CALIBRE
1666

	Version A	Version B	Version C
13 1/4''' Ø 30.60 mm			
Versions:	Trimmer	Limited edition	Heat-compensated
Height on movement		6.90 mm	
Number of jewels		9	
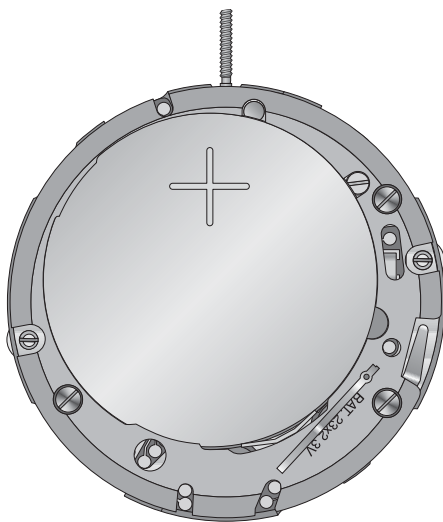
Exclusive OMEGA movement, Multi-function quartz. Luxury decoration, côtes de Genève, gilded engravings. Display of hour, minute and second in centre. Digital display : hours, minutes and seconds, date, alarm, mission elapsed time, mission elapsed alarm, universal time, universal time alarm, countdown, chronograph.

Contents

Major points

Information on the battery (ref. 1449953E20)

3 V	Lithium
Ø 23 mm	H 2 mm
Renata	CR2320
Varta	CR2320
Energizer	CR2320

Standard movement exchange
Follow Working Instruction 31 for standard movement exchanges.

Complete movement

Exchanges	
Version A	Complete movement version A: only with version C

Mandatory tools:

Hand fitting	**Ref.**
Movement holder for hand fitting	502 110 0715

Tools	
Plastic tweezers	502 310 0051
Full hand-fitting set	507 0011
Screwdriver for push-piece screw	502 220 0051
Nasa caseback plastic fitting	502 T98 0011
Metal fitting to remove hands	502 T98 0021
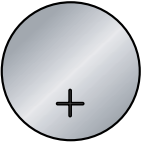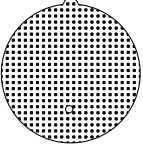
Battery	Version	Reference
	1666A	1449953E20
	1666B	limited version
	1666C	1449953E20

Battery insulator	Version	Reference
	1666A	722166620651
	1666B	limited version
	1666C	722166620651

Time setting stem switch	Version	Reference
	1666A	
	1666B	722166651020
	1666C	

Fig. 1.0

Battery + pole

C+

C-
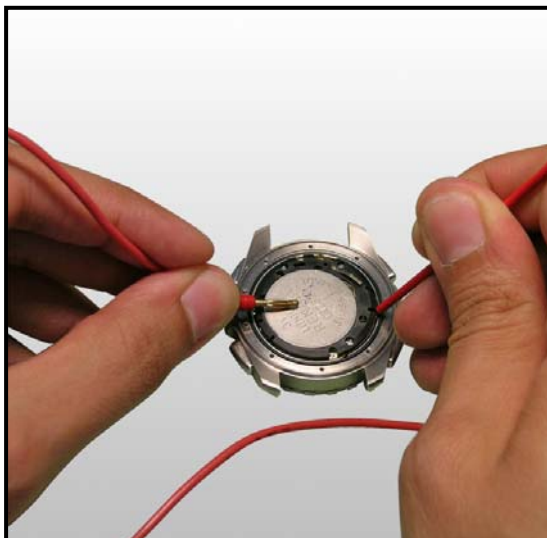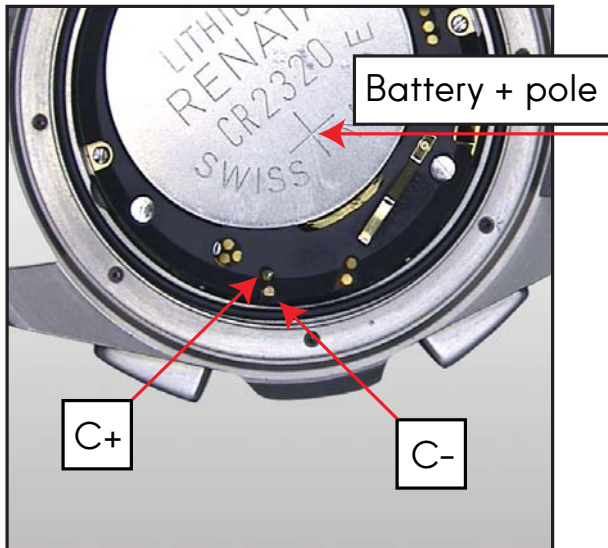
1.0 CS Test (Customer services)

1.1 Operations to enter into CS test mode:
1. Remove the battery
2. Wait for the LCD segments to disappear.
3. Hold the crown pressed in.
4. Insert the battery, the LCD displays «TEST 0».
5. Release the crown, test 0 is carried out.
6. Press the crown to perform the next test, the LCD displays the number of the next test «TEST X» (see p. 7).
7. Release the crown to carry out the test.

Rate adjustment
Test 1 displays the current value of the rate correction. This correction is calculated then saved in the movement during production tests.
This test is also used to modify this correction value if necessary. Every connection between the battery's + pole and the C+ or C– test points increases or decreases the correction value and therefore adjusts the watch rate.

Operating procedure

1. Measure the rate with an integration time of 960 seconds (sixteen minutes).
   The rate is measured with the stem pulled out to position 2.
   Test mode « magnetic » (rate measure of step motor).
2. Perform steps 1 to 5 of chapter 1.1 (operation to enter into CS test mode).
3. Press the crown once, the LCD displays «TEST 1».
4. Release the crown, the LCD displays C and the current correction value.
5. Perform corrections C+ or C– according to the formula below (see the two examples).
6. Press P1, P2, P3 or P4 to adjust the new value.
7. The LCD displays the new correction value.
8. If the value displayed does not conform, perform corrections on C+ or C– then press P1, P2, P3 or P4 to adjust and display the new value.
9. Press the crown twelve times, the LCD displays «F».
10. Wait for four seconds; the watch returns to time mode.

Formula:

$$\left(\frac{\text{Measured error} \times 1000}{10.986} \right) = \text{Number of pulses}$$

Comment:
When there is a positive number of pulses use C+
When there is a negative number of pulses use C–

Sample calculation:

Current correction value		089
Measured rate error		+0.1s/day
Calculation to be made	$\left(\dfrac{0.1 \times 1000}{10.986} \right)$	= 9
There must be 9 connections between C+ and the battery's + pole		
New correction value to be stored in the movement 089+9 = 098		

Sample calculation:

| Current correction value		175
Measured rate error		–0.2s/day
Calculation to be made	$\left(\dfrac{-0.2 \times 1000}{10.986} \right)$	= 18
There must be 18 connections between C– and the battery's + pole		
New correction value to be stored in the movement 175–18 = 157		

Test description:

Identification	Test no.	Test description
IDENTIFICATION	**Test 0**	Software identification display.
Rate adjustment	**Test 1**	Displays the current value of the rate correction. This correction is calculated then saved in the movement during production tests. This test is also used to modify this value if necessary. Every connection between the battery's + pole and the C+ test point (respectively C–) accelerates the rate by decrementing the value (respectively slows down the rate by incrementing the value). This connection can be made using a conductor tool (tweezers, wire, etc.):
RUN MODE	**Test 2**	*Display all the LCD segments and put µC into RUN mode.*
HALT MODE	**Test 3**	*Disable the LCD driver and put µC into HALT mode.*
BUZZER MODE	**Test 4**	Trip the *BUZZER* at a frequency of 2700 Hz.
CW seconds motor	**Test 5**	The seconds motor is moved forward one pitch clockwise every time P1, P2, P3 or P4 is pressed.
CW minutes motor	**Test 6**	The minutes motor is moved forward one pitch clockwise every time P1, P2, P3 or P4 is pressed.
CCW minutes motor	**Test 7**	The minutes motor is moved backward one pitch clockwise every time P1, P2, P3 or P4 is pressed.
CW minutes and seconds motor	**Test 8**	The seconds motor moves forward at a frequency of 32 Hz and the minutes motor at a frequency of 0.26 Hz (30 second pitches for one minute pitch).
LAMPE	**Test 9**	Activates the light.
Even LCD segments	**Test A**	Displays all the even LCD segments. This test checks whether two tracks next to one another are short-circuited.
Odd LCD segments	**Test B**	Displays all the odd LCD segments. This test checks whether two tracks next to one another are short-circuited.
EOL	**Test C**	Indicates the battery's voltage level. – Higher than 2.6 V – Buzzer release – Between 2.4 V and 2.6 V – Buzzer engaged at a frequency of 2000Hz – Lower than 2.4 V – Buzzer engaged at a frequency of 2700 Hz

How to leave the test:		
F TEST	**Exit**	Reset the watch after about four seconds; the watch restarts in standard Time mode. To restart in CS test mode (test 0), hold the crown pressed in.

Fig. 1.0
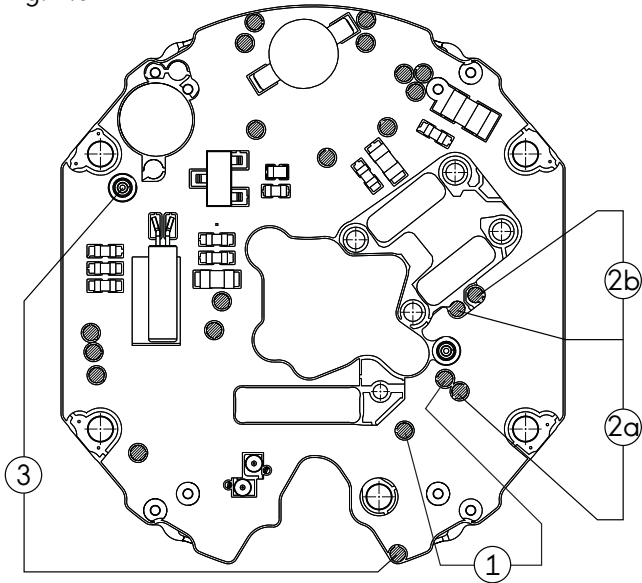
1.0 Electrical tests

Measurements in movement without battery enclosure.

For measurements with battery enclosure, measurement 3 is made directly on the piezzo contact spring.

Position	Setting of apparatus	Measurement	Test	Remarks
1	10 KΩ	2.6 - 3.4 KΩ	Condition of seconds motor coil	Measurement without battery, voltage supply 0.2 V
2a	10 KΩ	2.8 - 3.8 KΩ	Condition of minutes motor coil	Ohmmeter with a test voltage higher than 0.4 V unsuitable
2b	10 KΩ	2.8 - 3.8 KΩ		
3	10 KΩ	0.12 - 0.15 Ω	Condition of alarm coil	Recommended voltage 0.2 V Ambient temperature
-	-	3V	Battery voltage	To be tested outside of the movement

Fig. 1.0
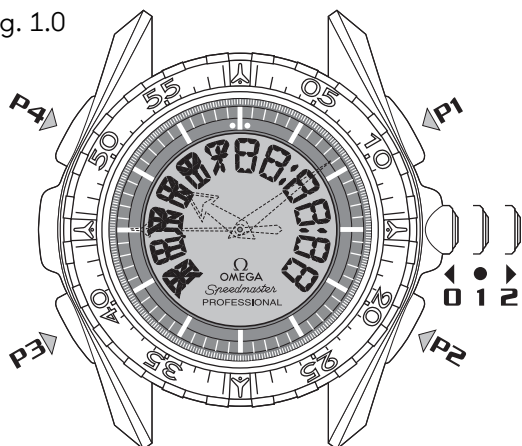
1.0 Operating instructions

Functions
The crown is the main command button for passing from one function to another. In neutral position 1, it guarantees the watch's water–resistance.
A short press on the crown makes the next function appear ; when pulled to position 2, the crown gives access to the functions commanded by push buttons P1, P2 and P3.

The different functions succeed one another in the following order:

1. TIME
2. DATE
3. ALARM
4. MISSION ELAPSED TIME (MT)
5. MISSION ELAPSED TIME ALARM (MA)
6. UNIVERSAL TIME (UT)
7. UNIVERSAL TIME ALARM (UA)
*8. COUNTDOWN (CDT)*
9. CHRONOGRAPH (CHR)

NB:
The displays are only in English.
When the crown is in neutral position 1, the screen may be lit at any time using push button P3. To save energy when the light is used, the seconds hand stops and then catches up when the light is turned off. The push button P4 can be used at any time to access to *MISSION ELAPSED TIME (MT)*.
A second press on P4 or the crown makes the previous function return. A press of more than 3 seconds clears the screen. A press on the crown or a push button makes the previous function return.

Fig. 2.0
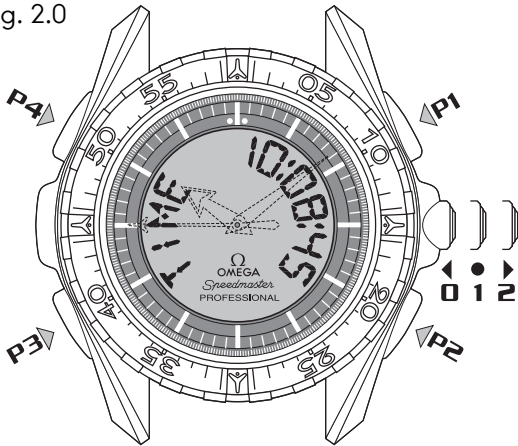
2.0 TIME

To set the digital time:

– Press the crown until $TIME$ is displayed.
– Pull out the crown to position 2 : $GO\ ON$? appears.
– Press P1, the seconds (SEC) blink.
– Press P2 to add or P3 to subtract seconds.
– Press P1, the minutes (MN) blink.
– Press P2 to add or P3 to subtract minutes.
– Press P1, the hours ($HOURS$) blink.
– Press P2 to add or P3 to subtract hours.
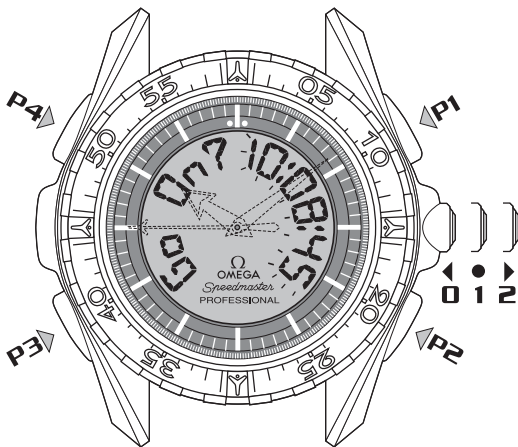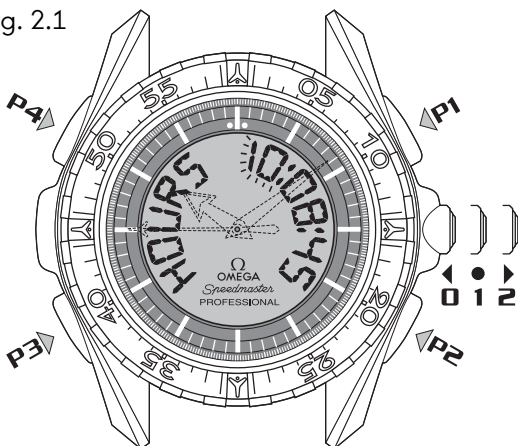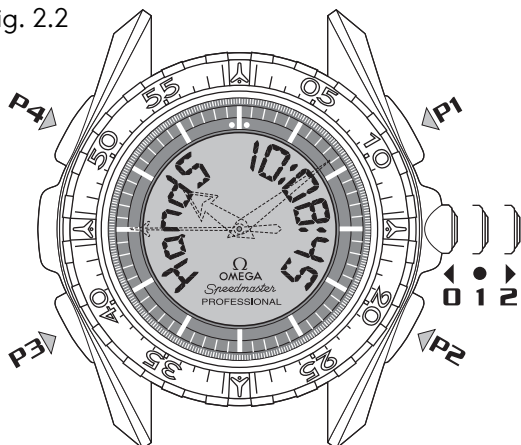– Push the crown back into position 1.

2.1 HOURS

Shortcut to the hours:

The hours can be changed directly
(e.g. change of time zone).
– Press the crown until $TIME$ is displayed.
– Press the crown for more than 3 seconds:
  $HOURS$ is displayed and the hour blinks.
– Press P2 to add or P3 to subtract hours.
– Press the crown again.

Fig. 2.1

Fig. 2.2

2.2 HANDS

To Synchronize the Hands with the Digital Time.
This is done only after the correct digital
time is set (TIME).
– Press P4 for more than 3 seconds to clear the screen.
– Pull out the crown to position 2. GO ON ? and the
   digital time are displayed.
– Press P1 : digital time stops and HANDS is displayed.
– Press P2 to make the seconds hand move forward, to
   synchronize it with the digital seconds.
– Press P1, HANDM is displayed.
– Press P2 to make the minute hand move forward or P3
   to make it move backward, to synchronize it with the
   digital minutes.
– Press P1, HANDH is displayed.
– Press P2 to make the hour hand move forward or P3
   to make it move backward, to synchronize it with the
   digital hour.
– Push the crown into position 1. The hands catch up to
   the correct time. Press the crown again to return to the
   previous function.

Attention
The minute hand jumps by ½ minute. If the seconds are
situated between 30 and 59 seconds, the minute hand
should be positioned between two minute–scale marks.

Fig. 2.3
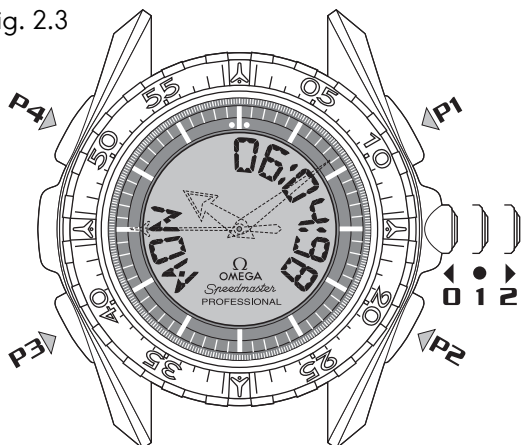
2.3 DATE

To Change the Date :

- Press the crown until the DATE function is displayed.
- Pull the crown to position 2 : GO ON ? is displayed and the date, month and year blink.
- Press P1, YEAR is displayed and the year blinks ; Press P2 to add or P3 to subtract years.
- Press P1, MONTH is displayed and the month blinks ; Press P2 to add or P3 to subtract months.
- Press P1, DAY is displayed and the date blinks ; Press P2 to add or P3 to subtract from the date. The day of the week displayed is adjusted automatically by the perpetual calendar.
- Press P1, then press P2 or P3 for D-M (date-month) or M-D (monthdate).
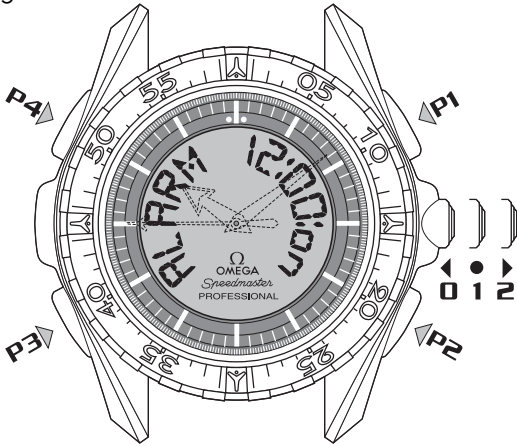- Push the crown back into position 1.

Fig. 2.4
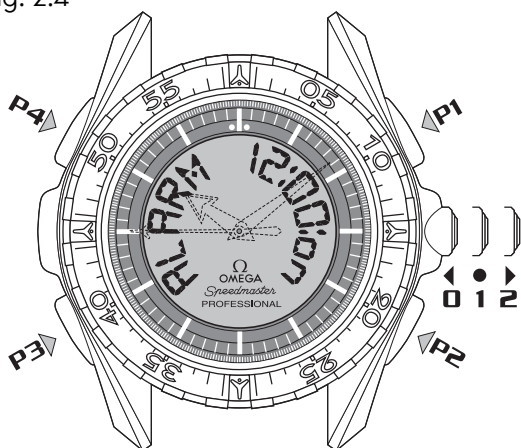
2.4 ALARM

The ALARM function rings every 24 hours for 20 seconds. When the alarm rings, the ALARM function is displayed. If the alarm ring is not stopped, a second alarm rings one minute later for 15 seconds.
- Press on the crown until ALARM is displayed.
- Press on the crown during 3 seconds or pull it into position 2. MN is displayed and the minutes blink.
- Press P2 to add or P3 to subtract minutes.

Fig. 2.4

2.4 ALARM

- Press P1 : **HOURS** is displayed and the hours blink.
- Press P2 to add or P3 to subtract hours.
- Press the crown into position 1. The **ALARM** is automatically set and **ON** is displayed.
- Press the crown or a push button to stop the alarm.
- Press P1 for more than one second to set the alarm (**ON** is displayed and sound signal is heard) or to stop the alarm (**OF** is displayed).
- Alarm ring : press P2 for more than 3 seconds to test the sound of the alarm ring.

Fig. 2.5

2.5 MISSION ELAPSED TIME (**MT**)

Description

With this chronograph function, the elapsed time of a mission of long duration can be timed. Already elapsed days, hours, minutes and seconds can be programmed before the function is started.
- Press the crown until **MT** is displayed
- Pull out the crown to position 2 : **GO ON ?** is displayed. Press P1 and **RESET ?** is displayed : press P2 or P3 for return–to–zero.

To start timing at the beginning of the mission
- Push the crown back into position 1
- Press P1 to start the timing

Adding already elapsed time
- Press P1, the seconds (**SEC**) blink.
- Press P2 to add or P3 to subtract seconds.
- Press P1, the minutes (**MN**) blink.
- Press P2 to add or P3 to subtract minutes.
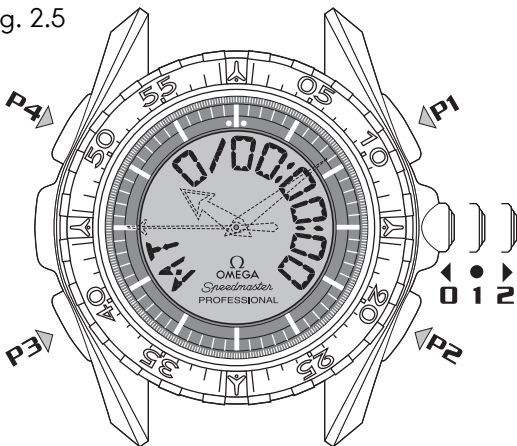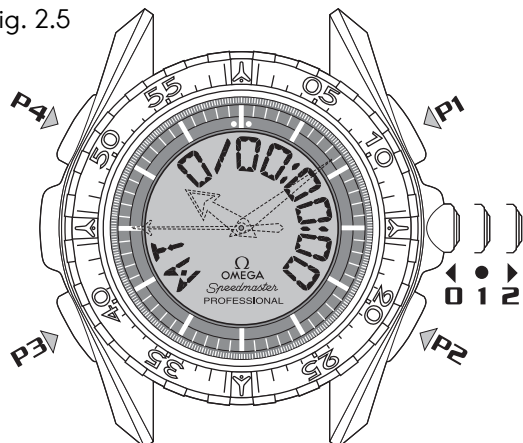- Press P1, the hours (**HOURS**) blink.
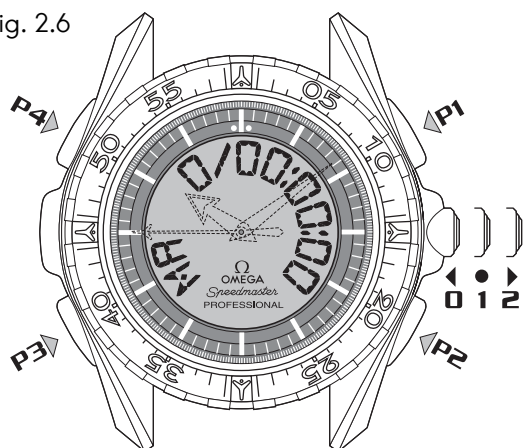
Fig. 2.5

2.5 MISSION ELAPSED TIME (MT)

– Press P2 to add or P3 to subtract hours.
– Press P1, the day number (DAYS) blinks.
– Press P2 to add or P3 to subtract days.
– Push the crown back into position 1.
– Press P1 to start the timing.

The chronograph is stopped in several steps
– Pull the crown into position 2.
– Press P1 and RESET ? is displayed.
– Push the crown into position 1.

The timing is stopped.

Fig. 2.6

2.6 MISSION ELAPSED TIME ALARM (MA)

Description

This alarm rings once, for 15 seconds, at a specified day and time. When the alarm rings, the MISSION ELAPSED TIME ALARM (MA) function is displayed. If the alarm ring is not stopped, a second alarm rings one minute later for 15 seconds.
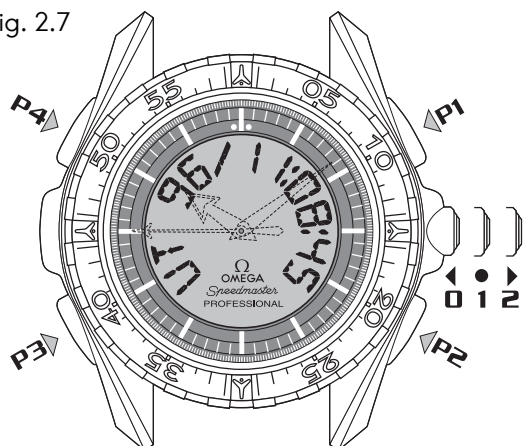– Press the crown until MA is displayed.
– Push the crown during 3 seconds or pull it to position 2. The seconds (SEC) blink.
– Press P2 to add or P3 to subtract seconds.
– Press P1, the minutes (MIN) blink. Press P2 to add or P3 to subtract minutes.
– Press P1, the hours (HOURS) blink.
– Press P2 to add or P3 to subtract hours.
– Press P1, the day number (DAYS) blinks.
– Press P2 to add or P3 to subtract days.
– Push the crown back into position 1.

The MISSION ELAPSED TIME ALARM (MA) function starts automatically.
– Press P1 for more than one second to set the alarm (sound signal is heard) or to stop the alarm (OF is displayed).
– Alarm ring: press P2 for more than 3 seconds to test the sound of the alarm ring.

Fig. 2.7

2.7 UNIVERSAL TIME (UT)

Universal Time
The UNIVERSAL TIME (UT) function makes it possible to display either GMT or a second time zone. In addition to 24 hour time, the number of the day of the year is displayed, as calculated by the perpetual calendar in the DATE function.
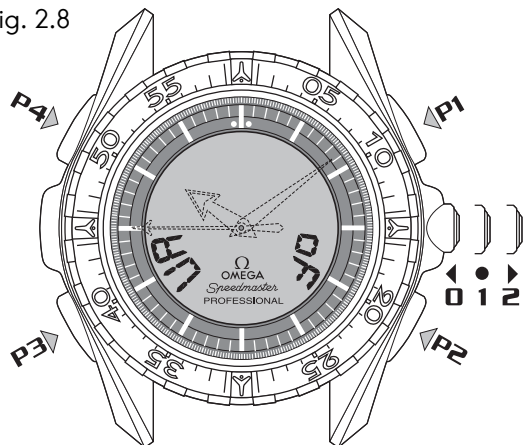
To set the Universal Time
– Press the crown until UT is displayed.
– Pull out the crown to position 2: GO ON ? is displayed.
– Press P1, the seconds (SEC) blink.
– Press P2 to add or P3 to subtract seconds.
– Press P1, the minutes (MN) blink.
– Press P2 to add or P3 to subtract minutes.
– Press P1, the hours (HOURS) blink.
– Press P2 to add or P3 to subtract hours.
– Press P1, the +/– sign of the OFFS value blink
  (see NB).
– Push the crown back into position 1.

NB
The OFFS + HH:MM value indicates the time zone difference. Press P2 or P3 to change the +/– sign to indicate if the local time (TIME) is situated east (+) or west (–) of the Greenwich meridian.

Fig. 2.8

## 2.8 UNIVERSAL TIME ALARM (UA)

Description

This alarm rings once, for 15 seconds, at a specified day and time. When the alarm rings, UNIVERSAL TIME ALARM (UA) function is displayed. If the alarm ring is not stopped, a second alarm rings one minute later for 15 seconds.

– Press the crown until UA is displayed.
– Push the crown during 3 seconds or pull it to position 2. The seconds (SEC) blink.
– Press P2 to add or P3 to subtract seconds.
– Press P1, the minutes (MN) blink.
– Press P2 to add or P3 to subtract minutes.
– Press P1, the hours (HOURS) blink.
– Press P2 to add or P3 to subtract hours.
– Press P1, the day number (DAYS) blinks.
– Press P2 to add or P3 to subtract days.
– Push the crown back into position 1.
– The UNIVERSAL TIME ALARM (UA) function starts automatically.
– Press P1 for more than one second to set the alarm (sound signal is heard) or to stop the alarm (OF is displayed).
– Alarm ring : press P2 for more than 3 seconds to test the sound of the alarm ring.

Fig. 2.9
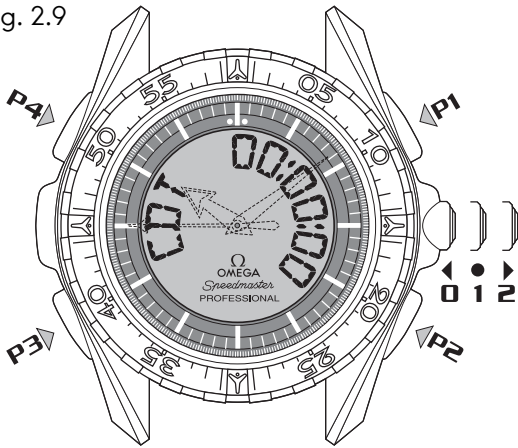
2.9 COUNTDOWN (CDT)
**To program the countdown time
(maximum countdown 99:59:59;)**

– Press the crown until CDT 00:00:00 is displayed.
– Push the crown during 3 seconds or pull it to
  position 2. The seconds (SEC) blink.
– Press P2 to add or P3 to subtract seconds.
– A (–) sign indicates the time to be counted down.
– Press P1, the minutes (MN) blink.
– Press P2 to add or P3 to subtract minutes.
– Press P1, the hours (HOURS) blink.
– Press P2 to add or P3 to subtract hours.
– Push the crown into position 1.

Start and stop of the countdown
– Press P1 to start the countdown for the time
  programmed.
– Press P1 to stop the sound signal.
– Press P2 to automatically reload the countdown time;
  press P1 to start the countdown.

The last five seconds are signaled by a brief sound
signal. As soon as the programmed time is exceeded,
a long sound signal rings every two seconds for around
15 seconds and the digital display blinks.
The Countdown continues to record the time elapsed
since the completion of the programmed countdown
(as indicated by the + sign).

Fig. 2.10
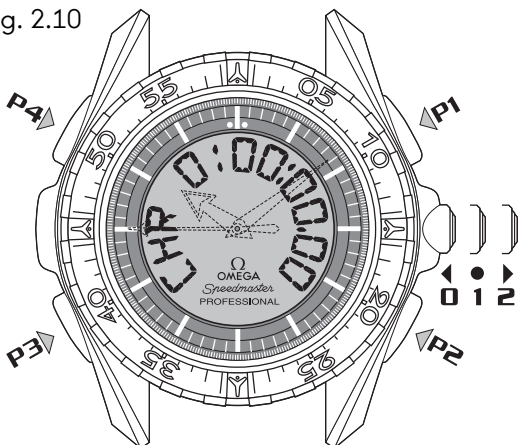
2.10 CHRONOGRAPH (CHR)
Description
The chronograph function times short time intervals to
1/100 second.
After 99 hours, 59 minutes, 59 and 99 hundredths
seconds the timing stops and returns automatically to
zero.

– Press the crown until CHR 0:00:00.00 is displayed.
– Cumulated time: press P1 start–stop, start–stop, etc.
– Split times: press P1 start, then P2 split, then P2 again to
  continue the timing.
– Stop: Press P1.
– Return–to–zero: Press P2 after pressing P1 for stop.