OUTBREAKER

USER'S MANUAL

Model: AT108/ATP108/ATC108

CONTENT

SECTION 1 INTRODUCTION

Congratulations on your purchasing the OUTBREAKER. Inside the OUTBREAKER there is implanted the advanced technology-Barocompensation. With this advanced technology the OUTBREAKER could distinguish the pressure change due to barometric change and altitude change. Using this advanced Barocompensation technology the performance of the OUTBREAKER on the altitude reading will be more reliable.

Your OUTBREAKER is a precision device for an active life. There are three models in the series:

- OUTBREAKER SMART
- OUTBREAKER PLUS
- OUTBREAKER PRO

The functions for the three models are listed in the following table, please refer to the functions list for your OUTBREAKER.

FUNCTIONS	OUTBREAKER	OUTBREAKER PLUS	OUTBREAKER PRO
Altimeter	X	X	X
Barometer	X	X	X
Thermometer	X	X	X
Calendar Clock	X	X	X
Chronometer	X	X	X
Heart Rate Monitor		X	X
Bicycle Computer			X
PC linkage	X	X	X
EL back light	X	X	X

The associated mode of each functions will be described following in this manual.

For each model there are accessories bundled with the package:

Accessories	OUTBREAKER SMART	OUTBREAKER PLUS	OUTBREAKER PRO
Wrist band	1	1	2
Heart Rate Monitor Chest Belt		X	X
Wireless Speedometer			X
Handlebar cradle with cadence meter			X
PC Docking Station (CD Rom included)			X

Note:

It is not recommended to substitute the device used for acquiring measurements required professional such as skydiving, hang gliding, paragliding, gyrocopter riding and flying small aircraft or industrial precision by the OUTBREAKER.

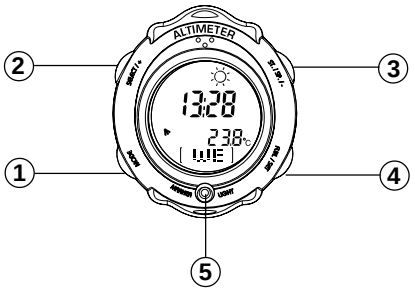
MEASUREMENTS AND UNITS

For each models there is two versions available.

MEASUREMENT FOR METRIC VERSION	MEASUREMENT FOR IMPERIAL VERSION
Date	Date
dd.mm.yy 24hr	mm.dd.yy 12hr
Temperature	Temperature
°C	°F
Altitude	Altitude
m	ft
m/s	ft/s
Barometer	Barometer
hPa	inHg
Heart rate monitor	Heart rate monitor
bpm	bpm
Bicycle computer	Bicycle computer
km/h	mile/h
rpm	rpm
km	mile
mm	inch

Note:
The unit of measurement cannot be changed either on the watch or through the PC software.

CONTROL BUTTONS



1. **MODE**
   Changes among clock, altimeter, barometer, heart rate monitor and bicycle computer
2. **SELECT/+**
   Changes among display lines or increases a value while setting
3. **START/STOP/-**
   Starts or stops the chronometer or decreases a value while setting
4. **FUNCTION/SET**
   Changes among functions in individual mode or holds to enter a setting routine
5. **LIGHT/MARKER**
   Turns on the back light or holds to set the marker during tour mode

OPERATING MODES

Refer to Fig 1 to change from one mode to the other.

Note:

Mode display varies for different models, please refer to the previous function list for detailed.

HOW TO USE THE BACK LIGHT

Press LIGHT to turn on the back light for five seconds.

Note:

a) Any key press will keep the back light to be turn on five second there when the back light is being turned on.

b) If the battery level is too low, there will be no effect when pressing the [LIGHT] button to save the battery of the unit. Once if you observe this phenomenon, change the watch battery.

SECTION 2 THE CALENDAR CLOCK, CHRONOMETER AND THERMOMETER

This section applies to all models.

Refer to diagram A to install the nylon wrist belt to the watch.

There are four display modes when the CLOCK operating mode is adopted.

Refer to fig 2 to change among the displays.

To display the daily alarm in any of these display modes, press FUNCTION (fig 2). Then press SELECT to turn on or off the alarm (fig 4a)

When the daily alarm is activated, it will sound off at the designated time. Press any control button to mute the alarm.

For OUTBREAKER PRO only

Refer to diagram B to install the additional rubber wrist belt to the watch.

HOW TO SET THE CALENDAR CLOCK

Refer to fig 3 to set the calendar clock.

Note:

The calendar clock may also set through the PC software. To connect the watch to the PC software please refers to Section 7.

HOW TO SET THE ALARM CLOCK

There are 4 alarms – 1 daily alarm & 3 event alarms equipped in the watch.

A) SET THE DAILY ALARM CLOCK ON THE WATCH

Refer to fig 4b to set the daily alarm clock.

Note:

a) The alarm will be automatically turned on during the setting procedure.

b) The event alarm is only settable by PC software only. To connect the watch to the PC sofware please refer to Section 7.

B) SET ALARM CLOCK BY PC SOFTWARE

The alarms may also set through the PC software. To connect the watch to the PC software please refer to Section 7.

HOW TO USE THE CHRONOMETER

When the chronometer is displayed, use START/STOP to start or stop a count up. Pressing the same button after stopping the count up will clear the chronometer. Refer to fig 5 for the operation.

Note:

Chronometer could be activated in various modes, please also refer to Section 3 –6.

HOW TO USE THE TIMER

Refer to fig 6 to set the timer.

To start the timer, press START/STOP. To stop, press the button again. Press the same button a third time to resume the count down. Refer to fig 7 for the operation.

Note:

When the timer reaches the preset time, it will count up as a chronometer automatically.

THE THERMOMETER

Your OUTBREAKER is equiped with a thermometer. Refer to Fig 2 to display the temperature in clock mode.

Note:

a) When the OUTBREAKER is worn on wrist, the temperature measured could be affected by the body heat. Remove the OUTBREAKER from the wrist and allow 15 minutes at least before reading the temperature to acquire an accurate reading.
b) The temperature could also be displayed in various modes, please also refer to Section 3 - 4.

SECTION 3 THE ALTIMETER

This section applies to all models.

Your OUTBREAKER is equipped with an intelligent barometer that help determine altitude by the built-in sensor with the advanced Barocompensation technology, the sensor can also distinguish the differences between pressure caused by changes in physical altitudes or pressure caused by weather conditions. This smart distinction eliminates discrepancies and makes the altimeter reading more accurate than the average devices.

DISPLAY MODES

There are four display modes in ALTIMETER:

- Altitude and clock
- Altitude and local barometric pressure
- Altitude and chronometer
- Altitude and temperature

Refer to fig 8 to change among the displays. Within the four display modes there are four functions can be recalled:

- Altitude memory
- Altitude alarm
- Climbing speed
- Climbing speed memory

Note:

The chronometer can also be activated under the climbing speed mode (fig 8a).

HOW TO SET THE CURRENT ALTITUDE

When you first use the OUTBREAKER, you should set the current altitude – that is the known altitude at the current location. You can obtain the correct altitude from a topographical map.

Refer to fig 8b to set the reference altitude.

Note:

The altitude could be re-calibrated in another way by input the sea-level pressure through the PC software. To connect the watch to the PC software please refer to section 7.

HOW TO SET THE ALTIMETER ALARM

Refer to fig 9 to set the altimeter alarm.

Once the altitude alarm is set, your OUTBREAKER will emit an alarm when the set altitude is exceeded.

Note:

a) Both ascending and descending altitude alarm is equipped in the watch.

b) The altitude alarm as far as the duration of the alarm may also set through the PC software. To connect the watch to the PC software please refer to Section 7.

MAXIMUM AND ACCUMULATED ALTITUDE

You may recall the maximum ascending or descending altitude as far as the total altitude for ascending and descending. You may also erase this memory record. (fig 10)

Note:

a) please refer to Section 7 for overall erase memory record.

b) This feasture can be applied companied with the PC docking station. You may set the threshold value of altitude change on the watch for the total ascending / descending altitude memory through the PC software. To connect the watch to the PC software please refer to section 7.

RATE OF CHANGE IN ALTITUDE

You may monitor the actual rate of change in altitude during your trip. The maximum ascending speed as well as the descending speed will be recorded automatically. You may recall and erase this memory record (fig 11).

Note:

please refer to Section 7 for overall erase memory record.

SECTION 4 THE BAROMETER

This section applies to all models.

There are two display modes in BAROMETER:

- Sea pressure and clock
- Sea pressure and temperature

Refer to Fig 12 to change among the display mode.

HOW TO SET THE SEA LEVEL PRESSURE

When you first use the OUTBREAKER, please calibrate the sea level pressure. It will not be altered due to the change in the altitude but with regard to the barometric change only.

You can obtain the current sea level pressure from newspaper, local news and radio weather reports or through the internet weather station.

Refer to fig 12a to set the sea level pressure. Repeat this procedure after changing the battery or after one year of operation.

BAROMETRIC HISTORY

Your unit retains the hourly barometric pressure for the past 24 hours. Refer to fig 12b to recall the reading for a certain hour.

WEATHER FORECAST

Apart from determining the altitude, the barometer also helps forecast the weather for the forthcoming 12 to 24 hours basing on barometric pressure changes. The effective range is 30 to 50 km.

The forecast will be automatically displayed in one of these four icons:

Indicator displays on the unit				
Forecast	Sunny	Slightly cloudy	Cloudy	Rainy

Note:

a) The weather forecast could be affected by oceanic or continental weather phenomenon. It is not responsible for any inconveniences so caused by an inaccurate forecast.

b) The weather forecast is meant for the next 12 to 24 hours. It may not necessarily reflect the current situation.

c) The "Sunny" icon, when appears at night, implies clear weather.

d) To have a faster respond to the weather forecast, you may match the current weather to the watch first by setting the weather forecast icon to the watch via the PC software. To connect the watch to the PC software please refers to section 7.

SECTION 5 THE HEART RATE MONITOR

This section applies to OUTBREAKER PLUS & OUTBREAKER PRO only.

THE CHEST BELT

The chest belt is used to count your heartbeat and transmit the data to the receiver on the OUTBREAKER. To put it on (diagram C),

a) Wet the conductive pads on the underside of the transmitter with water, sweat or a conductive gel to ensure a solid contact.

b) Strap the belt across the chest. Adjust the strap until the transmitter sits snugly below the pectoral muscles for an accurate heart rate signal.

Hints:

- The position of the transmitter affects its performance. Move the transmitter along the strap for the best transmission. Avoid areas with dense chest hair.
- In dry, cold climates, it takes the transmitter a while to function steadily. This is normal as the conductive pads need a film of sweat to improve contact with the skin.

EFFECTIVE RANGE

The transmitter and receiver will start transmitting and receiving signals once batteries are in place. Both units should be worn or mounted within an effective distance of 62.5 centimeters (25 inches). If the signals have become unsteady,

- Shorten the distance between the transmitter and receiver.
- Re-adjust the position of the transmitter.
- Check the batteries. Replace them when necessary.

DISPLAY MODES

There are two display modes in HEART RATE:

- Heart rate and chronometer
- Heart rate and clock

Refer to fig 13 to change among the display modes.

HOW TO MEASURE HEART RATE

Select either display mode in HEART RATE. The ♥ indicator will flash with the heart rate captured and the measurement will start from 0. The measuring range is 25 to 240 beats per minute.
When no signals are received or the measurement is out of range for five minutes, the receiver will disable the function and return to the previous operating mode automatically.
When the heart rate is displayed, you can go to other functions while measuring the heart rate in the background.

Note:

When you are measuring your heart rate, keep the watch away from signal generated sources e.g. PC, Television, car engine etc., othe wise irregular signal will be observed.

HOW TO SET HEART RATE LIMITS

The heart rate limits help you determine if you are exercising within your training zone. There are five preset training zones for you to select or you can set them between 50 to 240 beats per minute. You may select the preset training zone or alter the setting on the unit or through the PC software (To connect the watch to the PC software please refers to Section 7). When the heart rate alert alarm is activated, an audible beep sound will flash whenever you go above or below your limits.
Refer to fig 14 to set the heart rate limits and the heart rate alert alarm.

Note:

a) The upper limit must be set higher than the lower limit.
b) The alarms may also set through the PC software. To connect the watch to the PC software please refers to Section 7.

HEART RATE HISTORY

Your OUTBREAKER is capable of retaining 99 heart rate records. Each record contains:

- A time and date stamp
- Average heart rate and total exercise time
- Upper limit and time above limit
- Lower limit and time below limit
- Time within limit

Refer to fig 13a to scroll on the records.

Note:

When a record is selected, the information embedded in the record will be scrolled automatically.

SECTION 6 THE BICYCLE COMPUTER

This section applies to OUTBREAKER PRO only.

Before operating the bicycle computer, attached the bicycle computer to the receiver as shown in diagram D-E.

Note:

a) The maximum distance between the sensor magnet and sensor should be 5 mm (3/16 inches).
b) To ensure a secure signal transmission between the sensor magnet and sensor, the centre of the magnet should be aligned with the marker on the sensor.
c) The sensing distance between the wireless speedometer sensor and the handlebar cradle is around 1 m (39 inches).

The bicycle computer has three display modes:

- Bike speed and chronometer
- Bike speed and trip time
- Bike speed and clock

Refer to fig 15 to change among the display modes.

HOW TO SET THE BIKE CIRCUMFERENCE

For the bicycle computer to function properly, you have to set the wheel circumference for your bike.

Refer to fig 15a to set the wheel circumference.

Note:

a) You can obtain the wheel circumference by running a wheel-sized on one-revolution rollout test to your bike.

b) You may also set the circumference to the unit through the PC software. To connect the watch to the PC software please refer to Section 7.

c) You may select to input the wheel diameter instead to the PC software, it will convert the wheel circumference automatically for you to download to the unit.

d) In the PC software it can have various set of wheel size to be stored for your selection.

PERFORMANCE MEMORY

The bicycle computer retains and automatically clears and updates the following information:

- Wheel speed – obtained by the wireless sensor
- Cadence (the pedal speed) – obtained by the cabled sensor (linked to the handlebar cradle)

Refer to fig 16 to display such information.

A) WHEEL SPEED

There are four difference informations could be obtained.

- Average speed
- Maximum speed
- Tour distance
- Total distance travel

Refer to fig 17 to display such information and fig 18a to clear the memory.

Note:

a) The effective transmission distance between the handlebar cradle and the wireless speed sensor will be around 100cm (39 inches).

b) Please refer to Section 7 for overall erase memory record.

B) CADENCE

There are two display modes for the cadence measurement.

- Cadence and chronometer
- Cadence and clock

You could retain the average cadence and the maximum cadence in this mode.

Refer to fig 18 to display such information and fig 18a to clear the memory.

Note:

please refer to Section 7 for overall erase memory record.

SECTION 7 ADDITIONAL INFORMATION

This section applies to all models.

KEY LOCK

You may found that the OUTBREAKER is equipped with a key lock function to avoid any mis-touch of any key during the activities. To activate the function, simply press and hold SELECT. Press and hold the SELECT again to release the key lock function.

Refer to fig 19 on the LCD display in various when the key lock function is activated.

TOUR MODE

The tour mode retains tour memory for the ALTIMETER, BAROMETER, HEART RATE and BIKE operating modes.

To activate the tour mode, hold MODE and FUNCTION simultaneously in any of the above operating modes. The tour number and total memory used will be displayed. Press and hold FUNCTION to disable or enable the tour function. You can temporary stop the recording by making rest on one single tour.

Refer to Fig 20 for the operation.

Note:

a) Once the tour function is disable when it is activated again, a new tour memory will be started instead.

b) Tour memory can only be retreived on the PC with the PC docking station together with the PC software only.

c) Tour memory cannot be erased by the operation on the watch, it can be erased through the PC software only.

d) Difference information such as temperature, altitude, heart rate, wheel speed, cadence, trip distance etc. could be selected being recorded for the tour through the PC software.

MARKER

The marker function is used to mark a particular position of a tour. To use the marker, press and hold MARKER when the tour mode is in place.

Note:

The marker will only be observed in the data on the PC after download the tour record from the watch.

OVERALL ERASE MEMORY RECORD

All the maximum/minimum record on the unit could be erased together at once. Refer to fig 21 for the operation.

Note:

The tour memory record may not be affected.

PC LINKAGE

The PC docking station allows you to transfer data between your OUTBREAKER and a PC through RS232C connection.

To link up with a PC,

1. Connect the docking station to the PC with the linkage software pre-installed.
2. Sit the Outbreaker into the docking station.
3. Select the connection operation on the PC software. A 10-second linkage initiation will follow.

Note:

a) The PC download feature is availabe for all models. But it could only be done with the PC docking station only. For OUTBREAKER SMART and OUTBREAKER PLUS user please contact the nearest retailer for the optional PC docking station.

b) When the OUTBREAKER is plugged to the docking station ,it will switich to PC download mode automatically . (Fig1a.)

c) The cadence, speed and heart rate functions will be temporarily disabled during the PC communication.

BATTERY INFORMATION

The OUTBREAKER, chest belt and handlebar cradle each uses a CR2032 3V lithium battery, while the bicycle computer transmitter uses an E23A/MA/21-V23 12V alkaline battery. Batteries for initial testing are included with the package.

When the battery of the OUTBREAKER is running low, the low-battery indicator will light up and the back light will be restricted not to turn on to save the battery power. As for the transmitters, they stop transmitting signals when the battery is dry.

To change the battery, refer to diagram F.

Note:

If not disposed of properly, batteries can be harmful. Protect the environment by taking exhausted batteries to authorized disposal stations.

PRECAUTIONS

- Read the user's manual thoroughly.
- Do not subject the unit to excessive force, shock, dust and temperature.
- Do not tamper with the unit's internal components.
- Do not mix fresh and old batteries, or batteries of different specifications.

SPECIFICATIONS

Metric version

Calendar clock

Date and time format	:	dd.mm.yy and 24hr
100 years auto-calendar	:	2001-2100
Alarm	:	1 daily alarm (hh:mm) 3 event alarms (hh:mm, dd.mm.yy)
Chronometer/Timer	:	99:59:59

Thermometer

Range	:	-10.0 … 60.0°C
Resolution	:	0.1 °C
Accuracy	:	+/-1 °C

Altimeter

Altitude Range	:	-400 … 9,000m
Resolution	:	1m
Accuracy	:	+/-10m
Vertical speed	:	-50 … 50m/s
Vertical speed resolution	:	1m/s
Max change in altitude	:	+/-60,000m
Total change in altitude	:	+/-999,999m
Alert alarm	:	1 altitude alarm

Barometer

Local pressure range	:	300 … 1100hPa
Sea level pressure range	:	900 ... 1100hPa
Resolution	:	1hPa
Accuracy	:	+/-3hPa

Heart rate monitor

Heart rate range	:	25 … 240bpm
Resolution	:	1bpm
Accuracy	:	+/-1bpm
Heart rate zone	:	5
Heart rate alert limit	:	50 … 240bpm
Alert alarm	:	2 heart rate limit alarm
Number of memory	:	99

Bicycle computer

Wheel speed range	:	0 … 150km/h
Wheel speed resolution	:	1km/h
Cadence range	:	0 … 250rpm
Cadence resolution	:	1rpm
Max trip distance	:	999.9km
Max total distance	:	99,999.9km
Wheel circumference	:	1,000 … 3,000mm
Circumference resolution	:	1mm

Tour mode

Record time(5 sec sampling time) OUTBREAKER SMART (Altitude / Pressure / Temperature)	:	508min

OUTBREAKER PLUS (Heart rate / Altitude / Pressure / Temperature)	: 508min
OUTBREAKER PRO (Distance / Cadence /Heart Rate / Altitude / Pressure / Temperature)	: 753min

Environment

Operation	: -10 … 60 °C
Storage	: -5 … 70 °C at 10% … 95%RH
Water resistance	: not actuating keys to 30m

Power source

Wrist watch	: 1 x CR2032 3V lithium battery
Chest belt	: 1 x CR2032 3V lithium battery
Handlebar cradle	: 1 x CR2032 3V lithium battery
Wheel speed transmitter	: E23A/MA21-V23 12V alkaline battery

Imperial version

Calendar clock

Date and time format	: mm.dd.yy and 12hr
100 years auto-calendar	: 2001-2100
Alarm	: 1 daily alarm (hh:mm) 3 event alarms (hh:mm, mm.dd.yy)
Chronometer/Timer	: 99:59:59

Thermometer

Range	: 14.0 … 140.0°F
Resolution	: 0.2 °F
Accuracy	: +/-2°F

Altimeter

Altitude Range	: -1,312 … 30,000ft
Resolution	: 3ft
Accuracy	: +/-30ft
Vertical speed	: -150 … 150ft/s
Vertical speed resolution	: 3ft/s
Max change in altitude	: +/-180,000ft
Total change in altitude	: +/-999,999ft
Alert alarm	: 1 altitude alarm

Barometer

Local pressure range	: 8.86 … 32.48inHg
Sea level pressure range	: 26.58 ... 32.48 in Hg
Resolution	: 0.03inHg
Accuracy	: +/-0.1 inHg

Heart rate monitor

Heart rate range	: 25 … 240bpm
Resolution	: 1bpm
Accuracy	: +/-1bpm
Heart rate range	: 5
Heart rate alert limit	: 50 ... 240bpm
Alert alarm	: 2 heart rate limit alarm
Number of memory	: 99

Bicycle computer

Wheel speed range	: 0 ... 100 mile/h
Wheel speed resolution	: 1 mil/h
Cadence range	: 0 ... 250rpm
Cadence resolution	; 1rpm
Max trip distance	; 999.9mile
Max total distance	: 99,999.9mile
Wheel circumference	: 39.00 ... 118.00in
Circumference resolution	: 0.04in

Tour mode

Record time(5 sec sampling time)

OUTBREAKER SMART (Altitude / Pressure / Temperature)	: 508min
OUTBREAKER PLUS (Heart rate / Altitude / Pressure / Temperature)	: 508min
OUTBREAKER PRO (Distance / Cadence /Heart Rate / Altitude / Pressure / Temperature)	: 753min

Environment

Operation	: 14 ... 140°F
Storage	: 23 ... 158°F at 10% … 95%RH
Water resistance	: not actuating keys to 99ft

Power source

Wrist watch	: 1 x CR2032 3V lithium battery
Chest belt	: 1 x CR2032 3V : lithium battery
Handlebar cradle	: 1 x CR2032 3V lithium battery
Wheel speed transmither	: E23A/MA21-V23 12V alkaline battery

NOTE ON COMPLIANCE

Warming: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

R&TTE Compliance Note

This product complies with the essential requirements of Article 3 of the R&TTE 1999/5/EC Directives, if used for its intended use and that the following standard(s) has/have been applied:

Efficient use of radio frequency spectrum (Article 3.2 of the R&TTE Directive) applied standard(s): ETSI 300 330-2:(2001-6)

Electromagnetic compatibility (Article 3.1.b of the R&TTE Directive) applied standard(s): EN 301 489-3:V1.21(2000)

Safety of information technology equipment (Article 3.1.a of the R&TTE directive) applied standard(s):EN 60950:1997

Additional information:

The product is therefore conform with the Low Voltage Directive 73/23/EEC and 93/68/EEC the EMC Directive 89/336/EC and R&TTE Directive 1999/5/EC (appendix IV) and carries the respective CE marking.

VS-Villingen / Germany September 2001
Gerhard Preis
EC representative of manufacturer

CE 0359 ⓘ

RTTE Compliant Countries :
All EU countries, Switzerland (CH)

And Norway (N)

CAUTION

- The content of this manual is subject to change without further notice.
- Due to printing limitation, the displays shown in this manual may differ from the actual display.
- The contents of this manual may not be reproduced without the permission of the manufacturer.