TECHNICAL
INFORMATION

CITIZEN QUARTZ
Cal. No. D09※

● CITIZEN

§ 1. OUTLINE

The Citizen Voice Master VX-2 is the world's first voice-recognition watch.
- All functions can be operated by the user's own voice.
- Voice-controlled functions will only react to the voice that has been pre-recorded by the user.
- Registering and changing memos, switching function modes and setting the time, date, 2 alarms and a duel time can all be performed by speaking into the watch's built-in microphone.
- In addition to using the voice-controlled operating mode, the VX-2 can be operated manually with the S1 and S2 pushbuttons. (Memo input is the only function that must be performed by voice.)
- A maximum of 16 memos, each of which can hold up to 12 numeric characters (0-9), can be stored in the watch's memory.
- The VX-2 has six function modes which include Time, Calendar, Alarm 1, Alarm 2, Memo and Dual Time.

§ 2. SPECIFICATIONS

Movement	Do 90
Model	Voice Master VX-2
Accuracy	Within ± 30 seconds a month.
Crystal frequency	32,768 Hz.
IC	Watch IC, voice recognition IC, memory IC, one each.
Operating temperature	0°C-55°C (32°F-131°F)
Display function	Time : Hours, minutes, seconds AM/PM Calendar : Month, date, day Alarm 1, 2 : Hours, minutes, AM/PM Memo : 16 memos, 12 numeric characters Dual time : Hours, minutes, seconds AM/PM (12/24HR switch)
Batteries	280-15 (SR 1130W) 3 batteries. Battery life : Approximately 2 years (Alarm : 20 sec/day, voice operation : 20 sec/day)

§ 3. OPERATING SYSTEMS

Your VX-2 is the world's first voice-recognition wristwatch that combines standard button operation. The operating systems in your watch are divided into the following four operating modes:

Operating Mode		Content
1	Manual Mode	Each function can be performed by manual operation of the buttons as with any standard digital watch.(Current time is displayed in this mode when no other operation is being performed: Normal mode.) In this booklet, the terms Normal mode and Manual mode are used interchangeably when referring to the current time display.
2	Voice Recognition Mode	Moving between the six function modes and changing or inputting data can be performed by voice in this mode. (Commands can only be entered by the voice that has been previously registered.)
3	Voice Registration Mode	To operate the watch by voice in the Voice Recognition mode the operation commands must be recorded in the Voice Registration mode. (Voice-controlled operation is not possible if this registration is not performed.)
4	Voice Standby Mode	To prevent unnecessary battery consumption, operation automatically enters this mode when there has been no input for a period of 8 seconds or if no button input has been made. Voice input cannot be received in this mode. There is a Voice Recognition Standby mode and also a Voice Registration Standby mode.

Note : Command—A command is a word registered in the watch's memory and is used to operate the watch by voice.
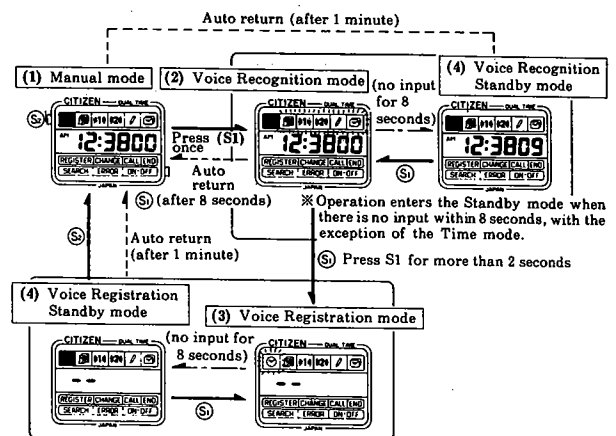
- If there is no voice input for 8 seconds in the Voice Recognition mode or Voice Registration mode, each mode enters its respective Standby mode.
- If there is no button input in the Voice Standby modes, operation automatically returns to the Manual mode (Auto return).

§ 4. PARTS OF THE WATCH (1)

Mode display
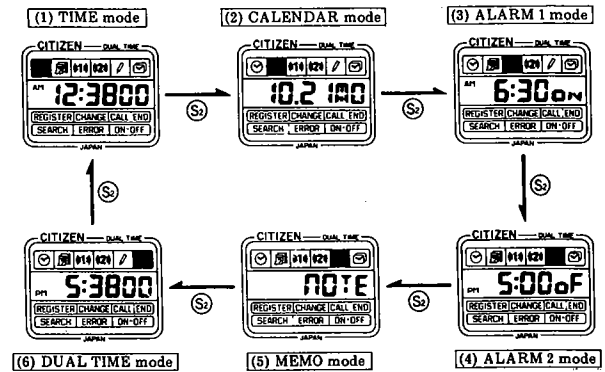Display
S₂ button
S₃ button
Microphone
S₁ button
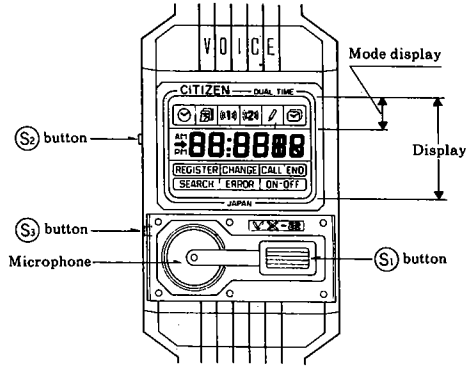
Button Functions

S1 button : Voice control button, correction button

S2 button : Function mode selection button, digit selection button

S3 button : ALL RESET button (cancels all data)

Note :

If the ALL RESET button is pressed, all input data is canceled and the display for each mode returns to its factory set initial value. (Refer to Section 9, Switch Specifications.)
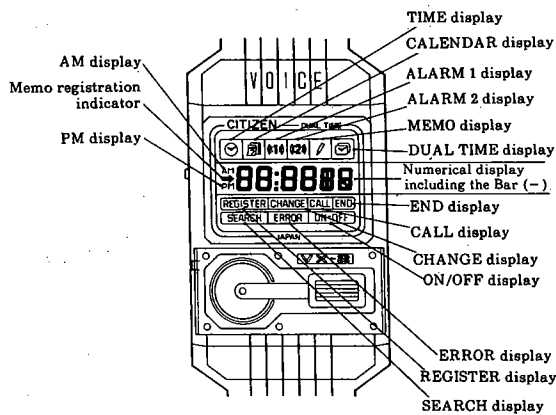
Command Display

AM display
Memo registration indicator
PM display

TIME display
CALENDAR display
ALARM 1 display
ALARM 2 display
MEMO display
DUAL TIME display
Numerical display including the Bar (−)
END display
CALL display
CHANGE display
ON/OFF display
ERROR display
REGISTER display
SEARCH display

§ 5. BUTTON OPERATIONS

5-1. Moving between function modes with the buttons in the Manual mode

[(1) TIME mode]   [(2) CALENDAR mode]   [(3) ALARM 1 mode]

[(6) DUAL TIME mode]   [(5) MEMO mode]   [(4) ALARM 2 mode]

- Each time S2 is pressed, the next function mode is highlighted in the mode display and operation moves to that mode. If S2 is pressed for more than 2 second in any mode, that mode's Change mode is entered. (Refer to Section 5-2.)
- If no operation is indicated for more than 1 minute in any mode, except TIME, operation automatically returns to the Normal mode and current time is displayed (Auto return).
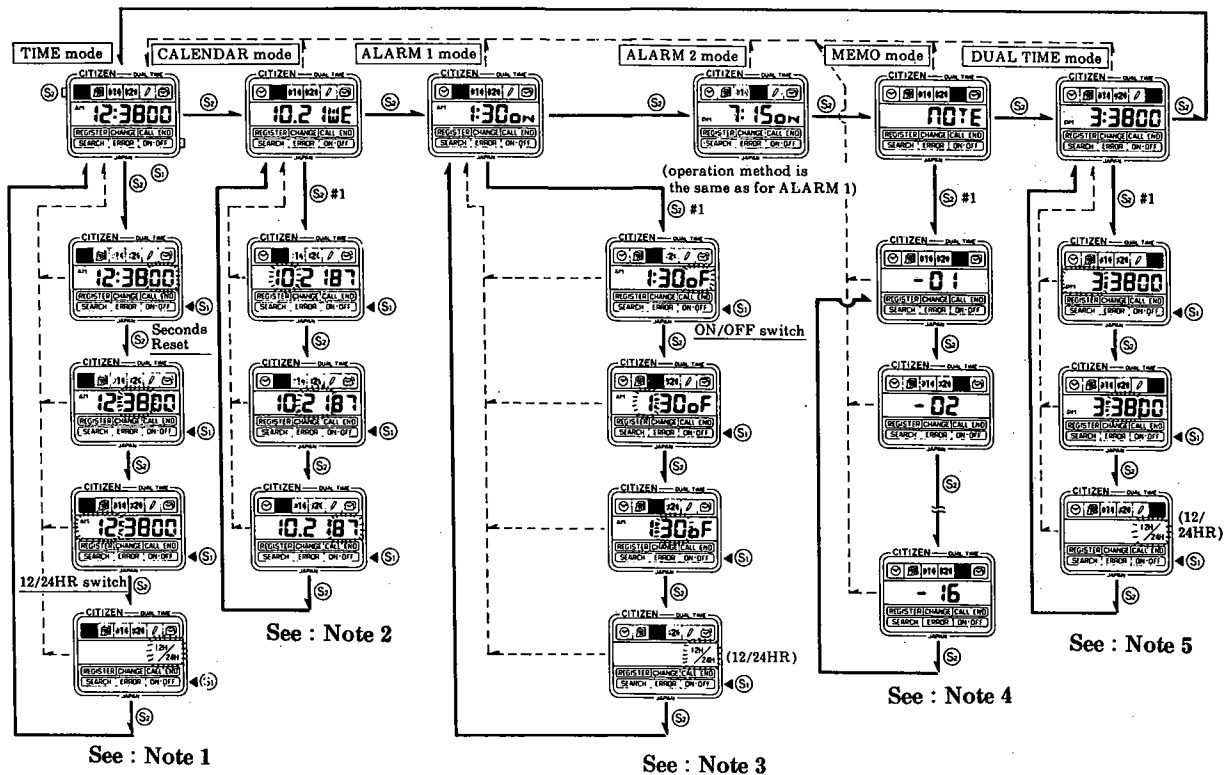
5-2. Setting changes with the buttons in the Manual mode

TIME mode | CALENDAR mode | ALARM 1 mode | ALARM 2 mode | MEMO mode | DUAL TIME mode

(operation method is the same as for ALARM 1)

Seconds Reset

ON/OFF switch

12/24HR switch

See : Note 2

See : Note 1

See : Note 3

(12/24HR)

See : Note 4

(12/24HR)

See : Note 5

Note 1:
- Seconds Reset means that the time currently indicated by the watch advances 1 minute if more than 30 seconds is taken in the setting procedure.
- The TIME display switches between the 12-hour and 24-hour systems when S1 is pressed.

Note 2:
- When the calendar is set to a nonexistent date it advances to the first day of the next month (example: Feb. 30 → March 1).
- Only the last 2 digits are indicated when the year is set (1987=87). Enter the month, date and year. When the display stops flashing, changes in the CALENDAR setting are registered and the new month, date and year are displayed.
- Adjustment at the end of the month is unnecessary.

Note 3:
- The setting method for ALARM 1 and ALARM 2 is the same.
- Adjust the alarm when it is switched OFF. When the display stops flashing, changes in the ALARM setting are registered and the alarm is automatically switched ON (ON is indicated on the display).

Note 4:
- The memos (input data) are displayed in the order they were registered when S2 is pressed.
- Data cannot be registered in MEMO by using the buttons.

Note 5:
- Another time can be entered in this mode.
- The setting method is the same as for TIME mode (See page 6, TIME mode.)
- The Seconds Reset cannot be performed since the seconds are continuously interfaced with the TIME mode.

Common Precautions:

1. When S2 is pressed continuously (for approximately 2 seconds) in any mode, the mode enters its Change mode and the settings begin to flash (flashing display).
2. The setting to be changed is reached by pressing S2 and changes are made by pressing S1.
3. In Change, the numbers can be advanced rapidly by holding down S1.
4. When S1 is not pressed for more than 2 minutes in Change, the display stops flashing, all new settings are registered and the new setting are displayed. If there is no input for another 1 minute, Normal mode is automatically returned when operation is in any mode other than TIME (Auto return).
5. Under the 12-hour system, the AM or the PM mark is displayed. The AM/PM marks are not displayed on the 24-hour system.
6. ALARM1, ALARM2 and DUAL TIME can be operated under the 12-hour or 24-hour system, irrespective of the TIME mode.
7. In the Change mode, if S2 is pressed for more than 2 seconds in any of the function modes, the new settings are registered, operation leaves the Change mode and the new setting are displayed (Forced resetting).

§ 6. VOICE OPERATIONS

Overview

Your VX-2 can be operated ONLY by the voice that was previously registered. Before voice operations can be performed you must register all commands in your own voice (**this is called Command Registration**).

- Before proceeding with the operations in this guide, please read Section 8 thoroughly.
- All words inside quotation marks (" ") in this booklet represent actual spoken commands.
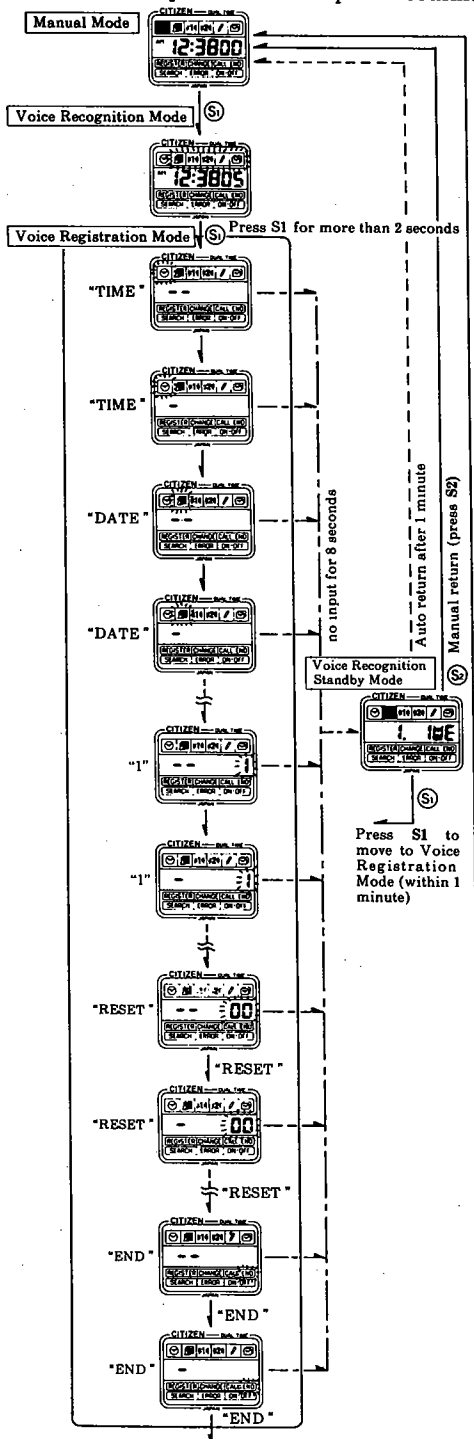
Registration Guidelines
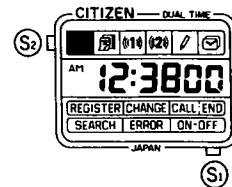
Perform Command Registration in the Voice Registration mode. When two bars (—) appear on the numerical display field in the Voice Registration mode, say the words that correspond to the command being highlighted. (refer to "Commands" on page 10-11.)

Say each command twice to perform the registration. Each time a command is spoken into the microphone, one bar will disappear from the field. When one registration is complete the next command highlights and two bars (—) again appear. Register the commands in the order as displayed. Operation returns to the Manual mode when registration is complete.

The commands are the words you use to operate the watch.

> **Note:**
> 1. When Command Registration is not performed correctly, ERROR flashes. Perform Command Registration again if this occurs.
> 2. In Voice Registration mode, each time S1 is pressed, the command indicated for the next function is displayed and can be registered (**Step-Up**). If S1 is held down, the commands advance rapidly on the display.
> This rapid-advance selection is convenient because it can be used to skip functions that are not used.
> 3. If S2 is pressed in Voice Registration mode, operation returns to the previous function that was displayed and the command can be registered for the first time (**Step-Back**). The commands are backspaced rapidly if S2 is pressed continuously.
> This rapid backspace selection is useful to register a partial setting correction or to change an erroneous registration.
> 4. If there is no voice input (or button input) for 8 seconds in Voice Registration, operation returns to the Voice Registration Standby Mode → and voice input cannot be received.
> In this case, operation returns to the Voice Registration mode by pressing S1 within one minute. In the Voice Registration Standby mode, press S2 to return to Manual mode. Operation automatically returns to Manual mode after one mintute has elapsed with no input (Auto return).
>
> a. When a command is newly registered, the previously registered command in that position is erased automatically.
> b. Registration can be skipped by pressing S1, but registration must be performed twice for each command to ensure correct operation for vocal input.
> c. Your watch can register a word as a command within a period of 0.2 to 1.0 seconds.
> Sometimes extremely short words can be difficult to register. Any portion of a word that exceeds 1.0 second is cut off. Refer to the Command Chart in Section 6-2.
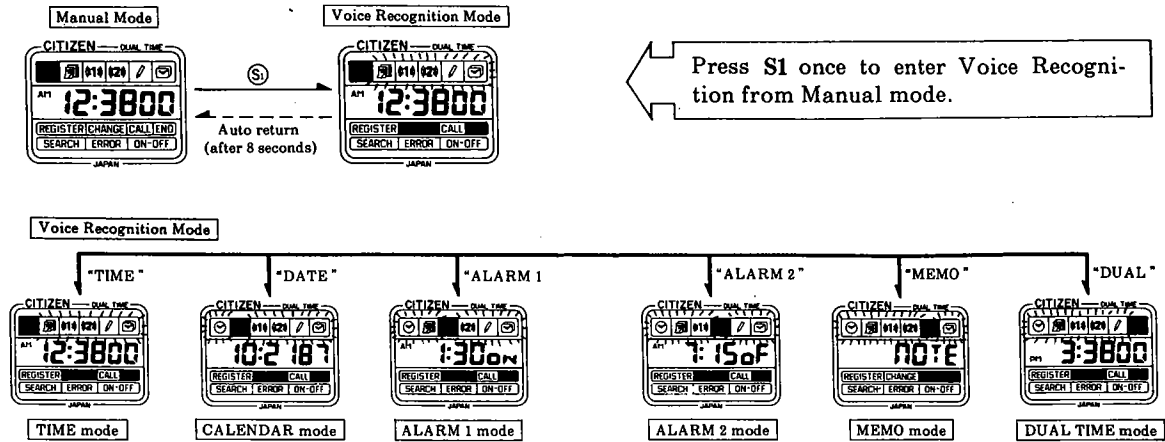
6-2. COMMAND CHART

The following list is only one example of a command chart. Your VX-2 is capable of accepting any word as a command in the Voice Registration mode.

Display	Command (Example)	Function	Remarks
⊙	TIME	Calls up TIME display	Displays hour, minutes and seconds
📅	DATE	Calls up CALENDAR display	Displays month, date and day
((①))	ALARM 1	Calls up ALARM 1 display	
((②))	ALARM 2	Calls up ALARM 2 display	
✐	MEMO	Calls up MEMO display	Up to 12 numeric characters
⊡	DUAL	Calls up DUAL TIME display	DUAL TIME allows you to enter another time setting.
CALL	CALL	Reads out memo on the MEMO display	Command to call up data input in MEMO
CHANGE	CHANGE	Changes data	Command to Change
END	END	Ends a mode	Command to End
0	0	Sets zero	Input commands for numeric data
1	1	Sets 1	
2	2	Sets 2	
3	3	Sets 3	
4	4	Sets 4	
5	5	Sets 5	
6	6	Sets 6	
7	7	Sets 7	
8	8	Sets 8	
9	9	Sets 9	
–	BAR	Sets a bar	
ON	ON	Turns on the alarm at the set time	Command to set ALARM ON/OFF
oF	OFF	Turns off the alarm at the set time	
AM	AM	Sets AM	Command to set AM/PM
PM	PM	Sets PM	
00	RESET	Resets Seconds value in TIME to 00	Command for Seconds Reset
CHANGE	CHANGE	Changes data	Command to Change
END	END	Ends a mode	Command to End
SEARCH	SEARCH	Reads memos in the order they were registered	Command to read memos in recorded order
REGISTER	REGISTER	Registers a name or numeric data in MEMO	Command to Register
CHANGE	CHANGE	Changes data	Command to Change
END	END	Ends a mode	Command to End

(Voice Registration Precautions)

a. Use words that you are accustomed to using when creating a command chart and registering the commands.

b. Be sure to hold your mouth close (5-15cm) to Registration and other voice-controlled operations.

c. A quiet location is important for correct voice operation.

6-3. MODE SWITCHING BY VOICE

Manual Mode		Voice Recognition Mode

Press **S1** once to enter Voice Recognition from Manual mode.

Auto return (after 8 seconds)

Voice Recognition Mode

"TIME" "DATE" "ALARM 1" "ALARM 2" "MEMO" "DUAL"

TIME mode	CALENDAR mode	ALARM 1 mode	ALARM 2 mode	MEMO mode	DUAL TIME mode

1. In Voice Recognition, any mode can be entered directly and any registered data, such as date or alarm setting, can be called up by using the verbal commands.
2. In the Voice Recognition mode (flashing mode display), any mode can be moved to by speaking the appropriate mode command into the microphone. For example, to move from TIME, say "MEMO" and the MEMO mode is entered.
3. Perform the following procedures to return to Manual mode from Voice Recognition mode.
   a. When there is no voice input or S1 is not pressed for 8 seconds, operation moves to

the Voice Recognition Standby mode. After one minute has passed, the Standby mode ends and operation automatically returns to Manual mode (Auto return). In the TIME mode, operation automatically returns to Manual mode after 8 seconds without input.
   b. Pressing S2 in the Voice Recognition Stand by mode allows you to return Manual mode at any time.
   c. In the Voice Recognition mode, operation can be returned to Manual mode by speaking "END" into the microphone.

6-4. SETTING CHANGES BY VOICE

The settings in any mode, with the exception of MEMO, can be changed manually with the buttons. The following instructions explain the most significant feature of your VX-2 watch — the voice-controlled operation in MEMO.
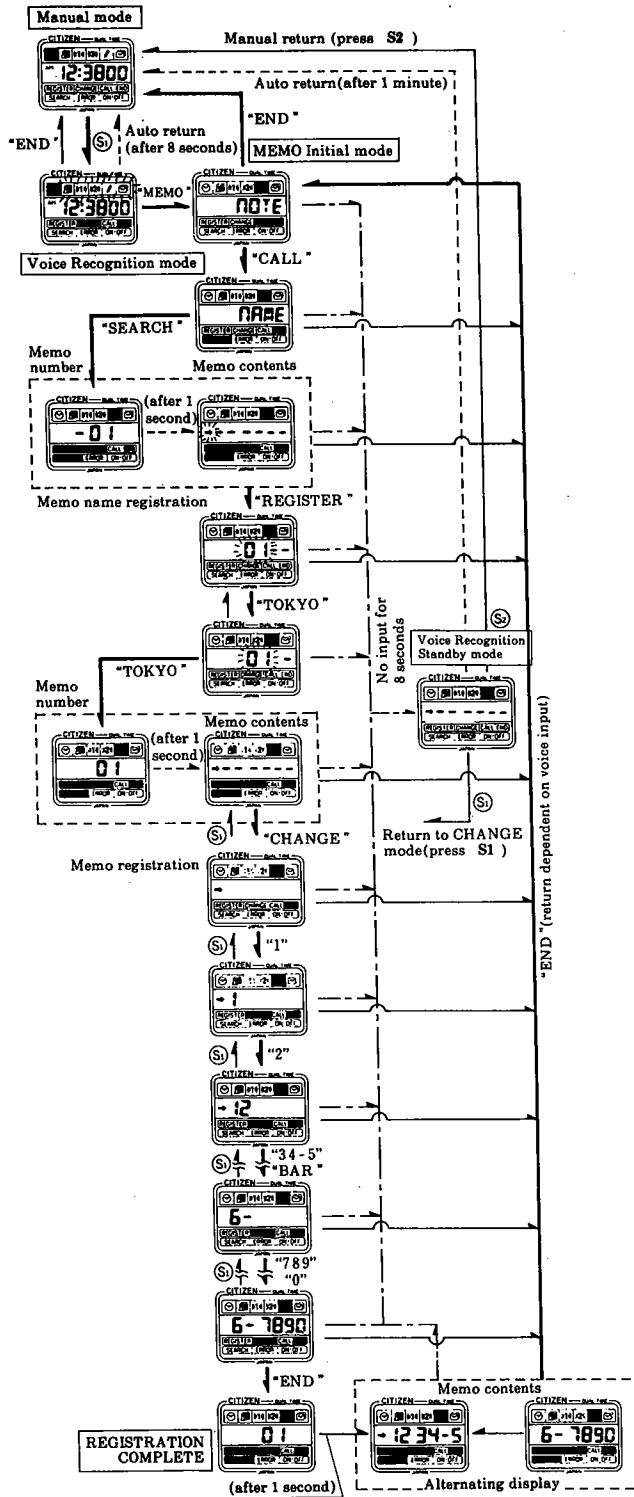
PRECAUTIONS

1. When S1 is pressed during the (highlighted) Change mode, operation returns to the previous function position. This is called Step-Back and is useful for correcting errors.
2. If there is no input for 8 seconds during Change, Voice Recognition Standby is entered and voice input cannot be received. In Voice Recognition Standby, press S1 to return to the Voice Recognition mode.
3. In the Standby mode, press S2 to return to Manual mode (Manual return). Press S2 to move onto the next memo after the correct data is displayed. Hold S2 down to return to MEMO Initial mode.
4. When Change is performed, the data that was previously entered is erased by saying CHANGE, and operation moves to the Voice Recognition mode.
5. An arrow (→) at the beginning of a registered memo indicates the first six digits of a longer memo.

6-5. INPUTTING A MEMO

(1) REGISTERING A NEW MEMO

> **Example : Registering "TOKYO**
> **1234-56-7890" as a memo**

Manual mode

Manual return (press S2)

Auto return (after 1 minute)

"END"

Auto return (after 8 seconds)   MEMO Initial mode

"END"

"MEMO"

Voice Recognition mode

"CALL"

"SEARCH"

Memo number   Memo contents

(after 1 second)

Memo name registration   "REGISTER"

"TOKYO"

"TOKYO"

Memo number   Memo contents

(after 1 second)

No input for 8 seconds

Voice Recognition Standby mode

Return to CHANGE mode (press S1)

"CHANGE"   "END" (return dependent on voice input)

Memo registration

"1"

"2"

"34-5" / "BAR"

"789" / "0"

"END"   Memo contents

REGISTRATION COMPLETE

(after 1 second)   Alternating display

In the Manual mode, press S1 once to enter the Voice Recognition mode.

In the Voice Recognition mode, when operations are not in MEMO, say "MEMO" to enter the MEMO mode.

Say "CALL" to open MEMO. The word NAME will appear on the display field. Now enter the word you have chosen to call up your memo. (Any short word can be used as the password to your memo.)

Say "SEARCH" to advance to the memo wanted. The memos are numbered from 01 to 16 and can be selected, in order, by using SEARCH. (example : "–01". The bar to the left indicates there is no message recorded in the first memo. When "01" is displayed (without the bar), this indicates that a message has been recorded.)

Registering your message in the watch's memory is the next step. First say "REGISTER". When "01- - "is displayed, input the chosen memo name twice (in this example "TOKYO"). After each input, one of the two bars disappears.

The arrow (→) on the left side of the display field flashes to indicate that a memo can be registered. At the same time, the bars (- - - - - -) are displayed across the field indicating there is no data registered in that particular file. (Should there already be data registered in the memo, it will be displayed at this time instead of the bars.)

Say "CHANGE". The bars exit the display field and the memo to be registered is input at this time.
mple : "1 → 2 → 3 → 4 →(—)→ 5 → 6 →(—) → 7 → 8 → 9 → 0 " is spoken into the microphone.

- Say "END" to complete the memo registration. (The memo will not be registered if this step is not performed. The new input is not recorded and the previous memo remains if "END" is not given.)
- One second after "END" is entered, the newly registered memo is alternatingly displayed six characters at a time so the user can check whether the memo was entered correctly.
- When it is not necessary to record 12 characters for a memo, say "END" to finish registering the memo.

Note :
1. Memo registration cannot be performed by pressing the buttons. A MEMO CAN ONLY BE REGISTERED BY VOICE.
2. The name used to call up a memo ("TOKYO") can be any word, but only numbers can be registered as a memo.
3. Memos can be entered in file 01-16. You can use any name you wish to call up a memo. No more than 12 numeric characters can be used as the memo.
4. Press S1 to delete any number while inputting a memo if a mistake is made (Step-Back).
5. When memo registration is complete and memo is displayed, say "REGISTER" to record a new memo name; "CHANGE" to register a new memo; "SEARCH" to move to the next memo; and "END" to return to MEMO Initial mode.

(2) CALLING UP A REGISTERED MEMO

1. MEMO 01 : **TOKYO**   **1234-56-7890**
                                    (Telephone number)
2. MEMO 02 : **LICENSE**   **010021**
                                    (Driver's license number)
3. MEMO 03 : **SMITH**   **098-76-54321**
                                    (Telephone number)

Memos recorded like the above can be called up by using the registered names: "TOKYO", "LICENSE", "SMITH". First press **(S1)** in MEMO. Say "CALL". After NAME enters the display field, give the memo name.

Say "SEARCH" to return to first MEMO
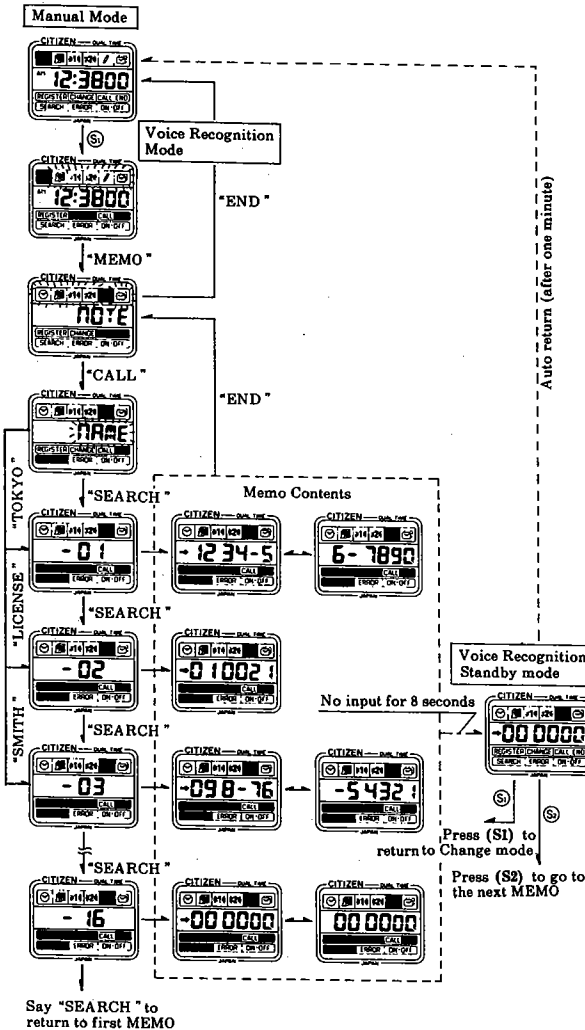
• Any registered memo from 01 to 16 can be called up by entering "SEARCH" as shown in the above figure.
• Instead of using "SEARCH", a registered memo can be called up directly by using the name given to the memo.
Example: Say the commands "CALL" and "SMITH" in this order into the microphone, and 098-76-54321 will be displayed.
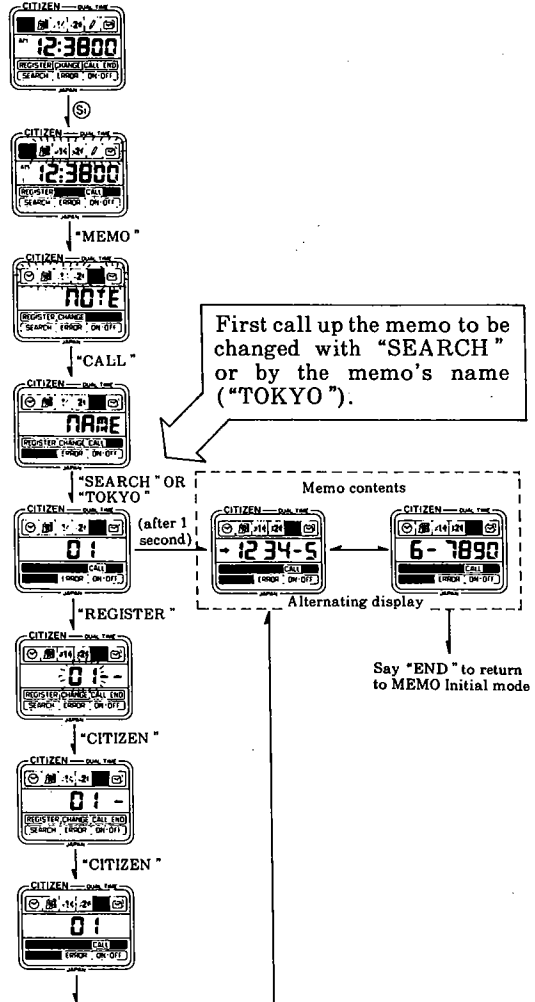
(3) CHANGING THE CONTENTS OF A MEMO

Procedure is the same as registering a new memo described in Section 6-5(1) (Page 14-15).
The memo to be changed is called up by repeating "SEARCH" from 01 until the desired memo appears, or called directly by saying the registered name of the memo, such as "TOKYO".

(4) CHANGING THE NAME OF A MEMO

The basic operation is the same as the procedure for registering a new memo (See Section 6-5(1)).

Example: Change "TOKYO" to "CITIZEN"

First call up the memo to be changed with "SEARCH" or by the memo's name ("TOKYO").

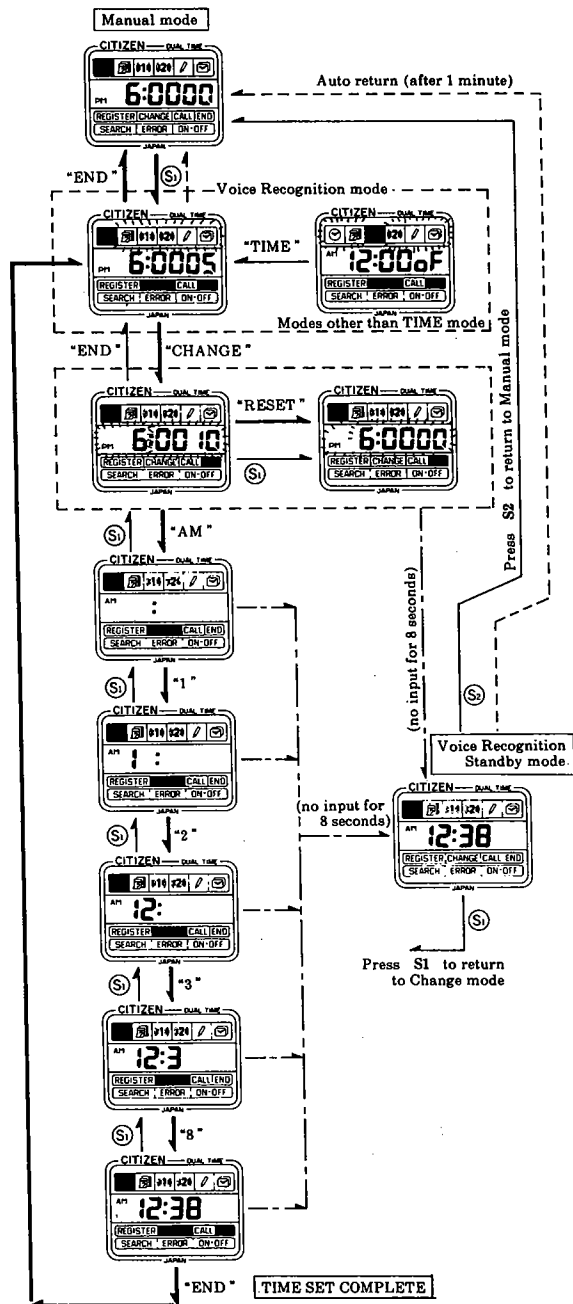Say "END" to return to MEMO Initial mode

(5) ERASING A REGISTERED MEMO

Perform "CALL" → "SEARCH" → "CHANGE" → "END" in the MEMO mode to erase a memo and its registered name. Perform these operations after verifying which memo (01 to 16) is to be erased.

6-6. SETTING THE TIME BY VOICE

Example: Set the time to 12:38:00 AM

Manual mode

Auto return (after 1 minute)

"END" (S1) Voice Recognition mode

"TIME"

Modes other than TIME mode

"END" "CHANGE"

"RESET"

(S1)

(S1) "AM"

(S1) "1"

(S1) "2"

(S1) "3"

(S1) "8"

"END" TIME SET COMPLETE

(no input for 8 seconds)

(no input for 8 seconds)

Voice Recognition Standby mode

Press S1 to return to Change mode

Press S2 to return to Manual mode

(S2)

Press S1 once in the Manual mode to enter Voice Recognition mode.

Say "TIME" to enter the TIME mode from another mode when in the Voice Recognition mode.

Say "CHANGE" to enter the Change mode.

Next enter the TIME values by voice.
00(RESET) → AM → 1 (HR : ten's place) → 2 (HR : one's place) → 3 (MIN : ten's place) → 8 (MIN : one's place)
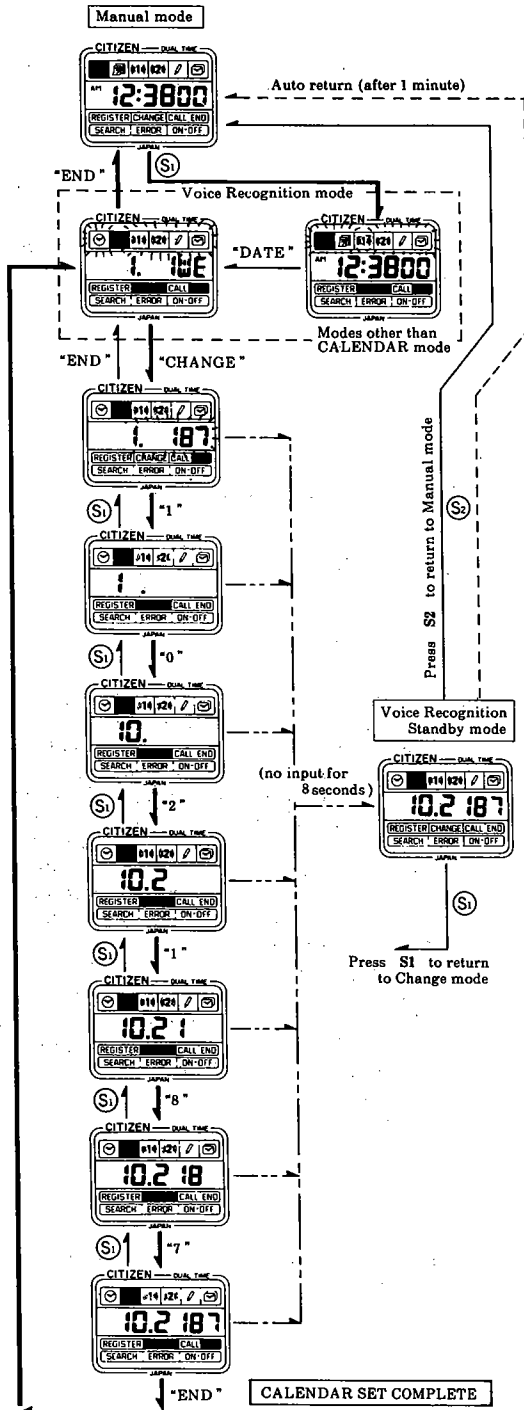
Note:

Seconds : Set the seconds display to 00 seconds by "RESET" (Seconds Reset) or by pressing S1 once. The seconds display will then start to advance. The minutes value increases by one minute if 30 or more seconds are displayed when the Seconds Reset operation is performed. The value displayed for the minutes does not increase if less than 30 seconds are displayed when the Seconds Reset operation is performed.

AM/PM Setting : This operation must be performed to use the 12-hour system, but is not necessary for the 24-hour system.

HOUR · MINUTE Setting: Be sure to enter four numbers for the TIME values.
Example : 1:05 → "0 → 1 → 0 → 5"

Enter the End command twice to complete the setting and return to the Manual mode. (Voice Recognition mode is entered after "END" is input once.)

Note:

Enter the End command to return to the original TIME display when a nonexistent time is entered by mistake.
Example : (Original display) AM 11:59:00 → (SET) 11:65:00
A logic error occurs in this case. Enter the End command to return to the original (11: 59:00) display.

6-7. SETTING THE CALENDAR BY VOICE

Example: Set the CALENDAR to oct. 21, 1987

Manual mode

Auto return (after 1 minute)

"END" (S1)

Voice Recognition mode

"DATE"

Modes other than CALENDAR mode

"END" "CHANGE"

(S1) "1"

(S1) "0"

(S1) "2"

(S1) "1"

(S1) "8"

(S1) "7"

"END" CALENDAR SET COMPLETE

Press S2 to return to Manual mode

(S2)

Voice Recognition Standby mode

(no input for 8 seconds)

(S1)

Press S1 to return to Change mode

Press S1 once in the Manual mode to enter the Voice Recognition mode.

Say "DATE" to enter the CALENDAR mode from another mode when in the Voice Recognition mode.

Say "CHANGE" to enter the Change mode.

Next enter the CALENDAR values in the following order: Oct. 21, 1987 → "1 → 0 → 2 → 1 → 8 → 7"

Note:

- Six (6) numbers must be entered for the CALENDAR values.
- Use the last two numbers of the year for the year setting.

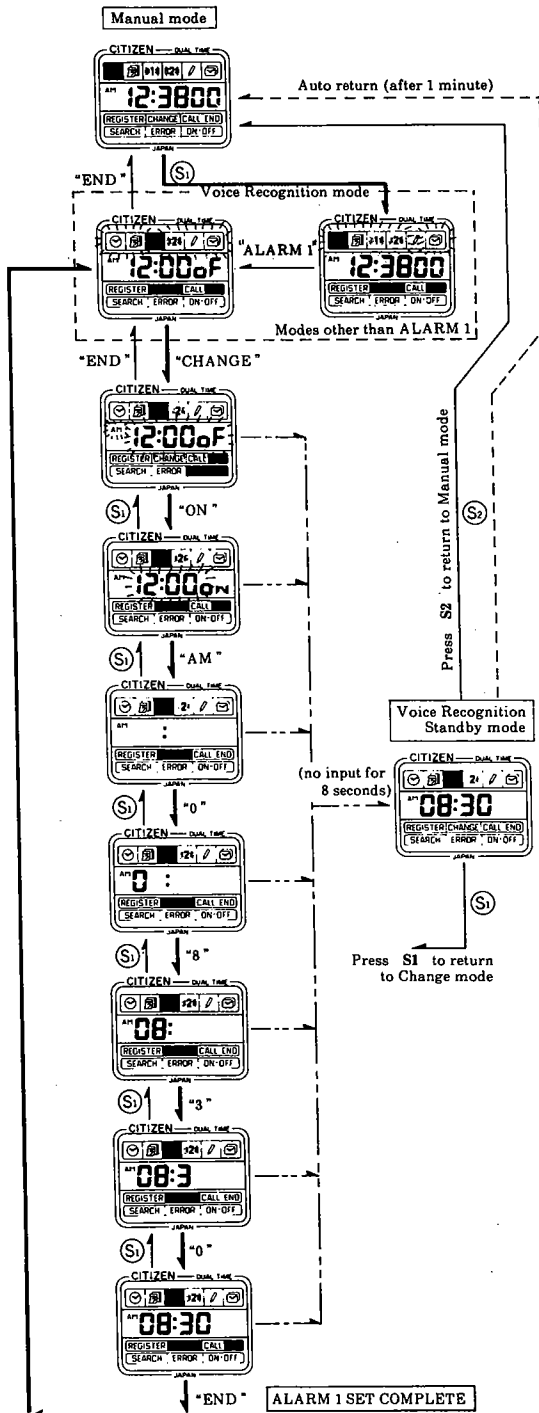 Example: Jan. 1, 1987 → "0 → 1 → 1 → 9 → 8 → 7"

Enter the End command twice to complete the setting and return to the Manual mode. (Voice Recognition mode is entered after "END" is input once.)

Note:

Enter the End command to return to the original CALENDAR display when a nonexistent date is entered by mistake.

Example: (Original display) 6/30/87 → (SET) 6/32/87.

A logic error occurs in this case. Enter the End command to return to the original (6/30/87) display.

6-8. SETTING THE ALARM BY VOICE

Example: The setting method for ALARM 1
and ALARM 2 is the same.
Set ALARM 1 to 8:30 AM

Manual mode

Auto return (after 1 minute)

"END" (S1)

Voice Recognition mode

"ALARM 1"

Modes other than ALARM 1

"END"   "CHANGE"

Press S2 to return to Manual mode   (S2)

(S1) "ON"

(S1) "AM"

(S1) "0"

Voice Recognition
Standby mode

(no input for
8 seconds)

(S1) "8"

(S1) "3"

(S1) "0"

Press S1 to return
to Change mode

(S1)

"END"   ALARM 1 SET COMPLETE

Press (S1) once in the Manual mode to enter the Voice Recognition mode.

Say "ALARM 1" to enter the ALARM 1 mode from another mode when in the Voice Recognition mode.

Say "CHANGE" to enter the Change mode.

Use voice commands to enter the following ALARM values: 8:30 AM → "ON → AM → 0 → 8 → 3 → 0 "

Note:
- The alarm can be switched ON and OFF independent of the other operations. To do so enter: "CHANGE" → "ON" or "OFF" → "END". The switch is not registered until the END command is entered.
- The AM/PM setting must be input when using the 12-hour system. This input is unnecessary for the 24-hour system.
- Be sure to enter four (4) numbers to set the hour and minutes.
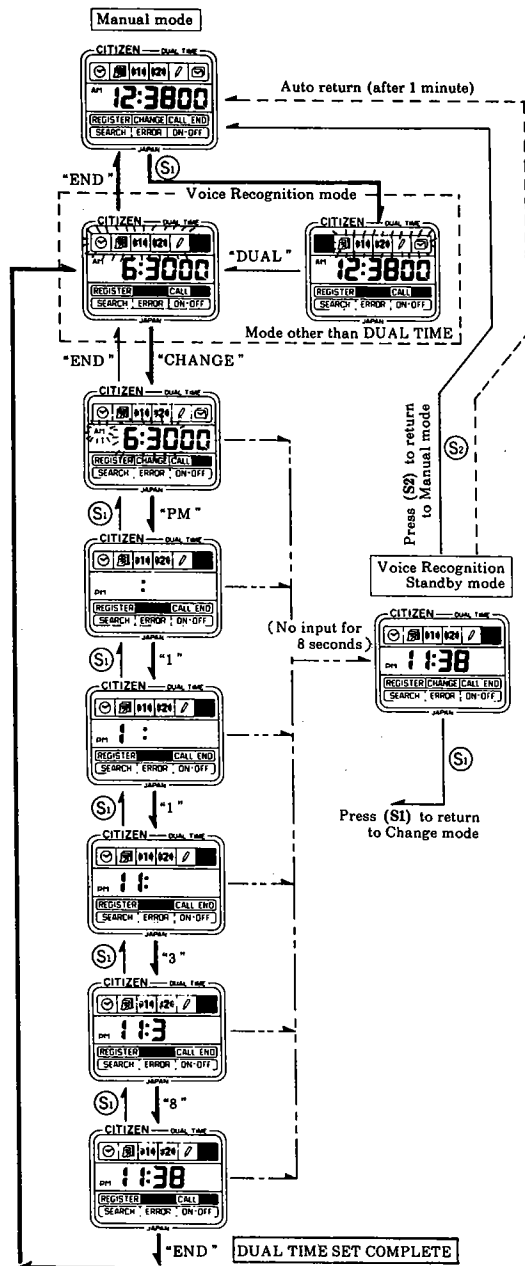 Example: 7:02 → "0 → 7 → 0 → 2 "

Enter the End command twice to complete the setting and return to the Manual mode. (Voice Recognition mode is entered after "END" is input once.)

Note:

Enter the End command to return to the original ALARM display when a nonexistent time is entered by mistake. This is the same procedure for setting the time by voice as described in Section 6-6.

6-9. SETTING THE DUAL TIME MODE BY VOICE

Example: Set to 11:38 PM.

Manual mode

Auto return (after 1 minute)

"END" (S1)

Voice Recognition mode

"DUAL" Mode other than DUAL TIME

"END" "CHANGE"

(S1) "PM"

Press (S2) to return to Manual mode (S2)

Voice Recognition Standby mode

(S1) "1"

(No input for 8 seconds)

(S1) "1"

Press (S1) to return to Change mode

(S1) "3"

(S1) "8"

"END" DUAL TIME SET COMPLETE

(S1)

> Press **S1** once in the Manual mode to enter the Voice Recognition mode.

> Say "DUAL" to enter the DUAL TIME mode from another mode when in the Voice Recognition mode.

> Say "CHANGE" to enter the Change mode.

> Use voice commands to enter the following TIME values: 11:38 PM → "PM → 1 → 1 → 3 → 8"

Note:

- This operation is the same as setting TIME by voice operation.
- The "RESET" operation is not possible because the seconds are interfaced according to the value in the TIME mode.

> Enter the End command twice to complete the setting and return to the Manual mode. (Voice Recognition mode is entered after "END" is input once.)

Note:

This function is useful for setting the time of another country.
DUAL TIME cannot be displayed continuously like the current time in the novmal mode.

§ 7. COMBINED VOICE AND MANUAL OPERATION

First press S2 to select the desired mode, then press S1 to select the Voice Recognition mode. Operations that can be performed by voice are possible after this procedure is completed.

§ 8. USING YOUR VOICE MASTER VX-2 PROPERLY

Read the following instructions carefully before attempting to operate the watch in the Voice Recognition mode. This will enable you to use the advanced functions of your VX-2 without difficulty.

(REGISTRATION/CALL)

● Your watch is capable of efficient voice-controlled operations using a wide range of words and expressions if they are spoken distinctly and selected properly.
● Hold the watch close to your mouth (approximately 5 - 15cm ; 2"-6") when performing voice operations.
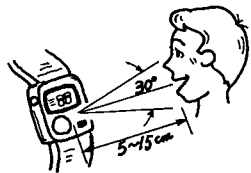
● Your watch has a built-in directional microphone. Hold the watch directly in front of you when performing operations in the Voice Recognition and Voice Registration modes.
● The watch might not operate correctly if there are radical changes in the operating environment. Your voice may differ from the voice pattern originally recorded in Voice Registration if you have a cold, sore throat, etc., or if there are other differences in the surrounding noise environment.
● Voice operations might be difficult or impossible if there is excessive external noise, for example, while in noisy outdoor areas. In this case, use the buttons in the Manual mode to perform the setting operations.
● Recognition or registration may be difficult for explosive sounds (ha, ma, pa) or voiceless sounds (oN, iN) or for sounds shorter than 0.2 seconds (he, a, to). In this case, try to use an equivalent word or another expression that avoids these problems.
● The ERROR display will flash if similar sounds (right, light ; led, red, etc.) cannot be distinguished.
● If your VX-2 dose not respond correctly to your voice input, use another word to register the command.
● When performing the command registrations, make sure that the watch operates correctly for each command before performing the next registration. The ERROR display flashes when the watch does not operate correctly.
● When the ERROR display continues to flash or if correct operations are difficult, perform the registration again for the necessary commands in the order described in Section 6-1, note 2, page 9.

(BATTERY REPLACEMENT)

● The life of the batteries is approximately 2 years.
● The batteries are used continuously for the display after installation at the factory, and may require replacement before two years from the purchase date.
● The voice recognition capability will also decrease if the battery voltage is lowered.
● When the battery voltage is low, the display becomes faint and the watch can run noticeably fast or slow. Replace the batteries if any of these conditions occur.
● The VX-2 uses 3 silver-oxide batteries [280-15 (SR1130W)]. Replace all three batteries at the same time when replacement is necessary.
● After replacing the batteries, the (S3) button must be pressed and the ALL RESET operation must be performed. If these procedures are not followed, abnormal performance may occur.
● Have the batteries replaced by an authorized Citizen dealer or at the store where the watch was purchased.

(SAVING MEMO DATA)

● Data in the MEMO mode is automatically erased after performing the ALL RESET operation, battery replacement or if the battery voltage level drops to an extremely low level. Save important memos in a separate location to prevent any possible inconvenience.
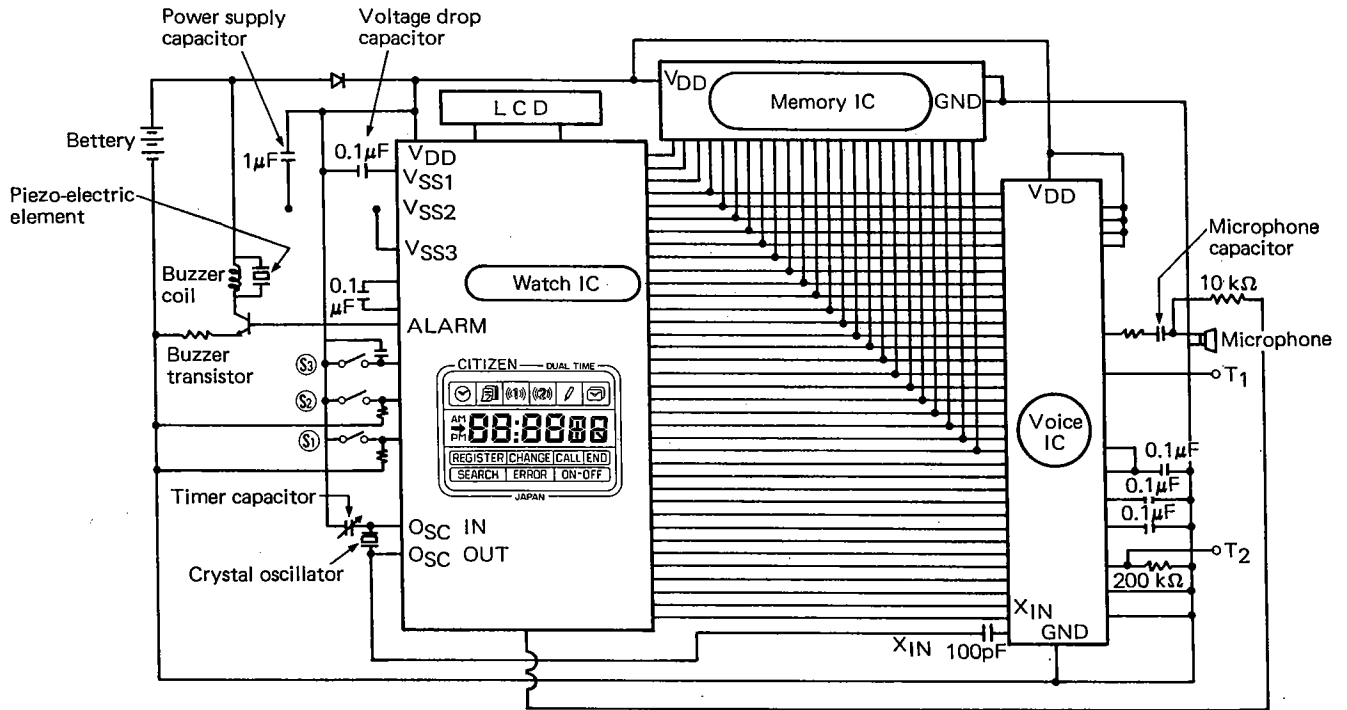
(MICROPHONE)

● The microphone is NOT waterproof. Be careful not to get it wet.
● The microphone is dust proof, but the microphone's sensitivity may be reduced by an accumulation of dust or debris in the protective screen. Clean the microphone screen with a soft brush to remove dust and dirt if necessary.

§ 9. SWITCH SPECIFICATIONS

	MODE	S1	S2	S3	S2 & S1
TIME	Normal mode	Moves to the Voice Recognition mode	Moves to CALENDAR mode, TIME Change		
	Voice Recognition mode	Command Registration			
	Change mode	CHANGE, RESET, STEP-BACK	Selects setting to be changed		
	Standby mode	Moves to the Change mode	Moves to Normal mode		
CALENDAR	Normal mode	Moves to the Voice Recognition mode	Moves to ALARM 1 mode, CALENDAR Change		
	Voice Recognition mode	Command Registration			
	Change mode	CHANGE, RESET, STEP-BACK	Selects setting to be changed		
	Standby mode	Moves to the Change mode	Moves to Normal mode		Entire Display Lights (When manual mode state)
ALARM 1, 2	Normal mode	Moves to the Voice Recognition mode	Moves to ALARM 2 or MEMO mode, ALARM Change	ALL RESET	
	Voice Recognition mode	Command Registration			
	Change mode	CHANGE, RESET, STEP-BACK	Selects setting to be changed		
	Standby mode	Moves to the Change mode	Moves to Normal mode		
MEMO	Normal mode	Moves to the Voice Recognition mode	Moves to DUAL TIME mode, MEMO Call		
	Voice Recognition mode	Command Registration			
	Change mode	STEP-BACK			
	Standby mode	Moves to the Change mode	Moves to Normal mode		
DUAL TIME	Normal mode	Voice Recognition mode	Moves to TIME mode, DUAL TIME Change		
	Voice Recognition mode	Command Registration			
	Change mode	CHANGE, STEP-BACK	Selects setting to be changed		
	Standby mode	Moves to the Change mode	Moves to Normal mode		
Command Registration	Voice Recognition mode	STEP-UP	STEP-BACK		
	Standby mode	Moves to Initial Command Registration mode	Moves to Normal mode		

This watch recognizes the voice of only the specified persons. The basic principle of the system of this watch is as follows.
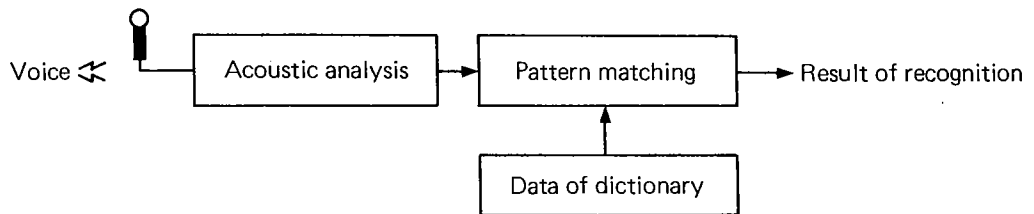
First, the voice recognizing LSI analyzes the voice input through the microphone in the registration mode and registers it as a data of dictionary in the memory IC for the word registration (memory IC).

Once the data are registered in the dictionary, the watch analyzes any word uttered by any person when the memory is called (in the recognition mode) and compares the contents of that uttered word with those of the stored data in the dictionary by means of pattern matching. Then, the watch outputs the data in the dictionary which is the most similar to the recognized word and indicate it on the LC display.

Pattern matching

The operation of comparing an input voice by four points of each of four channels (16 points in total) with each voice registered as a digital data in the memory to find out a similar one.
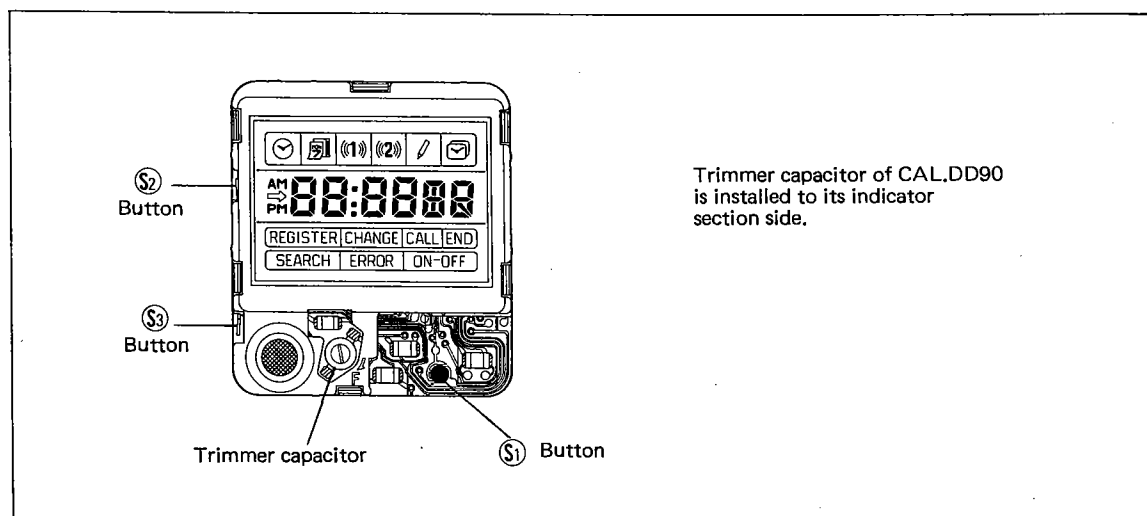
§11. PRECAUTIONS OF DISASSEMBLY AND ASSEMBLY

11-1. Adjustment of time rate

Adjust the time rate in the module state according to the following procedure.

1) In the manual operation mode, press buttons Ⓢ₂ and Ⓢ₁ at the same time in the order of Ⓢ₂ and Ⓢ₁ to turn on all the segments of display.

2) While all the segments are turned on, rotate the trimmer capacitor as shown below to adjust the time.

3) After finishing the adjustment, press button Ⓢ₁ or Ⓢ₂ , and the present time is indicated.

Note: a) If button Ⓢ₃ is pressed to reset all the data, all the segments are turned on and the time rate can be measured. However, if this operation is performed, all the data in all the modes are canceled and initialized, therefore all the data must be set correctly and necessary memory must be registered.

b) In the correction mode (while any segment is flashing), all the segments are not turned on even if buttons Ⓢ₁ and Ⓢ₂ are pressed in the order of Ⓢ₁ and Ⓢ₂ . Therefore, these buttons must be presed Ⓢ₂ firstly then Ⓢ₁ quickly.

Trimmer capacitor of CAL.DD90 is installed to its indicator section side.

11-2. Replacement of battery

Three batteries connected in series are used in this watch.

a) Replace all the three batteries at the same time. If only one or two of them are replaced, they may have a trouble such as inflation caused by chemical reaction in them.

b) The batteries are replaced, all the memories which have been registered are deleted.

c) After replacing the batteries, press button Ⓢ₃ without fail. If it is not pressed, an abnormal display may be indicated.

11-3. All-reset operation

If button Ⓢ₃ is pressed, all the data are reset to the following values in each mode.

- Time mode: AM 12: 00 00
- Calendar mode: JAN 01 WED
- Alarm 1 mode: AM 12:00 OF
- Alarm 2 mode: AM 12:00 OF
- Memory mode: NOTE indicated. All data canceled.
- Dual-time mode: AM 12:00 00

11-4. Protection of data

All the registered memory and data are deleted by the all-reset operation, replacement of batteries or extreme reduction of battery voltage.

Direct the customers to take the record of important memory separately.

If the battery voltage lowers, the brightness of indication becomes pale and the voice recognition performance lowers. Direct the customers to replace the battery in this case.

11-5. Microphone

a) The microphone is protected from dust. However, if it becomes dirty extremely, it is clogged and the sensitivity of the voice operation lowers. In this case, clean the microphone on the case with a soft brush, etc.

b) Direct the customers to protect the microphone from liquid including water, although it has double water-repellent structure.

§12. DISASSEMBLY AND ASSEMBLY OF MODULE

Disassembly of module	:	①	→	⑪
Assembly of module	:	⑪	→	①

Power cell strap ①

Power cell insulator ②

Power cell ③

Buzzer contact spring ④

Supporter for plate complete ⑤

Power cell connector spring ⑥

Plate complete ⑦

⑧ Spacer for LC display panel

⑨ LC display panel connection rubber

⑩ LC display panel

⑪ LC display panel supporter

CALIBER NO.
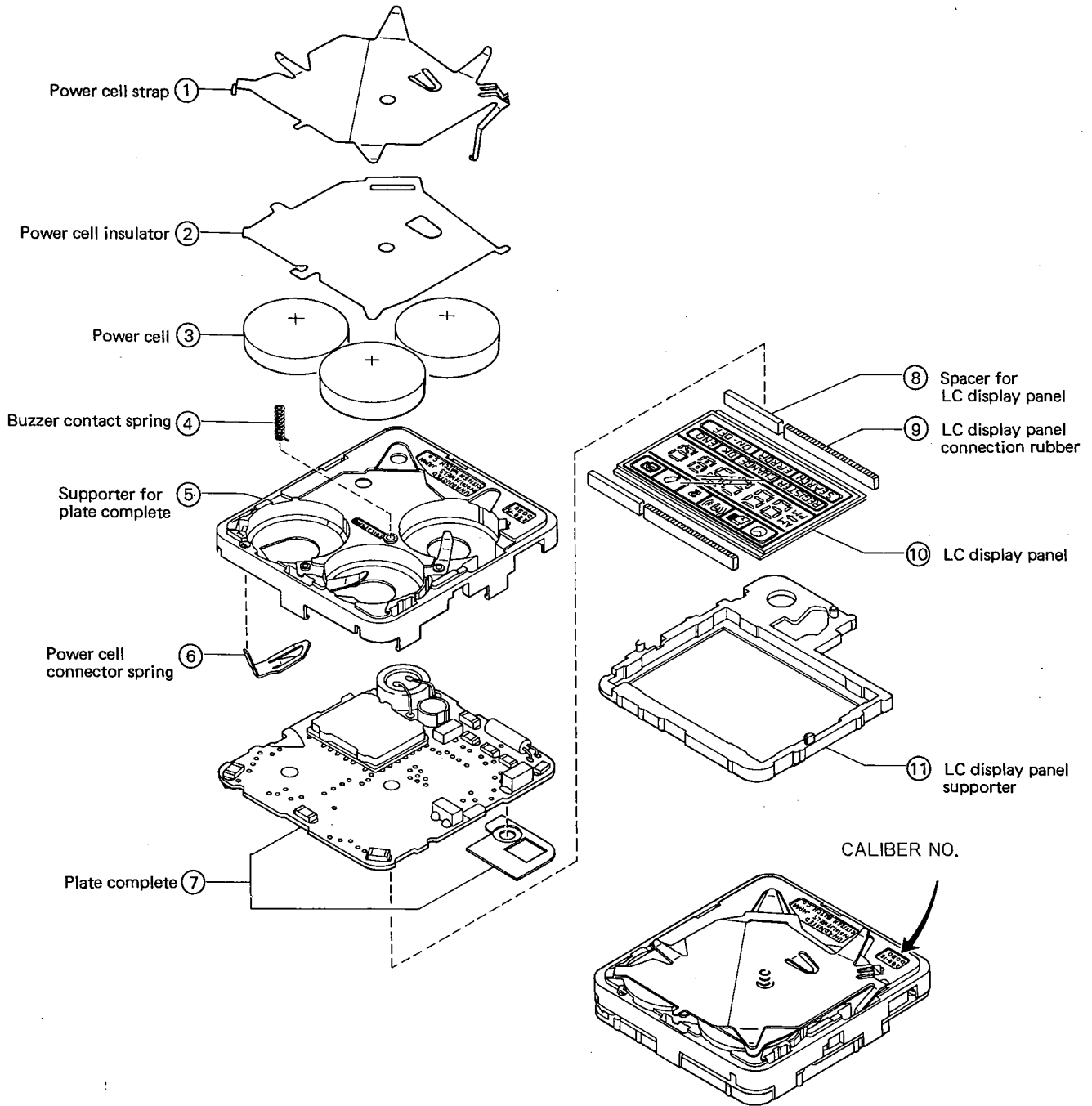
Development of external parts (Microphone section)
For details, see the Appearance Technical Informations.

Name plate

Two-sided adhesive type

Net

Water-repellent cloth

Button Ⓢ₁

Two-sided adhesive type

O-ring

Water-repellent cloth
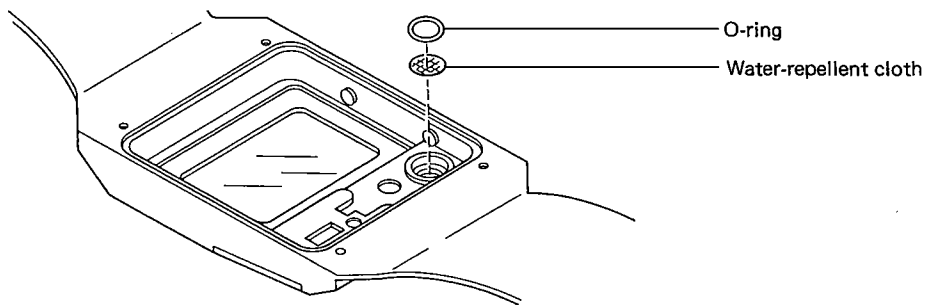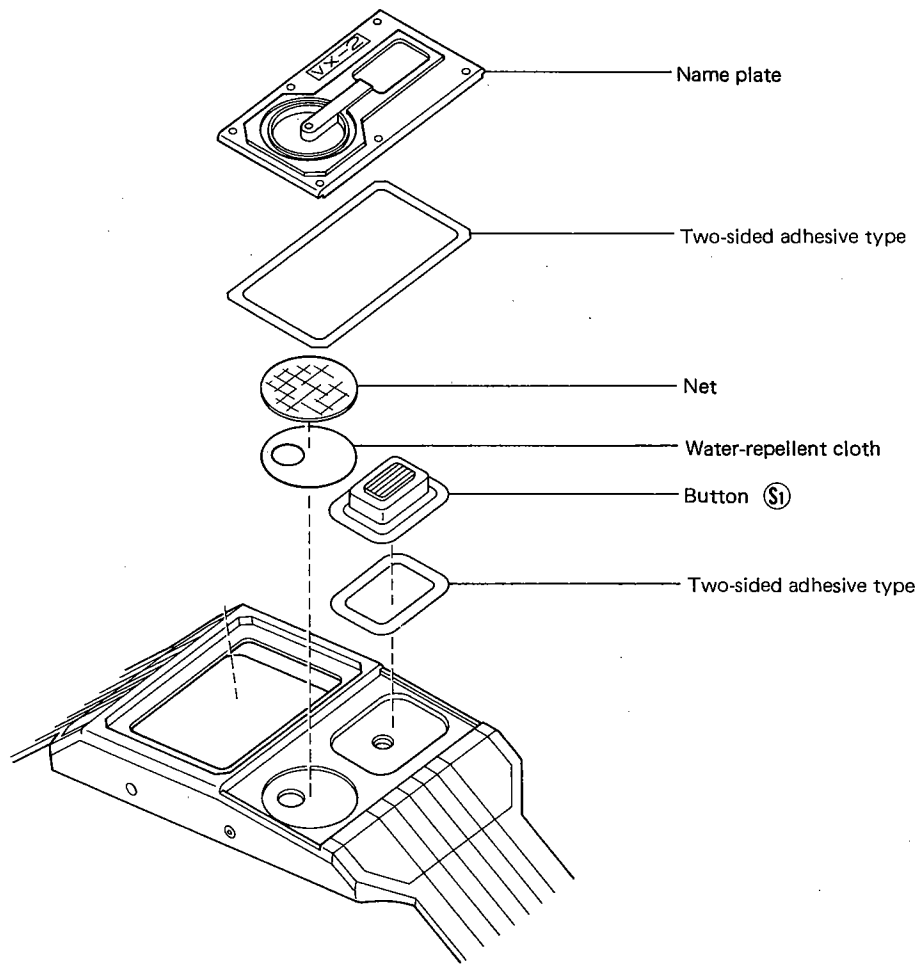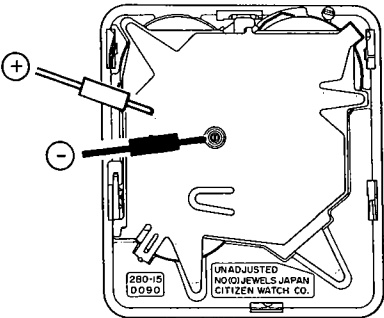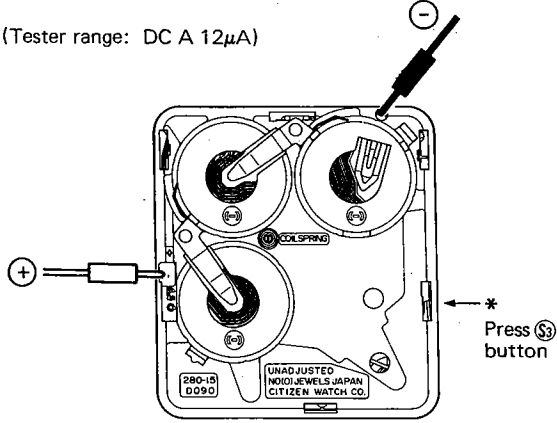
§13. TROUBLESHOOTING AND ADJUSTMENT OF MODULE

```
No display  →  [1] Measurement of     → Low voltage → Replacement      → O.K. ──
                   power cell voltage                   of power cell
                                        → O.K. ─────────────────────────  No good

Other defects → [2] Check of LC        → O.K. → Replacement of LC display
of display          display panel              panel or plate complete
                    connection parts   → No good → Correction or
                                                   replacement

Wrong time rate
Error of time rate → [3] a. Measurement → O.K. ──────────────────
                         of time rate                              Low voltage
                                        → No good → [1] Measurement of
                                                        power cell voltage

Defective functions
Defect in operations → [5] Check of switch → O.K. ──────→ Replacement of
                           mechanism                       plate complete
(Defect of display switch, etc.)
                                           → No good → ( Correction )

Defective alarm → [7] Check of alarm  → O.K. → Replacement of
                      mechanism                 plate complete
                                       → No good → ( Correction )

Defect in voice     → Display: Faded → [1] Measurement of → Low power → Replacement of
registration or          Pale              power cell voltage   cell voltage   power cell
recognition                                                   → O.K.
                    → Display: Normal ─────────────────────────
                    → Display: Error → Check again in quiet → O.K.
                                        place by correct
                                        operation.
                    → Indication of  → Re-registration of → No good → Replacement of
                      different data     incorrect data               plate complete
```
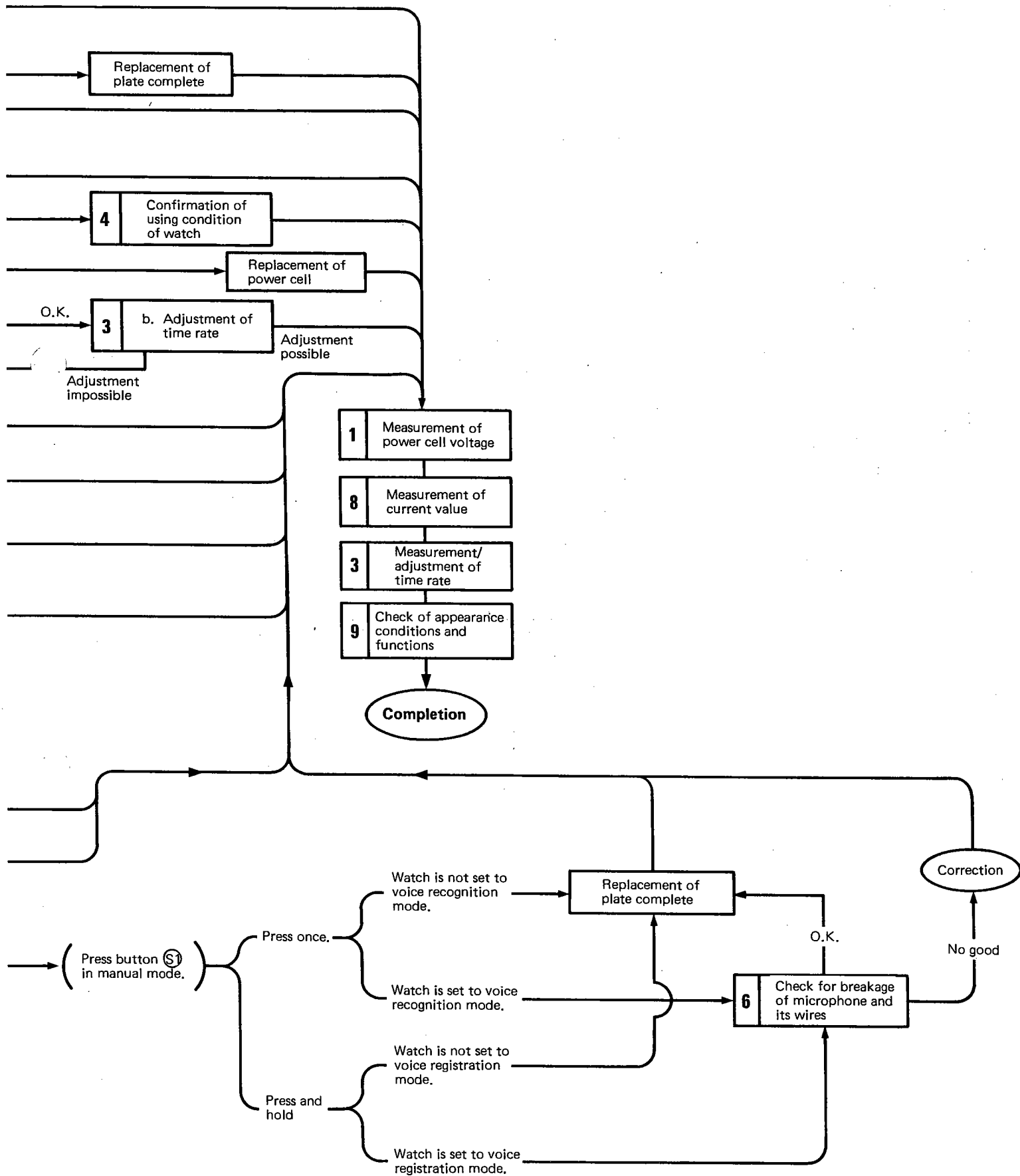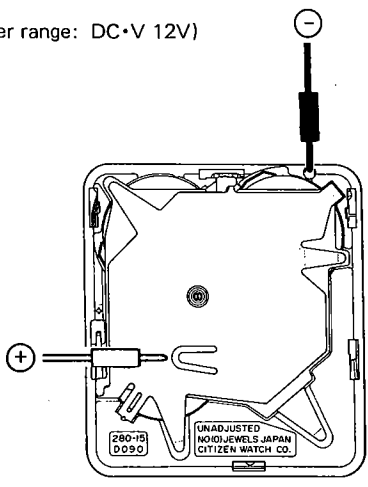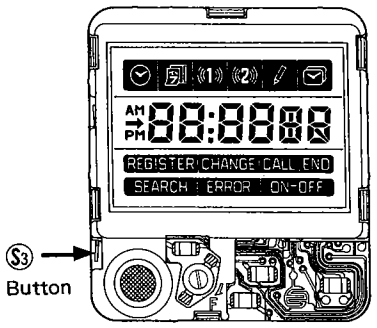
Replacement of
plate complete

4 | Confirmation of
using condition
of watch

Replacement of
power cell

O.K.

3 | b. Adjustment of
time rate

Adjustment
possible

Adjustment
impossible

1 | Measurement of
power cell voltage

8 | Measurement of
current value

3 | Measurement/
adjustment of
time rate

9 | Check of appearance
conditions and
functions

(**Completion**)

Correction

Watch is not set to
voice recognition
mode.

Replacement of
plate complete

O.K.

No good

Press once.

(Press button (S1)
in manual mode.)

Watch is set to voice
recognition mode.

6 | Check for breakage
of microphone and
its wires

Watch is not set to
voice registration
mode.

Press and
hold

Watch is set to voice
registration mode.

Checking items	How to check	Result and treatment
❶ Measurement of power cell voltage	<Refer to TECHNICAL MANUAL, BASIC COURSE II-1-a.> (Tester range: DC·V 12V)	**Over 4.5V** → Non-defective **Under 4.5V** → Replace power cell.
❷ Check of LC display panel connection parts	<Refer to TECHNICAL MANUAL, BASIC COURSE II-2-a DIGITAL.> ● All segments lighting check if button S_3 is pressed in normal indication state, all segments are turned on. Check segments for defects under this condition.	
❸ Measurement and check of time rate	<Refer to TECHNICAL MANUAL, BASIC COURSE II-2-d.> a) Measurement of time rate: "MEASURE TIME" can be measured by the 2-second range. b) Adjustment of time rate: Adjust time by turning the trimmer capacitor (installed on the LC display panel side). However, this adjustment must be performed after all the segments are turned on by pressing buttons S_2 and then S_1 at the same time in the manual operation mode.	Enables adjustment →Non-defective Does not enable adjustment → Replace the plate complete

Checking items	How to check	Result and treatment
❹ Confirmation of using condition	<Refer to TECHNICAL MANUAL, BASIC COURSE Ⅱ-2-e.> ●Check for a wrong usage, etc. Check the operation of push buttons, reigistered time, distance between mouth and microphone, etc. *See "Know-how for complete use of watch" (page 25).	
❺ Check of switch mechanism	●Confirm the pattern of the plate complete can be contacted with the switch actuating spring. ●Confirm the push buttons are free from deformation, dirt, etc. ●Confirm the sheet switch is not broken. *Be sure to apply silicone oil to the packings of the push buttons to secure the water resistance and smooth operation of the push buttons. Sheet switch	
❻ Check of microphone	Check the microphone and its wires for breakage etc.	Does not enable repair → Replace the plate complete.
❼ Check of alarm mechanism	<Refer to TECHNICAL MANUAL, BASIC COURSE Ⅱ-1-d.> a. Check of piezo-electric element This is the white element directly stuck to the rear cover. If its part which the buzzer contact spring comes in contact with is cracked or broken, the alarm does not work normally. b. Check of buzzer contact spring deformation, fatigue, etc.	

Checking items	How to check	Result and treatment
	c. Confirmation of alarm output signal from plate complete (which can be confirmed without taking the module out of the case). Apply the ⊕ lead of a tester (in 0.3V DC range) to the top of the battery and the ⊖ lead to the buzzer contact spring. (Every time button Ⓢ₃ is pressed, all the segments are reset, and the confirmation sound comes out about two seconds after. If the pointer of the tester swings, the watch is normal.) (Tester range: DC V 0.3V)	Tester pointer swings → Non-defective Does not swing → Replace the plate complete.
❽ Measurement of the current value	<Refer to TECHNICAL MANUAL, BASIC COURSE II-1-f.> (Tester range: DC A 12μA) * Press Ⓢ₃ button When measuring the current value, connect the lithium battery (3V) and silver battery (1.55V) in series to secure 4.5V. Effect of light Do not measure the current consumption, under the light of an incandescent lamp or the direct ray of the sun. If the watch is exposed to strong light, much current may be consumed. It is not affected by the light of a fluorescent lamp.	Current value of the complete module under 2.5μA → Non-defective **Over 2.5μA** → Replace the plate complete. Note: * Press button Ⓢ₃ to reset all the data before measurement. If not so, the current value may not be measured correctly.
❾ Check of appearance and functions	<Refer to TECHNICAL MANUAL, BASIC COURSE II-2-f.> Check the indication, operation of buttons, etc. of the complete watch for abnormality.	

[Know-how for complete use of watch]

- Understand the concept of the whole system.
- In the voice operation mode (registration and recognition), hold the watch close to your mouth (5 ~ 15 cm). The best distance is about 5 cm.
- Speak directly in front of the microphone to prevent external noises from entering the microphone.
- Do not use the watch in the voice operation mode in a noisy place (in a train, etc.).
- Do not care about the people around you and speak clearly. If you care about the people, the loudness and height of your voice will change.
- Articulate a word for 0.2 to 1.0 second. Hold a short word long on purpose.
- Do not use plosives (pa, pu, etc.) and voiceless (oN, iN, etc.) sounds.
- Speak the same pronunciation in both registration and recognition modes. Take care of the distance and angle of microphone, and loudness, length, accent and speed of pronunciation.
- Do not speak a word with a accent which cannot be reproduced easily.
- If the word is pronounced with different accent, it is recognized in different word. Therefore, do not change the accent of registered words once they are registered.
- Speak the words and expressions you use often to secure the reproductivity of them.
- Input words calmly one by one and confirm each word is recognized.
- Do not be hasty, even if an error is indicated or a word cannot be input. If you are hasty, you will speak fast or your voice will be changed.
- While an "error" mark is displayed, any voice cannot be accepted.
- Note that a hard breath, swallowing sound, tongue-clicking sound, clearing sound of throat, etc. are recognized as words.
- Note that the microphone has a high sensitivity and recognizes a rubbing sound of case, operating sound of buttons, etc.
- If a word cannot be registered, use a substitutional words.

In short, input words calmly and slowly without making noises. Practice makes perfect. Try until you will understand the operation completely.

CITIZEN WATCH CO., LTD.
Tokyo, Japan