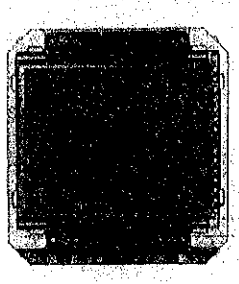
SEIKO

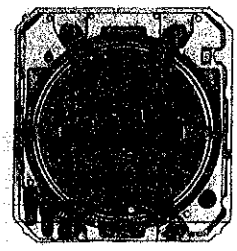
DIGITAL QUARTZ

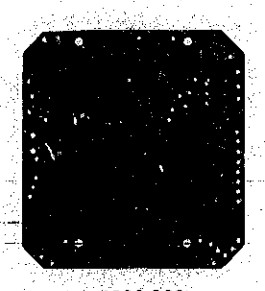
Cal. UW01A

PARTS CATALOGUE

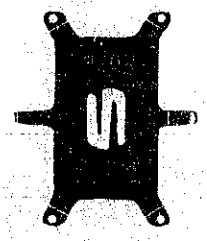
Cal. UW01A







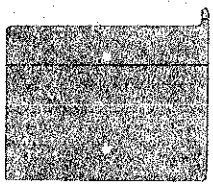
4000 322



4225 323

4245 328

4246 323



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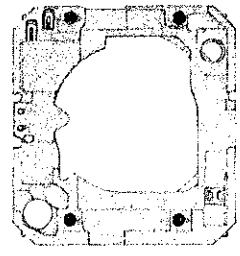
4270 329

4313 323



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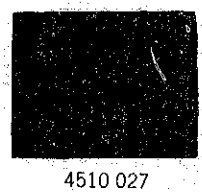
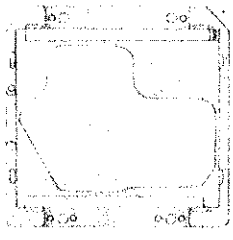


4510 027



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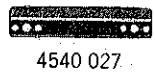
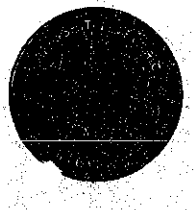
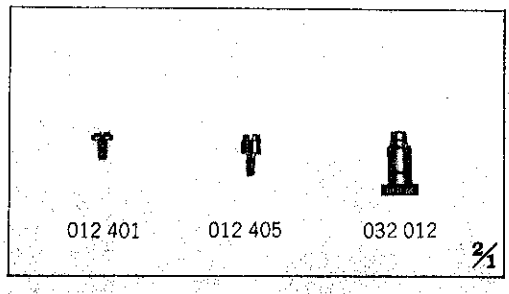


4540 027

4589 307



☆Matsushita BR2325



Cal. UW01A

Characteristics

Casing diameter : 30.9 × 28.8 mm
Maximum height : 7.05 mm
Frequency of quartz crystal oscillator : 32,768 Hz (Hz=Hertz . . . . . Cycles per second)
Time and calendar display
Alarm display
Stopwatch display
Calculator function (With keyboad)
Hourly time signal

PART NO.	PART NAME	PART NO.	PART NAME
4000 322	Circuit block		
4225 323	Battery clamp		
4245 328	Switch spring		
4246 323	Speaker lead terminal		
4257 322	Anti-static electricity plate		
4270 329	Battery connection (−)		
4313 323	Connector		
4395 322	Battery guard		
4510 027	Liquid crystal panel		
4512 027	Liquid crystal panel frame		
4540 027	Liquid crystal panel holder		
4589 307	Piezoelectric element		
012 401	Screw for liquid crystal panel holder		
012 405	Screw for battery clamp		
032 012	Tube for liquid crystal panel holder screw		
☆ Matsushita BR2325	Lithium battery		

Remarks :

Battery

Cal. UW01A
☆ Matsushita BR2325

Cal. UK01A
☆ SEIKO CR2016
☆ Maxell CR2016
☆ Sanyo CR2016
☆ Matsushita BR2016

The substitutive battery might be added to the applied battery in the future.
……In that case please refer to separate **"BATTERY LIST FOR SEIKO QUARTZ WATCHES"**.

☆ ⇨ Please see remarks.
Part numbers in light letters are not shown in photos.

Cal. UK01A

PART NO.	PART NAME	PART NO.	PART NAME
4000 323	Circuit block		
4245 329	Power switch spring		
4246 324	Lead terminal (+)		
012 025	Circuit block screw		
☆SEIKO CR2016 ☆Maxell CR2016 ☆Sanyo CR2016 ☆Matsushita BR2016	Lithium battery		

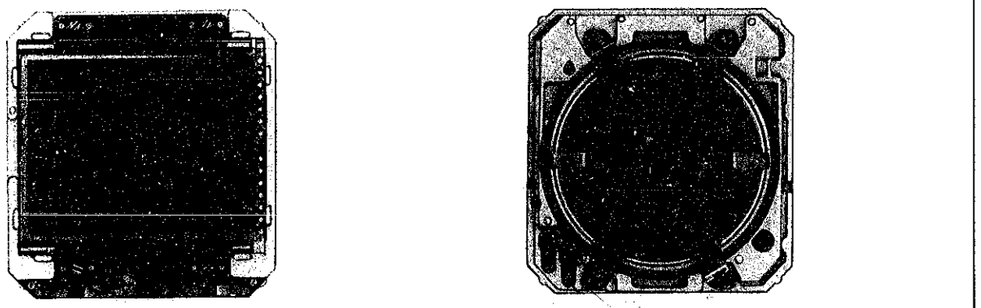
84. 4 Printed in Japan

TECHNICAL GUIDE

SEIKO

DIGITAL QUARTZ

CAL. UW01A

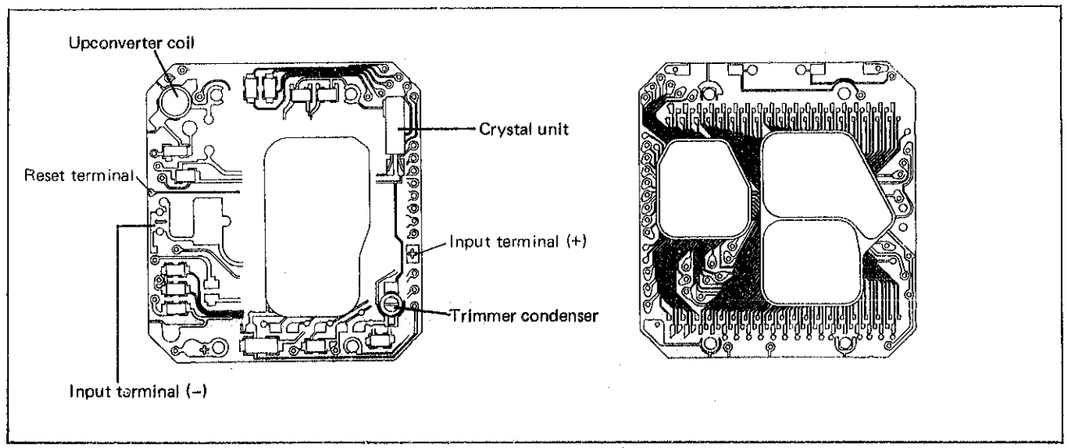


CONTENTS

I. SPECIFICATIONS

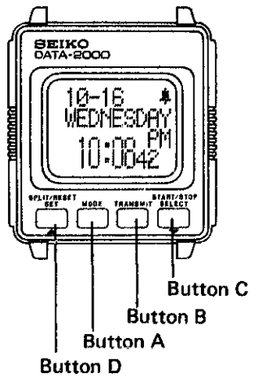
Item		Cal. UW01A (Watch)
Display medium		Nematic Liquid Crystal, FEM (Field Effect Mode)
Liquid crystal driving system		Multiplex driving system
Display system		• Time and calendar display • Stopwatch display (up to 10 hours) • Alarm display (Rings for 20 seconds) • Dual-memo display (Two memo areas, A and B, are available. Capacity per each : 1,000 characters.)
Additional mechanism		• Alarm test system • All dots light up system • Hourly time signal • Function changeover confirmation sound ("beep")
		When used with the keyboard • Memo A and Memo B input function • Calculator function
Loss/gain		Monthly rate at normal temperature range: less than 15 seconds
Movement size	Outside diameter	30.9 mm between 6 o'clock and 12 o'clock sides 28.8 mm between 3 o'clock and 9 o'clock sides
	Height	7.0 mm
Regulation system		Trimmer condenser
Measuring gate by quartz tester		Any gate can be used.
Battery		Lithium battery Matsushita BR2325 Battery life is approximately 1.5 years. Voltage: 3.0 V

II. STRUCTURE OF THE CIRCUIT BLOCK



III. DISPLAY FUNCTION

- **Names of the buttons and their functions**

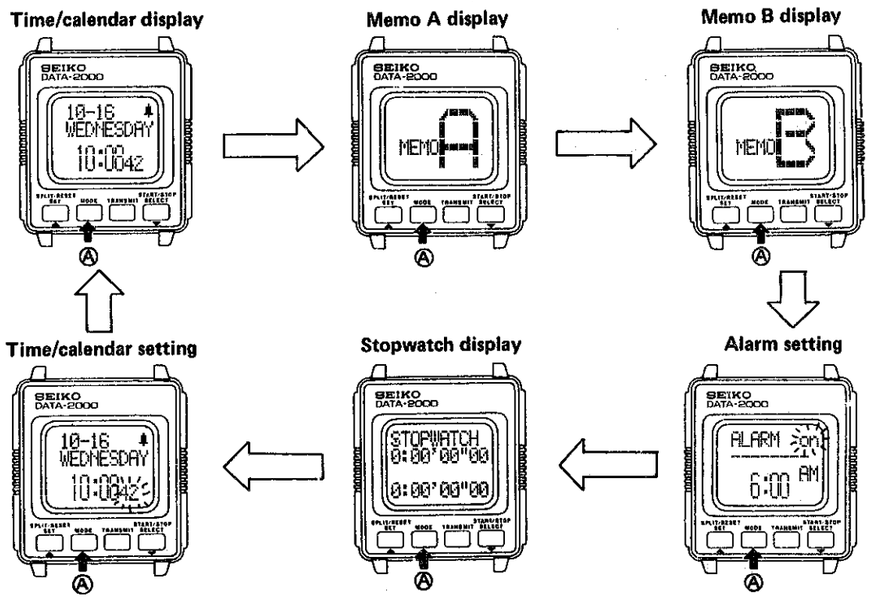


Button functions in each mode

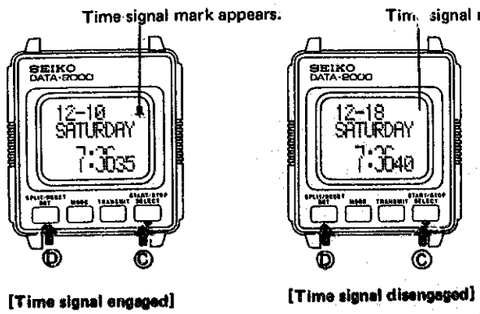
Mode \ Button	A	B	C	D
Time/calendar display	Mode change	Transmit ↓ ↑ Time/calendar display	Pressing the buttons at the same time alternately engages and disengages the hourly time signal. The alarm can be tested with a beeping sound by keeping them pressed.	
Memo A display	Mode change	Transmit ↓ ↑ Time/calendar display	Changes the display in the reverse direction by one line. Quick change by 4 lines at a time by keeping the button pressed.	Advances the display by one line. Quick advance by 4 lines at a time by keeping the button pressed.
Memo B display	Mode change	Transmit ↓ ↑ Time/calendar display		
Alarm setting	Mode change	Transmit ↓ ↑ Time/calendar display	Select	Set
Stopwatch display	Mode change	Transmit ↓ ↑ Time/calendar display	Start/Stop	Split/Reset
Time/calendar setting	Mode change	Transmit ↓ ↑ Time/calendar display	Select	Set

- **Changeover of the display**

The display changes in the following order with each press of button A.



- **Alarm test, and how to engage and disengage the hourly time signal**

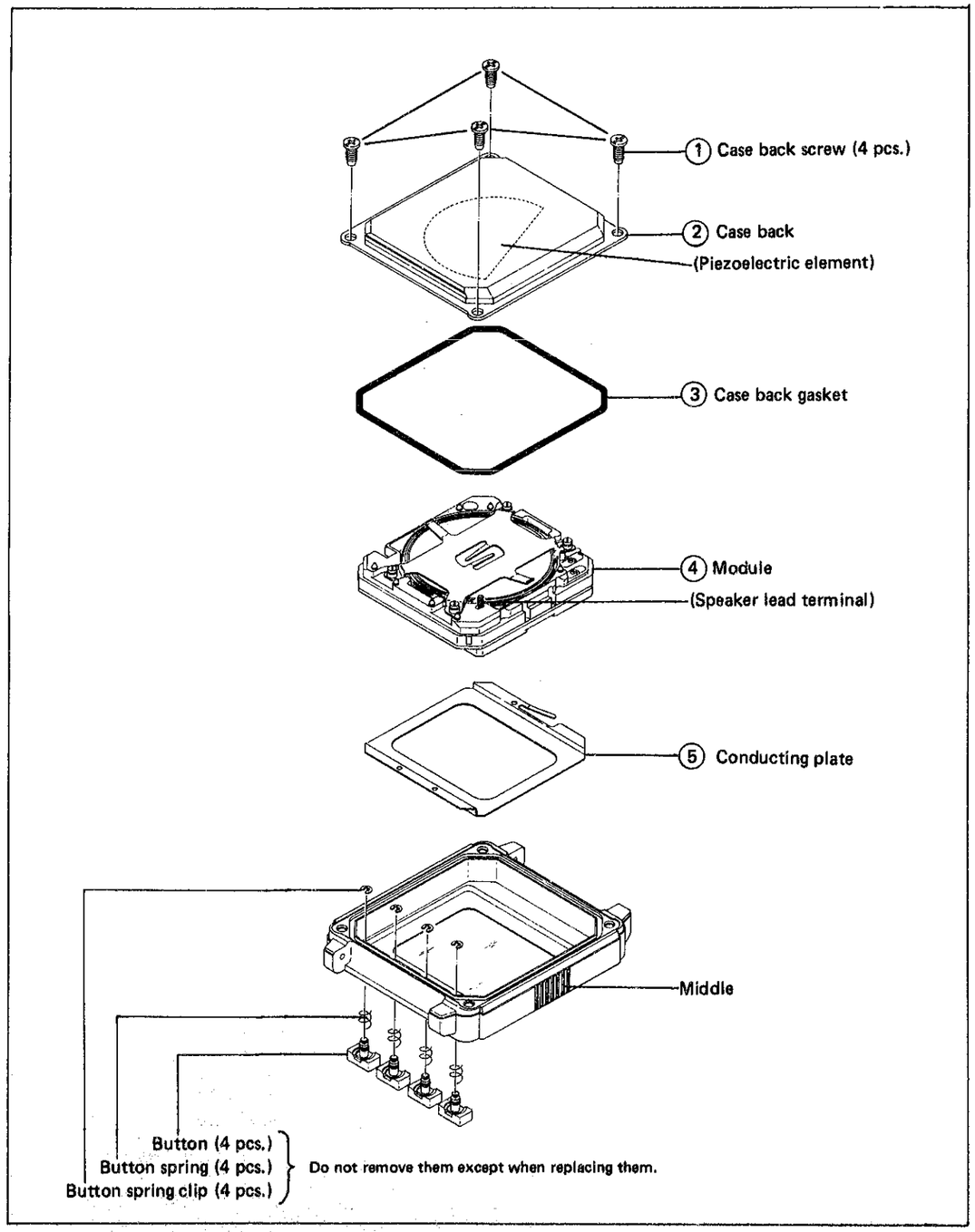


In the time/calendar display, pressing buttons C and D at the same time alternately engages and disengages the hourly time signal and the button operation confirmation sound in each mode.
The alarm can be tested with a beeping sound by keeping buttons C and D pressed.

IV. DISASSEMBLING AND REASSEMBLING OF THE CASE

Disassembling procedures Figs. : ① → ⑤
Reassembling procedures Figs. : ⑤ → ①

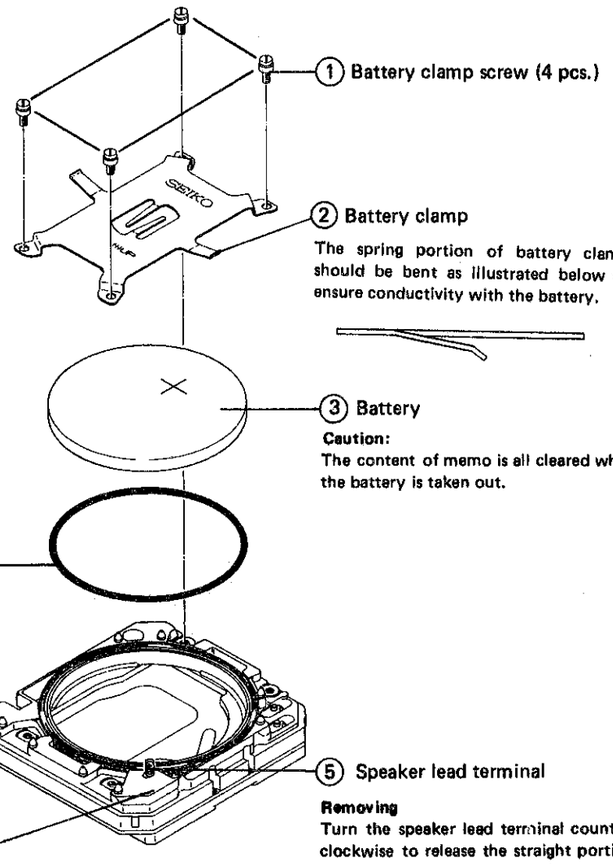
- **Case back screw ~ Conducting plate**



V. DISASSEMBLING AND REASSEMBLING OF THE MODULE

Disassembling procedures Figs. : ① → ⑮
Reassembling procedures Figs. : ⑮ → ①

1. Battery clamp screw ~ Speaker lead terminal



① Battery clamp screw (4 pcs.)

② Battery clamp

The spring portion of battery clamp should be bent as illustrated below to ensure conductivity with the battery.

③ Battery

Caution:
The content of memo is all cleared when the battery is taken out.

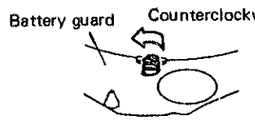
④ Battery spacer (Gasket)
Parts code 0A2135B01

Battery spacer should be installed when the watch is provided with a white battery guard.

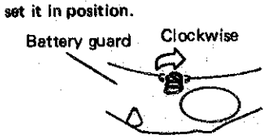
⑤ Speaker lead terminal

(Module)

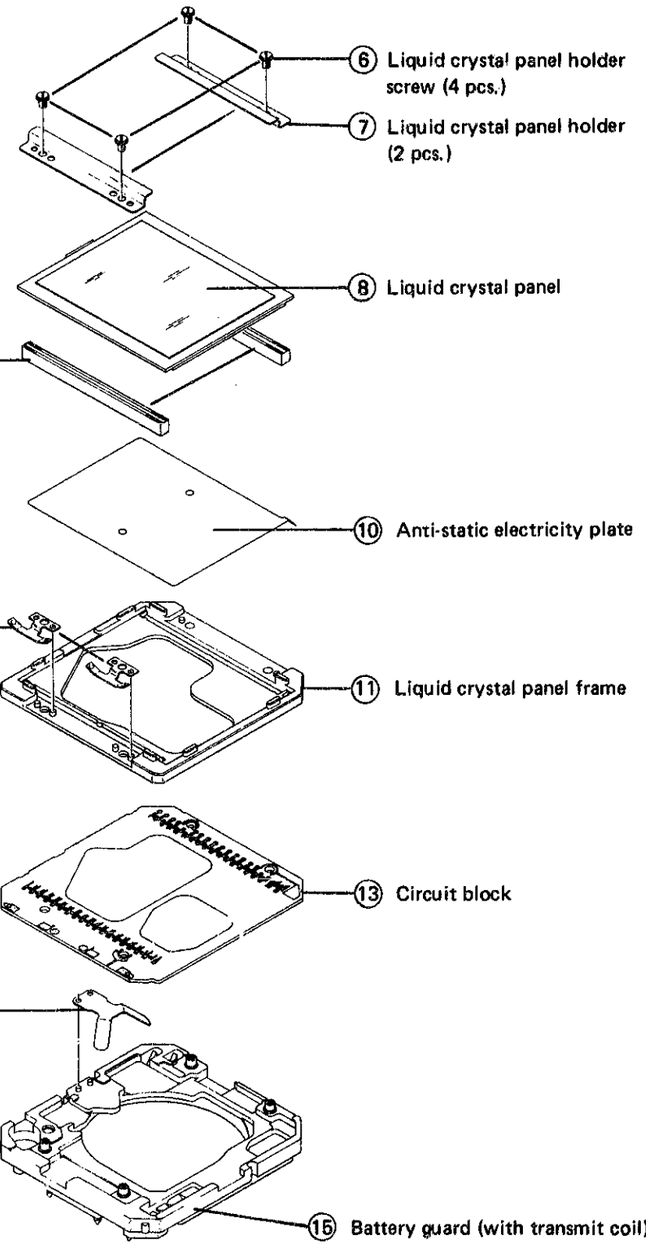
Removing
Turn the speaker lead terminal counterclockwise to release the straight portion of its end from the groove and remove it.



Installing
Turn the speaker lead terminal clockwise to hook the straight portion at the end of the speaker lead terminal to the groove and set it in position.



2. Liquid crystal panel holder screw ~ Battery guard



⑥ Liquid crystal panel holder screw (4 pcs.)

⑦ Liquid crystal panel holder (2 pcs.)

⑧ Liquid crystal panel

⑨ Connector (2 pcs.)

⑩ Anti-static electricity plate

⑫ Switch spring (2 pcs.)

⑪ Liquid crystal panel frame

⑬ Circuit block

⑭ Battery connection (–)

⑮ Battery guard (with transmit coil)

VI. CHECKING AND ADJUSTMENT

- The explanation here is only for the particular points of Cal. UW01A.
  Refer to the "TECHNICAL GUIDE, GENERAL INSTRUCTION" for SEIKO Digital Quartz for details.

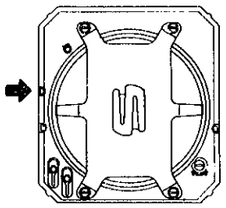
Procedure

Remarks on battery replacement

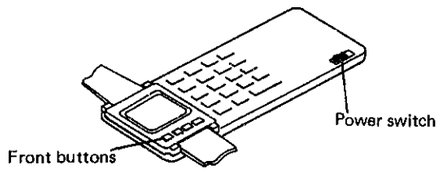
Reset the circuit after installing the battery in either of the following methods to display as shown on the right.

– Watch alone –

Touch the reset terminal on the circuit block (marked with the arrow in the illustration below) and the plus terminal, such as case, battery, or battery clamp, at the same time to short-circuit with tweezers.



– Watch with keyboard –



① Press the front 4 buttons of the watch at the same time.

② While keeping the front 4 buttons of the watch pressed as described in ①, repeat sliding the keyboard's power switch from "OFF" to "ON" several times.

Cautions:
If the battery is taken out at the time of the battery replacement or if the battery has run down when the watch is in use, the content of memo is all cleared.

CHECK BATTERY VOLTAGE

Use the Digital Multi-Tester S-840.

Mode to be used: DC V

Before starting measurement, short-circuit the probes to see that the Digital Multi-Tester displays "AUTO 00.0 mV" or "AUTO 00.1 mV".

Result:

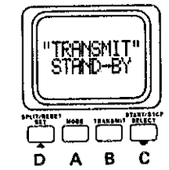
Normal : More than 2.6 V
Defective: Less than 2.6 V

Note:
After installing a battery, reset the circuit. See the explanation in the above for resetting the circuit.

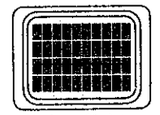
Procedure

CHECK ALL THE DOTS LIT UP

1. Press button B in the time and calendar display. ➡



2. Press button A while keeping button C pressed. ➡



All dots light up

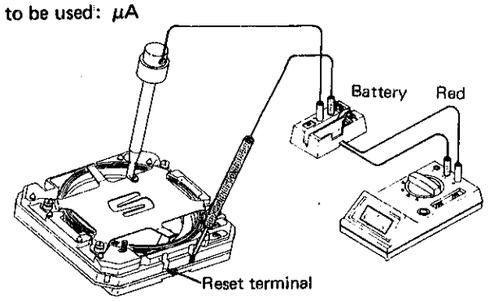
3. This can be released by pressing button C. ➡

Time/calendar display

CHECK CURRENT CONSUMPTION

Check current consumption for the whole of the module.
1. Remove the battery clamp screw (4 pcs.) and the battery clamp, and then take out the battery.
2. Reset them excluding the battery.
3. Apply tweezers to the reset terminal and the battery clamp to short-circuit them.

Use the Digital Multi-Tester S-840.
Mode to be used: μA



Probe red . . . . . Battery clamp
Probe black . . . . (–) terminal on the circuit block

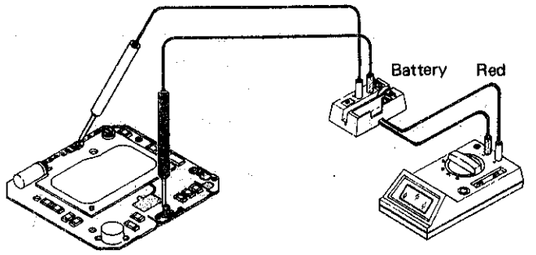
Result:

Normal : Less than 18 μA
Defective: More than 18 μA
*Check current consumption for the circuit block alone.

***How to find defects when the current consumption is more than 18μA**

Check current consumption for the circuit block alone.
DC power supply (Output voltage: DC 3V)

Probe red . . . . . Input terminal (+)
Probe black . . . . Input terminal (–)



Result:

Normal (Circuit block) : Less than 10μA
Replace the liquid crystal panel with a new one.

Defective (Circuit block) : More than 10μA
Replace the circuit block with a new one.

CHECK CONTACT BETWEEN C-MOS-LSI AND LIQUID CRYSTAL PANEL

Referring to the "RELATIONSHIP BETWEEN THE SEGMENT (LIQUID CRYSTAL PANEL ELECTRODE) AND THE C-MOS-LSI OUTPUT TERMINAL", check for poor conductivity of the liquid crystal panel, connector, and C-MOS-LSI output terminal.

CHECK CONDUCTIVITY OF SWITCH COMPONENTS

Check to see if the switch components operate normally.

CHECK ACCURACY

Light up all dots by referring to the procedure "CHECK ALL THE DOTS LIT UP". That facilitates measuring the daily rate.

CHECK FUNCTIONING AND ADJUSTMENT

Result:

Normal : Functions correctly.

Defective : Does not function correctly.
Reset the circuit or proceed to CHECK CIRCUIT BLOCK and CHECK CONDUCTIVITY OF SWITCH COMPONENTS.

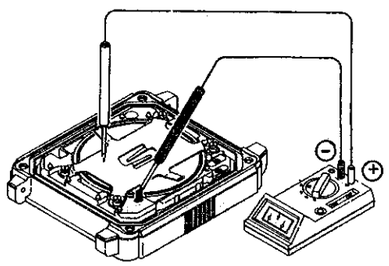
CHECK ALARM CONDITION

(1) Check to see if the output voltage for alarm is correctly transmitted from the circuit block.

Activate the alarm test system by pressing buttons C and D at the same time in the time and calendar display.

Digital Multi-Tester S-840.
Mode to be used: DC V or μA

Probe red . . . . . Battery clamp
Probe black . . . . . Speaker lead terminal



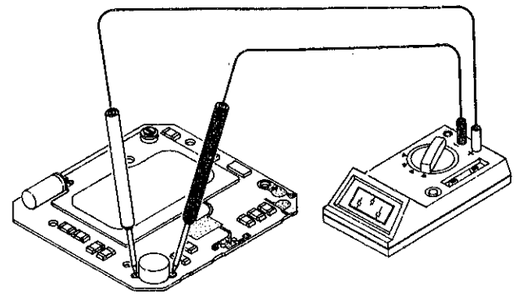
Result:

Normal : The output voltage is displayed intermittently.
Proceed to (3).

Defective : The digits displayed remain "00.0 V".
Proceed to (2).

(2) Check the upconverter coil.

Use the Digital Multi-Tester S-840.
Mode to be used: Ω



Result:

Normal : 110Ω ~ 150Ω
Proceed to (3).

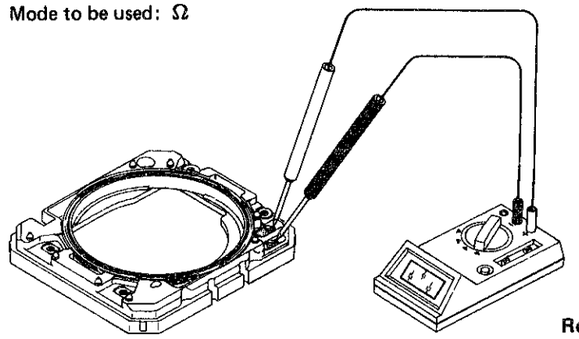
Defective — Less than 110Ω (Short circuit)
More than 150Ω (Broken wire)
Replace the circuit block.

(3) Check the piezoelectric element.

Check the piezoelectric element to see if there is any crack, chip, peeling, or the like on it.
Check to see if the piezoelectric element conducts the speaker lead terminal.

CHECK TRANSMIT COIL

Use the Digital Multi-Tester S-840.
Mode to be used: Ω



Result:

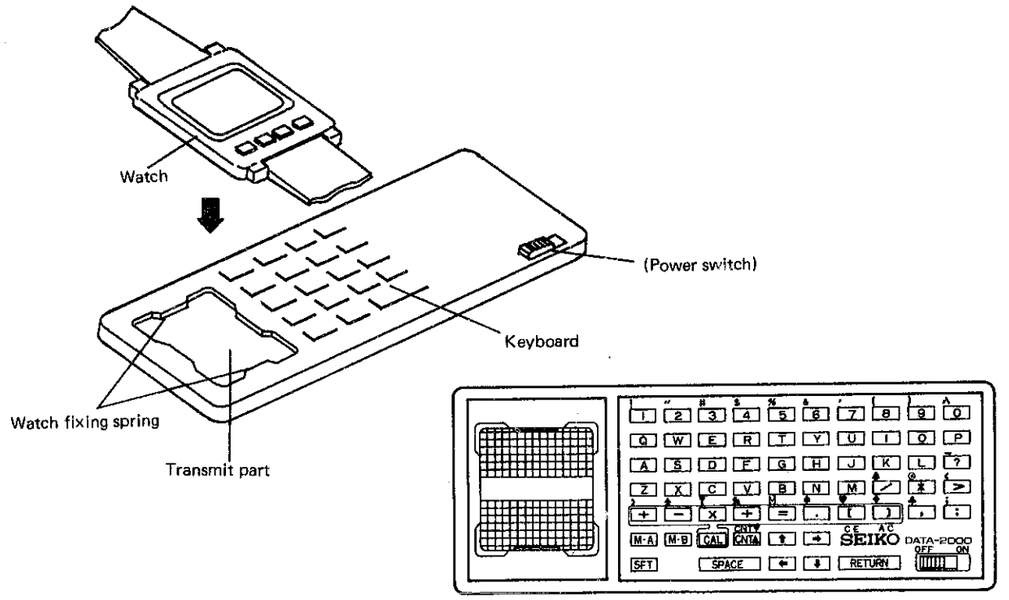
Normal : 3.0 KΩ ~ 5.0 KΩ

Defective — Less than 3.0 KΩ (Short circuit)
More than 5.0 KΩ (Broken wire)
Replace the battery guard with a new one.

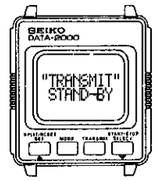
VII. SPECIFICATIONS

Item		Cal. UK01A (Keyboard)
Function		• Data input for Memo A and B • Calculation • Contrast control of the watch's display
Wireless data transmit system	Transmit method	Electromagnetic coupling bidirectional serial system
	Transmit speed	Approximately 2,048 baud (Baud = Number of bits to be transmitted per second)
	Carrier frequency	32 KHz
Overall dimensions		140 (+) x 54 (D) x 9 (H) mm
Operational temperature range		0°C ~ +40°C
Battery		Lithium battery SEIKO (SEIZAIKEN) CR2016, Maxell CR2016, Sanyo CR2016 or Matsushita BR2016 Battery life is approximately 5 years (if the keyboard is used for 2 hours a day, operating the keys 3,000 times in total a day). Voltage: 3.0 V

VIII. OPERATION



① Push button B of the watch to display '"TRANSMIT" STAND-BY'.



② Set the watch to the keyboard.

③ Turn on the power switch of the keyboard.

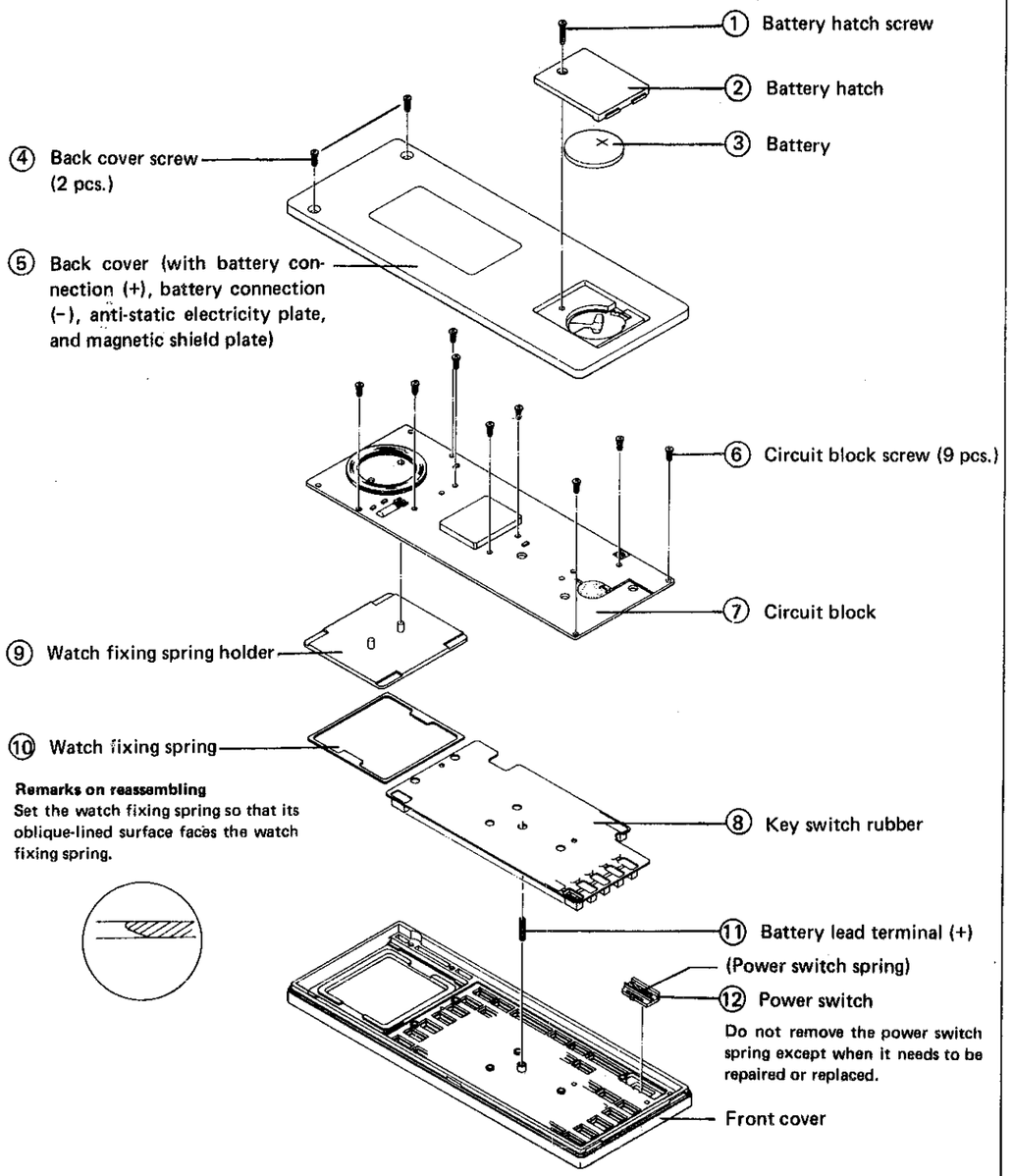
④ Push keys.

M – A M – B		Memo input function (Push the ↓ or RETURN key to display the memo area.)
CAL	:	Calculator function
CNT▲	:	Contrast increase
SFT + CNT▲	:	Contrast decrease

- **Disassembling and reassembling**

Disassembling procedures Figs.: ① → ⑫

Reassembling procedures Figs.: ⑫ → ①



IX. CHECKING AND ADJUSTMENT

Procedure

Remarks on battery replacement
- It is possible for users to replace the battery of keyboard.
- Turn off the power switch before taking out the old battery.
- After installing the battery, slide the power switch "OFF" → "ON" → "OFF" to reset the circuit.

CHECK BATTERY VOLTAGE

Use the Digital Multi-Tester S-840.
Mode to be used: DC V

Before starting measurement, short-circuit the probes to see that the Digital Multi-Tester displays "AUTO 00.0 mV" or "AUTO 00.1 mV".

Result:
Normal : More than 2.4 V
Defective: Less than 2.4 V

Note:
After installing the battery, reset the circuit by sliding the power switch "OFF" → "ON" → "OFF".

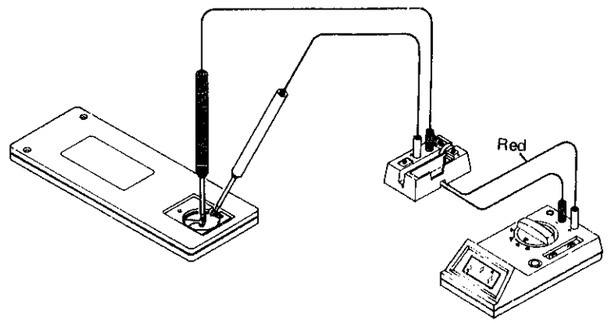
CHECK CURRENT CONSUMPTION

Use the Digital Multi-Tester S-840.
Mode to be used: μA

DC power supply
Output voltage: DC 3 V

Probe red . . . . . Battery connection (+)
Probe black . . . . . Battery connection (−)

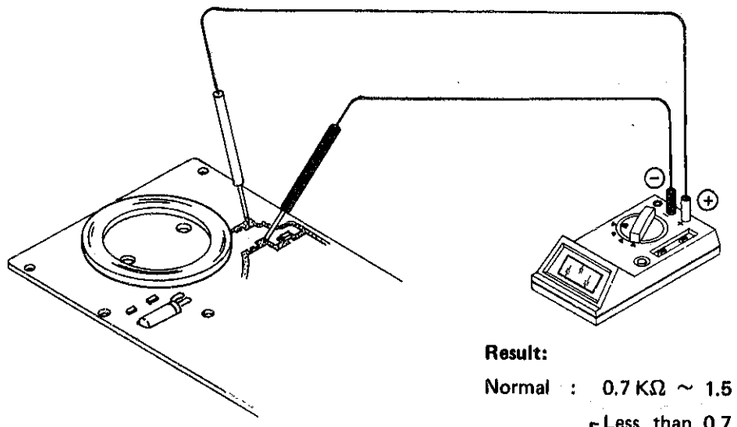
Result:
Normal : Less than 20 μA
Defective: More than 20 μA
Replace the circuit block with a new one.



Procedure

CHECK COIL BLOCK

Use the Digital Multi-Tester S-840.
Mode to be used: Ω



Result:

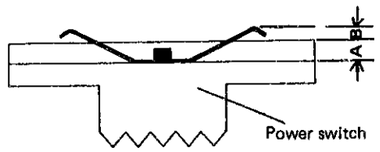
Normal : 0.7 KΩ ~ 1.5 KΩ

Defective — Less than 0.7 KΩ (Short circuit)
Defective — More than 1.5 KΩ (Broken wire)

Replace the circuit block with a new one.

CHECK CONDUCTIVITY OF SWITCH COMPONENTS

(1) Check the height of the power switch spring.



Result:

Normal : B ≧ A

Defective: B < A

Adjust the height with tweezers.

(2) Check for any contamination on the contacts of the power switch and the circuit block.

(3) Check for any contamination on the contacts of the key switch rubber and the circuit block.

CHECK FUNCTIONING

All procedures of Disassembling, Reassembling, Checking and Adjustment are completed.