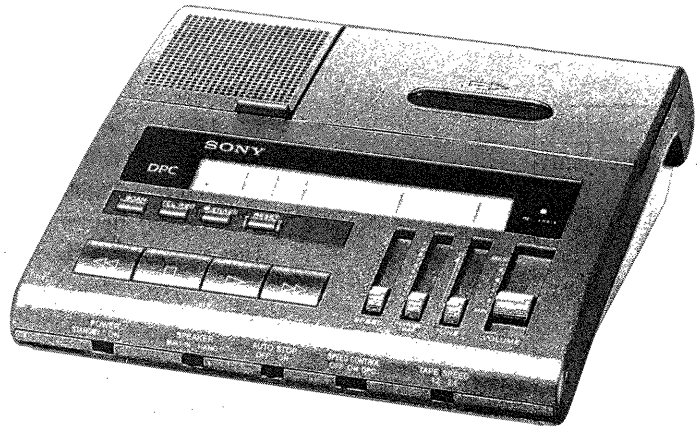
BM-890D/890T

SERVICE MANUAL

US Model
Canadian Model
AEP Model
UK Model



For the informations about the hand control unit (HU-80) supplied with BM-890D and the hoot control unit (FS-85) supplied with BM-890T, please refer to the HU-80 or FS-85 service manuals previously issued respectively.

Model Name Using Similar Mechanism	BM-880
Tape Transport Mechanism Type	MB-890-58

SPECIFICATIONS

Tape
(MICROCASSETTE)™ (normal position type)
Recording system
4-track 2-channel monaural
(L channel for electronic index signals, R channel for sound signals)
Tape speed
2.4 cm/s (15/16 in./s), 1.2 cm/s (15/32 in./s)
Fast winding time
Approx. 1 min. 50 sec. (2.4 cm/s) with Sony microcassette MC-60BM
Frequency response
200–4,000 Hz (at 1.2 cm/s)
200–6,000 Hz (at 2.4 cm/s)
Speaker
Approx. 5.7 cm (2 1/4 inches) dia.
Power output
350 mW (at 10% distortion)
Input
TELEPHONE PICKUP (minijack)
Sensitivity 0.2 mV
Input impedance 10 kilohms
Output
EARPHONE (minijack)
for 8–300-ohm earphones
CONTROL UNIT connector
for hand control unit or foot control unit

Power requirements
9 V DC
DC IN 9 V jack accepts the supplied AC power adaptor for use on
120 V AC, 60 Hz (US, Canadian)
220 V AC, 50 Hz (AEP)
240 V AC, 50 Hz (UK)
Power consumption
14 W (US, Canadian) (with the supplied AC power adaptor)
13 W (AEP, UK)
Dimensions
Approx. 200 x 70 x 245 mm (w/h/d) (7 7/8 x 2 7/8 x 9 3/4 inches)
including projecting parts and controls
Mass
Approx. 1.4 kg (3 lb 2 oz)
Accessories supplied
AC power adaptor (1)
Hand control unit (1, BM-890D only)
Cradle for the hand control unit (1, BM-890D only)
Foot control unit (1, BM-890T only)
Earphone (1, BM-890T only)

Design and specifications are subject to change without notice.

— Continued on next page —

MICROCASSETTE DICTATOR/TRANSCRIBER

SONY®

Differences in supplied accessories

Accessory \ Model	BM-890D	BM-890T
Hand Control Unit	Supplied	Not supplied
Cradle of Hand Control Unit	Supplied	Not supplied
Foot Control Unit	Not supplied	Supplied
Earphone	Not supplied	Supplied

TABLE OF CONTENTS

SAFETY-RELATED COMPONENT WARNING!!

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

SECTION 1
SERVICING NOTES

[NOTES ON REPAIRING]

1. STANDBY ON (S101) Switch
   The STANDBY ON switch is not a switch for turning ON/OFF the power source. Pay attention when repairing that the electricity is turned on even if the STANDBY ON switch is turned off.
   - The states when turnig off the STANDBY ON switch are as follows.
     a. LCD (ND901) display will be turned off.
     b. Motors (M901, 902) will be stopped.
     c. Plungers (PM901) will be turned off.
     d. Any key input will be ignored.

     The above items from a to d are controlled by the microcomputer which makes the pin ㊳ of IC113 (microcomputer) become Low level.

[PINCH ROLLER CLEAING MODE] (If You Want to Continue the Mechanical Operation with No Cassette)

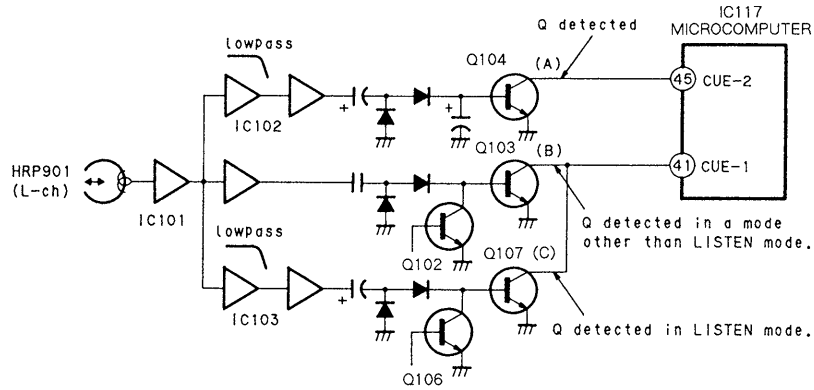
1. With no cassette and with the cassette holder down (Cassette lid: open), while holding down the cassette detection switch (S601), press LISTEN ▷ , FF ▷▷ and REW ◁◁ buttons on the this set to operate the mechanism.
2. Even if the switch (S601) is released, in spite of no cassette, the shut off function will not be in force, arrowing the mechanism to continue to operate.

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

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

[LTR/SEC Detection]

1. Detection Circuit

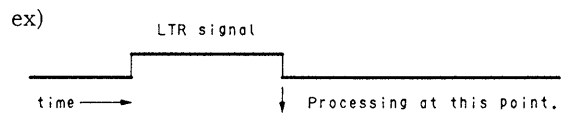


2. Discrimination Between LTR and SEC

	At LISTEN				At FF/REW			
(A) CUE-2	(L)	H	L	H	L	H	(L)	H
(B or C) CUE-1	(L)	L	H	H	L	L	(H)	H
	↓	↓	↓	↓	↓	↓	↓	↓
Judgement by microcomputer	(LTR)	LTR	SEC	no signal	LTR	SEC	(LTR)	no signal

- L(Low) and H(High) levels are input levels to the microcomputor CUE-1 and CUE-2.
- For the modes surrounded by pararenthese, their level combinations do not exit by hardware but they are the LTR modes by software.

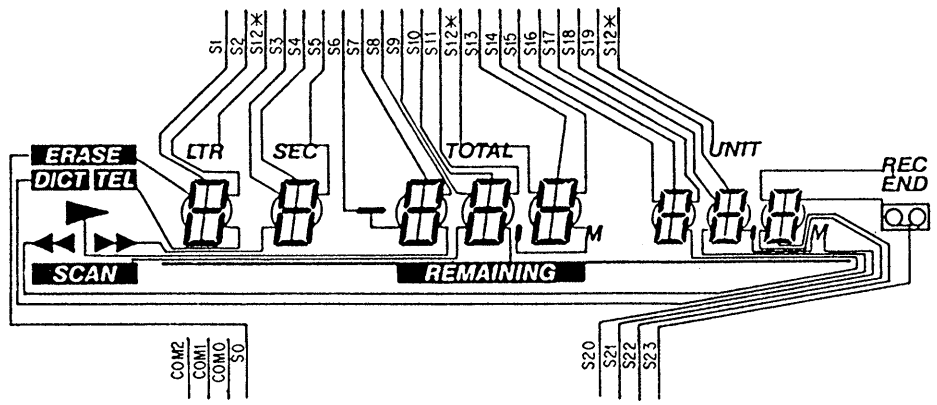
3. After discrimination, LTR/SEC processing will be perfomed when the LTR/SEC signal disappears.



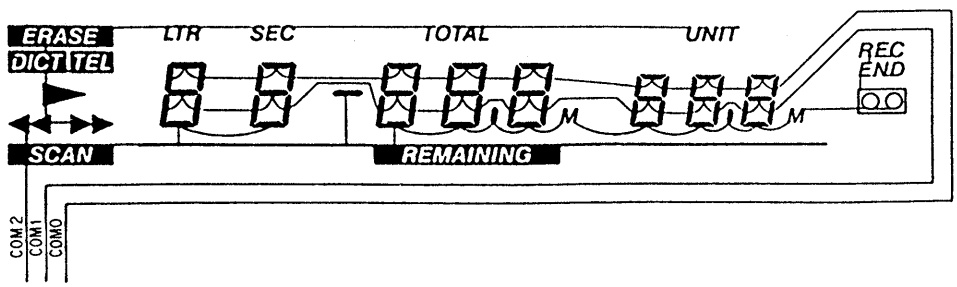
[LCD (ND901) Connection Diagram]

* : The name of S12 is all the same because S12 is shortened on the printed board.

SEGMENT



COMMON



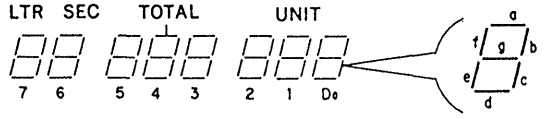
• LCD Check Method

This unit has LCD all lighting mode in order to check LCD.

1. In order to perform LCD all lighting,
   • Without inserting a cassette, press the three buttons of RESET, ERASE, SCAN at the same time.
   LCD is all lighting.
2. In order to release LCD all lighting,
   • Insert a cassette, or turn off the STANDBY ON switch once.

[LCD (ND901) Display Map]

* Segment output (S0 to S23)



IC117 Pin No.	Segment Name	COM 0	COM 1	COM 2
12	S23	Counter D0-b	Counter D0-c	⊂⊃
11	S22	Counter D0-a	Counter D0-g	Counter D0-d
10	S21	Counter D0-f	Counter D0-e	"REC END"
9	S20	Counter D1-b	Counter D1-c	"." (dot) and "M"
8	S19	Counter D1-a	Counter D1-g	Counter D1-d
7	S18	Counter D1-f	Counter D1-e	"DICT"
6	S17	Counter D2-b	Counter D2-c	◀◀ (REW)
5	S16	Counter D2-a	Counter D2-g	Counter D2-d
4	S15	Counter D2-f	Counter D2-e	(not used)
3	S14	Counter D3-b	Counter D3-c	"." (dot) of TOTAL and "M"
2	S13	Counter D3-a	Counter D3-g	Counter D3-d
1	S12	Counter D3-f	Counter D3-e	"TOTAL", "UNIT", "LTR" (short on the LCD block board)
80	S11	Counter D4-b	Counter D4-c	"REMAINING"
79	S10	Counter D4-a	Counter D4-g	Counter D4-d
78	S9	Counter D4-f	Counter D4-e	"SCAN"
77	S8	Counter D5-b	Counter D5-c	▶ (FWD)
76	S7	Counter D5-a	Counter D5-g	Counter D5-d
75	S6	Counter D5-f	Counter D5-e	▬ (minus sign)
74	S5	Counter D6-b	Counter D6-c	"SEC"
73	S4	Counter D6-a	Counter D6-g	Counter D6-d
72	S3	Counter D6-f	Counter D6-e	▶▶ (FF)
71	S2	Counter D7-b	Counter D7-c	"TEL"
70	S1	Counter D7-a	Counter D7-g	Counter D7-d
69	S0	Counter D7-f	Counter D7-e	"ERASE"

• The pin name of the microcomputer (IC117) and the LCD segment name are the same.

[Key-scan • Matrix]

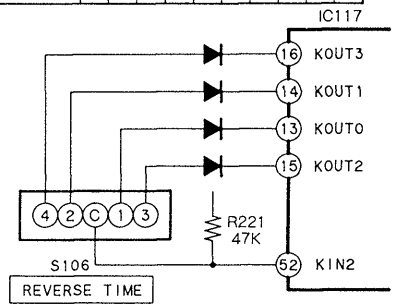
The pin No. and the pin name stand for those of the microcomputer (IC117).

Input \ Output		(Pin No.) 13	14	15	16
		(Pin Name) KOUT 0	KOUT 1	KOUT 2	KOUT 3
(Pin No.)	(Pin Name)				
50	KIN 0	RESET (S110)	ERASE (S109)	TEL REC (S108)	SCAN (S107)
51	KIN 1	FF (S114)	REW (S113)	LISTEN (S112)	STOP (S111)
52	KIN 2	REVERSE TIME			
		(Pin ① of S106)	(Pin ② of S106)	(Pin ③ of S106)	(Pin ④ of S106)
53	KIN 3	EJECT (S603)	not used	AUTO STOP (S104)	TAPE SPEED (S102)

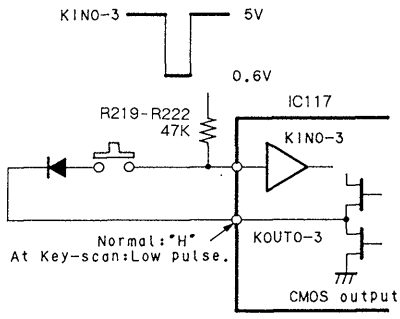
- Hard is controlled by Low active (Low is input with turning on each switch.)
  TAPE SPEED is 2.4cm/s at Low.
  AUTO STOP is turned "ON" at Low.
  Refer to the following figure for the key matrix of S106.

S106 position ○: ON

	0	1	2	3	4	5	6	7	8	9
Between C and 1		○		○		○		○		○
Between C and 2			○	○			○	○		
Between C and 3					○	○	○	○		
Between C and 4									○	○



- Key-scan is controlled by Low active.



This section is extracted from instruction manual.

[Detection of T and S Reel]

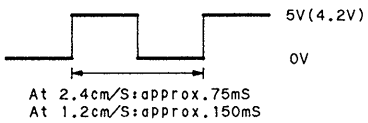
Pin ⑧ of IC119 (Pin ㊸ of IC117) : T reel
Pin ⑩ of IC119 (Pin ㊷ of IC117) : S reel

Waveform condition:

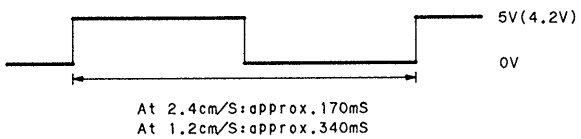
- Tape MC-60 is used.
- The period is different by the tape position.
- ( ): Voltage of IC117 port.

FWD:

T reel at the tape TOP
S reel at the tape END

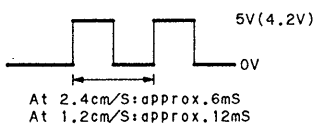


S reel at the tape TOP
T reel at the tape END

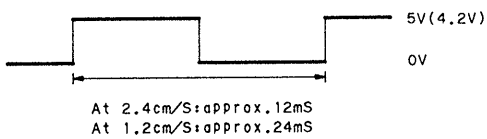


FF/REW:

T reel at the tape TOP
S reel at the tape END



S reel at the tape TOP
T reel at the tape END



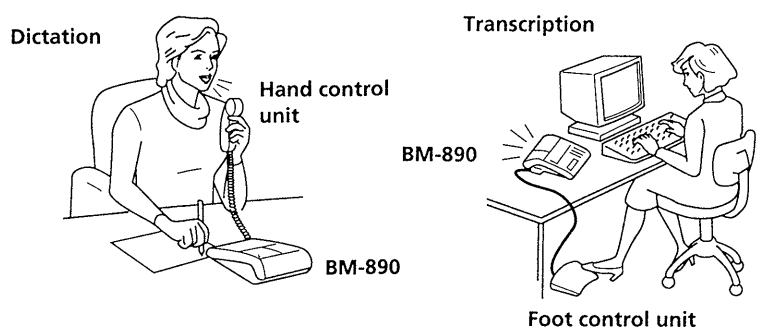
Features

As a dictator

- The hand control unit remotely controls the BM-890.
- Dual electronic indexing function signals—"LTR" (end of letter) and "SEC" (special instructions to secretary) signals—can be recorded on a tape during dictating, recording of telephone calls, listening or in the stop mode.
- The end of the last recorded segment on the tape can easily be located using the record-end function.
- Alarm sound and indication on the display window informs recording error.
- Recording of telephone calls can be performed with the use of the optional TL-4 telephone recording adaptor.
- With the use of the optional DE-45, DE-36 or MDR-U10M earphones, you can monitor the sound with the desired sound level during recording.

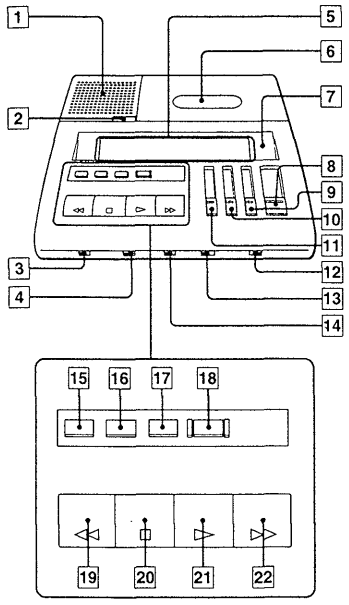
As a transcriber

- The foot control unit allows you to move the tape without using your hands.
- The scanning function allows easy display of the total recorded time of dictation in minutes, the number of documents and instructions recorded on the tape.
- Auto-stop function quickly accesses instructions and documents.
- DPC (Digital Pitch Control) allows you to increase or decrease the playback tape speed within the range of approximately –30% to +80%.
- Auto backspace function with the REVERSE TIME control makes transcribing easy by enabling the reviewing of the last recorded words each time listening is resumed.
- Two tape speeds (2.4 cm/sec. and 1.2 cm/sec.) can be selected according to the user's needs.
- Rapid erasing function with ERASE and REW buttons.
- The Electronic "Index OFF" mode allows you to transcribe a cassette which was not recorded using a Sony Professional Dictating Machine.



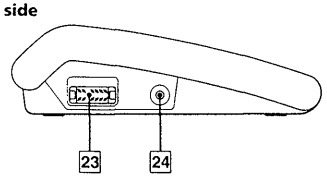
Location and Function of Controls

For details, refer to the pages indicated in ( ).



1 Built-in speaker
2 Eject button
Press to eject the cassette. The digital counter is reset to 00 0.0M0.0M every time the cassette is ejected.
3 POWER switch
4 SPEAKER selector (18)
5 Display window (28)
6 Cassette holder
7 REC (record)/ERASE lamp (8, 20)
8 VOLUME control
9 TONE control
10 REVERSE TIME control (17)
11 SPEED control (16)
12 TAPE SPEED selector (12)
13 SPEED CONTROL selector (16)
OFF/ON/DPC
14 AUTO STOP selector (16)
15 SCAN button (15)
16 TEL REC (telephone recording) button (21)
17 ● ERASE button (20)
18 RESET button (9, 10)
19 ◄◄ REW (rewind)
20 ■ STOP
21 ► LISTEN
22 ►► FF (fast forwad)

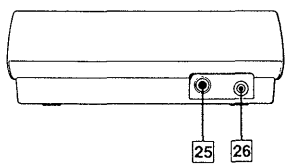
Left side



Left side

23 CONTROL UNIT connector (6)
24 EARPHONE jack (13, 18)

Rear



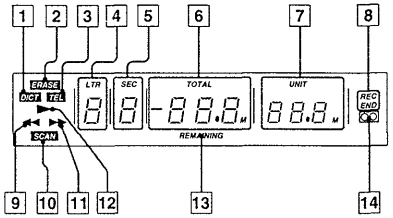
Rear

25 TELEPHONE PICKUP jack (21)
26 DC IN 9 V (6)

Continued on next page.

Location and Function of Controls (continued)

Display Window



1 DICT (dictation) indicator
Displayed during recording
2 ERASE indicator
Displayed while the cassette is being erased.
3 TEL (telephone) recording indicator
Displayed during recording of telephone calls.
4 LTR (letter) counter
End of letter counter
Displays the number of end-of-letter signals (i.e. the number of documents) recorded.
5 SEC (secretary) counter
Special instructions for secretary counter
Displays the number of special-instructions-for-secretary signals recorded.
6 TOTAL (time/tape) counter
Displays time or tape length of the recorded documents. The time counter and the tape counter is switched by pressing the RESET button for more than two seconds.
Time counter indicates the approximate time of the recorded documents.
Tape counter indicates the tape length of the recorded documents.
7 UNIT (time) counter
Displays the time of each recorded document, i.e. displays the approximate recorded time of a dictation, from the portion where the LTR signal is recorded to the portion where the next LTR signal is recorded.
8 REC END indicator
Blinks for approx. three seconds when the recording end portion is detected and disappears.
9 ◄◄ (rewind) indicator
Displayed while the cassette is being rewound.
10 SCAN indicator
Appears when the SCAN button is pressed. While SCAN is displayed, REMAINING is also displayed. In this case, the display window indicates the remaining time of the recorded documents, remaining numbers of recorded LTR and SEC signals and the remaining time of the actual document.
This disappears with a long beep tone when the tape reaches the tape top.
11 ►► (fast forward) indicator
Displayed while the tape is advanced rapidly.
12 ► (listen) indicator
Displayed during playback.
13 REMAINING indicator
Appears when the SCAN button is pressed.
While REMAINING is displayed, recordings of dictation, telephone calls, LTR signals and SEC signals cannot be made. If the function selector is set to DICT or TEL REC, LTR or SEC button is pressed, REMAINING blinks and a beep tone is heard.
The numbers on the digital counter (LTR, SEC, TOTAL and UNIT) indicate the remaining number of the LTR signals and the SEC signals, remaining amount of dictations (TOTAL) and remaining time of the actual document while the unit is in playback, fast forward or rewind mode.
To clear the REMAINING mark, press RESET or the eject button.
14 ⌧ (cassette) indicator
Displayed while cassette is inserted.
The indicator blinks in the following cases:
- The button is pressed when no cassette is inserted or when the cassette's safety tabs have been removed.
- About 3 minutes before reaching the end of the tape. (During dictating or recording of telephone call)
- End of tape or the tape is torn.

Notes

- It may be difficult to read the liquid crystal counter display due to the watching angle.
- If you play back a cassette which was not recorded using a Sony Professional Dictating Machine, set the unit to the Electronic "Index OFF" mode (see page 19).

Operation Flow Chart

For details, refer to the pages in ( ).

[ ] : Necessary step [ ] : Optional step

Dictation (BM-890D)

- Connect the AC power adaptor to the unit and to an AC outlet (6).
- Connect the hand control unit (6).
- Set POWER to ON.
- Insert a cassette (7).
  - If the counter is not reset to zero, press RESET (9).
- Set TAPE SPEED.
- Set the function selector of the hand control unit to DICT.
  Speak into the microphone.
  - Record the SEC signal before giving instructions to the secretary (11).
  - Quick review playback and correct the dictated material.
    Keep the function selector of the hand control unit pressed down toward B. SPACE to rewind the tape until the desired point on the tape is reached. Release the selector and playback of the dictation begins. When the reviewing is completed, set the function selector to DICT to proceed with dictation.
  - Record the LTR signal at the end of each document (11).
  - Check the recorded material with the use of the DPC function (16) when the recording is completed. Then, find the end of the last recorded portion with the use of the record-end function (12).

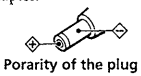
- Set the function selector of the hand control unit to STOP.
- Press the eject button to remove the cassette.
- Hand the cassette to your secretary or transcriptionist.

Transcription (BM-890T)

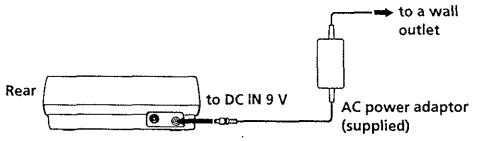
- Disconnect the hand control unit.
- Connect the foot control unit (6).
- Set POWER to ON.
- Insert the cassette (7).
- Set SPEAKER to BUILT-IN (18) or connect earphones.
- Set AUTO STOP to OFF (16).
- Set TAPE SPEED (12).
- Press SCAN.
  When the tape reaches the beginning of the dictated material, a beep tone is heard and the unit automatically shuts off (15).
- Keep the right side of the pedal depressed.
  (When the foot control unit is connected.) (18)
  or
  Set the function selector of the hand control unit to LISTEN.
  (When the hand control unit is connected.) (18)
  or
  Press LISTEN.
  (When the BM-890 is used for operation.) (18)
- Adjust VOLUME and TONE.
  - Adjust the starting point for playback with the use of REVERSE TIME. (When the foot control unit is used.)
    Set SPEED CONTROL to DPC or ON and adjust SPEED.
- After transcribing, stop the tape.
  Release the pedal. (When the foot control unit is used.) (18)
  or
  Set the function selector to STOP. (When the hand control unit is used.) (18)
  or
  Press STOP. (When LISTEN on the BM-890 is pressed to play back the tape.) (18)
- Erase the tape (20).

Power Connection

Note on the AC power adaptor
Use only the AC power adaptor supplied. Do not use any other AC power adaptor.



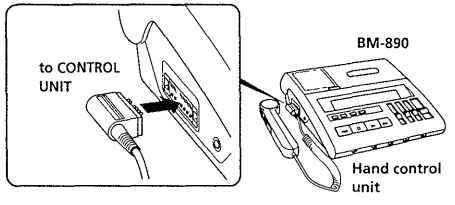
Porarity of the plug



Setting Up the Unit

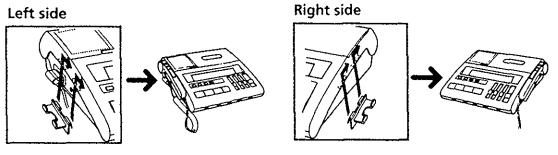
Connecting the Hand Control Unit (supplied with the BM-890D only)

For operation, refer to "Dictation" on page 8.



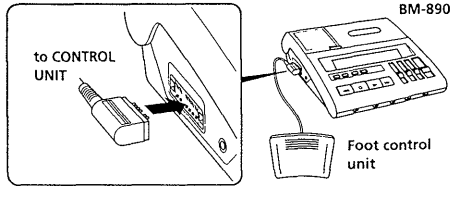
Attaching the cradle

Attach the cradle to the left or right side of the unit. Place the hand control unit on the cradle while not in use. Insert the cradle into the slots and slide to secure it.

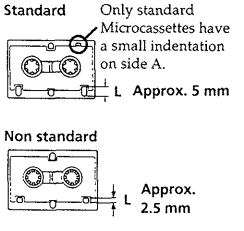


Connecting the Foot Control Unit (supplied with the BM-890T only)

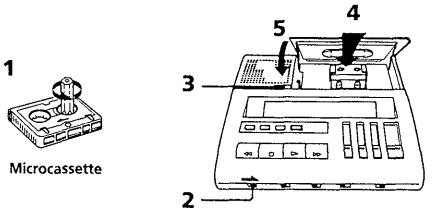
For operation, refer to "Transcription" on page 14.



This unit uses only standard Microcassettes.
Non standard cassettes cannot be used because their "L" dimension (see illustration) is different.



Cassette Insertion



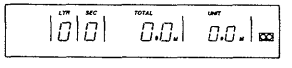
1 Take up any slack in the tape.

2 Set POWER to ON.

3 Press the eject button to open the cassette holder.

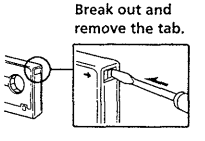
4 Insert a cassette into the cassette holder with the side to be recorded on or played back facing upward.
Push the cassette into the holder completely.

5 Close the cassette holder.
The digital counter displays zero and ⌧ appears.

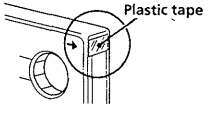


Notes on the Microcassette

To protect cassettes from accidental erasure
When a recording is made, the previous recording is automatically erased.
To prevent erasure, break the cassette tabs.

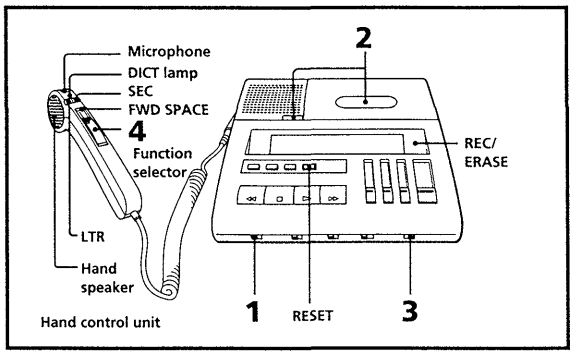


To reuse a cassette
To record on a cassette with removed tabs, cover each slot with a piece of plastic tape.



Dictation

You need the BM-890D or, if your model is BM-890T, the hand control unit.
To use the unit as a dictating machine, connect the hand control unit.
For connection, see page 6.

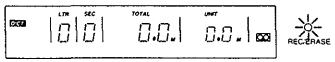


1 **Set POWER to ON.**

2 **Insert a cassette.** (See page 7.)

3 **Set TAPE SPEED to the desired tape speed, 2.4 or 1.2 (cm/sec.).**

4 **Set the function selector to DICT.**
Recording starts. Speak into the microphone. DICT appears on the display window. The DICT lamp on the hand control unit lights up and REC/ERASE lamp on the BM-890 blinks when the microphone picks up sound.



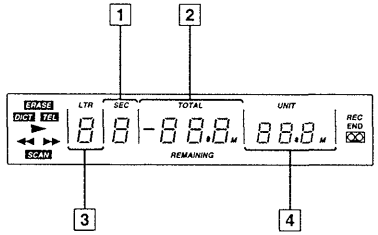
To stop the tape

Set the function selector to STOP.

Note
Keep the hand control unit away from the BM-890 during recording. If not, noise may be recorded.

Notes
- The time counters are normally within plus or minus two minutes of the actual time when using a MC-60BM Microcassette.
- In case a microcassette other than MC-60BM is used, the time counter reading may differ to a large extent from the actual time.
- The tape counter is switched to the time counter when the SCAN button is pressed.
- The numbers on the digital counter are memorized even when the POWER switch is turned off.

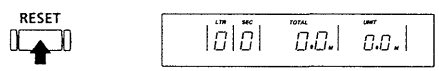
Digital Counter While Dictating



[1] The number of instructions recorded increases by one every time SEC is pressed.
When the SEC button is pressed, the number blinks for about 3 seconds and then stops blinking.
[2] Time counter: Total recorded time of dictation in minutes.
Tape counter: Numerical reference for recording and listening.
To switch the counter to time or tape indication, keep the RESET button pressed for more than two seconds.
[3] The number of documents recorded increases by one every time LTR is pressed.
When the LTR button is pressed, the number blinks for about 3 seconds and then stops blinking.
[4] Recorded time of each document in minutes.

To set the digital counter to zero

We recommend that you press the RESET button before starting dictation. Keep the RESET button pressed for more than 0.5 second to reset the LTR (document), SEC (special instruction), TOTAL (time/tape) and UNIT (time) counters to zero.

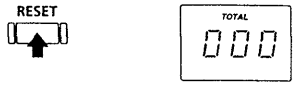


Continued on next page.

Dictation (continued)

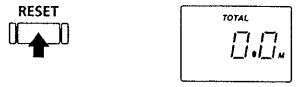
To reset the TOTAL (time/tape) counter to zero tape counter

When the RESET button is pressed for more than 2 seconds in the tape stop mode, the TOTAL (time/tape) counter changes to 000 and functions as a tape counter.



To reset the TOTAL (time/tape) counter to zero time counter

Keep the RESET button pressed for more than 2 seconds in the tape stop mode. The TOTAL (time/tape) counter changes to 0.0M and functions as a time counter



The TOTAL (time/tape) counter and the UNIT time counter indicate the approximate time of the recorded material.

Convenient Functions

To record LTR (letter) and SEC (secretary) signals

You can record electronic index signals on the tape while the unit is set in recording (dictation), telephone recording, stop or playback (with the hand control unit) mode.

LTR (letter=end of document) signal: Record at the end of each document.
SEC (secretary=special instructions to secretary) signal: Record before giving instructions to the secretary.

When the AUTO STOP function (see page 16) is activated (AUTO STOP: ON), the tape automatically stops at each index signal when it is rewound, rapidly advanced or scanned. Documents and instructions can be located without the user's having to listen to the entire tape.

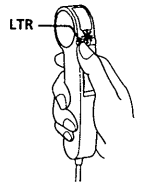
- **Before dictating, press RESET** to reset the counters to zero.

Notes

- The LTR or the SEC signal should be recorded with the intervals of more than 6 seconds.
- Playback sound is muted when either the LTR or SEC button is pressed.
- If either the LTR or SEC button is pressed while turning on the SPEED CONTROL selector, the tape will run at normal tape speed.
- While playing back, if either the LTR or SEC button is pressed to record the index signal on the previously recorded LTR or SEC signal by mistake, a beep tone is heard and the index signal cannot be recorded.

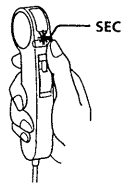
To record the LTR signal

Press LTR on the hand control unit.
Each time the button is pressed, the number on the LTR (document) counter increases by one.



To record the SEC signal

Press SEC on the hand control unit.
Each time the button is pressed, the number on the SEC (special instruction) counter increases by one.



When the LTR or SEC signal is recorded, the number on the counter blinks and then lights up. Up to nine signals each can be recorded on each side of a cassette. If more than nine signals are recorded, "E" appears in the counter display.

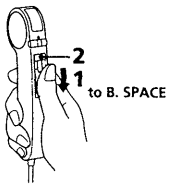
Continued on next page.

Dictation (continued)

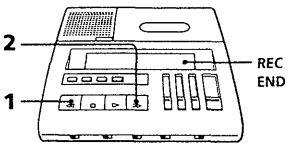
Record-end function

You can easily find the end of the last recorded segment on the tape. This function enables you to continue recording from the point where you left off.

Hand control unit



BM-890



1 Rewind the tape a little.

2 Press ▶▶ FF (FWD SPACE).

The tape will rapidly advance and stop at the end of the last recorded segment. At the end of the last recording, a long beep tone is heard and REC END blinks for approx. 3 seconds on the display window and then, disappears.
If the unit is set in record mode by mistake, immediately stop the recording. The record-end function does not operate if the recorded material is shorter than a second.

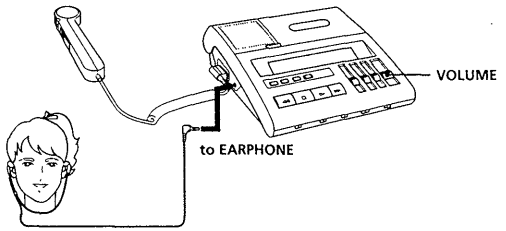
Note
Once the cassette is ejected or the POWER switch is set to STANDBY, the record-end memory is cleared and the record-end function does not operate.

Recording time

Select the desired tape speed for recording with the use of the TAPE SPEED selector.
2.4 cm: For optimum sound (recommended for normal use)
A 60-minute recording can be made using both sides of the MC-60BM Microcassette.
1.2 cm: For longer recording time
A 120-minute recording can be made using both sides of the MC-60BM Microcassette.

Monitoring while dictating

The recording can be monitored through earphones. Connect a Sony DE-45, DE-36 or MDR-U10M earphones (not supplied) to the EARPHONE jack located on the left side of the unit. Adjust VOLUME if required.

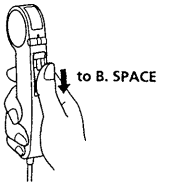


Earphone (supplied with BM-890T only)

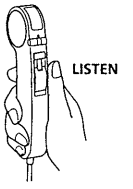
Quick reviewing (playback)/correcting the dictated material

You can easily listen to the dictated material and correct it if required.

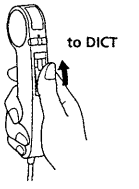
1 Keep the function selector of the hand control unit pressed down toward B. SPACE to rewind the tape.



2 Release the selector. Playback of the dictation begins.

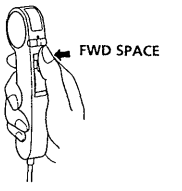


3 When the reviewing is completed, set the function selector to DICT to proceed with the dictation.



For fast winding of the tape

Keep the FWD SPACE button of the hand control unit pressed until the desired portion is reached.



When you have finished dictating

Hand the cassette to your secretary without rewinding the tape.

Tips for More Efficient Dictation

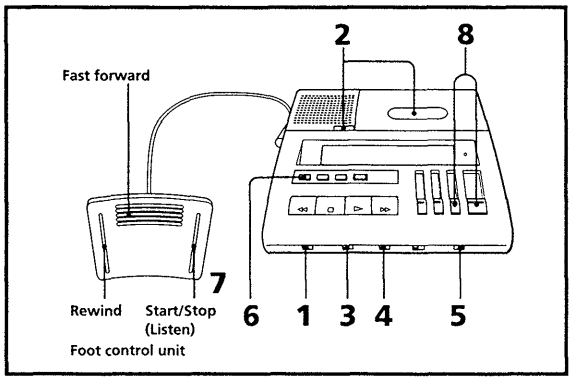
Before you start dictation
- Organize your thoughts.
- Make notes or an outline of what you want to dictate.
- Check that the cassette is erased. (See page 20.)

When you dictate
- Identify yourself. (Name, department, phone number)
- Indicate the type of dictation. (Memo, letter, etc.)
- Give transcribing instructions. (Type of stationery, number of copies and who they are for, envelopes, etc.)
- Specify distribution. (Names, addresses, etc.)

During dictation
- Relax and speak clearly, at normal speed.
- Short sentences are best.
- Include punctuation.
- Spell difficult or unusual words.
- Correct your mistakes. (Review and redictate, or use SEC signal to alert the transcriptionist of changes or corrections.)
- At the end of each document, record an LTR signal.

Transcription

You need the BM-890T or, if your model is BM-890D, the foot control unit.
To use the unit as a transcribing machine, connect the foot control unit.
For connection, see page 6.



Tips on Transcription
- Before typing, check the recorded time of the dictation and the number of LTR and SEC signals recorded on the cassette using the SCAN function.
- Erase the tape when transcription is finished.

Notes
- To stop scanning, press STOP.
- When the AUTO STOP switch is set to ON, the tape automatically stops at each electronic index signal previously recorded on the tape while scanning. This is convenient to locate the beginning of each document or special instruction.
- To restart scanning after it is stopped at the electronic index signal, press the SCAN or REW button.

1 **Set POWER to ON.**

2 **Insert a cassette.** (See page 7.)

3 **Set SPEAKER to BUILT-IN.**

4 **Set AUTO STOP to OFF.** (See page 16.)

5 **Set TAPE SPEED to the same tape speed as that used for recording (dictation).**

6 **To check the recorded material by using the SCAN function, press SCAN for a second.**
SCAN and REMAINING appear on the display and the tape starts to be rewound. When the tape is completely rewound, a beep is heard and the unit automatically shuts off. As to the digital counter, see page 15.

7 **Keep the right side of the foot control unit pedal depressed to listen to the tape.**

8 **Adjust VOLUME and TONE.**

Notes on the time counter
While REMAINING is displayed (in scanning mode or in rewind mode after scanning) and the unit is stopped automatically when the LTR signal is detected, the number on the UNIT counter will be reset to 0.0M after blinking for about 3 seconds to read the amount of the document.

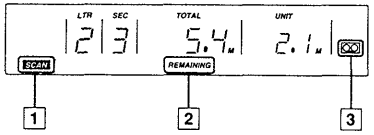
To stop the tape
Release the pedal.

To rewind the tape
Keep the left side of the foot control unit pedal depressed.

To rapidly advance the tape
Keep the center top of the foot control unit pedal depressed.

Digital Counter While Scanning

To use the SCAN function, press the SCAN button for a second. When the tape reaches the beginning of the dictated material, a beep tone is heard and the unit automatically shuts off. When the tape is completely rewound, the total dictated time and the recorded time of the first document are displayed. The numbers of documents and special instructions recorded on the tape are also displayed on the display window.



1 SCAN indicator
Disappears when the unit shuts off.
2 REMAINING indicator
While REMAINING is displayed, the numbers on the display window indicate the amount of tape left. This is convenient to know the remaining amount of dictation when transcribing.
While REMAINING is displayed, dictating, telephone recording and recording of LTR and SEC signals cannot be performed.
Press RESET or the eject button. REMAINING will disappear.
3 (cassette) indicator
When the tape reaches the tape top, this mark blinks while a long beep tone is heard and then lights up.

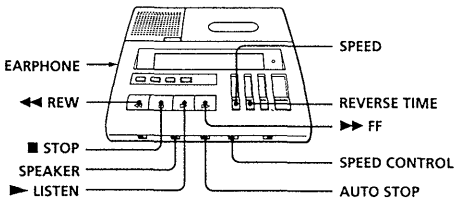
The above example of the counter indicates that the cassette has 2 documents and 3 special instructions. Total recorded time of the dictation is approx. 5.4 minutes and the recorded time of the first document is approx. 2.1 minutes.

Scan-top function
When the tape is advanced rapidly (in fast forward mode after scanning) while REMAINING is displayed, the tape will stop automatically at the portion from which the scanning was started. In this case, a beep tone is heard and the – (minus) mark on the TOTAL counter blinks for about 3 seconds and then stops blinking.

Continued on next page.

Transcription (continued)

Convenient Functions



AUTO STOP function

With the AUTO STOP function, recorded documents and instructions can be located without the user's having to listen to the entire tape.

This function activates only in rewind, fast forward or scanning mode.

When the AUTO STOP switch is set to ON, the tape automatically stops at each electronic index signal previously recorded on the tape. (See "To record LTR and SEC signals" on page 10.)

- **When the LTR signal is detected**, the LTR document counter number increases or decreases and blinks for approximately 3 seconds, and a beep tone is heard. The tape stops automatically.
- **When the SEC signal is detected**, the special instruction counter number increases or decreases and blinks for approximately 3 seconds, and a beep tone is heard. The tape stops automatically.

When the AUTO STOP switch is set to OFF, the numbers on the LTR (document) and SEC (special instruction) counters increase or decrease and blink when an LTR or SEC signal is detected, but the tape does not stop.

Note
The tape does not stop at the LTR or the SEC signal even if the AUTO STOP switch is set to ON while the FF or REW button is continuously depressed.

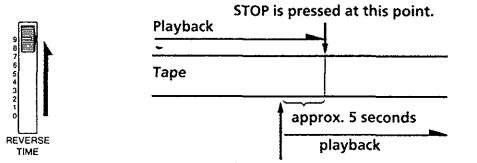
DPC (Digital Pitch Control) and speed control function

You can make the sound more comprehensible when changing the tape speed. Set the SPEED CONTROL selector to DPC so that the pitch does not change, even when the tape is played back at high or low speed by the SPEED control.
Set the SPEED CONTROL selector to ON to adjust the speed only by the SPEED control.
When the SPEED CONTROL selector is set to OFF, the tape moves at the normal speed regardless of the position of the SPEED control.

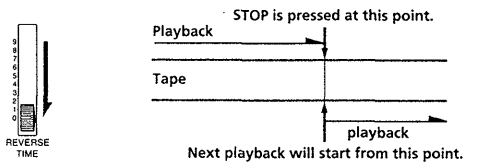
Auto backspace function

This control operates only when the foot control unit is connected.
With the use of the REVERSE TIME control, the tape is rewound a little each time it is stopped. Then, the last few recorded words can be reviewed when you resume listening. Adjust the REVERSE TIME control to determine the length of tape to be rewound.
At "9" position, the tape is rewound so that the dictated material can be reviewed for about 5 seconds. At "0" position, the tape stops without being rewound at all.
Set the REVERSE TIME control to the desired position and keep the right side of the pedal depressed to listen to the tape.

REVERSE TIME : at "9" position



REVERSE TIME : at "0" position



Continued on next page.

Transcription (continued)

Notes

- When the button is pressed while detecting the index signal during playback, the switching time of the operation modes may be delayed.
- When a cassette which was not recorded using a Sony Professional Dictating Machine (BM-531, 560, 570, 820, 880, 890 etc.) is played back or wound rapidly (in fast forward or rewind mode), the switching time of the operation modes may be delayed. In this case, set the unit to the Electronic "Index OFF" mode. (See page 19.)

Notes

- E-INDEX signal of the Sony conventional models BM-531 and so on corresponds to the LTR signal of the model BM-890.
- LTR/SEC signals and E-INDEX signal do not correspond to the cue signals used for consumer type tape recorder.

Tape transport operation

To	BM-890	Hand control unit	Foot control unit
Rewind	Press ◀◀ REW.	Keep the function selector pressed down toward B.SPACE.	Keep the left side of the pedal depressed.
Stop	Press ■ STOP.	Set the function selector to STOP.	Release the pedal.
Listen	Press ► LISTEN.	Set the function selector to LISTEN.	Keep the right side of the pedal depressed.
Fast forward	Press ▶▶ FF.	Keep the FWD SPACE button pressed.	Keep the top center of the pedal depressed.

Private listening

Connect a Sony DE-45, DE-36 or MDR-U10M earphones (not supplied) to the EARPHONE jack.
The sound will be heard through the earphones and speaker sound will be disconnected.

Selecting the speaker

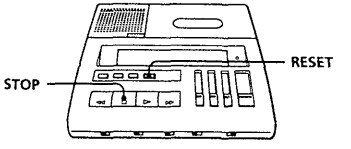
You can listen to the dictated material through the built-in speaker or the speaker on the hand control unit by switching the SPEAKER selector to BUILT-IN or HAND.

Notes

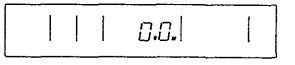
- In the Electronic "Index OFF" mode
  - — the LTR or the SEC signal is not recorded even if you press the LTR or SEC button.
  - — the AUTO STOP function does not work even if the AUTO STOP switch is set to "ON".
- If you play back in the Electronic "Index ON" mode and the cassette was not recorded using a Sony Professional Dictating Machine (BM-531, 560, 570, 820, 880, 890 etc.), neither the operation buttons, the counters nor the auto backspace function will work correctly.

Transcribing a Cassette Recorded with a Dictator Other Than Sony's

If you transcribe a cassette which was not recorded using a Sony Professional Dictating Machine, set the unit to the Electronic "Index OFF" mode.



In the tape stop mode, keep both RESET and STOP pressed for more than 2 seconds.
Only the TOTAL counter is displayed and the number is reset to "0". The unit is in the Electronic "Index OFF" mode.



To return the unit to the Electronic "Index ON" mode

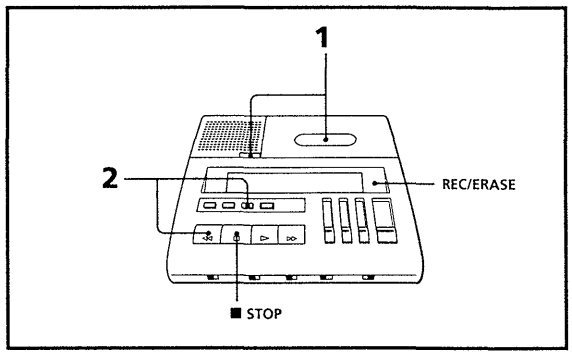
Change the mode by following the procedure above.

To switch the counter to time or tape indication

See page 9.

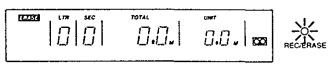
Erasing

The recording can be erased rapidly.



1 **Insert the cassette with the side to be erased up.** (See page 7).
Be sure not to rewind the tape after transcribing. The end portion of the dictated material to be erased should be positioned at the recording head.

2 **Keep ERASE pressed and then press ◀◀ REW.**
The REC/ERASE lamp lights up and ERASE appears on the display window.
The portion of the tape being rewound is erased.



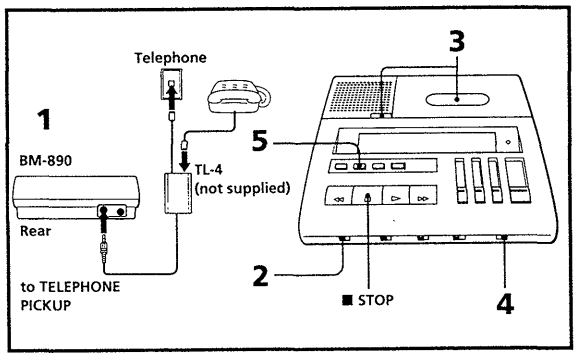
To stop the tape
Press ■ STOP.

Tip
For easier and quicker erasure of the entire cassette, use Sony BE-9H cassette eraser (not supplied).

Telephone Recording

To record telephone conversation, connect the optional TL-4 telephone recording adaptor* to the TELEPHONE PICKUP jack. For further details, refer to the instruction manual of the telephone recording adaptor.

* The TL-4 cannot be used on some telephones.



At the beginning of telephone recording
LTR signal is automatically recorded.
While the LTR signal is being recorded (for about 3 seconds), the unit cannot be stopped even though the STOP button is pressed.

During telephone recording
Only the LTR, SEC and STOP buttons are operative.

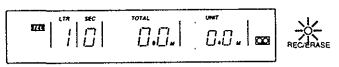
1 **Connect the TL-4 (not supplied) to the unit.**

2 **Set POWER to ON.**

3 **Insert a cassette.** (See page 7.)

4 **Set TAPE SPEED to the desired tape speed.**

5 **Keep TEL REC pressed for more than a second.**
Telephone recording begins. REC/ERASE lamp blinks and TEL appears on the display window.



To stop the tape
Press ■ STOP.

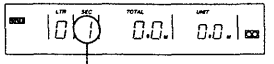
Example of Dictation and Transcription

Example of Dictation

Set the function selector of the hand control unit to DICT.

↓

Press SEC.



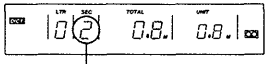
Blinks for approx. 3 seconds and stops blinking.

"This is a letter. Type it up and send it by express."
"Today's date is July 4, 1994.
This letter is for Mr. Alan R. Jefferson
Pyrene House, Sunbury on Thames,
Middlesex, TW16 7AT, U.K.

Dear Sir,
We received your order for"

↓

Press SEC.



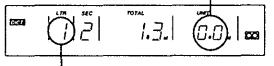
Blinks for approx. 3 seconds and stops blinking.

"under line
POI-L-5049-D3581", "quantity 270,000 today.
Shipment can be made within two weeks by Air.
Please accept our thanks for your order.
Faithfully yours,
John S. Smith
Sales Manager
U.K.G. Ltd."

This number is reset to 0.0 when the LTR button is pressed and increases until the LTR button is pressed again.

↓

Press LTR.



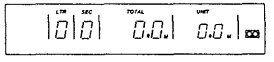
Blinks for approx. 3 seconds and stops blinking.

↓

Set the function selector of the hand control unit to STOP.

Example of Transcription

Insert the cassette.



↓

Set AUTO STOP to OFF.

↓

Press SCAN.

The unit automatically shuts off when the tape reaches the tape top.
The counter indicates the total amount of dictation.

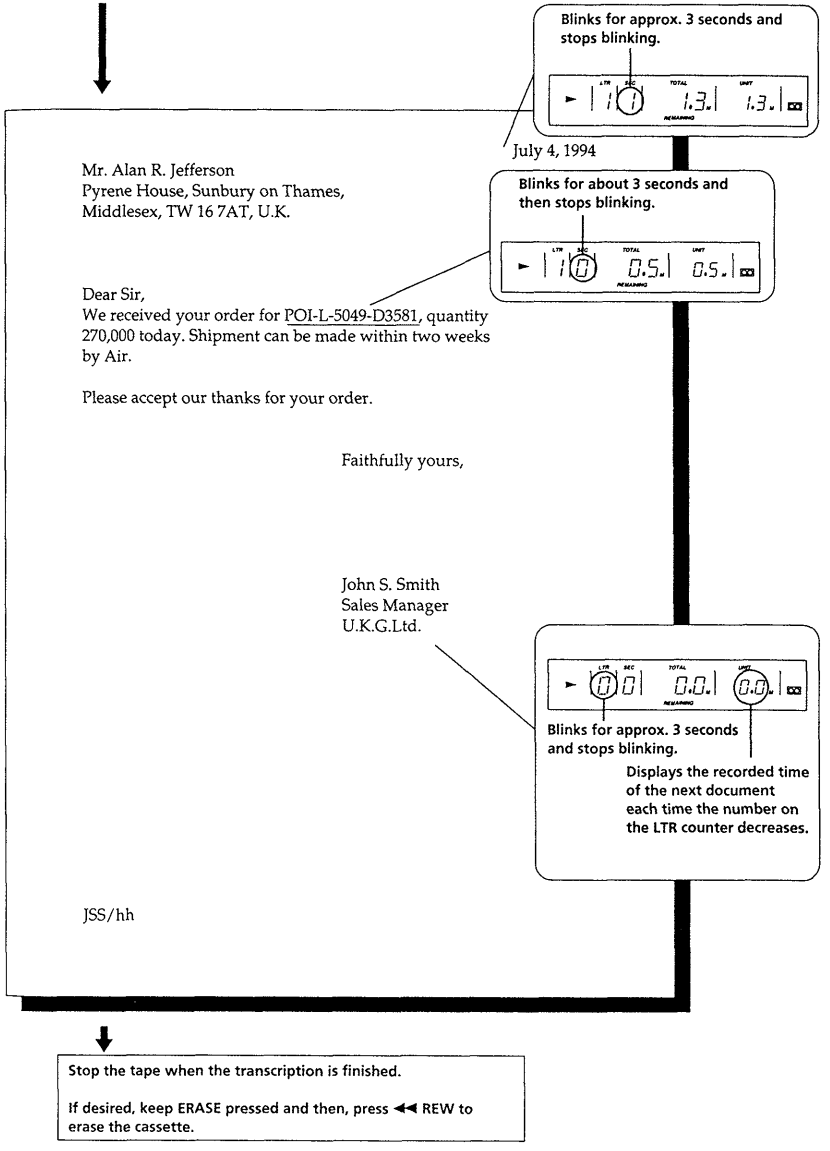
When the tape reaches the beginning, SCAN disappears and the ⊠ blinks for about 3 seconds and then stops blinking.

↓

Keep the right side of the foot control unit pedal depressed.

Tape playback starts.

↓



↓

Stop the tape when the transcription is finished.

If desired, keep ERASE pressed and then, press ◄◄ REW to erase the cassette.

Alarm System

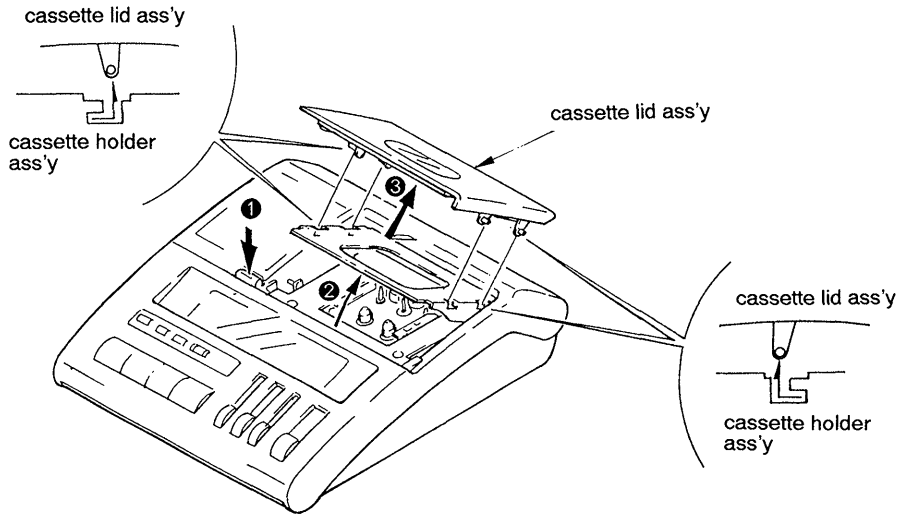
An alarm sounds and an indication appears on the display window in the following situations.

Alarm system	Situation	To release alarm system
When you press a button. → A beep is heard and ⌧ blinks.	• No cassette is inserted. • The cassette's safety tabs have been removed.	First, release the button, then • Insert a cassette. • Insert a new cassette or cover the safety slot.
The unit shuts off. → A beep is heard and ⌧ blinks.	• End of tape • The tape is torn.	• Rewind the tape. • Insert a new cassette.
When you press a button. → A beep is heard and REMAINING blinks.	• When you attempt to record while REMAINING is displayed.	• Clear the REMAINING mark by pressing the RESET or eject button.
While recording. → Beeps are heard and ⌧ blinks until the unit shuts off at the end of tape.	• Approx. 3 minutes before the unit shuts off at the end of tape while recording.	• Press ► LISTEN to stop alarm sound. • Stop recording and insert a new cassette.
The unit shuts off during FF mode. → A beep sounds and REC END blinks.	• End of recording	• The REC END disappears and alarm stops automatically when about 3 seconds have passed.
→ "E" appears.	• The number of LTR or SEC signal exceeds 9.	• Do not press LTR or SEC button more than 9 times.
The unit shuts off during FF mode. → The – (minus) mark on the TOTAL counter blinks. A beep is heard.	• While REMAINING is displayed, the unit is rapidly advanced and automatically stopped at the portion from which the scanning was started.	• The minus mark stops blinking and lights up automatically when about 3 seconds have passed.
The unit shuts off. → A beep is heard and number of LTR or SEC blinks.	• Either LTR or SEC are detected while the tape is wound rapidly (in fast forward, rewind or scanning mode) and the AUTO STOP switch is set to ON.	• The number of LTR or SEC stops blinking and lights up automatically when about 3 seconds have passed.
Either the LTR or SEC buttons are pressed while playing back the tape. → A beep is heard.	• Either the LTR or SEC signals are detected on the tape.	• Release the button. • Play back the tape continuously for more than 6 seconds and then, press the button again.
When you press a button. → A beep is heard.	• When you press the TEL REC button except in the stop or dictating mode. • When you put the hand control unit in the dictating mode during the FF, REW or ERASE mode.	• To stop alarm sound, release the TEL REC button, or put the hand control unit in the stop mode. • To start recording, put the BM-890 in the stop mode first and then start recording.

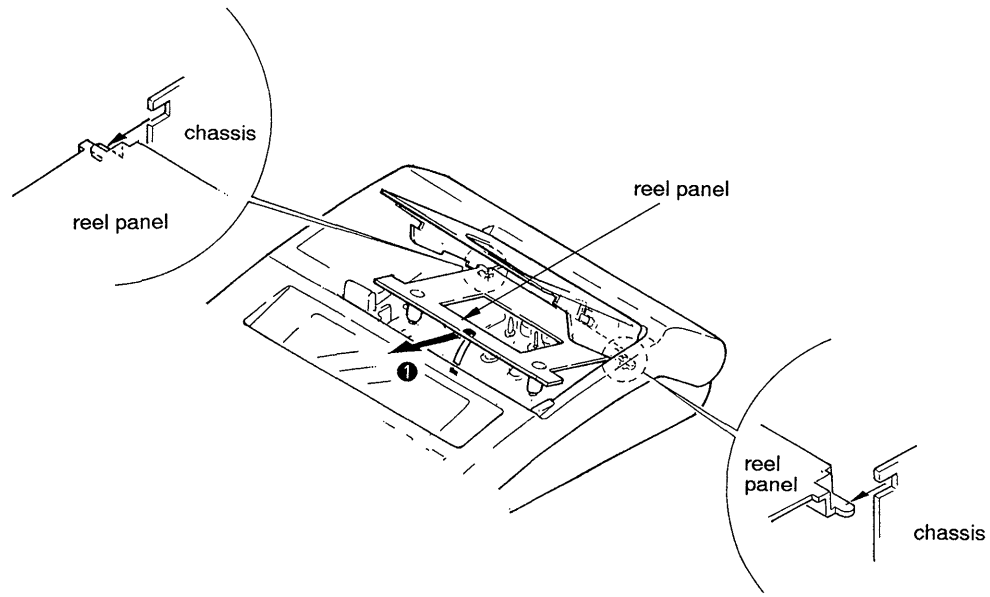
SECTION 3
DISASSEMBLY

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

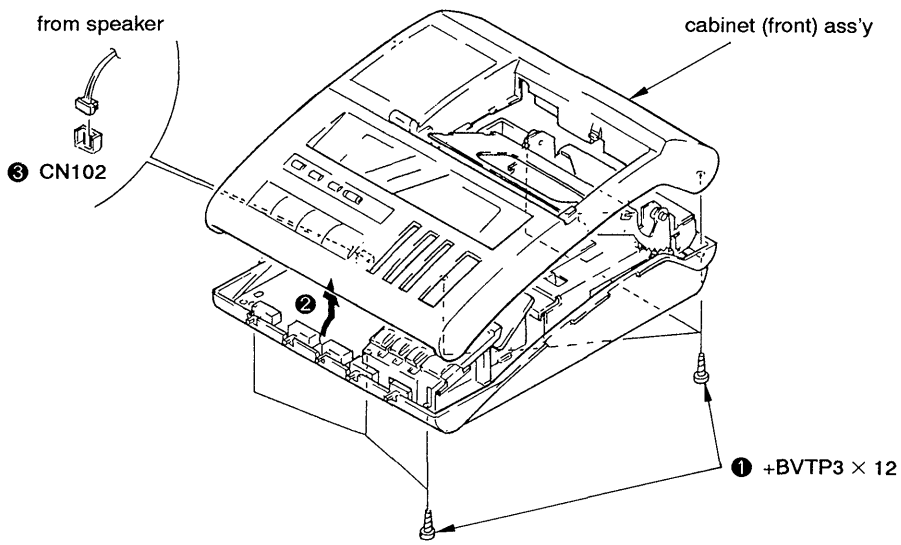
CASSETTE LID ASS'Y



REEL PANEL



CABINET (FRONT) ASS'Y



SECTION 4
MECHANICAL ADJUSTMENTS

PRECAUTION

1. Clean the following parts with a denatured alcohol-moistened swab:
   record/playback head pinch roller
   erase head rubber belts
   capstan
2. Demagnetize the record/playback head with a head demagnetizer. (Do not bring the head demagnetizer close to the erase head.)
3. Do not use a magnetized screwdriver for the adjustment.
4. After the parts adjustments, apply suitable locking compound to the parts adjusted.
5. The adjustments should be perfomed with the rated power supply voltage unless otherwise noted.

Torque Measurement

Mode	Micro cassette type torque meter	Meter reading
Forward	CQ-103M	4 to 15g•cm (0.06 to 0.20oz•inch)
Fast Forward, Rewind	CQ-201M	35 to 90g•cm (0.49 to 1.25 oz•inch)

Tape Tension Measurement

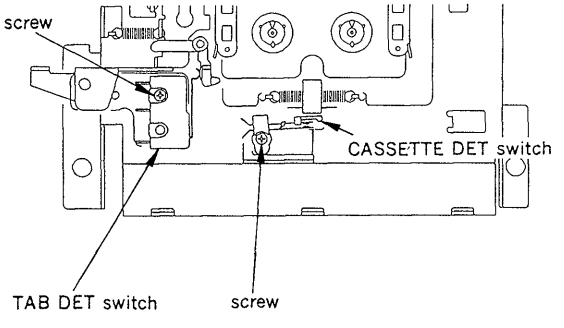
Micro cassette type tension meter	Meter reading
CQ-403M	30 to 60g (1.06 to 2.11oz)

TAB DET Switch Position

Adjust the screw for following position.
When inserting the cassette with the tab ·····ON
When inserting the cassette without the tab ·····OFF

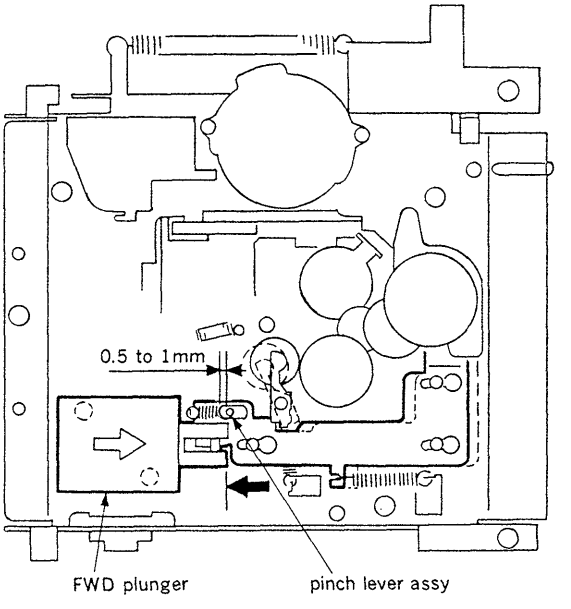
CASSETTE DET Switch Position Adjustment

Adjust the screw so that CASSETTE DET switch goes ON when inserting the cassette.



FWD Plunger Position Adjustment

1. When pulling FWD plunger fully with the hand, adjust the plunger installing screw so that clearance between FWD lever assy and FWD lever is approximately 0.5 to 1 mm.
2. After adjustment, confirm that the pinch roller press against the capstan in FWD mode.



SECTION 5
ELECTRICAL ADJUSTMENTS

PRECAUTION

1. Demagnetize the record/playback head with a head demagnetizer. (Do not bring the head demagnetizer close to the erase head.)
2. Do not use a magnetized screwdriver for the adjustment.
3. After the parts adjustments, apply suitable locking compound to the parts adjusted.
4. The adjustments should be performed with the rated power supply voltage unless otherwise noted.
5. The adjustments should be performed in the order given in this service manual. (As a rule, playback circuit adjustment should be completed before performing recording circuit adjustment.)

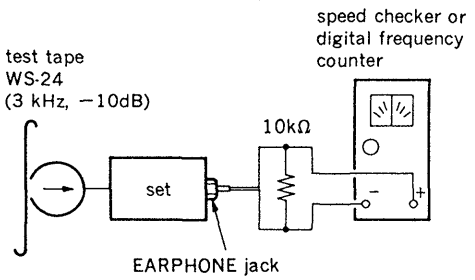
- Switches and controls should be set as follows unless otherwise specified.

STANDBY ON switch : ON
SPEED CONTROL switch : OFF
AUTO STOP switch : OFF
SPEAKER switch : BUILT-IN
TONE control : max. (+)
REVERSE TIME : 0
TAPE SPEED switch : 2.4

Tape Speed Adjustment

Setup:

Mode: playback (LISTEN)



Procedure:

1. SPEED CONTROL switch: OFF
   TAPE SPEED switch: 2.4
   Adjust RV105 for specified reading on speed checker or digital frequency counter.

Adjustment Values:

Speed checker	Digital frequency counter
0 to +1%	3,000 to 3,030 Hz

2. SPEED CONTROL switch: OFF
   TAPE SPEED switch: 1.2
   Adjust RV104 for specified reading on speed checker or digital frequency counter.

Adjustment Values:

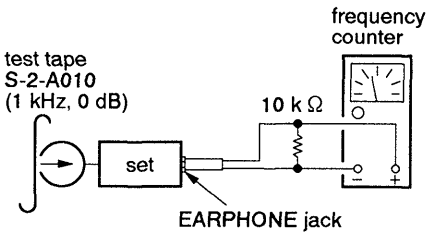
Speed checker	Digital frequency counter
1.3 to 2.3%	1,520 to 1,535 Hz

Tape Speed Variable Range Adjustment

Setup:

TAPE SPEED switch: 2.4
SPEED CONTROL switch (S103): ON
SPEED CONTROL slide volume (RV107): MIN

Mode: playback (LISTEN)



Procedure:

1. Adjust RV106 so that the output goes 700 ± 10 Hz.
2. Adjust RV107 (SPEED CONTROL) and confirm the reading on frequency counter goes as shown below.

RV107 (SPEED CONTROL)	Reading on frequency counter
Maximum	1,800 $^{+200}_{-100}$ Hz

3. Turn TAPE SPEED switch to 1.2 cm/s.
4. Adjust RV107 (SPEED CONTROL) and confirm the reading on frequency counter goes as shown below.

RV107 (SPEED CONTROL)	Reading on frequency counter
Maximum	900 $^{+100}_{-50}$ Hz
Minimum	350 ± 50 Hz

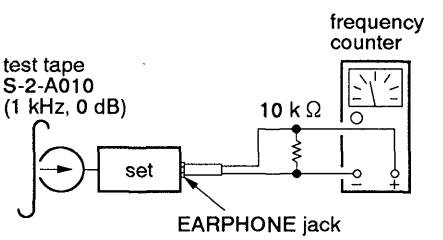
Adjustment Location: Main board

DPC Adjustment

Setup:

TAPE SPEED switch: 2.4
SPEED CONTROL switch (S103): DPC
SPEED CONTROL slide volume (RV107): MIN

Mode: playback (LISTEN)



Procedue:

1. Adjust RV103 so that the output goes 970 Hz.
2. Adjust RV107 (SPEED CONTROL) to maximum and confirm the reading on frequency counter to 1,000 ± 100 Hz.
3. When it is out of order (more than 1,100 Hz), short-circuit R169 and adjust items 1 and 2 again.
4. Turn TAPE SPEED switch to 1.2 cm/s.

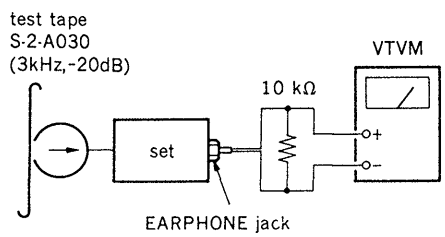
5. Confirm the reading on frequency counter goes 500 ± 50 Hz on both RV107 maximum and RV107 minimum.

Adjustment Location: Main board

Record/playback Head Azimuth Adjustment

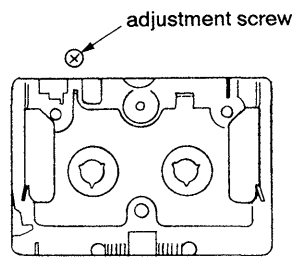
Procedure:

1. Mode: Playback (LISTEN)



2. Turn the adjustment screw to obtain the maximum reading on VTVM.
   Adjustment should be finished with the screw in tightening direction.
3. After the adjustment, lock the adjustment screw with suitable locking compound.

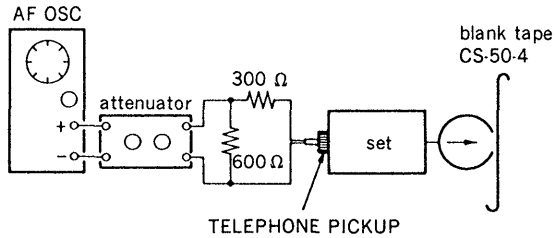
Adjustment Location: record/playback head



Record Bias Adjustment

Procedure:

1. Mode:record



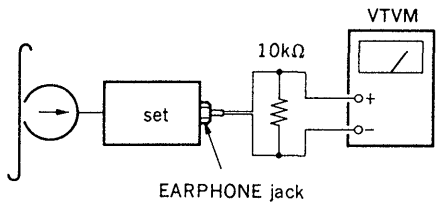
300Hz
3 kHz
5 kHz } 77.5μV (−80dB)

2.4 (cm)

300Hz
3 kHz } 77.5μV (−80dB)

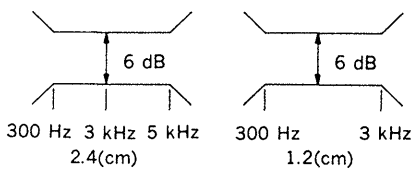
1.2 (cm)

2. Mode:playback(LISTEN)



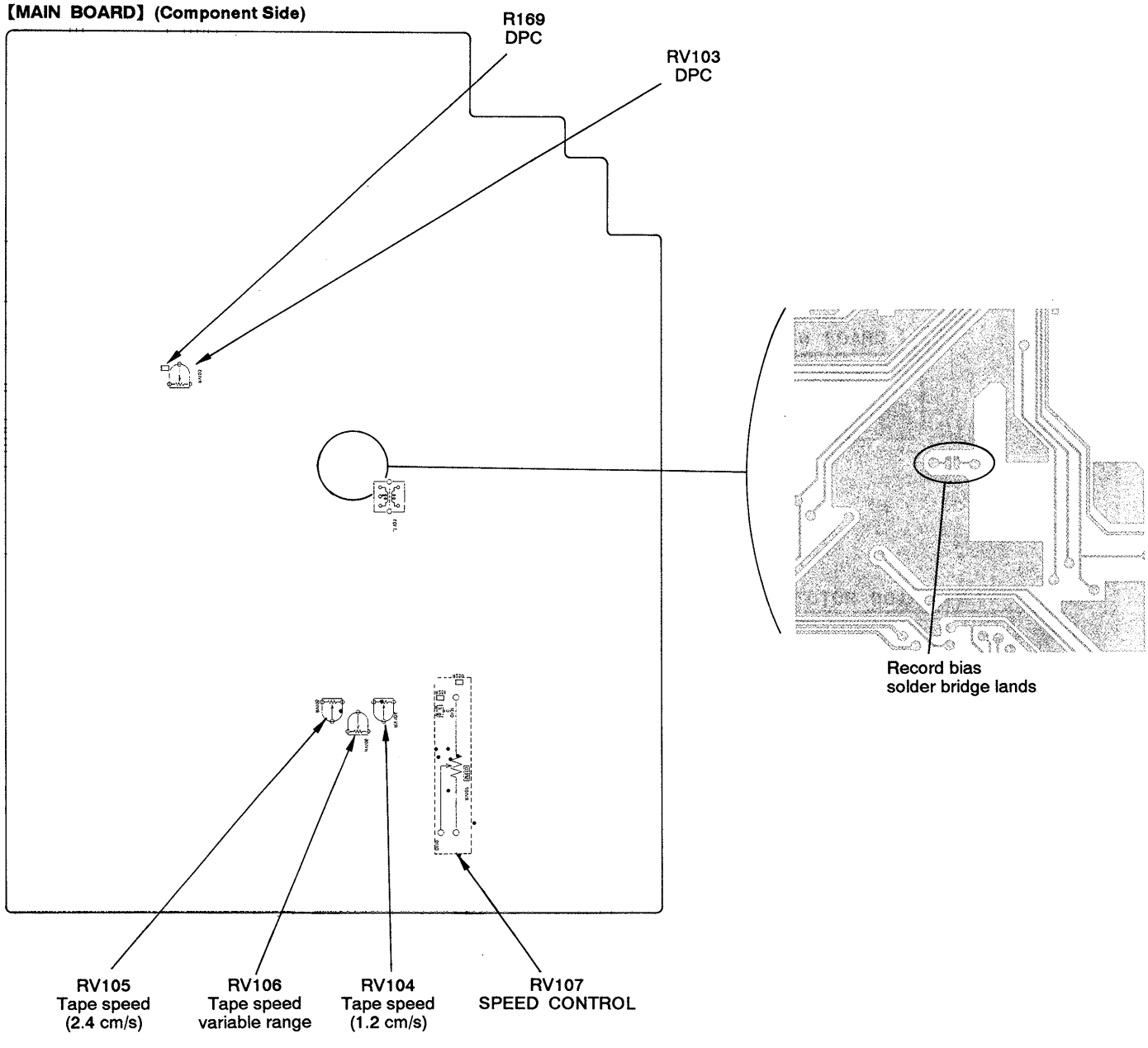
3. Playback the tape recorded in step 1. If the specification is not satisfied, soldering or open for record bias pattern, then repeat step 1 and 2.

Adjustment values:



Adjustment Location: main board

• **Adjustment Location**



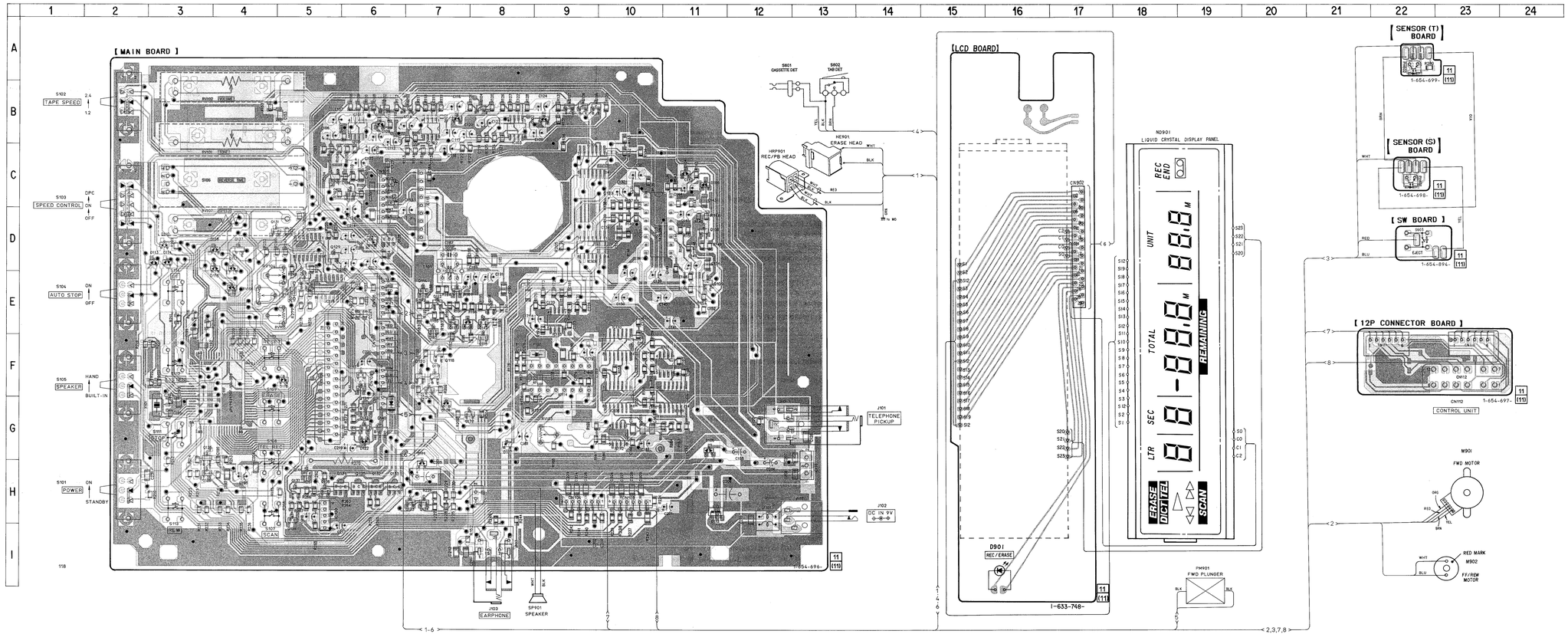
SECTION 6
DIAGRAMS

6-1. PRINTED WIRING BOARDS • See page 34 for Semiconductor Lead Layouts.

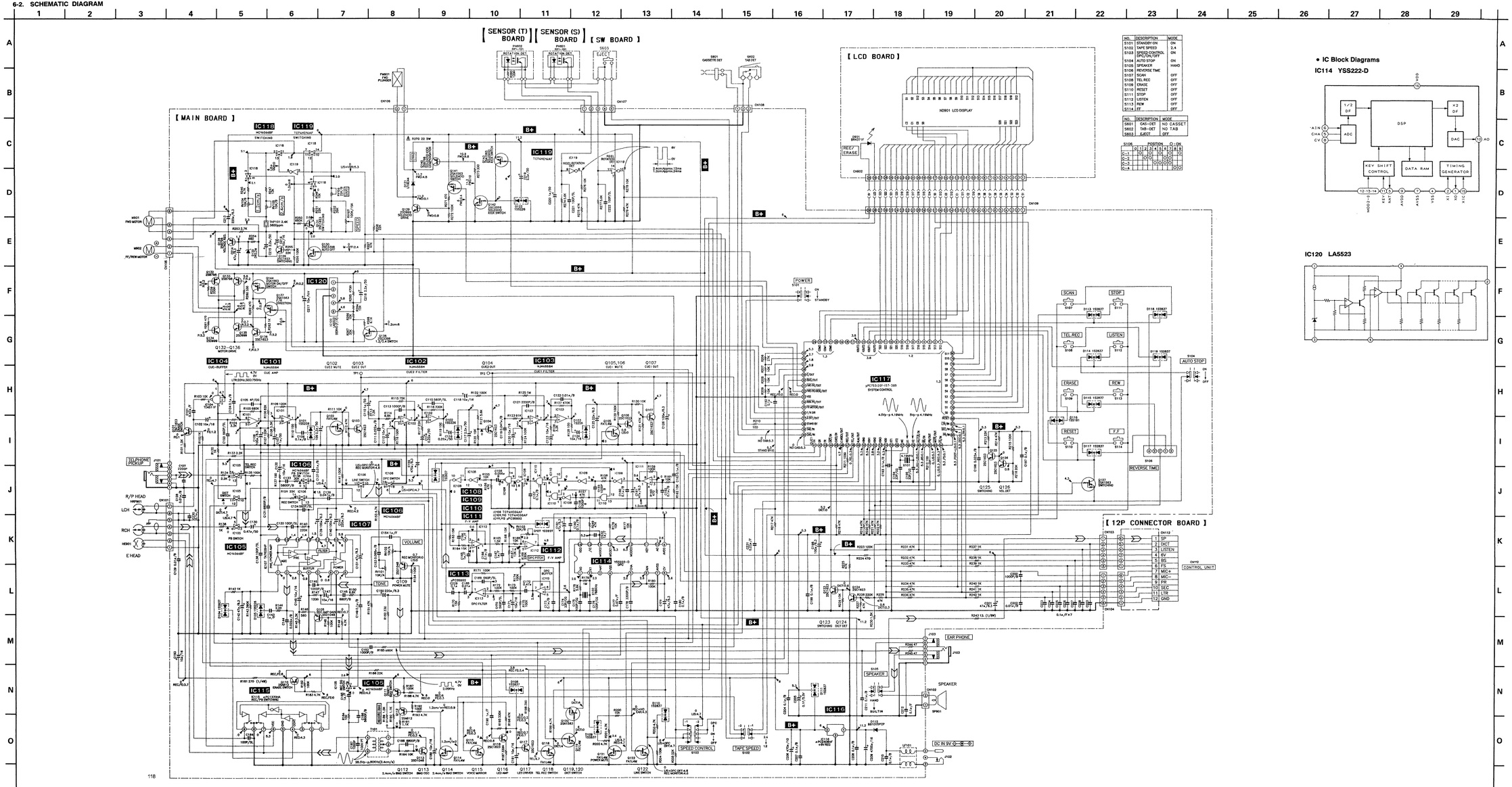
• **Semiconductor Location**

Ref. No.	Location	Ref. No.	Location
D101	B-6	Q101	C-6
D102	B-7	Q102	B-6
D103	B-9	Q103	B-7
D104	C-11	Q104	B-8
D105	C-11	Q105	B-9
D106	G-11	Q106	B-9
D107	G-8	Q107	B-9
D108	E-7	Q108	D-11
D109	G-7	Q109	E-11
D110	D-3	Q110	E-7
D111	H-7	Q111	E-7
D112	H-11	Q112	E-7
D113	D-3	Q113	E-7
D114	D-3	Q114	E-7
D115	D-4	Q115	F-8
D116	F-5	Q116	E-8
D117	D-4	Q117	E-8
D118	D-4	Q118	F-7
D119	F-4	Q119	F-7
D120	D-6	Q120	F-7
D121	G-6	Q121	F-7
D122	G-6	Q122	G-7
D901	I-16	Q123	H-7
		Q124	H-7
IC101	B-6	Q125	G-3
IC102	B-7	Q126	H-3
IC103	B-8	Q127	D-4
IC104	C-5	Q128	D-6
IC105	C-9	Q129	D-5
IC106	D-9	Q130	E-5
IC107	D-10	Q131	D-4
IC108	G-10	Q132	H-6
IC109	G-11	Q133	H-6
IC110	F-10	Q134	H-5
IC111	F-11	Q135	H-6
IC112	G-10	Q136	H-5
IC113	F-9	Q137	H-5
IC114	F-9	Q138	H-5
IC115	C-7	Q139	G-6
IC116	H-13	Q140	G-6
IC117	F-4	Q141	F-6
IC118	D-5	Q142	G-6
IC119	E-5	Q143	F-6
IC120	H-5	Q144	H-5
PH601	C-22		
PH602	A-22		

Note:
- • : Through hole.
- • : Pattern on the side which is seen.
- ◦ : Pattern of the rear side.



6-2. SCHEMATIC DIAGRAM



NO.	DESCRIPTION	MODE
S101	STANDBY ON	ON
S102	TAPE SPEED	2.4
S103	SPEED CONTROL VARI	ON
S104	AUTO STOP	ON
S105	SPEAKER	HAND
S106	REVERSE TIME	
S107	SCAN	OFF
S108	TEL REC	OFF
S109	ERASE	OFF
S110	RESET	OFF
S111	STOP	OFF
S112	LISTEN	OFF
S113	REW	OFF
S114	FF	OFF

NO.	DESCRIPTION	MODE
S601	CAS−DET	NO CASSET
S602	TAB−DET	NO TAB
S603	EJECT	OFF

S106

	POSITION								C: ON
	0	1	2	3	4	5	6	7	8	9
C−1	○	○				○	○			○
C−2			○	○				○	○	
C−3					○	○	○	○	○	
C−4									○	○

• IC Block Diagrams

IC114 YSS222-D

IC120 LA5523

Note:

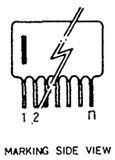
- All capacitors are in μF unless otherwise noted. pF: μμF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and ¼ W or less unless otherwise specified.
- ⚠ : nonflammable resistor.

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

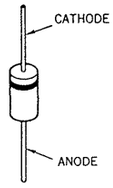
- B+ : B + Line.
- ▭ : adjustment for repair.
- Voltages and waveforms are dc with respect to ground under no-signal conditions.
  no mark : STOP (Cassette: IN, Motor: ON, 2.4 cm/s)
  LIS : LISTEN ▷
  FE : Fast-Erase
  REC : DICT/TEL-REC (no signal)
  1.2 : 1.2 cm/s
  F : FF
  R : REW
  FWD : LISTEN ▷, DICT, TEL, LTR, SEC
  M-OFF : MOTOR OFF
  VARI : SPEED CONTROL ON or DPC
- Voltages are taken with a VOM (10 MΩ/V). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Signal path.
  ▷ : PB
  ◁ : REC

• Semiconductor Lead Layouts

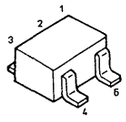
LA5523



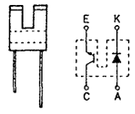
RD2.2M



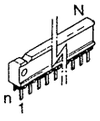
TC4S11F



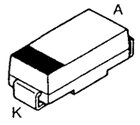
RPI-131



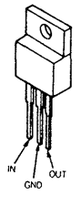
μPC1330HA



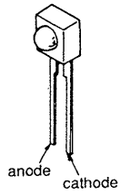
U1GC44



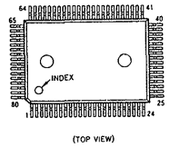
μPC2406HF



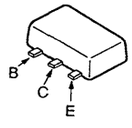
BR4371F



μPD75312GF-157-3B9

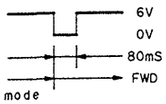
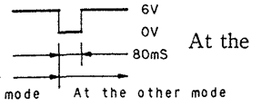


2SB798DL
2SD999-CLCK



6-3. IC PIN FUNCTIONS

[MICROCOMPUTER μPD75312GF-157-3B9 (IC117)]

Pin No.	Pin Name	Usage	Voltage, Remarks
1	S12	LCD segment output	
2	S13	LCD segment output	
3	S14	LCD segment output	
4	S15	LCD segment output	
5	S16	LCD segment output	
6	S17	LCD segment output	
7	S18	LCD segment output	
8	S19	LCD segment output	
9	S20	LCD segment output	
10	S21	LCD segment output	
11	S22	LCD segment output	
12	S23	LCD segment output	
13	KOUT 0	Key scan output	
14	KOUT 1	Key scan output	
15	KOUT 2	Key scan output	
16	KOUT 3	Key scan output	
17	——	Not used	Open
18	——	Not used	Open
19	——	Not used	Open
20	——	Not used	Open
21	COM 0	LCD common output	
22	COM 1	LCD common output	
23	COM 2	LCD common output	
24	——	Not used	Open
25	LCD-BIAS	Output for LCD outer resistance	4.7V
26	V_{LCD0}	Power source for LCD drive	2.4V
27	V_{LCD1}	Power source for LCD drive	1.6V
28	V_{LCD2}	Power source for LCD drive	0.8V
29	ERASE-OUT	Erase control output	At Fast-Erase, DICT and TEL-REC : 0V At the other : 6V
30	BIAS-OUT	Bias control output	At DICT and TEL-REC : 0V At the other : 6V
31	FWD-PG-OUT	FWD plunger output	At FWD : 0.4V At the other : 6V
32	FWD-PG-KICK-OUT	FWD plunger kick output	In an instant of FWD :  At the other : 6V
33	VSS	GND	0V
34	BRK-PG-OUT	Brake plunger output	Finish the FF/REW :  At the other : 6V
35	FR-MOTOR-OUT	FF/REW-motor-output	At FF/REW : 0.2V At the other : 6V
36	FR-DIR-OUT	FF/REW-motor-direction-output	At FF : 0.5V At the other : 6V

Pin No.	Pin Name	Usage	Voltage, Remarks
37	A-OFF-OUT	Motor Auto-off output	Motor Auto-off (no cassette or after three minutes after STOP) : 2.4V At the other : 0V
38	STAND-BY	Standby switch input	ON : 4.7V STAND-BY : 0V
39	TAB-IN	TAB (erase proof) detection switch input	Cassette with TAB : 0V Cassette without TAB : 4.7V
40	CAS-IN	Cassette detection switch input	With a cassette : 0V Without a cassette : 4.7V
41	CUE-1-IN	CUE-1 input	} Refer to page 3 for LTR/SEC Detection.
45	CUE-2-IN	CUE-2 input	
42	SR	S reel signal input	Refer to page 7 for Detection of T and S Reel.
43	TR	T reel signal input	Refer to page 7 for Detection of T and S Reel.
44	DICT-IN	HU-DICT key input	At DICT key input of the hand control unit (HU-80) : 0V At the other : 4.6V
46	E INDEX-OUT	LTR/SEC signal output	At LTR oscillating : 5.1V Output 20Hz for three seconds. At SEC oscillating : 4.7V Output 750Hz for three seconds. At the other : 4.7V
47	REC-OUT	DICT, TEL-REC control output	At DICT, TEL-REC : 4.2V At the other : 0V
48	TEL-OUT	TEL-REC control output	At TEL-REC : 4.7V At the other : 0V
49	ALM-OUT	Alarm output	At alarm oscillating : 4.7V 2.05kHz
50	KIN 0	key scan input	
51	KIN 1	key scan input	
52	KIN 2	key scan input	
53	KIN 3	key scan input	
54	VDD	Positive power source terminal of the microcomputer	4.7V
55	——	Not used	Connect to VSS
56	——	Not used	Open
57	NC	Not used	Connect to VDD
58	X 1	Input for clock oscillation	4.5Vp-p 4.19MHz
59	X 2	Input for clock oscillation	5.0Vp-p 4.19MHz
60	HU-LIS-IN	HU-LISTEN key input	At LISTEN key-in of the hand control unit (HU-80) : 0.1V At the other : 4.7V
61	BS-IN	HU-BS key input	At BS key in of the hand control unit (HU-80) : 0.1V At the other : 4.7V
62	PB-OUT	Playback control output	At LISTEN : 4.7V At the other : 0V
63	MUTE-OUT	Amplifier mute output	At LISTEN, DICT, TEL-REC : 4.7V At the other : 0V
64	FS-IN	HU-FS key input	At FS key input of the hand control unit (HU-80) : 0.1V At the other : 4.7V
65	PR-IN	Foot switch LISTEN key input	At LISTEN key input of the foot control unit (FS-85) : 0.1V At the other : 4.7V
66	SEC-IN	HU-SEC key input	At SEC key input of the hand control unit (HU-80) : 0.1V At the other : 4.7V

Pin No.	Pin Name	Usage	Voltage, Remarks
67	LTR-IN	HU-LTR key input	At LTR key input of the hand control unit (HU-80) : 0.1V At the other : 4.7V
68	RESET	Microcomputer•reset input	Normal : 4.7V
69	S 0	LCD segment output	
70	S 1	LCD segment output	
71	S 2	LCD segment output	
72	S 3	LCD segment output	
73	S 4	LCD segment output	
74	S 5	LCD segment output	
75	S 6	LCD segment output	
76	S 7	LCD segment output	
77	S 8	LCD segment output	
78	S 9	LCD segment output	
79	S 10	LCD segment output	
80	S 11	LCD segment output	

SECTION 7
EXPLODED VIEWS

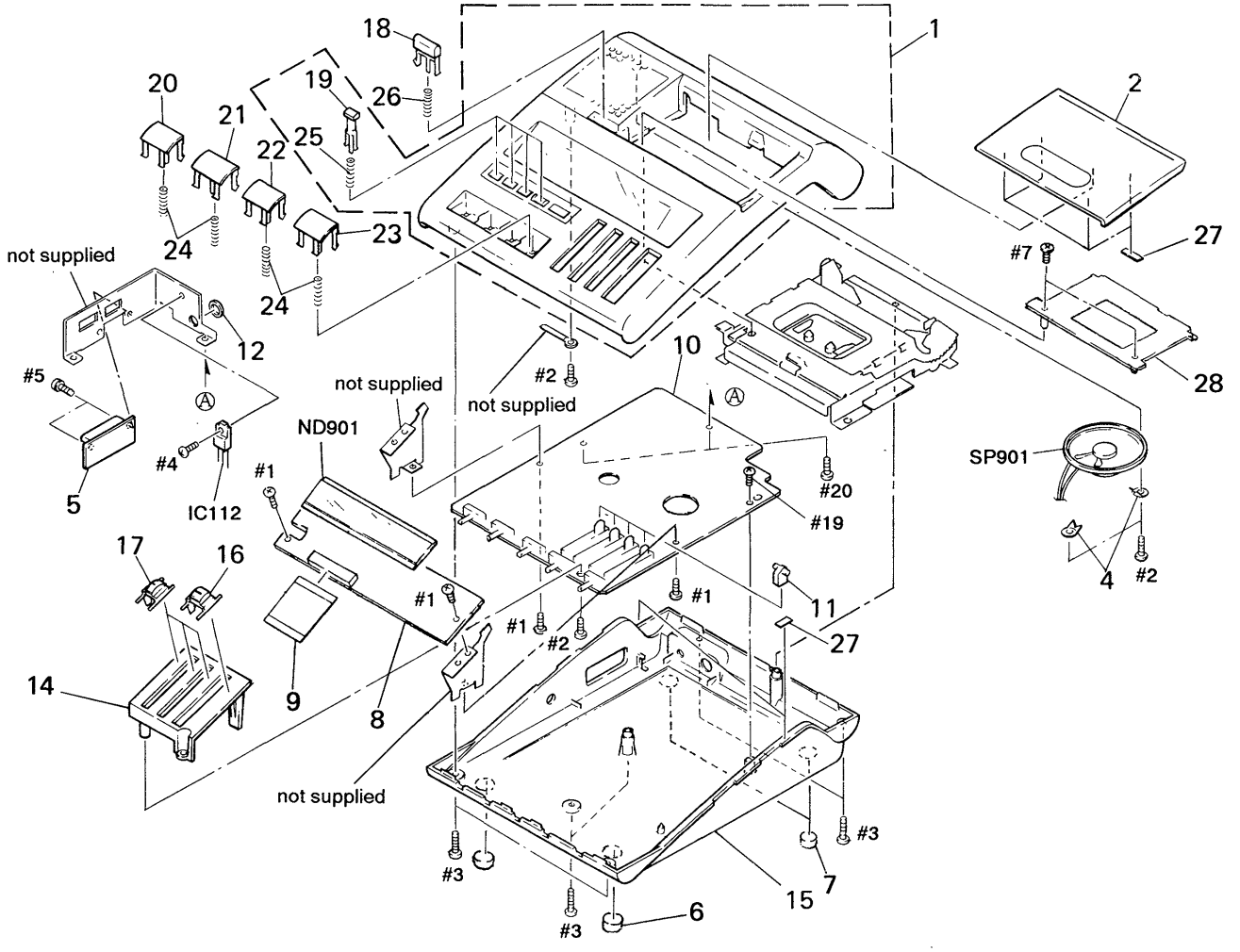
NOTE:

- -XX and -X mean standardized parts, so they may have some difference from the original one.
- Color Indication of Appearance Parts
  Example:
  KNOB, BALANCE (WHITE) . . . (RED)
  ↑ ↑
  Parts Color Cabinet's Color
- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list and accessories and packing materials are given in the last of the electrical parts list.

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

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

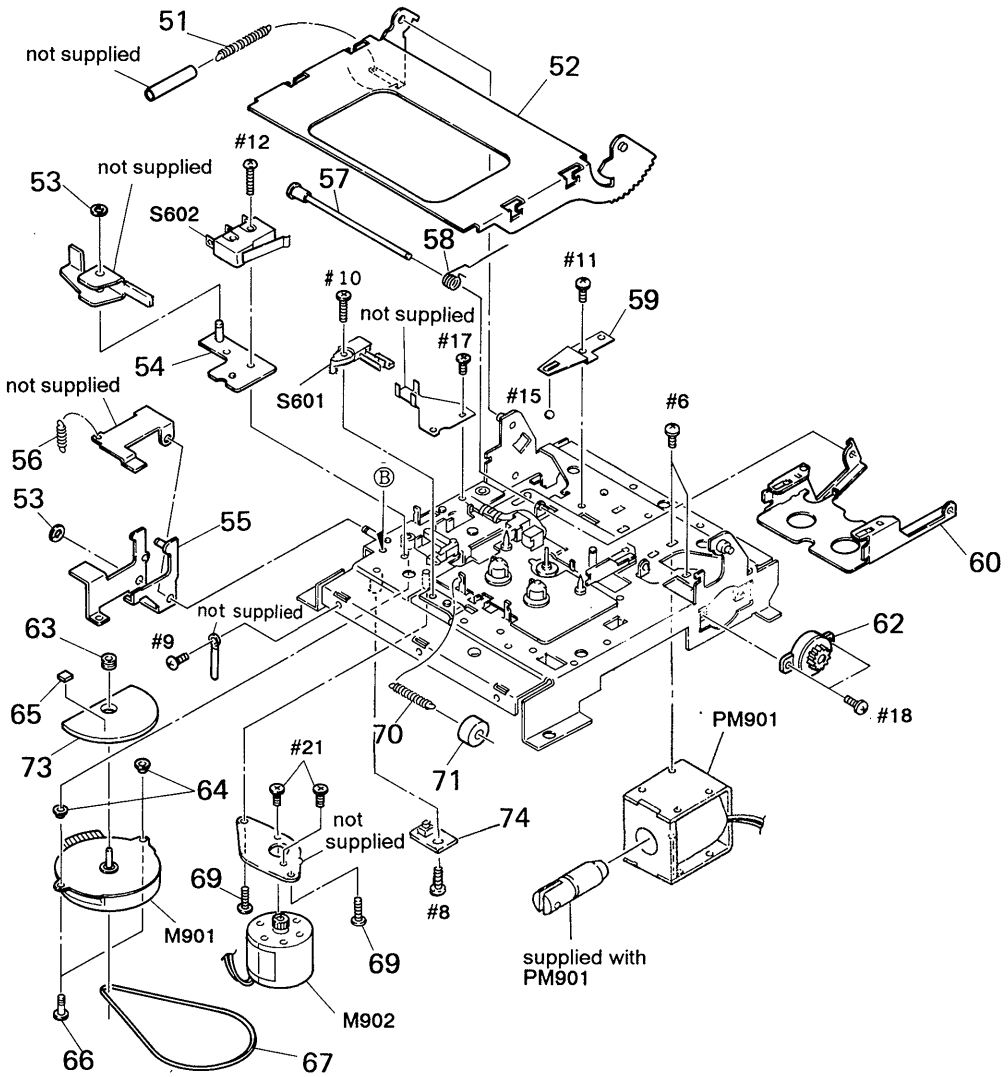
(1) CABINET SECTION



Ref. No.	Part No.	Description	Remark
1	X-3369-949-1	CABINET (FRONT) ASSY	
2	X-3364-490-1	LID (CASSETTE) ASSY	
4	3-845-110-00	RETAINER, SPEAKER	
* 5	1-654-697-11	CONNECTOR (12P) BOARD	
6	3-329-013-01	FOOT, RUBBER	
7	3-343-250-01	CUSHION	
* 8	1-633-748-11	LCD BOARD	
9	1-575-497-11	WIRE, FLAT TYPE (29 CORE)	
* 10	A-3061-108-A	MAIN BOARD, COMPLETE	
* 11	3-323-679-01	BUSHING	
* 12	3-323-680-01	COVER, JACK	
14	3-359-104-01	GUIDE, KNOB	
15	A-3041-767-A	CABINET (REAR) ASSY	
16	X-3323-535-1	KNOB (VOL) ASSY	
17	X-3323-536-1	KNOB (TONE) ASSY	

Ref. No.	Part No.	Description	Remark
18	3-375-313-01	BUTTON (EJECT)	
19	3-323-695-01	BUTTON (RESET/ERASE/TEL REC/SCAN)	
20	3-323-698-01	BUTTON (MD) (REW)	
21	3-323-697-01	BUTTON (STOP)	
22	3-323-698-11	BUTTON (MD) (LISTEN)	
23	3-323-698-21	BUTTON (MD) (FF)	
24	3-323-696-01	SPRING, COMPRESSION	
25	3-323-694-01	SPRING, COMPRESSION	
26	3-323-692-01	SPRING, COMPRESSION	
27	3-831-441-XX	CUSHION	
28	3-375-312-01	PANEL (REEL)	
ND901	1-808-961-21	DISPLAY PANEL, LIQUID CRYSTAL	
IC112	8-759-100-94	IC uPC358G2	
SP901	1-504-172-11	SPEAKER	

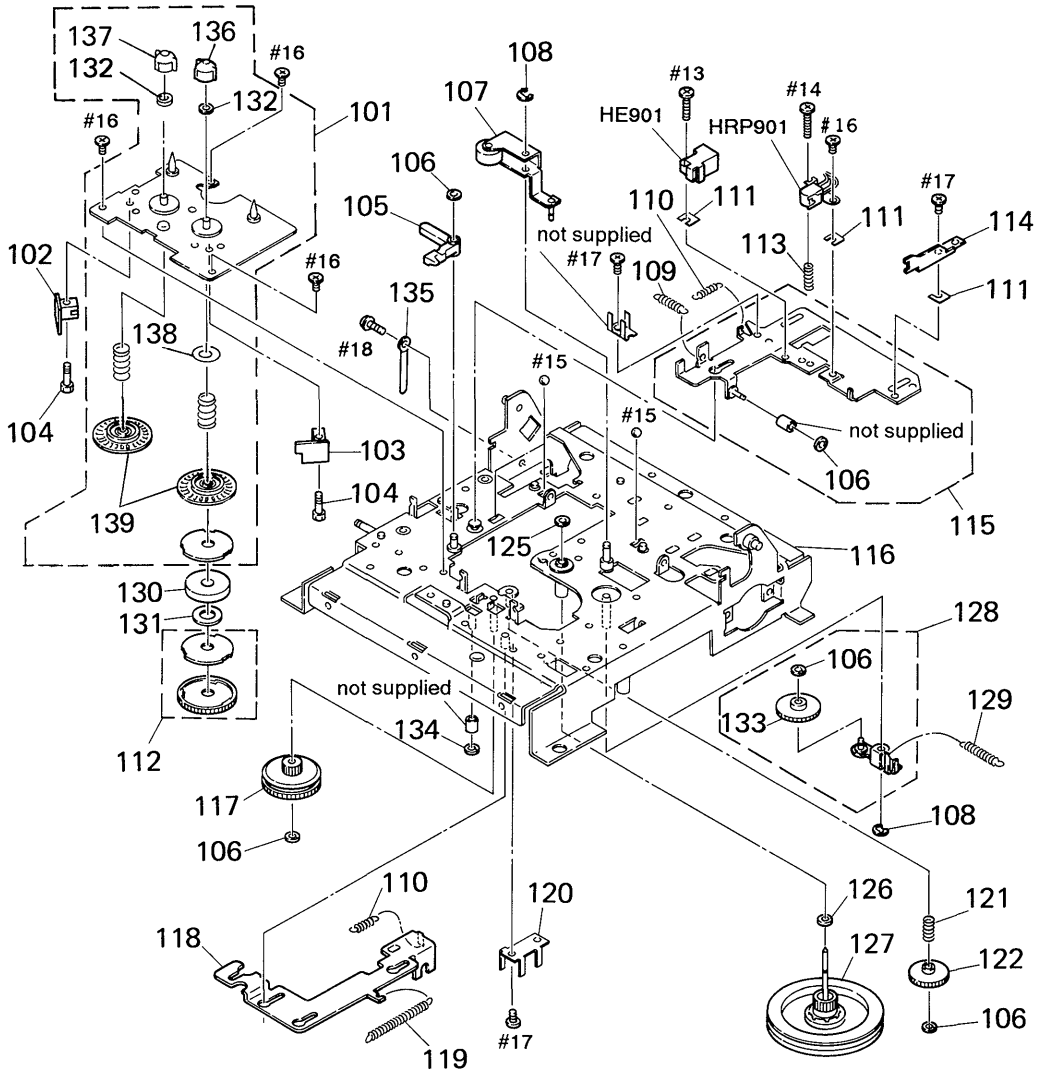
(2) MECHANISM DECK SECTION-1 (MB-890-58)



Ref. No.	Part No.	Description	Remark
51	3-375-321-01	SPRING, TENSION	
* 52	3-375-307-01	ARM (CASSETTE HOLDER)	
53	3-307-948-21	WASHER, NYLON	
* 54	X-3364-493-1	PLATE (EJECT) ASSY	
* 55	X-3364-491-1	LEVER (EJECT) ASSY	
56	3-375-319-01	SPRING, TENSION	
* 57	X-3364-492-1	HOLDER ASSY, SPRING	
58	3-375-320-01	SPRING (HOLDER)	
* 59	3-335-111-01	SPRING	
60	X-3335-109-1	HOLDER COMPLETE ASSY, CASSETTE	
62	3-343-248-01	DAMPER (P), SMALL	
* 63	3-815-122-00	BUSHING, RUBBER	
* 64	3-335-208-01	CUSHION, MOTOR	
65	2-389-320-01	CUSHION, MOTOR	

Ref. No.	Part No.	Description	Remark
66	3-335-207-01	SHAFT, MOTOR	
67	3-375-322-01	BELT	
69	3-714-118-01	SCREW (1.7X4)	
70	3-335-151-01	SPRING, TENSION	
* 71	3-335-116-01	ROLLER, EMP	
* 73	3-375-326-01	PLATE, MOTOR	
74	1-654-894-11	SW BOARD	
M901	1-541-332-11	MOTOR (NBL-32R)	
M902	X-3367-201-1	MOTOR (F/R) ASSY	
PM901	1-454-604-11	SOLENOID, PLUNGER	
S601	1-762-313-11	SWITCH, LEAF (TAB DET)	
S602	1-554-385-00	SWITCH, MICRO (CASSETTE DET)	

(3) MECHANISM DECK SECTION-2
(MB-890-58)



Ref. No.	Part No.	Description	Remark
101	X-3369-950-1	CHASSIS ASSY, SUB	
* 102	1-654-698-11	SENSOR (S) BOARD	
* 103	1-654-699-11	SENSOR (T) BOARD	
104	3-335-104-01	SHAFT, INTERRUPTER	
* 105	3-335-167-01	LEVER, ERASING PROTECTION	
106	3-570-615-00	POLY-WASHER (DIA. 1.2)	
107	X-3335-134-2	LEVER ASSY, PINCH	
108	3-590-768-00	RING (A), E	
109	3-335-146-01	SPRING, TENSION	
110	3-335-150-01	SPRING, TENSION(POWER TENSION)	
111	3-578-138-01	SHIM (T=0.1)	
111	3-578-138-11	SHIM (T=0.2)	
111	3-578-138-21	SHIM (T=0.3)	
112	X-3335-107-1	LIMITER (B) ASSY, FWD	
113	3-375-311-01	SPRING, COMPRESSION	
114	3-375-318-01	GUIDE, TAPE	
* 115	X-3364-486-1	HEAD (BASE) ASSY	
116	X-3369-951-1	CHASSIS ASSY, MECHANICAL	
117	X-3335-135-1	LIMITER ASSY, FR	
* 118	3-335-174-01	LEVER, FWD	
119	3-335-143-01	SPRING, TENSION(POWER TENSION)	
120	3-335-109-01	SPRING	
121	3-335-230-01	SPRING, COMPRESSION	
122	3-335-121-01	GEAR, FR	
125	3-578-242-11	WASHER	
126	3-701-436-11	WASHER, 1.6 POLYETHYLENE	
127	X-3335-112-1	FLYWHEEL ASSY	
* 128	X-3335-106-1	LEVER ASSY, FG	
129	3-335-152-01	SPRING, TENSION(POWER TENSION)	
130	3-335-126-01	PLATE, MAGNET	
131	3-335-123-01	SPACER (M)	
132	3-321-394-01	WASHER	
133	3-568-371-00	GEAR, FR IDLER	
134	3-321-393-01	WASHER, STOPPER	
* 135	2-277-426-01	CLAMP	
136	X-3335-103-2	CLAW ASSY, T REEL	
137	X-3335-104-1	CLAW ASSY, S REEL	
138	3-321-394-21	WASHER	
139	X-3369-952-1	GEAR ASSY, REEL SHAFT	
HE901	1-543-899-11	HEAD, MAGNETIC (ERASE)	
HRP901	1-543-725-11	HEAD (RECORD PLAYBACK)	

SECTION 8
ELECTRICAL PARTS LIST

CONNECTOR (12P) **LCD** **MAIN**

NOTE:
- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms.
  METAL:Metal-film resistor.
  METAL OXIDE: Metal oxide-film resistor.
  F:nonflammable
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u:μ, for example:
  uA..: μA.. uPA..: μPA..
  uPB..: μPB.. uPC..: μPC.. uPD..: μPD..
- CAPACITORS
  uF: μF
- COILS
  uH: μH

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

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

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

Ref.No.	Part No.	Description			Remark
*	1-654-697-11	CONNECTOR (12P) BOARD			
		**********			
		< CONNECTOR >			
* CN112	1-561-533-00	SOCKET, CONNECTOR 12P (CONTROL UNIT)			
**********					
*	1-633-748-11	LCD BOARD			
		*********			
		< CONNECTOR >			
* CN902	1-568-871-11	SOCKET, CONNECTOR 29P			
		< DIODE >			
D901	8-719-984-02	LED BR4371F (REC/ERASE)			
		< DISPLAY PANEL, LIQUID CRYSTAL >			
ND901	1-808-961-21	DISPLAY PANEL, LIQUID CRYSTAL			
**********					
*	A-3061-108-A	MAIN BOARD, COMPLETE			
		**********			
		< CAPACITOR >			
C101	1-162-637-11	CERAMIC CHIP	0.47uF		16V
C102	1-126-157-11	ELECT	10uF	20%	16V
C103	1-163-135-00	CERAMIC CHIP	560PF	5%	50V
C104	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C105	1-163-087-00	CERAMIC CHIP	4PF		50V
C106	1-124-584-00	ELECT	100uF	20%	10V
C107	1-126-160-11	ELECT	1uF	20%	50V
C108	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C109	1-124-257-00	ELECT	2.2uF	20%	50V
C110	1-126-160-11	ELECT	1uF	20%	50V
C111	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C112	1-126-157-11	ELECT	10uF	20%	16V
C113	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C114	1-124-464-11	ELECT	0.22uF	20%	50V
C115	1-163-135-00	CERAMIC CHIP	560PF	5%	50V
C116	1-124-464-11	ELECT	0.22uF	20%	50V
C117	1-124-257-00	ELECT	2.2uF	20%	50V
C118	1-126-157-11	ELECT	10uF	20%	16V
C119	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C120	1-126-157-11	ELECT	10uF	20%	16V
C121	1-164-161-11	CERAMIC CHIP	0.0022uF	10%	100V
C122	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C123	1-126-157-11	ELECT	10uF	20%	16V
C124	1-126-157-11	ELECT	10uF	20%	16V
C125	1-126-153-11	ELECT	22uF	20%	6.3V
C126	1-124-584-00	ELECT	100uF	20%	10V
C127	1-164-161-11	CERAMIC CHIP	0.0022uF	10%	100V
C128	1-163-059-00	CERAMIC CHIP	0.01uF	10%	50V
C129	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C130	1-124-465-00	ELECT	0.47uF	20%	50V
C131	1-163-057-00	CERAMIC CHIP	0.0068uF	10%	50V
C132	1-126-157-11	ELECT	10uF	20%	16V
C133	1-163-018-00	CERAMIC CHIP	0.0056uF	5%	50V
C134	1-163-135-00	CERAMIC CHIP	560PF	5%	50V
C135	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C136	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C137	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C138	1-163-075-00	CERAMIC CHIP	0.047uF		50V
C139	1-124-584-00	ELECT	100uF	20%	10V
C140	1-124-584-00	ELECT	100uF	20%	10V
C141	1-124-635-00	ELECT	220uF	20%	6.3V
C142	1-126-154-11	ELECT	47uF	20%	6.3V
C143	1-162-638-11	CERAMIC CHIP	1uF		16V
C144	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C145	1-126-157-11	ELECT	10uF	20%	16V
C146	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C147	1-126-157-11	ELECT	10uF	20%	16V
C148	1-163-007-11	CERAMIC CHIP	680PF	10%	50V
C149	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C150	1-124-635-00	ELECT	220uF	20%	6.3V
C151	1-126-154-11	ELECT	47uF	20%	6.3V
C152	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C153	1-164-157-11	CERAMIC CHIP	0.068uF	10%	25V
C154	1-162-638-11	CERAMIC CHIP	1uF		16V
C155	1-124-472-11	ELECT	470uF	20%	10V

MAIN

Ref. No.	Part No.	Description			Remark
C156	1-164-343-11	CERAMIC CHIP	0.056uF	10%	25V
C157	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C158	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C159	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C160	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C161	1-126-154-11	ELECT	47uF	20%	6.3V
C162	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C163	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C164	1-162-638-11	CERAMIC CHIP	1uF		16V
C165	1-162-638-11	CERAMIC CHIP	1uF		16V
C166	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C167	1-162-638-11	CERAMIC CHIP	1uF		16V
C168	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C169	1-163-135-00	CERAMIC CHIP	560PF	5%	50V
C170	1-163-135-00	CERAMIC CHIP	560PF	5%	50V
C171	1-126-157-11	ELECT	10uF	20%	16V
C172	1-162-637-11	CERAMIC CHIP	0.47uF		16V
C173	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C174	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C175	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C176	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C177	1-162-637-11	CERAMIC CHIP	0.47uF		16V
C178	1-164-182-11	CERAMIC CHIP	0.0033uF	10%	50V
C179	1-126-154-11	ELECT	47uF	20%	6.3V
C180	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C181	1-126-154-11	ELECT	47uF	20%	6.3V
C182	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C183	1-126-157-11	ELECT	10uF	20%	16V
C184	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C185	1-162-638-11	CERAMIC CHIP	1uF		16V
C186	1-163-018-00	CERAMIC CHIP	0.0056uF	5%	50V
C187	1-106-343-00	MYLAR	1000PF	5%	200V
C188	1-163-019-00	CERAMIC CHIP	0.0068uF	10%	50V
C189	1-126-157-11	ELECT	10uF	20%	16V
C190	1-162-638-11	CERAMIC CHIP	1uF		16V
C191	1-126-157-11	ELECT	10uF	20%	16V
C192	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C193	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C194	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C195	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C196	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C197	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C198	1-124-584-00	ELECT	100uF	20%	10V
C199	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C200	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C201	1-126-154-11	ELECT	47uF	20%	6.3V
C202	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C203	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C204	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C205	1-125-710-11	CAP, DOUBLE LAYER			0.10F
C206	1-124-472-11	ELECT	470uF	20%	10V
C207	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C208	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C209	1-124-898-11	ELECT	4700uF	20%	16V
C210	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C211	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C212	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C213	1-124-635-00	ELECT	220uF	20%	6.3V
C214	1-126-154-11	ELECT	47uF	20%	6.3V
C215	1-124-257-00	ELECT	2.2uF	20%	50V
C216	1-126-157-11	ELECT	10uF	20%	16V
C217	1-126-157-11	ELECT	10uF	20%	16V
C218	1-124-257-00	ELECT	2.2uF	20%	50V
C219	1-124-257-00	ELECT	2.2uF	20%	50V
C220	1-126-160-11	ELECT	1uF	20%	50V
C221	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C222	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C223	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C224	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C225	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C226	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C227	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C228	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C229	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C230	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C231	1-163-081-00	CERAMIC CHIP	0.22uF		25V
C232	1-162-638-11	CERAMIC CHIP	1uF		16V

< CONNECTOR >

Ref. No.	Part No.	Description
CN101	1-506-472-11	PIN, CONNECTOR 7P
* CN102	1-564-001-11	PIN, CONNECTOR 2P
* CN103	1-564-005-11	PIN, CONNECTOR 6P
* CN104	1-564-005-11	PIN, CONNECTOR 6P
* CN105	1-564-005-11	PIN, CONNECTOR 6P
CN106	1-506-467-11	PIN, CONNECTOR 2P
* CN107	1-564-004-11	PIN, CONNECTOR 5P
CN108	1-564-002-11	PIN, CONNECTOR 3P
* CN109	1-568-844-11	SOCKET, CONNECTOR 29P

< DIODE >

Ref. No.	Part No.	Description	
D101	8-719-914-42	DIODE	DA204K-T-146
D102	8-719-914-42	DIODE	DA204K-T-146
D103	8-719-914-42	DIODE	DA204K-T-146
D104	8-719-914-43	DIODE	DAN202K-T-146
D105	8-719-914-42	DIODE	DA204K-T-146
D106	8-719-914-43	DIODE	DAN202K-T-146
D107	8-719-914-43	DIODE	DAN202K-T-146

Ref. No.	Part No.	Description	Remark
D108	8-719-914-43	DIODE DAN202K-T-146	
D109	8-719-914-43	DIODE DAN202K-T-146	
D110	8-719-914-43	DIODE DAN202K-T-146	
D111	8-719-914-43	DIODE DAN202K-T-146	
D112	8-719-938-78	DIODE SB10-05PCP	
D113	8-719-914-43	DIODE DAN202K-T-146	
D114	8-719-914-43	DIODE DAN202K-T-146	
D115	8-719-914-43	DIODE DAN202K-T-146	
D116	8-719-820-05	DIODE 1SS181	
D117	8-719-914-43	DIODE DAN202K-T-146	
D118	8-719-914-43	DIODE DAN202K-T-146	
D119	8-719-914-43	DIODE DAN202K-T-146	
D120	8-719-045-99	DIODE RD2.2M-T1B	
D121	8-719-019-00	DIODE U1GC44-TE12R	
D122	8-719-914-42	DIODE DA204K-T-146	
		< IC >	
IC101	8-759-100-96	IC uPC4558G2	
IC102	8-759-100-96	IC uPC4558G2	
IC103	8-759-100-96	IC uPC4558G2	
IC104	8-759-209-69	IC TC4S11F	
IC105	8-759-008-67	IC MC14066BF	
IC106	8-759-008-67	IC MC14066BF	
IC107	8-759-230-04	IC TA7628HP	
IC108	8-759-925-74	IC SN74HC04ANS	
IC109	8-759-032-01	IC MC74HC00AF	
IC110	8-759-032-01	IC MC74HC00AF	
IC111	8-759-100-94	IC uPC358G2	
IC112	8-759-100-94	IC uPC358G2	
IC113	8-759-100-94	IC uPC358G2	
IC114	8-759-291-97	IC YSS222-D	
IC115	8-759-143-54	IC uPC1330HA	
IC116	8-759-148-79	IC uPC2406HF	
IC117	8-759-071-27	IC uPD75312GF-157-3B9	
IC118	8-759-008-67	IC MC14066BF	
IC119	8-759-232-16	IC TC74HC14AF-TP1	
IC120	8-759-801-12	IC LA5523	
		< JACK >	
J101	1-566-891-21	JACK (TELEPHONE PICKUP)	
J102	1-568-727-31	JACK, DC (DC IN 9V)	
J103	1-566-891-21	JACK (EARPHONE)	
		< LINE FILTER >	
LF101	1-424-361-11	FILTER, LINE	

Ref. No.	Part No.	Description	Remark
		< TRANSISTOR >	
Q101	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q102	8-729-112-97	TRANSISTOR FA1L4M-L31	
Q103	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q104	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q105	8-729-112-97	TRANSISTOR FA1L4M-L31	
Q106	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q107	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q108	8-729-800-37	TRANSISTOR 2SD1048-X7	
Q109	8-729-800-37	TRANSISTOR 2SD1048-X7	
Q110	8-729-216-22	TRANSISTOR 2SA1162-G	
Q111	8-729-216-22	TRANSISTOR 2SA1162-G	
Q112	8-729-216-22	TRANSISTOR 2SA1162-G	
Q113	8-729-800-37	TRANSISTOR 2SD1048-X7	
Q114	8-729-112-97	TRANSISTOR FA1L4M-L31	
Q115	8-729-112-97	TRANSISTOR FA1L4M-L31	
Q116	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q117	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q118	8-729-112-97	TRANSISTOR FA1L4M-L31	
Q119	8-729-112-97	TRANSISTOR FA1L4M-L31	
Q120	8-729-805-91	TRANSISTOR 2SA1563	
Q121	8-729-112-97	TRANSISTOR FA1L4M-L31	
Q122	8-729-112-97	TRANSISTOR FA1L4M-L31	
Q123	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q124	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q125	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q126	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q127	8-729-805-91	TRANSISTOR 2SA1563	
Q128	8-729-101-07	TRANSISTOR 2SB798-DL	
Q129	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q130	8-729-805-41	TRANSISTOR 2SC3398	
Q131	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q132	8-729-101-07	TRANSISTOR 2SB798-DL	
Q133	8-729-101-07	TRANSISTOR 2SB798-DL	
Q134	8-729-140-75	TRANSISTOR 2SD999-CLCK	
Q135	8-729-140-75	TRANSISTOR 2SD999-CLCK	
Q136	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q137	8-729-805-91	TRANSISTOR 2SA1563	
Q138	8-729-805-41	TRANSISTOR 2SC3398	
Q139	8-729-140-75	TRANSISTOR 2SD999-CLCK	
Q140	8-729-101-07	TRANSISTOR 2SB798-DL	
Q141	8-729-805-91	TRANSISTOR 2SA1563	
Q142	8-729-805-41	TRANSISTOR 2SC3398	
Q143	8-729-805-91	TRANSISTOR 2SA1563	
Q144	8-729-805-91	TRANSISTOR 2SA1563	

MAIN

Ref. No.	Part No.	Description			Remark
		< RESISTOR >			
R101	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R102	1-216-049-00	METAL CHIP	1K	5%	1/10W
R103	1-216-073-00	METAL CHIP	10K	5%	1/10W
R104	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R105	1-216-117-00	METAL CHIP	680K	5%	1/10W
R106	1-216-095-00	METAL CHIP	82K	5%	1/10W
R107	1-216-099-00	METAL CHIP	120K	5%	1/10W
R108	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R109	1-216-099-00	METAL CHIP	120K	5%	1/10W
R110	1-216-025-00	METAL CHIP	100	5%	1/10W
R111	1-216-073-00	METAL CHIP	10K	5%	1/10W
R112	1-216-089-00	METAL CHIP	47K	5%	1/10W
R113	1-216-070-00	METAL CHIP	7.5K	5%	1/10W
R114	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R115	1-216-094-00	METAL GLAZE	75K	5%	1/10W
R116	1-216-097-00	METAL CHIP	100K	5%	1/10W
R117	1-216-081-00	METAL CHIP	22K	5%	1/10W
R118	1-216-109-00	METAL CHIP	330K	5%	1/10W
R119	1-216-025-00	METAL CHIP	100	5%	1/10W
R120	1-216-077-00	METAL CHIP	15K	5%	1/10W
R121	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R122	1-216-097-00	METAL CHIP	100K	5%	1/10W
R123	1-216-096-00	METAL GLAZE	91K	5%	1/10W
R124	1-216-097-00	METAL CHIP	100K	5%	1/10W
R125	1-216-121-00	METAL CHIP	1M	5%	1/10W
R126	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R127	1-216-113-00	METAL CHIP	470K	5%	1/10W
R128	1-216-025-00	METAL CHIP	100	5%	1/10W
R129	1-216-097-00	METAL CHIP	100K	5%	1/10W
R130	1-216-073-00	METAL CHIP	10K	5%	1/10W
R131	1-216-089-00	METAL CHIP	47K	5%	1/10W
R132	1-216-049-00	METAL CHIP	1K	5%	1/10W
R133	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R134	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R135	1-216-097-00	METAL CHIP	100K	5%	1/10W
R136	1-216-049-00	METAL CHIP	1K	5%	1/10W
R137	1-216-029-00	METAL CHIP	150	5%	1/10W
R138	1-216-084-00	METAL CHIP	30K	5%	1/10W
R139	1-216-085-00	METAL CHIP	33K	5%	1/10W
R140	1-216-105-00	METAL GLAZE	220K	5%	1/10W
R141	1-216-097-00	METAL CHIP	100K	5%	1/10W
R142	1-216-049-00	METAL CHIP	1K	5%	1/10W
R143	1-216-111-00	METAL CHIP	390K	5%	1/10W
R144	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R145	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R146	1-216-043-00	METAL GLAZE	560	5%	1/10W
R147	1-216-027-00	METAL CHIP	120	5%	1/10W
R148	1-216-097-00	METAL CHIP	100K	5%	1/10W
R149	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R150	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R151	1-216-089-00	METAL CHIP	47K	5%	1/10W
R152	1-216-037-00	METAL CHIP	330	5%	1/10W
R153	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R154	1-216-097-00	METAL CHIP	100K	5%	1/10W
R155	1-216-073-00	METAL CHIP	10K	5%	1/10W
R156	1-216-089-00	METAL CHIP	47K	5%	1/10W
R157	1-216-089-00	METAL CHIP	47K	5%	1/10W
R158	1-216-089-00	METAL CHIP	47K	5%	1/10W
R159	1-216-097-00	METAL CHIP	100K	5%	1/10W
R160	1-216-041-00	METAL CHIP	470	5%	1/10W
R161	1-216-073-00	METAL CHIP	10K	5%	1/10W
R162	1-216-073-00	METAL CHIP	10K	5%	1/10W
R163	1-216-077-00	METAL CHIP	15K	5%	1/10W
R164	1-216-077-00	METAL CHIP	15K	5%	1/10W
R165	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R166	1-216-077-00	METAL CHIP	15K	5%	1/10W
R167	1-216-076-00	METAL CHIP	13K	5%	1/10W
R168	1-216-073-00	METAL CHIP	10K	5%	1/10W
R169	1-216-109-00	METAL CHIP	330K	5%	1/10W
R170	1-216-077-00	METAL CHIP	15K	5%	1/10W
R171	1-216-097-00	METAL CHIP	100K	5%	1/10W
R172	1-216-097-00	METAL CHIP	100K	5%	1/10W
R173	1-216-097-00	METAL CHIP	100K	5%	1/10W
R174	1-216-097-00	METAL CHIP	100K	5%	1/10W
R175	1-216-097-00	METAL CHIP	100K	5%	1/10W
R176	1-216-073-00	METAL CHIP	10K	5%	1/10W
R177	1-216-073-00	METAL CHIP	10K	5%	1/10W
R178	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R179	1-216-121-00	METAL CHIP	1M	5%	1/10W
R180	1-216-097-00	METAL CHIP	100K	5%	1/10W
R181	1-216-184-00	METAL GLAZE	270	5%	1/8W
R182	1-216-097-00	METAL CHIP	100K	5%	1/10W
R183	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R184	1-216-073-00	METAL CHIP	10K	5%	1/10W
R185	1-216-117-00	METAL CHIP	680K	5%	1/10W
R186	1-216-081-00	METAL CHIP	22K	5%	1/10W
R187	1-216-097-00	METAL CHIP	100K	5%	1/10W
R188	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R189	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R190	1-216-050-00	METAL GLAZE	1.1K	5%	1/10W
R191	1-216-050-00	METAL GLAZE	1.1K	5%	1/10W
R192	1-216-097-00	METAL CHIP	100K	5%	1/10W
R193	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R194	1-216-073-00	METAL CHIP	10K	5%	1/10W
R195	1-216-109-00	METAL CHIP	330K	5%	1/10W

Ref. No.	Part No.	Description			Remark
R196	1-216-089-00	METAL CHIP	47K	5%	1/10W
R197	1-216-037-00	METAL CHIP	330	5%	1/10W
R198	1-216-039-00	METAL CHIP	390	5%	1/10W
R199	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R200	1-216-073-00	METAL CHIP	10K	5%	1/10W
R201	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R202	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R203	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R204	1-216-097-00	METAL CHIP	100K	5%	1/10W
R205	1-216-081-00	METAL CHIP	22K	5%	1/10W
R206	1-216-083-00	METAL CHIP	27K	5%	1/10W
R207	1-216-073-00	METAL CHIP	10K	5%	1/10W
R208	1-216-073-00	METAL CHIP	10K	5%	1/10W
R209	1-216-073-00	METAL CHIP	10K	5%	1/10W
R210	1-216-025-00	METAL CHIP	100	5%	1/10W
R211	1-216-025-00	METAL CHIP	100	5%	1/10W
R212	1-216-025-00	METAL CHIP	100	5%	1/10W
R213	1-216-081-00	METAL CHIP	22K	5%	1/10W
R214	1-216-089-00	METAL CHIP	47K	5%	1/10W
R215	1-216-097-00	METAL CHIP	100K	5%	1/10W
R216	1-216-080-00	METAL CHIP	20K	5%	1/10W
R217	1-216-089-00	METAL CHIP	47K	5%	1/10W
R218	1-216-089-00	METAL CHIP	47K	5%	1/10W
R219	1-216-089-00	METAL CHIP	47K	5%	1/10W
R220	1-216-089-00	METAL CHIP	47K	5%	1/10W
R221	1-216-089-00	METAL CHIP	47K	5%	1/10W
R222	1-216-089-00	METAL CHIP	47K	5%	1/10W
R223	1-216-097-00	METAL CHIP	100K	5%	1/10W
R224	1-216-041-00	METAL CHIP	470	5%	1/10W
R225	1-216-089-00	METAL CHIP	47K	5%	1/10W
R226	1-216-073-00	METAL CHIP	10K	5%	1/10W
R227	1-216-089-00	METAL CHIP	47K	5%	1/10W
R228	1-216-105-00	METAL GLAZE	220K	5%	1/10W
R229	1-216-089-00	METAL CHIP	47K	5%	1/10W
R230	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R231	1-216-089-00	METAL CHIP	47K	5%	1/10W
R232	1-216-089-00	METAL CHIP	47K	5%	1/10W
R233	1-216-089-00	METAL CHIP	47K	5%	1/10W
R234	1-216-089-00	METAL CHIP	47K	5%	1/10W
R235	1-216-089-00	METAL CHIP	47K	5%	1/10W
R236	1-216-089-00	METAL CHIP	47K	5%	1/10W
R237	1-216-049-00	METAL CHIP	1K	5%	1/10W
R238	1-216-049-00	METAL CHIP	1K	5%	1/10W
R239	1-216-049-00	METAL CHIP	1K	5%	1/10W
R240	1-216-049-00	METAL CHIP	1K	5%	1/10W
R241	1-216-049-00	METAL CHIP	1K	5%	1/10W
R242	1-216-049-00	METAL CHIP	1K	5%	1/10W
R243	1-216-152-00	METAL GLAZE	12	5%	1/8W
R244	1-216-017-00	METAL CHIP	47	5%	1/10W
R245	1-216-017-00	METAL CHIP	47	5%	1/10W
R246	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R247	1-216-076-00	METAL CHIP	13K	5%	1/10W
R248	1-216-073-00	METAL CHIP	10K	5%	1/10W
R249	1-216-089-00	METAL CHIP	47K	5%	1/10W
R250	1-216-117-00	METAL CHIP	680K	5%	1/10W
R251	1-216-081-00	METAL CHIP	22K	5%	1/10W
R252	1-216-689-11	METAL CHIP	39K	0.5%	1/10W
R253	1-216-059-00	METAL CHIP	2.7K	5%	1/10W
R254	1-216-045-00	METAL CHIP	680	5%	1/10W
R255	1-216-081-00	METAL CHIP	22K	5%	1/10W
R256	1-216-097-00	METAL CHIP	100K	5%	1/10W
R257	1-216-089-00	METAL CHIP	47K	5%	1/10W
R258	1-216-081-00	METAL CHIP	22K	5%	1/10W
R259	1-216-037-00	METAL CHIP	330	5%	1/10W
R260	1-216-037-00	METAL CHIP	330	5%	1/10W
R261	1-216-041-00	METAL CHIP	470	5%	1/10W
R262	1-216-041-00	METAL CHIP	470	5%	1/10W
R263	1-216-049-00	METAL CHIP	1K	5%	1/10W
R264	1-216-073-00	METAL CHIP	10K	5%	1/10W
R265	1-216-041-00	METAL CHIP	470	5%	1/10W
R266	1-216-073-00	METAL CHIP	10K	5%	1/10W
R267	1-216-085-00	METAL CHIP	33K	5%	1/10W
R268	1-216-072-00	METAL CHIP	9.1K	5%	1/10W
R270	1-215-907-11	METAL OXIDE	22	5%	3W F
R271	1-216-041-00	METAL CHIP	470	5%	1/10W
R272	1-216-097-00	METAL CHIP	100K	5%	1/10W
R273	1-216-037-00	METAL CHIP	330	5%	1/10W
R274	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R275	1-216-089-00	METAL CHIP	47K	5%	1/10W
R276	1-216-073-00	METAL CHIP	10K	5%	1/10W
R277	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R278	1-216-073-00	METAL CHIP	10K	5%	1/10W
R279	1-216-089-00	METAL CHIP	47K	5%	1/10W

< VARIABLE RESISTOR >

RV101	1-230-564-11	RES, VAR, SLIDE 10K (TONE)
RV102	1-230-564-11	RES, VAR, SLIDE 10K (VOLUME)
RV103	1-228-995-00	RES, ADJ, METAL 22K
RV104	1-228-994-00	RES, ADJ, METAL 10K
RV105	1-228-994-00	RES, ADJ, METAL 10K
RV106	1-228-995-00	RES, ADJ, METAL 22K
RV107	1-237-364-11	RES, VAR, SLIDE 100K (SPEED)

MAIN **SENSOR (S)** **SENSOR (T)** **SW**

Ref. No.	Part No.	Description	Remark
		< SWITCH >	
S101	1-572-251-11	SWITCH, SLIDE (POWER)	
S102	1-572-251-11	SWITCH, SLIDE (TAPE SPEED)	
S103	1-571-212-11	SWITCH, SLIDE (SPEED CONTROL)	
S104	1-572-251-11	SWITCH, SLIDE (AUTO STOP)	
S105	1-572-251-11	SWITCH, SLIDE (SPEAKER)	
S106	1-570-361-11	SWITCH, SLIDE (DIGITAL CORD) (REVERSE TIME)	
S107	1-554-303-21	SWITCH, TACTILE (SCAN)	
S108	1-554-303-21	SWITCH, TACTILE (TEL REC)	
S109	1-554-303-21	SWITCH, TACTILE (ERASE)	
S110	1-554-303-21	SWITCH, TACTILE (RESET)	
S111	1-554-303-21	SWITCH, TACTILE (STOP)	
S112	1-554-303-21	SWITCH, TACTILE (LISTEN)	
S113	1-554-303-21	SWITCH, TACTILE (REW)	
S114	1-554-303-21	SWITCH, TACTILE (FF)	
		< TRANSFORMER >	
T101	1-433-251-00	TRANSFORMER, BIAS OSCILLATOR	
		< THERMISTOR (POSITIVE) >	
THP101	1-810-371-11	THERMISTOR, POSITIVE	
		< VIBRATOR >	
X101	1-577-273-11	OSCILLATOR, CERAMIC (4.19MHz)	
X102	1-760-521-11	VIBRATOR, CERAMIC (768KHz)	
**********			
*	1-654-698-11	SENSOR (S) BOARD	
		**********	
		< IC >	
PH601	8-749-923-52	IC RPI-131	
**********			
*	1-654-699-11	SENSOR (T) BOARD	
		**********	
		< IC >	
PH602	8-749-923-52	IC RPI-131	
		< RESISTOR >	
R280	1-216-027-00	METAL CHIP 120 5% 1/10W	
**********			

Ref. No.	Part No.	Description	Remark
*	1-654-894-11	SW BOARD	
		********	
		< SWITCH >	
S603	1-554-303-21	SWITCH, TACTILE (EJECT)	
**********			
		MISCELLANEOUS	
		**********	
9	1-575-497-11	WIRE, FLAT TYPE (29 CORE)	
HE901	1-543-899-11	HEAD, MAGNETIC (ERASE)	
HRP901	1-543-725-11	HEAD (RECORD PLAYBACK)	
M901	1-541-332-11	MOTOR (NBL-32R)	
M902	X-3367-201-1	MOTOR (F/R) ASSY	
PM901	1-454-604-11	SOLENOID, PLUNGER	
S601	1-762-313-11	SWITCH, LEAF	
S602	1-554-385-00	SWITCH, MICRO	
SP901	1-504-172-11	SPEAKER	
**********			
		ACCESSORIES & PACKING MATERIALS	
		**********	
⚠	1-465-393-11	ADAPTOR, AC (US, Canadian)	
⚠	1-465-428-21	ADAPTOR, AC (UK)	
⚠	1-465-429-21	ADAPTOR, AC (AEP)	
	3-798-144-11	MANUAL, INSTRUCTION (ENGLISH, FRENCH, GERMAN, SPANISH, DUTCH) (Canadian, AEP, UK)	
	3-798-144-21	MANUAL, INSTRUCTION (ENGLISH) (US)	
*	3-922-452-01	CUSHION (L)	
*	3-922-453-01	CUSHION (R)	
*	3-922-463-01	INDIVIDUAL CARTON (890D)	
*	3-922-465-01	INDIVIDUAL CARTON (890T)	
	8-953-098-90	HEADPHONE DE-45 SET (890T)	
	X-2184-302-1	CRADLE (890D)	
**********			

****
HARDWARE LIST
****

#1	7-682-647-01	SCREW +PS 3X6
#2	7-685-646-79	SCREW +BVTP 3X8 TYPE2 N-S
#3	7-685-648-79	SCREW +BVTP 3X12 TYPE2 N-S
#4	7-682-548-04	SCREW +B 3X8
#5	7-621-770-XX	SCREW +P 2.6X8
#6	7-682-646-09	SCREW +PS 3X5
#7	7-621-772-20	SCREW +B 2X5
#8	7-621-773-86	SCREW +B 2.6X4
#9	7-685-861-01	SCREW +BVTT 2.6X5 (S)

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

Ref. No.	Part No.	Description	Remark
#10	7-621-255-35	SCREW +P 2X5	
#11	7-628-253-95	SCREW +PS 2.6X4	
#12	7-621-772-58	SCREW +B 2X10	
#13	7-627-552-57	SCREW, PRECISION +P 1.7X5	
#14	7-627-552-97	SCREW, PRECISION +P 1.7X6	
#15	7-671-111-11	STEEL, BOUL 1.5MM	
#16	7-627-552-28	SCREW, PRECISION +P 1.7X2	
#17	7-627-552-18	SCREW, PRECISION +P 1.7X1.6	
#18	7-628-253-05	SCREW +PS 2X4	
#19	7-621-255-45	SCREW +BVTT 2X6 (S)	
#20	7-685-871-01	SCREW +BVTT 3X6 (S)	
#21	7-621-255-15	SCREW +P 2X3	

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