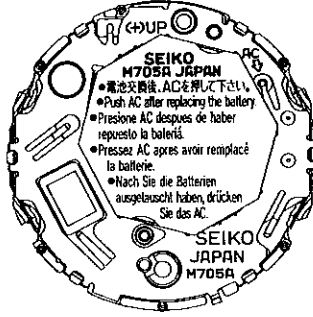


# PARTS CATALOGUE / TECHNICAL GUIDE

## Cal. M705A

### [SPECIFICATIONS]

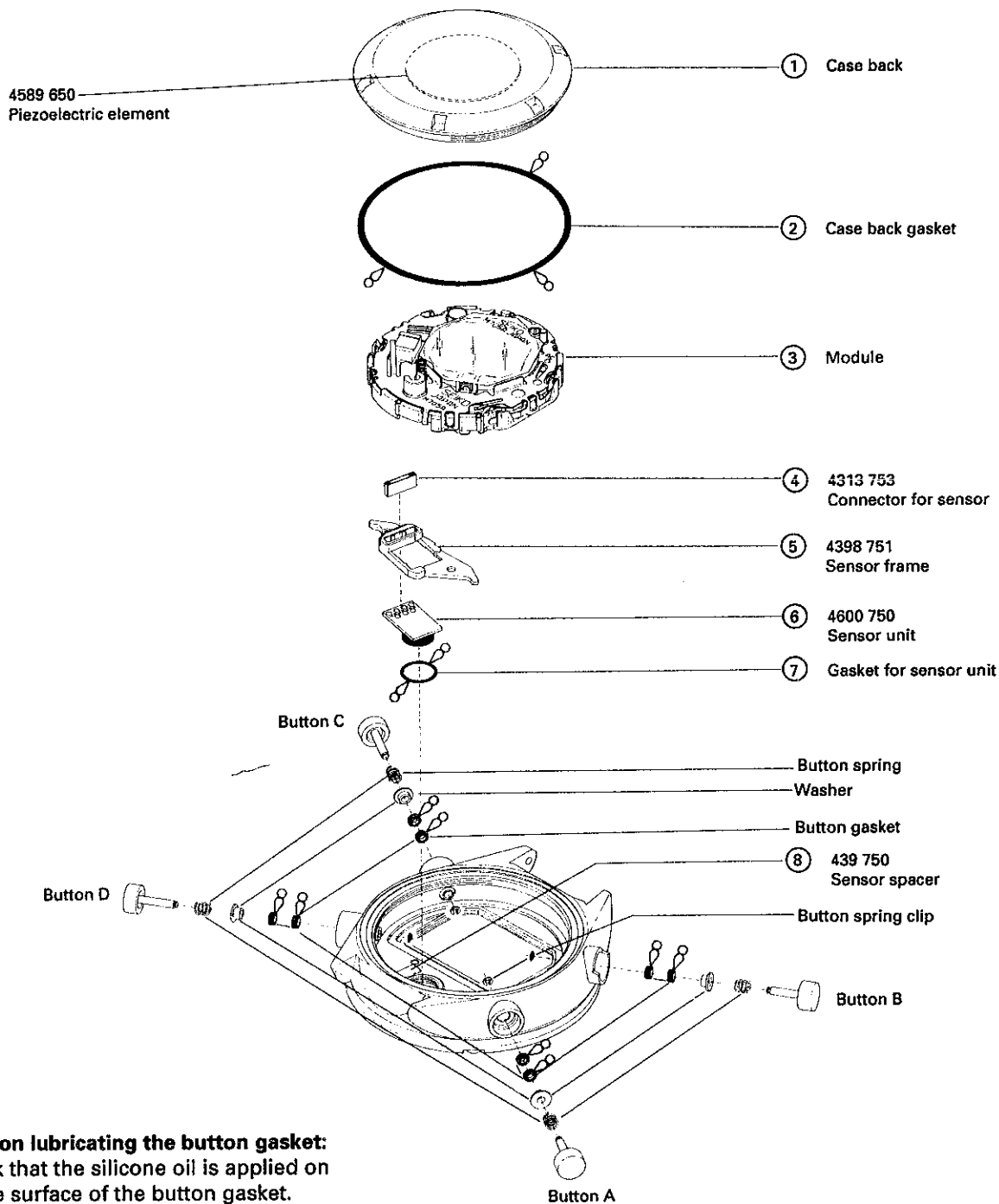
Item		Cal. No.	M705A
Module			 
Module size	Outside diameter		ø34.2 mm
	Casing diameter		—
	Height		6.48 mm
Display medium			Nematic Liquid Crystal, FEM (Field Effect Mode)
Liquid crystal driving system			1/4 multiplex driving system
Display system			<ul style="list-style-type: none"> <li>• Time / calendar display</li> <li>• Dive display</li> <li>• Dive table display</li> <li>• Log data display</li> <li>• Alarm display</li> </ul>
Additional mechanism			<ul style="list-style-type: none"> <li>• Daily alarm</li> <li>• Warning beep</li> <li>• Communication beep</li> <li>• Illuminating light</li> <li>• Battery life indicator</li> </ul>
Range of the depth measurement			Up to 80 m (250 ft)
Accuracy of the depth measurement			±[3% of the displayed value + 0.5 m (2 ft)]
Loss/gain			Monthly rate at normal temperature range: less than 15 seconds
Regulation system			Trimmer condenser
Measuring gate by quartz tester			Any gate can be used.
Battery			SEIKO CR2025, Matsushita CR2025 Battery life is approximately 3 years. Voltage: 3.0V

(x 1.2)

# PARTS CATALOGUE

Cal. M705A

Disassembling procedure Figs. : ① → ②①  
 Reassembling procedure Figs. : ②① → ①  
**Lubricating: Types of oil**                      **Oil quantity**  
 ○ ○ Silicone oil 500,000 c.s.                      ○ ○ Normal quantity

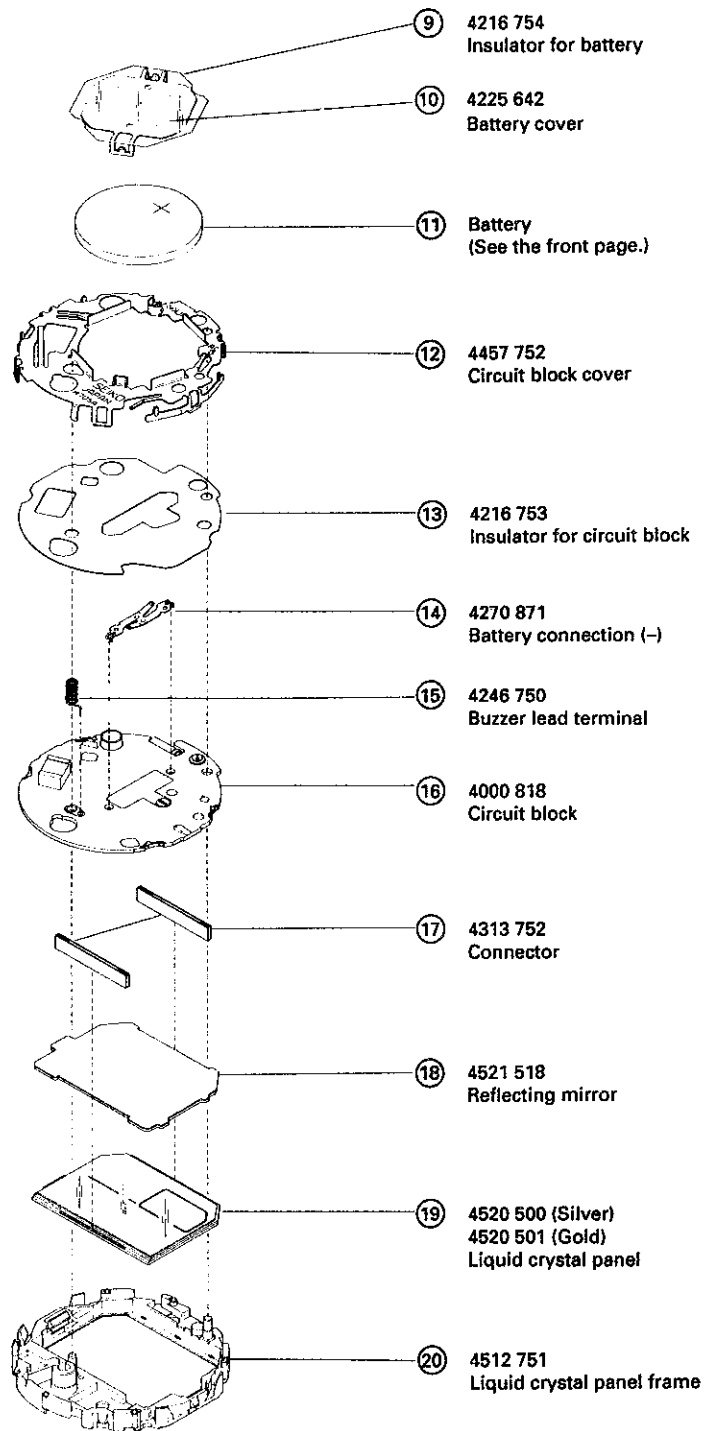


**Note on lubricating the button gasket:**  
 Check that the silicone oil is applied on all the surface of the button gasket.

○ ➡ Please see the remarks on the following pages.

# PARTS CATALOGUE

Cal. M705A



**Remarks:**

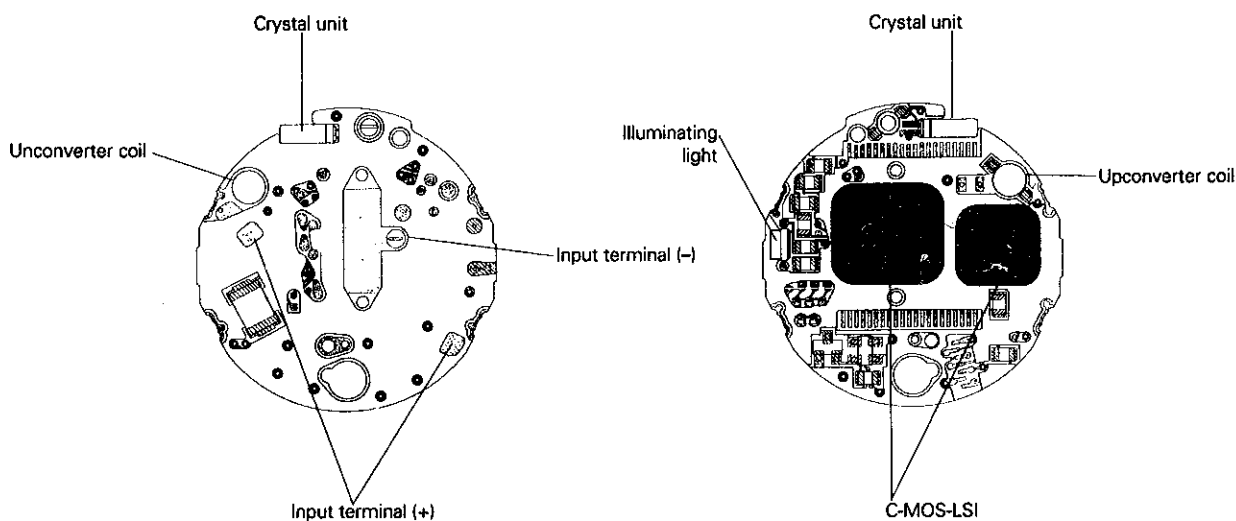
① Liquid crystal panel

The type of liquid crystal panel differs depending on models. Refer to "SEIKO Casing Parts Catalogue" to choose a corresponding liquid crystal panel.

○ ➡ Please see the remarks on the following pages.

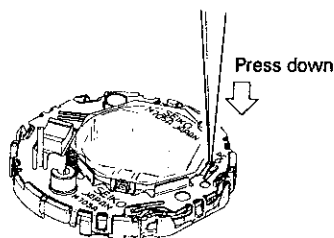
- The explanation here is only for the particular points of Cal. M705A.
- For the repairing, checking and measuring procedures, refer to the "TECHNICAL GUIDE, GENERAL INSTRUCTIONS".

## I. STRUCTURE OF THE CIRCUIT BLOCK



## II. REMARKS ON INSTALLING THE BATTERY

- After the battery is replaced with a new one, or after the battery is re-installed following the repairing procedures, be sure to reset the circuit by pressing down the AC terminal of the circuit block cover with tweezers.

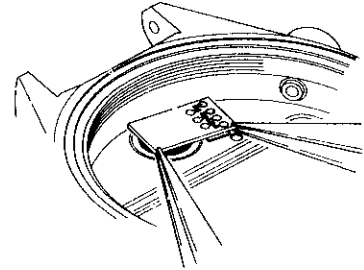


## III. REMARKS ON DISASSEMBLING AND REASSEMBLING

### ⑥ Pressure sensor unit

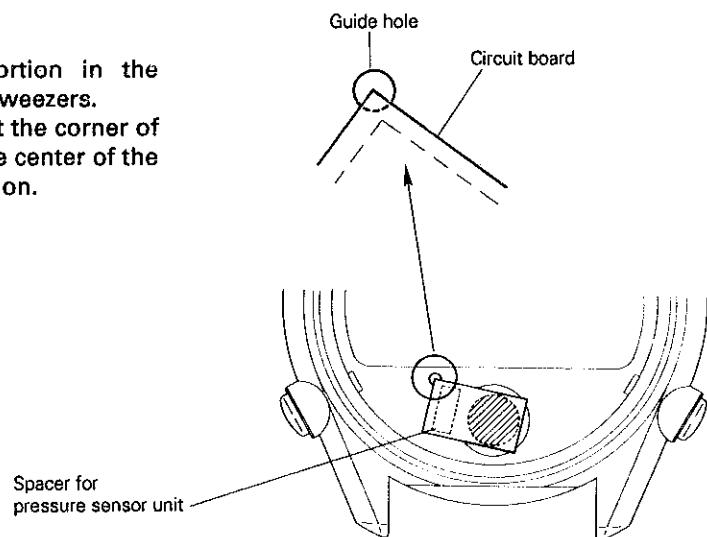
#### • How to remove

Catch the circuit board of the pressure sensor unit with tweezers as shown in the illustration and lift it up alternately at both sides.



#### • How to install

- Press all around the shaded portion in the illustration gently and evenly with tweezers.
- Set the pressure sensor unit so that the corner of the circuit board is positioned at the center of the guide hole as shown in the illustration.



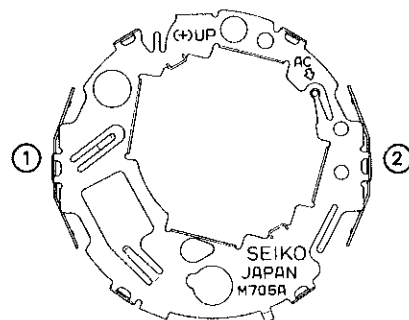
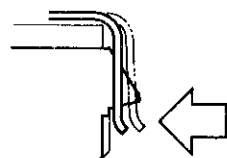
### ⑪ Battery

After installing the battery, be sure to reset the circuit. (Refer to "REMARKS ON INSTALLING THE BATTERY.")

### ⑫ Circuit block cover

#### • How to install

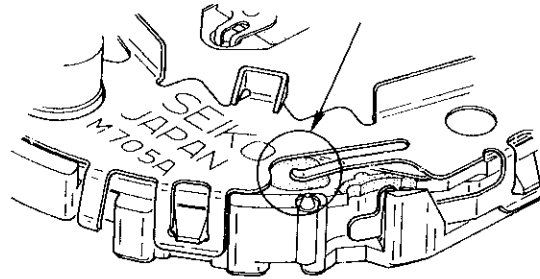
- Set the hooking portions of the circuit block cover in the order of ① and ② in the illustration at right.
- Check that the six hooking portions are all securely set as shown in the illustration below.



# TECHNICAL GUIDE

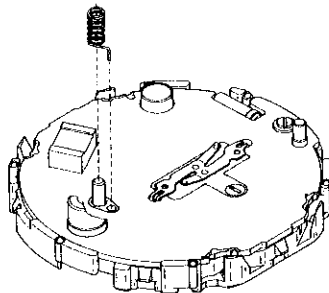
Cal. M705A

- Check that the circuit block cover securely touches the input terminal of the circuit block. Otherwise, the display may not appear on the liquid crystal panel. In that case, bend down the contact portion of the circuit block cover so that it touches the circuit block securely.



## ⑮ Buzzer lead terminal

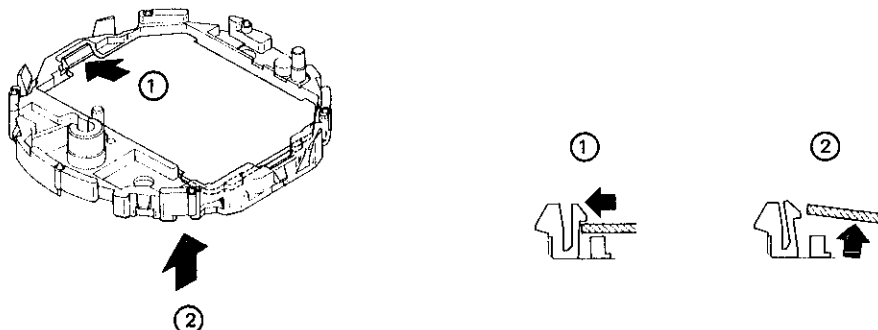
Set the buzzer lead terminal as shown in the illustration.



## ⑱ Reflecting mirror

### • How to remove

While pushing the hooking portion of the liquid crystal panel frame in the direction of the arrow ① push up the reflecting mirror as indicated by the arrow ②



## IV. VALUE CHECKING AND FUNCTION CHECKING

- Current consumption

For the whole of the module :      less than 2.2 $\mu$ A  
For the circuit block alone      :      less than 1.8 $\mu$ A

- Upconverter coil resistance

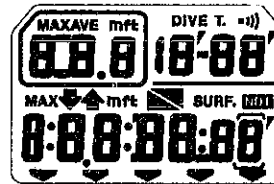
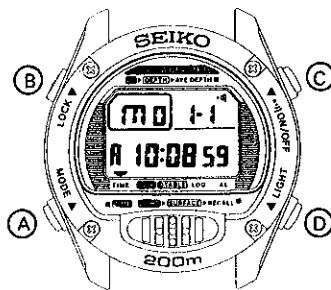
50 $\Omega$  ~ 90 $\Omega$

- Note on measuring current consumption

The circuit of this watch checks the battery life once every 10 seconds and the current consumption increases accordingly. When the SEIKO Digital Multi-Tester S-841 is used to measure current consumption, therefore, the measurement increases momentarily every 10 seconds in the same manner as a tester is used with an analogue quartz whose minute hand moves at 10-second intervals. Read the lowest value as the representative one.

- All the segments lit up

- 1) Press Button A (MODE) to show the TIME mode.
- 2) Press Button B (LOCK) to show the TIME/CALENDAR SETTING display.
- 3) Press Buttons C and D at the same time.
- 4) Check that all the segments of the display light up as shown below.



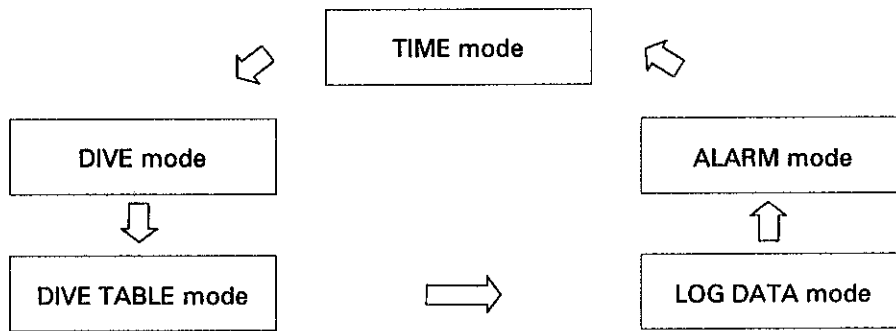
- 5) To return to the TIME mode, press any one of Buttons A, C and D.

- Time accuracy

To measure accuracy, light up all the segments of the display.

• **Mode change**

Check that the mode changes as follows with each press of Button A.



• **Changeover between TIME mode and TIME/CALENDAR SETTING display**

- 1) Press Button A to show the TIME mode.
- 2) Press Button B to check that the TIME/CALENDAR SETTING display appears. (The second digits start flashing.)
- 3) Check that the flashing digits change over as follows with each press of Button C.



- 4) By pressing Button D, the flashing digits can be set. The digits advance quickly by pressing the button for 2 to 3 seconds.  
 \*If the watch is left untouched in the TIME/CALENDAR SETTING display with the digits flashing, the display automatically returns to the TIME mode in 1 to 2 minutes.

• **Communication beep test**

- 1) Press Button A to show the TIME mode.
- 2) Press Buttons C and D at the same time to check that the beeping sound rings.

• **Illuminating light**

- 1) Press Button A to show the TIME, DIVE or ALARM mode.
- 2) Press Button D to check that the light illuminates the display for 3 to 4 seconds.

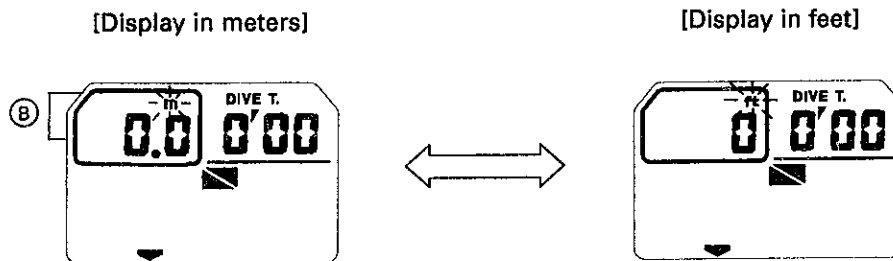


# TECHNICAL GUIDE

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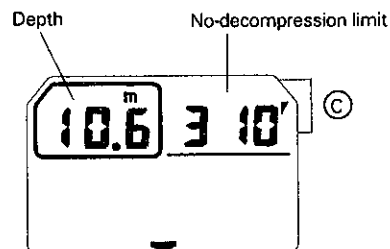
## • Changeover of depth unit

- 1) Press Button A to show the DIVE mode.
- 2) Check that the unit of depth changes over alternately between meters and feet, with each press of Button B for 1 to 2 seconds.



## • No-decompression limit display (before the first dive)

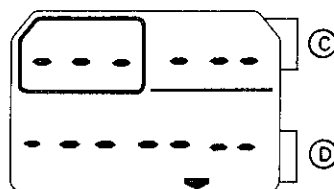
- 1) Press Button A to show the DIVE TABLE mode.
- 2) Check that the depths and the corresponding no-decompression limits are shown in order, with each press of Button C.



## • Display in the LOG DATA mode

Press Button A to show the LOG DATA mode.

- After the battery is replaced with a new one, or after the watch is reassembled, the following display will appear to indicate that no data is stored in memory.
- To clear the log data in memory, press Buttons C and D at the same time for 3 to 4 seconds.

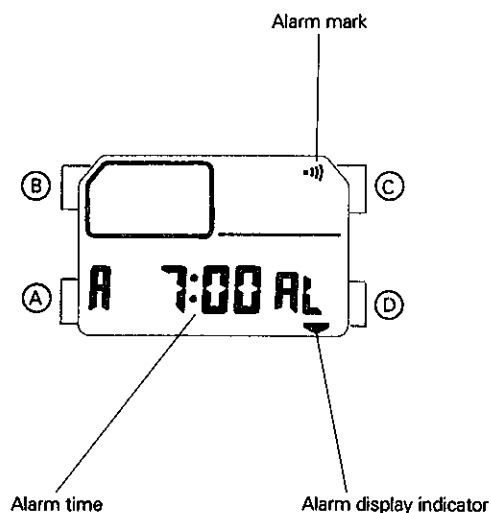


# TECHNICAL GUIDE

Cal. M705A

- **Function of the watch in the ALARM mode**

- 1) Press Button A to show the ALARM mode.
- 2) Press Button B to check that the ALARM SETTING display appears. (The hour digits start flashing.)
- 3) Check that the flashing digits change over between hour and minutes with each press of Button C.
- 4) Press Button D to check that the flashing digits can be set.
  - \* Changeover between 12- and 24-hour indications can be made in the TIME/CALENDAR SETTING display.
- 5) Press Button B to return to the ALARM mode.
- 6) Check that the alarm is engaged and disengaged alternately with each press of Button C. The alarm mark appears when the alarm is engaged, and disappears when it is disengaged.
- 7) Press Button D to check that the light illuminates the display for 3 to 4 seconds.
- 8) Press Buttons C and D at the same time to check that the communication beep rings.



• **Accuracy of the pressure sensor**

To measure the accuracy of the pressure sensor, use Water Resistance Tester S-470 developed for exclusive use with Cal. M7 Series. Water resistance testers of the conventional type cannot allow a precise checking of the depth measurement of the watch. Equipped with a transparent water tank and digital water pressure gauge S-470 can check the accuracy of the pressure sensor and functioning of Cal. M7 Series watches by simulating actual diving activities besides being capable of testing the water resistant quality of conventional watches up to 10 atmospheric pressure/bar.

Follow the procedure below to check the accuracy of the pressure sensor.

- 1) Press Button A to show the DIVE mode.
- 2) Check that the depth is displayed in meters. (If not, press Button B for 1 to 2 seconds to change the depth unit of "m".)
- 3) Put the watch into the water tank of Water Resistance Tester S-470, and check if the dive flag flashes when the assumed depth is more than 1.5m (5 ft.).
- 4) Apply pressure gradually, and make a note of the depth displayed by the watch when 1.00 kg/cm<sup>2</sup> of pressure is applied.
- 5) Make a note of the depth when the applied pressure is 5.00 kg/cm<sup>2</sup>.
- 6) If the obtained depths fall within the range shown in the table below, the pressure sensor is normal and accurately measures the depth. If not, it is considered defective, and you should replace the connector for sensor or the pressure sensor unit.

\*The value range of "Depth display of Cal. M705" in the table below assumes that the watch is tested in fresh water, and possible measurement errors are taken into account.

Depth assumed	Pressure value of S-470	Depth display of Cal. M705
10 m	1.00 kg/cm <sup>2</sup>	8.5 ~ 10.5 m
50 m	5.00 kg/cm <sup>2</sup>	46.5 ~ 51.0 m
70 m	7.00 kg/cm <sup>2</sup>	65.0 ~ 71.5 m

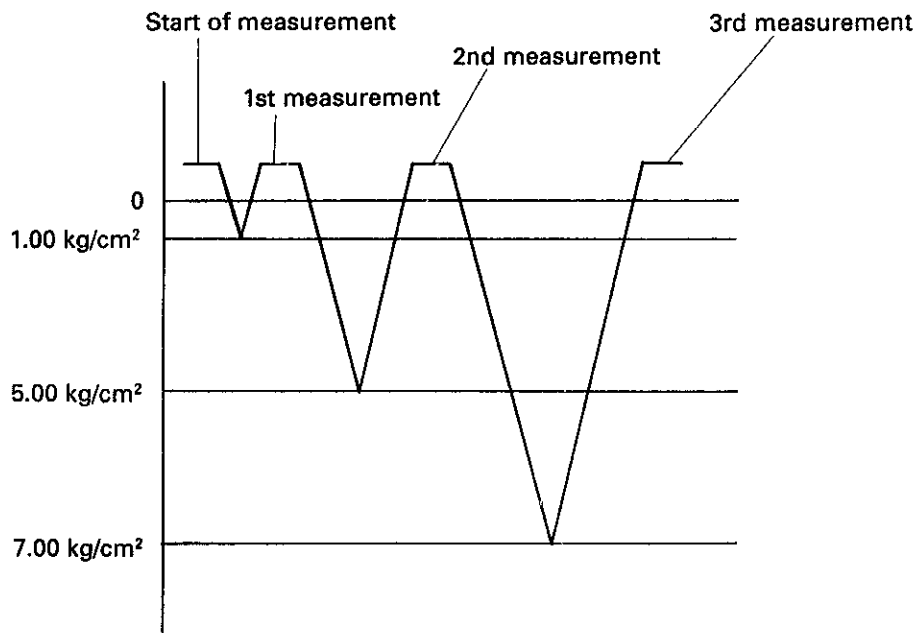
**Note:** Cal. M7 Series watches measure the depth of water on the basis of seawater having a specific gravity of 1.025. To know the actual depth in fresh water such as lakes, therefore, the displayed depth should be corrected by multiplying it by 1.025.

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- If you have Water Resistance Tester S-460 for 1,000 m water resistant divers' watches, precise depth measurement checking is possible by making alterations to it using Digital Depth Gauge Unit S-461. S-461 does not have a window to check the depth display of the watch. To check the accuracy of the depth measurement, therefore, use the maximum depth display of the watch.

As in the checking procedure of S-470, check the maximum depth displays of the watch when 1.00 kg/cm<sup>2</sup> and 5.00 kg/cm<sup>2</sup> of pressure are applied to it. Each time, after the respective pressure is applied, take the watch out of the water and make a note of the maximum depth displayed on it.



\*For the normal value range of depth display, refer to the table on page 11.

- If you do not have either S-470 or S-461, it is not possible to precisely check the accuracy of the depth measurement of the watch. In that case, only check if the pressure sensor functions.

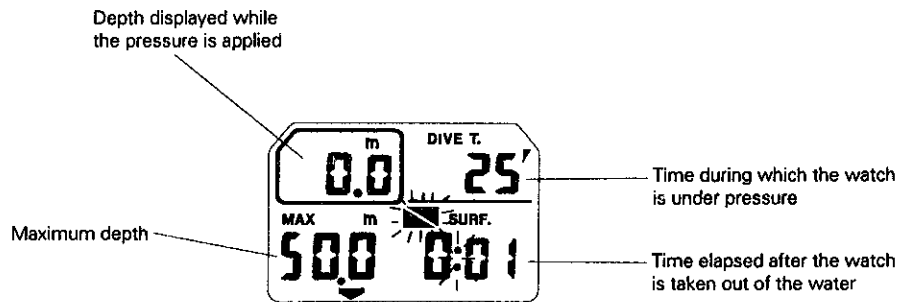
\*Never use gas or air to apply pressure to the watch as this may damage the pressure sensor unit.

- 1) Press Button A to show the DIVE mode.
- 2) Press Button B to check if the depth is displayed in meters. (If not, press Button B for 1 to 2 seconds to change the depth unit to "m".)
- 3) Put the watch into the chamber of the water resistance tester, and apply 5 atmospheres of pressure/bar for approximately 1 minute.

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- 4) Decrease the pressure, and take the watch out of the water.



- 5) If the displayed maximum depth is between 45.0 and 55.0 m, the pressure sensor is considered to be normal.

- After the checking procedure is completed, clear the data in memory.

- 1) When more than 10 minutes have elapsed after the watch is taken out of the water, check that the dive flag stops flashing and press Buttons B and C at the same time for 3 to 4 seconds in the DIVE mode. The maximum depth, the time elapsed after the watch is taken out of the water and the time during which the watch is under pressure are all cleared from memory.

- 2) Press Button A to show the LOG DATA mode.

- 3) Press Buttons C and D at the same time for 3 to 4 seconds to clear all the data in memory.

\*If more than 8 atmospheres of pressure/bar is applied to the watch, "--" is displayed for the maximum depth. Clear the memory following the procedure described above.

