back WS-48A (tape center portion) in REV mode. Confirm that the reading of frequency counter is within 2.5% from the reading in step 1.

Adjustment Parts Location Diagram : AUDIO BOARD (SIDE B)



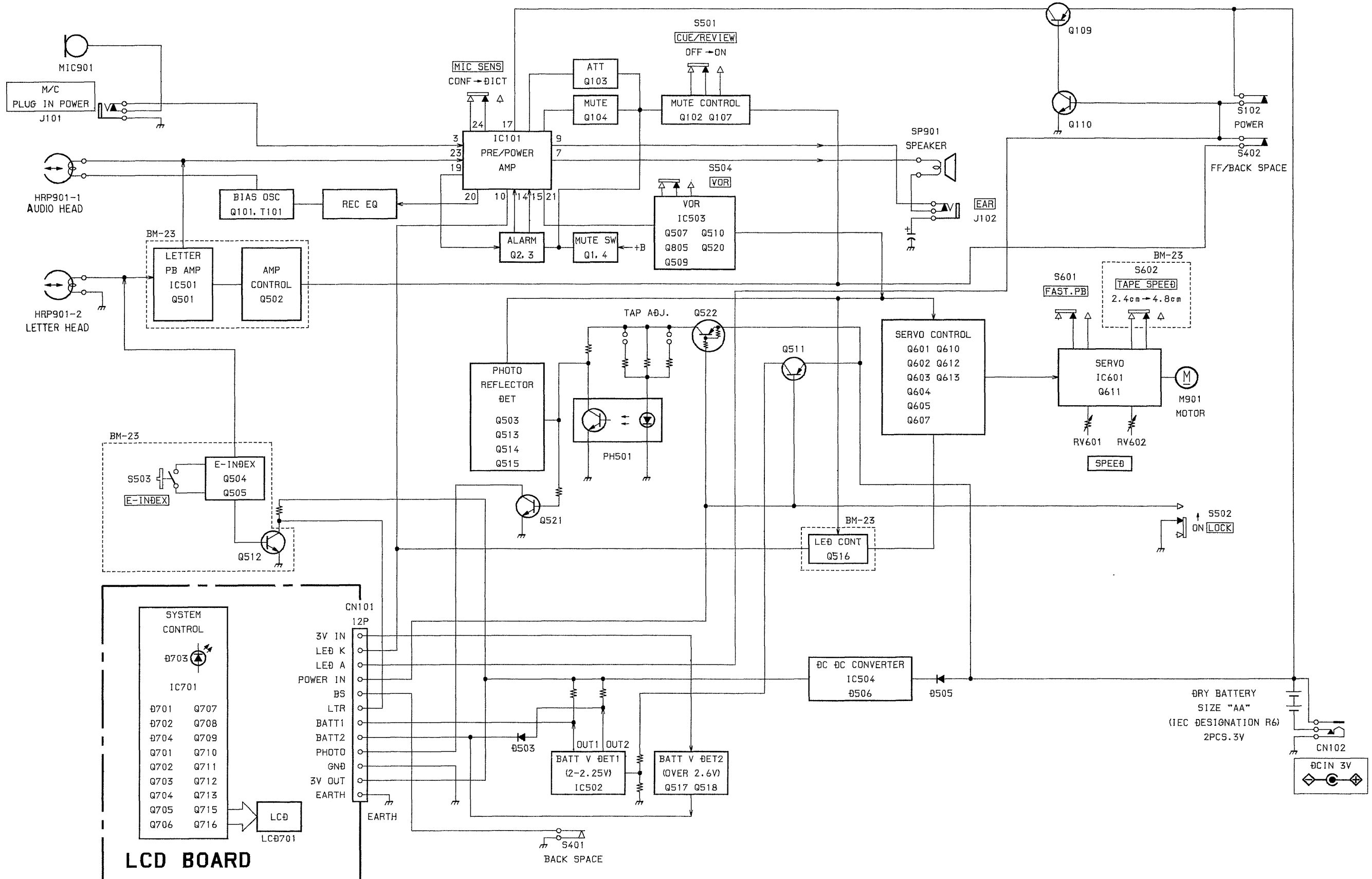
SECTION 5 DIAGRAMS

5-1. IC PIN FUNCTION

IC701 SYSTEM CONTROLLER (BU2456-23)

| Pin No. | Signal Name | I/O | Function |
|---------|---------------|-----|--|
| 1 | INT | I | Reset terminal |
| 2 | GND | — | GND terminal |
| 3 | POWER | I | <ol style="list-style-type: none"> 1. When POWER. IN becomes level "L", UP counter, BATT, or LTR is displayed according to PHOTO. IN change. 2. When POWER. IN becomes level "H", the HALT state is set, displaying is stopped, and the detection of all inputs are also stopped. |
| 4 | IN. CTL | O | Rc/Rd input control terminal |
| 5 | COM1 | O | COM 1 First digit (first digit from the right) |
| 6 | COM2 | O | COM 2 Second digit (second digit from the right) |
| 7 | BATT1 (RESET) | I | <p>BATT.IN</p> <ol style="list-style-type: none"> 1. When BATT1=H, and BATT2=L, " is displayed. 2. When BATT1=H, and BATT2=H, " is displayed. 3. When BATT1=L, and BATT2=H, " is displayed. 4. When BATT1=L, and BATT2=L, " is displayed. 5. BATT IN will not be accepted during HALT. <p>RESET. IN</p> |
| 8 | BATT2 (LTR) | I | <ol style="list-style-type: none"> 1. Forces the counter to display "888" while it is displaying. 2. Sets the RAM of the counter to display "888" while the LTR is displaying. 3. RESET. IN will not be accepted during HALT. <p>LTR. IN</p> <ol style="list-style-type: none"> 1. The counter is stopped if it is displaying and "L" is displayed. 2. Even if "L" is displayed, the counter will operate. 3. LTR. IN will not be accepted during HALT. |
| 9 | PHOTO | I | <ol style="list-style-type: none"> 1. When the tape is rotated while the tape recorder is operating, photo detection is input. 2. PHOTO. IN will not be accepted during HALT. |
| 10 | BS | I | <ol style="list-style-type: none"> 1. The DOWN counter is set when L and the UP counter is set when H. 2. BS. IN will not be accepted during HALT. |
| 11 | SEG8 | O | Segment output terminal |
| 12 | NC | — | |
| 13 | NC | — | |
| 14 | SEG1 | O | Segment output terminal |
| 15 | SEG2 | O | Segment output terminal |
| 16 | SEG3 | O | Segment output terminal |
| 17 | SEG4 | O | Segment output terminal |
| 18 | SEG5 | O | Segment output terminal |
| 19 | SEG6 | O | Segment output terminal |
| 20 | SEG7 | O | Segment output terminal |
| 21 | COM3 | O | COM 3 Third digit (third digit from the right) |
| 22 | OSC | O | X'tal oscillation terminal (1 MHz) |
| 23 | OSC | I | X'tal oscillation terminal (1 MHz) |
| 24 | Vcc | — | Power supply terminal |

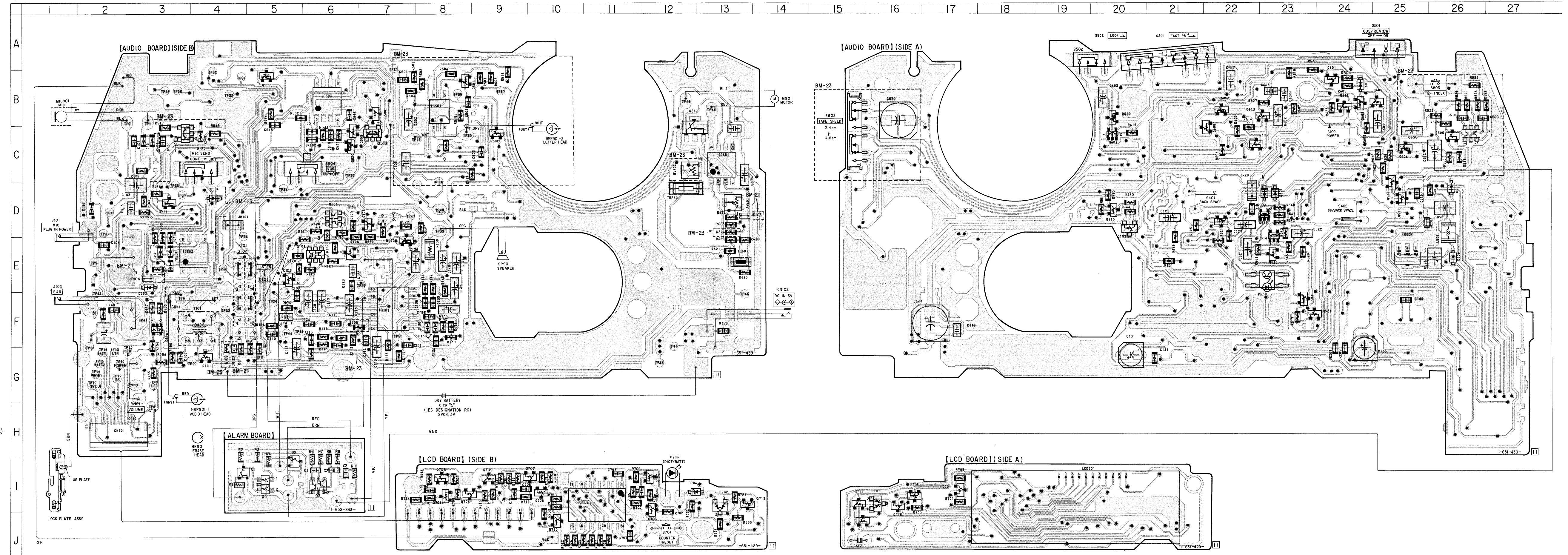
5-2. BLOCK DIAGRAM

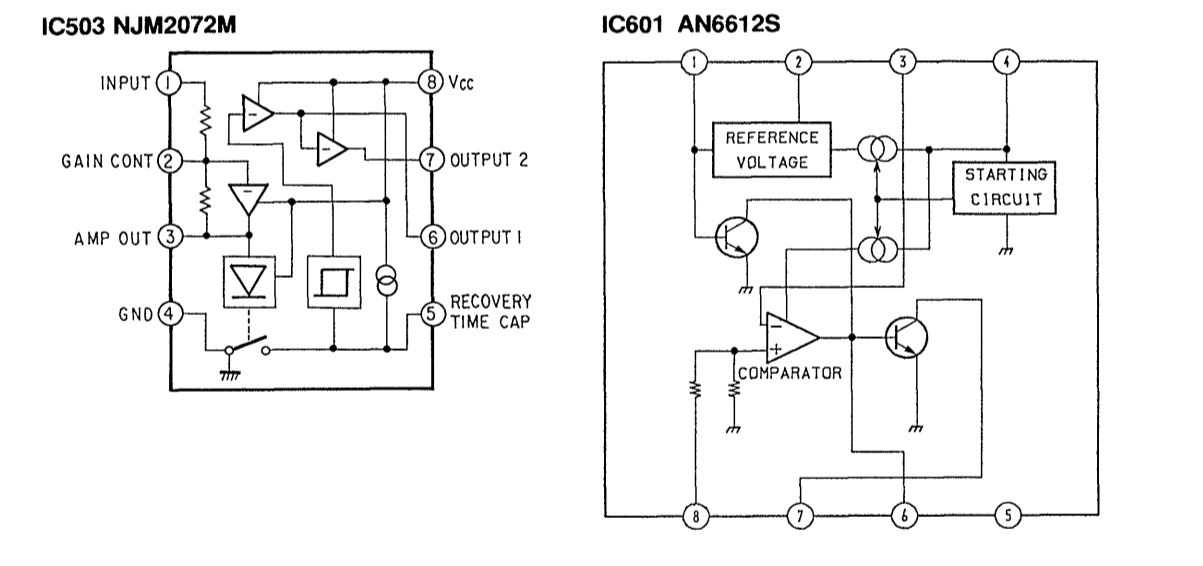
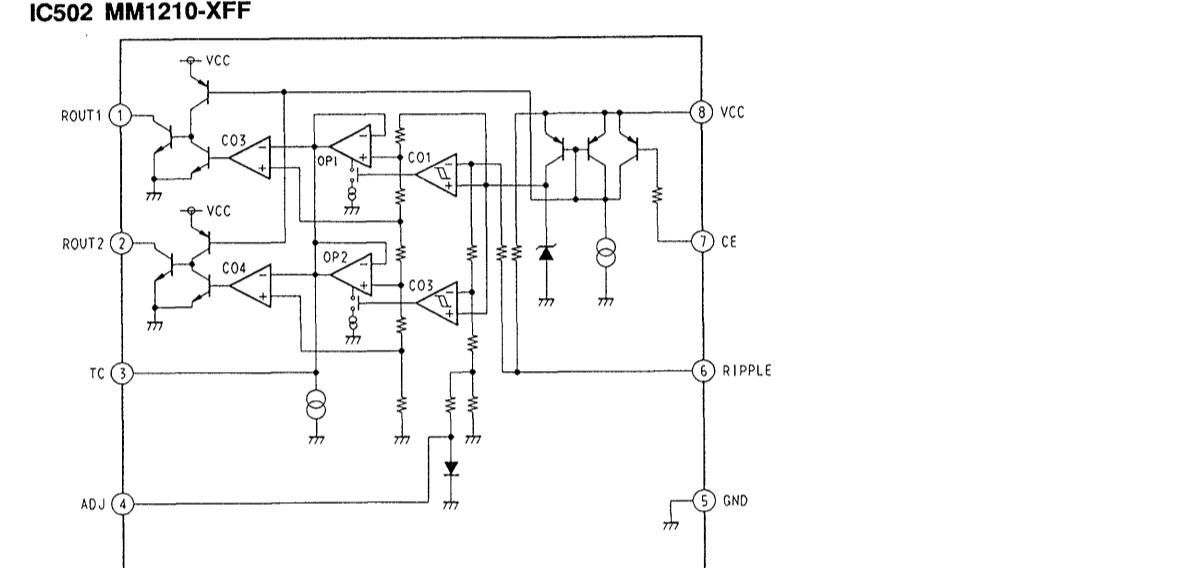
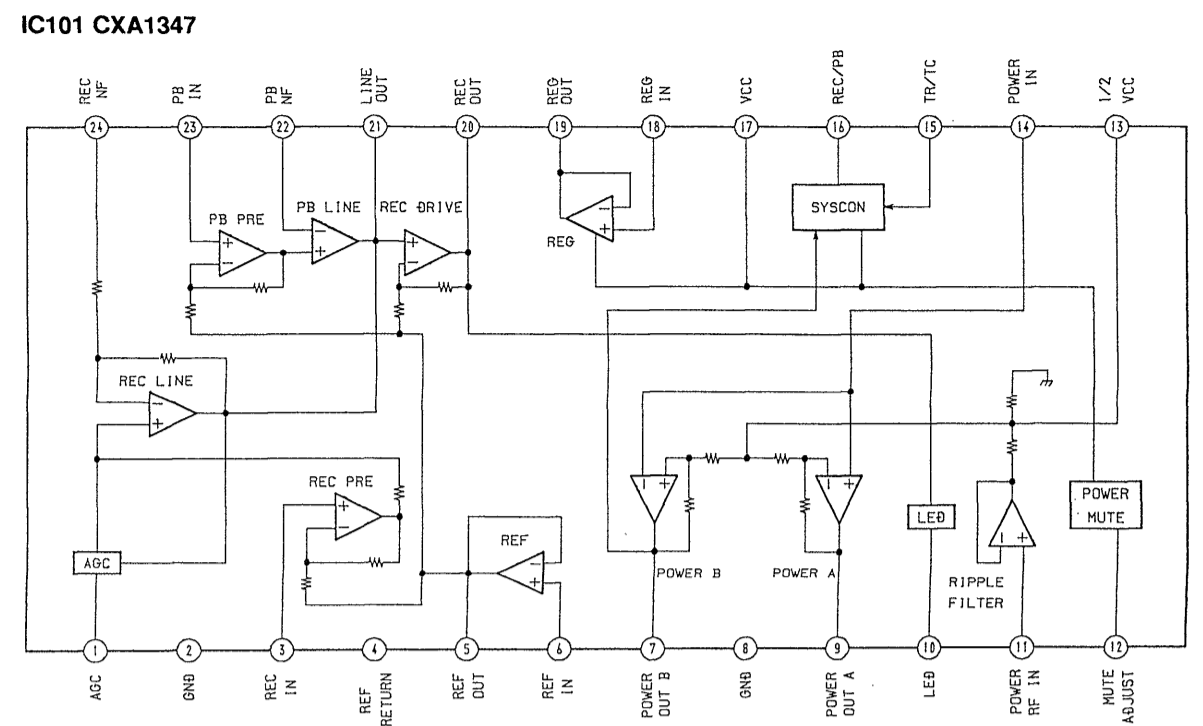
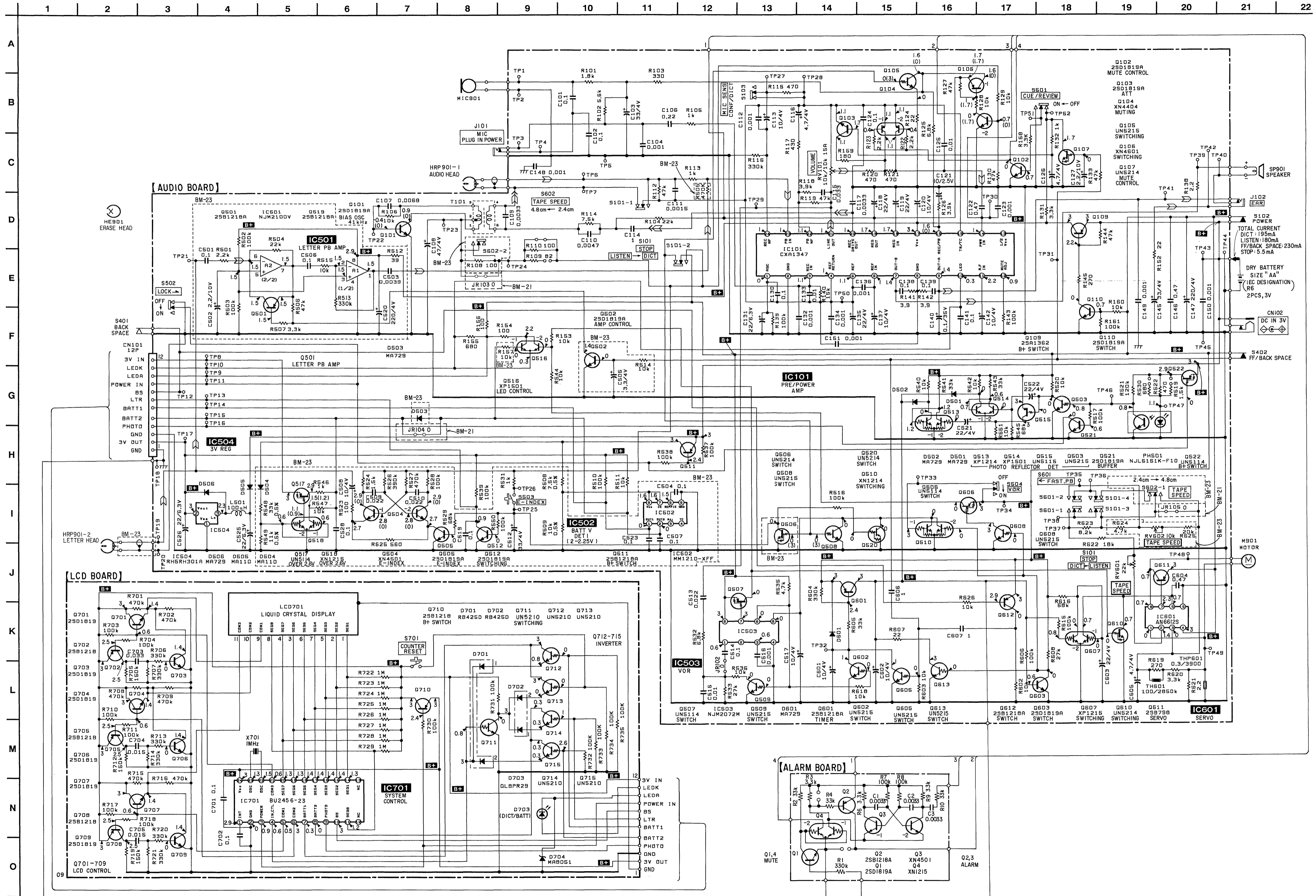


• Semiconductor Location

| Ref. No. | Location | Ref. No. | Location |
|----------|----------|----------|----------|
| D501 | D-23 | Q507 | B-5 |
| D502 | D-23 | Q508 | B-7 |
| D503 | F-3 | Q509 | C-7 |
| D504 | D-4 | Q510 | C-7 |
| D505 | D-26 | Q511 | D-25 |
| D506 | E-26 | Q512 | D-25 |
| D601 | B-24 | Q513 | D-23 |
| D701 | I-16 | Q514 | E-23 |
| D702 | I-13 | Q515 | E-23 |
| D703 | I-12 | Q516 | F-3 |
| D704 | I-12 | Q517 | D-3 |
| | | Q518 | C-3 |
| IC101 | F-7 | Q520 | C-6 |
| IC501 | B-8 | Q521 | F-24 |
| IC502 | E-3 | Q522 | D-22 |
| IC503 | B-6 | Q601 | B-24 |
| IC504 | E-25 | Q602 | B-24 |
| IC601 | C-13 | Q603 | C-23 |
| IC701 | I-11 | Q605 | B-25 |
| | | Q606 | B-22 |
| PH501 | F-23 | Q607 | C-20 |
| | | Q608 | C-22 |
| Q1 | I-5 | Q610 | B-20 |
| Q2 | H-5 | Q611 | B-12 |
| Q3 | I-6 | Q612 | B-24 |
| Q4 | I-5 | Q613 | B-22 |
| Q101 | G-4 | Q701 | I-17 |
| Q102 | E-6 | Q702 | I-12 |
| Q103 | E-5 | Q703 | I-12 |
| Q104 | E-5 | Q704 | I-8 |
| Q105 | D-7 | Q705 | I-8 |
| Q106 | D-6 | Q706 | I-8 |
| Q107 | E-7 | Q707 | I-10 |
| Q109 | E-20 | Q708 | I-10 |
| Q110 | D-20 | Q709 | I-9 |
| Q501 | B-9 | Q710 | J-10 |
| Q502 | C-9 | Q711 | J-15 |
| Q503 | F-23 | Q712 | I-15 |
| Q504 | C-27 | Q713 | I-14 |
| Q505 | C-26 | Q714 | I-16 |
| Q506 | C-25 | Q715 | J-16 |

Note:
 • : parts extracted from the conductor side.
 • : Through hole.
 • : Pattern on the side which enable seeing.
 (The other layer's patterns are not indicated.)



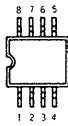


Note:

- All capacitors are in μF unless otherwise noted. $\text{pF} = \mu\text{F} \times 10^{-6}$. 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4W or less unless otherwise specified.
- % indicates tolerance.
- : panel designation.
- B+: B+ Line
- ⊕: adjustment for repair.
- Voltage and waveforms are dc with respect to ground under no-signal conditions. When opening the board and measuring, turned on S102 (POWER) and S402 (FF/BACK SPACE), no mark: REC (DICT)
- (): PB (LISTEN)
- Voltages are taken with a VOM (input impedance 10M Ω). Voltage variations may be noted due to normal production tolerances.
- Power voltage is dc 3V and fed with regulated dc power supply from external power voltage jack.
- Total current is measured with no cassette installed.
- Signal path.
- ⊕: PB (LISTEN)
- ⊕: REC (DICT)

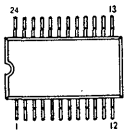
5-5. SEMICONDUCTOR LEAD LAYOUTS

AN6612S
 NJM2100V
 NJM2072M
 MM1210-XFF



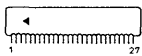
(TOP VIEW)

BU2456-23
 CXA1347N

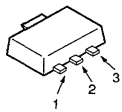


(TOP VIEW)

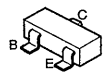
NJ5161K-F10-A



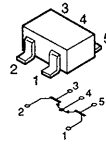
RH5RH301A



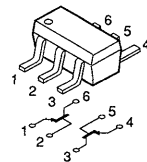
UN5114
 UN5115
 UN5210
 UN5214
 UN5215
 2SA1362G
 2SA1586-YG
 2SD1819A-R



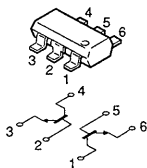
XN1214
 XN1215



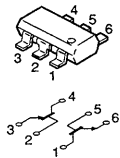
XN4404



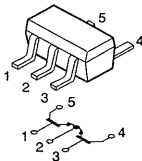
XN4501



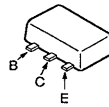
XN4601



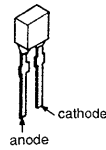
XP1214
 XP1215
 XP1501



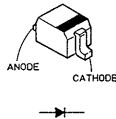
2SB798-DL



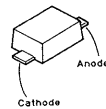
GL8PR29



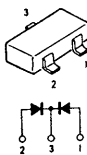
MA110
 MA8051



MA729



RB425D



SECTION 6 EXPLODED VIEWS

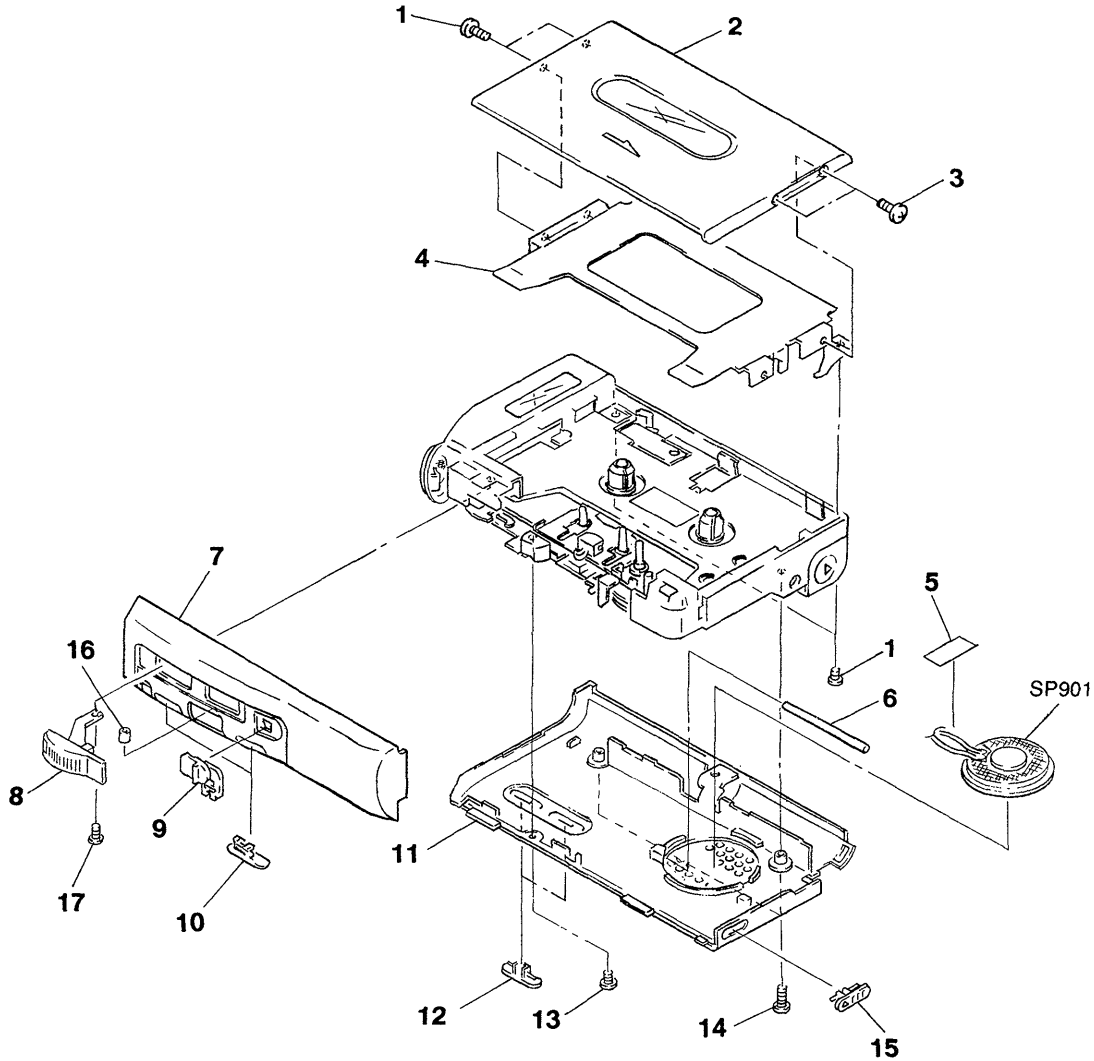
NOTE:

- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Color Indication of Appearance Parts Example:
KNOB, BALANCE (WHITE) . . . (RED)

↑
Parts color

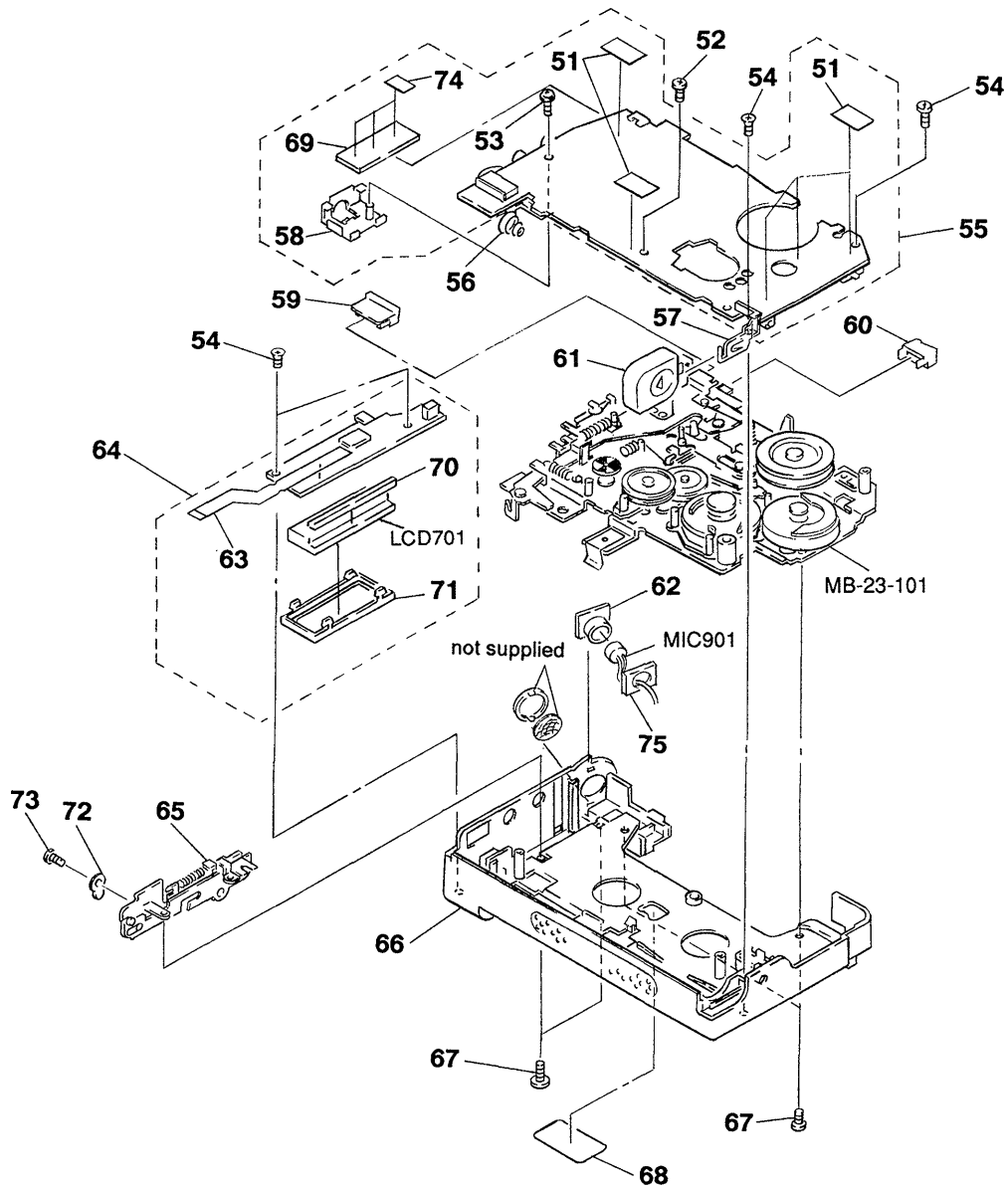
↑
Cabinet's color
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Accessories and packing materials are given in the last of this parts list.

6-1. CABINET SECTION



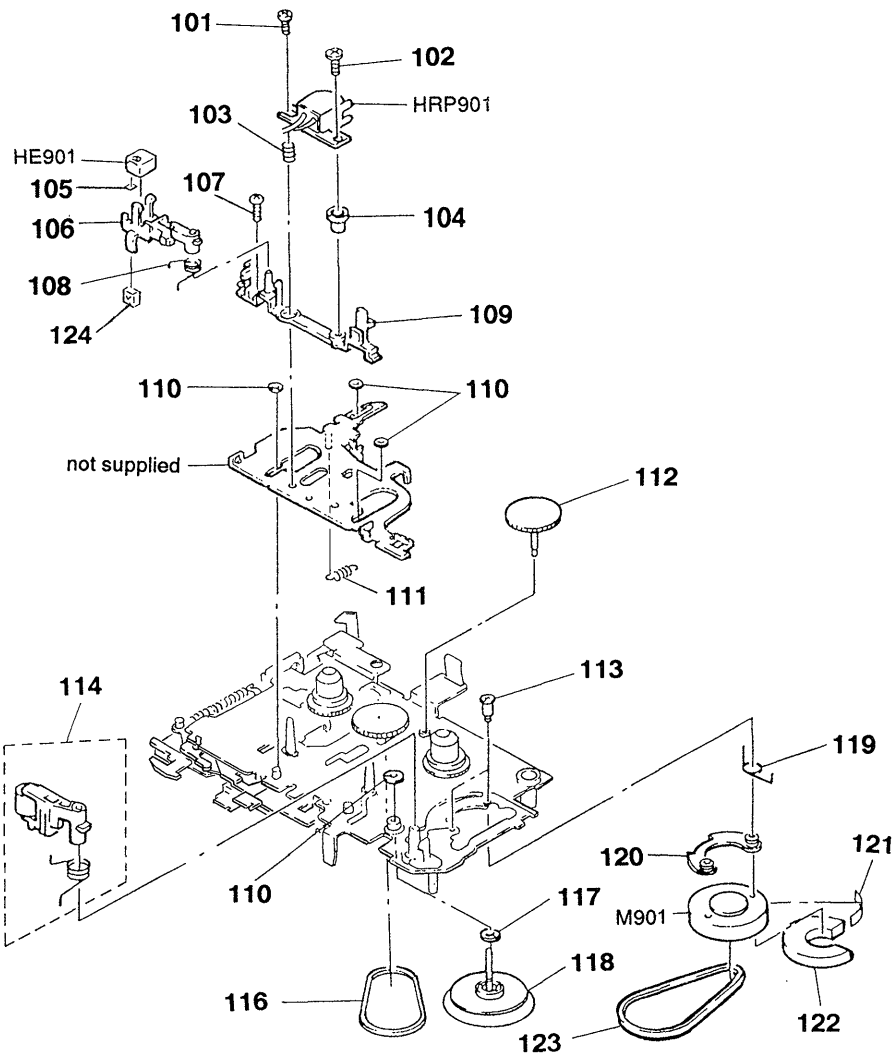
| Ref. No. | Part No. | Description | Remark | Ref. No. | Part No. | Description | Remark |
|----------|--------------|-----------------------------|--------|----------|--------------|-----------------------------|--------|
| 1 | 3-704-197-03 | SCREW (M1. 4X1. 6), LOCKING | | 10 | 3-909-954-01 | KNOB (A) | |
| 2 | X-3367-817-1 | PANEL ASSY, CASSETTE (23) | | 11 | X-3367-816-1 | CABINET (REAR) ASSY (23) | |
| 2 | X-3368-079-1 | PANEL ASSY, CASSETTE (21) | | 11 | X-3368-081-1 | CABINET (REAR) ASSY (21) | |
| 3 | 3-704-197-42 | SCREW (M1. 4X2. 2), LOCKING | | 12 | 3-909-957-01 | KNOB (VOR) | |
| 4 | X-3367-810-1 | PANEL ASSY, HOLDER | | 13 | 3-704-197-82 | SCREW (M1. 4X5. 0), LOCKING | |
| 5 | 3-831-441-XX | CUSHION | | 14 | 3-334-565-11 | SCREW (Bl. 7X10), TAPPING | |
| * 6 | 3-374-741-01 | BRACKET (SPEAKER), CONCLUDE | | 15 | 3-365-623-01 | KNOB (DOLBY) (23) | |
| 7 | 3-909-973-01 | PANEL, CONTROL (23) | | 16 | 3-347-746-01 | COLLAR | |
| 7 | 3-909-973-11 | PANEL, CONTROL (21) | | 17 | 3-365-630-02 | SCREW (M1. 4) | |
| 8 | X-3367-812-1 | BUTTON ASSY, CONTROL | | SP901 | 1-504-294-11 | SPEAKER (3. 6CM) | |
| 9 | 3-909-955-01 | KNOB (HOLD) | | | | | |

6-2. PC BOARD SECTION



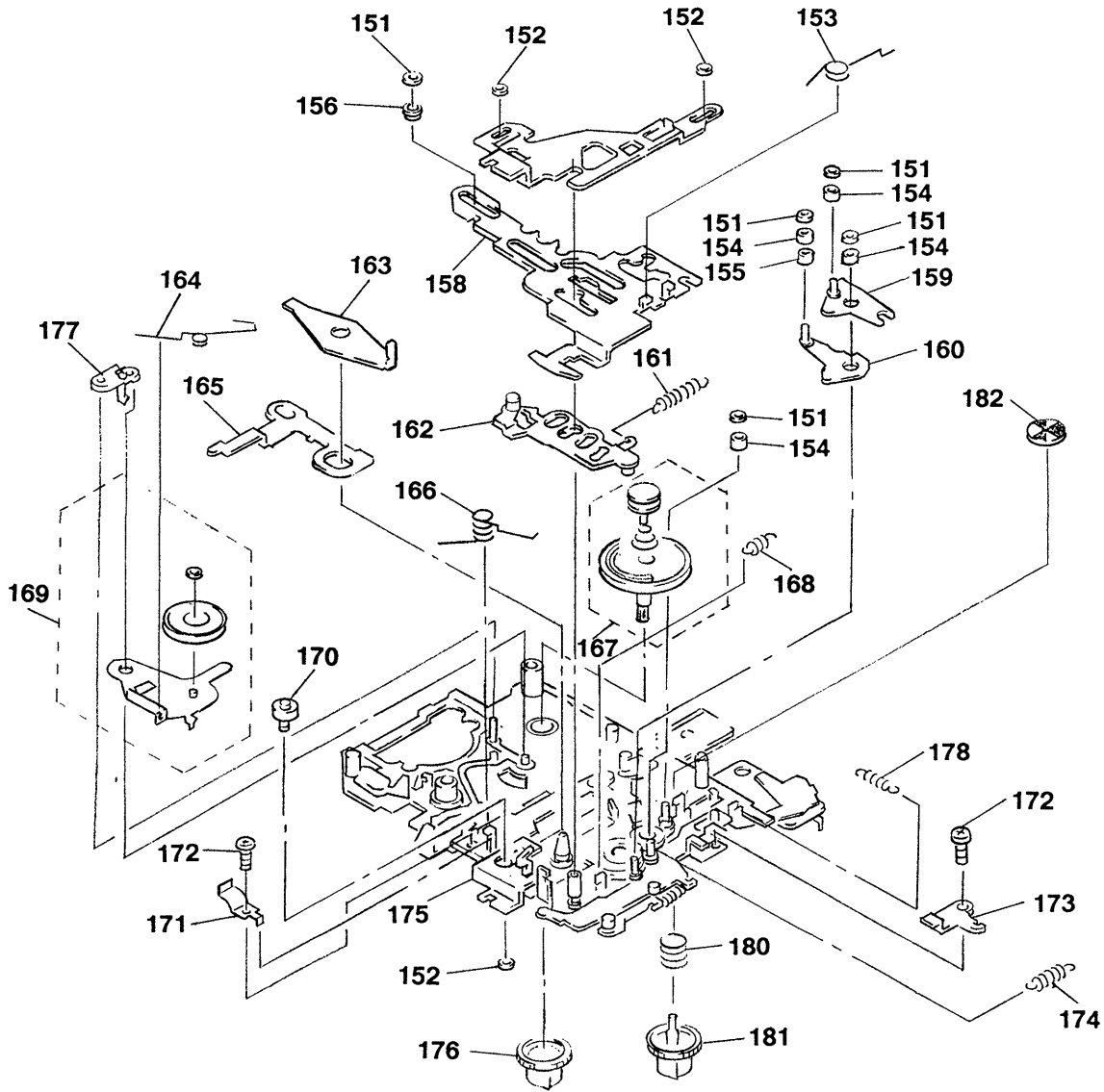
| Ref. No. | Part No. | Description | Remark | Ref. No. | Part No. | Description | Remark |
|----------|--------------|------------------------------|--------|----------|--------------|--------------------------------|--------|
| 51 | 3-831-441-XX | CUSHION | | 65 | X-3367-814-1 | PLATE, LOCK ASSY | |
| 52 | 3-335-797-01 | SCREW (M1.4X2), TOOTHED LOCK | | 66 | X-3367-813-1 | FRONT ASSY, CABINET (23) | |
| 53 | 3-703-502-31 | SCREW | | 66 | X-3368-080-1 | FRONT ASSY, CABINET (21) | |
| 54 | 3-375-114-61 | SCREW | | 67 | 3-704-197-33 | SCREW (M1.4X3.0), LOCKING | |
| 55 | A-3016-512-A | AUDIO BOARD, COMPLETE (23) | | 68 | 3-371-862-01 | PLATE, ORNAMENTAL | |
| 55 | A-3016-561-A | AUDIO BOARD, COMPLETE (21) | | * 69 | 1-652-833-11 | ALARM BOARD | |
| 56 | 3-909-950-01 | SPRING, BATTERY COIL | | * 70 | 1-537-724-11 | CONDUCTIVE BOARD, CONNECTION | |
| 57 | X-3367-811-1 | TERMINAL BOARD ASSY | | 71 | 3-911-887-01 | HOLDER, LCD | |
| * 58 | X-3363-574-1 | HOLDER ASSY, JACK | | 72 | 7-623-505-01 | LUG, 2 | |
| 59 | 3-909-952-01 | BUTTON (EJECT) | | 73 | 3-891-132-00 | SCREW (M1.7X2.0), SPECIAL HEAD | |
| 60 | 3-909-951-01 | BUTTON (FF) | | 74 | 4-017-441-01 | CUSHION (B) | |
| 61 | 3-909-953-01 | LID, BATTERY CASE | | * 75 | 3-914-611-01 | HOLDER, MICROPHONE | |
| 62 | 3-320-975-01 | CUSHION (A), MICROPHONE | | LCD701 | 1-810-464-11 | DISPLAY PANEL, LIQUID CRYSTAL | |
| 63 | 1-652-024-11 | PC BOARD, FLEXIBLE | | MIC901 | 1-542-080-11 | MICROPHONE, BUILT-IN | |
| 64 | A-3016-511-A | LCD BOARD, COMPLETE | | | | | |

6-3. MECHANISM DECK SECTION-1 (MB-23-101)



| Ref. No. | Part No. | Description | Remark | Ref. No. | Part No. | Description | Remark |
|----------|--------------|-------------------------------|--------|----------|--------------|--------------------------------|--------|
| 101 | 3-375-135-01 | SCREW (1.4), SPECIAL | | 116 | 3-371-868-01 | BELT (FR) | |
| 102 | 3-376-177-01 | SCREW (M1.4X3.8) | | 117 | 3-701-437-41 | WASHER | |
| 103 | 3-371-882-01 | SPRING (AZIMUTH), COMPRESSION | | 118 | X-3363-571-1 | WHEEL ASSY (ZNDC), CAPSTAN | |
| 104 | 3-375-045-01 | COLLAR (HEAD) | | 119 | 3-374-119-02 | SPRING (GROUND), TORSION | |
| 105 | 3-385-317-11 | CUSHION (E HEAD) | | * 120 | 3-371-885-01 | CUSHION, MOTOR | |
| 106 | 3-371-851-01 | BRACKET (E HEAD) | | 121 | 3-831-441-XX | CUSHION | |
| 107 | 3-704-197-11 | SCREW (M1.4X2.0), LOCKING | | * 122 | 3-372-991-01 | DAMPER | |
| 108 | 3-371-873-01 | SPRING (E HEAD), TORSION | | 123 | 3-371-869-01 | BELT (CAPSTAN) | |
| 109 | 3-371-839-11 | BRACKET (HEAD) | | 124 | 3-915-014-01 | REINFORCEMENT | |
| 110 | 3-321-483-11 | RING, RETAINING | | HE901 | 8-825-779-41 | HEAD, ERASE EBF5-36S | |
| 111 | 3-910-002-01 | SPRING, TENSION | | HRP901 | 1-500-126-11 | HEADMAGNETIC (RECORD/PLAYBACK) | |
| 112 | 3-371-854-01 | GEAR (FF) | | M901 | 1-541-921-11 | MOTOR | |
| 113 | 3-371-886-01 | SCREW (MOTOR), STEP | | | | | |
| 114 | X-3368-042-1 | PINCH ROLLER ASSY | | | | | |

6-4. MECHANISM DECK SECTION-2 (MB-23-101)



| Ref. No. | Part No. | Description | Remark | Ref. No. | Part No. | Description | Remark |
|----------|--------------|-------------------------|--------|----------|--------------|-----------------------------|--------|
| 151 | 3-315-384-11 | WASHER, STOPPER | | 167 | X-3367-818-1 | TABLE ASSY, FELT | |
| 152 | 3-321-483-11 | RING, RETAINING | | 168 | 3-910-004-01 | SPRING, TENSION | |
| 153 | 3-910-006-01 | SPRING, TORSION | | 169 | X-3363-568-1 | LEVER ASSY, IDLER | |
| 154 | 3-909-999-01 | ROLLER (C) | | 170 | 3-909-996-01 | SHAFT (CHASSIS-D) | |
| 155 | 3-909-997-01 | ROLLER (A) | | 171 | 3-915-376-01 | SPRING (LOCK), LEAF | |
| 156 | 3-909-998-01 | ROLLER (B) | | 172 | 3-704-197-03 | SCREW (M1.4X1.6), LOCKING | |
| * 157 | 3-909-985-01 | LEVER (EJECT) | | * 173 | 3-909-986-01 | HOLDER (SPRING) | |
| * 158 | 3-909-987-01 | LEVER (SLIDE) | | 174 | 3-910-003-01 | SPRING, TENSION | |
| 159 | X-3367-822-1 | LEVER (REC 2) ASSY | | 175 | X-3367-819-1 | CHASSIS ASSY | |
| 160 | X-3367-823-1 | LEVER (CL) ASSY | | 176 | 3-371-865-01 | GEAR (T REEL) | |
| 161 | 3-910-005-01 | SPRING, TENSION | | * 177 | 3-914-860-01 | STOPPER (IDLER) | |
| 162 | X-3367-820-1 | LEVER (EJECT) ASSY | | 178 | 3-911-371-01 | SPRING, TENSION | |
| * 163 | 3-909-995-01 | LEVER (SW) | | 180 | 3-371-881-01 | SPRING (B. T.), COMPRESSION | |
| 164 | 3-910-007-01 | SPRING (IDLER), TORSION | | 181 | 3-371-866-01 | GEAR (S REEL) | |
| * 165 | 3-909-988-01 | LEVER (LOCK) | | 182 | 3-910-000-01 | REFLECTOR | |
| 166 | 3-371-872-01 | SPRING (FR), TORSION | | | | | |

ALARM **AUDIO**

**SECTION 7
ELECTRICAL PARTS LIST**

NOTE:

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

- 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.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- -XX, -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
- Accessories and packing materials are given in the last of this parts list.

- RESISTORS
 All resistors are in ohms
 METAL: Metal-film resistor
 METAL OXIDE: Metal Oxide-film resistor
 F : nonflammable
- 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

| Ref.No. | Part No. | Description | Remark | Ref.No. | Part No. | Description | Remark |
|---------|--------------|--|--------|---------|--------------|----------------------------------|--------|
| * | 1-652-833-11 | ALARM BOARD ***** | | C107 | 1-162-969-11 | CERAMIC CHIP 0.0068uF 10% 25V | |
| | 4-017-441-01 | CUSHION (B) < CAPACITOR > | | C108 | 1-126-607-11 | ELECT CHIP 47uF 20% 4V | |
| C1 | 1-162-967-11 | CERAMIC CHIP 0.0033uF 10% 50V | | C109 | 1-162-967-11 | CERAMIC CHIP 0.0033uF 10% 50V | |
| C2 | 1-162-967-11 | CERAMIC CHIP 0.0033uF 10% 50V | | C110 | 1-162-968-11 | CERAMIC CHIP 0.0047uF 10% 50V | |
| C3 | 1-162-967-11 | CERAMIC CHIP 0.0033uF 10% 50V | | C111 | 1-162-965-11 | CERAMIC CHIP 0.0015uF 10% 50V | |
| | | < TRANSISTOR > | | C112 | 1-162-964-11 | CERAMIC CHIP 0.001uF 10% 50V | |
| Q1 | 8-729-402-32 | TRANSISTOR 2SD1819A-R | | C113 | 1-135-201-11 | TANTALUM CHIP 10uF 20% 4V | |
| Q2 | 8-729-230-60 | TRANSISTOR 2SA1586-YG | | C114 | 1-164-346-11 | CERAMIC CHIP 1uF 16V | |
| Q3 | 8-729-402-81 | TRANSISTOR XN4501 | | C115 | 1-164-677-11 | CERAMIC CHIP 0.033uF 10% 16V | |
| Q4 | 8-729-403-17 | TRANSISTOR XN1215 | | C116 | 1-135-151-21 | TANTALUM CHIP 4.7uF 20% 4V | |
| | | < RESISTOR > | | C117 | 1-162-967-11 | CERAMIC CHIP 0.0033uF 10% 50V | |
| R1 | 1-216-851-11 | METAL CHIP 330K 5% 1/16W | | C118 | 1-104-847-11 | TANTAL. CHIP 22uF 20% 4V | |
| R2 | 1-216-839-11 | METAL CHIP 33K 5% 1/16W | | C119 | 1-104-847-11 | TANTAL. CHIP 22uF 20% 4V | |
| R3 | 1-216-827-11 | METAL CHIP 3.3K 5% 1/16W | | C120 | 1-135-201-11 | TANTALUM CHIP 10uF 20% 4V | |
| R4 | 1-216-839-11 | METAL CHIP 33K 5% 1/16W | | C121 | 1-107-983-11 | TANTAL. CHIP 10uF 20% 2.5V | |
| R6 | 1-216-827-11 | METAL CHIP 3.3K 5% 1/16W | | C122 | 1-164-005-11 | CERAMIC CHIP 0.47uF 25V | |
| R7 | 1-216-845-11 | METAL CHIP 100K 5% 1/16W | | C123 | 1-162-964-11 | CERAMIC CHIP 0.001uF 10% 50V | |
| R8 | 1-216-845-11 | METAL CHIP 100K 5% 1/16W | | C124 | 1-164-360-11 | CERAMIC CHIP 0.1uF 16V | |
| R9 | 1-216-827-11 | METAL CHIP 3.3K 5% 1/16W | | C125 | 1-162-970-11 | CERAMIC CHIP 0.01uF 10% 25V | |
| R10 | 1-216-839-11 | METAL CHIP 33K 5% 1/16W | | C126 | 1-135-151-21 | TANTALUM CHIP 4.7uF 20% 4V | |
| ***** | | | | C127 | 1-135-149-21 | TANTALUM CHIP 2.2uF 20% 10V | |
| * | A-3016-512-A | AUDIO BOARD, COMPLETE (23) (including ALARM BOARD) ***** | | C130 | 1-164-360-11 | CERAMIC CHIP 0.1uF 16V | |
| * | A-3016-561-A | AUDIO BOARD, COMPLETE (21) (including ALARM BOARD) ***** | | C131 | 1-124-778-00 | ELECT CHIP 22uF 20% 6.3V | |
| | 3-703-502-31 | SCREW | | C132 | 1-162-964-11 | CERAMIC CHIP 0.001uF 10% 50V | |
| | 3-831-441-XX | CUSHION | | C133 | 1-162-970-11 | CERAMIC CHIP 0.01uF 10% 25V | |
| | X-3363-574-1 | HOLDER ASSY, JACK | | C134 | 1-162-964-11 | CERAMIC CHIP 0.001uF 10% 50V | |
| | | < CAPACITOR > | | C135 | 1-104-847-11 | TANTAL. CHIP 22uF 20% 4V | |
| C101 | 1-164-360-11 | CERAMIC CHIP 0.1uF 16V | | C136 | 1-162-964-11 | CERAMIC CHIP 0.001uF 10% 50V | |
| C102 | 1-164-360-11 | CERAMIC CHIP 0.1uF 16V | | C137 | 1-135-201-11 | TANTALUM CHIP 10uF 20% 4V | |
| C103 | 1-135-318-11 | TANTAL. CHIP 33uF 20% 4V | | C138 | 1-164-360-11 | CERAMIC CHIP 0.1uF 16V | |
| C104 | 1-162-964-11 | CERAMIC CHIP 0.001uF 10% 50V | | C139 | 1-164-360-11 | CERAMIC CHIP 0.1uF 16V | |
| C106 | 1-164-489-11 | CERAMIC CHIP 0.22uF 10% 16V | | C140 | 1-135-070-00 | TANTALUM CHIP 0.1uF 10% 35V | |
| | | | | C141 | 1-164-360-11 | CERAMIC CHIP 0.1uF 16V | |
| | | | | C142 | 1-135-201-11 | TANTALUM CHIP 10uF 20% 4V | |
| | | | | C145 | 1-135-318-11 | TANTAL. CHIP 33uF 20% 4V | |
| | | | | C146 | 1-164-005-11 | CERAMIC CHIP 0.47uF 25V | |
| | | | | C147 | 1-126-246-11 | ELECT CHIP 220uF 20% 4V | |
| | | | | C148 | 1-162-964-11 | CERAMIC CHIP 0.001uF 10% 50V | |
| | | | | C149 | 1-162-964-11 | CERAMIC CHIP 0.001uF 10% 50V | |
| | | | | C150 | 1-162-964-11 | CERAMIC CHIP 0.001uF 10% 50V | |
| | | | | C151 | 1-162-964-11 | CERAMIC CHIP 0.001uF 10% 50V | |
| | | | | C501 | 1-164-360-11 | CERAMIC CHIP 0.1uF 16V (23) | |
| | | | | C502 | 1-135-149-21 | TANTALUM CHIP 2.2uF 20% 10V (23) | |

| Ref. No. | Part No. | Description | Remark | Ref. No. | Part No. | Description | Remark |
|----------|--------------|---|-----------------------|----------|--------------|----------------------------|--------|
| C503 | 1-164-173-11 | CERAMIC CHIP | 0.0039uF 10% 50V (23) | IC601 | 8-759-400-12 | IC AN6612S | |
| C504 | 1-164-360-11 | CERAMIC CHIP | 0.1uF 16V (23) | | | < JACK > | |
| C505 | 1-135-180-21 | TANTALUM CHIP | 3.3uF 20% 6.3V(23) | J101 | 1-563-319-21 | JACK (MIC PLUG IN POWER) | |
| C506 | 1-164-360-11 | CERAMIC CHIP | 0.1uF 16V (23) | J102 | 1-563-319-21 | JACK (EAR) | |
| C507 | 1-164-360-11 | CERAMIC CHIP | 0.1uF 16V (23) | | | < JUMPER RESISTOR > | |
| C508 | 1-135-201-11 | TANTALUM CHIP | 10uF 20% 4V (23) | JR102 | 1-216-864-11 | METAL CHIP 0 5% 1/16W | |
| C509 | 1-164-227-11 | CERAMIC CHIP | 0.022uF 10% 25V (23) | JR103 | 1-216-864-11 | METAL CHIP 0 5% 1/16W (21) | |
| C510 | 1-164-227-11 | CERAMIC CHIP | 0.022uF 10% 25V (23) | JR104 | 1-216-864-11 | METAL CHIP 0 5% 1/16W (21) | |
| C512 | 1-135-318-11 | TANTAL. CHIP | 33uF 20% 4V (23) | JR105 | 1-216-864-11 | METAL CHIP 0 5% 1/16W (21) | |
| C513 | 1-164-227-11 | CERAMIC CHIP | 0.022uF 10% 25V | JR201 | 1-216-296-11 | METAL CHIP 0 5% 1/16W | |
| C514 | 1-164-360-11 | CERAMIC CHIP | 0.1uF 16V | JR202 | 1-216-864-11 | METAL CHIP 0 5% 1/16W | |
| C515 | 1-162-970-11 | CERAMIC CHIP | 0.01uF 10% 25V | JR203 | 1-216-864-11 | METAL CHIP 0 5% 1/16W | |
| C516 | 1-162-964-11 | CERAMIC CHIP | 0.001uF 10% 50V | JR204 | 1-216-864-11 | METAL CHIP 0 5% 1/16W | |
| C517 | 1-135-201-11 | TANTALUM CHIP | 10uF 20% 4V | JR205 | 1-216-864-11 | METAL CHIP 0 5% 1/16W | |
| C519 | 1-164-360-11 | CERAMIC CHIP | 0.1uF 16V (23) | | | < COIL > | |
| C520 | 1-126-246-11 | ELECT CHIP | 220uF 20% 4V (23) | L501 | 1-412-064-11 | INDUCTOR CHIP 100uH | |
| C521 | 1-104-847-11 | TANTAL. CHIP | 22uF 20% 4V | | | < PHOTO INTERRUPTER > | |
| C522 | 1-104-847-11 | TANTAL. CHIP | 22uF 20% 4V | PH501 | 8-719-017-54 | DIODE NJ5161K-F10-A | |
| C523 | 1-164-360-11 | CERAMIC CHIP | 0.1uF 16V (23) | | | < TRANSISTOR > | |
| C525 | 1-104-852-11 | TANTAL. CHIP | 22uF 20% 6.3V | Q101 | 8-729-402-32 | TRANSISTOR 2SD1819A-R | |
| C526 | 1-104-852-11 | TANTAL. CHIP | 22uF 20% 6.3V | Q102 | 8-729-402-32 | TRANSISTOR 2SD1819A-R | |
| C528 | 1-164-360-11 | CERAMIC CHIP | 0.1uF 16V (23) | Q103 | 8-729-402-32 | TRANSISTOR 2SD1819A-R | |
| C601 | 1-135-201-11 | TANTALUM CHIP | 10uF 20% 4V | Q104 | 8-729-422-39 | TRANSISTOR XN4404 | |
| C602 | 1-135-201-11 | TANTALUM CHIP | 10uF 20% 4V | Q105 | 8-729-420-50 | TRANSISTOR UN5215 | |
| C603 | 1-104-847-11 | TANTAL. CHIP | 22uF 20% 4V | Q106 | 8-729-402-84 | TRANSISTOR XN4601 | |
| C604 | 1-164-005-11 | CERAMIC CHIP | 0.47uF 25V | Q107 | 8-729-402-93 | TRANSISTOR UN5214 | |
| C605 | 1-135-151-21 | TANTALUM CHIP | 4.7uF 20% 4V | Q109 | 8-729-230-69 | TRANSISTOR 2SA1362G | |
| C606 | 1-164-346-11 | CERAMIC CHIP | 1uF 16V | Q110 | 8-729-402-32 | TRANSISTOR 2SD1819A-R | |
| C607 | 1-164-346-11 | CERAMIC CHIP | 1uF 16V | Q501 | 8-729-230-60 | TRANSISTOR 2SA1586-YG (23) | |
| | | < CONNECTOR > | | Q502 | 8-729-402-32 | TRANSISTOR 2SD1819A-R (23) | |
| * CN101 | 1-750-338-11 | CONNECTOR, FFC/FPC (ZIF) 12P | | Q503 | 8-729-420-50 | TRANSISTOR UN5215 | |
| CN102 | 1-580-372-11 | JACK, DC(POLARITY UNIFIED TYPE)(DC IN 3V) | | Q504 | 8-729-402-81 | TRANSISTOR XN4501 (23) | |
| | | < DIODE > | | Q505 | 8-729-402-32 | TRANSISTOR 2SD1819A-R (23) | |
| D501 | 8-719-420-51 | DIODE MA729 | | Q506 | 8-729-402-93 | TRANSISTOR UN5214 (23) | |
| D502 | 8-719-420-51 | DIODE MA729 | | Q507 | 8-729-402-96 | TRANSISTOR UN5114 | |
| D503 | 8-719-420-51 | DIODE MA729 (23) | | Q508 | 8-729-420-50 | TRANSISTOR UN5215 | |
| D504 | 8-719-404-46 | DIODE MA110 (23) | | Q509 | 8-729-420-50 | TRANSISTOR UN5215 | |
| D505 | 8-719-404-46 | DIODE MA110 | | Q510 | 8-729-420-16 | TRANSISTOR XN1214 | |
| D506 | 8-719-420-51 | DIODE MA729 | | Q511 | 8-729-230-60 | TRANSISTOR 2SA1586-YG | |
| D601 | 8-719-420-51 | DIODE MA729 | | Q512 | 8-729-402-32 | TRANSISTOR 2SD1819A-R (23) | |
| | | < IC > | | Q513 | 8-729-426-31 | TRANSISTOR XP1214 | |
| IC101 | 8-752-036-39 | IC CXA1347N | | Q514 | 8-729-429-44 | TRANSISTOR XP1501 | |
| IC501 | 8-759-097-93 | IC NJM2100V (23) | | Q515 | 8-729-420-53 | TRANSISTOR UN5115 | |
| IC502 | 8-759-180-33 | IC MM1210-XFF (23) | | Q516 | 8-729-429-44 | TRANSISTOR XP1501 | |
| IC503 | 8-759-701-51 | IC NJM2072M | | | | | |
| IC504 | 8-759-253-51 | IC RH5RH301A | | | | | |

AUDIO

| Ref. No. | Part No. | Description | Remark | Ref. No. | Part No. | Description | Remark |
|----------|--------------|------------------------|------------|----------|--------------|-----------------------|------------|
| Q517 | 8-729-402-96 | TRANSISTOR UN5114 (23) | | R139 | 1-216-845-11 | METAL CHIP 100K 5% | 1/16W |
| Q518 | 8-729-403-17 | TRANSISTOR XN1215 (23) | | R140 | 1-216-835-11 | METAL CHIP 15K 5% | 1/16W |
| Q520 | 8-729-402-93 | TRANSISTOR UN5214 | | R141 | 1-216-792-11 | METAL GLAZE 3.9 5% | 1/16W |
| Q521 | 8-729-402-32 | TRANSISTOR 2SD1819A-R | | | | | |
| Q522 | 8-729-402-96 | TRANSISTOR UN5114 | | R142 | 1-216-792-11 | METAL GLAZE 3.9 5% | 1/16W |
| Q601 | 8-729-230-60 | TRANSISTOR 2SA1586-YG | | R143 | 1-216-845-11 | METAL CHIP 100K 5% | 1/16W |
| Q602 | 8-729-420-50 | TRANSISTOR UN5215 | | R144 | 1-216-841-11 | METAL CHIP 47K 5% | 1/16W |
| Q603 | 8-729-402-32 | TRANSISTOR 2SD1819A-R | | R145 | 1-216-814-11 | METAL CHIP 270 5% | 1/16W |
| Q605 | 8-729-420-50 | TRANSISTOR UN5215 | | R152 | 1-216-801-11 | METAL CHIP 22 5% | 1/16W |
| Q606 | 8-729-420-53 | TRANSISTOR UN5115 | | R153 | 1-216-833-11 | METAL CHIP 10K 5% | 1/16W |
| Q607 | 8-729-426-36 | TRANSISTOR XP1215 | | R154 | 1-216-809-11 | METAL CHIP 100 5% | 1/16W |
| Q608 | 8-729-420-50 | TRANSISTOR UN5215 | | R155 | 1-216-819-11 | METAL CHIP 680 5% | 1/16W |
| Q610 | 8-729-402-93 | TRANSISTOR UN5214 | | R156 | 1-216-809-11 | METAL CHIP 100 5% | 1/16W |
| Q611 | 8-729-101-07 | TRANSISTOR 2SB798-DL | | R157 | 1-216-833-11 | METAL CHIP 10K 5% | 1/16W |
| Q612 | 8-729-230-60 | TRANSISTOR 2SA1586-YG | | R158 | 1-216-827-11 | METAL CHIP 3.3K 5% | 1/16W |
| Q613 | 8-729-420-50 | TRANSISTOR UN5215 | | R159 | 1-216-812-11 | METAL CHIP 180 5% | 1/16W |
| | | < RESISTOR > | | R160 | 1-216-833-11 | METAL CHIP 10K 5% | 1/16W |
| R101 | 1-216-824-11 | METAL CHIP 1.8K 5% | 1/16W | R161 | 1-216-845-11 | METAL CHIP 100K 5% | 1/16W |
| R102 | 1-216-830-11 | METAL CHIP 5.6K 5% | 1/16W | R501 | 1-216-825-11 | METAL CHIP 2.2K 5% | 1/16W (23) |
| R103 | 1-216-815-11 | METAL CHIP 330 5% | 1/16W | R502 | 1-216-845-11 | METAL CHIP 100K 5% | 1/16W (23) |
| R104 | 1-216-837-11 | METAL CHIP 22K 5% | 1/16W | R503 | 1-216-845-11 | METAL CHIP 100K 5% | 1/16W (23) |
| R105 | 1-216-821-11 | METAL CHIP 1K 5% | 1/16W | R504 | 1-216-837-11 | METAL CHIP 22K 5% | 1/16W (23) |
| R106 | 1-216-833-11 | METAL CHIP 10K 5% | 1/16W | R505 | 1-216-853-11 | METAL CHIP 470K 5% | 1/16W (23) |
| R108 | 1-216-809-11 | METAL CHIP 100 5% | 1/16W (23) | R506 | 1-216-841-11 | METAL CHIP 47K 5% | 1/16W (23) |
| R109 | 1-216-808-11 | METAL CHIP 82 5% | 1/16W | R507 | 1-216-827-11 | METAL CHIP 3.3K 5% | 1/16W (23) |
| R110 | 1-216-809-11 | METAL CHIP 100 5% | 1/16W | R508 | 1-218-344-11 | METAL CHIP 7.5K 0.50% | 1/16W (23) |
| R112 | 1-216-841-11 | METAL CHIP 47K 5% | 1/16W | R509 | 1-218-716-11 | METAL CHIP 10K 0.50% | 1/16W (23) |
| R113 | 1-216-821-11 | METAL CHIP 1K 5% | 1/16W | R510 | 1-216-845-11 | METAL CHIP 100K 5% | 1/16W |
| R114 | 1-218-344-11 | METAL GLAZE 7.5K 5% | 1/16W | R511 | 1-216-833-11 | METAL CHIP 10K 5% | 1/16W |
| R115 | 1-216-817-11 | METAL CHIP 470 5% | 1/16W | R512 | 1-216-804-11 | METAL CHIP 39 5% | 1/16W (23) |
| R116 | 1-216-851-11 | METAL CHIP 330K 5% | 1/16W | R513 | 1-216-851-11 | METAL CHIP 330K 5% | 1/16W (23) |
| R117 | 1-218-482-11 | METAL GLAZE 430 5% | 1/16W | R514 | 1-216-833-11 | METAL CHIP 10K 5% | 1/16W (23) |
| R118 | 1-216-828-11 | METAL CHIP 3.9K 5% | 1/16W | R515 | 1-216-833-11 | METAL CHIP 10K 5% | 1/16W (23) |
| R119 | 1-216-841-11 | METAL CHIP 47K 5% | 1/16W | R516 | 1-216-845-11 | METAL CHIP 100K 5% | 1/16W |
| R120 | 1-216-817-11 | METAL CHIP 470 5% | 1/16W | R517 | 1-216-845-11 | METAL CHIP 100K 5% | 1/16W |
| R121 | 1-216-817-11 | METAL CHIP 470 5% | 1/16W | R519 | 1-216-823-11 | METAL CHIP 1.5K 5% | 1/16W |
| R122 | 1-216-825-11 | METAL CHIP 2.2K 5% | 1/16W | R520 | 1-216-833-11 | METAL CHIP 10K 5% | 1/16W |
| R123 | 1-216-825-11 | METAL CHIP 2.2K 5% | 1/16W | R521 | 1-216-846-11 | METAL CHIP 120K 5% | 1/16W |
| R124 | 1-216-801-11 | METAL CHIP 22 5% | 1/16W | R522 | 1-216-817-11 | METAL CHIP 470 5% | 1/16W |
| R125 | 1-216-831-11 | METAL CHIP 6.8K 5% | 1/16W | R523 | 1-216-809-11 | METAL CHIP 100 5% | 1/16W (23) |
| R126 | 1-216-828-11 | METAL CHIP 3.9K 5% | 1/16W | R524 | 1-216-823-11 | METAL CHIP 1.5K 5% | 1/16W (23) |
| R127 | 1-216-841-11 | METAL CHIP 47K 5% | 1/16W | R525 | 1-216-818-11 | METAL CHIP 560 5% | 1/16W (23) |
| R128 | 1-216-833-11 | METAL CHIP 10K 5% | 1/16W | R526 | 1-216-852-11 | METAL CHIP 390K 5% | 1/16W (23) |
| R129 | 1-216-833-11 | METAL CHIP 10K 5% | 1/16W | R527 | 1-216-853-11 | METAL CHIP 470K 5% | 1/16W (23) |
| R130 | 1-216-841-11 | METAL CHIP 47K 5% | 1/16W | R528 | 1-216-845-11 | METAL CHIP 100K 5% | 1/16W (23) |
| R131 | 1-216-827-11 | METAL CHIP 3.3K 5% | 1/16W | R529 | 1-216-843-11 | METAL CHIP 68K 5% | 1/16W (23) |
| R132 | 1-216-821-11 | METAL CHIP 1K 5% | 1/16W | R530 | 1-216-819-11 | METAL CHIP 680 5% | 1/16W |
| R133 | 1-216-841-11 | METAL CHIP 47K 5% | 1/16W | R531 | 1-216-821-11 | METAL CHIP 1K 5% | 1/16W (23) |
| R138 | 1-216-134-00 | METAL CHIP 2.2 5% | 1/8W | R532 | 1-216-831-11 | METAL CHIP 6.8K 5% | 1/16W |
| | | | | R533 | 1-216-838-11 | METAL CHIP 27K 5% | 1/16W |
| | | | | R535 | 1-216-829-11 | METAL CHIP 4.7K 5% | 1/16W |

| Ref. No. | Part No. | Description | Remark | Ref. No. | Part No. | Description | Remark |
|----------|--------------|------------------------------------|----------------------|----------|--------------|---------------------------------|---------|
| R536 | 1-216-833-11 | METAL CHIP | 10K 5% 1/16W | S601 | 1-570-087-11 | SWITCH, SLIDE (FAST PB) | |
| R537 | 1-216-845-11 | METAL CHIP | 100K 5% 1/16W | S602 | 1-571-277-31 | SWITCH, SLIDE (TAPE SPEED) (23) | |
| R538 | 1-216-845-11 | METAL CHIP | 100K 5% 1/16W | | | < TRANSFORMER > | |
| R539 | 1-216-845-11 | METAL CHIP | 100K 5% 1/16W | T101 | 1-433-251-00 | TRANSFORMER, BIAS OSCILLATOR | |
| R540 | 1-216-833-11 | METAL CHIP | 10K 5% 1/16W | | | < THERMISTOR > | |
| R541 | 1-216-839-11 | METAL CHIP | 33K 5% 1/16W | TH601 | 1-809-545-11 | THERMISTOR | |
| R542 | 1-216-833-11 | METAL CHIP | 10K 5% 1/16W | | | < THERMISTOR(POSITIVE) > | |
| R543 | 1-216-839-11 | METAL CHIP | 33K 5% 1/16W | THP601 | 1-809-342-11 | THERMISTOR, POSITIVE | |
| R544 | 1-216-833-11 | METAL CHIP | 10K 5% 1/16W | | | ***** | |
| R545 | 1-216-843-11 | METAL CHIP | 68K 5% 1/16W | | A-3016-511-A | LCD BOARD, COMPLETE | |
| R546 | 1-216-821-11 | METAL CHIP | 1K 5% 1/16W (23) | | | ***** | |
| R547 | 1-216-833-11 | METAL CHIP | 10K 5% 1/16W (23) | * | 1-537-724-11 | CONDUCTIVE BOARD, CONNECTION | |
| R548 | 1-218-883-11 | METAL CHIP | 33K 0.50% 1/16W (23) | | 1-652-024-11 | PC BOARD, FLEXIBLE BOARD | |
| R549 | 1-218-717-11 | METAL CHIP | 11K 0.50% 1/16W (23) | | 3-911-887-01 | HOLDER, LCD | |
| R550 | 1-216-845-11 | METAL CHIP | 100K 5% 1/16W (23) | | | < CAPACITOR > | |
| R551 | 1-216-833-11 | METAL CHIP | 10K 5% 1/16W | C701 | 1-164-360-11 | CERAMIC CHIP 0.1uF | 16V |
| R602 | 1-216-833-11 | METAL CHIP | 10K 5% 1/16W | C702 | 1-164-360-11 | CERAMIC CHIP 0.1uF | 16V |
| R603 | 1-216-833-11 | METAL CHIP | 10K 5% 1/16W | C703 | 1-164-677-11 | CERAMIC CHIP 0.033uF | 10% 16V |
| R604 | 1-216-851-11 | METAL CHIP | 330K 5% 1/16W | C704 | 1-164-245-11 | CERAMIC CHIP 0.015uF | 10% 25V |
| R605 | 1-216-839-11 | METAL CHIP | 33K 5% 1/16W | C705 | 1-164-245-11 | CERAMIC CHIP 0.015uF | 10% 25V |
| R606 | 1-216-845-11 | METAL CHIP | 100K 5% 1/16W | | | < DIODE > | |
| R607 | 1-216-801-11 | METAL CHIP | 22 5% 1/16W | D701 | 8-719-991-75 | DIODE RB425D | |
| R608 | 1-216-838-11 | METAL CHIP | 27K 5% 1/16W | D702 | 8-719-991-75 | DIODE RB425D | |
| R615 | 1-216-845-11 | METAL CHIP | 100K 5% 1/16W | D703 | 8-719-047-19 | LED GL8PR29 (DICT/BATT) | |
| R616 | 1-216-843-11 | METAL CHIP | 68K 5% 1/16W | D704 | 8-719-422-37 | DIODE MA8051 | |
| R618 | 1-216-833-11 | METAL CHIP | 10K 5% 1/16W | | | < IC > | |
| R619 | 1-216-814-11 | METAL CHIP | 270 5% 1/16W | IC701 | 8-759-276-81 | IC BU2456-23 | |
| R620 | 1-216-827-11 | METAL CHIP | 3.3K 5% 1/16W | | | < LIQUID CRYSTAL DISPLAY > | |
| R621 | 1-216-789-11 | METAL CHIP | 2.2 5% 1/16W | LCD701 | 1-810-464-11 | DISPLAY PANEL, LIQUID CRYSTAL | |
| R622 | 1-216-836-11 | METAL CHIP | 18K 5% 1/16W | | | < TRANSISTOR > | |
| R623 | 1-216-832-11 | METAL CHIP | 8.2K 5% 1/16W | Q701 | 8-729-402-32 | TRANSISTOR 2SD1819A-R | |
| R624 | 1-216-829-11 | METAL CHIP | 4.7K 5% 1/16W (23) | Q702 | 8-729-230-60 | TRANSISTOR 2SA1586-YG | |
| R625 | 1-218-292-11 | METAL GLAZE | 20K 5% 1/16W (23) | Q703 | 8-729-402-32 | TRANSISTOR 2SD1819A-R | |
| R626 | 1-216-833-11 | METAL CHIP | 10K 5% 1/16W | Q704 | 8-729-402-32 | TRANSISTOR 2SD1819A-R | |
| | | < VARIABLE RESISTOR > | | Q705 | 8-729-230-60 | TRANSISTOR 2SA1586-YG | |
| RV101 | 1-223-510-11 | RES, VAR, CARBON 10K/10K (VOLUME) | | Q706 | 8-729-402-32 | TRANSISTOR 2SD1819A-R | |
| RV601 | 1-238-091-11 | RES, ADJ, CERMET 22K | | Q707 | 8-729-402-32 | TRANSISTOR 2SD1819A-R | |
| RV602 | 1-238-090-11 | RES, ADJ, CERMET 10K (23) | | Q708 | 8-729-230-60 | TRANSISTOR 2SA1586-YG | |
| | | < SWITCH > | | Q709 | 8-729-402-32 | TRANSISTOR 2SD1819A-R | |
| S101 | 1-572-039-11 | SWITCH, SLIDE (STOP, DICT, LISTEN) | | | | | |
| S102 | 1-572-288-11 | SWITCH, PUSH (POWER) | | | | | |
| S103 | 1-571-275-31 | SWITCH, SLIDE (MIC SENS) | | | | | |
| S401 | 1-572-288-11 | SWITCH, PUSH (BACK SPACE) | | | | | |
| S402 | 1-572-288-11 | SWITCH, PUSH (FF/BACK SPACE) | | | | | |
| S501 | 1-570-397-11 | SWITCH, SLIDE (CUE/REVIEW) | | | | | |
| S502 | 1-572-263-31 | SWITCH, SLIDE (LOCK) | | | | | |
| S503 | 1-570-204-21 | SWITCH, KEY BOARD (E-INDEX) (23) | | | | | |
| S504 | 1-571-275-31 | SWITCH, SLIDE (VOR) | | | | | |

LCD

| Ref. No. | Part No. | Description | Remark | Ref. No. | Part No. | Description | Remark |
|--------------|--------------|-----------------------------------|---------------|---|-------------------------------------|-------------|--------|
| Q710 | 8-729-230-60 | TRANSISTOR | 2SA1586-YG | ***** | | | |
| Q711 | 8-729-420-44 | TRANSISTOR | UN5210 | MISCELLANEOUS | | | |
| Q712 | 8-729-420-44 | TRANSISTOR | UN5210 | ***** | | | |
| Q713 | 8-729-420-44 | TRANSISTOR | UN5210 | | | | |
| Q714 | 8-729-420-44 | TRANSISTOR | UN5210 | HE901 8-825-779-41 HEAD, ERASE EBF5-36S | | | |
| Q715 | 8-729-420-44 | TRANSISTOR | UN5210 | HRP901 1-500-126-11 HEADMAGNETIC (RECORD/PLAYBACK) | | | |
| < RESISTOR > | | | | M901 1-541-921-11 MOTOR | | | |
| R701 | 1-216-853-11 | METAL CHIP | 470K 5% 1/16W | MIC901 1-542-080-11 MICROPHONE, BUILT-IN | | | |
| R702 | 1-216-853-11 | METAL CHIP | 470K 5% 1/16W | SP901 1-504-294-11 SPEAKER (3.6CM) | | | |
| R703 | 1-216-845-11 | METAL CHIP | 100K 5% 1/16W | ***** | | | |
| R704 | 1-216-845-11 | METAL CHIP | 100K 5% 1/16W | ACCESSORIES & PACKING MATERIALS | | | |
| R705 | 1-216-847-11 | METAL CHIP | 150K 5% 1/16W | ***** | | | |
| R706 | 1-216-851-11 | METAL CHIP | 330K 5% 1/16W | 3-758-326-11 MANUAL, INSTRUCTION | | | |
| R707 | 1-216-851-11 | METAL CHIP | 330K 5% 1/16W | (ENGLISH, FRENCH, GERMAN, DUTCH) (23:Canadian, AEP, UK) | | | |
| R708 | 1-216-853-11 | METAL CHIP | 470K 5% 1/16W | 3-758-326-21 MANUAL, INSTRUCTION (ENGLISH) (21/23:US) | | | |
| R709 | 1-216-853-11 | METAL CHIP | 470K 5% 1/16W | 3-909-958-01 CASE, CARRYING (23) | | | |
| R710 | 1-216-845-11 | METAL CHIP | 100K 5% 1/16W | * | 3-911-190-01 INDIVIDUAL CARTON (23) | | |
| R711 | 1-216-845-11 | METAL CHIP | 100K 5% 1/16W | * | 3-911-191-01 CUSHION | | |
| R712 | 1-216-847-11 | METAL CHIP | 150K 5% 1/16W | * | 3-911-716-01 INDIVIDUAL CARTON (21) | | |
| R713 | 1-216-851-11 | METAL CHIP | 330K 5% 1/16W | | | | |
| R714 | 1-216-851-11 | METAL CHIP | 330K 5% 1/16W | | | | |
| R715 | 1-216-853-11 | METAL CHIP | 470K 5% 1/16W | | | | |
| R716 | 1-216-853-11 | METAL CHIP | 470K 5% 1/16W | | | | |
| R717 | 1-216-845-11 | METAL CHIP | 100K 5% 1/16W | | | | |
| R718 | 1-216-845-11 | METAL CHIP | 100K 5% 1/16W | | | | |
| R719 | 1-216-847-11 | METAL CHIP | 150K 5% 1/16W | | | | |
| R720 | 1-216-851-11 | METAL CHIP | 330K 5% 1/16W | | | | |
| R721 | 1-216-851-11 | METAL CHIP | 330K 5% 1/16W | | | | |
| R722 | 1-216-857-11 | METAL CHIP | 1M 5% 1/16W | | | | |
| R723 | 1-216-857-11 | METAL CHIP | 1M 5% 1/16W | | | | |
| R724 | 1-216-857-11 | METAL CHIP | 1M 5% 1/16W | | | | |
| R725 | 1-216-857-11 | METAL CHIP | 1M 5% 1/16W | | | | |
| R726 | 1-216-857-11 | METAL CHIP | 1M 5% 1/16W | | | | |
| R727 | 1-216-857-11 | METAL CHIP | 1M 5% 1/16W | | | | |
| R728 | 1-216-857-11 | METAL CHIP | 1M 5% 1/16W | | | | |
| R729 | 1-216-857-11 | METAL CHIP | 1M 5% 1/16W | | | | |
| R730 | 1-216-845-11 | METAL CHIP | 100K 5% 1/16W | | | | |
| R731 | 1-216-845-11 | METAL CHIP | 100K 5% 1/16W | | | | |
| R732 | 1-216-845-11 | METAL CHIP | 100K 5% 1/16W | | | | |
| R733 | 1-216-845-11 | METAL CHIP | 100K 5% 1/16W | | | | |
| R734 | 1-216-845-11 | METAL CHIP | 100K 5% 1/16W | | | | |
| R735 | 1-216-845-11 | METAL CHIP | 100K 5% 1/16W | | | | |
| < SWITCH > | | | | | | | |
| S701 | 1-692-878-11 | SWITCH, KEY BOARD (COUNTER RESET) | | | | | |
| < VIBRATOR > | | | | | | | |
| X701 | 1-577-306-11 | OSCILLATOR, CERAMIC (1MHz) | | | | | |

BM-21/23

SONY®

SERVICE MANUAL

US Model
AEP Model

BM-21/23

Canadian Model

UK Model

BM-23

SUPPLEMENT-1

File this supplement with the Service Manual.
(Printed wiring boards only are shown.)

Suffix of board parts number of AUDIO and LCD boards is changed.

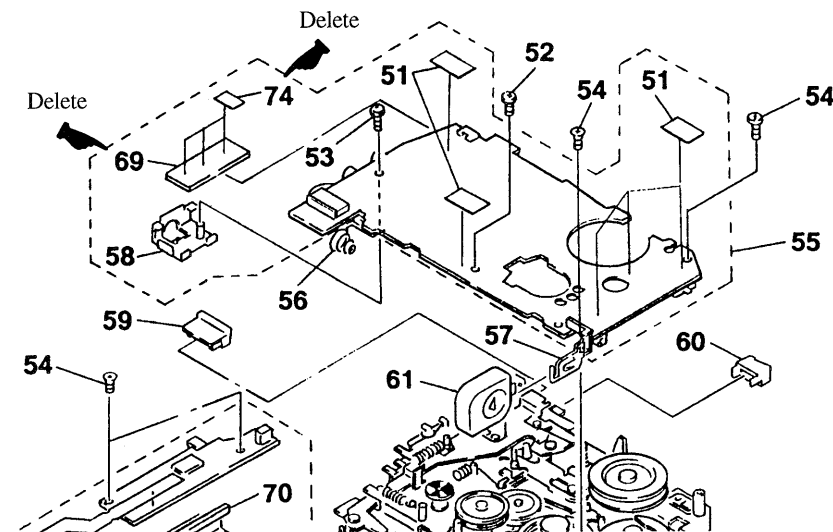
AUDIO BOARD : 1-651-430-**11** → 1-651-430-**13**
LCD BOARD : 1-651-429-**11** → 1-651-429-**13**

• Content of main change

The ALARM board (1-652-833-11) is unified into the AUDIO board.

(Page 23)

6-2. PC BOARD SECTION



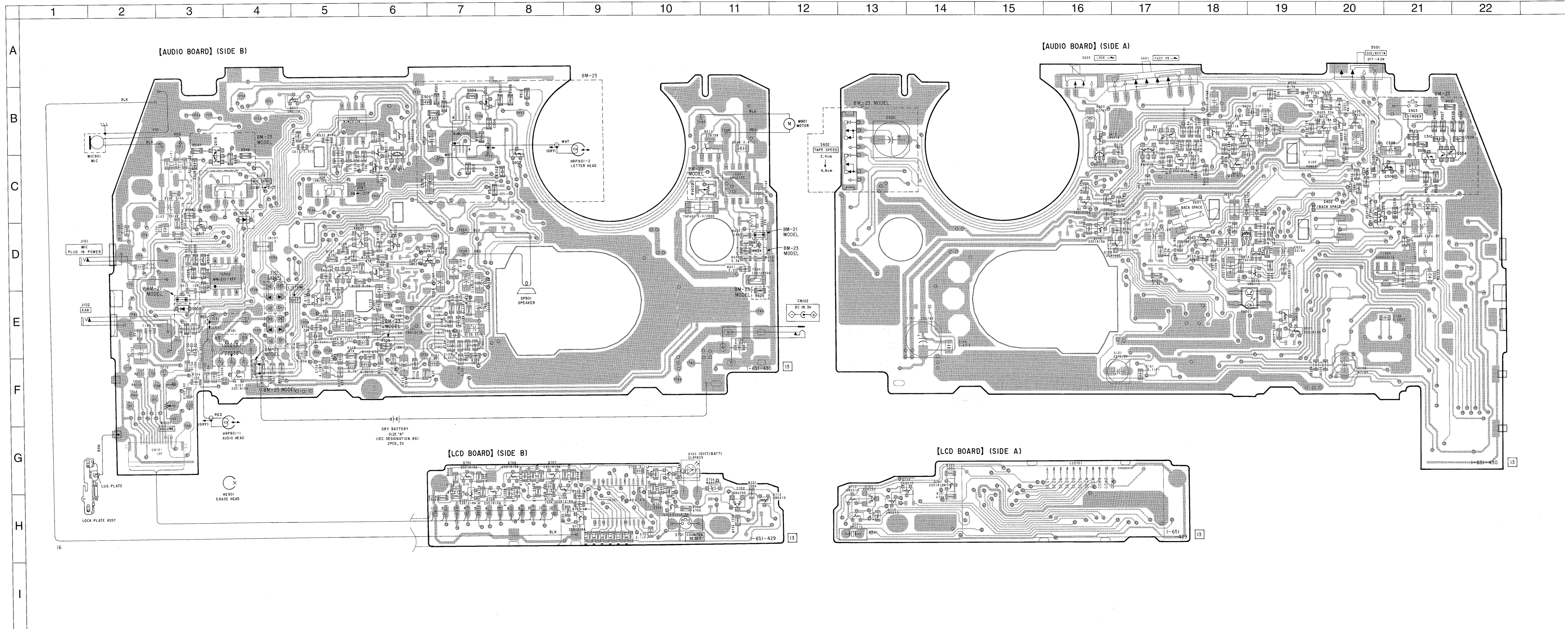
| | | AUDIO BOARD 1-651-430 | |
|------|-------------|-----------------------|------------|
| | | FORMER (- 11) | NEW (- 13) |
| * 69 | ALARM BOARD | 1-652-833-11 | _____ |
| 74 | CUSHION (B) | 4-017-441-01 | _____ |

PRINTED WIRING BOARD

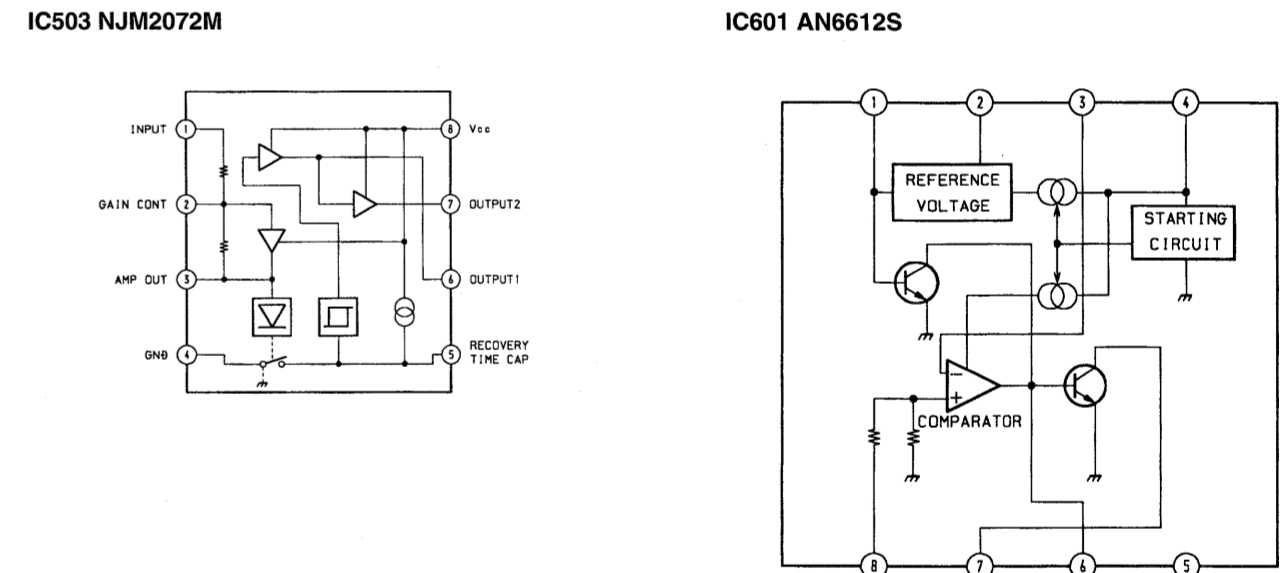
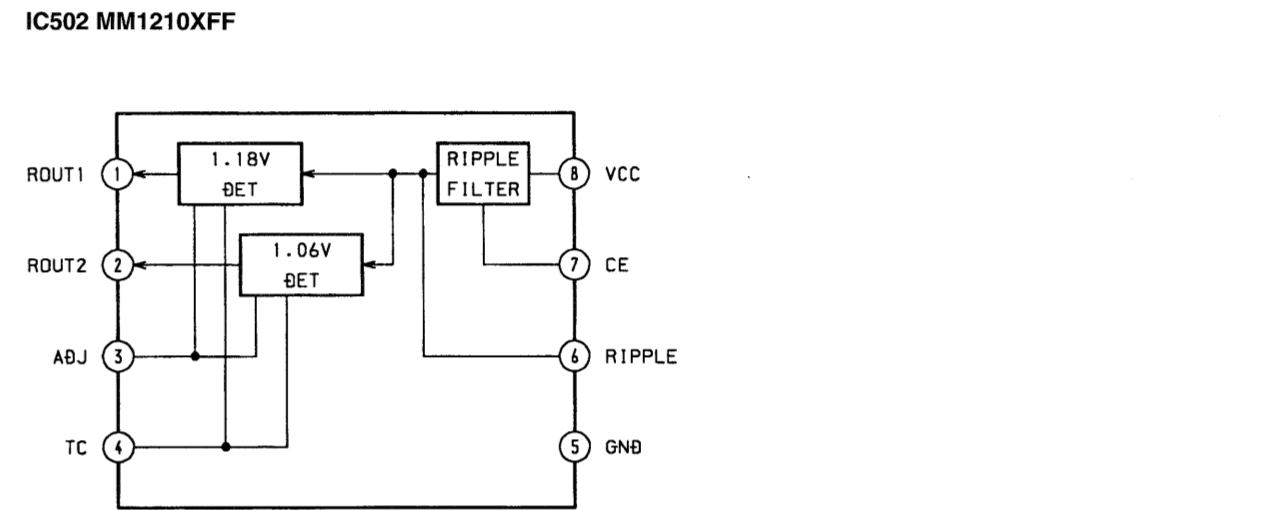
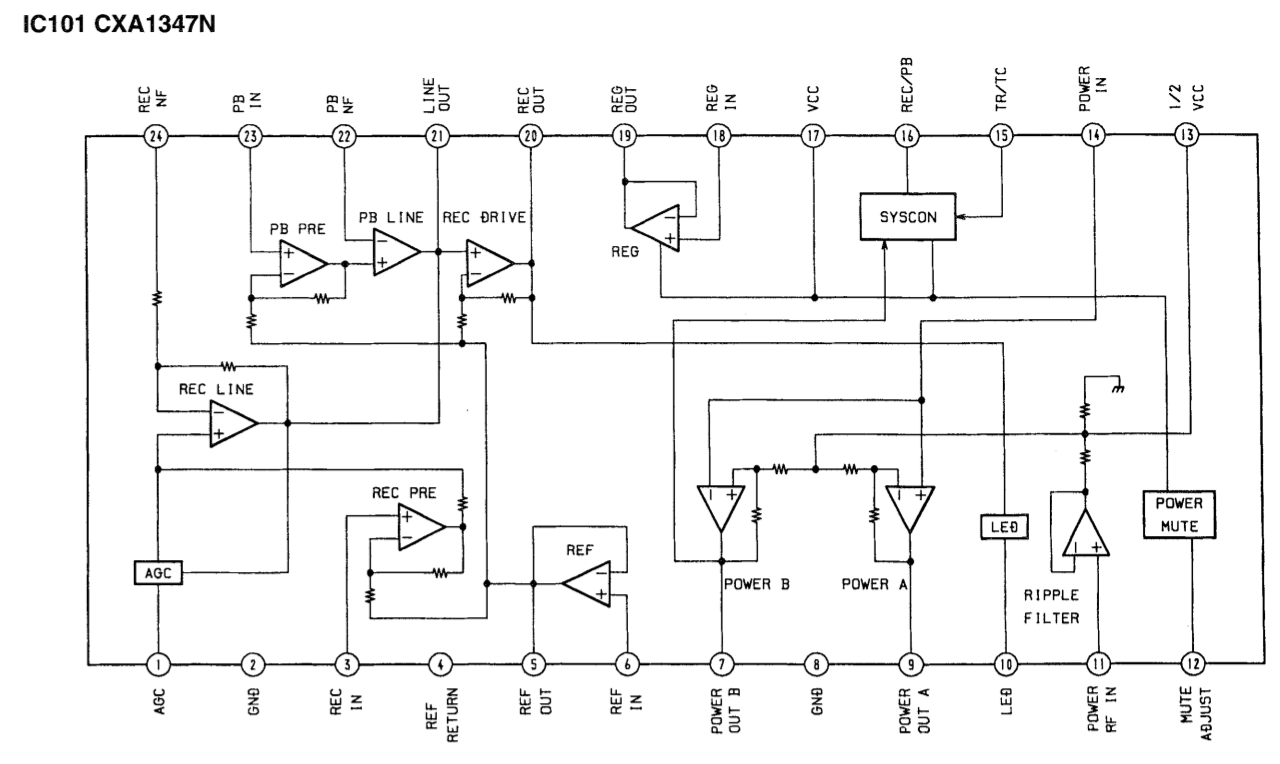
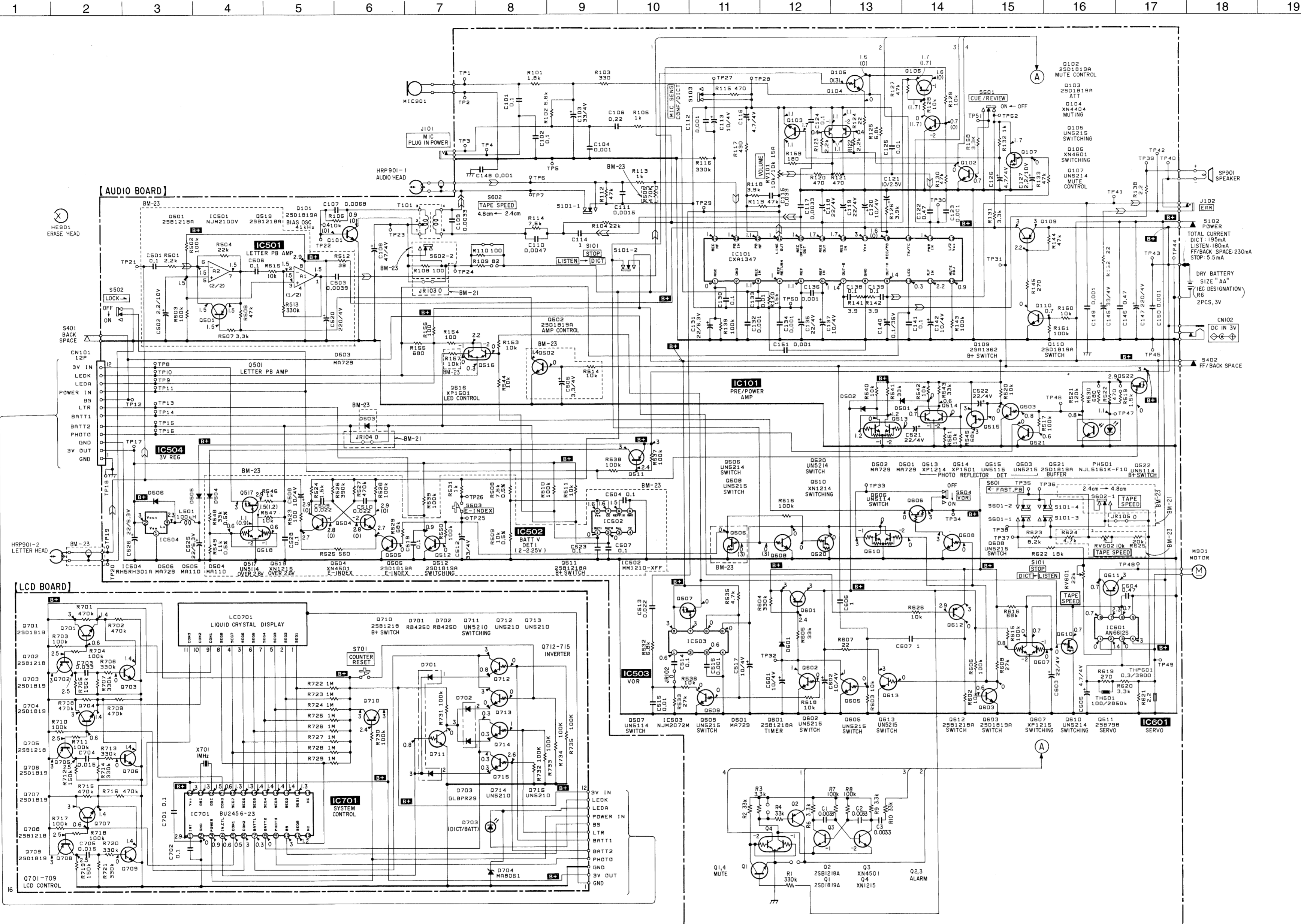
• Semiconductor Location

| Ref. No. | Location | Ref. No. | Location |
|----------|----------|----------|----------|
| D501 | C-19 | Q507 | B-5 |
| D502 | C-18 | Q508 | B-6 |
| D503 | E-3 | Q509 | C-7 |
| D504 | C-4 | Q510 | C-6 |
| D505 | C-21 | Q511 | C-20 |
| D506 | D-21 | Q512 | C-20 |
| D507 | C-20 | Q513 | D-18 |
| D601 | B-20 | Q514 | D-18 |
| D701 | G-13 | Q515 | D-19 |
| D702 | G-11 | Q516 | E-3 |
| D704 | G-11 | Q517 | D-3 |
| | | Q518 | B-3 |
| | | Q520 | C-6 |
| IC101 | E-6 | Q521 | E-19 |
| IC501 | B-7 | Q522 | D-18 |
| IC502 | D-4 | Q601 | B-19 |
| IC503 | B-5 | Q602 | B-20 |
| IC504 | D-21 | Q603 | C-18 |
| IC601 | C-11 | Q605 | B-20 |
| IC701 | H-9 | Q606 | B-18 |
| | | Q607 | C-16 |
| PH501 | E-19 | Q608 | B-18 |
| | | Q610 | B-16 |
| Q1 | C-18 | Q611 | B-11 |
| Q2 | C-16 | Q612 | B-20 |
| Q3 | B-17 | Q613 | B-18 |
| Q4 | C-17 | Q701 | G-14 |
| Q101 | F-4 | Q702 | G-10 |
| Q102 | D-6 | Q703 | H-10 |
| Q103 | E-5 | Q704 | H-7 |
| Q104 | D-5 | Q705 | H-7 |
| Q105 | D-6 | Q706 | G-7 |
| Q106 | D-5 | Q707 | G-8 |
| Q107 | D-6 | Q708 | H-8 |
| Q109 | D-16 | Q709 | G-8 |
| Q110 | D-16 | Q710 | H-9 |
| Q501 | B-7 | Q711 | H-13 |
| Q502 | C-8 | Q712 | G-13 |
| Q503 | E-19 | Q713 | H-11 |
| Q504 | B-22 | Q714 | G-13 |
| Q505 | B-21 | Q715 | H-13 |
| Q506 | C-21 | | |

Note :
 • : Parts extracted from the conductor side.
 ○ : Through hole.
 ◌ : Pattern on the side which enable seeing.
 (The other layer's patterns are not indicated.)



SCHMATIC DIAGRAM



- Note:**
- All capacitors are μF unless otherwise noted. pF ; μF 50WV or less are not indicated except for electrolytics and tantalums.
 - All resistors are in Ω and 1/4W or less unless otherwise specified.
 - % : indicates tolerance.
 - : panel designation.
 - ⊕ : B+ Line
 - ⊖ : adjustment for repair.
 - Voltage and waveforms are dc with respect to ground under no-signal conditions. When opening the board and measuring turned on S102 (POWER) and S402 (FF/BACK SPACE). nomark : REC (DICT) () : PB (LISTEN)
 - Voltages are taken with a VOM (Input impedance 10 Ω). Voltage variations may be noted due to normal production tolerances.
 - Power voltage is dc 3V and fed with regulated dc power supply from external power voltage jack.
 - Total current is measured with no cassette installed.
 - Signal path