

TECHNICAL GUIDE

AND PARTS LIST

CAL. Y450A

DIGITAL QUARTZ

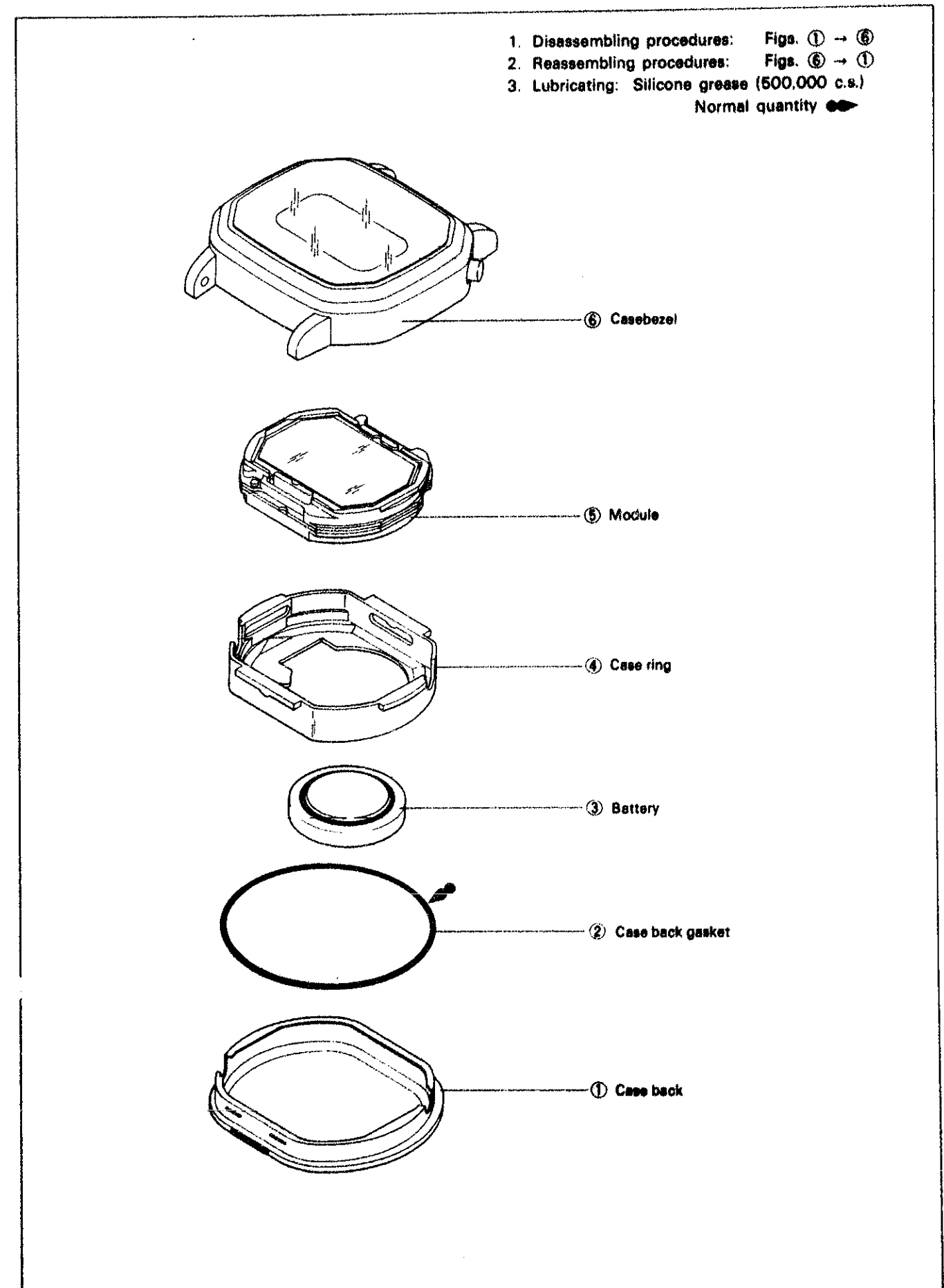
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I. SPECIFICATIONS

Item	Cal No.	Y450A
Display medium		Nematic Liquid Crystal, FEM (Field Effect Mode)
Display system		Hour and minute → Month and date ↓ ↑ Second Day of the week • Depressing the button will change the indication mode from hours and minutes in the above sequence.
Crystal oscillator		32,768 Hz (Hz = Hertz Cycles per second)
Loss/Gain		Loss/Gain at normal temperature range Mean monthly rate: Less than 20 seconds (Annual rate: Less than 4 minutes)
Casing diameter		φ18.0 mm (15.5 mm between 6 o'clock and 12 o'clock)
Height		4.7 mm without battery
Operational temperature range		-10°C ~ +50°C (14°F ~ 122°F)
Regulation system		Trimmer condenser
Battery power		Silver oxide battery: Maxell SR1120SW Silver peroxide battery: Maxell SR1120W Battery life: Approx. 2 years Voltage: 1.55V
IC (Integrated Circuit)		C-MOS-LSI 1 unit

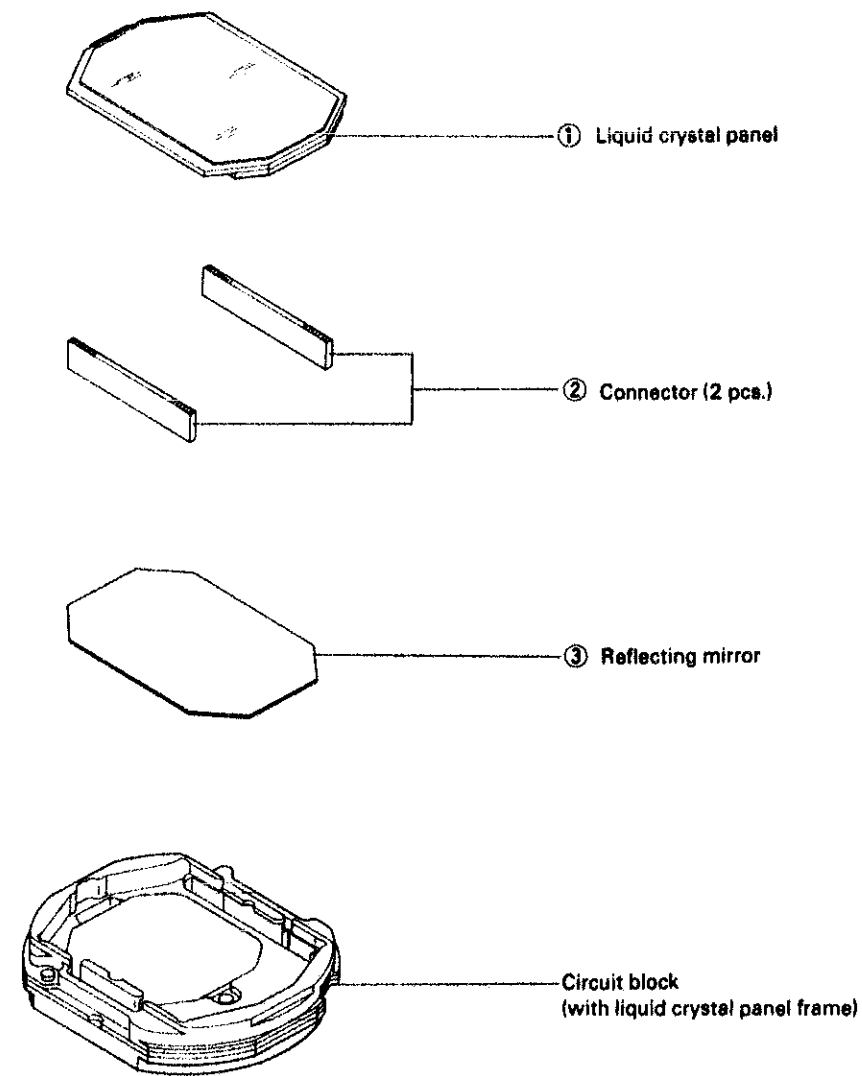
II. DISASSEMBLING AND REASSEMBLING OF THE CASE



III. DISASSEMBLING, REASSEMBLING AND CLEANING OF THE MODULE

1. Crystal panel side

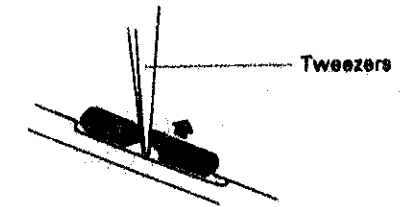
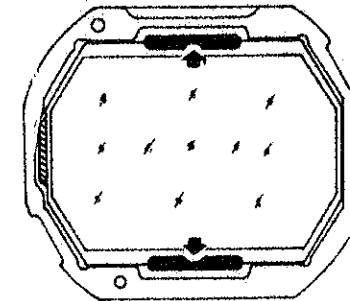
Disassembling procedures: Figs. ① → ②
 Reassembling procedures: Figs. ② → ①



REMARKS FOR DISASSEMBLING AND REASSEMBLING

① Liquid crystal panel

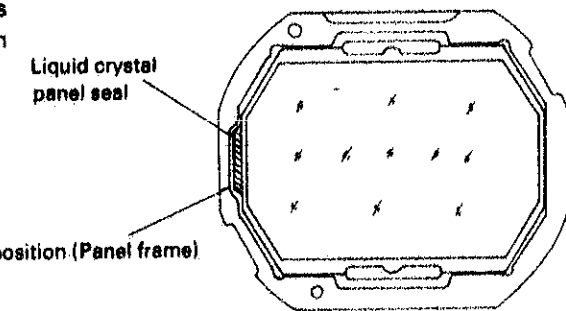
Remarks for disassembling



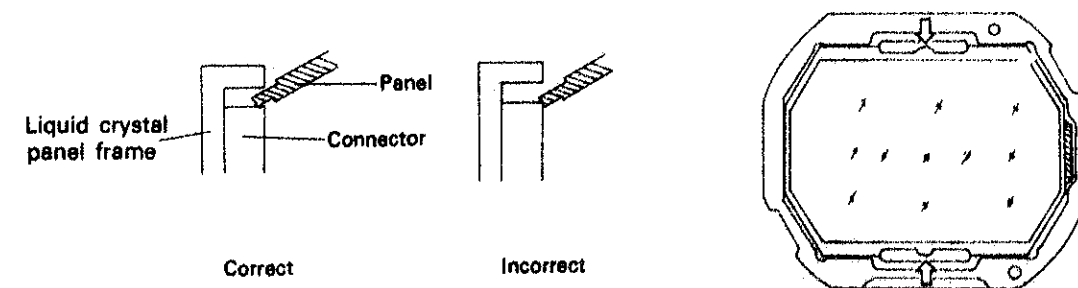
Push the liquid crystal panel frame (arrowed portions (◆)) outward (in the arrowed direction ◆) with tweezers and remove the liquid crystal panel, being careful not to scratch it.

● Remarks for reassembling

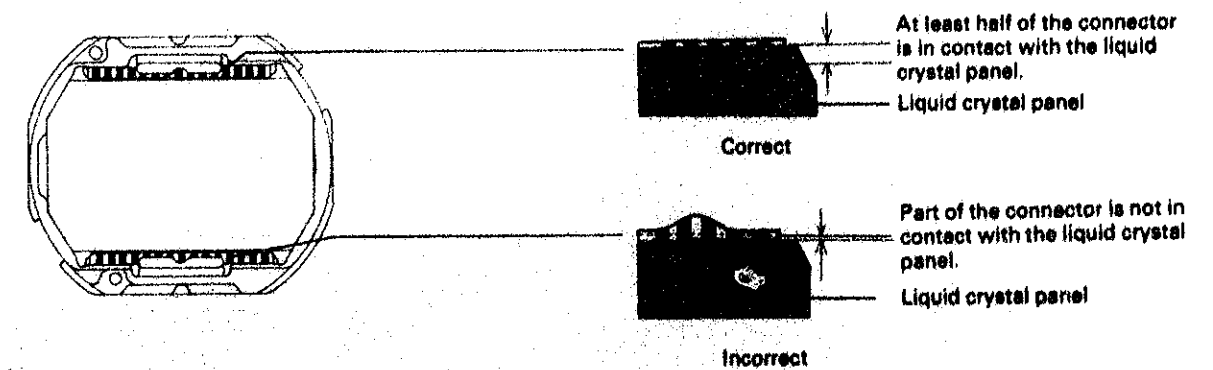
1) Reassemble the liquid crystal panel so that its seal is positioned in the panel frame as shown on the right.



2) Set the liquid crystal panel between the liquid crystal panel frame and the connector and fix it by pushing the liquid crystal panel frame inward.



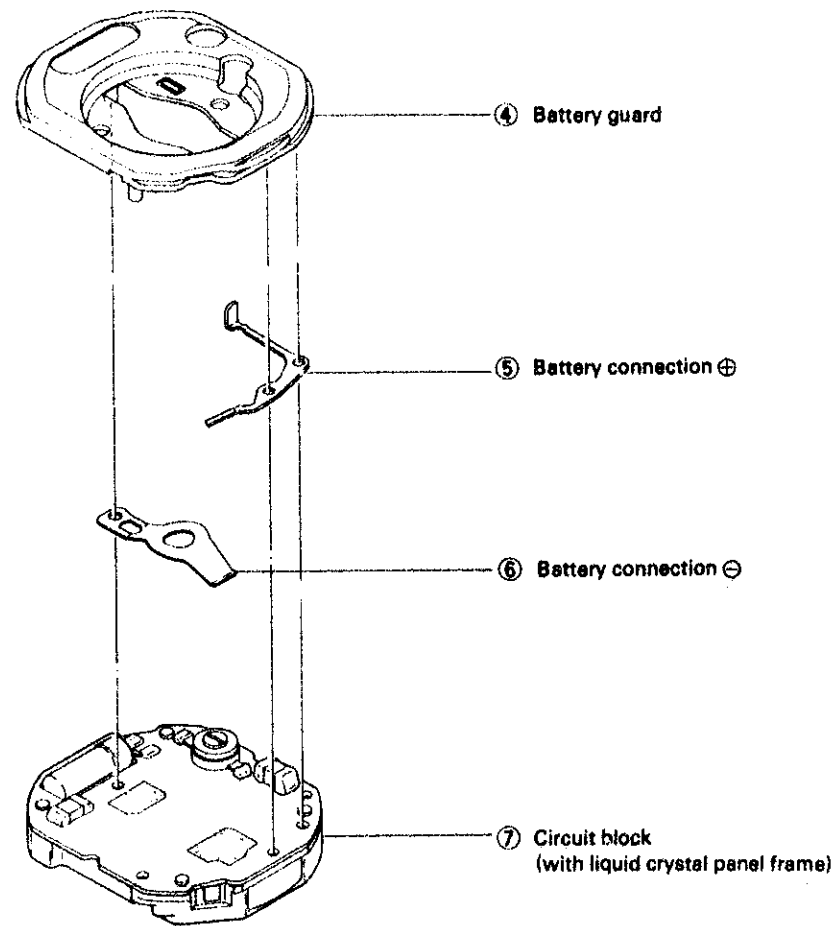
3) Check the connecting portions of the liquid crystal panel and the connectors.



② Connector

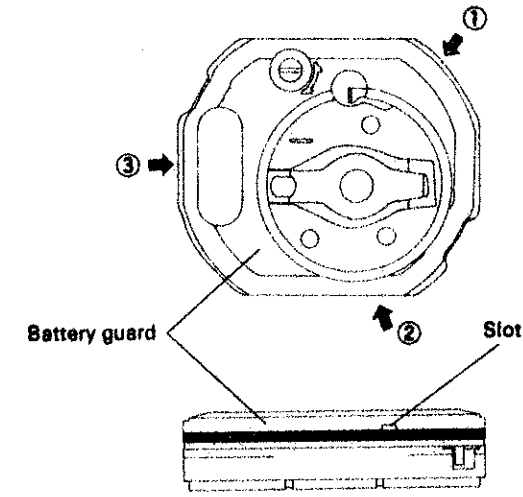
There is no difference between the two connectors. The black portions are conductive. Check to see if there are any scratches or contamination.

2. Battery side



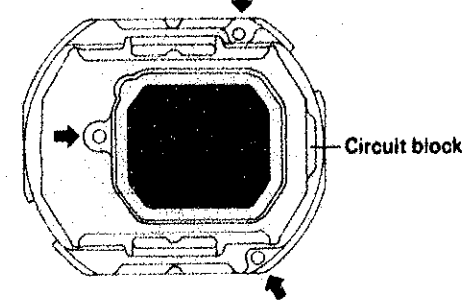
④ Battery guard

Remarks for reassembling



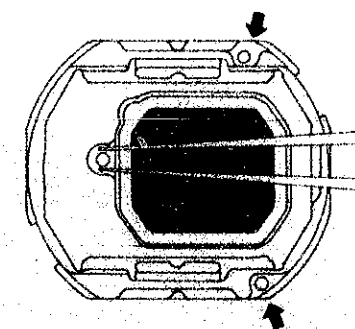
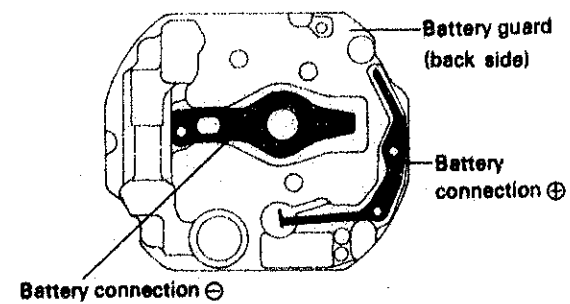
Pry the battery guard up by inserting a suitable screwdriver into the slots in the order of ①, ② and ③. Repeat this procedure until the battery guard is removed.

Remarks for reassembling



Insert the projections battery guard into the three holes (arrowed) of the circuit block.


Before reassembling the battery guard, place the battery connections ⊕ and ⊖ on it as shown on the left.



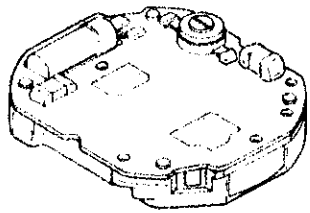
A gap is sometimes left between the circuit block and battery guard. Depress the circuit block to close the gap.

3. CLEANING

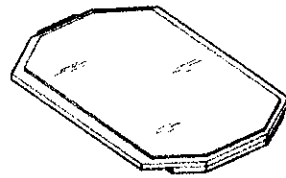
1) Cleaning method

Name of parts	Cleaning	Drying	Solution	Remarks
Connector 	Rinse, or wash with a soft brush.	Warm air.	Alcohol	<ul style="list-style-type: none"> ● Never use benzene or trichloroethylene as these will melt the connector. ● Do not install a connector until it is completely dry.
Plastic parts (Battery guard)	Rinse, or wash with a soft brush.	Warm air.	Benzene or alcohol	
Other parts (Battery connections ⊕ and ⊖)	Rinse, or wash with a soft brush.	Warm or hot air.	Benzene, trichloroethylene or alcohol	

2) Parts that must not be cleaned



Circuit block
(with liquid crystal panel frame)



Liquid crystal panel



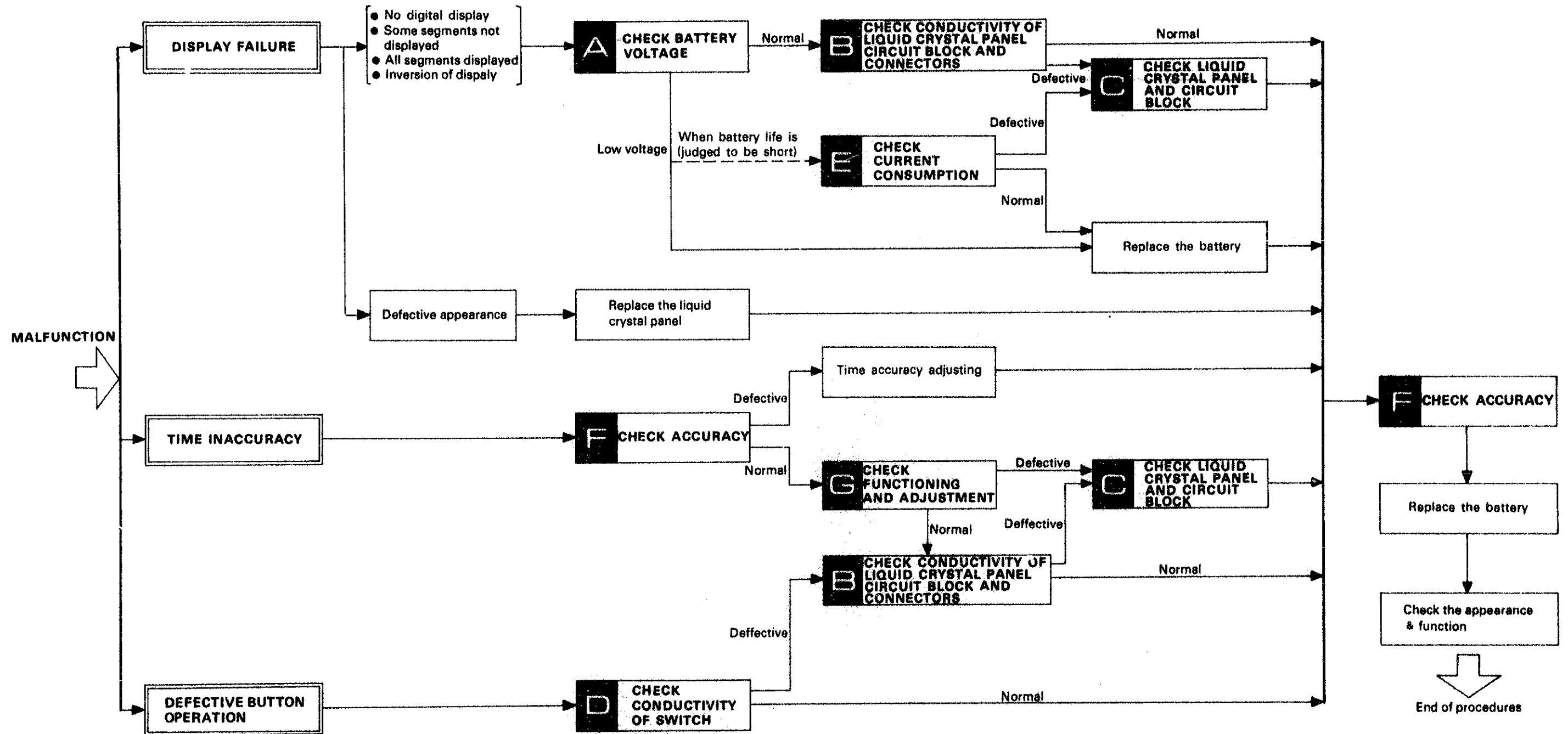
Reflecting mirror

- Only the conductive portions should be wiped with a cloth moistened with benzine or alcohol and dried with warm air.
- Remove dust or lint with a soft brush.

IV. CHECKING AND ADJUSTMENT

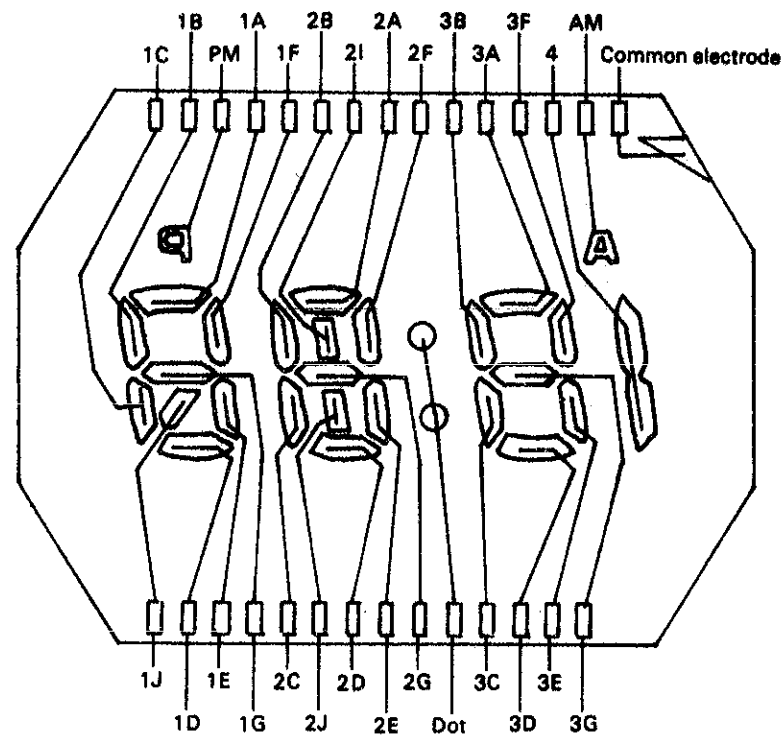
Be sure to use the Static electricity protector when handling the module.

1. Guide table for checking and adjustment

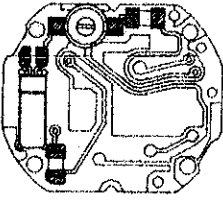
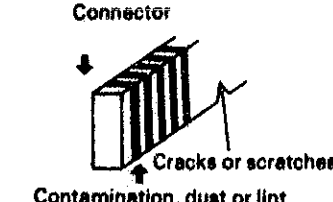
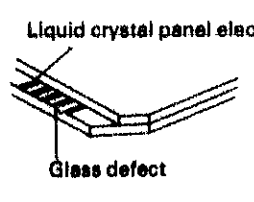
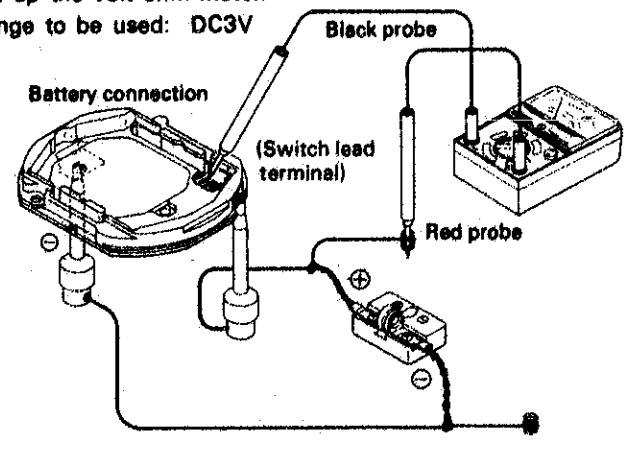


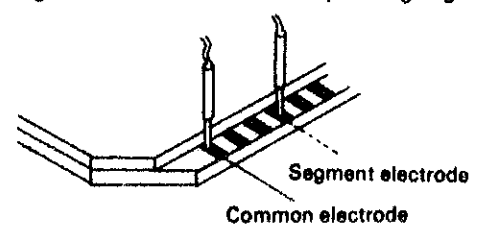
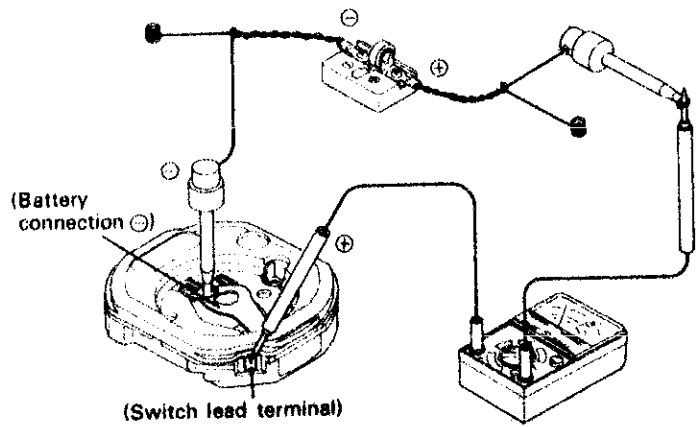
2. Liquid crystal panel segment electrode

Y450A



3. Procedures for checking and adjustment

	Procedure	Result and repair
CHECK BATTERY VOLTAGE	<p>Check battery voltage</p> <p>(1) Set up the volt-ohm-meter. Range to be used: DC 3V</p> <p>(2) Measuring. Probe Red (+): Battery surface (+) Probe Black (-): Battery surface (-)</p>	<p>Specified values</p> <p>More than 1.5V Normal Less than 1.5V Defective Replace the battery</p>
CHECK CONDUCTIVITY OF LIQUID CRYSTAL PANEL, CIRCUIT BLOCK AND CONNECTORS	<p>Check conductivity of liquid crystal panel, circuit block and connectors</p> <p>● Check for any dust, lint, contamination, cracks and scratches on the liquid crystal panel, circuit block and connectors.</p> <div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;">  <p>Circuit block</p> </div> <div style="text-align: center;">  <p>Connector Cracks or scratches Contamination, dust or lint</p> </div> <div style="text-align: center;">  <p>Liquid crystal panel electrode Glass defect</p> </div> </div>	
CHECK LIQUID CRYSTAL PANEL AND CIRCUIT BLOCK	<p>Check liquid crystal panel and circuit block</p> <p>Check to see if the liquid crystal panel and the circuit block function correctly.</p> <p>(1) Check the circuit block output voltage. Set up the volt-ohm-meter. Range to be used: DC3V</p> <div style="text-align: center;">  </div> <p>(2) Check liquid crystal panel.</p> <p>1. Set up the volt-ohm-meter. Range to be used: OHMS R x 1 ~ R x 1K</p> <p>Note: Any range will do if more than 3V is applied to the probes of the volt-ohm-meter. If more than 3V is not applied to the probes, any segments may not be lit. Change the range to the one (R x 10K) which is higher in resistance than R x 1K.</p>	<p>Specified values</p> <p>More than 0.8V Normal Less than 0.8V Defective Replace the circuit block with a new one.</p>

	Procedure	Result and repair
CHECK LIQUID CRYSTAL PANEL AND CIRCUIT BLOCK	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.) 	Lights up: Normal Does not light up or more than two segments light up: Defective Replace the liquid crystal panel with a new one.
CHECK CONDUCTIVITY OF SWITCH	Check conductivity of switch 1. Check the switch function. 2. Check the electrode in contact with the battery connection and circuit block switch, for contamination, dust or lint.	Functions correctly: Normal Does not function correctly: Defective If the switch springs do not function correctly after the switch springs are set correctly, replace the switch springs with new ones. No dust, lint or uncontaminated: Normal Proceed to E Dust, lint or contaminated: Defective Wipe off any foreign matter.
CHECK CURRENT CONSUMPTION	Check current consumption (1) Check to see if the current consumption is normal. (Can be checked no matter which function the watch may be performing.) • Set up the volt-ohm-meter. Range to be used: DC 12 μ A (DC 0.03mA)* Use the current supplier and connect as shown in the illustration below.  (Switch lead terminal) (2) Disassemble the liquid crystal panel, and check to see if the current consumption is normal. Follow the procedures in E (1).	*Note: If the pointer of the volt-ohm-meter swings over the maximum value when DC 12 μ A (DC 0.03mA) 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 μ A (DC 0.03mA) again for measuring. Less than 2.2 μ A: Normal Replace the battery with a new one. More than 2.2 μ A: Defective Normal: Replace the liquid crystal panel with a new one. Defective: Replace the circuit block with a new one.

	Procedure	Result and repair
CHECK ACCURACY	Check accuracy Check gain and loss of time. 1. Set up the Quartz Tester. 2. Measuring	Does not lose or gain: Normal Loses or gains: Defective Time accuracy is adjusted by turning the trimmer condenser.
CHECK FUNCTIONING AND ADJUSTMENT	Check functioning and adjustment Check to see if the watch functions correctly and can be adjusted by the button operation. Check the time and calendar setting function. • Rotate the time and calendar digits more than one cycle for each unit and check to see if each digit is advancing correctly.	Functions correctly and can be adjusted: Normal Wear the watch on the wrist to check time accuracy. Does not function correctly or cannot be adjusted: Defective Replace the circuit block.

All procedures of Disassembling, Reassembling and Adjustment are completed.

V. PARTS LIST OF MODULE

Cal. Y450A			
PART NO.	PART NAME	PART NO.	PART NAME
4001 450	Circuit block		
4270 450	Battery connection (-)		
4271 451	Battery connection (+)		
4313 450	Connector		
4398 069	Battery guard		
4510 450	Liquid crystal panel		
4521 450	Reflecting mirror		
☆ Maxell SR1120SW	Silver oxide battery		
☆ Maxell SR1120W	Silver peroxide battery		
Remarks:			
Battery			
☆ Maxell SR1120SW }An additional battery for this calibre might be added as a substitute in the future.			
☆ Maxell SR1120W }			

☆ ○ Please see remarks.