



**Overboard Recovery
Communications Apparatus
(ORCA®)
ORCA DSC User's Guide**



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Introduction

ORCA[®] is a personal saltwater or manual-activated man overboard (MOB) alarm system developed by BriarTek Inc. The system is utilized by the U.S. Navy and other mariners to aid in the rescue of an MOB victim and includes a transmitter, receiver, and direction finder. The ORCA[®] DSC transmitter alerts a MOB event on VHF marine channel 70 and 121.5 MHz. When the transmitter is activated, it transmits a digital selective calling (DSC) distress message on VHF marine channel 70 from the victim to any vessel operating with a DSC compliant VHF marine radio. ORCA[®] DSC also transmits a distress message to an ORCA[®] receiver on 121.5 MHz during a MOB event. The receiver emits an audible alarm and displays the ship type/hull number and serial number of the transmitter on the ORCA[®] receiver's LCD. The transmitter also emits a signal that is received by the direction finder and other standard search and rescue (SAR) equipment to locate the MOB.

ORCA[®] DSC Parts Overview (See figure 1)

- A - Antenna
- B - Manual activation/ deactivation recess
- C - Water sensors
- D - Distress marker light (DML)
- E - Battery door

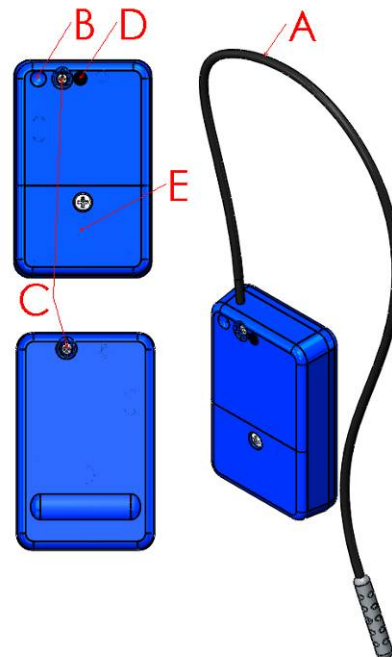


Figure: 1

Modes

The ORCA[®] DSC has three modes:

- ◆ ARMED - Each transmitter is ARMED after a 3 volt CR123 lithium battery is correctly installed.
- ◆ TRANSMIT - The transmitter goes from ARMED to TRANSMIT mode when it is automatically activated by submerging it in saltwater for a minimum of 3 seconds or when it is manually activated. After the transmitter is activated, it emits a DSC message on VHF marine channel 70 per the ITU-R M.493-11 protocol to its registered VHF marine radio. It repeats this message every five minutes for 30 minutes. If the unit has not been turned off after 30 minutes, it will then transmit a group distress message to DSC equipped radios within range of the transmitter. The unit also transmits a FM distress signal at 121.5MHZ after the initial DSC transmission. This sends the transmitter identification to the ORCA[®] receiver. After sending this FM distress message for approximately 1 minute, the transmitter switches to a non-data transmission for 40 seconds. This allows the DF to track the transmitter more effectively. After every 40 second non-data transmission, the unit transmits identification information to the ORCA[®] receiver for 9-15 seconds.
- ◆ DISABLED - The transmitter is DISABLED when the battery is removed or the battery runs out.

Operating Instructions

Manual activation:

Align antenna tip (A) with manual activation/deactivation recess (B) for approximately 3 seconds until the DML begins flashing rapidly. See figures 1 & 2.

After the DML begins flashing, remove antenna tip for activation/deactivation recess. Approximately 3-5 seconds after the DML begins flashing, the transmitter will begin transmitting a distress message.

Automatic activation: The transmitter will activate when the water sensors are submerged in saltwater for at least 3 seconds.



Figure: 2

All Clear (deactivate transmitter): When the MOB is recovered, align the antenna tip with the manual activation/deactivation recess for approximately 3 seconds. This disables the DSC transmission, sends an ALL CLEAR message to the ORCA[®] receiver and returns the transmitter to the ARMED mode.

Wearing the transmitter

THE TRANSMITTER MUST BE WORN SO THAT THE WATER SENSORS ARE UNDER WATER AND WET AND THE ANTENNA IS ABOVE THE WATER SURFACE WHEN THE PERSON IS FLOATING.

The following is the recommended method for wearing the transmitter on the MK-1.

- Insert transmitter into MK-1 pocket adjacent to the sea dye marker pocket. See figure 3. Finally, insert antenna in hole under pocket flap and through channels sewn into the liner of the MK-1. Figure 4 shows the ORCA® DSC inserted in the pocket and the dotted red line shows the route of the antenna inside the jacket.



Figure: 3



Figure: 4

Important: Do not coil antenna as this will degrade the transmission signal.

Battery Information

Battery Lifespan: The ORCA® DSC has very low current consumption. It is recommended that the battery should be replaced once a year and sooner if the ORCA® DSC has been activated for more than occasional testing. When the ORCA® DSC is in TRANSMIT mode, a new battery will last approximately 24 hours.

Use the following steps to test the battery strength:

1. Activate the unit by aligning the antenna tip with the manual activation/ deactivation recess.

2. As soon as the DML begins to flash rapidly, remove the antenna tip at least 1” from the recess. Then realign the antenna tip with the manual activation/ deactivation recess once again for approximately 3 seconds.
3. If the light turns on and remains on solid for approximately 3 seconds, the battery is useable. If, instead, the DML flashes on and off at this point, the battery is not useable and must be replaced.

Use the following steps to replace the battery:

1. Using a #1 size Phillips head screwdriver, unscrew the crosshead screw on the battery door. See figure 5.
2. Remove battery door.
3. Remove used battery.
4. Insert new 3 volt CR123 lithium battery according to polarity diagram on the inside of the battery door.
5. Replace battery door. Grasping screwdriver with thumb and forefinger, screw down the battery door to 45 in/oz.
6. Do not over tighten!



Figure: 5

DSC Maritime Mobile Service Identity (MMSI) Registration

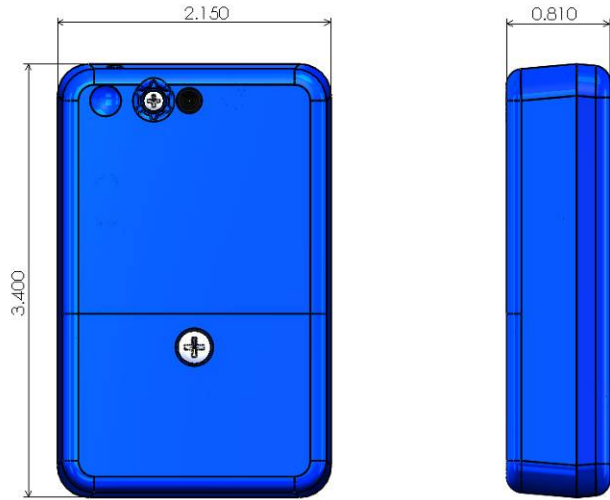
Each DSC transmitter should be programmed to operate with the owner’s registered DSC capable VHF marine radio. The registration number, known as the VHF marine radio’s MMSI number, is a unique 9-digit identification number that can only be supplied by the United States Coast Guard and its affiliated MMSI registration partners. More information regarding MMSI registration for VHF marine radios may be found at the following Internet address:

<http://www.navcen.uscg.gov/marcomms/gmdss/mmsi.htm>

The digital selective calling feature of an ORCA® DSC beacon, by default, will transmit a generic MMSI number that is not registered to any VHF marine radio. The owner’s registered MMSI number can be programmed at the factory or at an approved reseller’s facility.

Specifications

- ◆ Size: length = 3.4 inches x width = 2.15 inches x depth = 0.81 inches.
- ◆ Weight: 2.5 oz. (70.9 g)
- ◆ Power: 156.525MHz = 100 mW;
121.5MHz = 100mW
- ◆ Tracking Range: 2 NM from small craft, 5 NM from ship, 20 NM or greater from aircraft
- ◆ Alerting Range: 1 NM to receiver
- ◆ Power Source: One (1) 3 volt CR123 lithium battery
- ◆ Battery Life: One year (Armed mode); 24 hours continuous once activated (Transmit mode)
- ◆ Activation: manual or saltwater
- ◆ Current Draw: Armed 21 uA;
Transmit (DSC): 125mA; Transmit (high power): 200mA; Transmit (low power): 100mA
- ◆ Modulation Frequency: 121.5 MHz & 156.525MHz
- ◆ 25.5 inch (64.75 cm) external antenna with strain relief (the length can be modified based on user needs)
- ◆ Operating Temperature -20° C (-4° F) to +55° C (131° F)
- ◆ Storage Temperature -40° C (-40° F) to +85° C (185 ° F)



Warranty

BriarTek will provide a one-year warranty on the ORCA[®] man overboard alarm system following the purchase date.

If a component fails to function properly during its warranty period (one year), the manufacturer will proceed according to its warranty as follows:

BriarTek Inc. guarantees each product it distributes to be free from defective materials and workmanship and agrees to remedy any such defect, or to furnish a new or equal part in exchange (at its option) for a period of one year from the date the component is purchased. For an exchange of the product, carefully pack the equipment and return to BriarTek Inc. at the following address:

BriarTek Inc.
3129 Mt. Vernon Ave.
Alexandria, VA 22305

This warranty is void if:

- ◆ any component has been subject to misuse or improper installation by a non-BriarTek employee, or has been repaired or altered by a non-BriarTek employee.
- ◆ any component fails to function properly after being put into service due to something other than defective materials or workmanship, i.e. excessive temperature, humidity or shock while component is in storage.

Notes: