ORCA™

*O*VERBOARD *R*ECOVERY *C*OMMUNICATIONS *A*PPARATUS

User's Guide

Briar
Tek*™ *Incorporated
Applied Innovations

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ORCA™

User's Guide

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BriarTek Inc.
112 E. Del Ray
Suite A
Alexandria, VA 22301

ORCA™ (Overboard Recovery Communications Apparatus) is a personal water-activated man overboard (MOB) alarm system developed by BriarTek Inc. The alarm system includes a signal device transmitter (TX100-base model), a receiving station (RX100-base model), and an optional direction finder (RDF). ORCA™ aids in the detection, location and recovery of individuals who become separated from the safety of their vessel, and thus exposed to the harsh elements of the sea. When the alarm is activated, ORCA™ transmits an initial FM message from the victim to the victim's shipboard receiver. The onboard alarm sounds upon receipt of a valid message. If the wearer of the transmitter does not disable the alarm within one (1) minute, the ORCA™ will begin transmitting an AM alerting signal that can be received by standard SAR equipment including most types of RDFs. The ID data will be rebroadcast on average every minute.

ORCA thus allows for a locally managed MOB situation ensuring that a victim is recovered quickly so as to minimize effects of exposure. Search and rescue (SAR) assets outfitted with direction finding equipment are capable of homing in on the 121.5 MHz emergency frequency to aid in a recovery effort.

ORCA™ Special Features:

- Capable of communicating with rescue authorities and other ships in the immediate area.
- Uses patented technology to communicate with the ship in an emergency.
- Provides unique identification.
- The RX100 can be used to determine how many sailors are in the water and in need of rescue.
- Enables the user to signal “All Clear” to all receivers in the event of an inadvertent activation.
- The TX100 has very low current consumption for longer battery life.
- The TX100 uses standard 9 volt alkaline batteries.

WARRANTY INFORMATION

Please detach and complete the following warranty information and mail to BriarTek Inc. at the address listed below. This updates our owner records and places you on our private mailing list for updated product and service information.

User Name _____

User Address _____

City/State/ZIP _____

User Affiliation (U.S. Navy, Coast Guard, comm. boating, etc…) _____

Model #: _____ Serial #: _____

BriarTek Incorporated
112 East Del Ray Ave
Alexandria, Virginia 22301

WARRANTY

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 of purchase. For an exchange of the product, carefully pack the equipment and return to BriarTek Inc. at the following address:

BriarTek Inc.
112 E. Del Ray Ave
Suite A
Alexandria, VA 22301

This warranty is void if equipment has been subject to misuse, improper installation by a non-BriarTek employee or designee, or has been repaired or altered by a non-BriarTek employee or designee.

FACTORY REPAIR

For repairs not covered by the warranty, or for repairs after the warranty expires, the factory offers repair service for a nominal charge. For service, carefully pack the equipment and return to BriarTek Inc. at the address listed above. Please include a description of the problem as well as your name, address and telephone number along with the package.

TRANSMITTER OPERATION

Parts Overview - See Figure 1.

A. Manual Activation/Test Button (ON)- Depress for test purposes to confirm the operability of ORCA™ TX 100.
B. Reset Button (OFF) - Depress to reset ORCA™ from 'Transmit Mode' to 'Armed Mode'.
C. Water Sensors - Detects the presence of water in a man overboard situation. Keep clear of debris!
D. LED/Antenna - Flashing LED confirms the transmission of emergency signal during a man overboard situation or during operational testing.

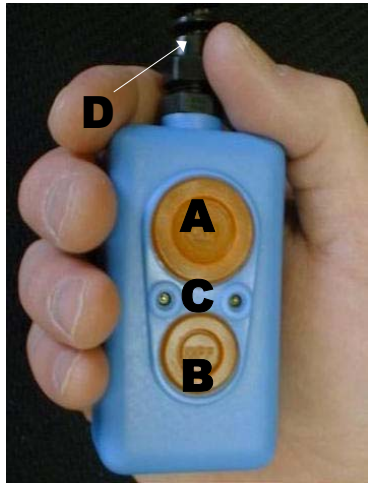

Figure 1. ORCA ™ TX100

Activation - Insert an alkaline 9-volt battery into the rear panel of ORCA™ (all ORCA™ TX100s are shipped from the factory with new batteries installed). This will automatically arm ORCA™ until activated through a man overboard situation or by depressing the ON button for manual activation or operational tests. Once activated, the LED will begin blinking to indicate it is transmitting an emergency signal. The emergency signal contains identification data tones to be decoded by the matching receiver, in addition to an extended RDF transmission to aid in the location and recovery of the sailor overboard.

Once the device is activated, the LED will flash on and off for approximately 10 seconds. Once the unit begins to transmit an alert it will turn on and stay on for at least a minute as the unit transmits the alert and ID code to the receiver using FM mode. Once the ID codes have been sent the unit will transmit an audible tone in AM mode to allow RDF equipment an opportunity to locate the device. When the unit is transmitting in AM mode the LED will flash, and when the unit is transmitting in FM mode the LED will remain illuminated.

Deactivation - The OFF button should generally be used if the transmitter was unintentionally activated. DO NOT DEPRESS THE OFF BUTTON IF YOU HAVE FALLEN IN THE WATER. To deactivate ORCA™, simply depress the OFF button for approximately one second. Continue depressing the OFF button until the LED powers off.

NOTE - Deactivation resets ORCA™ to its armed mode until activated to transmit again or until the user removes the battery

Low Battery Indicator - The ORCA™ is equipped with an internal low battery indicator circuit. To determine if the battery needs to be replaced follow these steps.

1. Activate the unit by depressing the ON button
2. As soon as the LED begins to flash depress and hold the OFF button
3. If the LED turns on and remains on for 10 seconds prior to unit shut off, the battery is still useable. If however the LED flashes on and off prior to shutting down, the battery should be replaced.

Battery Replacement - Using a small Phillips head screwdriver, unscrew the two battery door screws on the rear panel of ORCA™. Be careful not to lose battery door gasket and screws when replacing battery. Open battery door and remove used battery by holding battery connector and disconnecting battery. See figure 2. Caution: Applying excessive force on battery lead when disconnecting battery may break battery lead and cause unit to fail.

Figure 2. Battery Removal

Notes

Notes

Attach new 9-volt alkaline battery and place in battery housing. Ensure battery door gasket is correctly seated (see figures 3 and 4). Battery connector lead should not interfere with seal between battery door gasket and battery compartment (see figures 5 and 6). Close and screw down battery door.

Figure 3. INCORRECT gasket seating

Figure 4. CORRECT gasket seating

Figure 5. INCORRECT battery connector lead

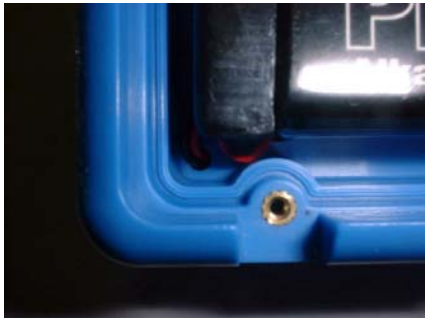

Figure 6. CORRECT battery connector lead

How To Wear The Beacon

The beacon should be worn in a manner such that the beacon will be easily accessible should the person fall overboard. If the user intends the beacon to activate automatically in the water, the beacon should be worn so that the water sensors would be underwater and the antenna would be above water when the person is floating in the water.

Figure 7. TX100 placement - no PFD

Figure 8. TX100 placement - PFD

Receiver

Size: 7.9 in x 5.9 in x 2.75 in

Weight: 15.2 oz

Power source: One (1) 9V alkaline battery or wall adaptor

Current draw (typical): 55 mA

RF sensitivity: .25 - .60 uVpd

RF Input Impedance: 50 ohms

Adjacent Channel Rejection: 70 dB

SPECIFICATIONS

Transmitter

Size: 3 in x 1.5 in. x 1.7 in

Weight: 5.6 oz

Range: 2 miles (surface to surface) Ranges of 20 miles have been recorded when alerting an elevated antenna.

Power source: One (1) 9V alkaline battery

Battery Life: One year or one activation. Once activated a minimum of 24 hours transmission time.

Activation:
- Manual
- Water

Current draw:

-Armed	10uA
-Sleep	1 mA
-Transmitting	18mA

Modulation Frequency: 121.5MHz FM/AM

Frequency accuracy: +/- 2.0 kHz

Spurious and harmonic output:
- -typical –60dBm
- -max –45dBm

FM deviation: 1.5 – 3.5 kHz

Modulation bandwidth: 0 – 1500 Hz

Operating temperature: -10 deg C to +55 deg C

Storage temperature: -40 deg C to +80 deg C

RECEIVER OPERATION

Parts Overview - See Figures 9 and 10

A. LCD - Displays MOB
B. Keypad - Data input
C. Buzzer - Audible alarm
D. Serial Connector
E. Antenna jack
F. Power jack
G. Audio jack
H. Power switch - Activates receiver to receive MOB transmissions.

Figure 9. ORCA™ RX100 - face panel

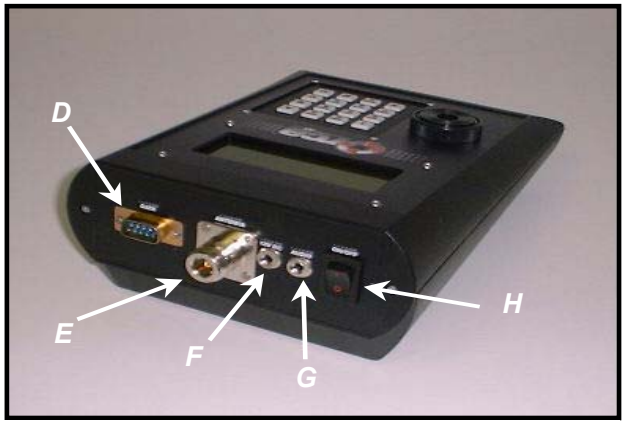

Figure 10. ORCA™ RX100 - end panel

Receiving MOB Transmissions

- Connect the antenna to the UHF coaxial antenna connector "E".
- The ON/OFF switch 'H' is a rocker switch that, when in the ON position, powers up the RX100 using 12VDC applied at the 1.3 mm 12VDC jack "F". The RX100B also comes with a backup 9VDC battery connector.
- The LCD "A" will display "ORCA v___" after the system has initialized. It will then begin scanning and will remain in this mode until it receives a MOB transmission.
- When a MOB transmission is received, the LCD will indicate which transmitter has been activated and an audible alarm will sound. The alarm is a piezo-electric buzzer providing a 100 dB alert.
- When an alarm is received, the user should depress the asterisk on the keypad to silence the alarm. *Note: This only silences the alarm, it does not clear the MOB from the database.*
- If more than one transmitter has been activated, the LCD will display each transmitter in sequence as the respective signals are received.

Resetting the Receiver

- To reset the receiver, push switch to the OFF position, wait 5 seconds and then push it back to the ON position. Once the receiver has been reset, it will continue to receive MOB transmissions from ORCA™ if the individual transmitters have not been reset to the armed mode. *Note: A receiver reset will not clear the MOB data currently in the database.*
- When an individual ORCA™ transmitter is reset, the receiver's LCD will display "ALARM RESET". This only removes *that* transmitter's ID from the receiver's system. The identification numbers of all other active ORCAs will remain displayed on the receiver's LCD.

Automatic Systems Diagnostics

When the receiver is turned on a pattern of asterisks should flash across the top of the LCD indicating that the system is functioning properly. If this pattern stops or fails to appear the receiver will not receive alarms. The receiver should be reset for 5 seconds and then turned on. If the test pattern appears indicating normal operations then no further servicing is required. If the test pattern fails to appear and move from left to right then the unit is broken and should be returned to the manufacturer for servicing.

To register a transmitter as belonging to ownship

Press the A button on the receiver keypad. The LCD should change to display "Activate the ORCA to be registered." Follow the on screen instructions, activate the transmitter and as soon as the transmitter is identified by the receiver, the receiver will display "If ID number is correct press A." ***NOTE:*** *the ID number is the same as the transmitter serial number, this number can be found in two places. One label with the serial number is on the back of the transmitter unit, the other label is located inside the battery compartment*. If the ID number displayed on the receiver is not correct, press the B button on the keypad and restart the process. Once the unit is registered the transmitter should be turned off. To exit setup mode press the D button on the keypad.

To delete transmitter(s) from the ownship list

To delete one or more selected transmitters from the ownship list, press the B button on the receiver keypad. The LCD should change to display "Activate the ORCA to be Unregistered." Follow the on screen instructions, activate the transmitter and as soon as the transmitter is identified by the receiver, the receiver will display "If ID number is correct press A" ***NOTE:*** *the ID number is the same as the transmitter serial number, this number can be found in two places. One label with the serial number is on the back of the transmitter unit, the other label is located inside the battery compartment.* If the ID number displayed on the receiver is not correct, press the B button on the keypad and restart the process. Once the unit is unregistered the transmitter should be turned off. To exit setup mode press the D button on the keypad.

To clear MOB from the ownship list

To clear the receiver of all MOB ownship contacts, press the C "Clear MOB List." ***NOTE:*** *The MOB list cannot be deleted by cycling power to the receiver. It must be cleared by this procedure. It is meant to force attention to the registerred man over board alarm.* If power is recycled, an uncleared MOB's will reactivate the alarm.