

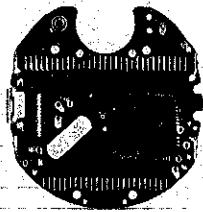
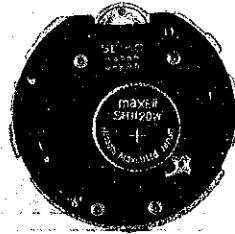
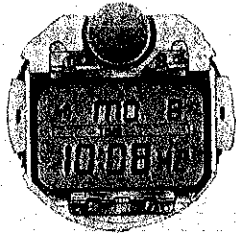
**SEIKO**

**DIGITAL QUARTZ**

**Cal. A358A**

**PARTS LIST**

# Cal. A358A



4001 530



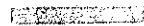
4242 530



4242 531



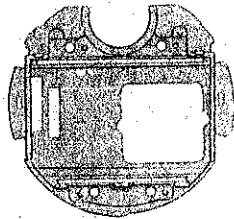
4245 530



4313 530



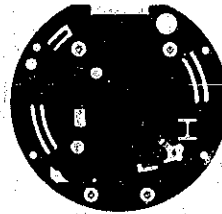
4313 531



4398 530



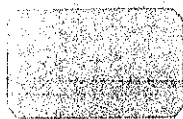
4408 530



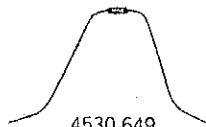
4410 532



☆4510 530



4521 580



4530 649



4540 530



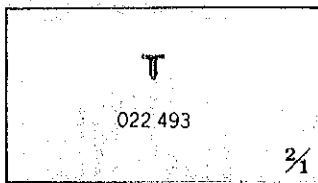
4540 860



4580 530



☆Maxell SR1120W



T  
022 493

2/1

# Cal. A358A

## Characteristics

Casing diameter :  $\phi$  30.2 mm  
 Maximum height : 4.8 mm without battery  
 Frequency of quartz crystal oscillator : 32,768 Hz (Hz = Hertz . . . . Cycles per second)  
 Home time and calendar display : 12-hour Digital Display System showing hour, minute, second, AM./PM., date and day of the week, month and year.  
 World time and calendar display : 12-hour Digital Display System showing hour, minute, second, AM./PM., date and day of the week for almost all parts of the world are displayed.  
 Alarm display : a) Home time alarm : In the home time display, it can be set to operate at any desired minute and hour.  
 b) World time alarm : In the world time display, it can be set to operate at any desired minute and hour of the designated area every day.  
 Display medium : Nematic Liquid Crystal, FE-Mode  
 Time micro adjustor : Trimmer condenser system  
 Time signal : It can be set to ring every hour on the hour.  
 Illuminating light : Illuminates all the digital displays in the dark by depressing the light button.  
 Battery life indicator : All the digits in the display begin flashing.

PART NO.	PART NAME	PART NO.	PART NAME
4001 530	Circuit block		
4242 530	Plus terminal of battery connection		
4242 531	Speaker block lead terminal		
4245 530	Switch spring		
4313 530	Connector A		
4313 531	Connector B		
4398 530	Liquid crystal panel frame		
4408 530	Bulb rest		
4410 532	Circuit cover		
☆4510 530	Liquid crystal panel		
☆4510 531			
4521 580	Reflecting mirror		
4530 649	Bulb		
4540 530	Liquid crystal panel holder A		
4540 860	Liquid crystal panel holder B		
4580 530	Speaker block		
022 493	Liquid crystal panel holder screw		
☆Maxell SR1120W	Silver oxide battery		
☆U. C. C. 391			

### Remarks :

#### Liquid crystal panel

☆4510 530 (Gray background) }  
 ☆4510 531 (Green background) } ..... Be sure that the combination between the color of panel cover and liquid crystal panel should be matched according to the "SEIKO Quartz Casing Parts List".

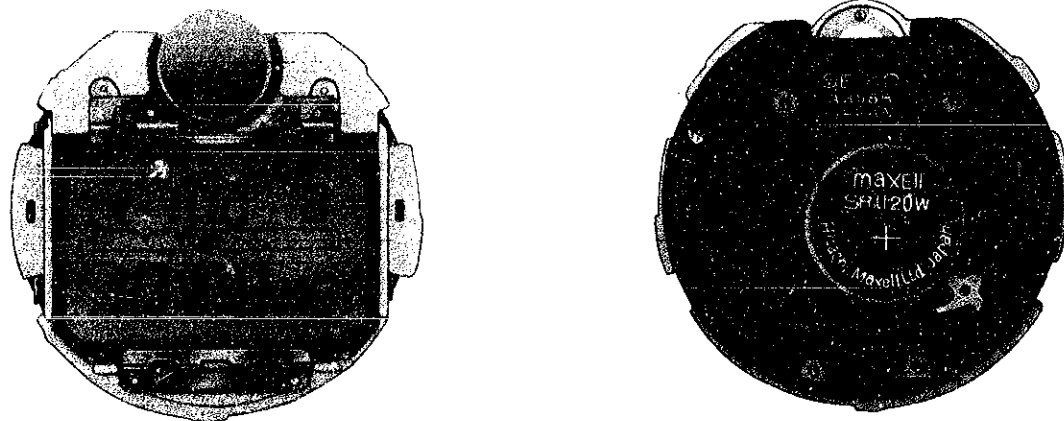
#### Battery

☆Maxell SR1120W }  
 ☆U. C. C. 391 } ..... The applied battery for this calibre might be added the substitutive in the future. In that case, please refer to separate "BATTERIES FOR SEIKO QUARTZ WATCHES".

# TECHNICAL GUIDE

## SEIKO DIGITAL QUARTZ

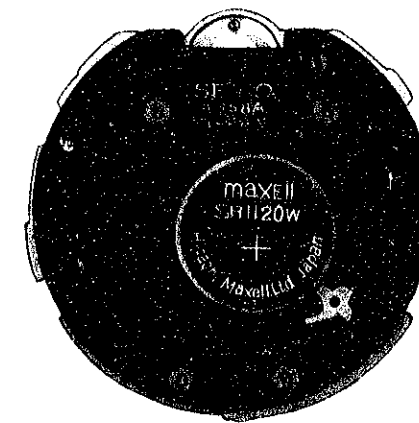
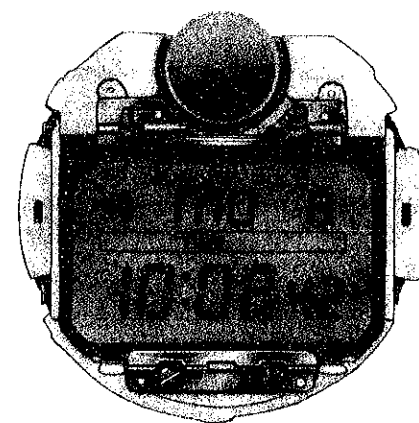
CAL. A358A



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Cal. A358A



Module

## I. SPECIFICATIONS

Item	Cal. No.	A358A
Display medium	Nematic Liquid Crystal, FEM (Field Effect Mode)	
Display system	<p>Five-function changeover system with home time/calendar, world time/calendar, alarm time setting, home time zone setting and time/calendar setting function.</p> <ul style="list-style-type: none"> <li>Home time/calendar function: 12-hour digital display system showing "TIME" mark, hour, minute, second, date, day of the week, A.M./P.M. and time zone mark. In the home time/calendar function, depress the buttons to display as follows:            GMT display: "WORLD TIME" mark, hour (24-hour indication), minute, second, date, day of the week and time zone mark.            Calendar display: year, month, date, day of the week and time zone mark.            Alarm set time display: "ALARM" mark, hour, minute, A.M./P.M. and time zone mark (home time or world time simultaneously displayed).</li> <li>World time/calendar function: 12-hour digital display system showing "WORLD TIME" mark, hour, minute, second, date, day of the week, A.M./P.M. and time zone mark.</li> <li>Alarm time setting function:            Home time alarm "ALARM SET" mark, hour, minute, A.M./P.M. (home time and time zone mark also displayed at the set time)            World time alarm "WORLD ALARM SET" mark, hour, minute, A.M./P.M. and time zone mark (world time also displayed at the set time)</li> <li>Home time zone setting function: "SET" mark and time zone mark.</li> <li>Time/calendar setting function: "TIME SET" mark, second, minute, hour (A.M./P.M.), month, year, date, day of the week setting and time zone mark.</li> </ul>	
Additional mechanism	<ul style="list-style-type: none"> <li>Alarm test system</li> <li>Battery life indicator (All the digits in the display start flashing when the battery life nears its end.)</li> <li>Time signal (The time signal sounds when the minute and second are reset to "00".)</li> <li>Illuminating light</li> <li>Pattern segment checking system (also transmits the signal for measuring the daily rate.)</li> </ul>	
Crystal oscillator	32,768 Hz (Hz = Hertz . . . Cycles per second)	
Loss/gain	Loss/gain at normal temperature range Mean monthly rate: less than 10 seconds (Annual rate: less than 2 minutes)	
Casing diameter	φ 30.2 mm	
Height	4.8mm without battery	
Operational temperature range	-10°C ~ 60°C (14°F ~ 140°F)	
Regulation system	Trimmer condenser	
Battery power	Silver oxide battery U.C.C. 391 or Maxell SR1120W Battery life is approximately 2 years. Voltage: 1.55V	
IC (Integrated Circuit)	C-MOS-LSI . . . 1 unit	

## II. DISASSEMBLING, REASSEMBLING AND LUBRICATING

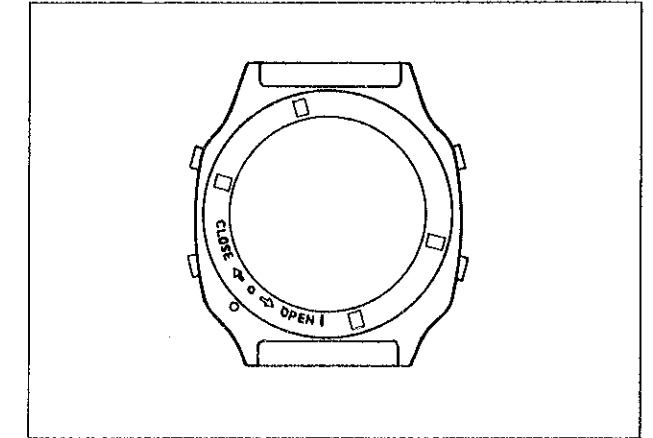
### 1. Disassembling and reassembling of the bayonet type case back

THE BAYONET TYPE CASE BACK is used for Cal. A358A.

Before disassembling and reassembling it, read carefully the following instructions.

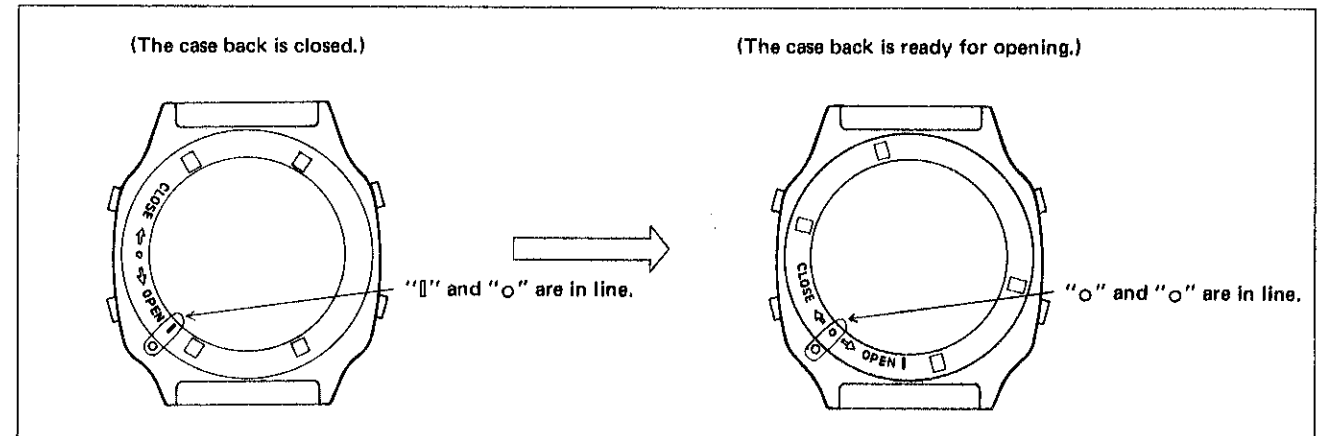
#### How to identify the bayonet type case back

- There are four spanner grooves provided on the case back for opening and closing as shown in the illustration on the right. (Six spanner grooves are provided for the screw type case back.)
- The "CLOSE ⇐ ○ ⇒ OPEN" mark is inscribed on the case back.

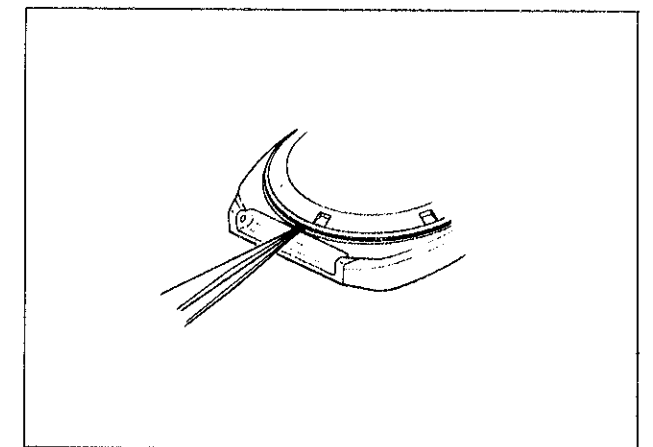


#### How to open the bayonet type case back

- Use the case opener with two claws and turn the case back in the direction of "OPEN" until the "○" mark is lined up with the same mark on the case bezel.



- If the case back is in position to open and it still does not come upward, then put the tips of the tweezers into the groove on the case bezel at the 6 o'clock position and pry up the case back.




#### How to close the bayonet type case back

- Close the case back in reverse order to the opening procedures.
- Be sure to turn the case back until the "○" mark on the case bezel is lined up with the "□" mark on the case back.

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

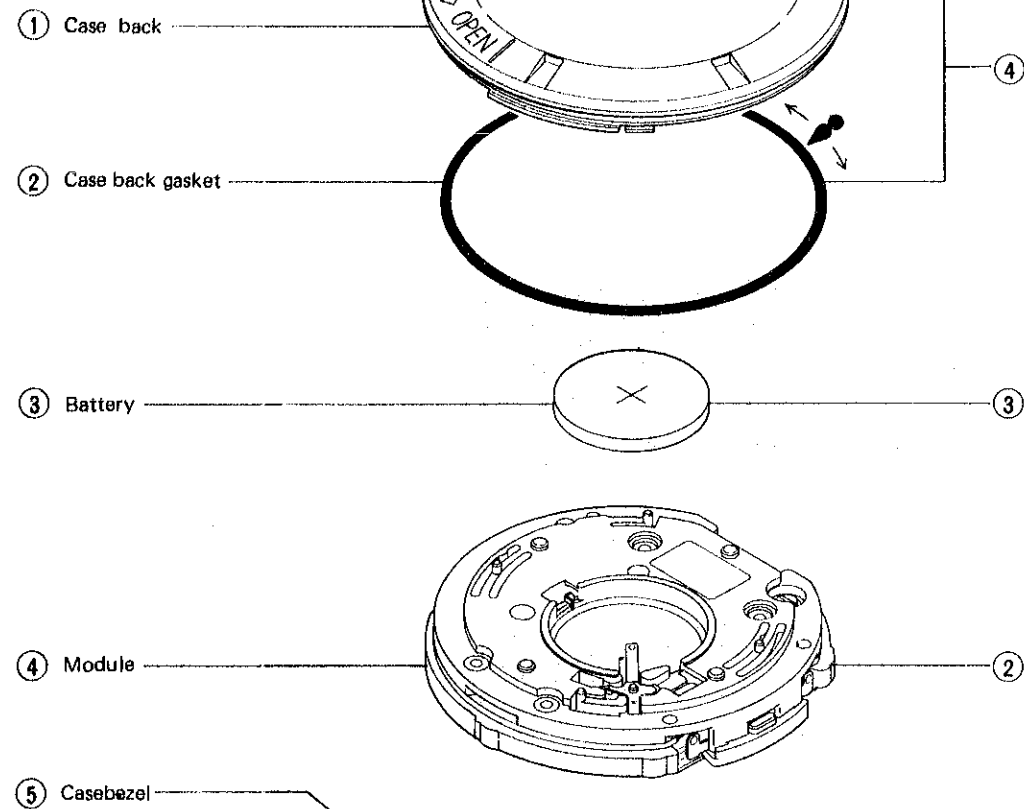
Lubricating: Silicone grease 500,000 c.s.

Normal quantity ●

Ex.) A358-5009 

The bayonet type case back is used for Cal. A358A. Before opening and closing the case back, read carefully the remarks on the previous page.

(Disassembling procedures)

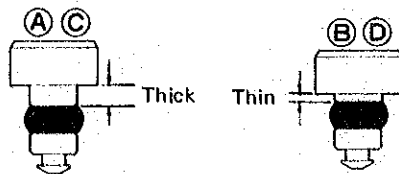


(Reassembling procedures)

(Hook-up for time adjusting button)  
(Time adjusting button)

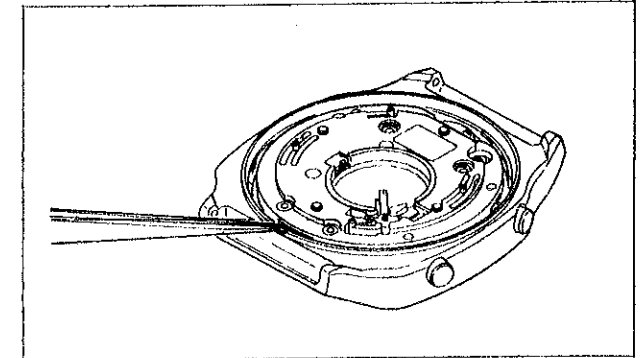
It is not necessary to disassemble the time adjusting buttons and hook-ups for time adjusting buttons (4 assemblies) except when they are required to be replaced.

When the buttons have been disassembled, be careful not to mistake the buttons **B** and **D** for **A** and **C** as they are different in length.

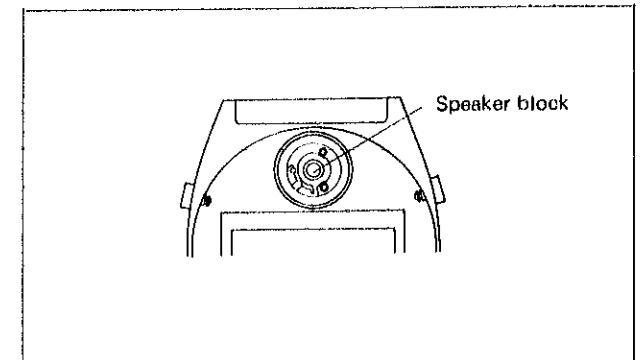


Remarks for disassembling

- ① **Case back**
  - Open the case back according to the remarks on page 2.
- ④ **Module**
  - The liquid crystal panel frame is fixed firmly to the casebezel. Pry up the module with tweezers to take out. (Do not pry up at the speaker portion; the terminals of the speaker coil may be broken.)

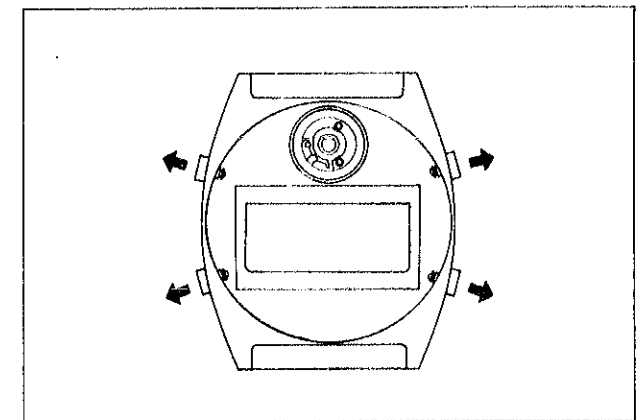


- ⑤ **Casebezel**
  - The speaker block is set in the casebezel. (Refer to page 8 for disassembling procedures.)

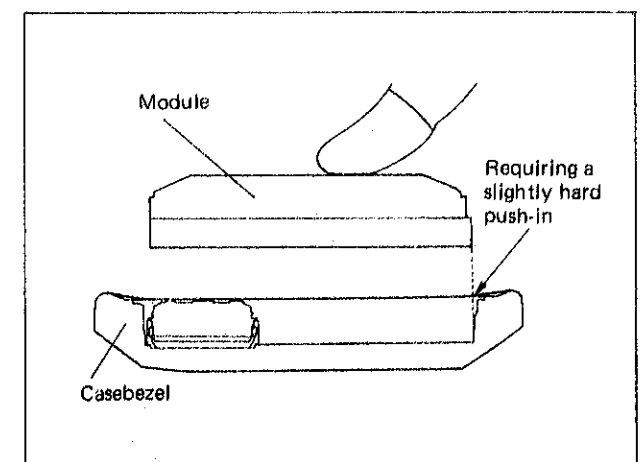


Remarks for reassembling

- ⑤ **Casebezel**
  - Before reassembling the module, pull out all buttons so that the switch springs do not prevent the module from being reassembled. (Push the buttons from inside with tweezers.)



- ④ **Module**
  - The liquid crystal panel frame is fixed firmly to the casebezel. Push in the module with fingers. (Use finger-cots on your fingers.)
  - Push it in so that it does not catch the buttons.

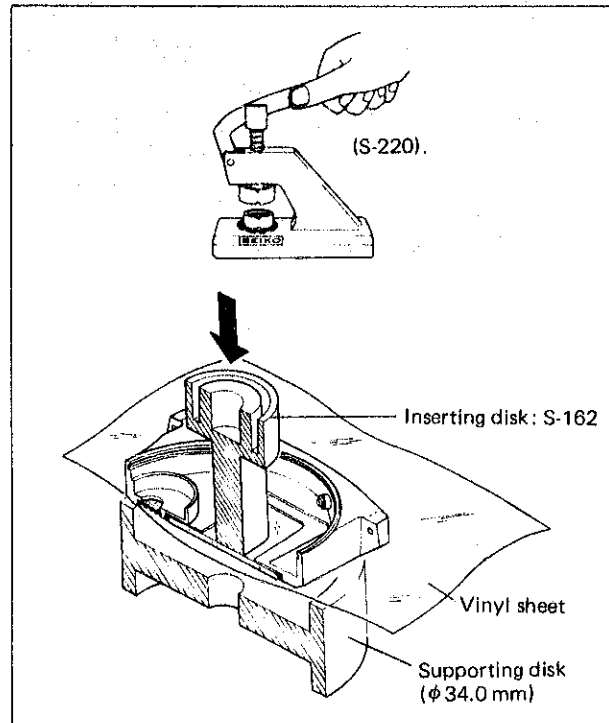


### How to replace the glass

(It is not necessary to disassemble the glass except when the glass or panel cover is replaced.)

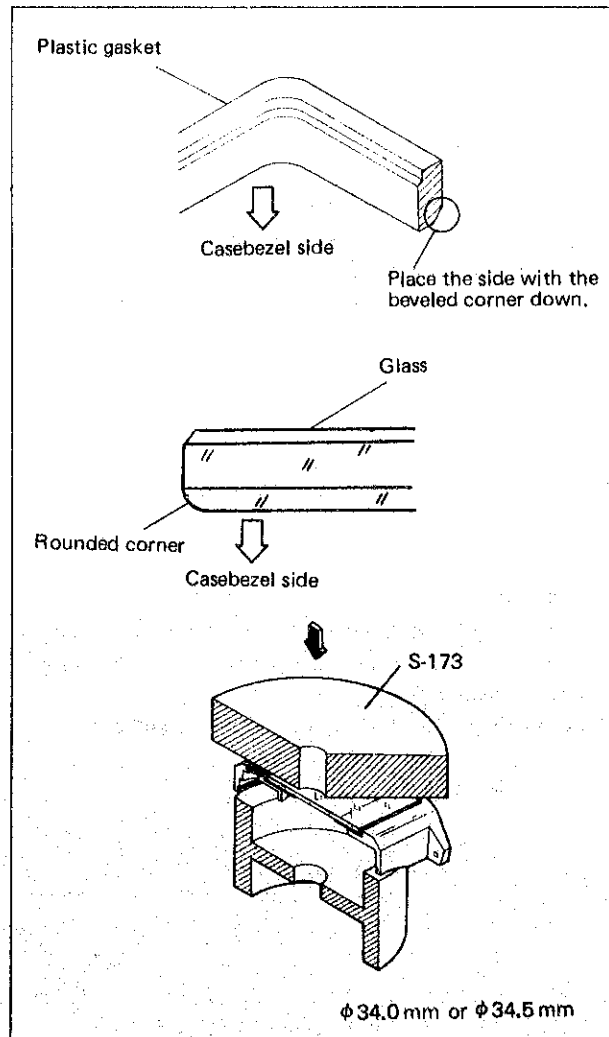
#### ● How to disassemble the glass

- Remove the glass with the tightening tool (S-220).  
Inserting disk: S-162  
Supporting disk:  $\phi 34.0\text{mm}$
- Place a vinyl sheet between the glass and the supporting disk as shown in the illustration on the right.
- Push the glass directly with the inserting disk (S-162) so as not to touch the panel cover and remove it.



#### ● How to reassemble the glass

- Set the plastic gasket to the casebezel.
  - Be sure to replace the plastic gasket with a new one in order to maintain water resistance.
- Reassemble the panel cover.
  - Be sure to set the backside of the panel cover close to the casebezel.
  - Be sure that the space between the casebezel and the edge of the panel cover is uniform in width.
- Place the glass.
  - Be sure to set the backside of the panel cover close to the casebezel.
  - Be sure that the space between the casebezel and the edge of the panel cover is uniform in width.
- Push in the glass (by using S-220).  
Inserting disk: Plastic inserting disk (S-173)  
Supporting disk:  $\phi 34.0\text{ mm}$  or  $\phi 34.5\text{ mm}$

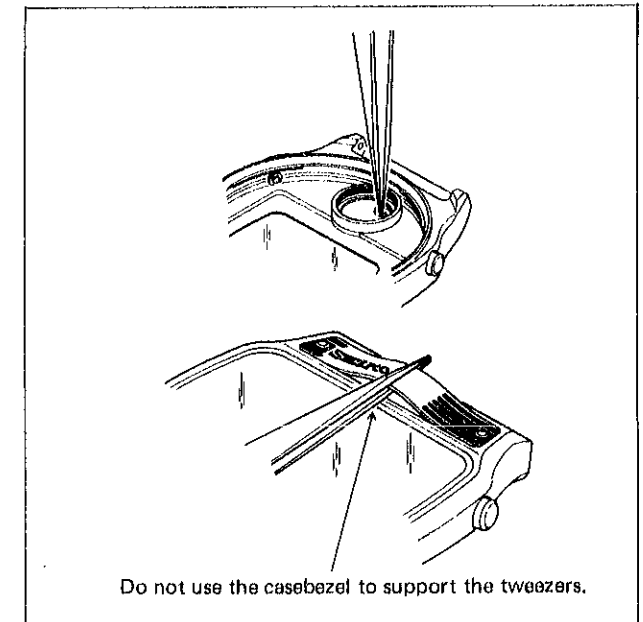
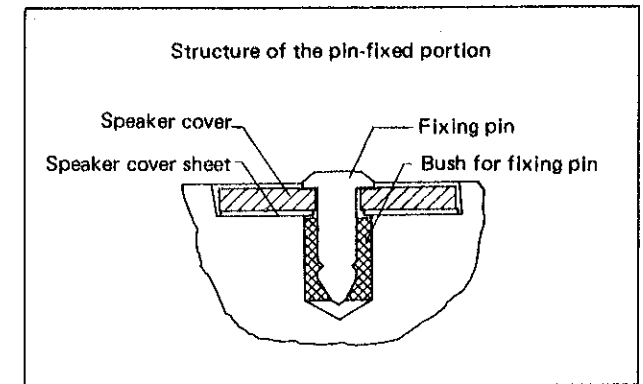


### How to replace the speaker cover

(The speaker cover is fixed to the casebezel with two pins. It is not necessary to disassemble the speaker cover except when it is required to be replaced.)

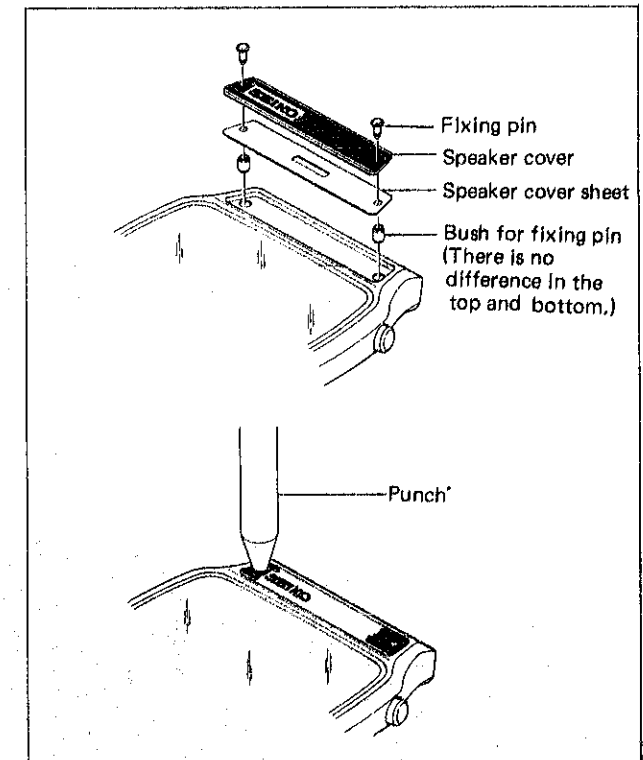
#### ● How to disassemble the speaker cover

- Disassemble the speaker block.  
(Refer to page 8 for disassembling procedures of the speaker block.)
- Disassemble the speaker cover by pushing it with tweezers or screwdriver through the speaker hole inside the casebezel and bending it.
- Lift up the pin portion with tweezers as shown in the illustration on the right and remove the speaker cover.
- If the bush for fixing pin is left in the casebezel, remove it with tweezers.



#### ● How to reassemble the speaker cover

- Set the bush for fixing pin to the casebezel. As it should be fixed fast to the casebezel, push it in with a punch. To ensure proper fixing, be sure to use a new one.
- Set the speaker cover sheet.  
The speaker cover sheet is transparent. Do not forget to reassemble it.
- Set the speaker cover.
- Be sure to push in the fixing pins with a punch.

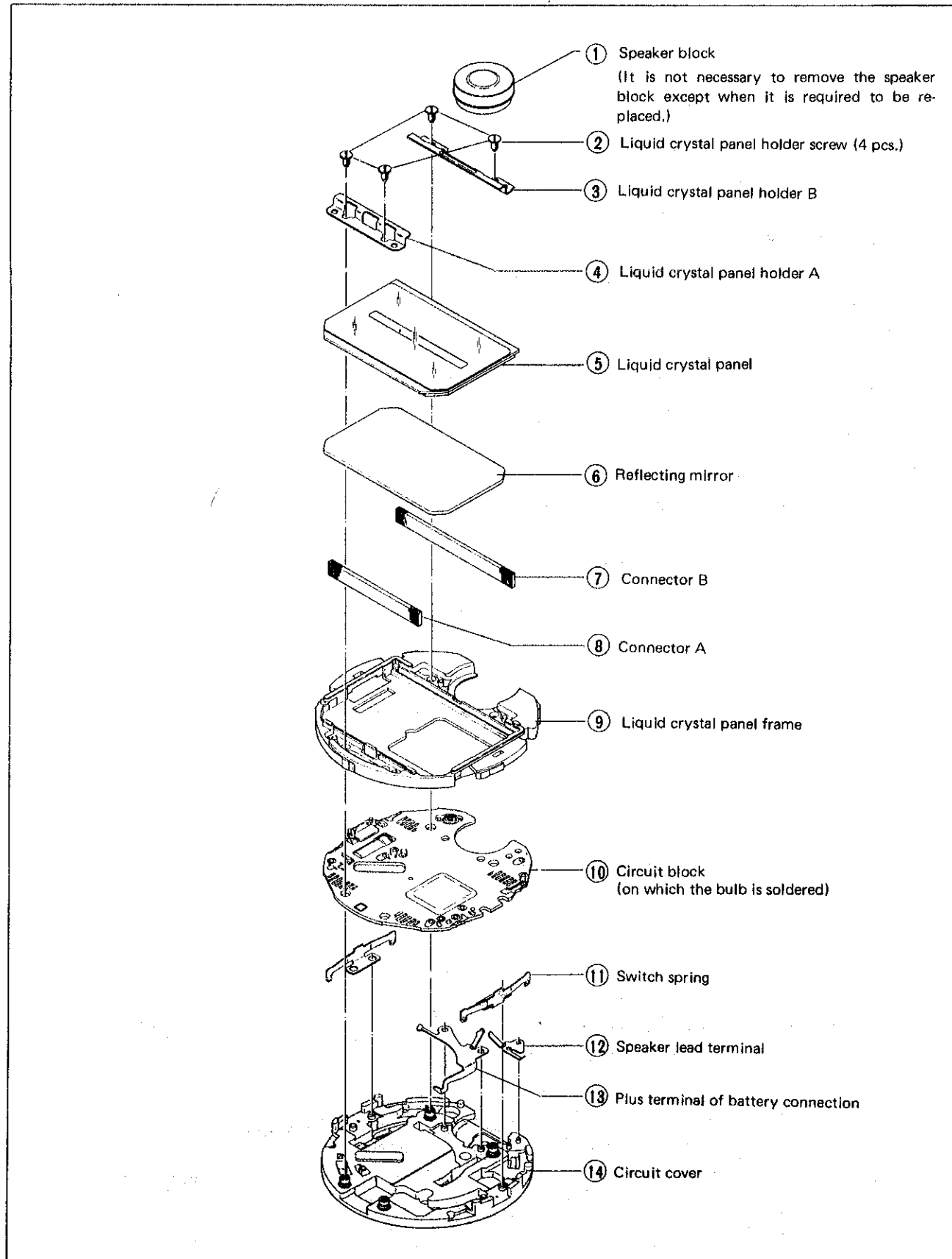




### 3. Disassembling and reassembling of the module

Disassembling procedures Figs.: ① → ⑭

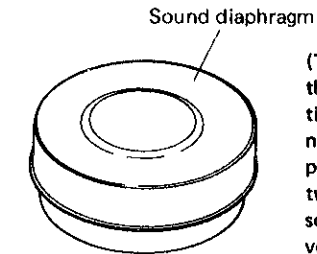
Reassembling procedures Figs.: ⑭ → ①



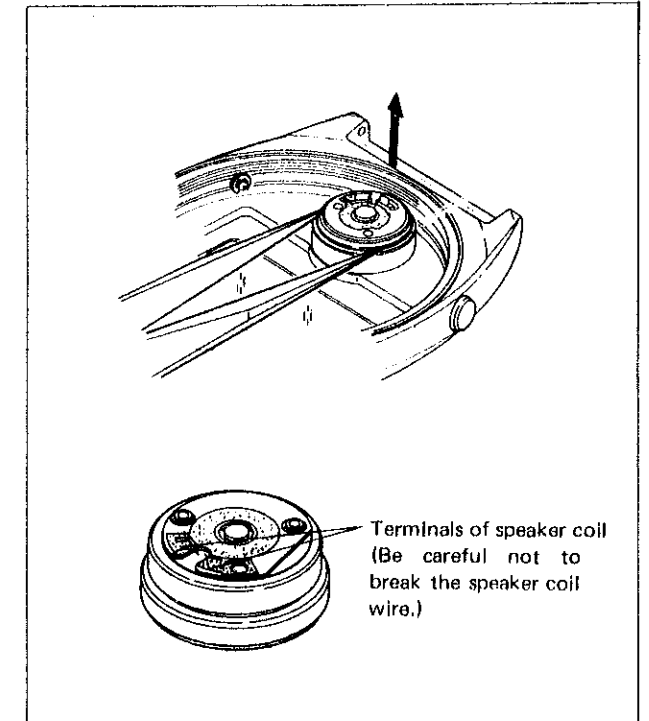
#### Remarks for disassembling

##### ① Speaker block

- The speaker block is set in the casebezel. Be sure to hold it at its groove by the tips of the tweezers and pry it up from the casebezel as shown in the illustration.
- Or pry up the outer edge of the speaker block little by little by the tip of the screwdriver.



(The sound diaphragm is so thin that it is easily damaged by the tips of the tweezers. Be careful not to pick at the sound diaphragm with the tips of the tweezers. Any damage to the sound diaphragm will change the volume and tone of the alarm or cause poor water resistance.)



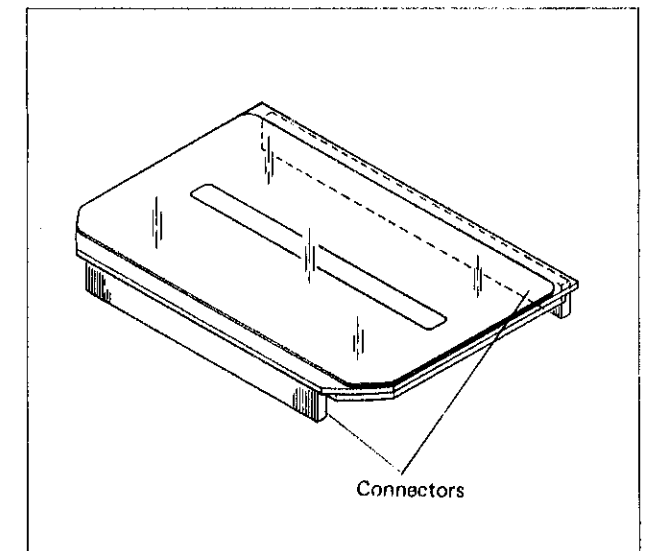
##### ⑥ Reflecting mirror

- Be careful not to scratch or contaminate the reflecting mirror.

##### ⑦ Connector A

##### ⑧ Connector B

- The connectors may be disassembled together with the liquid crystal panel.
- Be careful not to scratch the connectors with the tweezers.



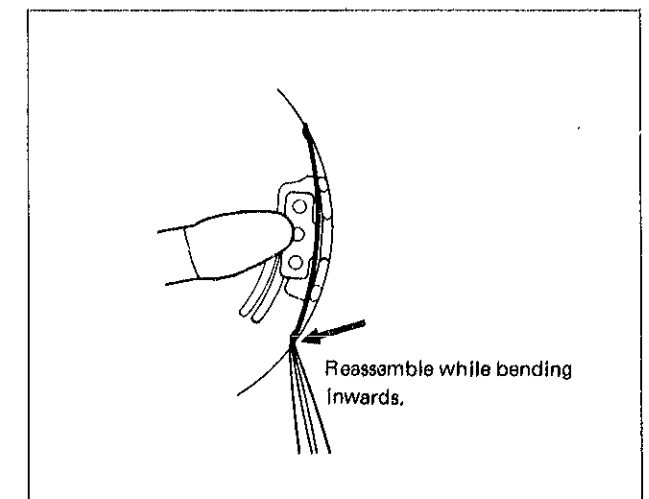
##### ⑩ Circuit block

- Be sure to handle the circuit block with tweezers or with fingercots on the fingers. (Do not handle with bare hands.)

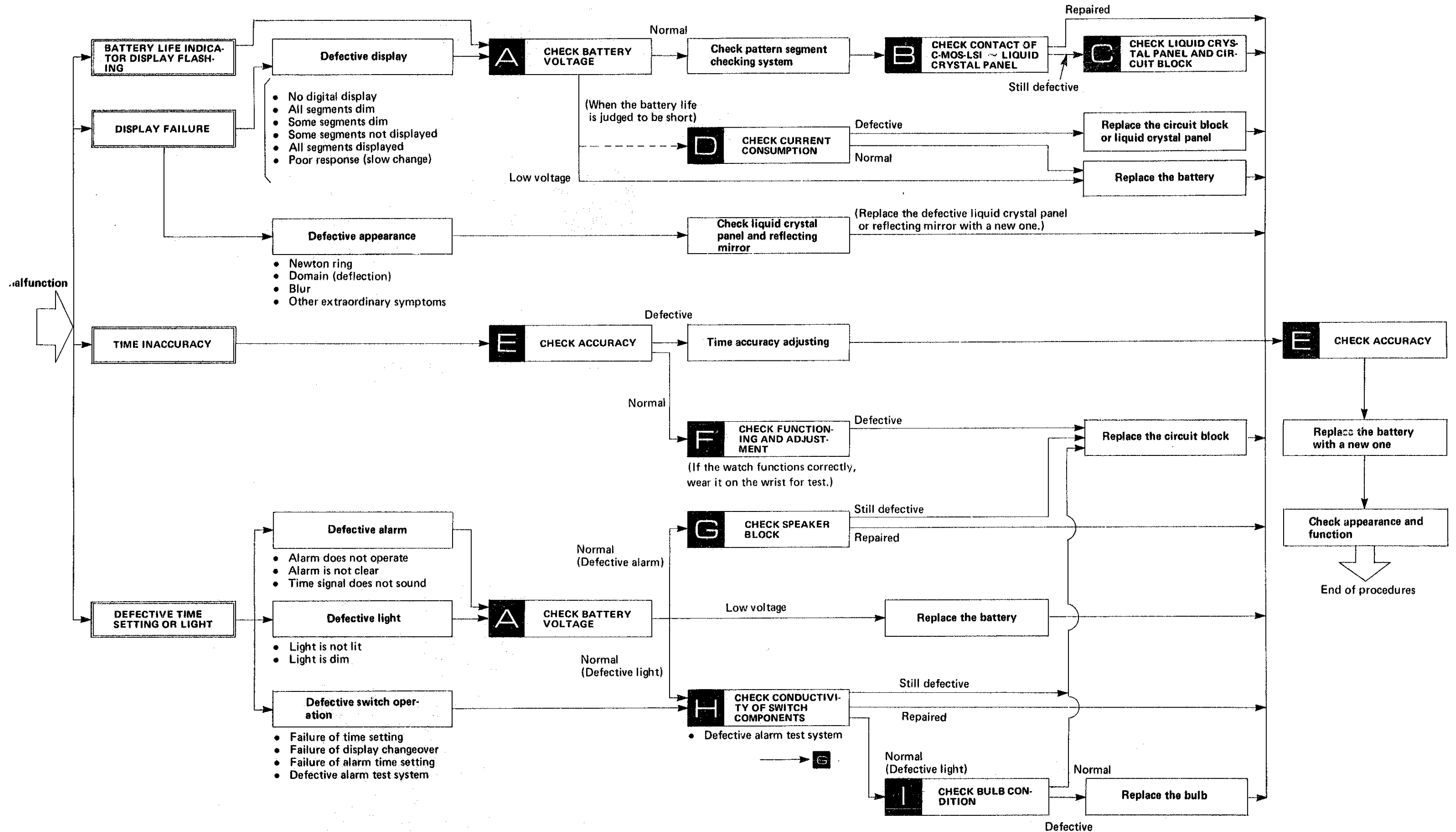
#### Remarks for reassembling

##### ⑪ Switch spring

- Fit the hole portion of the switch spring to the pin portion of the circuit cover and reassemble the switch spring while bending the spring portion inwards.



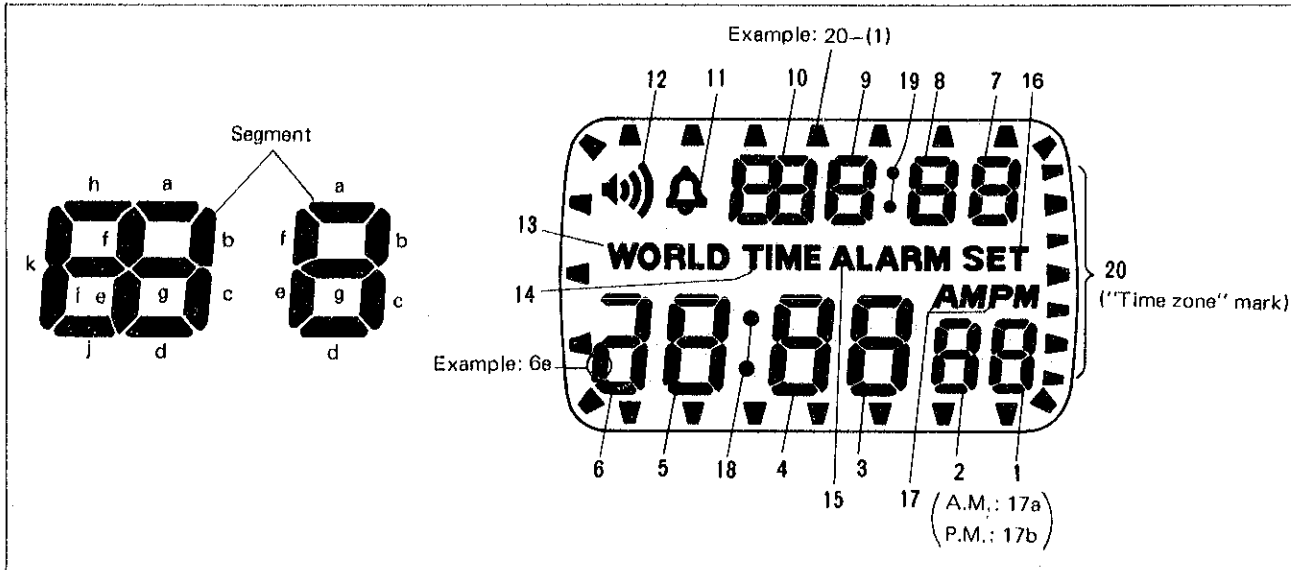
1. Guide table for checking and adjustment



**2. Relationship between the segment (Liquid Crystal Panel Electrode) and the C-MOS-LSI output terminal**

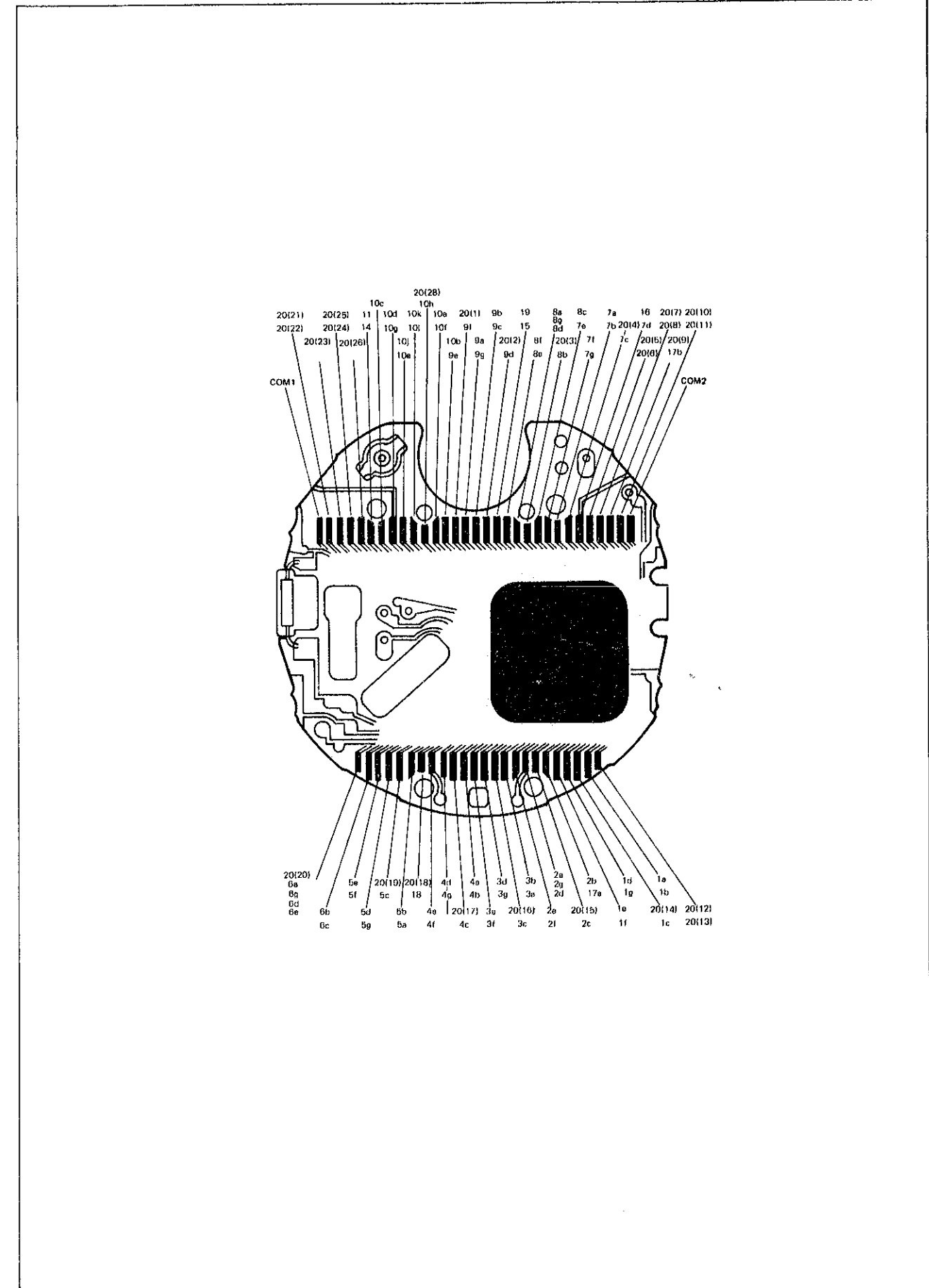
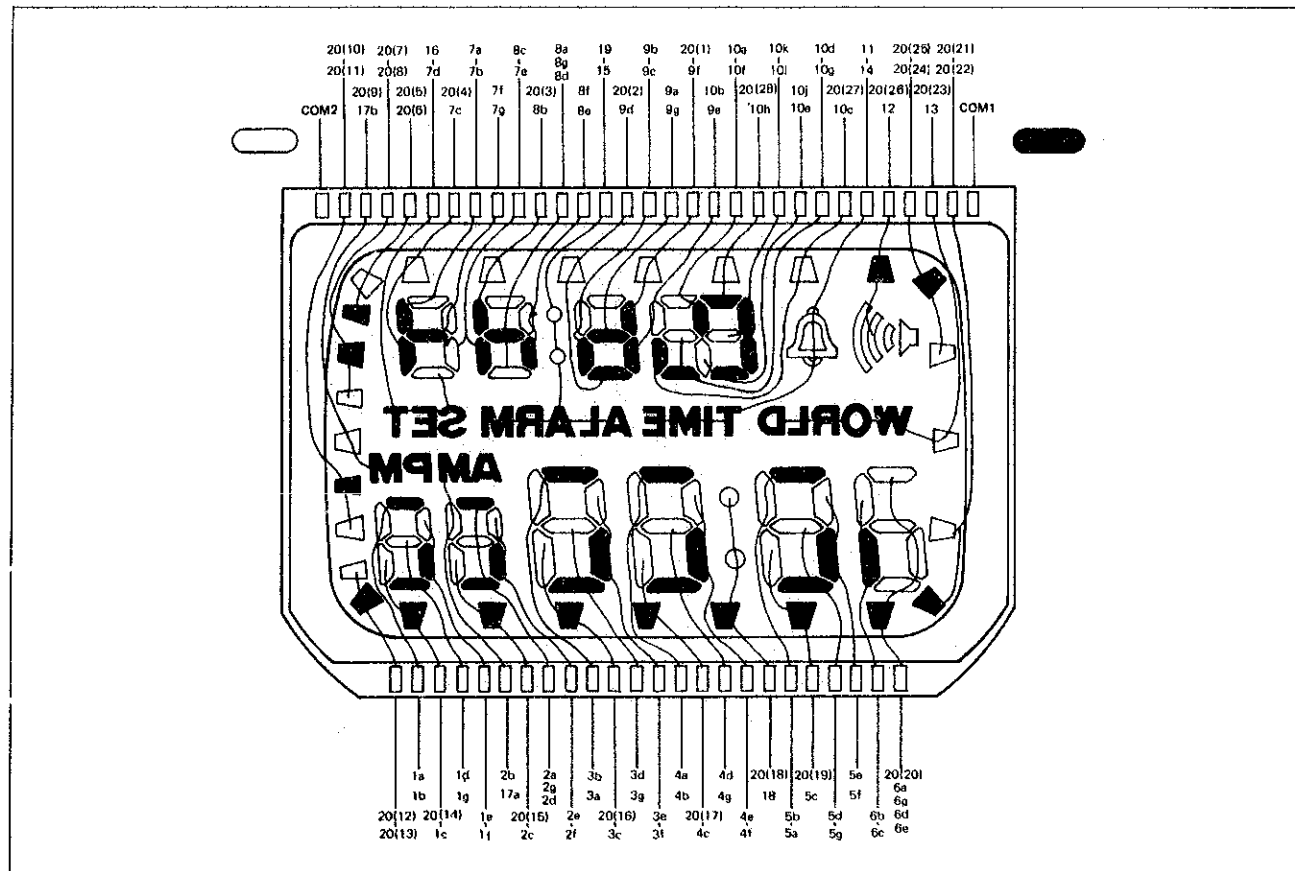
A complete knowledge of how the segment (Liquid Crystal Panel Electrode) works with the C-MOS-LSI output terminal will provide the proper procedures for checking and adjustment.

• Designation of segment

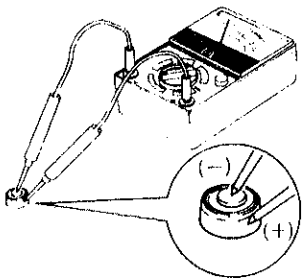
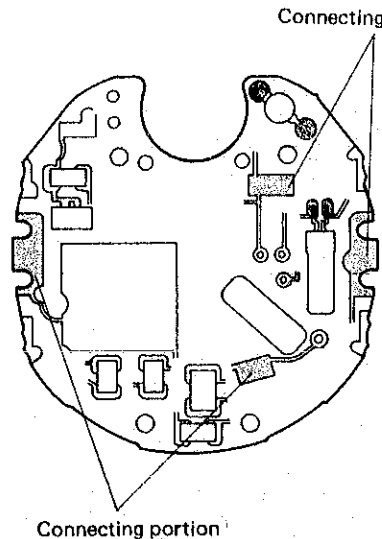


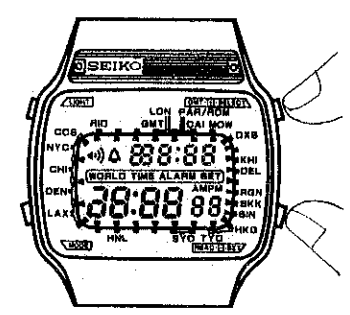

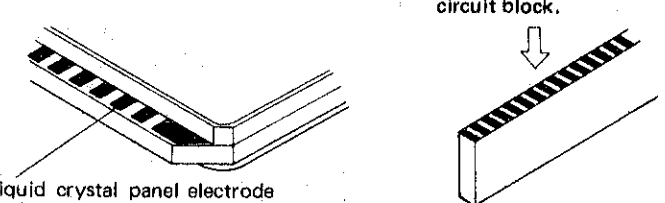
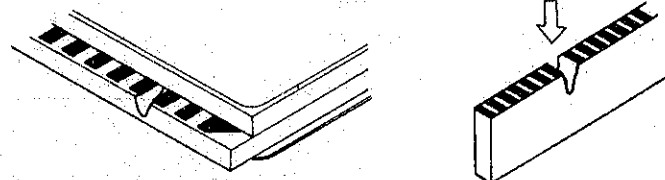
• Relationship between the segment and the C-MOS-LSI output terminal

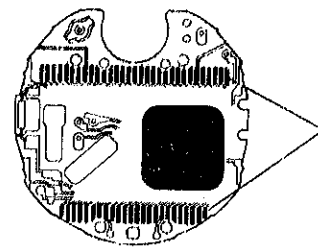

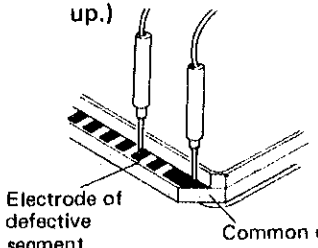



The liquid crystal panel electrode is connected electrically with each segment which forms a digital figure as shown in the illustration of the panel pattern below. (The panel pattern can be seen if the panel is slightly tilted and looked at in an angular position.) Also, the liquid crystal panel electrode is connected electrically with the C-MOS-LSI output terminal by the connector.

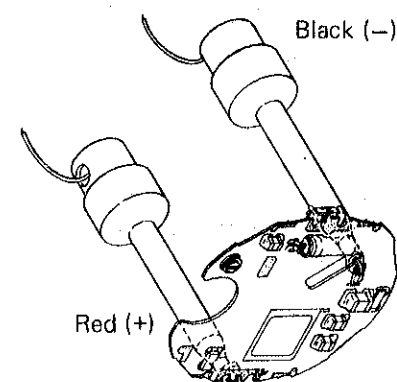
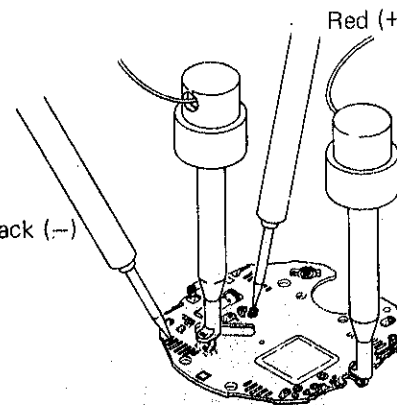



### 3. Procedures for checking and adjustment

	Procedures	Result and repair
CHECK BATTERY VOLTAGE	<p>Check battery voltage.</p> <p>1. Set up the volt-ohm-meter. Range to be used: DC 3 V</p>  <p>2. Measuring</p> <ul style="list-style-type: none"> <li>Probe Red (+) . . . Battery surface (+)</li> <li>Probe Black (-) . . . Battery surface (-)</li> </ul> <p>When there is battery electrolyte leakage, refer to "HOW TO CHECK BATTERY ELECTROLYTE LEAKAGE AND REPAIR" below for repairing.</p>	<p>More than 1.5V: Normal Less than 1.5 V: Defective</p>
HOW TO CHECK BATTERY ELECTROLYTE LEAKAGE AND REPAIR	<p>1. Remove the module from the case bezel. 2. Disassemble the module. 3. Wipe off battery electrolyte on the circuit block.</p> <p>(1) Wipe off battery electrolyte with a cloth moistened with distilled water. (If distilled water is not available, use tap water.)</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>Do not expose the trimmer condenser to water or alcohol, and if it is exposed, there may be a change in its capacity and eventually in the time accuracy.</li> <li>Use a nylon cloth, etc. which does not give off lint.</li> </ul> </div> <p>When the circuit block is cleaned, be sure to clean the connecting portions.</p>  <p>If the circuit block is badly contaminated with battery electrolyte, replace the circuit block with a new one.</p> <p>Ex.</p> <ul style="list-style-type: none"> <li>When the circuit block is rusted.</li> <li>When the liquid crystal panel side has already been contaminated with battery electrolyte.</li> </ul> <p>(2) Wipe off the connecting portions with a cloth moistened with alcohol. (If the cleaned portions remain wet with water, they will corrode with rust.) (3) Dry with warm air by using a dryer.</p>	

	Procedures	Result and repair
HOW TO CHECK BATTERY ELECTROLYTE LEAKAGE AND REPAIR	<p>4. Clean the other parts (circuit cover, plus terminal of battery connection, etc.).</p> <p>(1) Wipe off battery electrolyte on each part with a soft brush moistened with distilled water. (If distilled water is not available, use tap water.) (2) Rinse with alcohol. (3) Dry with warm air by using a dryer.</p> <p>5. Reassemble the module. Replace the battery with a new one.</p> <p>6. Check to see if the home time and world time setting functions, the alarm time setting function, the home zone setting function and the time and calendar setting function are normal and if the current consumption is normal.</p>	
CHECK PATTERN SEGMENT CHECKING SYSTEM	<p>If some segments are dead or dim, set the mode for the time and calendar setting function. Then depress the buttons <b>B</b> and <b>C</b> together to find defective segments. (If there is no defective segment, all the segments light up.)</p>  <p>When the buttons <b>B</b> and <b>C</b> are depressed together, the alarm rings every second. After having checked, depress the button <b>A</b> to reset to the home time setting function. (Even if the button <b>A</b> is not depressed, the watch returns automatically to the home time setting function in 1 to 2 minutes.)</p>	
CHECK CONTACT OF C-MOS-LSI LIQUID CRYSTAL PANEL	<p>After removing the liquid crystal panel, check for poor conductivity of the liquid crystal panel, connectors and C-MOS-LSI output terminal whose segments are found to be defective in "CHECK PATTERN SEGMENT CHECKING SYSTEM". (Refer to the "Relationship between the segment and the C-MOS-LSI output terminal" on page 11.) Use a microscope for checking.</p> <p>1. Check for dust, lint and other contamination on the liquid crystal panel electrode and the connectors.</p> <p>Be sure to check carefully the connecting portions with the liquid crystal panel and the circuit block.</p>  <p>2. Check for any scratch, crack and break of the liquid crystal panel and the connectors.</p> 	<p>No dust, lint or uncontaminated: Normal Proceed to <b>B</b> 2. Dust, lint or contaminated: Defective Wipe off any foreign matter.</p> <p>No scratch, crack or break: Normal Proceed to <b>B</b> 3. Scatched, cracked or broken: Defective Replace the connector or liquid crystal panel with a new one.</p>

	Procedures	Result and repair
CHECK CONTACT OF C-MOS-LSI ~ LIQUID CRYSTAL PANEL	<p>3. Check for dust, lint and other contamination on the circuit block output terminal.</p>  <p style="text-align: right;">Circuit block output terminal</p>	<p>No dust, lint or uncontaminated: Normal Proceed to .</p> <p>Dust, lint or contaminated: Defective Wipe off any foreign matter.</p>
CHECK LIQUID CRYSTAL PANEL AND CIRCUIT BLOCK	<p>Check to see if the liquid crystal panel and the circuit block function correctly. (Refer to the "Relationship between the segment and the C-MOS-LSI output terminal" on page 11.)</p> <p>1. How to check the liquid crystal panel (1) Set up the volt-ohm-meter. Range to be used: OHMS R x 1 ~ R x 1K</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p><b>Note:</b> Any range will do if more than 3 V is applied to the terminal of the volt-ohm-meter. When the volt-ohm-meter other than the SEIKO volt-ohm-meter S-831 is used, no segments may be lit. If any segment does not light up, change the range to the one (R x 10K) which is higher in resistance than R x 1K.</p> </div> <p>(2) Remove the liquid crystal panel from the module and turn it upside down. (3) Measuring (Check to see if the corresponding segment lights up.)</p>  <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p><b>Note:</b> Either red or black probe will do.</p> </div> <p>(Either red or black probe must be applied to the common electrode.)</p> <p><b>Note:</b> The liquid crystal panel of Cal. A358A is provided with two common electrodes as shown in the illustration for the "Relationship between the segment and the C-MOS-LSI output terminal" on page 11. Each segment lights up black by the potential difference between either of the two common electrodes. The combination of each segment and the common electrodes 1 and 2 is distinguished individually as shown on page 11.</p> <p>Common electrode 1 ...  Common electrode 2 ... </p>	<p>Lights up: Normal Proceed to  2.</p> <p>Does not light up: Defective Replace the liquid crystal panel with a new one.</p> <p>The checking example is shown on the following page.</p>

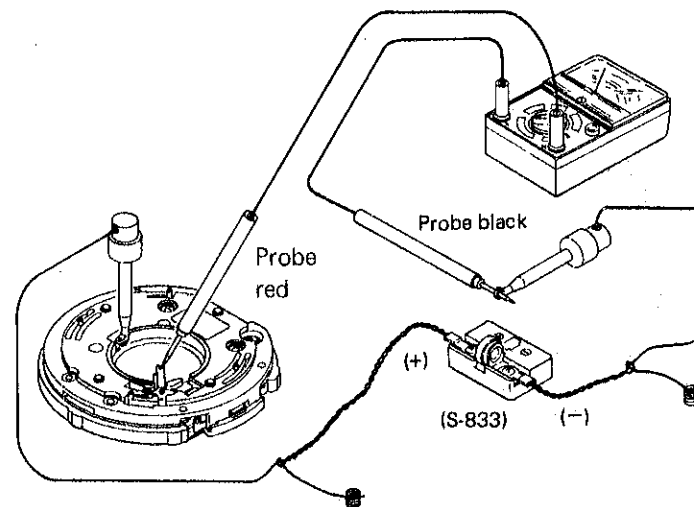
CHECK LIQUID CRYSTAL PANEL AND CIRCUIT BLOCK	Procedures	Result and repair
	<p>&lt;Checking example&gt; When the segments of 5d, 5g do not light up:</p> <ul style="list-style-type: none"> <li>• Check to see if 5d is combined with the common electrode 1 and 5g is combined with the common electrode 2 according to the illustration on page 11.</li> <li>• Make sure of the position of the electrode corresponding to 5d, 5g, and check to see if 5d lights up when each probe is applied to the electrode corresponding to 5d, 5g and the common electrode 1 with the liquid crystal panel turned over.</li> <li>• Next check to see if 5g lights up when each probe is applied to the electrode corresponding to 5d, 5g and the common electrode 2.</li> </ul> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p><b>Note:</b> When the segment electrode is connected with one common electrode, a segment corresponding to the other common electrode may light up at the same time. But this phenomenon does not ensure the completion of checking both the segments since it may not occur. Therefore, it is required to connect the segment electrode with the corresponding common electrode for checking.</p> </div> <p>2. Check the circuit block output voltage.</p> <p>(1) Set up the volt-ohm-meter. Range to be used: DC 3V</p> <p>(2) Set up the circuit block. Connect the circuit block with the power supply by using the current supplier (S-833).</p>  <p>Clip (+) ... connecting portion with the switch spring Clip (-) ... connecting portion with the battery connection</p> <p>(3) Measuring Probe red (+) ... Circuit block (portion shown in the illustration on the right) Probe black (-) ... C-MOS-LSI Each portion of output terminal</p> 	<p>More than 0.8V: Normal Return to .</p> <p>Less than 0.8V: Defective Proceed to <u>Replace the circuit block.</u></p>

## Procedures

Check to see if the current consumption is normal.

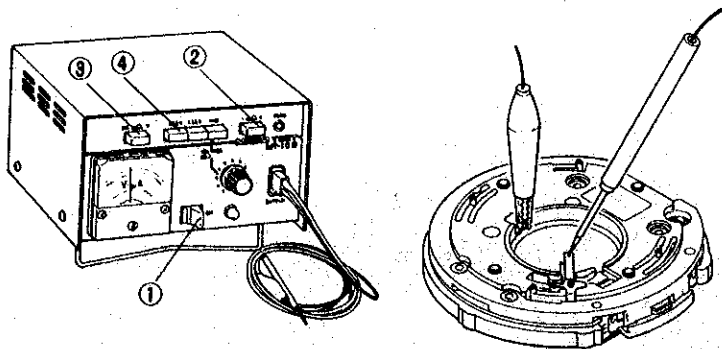
**Note:** When the current supplier (S-833) is connected with the module, the alarm may ring for an instant and the pointer of the volt-ohm-meter or of the Micro Test swings over. Therefore, be sure to check the current consumption with the speaker removed (only with the module).

1. Check the total current consumption for the module.
  - When the volt-ohm-meter is used, Range to be used: DC  $12\mu\text{A}$  (DC 0.03mA)\* Use the current supplier (S-833) and connect as shown in the illustration below.



To ensure the conductivity between the battery connection and the circuit block, be sure to check the current consumption while pushing the battery connection with the probe red.

- When the Micro Test MT-10II is used. Set up the Micro Test.
  - ① Power switch: ON
  - ② Polarity changeover switch: +
  - ③ Current consumption/Voltage indication button:  $\mu\text{A}$
  - ④ Voltage selection switch: 1.55V
 Probe black (-): Battery connection  
 Clip red (+): Plus terminal of battery connection



## Result and repair

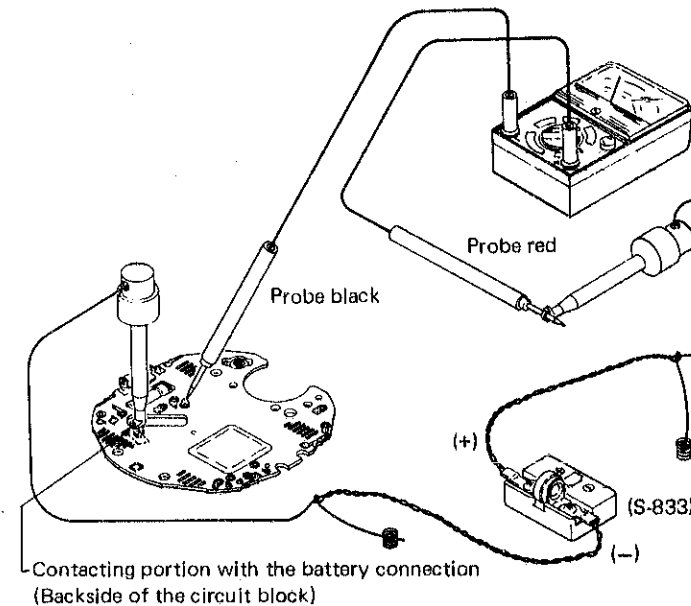
\* Note:  
If the pointer of the volt-ohm-meter swings over the maximum value when DC  $12\mu\text{A}$  (DC 0.03 mA) is used, change the range to a greater one where the pointer does not run over the maximum value while applying the probes to the respective portions. Then after two or three seconds, return the range to DC  $12\mu\text{A}$  (DC 0.03mA) again for measuring.

Less than  $2.5\mu\text{A}$ : Normal  
 Proceed to **Replace the battery**.  
 More than  $2.5\mu\text{A}$ : Defective  
 Proceed to **2**.

**Note:**  
If the pointer of the Micro Test swings over the maximum value while the current consumption is measured, depress the Current consumption/Voltage indication button ③ so that it is released to indicate the voltage ( $\mu\text{V}$ ) while the probe black and the red clip are applied. Then, after two or three seconds, depress the Current consumption/Voltage indication button again so that it holds in the pushed-in position ( $\mu\text{A}$ ) to indicate the current consumption for measuring.

## Procedures

2. Check the current consumption for the circuit block alone. Follow the same checking procedures as in **1**. Use the current supplier (S-833) and connect as shown in the illustration below.



CHECK CURRENT CONSUMPTION

Less than  $2.5\mu\text{A}$ : Normal  
 Proceed to **Replace the liquid crystal panel**.

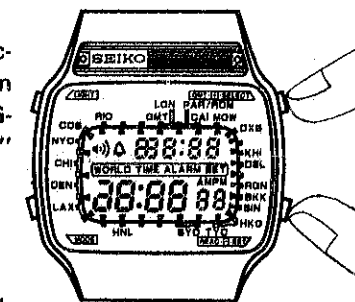
More than  $2.5\mu\text{A}$ : Defective  
 Proceed to **Replace the circuit block**.

CHECK CURRENT CONSUMPTION

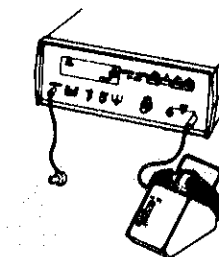
Check loss and gain of time.

1. Set up the Quartz Tester. There are several types of Quartz Testers. Refer to the respective "Instruction Manual" for details.

2. Light up all the segments according to the instructions in the "CHECK PATTERN SEGMENT CHECKING SYSTEM" on page 14.



3. Measuring  
The alarm rings every second. At this time, magnetism is being generated from the speaker coil and it is possible to check time accuracy with the magnetic microphone. (But, after 1 to 2 minutes, one-second signal stops. Repeat the same procedure.)



CHECK ACCURACY

Does not lose or gain: Normal  
 Loses or gains: Defective  
 Proceed to **Time accuracy adjusting**.  
 Time accuracy is adjusted by turning the trimmer condenser.

Procedures

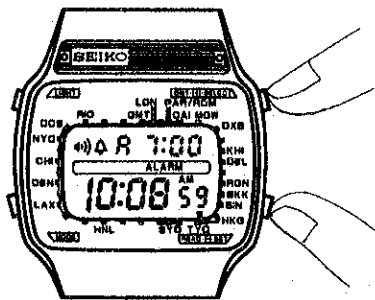
Check to see if the button operation and the adjustment correctly correspond in all time adjusting operations.

1. Check for the world time setting function.  
In the world time setting function, check to see if the time zone is changed over correctly.
2. Check for the alarm time setting function.  
In the world time alarm and the home time alarm setting functions, carry out the setting of the hour and minute through more than one cycle to be sure that the digits advance correctly.
3. Check for the home zone setting function.  
In the home zone setting function, check to see if the time zone mark moves correctly.
4. Check for the time and calendar setting function.  
Carry out the setting of the time and calendar for each digit through more than one cycle to be sure that the digits advance correctly.

Result and repair

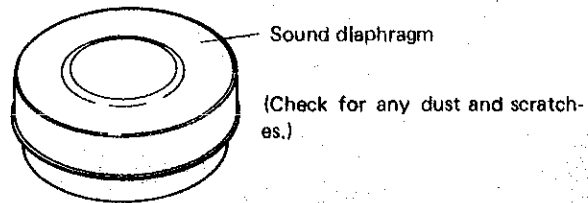
Functions correctly and can be adjusted: Normal  
Wear the watch on the wrist to check time accuracy.  
Does not function or cannot be adjusted: Defective  
Proceed to **Replace the circuit block**.

1. Check to see if the speaker sounds the alarm correctly.
  - In the home time function, check to see if the speaker sounds the alarm when the two buttons on the right side are depressed together.

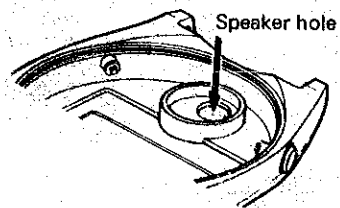


Speaker sounds: Normal  
Set the alarm time again and if the alarm does not operate at the set time, proceed to **Replace the circuit block**.  
Speaker does not sound or it sounds low: Defective  
Proceed to **2**.

2. Check for any dust and scratches on the sound diaphragm of the speaker block.



**Note:** Make sure that the speaker hole is not clogged with dust.

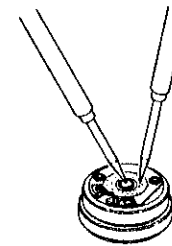


No dust or scratches: Normal  
Proceed to **3**.  
Dust: Defective  
Wipe off any foreign matter with a cloth moistened with cleaning solution.  
Scratched: Defective  
Proceed to **Replace the speaker block**.

Procedures

3. Check for any broken coil wire and short circuit of the speaker block.

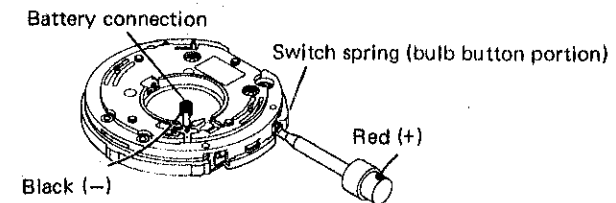
- (1) Set up the Volt-ohm-meter.  
Range to be used: OHMS R x 1
- (2) Measuring  
Apply the probes of the Volt-ohm-meter to the lead terminal of the speaker block.



**Note:** Be careful not to break the coil wire when the probes are applied to the coil terminal.

4. Check to see if the output signal of the circuit block is transmitted to operate the speaker block.

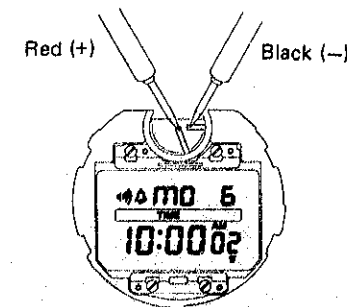
- (1) Set up the Volt-ohm-meter.  
Range to be used: DC 3V
- (2) Supply the current power to the module.
  - Use the current supplier (S-833) and connect as shown in the illustration below.



**Be careful not to pull up the battery connection because it will cause poor contact with the circuit block.**

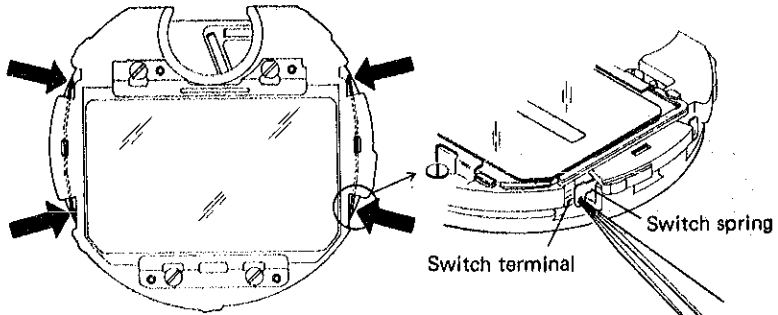
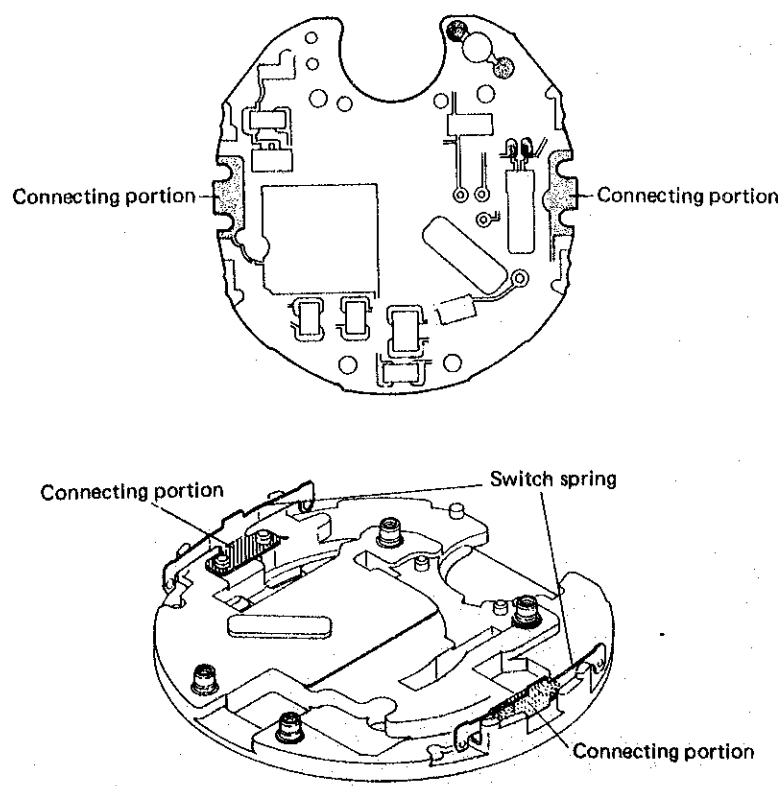
- (3) Display the alarm mark by operating the switch spring and set the time set for alarm to the present time (home time) to make the alarm ready for sounding.

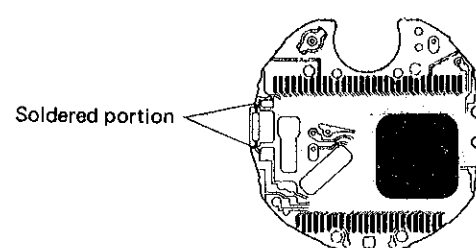
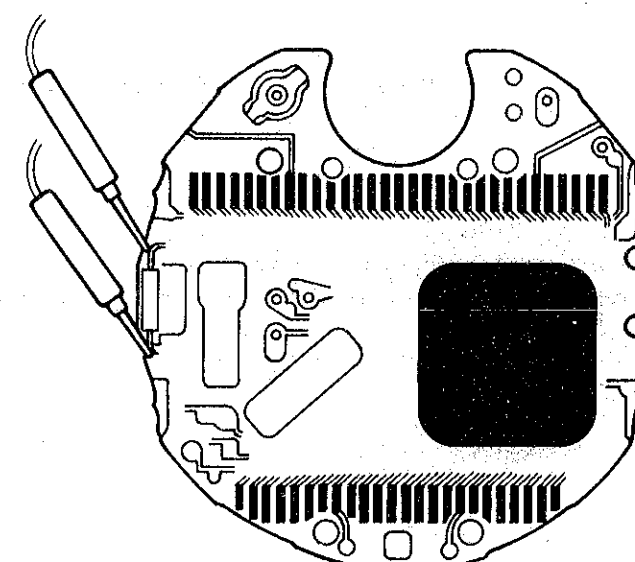
- (4) Measuring  
Apply the probes of the Volt-ohm-meter to the speaker output terminals of the circuit block as shown in the illustration on the right.



Resistance 30Ω ~ 150Ω: Normal  
Proceed to **4**.  
Less than 30Ω or more than 150Ω: Defective  
Proceed to **Replace the speaker block**.

The pointer swings twice or four times every second: Normal  
Proceed to **Replace the speaker block**.  
The pointer does not swing twice or four times every second: Defective  
Proceed to **Replace the circuit block**.

	Procedures	Result and repair
<b>I</b>	<p>Check to see if the switch springs function correctly.</p> <p>1. Check to see if the switch springs (four arrow-marked portions shown in the illustration below) function correctly when they are pushed in.</p> <p>(1) Check to see if the four arrow-marked springs touch the switch terminals of the circuit block when they are pushed in with the tips of tweezers and they do not touch the switch terminals of the circuit block when released.</p>  <p>(2) Check for dust, lint and other contamination on the connecting portions.</p> <p>2. Check to see if the switch springs touch the lead terminals of the circuit block. Check for dust, lint and other contamination on the connecting portions of the circuit block with the switch springs.</p> <p>(Backside of the circuit block)</p> 	<p>Functions correctly: Normal Does not function correctly: Defective Proceed to <b>Replace the switch spring</b>.</p> <p>No dust, lint or uncleaned: Normal Proceed to <b>2</b>. Dust, lint or contaminated: Defective Wipe off any foreign matter.</p> <p>No dust, lint or uncleaned: Normal • The bulb is defective: Proceed to <b>2</b>. • Other defects: Proceed to <b>Replace the circuit block</b>. Dust, lint or contaminated: Defective Wipe off any foreign matter.</p>

	Procedures	Result and repair
<b>I</b>	<p>1. Check to see if the bulb lead terminals are soldered securely to the circuit block.</p>  <p>2. Check to see if there is a broken filament in the bulb.</p> <p>(1) Set up the Volt-ohm-meter. Range to be used: OHMS R x 1</p> <p>(2) Measuring Apply the two probes of the Volt-ohm-meter to the bulb lead terminals as shown in the illustration below.</p>  <p><b>Note:</b> Either red or black probe will do.</p>	<p>Soldered securely: Normal Proceed to <b>2</b>. Solder removed: Defective Resolder the bulb lead terminals. Refer to <b>HOW TO REPLACE THE BULB</b> on the following page for resoldering.</p> <p>The bulb lights up: Normal Proceed to <b>Replace the circuit block</b>. The bulb does not light up: Defective Proceed to <b>Replace the bulb</b>. Refer to <b>HOW TO REPLACE THE BULB</b> on the following page.</p>

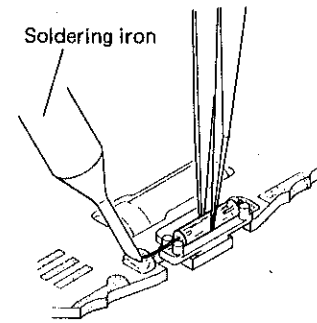


Procedures

Be sure to use a soldering iron of low heat capacity with as fine a tip as possible.

Thickness of the tip: approx.  $\phi$  1 mm

Heat capacity: 5W ~ 20W of power consumption



1. Remove the defective bulb.

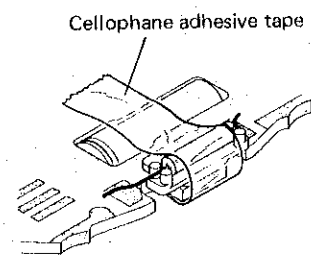
Hold the defective bulb gently with tweezers, apply the soldering iron to the bulb lead terminal and lift the lead of the bulb to remove it.

2. Check to see if the new bulb is normal.

Refer to **I** "CHECK BULB CONDITION".

3. Be sure to solder the lead of the bulb securely so that it may not slacken.

Fix the bulb to the circuit block with a cellophane adhesive tape, etc. It will make it easier to solder the bulb.

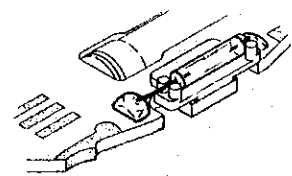


4. The lead of the bulb is made somewhat longer. After soldering the bulb, cut it off properly with cutting pliers or scissors.

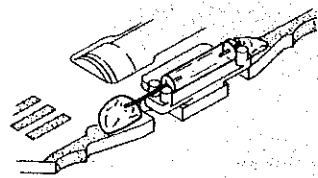
Note:

- (1) If the soldering iron is applied for too long a period, the circuit block may be damaged. Be sure to apply the soldering iron only to such an extent that the solder is melted uniformly at the connection (for approx. 1 second).
- (2) Be careful not to touch the bulb rest (plastic part) with the soldering iron.

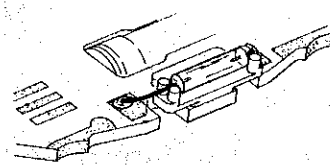
Correct



Excessive



Insufficient



5. Finally check the bulb condition again.

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