Safe Marine Limited

User Guide

for

WRIST WATCH PLB

GAS 6059 / 6060

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1. INTRODUCTION

This User Guide is intended to outline to the end user the functions and operations of the wrist watch PLB unit.

Both variants of the unit are covered, GAS 6059 and GAS 6060.

GAS 6059 is the 121.5 MHz Emergency channel unit,

GAS6060 is the 121.65 MHz test channel unit

1.1. Glossary

The following abbreviations are used in this document

EPIRB	Emergency Position Indicating Radio Beacon
DF	Direction Finder
PLB	Personal Locator Beacon
WWPLB	Wrist Watch PLB
MOB	Man Overboard

1.2. References

EN 50014: 1997

EN 50020: 1994

ETSI EN 300 152 European Telecommunications standard

BASEEFA EXN 2C approved for use in Zone 2 areas.

2. Overview

The Wristwatch Personal Locator Beacon is a wrist worn low power radio transmitter with an integral antenna and a built-in time movement (Watch).

The WWPLB is comprised of a radio transmitter and antenna, LCD time movement, 3V Lithium battery (CR2), Fibreglass housing with rugged watchstrap.

The WWPLB is intended to be worn by personal at sea or offshore oil installation. One of the major hazards is falling overboard and either not being noticed or not being able to locate the person once in the water. The WWPLB significantly increases the chance of locating a person lost overboard at sea.

When the activated (manually or when immersed in water), the WWPLB transmits a signal on the international SAR frequency which rescuers would home onto using a special radio receiver and antenna. These receivers are tuned to 121.5Mhz, which is the International frequency for Emergency Position Indicating Radio Beacon's (EPIRB's). The WWPLB transmits a swept tone on that emergency frequency. The swept tone signal is of sufficient power to be heard by a special receiver fitted on a vessel / oil platform or a rescue vessel / helicopter listening on the emergency frequency of 121.5 MHz. The homing direction finder equipment is also used to locate the WWPLB / MOB.

3.   WWPLB features and Functions

3.1.   Transmitter

The WWPLB features a Radio Frequency Transmitter with a built in antenna.   The
design is developed to transmit on the 121.5MHz frequency. The ETSI EN 300 152
European Standard is used as a guidance for the RF transmitter development.
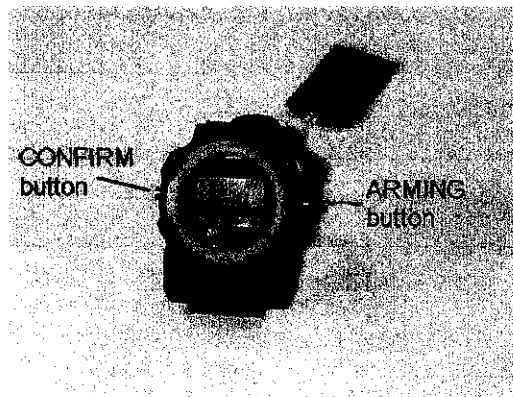
3.1.1.   Transmitter Control

The transmitter can be set into one of 3 modes

1.   Off.
2.   Test – Temporarily transmitting at $1/10^{th}$ of full power.
3.   Transmitting – Permanently firing on full power.

The activation system can be triggered by one of 2 methods

1.   Manually
2.   Automatically – by water immersion

3.1.2.   ARM & CONFIRM Button Control

Status Verification
To verify the arming status of the WWPLB, press and hold the ARMING button only.
The WWPLB will acknowledge with beeps and LED flashes while the button is pressed.

A single 'beep-beep' with an accompanying LED flash indicates that the water activation
is disarmed.

Continuously repeating 'beep-beep' with LED flashes indicates that water activation is
armed.

Test Mode
To put the WWPLB in test mode, press and hold the CONFIRM button. At 3 seconds
there is a single beep and a single LED flash to confirm WWPLB test mode followed by
low Power RF Transmission. The internal sounder will buzz to indicate when the unit is
transmitting. Once the CONFIRM button is released, the transmission ceases

ARM

To set the WWPLB in ARM mode it takes two steps:

Step 1: Press the CONFIRM button 3 times.
A single beep and LED flash will confirm step one.

Step 2: Press the ARMING button once
The WWPLB will acknowledge with a double beep and LED flash.
Once it is ARMED the LED will flash once every minute to indicate that it is in ARM mode.

DISARM

To DISARM the WWPLB it takes two steps:

Step 1: Press the CONFIRM button 6 times.
A single beep and LED flash will confirm step one.

Step 2: Press the ARMING button once.
The WWPLB will acknowledge with a double beep and LED flash.

Transmit (Manually)

To start transmitting manually, press and hold both the ARMING and CONFIRM buttons for 3 seconds. The WWPLB will acknowledge with a double beep and LED flash. The WWPLB will know start to Transmit on full power.

To stop transmitting the Disable Transmitting sequence must be performed.

Disable Transmitting

To stop transmitting manually, press and hold both the ARMING and CONFIRM buttons for 6 seconds. The WWPLB will acknowledge with a double beep and LED flash.

3.1.3. Water Sensor

The WWPLB housing has 2 stainless steel sensors that are exposed the outside of the main housing. These sensor Pins make contact to the WWPLB circuit via contact Clips that are solder into the WWPLB board. To minimise false water activation the unit must be submerge into water for a minimum for 4 seconds.

The Water Activation Sensor will only function when the WWPLB is in the ARMED mode.

3.1.4. LED indicator

The LED indicator is used as a visual feed back for Mode setting confirmation (i.e. one flash/minute to indicate ARM status) and Button pressed confirmation. The LED is imbedded into the WWPLB board. A clear lens is used to conduct the LED light through the Wristwatch housing.

When the WWPLB unit is in ARM mode, the LED will flash once every Minute.
The LED will also flash for Button pressed confirmation, Mode set confirmation and Test transmit or Full power transmit Swept Tone Audio confirmation.

3.1.5. Audio Feedback

The WWPLB circuit board drives a Piezo-Electric as a sounder. The sounder is located inside the rear cover of the unit, and buzzes when required

3.2. Antenna

The antenna is an etched trace on a printed circuit board with the same dimension as the WWPLB board. The antenna is design is part of a "sandwich" assembly. Both the WWPLB board and the antenna board are mounted into a plastic spacer washer thus making it a single assembly.

3.3. Battery

The battery is a cylindrical crimp-sealed Manganese Dioxide Lithium Battery (spiral type).

-Type		CR2
-Nominal Capacity*		750mAh
-Nominal Voltage		3 Volt
-Max Discharge Current		1000mA
-Operating Temperature Range		-20°C ~ +70°C
-Weight		11 g
-Dimensions	Height	27.0 mm
	Diameter	15.6 mm
-Battery shelf life		10 years

- Nominal capacity is determined to an end voltage of 2.0V when the battery is allowed to discharge at a standard current level at 23°C.

3.3.1. Precautions in Using Batteries

- Avoid inserting batteries into antistatic materials or wrapping with any conductive sheets, this may cause a voltage drop or consumption of the capacity.
- Do not place two or more batteries loosely in a bag or a container: external shorts between batteries may cause a voltage drop or reduced capacity.

3.3.2. Battery Storage Precautions

- Avoid storing batteries at unusually high or low temperatures.
- Keep batteries in a low-humidity location with little temperature variation. If batteries are kept in a humid place, moisture may condense on them exerting an adverse influence on their electrical characteristics.
- Keep batteries away from direct sunlight.

3.4.   LCD Timepiece Features and Functions

Built-in LCD Time Movement. The movement uses 4 external push buttons (Start, Reset, Mode and Light) for setting and adjustment. The following features are included:

1. Hour, Minute, Seconds and Day of the Week

2. Month and Date

3. Chronograph 1/100 Second with Lap/Split Control

4. 4 Year Calendar

5. Alarm with Chime

6. 30 Second correction for synchronisation

7. 12/24 Hour display for user's option

8. Maximum count: 23Hours 59 Minutes 59 Seconds.

3.4.1. Switch Control

Normal Readout:

1. Press START once: Month, Date and Day of Week

2. Press RESET once: Alarm Time

3. Press MODE once: Chronograph Function

4. Press LIGHT once: EL Light

3.4.2. Setting Sequence

A) Normal Time Setting

1. Press Mode 3 times to get normal time setting mode. "Sec" will start flashing, press Start for synchronisation.

2. Press Reset once: "Min" flashing, press Start to advance.

3. Press Reset once: "Hour" flashing, press Start to advance ("A" is AM, "P" is PM and "H" is 24 hour format).

4. Press Reset once: "Date" flashing, press Start to advance.

5. Press Reset once: "Month" flashing, press Start to advance.

6. Press Start once: "Day of Week" flashing, press Start to advance.

7. Press Mode once: Setting completed, return to normal time readout.

B) Alarm Times Setting

1. Press Mode twice, Alarm Time "Hour" flashing, press Start to advance.

2. Press Reset once, Alarm Time "Min" flashing, press Start to advance.

3. Press Mode once, setting is completed, return to normal time readout.

3.4.3. Alarm Function

1. Armed Alarm by pressing Start & Reset simultaneously, "ALM" flag will appear.

2. Disarmed Alarm by pressing Start & Reset simultaneously, "ALM" flag will disappear.

3.4.4. Chime

1. Chime is activated by pressing and holding Reset, then pressing Mode once, the "SU through SA" flags appear.

2. Deactivate Chime by pressing and holding Reset then pressing Mode once, the "SU through SA" flags disappear.

3.4.5. Chronograph

Press Mode once to get into "Chronograph" mode. Use the Start button to start and stop a counting event. During a counting, pressing Reset will enter the watch into LAP time mode, meaning 1 portion of the counting is registered on the display while the counting continues until completed by pressing Start then press of Reset. The timing can be reset back to "0:00:00" by stopping the counter and pressing Reset.

3.5. WWPLB Housing

The WWPLB main housing is made of Fibreglass. Fibreglass is proven to be an excellent material to enclose RF radiators, like antennas from the elements. Fibreglass is also rugged and can be made to be watertight at high water pressure.

3.6. Housing Strap

The total length of the WWPLB including the strap is 295mm long. It is a requirement to have the WWPLB be worn by people with small to large wrists directly on their wrist or on their wrist over a survival suite. The strap is design to be easily replaced in case it is damaged. A Stainless steel wristband pin secures each of the straps.

4.   Specifications

4.1.   Environmental

* Operating Temperature Range: -20°C ~ +70°C
* Water Pressure Rated: to 50 metres or 5 atm

4.2.   Electrical

RF transmitter

* Frequency: 121.5MHz (121.65MHz GAS 6060)
* Class of Emission   A3X
* RF Power: Up to -25 dBm
* Frequency Error: +/- 3.5KHz
* Duty Cycle: 100%

* Modulation Type: Sweep downward from 1.3KHz to 600Hz
    With sweep repetition rate of 3Hz
* Modulation duty-cycle: 40% (When unit is activated)

Power

* Voltage: 3.2 Volts max. (CR2 Lithium Battery)
* Current draw: 20uAmps Quiescent
    110mAmps Transmitting

4.3. Approvals

4.3.1. Ex rating

The WWPLB is certified under the European Standard which specifies the construction and testing of intrinsically safe apparatus, intended for use in potentially explosive atmospheres and for associated apparatus, which is intended for connection to intrinsically safe circuits which enter such atmospheres.

The WWPLB is rated "EEx ib IIB T5"

With the applicable standards:
-EN 50020: 1994
-EN 50014: 1997

4.3.2. ETSI EN 300 152 European Standard

A formal review by the Marine Type Approvals agency (DERA) determined that the WWPLB is not subject to meet all of the specifications set by the ETSI EN 152 Standard for maritime Emergency Position Indicating Radio Beacons (EPIRBs). The following is a list of test required under the R&TTE directive;

- For Radio Testing:

  EN 300 152

  Clause 8.1 Frequency Error

  Clause 8.5 Radiation produced by the operation of the test facility

  Clause 8.6 Spurious Emissions

- For EMC Testing

  EN60945: 1997

  Clause 9.3 Radiated emissions from enclosure port

  Clause 10.4 Immunity to radiated radio frequencies

  Clause 10.9 Immunity to electrostatic discharge