TECHNICAL GUIDE

CAL. Y430 A

DIGITAL QUARTZ

CONTENTS

I. SPECIFICATIONS AND FEATURES

1. Specifications

Item	Calibre No. Y430A
Display medium	Nematic Liquid Crystal, FEM (Field Effect Mode)
Display system	• Time display (Constant display) Hour, minute & second: 12-hour digital display system • Calendar display (The calendar digits are displayed for 2 seconds by depressing button (A) when the time digits are displayed.) • Day and date: Automatic calendar system (Automatically adjusts for even and odd months except February of leap years.) • Month, A.M. (▭) & P.M. (▭) are displayed when the time and calendar digits are adjusted.
Additional mechanism	Battery life indicator (All the digits in the display start flashing when the battery life nears its end.) Illuminating light
Crystal oscillator	32,768 Hz (Hz = Hertz . . . Cycle per second)
Loss/gain	Loss/gain at normal temperature range Monthly rate : less than 20 seconds (Annual rate : less than 4 minutes)
Casing diameter	ϕ17.5mm (14.0mm between 6 o'clock and 12 o'clock sides; 17.0mm between 3 o'clock and 9 o'clock sides)
Height	4.2mm without battery
Operational temperature range	-10°C ~ +60°C (14°F ~ 140°F)
Regulation system	Trimmer condenser
Battery power	Toshiba WG-3 Battery life is approximately 2 years. Voltage: 1.55V
IC (Integrated Circuit)	C-MOS-LSI . . . 1 unit

2. Features

This Ladies' Digital Quartz Cal. Y430A has the same accuracy and reliability for which the existing Digital Quartz watches are known. It has been made even smaller and thinner for ladies' timepieces.

(1) In addition to the "hour", "minute" and "second" digits, the "day" letters (alpha) and "date" digits also are displayed by button operation.

(2) With the simplified block system of the module, it is easier to provide after-sale servicing. (No screws are used in the module.)

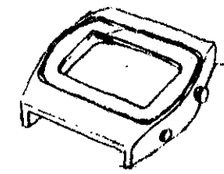
II. DISASSEMBLING AND REASSEMBLING OF THE CASE

1. How to disassemble the module

● Lubricating Silicone grease 500,000 c.s. Normal quantity ◆

Example: Y430-4020

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



(1) Case back
Note: Be careful not to push the center of the case back.

(2) Case ring

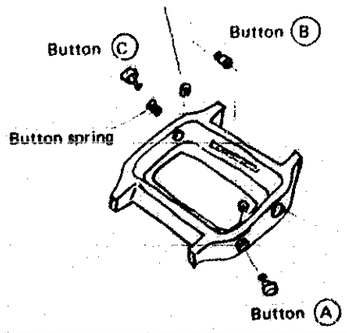
(3) Module

(4) Battery

(5) Casebezel (with glass, plastic gasket and panel cover)

2. How to disassemble the buttons

Hook-up for time adjusting button



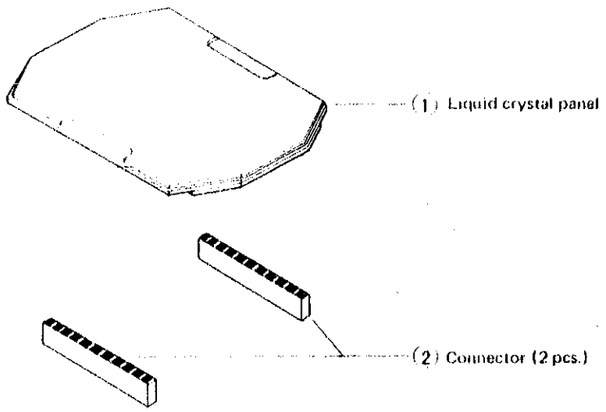
- Button Ⓐ: Remove the hook-up for time adjusting button and pull out the button Ⓐ.
- Button Ⓑ: Push the button B inwards.
- Button Ⓒ: Remove the hook-up for time adjusting button and pull out the button Ⓒ. Be careful not to spring out the button spring.

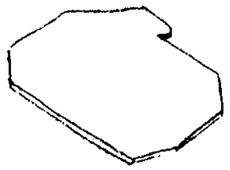
III. DISASSEMBLING, REASSEMBLING AND CLEANING

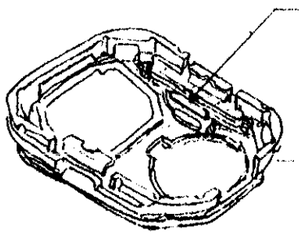
Disassembling procedures Figs.: (1) ~ (8)

Reassembling procedures Figs.: (8) ~ (1)

1. Liquid crystal panel side



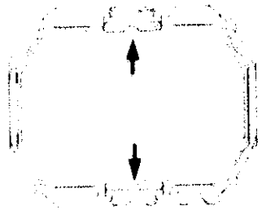




Remarks for disassembling and reassembling

(1) Liquid crystal panel

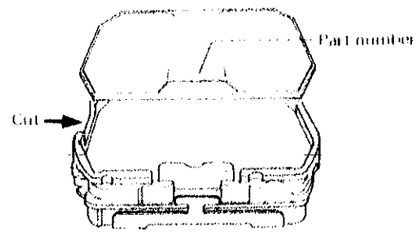
- How to disassemble the liquid crystal panel



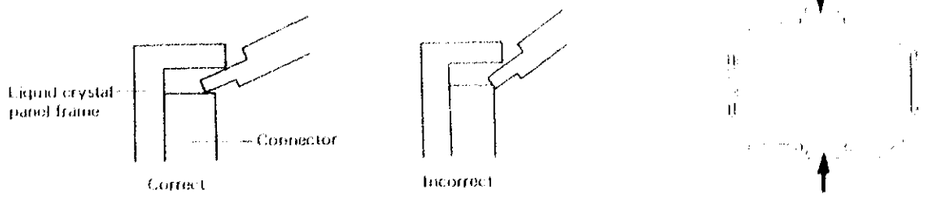
- Push the liquid crystal panel frame (arrow-marked portions ◄) outward (in the arrow-marked direction ►) with tweezers and disassemble the liquid crystal panel. Be careful not to scratch the liquid crystal panel.

- How to reassemble the liquid crystal panel

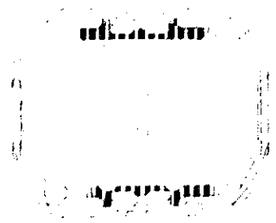
1) Reassemble the liquid crystal panel in such a manner that its part number portion comes to the upper side when the cut (arrow-marked portion) of the liquid crystal panel frame is on the left side as shown in the illustration.

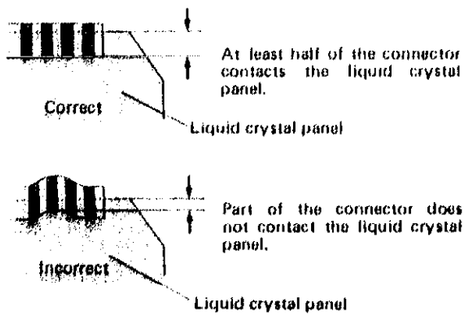


2) First set the liquid crystal panel between the liquid crystal panel frame and the connector and then reassemble it by pushing the liquid crystal panel frame inward.



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

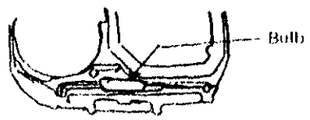




(2) **Connector**

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

- How to replace the bulb
  - Position to be attached

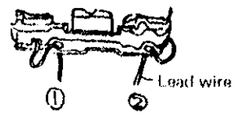


  - Reassembling

1)

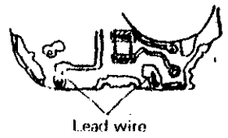
- Put the lead wire of the bulb into the clearance between the circuit block and the liquid crystal panel frame and pull it outwards.

2)



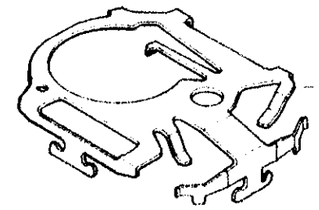
- Put the lead wire pulled outwards into the hole of the circuit board and pull it to the backside. Insert(①)first.

3)

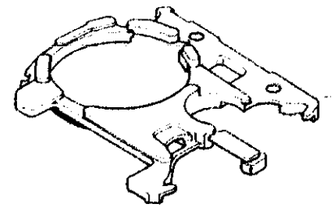


- Cut the lead wire to the electrode portion of the circuit block and bend it. Be careful not to touch it to the other electrode.

2. Battery side



(4) Circuit block cover with switch spring

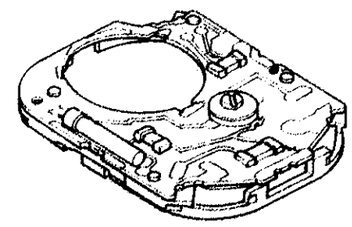


(5) Battery guard

(6) Insulator for battery

Note: Before reassembling the insulator for battery, reassemble the battery guard and the circuit block cover with switch spring.

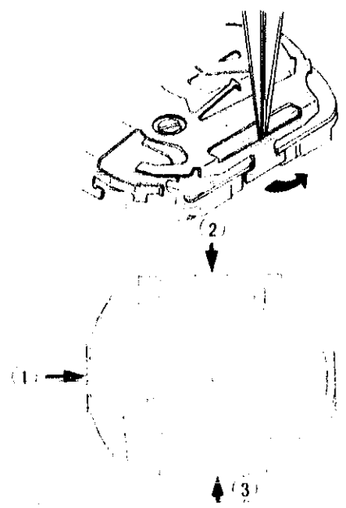
(7) Battery connection



(8) Circuit block (with liquid crystal panel frame)

Remarks for disassembling and reassembling

(5) Circuit block cover with switch spring



- How to disassemble the circuit block cover with switch spring

  Pry it up with tweezers in the arrow-marked direction.

- How to reassemble the circuit block cover with switch spring

  Set (1) portion first and then (2) and (3) portions.
  Be careful not to push the crystal unit with a finger. Finally check to see if the circuit block cover with switch spring and the battery guard are fixed in position at the arrow-marked portions.

(6) How to reassemble the battery guard

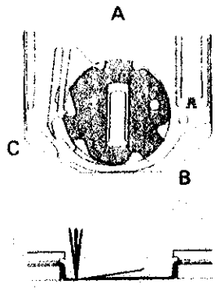
Be sure to set the two battery guard pins into the holes of the circuit block. After reassembling the battery guard and the circuit block, make sure that there is no clearance between them.

(7) How to reassemble the insulator for battery

After reassembling the battery guard and the circuit block cover with switch spring, reassemble the insulator for battery in accordance with the following procedures.

1) First insert the B portion of the three protrusions of the insulator for battery into the space between the battery connection and the battery guard.
   Be sure to set it in position.

2) Next push the remaining two portions A and C with tweezers to set them in position. Be careful not to scratch the battery guard.

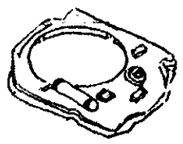


3. Cleaning

1) HOW TO CLEAN

Name of parts	Cleaning	Drying	Solution	Remarks
Connector	Rinse or clean with a brush.	Warm air	Alcohol	• Be sure to reassemble after drying thoroughly. • Do not use benzine or trichloroethylene.
Plastic parts Battery guard and insulator for battery	Rinse or clean with a brush.	Warm air	Benzine or alcohol	
Other parts Battery connection and circuit block cover with switch spring	Rinse or clean with a brush.	Warm or hot air	Benzine or alcohol	

2) PARTS THAT MUST NOT BE CLEANED



Circuit block

Liquid crystal panel

Reflecting mirror

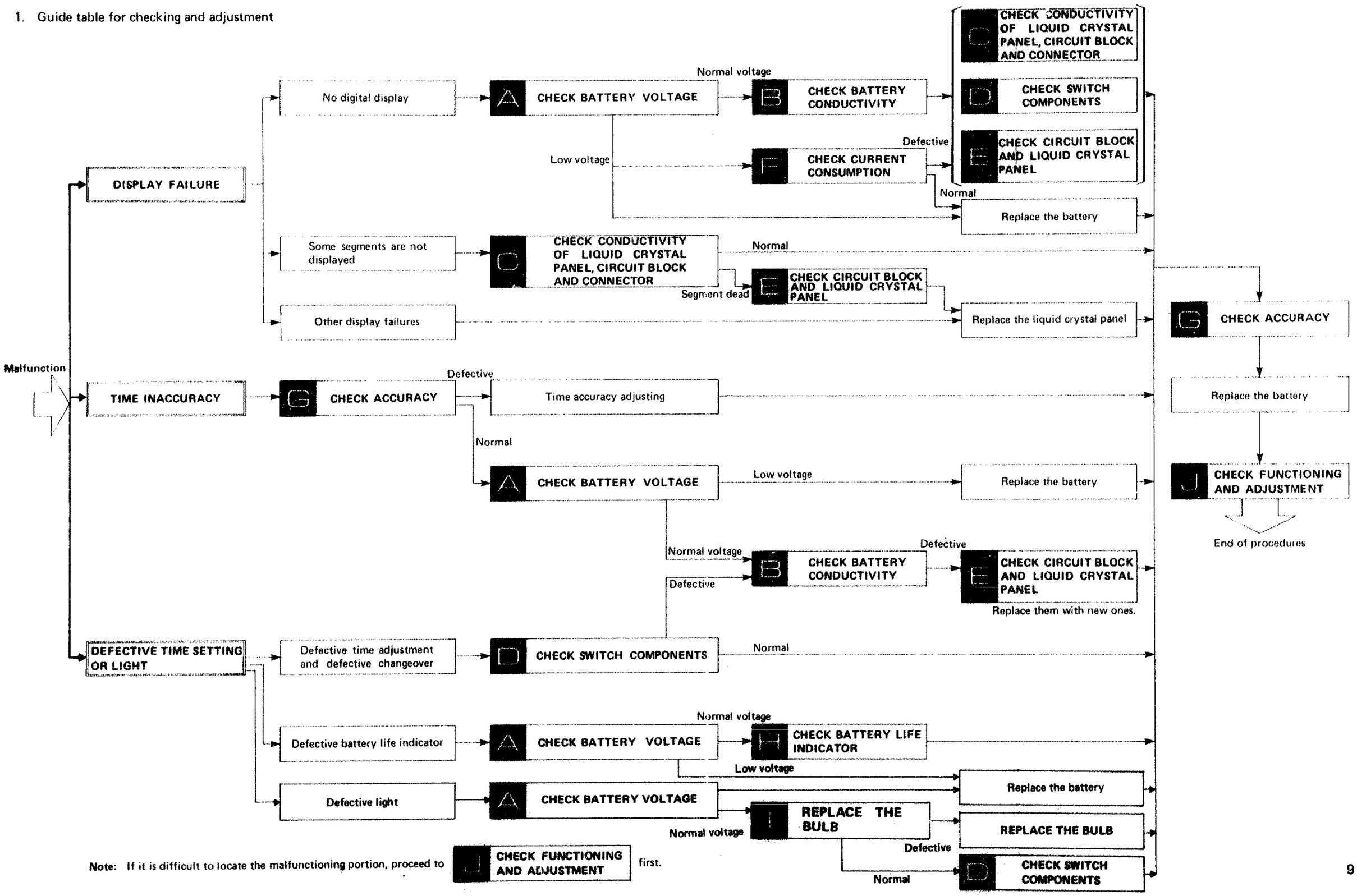
Bulb

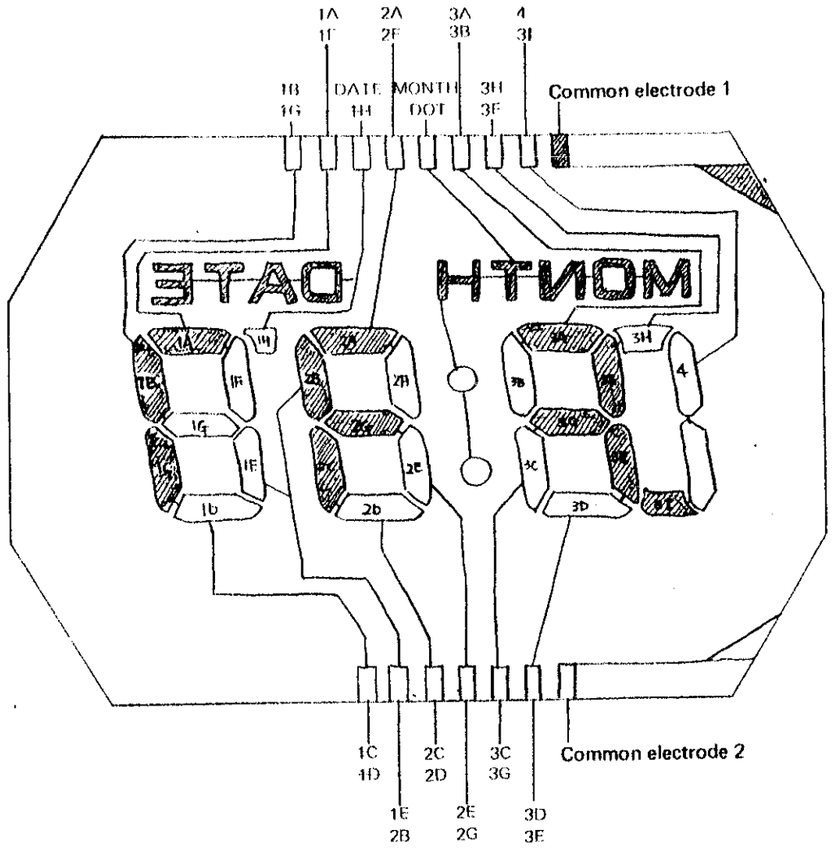
Battery

- Be sure to clean only stains on the conductive portions with a cloth moistened with benzine alcohol and dry with warm air. (Wipe the battery and the reflecting mirror with a dry cloth.)
- Wipe dust and lint off with a soft brush.

V. CHECKING AND ADJUSTMENT

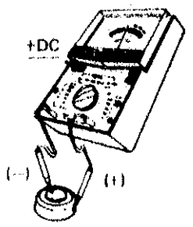
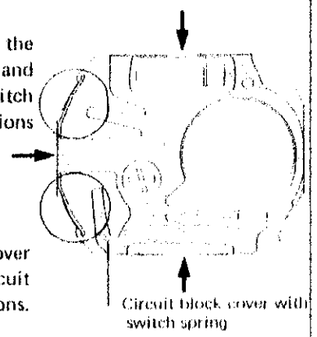
1. Guide table for checking and adjustment



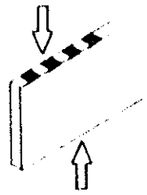
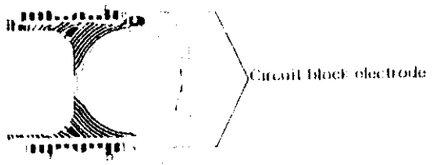


Common electrode 1 is connected electrically with ▨ segments.
Common electrode 2 is connected electrically with ▭ segments.

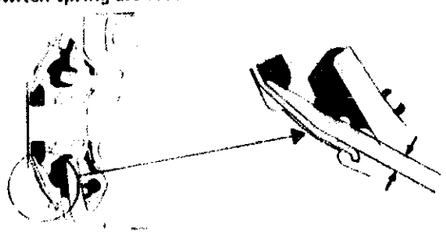
2. Procedures for checking and adjustment

	Procedures	Results and repair
A CHECK BATTERY VOLTAGE	Check battery voltage. ● Set up the volt-ohm-meter. Range to be used: DC 3V ● Measuring Probe Red (+) . . . Battery surface (+) Probe Black (−) . . . Battery surface (−) 	More than 1.55V: Normal Less than 1.55V : Defective Replace the battery with a new one.
B CHECK BATTERY CONDUCTIVITY	**First check** Check for any contamination on the battery, the battery connection and the circuit block cover with switch spring, particularly at the portions marked with the circles.  **Second check** Check to see if the circuit block cover with switch spring is set to the circuit block at the arrow-marked portions. **Third check** Check to see if there is battery electrolyte leakage. ○ How to repair battery electrolyte leakage 1. Remove the module from the case. 2. Disassemble the module. 3. Clean the parts contaminated with battery electrolyte. ● Clean the circuit block. (1) Wipe off battery electrolyte on the circuit block with a cloth moistened with distilled water (or tap water) first and then with a cloth moistened with alcohol. **Note:** ● Do not use a cloth which gives off lint such as gauze, flannel, etc. ● Be careful that the trimmer condenser is not exposed to water or alcohol. (2) Dry with warm air by using a dryer. ● Clean the other parts. (1) Wipe off battery electrolyte on the other parts with a soft brush moistened with distilled water (or tap water). (2) Dry with warm air by using a dryer. 4. Reassemble the module and replace the battery with a new one. 5. Check to see if the time setting functions and the current consumption are normal.	Uncontaminated: Normal Contaminated: Defective Wipe off any foreign matter. Set firmly: Normal Not set firmly: Defective Set firmly. No battery electrolyte leakage: Normal Battery electrolyte leakage: Defective Wipe off battery electrolyte by following the repairing procedures.

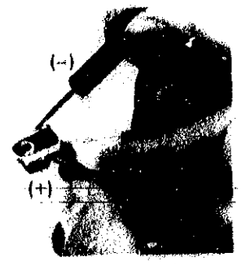
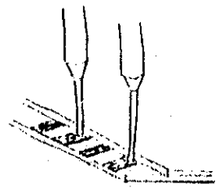
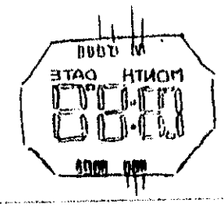
C CHECK CONDUCTIVITY OF LIQUID CRYSTAL PANEL, CIRCUIT BLOCK AND CONNECTOR

Procedures	Results and repair
First check Check for any contamination, crack and tiny break of the connector.  Check carefully the connecting portions with the liquid crystal panel and the circuit block.	No contamination, crack or minute break: Normal Contaminated: Defective Wipe off any foreign matter. Cracked or broken: Defective Replace the connector with a new one.
Second check Check the liquid crystal panel electrode (connecting portion with the connector) for any foreign matter and glass defects. 	No contamination or glass defect: Normal Contaminated: Defective Wipe off any foreign matter. Glass defect: Defective Replace the liquid crystal panel with a new one.
Third check Check the circuit block electrode (connecting portion with the connector) for any foreign matter. 	Uncontaminated: Normal Contaminated: Defective Wipe off any foreign matter.

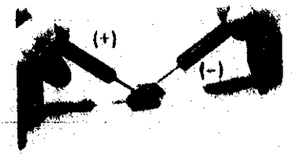
D CHECK SWITCH COMPONENTS

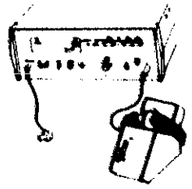
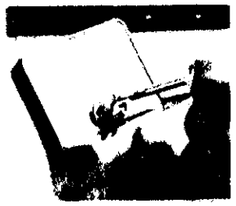
Procedures	Results and repair
First check Check for any contamination on the switch spring of the circuit block cover and the circuit block (connecting portion with the switch spring). 	Uncontaminated: Normal Contaminated: Defective Wipe off any foreign matter.
Second check Check for clearance between the switch spring and the circuit block. (Check for clearance after the battery guard and the circuit block cover with switch spring are reassembled.)  Check for clearance by looking from above.	Clearance: Normal No clearance: Defective Correct the switch spring with tweezers so that there is a clearance.

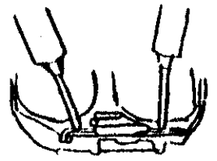
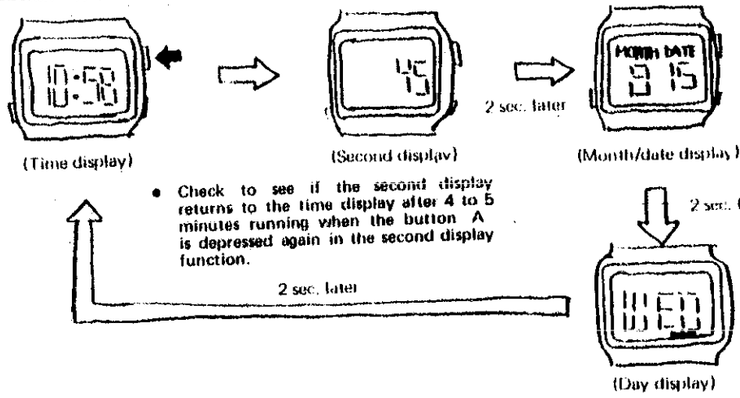
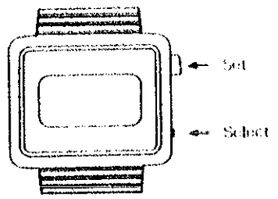
E CHECK CIRCUIT BLOCK AND LIQUID CRYSTAL PANEL

Procedures	Results and repair
First check Check to see if the electric signal flows into the liquid crystal panel from the circuit block correctly. (1) Set the battery in the module and operate the watch. (2) Disassemble the liquid crystal panel by following the disassembling procedures. (3) Set up the volt-ohm-meter. Range to be used: DC 3V (4) Measuring Probe Red (+): Circuit block cover with switch spring Probe Black (–): Black portions of the connector (Apply the probe to several portions.)  **Note:** Be sure to touch the connector lightly with the probe.	More than 0.8V: Normal Less than 0.8V: Defective Replace the circuit block with a new one. (The above voltage is obtained when measured with the Volt-ohm-meter mentioned in the Technical Guide. When another Volt-ohm-meter is used, a slightly low voltage may be indicated.)
Second check Check the liquid crystal panel for any broken panel pattern, short circuit, etc. 1. Set up the Volt-ohm-meter. Range to be used: OHMS R × 1 2. Remove the liquid crystal panel from the module and turn it upside down. 3. Measuring Apply the two probes of the Volt-ohm-meter to the common electrode and the segment electrode. (There are two common electrodes in the liquid crystal panel and either of the two lights up.)  	Lights up: Normal Does not light up: Defective Replace the liquid crystal panel with a new one.

F CHECK CURRENT CONSUMPTION

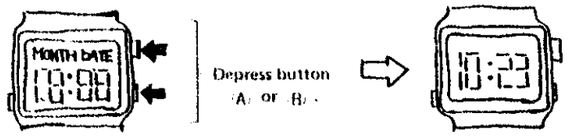
Check to see if the current consumption is normal. (1) Set up the volt-ohm-meter. Range to be used: DC 12μA (2) Probe Red (+) . . . Battery connection Probe Black (–) . . . Battery surface (–) 	Less than 2.1μA: Normal More than 2.1μA: Defective Proceed to ■, ■ and ■.

	Procedures	Results and repair
G CHECK ACCURACY	Check gain and loss of time. As a special circuit is provided in Cal. Y430A, measure time accuracy with all the segments displayed. (1) Depress and hold button (B) for 3 to 4 seconds to display all the segments.  (2) Measuring  Set the microphone switch (Electro-magnetic and Electric field detection Changeover-Power switch) to I.C. ON position. ● **How to adjust time accuracy** The watch will gain or lose according to the direction in which the trimmer condenser is turned.  ● When the adjustment is completed, depress either button (A) or button (B) to display time digits.	Bulb lights up: Normal Bulb does not light up: Defective Replace the bulb with a new one.
I CHECK BATTERY LIFE INDICATOR	Check to see if the battery life indicator functions correctly. **First check** (1) Set up the Micro Test. Set the voltage at 1.35V. (2) Remove the battery from the module and apply the terminals of the Micro Test to the module. Red Clip (+) . . . Circuit block cover with switch spring Black Probe (−) . . . Battery connection 	Display flashes: Normal Display does not flash: Defective Replace the circuit block with a new one.
	Second check (1) Set up the Micro Test. Set the voltage at 1.55V. (2) Apply the terminals of the Micro Test to the module in the same manner as in (2) of First check.	Display does not flash: Normal Display flashes: Defective Replace the circuit block with a new one.

	Procedures	Results and repair
J CHECK BULB CONDITION	Check to see if there is a broken filament in the bulb. 1. Set up the Volt-ohm-meter. Range to be used: OHMS R x 1 2. Measuring Apply the two probes of the Volt-ohm-meter to the bulb lead terminals as shown in the illustration. (Either red or black probe will do.) 	Does not lose or gain: Normal Loses or gains: Defective Proceed to Time accuracy adjusting .
K	Check to see if display changeover and adjustment function correctly by button operation. **First check** Check to see if the time display and the calendar display are changed into the desired display by depressing button (A).  (Time display) (Second display) (Month/date display) ● Check to see if the second display returns to the time display after 4 to 5 minutes running when the button A is depressed again in the second display function. (Day display) **Second check** Check to see if each digit is selected and set by depressing buttons (A) and (B).  **Third check** (1) Depress and hold button (B) for 3 to 4 seconds and check to see if all the segments are displayed. (Check to see if there are any segments which do not light up.) 	

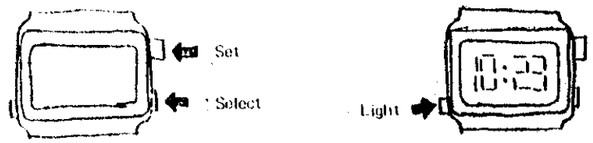
Procedures

(2) Check to see if all the segments are reset to the time display by depressing either button (A) or button (B).



Fourth check

Check to see if each display is selected and set by depressing button (A) and (B) and if the light is lit by depressing button (C).



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

No. _____

PARTS LIST FOR CAL. Y430A

PARTS NO.	PARTS NAME	PARTS NO.	PARTS NAME
4001119	Circuit block (with liquid crystal panel frame)		
4216047	Insulator for battery		
4270027	Battery connection		
4313024	Connector		
4398053	Battery guard		
4457007	Circuit block cover		
4510021	Liquid crystal panel		
4521021	Reflecting mirror		
4530230	Bulb		
SEIKO (SEIZAIKEN)	TR41W (Silver oxide battery)		
MAXELL	SR41W (Silver oxide battery)		
SONY EVEREADY	392 (Silver oxide battery)		
U.C.C.	392 (Silver oxide battery)		

コクヨ シヨ-20 (40×20)