

ULB-362 ULB362/PL Series Underwater Locator Beacon

User's Manual

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Preface

This manual describes the installation and operation of the ULB-362 Series Underwater Locator Beacons used for marking underwater locations, equipment and subsea vehicles. This manual is divided into the following six sections:

- 1 **Description**
- 2 **Specifications**
- 3 **Installation and Checkout**
- 4 **Beacon Maintenance**
- 5 **Return Procedures**
- 6 **Warranty**

Proprietary Information

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Changes

RJE International, Inc. reserves the right to make changes to meet new specifications at any time without incurring any obligation to modify previously installed units. This manual is provided for informational and reference purposes only and is subject to change without notice.

Notes and Warnings

Where applicable, special notes and warnings are presented as follows:

NOTE: A reminder to check that certain criteria are met before proceeding further in a step or sequence.



WARNING: A reminder that dangerous consequences could result if certain recommended procedures are not followed

Table of Contents

1	Description	1
	External Construction	2
	Internal Construction	3
	Theory of Operation	3
	Locating the Beacon	3
2	Specifications	4
3	Installation and Checkout	5
	Installation Considerations	5
	Installation Procedures for ULB-362 and ULB362-02 Mounting	
	Bracket	6
	Installation Procedures for ULB-362/PL	8
	Pre-Deployment Tests	9
	<i>Using ATS-260 Acoustic Test Set with the ULB-362B</i>	9
	<i>Using ATS-260 Acoustic Test Set with the ULB-362PL/B37</i>	10
	<i>ATS-260 Acoustic Test Set Service</i>	11
	<i>Alternative Battery Check</i>	11
4	Beacon Maintenance	13
	Beacon Cleaning	13
	Beacon Maintenance Precautions	13
	Battery Maintenance	13
	<i>Tooling Requirements for Battery Replacement</i>	14
	Beacon Disposal	14
5	Return Procedures	15
6	Warranty	16

List of Figures

<i>Figure 1-1 ULB-362B/37</i>	<i>1</i>
<i>Figure 1-2 Installed in Mounting Bracket</i>	<i>2</i>
<i>Figure 1-3 Dimensions</i>	<i>2</i>
<i>Figure 1-4 Locating the ULB-362 After Water Activation</i>	<i>3</i>
<i>Figure 3-1 Mounting Bracket Hole Pattern</i>	<i>6</i>
<i>Figure 3-2 Securing the Mounting Bracket</i>	<i>7</i>
<i>Figure 3-3 Installing the Beacon into the Mounting Bracket</i>	<i>7</i>
<i>Figure 3-4 Wiring Diagram of the ULB-362PL/B37</i>	<i>8</i>
<i>Figure 3-5 Connecting the ATS-260 Acoustic Test Set</i>	<i>11</i>

1 Description

The ULB-362 Series Underwater Locator Beacons are durable, water-activated, underwater location aids. A Power Loss version is also available. The ULB-362 series beacons can also be order in several frequencies, 27kHz, 37.5kHz and 45kHz. The beacons transmit an acoustic signal once every second after activation. The acoustic output for the 30 day battery will remain above 157.0 dB for 30 days.

RJE International, Inc. also offers a standard mounting bracket (P/N B362-05591). The bracket allows the beacon to be securely mounted (Please contact RJE International, Inc. if the mounting bracket does not meet your needs). The ULB-362 beacon is shown in Figure 1-1. The beacon is also shown installed in its standard mounting bracket in Figure 1-2, and a dimensional outline of the beacon is shown in Figure 1-3.

This section provides a general descriptive overview of the beacon, its theory of operation, and use.



Figure 1-1 ULB-362B/37

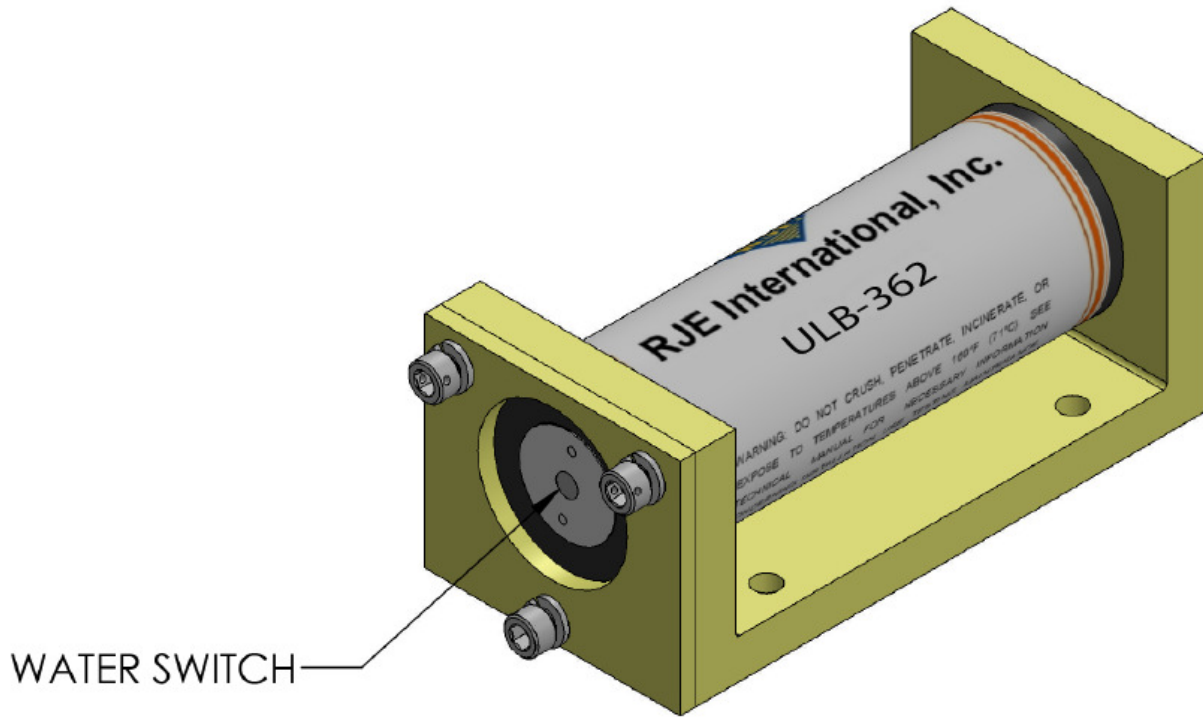


Figure 1-2 Installed in Mounting Bracket

External Construction

The beacon is contained in a water-tight aluminum case capable of withstanding high-impact shock and deep-water immersion. As shown in Figure 1-2, one of the end caps has a water-activated built in switch that causes the beacon to begin transmitting when the switch comes in contact with water.



Figure 1-3 Dimensions

Internal Construction

The major internal components of the beacon include a printed circuit board assembly, a urethane-encapsulated transducer assembly, and a battery. The battery is contained in its own, separate, user accessible compartment.

Theory of Operation

The printed circuit board assembly generates all the necessary logic functions to produce a pulse with the desired characteristics. The pulse is then transformed from a CMOS level square wave to a much larger sinusoidal pulse by a transformer. The output of the transformer drives the urethane-encapsulated transducer, which propagates through the housing in the form of a tuned acoustic signal based on the frequency of the beacon (27kHz, 37.5kHz, or 45kHz).

Locating the Beacon

When the beacon is immersed in water, it will begin to radiate an acoustic signal which can be received and transformed into a visual signal by using the RJE International, Inc. STI-350, DTI-300A, VADR-1000M, or VADR6000M Acoustic Receivers. When using the STI-350 Surface Acoustic Receiver, the general vicinity of the ULB-362 beacon can be located from shipboard. After the area is known, a diver can be deployed with the DTI-300A diver acoustic receiver, which will give the exact location of the beacon. When recovery is too deep for diver operations, a VADR receiver, mounted on a ROV, can be used. Other equivalent pinger receivers may also be used to relocate the ULB-362 beacon.

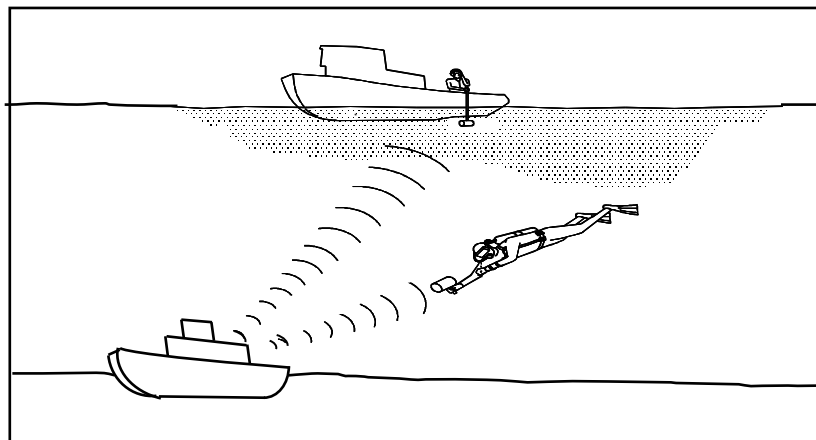


Figure 1-4 Locating the ULB-362 After Water Activation

2 Specifications

ULB-362B/27, ULB-362B/37, ULB-362B/45

Specifications

ULB-362PL/B37

27, 37.5, 45 kHz, ± 1 kHz	Operating Frequency:	37.5 kHz, ± 1 kHz
0 to 20,000 feet (6,096 meters)	Operating Depth:	0 to 20,000 feet (6,096 meters)
≥ 9 ms	Pulse Length:	≥ 9 ms
B362-B30-01 Incl. battery, o-ring, lube & inst.	Battery Kit:	B362-B30-01 Incl. battery, o-ring, lube & inst.
≥ 30 days	Operating Life:	≥ 30 days
6 years from date of manufacture	Battery Storage Life in Beacon:	6 years from date of manufacture
≥ 160.5 dB re 1 μ Pa @ 1 meter	Acoustic Output:	≥ 160.5 dB re 1 μ Pa @ 1 meter
Water immersion	Activation:	Water immersion and closure of external relay through a connector on beacon
80% sphere	Beam Pattern:	80% sphere
1.30 in. (3.30 cm) diameter 3.92 in (10 cm) long	Case Size:	1.30 in. (3.30 cm) diameter 3.92 in (10 cm) long
7075 T6 aluminum	Case Material:	7075 T6 aluminum
5.95 oz. (168g) Maximum	Weight:	7.00 oz. (198g) Maximum
-55°C (-67°F) to 71°C (160°F)	Storage Temperature:	-55°C (-67°F) to 71°C (160°F)
-2°C (28°F) to 38°C (100°F)	Operating Temperature:	-2°C (28°F) to 38°C (100°F)

3 Installation and Checkout

This section encompasses the installation considerations and procedures for mounting the beacon using the mounting bracket kit, and a pre-deployment test that can be conducted using a RJE International, Inc. ATS-260 Acoustic Test set.

Installation Considerations

To minimize the probability of physical damage or inadvertent activation, the following precautions should be considered when mounting the beacon:

- *The beacon should normally be mounted in to a sturdy structure without weakening the structure itself.*
- *The beacon should be mounted in an area guarded against heavy equipment tearing loose and striking the beacon and should be mounted in a way that provides convenient access during regular inspections and tests.*
- *The beacon should be mounted in an area where sound absorbent materials are not present. Avoid affixing labels to the beacon or any other material that would affect the acoustic beam.*
- *The shelf life of the battery will be decreased when exposure to higher than normal temperatures. The maximum temperature where the beacon is mounted should not exceed 71°C (160° F).*
- *Nonconformance to the mounting instructions or intended use may void the warranty.*

Installation Procedures for ULB-362 and ULB362-02 Mounting Bracket

Carefully unpack the beacon and inspect it for shipping damage. If any damage is evident, it should be reported to the freight carrier and to RJE International, Inc. If ordered, the mounting bracket kit includes an aluminum-mounting bracket, an aluminum end plate, three drilled (for lockwire) socket head cap screws, and three lock washers.

NOTE: Before installing the mounting bracket, be sure that it will be possible to install and remove the beacon once the bracket is installed.

To mount the beacon, perform the following steps:

1. Ensure the beacon is mounted in the vehicle so that it has a clear path to send the acoustic signal. Avoid mounted it behind other equipment.
2. Mount the beacon with the water switch down to prevent accidental activation.
3. Refer to the mounting bracket hole pattern shown in Figure 3-1 and drill four 0.191 in (0.48 cm) diameter holes.
4. Secure the mounting bracket with four 10-32 stainless steel screws and associated hardware (not supplied) as shown in Figure 3-2.
5. Slide the beacon into the bracket as shown in Figure 3-3. Rotate the beacon until the battery date is visible and secure it in place with the end plate and the three drilled socket head cap screws.
6. Lockwire the drilled screws and clean the water activation switch (refer to section 4 Beacon Cleaning).

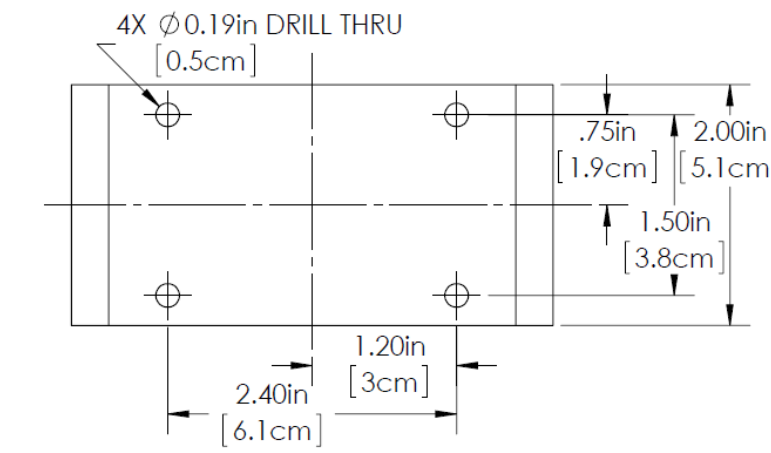


Figure 3-1 Mounting Bracket Hole Pattern

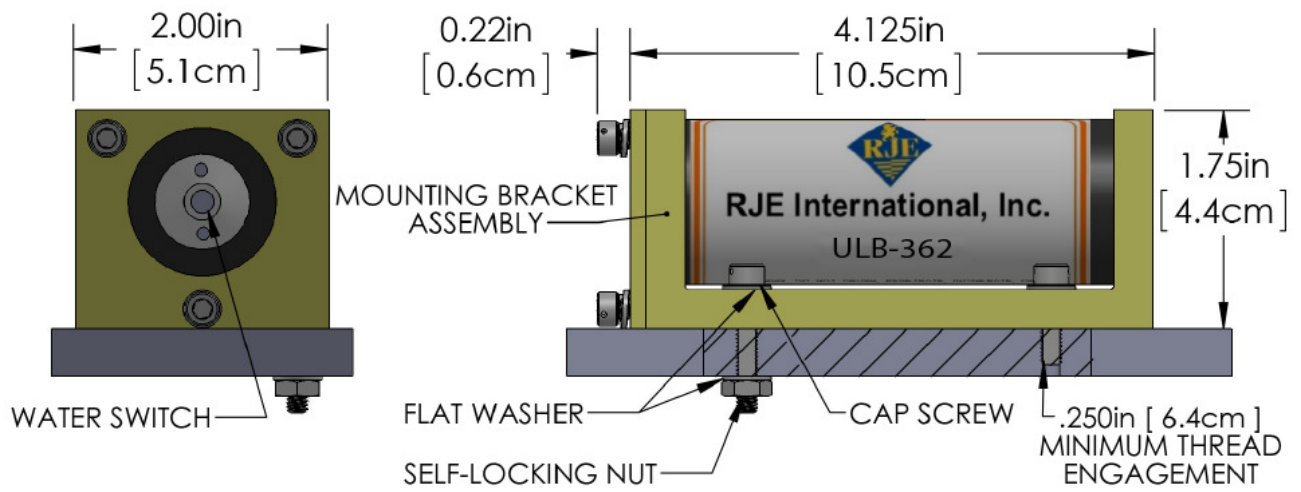


Figure 3-2 Securing the Mounting Bracket

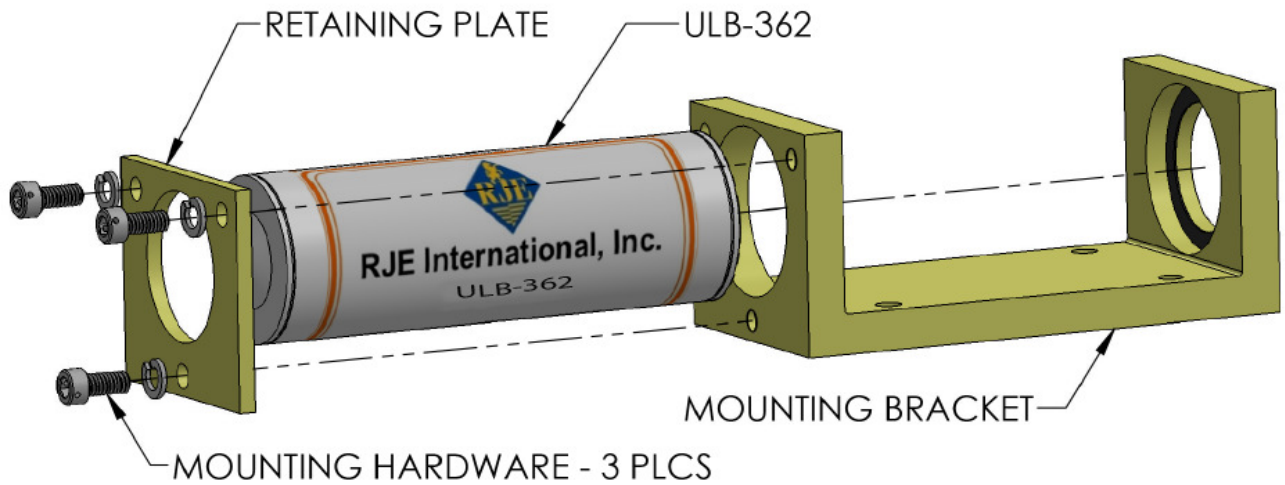


Figure 3-3 Installing the Beacon into the Mounting Bracket

Installation Procedures for ULB-362/PL

Carefully unpack the beacon and inspect it for shipping damage. If any damage is evident, it should be reported to the freight carrier and to RJE International, Inc.

To mount the beacon, perform the following steps:

1. Ensure the beacon is mounted in the vehicle so that it has a clear path to send the acoustic signal. Avoid mounted it behind other equipment.
2. Mount the beacon with the water switch down to prevent accidental activation.
3. Male E/O Pigtail Connector, Provided with the unit, is wired to Vehicle's electronics module through a penetrator.
4. A 'normally closed' electrical relay is installed in electronics module of the Vehicle. This relay is wired to the vehicle's power supply. (see below diagram)

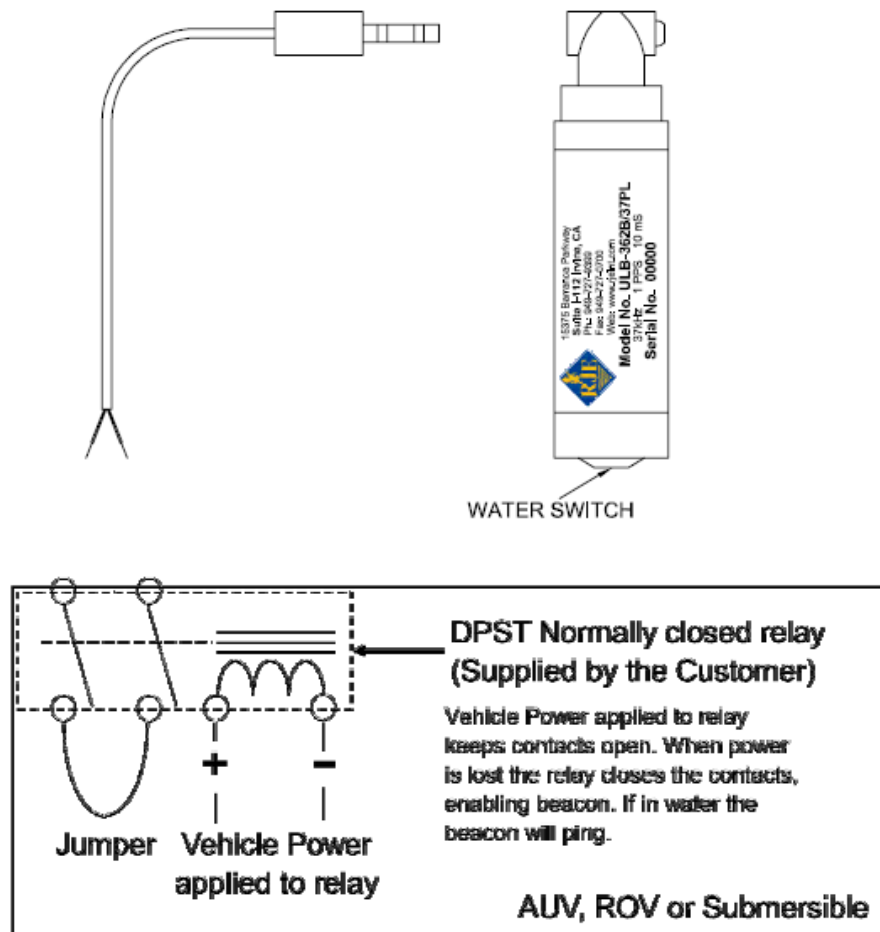


Figure 3-4 Wiring Diagram of the ULB-362PL/B37

Pre-Deployment Tests

A pre-deployment test on each beacon should be performed before and after mounting using the RJE International, Inc. Short out the water switch and use a acoustic pinger receiver to determine if the beacon is functioning.

For the ULB-362B series beacon, the ATS-260 Acoustic Test Set can be used to check both the beacon's battery condition and operation. Also, an alternative method using a digital voltmeter can be used to check the beacon's battery condition.

Using ATS-260 Acoustic Test Set with the ULB-362B

To use the ATS-260 Acoustic Test Set to verify the battery condition and test the operations of the beacon, use the following procedure:

1. Place the clip for the test set on the housing of the beacon as shown in Figure 3-5. If using the B362-05591 channel mount, it is not necessary to remove the beacon to conduct the test.
2. Place the test set probe on the water activation switch as shown in Figure 3-5.
3. Hold down the button labeled **PUSH TO TEST** on the test set handle.
4. Check the beacon battery condition by observing the green and red indicators on the test set.

If the green indicator is lit, the battery is good.

***If the red indicator is lit, the battery should be replaced.
(See Alternate Battery Check, page 10)***

5. Check the beacon operating condition by listening for an audible tone from the test set and /or observing the amber indicator.

If there is an audible tone and /or the amber indicator is flashing, the beacon is operating properly.

If there is no audible tone and the amber indicator is not flashing, the beacon is not operating properly.

Using ATS-260 Acoustic Test Set with the ULB-362PL/B37

To use the ATS-260 Acoustic Test Set to verify the battery condition and test the operations of the beacon, use the following procedure:

1. Place the clip for the test set on the housing of the beacon as shown in Figure 3-4. If using the B362-05591 channel mount, it is not necessary to remove the beacon to conduct the test.
2. Close the contacts that short the two conductors of the pig-tale connector to indicate a 'loss-of-power' as shown in fig 3-5. If the pig-tale is not wired to the vehicle, short the two conductors.
3. Place the test set probe on the water activation switch as shown in Figure 3-5.
4. Hold down the button labeled **PUSH TO TEST** on the test set handle.
5. Check the beacon battery condition by observing the green and red indicators on the test set.

If the green indicator is lit, the battery is good.

***If the red indicator is lit, the battery should be replaced.
(See Alternate Battery Check, page 11)***

6. Check the beacon operating condition by listening for an audible tone from the test set and /or observing the amber indicator.

If there is an audible tone and /or the amber indicator is flashing, the beacon is operating properly.

If there is no audible tone and the amber indicator is not flashing, the beacon is not operating properly.

NOTE: If the beacon does not operate properly, return it RJE International, Inc. for service. (See Section 5 *Return Procedures* for instructions on how to return the beacon.)

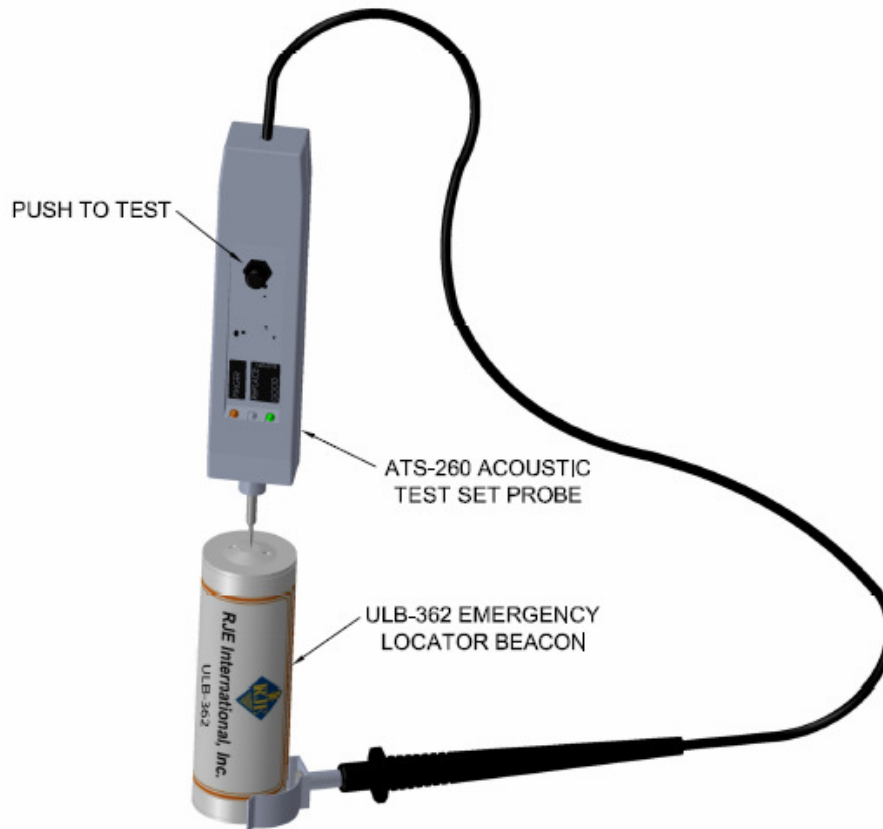


Figure 3-5 Connecting the ATS-260 Acoustic Test Set

ATS-260 Acoustic Test Set Service

The ATS-260 Acoustic Test Set is factory calibrated at the date of manufacture, and must be recalibrated every 36 months. When the "Push to Test" button is pressed and no light illuminates or is dim, the ATS-260 must be serviced. (See Section 5 *Return Procedures* for instructions on how to return the test set.)

Alternative Battery Check

In addition to using the test set to check the beacon's battery condition, a high-impedance (minimum input impedance of 10 Megohms) digital voltmeter can be used to measure the battery voltage. Use the following procedure to measure the battery voltage:

1. Place the negative meter lead on the water activation switch.
2. Place the positive meter lead on any exposed surface of the housing.

Note: if testing a ULB-362PL/B37, the Pig-Tale conductors need to be shorted together.

3. Read the voltmeter.

If the voltmeter reading is 6.0 volts or more, the beacon has sufficient operating power.

If the voltmeter reading is 6.0 volts, battery needs to be replaced. Follow procedures included the B362-B30-01 Battery Kit.



WARNING: Failure to observe these precautions could result in the release of hazardous chemicals.

4 Beacon Maintenance

This section covers the cleaning, recommended testing interval, disposal, storage procedures, and battery replacement for the ULB-362 Series Underwater Locator Beacons.

Beacon Cleaning

The end cap with the water switch should remain free and clear of dirt, grease, and dust. The beacon should be cleaned with a mild detergent and dried thoroughly with a clean cloth. This process should be repeated periodically depending on the local environment.

Beacon Maintenance Precautions

The following precautions should be exercised when handling or storing the beacon:

- ***The beacon should not be exposed to temperatures in excess of 71°C (160°F), as the battery life can be reduced by storage in a high temperature environment.***
- ***Any situation that could possibly crush or penetrate the case of the beacon should be avoided.***

Battery Maintenance

The shelf life on the ULB-362 beacon is six (6) years. The standard operational life of the beacon is thirty (30) days of continuous use and it is recommended that the battery be replaced after every deployment.

When deploying an ULB-362PL/37 power loss beacon on a vehicle, replace the battery on or before the date stamped on the beacon label.

When replacing the battery on ULB-362 beacon, please follow the chart below for selecting the proper Battery Kit.

Beacon Part Number	Battery Kit Part Number
ULB-362/18, ULB-362/37, ULB-362/27, ULB-362/45, ULB-362PL/27, ULB-362PL/37, ULB-362A/27, ULB-362A/37	B362-A30-01
ULB-362B/27, ULB-362B/37, ULB-372B/45, ULB-362PL/B37	B362-B30-01



WARNING: Hazardous chemicals are used in the beacon battery. Dispose of the battery in accordance with local regulations.

Use the battery replacement procedure provided with the lithium battery replacement kit P/N B362-B30-01 or B362-A30-01.

Tooling Requirements for Battery Replacement

Item	Part Number
1/2" Box End Wrench	Commercially Available
Torque Adapter	B362-09111
ATS-260 Test Set	362-00013

Beacon Disposal

If it is necessary to dispose of the beacon, perform the Alternative Battery Check referenced in Section 3 of this User's Manual first.

If the battery voltage is 6.0 volts or more, remove the battery and dispose of the battery and beacon in accordance with local regulations.

If the battery voltage is less than 6.0 volts, DO NOT remove the battery access end cap and dispose of the beacon in accordance with local regulations.



WARNING: Failure to observe these precautions could result in the release of hazardous chemicals.

Beacon Storage

When long-term storage is required, the beacon should be stored in a cool, dry environment in its original shipping container.

5 Return Procedures

If you need to return an ULB-362 Underwater Locator Beacon for warranty service, contact RJE International, Inc. for a **Case Number** and shipping instructions.

RJE International, Inc.
Tel: +1-949-727-9399
Fax: +1-949-727-0070
e-mail: sales@rjeint.com

You will need to provide the following information to receive a **Case Number**:

- **Reason for return**
- **Number of beacons to be returned**
- **Serial number of each unit**
- **Shipping method, if applicable**

NOTE: Do not ship a beacon without a **Case Number**.

6 Warranty

LIMITED WARRANTY. RJE International, Inc. warrants that the products sold hereunder shall be free from defects in materials and workmanship under normal use and service when correctly installed, used and maintained for a period of 12 months from date of shipment from RJE International, Inc. Purchaser's receipt of any product delivered hereunder shall be an unqualified acceptance of and a waiver by Purchaser of the right of Purchaser to make a claim with respect to such product unless Purchaser gives RJE International, Inc. notice of any claim within 12 months after the receipt of such product. This warranty is limited to repair or replacement of the said product at RJE International, Inc. plant in Irvine, California, providing the product was not abused or operated other than in accordance with the RJE International, Inc. instruction manuals. RJE International, Inc. does not assume responsibility for any damage due to leakage or implosion. RJE International, Inc. reserves the right to modify its warranty at any time, in its sole discretion. THIS LIMITED WARRANTY IS NOT TRANSFERABLE.

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