

TECHNICAL GUIDE AND PARTS LIST

CAL. Y951A

COMBINATION QUARTZ

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FOREWORD

SYSTEM RESET WHEN REPLACING BATTERY

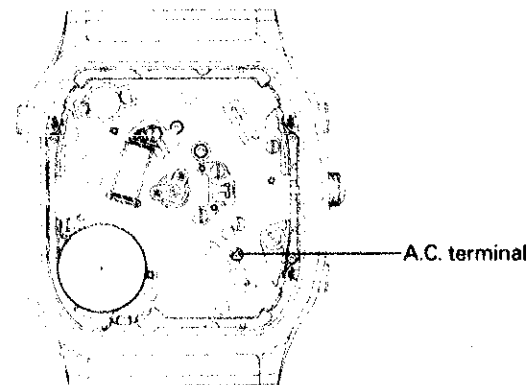
Because of the characteristics of the IC used in Cal. Y951A, the following procedures are required when the battery is replaced. When replacing the battery, always proceed as follows.

[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			<ul style="list-style-type: none"> ● 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

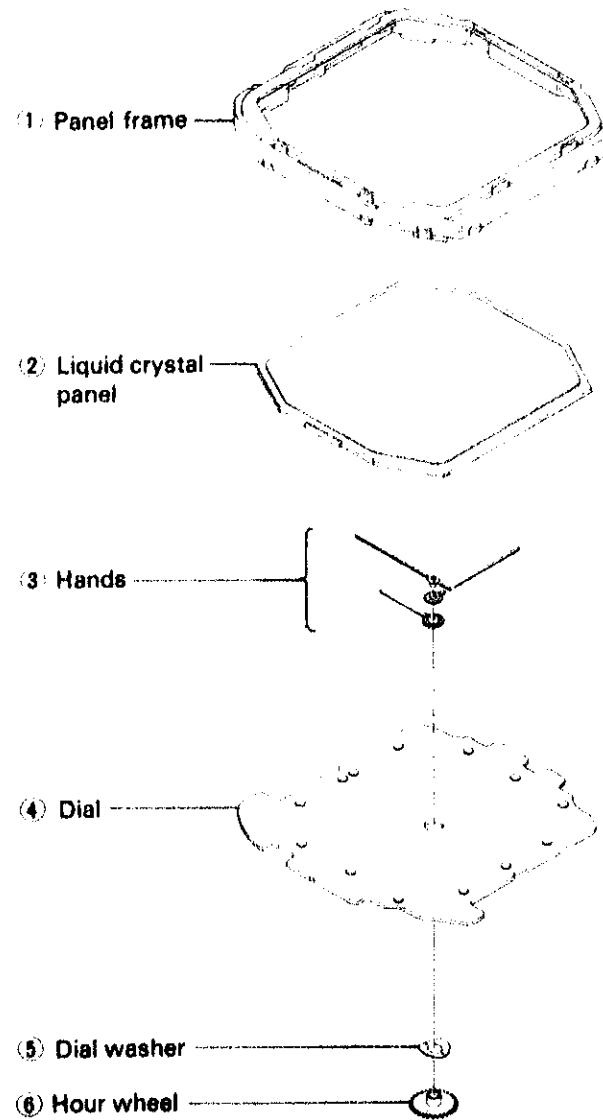
Disassembling procedures: Figs (1) ~ (6)

Reassembling procedures: Figs (6) ~ (1)

Lubrication:

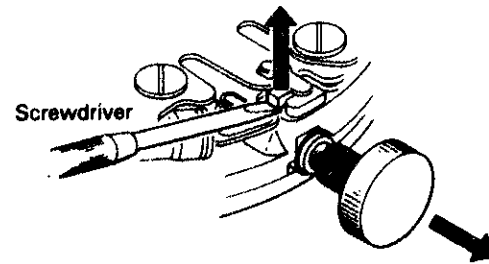
Moebius A

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.



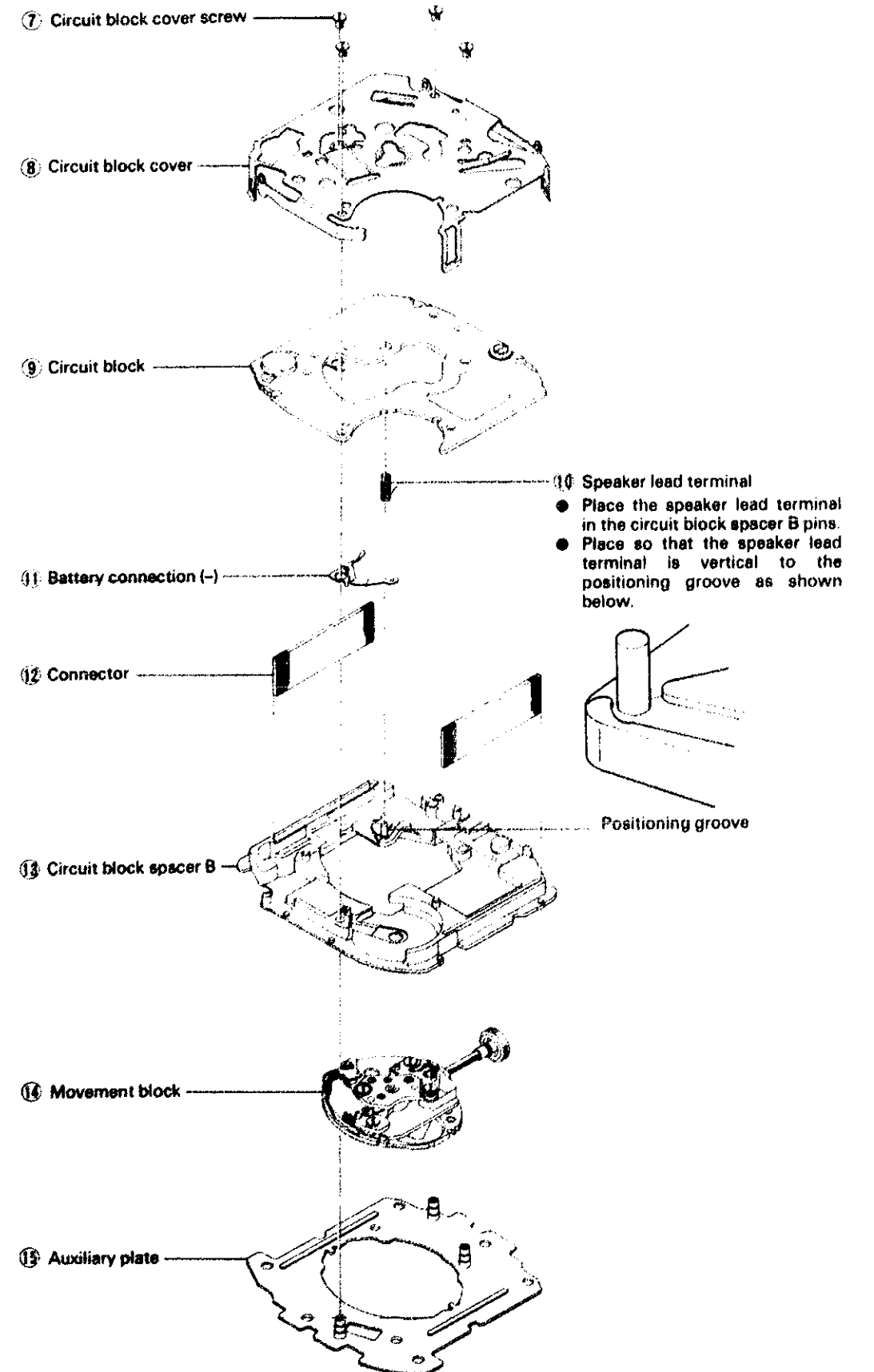
1 Removing panel frame

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.

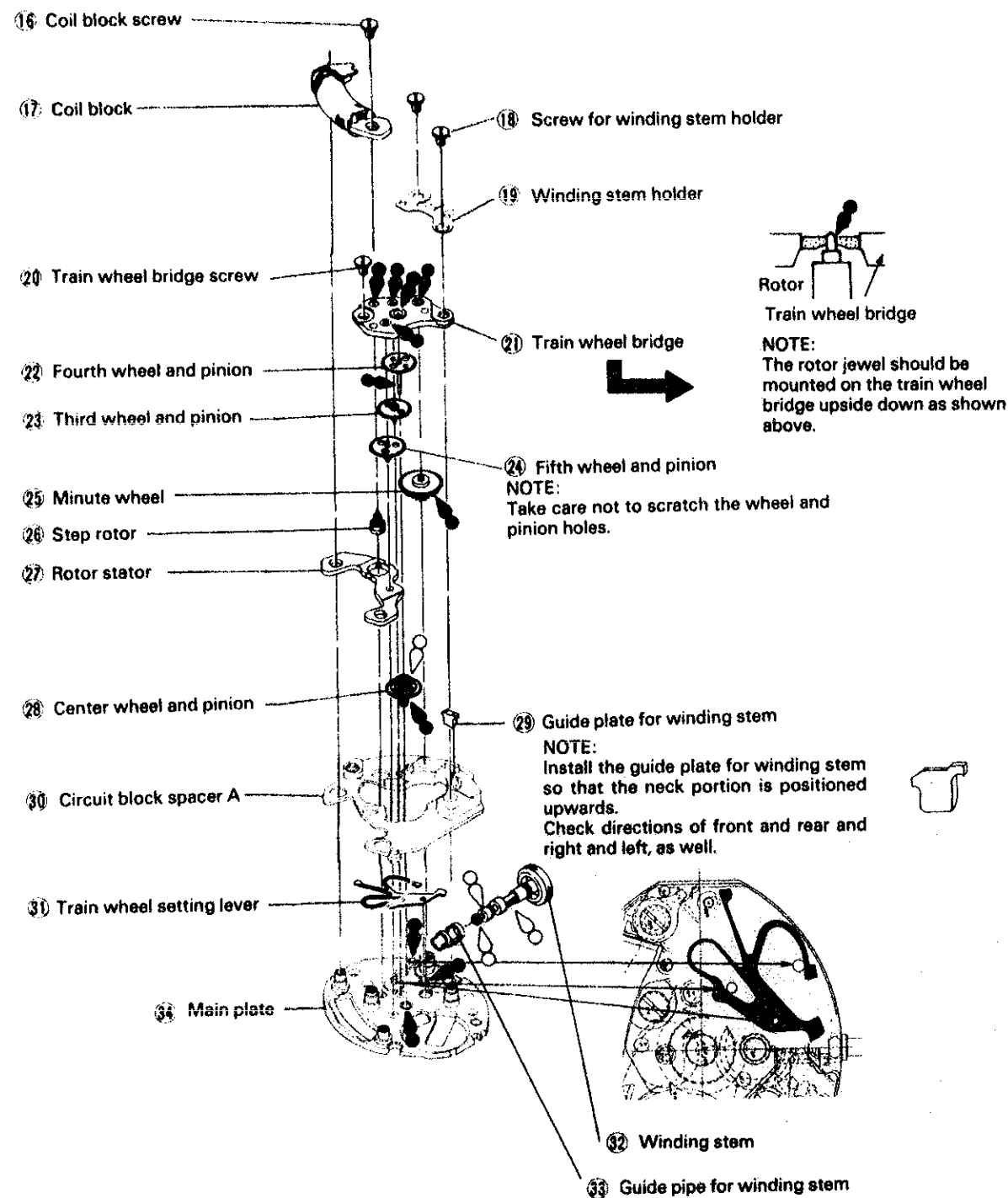
2 Disassembling and Reassembling the movement (Circuit block cover - Auxiliary plate)



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

Lubrication:

● Moebius A



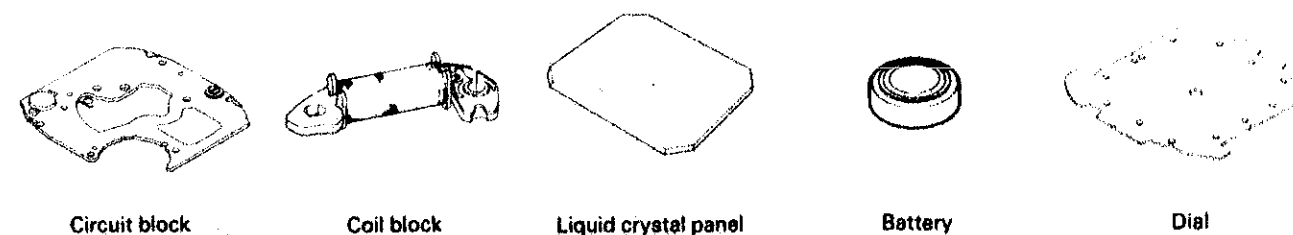
4 Notes on cleaning

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	<ul style="list-style-type: none"> 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.



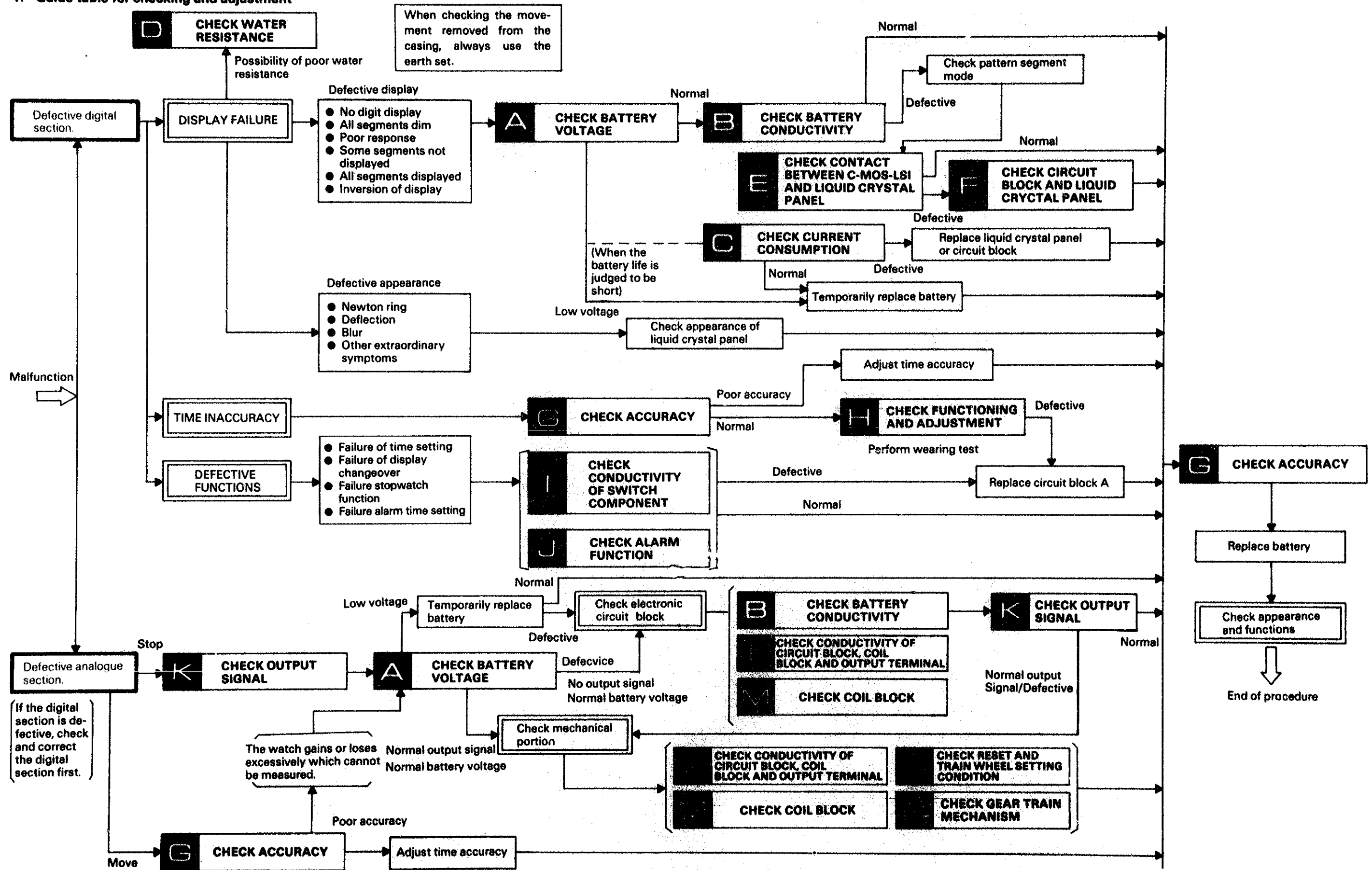
Be sure to clean only stains on the conductive portions (liquid crystal panel and circuit block, etc.) with a cloth moistened with benzene, alcohol and dry them with warm air.

(3) Cleaning condition

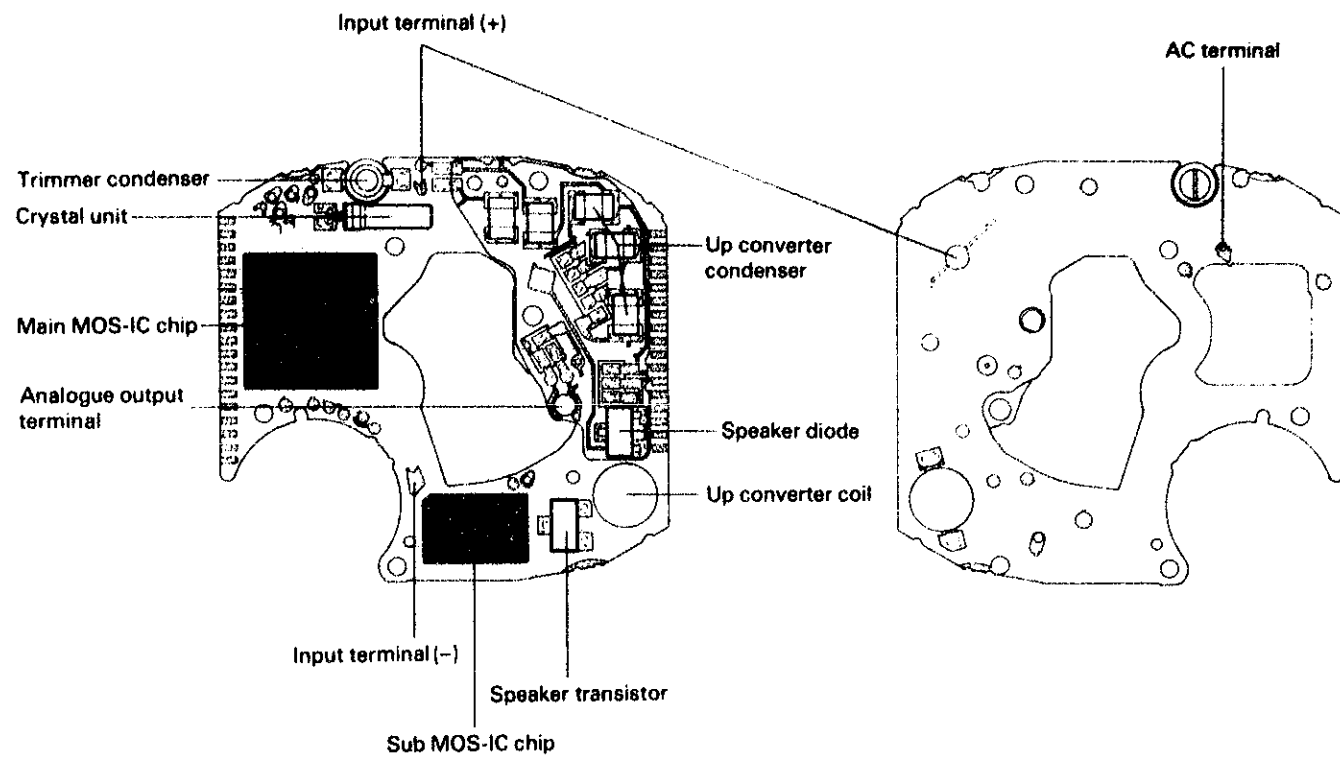
Be sure to clean the parts in a room that is well ventilated. Do not leave the washing tank of the cleaning solution uncapped for hours in a poorly ventilated room. The vapor of the cleaning solution is slightly toxic. Prolonged breathing of the vapor may induce drowsiness, provoke nausea, headache or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

IV. CHECKING AND ADJUSTMENT

1. Guide table for checking and adjustment

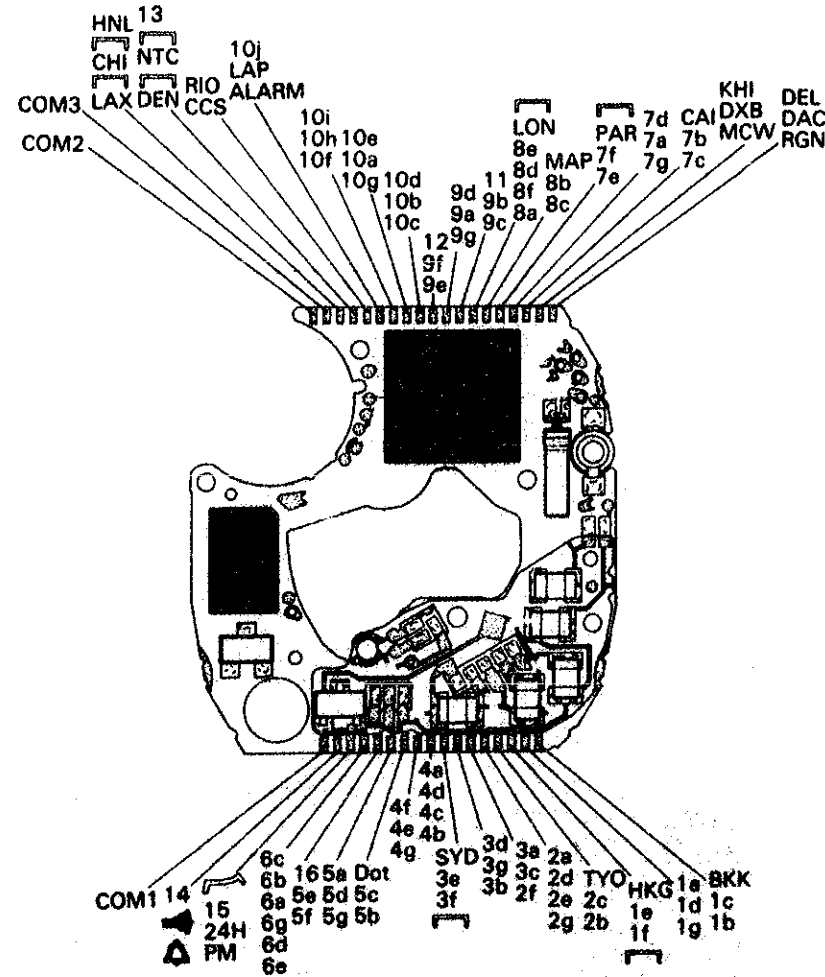


2. Circuit block schematic

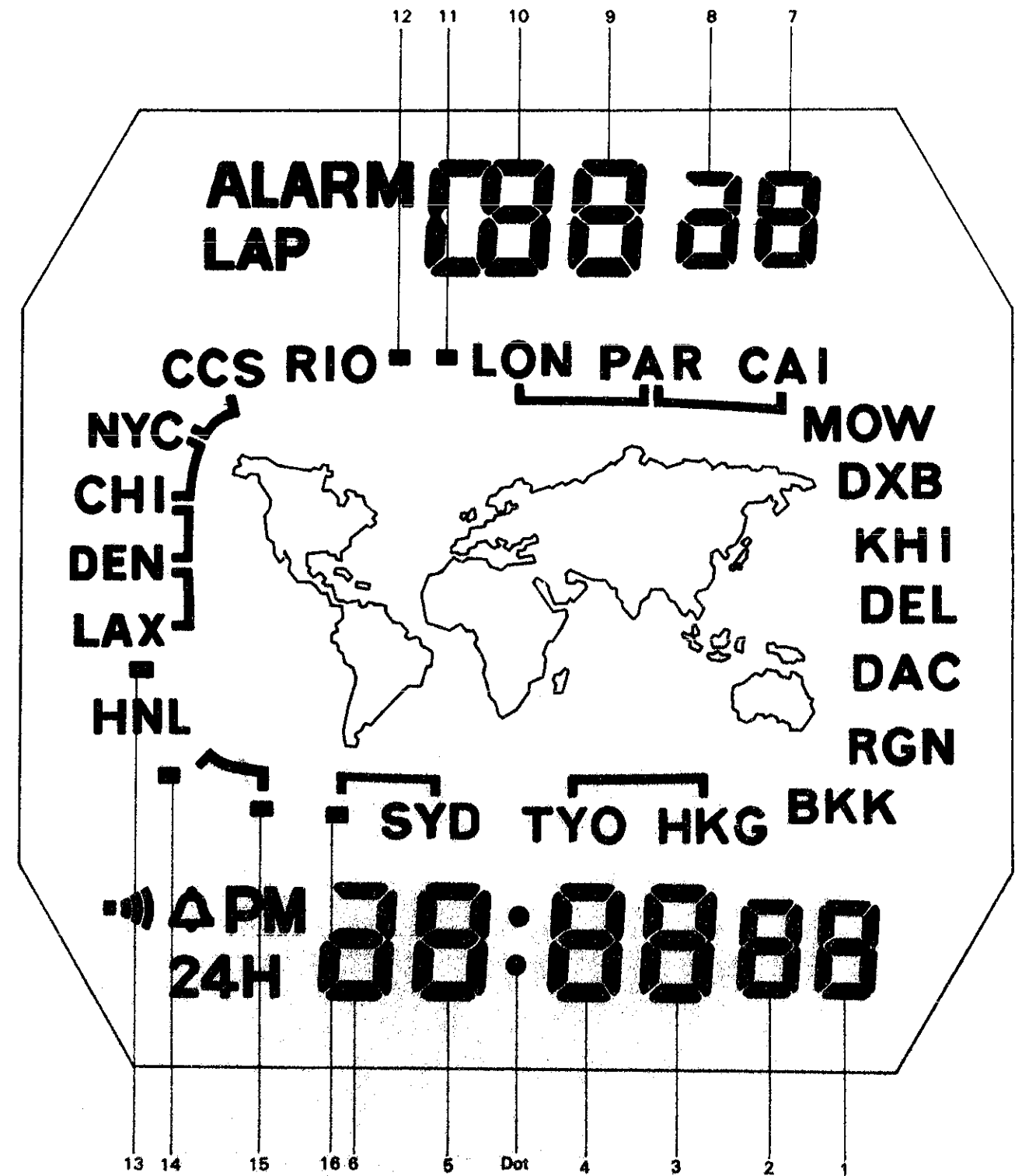
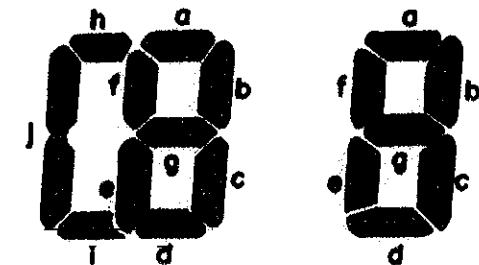


3. Relationship between the segments (Liquid Crystal Panel electrodes) and C-MOS-LSI output terminals.

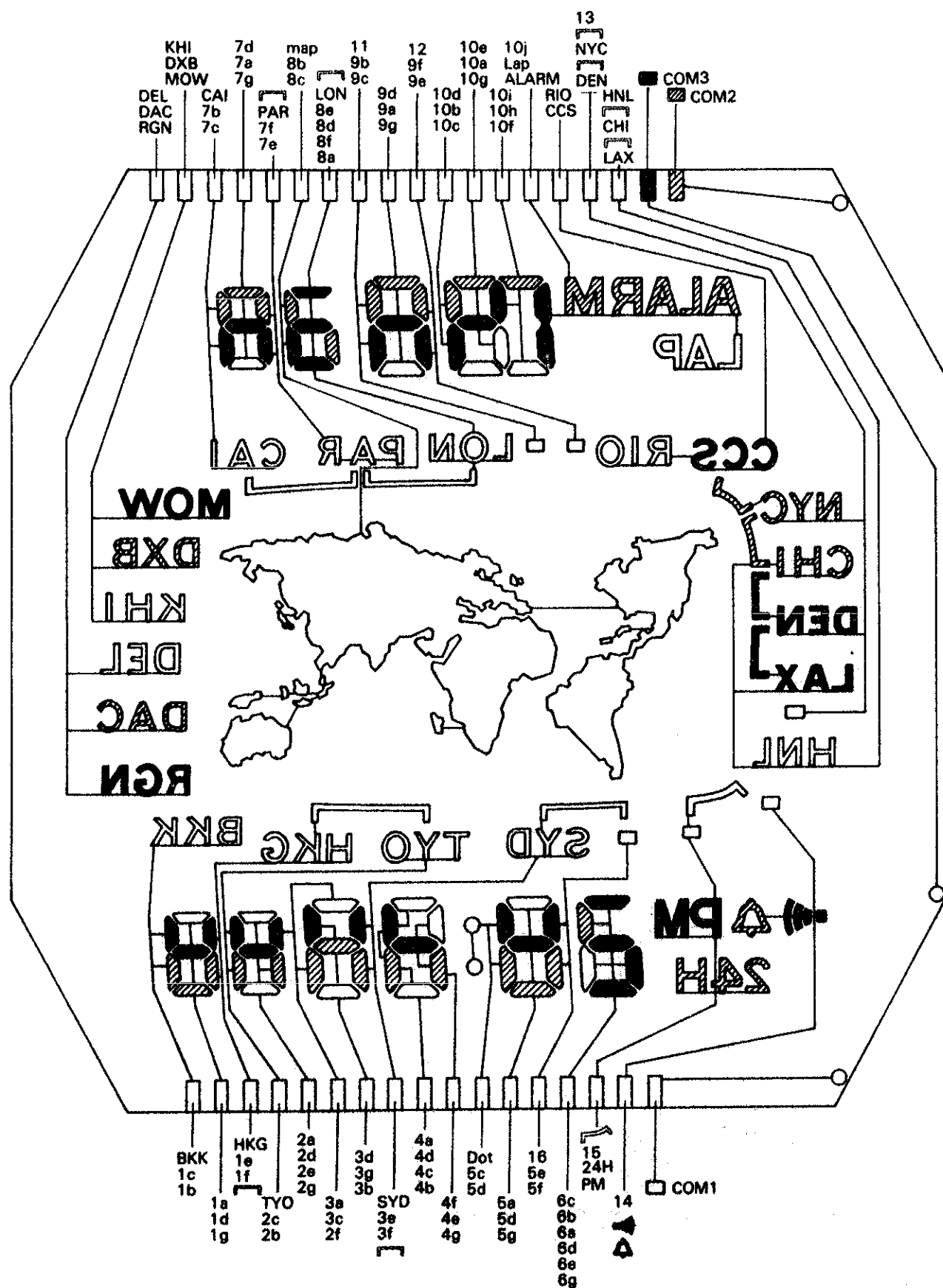
● C-MOS-LSI output terminals



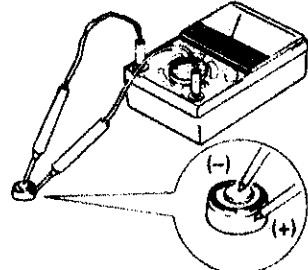
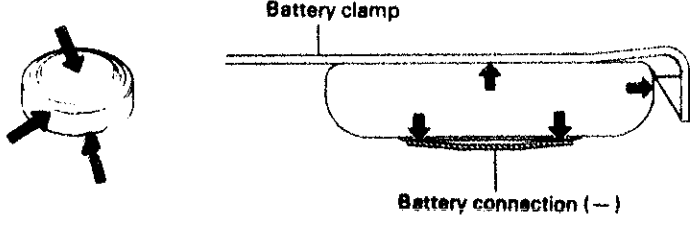
● Designation of segment



● Segments (Liquid Crystal Panel electrodes)



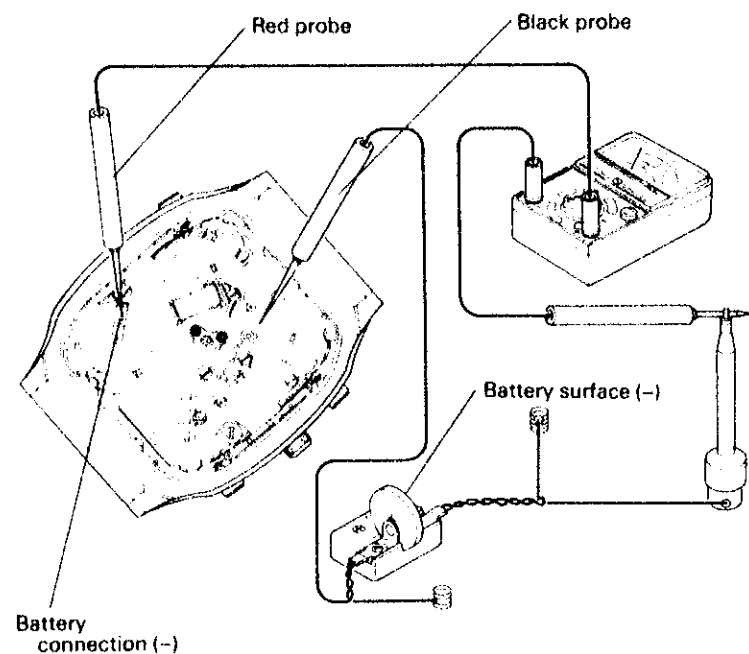
4. Procedure for checking and adjustment

	Procedure	Result and repair
CHECK BATTERY VOLTAGE	 <p>Check battery voltage.</p> <ul style="list-style-type: none"> ● Set up the Volt-ohm-meter. Range to be used: DC 3V ● Measuring Red probe (+)... Battery surface (+) Black probe (-)... Battery surface (-) 	<p>1.5V or more: Normal Less than 1.5V: Defective</p>
CHECK BATTERY CONDUCTIVITY	<p>Check the battery, battery clamp and battery connection (-) for contamination.</p> 	<p>Uncontaminated: Normal Contaminated: Defective Clean. Poor water resistance is found: Correct water resistance.</p>

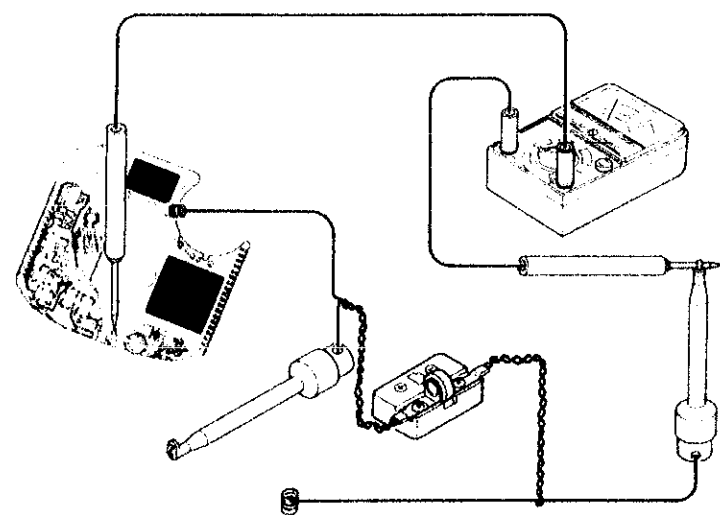
Procedure

- Measure the current consumption as shown below.
- (1) Total current consumption of module

Connect the power supply and Volt-ohm-meter as illustrated below.



- (2) Current consumption of circuit block.



Result and repair

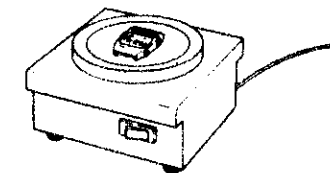
Less than 3.0 μ A: Normal
 More than 3.0 μ A: Defective
 Check the current consumption of circuit block.

Note:
 Short-circuit AC terminal of the circuit block and circuit block cover, then measure.

Less than 2.1 μ A: Normal
 When there is no short-circuit in **M**, replace the liquid crystal panel.
 More than 2.1 μ A: Defective
 Replace the circuit block.

Procedure

- Check for moisture in the watch.
- 1 Place the watch on a hot plate and heat it for 15 minutes.



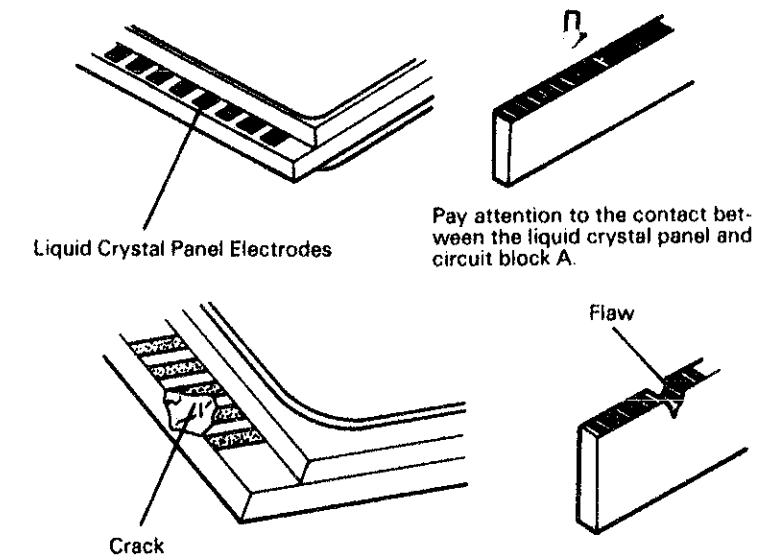
- 2 Check that the glass does not collect moisture.

CHECK WATER RESISTANCE

Result and repair

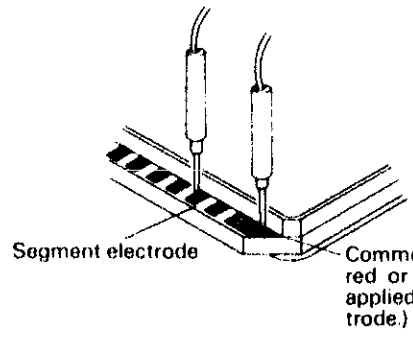
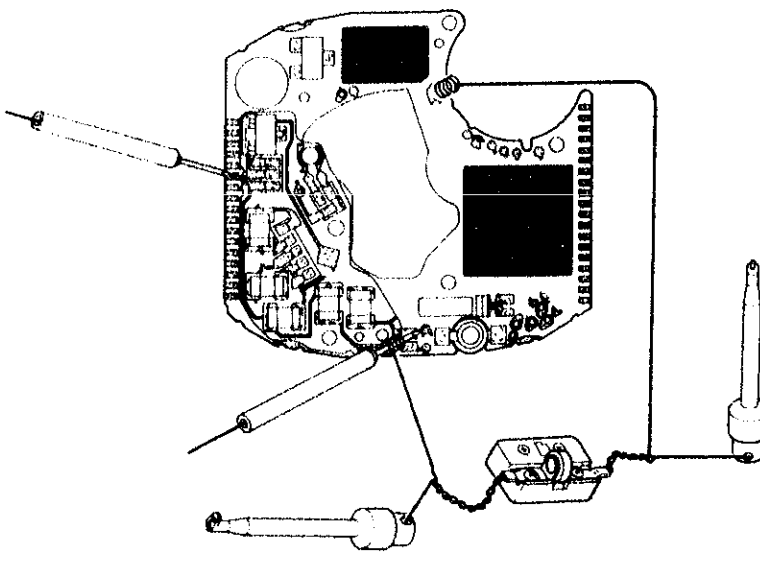
Does not collect moisture: Normal
 Collects moisture: Defective
 Correct the water resistance. Refer to "Watch Case Servicing Guide."

- (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.



CHECK CONTACT BETWEEN C-MOS-LSI AND LIQUID CRYSTAL PANEL

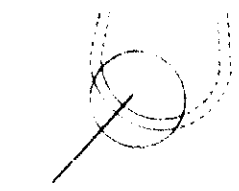
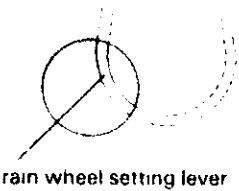
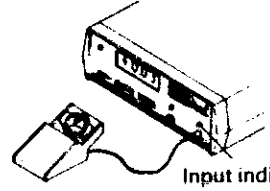
Uncontaminated: Normal
 Contaminated: Defective
 Remove any foreign matter.

	Procedure	Result and repair
T	<p>● 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."</p> <p>(1) Checking the liquid crystal panel.</p> <p>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>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 x 10K).</p> </div> <p>2 Remove the liquid crystal panel from the module and turn it to the reverse side.</p> <p>3 Check that the corresponding segment is displayed.</p> <div style="text-align: center; margin: 10px 0;">  <div style="border: 1px solid black; padding: 5px; display: inline-block; margin-left: 20px;"> <p>NOTE: Either red or black probe will do.</p> </div> </div> <p>(2) Checking the circuit block output</p> <p>1 Set up the Volt-ohm-meter. Range to be used: DC 3V</p> <p>2 Set up the circuit block.</p> <p>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.</p> <div style="text-align: center; margin-top: 20px;">  </div>	<p>Displayed: Normal Not displayed: Defective Replace the defective liquid crystal panel.</p>

	Procedure	Result and repair
T	<p>3 Checking</p> <p>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.)</p>	<p>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.</p>
G	<p>Measure in the analogue mode. (The pattern segment mode is also available.)</p>	<p>Does not lose/gain: Normal Loses/gains: Defective Replace the circuit block.</p>
I	<p>Check functioning and adjustment referring to "Display system" on page 1.</p> <p>1 Check that the time mode and calendar mode are changed correctly.</p> <p>2 Perform the alarm test and check that the alarm sounds correctly and alarm mark and time signal mark are displayed correctly.</p> <p>3 Check the functioning for each digit in the time and calendar modes and confirm that the digit is advanced correctly.</p>	<p>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.</p>

	Procedure	Result and repair
CHECK CONDUCTIVITY OF SWITCH COMPONENT	<p>(1) Check that the switch spring functions correctly.</p> <p>(2) Check for dust, lint and other contamination of the connecting portions.</p>	<p>Functions correctly: Normal Does not function correctly: Defective Correct the switch spring with tweezers, or replace the circuit cover with a new one.</p> <p>Uncontaminated: Normal Contaminated: Defective Wipe off any foreign matter.</p>
CHECK ALARM FUNCTION	<p>(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.</p> <p>(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</p> <ul style="list-style-type: none"> ● Checking Apply the probes to the up converter coil terminals. Either red or black probe will do. 	<p>Uncontaminated: Normal Contaminated: Defective Wipe off any foreign matter. Deformed: Defective Correct with tweezers.</p> <p>50Ω - 90Ω: Normal Less than 50Ω: Defective (Short-circuit) More than 90Ω: Defective (Broken wire) Replace the circuit block with a new one.</p>
CHECK OUTPUT SIGNAL	<p>Check for output signal of analogue section.</p> <ol style="list-style-type: none"> 1. Set up the Quartz Tester. 2. Checking Check for blinking input indicator light. 	<p>Blinking for 1 sec: Normal No blinking for 1 sec: Defective Return to </p>

	Procedure	Result and repair
CHECK CONDUCTIVITY OF CIRCUIT BLOCK OUTPUT TERMINAL AND COIL BLOCK	<p>Remove the circuit block and check contacts. Check the circuit block output terminal and coil lead plate for contamination.</p>	<p>Uncontaminated: Normal Contaminated: Defective Wipe off any foreign matter.</p> <p>If the poor conductivity still persists, replace the circuit block or coil block.</p>
CHECK COIL BLOCK	<p>Check for broken coil wire and short-circuit of the coil block.</p> <ol style="list-style-type: none"> 1. Set up the Volt-ohm-meter. Range to be used: OHMS R x 100 2. Checking <ul style="list-style-type: none"> ● 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. 	<p>2.95 kΩ or more: Normal Broken coil wire (∞): Defective Short-circuit (less than 2.95 kΩ): Defective Replace the coil block.</p>
CHECK RESET AND TRAIN WHEEL SETTING CONDITION	<p>Check the reset and train wheel setting condition.</p> <ol style="list-style-type: none"> 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. 	<p>Starts after 1 second: Normal Does not stop: Defective Proceed to N₂</p>

Z CHECK RESET AND TRAIN WHEEL SETTING CONDITION	Procedure	Result and repair
	<p>● with the crown at normal position</p>  <p>Train wheel setting lever</p> <p>● With the crown at pulled out position</p>  <p>Train wheel setting lever</p> <p>3 Pull the crown out and check the Quartz Tester output signal.</p>	<p>Functions correctly: Normal Does not function correctly: Defective Replace the train wheel setting lever</p> <p>(Blinks for 1 sec) Output signal: Normal No output signal: Defective Replace the circuit block.</p>
O	<p>Check gear train mechanism for the following points.</p> <ol style="list-style-type: none"> 1. For dust, lint or foreign matters. 2. For lubricants (quality and quantity). 3. For fluctuation. 	<p>No problem: Normal Check the circuit block. Problem: Defective Correct the problem.</p>
U CHECK ACCURACY	<p>● Check gain and loss of time.</p> <ol style="list-style-type: none"> (1) Set up the Quartz tester. (2) Checking  <p>Input indicator light</p>	

V. PARTS LIST for Cal. Y951A

PART NO.	PART NAME	PART NO.	PART NAME
105 542	Auxiliary plate	★4510 871	Liquid crystal panel
125 715	Train wheel bridge	★4510 872	Liquid crystal panel
221 706	Center wheel & pinion	4512 542	Panel frame
231 715	Third wheel & pinion	022 241	Train wheel bridge screw
238 715	Guide pipe for winding stem	022 241	Coil block screw
241 705	Fourth wheel & pinion	022 241	Screw for winding stem holder
261 705	Minute wheel	022 241	Circuit block cover screw
271 706	Hour wheel	011 325	Upper hole jewel for fourth wheel
354 541	Winding stem	011 542	Upper hole jewel for third wheel
391 716	Train wheel setting lever	011 542	Upper hole jewel for fifth wheel
491 589	Dial washer	011 547	Lower hole jewel for step rotor
701 715	Fifth wheel & pinion	011 568	Upper hole jewel for step rotor
711 715	Guide plate for winding stem	027 122	Tube for train wheel bridge
735 542	Winding stem holder	027 122	Tube for circuit block cover screw A
4001 543	Circuit block	027 124	Tube for regulating switch lever screw
4002 715	Coil block	027 125	Tube for battery connection (+) screw
4146 715	Step rotor	027 131	Tube for circuit block cover screw B
4239 715	Rotor stator	027 721	Train wheel setting lever adjusting pin
4246 542	Speaker lead terminal	027 722	Hooking pin for train wheel setting lever
4270 542	Battery connection (-)	027 723	Banking pin for train wheel setting lever
4313 542	Connector	027 724	Reset pin
4408 542	Circuit block spacer A	U.C.C. 399	Battery
4408 543	Circuit block spacer B	MAXELL SR926W	
4457 544	Circuit block cover	SEIZAIKEN TR926W	

Remarks:

Liquid crystal panel

★ 4510871 (Silver)

★ 4510872 (Gold)

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