RJE International, Inc.
Irvine, California

TECHNICAL MANUAL
ULB-362 SERIES
UNDERWATER ACOUSTIC BEACON

August 1, 2002
REV 00

RJE International, Inc.
15375 Barranca Pkwy, Suite B107,
Irvine, California 92618
Tel: (949) 727-9399 Fax: (949) 727-0070
E-mail: sales@rjeint.com Web Page: www.rjeint.com

This manual should be read in its entirety prior to using the ULB-362 Series

SECTION I
INTRODUCTION

1.1. GENERAL. This manual contains the description, operation, theory and maintenance procedures for the Underwater Acoustic Beacon Model ULB-362 Series, hereafter referred in this manual as the Model ULB-362.

1.1.1. The ULB-362 is a water switch activated underwater locating device designed for use in marking applications. Housed in a water tight case, the ULB-362 consists of an electronic module, transducer and a self contained battery. The ULB-362 operates at depths down to 20,000 feet (6096 m).

1.1.2. The ULB-362 will operate for a minimum of 30 days under normal conditions.

FIGURE 1. ULB-362 UNDERWATER ACOUSTIC BEACON

TABLE 1. ULB-362 ACOUSTIC BEACON SPECIFICATIONS

Operating Frequency	37.5 kHz ± 1kHz
Operating	Depth Surface to 20,000 feet (6096 meters)
Pulse Length	10 milliseconds ± 10%
Pulse Repetition Rate	Not less than 0.9 Pulses/Sec
Operating Life	30 Days (minimum)
Acoustic Output Initial	1060 dynes/cm² rms pressure at 1 meter (160.5dB)
Acoustic Output After 30 Days	700 dynes/cm² rms pressure at 1 meter (157.0 dB)
Operating Temperature Range	+28°F to +100°F (-2°C to +38°C)
Actuation	Fresh or salt water
Size	1.30 inches (3.30 cm) diameter x 3.92 inches (9.95 cm) long
Weight, Beacon	6.7 ounces (190 grams)
Storage Temperature	-65°F (-54°C) to 160°F (71°C)

SECTION II
BEACON MAINTENANCE

2.1. BEACON TESTING. The beacon should be tested prior to each use.

2.1.1. Using the 42A12 Series Ultrasonic Test Sets, test the beacon in the following manner:

2.1.2. Turn the GAIN control to a fully clockwise position. A pronounced background noise should be present. Lack of noise may indicate a dead battery. Should this occur, replace battery in the test set before resuming operational testing.

2.1.3. Set the TUNING control to approximately midscale. Rubbing fingers in front of microphone should produce a rushing noise from the speaker.

2.1.4. Set the GAIN control at a comfortable listening level.

2.1.5. Point the microphone of the Test Set towards the water switch end of the beacon for best results. If the beacon is mounted, position the Test Set for maximum unobstructed signal. Beacon operation will be indicated by an audible pulsing tone.

2.2. GENERAL. This section describes beacon cleaning, disassembly, O-ring replacement, battery replacement and battery testing.

2.3. BEACON CLEANING. Clean the switch end of the beacon with mild detergent then dry thoroughly with a clean cloth. Clean the switch end insulator frequently to prevent leakage currents from occurring across the switch due to dirt and moisture.

2.4. BEACON DISASSEMBLY. Disassembly of the beacon is limited to battery replacement, as outlined in Section 2.5.

2.5. BATTERY REPLACEMENT AND TESTING.

2.5.1. GENERAL. Perform an operational test (Section 2.1.) to determine if beacon is operational. If not, insert a new battery and measure Off-Current per Section 2.6. Battery replacement should be done in a maintenance shop under clean conditions to prevent dust from contaminating O-ring and lubricant. Because the old O-ring may have developed a set with age, a replacement is mandatory at the time of battery change. O-ring lubrication should be applied to the new O-ring and threads before installation.

CAUTION

TO AVOID INTERNAL DAMAGE, DO NOT CLAMP THE BEACON IN A VISE, UNLESS A VISE -CLAMP IS USED.

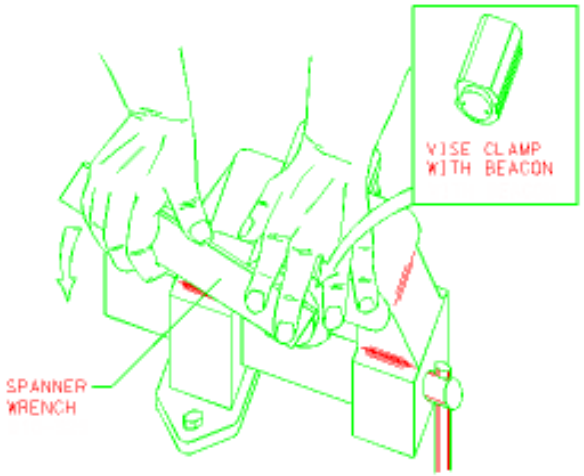


FIGURE 2. BATTERY END COVER REMOVAL WITH VISE CLAMP AND SPANNER WRENCH

2.5.2. PROCEDURE. To replace the battery, remove battery end cap from beacon as follows:

2.5.3. Secure the beacon with Vise-Clamp (ULB-362/04 for the aluminum beacon and ULB-362/04 for the stainless steel beacon) as shown in FIGURE 2. Use Spanner Wrench (ULB-362/06) to remove end cover marked “BATTERY ACCESS” by unscrewing counterclockwise. Break away torque is usually high so spanner wrench should be held firmly in contact with battery end cap in order to prevent damage to wrench holes.

2.5.4. Remove battery from beacon. Replace with battery found in the Battery replacement kit ULB-362/01.

FIGURE 3. BEACON EXPLODED VIEW SHOWING RELATIVE LOCATION OF BATTERY AND RELATED PARTS

2.5.5. Perform OFF-CURRENT TEST as outlined in Section 2.5.

2.5.6. Remove the old O-ring from the cover. Do not use steel screwdriver or sharp tool because of danger to damaging O-ring groove.

2.5.7. Clean the threads, O-ring groove in the body and the threads on the cover by wiping them thoroughly with mild solvent.

CAUTION

DIRT, LINT, SAND AND OTHER FOREIGN SUBSTANCES IN LUBRICANT ON SEALING SURFACES MAY DAMAGE THREADS AND/OR ALLOW WATER LEAKAGE THROUGH THE O-RING SEAL. SCRATCHES OR GOUGES WILL ALSO CAUSE WATER LEAKAGE.

2.5.8. Carefully install new O-ring on battery cap. Apply a thin coating of O-ring lubricant to O-ring, O-ring groove and threads.

2.5.9. Replace the end cap and tighten until the cap flange contacts the body or leaves less than a 0.003 inch (0.076 mm) gap. Use hand force only on the wrench. Hold the Beacon in a vise clamp as shown in FIGURE 2. Clean beacon exterior of excess O-ring grease.

2.5.10. Perform operational test of beacon as outlined in Section 1.2.

2.6. BEACON OFF-CURRENT TEST.

2.6.1. Connect test leads as shown in FIGURE 4. and check for current leakage between battery and Beacon body.

2.6.2. The battery OFF current must be less than 2 microamperes. As little as 1 milliampere OFF current will deplete a new battery in 30-40 days. Beacons with greater than 2 microamperes OFF current should be taken out of service immediately. Such units are not field repairable. Contact RJE International, Inc. for return information.

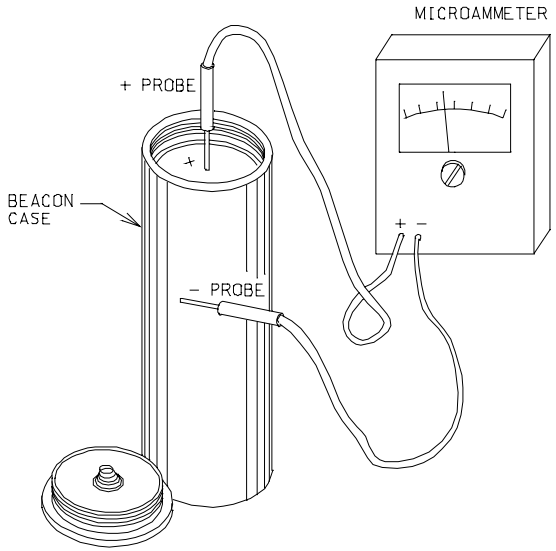


FIGURE 4. BEACON OFF-CURRENT TEST SET-UP

3.0 Returning Product for Service

When shipping a product back to RJE from either inside or outside the United States, the following instructions will help ensure the equipment arrives with the minimum possible delay. Any deviation from these instructions increases the potential for delay.

Step 1 - Get a Return Authorization

The best way to make sure RJE is aware of your intentions to ship equipment is to obtain a Return Material Authorization (RMA) before sending the shipment. Return Material Authorizations are issued by Sales Administration or Customer Service and are used to notify us of your needs in advance of arrival so we can provide a faster turnaround. When requesting a Return Material Authorization, please give us the following information.

- What is being shipped (include the serial number)
- When you plan to send the shipment
- What problem(s) need correction
- When you need the instrument returned

When the Return Material Authorization is issued, we will tell you the RMA number. Please include this number on all packages and correspondence.

Mark the Package(s)

To: RJE International, Inc. (RMA Number)

15375 Barranca Parkway, Suite B107

Irvine, California 92618

Step 3 - Update RJE International

Send the following information by fax or telephone to RJE.

Attention: **Sales Administration**

Fax: **(949) 727-0070**

Phone: **(949) 727-9399**

- Detailed descriptions of what you are shipping (number of packages, sizes, weights, and contents).

- The name of the freight carrier
- Master Air bill number
- Carrier route and flight numbers for all flights the package will take

SECTION III
WARRANTY

RJE International warrants that this equipment (referred to as the unit) will be free from defects in materials and workmanship, when used under normal operating conditions as determined solely by RJE International, for a period of one (1) year from the date of shipment from RJE International.

As the sole remedy for breach of the foregoing warranty, RJE International shall repair or replace, at RJE International's option, any unit, component or part thereof found defective or nonconforming within said one (1) year period from the date of shipment. Customer shall give RJE International notice of any defect or nonconformity and, if so instructed by RJE International, customer shall, at its expense, ship the unit, component or part to RJE International. If RJE International determines that the unit, component or part is actually defective or nonconforming, it shall, at its expense, ship a new or a rebuilt unit, component or part to the customer. The customer shall be responsible to perform, at its own expense, any necessary installation work related to any defective or nonworking unit, component or part. The functionality and operational aspects of the unit is determined by the unit operating within the specifications and is dependent of proper maintenance as required to be performed by the customer.

RJE International shall not be liable for any expense or damages resulting from interruptions in the operation of the unit.

RJE International shall not be liable for the cost of any repairs undertaken by the customer or any third party without RJE International prior written authorization.

RJE International shall not be liable for any incidental, special consequential or exemplary damages arising out of the installation, use, testing, servicing or maintenance of any unit, component or part. This warranty is given in lieu of all other warranties, expressed or implied, including the warranties of merchantability or fitness for a particular purpose.

RJE International's total liability under this warranty is limited to the remanufacture or replacement of the unit, component or part.

APPENDIX A
ULB-362/TD1

A.1. GENERAL. The ULB-362S/TD1 is configured with the time delay option. This configuration will delay the normal underwater operation of the beacon for a user selectable period of 0, 8, 16, or 32 minutes. This is accomplished by changing the positioning of the programming screw located under the water switch cap (See FIGURE A2).

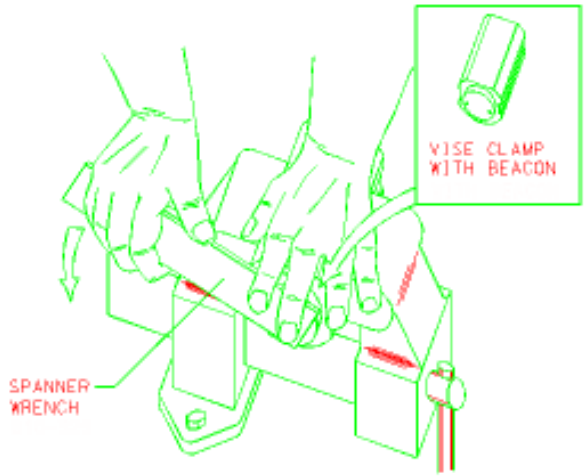


FIGURE A1. BATTERY END COVER REMOVAL WITH VISE CLAMP AND SPANNER WRENCH

The available delay times are listed in **TABLE A1** below.

Position	Delaying Period
A	No Delay
B	8 Minutes
C	16 Minutes
D	32 Minutes
N/D	Not used

A.1.1. To access the programming screws remove the water switch cap from the beacon as follows:

A.1.2. Secure the beacon with Vise-Clamp ULB-362/04 as shown in FIGURE A1. Use Spanner Wrench (ULB-362/07) to remove the water switch by unscrewing counterclockwise. Break away torque is usually high so spanner wrench should be held firmly in contact with the end cap in order to prevent damage to wrench holes.

A.1.3. Clean and inspect the water switch o-ring and threads for damage. Lubricate or replace as necessary.

A.1.4. Position the 0-80 programming screw in the desired delaying position (see TABLE A1).

FIGURE A2. PROGRAMMING LOCATIONS

CAUTION

DIRT, LINT, SAND AND OTHER FOREIGN SUBSTANCES IN LUBRICANT ON SEALING SURFACES MAY DAMAGE THREADS AND/OR ALLOW WATER LEAKAGE THROUGH THE O-RING SEAL. SCRATCHES OR GOUGES WILL ALSO CAUSE WATER LEAKAGE.

A.1.5. Replace the end cap and tighten until the cap flange contacts the body or leaves less than a 0.003 inch (0.076 mm) gap. Use hand force only on the wrench. Hold the Beacon in a vise clamp as shown in FIGURE A1. Clean beacon exterior of excess O-ring grease.

A.2. BEACON DELAYING FUNCTION.

A.2.1. When the beacon is set to one of the three delaying periods the operation of the beacon will be as follows:

A.2.2. When the water switch is activated the beacon will ping several times and then begin the selected delaying period. This function is provided to verify the operation of the beacon and the delaying period.

A.2.3. Upon completion of the selected delaying period the beacon will resume pinging for the live of the battery.

A.2.4. Removing the beacon from the water will reset the delaying period.

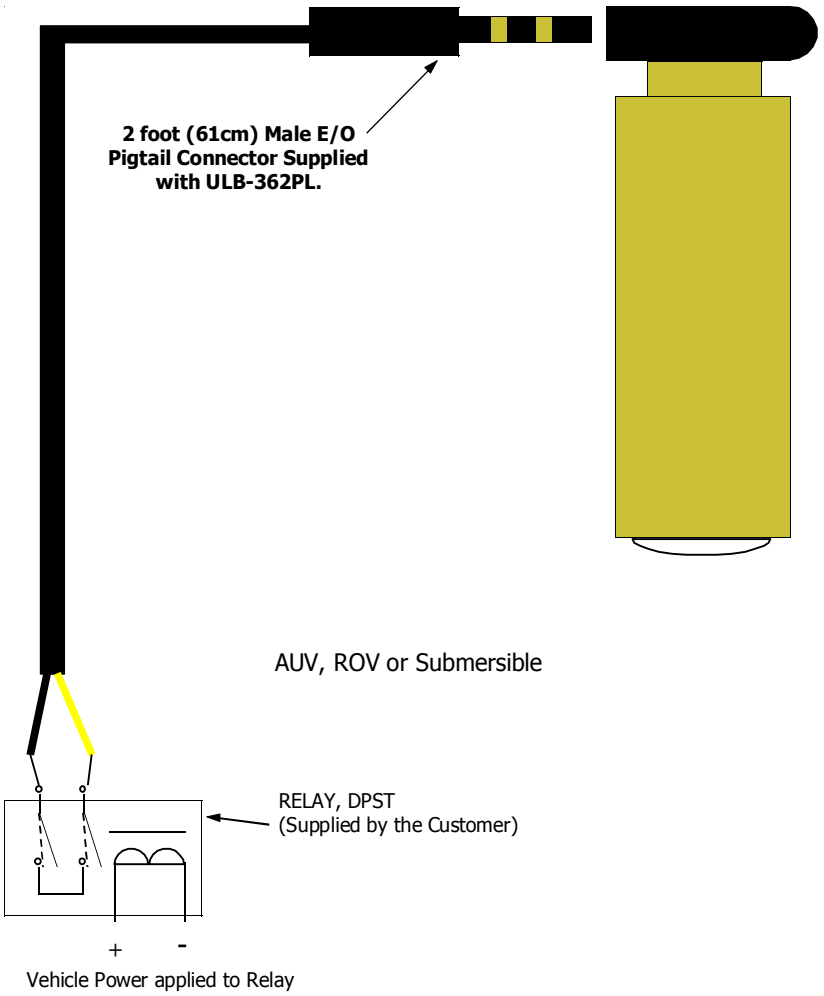
A.3 BEACON POWER LOSS FUNCTION

A.3.1 The power loss function is design to activate the beacon when the unit is wired per diagram on next page:

A.3.2 Pinger is mounted on outside of vehicle or Towed Body.

A.3.3. Male E/O Pigtail Connector is wired to Electronics Module through a penetrator.

A. 3.4 A normal closed Relay is installed in electronics module of the Vehicle. This relay is wired to the vehicle's power supply. The end of the Pigtail Connector is wired to the contacts of the Relay.


2 foot (61cm) Male E/O
Pigtail Connector Supplied
with ULB-362PL.
AUV, ROV or Submersible
RELAY, DPST
(Supplied by the Customer)
+
-
Vehicle Power applied to Relay