PARTS CATALOGUE/TECHNICAL GUIDE
Cal. S129A

[SPECIFICATIONS]

| Cal. No. / Item		S129A
Module		(x 0.38)
Module size	Outside dimensions	198.1 x 81.6mm
	Casing diameter	–
	Height	28.5mm
Display medium		Nematic Liquid Crystal, FEM (Field Effect Mode)
Liquid crystal driving system		1/4 multiplex driving system
Display system		• Stopwatch display (up to 10 hours) 　• Split time measurement 　• Lap time measurement 　• Accumulated elapsed time measurement • Time/calendar display • Auto s'art setting display
Additional mechanism		• Memory function (up to 100 measurements) • Confirmation sound for watch operation • Warning sound against memory overflow • Battery life indicator • Auto start function • Transfer of auto start time to Cal. S123 or S124 • Connection with grip switch
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.
Printer	Print system	Thermal serial dot printing system
	Print method	One-way printing (from left to right)
	Print speed	Approx. 1.5 lines/sec. (DC 5.0V at 25°C)
	Characters	Numerals, alphabets, +, –, x, +, =, ?, !, ., :, ', ", /
Battery for the stopwatch		SEIKO CR2032, Maxell CR2032 Battery life is approximately 5 years. Voltage: 3.0V
Battery for the printer		IEC R6/ANSI AA manganese/alkaline manganese dry battery (4 pcs.) Manganese battery　　　:　Approx. 10,000 lines can be printed out. Alkaline manganese battery:　Approx. 20,000 lines can be printed out. Voltage: 1.5V x 4 (6.0V)

HATTORI SEIKO CO., LTD.

PARTS CATALOGUE

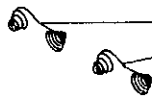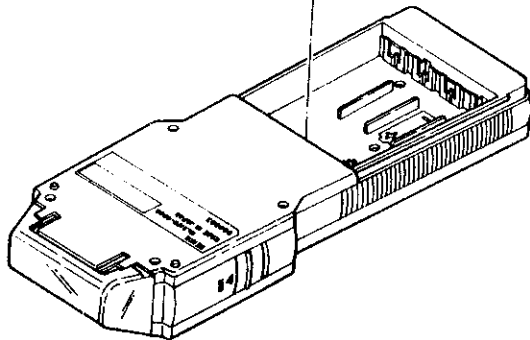| Disassembling procedures Figs. : | ① | → | ㉟ |
| Reassembling procedures Figs. : | ㉟ | → | ① |
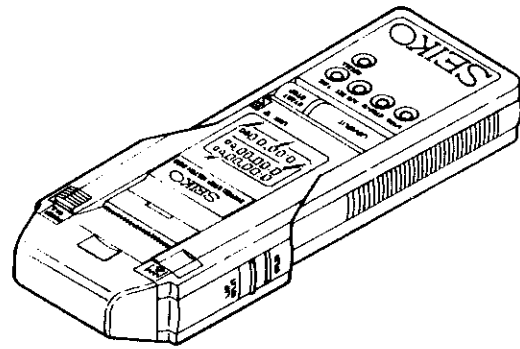
① 8260 0023
Battery hatch
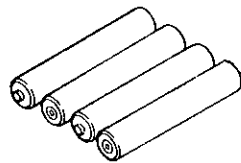
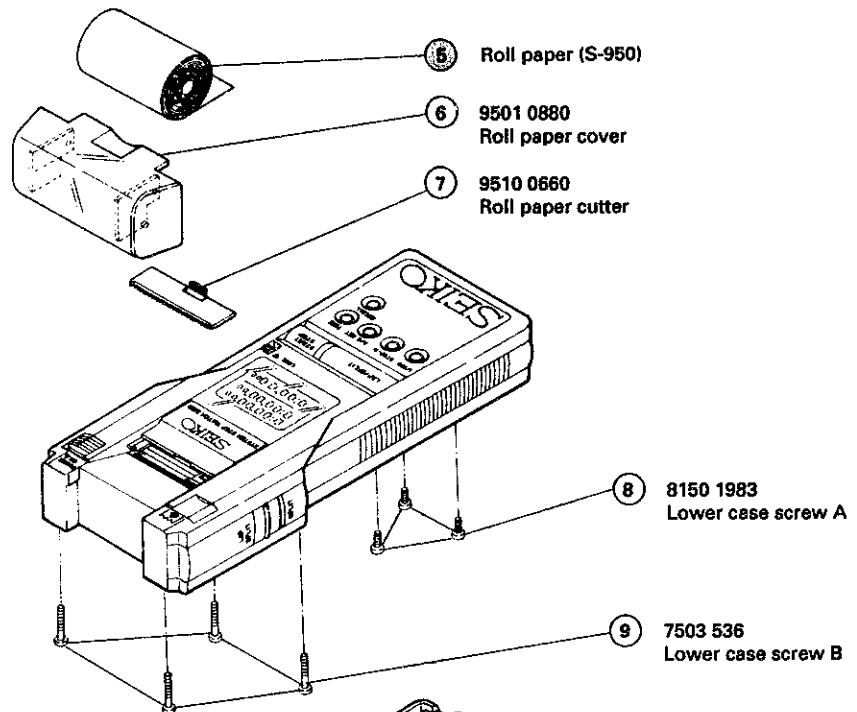② Dry battery (for the printer)

③ 7503 521
Battery lead terminal D

④ 7503 515
Battery lead terminal C

(5) Roll paper (S-950)

(6) 9501 0880
Roll paper cover

(7) 9510 0660
Roll paper cutter

(8) 8150 1983
Lower case screw A

(9) 7503 536
Lower case screw B

7503 563
Flat cable

7503 562
Power supply lead wire
(red, white, blue in a set)

Remarks:

* Power supply lead wire
  ((B) portion)

* **How to remove**
  1) Remove the soldering; or
  2) After removing the
     power switch cover,
     remove the fixing screws.

Red White Blue

* Flat cable
  ((A) portion)

Connector

Flat cable
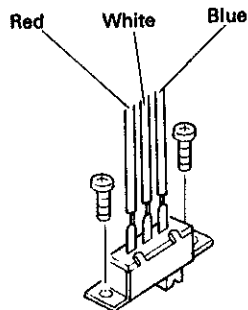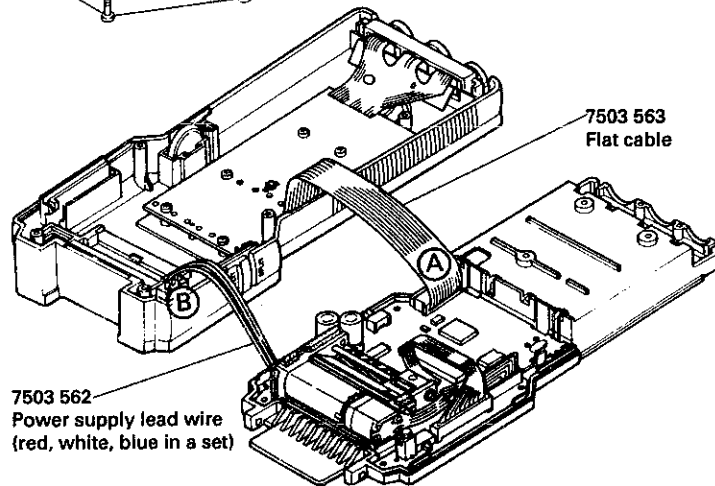
Connector

Flat cable
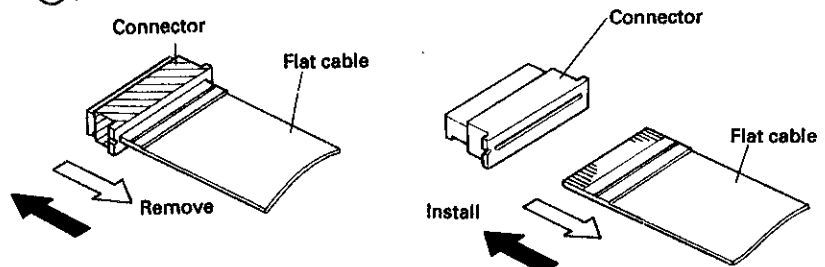
Remove

Install

* **How to remove**
  After unlocking the connector,
  pull out the flat cable.

* **How to install**
  Insert the flat cable in the connector,
  and lock the connector.

◯ ⇨ Please see the remarks on the following pages.

(10) Battery for the stopwatch
(See the front page.)

(11) 4216 750
Insulator for circuit

(12) 7503 536
Power switch fixing screw

(13) 7503 544
Power switch

(14) 9501 0900
Power switch cover

(15) 7504 618
Jack cap

(16) 7504 615
Jack unit

(17) 9510 0623
Holder

(18) 7503 536
Screw for
circuit block A

(19) 4000 858
Circuit block A
(with jack unit)

(20) 4313 825
Connector

(21) 4510 617
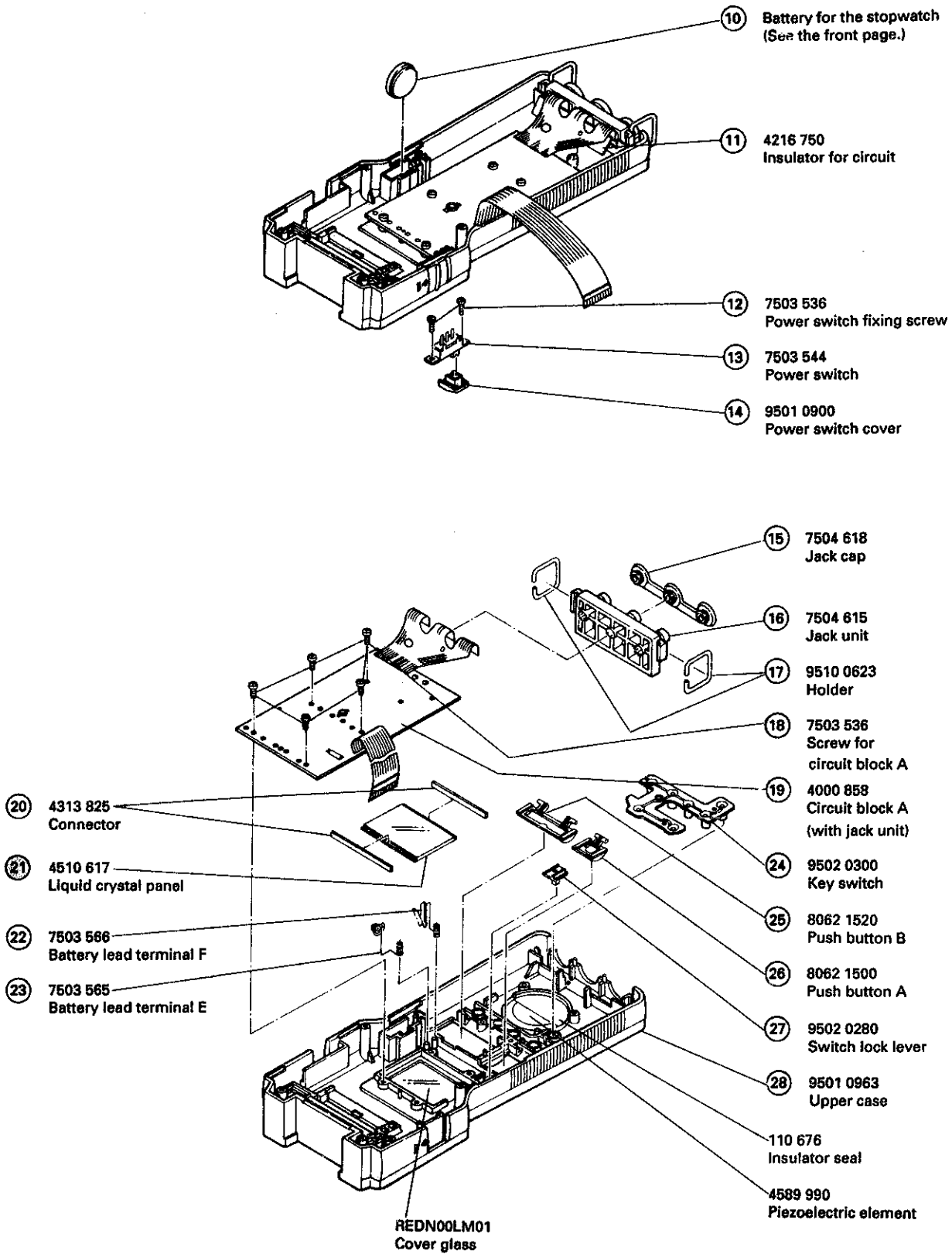Liquid crystal panel

(22) 7503 566
Battery lead terminal F

(23) 7503 565
Battery lead terminal E

(24) 9502 0300
Key switch

(25) 8062 1520
Push button B

(26) 8062 1500
Push button A

(27) 9502 0280
Switch lock lever

(28) 9501 0963
Upper case

110 676
Insulator seal

4589 990
Piezoelectric element

REDN00LM01
Cover glass

○ ⟹ Please see the remarks on the following pages.

7503 545
Cushion A

(29) 7503 542
Printer unit

7503 546
Cushion B

(30) 7503 571
Screw for circuit block B

(31) 9501 0920
Paper advancing switch cover

(32) 9501 0820
External switch cover

(33) 4000 853
Circuit block B

(34) 9501 0800
Print mode selection switch cover

(35) 9501 1003
Lower case

TECHNICAL GUIDE

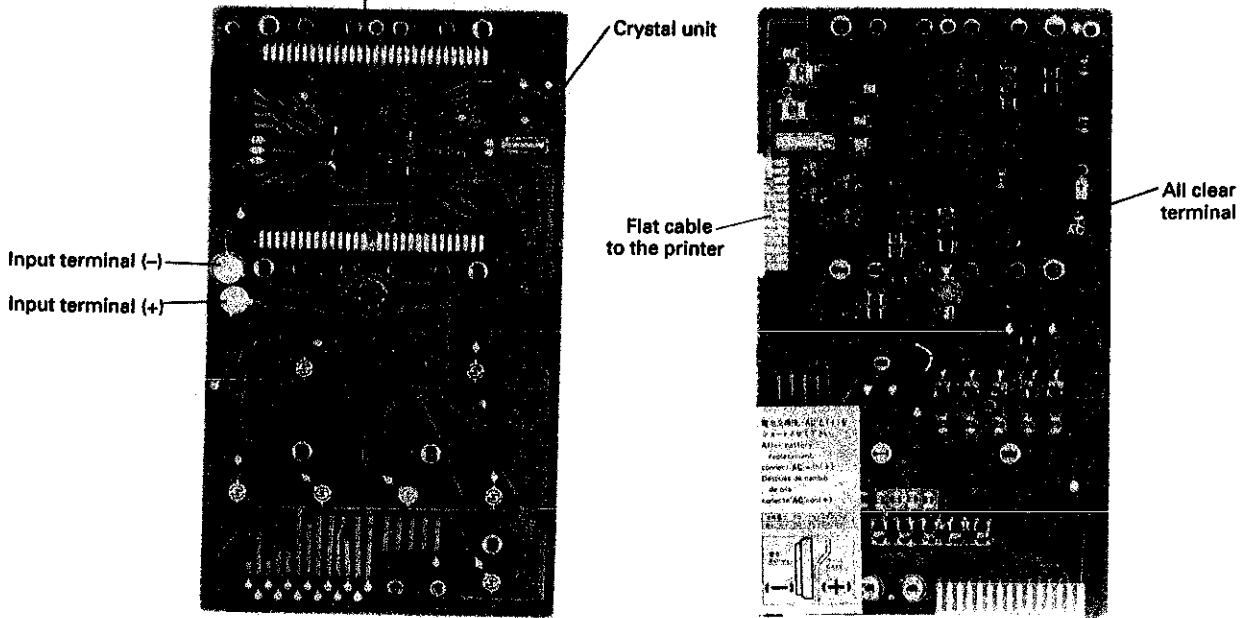- The explanation here is only for the particular points of Cal. S129A.
- For the repairing, checking and measuring procedures, refer to the "TECHNICAL GUIDE, GENERAL INSTRUCTIONS".

I. STRUCTURE OF THE CIRCUIT BLOCK

[Circuit block A]
(for the stopwatch)

C-MOS-LSI

Crystal unit

All clear terminal

Flat cable to the printer

Input terminal (−)

Input terminal (+)

Jack lead printed circuit board

[Circuit block B]
(for the printer)

Lead wire

Connector

Print color adjuster

Connector

Connector
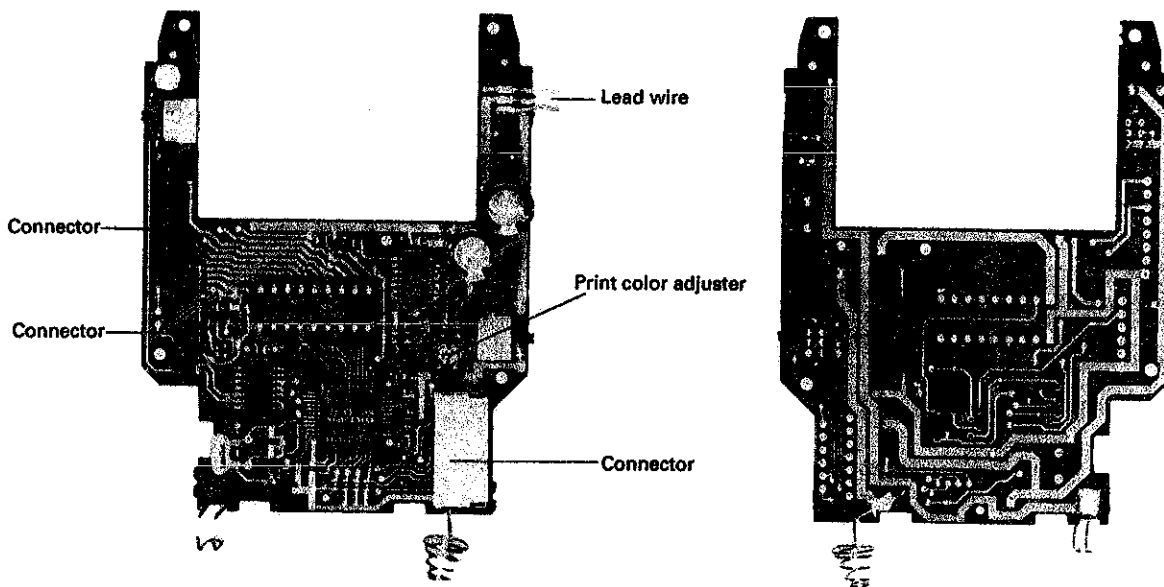
II. REMARKS ON INSTALLING THE BATTERY

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 and plus terminal of the circuit block with conductive tweezers as indicated in the illustration below to reset the circuit.

Conductive tweezers
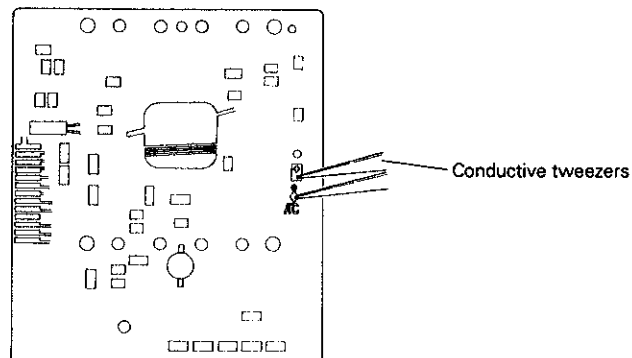
Note: After the circuit is reset, the display shows "January 1, 1988, 0:00'00".

III. REMARKS ON DISASSEMBLING AND REASSEMBLING

⑤ Roll paper

● **How to remove**
Cut out the roll paper in the paper cover, and then remove the remaining paper by keeping the paper advancing switch pressed.
* Never pull out the paper from the paper inserting slot.

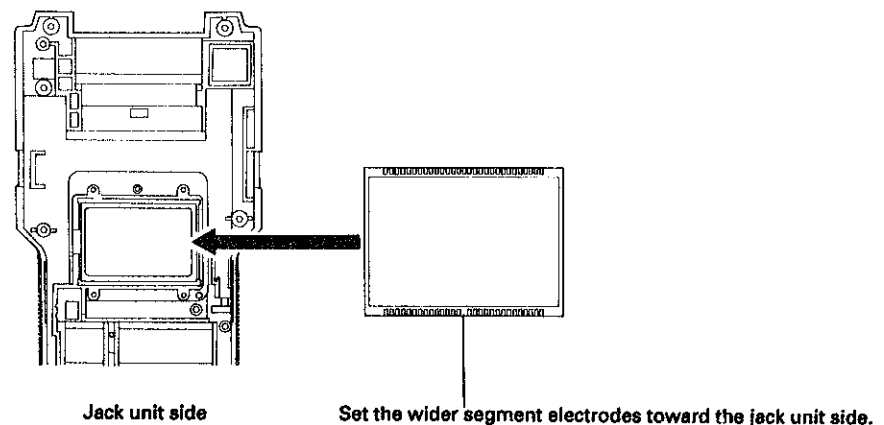● **How to install**
Insert the end of the roll paper into the paper inserting slot, and keep the paper advancing switch pressed until the end of the paper is advanced out 2 to 3 cm from the printer.

㉑ Liquid crystal panel

● **How to install**
Set the liquid crystal panel as shown in the illustration below.

Jack unit side   Set the wider segment electrodes toward the jack unit side.

• Adjustment of the print color

After the printer unit or circuit block B is replaced with a new one, characters may be printed too lightly or too deeply. In that case, adjust the print color as shown in the illustration below.
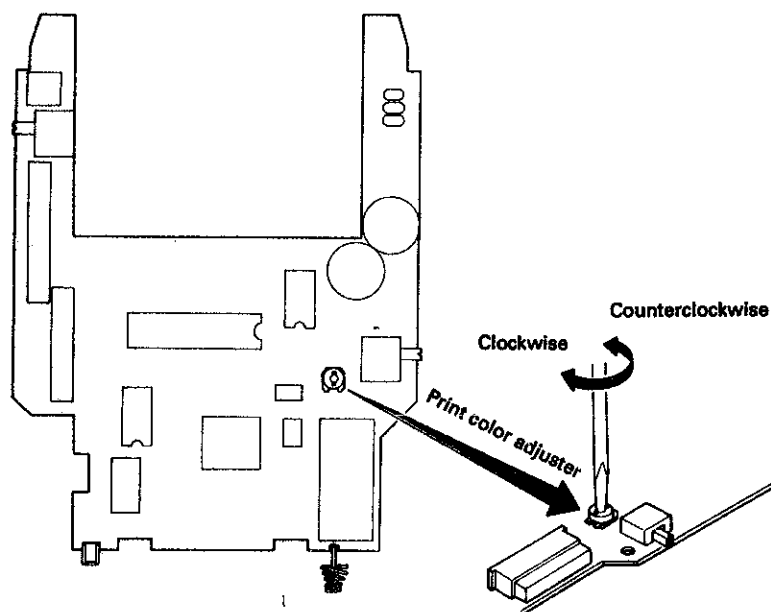
Turn the print color adjuster with a screwdriver.

     To make the color deep :   Turn clockwise.
     To make the color light :   Turn counterclockwise.

Notes: 1. If the print color is excessively deepened, the current consumption increases and the battery life is shortened.
        2. Adjust the print color in the normal temperature (24°C).

IV. VALUE CHECKING
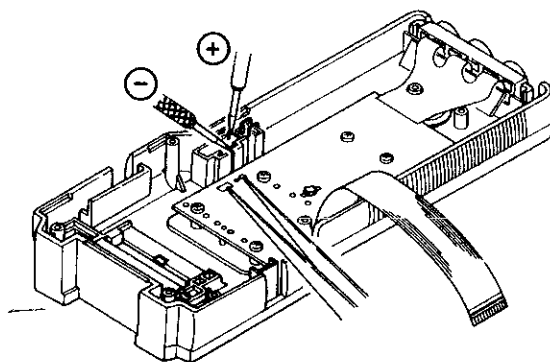
- **Upconverter coil resistance**
  $50\Omega \sim 80\Omega$

- **Current consumption**
  For the whole of the module: less than $7.0\mu A$

* Measuring current consumption using S-840A
  Apply the probes of the tester as shown in the illustration below.

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

• Parts identification

Paper advancing switch:
• With each press of the switch, the roll paper is advanced by one line.
• The roll paper is advanced continuously if the switch is kept pressed.

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".

Button G:
• With each press of the button, the readout of the stopwatch changes over between 1 second and 1/100 seconds.

Button F : Showing the stopwatch display

Button E : Auto start setting

Button D : Showing the time/calendar display

Roll paper cover

Power switch for printer

Grip switch selector:
• Slide up the selector to use the grip switch.
• Slide down the selector while the grip switch is not used.

**Lock lever:**
• The lever locks button "A".

	Stopwatch display	Auto start setting time/calendar display
Button A	Start/stop	Setting the digits
Button B	Split lap/Reset	Selection of the digits to be adjusted.

Button C: Recall of the stored data
• With each press of the button, the time stored is recalled.

Jack for external data output: Parallel signal

Jack for grip switch:
• Connecting the grip switch.

Jack for auto start:
• Used to transfer the auto start time.

• Checking the changeover of displays
The display changes over as follows by pressing the respective buttons.

Auto start setting display

Time/calendar display

Stopwatch display

1 second readout

1/100 seconds readout
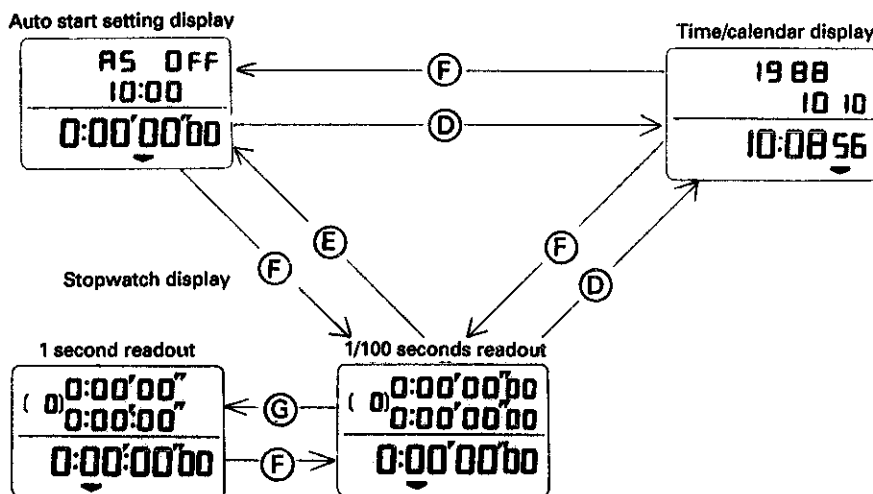
Notes: 1. Reset the display to "00" before changing over the readout of the measurement.
2. If the display is reset after the measurement is made with 1 second readout, the display automatically returns to 1/100 seconds readout.

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● **Checking all the segments lit up**
   Press buttons "A" and "B" at the same time in the time/calendar display to light up all the segments.

Button A
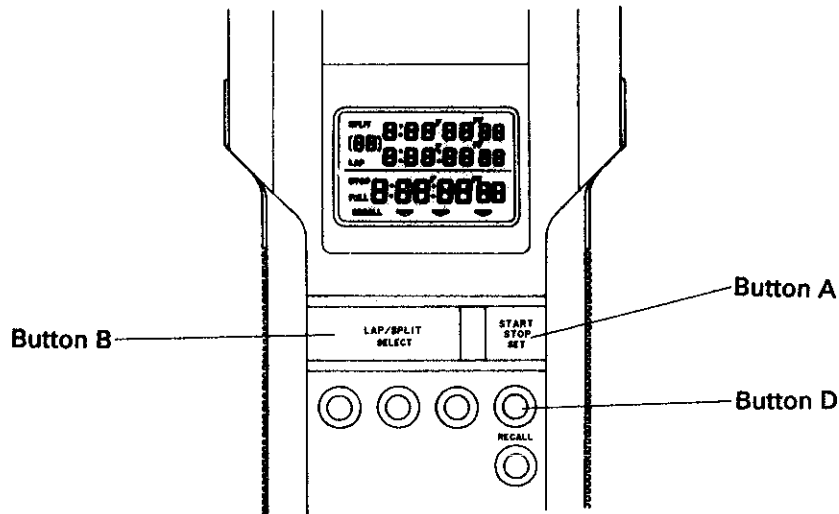
Button B

Button D

If the stopwatch is left untouched with all the segments lighting up, the display will automatically return to the time/calendar in 1 to 2 minutes. To return to the time/calendar display manually, press button "D".

● **Repairing defective segments**
   1) Check if the segment electrode of the circuit block A is soiled.
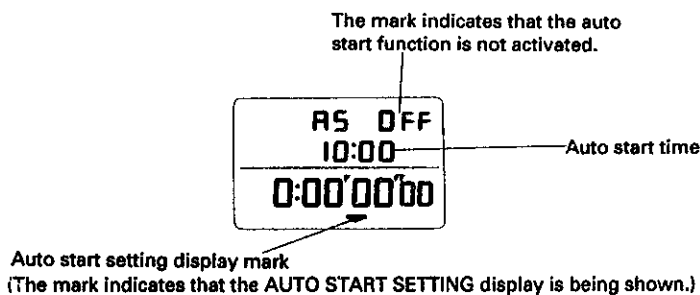   2) Check if the connector is soiled or if dust or lint sticks to it.

● **Checking the printing of the printer**
1) Slide up the print mode selection switch to "SPLIT LAP".
2) Turn on the power switch. The roll paper is advanced by one line.
3) Press the paper advancing switch. The roll paper is advanced by one line.
4) Press button "F" to show the stopwatch display. Check that the digits are reset to "00".
   * When the stopwatch is counting, press button "A" to stop the measurement and then press button "B" to reset the digits to "00".
5) Press button "A" to check if year, month, date and starting time are printed out. ...... a
6) Press button "B" several times to check if split times and lap times are printed out successively. ...... b
7) Press button "A" to check if the finish time is printed out. c

```
Year · Month · Date ————— 1988  10  10      ⎫
Start time ————————————— START  10:19      ⎬ ...... a
                         SPLIT/LAP          
                         1  0:18  05  33     ⎫
                            0:18  05  33     
                         2  0:36  37  78     
                            0:18  32  45     
                         3  0:55  13  11     
                            0:18  35  33     
Split time               4  1:13  25  34     
Lap time                    0:18  12  23     ⎬ ...... b
                         5  1:31  57  55     
                            0:18  32  21     
                         6  1:49  32  78     
                            0:17  35  23     
                         7  2:07  31  04     
                            0:17  58  26     
                         8  2:25  43  62     
                            0:18  12  58     ⎭
Finish time ——————————— /S/2:34  02  77      ...... c
```

● **Checking the auto start function**
1) Press button "D" to show the time/calendar display, and then check the current time.
2) Press button "E" to show the auto start setting display.

The mark indicates that the auto
start function is not activated.

```
 AS  OFF
 10:00 ————————————Auto start time
0:00'00"00
```

Auto start setting display mark
(The mark indicates that the AUTO START SETTING display is being shown.)

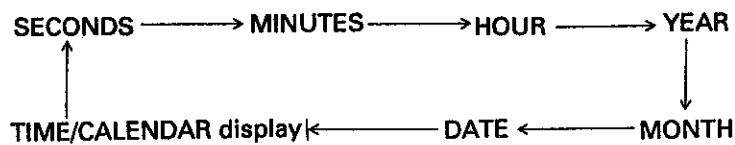3) Press button "B" to select the digits to be adjusted (flashing).

```
 AS  On
 10:00
0:00'00"00
```
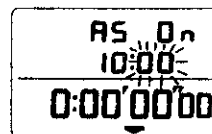
4) Press button "A" to advance the flashing digits 2 minutes ahead of the current time.
5) Press button "B" again to enter the designated auto start time in memory. The stopwatch is ready to start at the designated time. Then press "F" to show the stopwatch display.
6) Check if the buzzer rings with three beeps 3 seconds before the designated auto start time.
7) Check if the stopwatch starts measuring when the buzzer stops beeping.

* **Time/calendar setting**
1) Press button "D" to show the time/calendar display.
2) Press button "B" to select the digits to be adjusted.
   With each press of the button, the digits to be adjusted change over in the following order.

$$\text{SECONDS} \longrightarrow \text{MINUTES} \longrightarrow \text{HOUR} \longrightarrow \text{YEAR}$$

$$\text{TIME/CALENDAR display} \longleftarrow \text{DATE} \longleftarrow \text{MONTH}$$

3) Press button "A" to adjust the digits.
4) Press button "B" to return to the time/calendar display.