

## **MOBILARM V100 VPIRB TECHNICAL SPECIFICATIONS**

*(amalgamated from all applicable standards)*

### **DSC TRANSMITTER**

*In accordance with ITU Recommendation ITU-R M.493-11:*

Frequency: 156.525 MHz

Class of emission: G2B.

Frequency tolerance: not to exceed 10 parts per million.

Necessary bandwidth: less than 16 kHz.

Spurious emissions: shall not exceed 75 dB $\mu$ V/m, when measured in the vertical plane at a distance of 10 m from the antenna.

Output power: at least 1W.

The emission should be vertically polarized at the source.

Frequency modulation with a pre-emphasis of 6 dB/octave (phase modulation) with frequency-shift of the modulating sub-carrier between 1 300 and 2 100 Hz; the sub-carrier being at 1 700 Hz;

Frequency tolerance of the 1300 and 2100 Hz tones: +-10 Hz;

Modulation rate: 1200 bauds.

Modulation index: 2.0 + 10%.

### **DSC MESSAGE FORMAT**

*In accordance with ITU Recommendation ITU-R M.493-11, table 4.1, line 1:*

Nature of distress indication: "Man overboard" (symbol 110)

### **RADIOTELEPHONE TRANSMITTER**

Frequency: 156.8 MHz (or other frequency if required by local considerations)

Class of emission: G3E (frequency modulation with a pre-emphasis of 6 dB/octave)

Frequency tolerance: not to exceed 10 parts per million.

Maximum deviation: +- 5 kHz

Spurious emissions: shall not exceed 75 dB $\mu$ V/m, when measured in the vertical plane at a distance of 10 m from the antenna.

Output power: at least 1W.

The emission should be vertically polarized at the source.

### **RADIOTELEPHONE DISTRESS MESSAGE FORMAT**

The beacon shall only transmit a synthesised voice message after a valid fix has been obtained from the in built GPS receiver.

Message format:

MAYDAY MAYDAY MAYDAY  
THIS IS (UNIQUE IDENTIFICATION NUMBER)  
MAN OVERBOARD  
POSITION xx.xxS/N xxx.xxE/W  
REPEAT  
POSITION xx.xxS/N xxx.xxE/W  
TIME XXXX UTC

### **EQUIPMENT CONTROLS**

The equipment shall be fitted with the following controls:

- ARMED** In the **ARMED** mode, the transmitter is normally inactive, but automatically activates when the unit is immersed in water.
- ON** In the **ON** mode, the transmitter is activated, whether in or out of the water. This function must be provided by a separate mechanism in addition to the automatic actuator.
- TEST** See Test Mode paragraph below.
- OFF** In the **OFF** mode, the transmitter is deactivated.

When the beacon has been automatically or manually activated, no transmission should occur for the first 20 second of operation (to allow users to deactivate the device if it is an inadvertent activation).

The water-activation function shall be protected against inadvertent activation from salt-water spray or rain. The water contacts should be physically protected from spray and a short electronic delay in activation should be used to avoid inadvertent activation of the water switch.

### **TEST MODE**

The device shall include a self-test facility designed to test the beacon's radio frequency circuitry. The test facility shall be capable of operation only by mechanical actions that are distinctly separate from those normally required for activation of the transmitter.

These actions shall be designed so as to preclude accidental operation of the test facility and shall be non-locking. During the self test function, the beacon shall transmit in such a way that it will not cause a distress alert to be radiated.

### **STROBE LIGHT**

An inbuilt strobe light shall commence operation immediately the beacon is activated and is radiating RF energy, and shall remain on until the beacon is switched off or the batteries expire.

### **AUDIBLE INDICATION OF TRANSMISSION**

The beacon shall be fitted with an audible warning to indicate when the beacon is radiating radio frequency energy. This need only operate during actual transmissions.

### **BATTERY REQUIREMENTS**

The beacon shall be self-contained and operate independently of any external power source when activated.

The battery shall be contained within the equipment. Replacement of the battery, if user-replaceable, shall be possible with relative ease, and any interface connections shall be such as to prevent incorrect installation.

If it is possible to install the battery in a reverse polarity manner, the circuitry shall be designed to work equally well on either polarity. Provision shall be made to ensure beacon watertight integrity upon replacement of the battery.

In addition, the battery shall; -

- Have the capacity to operate the beacon continuously for at least 12 hours under all temperature conditions (-10C to +55C).;
- Be leak-proof under all conditions of stowage and operation;
- Have a minimum battery shelf life of two years; and
- Not be rechargeable.

It is recommended the battery be replaced at half the declared shelf life and the expiry date shall be clearly and durably marked on the battery sub-assembly where practicable and on the outside of the device in all cases.

A declaration of battery shelf life achievable at a steady temperature of +20°C shall be provided.

### **INBUILT GPS RECEIVER**

The unit shall be fitted with an inbuilt GPS receiver, which shall comply with IEC standard 61108-1 - *Maritime navigation and radio communication equipment and systems – Global*

*navigation satellite systems (GNSS) – Part 1: Global positioning system (GPS) – Receiver equipment – Performance standards, methods of testing and required test results (2003-07)*

The Time To First Fix (TTFF) of the GPS receiver shall be less than 10 minutes regardless of the start configuration of the beacon.

The device shall be fitted with a LED to indicate that the GPS is providing a fix.

If a valid GPS fix has not been obtained, then the Position field in the DSC messages shall be replaced with the digit 9 and the Time field shall be replaced with the digit 8.

If valid GPS updates cannot be maintained after an initial fix, then the last valid encoded position (and time) shall continue to be transmitted for a period of 3 hours.

If within this time a valid fix is obtained then the new updated position shall be transmitted. If however after 3 hours a valid fix has not been obtained, then the DSC message shall revert to the no position and time indicators as described above.

## **PHYSICAL AND CLIMATIC/DURABILITY REQUIREMENTS**

*(extract from IEC 60945)*

### **BASIC CONSTRUCTION**

The device shall meet the following construction requirements:

- Manufacture shall be from suitable materials and the device shall be designed and constructed to ensure reliable operation in the marine environment when exposed to shock, vibration, magnetic influences, rain, sea spray, hose wash down spray thermal extremes and other environmental conditions likely to be encountered in an exposed above-deck condition when at sea.
- Impact-resistant materials shall be used for its casing. The material shall be resistant to deterioration from prolonged exposure to sunlight, and shall not be unduly affected by seawater or oil.
- Its electronic components shall be protected to prevent malfunction under prolonged conditions of high humidity, including condensation.
- The transmitter shall be effectively protected from damage due to short or open circuit of the antenna when transmitting at maximum power.
- The beacon shall be capable of being easily deployed.
- The device shall be manufactured as one watertight unit and have a smooth exterior design with no sharp projection (including the antenna) which may cause damage to an inflatable life raft, safety harness, PFD or lifejacket.
- The unit shall have sufficient positive buoyancy to float.
- Finish shall be a highly-visible colour such as Dayglo orange or yellow

## **TETHERING ARRANGEMENT**

The beacon shall be fitted with either:

- A highly visible and coloured (such as Dayglo orange or yellow) rot-proof and chafe-resistant buoyant line of at least 2 metres in length with a breaking strain including the tether point of not less than 120 N; or
- A personal tethering device such as a neck or wrist strap.

## **MARKINGS**

All labeling on the exterior of the unit shall be resistant to deterioration by prolonged exposure to sunlight, should not be unduly affected by seawater or oil, and should be abrasion resistant.

The outside of the unit shall be marked indelibly and legibly with the following; -

- Concise operating instructions
- The name and address of the manufacturer.
- The type number or model identification
- Storage and operating temperature range
- Self-test instructions.
- Compass safe distance.
- The statement that DELIBERATE MISUSE MAY INCUR A SEVERE PENALTY

## **STOWAGE TEMPERATURE**

-30° to +70° C (-22° to 158° F).

## **CLIMATIC AND DURABILITY REQUIREMENTS**

The device shall meet the climactic and durability tests as specified in IEC Standard 60945 for portable equipment.

Tests shall be carried out in the order specified in IEC 60945:

- Dry heat
- Damp heat
- Low temperature
- Thermal shock
- Drop
- Vibration
- Immersion

- Solar radiation
- Oil resistance
- Corrosion
- Immunity to electrostatic discharge

In the drop test, the three drop orientations may be carried out concurrently with three samples of the same device.

### **COMPASS SAFE DISTANCE**

The beacon, whilst not activated, shall be subjected to the compass safe distance test in IEC 60945.