TECHNICAL GUIDE
AND
PARTS LIST

CAL. Y951A

COMBINATION QUARTZ

CONTENTS

FOREWORD

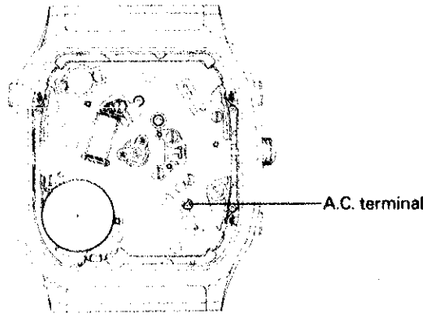
SYSTEM RESET WHEN REPLACING BATTERY

Because of the characteristics of the IC used in Cal. Y951A, the following procedures are required when the battery is replaced. When replacing the battery, always proceed as follows.

[Loading battery/installing module]

When the battery is replaced, the liquid crystal panel shows wrong or no indication. When replacing the battery, carry out the system reset as follows.

<**Procedure**>
After installing the battery, short-circuit the A.C. terminal and the circuit block cover.



[Measuring current consumption]

To measure the current consumption,carry out the system reset procedure.

The mark seal indicating the above system reset procedures is stuck onto the case back.

NOTE
Short (AC ▶) and (◀) after replacing the battery.

I. SPECIFICATIONS

Item \ Cal. No.	Y951A	
	Analogue section	Digital section
Display medium	Three hands	Nematic Liquid Crystal, FEM (Field Effect Mode)
Drive system	Step motor	Multiplex driving
Display system		● Home time display (12/24 hour system) ● Calendar display ● Alarm display ● Stopwatch display ● World time ● 26 time zone display
Additional mechanism	Second setting device Electric circuit reset switch	Time signal
Loss/gain	Loss/gain at normal temperature range Monthly rate: Less than 15 seconds	
Casing diameter	12h – 6h 27.38 mm 3h – 9h 26.26 mm	
Height (Including battery)	5.81 mm (5.99 mm)	
Regulation system	Trimmer condenser	
Quartz tester measuring gate	Any gate is available	
Battery	U.C.C. 399, MAXELL SR926W, SEIZAIKEN TR926W Voltage: 1.55V Battery life: Approx. 2 years	
Jewels	5 jewels	

II. LIST OF SCREWS USED

Only one type of screw is commonly used in Y951A watches.

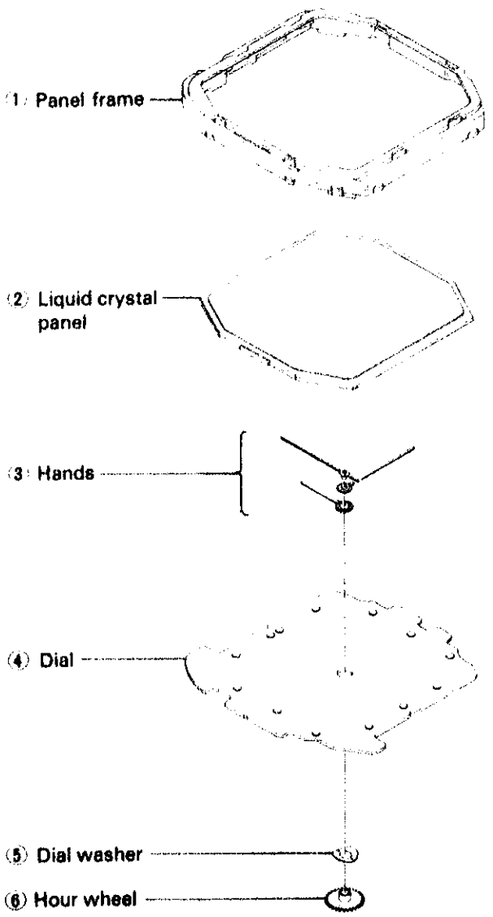
Part No. 022241
Circuit block cover screw 4
Coil block screw..... 1
Winding stem screw..... 2
Train wheel bridge screw 1

III. DISASSEMBLING, REASSEMBLING AND LUBRICATING

Disassembling procedures: Figs ① ~ ㉞
Reassembling procedures: Figs ㉞ ~ ①

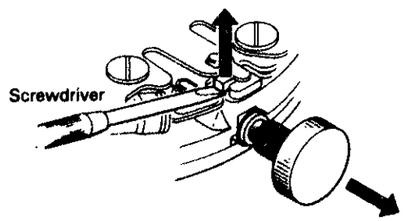
Lubrication:
Moebius A

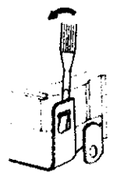
1. Disassembling and reassembling of the movement (Panel frame – Hour wheel)



Removing winding stem

Pull out winding stem while raising the guide plate for winding stem with a tweezers.

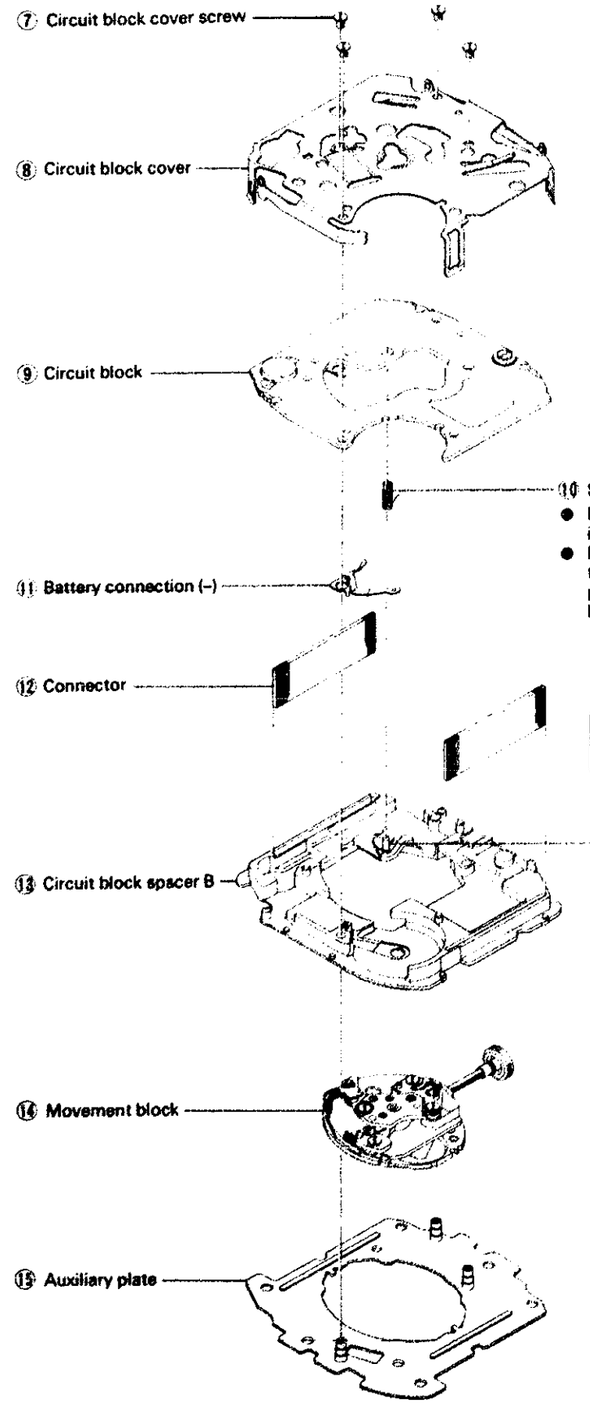




1 Removing panel frame
The liquid crystal panel frame is fixed to the circuit block cover at 2, 4, 7 and 11 hour positions. Separate them by moving 4 claws of the circuit block cover outward with a thin screwdriver.

4 Removing Dial
No screw is used to fix the dial. Reciprocally pry out the right and left parts of the dial from the auxiliary plate by a thin screwdriver.
When installing the dial, take care not to bend the dial legs and press in evenly.

2 Disassembling and Reassembling the movement (Circuit block cover – Auxiliary plate)

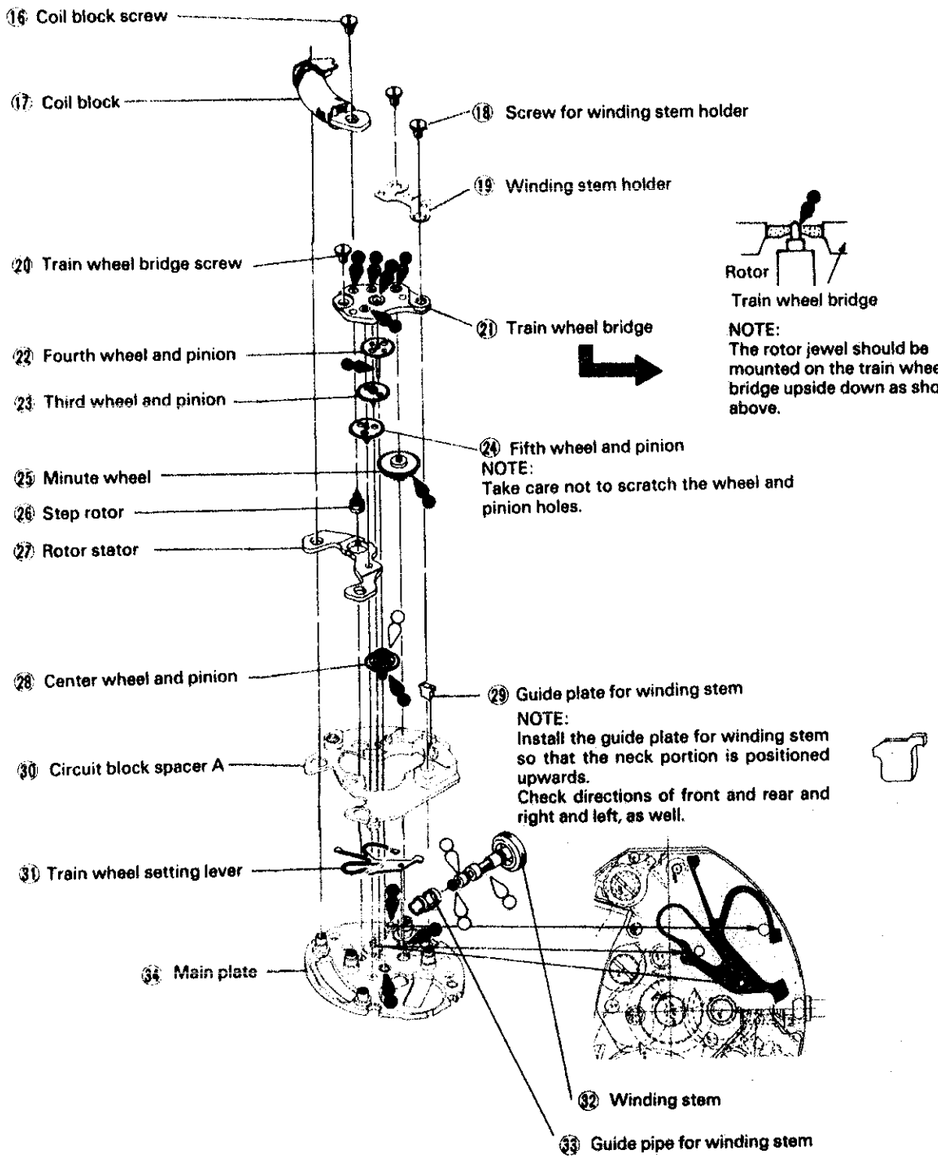


- Place the speaker lead terminal in the circuit block spacer B pins.
- Place so that the speaker lead terminal is vertical to the positioning groove as shown below.

3. Disassembling and Reassembling the movement (Coil block screw – Winding stem)

Lubrication:

Moebius A



Rotor

Train wheel bridge

NOTE:
The rotor jewel should be mounted on the train wheel bridge upside down as shown above.

NOTE:
Take care not to scratch the wheel and pinion holes.

NOTE:
Install the guide plate for winding stem so that the neck portion is positioned upwards.
Check directions of front and rear and right and left, as well.

4 Notes on cleaning

Follow the procedures below to clean Cal. Y951A parts.

(1) How to clean

Name of parts	Cleaning	Drying	Cleaning solution	Remarks
Step rotor Plastic parts (circuit block spacer)	Rinse or scrub with a soft brush	Warm air drying	Benzene Alcohol	● Use a clean solution as the step rotor is magnetized. Any foreign matter which cannot be removed by cleaning should be removed with rodico. ● When cleaning with benzene, the cleaning time should be minimized.
Others (excluding parts that must not be cleaned.)	Clean with the cleaner, rinse or gently scrub with a soft brush.	Warm or hot air drying	Benzene Alcohol Trichloroethylene	

(2) Parts that must not be cleaned.

Circuit block　Coil block　Liquid crystal panel　Battery　Dial

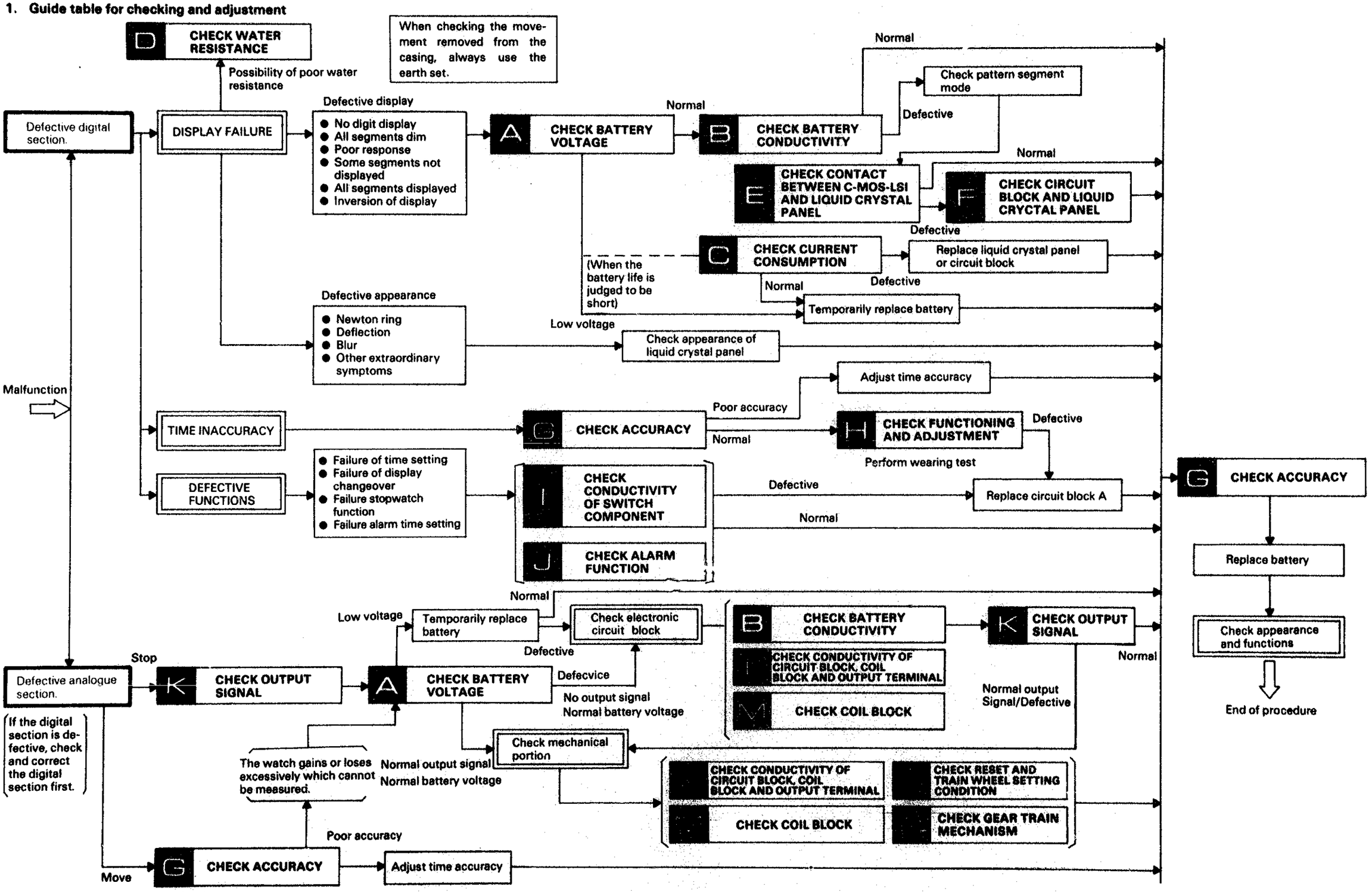
Be sure to clean only stains on the conductive portions (liquid crystal panel and circuit block, etc.) with a cloth moistened with benzene, alcohol and dry them with warm air.

(3) Cleaning condition

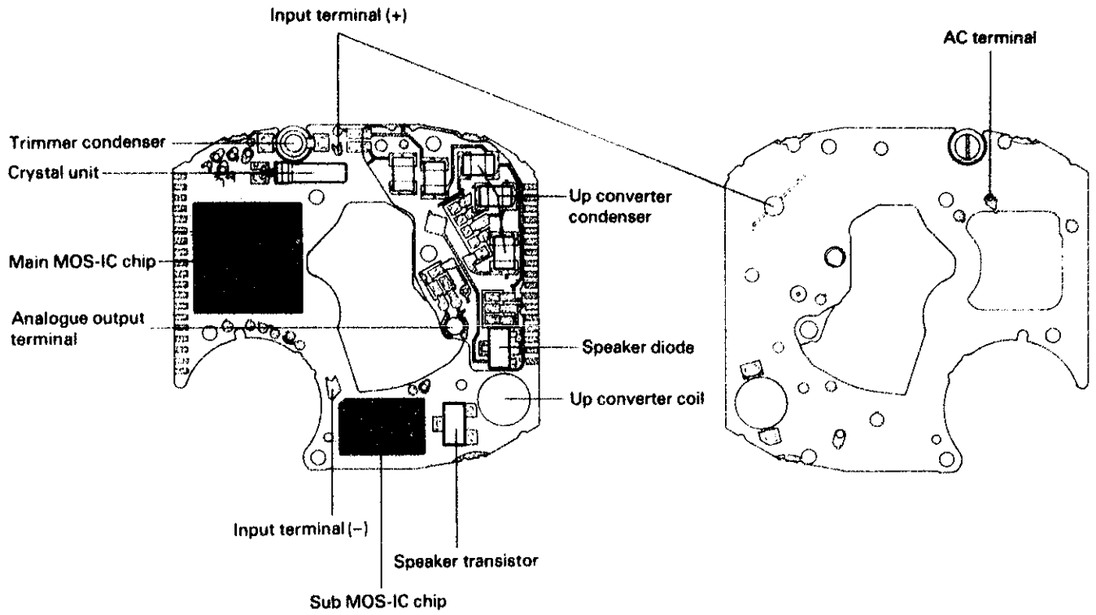
Be sure to clean the parts in a room that is well ventilated. Do not leave the washing tank of the cleaning solution uncapped for hours in a poorly ventilated room. The vapor of the cleaning solution is slightly toxic. Prolonged breathing of the vapor may induce drowsiness, provoke nausea, headache or make you feel dizzy.

IV. CHECKING AND ADJUSTMENT

1. Guide table for checking and adjustment

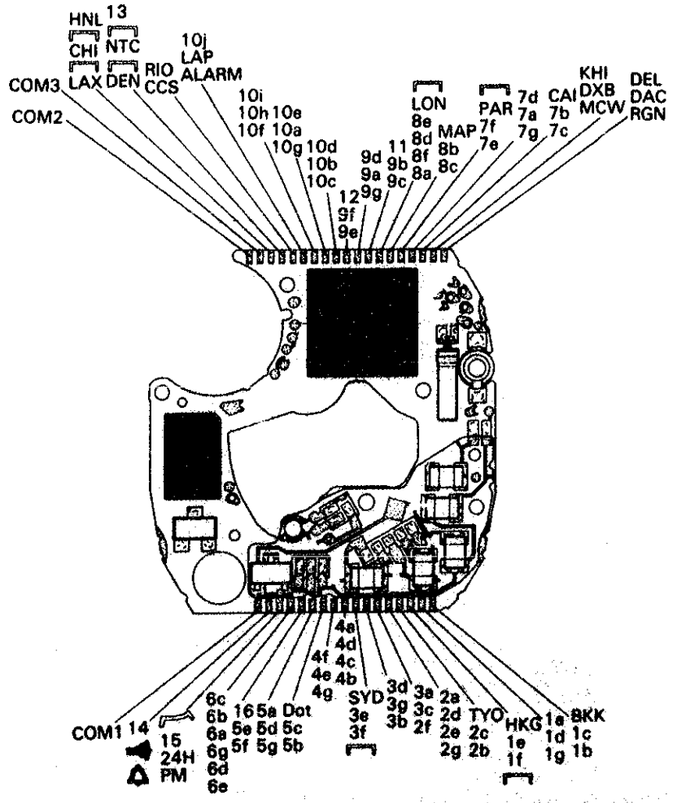


2. Circuit block schematic

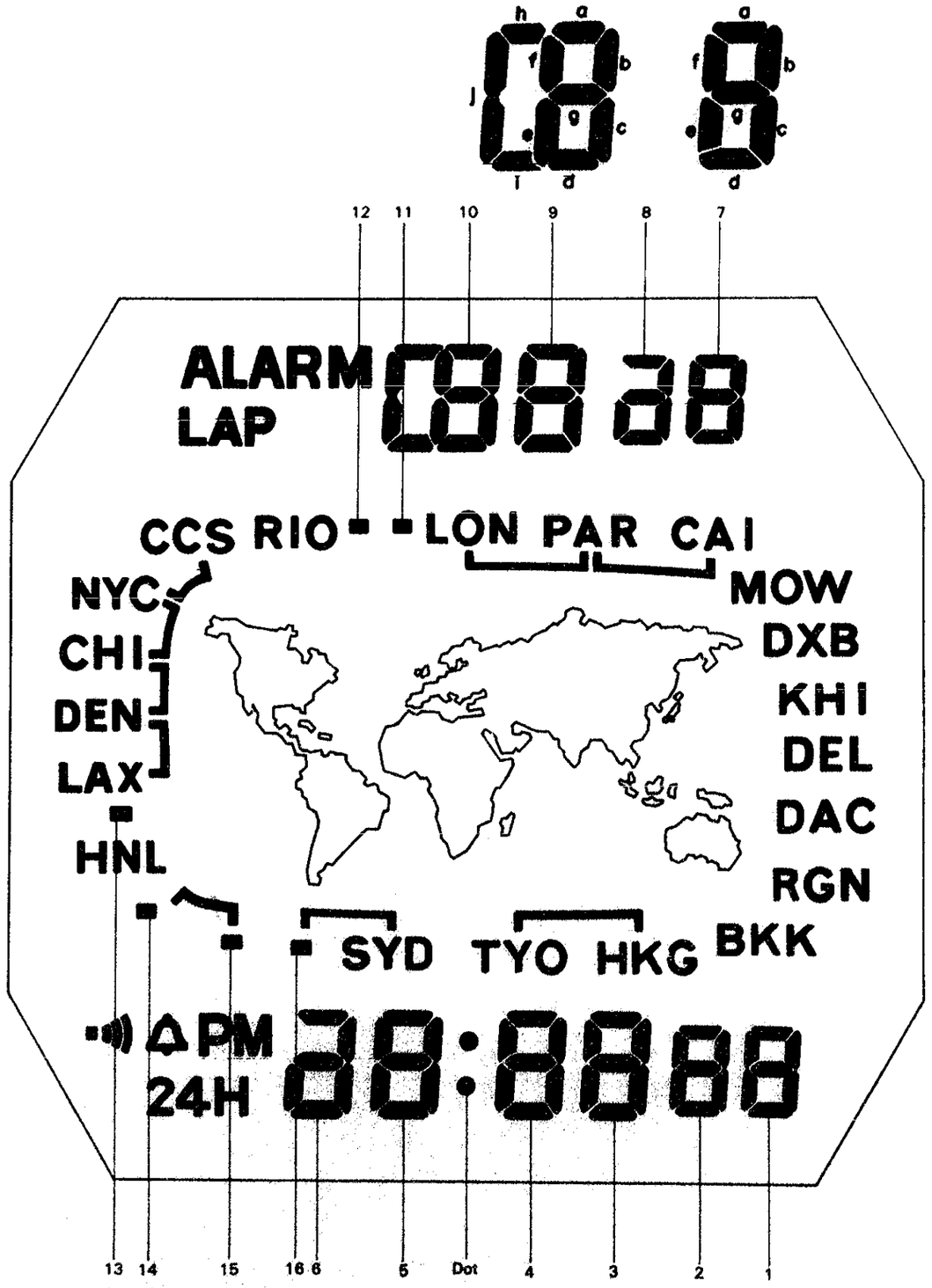


3. Relationship between the segments (Liquid Crystal Panel electrodes) and C-MOS-LSI output terminals.

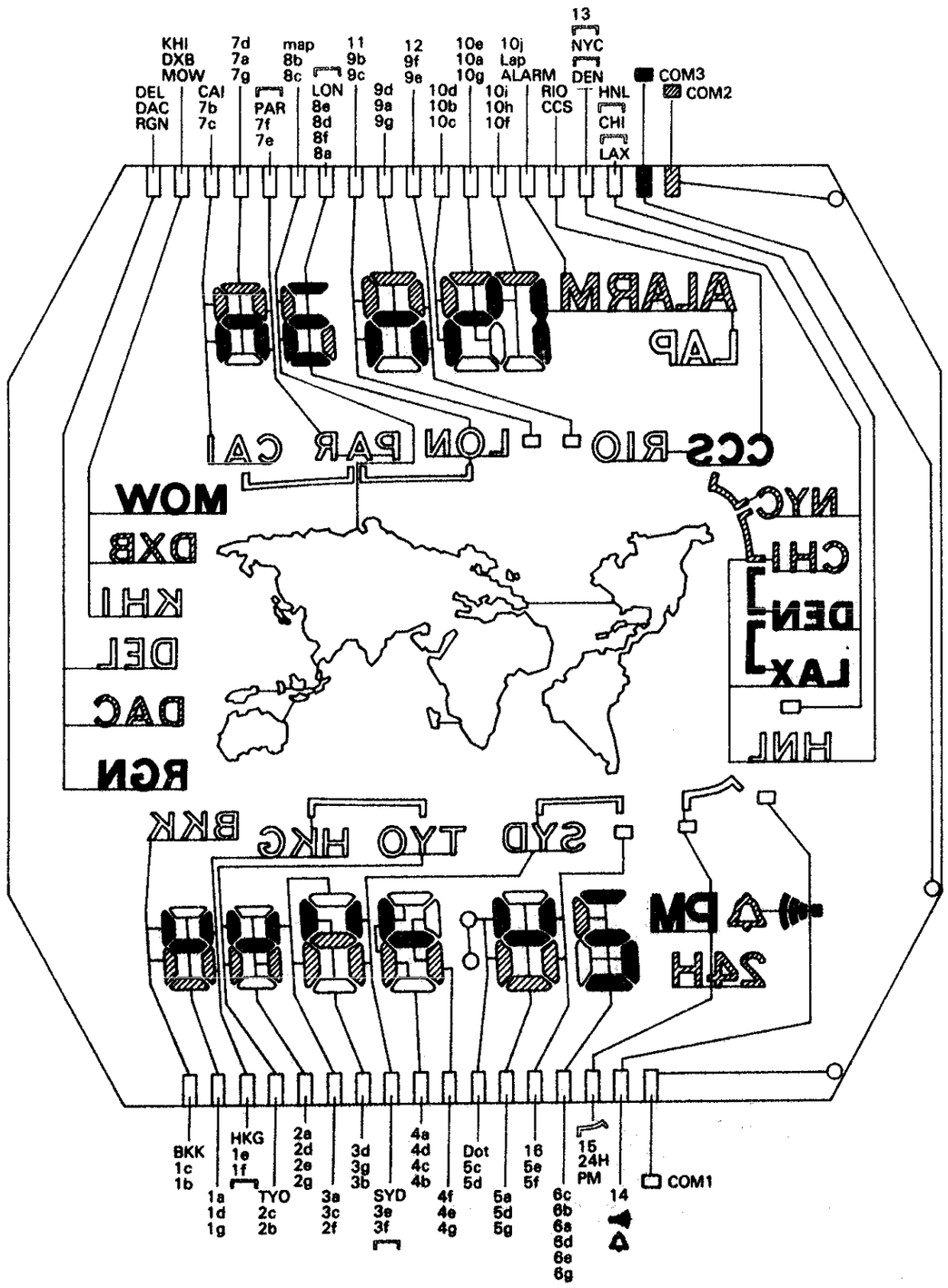
● **C-MOS-LSI output terminals**



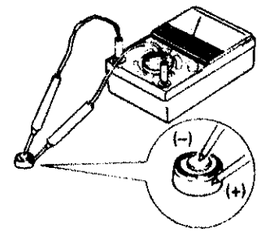
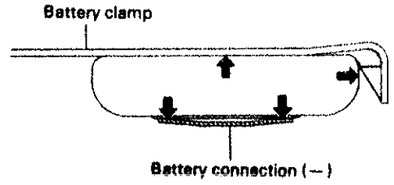
● **Designation of segment**



● **Segments (Liquid Crystal Panel electrodes)**

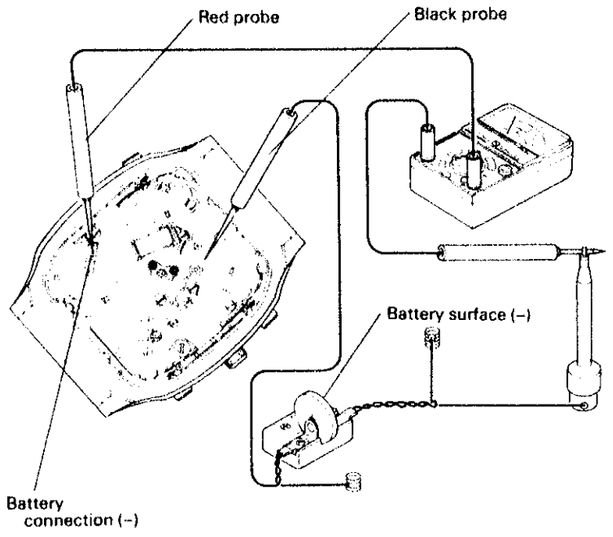


4. Procedure for checking and adjustment

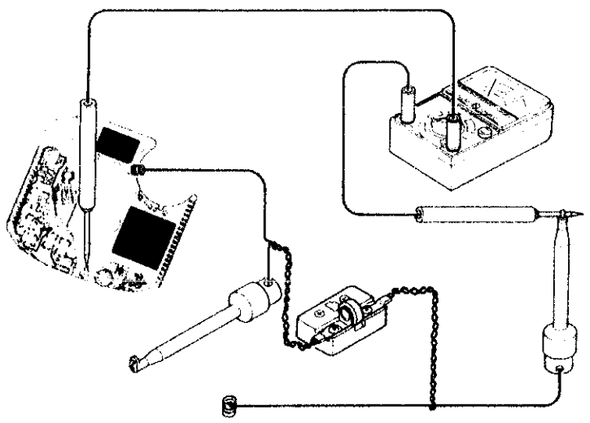
	Procedure	Result and repair
A CHECK BATTERY VOLTAGE	 Check battery voltage. ● Set up the Volt-ohm-meter. Range to be used: DC 3V ● Measuring Red probe (+)... Battery surface (+) Black probe (–)... Battery surface (–)	1.5V or more: Normal Less than 1.5V: Defective
B CHECK BATTERY CONDUCTIVITY	Check the battery, battery clamp and battery connection (–) for contamination.  	Uncontaminated: Normal Contaminated: Defective Clean. Poor water resistance is found: Correct water resistance.

C CHECK CURRENT CONSUMPTION

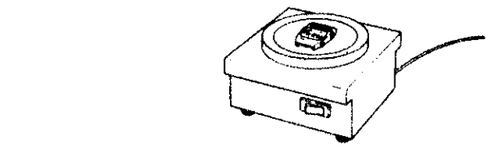
Procedure	Result and repair
● Measure the current consumption as shown below. (1) Total current consumption of module Connect the power supply and Volt-ohm-meter as illustrated below.	Less than 3.0 μA: Normal More than 3.0 μA: Defective Check the current consumption of circuit block. **Note:** Short-circuit AC terminal of the circuit block and circuit block cover, then measure.

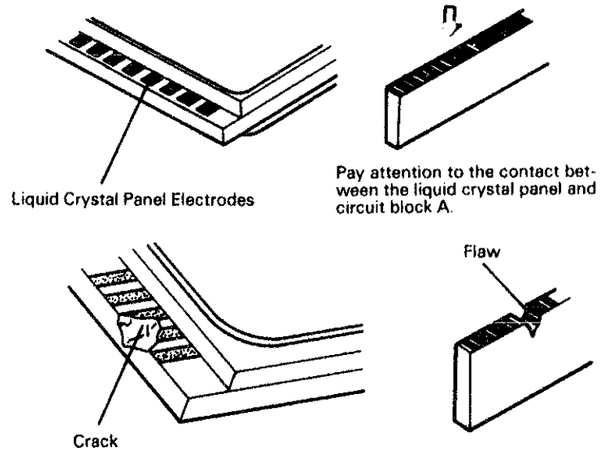


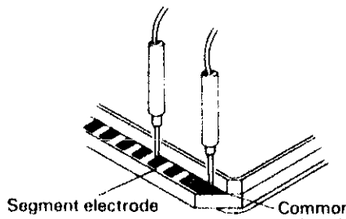
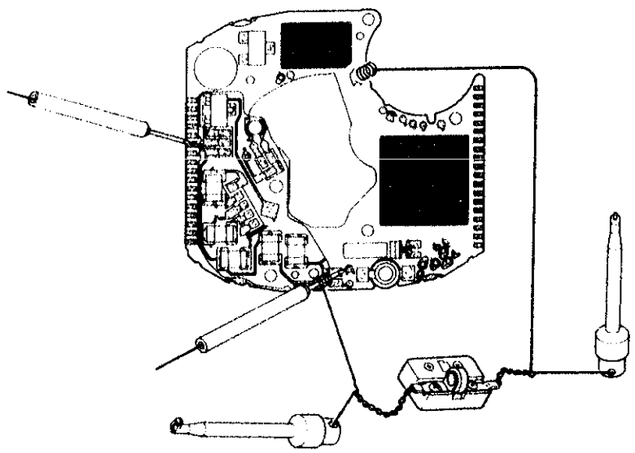
(2) Current consumption of circuit block.	Less than 2.1 μA: Normal When there is no short-circuit in M, replace the liquid crystal panel. More than 2.1 μA: Defective Replace the circuit block.



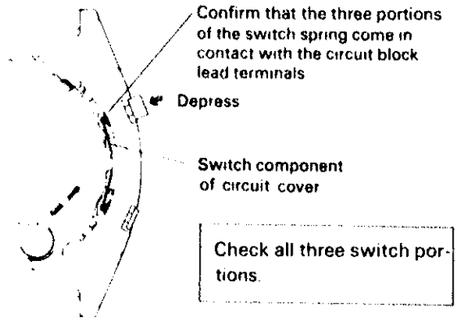
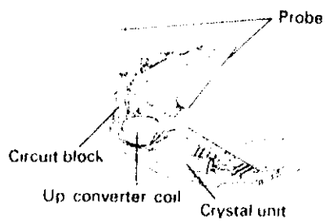
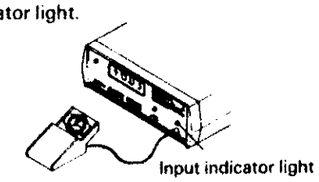
	Procedure	Result and repair
D CHECK WATER RESISTANCE	Check for moisture in the watch. 1 Place the watch on a hot plate and heat it for 15 minutes. 2 Check that the glass does not collect moisture.	Does not collect moisture: Normal Collects moisture: Defective Correct the water resistance. Refer to "Watch Case Servicing Guide."
M CHECK CONTACT BETWEEN C-MOS-LSI AND LIQUID CRYSTAL PANEL	(1) Check for dust, lint and contamination on the liquid crystal panel electrodes and connectors and also for flaws, cracks and defects on the liquid crystal panels and connectors.	Uncontaminated: Normal Contaminated: Defective Remove any foreign matter.

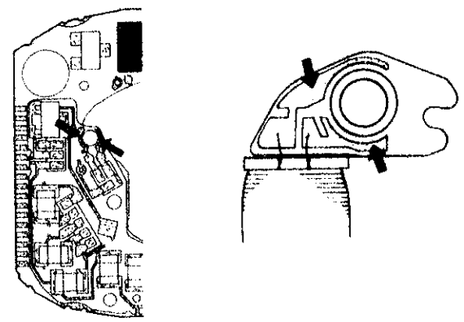
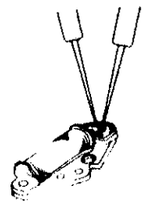
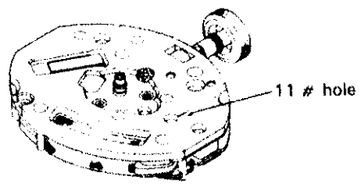


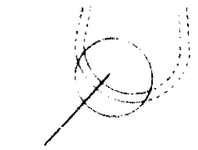
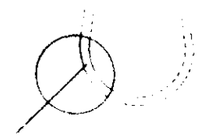
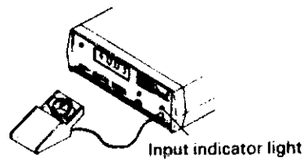


	Procedure	Result and repair
F CHECK LIQUID CRYSTAL PANEL AND CIRCUIT BLOCK	● Check that the liquid crystal panel and circuit block function correctly. Refer to "Relationship between the segments (liquid crystal panel electrodes) and C-MOS-LSI output terminals on page 8." (1) Checking the liquid crystal panel. 1 Set up the Volt-ohm-meter. Range to be used: OHMS R × 1 – R × 1K **NOTE:** Any range will do if more than 3V is applied to the terminals of the Volt-ohm-meter. In some Volt-ohm-meter, a voltage of more than 3V cannot be applied to the terminal. In this case, all segments are not displayed. Use a higher resistance range (R × 10K). 2 Remove the liquid crystal panel from the module and turn it to the reverse side. 3 Check that the corresponding segment is displayed.  **NOTE:** Either red or black probe will do. (2) Checking the circuit block output 1 Set up the Volt-ohm-meter. Range to be used: DC 3V 2 Set up the circuit block. 1) Disassemble the module and remove the circuit block. 2) Supply power to the circuit block by connecting the power supplier as shown in the illustration. 	Displayed: Normal Not displayed: Defective Replace the defective liquid crystal panel.

	Procedure	Result and repair
F CHECK LIQUID CRYSTAL PANEL AND CIRCUIT BLOCK	3 Checking Red probe: Circuit block (+) terminal Black probe: C-MOS-LSI output terminal (If a segment is defective, connect the black probe to the corresponding electrode.)	0.8V or more: Normal (The voltage at all terminals should be 0.8V or more.) Less than 0.8V: Defective Replace the circuit block.
G CHECK ACCURACY	Measure in the analogue mode. (The pattern segment mode is also available.)	Does not lose/gain: Normal Loses/gains: Defective Replace the circuit block.
H CHECK FUNCTIONING AND ADJUSTMENT	Check functioning and adjustment referring to "Display system" on page 1. 1 Check that the time mode and calendar mode are changed correctly. 2 Perform the alarm test and check that the alarm sounds correctly and alarm mark and time signal mark are displayed correctly. 3 Check the functioning for each digit in the time and calendar modes and confirm that the digit is advanced correctly.	Functions correctly and can be adjusted: Normal Wear the watch on the wrist to check time accuracy. Does not function correctly and cannot be adjusted: Defective Replace the circuit block.

	Procedure	Result and repair
I CHECK CONDUCTIVITY OF SWITCH COMPONENT	(1) Check that the switch spring functions correctly.  Check all three switch portions.	Functions correctly: Normal Does not function correctly: Defective Correct the switch spring with tweezers, or replace the circuit cover with a new one.
	(2) Check for dust, lint and other contamination of the connecting portions.	Uncontaminated: Normal Contaminated: Defective Wipe off any foreign matter.
J CHECK ALARM FUNCTION	(1) Check the contacting portion of the piezo electric element on the case back and speaker lead terminal for contamination and check the speaker lead terminal for deformation.	Uncontaminated: Normal Contaminated: Defective Wipe off any foreign matter. Deformed: Defective Correct with tweezers.
	(2) Measure the up converter coil resistance of the circuit block to check for a short-circuit and a broken wire. Range to be used: OHMS R x 1 ● **Checking** Apply the probes to the up converter coil terminals. Either red or black probe will do.  	50Ω – 90Ω: Normal Less than 50Ω: Defective (Short-circuit) More than 90Ω: Defective (Broken wire) Replace the circuit block with a new one.
K CHECK OUTPUT SIGNAL	Check for output signal of analogue section. 1. Set up the Quartz Tester. 2. Checking Check for blinking input indicator light.  	Blinking for 1 sec: Normal No blinking for 1 sec: Defective Return to A

	Procedure	Result and repair
L CHECK CONDUCTIVITY OF CIRCUIT BLOCK OUTPUT TERMINAL AND COIL BLOCK	Remove the circuit block and check contacts. Check the circuit block output terminal and coil lead plate for contamination. 	Uncontaminated: Normal Contaminated: Defective Wipe off any foreign matter. If the poor conductivity still persists, replace the circuit block or coil block.
M CHECK COIL BLOCK	Check for broken coil wire and short-circuit of the coil block. 1. Set up the Volt-ohm-meter. Range to be used: OHMS R x 100 2. Checking ● Apply the red and black probes of the Volt-ohm-meter to the two lead terminals of the coil block. ● Either red or black probes will do. 	2.95 kΩ or more: Normal Borken coil wire (∞): Defective Short-circuit (less than 2.95 kΩ): Defective Replace the coil block.
N CHECK RESET AND TRAIN WHEEL SETTING CONDITION	Check the reset and train whee' setting condition. 1. Pull the crown out and confirm that the second hand stops. Push in the crown to the normal position and confirm that the second hand starts again after 1 second. (Check with the input indicator of the Quartz Tester or with the second hand installed.) 2. Check the function of the train wheel setting lever through the 11 # hole in the main plate. Check the position of the train wheel setting lever when the crown is fully pulled and pushed in to the normal position.  	Starts after 1 second: Normal Does not stop: Defective Proceed to N_2

	Procedure	Result and repair
N CHECK RESET AND TRAIN WHEEL SETTING CONDITION	● **with the crown at normal position**  Train wheel setting lever ● **With the crown at pulled out position**  Train wheel setting lever	Functions correctly: Normal Does not function correctly: Defective Replace the train wheel setting lever
	3 Pull the crown out and check the Quartz Tester output signal.	(Blinks for 1 sec) Output signal: Normal No output signal: Defective Replace the circuit block.
O	Check gear train mechanism for the following points. 1. For dust, lint or foreign matters. 2. For lubricants (quality and quantity). 3. For fluctuation.	No problem: Normal Check the circuit block. Problem: Defective Correct the problem.
P CHECK ACCURACY	● Check gain and loss of time . (1) Set up the Quartz tester. (2) Checking  Input indicator light	

V. PARTS LIST for Cal. Y951A

PART NO.	PART NAME
105 542	Auxiliary plate
125 715	Train wheel bridge
221 706	Center wheel & pinion
231 715	Third wheel & pinion
238 715	Guide pipe for winding stem
241 705	Fourth wheel & pinion
261 705	Minute wheel
271 706	Hour wheel
354 541	Winding stem
391 716	Train wheel setting lever
491 589	Dial washer
701 715	Fifth wheel & pinion
711 715	Guide plate for winding stem
735 542	Winding stem holder
4001 543	Circuit block
4002 715	Coil block
4146 715	Step rotor
4239 715	Rotor stator
4246 542	Speaker lead terminal
4270 542	Battery connection (–)
4313 542	Connector
4408 542	Circuit block spacer A
4408 543	Circuit block spacer B
4457 544	Circuit block cover

PART NO.	PART NAME
★4510 871	Liquid crystal panel
★4510 872	Liquid crystal panel
4512 542	Panel frame
022 241	Train wheel bridge screw
022 241	Coil block screw
022 241	Screw for winding stem holder
022 241	Circuit block cover screw
011 325	Upper hole jewel for fourth wheel
011 542	Upper hole jewel for third wheel
011 542	Upper hole jewel for fifth wheel
011 547	Lower hole jewel for step rotor
011 568	Upper hole jewel for step rotor
027 122	Tube for train wheel bridge
027 122	Tube for circuit block cover screw A
027 124	Tube for regulating switch lever screw
027 125	Tube for battery connection (+) screw
027 131	Tube for circuit block cover screw B
027 721	Train wheel setting lever adjusting pin
027 722	Hooking pin for train wheel setting lever
027 723	Banking pin for train wheel setting lever
027 724	Reset pin
U.C.C. 399 MAXELL SR926W SEIZAIKEN TR926W	Battery

Remarks:

Liquid crystal panel

★ 4510871 (Silver)

★ 4510872 (Gold)

The type of liquid crystal panel is determined based on the design of case.