



*RJE INTERNATIONAL, INC.*

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**ULB-364EL**

**USER'S MANUAL**

**REV 3.2**

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# FORWARD

This manual provides instructions and descriptions regarding the deployment, operation, and maintenance of the Underwater Locator Beacon 364 Extended Life (ULB-364EL). All figures, tables, images, and texts are intended to help you understand and get the most out of your device.

**Chapter 1 – An overview of the ULB-364EL.** *General notes on the ULB-364EL, including brief sections describing the applications and physical characteristics of the beacon.*

**Chapter 2 – Specifications.** *Table of specifications for the ULB-364EL.*

**Chapter 3 – Operation and Installation Notes.** *A walkthrough of how to unpack the ULB-364EL and set specific frequency and repetition rates.*

**Chapter 4 - Maintenance.** *Notes on periodic maintenance as well as testing and replacing the battery.*

**Appendices –** *Separate appendices containing mechanical and electrical drawings, as well as diagrams, parts lists, and integrated components list.*

**Please forward all comments and questions about the text, figures, and/or equipment displayed in this manual to RJE International. You can contact us using the information below:**

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## **LIMITED WARRANTY**

RJE International, Inc. (RJE) guarantees its products to be free from defects in materials and workmanship for a period of one year from the date of shipment. In the event a product malfunctions during this period, RJE's obligation is limited to the repair or replacement, at RJE's option, of any product returned to the RJE factory. Products found defective should be returned to the factory freight prepaid and carefully packed, as the customer will be responsible for any damage during shipment.

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All returned products must be accompanied by a Case Number issued by RJE. Shipments without a Case Number will not be accepted.

## **LIABILITY**

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## **RETURN PROCEDURE**

Before returning any equipment to RJE, you must contact RJE and obtain a Case Number. The Case Number assists RJE in identifying the origin and tracking the location of returned items.

When returning items to RJE from outside the United States, follow the checklist presented below to prevent any delays or additional costs.

- Include with all shipments two copies of your commercial invoice showing the value of the items and the reason you are returning them. Whenever possible, send copies of the original export shipping documents with the consignment.
- Route via courier (FedEx or UPS).
- If there is more than one item per consignment, include a packing list with the shipment. It is acceptable to combine the commercial invoice and packing list with the contents of each carton clearly numbered and identified on the commercial invoice.
- If it is necessary to ship via air freight, contact RJE for specific freight forwarding instructions. You will be charged for customs clearance and inbound freight.
- Insure the items for their full value.
- Refer to the RJE issued Case Number on all documents and correspondence.
- Prepay the freight.

## **TITLE**

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## INTRODUCTION TO THE ULB-364EL

### 1.1 Overall Description

The ULB-364 series beacons are underwater acoustic signaling devices used in subsea marking and relocation of equipment and other assets. They are free-running pingers which allow the user to adjust the frequency and repetition rate of the pulse. The beacon comes in two versions: the ULB-364 and ULB-364 Extended Life (EL).

Figure 1-1  
ULB-364EL Beacon



#### 1.1.1 The ULB-364EL

The ULB-364EL is a battery-operated beacon that can relocate underwater targets as far down as 1,000 meters. With a lightweight aluminum housing and user-adjustable settings, the ULB-364EL can be deployed for up to 540 days, depending on the settings and batteries used.

## ULB-364EL SPECIFICATIONS

### 2.1 ULB-364EL Specifications

**Table 2-1 ULB-364EL Specifications**

Transmit Frequency	27, 29, 32, 34, 37, 39, 42, 45 kHz (user adjustable)
Acoustic Source Level	165 dB re 1 $\mu$ Pa @ 1 meter
Transmit Repetition Rate	1 pulse per second/1 pulse every two seconds (user adjustable)
Transmit Pulse Length	5 ms
Activation	Battery activation
Battery	9 volt (PP3) alkaline or lithium battery, qty.: six (6)
Operating Life	Alkaline: 1 pulse per second: 90 days 1 pulse every 2 seconds: 120 days Lithium: 1 pulse per second: 270 days 1 pulse every 2 seconds: 540 days
Operating Temperature Range	-40 °C to +125 °C
Storage Temperature Range	-65 °C to +150 °C
Operational Depth	1,000 m (3,080 ft)
Housing Material	Aluminum; O-ring sealed
Dimensions	33.5 cm (L) x 5.7 cm (D) 13.25 in (L) x 2.25 in (D)
Weight	In Air: 907 g (2.0 lbs.)

Specifications are subject to change.



## **OPERATION & INSTALLATION NOTES**

### **3.1 Introduction**

The ULB-364EL Underwater Locator Beacon is a small, self-contained, free-running pinger activated by battery installation. It operates in both fresh and salt water.

By rotating a switch on its printed circuit board (PCB), the ULB-364EL allows the user to select the operating frequency between 27 and 45 kHz (see Table 3-1 for all available frequency options). This same switch also allows the operator to change the repetition rate from a pulse per second to a pulse every two seconds, extending the operational life of your device.

With the right settings, the ULB-364EL can continuously emit signals for up to 540 days, depending on the batteries used. It is powered by non-rechargeable 9-volt alkaline or lithium batteries (type PP3).

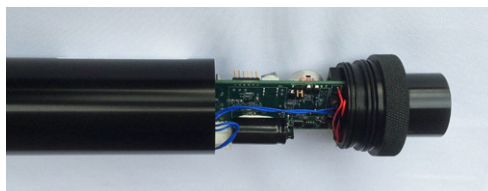
### **3.2 Unpacking**

When opening the shipping cartons, carefully inspect each pinger as it is unpacked, and report any damage to the freight carrier and to RJE International.

As with any sophisticated electronic equipment, RJE International products should be handled with a reasonable amount of care during unpacking, transporting and storing. Pay specific attention to make sure that there is no damage to the housing or transducer.

### **3.3 Setting the ULB-364EL Transmit Frequency and Repetition Rate**

- Gently loosen and remove the transducer/PCB assembly from the housing.



**Figure 3-1 ULB-363EL Disassembly**

- Orient the unboxed ULB-364EL so the rotary switch is located as shown below:

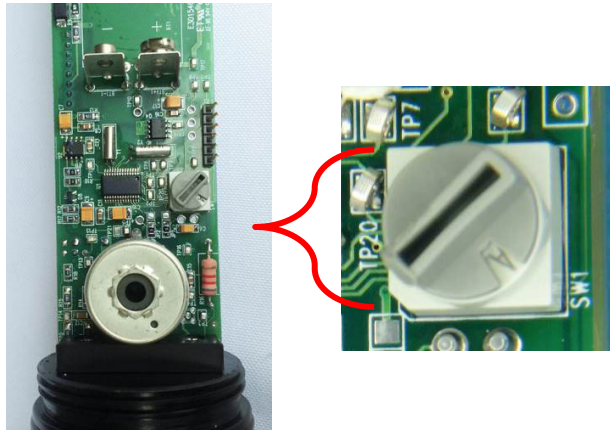


Figure 3-2 Frequency Select Switch

- Set the switch position of SW1 to the position for the desired frequency (Table 3-1)

**Table 3-1 Frequency/Rep Rate Select Switch Settings**

Mode	SW Selection
27kHz @ 1 pulse per second	0
29kHz @ 1 pulse per second	1
32kHz @ 1 pulse per second	2
34kHz @ 1 pulse per second	3
37kHz @ 1 pulse per second	4
39kHz @ 1 pulse per second	5
42kHz @ 1 pulse per second	6
45kHz @ 1 pulse per second	7
27kHz @ 1 pulse per 2 seconds	8
29kHz @ 1 pulse per 2 seconds	9
32kHz @ 1 pulse per 2 seconds	A
34kHz @ 1 pulse per 2 seconds	B
37kHz @ 1 pulse per 2 seconds	C
39kHz @ 1 pulse per 2 seconds	D
42kHz @ 1 pulse per 2 seconds	E
45kHz @ 1 pulse per 2 seconds	F

### 3.4 Activating the ULB-364EL

The ULB-364EL is activated by battery installation. See section 4.3 for instructions on how to install batteries.

## ULB-364EL MAINTENANCE

### 4.1 Maintenance

Upon completion of each deployment, take these steps to assure continued reliable performance from the ULB-364EL:

- Wash the exterior of the equipment with fresh water and mild detergent. Pay particular attention to cleaning film build-up on the transducer end.
- Make sure the equipment has been thoroughly dried and the batteries have been removed before storage.
- Inspect O-rings for damage and wear. Order replacements if required.

### 4.2 Battery Test

This test allows you to roughly determine the state of the 9-volt batteries without removing the batteries from the unit. All batteries are different and we recommend that you replace the batteries after every deployment to ensure full operational life.

Using a Volt/Ohm meter (VOM) set to measure DC voltage, place the meter's probes across the water switch contacts located on top of the transducer. Measure the voltage and use the chart below. **Note:** Polarity is not important in this measurement.

**Table 4-1 Voltage Reading v. Battery Status**

Voltage Reading	Battery Status
$\geq 3$ vdc	New
$\geq 2.8$ vdc	Good
$\geq 2.75$ vdc	Marginal
$< 2.75$ vdc	Replace

### 4.3 Replacing the ULB-364EL Batteries

The batteries in the ULB-364EL transponder should be replaced after six months or prior to each use. To change the ULB-364EL batteries follow this procedure:

- Gently loosen and remove the transducer/PCB assembly from the housing.



Figure 4-1 ULB-364EL Disassembled

- Remove the old batteries and install the new batteries as shown. Note the battery terminal orientation before making a connection. Ensure the battery terminals are fully seated.

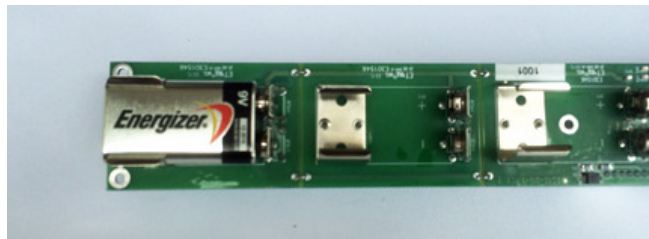


Figure 4-2 ULB-364EL Battery Connections

- Rotate the transponder/PCB assembly and repeat the same steps for the opposite side. Each battery should fit into their respective terminal as shown below:

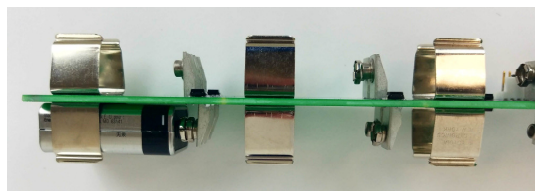
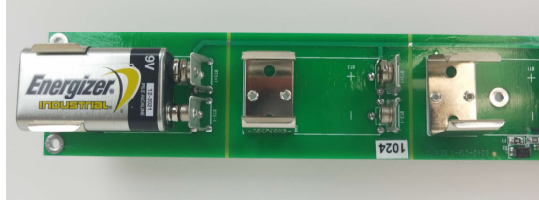


Figure 4-3 ULB-364EL Battery installation, side view



**Figure 4-4 ULB-364EL Battery installation, direct view**

- Before installing the end cap assembly, make sure the O-ring and O-ring surfaces are clean and free of debris. Lubricate the O-ring with a light coat of silicon grease (O-lube).
- If preparing for a new deployment, note that the beacon is activated by the installation of the batteries and is ON.
- Reassemble the unit by reversing the order of disassembly.