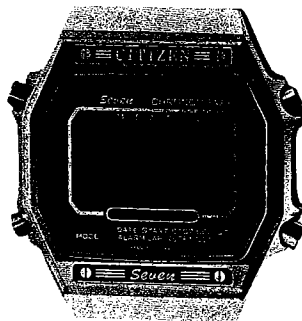


TECHNICAL INFORMATION

CITIZEN QUARTZ

Cal. No. 4921



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■1. OUTLINE

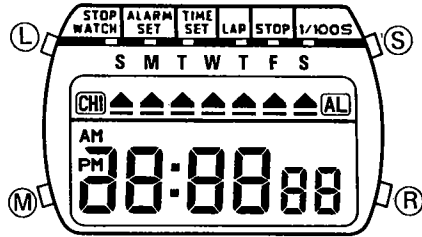
This is a liquid crystal-displayed quartz watch with alarm and stopwatch, and was designed to be popularly used by men.

■2. SPECIFICATIONS

Caliber No.		4921-00
Type		Digital quartz watch
Movement (mm)		Diameter: 27.0 ϕ Thickness: 3.75 ^t (Thickness of the power cell part: 5.45 at maximum)
Accuracy		\pm 30 seconds at normal temperatures
Oscillation		32,768Hz
Display method		FE-nematic liquid crystal, multiplex drive
Integrated circuit		C/MOS-LSI (1 unit)
Effective temp. range		0°C ~ +55°C (32°F ~ 131°F)
Adjustment of time rate		By trimmer condenser
Measurement of time rate		2 seconds
Display functions	Time	Hour, minute, second, AM/PM, day
	Calendar	Month, date, day
	Alarm	Hour, minute, AM/PM, set mark
	Stopwatch	Minute, second, 1/100 (Over 30 minutes; hour, minute, second)
	Hourly chime	Set mark
Additional functions		<ul style="list-style-type: none"> ● Fully automatic calendar (February ends with 28th) ● Switching function between 12H and 24H display ● Sound monitor ● Illumination lamp ● Previous condition restoration ● Alarm ● Hourly chime
Power cell	Parts No.	280-44
	Cell code	SR926W
	Size	9.5 ϕ x 2.6 ^t (mm)
	Voltage	1.55V
	Capacity	55mAH
	Lifetime	About 2 years
Value of current		Within 2.3 μ A (for the operation of the module)
Remarks		

■3. HANDLING INSTRUCTIONS

(1) Nomenclature

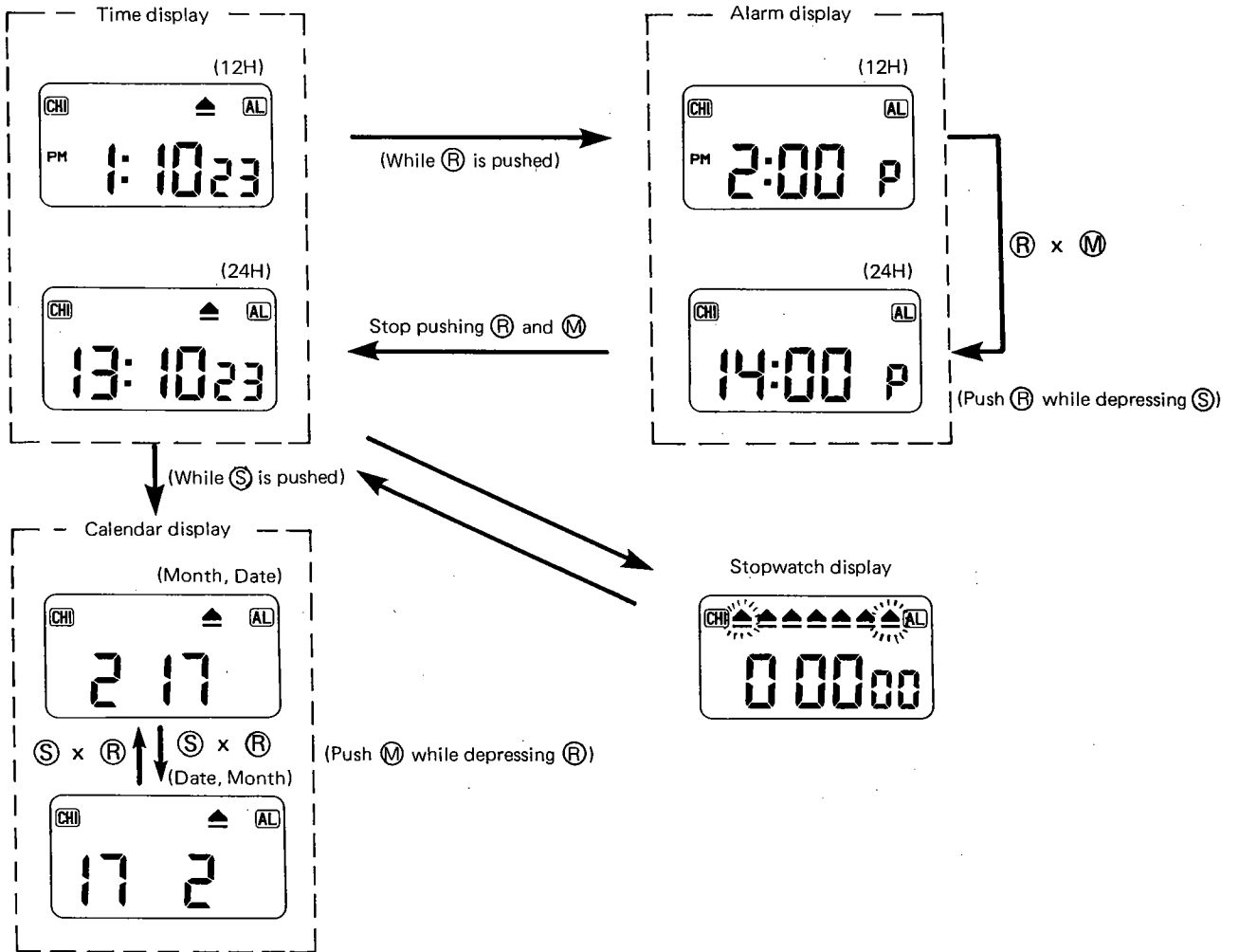


- Ⓢ : Select button
- Ⓡ : Read set button
- Ⓛ : Light button
- Ⓜ : Mode switching button
- CHI : Chime mode
- AL : Alarm mode

(2) Table of functions obtained by operating the buttons

	Time	Alarm (Keep pushing Ⓡ button)	Calendar (Keep pushing Ⓢ button)	Stopwatch
Ⓢ	*Calendar display, Selection of digits to be corrected	Alarm, chime ON/OFF		RUN/STOP
Ⓡ	*Alarm time display, Correction, Alarm stop		Switching between Month and Date display	
Ⓜ	*Selection of correction mode, Stopwatch, Previous condition restoration	Switching between 12H and 24H display		Restoration of time display
Ⓛ	Lamp	←	←	←
Ⓢ x Ⓡ	All the display keep lighting Sound monitor			

(3) Switching of the display



(4) Correcting procedures of time and calendar

<1> How to correct seconds

If the **(M)** button is pushed for more than 2 seconds when time is displayed, the hour correction mode of alarm time display is obtained. If the **(M)** button is pushed again at that moment, the second correction mode of time display is obtained and the second digits will flash.

Then, the seconds digits indicate "00" if the **(R)** button is pushed.

(If the **(R)** button is pushed when figures between 30 and 59 are being indicated on the second display, figures on the minute display will increase by one.)

<2> How to correct minutes

If the **(S)** button is pushed in the second correction mode, the minute correction mode is obtained and the minute digits will flash.

Then, push the **(R)** button, and minutes will be corrected.

<3> How to correct hours

If the **(S)** button is pushed in the minute correction mode, the hour correction mode is obtained, and the hour digits will flash.

Then, push the **(R)** button, and hours will be corrected.

(When 12H display is on, either "AM" or "PM" will flash.)

* In the time correction mode, only the flag for "TIME SET" will flash and the remaining flags will keep lighting.

<4> How to correct dates

If the **(S)** button is pushed in the hour correction mode, the calendar will be displayed and the date digits will flash.

(At this moment, the colon will not be displayed.)

Then push the **(R)** button, and dates will be corrected.

(A non-existing date which has been set in the date correction mode, will be automatically corrected and changed to the first day of the following month if the normal calendar display is restored.)

<5> How to correct months

If the **(S)** button is pushed in the hour correction mode, the calendar will be displayed and the date digits will flash.

Then push the **(R)** button, and months will be corrected.

* Calendar (month, date) will be corrected with the right-hand display first. Accordingly, in case calendar is displayed in such a way as "Date : Month", the month digits will have a priority over the date digits in correction.

<6> How to correct days of the week

If the (S) button is pushed in the month or date correction mode, the day correction mode is obtained and the flag for days will flash.

Then push the (R) button, and days will be corrected.

- * A push of the (R) button will generate one movement. A continuous push of the (R) button for more than 2 seconds will enable a quick correction at 4 Hz. (The above-described properties of the (R) button are effective in all the correction modes except in the second correction mode.)

* In any correction modes, time display will be restored by pushing the (M) button.

* Calendar will automatically change. However, it is necessary to set February 29th in a leap year because this caliber was originally designed to have 28 days in February.

(5) Operation procedures of alarm and chime

<1> Setting of On and Off

The time display will be replaced by the alarm time display with a continuous push of the (R) button.

Then push the (S) button, and both alarm and chime can be set.

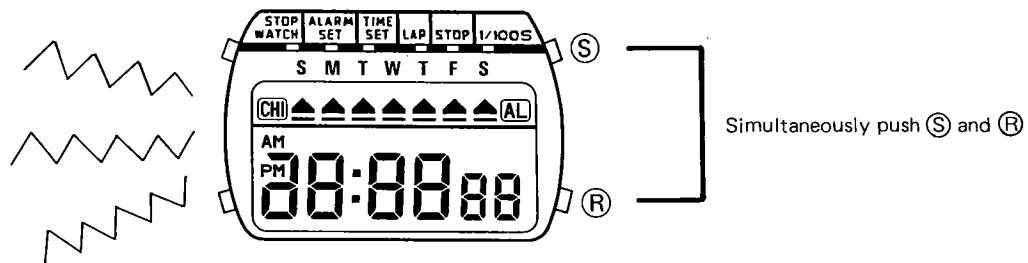
The right table shows how alarm and chime switch from ON to OFF, and vice versa, according to the number of times the (S) button is pushed, starting with both alarm and chime set to OFF.

(R) x (S)	Alarm	Chime
(S) x 1 time	OFF	ON
(S) x 2 times	ON	ON
(S) x 3 times	ON	OFF
(S) x 4 times	OFF	OFF

* Whether alarm and chime are ON or OFF is confirmed by mode mark of their own. (ON is identified with the mode mark which lights up.)

* Alarm sounds for 20 seconds. Alarm stops sounding with a push of the (R) button, even if the 20-second period has not yet come to end.

* A simultaneous push of the (S) and (R) buttons enables all the displays to light up. At this moment, alarm sound is confirmed.



All the displays keep lighting. (Alarm sound is heard.)

<2> Correcting procedures of alarm time

1. How to correct hours

If the (M) button is pushed for more than 2 seconds when time is displayed, the hour correction mode of alarm time display will be obtained and at the same time the hour digits and letters "AM" and "PM" will flash.

Then push the (R) button, and hours will be corrected.

2. How to correct minutes

If the (S) button is pushed in the hour correction mode, the calendar will be displayed and the date digits will flash.

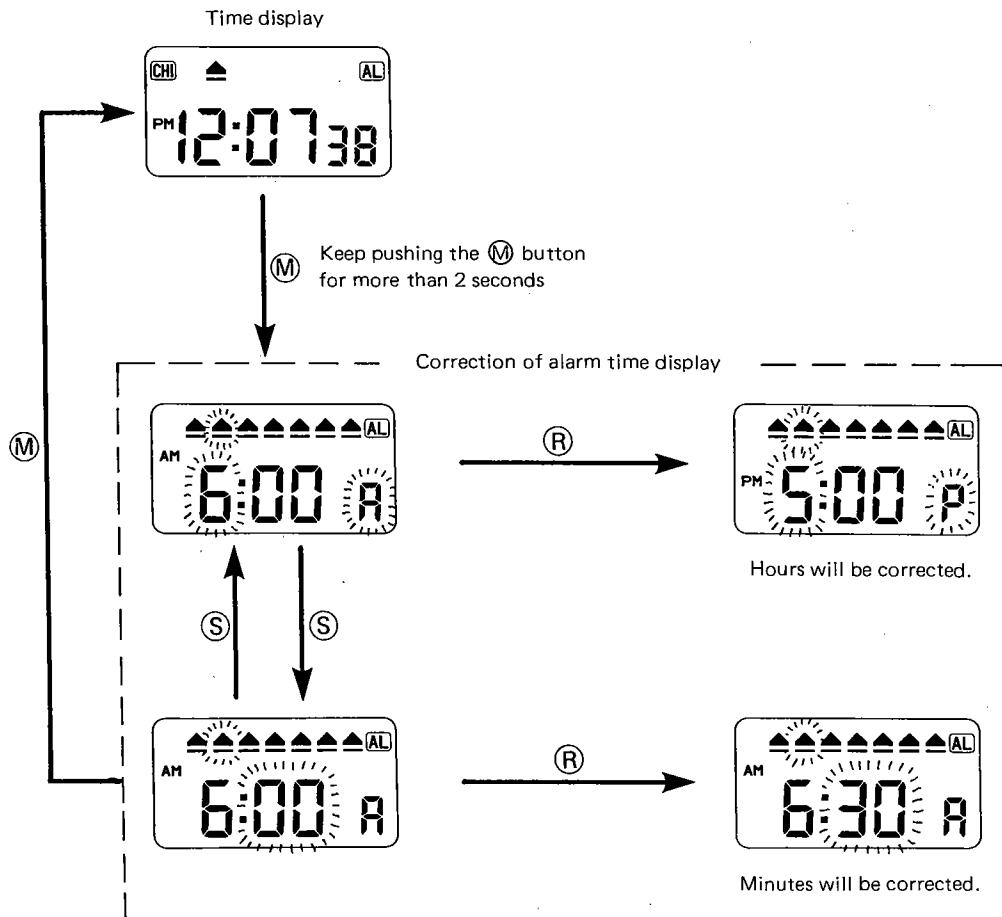
Then push the (R) button, and minutes will be corrected.

* The hour correction mode and the minute correction mode will alternately be obtained with each push of the (S) button.

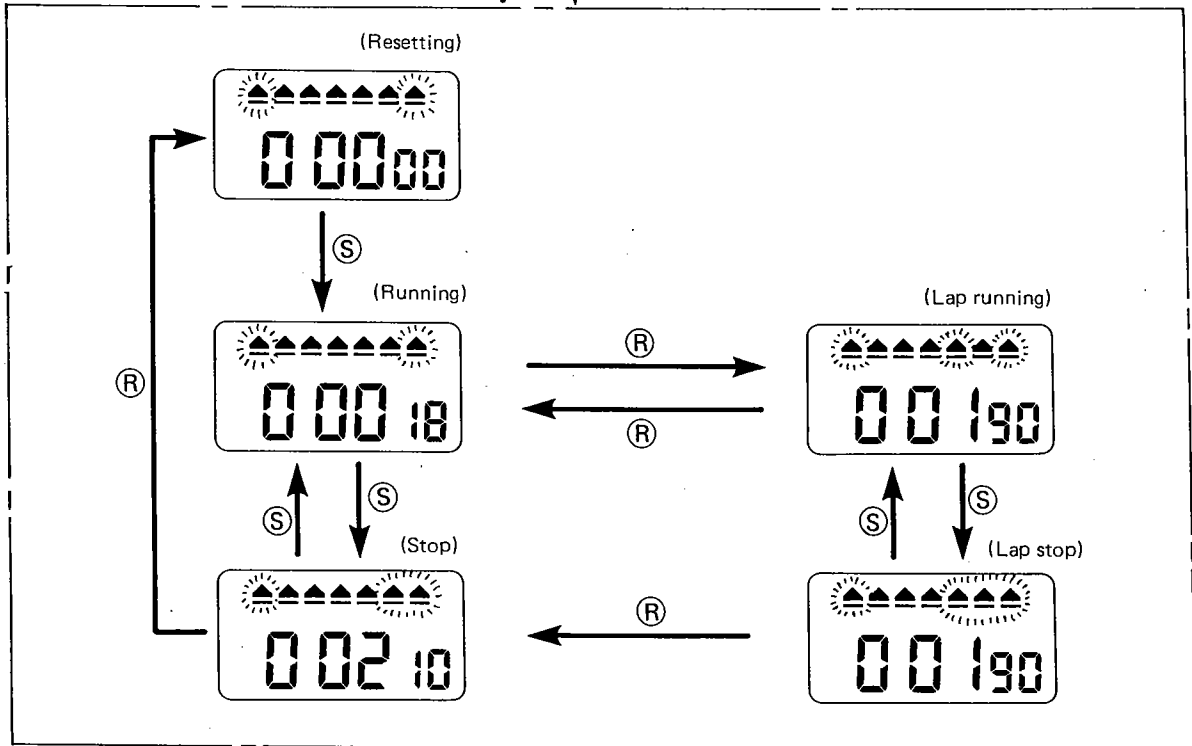
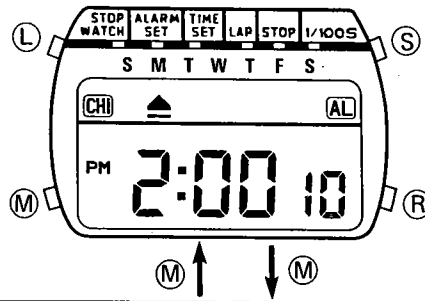
* In the alarm time correction mode, only the flag for "ALARM SET" will flash and the remaining flags will keep lighting.

* A quick correction at 4 Hz is possible with a continuous push of the (R) button for more than 2 seconds.

* The time display will be restored with a push of the (M) button.



(6) Operation procedures of stopwatch



* Stopwatch timing will be displayed differently between 0 min. 00 sec. 00 and 29 min. 59 sec. 99 from between 30 min. 00 sec. and 23 hr. 59 min. 59 sec., which will be explained below.

00:00 (0 min. 00 sec. 00/100, Colon does not light.)

29:59:99 (29 min. 59 sec. 00/100, Colon does not light.)

0:30:00 (0 hr. 30 min. 00 sec., Colon lights.)

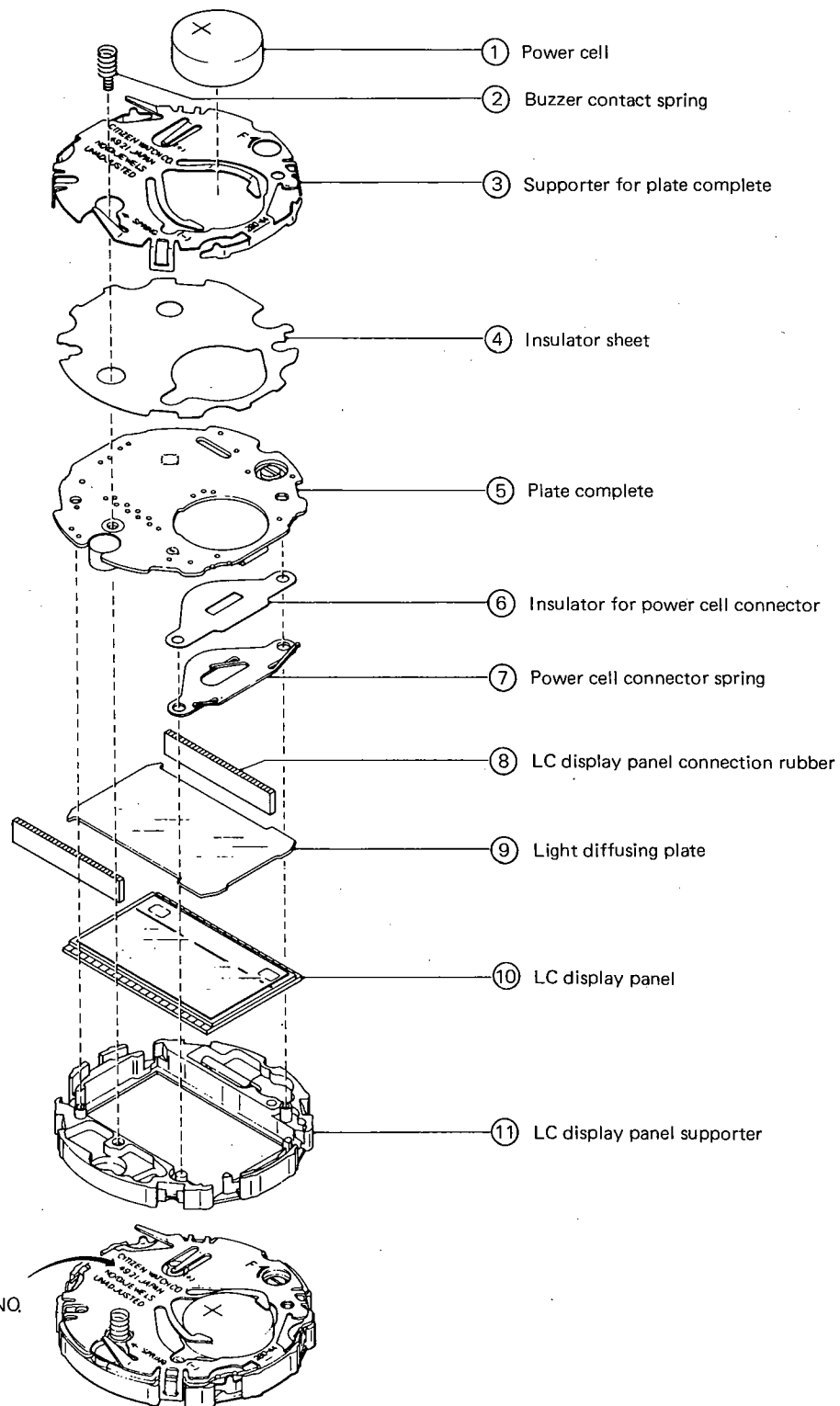
23:59:59 (23 hr. 59 min. 59 sec., Colon lights.)

As known from the above, display digits are identified with the presence of the colon.

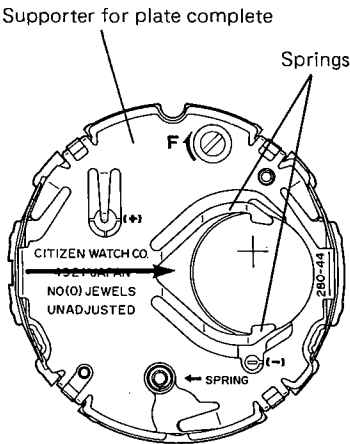
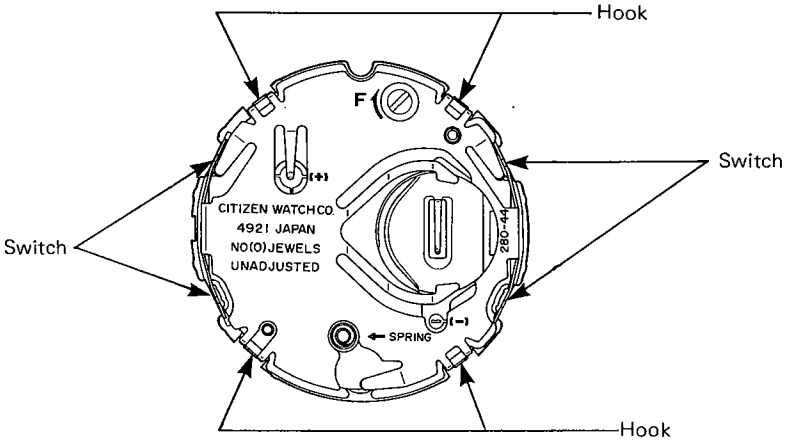
4. DISASSEMBLY & ASSEMBLY

Disassembling procedures : ① → ⑪

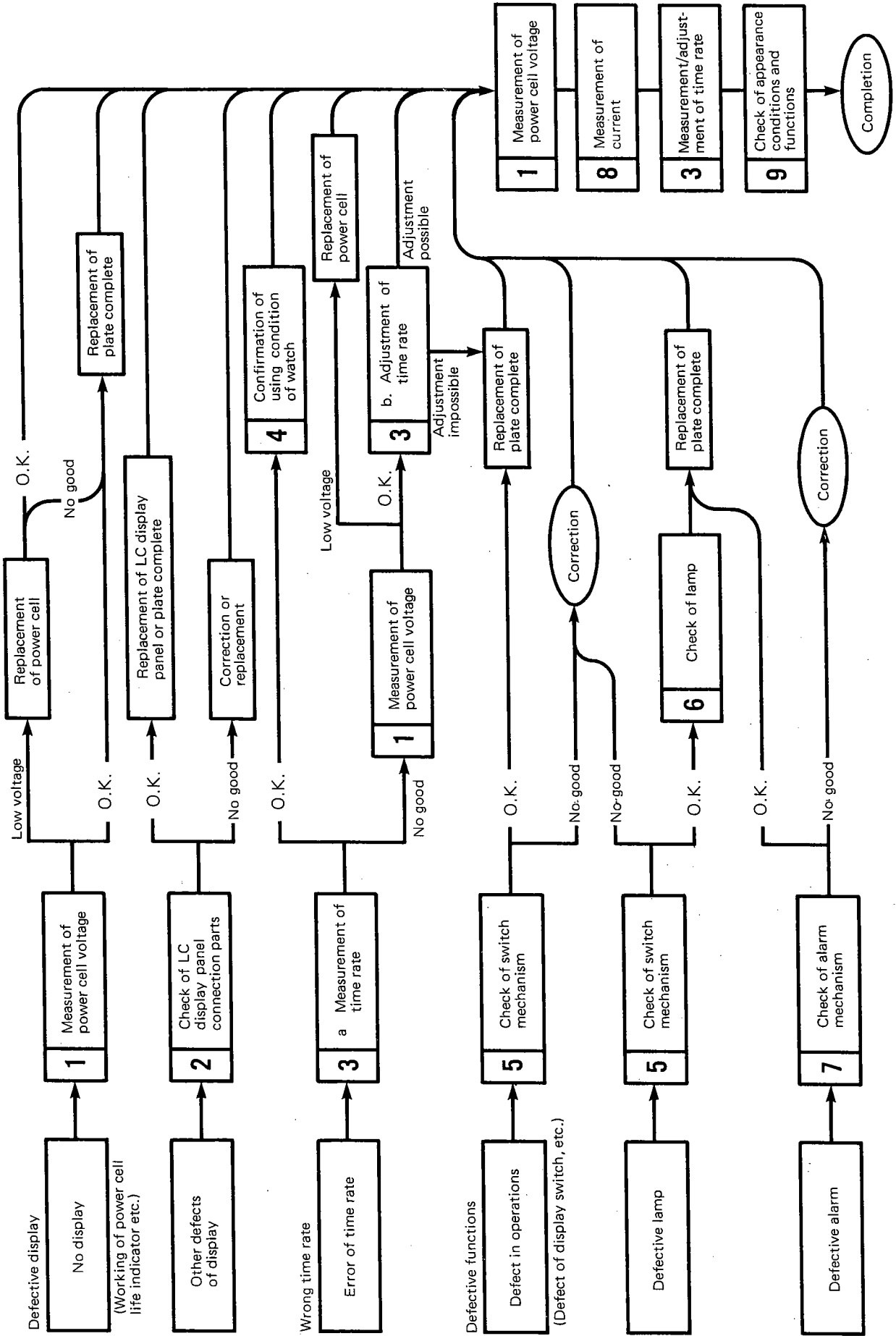
Assembling procedures : ⑪ → ①

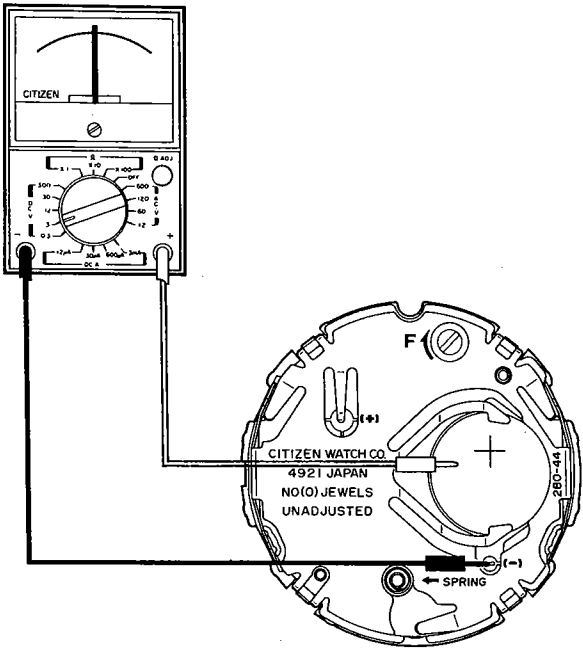
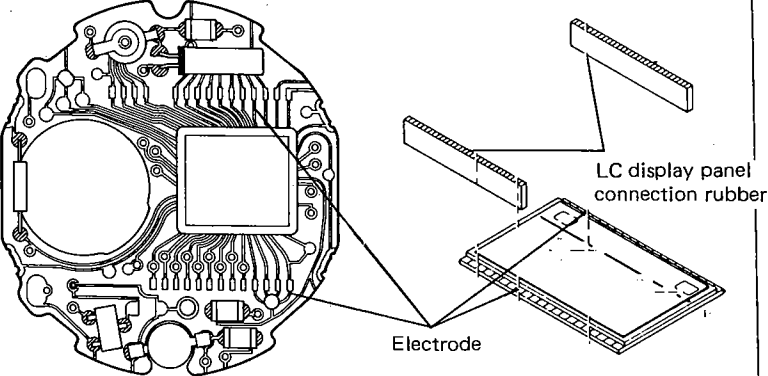


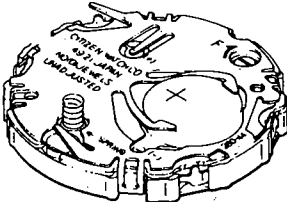
■5. NOTES ON DISASSEMBLY & ASSEMBLY

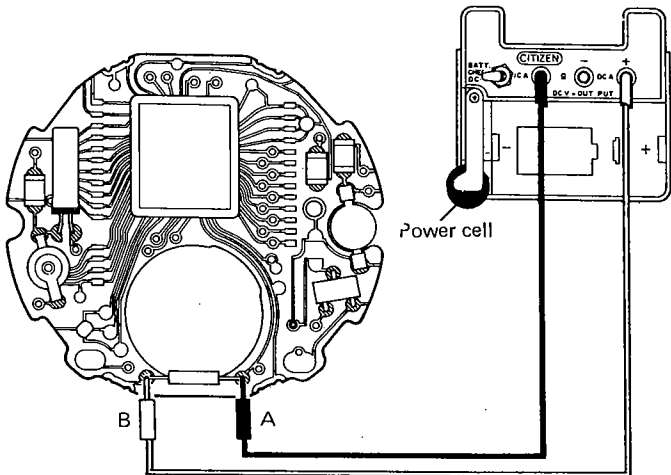
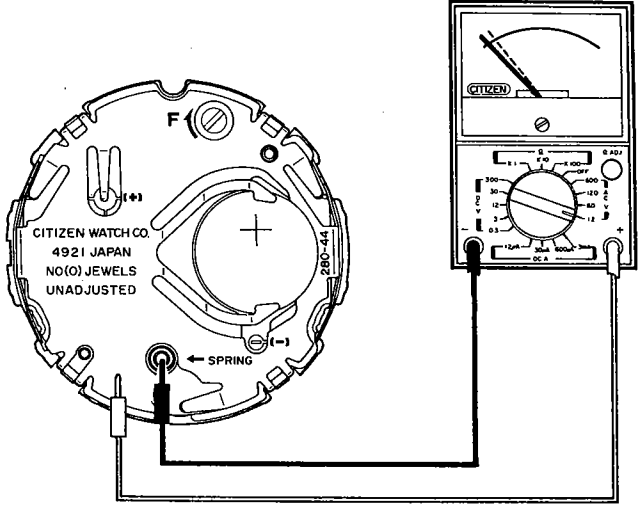
Items	Contents
<p>(1) Mounting and dismounting of power cell</p>	 <ul style="list-style-type: none"> ● The power cell has been firmly fixed by two springs of the supporter for plate complete, as illustrated in the figure. ● Dismounting of the power cell Push the springs away from the surface of the power cell one by one using a pair of tweezers or the like while gently pushing the power cell. Then, remove the power cell. ● Mounting of the power cell Insert the power cell between the two springs in the direction of the arrow. Then, pull the two springs onto the surface of the power cell and fix the power cell as shown in the figure. ● When mounting or dismounting the power cell, be careful not to short the power cell or deform the two springs.
<p>(2) Mounting of LC display panel connection rubber</p>	<ul style="list-style-type: none"> ● The positioning of the LC display panel connection rubber depends on the light diffusing plate. So, be sure to mount the LC display panel connection rubber after the light diffusing plate has been properly placed.
<p>(3) Mounting of supporter for plate complete</p>	<ul style="list-style-type: none"> ● This module has been fixed by the four hooks of the supporter for plate complete. Fasten the hooks and switch springs firmly and accurately at the time of mounting. Pay full attention to the switch springs, etc. so that they won't be deformed. 

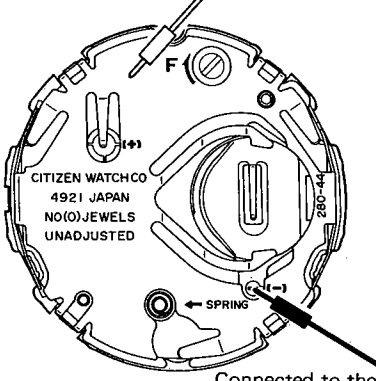
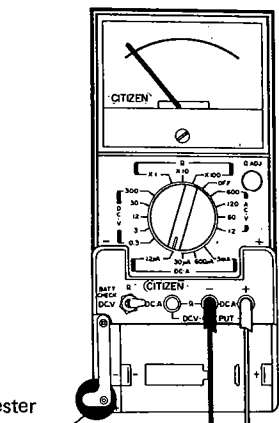
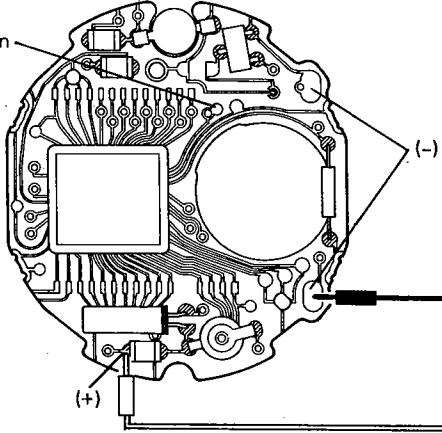
■6 TROUBLESHOOTING AND ADJUSTMENT



Checking items	How to check	Result and treatment
<p>1 Measurement of power cell voltage</p>	<p>< Tester range: D.C. 3V ></p> 	<p>Over 1.5V → Nondefective</p> <p>Under 1.5V → Replacement of the power cell</p>
<p>2 Checking of LC display panel connection parts</p>	<p>1) Checking of all segments while they are lighting If the Ⓢ and Ⓡ buttons are simultaneously pushed when time is displayed, all the segments will keep lighting while the two buttons are pushed. At this moment check out defective segments.</p> <p>* In case "Alarm time" and "Calendar" are displayed with a simultaneous push of the Ⓢ and Ⓡ buttons, push the two buttons any number of times until all the segments light up.</p> <p>2) Checking of LC display panel, connection rubber and plate complete for electric conductivity</p> 	<ul style="list-style-type: none"> ● Check that each part has been properly installed. If not → Install again from the beginning. ● Check that dust, dirt, cracks or scratches have not hampered conductivity. Dust or dirt → Removal. Scratches, cracks, etc. → Replacement of the defective parts.

Checking items	How to check	Result and treatment
3 Measurement and adjustment of time rate	<p>a) Measurement of time rate Time rate can be measured in a range of two seconds.</p> <p>b) Adjustment of time rate Adjustment should be made by turning the trimmer condenser with the screwdriver. (Do not measure time rate in a direct sun or under an incandescent electric light, or accurate measurement may not be possible because of a shift in time rate.)</p>	
4 Confirmation of using conditions	<p>Ask users of this watch about their using conditions to make sure that, for example, they have properly handled their watch.</p> <p>Checking the following points:</p> <ul style="list-style-type: none"> ● Whether the customers handle the watch properly ● Whether they use it beyond the effective temperature range ● How long it has been since they set the watch 	
5 Checking of switch mechanism	<p>a) Check the module after being assembled</p> <div style="display: flex; align-items: center;">  <div style="margin-left: 20px;"> <ul style="list-style-type: none"> ● Make sure that the LC display panel supporter and the hooks of the supporter for plate complete properly engage with each other. ● Make sure that the pattern of the plate complete is ready to contact with the switch actuating spring in a desired manner. </div> </div> <p>b) Checking of push buttons and the surrounding areas</p> <ul style="list-style-type: none"> ● Make sure that the push buttons attached on the case have not been deformed or soiled. <p>* Be sure to apply silicon oil to the push buttons, which is helpful in maintaining water-resistance and operating the push buttons smoothly.</p>	

Checking items	How to check	Result and treatment
<p>6 Checking of light</p>	<p>Apply the tester adapter to the power cell and check it using D.C.V. OUT-PUT. (There is no polarity.)</p>  <p>The diagram shows a top-down view of a watch case back with various electronic components. A power cell is connected to two points, A and B. A tester adapter is connected to these points, with the label 'DC V. OUT PUT' visible on the adapter.</p>	<ul style="list-style-type: none"> ● Checking of conductivity between A and B Light works <ul style="list-style-type: none"> → Nondefective Light does not work <ul style="list-style-type: none"> → Replacement of the plate complete
<p>7 Checking of alarm mechanism</p>	<p>a) Checking of the piezo-electric element The pieze-electric element is a white-colored voltage element that has been directly attached to the case back. If crack or cut is caused when the piezo-electric element contacts with the buzzer contact spring, alarm won't sound properly.</p> <p>b) Checking of the buzzer contact spring Make sure that the buzzer contact spring has not been deformed or bent.</p> <p>c) Confirmation of alarm output signal of the plate complete (The above confirmation can be made with the module remaining placed in the case.) Confirm the alarm output signal after generating the sound monitor with a simultaneous push of the (S) and (R) buttons.</p> <p><Tester range: A.C. 12V></p>  <p>The diagram shows the back of a watch case with a piezo-electric element and a buzzer contact spring. A multimeter is connected to these components. The case back has the following text: 'CITIZEN WATCH CO. 4921 JAPAN NO(O) JEWELS UNADJUSTED'. The multimeter is set to the A.C. 12V range.</p>	<ul style="list-style-type: none"> The tester pointer swings <ul style="list-style-type: none"> → Nondefective The tester pointer does not swing at all <ul style="list-style-type: none"> → Replacement of the plate

Checking items	How to check	Result and treatment
<p>8 Measurement of current</p>	<p>[Measurement of the finished module for current]</p> <p>Connected to the (+) terminal of the tester</p>  <p>Connected to the (-) terminal of the tester</p> <p><Tester range: D.C. 12μA></p>  <p>Power cell</p> <p>[Measurement of the plate complete alone for current]</p>  <p>All reset pattern</p> <p>(-)</p> <p>(+)</p> <p>Note:</p> <p>This caliber may sometimes receive a very large supply of current when alarm is activated after power source is energized, due to the characteristics of IC.</p> <p>At that moment, change the tester range to 3mA, and either wait (for 20 seconds at maximum) until alarm is deactivated or deactivate alarm purposely according to the following procedures. Then switch the tester range back to 12μA. After that, measure current.</p> <p>Deactivating procedures of alarm.</p> <ol style="list-style-type: none"> In case the finished module is measured for current, push the $\text{\textcircled{R}}$ button. In case the plate complete alone is measured for current, short-circuit all reset pattern and (-) pattern. 	<p>Under 2.3μA</p> <p>→ Nondefective</p> <p>Over 2.3μA</p> <p>→ Measurement of the plate complete alone for current</p> <p>Measurement of the plate complete alone for current</p> <p>Under 2.0μA</p> <p>→ Nondefective</p> <p>Over 2.0μA</p> <p>→ Replacement of the plate complete</p> <p>Note:</p> <p>Do not measure in a direct sun or under an incandescent electric light, or correct measurement may not be achieved.</p>
<p>9 Checking of appearance and functions</p>	<p>Make a check on the finished watch in the following points:</p> <ul style="list-style-type: none"> • that there is nothing wrong with the displays. • that each button operates correctly without causing problems. 	

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