

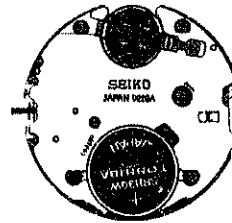
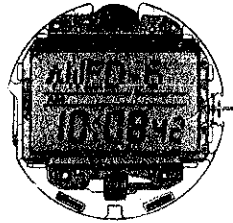
**SEIKO**

**DIGITAL QUARTZ**

**Cal. D229A**

**PARTS  
CATALOGUE**

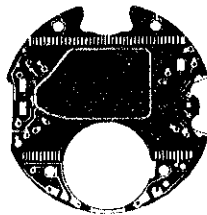
# Cal. D229A



☆ 354 449



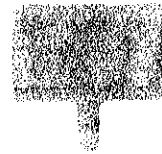
782 444



4001 444



4256 444



4257 445



4270 444



4271 444



4313 444



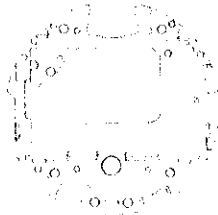
4313 445



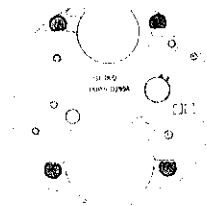
4313 446



☆ 4313 447



4398 446



4398 447



4398 449



☆ 4398 450



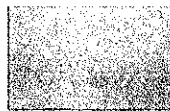
4408 028



4450 445



4510 026



4521 444



4530 010



4540 444



4580 446



☆ 4580 447



4991 237



☆ 4991 239



☆ Toshiba SR1130W



012 462



017 293



017 518



017 519

2/1

# Cal. D229A

## Characteristics

Casing diameter :  $\phi$  28.3 mm  
 Maximum height : 5.1 mm without battery  
 Frequency of quartz crystal oscillator : 32,768 Hz (Hz=Hertz . . . . Cycles per second)  
 Time and calendar display : Digital display system showing hour (12-hour or 24 hour indication), minute, second, date and day of the week. Year is displayed only when the calendar is adjusted.  
 Timer display : Can be set to count down any number of minute from 1 minute to 20 hours.  
 Alarm display : Can be set to operate at any desired hour and minute in 3 kinds of alarm time.  
 Stopwatch display : Hour, minute, second, and 1/100 second up to 10 hours.  
 Display medium : Nematic Liquid crystal, FE-Mode.  
 Regulation system : Trimmer condenser  
 Time signal : Can be set to ring every hour on the hour.  
 Illuminating light : Illuminates the display in the dark.  
 Battery life indicator : All the digits in the display begin flashing by depressing the light button.

PART NO.	PART NAME	PART NO.	PART NAME
☆354 449	Winding stem	017 518	Speaker lead pin
782 444	Setting lever spring	017 519	Switch lever pin
4001 444	Circuit block	☆ Toshiba SR1130W	Silver oxide battery
4256 444	Speaker block fixing spring	☆ Maxell SR1130W	
4257 445	Anti-static electricity plate	☆ U.C.C. 389	
4270 444	Battery connection (-)		
4271 444	Battery connection (+)		
4313 444	Connector (A)		
4313 445	Connector (B)		
4313 446	Connector (C)		
☆4313 447	Liquid crystal panel frame		
4398 446	Battery guard		
4398 447	Speaker block frame		
4398 449	Speaker block frame		
☆4398 450	Switch lever washer		
4408 028	Switch lever		
4450 445	Liquid crystal panel		
4510 026	Reflecting mirror		
4521 444	Bulb		
4530 010	Liquid crystal panel holder		
4540 444	Speaker block		
4580 446	Speaker block		
☆4580 447	Speaker gasket		
4991 237	Liquid crystal panel holder screw		
☆4991 239	Tube for Liquid crystal panel holder screw		
012 462			
017 293			

### Remarks :

#### Winding stem

☆354 449 . . . . . There are two connectors designated by the same number, which have different patterns on their sides. However they are interchangeable.

#### Connector, Speaker block frame, Speaker block, Speaker gasket

☆4313 447 }  
 ☆4398 450 } The parts designated with these parts numbers are manufactured specially for the water  
 ☆4580 447 } . . . . . resistant case of a pressure of 10 atmospheres (100 meters or 300 feet). Be sure to  
 ☆4991 239 } use these parts for maintaining high-water-resistant quality.

#### Battery

☆ Toshiba SR1130W }  
 ☆ Maxell SR1130W } The substitutive battery might be added to the applied battery in the future.  
 ☆ U. C. C. 389 } . . . . . In that case, please refer to separate "BATTERY LIST FOR SEIKO QUARTZ  
**WATCHES".**

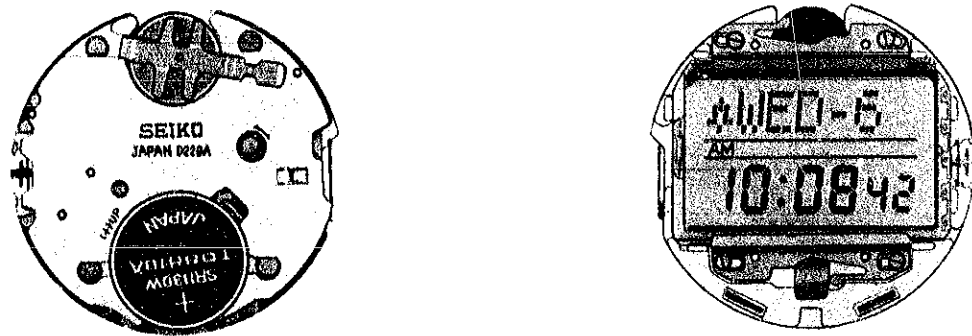
☆ ⇨ Please see remarks.

Part numbers in light letters are not shown in photos.

# TECHNICAL GUIDE

## SEIKO DIGITAL QUARTZ

CAL. D229A



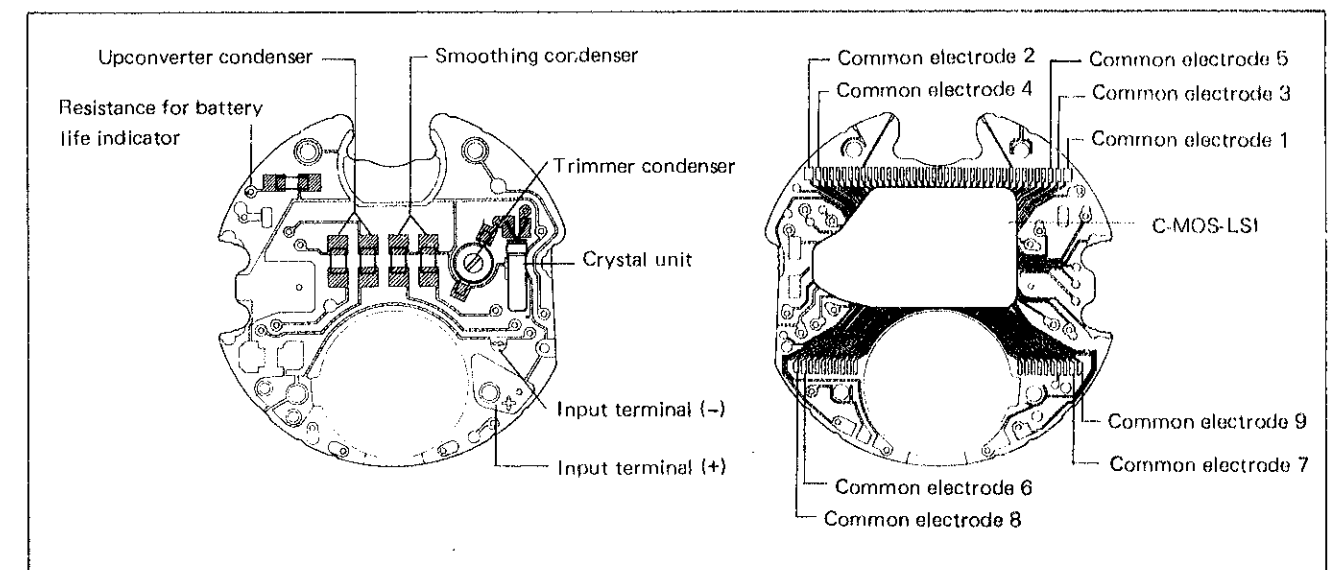
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## I. SPECIFICATIONS

Item	Cal. No.	D229A
Display medium		Nematic liquid crystal, FEM (Field Effect Mode)
Liquid crystal driving system		Multiplex driving system
Display system		Dot-matrix display (upper row) Segment display (lower row) <ul style="list-style-type: none"> <li>• Alarm function</li> <li>• Time and calendar function (12- or 24-hour indication)</li> <li>• Stopwatch function</li> <li>• Timer function</li> </ul>
Additional mechanism		<ul style="list-style-type: none"> <li style="width: 50%;">• Time signal</li> <li style="width: 50%;">• Pattern segments checking system</li> <li style="width: 50%;">• Alarm test system</li> <li style="width: 50%;">• Changeover confirmation sound</li> <li style="width: 50%;">• Battery life indicator</li> <li style="width: 50%;">• Illuminating light</li> </ul>
Loss/gain		Loss/gain at normal temperature range Monthly rate : less than 15 seconds (Annual rate : less than 3 minutes)
Casing diameter		φ28.3mm
Height		5.1 mm without battery
Regulation system		Trimmer condenser
Measuring gate by Quartz Tester		Any gate is available
Battery		Silver oxide battery Maxell SR1130W, U.C.C. 389, Toshiba SR1130W Battery life is approximately 2 years Voltage: 1.55V

## II. STRUCTURE OF CIRCUIT BLOCK



### III. DISASSEMBLING, REASSEMBLING AND LUBRICATING

#### ● Remarks for setting of battery

When replacing a battery or reassembling a battery after repairing the watch, be sure to adjust the time and the calendar through the following procedures. Depress quick selection buttons "1" (Alarm) and "2" (Timer) on the front panel at the same time while depressing button "A" with the winding stem pulled out.


When the buttons are depressed, all displays disappear, and when they are released the display shows the time of 12:00'00" A.M., Thursday, January 1, 1981.

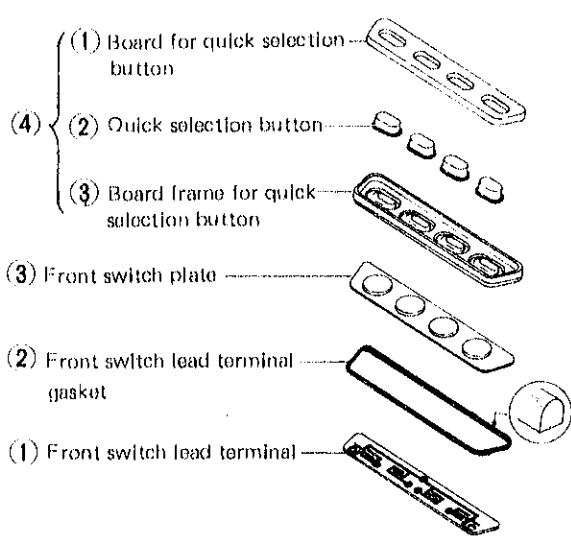
#### 1. Disassembling, reassembling and lubricating of the case

Followings are the procedures for disassembling and reassembling of the front switch portion.

Disassembling procedures: ① ~ ④

Reassembling procedures: ④ ~ ①

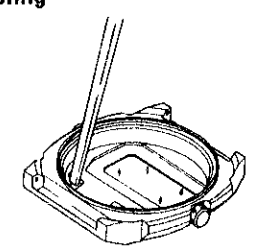
Lubricating: SEIKO Watch Oil S-6 



① Board for quick selection button  
② Quick selection button  
③ Board frame for quick selection button  
④ Front switch plate  
⑤ Front switch lead terminal gasket  
⑥ Front switch lead terminal

Middle with bezel  
Guide pin for front switch lead terminal

**Disassembling**



Push the front switch portion from the back side of the middle with bezel with a soft stick.

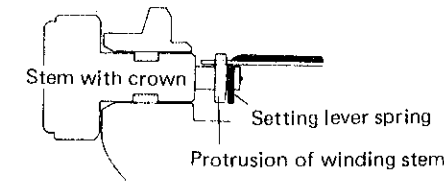
**Reassembling**

First set the board for quick selection button and quick selection buttons into the front switch plate and reassemble it into the middle with bezel. When reassembling, use the replaced board for quick selection button as an inserting disk.

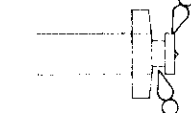
● Reassembling of the winding stem

As shown in the illustration, be sure to set the setting lever spring in the groove of the winding stem.

(There are two types of winding stem, one with 4 protrusions and the other with 2 protrusions.)



● Lubricating of the winding stem



**Remarks for reassembling**


- Parts to be set in the fixed direction
 

Front switch lead terminal	:	Set it with its pattern side up.
Front switch lead terminal gasket	:	Place it with its rounded surface up.
Front switch plate	:	Place it with its projecting surface up.
- Be sure to replace the following parts with new ones when reassembling.  
Keyboard fixing frame, Front switch plate, Front switch lead board.

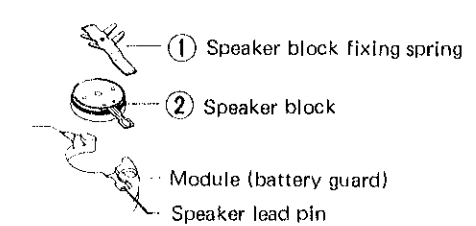
#### 2. Disassembling, reassembling and lubricating of the module

Disassembling procedures: ① ~ ⑩

Reassembling procedures: ⑩ ~ ①

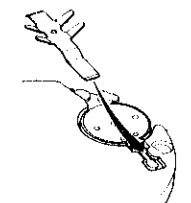
Lubricating: SEIKO Watch Oil S-6 

● Battery side



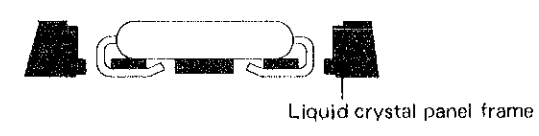
① Speaker block fixing spring  
② Speaker block  
Module (battery guard)  
Speaker lead pin

● How to set the speaker block fixing spring



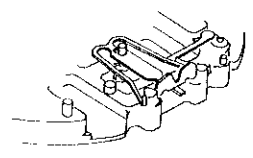
● Bulb

It is not necessary to remove the bulb except when the defective bulb is replaced with a new one. When replacing, insert the both ends of bulb lead wire into the holes of the liquid crystal panel frame as shown in the illustration.

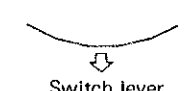


● Setting position of the switch lever

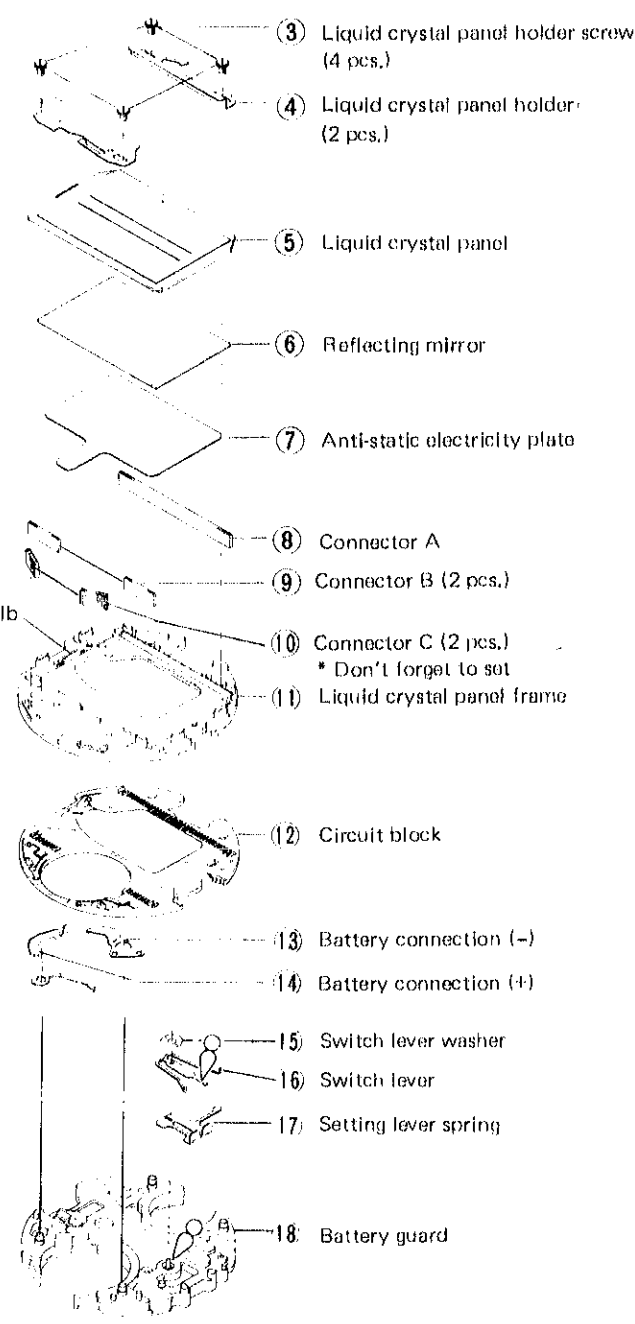
Be sure to assemble the switch lever so that the bending portions of the tips face the circuit block.



● How to set the switch lever washer

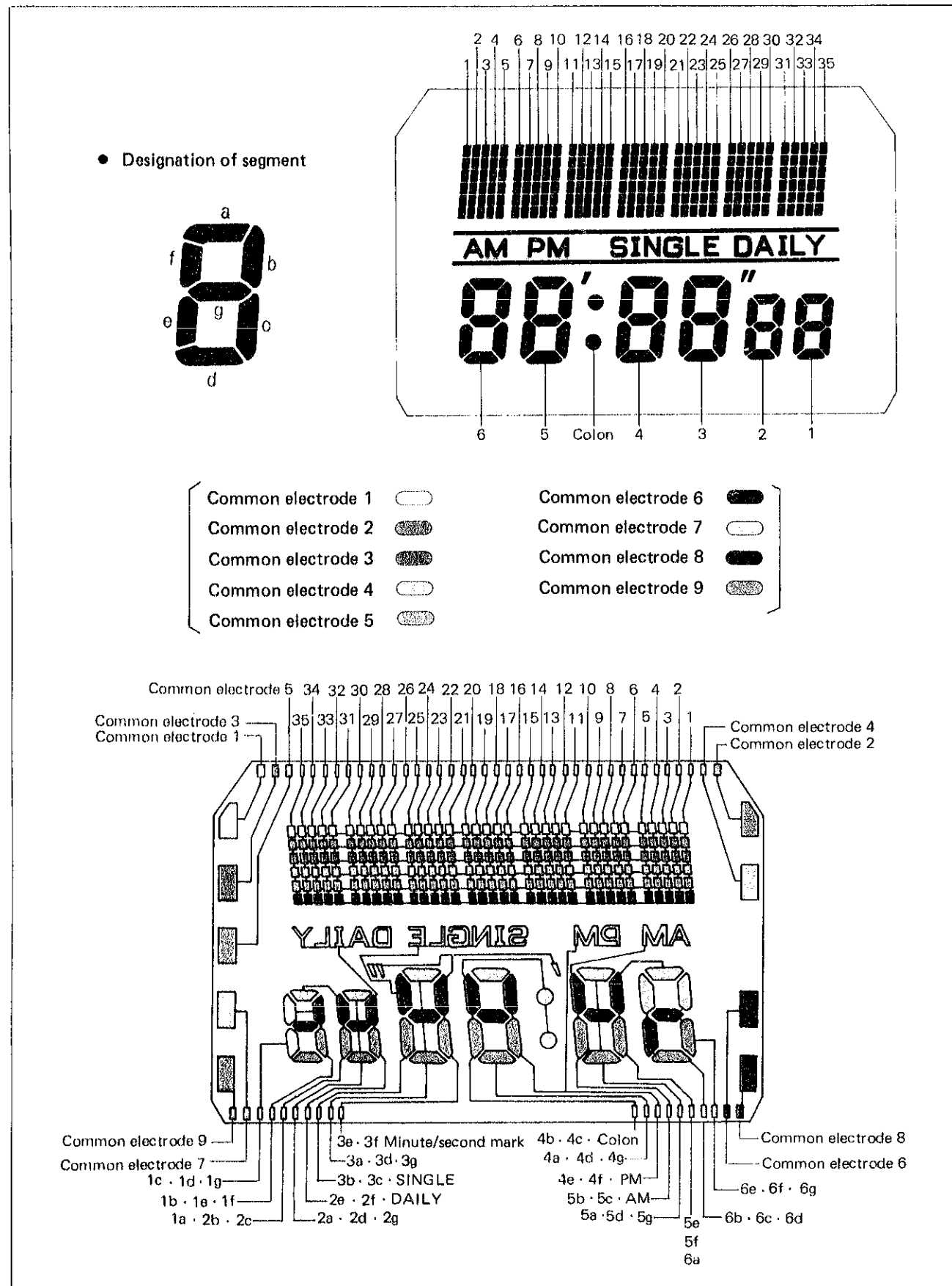


● Liquid crystal panel side



③ Liquid crystal panel holder screw (4 pcs.)  
④ Liquid crystal panel holder (2 pcs.)  
⑤ Liquid crystal panel  
⑥ Reflecting mirror  
⑦ Anti-static electricity plate  
⑧ Connector A  
⑨ Connector B (2 pcs.)  
⑩ Connector C (2 pcs.)  
\* Don't forget to set  
⑪ Liquid crystal panel frame  
⑫ Circuit block  
⑬ Battery connection (-)  
⑭ Battery connection (+)  
⑮ Switch lever washer  
⑯ Switch lever  
⑰ Setting lever spring  
⑱ Battery guard

### 3. Relationship between the segment (Liquid crystal panel electrode) and C-MOS-LSI output terminal



### IV. CHECKING AND ADJUSTMENT

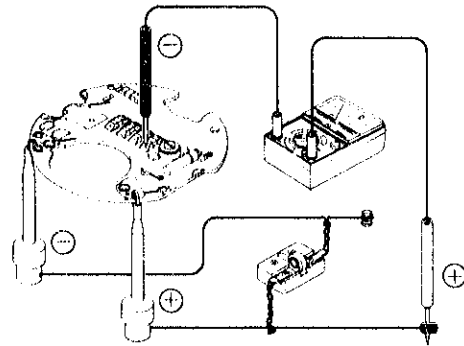
Refer to the "SEIKO QUARTZ TECHNICAL GUIDE, GENERAL INSTRUCTION" for Digital Watches for details.

Procedure	
<b>CHECK BATTERY VOLTAGE</b>	<b>Result:</b> More than 1.5V: Normal Less than 1.5V: Defective
<b>CHECK BATTERY CONDUCTIVITY</b>	
<b>CHECK ALL DOTS AND SEGMENTS DISPLAY</b>	<b>Result:</b> All dots and segments light up: Normal Any parts of dots or segments don't light up: Defective
<ul style="list-style-type: none"> <li>Depress the quick-selection button "4" (TIME) for 3 to 4 seconds continuously, and all the dots and segments light up.</li> </ul> <p>[Ex: Defective dot display] When a vertical line of dots do not light up ..... Defective conductivity other than common electrode. When a horizontal line of dots do not light up ..... Defective conductivity of common electrode.</p>	
<b>CHECK CONDUCTIVITY OF LIQUID CRYSTAL PANEL, CIRCUIT BLOCK AND CONNECTOR</b>	
<b>CHECK CIRCUIT BLOCK</b>	
<p>1. Check output voltage for circuit block.</p> <p>Range to be used: DC3V</p>	<b>Result:</b> More than 0.8V: Normal Less than 0.8V: Defective Replace the circuit block with a new one.

Procedure

2. Check upconverter voltage of the circuit block

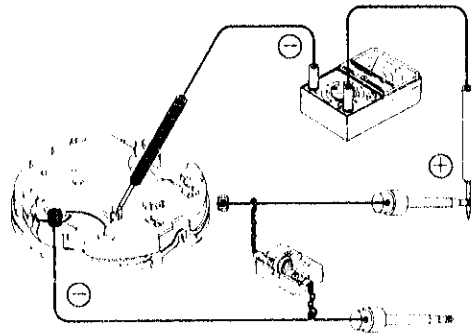
Range to be used: DC3V



**Result:**  
 More than 4.0V: Normal  
 Less than 4.0V: Defective  
 Replace the circuit block with a new one.

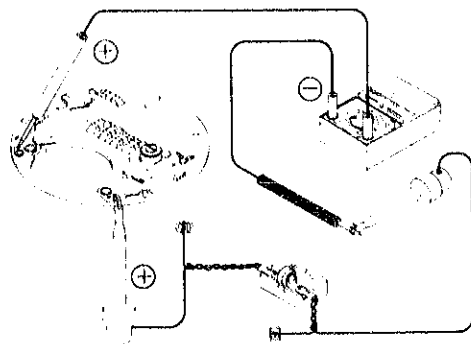
CHECK CURRENT CONSUMPTION

- Check the current consumption for the whole of the module.



**Result:**  
 Less than 4.0μA: Normal  
 More than 4.0μA: Defective

- How to check if the liquid crystal panel or the circuit block is defective when the current consumption is more than 4.0μA.



Check the current consumption with the circuit block alone.

**Result:**  
 Less than 2.8μA  
 Replace the liquid crystal panel with a new one.  
 More than 2.8μA  
 Replace the circuit block with a new one.

CHECK SPEAKER BLOCK

**Result:**  
 120Ω ~ 140Ω: Normal  
 Less than 120Ω (Short circuit) } Defective  
 More than 140Ω (Broken wire) }  
 Replace the speaker block with a new one.

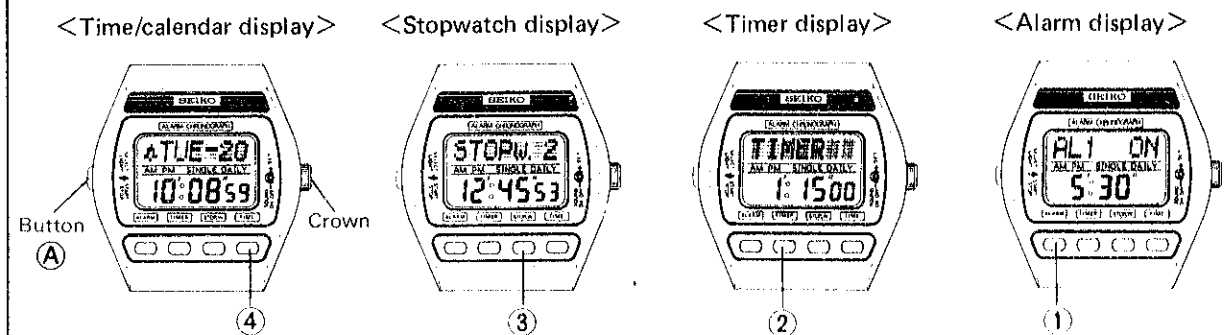
Procedure

CHECK ACCURACY

- Depress the Quick-selection button "4" (TIME) for 3 to 4 seconds continuously, and all dots and segments light up. That facilitates measuring the daily rate.

CHECK FUNCTIONING AND ADJUSTMENT

- Check to see if the display changes in the following order by depressing the quick-selection button "1", "2", "3" and "4"



- Check to see if each display functions correctly.

Alarm time setting:

Check to see if in the alarm display, the setting of the alarm time can be made by pulling out the crown and turning it. And check also if the alarm type can be selected by turning the crown after depression of button "A".

Timer setting:

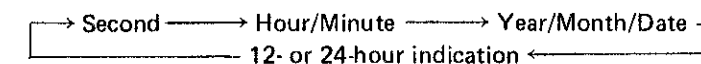
Check to see if in the timer display, the setting of the timer can be made by pulling out the crown and turning it. And check also if each depression of button "A" repeats start and stop of counting down with the crown pushed in.

Stopwatch operating:

Check to see if in the stopwatch display, each depression of button "A" repeats start and stop of measuring and also if the digits can be reset to "00" by depressing the quick-selection button "3".

Time/calendar setting:

Check to see if in the time/calendar display, the time/calendar setting function can be activated by pulling out the crown. And check to see also if the digits to be adjusted changes in the following order by each depression of button "A" and they can be adjusted by turning the crown.



- Check to see if the alarm sound can be stopped by depressing the button "A", "1", "2", "3", or "4" or turning the crown.

**Note:** When the time is set in the 24-hour indication, the alarm time will also be set in the 24-hour indication.

All procedures of disassembling, reassembling, lubricating, checking and adjustment are completed.