



RJE INTERNATIONAL, INC.



**ATT-400/AODC
TRANSPONDER
USER MANUAL
REV. A**

600-17025

Forward

This manual is comprised of figures and text intended to provide descriptions and instructions for the installation, operation, and maintenance of the RJE International ATT-400/AODC Series Acoustic Target Transponder. The information herein is arranged into chapters and sections as follows:

Chapter 1 – An overview of the ATT-400/AODC. General notes including brief sections describing the applications and physical characteristics of the beacon itself.

Chapter 2 – Specifications. Section comprised of a list of both general and unique- to-the-unit specifications.

Chapter 3 – Operation and Installation Notes. Sections detail the unpacking and pre-deployment checkout procedures for the ATT-400/AODC.

Chapter 4 - Maintenance. Sections detail periodic maintenance, battery replacement and calibration procedures.

Please forward comments, questions, suggestions, or problems with the text, figures, or equipment to RJE International.

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PROPRIETARY MATERIAL

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RJE International, Inc. reserves the right to make changes in design or specifications at any time without incurring any obligation to modify previously installed units.

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 mishandled, 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 International, Inc. 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 airfreight, 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 at 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 in 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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1.1 Overall Description

The RJE International ATT-400/AODC Acoustic Transponder is an underwater acoustic signaling device that works with the DTI-300/AODC interrogator and Sonardyne's tracking systems for marking and relocating diving bells. The ATT-400/AODC Transponder meets the DNV specifications for offshore use.



Figure 1-1
DTI-300/AODC Diver Transponder

1.2 ATT-400/AODC Series Acoustic Target Transponder

The ATT-400/AODC transponder is a small battery operated underwater acoustic device that works with the DTI-300/AODC and Sonardyne Homer-Pro receiver and Ranger2 USBL tracking systems. It is designed to meet DNV-OS-EA02 STI-350 for marking commercial diving bells in a range of up to 750 meters (2461ft). ATT-400/AODCST comes in two models that are based on the factory set receive frequency, 38.5kHz (Ch-A) and 39.5kHz (Ch-B).

Once deployed, a water switch activates the transponder. The activated ATT-400/AODC remains in the receive mode for up to 36 months, waiting quietly for an interrogation signal from a transponder interrogator. Once interrogated, the ATT-400/AODC transponder responds to the interrogator with a 37.5Khz acoustic signal.

Constructed of non-corrosive material, the ATT-400/AODC transponders can be deployed to depths from 100 meters to 6000 meters, depending on the Model.



Figure 1-2
ATT-400/AODC Transponder

2.1 ATT-400/AODC Acoustic Target Transponder Specifications

Table 2-1 ATT-400/AODC Series Acoustic Transponder Specifications

Receive Frequency	38.5kHz (CH-A) and 39.5kHz (Ch-B) factory set
Acoustic Source Level	180 dB re 1 μ Pa @ 1 meter
Transmit Repetition Rate	Normal: 1.0 second
Transmit Pulse Length	5.0 ms
Transmit Frequency	37.5kHz
Transponder Turnaround Time Compensation	125.8 ms
Activation	Water Activated Switch
Battery	9 Volt Battery, Alkaline or Lithium
Range	750m (2461ft) with DTI-300/AODC
Operating Life	Alkaline Battery: 18 Months Stand-by or 1,000,000 Replies in Transponder Mode. 12 Days in Pinger Mode Lithium Battery: 36 months Stand-by or 2,000,000 Replies in Transponder Mode. 24 Days in Pinger Mode
Operational Depth	1,000 Meters (3,281ft)
Housing Material	Anodized Aluminum
Dimensions	30cm x 6.4cm \odot (12.0in x 2.5in \odot)
Weight	In Air: 2.0lbs (907g)

Specifications are subject to change.

OPERATION & INSTALLATION NOTES

3.1 Introduction

The ATT-400/AODC is a small, self-contained acoustic device that can operate as a transponder. Using a water switch, the ATT-400/AODC activates once it is placed in the water and shuts down when removed from the water. It operates in both fresh and saltwater environments.

Once wet the ATT-400/AODC will remain activated for up to thirty-six months (based on the battery type) while it waits to receive a coded interrogation signal from a transponder interrogator.

3.2 Unpacking

When opening the shipping carton, carefully inspect each piece of equipment 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 attention to make sure that:

- The end caps are properly secured, and the end cap screws are tightened.
- There is no damage to the housing.



Figure 3-1 ATT-400/AODC Disassembly

3.3 Pre-Deployment Check

Perform an in-air check by using the DTI-300/AODC interrogator with the following sequence:

- Turn the DTI-300/AODC receiver on by using the main power switch and press any control switch before 10 seconds pass to confirm activation.
- On the DTI-300/AODC, press UP or DOWN buttons to select the proper channel (Ch-A) or (Ch-B) for the model of the ATT-400/AODC being used.
- Aim the DTI-300/AODC transducer at the transponder. Observe the interrogator **T** (transmit) flash and verify that the **R** (receive) flashes alternately. The unit will display an intermittent range and bearing to the transponder being tested.

Note: The range and bearing acquired during in-air testing will not be accurate as the air is a slower and more difficult sound medium than water. If the in-air testing is not satisfactory, submerge the units in water and repeat the test.

ATT-400/AODC MAINTENANCE

4.1 Maintenance

Upon completion of each dive mission, take these steps to assure continued reliable performance from the ATT-400/AODC.

- Wash the exterior of the equipment with fresh water and mild detergent. Make sure to clean filmy build-up on the transducer face.
- Make sure the equipment has been thoroughly dried before storage.
- Inspect all system components for damage and wear. Order needed replacement parts 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, which you can find on the 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

4.3 Replacing the ATT-400/AODC batteries

The batteries in the ATT-400/AODC transponder should be replaced after eighteen to thirty-six months, based on model, or prior to each use. To change the ATT-400/AODC batteries follow this procedure:

- Gently loosen and remove the end cap assembly from the housing by turning the housing counter-clockwise.



Figure 4-1 ATT-400/AODC Disassembly

- 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 ATT-400/AODC Battery Connections

- Rotate the transponder assembly and repeat the same steps for the opposite side.

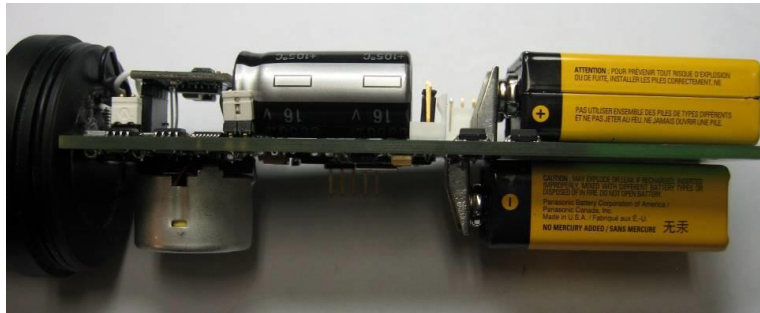


Figure 4-3 ATT-400/AODC Battery Installation

- 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) supplied in the spares kit.
- Reassemble the unit.