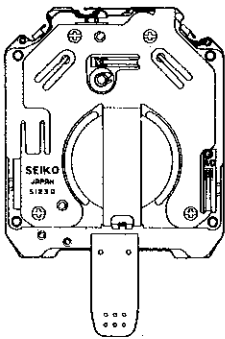
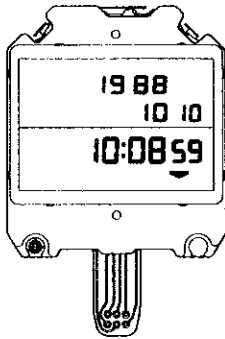


PARTS CATALOGUE/TECHNICAL GUIDE

Cal. S120A

Cal. S123A

[SPECIFICATIONS]

Item		Cal. No.	S120A	S123A
Module				
The illustrations refer to Cal.S123A. (x 0.70)				
Module size	Outside diameter		49.3 mm between 6 o'clock and 12 o'clock sides 43.0 mm between 3 o'clock and 9 o'clock sides	
	Casing diameter		-	
	Height		8.75 mm (including the battery portion)	
Display medium			Nematic Liquid Crystal, FEM (Field Effect Mode)	
Liquid crystal driving system			1/4 multiplex driving system	
Display system			<ul style="list-style-type: none"> • Stopwatch display (up to 10 hours) • Split time measurement • Lap time measurement • Accumulated elapsed time measurement • Time/calendar display 	
Additional mechanism			<ul style="list-style-type: none"> • Memory function (up to 100 measurements) • Confirmation sound for watch operation • Warning sound against memory overflow • Battery life indicator 	
			<ul style="list-style-type: none"> • Stroke/frequency measurement display • Automatic printout function 	
Loss/gain			Monthly rate at normal temperature range: less than 15 seconds	
Regulation system			Nil	
Measuring gate by quartz tester			Any gate can be used.	
Battery			SEIKO CR2032, Maxell CR2032 Battery life is approximately 5 years. Voltage: 3.0 V	

HATTORI SEIKO CO., LTD.

PARTS CATALOGUE

Cal. S120A, S123A

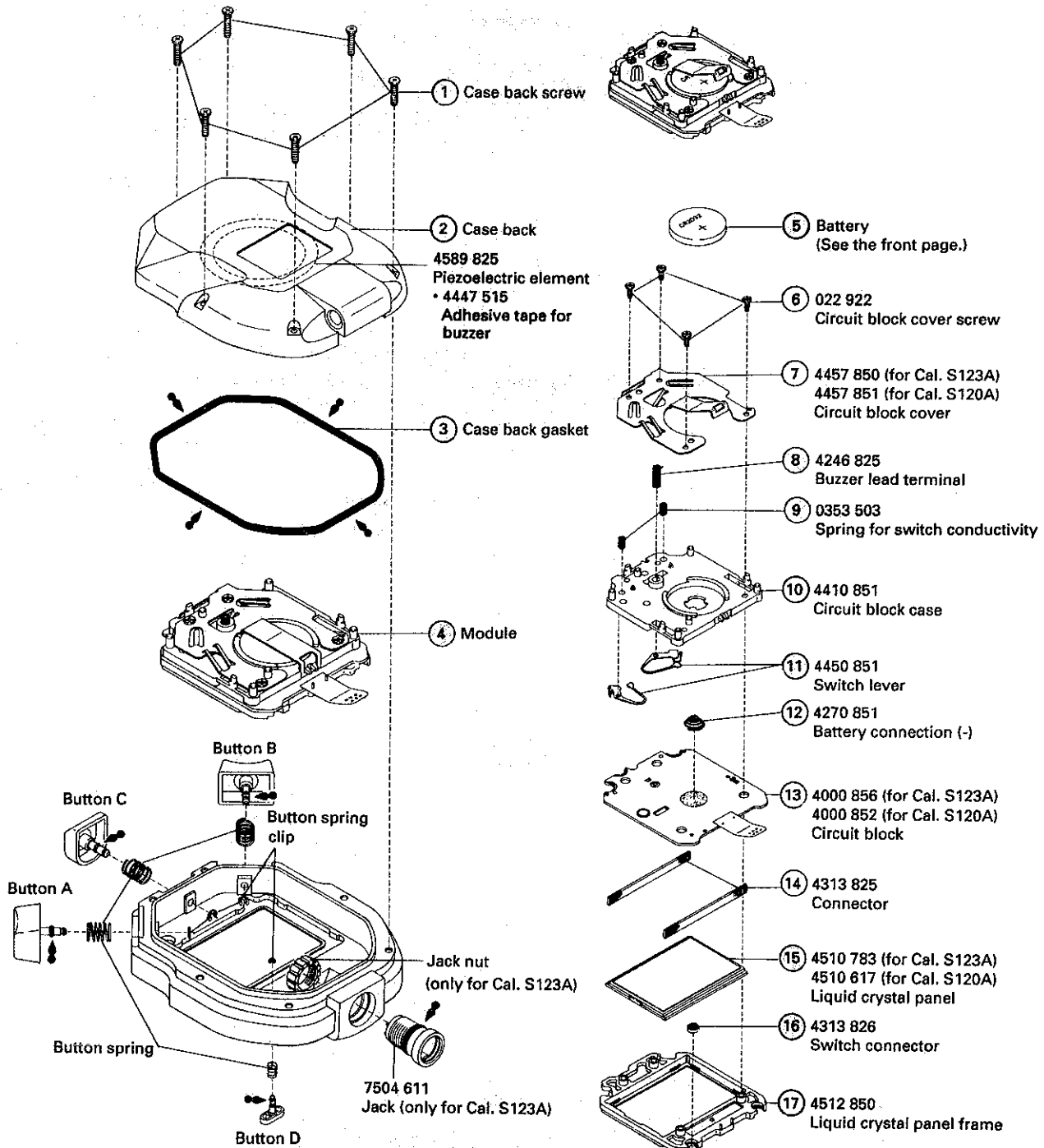
Disassembling procedure Figs. : ① → ⑰

Reassembling procedure Figs. : ⑰ → ①

Lubricating: Types of oil

Oil quantity

- Silicone oil 500,000 c.s.
- SEIKO Watch Oil S-6
- Normal quantity
- Extremely small



⊙ ⇨ Please see the remarks on the following pages.

Remarks:

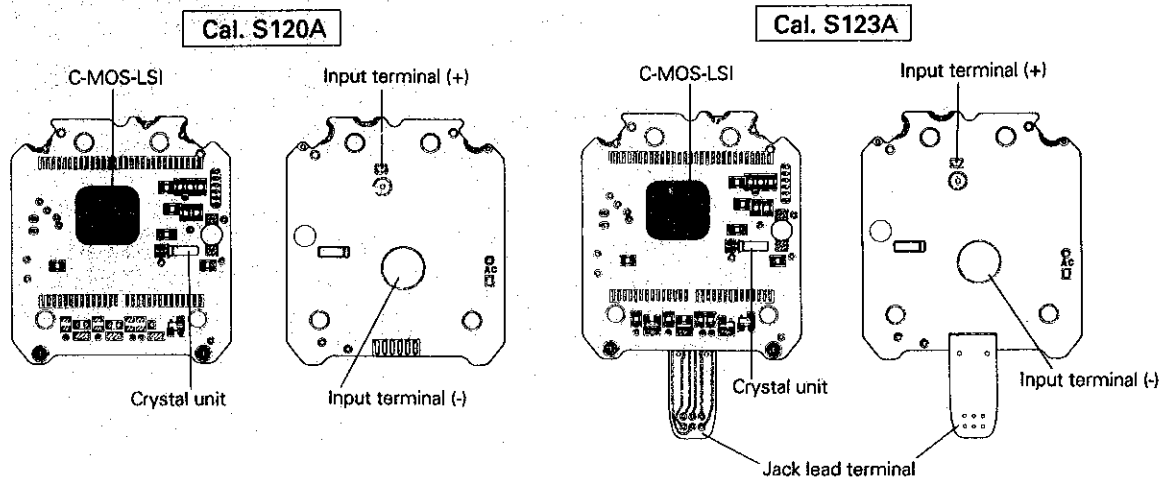
⑮ Liquid crystal panel

The type of liquid crystal panel is determined based on the design of cases. Refer to "SEIKO Casing Parts Catalogue" to choose a corresponding liquid crystal panel.

TECHNICAL GUIDE

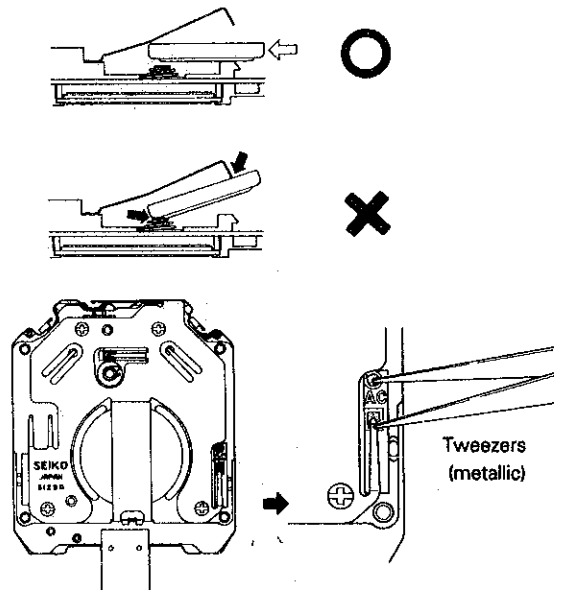
- The explanation here is only for the particular points of Cal. S120A and S123A.
- For the repairing, checking and measuring procedures, refer to the "TECHNICAL GUIDE, GENERAL INSTRUCTIONS".

I. STRUCTURE OF THE CIRCUIT BLOCK



II. REMARKS ON BATTERY REPLACEMENT

- **Remarks on installing the battery**
 - Keep the battery level while installing it lest it should touch the circuit block cover.
 - Be careful not to short-circuit the battery connection (-) and the circuit block cover. Otherwise, the display may remain blank for 1 to 6 minutes after the battery is installed.
 - *If the display remains blank, wait until it appears and then, reset the circuit following the procedure below.
- **Remarks after installing the battery**
 - After the battery is replaced with a new one, or after the battery is re-installed following the repairing procedures, be sure to short-circuit the AC terminal of the circuit block and the circuit block cover with conductive tweezers as illustrated at right to reset the circuit.



TECHNICAL GUIDE

Cal. S120A, S123A

III. REMARKS ON DISASSEMBLING AND REASSEMBLING

Use the universal movement holder for disassembling and reassembling.

④ Module

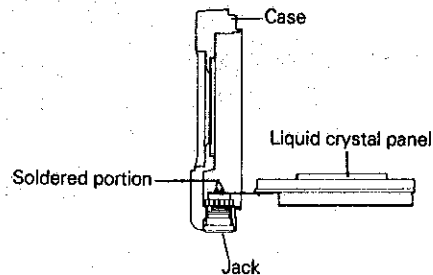
• Remarks on removing/installing (only for Cal. S123)

As the jack and the jack lead terminal are soldered together, use a soldering iron when removing or installing the module.

*Be careful not to heat the soldering iron excessively as the plastic parts will melt with heat.

• Jack

- To remove, loosen the jack nut. Before reassembling the jack, clean the gasket and apply silicone oil to it.
- To reassemble the jack, set the notch of the jack to the groove of the case.



⑧ Buzzer lead terminal

• How to remove

Remove the buzzer lead terminal after detaching the circuit block case from the circuit block.

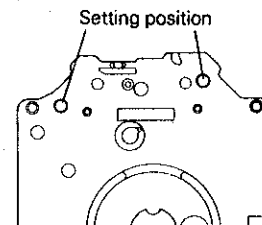
• How to install

To install the buzzer lead terminal, set the end portion of the coil to the groove of the circuit block case, and then turn the coil slightly so that it may not come off.



⑨ Spring for switch conductivity

For the stopwatches produced after autumn of 1989, two springs have been attached to the circuit block case to secure constant flow of electricity. If the stopwatch being repaired does not have ones, be sure to attach the springs as illustrated at right.



⑪ Switch lever

• Setting position and lubricating

Lubricate the switch levers as shown in the illustrations and set them on the rear of the circuit block case.

Set a ~ f as illustrated.



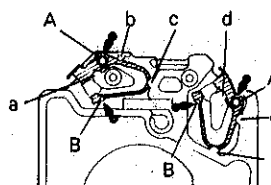
Lubricate A and B as illustrated.



A



B



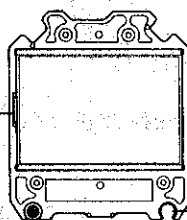
⑮ Liquid crystal panel

⑯ Switch connector

• How to install

See the illustration on the right.

Set the stopper of the liquid crystal panel to the groove of the liquid crystal panel frame.



For Cal.S120A and S123A, this groove is not used and left open.

Set the switch connector with the conductive portion (black) up.

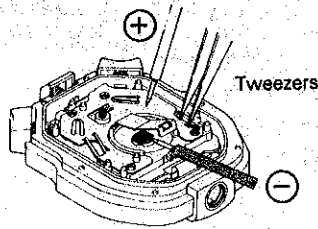
IV. VALUE CHECKING

- Upconverter coil resistance
50Ω ~ 80Ω
- Current consumption
For the whole of the module : 5μA
For the circuit block alone : 4μA

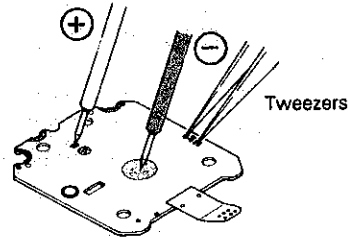
*Measuring current consumption using S-840A

Apply the probes of the tester as shown in the illustration below.

For the whole of the module



For the circuit block alone

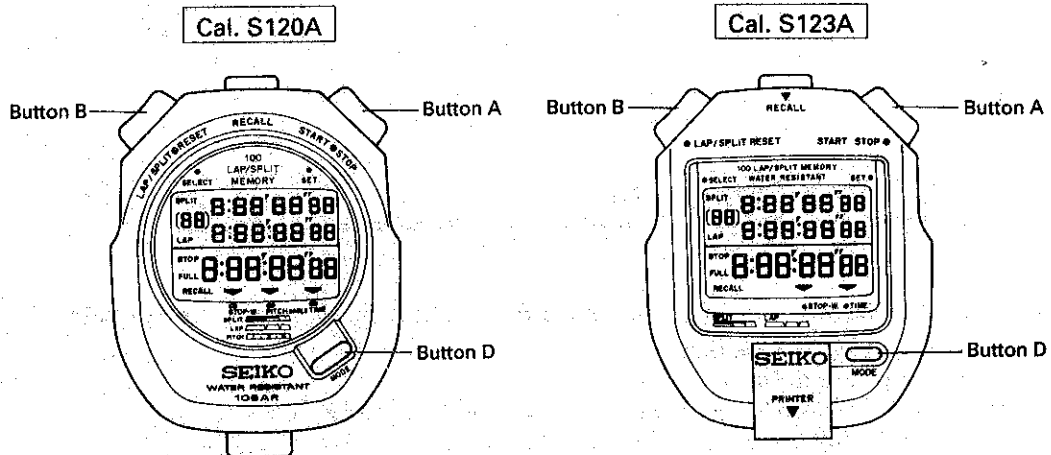


Note: Start measurement 10 seconds after resetting the circuit by using the tweezers as illustrated.

V. CHECKING THE FUNCTIONS

- All the segments lit up

- 1) Press Button D to show the TIME/CALENDAR display.
- 2) Press Button B to show the TIME/CALENDAR SETTING display.
- 3) Press Button A and B at the same time. All the segments of the display will light up.
- 4) Check if the displays below appear for the respective watches.



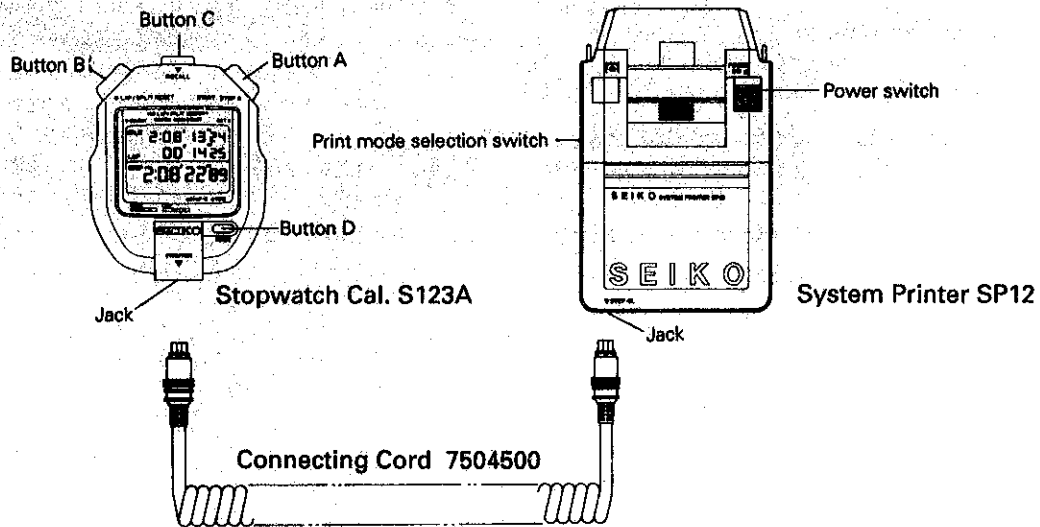
*If the stopwatch is left untouched with all the segments lit up, the display will automatically return to the TIME/CALENDAR display in 1 to 2 minutes.

To return to the TIME/CALENDAR display manually, press Button D.

TECHNICAL GUIDE

Cal. S120A, S123A

• Connection with the System Printer SP12 (only for Cal. S123A)



*In inserting the plug of the connecting cord into the jack, check that their notched portions properly meet with each other.

Switch operation

Print mode selection switch:

- Split time and lap time are printed out while the switch is set at "LAP SPLIT".
- Only split time is printed out while the switch is set at "SPLIT".

Power switch:

- The switch turns on and off the printer.
- When the switch is set to "ON", the roll paper will be advanced by one line.

• Checking the connection and operation of the Stopwatch Cal. S123A and the System Printer SP12

Printout during the measurement

- 1) Turn ON the power switch of the printer.
- 2) Slide the print mode selection switch of the printer to "LAP SPLIT".
- 3) Press Button D to show the STOPWATCH display.
- 4) Press Button A to start the measurement. The year, month, date and starting time will be printed out.
*If the stopwatch is counting, press Button A to stop the measurement, press Button B to reset the digits to "00", then press Button A again to start the measurement.
- 5) Press Button B repeatedly. With each press of the button, the split/lap number, split time and lap time will be printed out.

TECHNICAL GUIDE

Cal. S120A, S123A

Printout of the stored data

* Measure the split and lap times without connecting the stopwatch and the printer.

- 1) Press Button A to start the measurement.
- 2) Press Button B repeatedly to measure split and lap times.
- 3) Press Button A to stop the measurement.
- 4) Connect the stopwatch with the printer, turn on the power switch of the printer and then slide the print mode selection switch of the printer to "LAP SPLIT".
- 5) Press Button C repeatedly. With each press of the button, the split/lap number, split time and lap time will be printed out.
- 6) All the stored data are automatically printed out successively if Button C is kept pressed for 2 to 3 seconds.

Printout of the lapse of time

- 1) In the STOPWATCH display, press Button B to reset the digits to "00".
- 2) Press Button D to show the TIME/CALENDAR display.
- 3) Press Button A to start the measurement. The year, month, date and starting time will be printed out.
- 4) With each press of Button B, the time and the number of measurements are printed out.

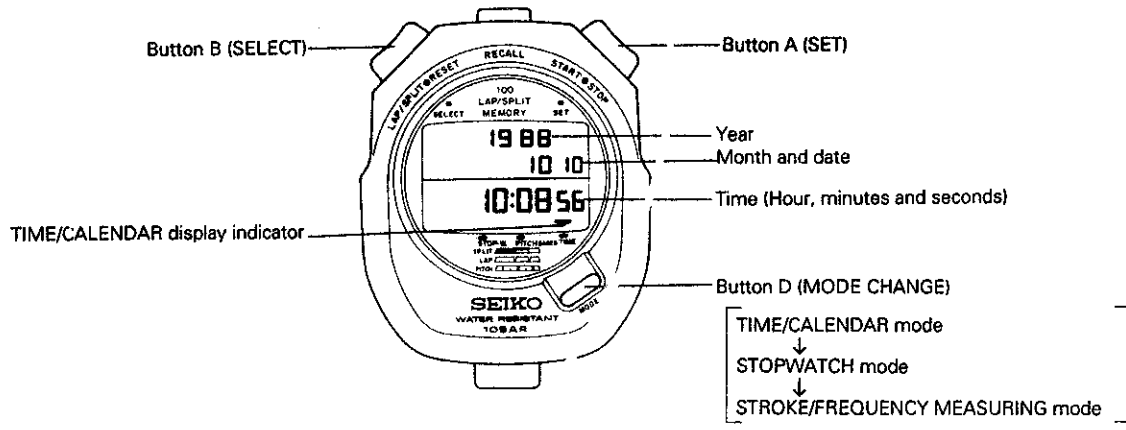
*The lapse of time cannot be printed out by pressing Button C.

*If the digits have not been reset to "00", the time cannot be printed out.

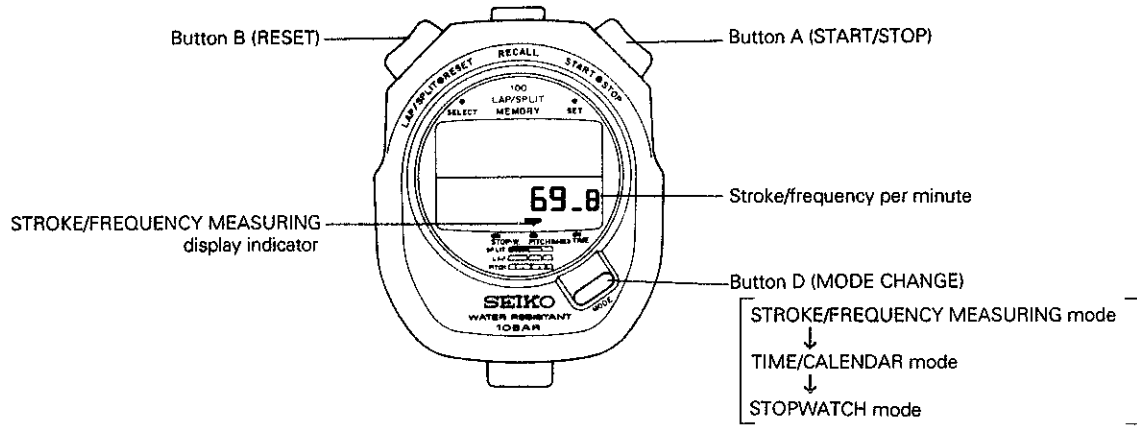
- If the measurement data are not printed out properly, check the following points.
 - 1) Check if the connecting cord (7504500) is broken, by using the tester.
 - 2) Replace the batteries of the printer with new ones.
 - 3) Check if the soldered portion of the jack lead terminal of the stopwatch is damaged to cause short-circuit.

S120A

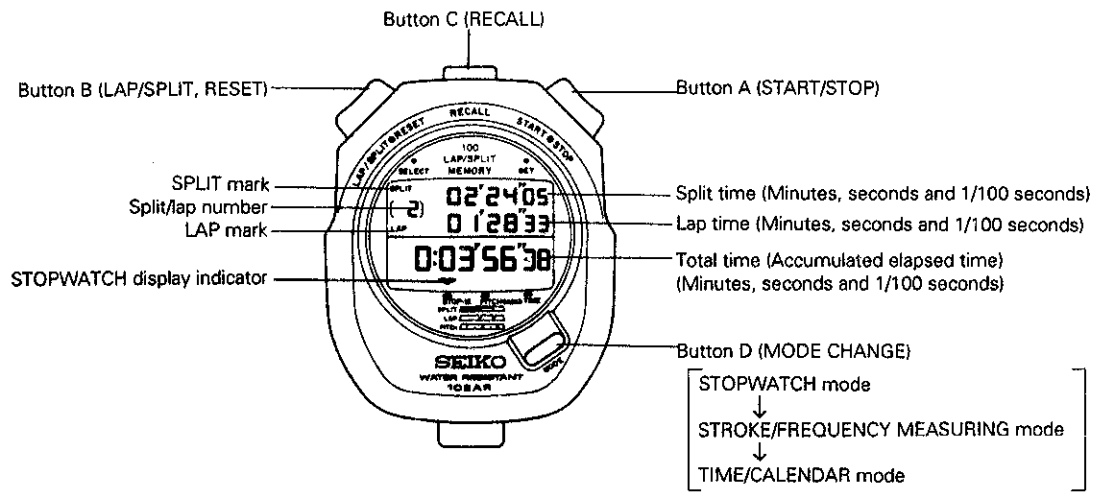
[TIME/CALENDAR display]



[STROKE/FREQUENCY MEASURING display]

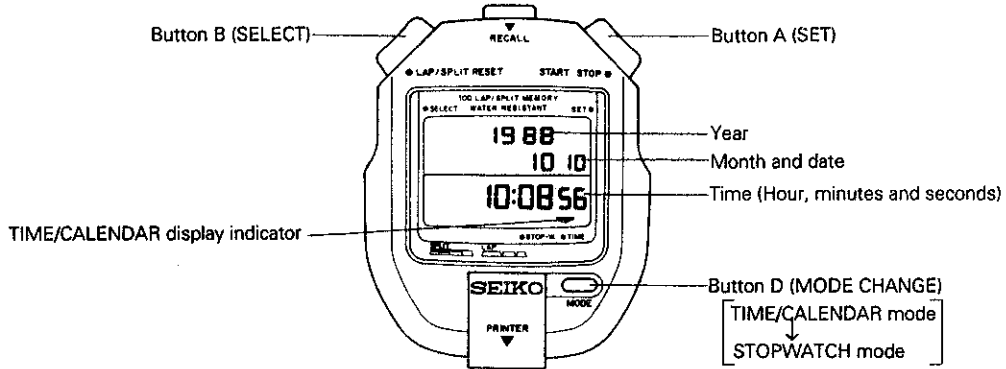


[STOPWATCH display]



S123A

[TIME/CALENDAR display]



[STOPWATCH display]

