BM-21/23

SERVICE MANUAL

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

Photo : 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 (5/32 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.

使用時は添付資料も参照のこと
Refer to the additional documents.

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.

Fiexible 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.

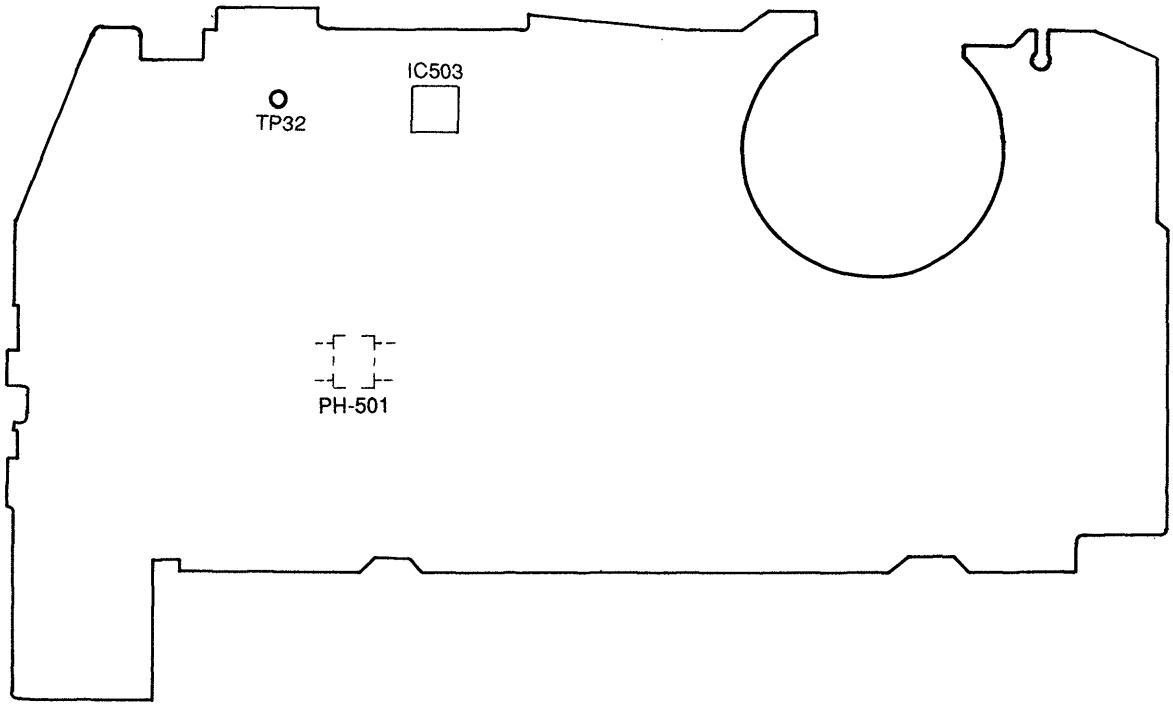
TABLE OF CONTENTS

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)



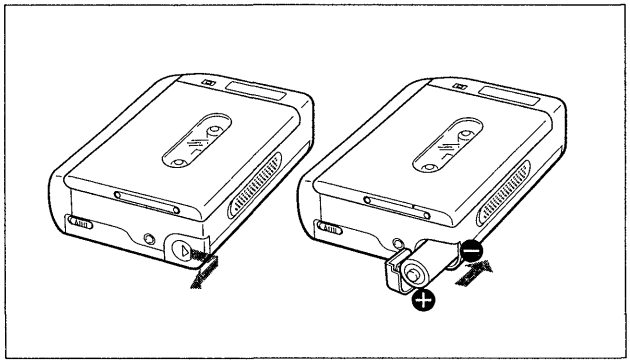
SECTION 2
GENERAL

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.

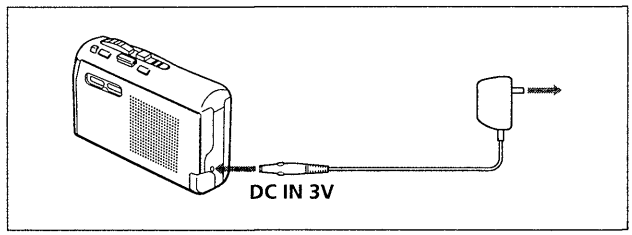
For BM-23 only
You can check the approximate battery condition with the battery indication (▭) displayed while using the dictator.

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.

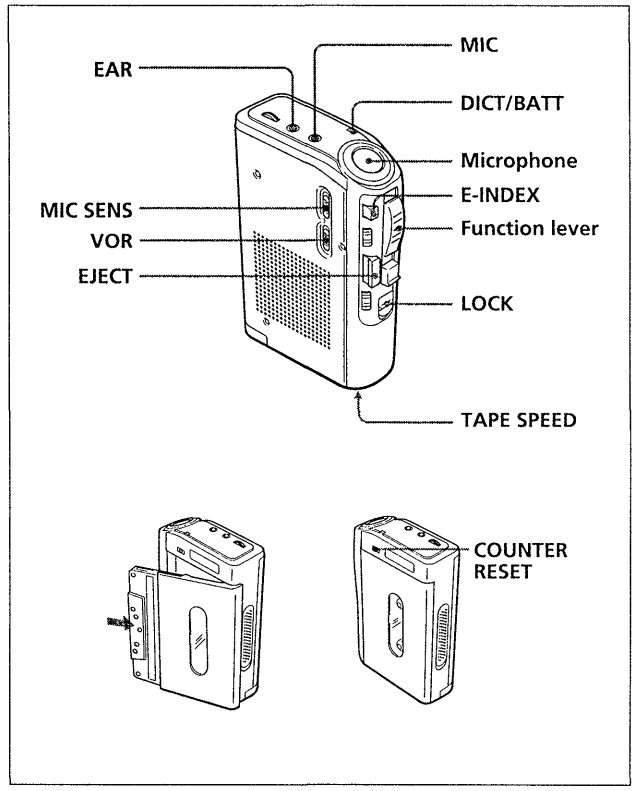
House Current



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.

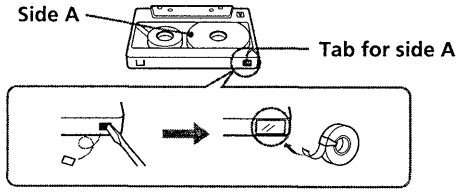
Use for	Set to
normal use	DICT (dictation)
recording a conference or telephone conversation	CONF (conference)

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 CrO_2 (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).

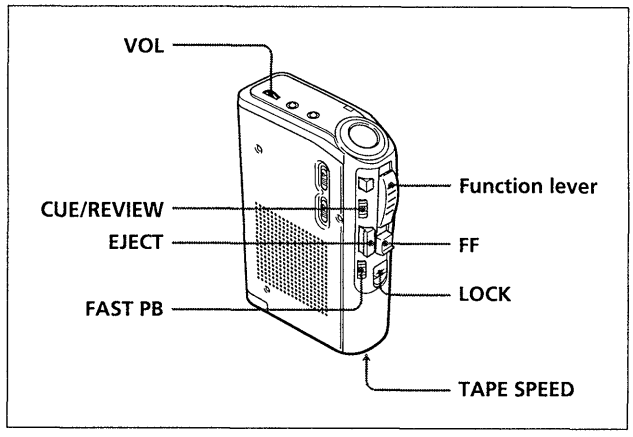
Recording with an external microphone
Connect the microphone to the MIC jack. When connecting the electret condenser microphone with "plug-in power" system, the power of the microphone is supplied from this unit.

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.

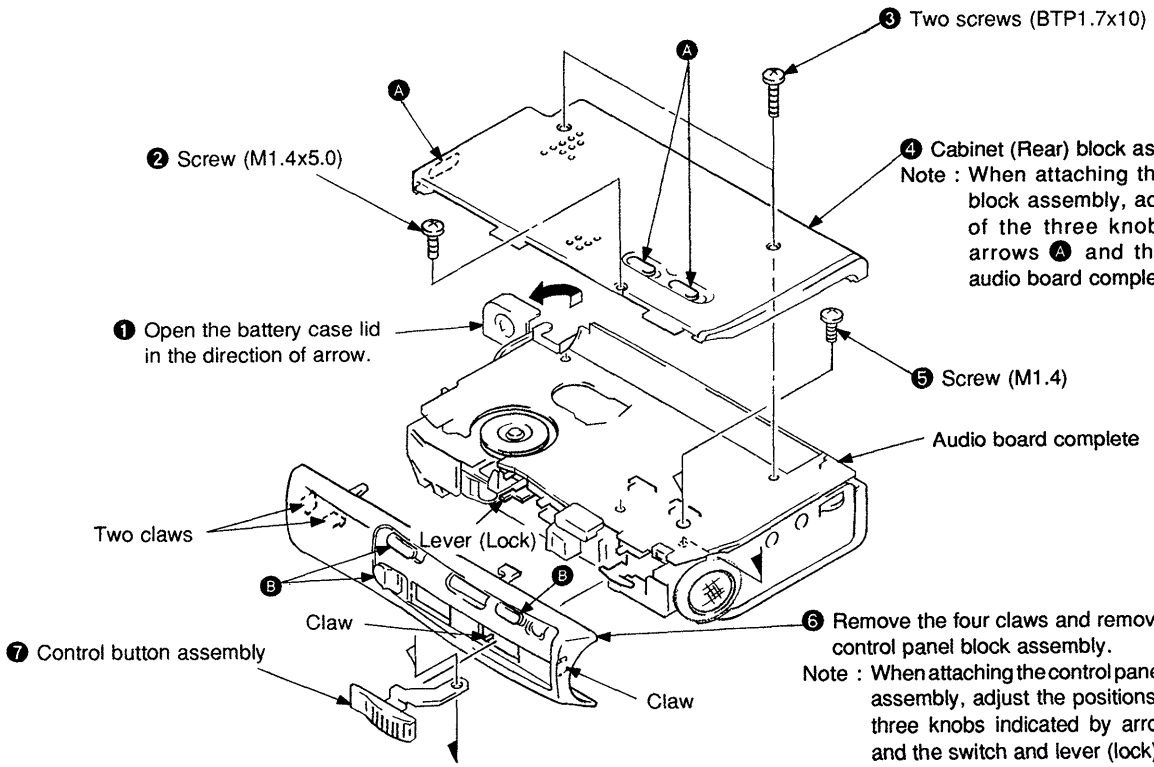
To listen to the tape at a faster speed than normal
Slide FAST PB (fast playback) up while listening to the tape.
To rewind the tape
Slide down the function lever at the BACK SPACE and release it at the desired point.
To rapidly advance the tape
Set the function lever to STOP, then keep pressing FF (fast 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.

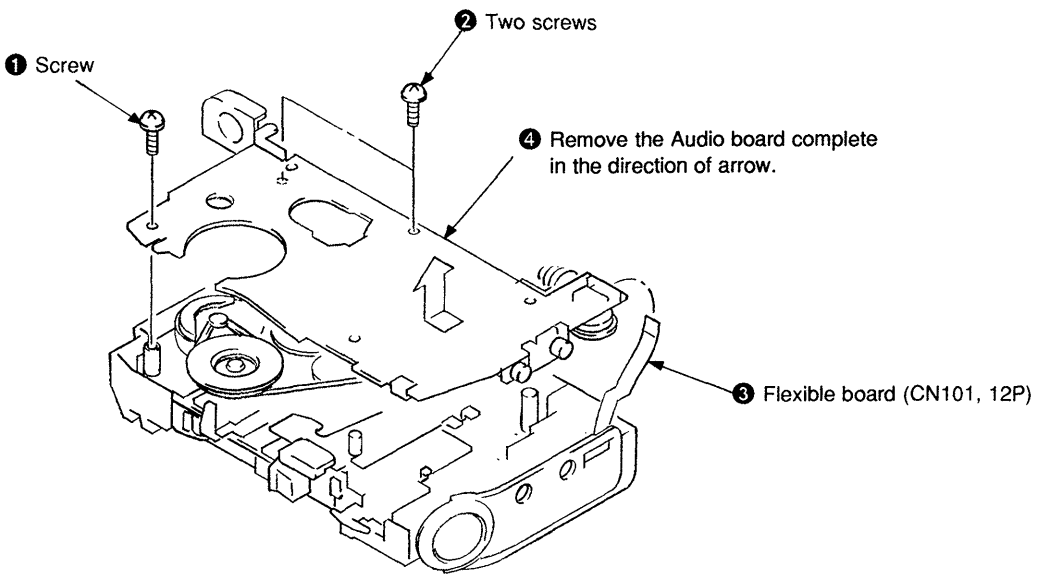
Searching a desired portion (BM-21 only)
Set the CUE/REVIEW switch to ON. You can hear the recording rapidly in the fast forward or rewind (back space) mode. When it is not necessary to hear the recording, set the CUE/REVIEW switch to OFF.

SECTION 3
DISASSEMBLY

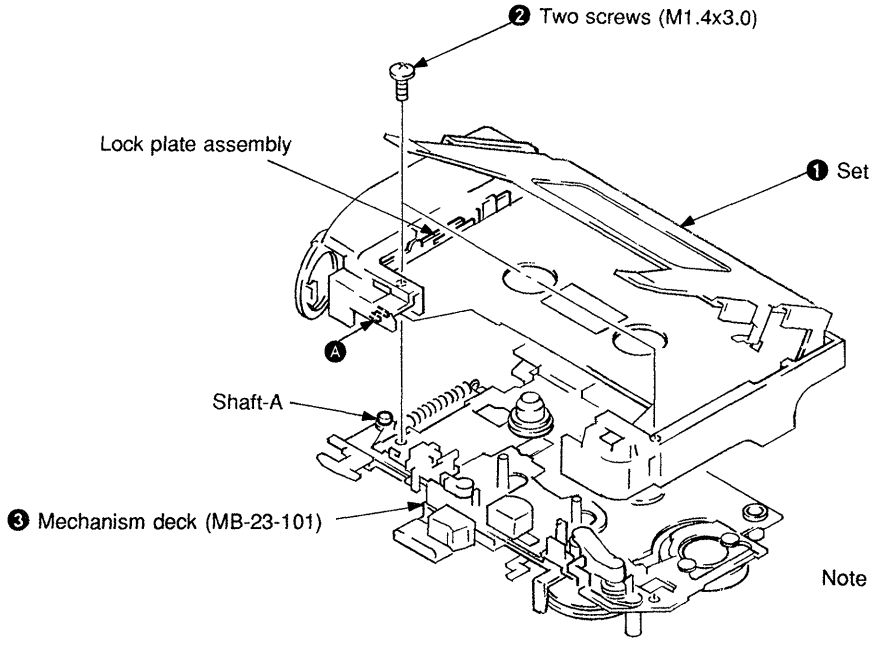
3-1. CONTROL PANEL BLOCK ASSEMBLY REMOVAL



3-2. AUDIO BOARD COMPLETE REMOVAL

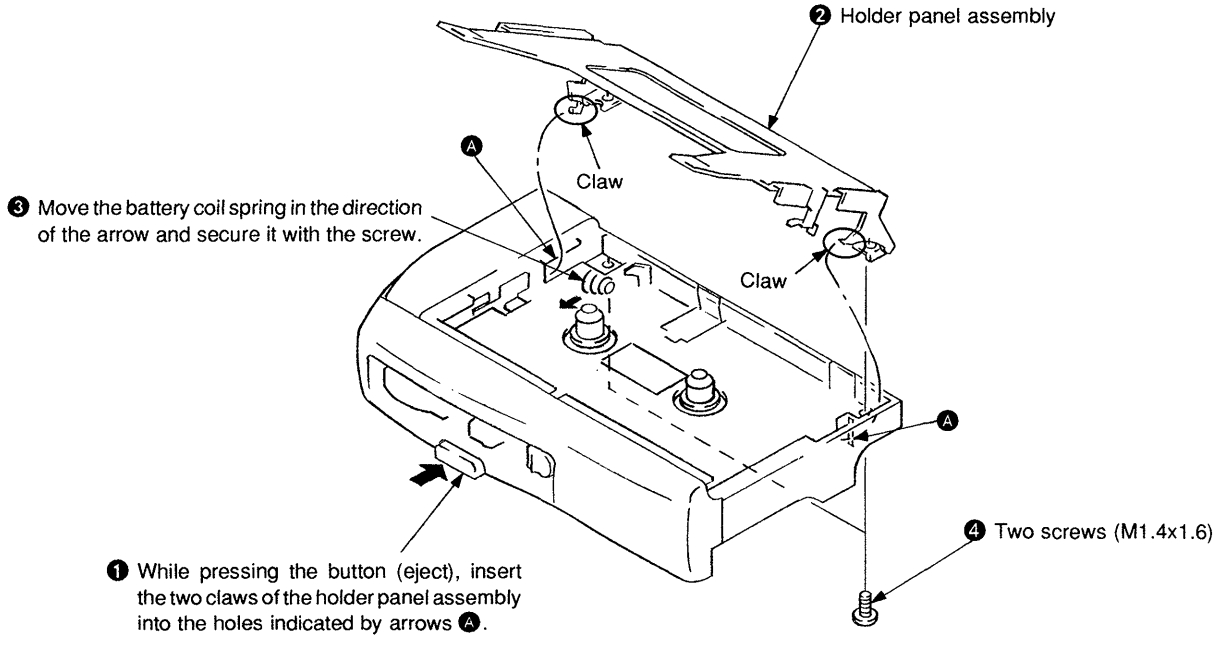


3-3. MECHANISM DECK (MB-23-101) REMOVAL



Note : When attaching the Mechanism deck, set the Mechanism deck to stop and adjust the position of shaft-A and part Ⓐ of the lock plate assembly.

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

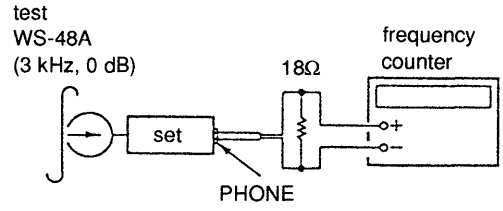
Test Tape

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

TAPE SPEED 4.8 cm/s ADJUSTMENT

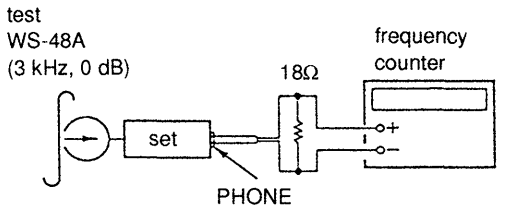
Switch position (BM-23)
TAPE SPEED Switch : 4.8 cm

Procedure :



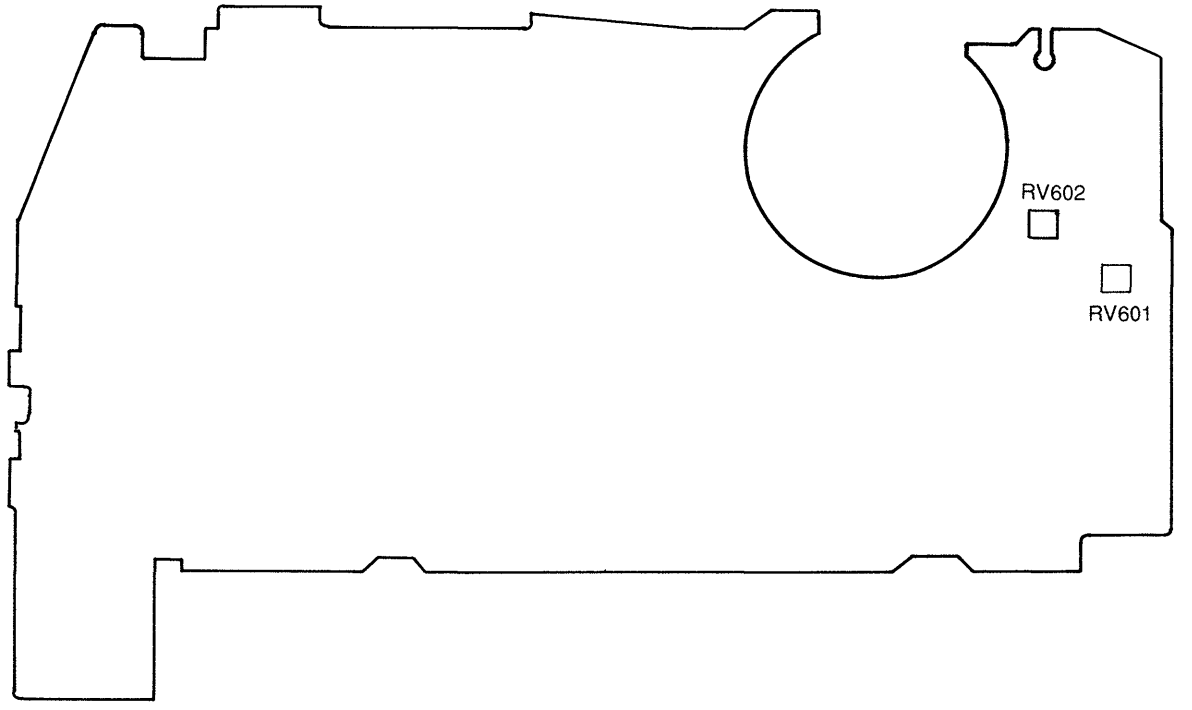
1. Play back WS-48A (tape center portion) in FWD mode. Adjust the RV601 so that the frequency counter reads 3,000± 30 Hz.
2. Play back WS-48A (tape center portion) in REV mode. Confirm that the reading of frequency counter is within 2.5% from the reading in step 1.

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 ± 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)



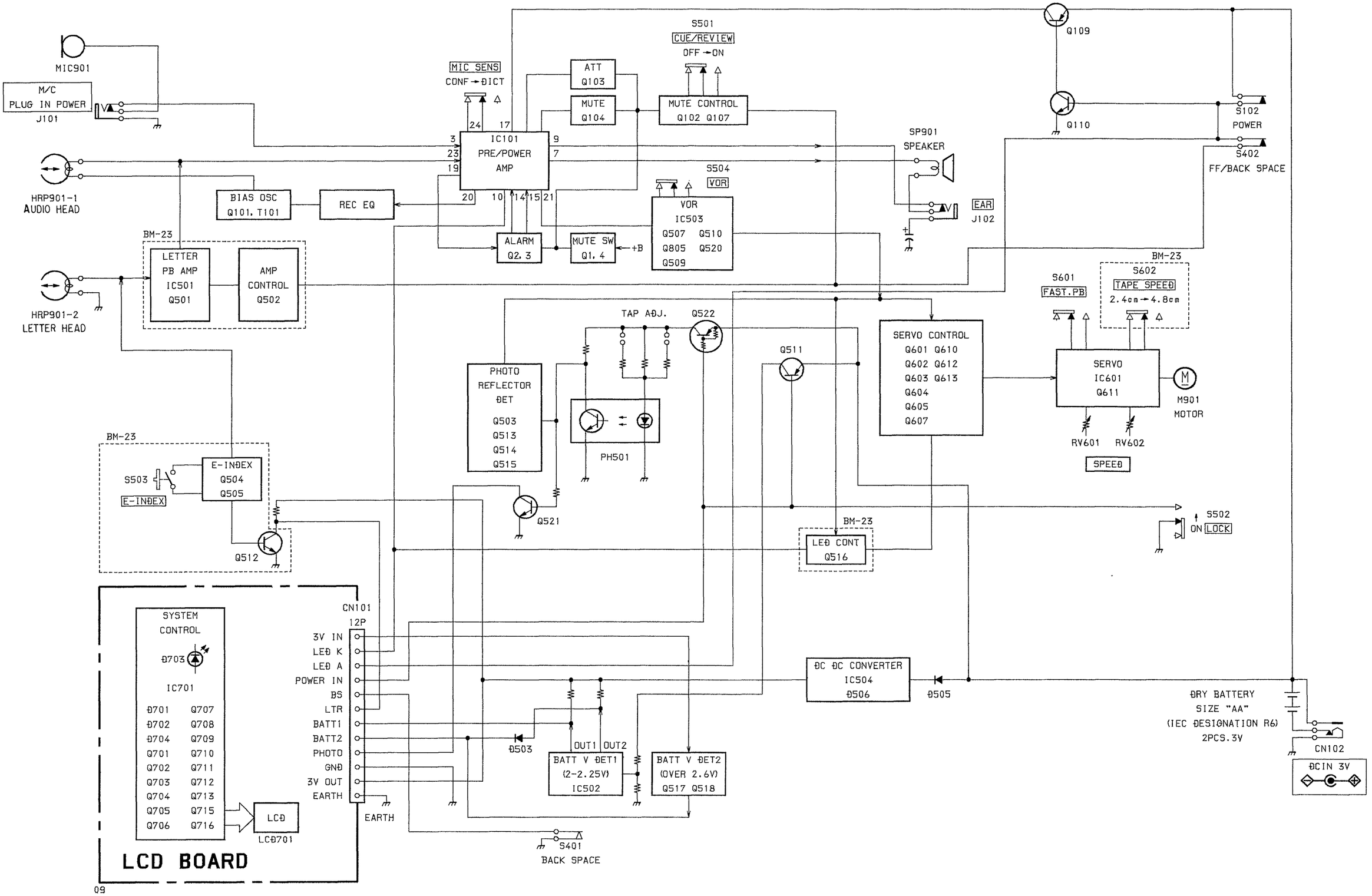
SECTION 5
DIAGRAMS

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	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	BATT.IN 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. RESET. IN 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. LTR. IN 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.
8	BATT2 (LTR)	I	
9	PHOTO	I	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	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



5-3. PRINTED WIRING BOARD

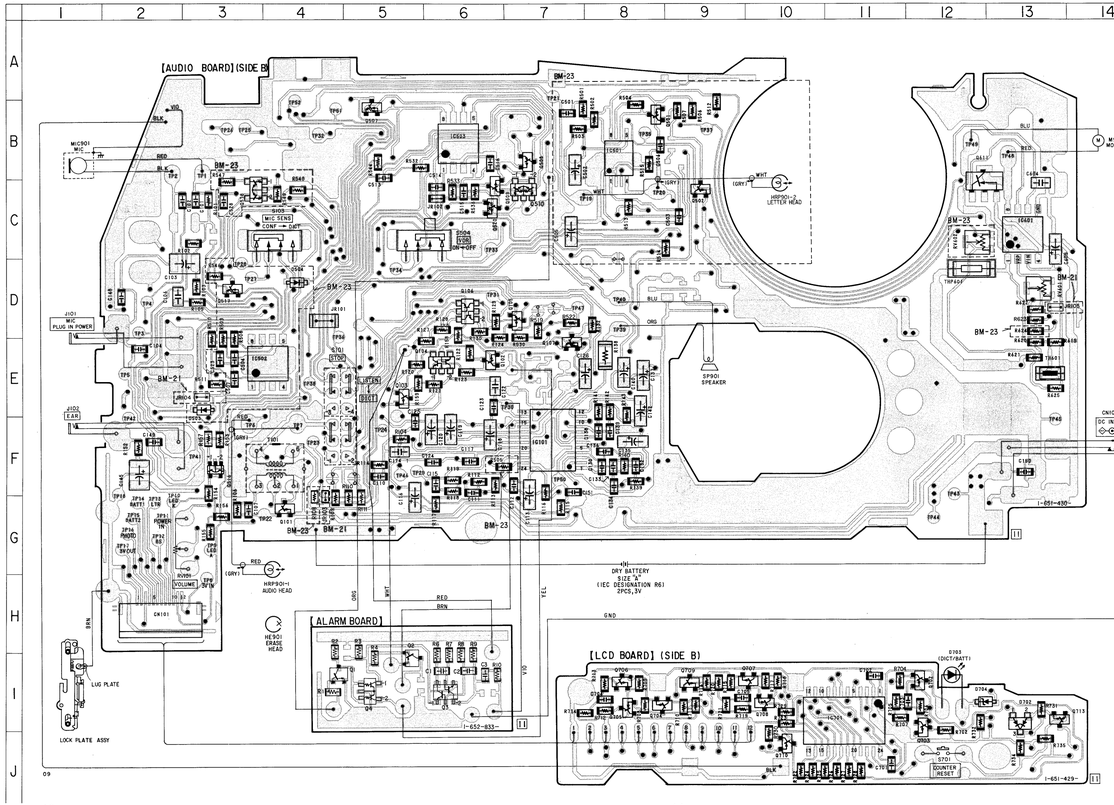
• See page 21 for Semiconductor Lead Layouts.

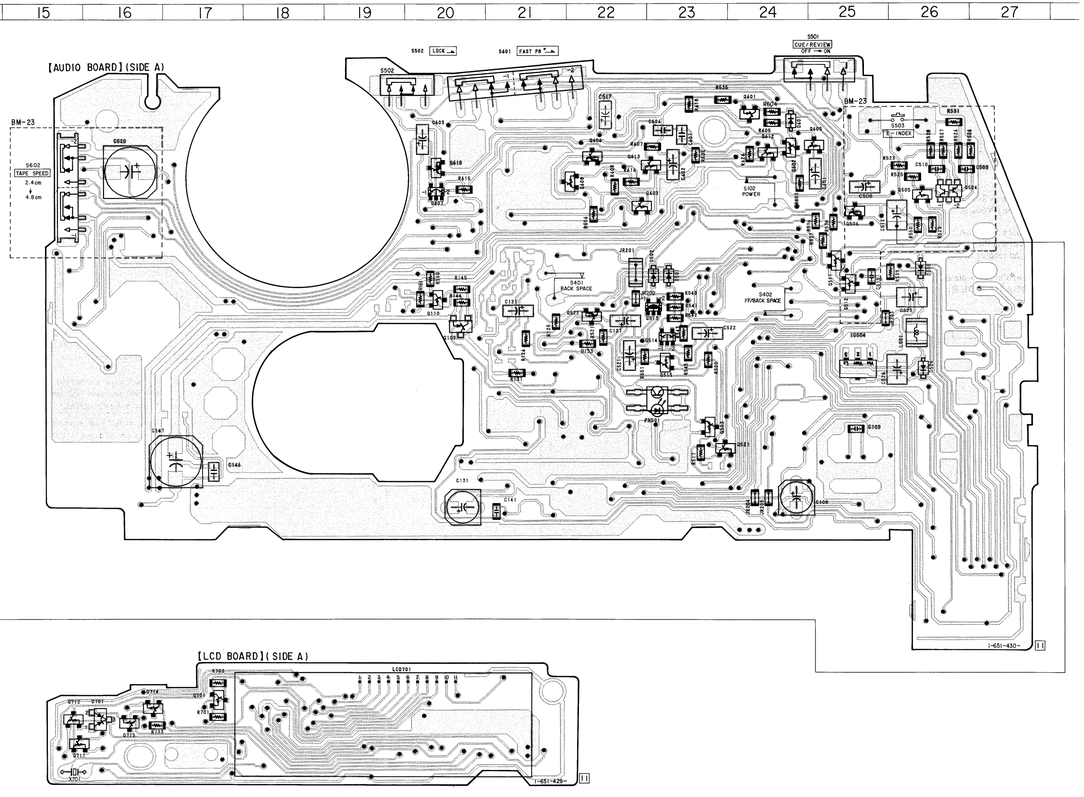
• Semiconductor Location

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:

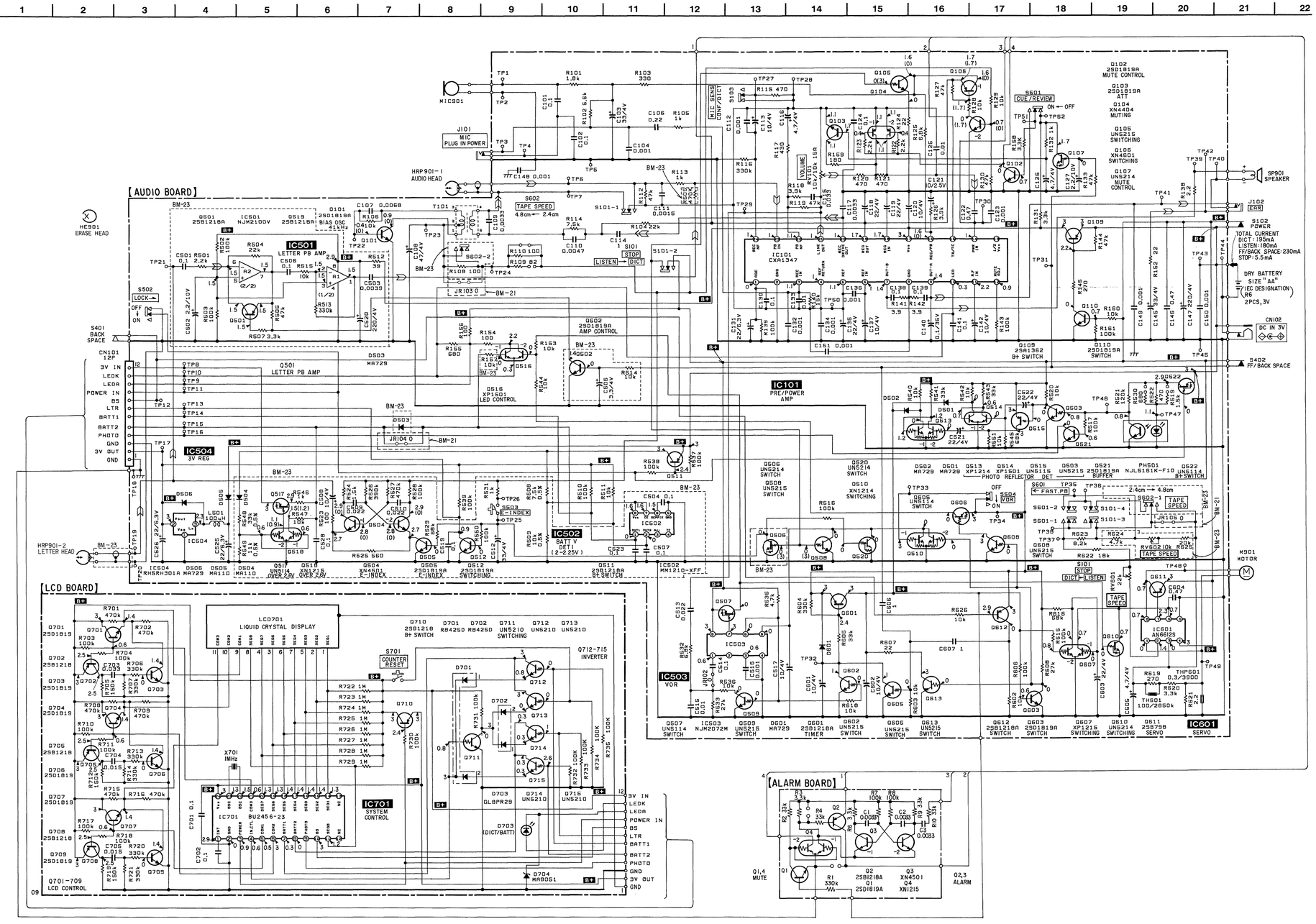
- ——: parts extracted from the conductor side.
- ●: Through hole.
- ▭: Pattern on the side which enable seeing. (The other layer's patterns are not indicated.)



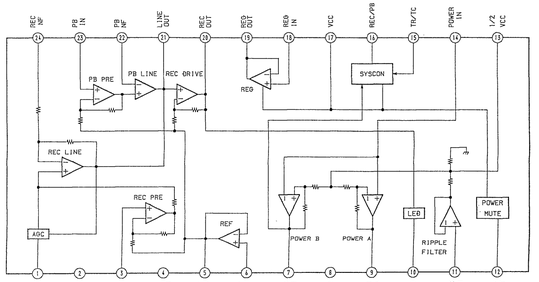


5-4. SCHEMATIC DIAGRAM

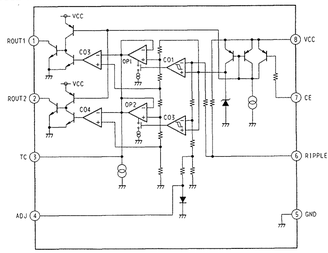
• See page 10 for IC Pin Functions.



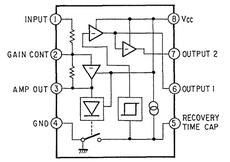
IC101 CXA1347



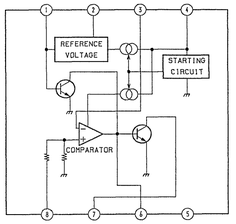
IC502 MM1210-XFF



IC503 NJM2072M



IC601 AN6612S

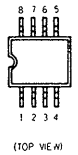


Note:

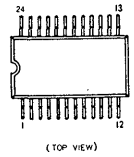
- All capacitors are in µF unless otherwise noted. pF:µµF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4W or less unless otherwise specified.
- % : indicates tolerance.
- ▭ : panel designation.
- B+ : B+ Line
- ▭ : adjustment for repair.
- Voltage 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 10MΩ). 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

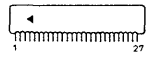
AN6612S
NJM2100V
NJM2072M
MM1210-XFF



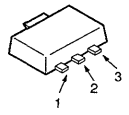
BU2456-23
CXA1347N



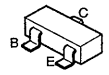
NJ5161K-F10-A



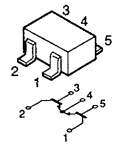
RH5RH301A



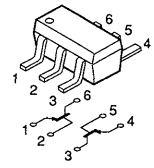
UN5114
UN5115
UN5210
UN5214
UN5215
2SA1362G
2SA1586-YG
2SD1819A-R



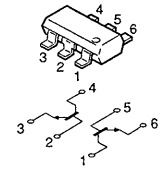
XN1214
XN1215



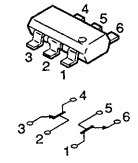
XN4404



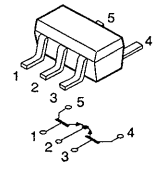
XN4501



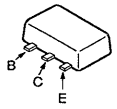
XN4601



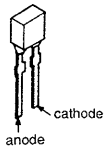
XP1214
XP1215
XP1501



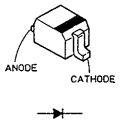
2SB798-DL



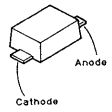
GL8PR29



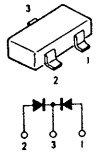
MA110
MA8051



MA729



RB425D

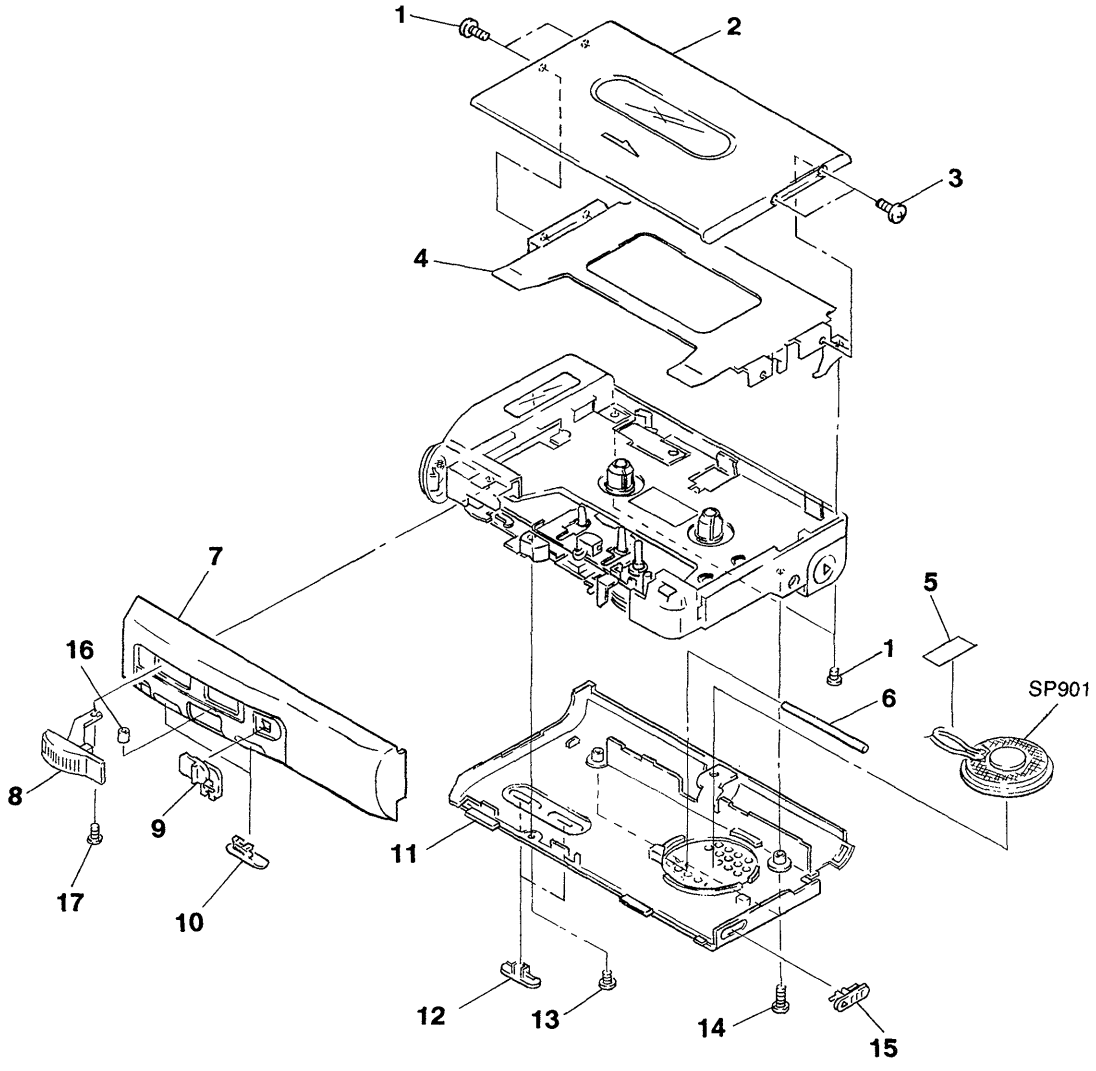


SECTION 6
EXPLODED VIEWS

NOTE:

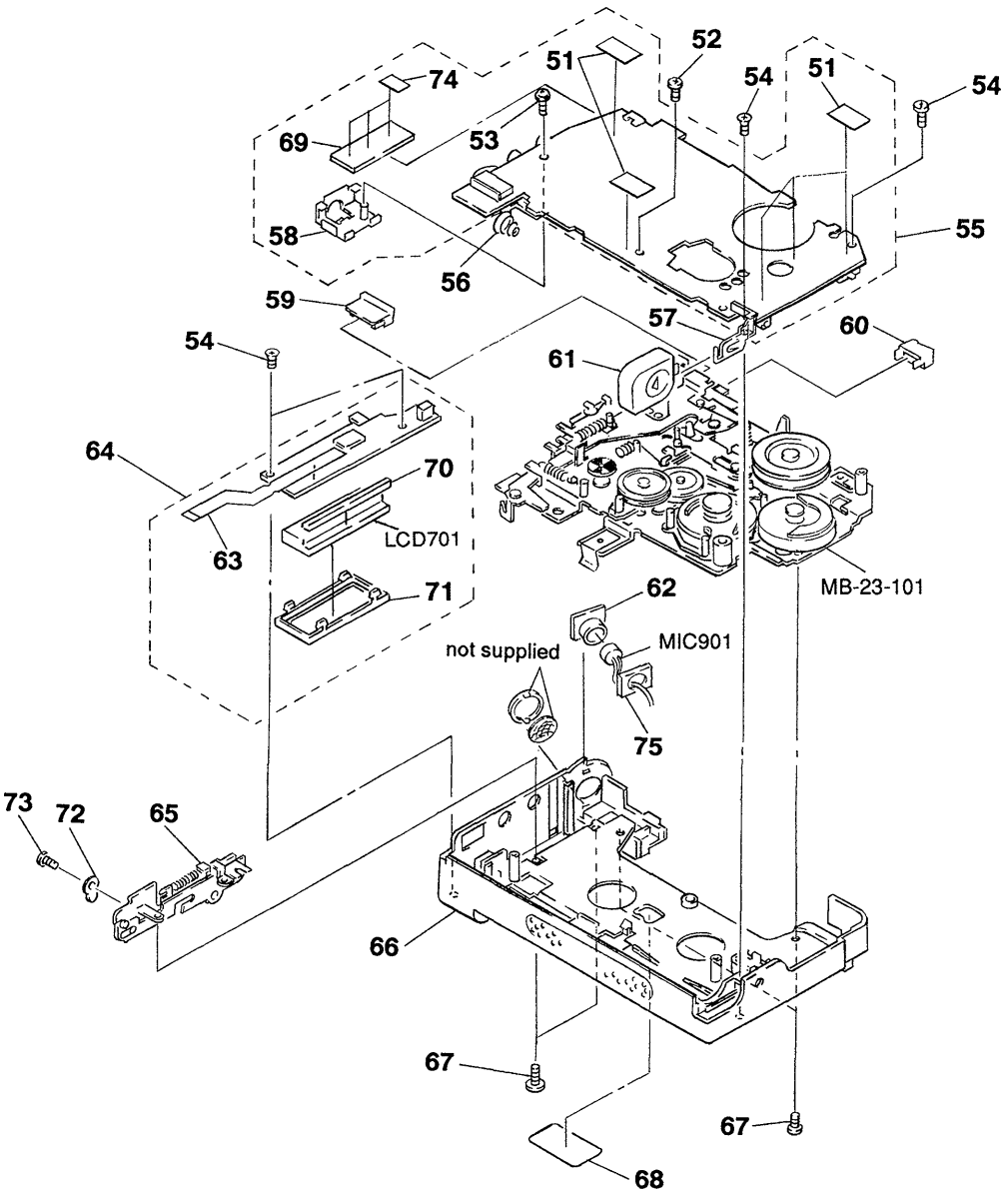
- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Color Indication of Appearance Parts Example:
  KNOB, BALANCE (WHITE) . . . (RED)
  ↑ Parts color ↑ Cabinet's color
- -XX, -X mean standardized parts, 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
1	3-704-197-03	SCREW (M1.4X1.6), LOCKING	
2	X-3367-817-1	PANEL ASSY, CASSETTE (23)	
2	X-3368-079-1	PANEL ASSY, CASSETTE (21)	
3	3-704-197-42	SCREW (M1.4X2.2), LOCKING	
4	X-3367-810-1	PANEL ASSY, HOLDER	
5	3-831-441-XX	CUSHION	
* 6	3-374-741-01	BRACKET (SPEAKER), CONCLUDE	
7	3-909-973-01	PANEL, CONTROL (23)	
7	3-909-973-11	PANEL, CONTROL (21)	
8	X-3367-812-1	BUTTON ASSY, CONTROL	
9	3-909-955-01	KNOB (HOLD)	
10	3-909-954-01	KNOB (A)	
11	X-3367-816-1	CABINET (REAR) ASSY (23)	
11	X-3368-081-1	CABINET (REAR) ASSY (21)	
12	3-909-957-01	KNOB (VOR)	
13	3-704-197-82	SCREW (M1.4X5.0), LOCKING	
14	3-334-565-11	SCREW (B1.7X10), TAPPING	
15	3-365-623-01	KNOB (DOLBY) (23)	
16	3-347-746-01	COLLAR	
17	3-365-630-02	SCREW (M1.4)	
SP901	1-504-294-11	SPEAKER (3.6CM)	

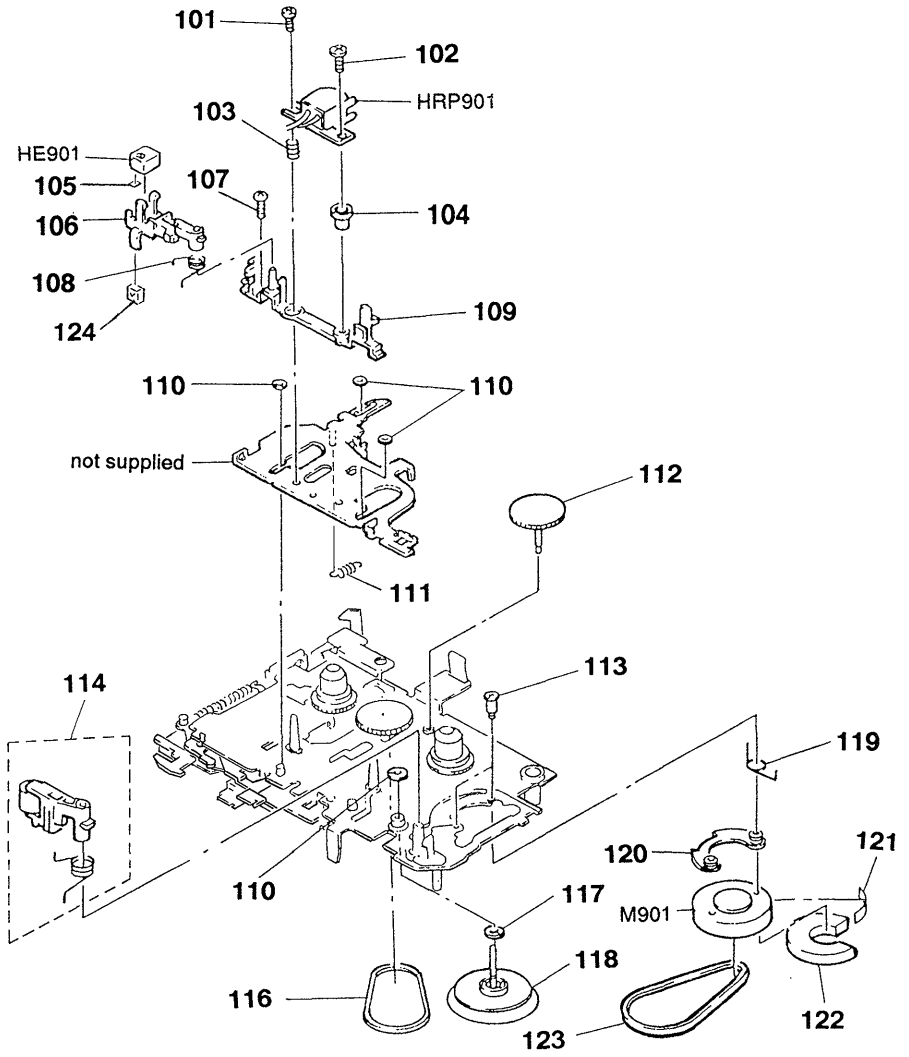
6-2. PC BOARD SECTION



Ref. No.	Part No.	Description	Remark
51	3-831-441-XX	CUSHION	
52	3-335-797-01	SCREW (M1.4X2), TOOTHED LOCK	
53	3-703-502-31	SCREW	
54	3-375-114-61	SCREW	
55	A-3016-512-A	AUDIO BOARD, COMPLETE (23)	
55	A-3016-561-A	AUDIO BOARD, COMPLETE (21)	
56	3-909-950-01	SPRING, BATTERY COIL	
57	X-3367-811-1	TERMINAL BOARD ASSY	
* 58	X-3363-574-1	HOLDER ASSY, JACK	
59	3-909-952-01	BUTTON (EJECT)	
60	3-909-951-01	BUTTON (FF)	
61	3-909-953-01	LID, BATTERY CASE	
62	3-320-975-01	CUSHION (A), MICROPHONE	
63	1-652-024-11	PC BOARD, FLEXIBLE	
64	A-3016-511-A	LCD BOARD, COMPLETE	

Ref. No.	Part No.	Description	Remark
65	X-3367-814-1	PLATE, LOCK ASSY	
66	X-3367-813-1	FRONT ASSY, CABINET (23)	
66	X-3368-080-1	FRONT ASSY, CABINET (21)	
67	3-704-197-33	SCREW (M1.4X3.0), LOCKING	
68	3-371-862-01	PLATE, ORNAMENTAL	
* 69	1-652-833-11	ALARM BOARD	
* 70	1-537-724-11	CONDUCTIVE BOARD, CONNECTION	
71	3-911-887-01	HOLDER, LCD	
72	7-623-505-01	LUG, 2	
73	3-891-132-00	SCREW (M1.7X2.0), SPECIAL HEAD	
74	4-017-441-01	CUSHION (B)	
* 75	3-914-611-01	HOLDER, MICROPHONE	
LCD701	1-810-464-11	DISPLAY PANEL, LIQUID CRYSTAL	
MIC901	1-542-080-11	MICROPHONE, BUILT-IN	

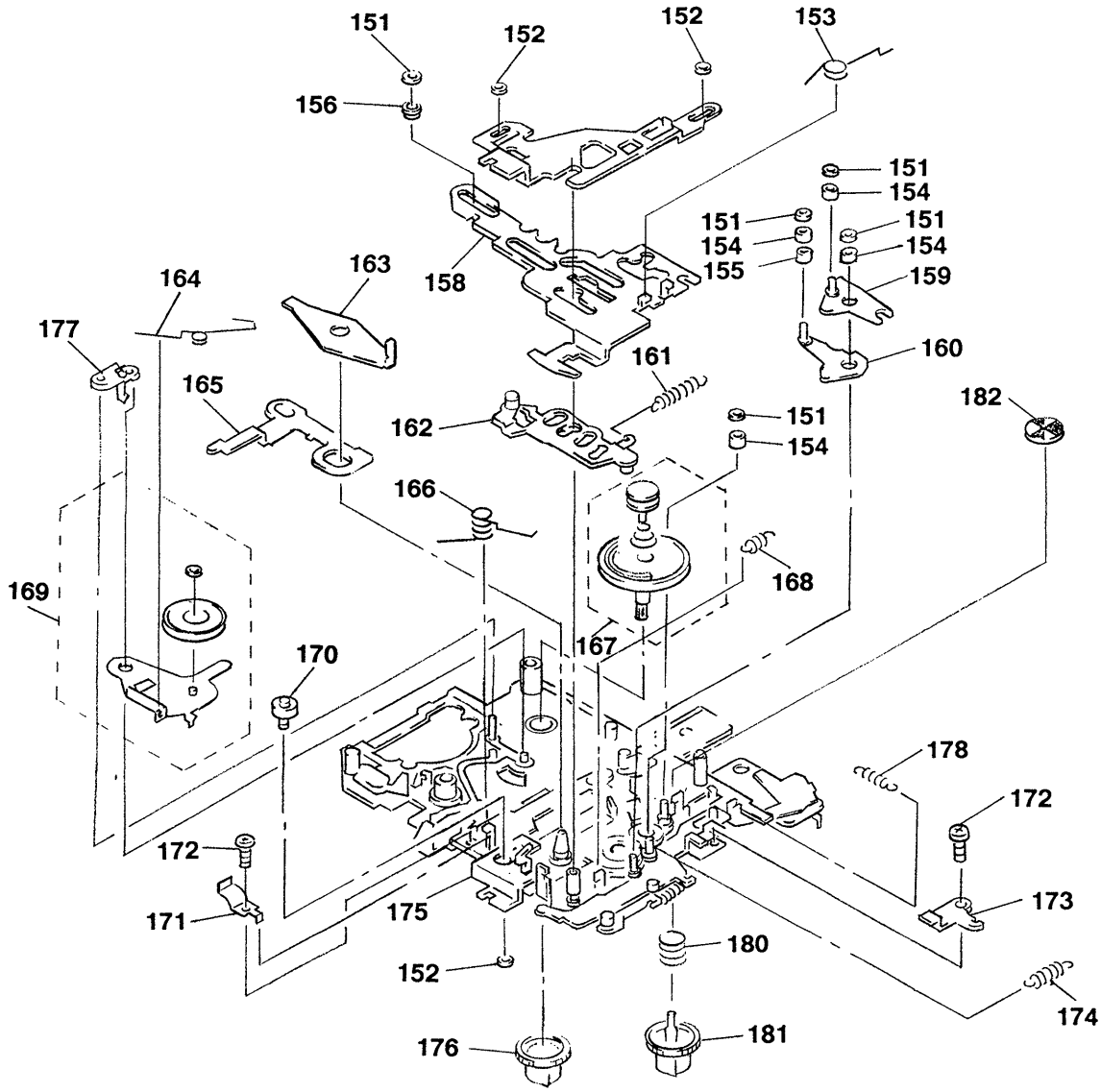
6-3. MECHANISM DECK SECTION-1 (MB-23-101)



Ref. No.	Part No.	Description	Remark
101	3-375-135-01	SCREW (1.4), SPECIAL	
102	3-376-177-01	SCREW (M1.4X3.8)	
103	3-371-882-01	SPRING (AZIMUTH), COMPRESSION	
104	3-375-045-01	COLLAR (HEAD)	
105	3-385-317-11	CUSHION (E HEAD)	
106	3-371-851-01	BRACKET (E HEAD)	
107	3-704-197-11	SCREW (M1.4X2.0), LOCKING	
108	3-371-873-01	SPRING (E HEAD), TORSION	
109	3-371-839-11	BRACKET (HEAD)	
110	3-321-483-11	RING, RETAINING	
111	3-910-002-01	SPRING, TENSION	
112	3-371-854-01	GEAR (FF)	
113	3-371-886-01	SCREW (MOTOR), STEP	
114	X-3368-042-1	PINCH ROLLER ASSY	

Ref. No.	Part No.	Description	Remark
116	3-371-868-01	BELT (FR)	
117	3-701-437-41	WASHER	
118	X-3363-571-1	WHEEL ASSY (ZNDC), CAPSTAN	
119	3-374-119-02	SPRING (GROUND), TORSION	
* 120	3-371-885-01	CUSHION, MOTOR	
121	3-831-441-XX	CUSHION	
* 122	3-372-991-01	DAMPER	
123	3-371-869-01	BELT (CAPSTAN)	
124	3-915-014-01	REINFORCEMENT	
HE901	8-825-779-41	HEAD, ERASE EBF5-36S	
HRP901	1-500-126-11	HEADMAGNETIC (RECORD/PLAYBACK)	
M901	1-541-921-11	MOTOR	

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



Ref. No.	Part No.	Description	Remark
151	3-315-384-11	WASHER, STOPPER	
152	3-321-483-11	RING, RETAINING	
153	3-910-006-01	SPRING, TORSION	
154	3-909-999-01	ROLLER (C)	
155	3-909-997-01	ROLLER (A)	
156	3-909-998-01	ROLLER (B)	
* 157	3-909-985-01	LEVER (EJECT)	
* 158	3-909-987-01	LEVER (SLIDE)	
159	X-3367-822-1	LEVER (REC 2) ASSY	
160	X-3367-823-1	LEVER (CL) ASSY	
161	3-910-005-01	SPRING, TENSION	
162	X-3367-820-1	LEVER (EJECT) ASSY	
* 163	3-909-995-01	LEVER (SW)	
164	3-910-007-01	SPRING (IDLER), TORSION	
* 165	3-909-988-01	LEVER (LOCK)	
166	3-371-872-01	SPRING (FR), TORSION	

Ref. No.	Part No.	Description	Remark
167	X-3367-818-1	TABLE ASSY, FELT	
168	3-910-004-01	SPRING, TENSION	
169	X-3363-568-1	LEVER ASSY, IDLER	
170	3-909-996-01	SHAFT (CHASSIS-D)	
171	3-915-376-01	SPRING (LOCK), LEAF	
172	3-704-197-03	SCREW (M1.4X1.6), LOCKING	
* 173	3-909-986-01	HOLDER (SPRING)	
174	3-910-003-01	SPRING, TENSION	
175	X-3367-819-1	CHASSIS ASSY	
176	3-371-865-01	GEAR (T REEL)	
* 177	3-914-860-01	STOPPER (IDLER)	
178	3-911-371-01	SPRING, TENSION	
180	3-371-881-01	SPRING (B.T), COMPRESSION	
181	3-371-866-01	GEAR (S REEL)	
182	3-910-000-01	REFLECTOR	

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...: μA..., uPA...: μPA..., uPB...: μPB..., uPC...: μPC..., uPD...: μPD...
- CAPACITORS
  uF : μF
- COILS
  uH : μH

Ref. No.	Part No.	Description			Remark
*	1-652-833-11	ALARM BOARD			
		**********			
	4-017-441-01	CUSHION (B)			
		< CAPACITOR >			
C1	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C2	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C3	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
		< TRANSISTOR >			
Q1	8-729-402-32	TRANSISTOR	2SD1819A-R		
Q2	8-729-230-60	TRANSISTOR	2SA1586-YG		
Q3	8-729-402-81	TRANSISTOR	XN4501		
Q4	8-729-403-17	TRANSISTOR	XN1215		
		< RESISTOR >			
R1	1-216-851-11	METAL CHIP	330K	5%	1/16W
R2	1-216-839-11	METAL CHIP	33K	5%	1/16W
R3	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R4	1-216-839-11	METAL CHIP	33K	5%	1/16W
R6	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R7	1-216-845-11	METAL CHIP	100K	5%	1/16W
R8	1-216-845-11	METAL CHIP	100K	5%	1/16W
R9	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R10	1-216-839-11	METAL CHIP	33K	5%	1/16W
**********					
*	A-3016-512-A	AUDIO BOARD, COMPLETE (23) (including ALARM BOARD)			
		**********			
*	A-3016-561-A	AUDIO BOARD, COMPLETE (21) (including ALARM BOARD)			
		**********			
	3-703-502-31	SCREW			
	3-831-441-XX	CUSHION			
	X-3363-574-1	HOLDER ASSY, JACK			
		< CAPACITOR >			
C101	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C102	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C103	1-135-318-11	TANTAL. CHIP	33uF	20%	4V
C104	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C106	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V
C107	1-162-969-11	CERAMIC CHIP	0.0068uF	10%	25V
C108	1-126-607-11	ELECT CHIP	47uF	20%	4V
C109	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C110	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C111	1-162-965-11	CERAMIC CHIP	0.0015uF	10%	50V
C112	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C113	1-135-201-11	TANTALUM CHIP	10uF	20%	4V
C114	1-164-346-11	CERAMIC CHIP	1uF		16V
C115	1-164-677-11	CERAMIC CHIP	0.033uF	10%	16V
C116	1-135-151-21	TANTALUM CHIP	4.7uF	20%	4V
C117	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C118	1-104-847-11	TANTAL. CHIP	22uF	20%	4V
C119	1-104-847-11	TANTAL. CHIP	22uF	20%	4V
C120	1-135-201-11	TANTALUM CHIP	10uF	20%	4V
C121	1-107-983-11	TANTAL. CHIP	10uF	20%	2.5V
C122	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C123	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C124	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C125	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C126	1-135-151-21	TANTALUM CHIP	4.7uF	20%	4V
C127	1-135-149-21	TANTALUM CHIP	2.2uF	20%	10V
C130	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C131	1-124-778-00	ELECT CHIP	22uF	20%	6.3V
C132	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C133	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C134	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C135	1-104-847-11	TANTAL. CHIP	22uF	20%	4V
C136	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C137	1-135-201-11	TANTALUM CHIP	10uF	20%	4V
C138	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C139	1-164-360-11	CERAMIC CHIP	0.1uF		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
C503	1-164-173-11	CERAMIC CHIP	0.0039uF	10%	50V (23)
C504	1-164-360-11	CERAMIC CHIP	0.1uF		16V (23)
C505	1-135-180-21	TANTALUM CHIP	3.3uF	20%	6.3V(23)
C506	1-164-360-11	CERAMIC CHIP	0.1uF		16V (23)
C507	1-164-360-11	CERAMIC CHIP	0.1uF		16V (23)
C508	1-135-201-11	TANTALUM CHIP	10uF	20%	4V (23)
C509	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V (23)
C510	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V (23)
C512	1-135-318-11	TANTAL. CHIP	33uF	20%	4V (23)
C513	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C514	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C515	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C516	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C517	1-135-201-11	TANTALUM CHIP	10uF	20%	4V
C519	1-164-360-11	CERAMIC CHIP	0.1uF		16V (23)
C520	1-126-246-11	ELECT CHIP	220uF	20%	4V (23)
C521	1-104-847-11	TANTAL. CHIP	22uF	20%	4V
C522	1-104-847-11	TANTAL. CHIP	22uF	20%	4V
C523	1-164-360-11	CERAMIC CHIP	0.1uF		16V (23)
C525	1-104-852-11	TANTAL. CHIP	22uF	20%	6.3V
C526	1-104-852-11	TANTAL. CHIP	22uF	20%	6.3V
C528	1-164-360-11	CERAMIC CHIP	0.1uF		16V (23)
C601	1-135-201-11	TANTALUM CHIP	10uF	20%	4V
C602	1-135-201-11	TANTALUM CHIP	10uF	20%	4V
C603	1-104-847-11	TANTAL. CHIP	22uF	20%	4V
C604	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C605	1-135-151-21	TANTALUM CHIP	4.7uF	20%	4V
C606	1-164-346-11	CERAMIC CHIP	1uF		16V
C607	1-164-346-11	CERAMIC CHIP	1uF		16V
		< CONNECTOR >			
* CN101	1-750-338-11	CONNECTOR, FFC/FPC (ZIF) 12P			
CN102	1-580-372-11	JACK, DC(POLARITY UNIFIED TYPE)(DC IN 3V)			
		< DIODE >			
D501	8-719-420-51	DIODE	MA729		
D502	8-719-420-51	DIODE	MA729		
D503	8-719-420-51	DIODE	MA729 (23)		
D504	8-719-404-46	DIODE	MA110 (23)		
D505	8-719-404-46	DIODE	MA110		
D506	8-719-420-51	DIODE	MA729		
D601	8-719-420-51	DIODE	MA729		
		< IC >			
IC101	8-752-036-39	IC	CXA1347N		
IC501	8-759-097-93	IC	NJM2100V (23)		
IC502	8-759-180-33	IC	MM1210-XFF (23)		
IC503	8-759-701-51	IC	NJM2072M		
IC504	8-759-253-51	IC	RH5RH301A		

Ref.No.	Part No.	Description			Remark
IC601	8-759-400-12	IC	AN6612S		
		< JACK >			
J101	1-563-319-21	JACK (MIC PLUG IN POWER)			
J102	1-563-319-21	JACK (EAR)			
		< JUMPER RESISTOR >			
JR102	1-216-864-11	METAL CHIP	0	5%	1/16W
JR103	1-216-864-11	METAL CHIP	0	5%	1/16W (21)
JR104	1-216-864-11	METAL CHIP	0	5%	1/16W (21)
JR105	1-216-864-11	METAL CHIP	0	5%	1/16W (21)
JR201	1-216-296-11	METAL CHIP	0	5%	1/16W
JR202	1-216-864-11	METAL CHIP	0	5%	1/16W
JR203	1-216-864-11	METAL CHIP	0	5%	1/16W
JR204	1-216-864-11	METAL CHIP	0	5%	1/16W
JR205	1-216-864-11	METAL CHIP	0	5%	1/16W
		< COIL >			
L501	1-412-064-11	INDUCTOR CHIP	100uH		
		< PHOTO INTERUPTER >			
PH501	8-719-017-54	DIODE	NJ5161K-F10-A		
		< TRANSISTOR >			
Q101	8-729-402-32	TRANSISTOR	2SD1819A-R		
Q102	8-729-402-32	TRANSISTOR	2SD1819A-R		
Q103	8-729-402-32	TRANSISTOR	2SD1819A-R		
Q104	8-729-422-39	TRANSISTOR	XN4404		
Q105	8-729-420-50	TRANSISTOR	UN5215		
Q106	8-729-402-84	TRANSISTOR	XN4601		
Q107	8-729-402-93	TRANSISTOR	UN5214		
Q109	8-729-230-69	TRANSISTOR	2SA1362G		
Q110	8-729-402-32	TRANSISTOR	2SD1819A-R		
Q501	8-729-230-60	TRANSISTOR	2SA1586-YG (23)		
Q502	8-729-402-32	TRANSISTOR	2SD1819A-R (23)		
Q503	8-729-420-50	TRANSISTOR	UN5215		
Q504	8-729-402-81	TRANSISTOR	XN4501 (23)		
Q505	8-729-402-32	TRANSISTOR	2SD1819A-R (23)		
Q506	8-729-402-93	TRANSISTOR	UN5214 (23)		
Q507	8-729-402-96	TRANSISTOR	UN5114		
Q508	8-729-420-50	TRANSISTOR	UN5215		
Q509	8-729-420-50	TRANSISTOR	UN5215		
Q510	8-729-420-16	TRANSISTOR	XN1214		
Q511	8-729-230-60	TRANSISTOR	2SA1586-YG		
Q512	8-729-402-32	TRANSISTOR	2SD1819A-R (23)		
Q513	8-729-426-31	TRANSISTOR	XP1214		
Q514	8-729-429-44	TRANSISTOR	XP1501		
Q515	8-729-420-53	TRANSISTOR	UN5115		
Q516	8-729-429-44	TRANSISTOR	XP1501		

AUDIO

Ref.No.	Part No.	Description	Remark
Q517	8-729-402-96	TRANSISTOR UN5114 (23)	
Q518	8-729-403-17	TRANSISTOR XN1215 (23)	
Q520	8-729-402-93	TRANSISTOR UN5214	
Q521	8-729-402-32	TRANSISTOR 2SD1819A-R	
Q522	8-729-402-96	TRANSISTOR UN5114	
Q601	8-729-230-60	TRANSISTOR 2SA1586-YG	
Q602	8-729-420-50	TRANSISTOR UN5215	
Q603	8-729-402-32	TRANSISTOR 2SD1819A-R	
Q605	8-729-420-50	TRANSISTOR UN5215	
Q606	8-729-420-53	TRANSISTOR UN5115	
Q607	8-729-426-36	TRANSISTOR XP1215	
Q608	8-729-420-50	TRANSISTOR UN5215	
Q610	8-729-402-93	TRANSISTOR UN5214	
Q611	8-729-101-07	TRANSISTOR 2SB798-DL	
Q612	8-729-230-60	TRANSISTOR 2SA1586-YG	
Q613	8-729-420-50	TRANSISTOR UN5215	
		< RESISTOR >	
R101	1-216-824-11	METAL CHIP 1.8K 5% 1/16W	
R102	1-216-830-11	METAL CHIP 5.6K 5% 1/16W	
R103	1-216-815-11	METAL CHIP 330 5% 1/16W	
R104	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R105	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R106	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R108	1-216-809-11	METAL CHIP 100 5% 1/16W	(23)
R109	1-216-808-11	METAL CHIP 82 5% 1/16W	
R110	1-216-809-11	METAL CHIP 100 5% 1/16W	
R112	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R113	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R114	1-218-344-11	METAL GLAZE 7.5K 5% 1/16W	
R115	1-216-817-11	METAL CHIP 470 5% 1/16W	
R116	1-216-851-11	METAL CHIP 330K 5% 1/16W	
R117	1-218-482-11	METAL GLAZE 430 5% 1/16W	
R118	1-216-828-11	METAL CHIP 3.9K 5% 1/16W	
R119	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R120	1-216-817-11	METAL CHIP 470 5% 1/16W	
R121	1-216-817-11	METAL CHIP 470 5% 1/16W	
R122	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R123	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R124	1-216-801-11	METAL CHIP 22 5% 1/16W	
R125	1-216-831-11	METAL CHIP 6.8K 5% 1/16W	
R126	1-216-828-11	METAL CHIP 3.9K 5% 1/16W	
R127	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R128	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R129	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R130	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R131	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R132	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R133	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R138	1-216-134-00	METAL CHIP 2.2 5% 1/8W	
R139	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R140	1-216-835-11	METAL CHIP 15K 5% 1/16W	
R141	1-216-792-11	METAL GLAZE 3.9 5% 1/16W	
R142	1-216-792-11	METAL GLAZE 3.9 5% 1/16W	
R143	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R144	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R145	1-216-814-11	METAL CHIP 270 5% 1/16W	
R152	1-216-801-11	METAL CHIP 22 5% 1/16W	
R153	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R154	1-216-809-11	METAL CHIP 100 5% 1/16W	
R155	1-216-819-11	METAL CHIP 680 5% 1/16W	
R156	1-216-809-11	METAL CHIP 100 5% 1/16W	
R157	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R158	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R159	1-216-812-11	METAL CHIP 180 5% 1/16W	
R160	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R161	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R501	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	(23)
R502	1-216-845-11	METAL CHIP 100K 5% 1/16W	(23)
R503	1-216-845-11	METAL CHIP 100K 5% 1/16W	(23)
R504	1-216-837-11	METAL CHIP 22K 5% 1/16W	(23)
R505	1-216-853-11	METAL CHIP 470K 5% 1/16W	(23)
R506	1-216-841-11	METAL CHIP 47K 5% 1/16W	(23)
R507	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	(23)
R508	1-218-344-11	METAL CHIP 7.5K 0.50% 1/16W	(23)
R509	1-218-716-11	METAL CHIP 10K 0.50% 1/16W	(23)
R510	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R511	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R512	1-216-804-11	METAL CHIP 39 5% 1/16W	(23)
R513	1-216-851-11	METAL CHIP 330K 5% 1/16W	(23)
R514	1-216-833-11	METAL CHIP 10K 5% 1/16W	(23)
R515	1-216-833-11	METAL CHIP 10K 5% 1/16W	(23)
R516	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R517	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R519	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R520	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R521	1-216-846-11	METAL CHIP 120K 5% 1/16W	
R522	1-216-817-11	METAL CHIP 470 5% 1/16W	
R523	1-216-809-11	METAL CHIP 100 5% 1/16W	(23)
R524	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	(23)
R525	1-216-818-11	METAL CHIP 560 5% 1/16W	(23)
R526	1-216-852-11	METAL CHIP 390K 5% 1/16W	(23)
R527	1-216-853-11	METAL CHIP 470K 5% 1/16W	(23)
R528	1-216-845-11	METAL CHIP 100K 5% 1/16W	(23)
R529	1-216-843-11	METAL CHIP 68K 5% 1/16W	(23)
R530	1-216-819-11	METAL CHIP 680 5% 1/16W	
R531	1-216-821-11	METAL CHIP 1K 5% 1/16W	(23)
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
R536	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R537	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R538	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R539	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R540	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R541	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R542	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R543	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R544	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R545	1-216-843-11	METAL CHIP	68K	5%	1/16W	
R546	1-216-821-11	METAL CHIP	1K	5%	1/16W	(23)
R547	1-216-833-11	METAL CHIP	10K	5%	1/16W	(23)
R548	1-218-883-11	METAL CHIP	33K	0.50%	1/16W	(23)
R549	1-218-717-11	METAL CHIP	11K	0.50%	1/16W	(23)
R550	1-216-845-11	METAL CHIP	100K	5%	1/16W	(23)
R551	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R602	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R603	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R604	1-216-851-11	METAL CHIP	330K	5%	1/16W	
R605	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R606	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R607	1-216-801-11	METAL CHIP	22	5%	1/16W	
R608	1-216-838-11	METAL CHIP	27K	5%	1/16W	
R615	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R616	1-216-843-11	METAL CHIP	68K	5%	1/16W	
R618	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R619	1-216-814-11	METAL CHIP	270	5%	1/16W	
R620	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R621	1-216-789-11	METAL CHIP	2.2	5%	1/16W	
R622	1-216-836-11	METAL CHIP	18K	5%	1/16W	
R623	1-216-832-11	METAL CHIP	8.2K	5%	1/16W	
R624	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	(23)
R625	1-218-292-11	METAL GLAZE	20K	5%	1/16W	(23)
R626	1-216-833-11	METAL CHIP	10K	5%	1/16W	
		< VARIABLE RESISTOR >				
RV101	1-223-510-11	RES, VAR, CARBON 10K/10K (VOLUME)				
RV601	1-238-091-11	RES, ADJ, CERMET 22K				
RV602	1-238-090-11	RES, ADJ, CERMET 10K (23)				
		< SWITCH >				
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)				
S601	1-570-087-11	SWITCH, SLIDE (FAST PB)				
S602	1-571-277-31	SWITCH, SLIDE (TAPE SPEED) (23)				
		< TRANSFORMER >				
T101	1-433-251-00	TRANSFORMER, BIAS OSCILLATOR				
		< THERMISTOR >				
TH601	1-809-545-11	THERMISTOR				
		< THERMISTOR(POSITIVE) >				
THP601	1-809-342-11	THERMISTOR, POSITIVE				
**********						
	A-3016-511-A	LCD BOARD, COMPLETE				
		**********				
*	1-537-724-11	CONDUCTIVE BOARD, CONNECTION				
	1-652-024-11	PC BOARD, FLEXIBLE BOARD				
	3-911-887-01	HOLDER, LCD				
		< CAPACITOR >				
C701	1-164-360-11	CERAMIC CHIP	0.1uF			16V
C702	1-164-360-11	CERAMIC CHIP	0.1uF			16V
C703	1-164-677-11	CERAMIC CHIP	0.033uF	10%		16V
C704	1-164-245-11	CERAMIC CHIP	0.015uF	10%		25V
C705	1-164-245-11	CERAMIC CHIP	0.015uF	10%		25V
		< DIODE >				
D701	8-719-991-75	DIODE RB425D				
D702	8-719-991-75	DIODE RB425D				
D703	8-719-047-19	LED GL8PR29 (DICT/BATT)				
D704	8-719-422-37	DIODE MA8051				
		< IC >				
IC701	8-759-276-81	IC BU2456-23				
		< LIQUID CRYSTAL DISPLAY >				
LCD701	1-810-464-11	DISPLAY PANEL, LIQUID CRYSTAL				
		< TRANSISTOR >				
Q701	8-729-402-32	TRANSISTOR 2SD1819A-R				
Q702	8-729-230-60	TRANSISTOR 2SA1586-YG				
Q703	8-729-402-32	TRANSISTOR 2SD1819A-R				
Q704	8-729-402-32	TRANSISTOR 2SD1819A-R				
Q705	8-729-230-60	TRANSISTOR 2SA1586-YG				
Q706	8-729-402-32	TRANSISTOR 2SD1819A-R				
Q707	8-729-402-32	TRANSISTOR 2SD1819A-R				
Q708	8-729-230-60	TRANSISTOR 2SA1586-YG				
Q709	8-729-402-32	TRANSISTOR 2SD1819A-R				

LCD

Ref.No.	Part No.	Description				Remark
Q710	8-729-230-60	TRANSISTOR	2SA1586-YG			
Q711	8-729-420-44	TRANSISTOR	UN5210			
Q712	8-729-420-44	TRANSISTOR	UN5210			
Q713	8-729-420-44	TRANSISTOR	UN5210			
Q714	8-729-420-44	TRANSISTOR	UN5210			
Q715	8-729-420-44	TRANSISTOR	UN5210			
		< RESISTOR >				
R701	1-216-853-11	METAL CHIP	470K	5%	1/16W	
R702	1-216-853-11	METAL CHIP	470K	5%	1/16W	
R703	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R704	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R705	1-216-847-11	METAL CHIP	150K	5%	1/16W	
R706	1-216-851-11	METAL CHIP	330K	5%	1/16W	
R707	1-216-851-11	METAL CHIP	330K	5%	1/16W	
R708	1-216-853-11	METAL CHIP	470K	5%	1/16W	
R709	1-216-853-11	METAL CHIP	470K	5%	1/16W	
R710	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R711	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R712	1-216-847-11	METAL CHIP	150K	5%	1/16W	
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)				

Ref.No.	Part No.	Description	Remark
**********			
		MISCELLANEOUS	
		**********	
HE901	8-825-779-41	HEAD, ERASE EBF5-36S	
HRP901	1-500-126-11	HEADMAGNETIC (RECORD/PLAYBACK)	
M901	1-541-921-11	MOTOR	
MIC901	1-542-080-11	MICROPHONE, BUILT-IN	
SP901	1-504-294-11	SPEAKER (3.6CM)	
**********			
		ACCESSORIES & PACKING MATERIALS	
		**********	
	3-758-326-11	MANUAL, INSTRUCTION (ENGLISH, FRENCH, GERMAN, DUTCH) (23:Canadian, AEP, UK)	
	3-758-326-21	MANUAL, INSTRUCTION (ENGLISH) (21/23:US)	
	3-909-958-01	CASE, CARRYING (23)	
*	3-911-190-01	INDIVIDUAL CARTON (23)	
*	3-911-191-01	CUSHION	
*	3-911-716-01	INDIVIDUAL CARTON (21)	

9-959-363-11

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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.)

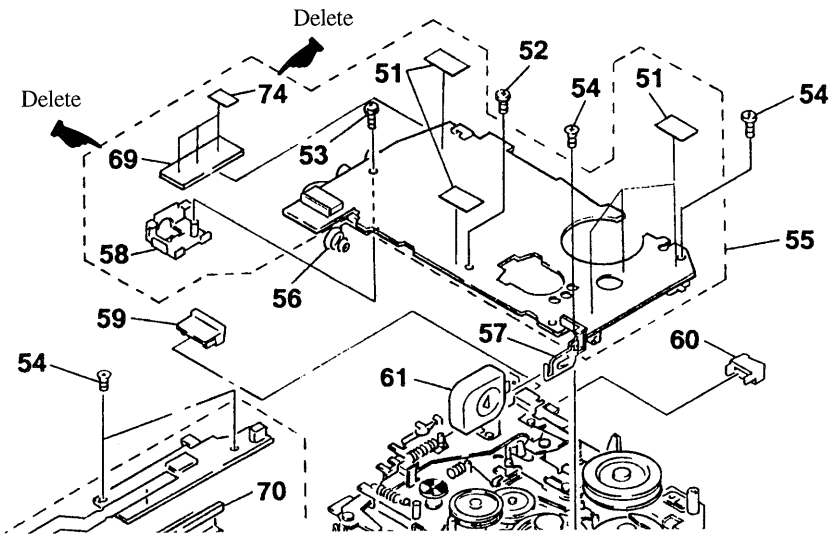
Suffix of board parts number of AUDIO and LCD boards is changed.

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	————

9-959-363-81

Sony Corporation
Personal A&V Products Company

97C1610-1
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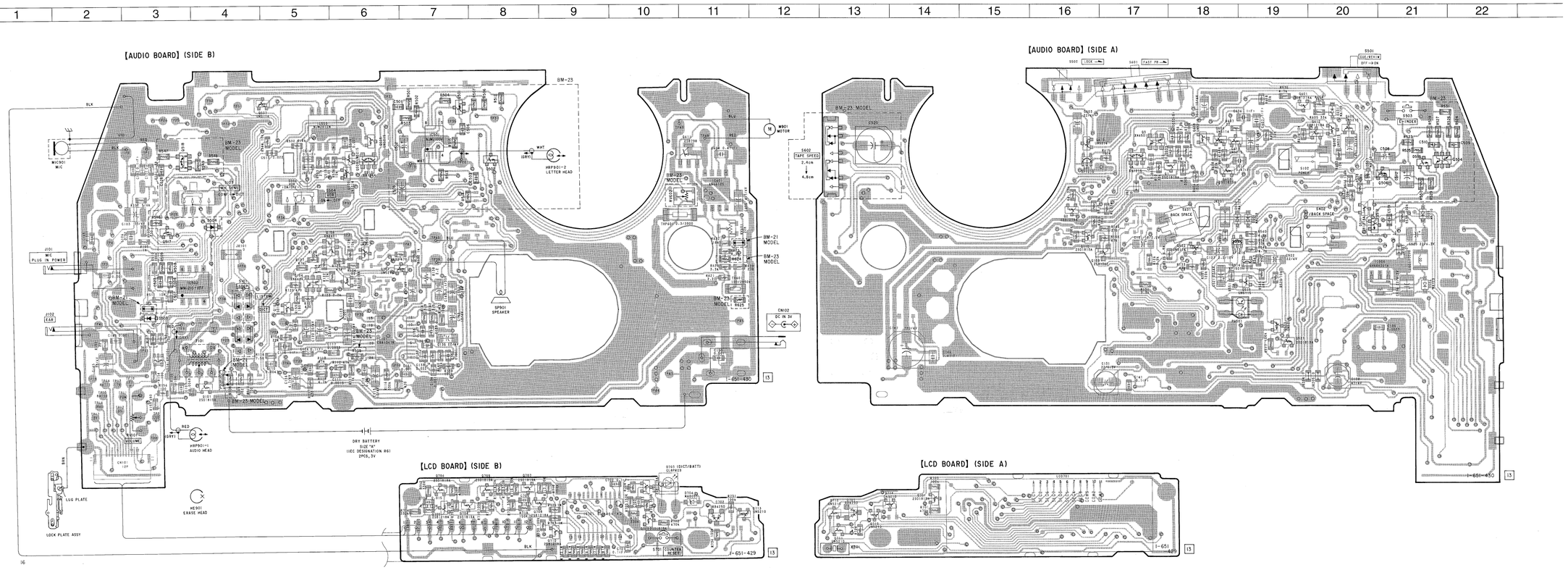
PRINTED WIRING BOARD

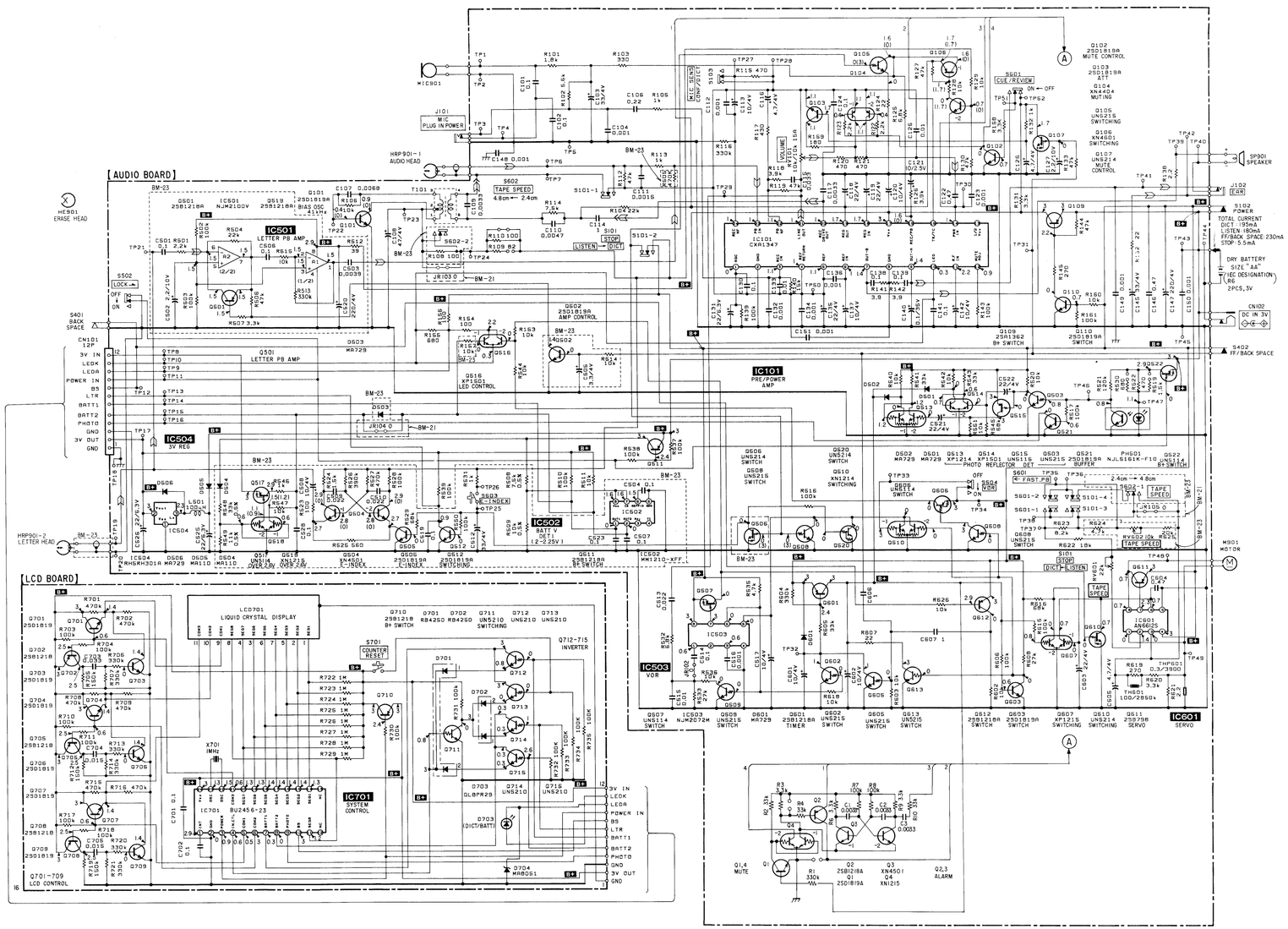
• Semiconductor Location

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
IC101	E-6	Q520	C-6
IC501	B-7	Q521	E-19
IC502	D-4	Q522	D-18
IC503	B-5	Q601	B-19
IC504	D-21	Q602	B-20
IC601	C-11	Q603	C-18
IC701	H-9	Q605	B-20
		Q606	B-18
PH501	E-19	Q607	C-16
		Q608	B-18
Q1	C-18	Q610	B-16
Q2	C-16	Q611	B-11
Q3	B-17	Q612	B-20
Q4	C-17	Q613	B-18
Q101	F-4	Q701	G-14
Q102	D-6	Q702	G-10
Q103	E-5	Q703	H-10
Q104	D-5	Q704	H-7
Q105	D-6	Q705	H-7
Q106	D-5	Q706	G-7
Q107	D-6	Q707	G-8
Q109	D-16	Q708	H-8
Q110	D-16	Q709	G-8
Q501	B-7	Q710	H-9
Q502	C-8	Q711	H-13
Q503	E-19	Q712	G-13
Q504	B-22	Q713	H-11
Q505	B-21	Q714	G-13
Q506	C-21	Q715	H-13

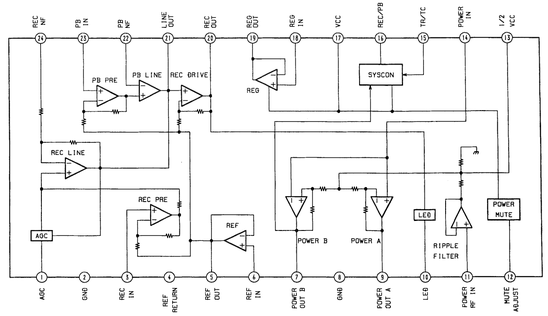
Note :
- •——— : Parts extracted from the conductor side.
- • ○ : Through hole.
- •═══ : Pattern on the side which enable seeing. (The other layer's patterns are not indicated.)



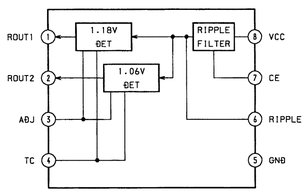
SCHEMATIC DIAGRAM



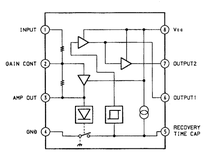
IC101 CXA1347N



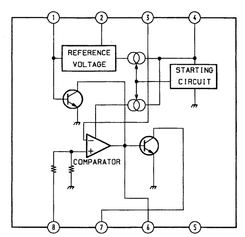
IC502 MM1210XFF



IC503 NJM2072M



IC601 AN6612S



Note :

- All capacitors are μF unless otherwise noted. pF : μμF
  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).
  nomark : REC (DICT)
  ( ) : PB (LISTEN)
- Voltages are taken with a VOM (Input impedance 10Ω).
  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)