TECHNICAL GUIDE
AND
PARTS LIST

CAL. Y772A

DIGITAL QUARTZ

FOREWORD

CHECKING AND ADJUSTMENT WHEN THE BATTERY IS INSERTED

Because of the characteristics of the set IC, the Y772A requires the following adjustment when the battery is loaded.

[Battery loading and module assembly]

- When the battery is loaded, the liquid crystal panel shows the wrong or no display. After loading the battery, perform the system reset procedure below.

<**Procedure**>

(1) Just after inserting the battery, depress buttons A, B, C and D simultaneously for a few seconds.

(2) When button D is released first, the alarm sounds continuously. Always release the buttons other than D first. If the alarm sounds continuously, depress buttons A, B, C and D simultaneously.

[Measuring the current consumption]

- Before measuring the current consumption of module or circuit block, the system reset procedure should be performed.

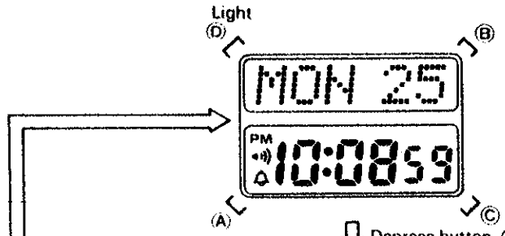
CONTENTS

I. SPECIFICATIONS

Item \ Cal. No.	Y772 A
Display medium	Nematic Liquid Crystal, FEM (Field Effect Mode)
Display system	● Time display ● Alarm display ● Stopwatch display ● Biorythm ● Birthday setting display ● Time setting display
Additional mechanism	● Pattern segment checking system ● Illuminating light ● System reset function ● Alarm test system
Loss/gain	Loss/gain at normal temperature range. Monthly rate: Less than 15 seconds
Casing diameter	ϕ28.1 mm
Height	4.9 mm
Liquid crystal panel drive system	Multiplex (segment), Dot matrix (dot)
Regulation system	Trimmer condenser
Measuring gate	Any gate is available
Battery	Lithium battery: MAXELL CR2016, MATSUSHITA BR2016 or SANYO CR2016 Voltage: 3.0V Battery life: approx. 2 years

II. DISPLAY FUNCTION

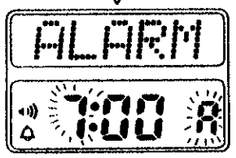
Mode
< Time display >



Ⓑ: Today's biorhythm
ⒷⒸ simultaneously: Alarm test, set/stop alarm and time signal

Depress button Ⓐ

< Alarm >

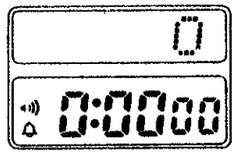


Ⓑ: Select

Ⓒ: Set

Depress button Ⓐ

< Stopwatch >

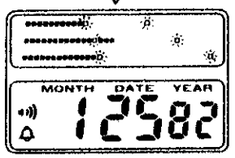


Ⓑ: Start/stop

Ⓒ: Lap/lap release/reset/lap stop/lap call

Depress button Ⓐ

< Biorhythm >



Ⓑ: Previous biorhythm
Ⓒ: Preceding biorhythm

Depress button Ⓐ

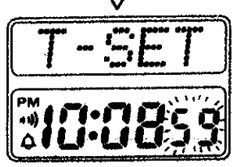
< Birthday setting >

Ⓑ: Select

Ⓒ: Set

Depress button Ⓐ

< Time setting >



Ⓑ: Select

Ⓒ: Set

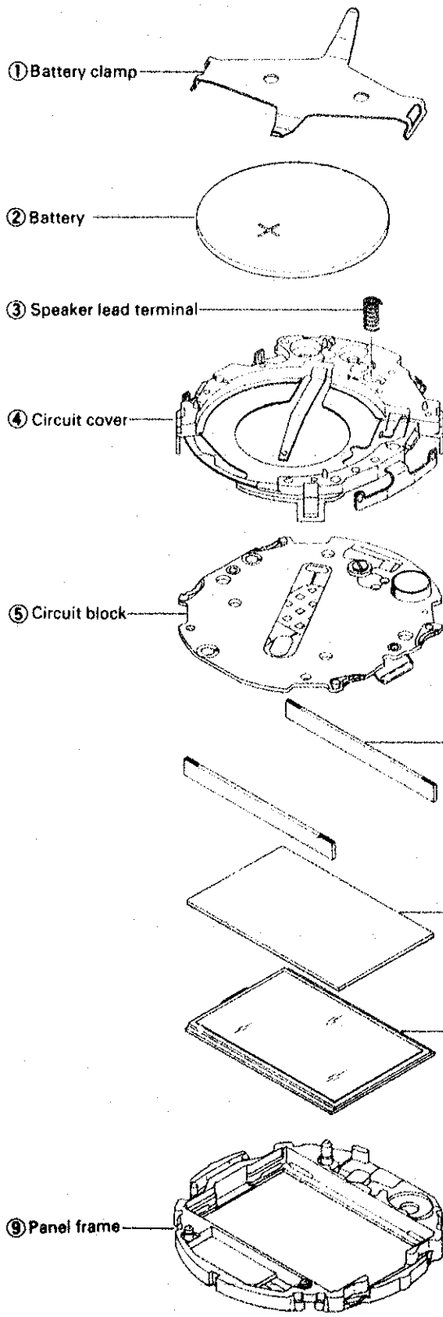
Ⓑ Ⓒ simultaneously: Pattern segment checking mode

Depress button Ⓐ

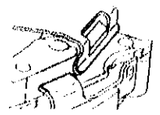
NOTE:
The dot indication of Cal. Y772A sometimes flickers in alarm, stopwatch or birthday setting mode. However, this is not a malfunction.

III. DISASSEMBLING, REASSEMBLING AND CLEANING

1. Disassembling and reassembling of the module

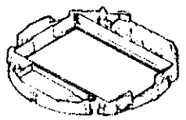


NOTE:
The plastic parts are used to engage the panel frame and circuit cover as shown in the illustration below. Do not remove the circuit cover forcibly. (Pry out the green circuit cover hook with tweezers.)

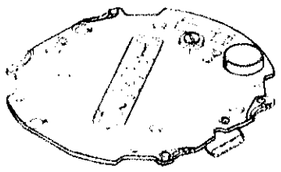


NOTE:
Identification of 6 o'clock and 12 o'clock position. When the liquid crystal panel frame is viewed from the side in which the circuit block is installed, the side in which circular hole is provided is 12 o'clock. The side in which square hole is provided is 6 o'clock. Install the liquid crystal panel frame correctly.

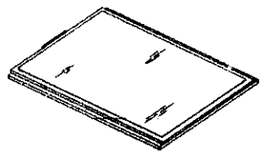
2. Cleaning

Name of parts	Cleaning	Drying	Solution	Remarks
Connector 	Rinse or wash with a soft brush.	Warm air	Alcohol	• Clean the contacting portion between the connector and liquid crystal panel, and circuit block. • Never use benzene or trichloroethylene as these will dissolve the parts. • Do not set the connector until it is completely dry.
Plastic parts • Panel frame  • Circuit cover	Rinse or wash with a soft brush.	Warm air	Alcohol or benzene	
Metal parts • Battery clamp	Rinse or wash with a cleaner or wash with a soft brush.	Warm or hot air	Alcohol, benzene or trichloroethylene	

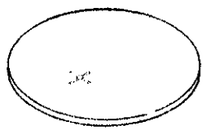
☆ Parts that must not be cleaned



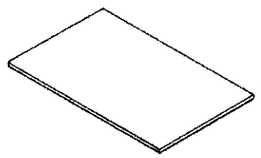
Circuit block



Liquid crystal panel



Battery

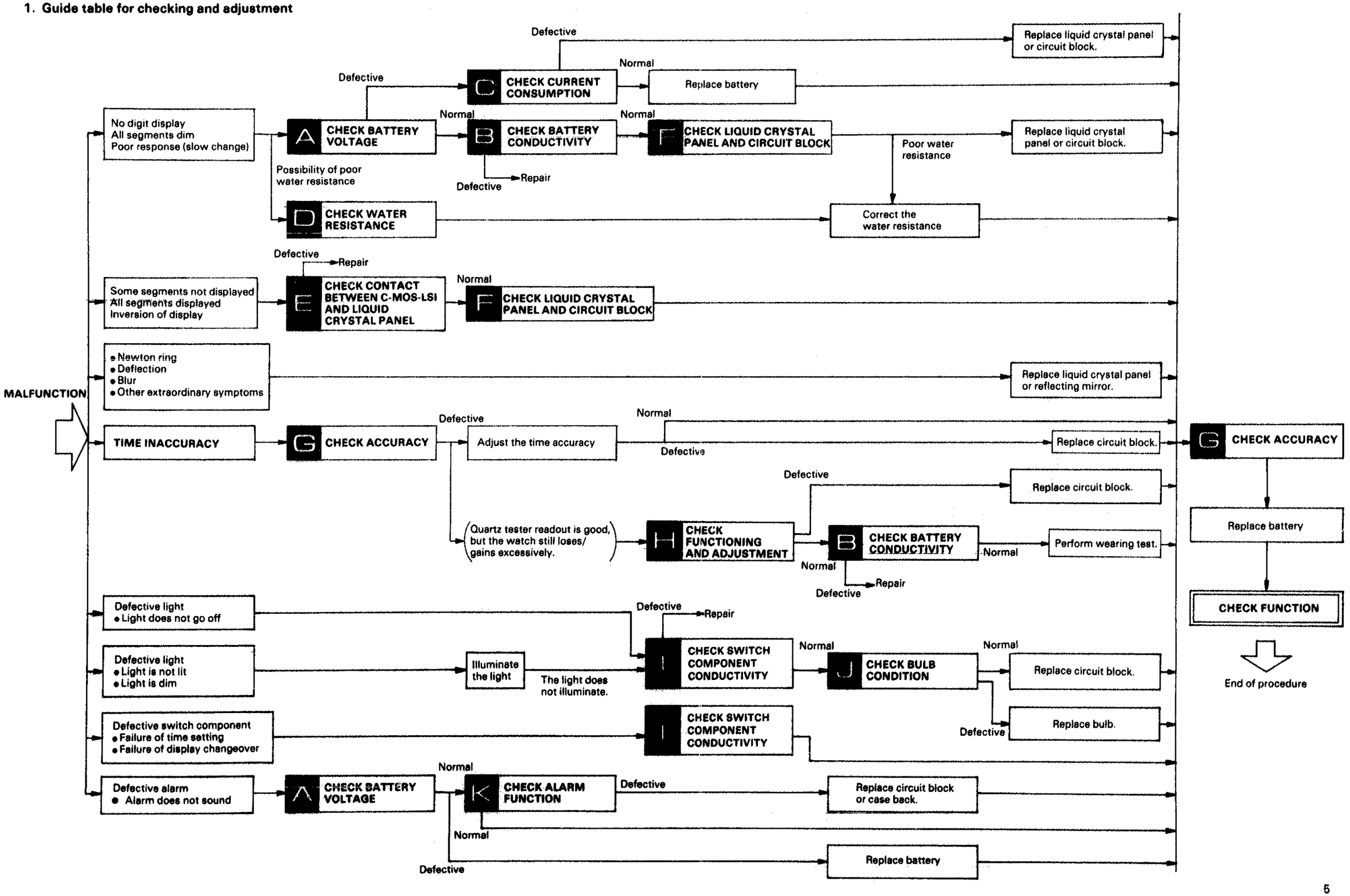


Reflecting mirror

- Only the conductive portions (liquid crystal panel and circuit block etc.) should be wiped with a cloth moistened with benzene and dried with warm air.
- Remove dust and lint with a brush.
- Be careful not to scratch the front surface of the reflecting mirror.

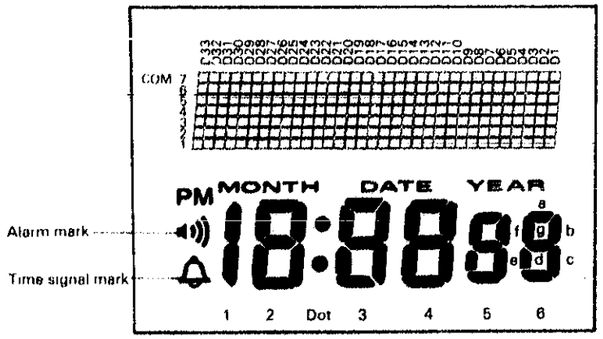
IV. CHECKING AND ADJUSTMENT

1. Guide table for checking and adjustment



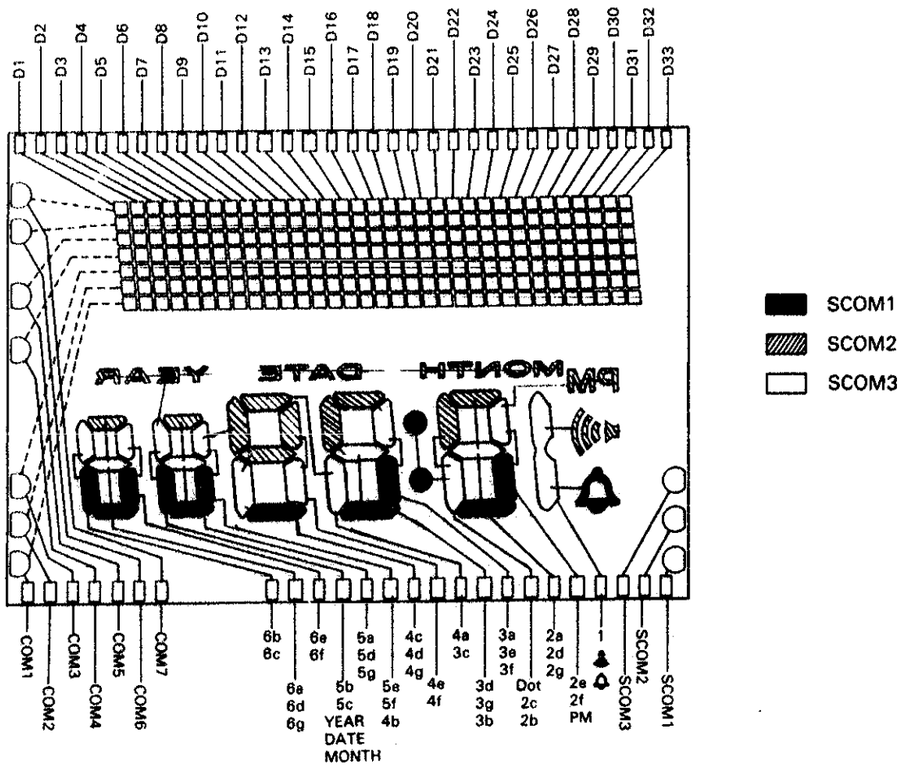
2. Relationship between the segments (Liquid Crystal Panel electrodes) and C-MOS-LSI output terminals

● **Disignation of segment**



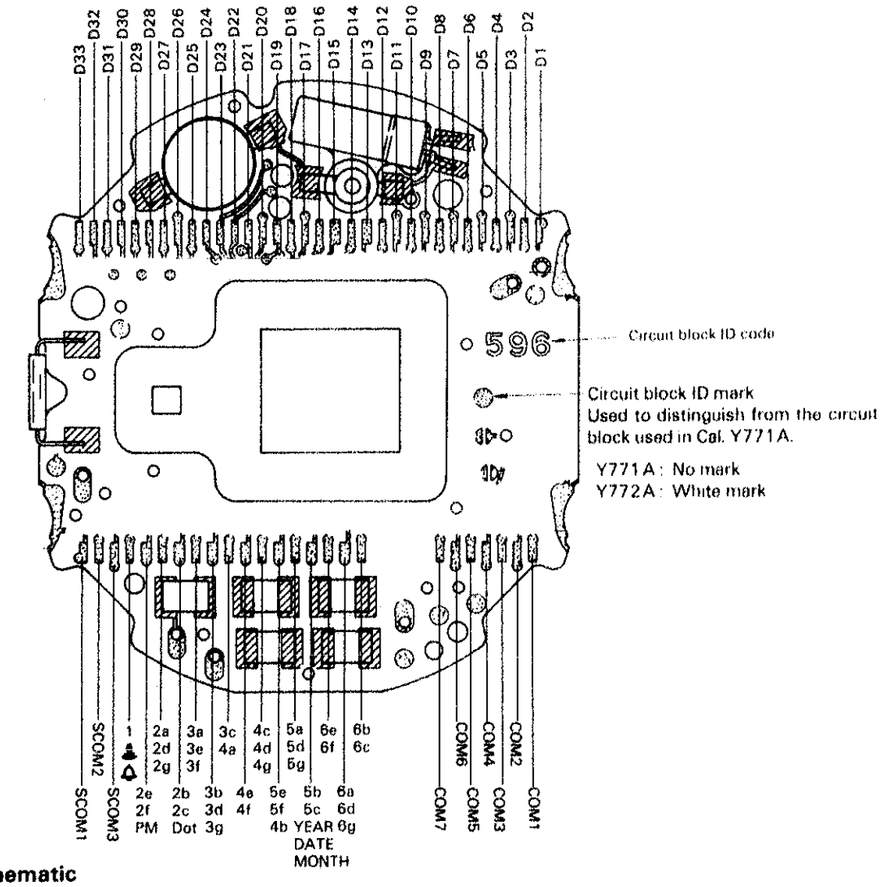
NOTE:
As Cal. Y772A uses dot matrix system, the common electrodes of the liquid crystal panel are described as follows.
Segment display..... SCOM
Dot display ..... COM

● **Segment (liquid crystal panel electrodes)**

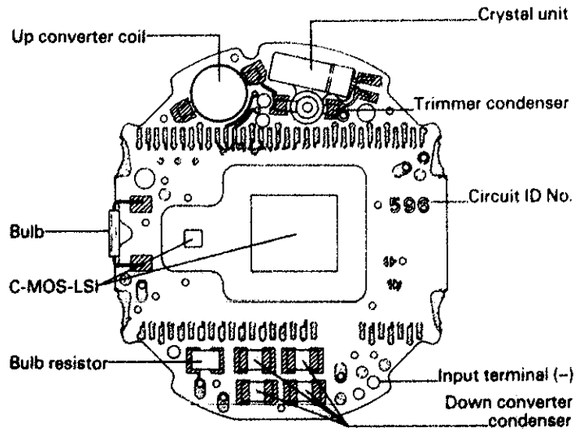


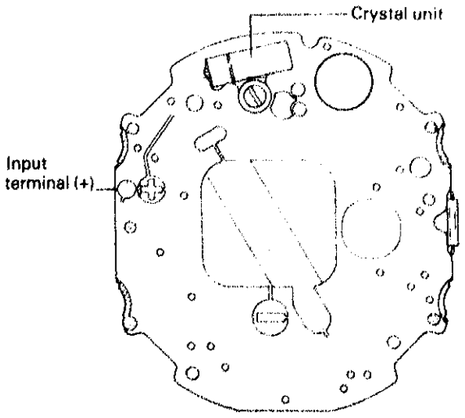
SCOM1
SCOM2
SCOM3

● **C-MOS-LSI output terminal**

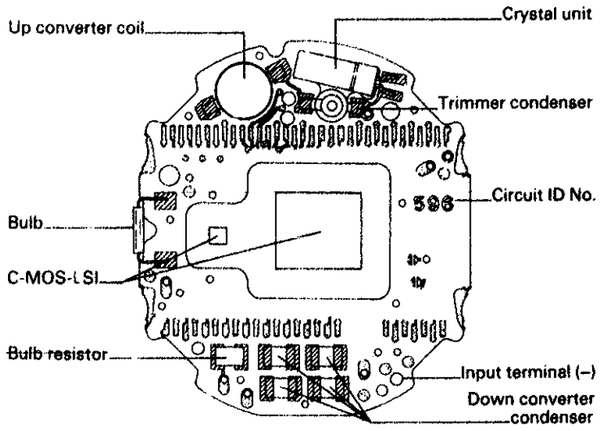


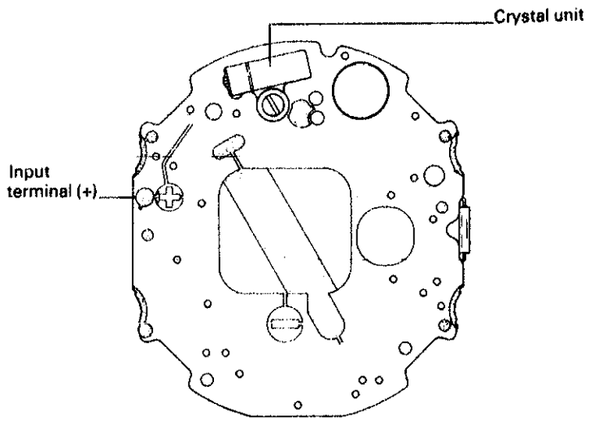
3. Circuit block schematic



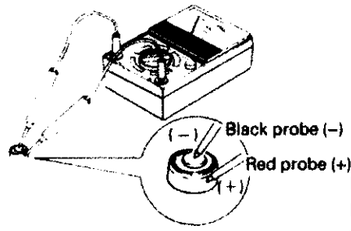
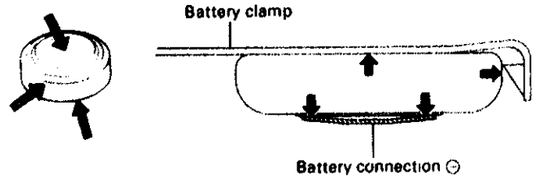
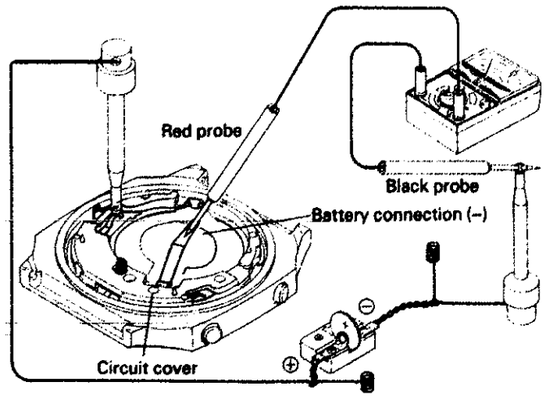


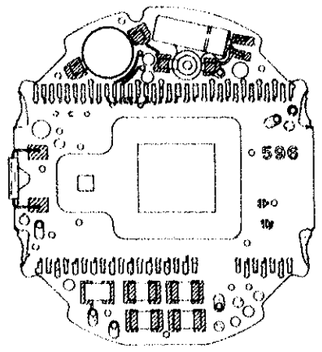
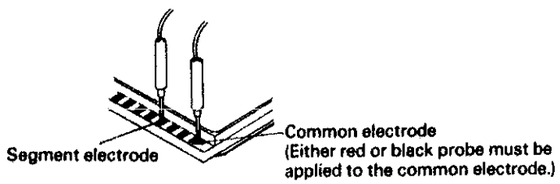
3. Circuit block schematic

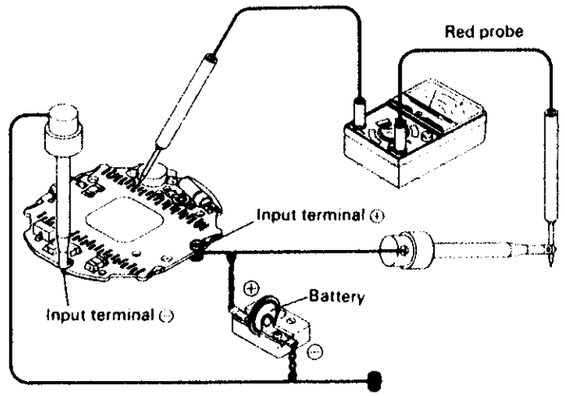


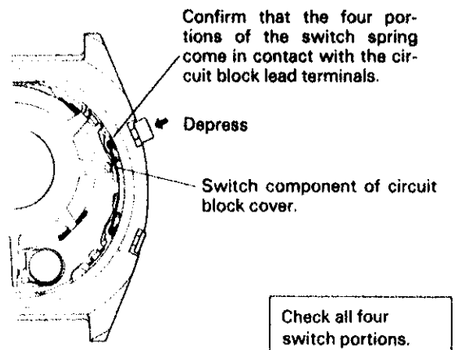
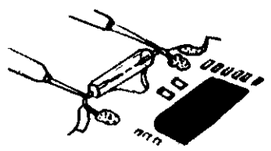
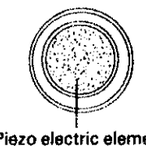
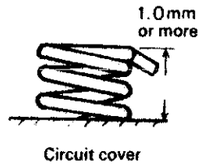


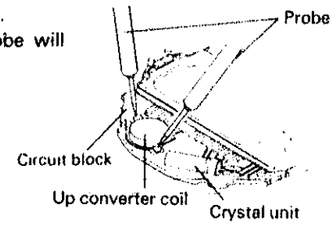
4. Procedure for checking adjustment

	Procedure	Result and repair
A CHECK BATTERY VOLTAGE	 **NOTE:** If the battery is swelled up, the battery is defective. This may occur due to large current. Always replace the battery with new one. (Swelling: 0.2 ~ 0.3 mm)	2.8V or more: Normal Less than 2.8V: Defective (Refer to NOTE 1 below.) **NOTE 1:** The battery voltage temporarily drops when the light is illuminated, alarm is operated or battery is short-circuited. When the battery voltage is 2.6 ~ 2.8V, leave the battery for a few minutes. If the battery voltage is still less than 2.8V, replace the battery with new one. • If the display goes out with the light lit, replace the battery even when the voltage is more than 2.8V.
B CHECK BATTERY CONDUCTIVITY	Check the battery, battery clamp and battery connection (–) for contamination. 	Uncontaminated: Normal Proceed to ■. Contaminated: Defective Clean. Poor water resistance is found: Correct water resistance.
C CHECK CURRENT CONSUMPTION	(1) Total current consumption of module. Proceed as follows. 1. Connect the module as shown below. 2. Short-circuit the (+) and (–) leads of the Volt-ohm-meter. 3. Hold the movement and depress and hold buttons A, B, C and D simultaneously for a few seconds. (System reset is now performed.) 4. Separate the (+) and (–) leads which are short-circuited in item 3 and the correct consumption can be measured.  Short-circuit in item 2 and separate in item 4.	Less than 3.2 μA: Normal 3.2 μA or more: Defective Proceed to ■ (2). Release button A, B or C first.

	Procedure	Result and repair
E CHECK CONTACT OF C-MOS-LSI ~ LIQUID CRYSTAL PANEL	Check for dust, lint and other contamination on the liquid crystal panel electrodes and connectors. Check the liquid crystal panel and connector for scratches, cracks or defects. 	Uncontaminated: Normal Proceed to F. Contaminated: Defective Wipe off any foreign matter.
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 6.) (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 terminal of the Volt-ohm-meter. In some Volt-ohm-meters, 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.	Displayed: Normal Proceed to F. Not displayed: Defective Replace the liquid crystal panel.

	Procedure	Result and repair
F CHECK LIQUID CRYSTAL PANEL AND CIRCUIT BLOCK	2) Supply power to the circuit block by connecting the power supplier as shown in the illustration below and perform the system reset in the same manner in C "CHECK CURRENT CONSUMPTION" on page 9.  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 more than 0.8V.) Return to F. Less than 0.8V: Defective Replace the circuit block.
G CHECK ACCURACY	(1) Set the watch in the pattern segment checking mode. (Either pattern segment checking modes will do.) (2) Any measuring gate of the Quartz tester can be used. (3) Adjust the level. (4) Measure the accuracy.	Does not loss or gain: Normal Losses or gains: Defective Adjust the time accuracy by turning the trimmer condenser. If the time accuracy cannot be adjusted by turning the trimmer condenser, replace the circuit block.
H CHECK FUNCTIONING AND ADJUSTMENT	Check functioning referring to "DISPLAY FUNCTION" on page 2. (1) Check that the time mode and calendar mode are changed correctly. (2) Perform 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: Normal Wear the watch on the wrist to check time accuracy. Does not function correctly: Defective Replace the circuit block.

	Procedure	Result and repair
I CHECK THE CONDUCTIVITY OF SWITCH COMPONENT	(1) Check that the switch spring functions correctly.  Check all four switch portions.	Functions correctly: Normal Does not function correctly: Defective Correct the switch spring with tweezers or replace the circuit block 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 BULB CONDITION	Check that there is a broken filament in the bulb. (1) Set up the Volt-ohm-meter. Range to be used: OHMS R × 1 (2) Checking Apply two probes of the Volt-ohm-meter to the bulb leads as shown in the illustration.  Either red or black probe will do.	Bulb lights up: Normal Bulb does not light up: Defective Replace the bulb with a new one.
K CHECK ALARM FUNCTION	(1) Check the contacting portion of the piezo electric element on the case back and speaker lead terminal and check the speaker lead terminal for deformation.  Piezo electric element **NOTE:** The speaker lead terminal should be protruded from the circuit cover by 1.0 mm or more. (Check when the speaker lead terminal is completely installed.)  Circuit cover	Uncontaminated: Normal Contaminated: Defective Wipe off any foreign matter. Deformed: Defective Correct with tweezers.

	Procedure	Result and repair
K CHECK ALARM FUNCTION	(2) Measure the coil resistance of the circuit block to check for a short-circuit and a broken wire. Range to be used: OHMS R × 1 • Checking Apply the probes to the up converter coil terminals. Either red or black probe will do.  	50Ω – 90Ω: Normal Less than 50Ω: (Short-circuit) More than 90Ω : Defective (Broken wire) Replace the circuit block with a new one.
HOW TO CHECK FOR BATTERY ELECTROLYTE LEAKAGE AND REPAIR	(1) Remove the module from the case. (2) Disassemble the module. (3) Wipe off any electrolyte from the circuit block. 1. Wipe off the electrolyte with cloth moistened with alcohol. (Pay particular attention to the connecting portion.) 2. Dry with warm air by using a dryer. **NOTE:** • If the electrolyte leakage is excessive, replace the circuit block. • Use a lint-free cloth. (4) Clean other parts (Circuit cover and liquid crystal panel frame) which become contaminated with the electrolyte. 1. Wipe off battery electrolyte on the other parts with a soft brush moistened with alcohol. 2. Dry with warm air by using a dryer. **NOTE:** • If each part is damaged, replace it with a new one. (5) Reassemble the module. Replace the battery with a new one. (6) Check function and current consumption.	

V. PARTS LIST for Cal. Y772A

PART NO.	PART NAME
4001 597	Circuit block
4225 597	Battery clamp
4246 795	Speaker lead terminal
4313 596	Connector
4398 785	Liquid crystal panel frame
4410 785	Circuit cover
4510 595	Liquid crystal panel
4521 840	Reflecting mirror
4530 230	Bulb
MAXELL CR2016 MATSUSHITA BR2016 SANYO CR2016	Lithium battery