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CASIO ECW-M300E SERVICE MANUAL



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SERVICE MANUAL
& PARTS LIST

REF. NO. S/M-1107
FEB. 2010

MODULE NO.

QW-5117



ECW-M300E

Ver.1 : Jul. 2011

CASIO®

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1. SPECIFICATIONS: MODULE QW-5117

Item	Detail
Battery	CTL920
Battery life	Approx. 6 months
Current consumption	0.5 µA maximum See page 11
Alarm system	Piezo plate on Cover/Back
Accuracy	±15 sec./month
Accuracy setting system	Theoretical regulation
Accuracy checking	See page 12
Functions	• Analog Timekeeping: Hour, minutes (hand moves every 10 seconds), • Digital Timekeeping: Hour, minutes, seconds, p.m. (P), month, day, day of the week Time format: 12-hour and 24-hour Calendar system: Full Auto-calendar pre-programmed from the year 2000 to 2099 Simultaneous Home Time/Dual Time indication • Time Calibration Signal Reception: Auto receive 6 times a day (Remaining auto receives cancelled as soon as one is successful) (five times for the China signal); Manual receive Receivable Time Calibration Signals: Fukushima, Japan (Call Sign: JJY, Frequency: 40.0 kHz); Fukuoka/Saga, Japan (Call Sign: JJY, Frequency: 60.0 kHz); Fort Collins, Colorado, the United States (Call Sign: WWVB, Frequency: 60.0 kHz); Anthorn, England (Call Sign: MSF, Frequency: 60.0 kHz); Mainflingen, Germany (Call Sign: DCF77, Frequency: 77.5 kHz); Shangqiu City, Henan Province, China (Call Sign: BPC, Frequency: 68.5 kHz) • World Time: 48 cities (29 time zones) Other: Daylight Saving Time/Standard Time; Home City/World Time City Swapping • Stopwatch: Measuring unit: 1/100 second Measuring capacity: 23’59.99” Measuring mode: Elapsed time, split time, two finishes • Countdown Timer: Measuring unit: 1 second Input range: 1 minute to 60 minutes (1-minute increments) Other: Auto-repeat timing • Alarms: Four one-time alarms; one snooze alarm; Hourly Time Signal • Illumination LED (light-emitting diode); Auto Light Switch (Full Auto LED Light operates only in the dark) • Power Saving

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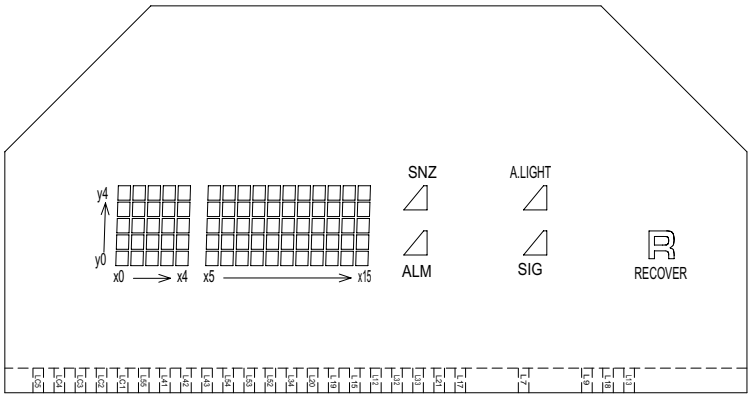
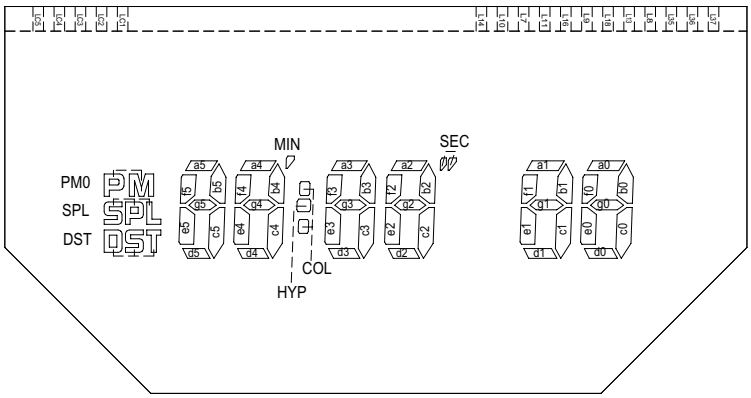
2. DRAWINGS: MODULE QW-5117

2-1. LCD DIAGRAM





SEG. \ COM.	LC1	LC2	LC3	LC4	LC5
L 7	e4	g4	f4	a4	RECOVER
L 8	e1	g1	f1	SEC	
L 9	d3	c3	b3	ALM	SNZ
L10	d5	c5	b5	PM0	SPL
L11	d4	c4	b4	MIN	HYP
L12	x11y4	x11y3	x11y2	x11y1	x11y0
L13	d2	c2	b2	a2	SIG
L14	e5	g5	f5	a5	DST
L15	x10y4	x10y3	x10y2	x10y1	x10y0
L16	e3	g3	f3	a3	COL
L17	x15y4	x15y3	x15y2	x15y1	x15y0
L18		e2	g2	f2	A.LIGHT
L19	x9y4	x9y3	x9y2	x9y1	x9y0
L20	x8y4	x8y3	x8y2	x8y1	x8y0
L21	x14y4	x14y3	x14y2	x14y1	x14y0
L32	x12y4	x12y3	x12y2	x12y1	x12y0
L33	x13y4	x13y3	x13y2	x13y1	x13y0
L34	x7y4	x7y3	x7y2	x7y1	x7y0
L35	d1	c1	b1	a1	
L36	e0	g0	f0		
L37	d0	c0	b0	a0	
L41	x1y4	x1y3	x1y2	x1y1	x1y0
L42	x2y4	x2y3	x2y2	x2y1	x2y0
L43	x3y4	x3y3	x3y2	x3y1	x3y0
L52	x6y4	x6y3	x6y2	x6y1	x6y0
L53	x5y4	x5y3	x5y2	x5y1	x5y0
L54	x4y4	x4y3	x4y2	x4y1	x4y0
L55	x0y4	x0y3	x0y2	x0y1	x0y0

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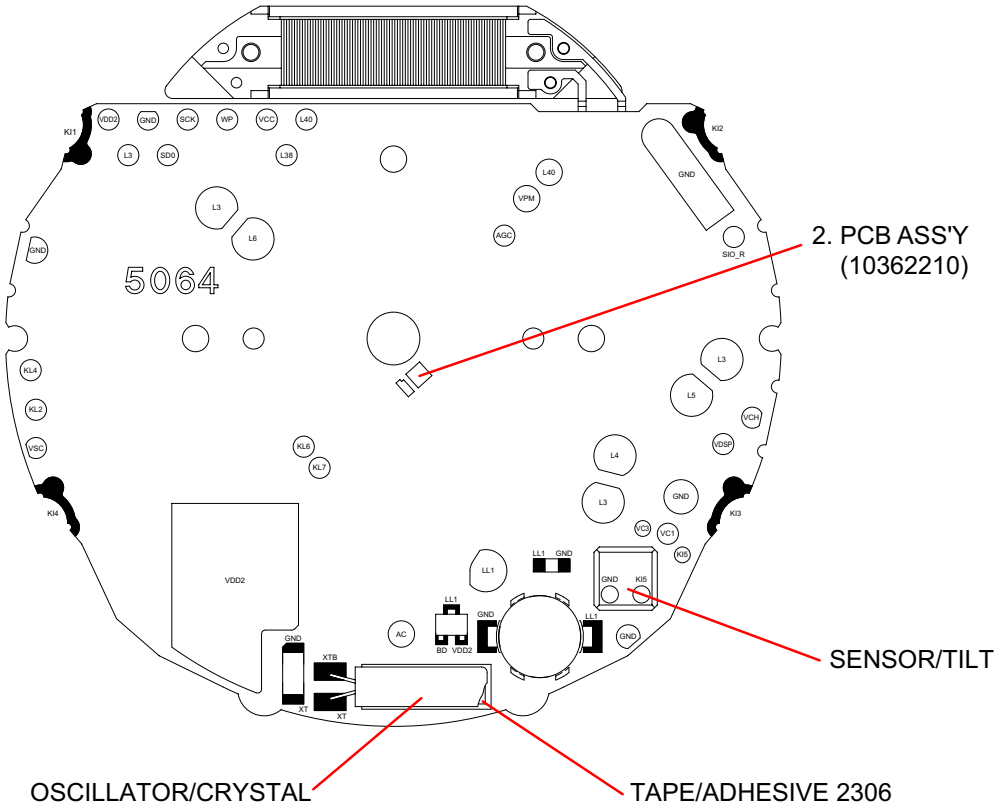
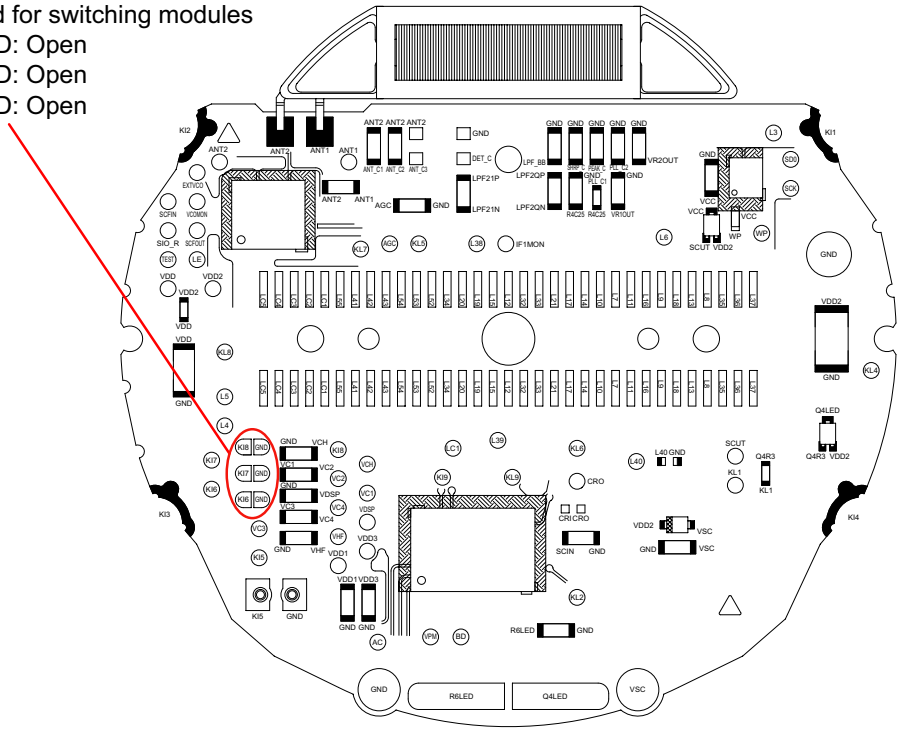
2-2. CHECKING TERMINALS AND COMPONENTS



Short pad for switching modules
KI8-GND: Open
KI7-GND: Open
KI6-GND: Open



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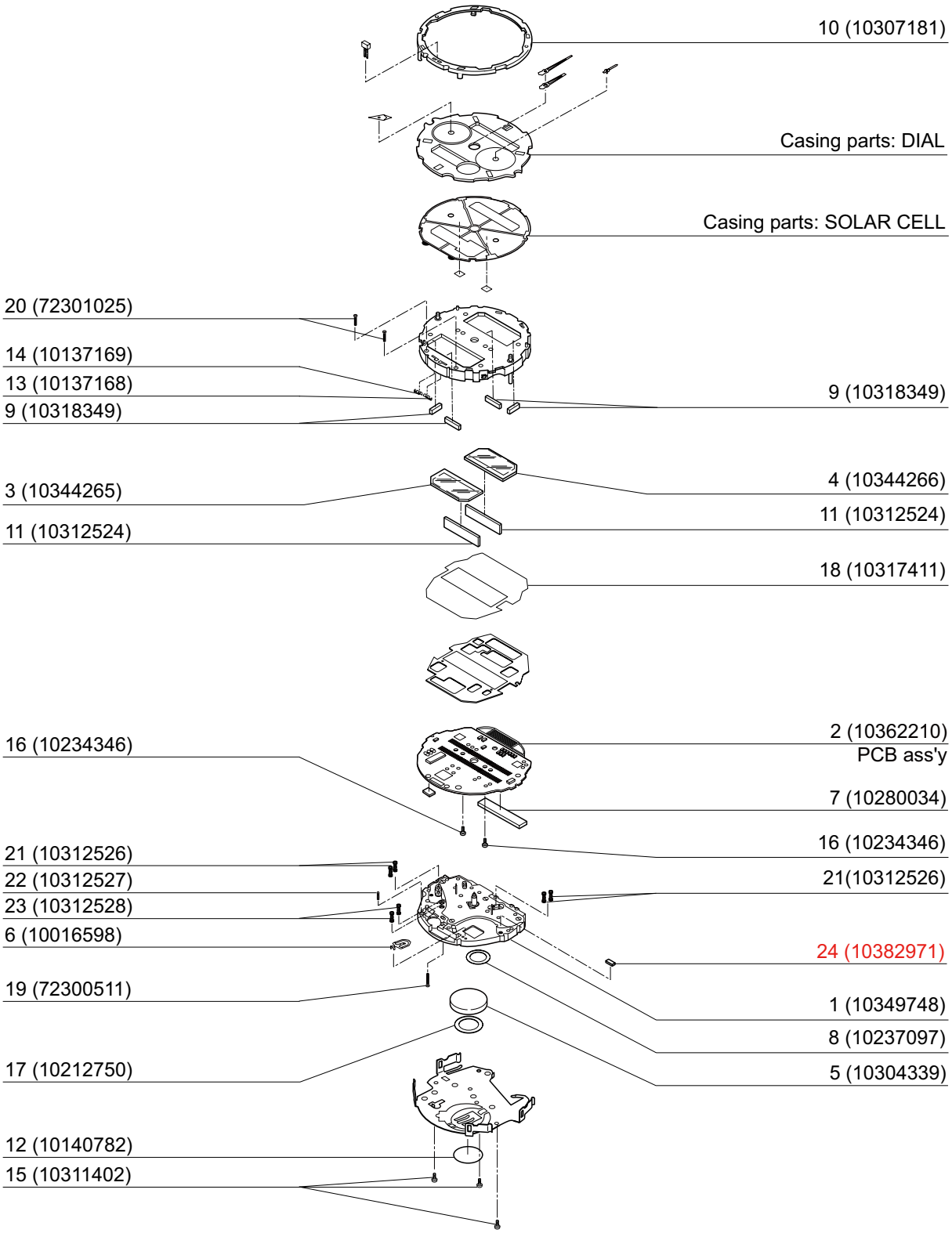
3. EXPLODED VIEW: MODULE QW-5117



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4. PARTS LIST: MODULE QW-5117

QW-5117AT
1 QW-5117AT-02TK

Note: 1. Prices and specifications are subject to change without prior notice.
2. Spare parts are classified as follows according to their importance in after-sales service.
A Rank ---------- Important
C Rank ---------- Not Important
3. Batteries in Bulk pack on the tray will be supplied from our Overseas Spare Parts Section under charge basis. Batteries in Blister pack will be supplied from our Sales Department.
4. As for order/supply of spare parts, refer to the separate publication "GUIDE BOOK for spare parts supply".

Attention to order
1. The most of normal repair or initial repair within 1year since released month can be done by main parts.
2. Minor parts should be ordered carefully in consideration of the actual usage of your repair and your technical skills.
3. Main parts should be ordered and stocked appropriately in consideration of your parts usage anre repair usage for similar models.

MAIN PARTS

Item	Code No.	Parts Name	Specification	Q'TY 1	R
	10349724	MODULE/WITH MOVEMENT	QW-5117AT-02TK	1	A
1	10349748	ANALOG BLOCK	QW-5117MV-82TK	1	A
2	10362210	PCB ASS'Y	RJQ551496*002TK	1	A
3	10344265	LCD (6H)	K5110W-02TV	1	A
4	10344266	LCD (12H)	K5110S-02TVP	1	A

MINOR PARTS

Item	Code No.	Parts Name	Specification	Q'TY 1	R
5	10304339	BATTERY/STORAGE	CTL-920F/CS	1	C
6	10016598	CONTACT/BATTERY (-) 2348	Q366836-1	1	C
7	10280034	CUSHION 3707-1	RJQ521249-001V03	1	C
8	10237097	CUSHION 4323-2	RJQ527452-001V02	1	C
9	10318349	CUSHION 5054-1	RJQ546189-001V01	4	C
24	10382971	CUSHION 5173-1	RJQ556803-001V01	1	C
10	10307181	HOLDER 5054	RJQ543051-001V01	1	C
11	10312524	INTERCONNECTOR 5054	RJQ543278-001V01	2	C
12	10140782	LABEL 2815	RJQ517198-001V02	1	C
13	10137168	PLATE/TERMINAL 2787-1	RJQ515398-001V02	1	C
14	10137169	PLATE/TERMINAL 2787-2	RJQ515399-001V02	1	C
15	10311402	SCREW 5054	RJQ545019-001V01	3	C
16	10234346	SCREW/FLAT 4329	RJQ532242-001V01	2	C
17	10212750	SHEET/INSULATION 4323-2	RJQ527449-001V01	1	C

Notes: R - Rank
A: Important
C: Not Important

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Item	Code No.	Parts Name	Specification	Q'TY 1	R
18	10317411	SHEET/INSULATION 5054-1	RJQ543100-001V02	1	C
19	72300511	SPRING/COIL 1253-2	Q439219-1	1	C
20	72301025	SPRING/COIL 1510-1	Q459238-1	2	C
21	10312526	SPRING/COIL 5054-1	RJQ543095-001V01	4	C
22	10312527	SPRING/COIL 5054-2	RJQ543096-001V01	1	C
23	10312528	SPRING/COIL 5054-3	RJQ543097-001V01	2	C

For the prices and minimum order/supply quantities of the above parts, refer to the Parts Price List P.L.-675.

Notes: R - Rank
A: Important
C: Not Important

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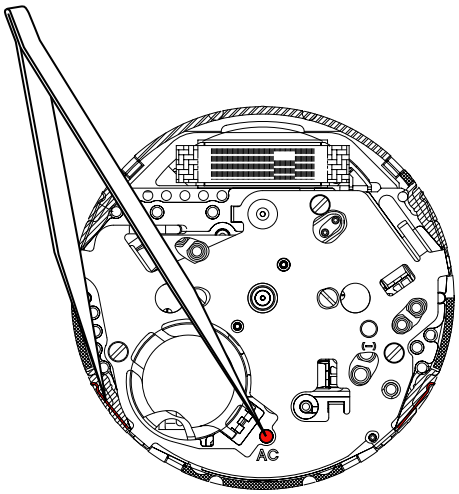
5. REPLACEMENT OF BATTERY: MODULE QW-5117

5-1. AC (ALL CLEAR)

Be sure to perform AC (All Clear) after batteries are replaced. The memory and/or counter may be displayed incorrectly without performing AC. Lightly touch the AC pad of the PCB with a metal tweezer, and touch the other tweezer with the switching plate (approx. 2 seconds).

* After performing AC, press any button to move to the Hand Set mode. Without pressing a button, it takes approximately 1 minute to automatically change to the Hand Set mode.



5-2. SETTINGS AFTER AC

Function	Settings	Setting
Time Keeping Mode (After AC)	■ Date: Saturday, January 1, 2005 12:00:00 AM ■ Home City Code: TYO ■ Home Time DST: AUTO (OFF) ■ Home Time Auto Receive: ON ■ Time Format: 12-hour format ■ Power-saving: ON ■ Auto Light: OFF ■ Battery Level: HIGH	—
Last Reception Display	■ Last Reception Display (- -:- -) ■ Time Format: 12-hour format	—
World Time	■ WT City Code: UTC ■ Date: December 31, 2004 3:00:00 PM ■ Time Format: 12-hour format ■ DST: All Cities OFF	—
Stopwatch	0’00’’00”’00	“Reset” setting
Countdown Timer	■ Timer: 05 minutes 00 seconds ■ Auto -repeat: OFF	“Reset” setting
Alarm	■ Time Format: 12-hour format ■ Alarm Time: 12:00:00 AM ■ Alarm: OFF ■ Snooze: OFF ■ Hourly Time Signal: OFF	ALM1

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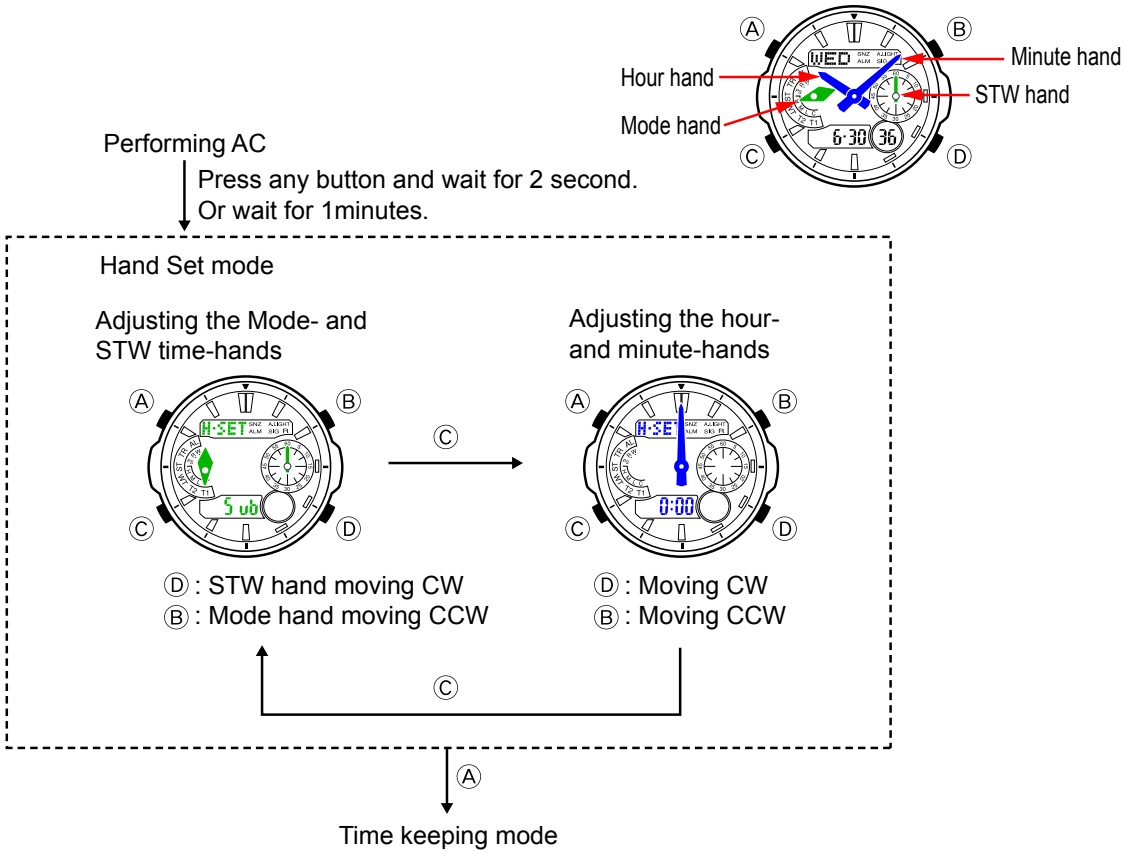
5-3. HAND SET MODE

Follow the steps below to se the hands to the baseline position.

* You may fast forward the operation of each button.
* You may return to the Timekeeping mode (showing the current time since the last AC as 0:00) by holding down Ⓐ button. If it is left untouched for a few minutes, the Auto Return activates and it returns to the Timekeeping mode.
* The hands do not automatically move to the baseline position while in Hand Set mode after AC.



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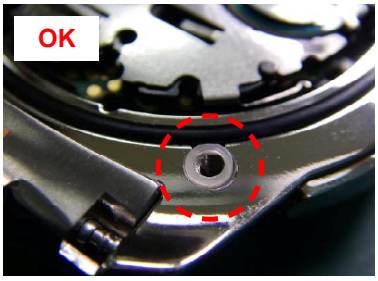
6. DISASSEMBLY AND REASSEMBLY: MODULE QW-5117

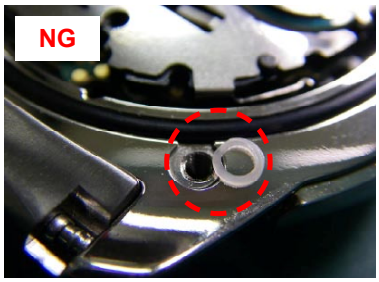
6-1. HANDLING INSTRUCTIONS TO FIT THE SPACER

In order to increase the sensitivity of signal reception, this model is fitted with a doughnut-shaped pacer at each of four screws assembling the back cover and the center piece. Be sure to align the spacers correctly when/after repairing.

Furthermore, set the back cover in position gently so as not to misalign the spacer.

Note: Replace the spacer with a new one if it is found unclean or deformed.

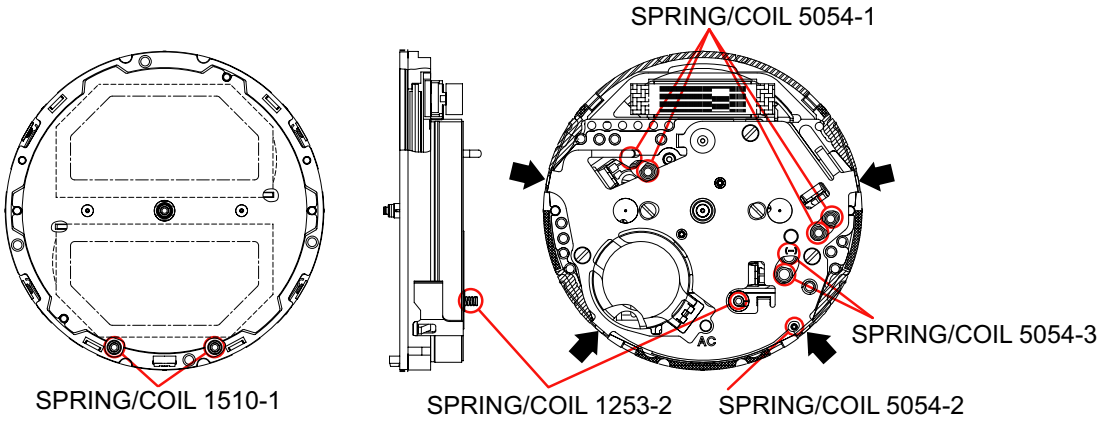




6-2. REMOVING THE MODULE

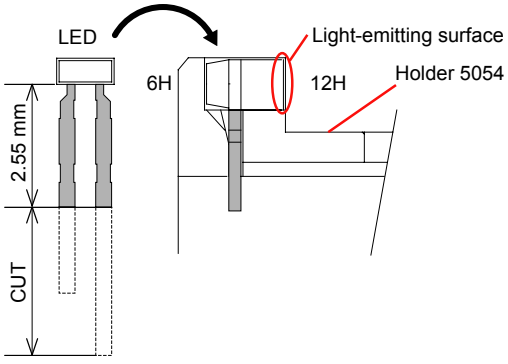
When removing the back cover, do not misplace the spring/coil.

On removing of the module from the case, please insert the precision screw driver between the module and the case pointed by arrows.

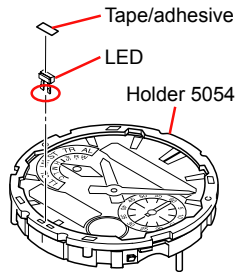


6-3. REASSEMBLY OF LED

1) Cut the LED as indicated in the illustration below.
2) Assemble the LED with its lead folded inside the holder.
3) Attach the TAPE/ADHESIVE on the upper surface of the LED.



Configuration diagram



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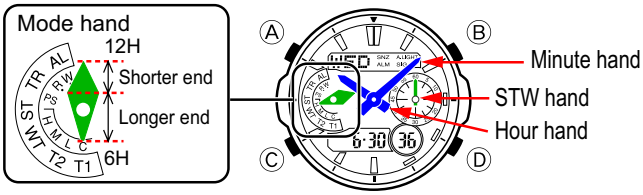
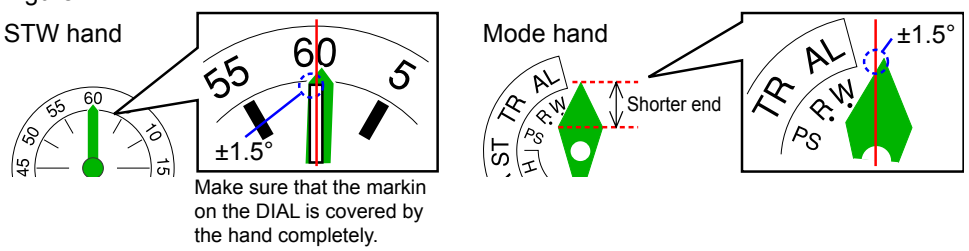
6-4. INSTALLING HANDS

Location of the buttons and name of the hands



Procedures	Button operations, additional instructions
1. Press fit the Mode hand	
1) Enter the Mode hand adjustment mode	AC → Ⓐ → Wait for 3 sec
2) Adjust the polarity of the Mode hand	Ⓑ × 2 times
3) Align the Mode hand at the 12:00 position and press fit the hand	
2. Press fit the STW hand	
1) Enter the STW hand adjustment mode	AC → Ⓐ → Wait for 3 sec
2) Adjust the polarity of the STW hand	Ⓓ × 2 times
3) Align the STW hand at the 12:00 position (60) and press fit the hand	
3. Press-fitting the hour and minute-hands	
1) Enter the Hour/Minute hands adjustment mode	Ⓒ
2) Press fit the Hour hand	Slightly before 12:00
3) Align the Hour hand at the 12:00 position	Align the position by Ⓓ (normal rotation)
4) Enter the Hour/Minute hands adjustment mode	AC → Ⓐ → Wait for 3 sec → Ⓒ
5) Press fit the Minute hand at 0-min. position	
4. Checking the polarity of the Mode / STW hands	
1) Enter the Mode/WT hands Adjustment mode	AC → Ⓐ → Wait for 3 sec
2) Confirm that each of the Mode and the STW hands moves one step at a time when pressing a respective button (Within ±1.5° : Figure 1)	Ⓓ → Ⓑ
6. Checking the accuracy of the Hour hand	
1) Enter the Hour/Minute hands adjustment mode	AC → Ⓐ → Wait for 3 sec → Ⓒ
2) Confirm the hour hand position when the minute hand indicates 11:57	Align the position with Ⓓ (normal rotation) → The hour hand:12 o'clock or slightly late
3) Confirm the hour hand position when the minute hand indicates 00:03	Align the position with Ⓓ (normal rotation) → The hour hand:12 o'clock or slightly fast

Figure 1



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7. TESTING: MODULE QW-5117

7-1. MEASURING CURRENT CONSUMPTION

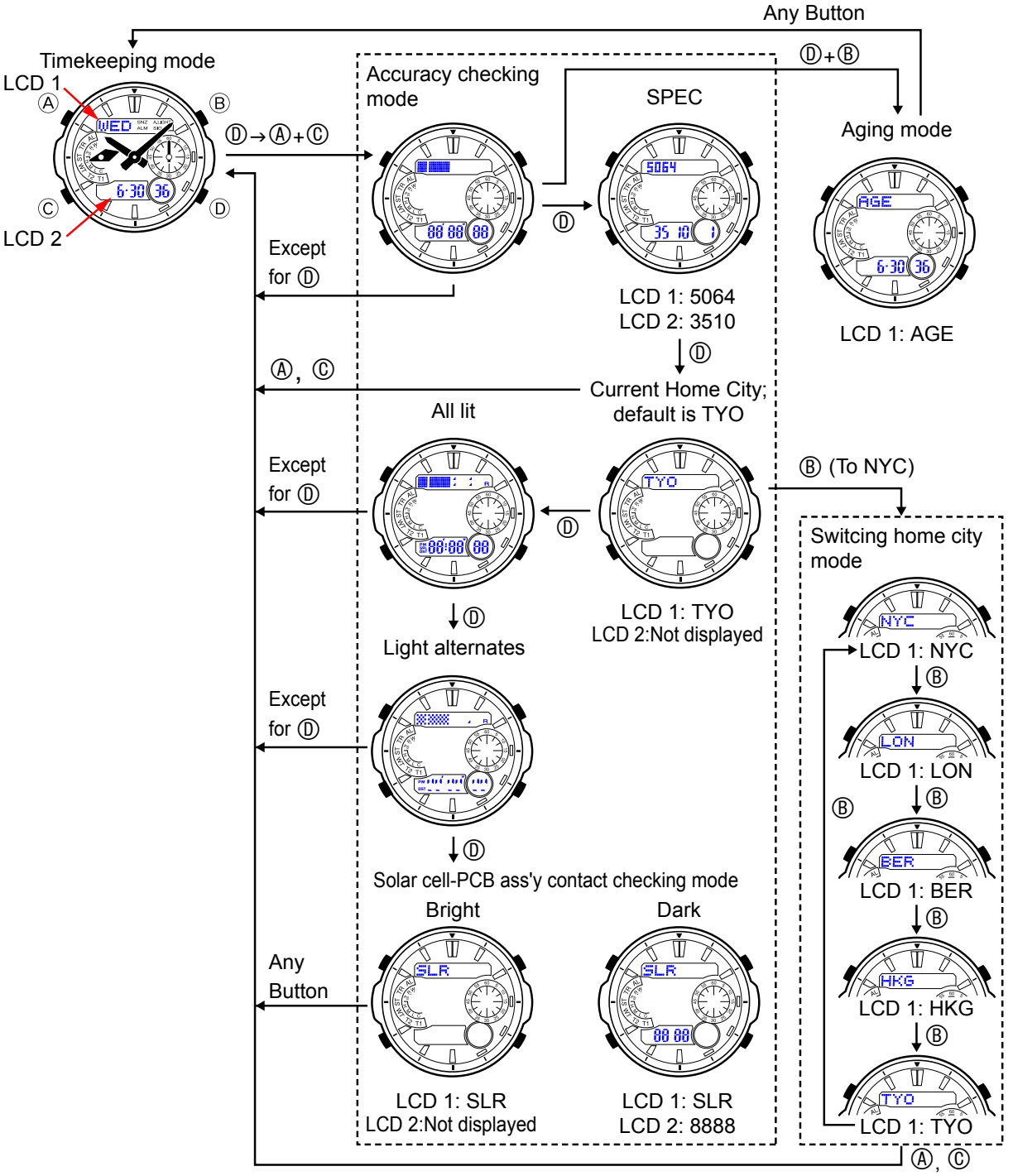
This model starts correct positioning of the second hand in the Hand Set mode immediately after AC.

When it is functioning, the value of consumption current would be a little higher as the internal circuit operation would be different from the usual status.

Measure the current value at 5 seconds after AC is performed.

* Measure within one minute while light is blocked from the watch face.
* Supply voltage is 2.5V.

7-2. CHECKING THE MODEL



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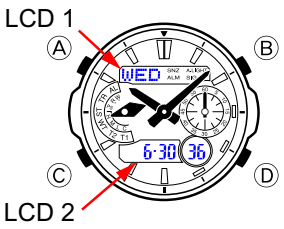
The Model Check mode leads to the following test modes:

- Accuracy checking mode
- Home City Switching mode
- Solar Cell-PCB Ass'y Contact Checking mode
- Aging mode

Location of the buttons and name of the lcds



1) While on the Timekeeping mode, hold down Ⓓ and press Ⓐ and Ⓒ at the same time to go to the Model Check mode.
2) Press Ⓓ to check the current display of each LCD.

LCD 1	LCD 2
5064	3510 1

3) Exiting the Model check mode.
   - Press Ⓓ to go the Home City Switching mode.
   - Press any button except for Ⓓ to return to the Timekeeping mode.

7-3. ACCURACY CHECKING

1) While on the Timekeeping mode, hold down Ⓓ and press Ⓐ and Ⓒ at the same time.
   The LCD turns to the Accuracy Checking mode, and the Mode hand moves 1 second at a time.
2) Exiting the Accuracy Checking mode.
   - Press Ⓓ to go to Checking the model mode.
   - Press Ⓓ and Ⓑ at the same time to go to the Aging mode.
   - Press any button except for Ⓓ to return to the Timekeeping mode.

7-4. CONFIGURING HOME CITY

You can use this mode to easily switch the city from which "Receiving Signal Check" is allowed.

1) While on the Timekeeping mode, hold down Ⓓ and press Ⓐ and Ⓒ at the same time.
2) Press Ⓓ two times.
   LCD 1 indicates the current Home City.
3) Each time Ⓑ is pressed, the Home City switches in the order below. Press Ⓐ or Ⓒ to exit the Home City Switching mode and return to the Time mode.

NYC → LON → PAR → HKG → TYO

Configuration of each Home City

HOME CITY	LCD 1	Calibration signal (Default)	DST Setting (After AC)
NYC	NYC	WWVB	OFF
LON	LON	MSF	OFF
PAR	PAR	DCF77	OFF
HKG	HKG	BPC	OFF
TYO	TYO	JJY40	OFF

4) Exit the Test mode.
   - Press Ⓐ or Ⓒ to return to the Timekeeping mode.
   - Press Ⓓ to turn the LCD to the All-illumination mode.

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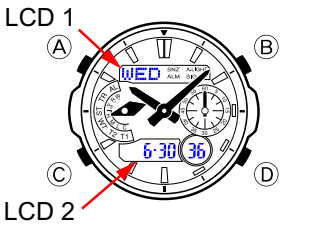
7-5. CHECKING ALL ILLUMINATION AND PARTIAL ILLUMINATION

1) While on the Timekeeping mode, hold down Ⓓ and press Ⓐ and Ⓒ at the same time.
2) Press Ⓓ three times.
   Check that all indication on the LCD illuminates.
3) Press Ⓓ to check that the partial indication on the LCD illuminates.
4) Exiting the All Illumination and the Partial Illumination mode
   You may return to the Timekeeping mode from either mode by pressing any button except for Ⓓ.

Location of the buttons and name of the lcds



7-6. SOLAR CELL-PCB ASS'Y CONTACT CHECKING

1) While on the Timekeeping mode, hold down Ⓓ and press Ⓐ and Ⓒ at the same time.
2) Press Ⓓ five times.
   The display on the LCD 1 changes to SLR, indicating that light is sufficient.
3) Place the watch on a desk with its glass face down for 2 seconds or more. Or go to a dark area and leave the watch for 2 seconds or more.
   8888 appears on the LCD 2 indicating that light is insufficient.
4) End the Solar Cell-PCB Ass'y Contact Checking mode
   Press any button or wait for the Auto Return (AR) to return to the Timekeeping mode.

7-7. AGING MODE

This mode allows you to check for lagging/advancing or stoppage of the hand(s) due to aging.

Aging mode differs from Timekeeping mode in following functions:

- Button operations, such as changing mode, are disabled. (Doing so will end the Aging mode.)
- The watch continues its timekeeping operations.
- Time signal is not received.
- The Sleep mode does not activate automatically.

PROCEDURES

1) While on the Timekeeping mode, hold down Ⓓ and press Ⓐ and Ⓒ at the same time.
   The watch enters in the Watch Accuracy checking mode and the LCD partially illuminates.
2) Hold down Ⓓ and press Ⓑ.
   AGE appears on the LCD 1 and the watch enters into the Aging mode.
3) Exit the Aging mode.
   Press any button to return to the Timekeeping mode.

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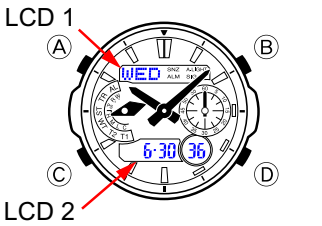
7-8. HOW TO CHECK TILT SENSOR

1) While pressing Ⓐ button, press Ⓒ and Ⓑ buttons at the normal timekeeping mode.
2) Check the display indicates as figure 1.
3) Tilt the watch in the way that the “6-o’clock” end of the face is lowered. (45°)
   How to tilt the watch: One tilting cycle is 0°(1 sec.) → 45°(1 sec.) → 0°. Repeat the cycle 3 times.
   (Check the tilt sensor as described above at least twice)
4) Check the display indicates as figure 2.
5) To exit from TEST mode.
   Press any button.

Location of the buttons and name of the lcds



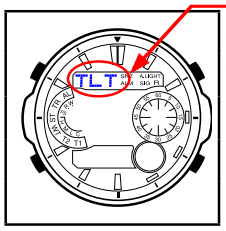


Figure 1

Appear “TLT” on display.

Tilt the watch in the way that the “6-o’clock” end of the face is lowered.
(Repeat the cycle 3 times.)

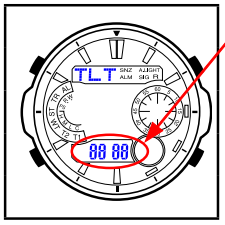


Figure 2

Appear “8888” on display.
(for more than two times)

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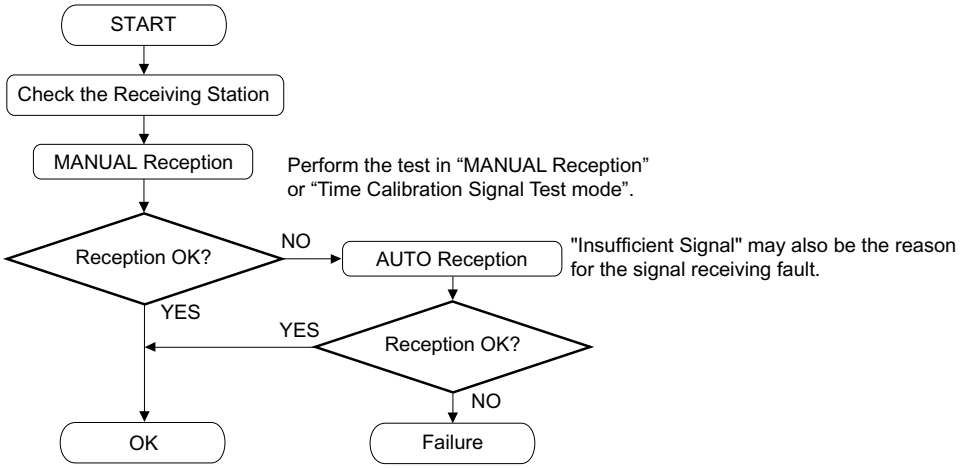
7-9. TIME CALIBRATION SIGNAL TEST

A signal reception failure may be caused by a number of of reasons.
Follow the steps shown in the flowchart below to run the signal receiving test.



Insufficient Signal

The time calibration signal may not be properly received under the following conditions.

- The strength of the signal has changed due to season or time of day
- The watch is placed in the reinforced concrete building
- There is a broadcasting station nearby
- Strong enough signal cannot be received due to the position of the watch

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The signal used for the local time setting differs from that for the facility testing in China using TEM cell.

* For the local time calibration signal, use the normal mode.

* To check the signal using TEM cell, perform the inspection in the Test Mode.

7-9-1. MANUAL/AUTO Reception

To change the signal station, you may easiliy do so by using the test mode in P.12 [CONFIGURING HOME CITY] For details of MANUAL and AUTO reception modes, refer to the Operation Guide.

MANUAL Reception

While on the Timekeeping mode, press Ⓐ for two seconds. The Mode Hand moves to “Ready (R)” position. While receiving signals, the Mode hand indicates “Work (W)” position and reception is enabled (LCD 1: GET; if signal cannot be received, the LCD 1 shows ERR). Press Ⓐ or wait for 1 – 2 minutes to return to the Timekeeping mode.

*Press any button to end the manual reception or the reception result display and return to the normal Time Keeping Mode.

AUTO Reception

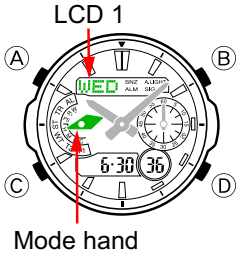
Turn on the AUTO Reception setting. When AUTO Reception is turned ON, the calibration signal is automatically received up to 6 times from midnight through early morning.

(If reception is successful once, the subsequent AUTO reception will not be conducted on the same day.)

* To check whether the calibration signal was received successfully, press Ⓐ and determine by the position of the indicator.

(The LCD 1 indicates GET if successful, and ERR if failed)

Location of the buttons and name of the hands



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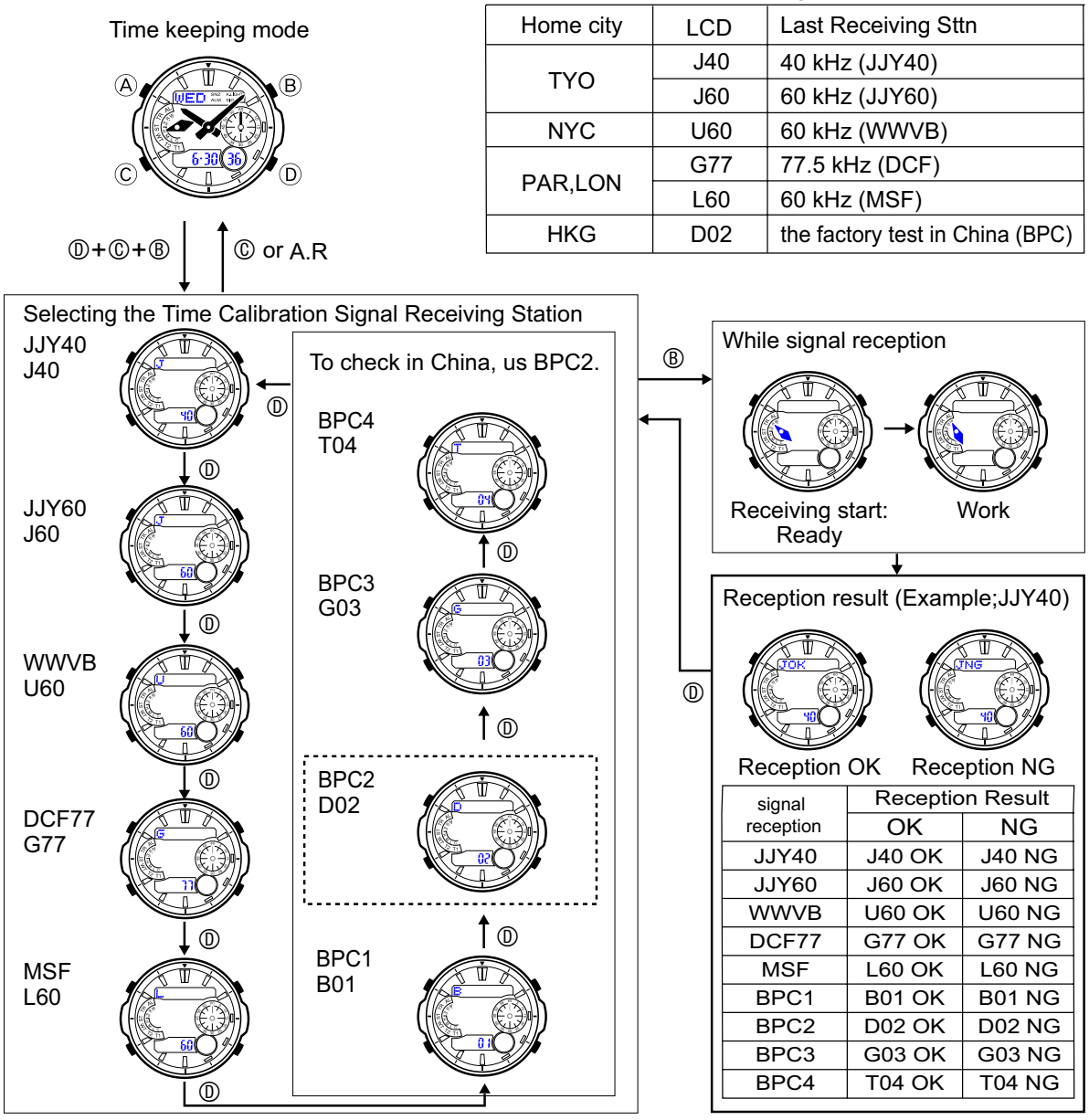
7-9-2. TEST MODE

1) From the Timekeeping mode, hold down Ⓓ and press Ⓑ and Ⓒ at the same time to start the Time Calibration Signal Test mode. The last receiving station will be indicated.
2) Each time Ⓓ is pressed, the test signal receiving station changes as shown below:
   JJY40 (J40) → JJY60 (J60) → WWVB (U60) → DCF77 (G77) → MSF (L60) → BPC1 (B01) → BPC2 (D02) → BPC3 (G03) → BPC4 (T04)
3) Press Ⓑ while in a receiving station state to start receiving a signal.
   * Be sure that the Mode hand is at the R position.
4) Press any button while receiving a signal to return to the Timekeeping mode.
5) In approximately 15 minutes, check the indication and determine the result by referring to the table below.
6) While in the Time Calibration Signal Test mode, you may press Ⓒ to exit the Time Calibration Signal Test Mode and return to the Timekeeping mode.

Indication of the Last Receiving Station

Home city	LCD	Last Receiving Sttn
TYO	J40	40 kHz (JJY40)
	J60	60 kHz (JJY60)
NYC	U60	60 kHz (WWVB)
PAR,LON	G77	77.5 kHz (DCF)
	L60	60 kHz (MSF)
HKG	D02	the factory test in China (BPC)



signal reception	Reception Result	
	OK	NG
JJY40	J40 OK	J40 NG
JJY60	J60 OK	J60 NG
WWVB	U60 OK	U60 NG
DCF77	G77 OK	G77 NG
MSF	L60 OK	L60 NG
BPC1	B01 OK	B01 NG
BPC2	D02 OK	D02 NG
BPC3	G03 OK	G03 NG
BPC4	T04 OK	T04 NG

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Correction of pages 4 and 5

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