



RJE INTERNATIONAL, INC.



ULB-364
UNDERWATER LOCATOR
BEACON
USER'S MANUAL
REV 3.1

10/23/2017

PROPRIETARY MATERIAL

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This manual is provided for information and reference purposes only and is subject to change without notice.

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.

Repairs or replacements, parts, labor, and return shipments under this warranty will be at no cost to the customer. This warranty is void if, in RJE's opinion, the product has been damaged by accident or mishandling, altered, or repaired by the customer, where such treatment has affected its performance or reliability. In the event of such mishandling, all costs for repair and return freight will be charged to the customer. All products supplied by RJE that are designed for use under hydrostatic loading have been certified by actual pressure testing prior to shipment. Any damage that occurs as a direct result of flooding is NOT covered by this warranty.

If a product is returned for warranty repair and no defect is found, the customer will be charged a diagnostic fee plus all shipping costs. Incidental or consequential damages or costs incurred as a result of a product's malfunction are not the responsibility of RJE.

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

LIABILITY

RJE shall not be liable for incidental or consequential damages, injuries, or losses as a result of the installation, testing, operation, or servicing of RJE products.

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

Title shall pass to buyer on delivery to carrier in Irvine, CA. Risk of damage or loss following such delivery shall be to the buyer and RJE International shall in no way be responsible for safe arrival of the shipment. Title shall so pass to buyer regardless of any provision for payment of freight or insurance by RJE International or of the form of shipping documents. If shipment is consigned to RJE International, it shall be for the purpose of securing buyer's obligations under the contract.

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INTRODUCTION TO THE ULB-364

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. The ULB-364 is a free-running pinger that allows 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).

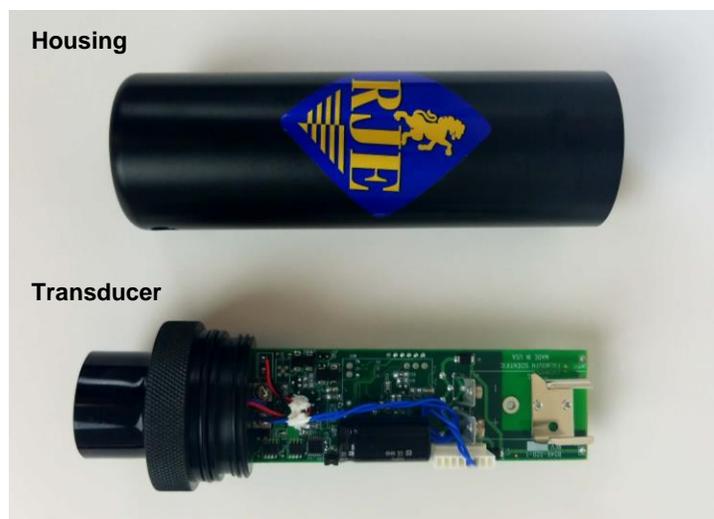


Figure 1-1 ULB-364 Beacon

1.1.1 The ULB-364

The ULB-364 is a battery-operated beacon that can relocate underwater targets as far down as 1,000 meters. With lightweight, aluminum housing and user-adjustable settings, the ULB-364 can be deployed for up to 180 days, depending on the settings and batteries used. The extended life version, the ULB-364 EL, can be deployed for up to 540 days.

ULB-364 SPECIFICATIONS

2.1 ULB-364 Specifications

Table 2-1 ULB-364 Specifications

Transmit Frequency	27, 29, 32, 34, 37, 39, 42, 45 kHz (user adjustable)
Acoustic Source Level	165 dB re 1 μ 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.: two (2)
Operating Life	Alkaline: 1 Pulse per second: 30 days 1 Pulse every 2 seconds: 40 days Lithium: 1 Pulse per second: 90 days 1 Pulse every 2 seconds: 180 days
Operating Temperature Range	-40C to +125C
Storage Temperature Range	-65C to +150C
Operational Depth	1,000 m (3,080 ft)
Housing Material	Aluminum; O-ring sealed
Dimensions	20.32 cm (L) x 5.71 cm (D) 8.00 in (L) x 2.25 in (D)
Weight	In Air: 806g (1.8lbs)

Specifications are subject to change.

OPERATION & INSTALLATION NOTES

3.1 Introduction

The ULB-364 is activated by shorting the water switch. It can operate in both fresh and salt water.

The ULB-364 allows the user to select an operating frequency by rotating a switch on the printed circuit board (PCB), choosing between 27, 29, 32, 34, 37, 39, 42, and 45 kHz. This switch also allows the operator to change the repetition rate from once per second to once every 2 seconds, extending the battery life of their device.

With the right settings and using non-rechargeable 9-volt lithium batteries, the ULB-364 can emit a signal for a maximum of up to 180 days.

3.2 Unpacking

When opening the shipping carton, 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 the housing and transducer to make sure that there is no damage.

3.3 Setting the ULB-364 Transmit Frequency and Repetition Rate

- Loosen and remove the knurled locking collar from the housing and gently remove the end cap.

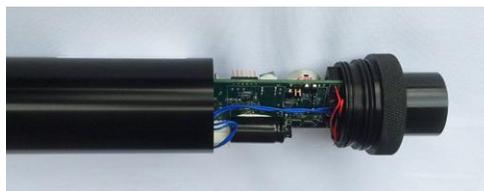


Figure 3-1 ULB-364 Disassembly

- Orient the ULB-364EL assembly so the rotary switch is located as shown below.

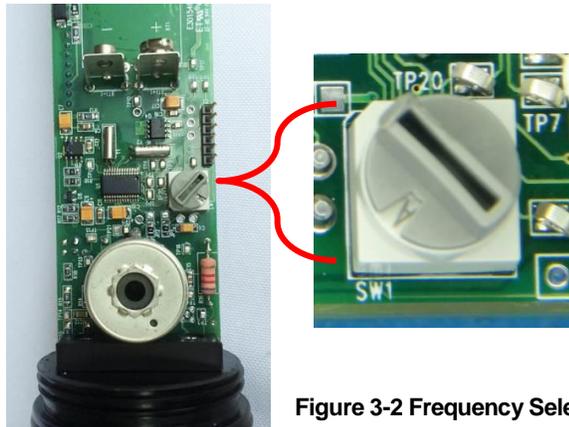


Figure 3-2 Frequency Select Switch

- Set the switch position of SW1 to the position for the desired channel and/or frequency, using the table below for reference (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-364

The ULB-364 is activated by shorting the water switch. See section 4.3 for instructions on how to install batteries.

ULB-364 MAINTENANCE

4.1 Maintenance

After each deployment, take the following steps to assure continued reliable performance from the ULB-364:

- Wash the exterior of the equipment with fresh water and mild detergent. Pay 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 needed replacements if required.

4.2 Battery Test

This test allows you to roughly determine the state of the 9-volt battery without removing the battery from the unit. All batteries are different and we recommend that you replace the battery 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.*

Voltage Reading	Battery Status
≥ 3 vdc	New
≥ 2.8 vdc	Good
≥ 2.75 vdc	Marginal
< 2.75 vdc	Replace

Table 4-1 Voltage Reading vs. Battery Status

4.3 Replacing the ULB-364 Batteries

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

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



Figure 4-1 ULB-364 Disassembled

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



Figure 4-2 ULB-364 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:

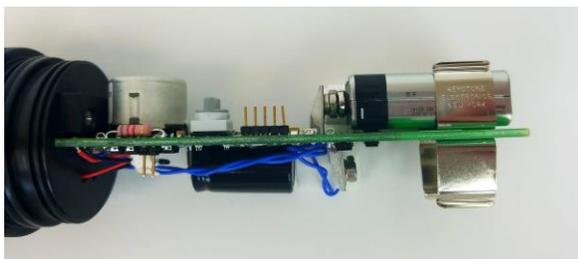


Figure 4-3 ULB-364 Battery Installation

- 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).
- Reassemble the unit by reversing the order of disassembly.