SERVICE MANUAL
& PARTS LIST

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MODULE NO.

QW-4378
QW-4379

WVA-210DE
WVA-210DU

Ver.1 : Sep. 2010

INDEX

CASIO®

(WITHOUT PRICE)

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1. SPECIFICATIONS: MODULE QW-4378/4379

Item	Detail
Battery	CR1616
Battery life	Approx. 2 years
Current consumption	0.36 μA maximum
Alarm system	Piezo plate on Cover/Back
Accuracy	±20 sec./month
Accuracy setting system	Chip capacitor selection
Accuracy checking	See page 13
Functions	• LED light Afterglow • Time calibration signal reception Auto receive Manual receive Last date/time received display • Time Calibration Signal Receivable Time Calibration Signals Mainflingen, Germany (Call Sign: DCF77, Frequency: 77.5kHz) Rugby, England (Call Sign: MSF, Frequency: 60kHz) • World Time 29 time zones (30 cities), daylight saving time on/off • 1/100-sec. stopwatch Measuring capacity: 99’59.99" Measuring modes: Elapsed time, split time, 1st-2nd place times • Daily alarms 3 independent daily alarms • Hourly time signal • Low battery warning display • Auto-calendar (to year 2099) • 12/24-hour format • Regular timekeeping: Analog: 3 hands (Hr, min, sec) Digital: Hr, min, sec, pm, month, date, day

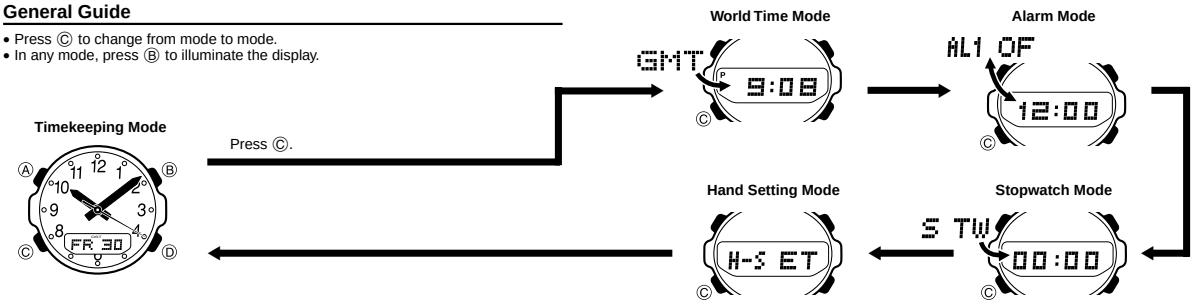
2. OPERATION CHART: MODULE QW-4378/4379

About This Manual

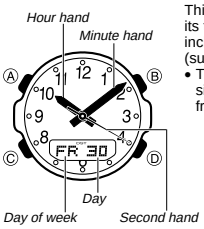
- Button operations are indicated using the letters shown in the illustration.
- Each section of this manual provides you with the information you need to perform operations in each mode. Further details and technical information can be found in the “Reference” section.

General Guide

- Press Ⓒ to change from mode to mode.
- In any mode, press Ⓑ to illuminate the display.



Radio-controlled Timekeeping



This watch receives a time calibration signal and updates its time setting accordingly. The time calibration signal includes both Standard Time and Daylight Saving Time (summer time) data.

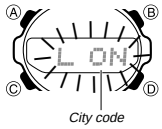
- This watch is designed to pick up the time calibration signal transmitted from Rugby, England and the signal from Mainflingen, Germany.

Current Time Setting

This watch automatically adjusts its time setting in accordance with a time calibration signal. You can also perform a manual procedure to set the time and date, when necessary.

- The first thing you should do after purchasing this watch is to set your Home City, which is the city where you will normally use the watch. For more information, see “To set your Home City” below.
- When using the watch in an area that is outside of the range of the transmitters in Rugby and Mainflingen, you need to manually adjust the time as required. See “Timekeeping” for information about manual settings.
- The analog time of this watch is synchronized with the digital time. Because of this, the analog time setting is automatically adjusted whenever you change the digital setting. See “Analog Timekeeping” for more information.

To set your Home City

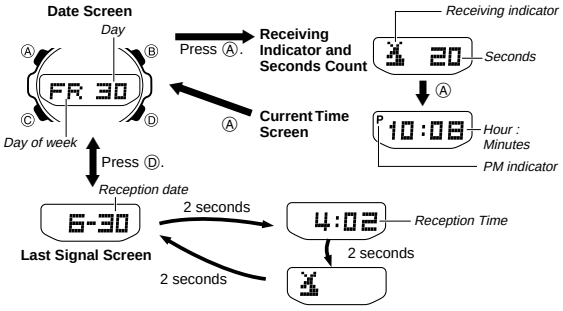


1. In the Timekeeping Mode, hold down Ⓐ until the city code starts to flash, which indicates the setting screen.
   - The second hand will move at high speed to the 12 o’clock position, where it will stop.
2. Use Ⓓ (east) and Ⓑ (west) to select the city code you want to use as your Home City.
   - The following are the city codes for major cities in the Western Europe time zones.
     LON: London
     PAR and BER: Paris, Berlin, Milan, Rome, Amsterdam, Hamburg, Frankfurt, Vienna
     ATH: Athens
3. Press Ⓐ to exit the setting screen.
   - The second hand will advance at high speed to the correct position in accordance with seconds count of the digital time, and resume normal movement from there.

- Normally, your watch should show the correct time as soon as you select your Home City code. If it does not, it should adjust automatically after the next auto receive (in the middle of the night). You can also perform manual receive or you can set the time manually.
- If you are in an area that does not use Daylight Saving Time (summer time), turn off the DST setting.
- The watch will receive the time calibration signal automatically from the applicable transmitter (in the middle of the night) and update its settings accordingly. For information about the relationship between city codes and transmitters, see “Transmitters”.

To display the digital time and last signal screen

- In the Timekeeping Mode, press Ⓐ to cycle through the digital time screens as shown below.
- In the Timekeeping Mode, press Ⓓ to display the last signal screen. The last signal screen shows the date and time of the last successful time calibration signal reception.



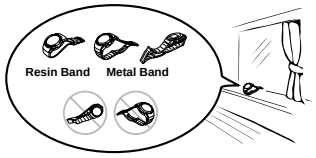
Time Calibration Signal Reception

There are two different methods you can use to receive the time calibration signal: auto receive and manual receive.

- **Auto Receive**
  With auto receive, the watch receives the time calibration signal automatically up to six times a day. When any auto receive is successful, the remaining auto receive operations are not performed. For more information, see “About Auto Receive”.
- **Manual Receive**
  Manual receive lets you start time calibration signal reception with the press of a button. For more information, see “To perform manual receive”.

Important!

- When getting ready to receive the time calibration signal, position the watch as shown in the nearby illustration, with its 12 o’clock side facing towards a window. Make sure there are no metal objects nearby.

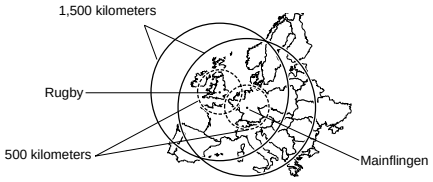


- The watch should not be on its side or facing the wrong way.
- Proper signal reception can be difficult or even impossible under the conditions listed below.

Inside or among buildings | Inside a vehicle | Near household appliances, office equipment, or a mobile phone | Near a construction site, airport, or other sources of electrical noise | Near high-tension power lines | Among or behind mountains

- Signal reception is normally better at night than during the day.
- Time calibration signal reception takes from two to seven minutes, but in some cases it can take as long as 14 minutes. Take care that you do not perform any button operations or move the watch during this time.

Reception Ranges



- At distances further than about 500 kilometers from a transmitter, signal reception may not be possible during certain times of year or times of day. Radio interference may also cause problems with reception.
- Even when the watch is within the reception range of the transmitter, signal reception will be impossible if the signal is blocked by mountains or other geological formations between the watch and signal source.
- Signal reception is affected by weather, atmospheric conditions, and seasonal changes.
- See the information under “Signal Reception Troubleshooting” if you experience problems with time calibration signal reception.

About Auto Receive

With auto receive, the watch receives the time calibration signal automatically up to six times a day. When any auto receive is successful, the remaining auto receive operations are not performed. The start times of the auto receive operations depend on the current Home City and DST settings.

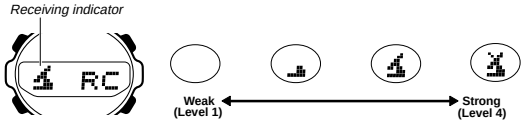
Home City		Auto Receive Start Times					
		1	2	3	4	5	6
LON	Standard Time	1:00 am	2:00 am	3:00 am	4:00 am	5:00 am	Midnight
	Daylight Saving Time	2:00 am	3:00 am	4:00 am	5:00 am	Midnight	1:00 am next day
PAR BER	Standard Time	2:00 am	3:00 am	4:00 am	5:00 am	Midnight	1:00 am next day
	Daylight Saving Time	3:00 am	4:00 am	5:00 am	Midnight	1:00 am next day	2:00 am next day
ATH	Standard Time	3:00 am	4:00 am	5:00 am	Midnight	1:00 am next day	2:00 am next day
	Daylight Saving Time	4:00 am	5:00 am	Midnight	1:00 am next day	2:00 am next day	3:00 am next day

Note

- Auto receive is performed only if the watch is in the Timekeeping Mode or World Time Mode when one of the calibration times is reached. It is not performed if a calibration time is reached while an alarm is sounding, or while you are configuring settings (while settings are flashing on the display).
- When a reception starts, the second hand will move at high speed to the 12 o’clock position where it will stop until the reception is complete.
- Auto receive of the calibration signal is designed to be performed early in the morning, while you sleep (provided that the Timekeeping Mode time is set correctly). Before going to bed for the night, remove the watch from your wrist, and put it in a location where it can easily receive the signal.
- When auto receive is turned on, the watch receives the calibration signal for two to seven minutes everyday when the time in the Timekeeping Mode reaches each of the calibration times. Do not perform any button operation within seven minutes before or after any one of the calibration times. Doing so can interfere with correct calibration.
- Remember that reception of the calibration signal depends on the time kept in the Timekeeping Mode. The receive operation will be performed whenever the display shows any one of the calibration times, regardless of whether or not the Timekeeping Mode time actually is the correct time.

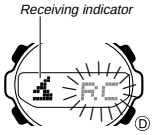
About the Receiving Indicator

The receiving indicator shows the strength of the calibration signal being received. For best reception, be sure to keep the watch in a location where signal strength is strongest.



- Even in an area where signal strength is strong, it takes about 10 seconds for signal reception to stabilize enough for the receiving indicator to indicate signal strength.
- Use the receiving indicator as a guide for checking signal strength and for finding the best location for the watch during signal reception.
- The Level 4 receiving indicator indicates that at least one of the auto calibration signal receive operation was successful. Note, however, that the Level 4 receiving indicator is cleared from the display when the first auto receive operation of the day is performed.
- The Level 4 receiving indicator appears on the Timekeeping Mode’s Receiving Indicator and Seconds Count screen only. The Level 4 receiving indicator is not displayed if signal reception was unsuccessful or after manual adjustment of the current time setting.

To perform manual receive



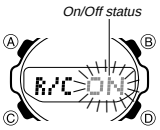
1. Place the watch on a stable surface so its top (12 o’clock side) is facing towards a window.
2. In the Timekeeping Mode, hold down Ⓓ for about two seconds until the watch beeps.
3. Release Ⓓ and **RC** flashes to indicate that signal reception has started.

- When a reception starts, the second hand will move at high speed to the 12 o’clock position where it will stop until the reception is complete.
- Time calibration signal reception normally takes from two to seven minutes, but in some cases it can take as long as 14 minutes. Take care that you do not perform any button operations or move the watch during this time.
- After signal reception is complete, the display of the watch changes to the last signal screen.

Note

- To interrupt a reception and return to the Timekeeping Mode, press Ⓓ.
- If the reception is unsuccessful, the message ERR appears on the display for about one or two minutes. After that, the watch returns to the Timekeeping Mode.
- You can also change from the last signal or ERR screen to the normal timekeeping screen by pressing Ⓓ.

To turn auto receive on and off



1. In the Timekeeping Mode, press Ⓓ to display the Last Signal screen.
2. Hold down Ⓐ until the current auto receive setting (ON or OF) starts to flash. This is the setting screen.
   - The second hand will move at high speed to the 12 o’clock position, where it will stop.
   - Note that the setting screen will not appear if the currently selected Home City is one that does not support time calibration reception.
3. Press Ⓓ to toggle auto receive on (ON) and off (OF).
4. Press Ⓐ to exit the setting screen.

- The second hand will advance at high speed to the correct position in accordance with the digital time seconds count, and resume normal movement from there.
- For information about city codes that support signal reception, see “To set your Home City”.

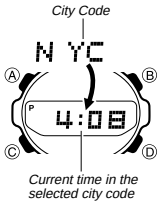
Signal Reception Troubleshooting

Check the following points whenever you experience problems with signal reception.

Problem	Probable Cause	What you should do
Cannot perform manual receive.	• The watch is not in the Timekeeping Mode. • Your current Home City is not one of the following city codes: **ATH**, **BER**, **PAR**, or **LON**.	• Enter the Timekeeping Mode and try again. • Select **ATH**, **BER**, **PAR**, or **LON** as your Home City.
Auto receive is turned on, but the Level 4 receiving indicator does not appear on the Timekeeping Mode display.	• You changed the time setting manually. • The watch was not in the Timekeeping or World Time Mode, or you were performing some button operation during auto receive. • Even if reception is successful, the Level 4 receiving indicator disappears each day when the first auto receive operation of the day is performed. • Time data (hour, minutes, seconds) only was received during the last reception. The Level 4 receiving indicator appears only when time data and date data (year, month, day) are both received.	• Perform manual receive or wait until the next auto receive is performed. • Check to make sure the watch is in a location where it can receive the signal.
Time setting is incorrect following signal reception.	• If the time is one hour off, the DST setting may be incorrect. • The Home City code setting is not correct for the area where you are using the watch.	• Change the DST setting to Auto DST . • Select the correct Home City code.

- For further information, see “Important!” under “Time Calibration Signal Reception” and “Radio-controlled Timekeeping Precautions”.

World Time



The World Time Mode digitally displays the current time in 30 cities (29 time zones) around the world.

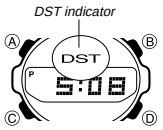
- Pressing Ⓐ in the World Time Mode causes the applicable city code to appear on the digital display for about two seconds.
- If the current time shown for a city is wrong, check your Home City time settings and make the necessary changes.
- The watch will perform a signal reception even if it is in the World Time Mode when a calibration time is reached. If this happens, the World Time Mode time settings will be adjusted in accordance with the Timekeeping Mode’s Home City time.
- All of the operations in this section are performed in the World Time Mode, which you enter by pressing Ⓒ.

To view the time in another city

While in the World Time Mode, press Ⓓ to scroll through the city codes (time zones).

- For full information on city codes, see “City Code Table”.

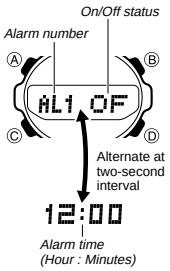
To toggle a city code time between Standard Time and Daylight Saving Time



1. In the World Time Mode, use to display the city code (time zone) whose Standard Time/Daylight Saving Time setting you want to change.
   - Pressing Ⓐ in the World Time Mode causes the applicable city code to appear on the digital display for about two seconds.
2. Hold down Ⓐ to toggle Daylight Saving Time (**DST** indicator displayed) and Standard Time (**DST** indicator not displayed).

- Note that you cannot use the World Time Mode to change the DST setting of the Home City code you currently have selected in the Timekeeping Mode. See “To change the Daylight Saving Time (summer time) setting” for information about turning the Home City code DST setting on and off.
- The **DST** indicator will appear on the display whenever you display a city code for which Daylight Saving Time is turned on.
- Note that you cannot switch between Standard Time and Daylight Saving Time while GMT is selected as the city code.
- Note that the DST/Standard Time setting affects only the currently displayed city code. Other city codes are not affected.

Alarms

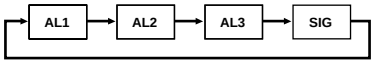


You can set three independent Daily Alarms. When an alarm is turned on, the alarm tone sounds when the alarm time is reached. You can also turn on an Hourly Time Signal that causes the watch to beep twice every hour on the hour.

- The alarm and Hourly Time Signal operate in accordance with the current digital time.
- The alarm number (**AL1** though **AL3**) indicates an alarm screen. **SIG** appears in place of the alarm number when the Hourly Time Signal screen is shown.
- All of the operations in this section are performed in the Alarm Mode, which you enter by pressing Ⓒ.

To set an alarm time

1. In the Alarm Mode, press Ⓓ to select the alarm whose time you want to set.



2. Hold down Ⓐ until the hour setting of the alarm time starts to flash, which indicates the setting screen.
   - This automatically turns on the alarm.
3. Press Ⓒ to move the flashing between the hour and minute settings.
4. While a setting is flashing, use Ⓓ (+) and Ⓑ (–) to change it.
   - When setting the alarm time using the 12-hour format, take care to set the time correctly as a.m. (no indicator) or p.m. (**P** indicator).
   - If you have 24-hour timekeeping selected in the Timekeeping Mode, the alarm time is also displayed in 24-hour format.
5. Press Ⓐ to exit the setting screen.

Alarm Operation

The alarm sounds in all modes at the preset time for about 10 seconds, or until you stop it by pressing any button.

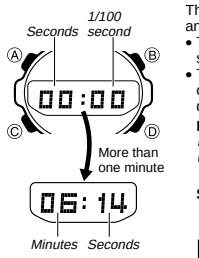
To test the alarm

In the Alarm Mode, hold down Ⓓ to sound the alarm.

To turn an alarm and the Hourly Time Signal on and off

1. In the Alarm Mode, press Ⓓ to select an alarm or the Hourly Time Signal.
2. When the alarm or the Hourly Time Signal you want to set is selected, press Ⓐ to turn it on (ON) and off (OF).

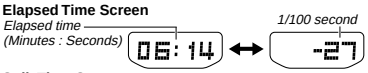
Stopwatch



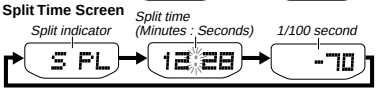
The stopwatch lets you measure elapsed time, split times, and two finishes.

- The display range of the stopwatch is 99 minutes, 59.99 seconds.
- The 1/100-second value appears while the elapsed time operation is stopped or while a split time is frozen on the display.

Elapsed Time Screen



Split Time Screen



- The stopwatch continues to run, restarting from zero after it reaches its limit, until you stop it.
- Exiting the Stopwatch Mode while a split time is frozen on the display clears the split time and returns to elapsed time measurement.
- The stopwatch measurement operation continues even if you exit the Stopwatch Mode.
- All of the operations in this section are performed in the Stopwatch Mode, which you enter by pressing Ⓒ.

To measure times with the stopwatch

Elapsed Time

Ⓓ **Start** → Ⓓ **Stop** → Ⓓ **Re-start** → Ⓓ **Stop** → Ⓐ **Clear**

Split Time

Ⓓ **Start** → Ⓐ **Split** → Ⓐ **Split release** → Ⓓ **Stop** → Ⓐ **Clear**

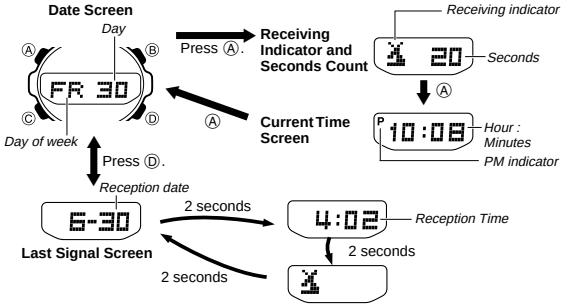
Two Finishes

Ⓓ **Start** → Ⓐ **Split** (First runner finishes. Display time of first runner.) → Ⓓ **Stop** (Second runner finishes.) → Ⓐ **Split release** (Display time of second runner.) → Ⓐ **Clear**

Timekeeping

Use the Timekeeping Mode to set and view the current time and date. This section also explains how to manually set the current date and time.

- In the Timekeeping Mode, press Ⓐ to cycle through the digital time screens as shown below.
- In the Timekeeping Mode, press Ⓓ to display the last signal screen. The last signal screen shows the date and time of the last successful time calibration signal reception.
- All of the operations in this section are performed in the Timekeeping Mode, which you can enter by pressing Ⓒ.

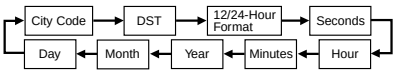


Setting the Digital Time and Date Manually

Make sure you select your Home City code before you change the current time and date settings. World Time Mode times are all displayed in accordance with the Timekeeping Mode settings. Because of this, World Time Mode times will not be correct if you do not select the proper Home City code before setting the time and date in the Timekeeping Mode.

To set the current digital time and date manually

1. In the Timekeeping Mode, hold down Ⓐ until the city code starts to flash, which indicates the setting screen.
   - The second hand will move at high speed to the 12 o'clock position, where it will stop.
2. Use Ⓒ to move the flashing in the sequence shown below to select other settings.



3. When the setting you want to change is flashing, use Ⓑ and/or Ⓓ to change it as described below.

Screen:	To do this:	Do this:
L ON	Change the city code	Use Ⓓ (east) and Ⓑ (west).
ON	Toggle between Daylight Saving Time (ON) , Standard Time (OF), or Auto DST (A)	Press Ⓓ.
12 H	Toggle between 12-hour (12 H) and 24-hour (24 H) timekeeping	Press Ⓓ.
20	Reset the seconds to 00	Press Ⓓ.
10:08	Change the hour or minutes	Use Ⓓ (+) and Ⓑ (–).
20 06	Change the year	Use Ⓓ (+) and Ⓑ (–).
6-30	Change the month or day	Use Ⓓ (+) and Ⓑ (–).

   - See "City Code Table" for a complete list of available city codes.
4. Press Ⓐ to exit the setting screen.

- The second hand will advance at high speed to the correct position in accordance with the digital time seconds count, and resume normal movement from there.
- When you exit the setting screen, the analog hands are adjusted automatically to match the digital time. See "Analog Timekeeping" for more information.

Note

- Auto DST (A) can be selected only while BER, PAR, LON, or ATH is selected as the Home City code. For more information, see "Daylight Saving Time (DST)" below.

Daylight Saving Time (DST)

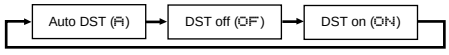
Daylight Saving Time (summer time) advances the time setting by one hour from Standard Time. Remember that not all countries or even local areas use Daylight Saving Time.

The time calibration signals transmitted from Rugby and Mainflingen includes both Standard Time and DST data. When the Auto DST setting is turned on, the watch switches between Standard Time and DST (summer time) automatically in accordance with the received time signal.

- Auto DST (A) can be selected only while BER, PAR, LON, or ATH is selected as the Home City code.
- The default DST setting is Auto DST (A) whenever you select BER, PAR, LON, or ATH as your Home City code.
- If you experience problems receiving the time calibration signal in your area, it is probably best to switch between Standard Time and Daylight Saving Time (summer time) manually.

To change the Daylight Saving Time (summer time) setting

1. In the Timekeeping Mode, hold down Ⓐ until the city code starts to flash, which indicates the setting screen.
2. Press Ⓒ to display the DST setting screen.
3. Use Ⓓ to cycle through the DST settings in the sequence shown below.



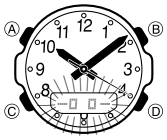
4. When the setting you want is selected, press Ⓐ to exit the setting screen.

- The **DST** indicator appears on the display to indicate that Daylight Saving Time is turned on.

Analog Timekeeping
The analog time of this watch is synchronized with the digital time. The analog time setting is adjusted automatically whenever you change the digital time.

Note
- The hands for the analog timepiece move to adjust to a new setting whenever any of the following occurs.
  When you change the digital time setting manually
  When the digital time setting is changed by time calibration signal reception
  When you change the Home City code and/or DST setting
- If the analog time does not match the digital time for any reason, use the procedure described under "To adjust the analog time" to match the analog setting to the digital setting.
- Whenever you need to adjust both the digital and the analog time settings manually, make sure you adjust the digital setting first.
- Depending on how much the hands have to move in order to adjust to the digital time, it may take some time before they stop moving.

To adjust the analog time



1. In the Timekeeping Mode, press Ⓒ four times to enter the Hand Setting Mode.
2. Hold down Ⓐ until –0 0– starts to flash, which indicates the setting screen.
   - The second hand will move at high speed to the 12 o'clock position, where it will stop.
3. If the second hand is not pointing precisely at 12 o'clock at this time, use Ⓓ to adjust its position.
   - Each press of Ⓓ causes the second hand to advance by one second.
4. Press Ⓒ. This will cause the time on the digital display to flash, which indicates that adjustment of hour and minute hands is selected.
5. Use Ⓓ and Ⓑ to adjust the analog setting as described below.

When you want to do this:	Perform this button operation:
Move the hand setting forward 10 seconds	• Press Ⓓ.
Move the hand setting back 10 seconds	• Press Ⓑ.
Move the hand setting a short way forward at high speed	• Hold down Ⓓ. • Release Ⓓ when the hands reach the setting you want.
Move the hand setting a short way back at high speed	• Hold down Ⓑ. • Release Ⓑ when the hands reach the setting you want.
Move the hand setting a long way forward at high speed	• While holding down Ⓓ to move the hands at high-speed, press Ⓑ to lock the high-speed hand movement. • To stop the hand movement, press any button. • Hand movement stops automatically if the hour hand makes one full (12-hour) revolution.
Move the hand setting a long way back at high speed	• While holding down Ⓑ to move the hands at high-speed, press Ⓓ to lock the high-speed hand movement. • To stop the hand movement, press any button. • Hand movement stops automatically if the hour hand makes one full (12-hour) revolution.

6. Press Ⓐ to exit the setting screen.
- The minute hand will be adjusted slightly to match the seconds when you exit the setting screen.
- To return to the Timekeeping Mode, press Ⓒ.

Reference

This section contains more detailed and technical information about watch operation. It also contains important precautions and notes about the various features and functions of this watch.

Auto Return Features
- If you leave the watch in the Alarm or Hand Setting Mode for two or three minutes without performing any operation, it automatically returns to the Timekeeping Mode.
- If you leave the watch with a flashing setting on the display for two or three minutes without performing any operation, the watch automatically exits the setting screen.

Scrolling
The Ⓑ and Ⓓ buttons are used in various modes and setting screens to scroll through data on the display. In most cases, holding down these buttons during a scroll operation scrolls through the data at high speed.

Initial Screens
When you enter the World Time or Alarm Mode, the data you were viewing when you last exited the mode appears first.

Radio-controlled Timekeeping Precautions
- Strong electrostatic charge can result in the wrong time being set.
- The time calibration signal bounces off the ionosphere. Because of this, such factors as changes in the reflectivity of the ionosphere, as well as movement of the ionosphere to higher altitudes due to seasonal atmospheric changes or the time of day may change the reception range of the signal and make reception temporarily impossible.
- Even if the time calibration signal is received properly, certain conditions can cause the time setting to be off by up to one second.
- The current time setting in accordance with the time calibration signal takes priority over any time settings you make manually.
- The watch is designed to automatically update the date and day of the week for the period January 1, 2000 to December 31, 2099. Setting of the date by the time calibration signal cannot be performed starting from January 1, 2100.
- This watch can receive signals that differentiate between leap years and non-leap years.
- Though this watch is designed to receive both time data (hour, minutes, seconds) and date data (year, month, day), certain signal conditions can limit reception to time data only.
- Normally, the signal reception date shown by the last signal screen is the date data included in the received time calibration signal. When only time data is received, however, the last signal screen shows the date as kept in the Timekeeping Mode at the time of signal reception.
- If you are in an area where proper time calibration signal reception is impossible, the watch keeps time within ±20 seconds a month at normal temperature.
- If you have problems with proper time calibration signal reception or if the time setting is wrong after signal reception, check your Home City code, DST (summer time), and auto receive settings. The following are the initial factory defaults for these settings.

Setting	Initial Factory Default	
City code	BER (Berlin) (Module 4378)	LON (London) (Module 4379)
DST (summer time)	DST A (Auto switching)	
Auto receive	A/C ON (Auto receive)	

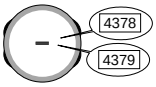
Transmitters
This watch is designed to receive the time calibration signal transmitted from Rugby, England and the signal from Mainflingen, Germany.
- The following explains how the watch determines which transmitter it should check first.

Module 4378

In this case:	The watch does this:
The first signal auto search operation after factory default settings are in effect, or after the city code has been changed	1. Checks the Mainflingen signal first. 2. If the Mainflingen signal cannot be received, checks the Rugby signal.
Any case other than the above.	1. Checks the last successfully received signal first. 2. If the last successfully received signal cannot be received, checks the other signal.

Module 4379

In this case:	The watch does this:
The first signal auto search operation after factory default settings are in effect, or after the city code has been changed	1. Checks the Rugby signal first. 2. If the Rugby signal cannot be received, checks the Mainflingen signal.
Any case other than the above.	1. Checks the last successfully received signal first. 2. If the last successfully received signal cannot be received, checks the other signal.



- To find out the module number of your watch, look at its back cover. The Module number (4378 or 4379) is engraved inside the box on the back cover.

Timekeeping
- Resetting the seconds to **00** while the current count is in the range of 30 to 59 causes the minutes to be increased by 1. In the range of 00 to 29, the seconds are reset to **00** without changing the minutes.
- The day of the week is automatically displayed in accordance with the date (year, month, and day) settings.
- The year can be set in the range of 2000 to 2099.
- The watch's built-in full automatic calendar makes allowances for different month lengths and leap years. Once you set the date, there should be no reason to change it except after you have the watch's battery replaced.
- The current time for all city codes in the Timekeeping Mode and World Time Mode is calculated in accordance with the Greenwich Mean Time (GMT) differential for each city, based on your Home City time setting.
- GMT differential is calculated by this watch based on Universal Time Coordinated (UTC*) data.

** UTC is the world-wide scientific standard of timekeeping. It is based upon carefully maintained atomic (cesium) clocks that keep time accurately to within microseconds. Leap seconds are added or subtracted as necessary to keep UTC in sync with the Earth's rotation. The reference point for UTC is Greenwich, England.*

12-hour/24-hour Timekeeping Formats
The 12-hour/24-hour timekeeping format you select in the Timekeeping Mode is also applied in all other modes.
- With the 12-hour format, the **P** (PM) indicator appears on the display for times in the range of noon to 11:59 p.m. and no indicator appears for times in the range of midnight to 11:59 a.m.
- With the 24-hour format, times are displayed in the range of 0:00 to 23:59 without any indicator.

Illumination Precautions
An LED (light-emitting diode) and a light guide panel illuminate the digital display for easy reading in the dark. In any mode, press Ⓑ to illuminate the display for about one second.
- The illumination provided by the light may be hard to see when viewed under direct sunlight.
- Illumination automatically turns off whenever an alarm sounds.
- Frequent use of illumination shortens the battery operating time.

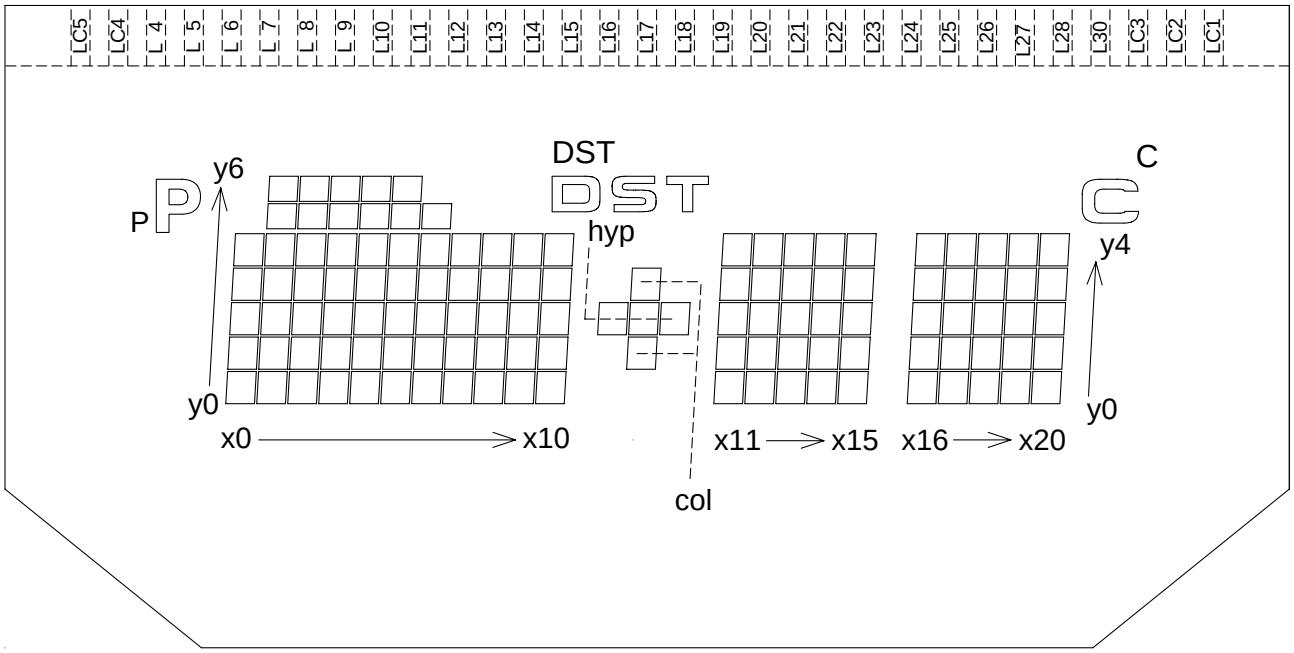
City Code Table

City Code	City	GMT Differential	Other major cities in same time zone
– – –		–11.0	Pago Pago
HNL	Honolulu	–10.0	Papeete
ANC	Anchorage	–09.0	Nome
LAX	Los Angeles	–08.0	San Francisco, Las Vegas, Vancouver, Seattle/Tacoma, Dawson City
DEN	Denver	–07.0	El Paso, Edmonton
CHI	Chicago	–06.0	Houston, Dallas/Fort Worth, New Orleans, Mexico City, Winnipeg
NYC	New York	–05.0	Montreal, Detroit, Miami, Boston, Panama City, Havana, Lima, Bogota
CCS	Caracas	–04.0	La Paz, Santiago, Port Of Spain
RIO	Rio De Janeiro	–03.0	Sao Paulo, Buenos Aires, Brasilia, Montevideo
– – –		–02.0	
– – –		–01.0	Praia
GMT		+00.0	Dublin, Lisbon, Casablanca, Dakar, Abidjan
LON	London		
PAR	Paris	+01.0	Milan, Rome, Madrid, Amsterdam, Algiers, Hamburg, Frankfurt, Vienna, Stockholm
BER	Berlin		
ATH	Athens	+02.0	Helsinki, Istanbul, Beirut, Damascus, Cape Town
CAI	Cairo		
JRS	Jerusalem		
JED	Jeddah	+03.0	Kuwait, Riyadh, Aden, Addis Ababa, Nairobi, Moscow
THR	Tehran	+03.5	Shiraz
DXB	Dubai	+04.0	Abu Dhabi, Muscat
KBL	Kabul	+04.5	
KHI	Karachi	+05.0	Male
DEL	Delhi	+05.5	Mumbai, Kolkata
DAC	Dhaka	+06.0	Colombo
RGN	Yangon	+06.5	
BKK	Bangkok	+07.0	Jakarta, Phnom Penh, Hanoi, Vientiane
HKG	Hong Kong	+08.0	Singapore, Kuala Lumpur, Beijing, Taipei, Manila, Perth, Ulaanbaatar
SEL	Seoul	+09.0	Pyongyang
TYO	Tokyo		
ADL	Adelaide	+09.5	Darwin
SYD	Sydney	+10.0	Melbourne, Guam, Rabaul
NOU	Noumea	+11.0	Port Vila
WLG	Wellington	+12.0	Christchurch, Nadi, Nauru Island

• Based on data as of December 2005.

3. DRAWINGS: MODULE QW-4378/4379

3-1. LCD DIAGRAM



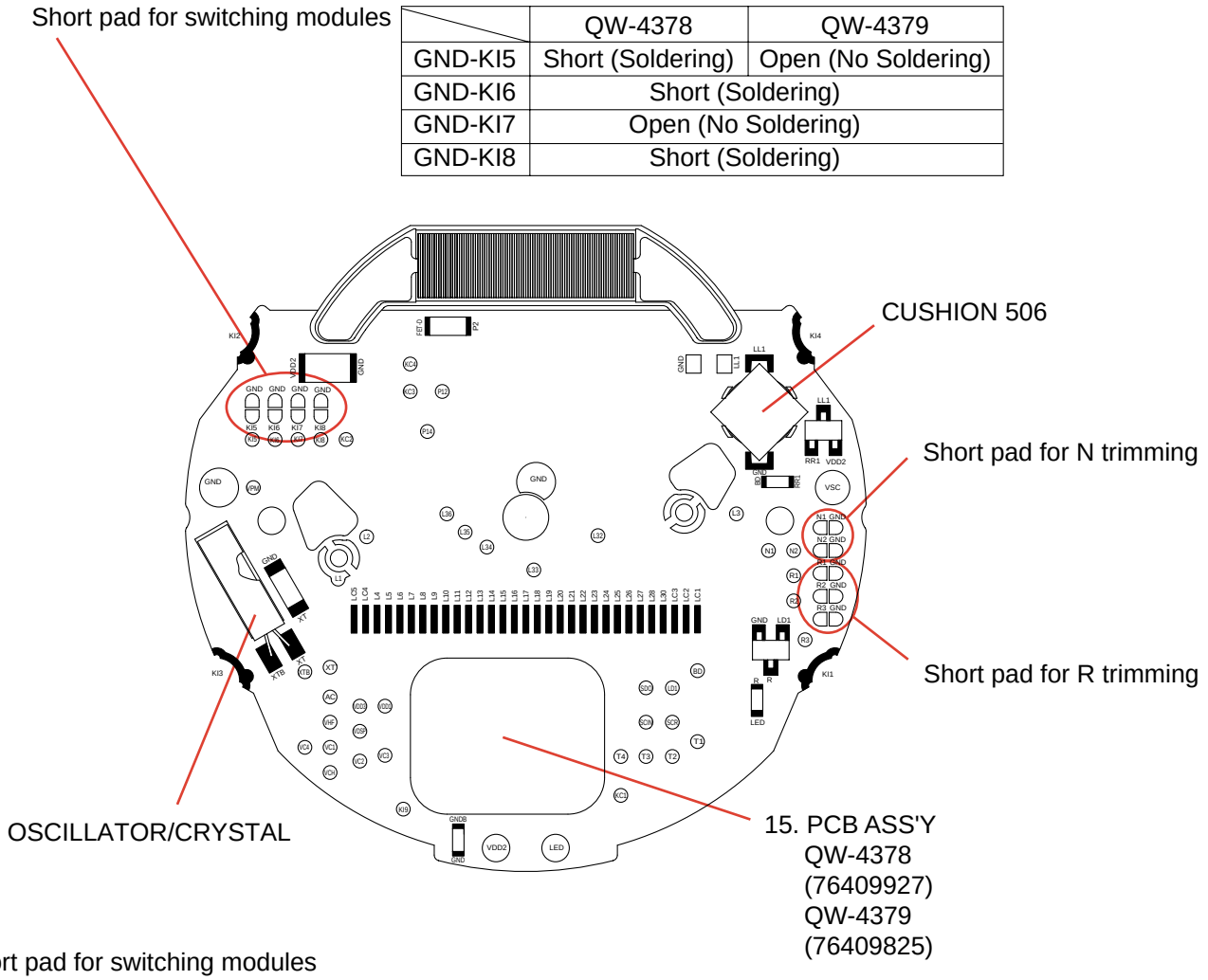
SEG \ COM	LC1	LC2	LC3	LC4	LC5
L 4	x10y2	x10y1	x10y0	x10y4	x10y3
L 5	x9y2	x9y1	x9y0	x9y4	x9y3
L 6	x8y2	x8y1	x8y0	x8y4	x8y3
L 7	x7y2	x7y1	x7y0	x7y4	x7y3
L 8	x6y2	x6y1	x6y0	x6y4	x6y3
L 9	x5y2	x5y1	x5y0	x5y4	x5y3
L10	x4y2	x4y1	x4y0	x4y4	x4y3
L11	x3y2	x3y1	x3y0	x3y4	x3y3
L12	x2y2	x2y1	x2y0	x2y4	x2y3
L13	x1y2	x1y1	x1y0	x1y4	x1y3
L14	x0y2	x0y1	x0y0	x0y4	x0y3
L15	x3y5	x4y5	x5y5	x1y5	x2y5
L16	x3y6	x4y6	x5y6	x1y6	x2y6
L17	hyp	p	x6y5	DST	col

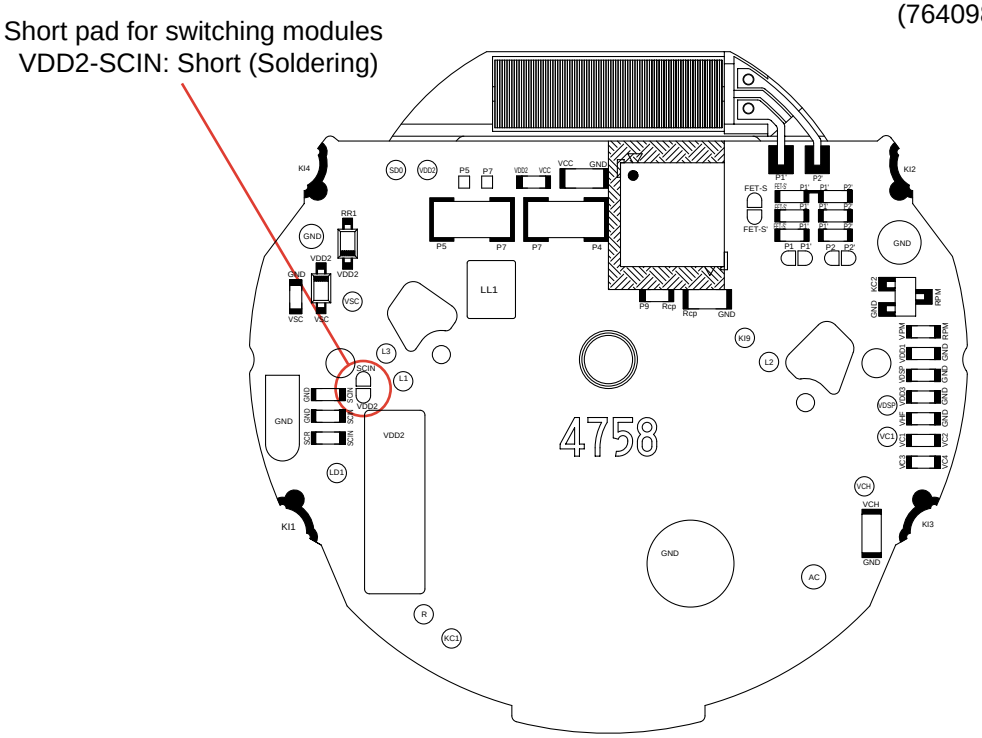
SEG \ COM	LC1	LC2	LC3	LC4	LC5
L18	x11y2	x11y1	x11y0	x11y4	x11y3
L19	x12y2	x12y1	x12y0	x12y4	x12y3
L20	x13y2	x13y1	x13y0	x13y4	x13y3
L21	x14y2	x14y1	x14y0	x14y4	x14y3
L22	x15y2	x15y1	x15y0	x15y4	x15y3
L23	x16y2	x16y1	x16y0	x16y4	x16y3
L24	x17y2	x17y1	x17y0	x17y4	x17y3
L25	x18y2	x18y1	x18y0	x18y4	x18y3
L26	x19y2	x19y1	x19y0	x19y4	x19y3
L27	x20y2	x20y1	x20y0	x20y4	x20y3

SEG \ COM	L30
L28	c

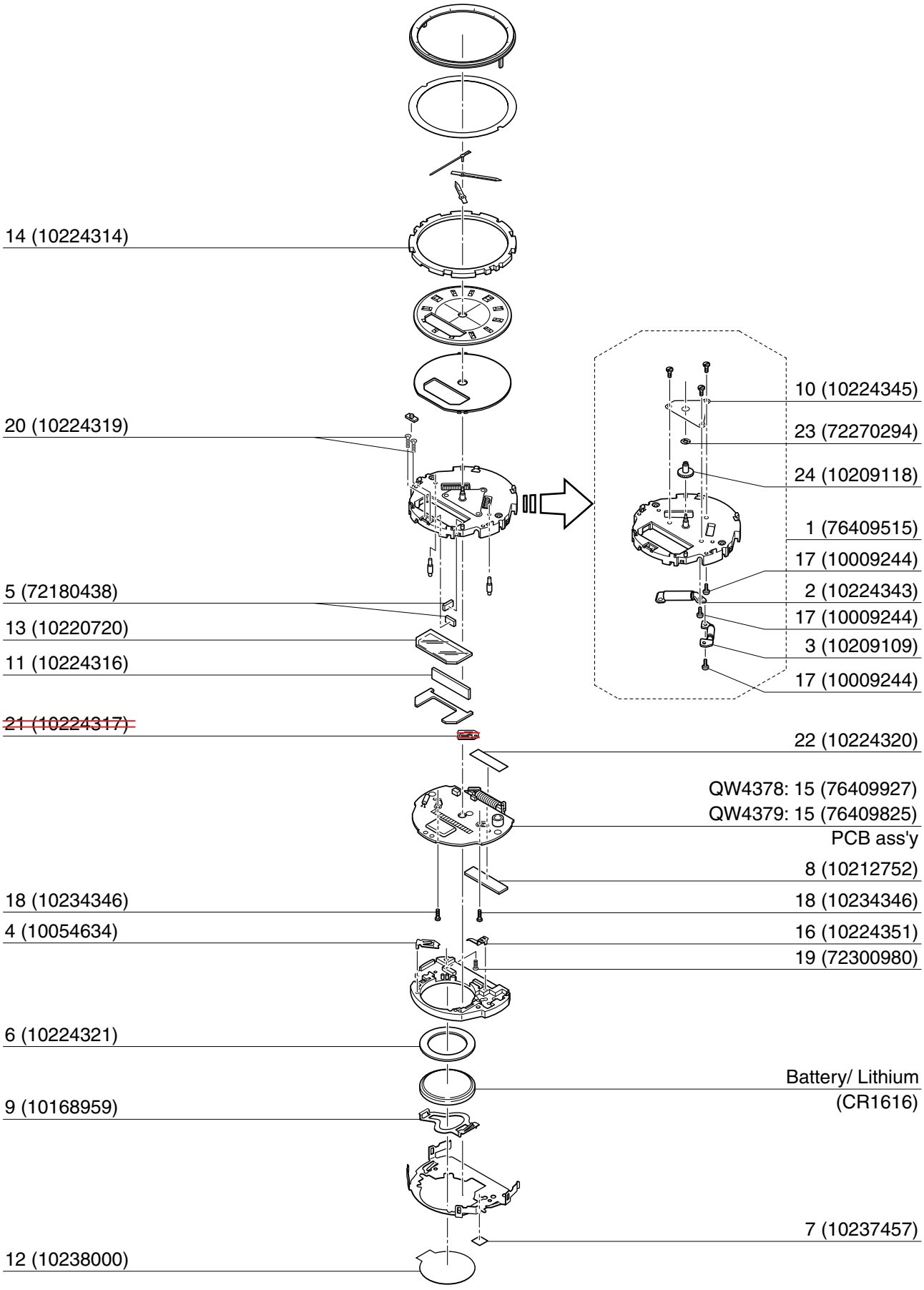
3-2. CHECKING TERMINALS AND COMPONENTS

	QW-4378	QW-4379
GND-KI5	Short (Soldering)	Open (No Soldering)
GND-KI6	Short (Soldering)	
GND-KI7	Open (No Soldering)	
GND-KI8	Short (Soldering)	





4. EXPLODED VIEW: MODULE QW-4378/4379



5. PARTS LIST: MODULE QW-4378/4379
MODULE QW-4378

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 ---------- Very Important
B Rank ---------- Important
C Rank ---------- Less 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".

Item	Code No.	Parts Name	Specification	Applicable	Q	R
	76409907	MODULE/WITH MOVEMENT	QW-4378AT-01TK	WVA-210DE-2AV	1	A
1	76409515	ANALOG BLOCK	QW-4319MV-82TK	QW-4378AT-01TK	1	A
2	10224343	COIL ASS'Y 4319	RJQ530538*001V02	QW-4378AT-01TK	1	A
3	10209109	COIL ASS'Y 4323-2	RJQ526940*001V02	QW-4378AT-01TK	1	A
4	10054634	CONTACT/BATTERY(-) 1828	Q359948D-4	QW-4378AT-01TK	1	C
5	72180438	CUSHION/524	Q411459-1	QW-4378AT-01TK	2	C
6	10224321	CUSHION 2850	RJQ518428-001V01	QW-4378AT-01TK	1	C
7	10237457	CUSHION 4319	RJQ532802-001V01	QW-4378AT-01TK	1	C
8	10212752	CUSHION 4323-1	RJQ527451-001V01	QW-4378AT-01TK	1	C
9	10168959	HOLDER/BATTERY 2730	Q255819-2V05	QW-4378AT-01TK	1	C
10	10224345	HOLDER/HOUR WHEEL 4319	RJQ529522-001V01	QW-4378AT-01TK	1	C
11	10224316	INTERCONNECTOR 4319	RJQ530169-001V01	QW-4378AT-01TK	1	C
12	10238000	LABEL 4379	RJQ532596-001V01	QW-4378AT-01TK	1	C
13	10220720	LCD	K4319-01TH	QW-4378AT-01TK	1	A
14	10224314	LIGHT GUIDE 4319	RJQ530220-001V02	QW-4378AT-01TK	1	C
15	76409927	PCB ASS'Y	RJQ532575*002V01TK	QW-4378AT-01TK	1	A
16	10224351	PLATE/TERMINAL 4319	RJQ530184-001V01	QW-4378AT-01TK	1	C
17	10009244	SCREW 2323	Q465649-1	QW-4378AT-01TK	3	B
18	10234346	SCREW 4329	RJQ532242-001V01	QW-4378AT-01TK	2	B
19	72300980	SPRING/COIL 1514	Q456768-1	QW-4378AT-01TK	1	B
20	10224319	SPRING/COIL 4319	RJQ530492-001V01	QW-4378AT-01TK	2	B
~~21~~	~~10224317~~	~~SPRING/LEAF 4319~~	~~RJQ529526-001V02~~	~~QW-4378AT-01TK~~	~~1~~	~~C~~
22	10224320	TAPE/ADHESIVE 4319	RJQ531012-001V01	QW-4378AT-01TK	1	C
23	72270294	WASHER/745	Q436294A-1	QW-4378AT-01TK	1	C
24	10209118	WHEEL/HOUR 4323	RJQ527219-001V01	QW-4378AT-01TK	1	C

For the prices and minimum order/supply quantities of the above parts, refer to the Parts Price List P.P.L.-632.

Notes: Q - Used quantity
R - Rank

MODULE QW-4379

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 ---------- Very Important
B Rank ---------- Important
C Rank ---------- Less 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".

Item	Code No.	Parts Name	Specification	Applicable	Q	R
	76409808	MODULE/WITH MOVEMENT	QW-4379AT-01TK	WVA-210DU-1AV	1	A
1	76409515	ANALOG BLOCK	QW-4319MV-82TK	QW-4379AT-01TK	1	A
2	10224343	COIL ASS'Y 4319	RJQ530538*001V02	QW-4379AT-01TK	1	A
3	10209109	COIL ASS'Y 4323-2	RJQ526940*001V02	QW-4379AT-01TK	1	A
4	10054634	CONTACT/BATTERY(-) 1828	Q359948D-4	QW-4379AT-01TK	1	C
5	72180438	CUSHION/524	Q411459-1	QW-4379AT-01TK	2	C
6	10224321	CUSHION 2850	RJQ518428-001V01	QW-4379AT-01TK	1	C
7	10237457	CUSHION 4319	RJQ532802-001V01	QW-4379AT-01TK	1	C
8	10212752	CUSHION 4323-1	RJQ527451-001V01	QW-4379AT-01TK	1	C
9	10168959	HOLDER/BATTERY 2730	Q255819-2V05	QW-4379AT-01TK	1	C
10	10224345	HOLDER/HOUR WHEEL 4319	RJQ529522-001V01	QW-4379AT-01TK	1	C
11	10224316	INTERCONNECTOR 4319	RJQ530169-001V01	QW-4379AT-01TK	1	C
12	10238000	LABEL 4379	RJQ532596-001V01	QW-4379AT-01TK	1	C
13	10220720	LCD	K4319-01TH	QW-4379AT-01TK	1	A
14	10224314	LIGHT GUIDE 4319	RJQ530220-001V02	QW-4379AT-01TK	1	C
15	76409825	PCB ASS'Y	RJQ532575*001V01TK	QW-4379AT-01TK	1	A
16	10224351	PLATE/TERMINAL 4319	RJQ530184-001V01	QW-4379AT-01TK	1	C
17	10009244	SCREW 2323	Q465649-1	QW-4379AT-01TK	3	B
18	10234346	SCREW 4329	RJQ532242-001V01	QW-4379AT-01TK	2	B
19	72300980	SPRING/COIL 1514	Q456768-1	QW-4379AT-01TK	1	B
20	10224319	SPRING/COIL 4319	RJQ530492-001V01	QW-4379AT-01TK	2	B
~~21~~	~~10224317~~	~~SPRING/LEAF 4319~~	~~RJQ529526-001V02~~	~~QW-4379AT-01TK~~	~~1~~	~~C~~
22	10224320	TAPE/ADHESIVE 4319	RJQ531012-001V01	QW-4379AT-01TK	1	C
23	72270294	WASHER/745	Q436294A-1	QW-4379AT-01TK	1	C
24	10209118	WHEEL/HOUR 4323	RJQ527219-001V01	QW-4379AT-01TK	1	C

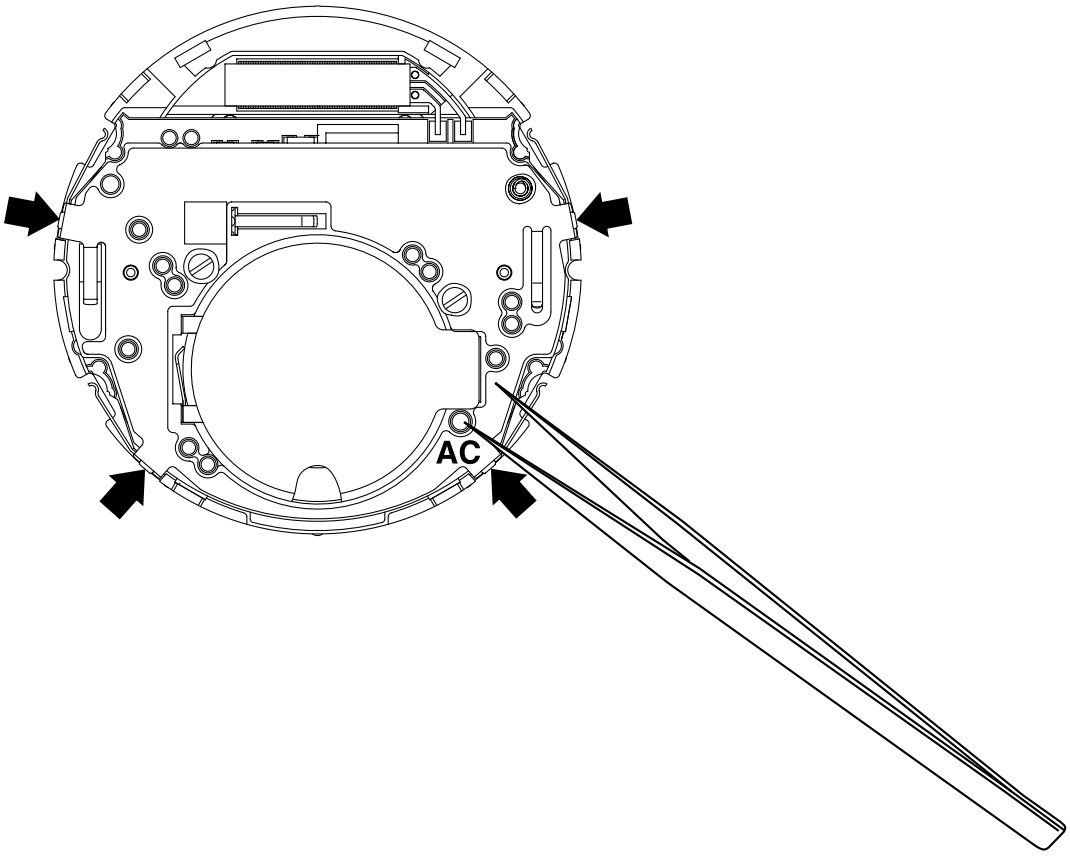
For the prices and minimum order/supply quantities of the above parts, refer to the Parts Price List P.P.L.-632.

Notes: Q - Used quantity
R - Rank

6. PRECAUTIONS FOR REPAIR: MODULE QW-4378/4379

6-1. AC (ALL CLEAR) AND REMOVING OF MODULE

1. Perform AC (ALL CLEAR) when inserting a new battery, or else the memories and/ or counters may give erratic displays.
   Touch the AC contact and the main plate with the metallic tweezers.
   The contact should be made for about two seconds.
2. On removing of the module from the case, please insert the precision screw driver between the module and the case pointed by arrows.



6-2. ACCURACY CHECKING

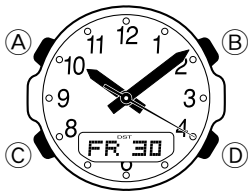
Check the accuracy of the module with the quartz timer after switching the module to “ACCURACY CHECKING MODE”.

The operations are shown below:

A) SWITCHING TO “ACCURACY CHECKING MODE”
While pressing the Ⓓ button, press Ⓐ and Ⓒ buttons at the normal timekeeping mode.
Then all the segments are displayed and the LCD drive signals are changed to the static drive signal of “32 Hz” so that you can check the accuracy with the quartz timer.

B) CANCELLATION OF THE “ACCURACY CHECKING MODE”
Press any button.
Then the display is returned to its original state.

NOTE: The “ACCURACY CHECKING MODE” will automatically return to the regular mode in 1 ~ 2 hour(s) without any operation.



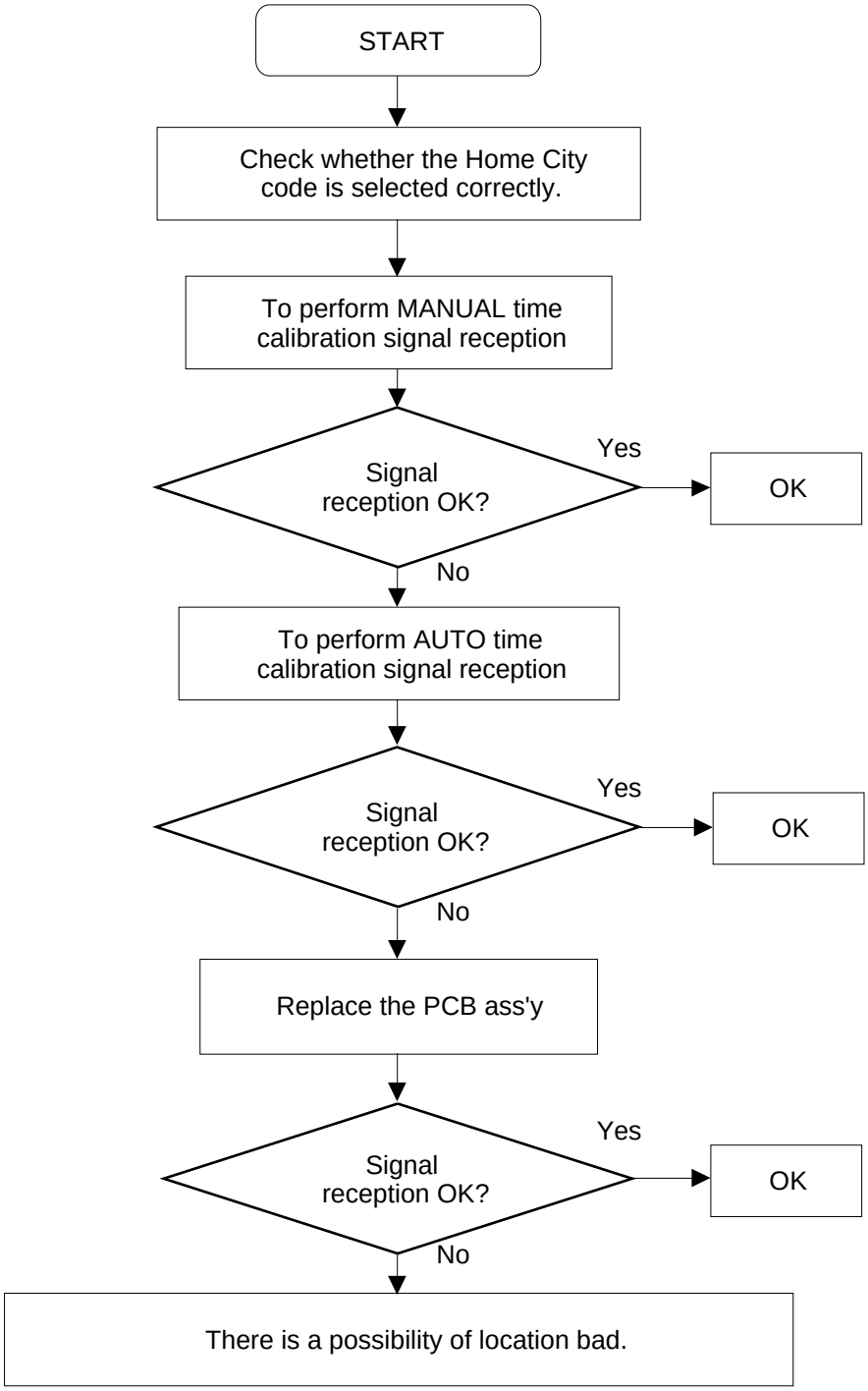
QW-4378
QW-4379

6-3. TIME CALIBRATION SIGNAL TEST MODE

1) Press Ⓑ, Ⓒ and Ⓓ button at the same time to enter the test mode.
2) Press Ⓐ button to switch from one signal source to another.
   L60 : Rugby, England (Call Sign: MSF, Frequency: 60kHz)
   G77: Mainflingen, Germany (Call Sign: DCF77, Frequency: 77.5kHz)
3) Press Ⓓ button to start signal reception.

7. TROUBLESHOOTING: MODULE QW-4378/4379

This is a flow chart about signal reception.



Ver. 1 : Sep. 2010

Correction of pages 9, 10 and 11

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