



RJE INTERNATIONAL, INC.



**ATT-400 SERIES
ACOUSTIC TARGET
TRANSDUCER
USER MANUAL
REV 1.5**

5/15/2015

Forward

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

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

Chapter 2 – Specifications. Sections comprised of lists of both general and unique-to-the-unit specifications.

Chapter 3 – Operation and Deployment Notes. Sections detail the unpacking and predeployment checkout procedures for the ATT-400.

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.

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 shipment 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. Shipments without a CASE number will not be accepted.

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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 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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TABLE OF CONTENTS

FORWARD

WARRANTY

1 – Introduction to the ATT-400 Acoustic Target Transponder

1.1 Overall Description	1
1.2 ATT-400 Series Acoustic Target Transponder.....	1

2 – ATT-400 Specifications

2.1 ATT-400 Acoustic Target Transponder Specifications.....	3
2.2 ATT-400EXT External Power Transponder Specifications	4
2.3 ATT-400IK-SW/WTO External Activation Transponder Specifications	5

3 – Operations & Installation Notes

3.1 Introduction.....	5
3.2 Unpacking.....	5
3.3 Setting the ATT-400 Transmit Frequency Selector Rotary Switch.....	6

4 – ATT-400 Maintenance

4.1 Maintenance	8
4.2 Replacing the ATT-400 Battery.....	8

ILLUSTRATIONS

FIGURE 1-1 Model DTI-300A Diver Transponder Interrogator.....	1
FIGURE 1-2 Model VADR-1000M Vehicle Acoustic Receiver	1
FIGURE 1-3 Model ATT-400 Acoustic Target Transponder	2
FIGURE 1-4 Model ATT-400EL Acoustic Target Transponder.....	2
FIGURE 1-5 Model ATT-400/1KM and ATT-400/6KM Transponder, Deep-water	2
FIGURE 1-6 Model ATT-400EXT Transponder External Power	2
FIGURE 2-1 Model ATT-400EXT Connection Detail	4
FIGURE 2-2 Model ATT-400IK-SW/WTO Connection Detail.....	4
FIGURE 3-1 ATT-400 Disassembly.....	6
FIGURE 3-2 Channel Selector Switch	6
FIGURE 4-1 ATT-400 Disassembly.....	8
FIGURE 4-2 ATT-400 Battery Connections.....	9
FIGURE 4-3 ATT-400 Battery Installation.....	9

TABLES

TABLES 2-1 ATT-400 Specifications.....	2
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TABLES 2-2 ATT-400EXT Specifications.....4

TABLES 3-1 Channel Select Switch Settings7

1.1 Overall Description

The RJE International ATT-400 Series Acoustic Target Transponder is an underwater acoustic signaling device that works with transponder interrogators for diver marking and relocation. In addition the ATT-400 Series Transponder can be configured to operate as a free running pinger with eight user selectable operating frequencies.



Figure 1-1
DTI-300A Diver Transponder
Interrogator



Figure 1-2
VDAR-1000M Vehicle
Acoustic Receiver

1.2 ATT-400 Series Acoustic Target Transponder

The ATT-400 series transponders are small battery operated underwater acoustic devices that works with the DTI-300A and STI-350 transponder interrogators or SEEKER series subsea vehicle acoustic receivers to mark and relocate targets underwater in ranges of 750 meters (2461ft). The ATT-400 comes in six models, ATT-400 standard, ATT-400EL long life, ATT-400/1KM, ATT-400/6KM deep-water models, ATT-400EXT external power model and ATT-400IK-SW/WTO externally activated. Once deployed, a water switch activates the transponder where it can remain in the receive mode for up to 18 months waiting quietly for an interrogation signal from a transponder interrogator. Once interrogated, the ATT-400 transponder responds to the interrogator using eight different user programmable channels.

The ATT-400 series transponder can also be operated as a free running pinger by changing the setting on the PCB as shown in section 3.3 of this manual. By selecting this option, the ATT-400 sends an acoustic signal continuous with eight user selectable channels.

In addition, the ATT-400 series transponder is positively buoyant and requires no additional flotation so deployment is easy. Constructed of non-corrosive material, the ATT-400 transponders can be deployed to depth from 100 meters to 6000 meters.



Figure 1-3
ATT-400 Transponder



Figure 1-4
ATT-400EL Long Life Transponder



Figure 1-5
ATT-400/1KM and ATT-400/6KM
Transponder, Deep-Water



Figure 1-6
ATT-400EXT Transponder External
Power

2.1 ATT-400 Acoustic Target Transponders Specifications

Table 2-1 ATT-400 Series Acoustic Transponder Specifications

Receive Frequency	26 kHz
Acoustic Source Level	180 dB re 1μPa @ 1 meter
Transmit Repetition Rate	Normal: 1.0 second
Transmit Pulse Length	5.0 ms
Transmit Frequency	Switch-selectable to 27, 28, 29, 30, 31, 32, 33, 34 kHz
Transponder Turnaround Time Compensation	20 ms
Activation	Water Activated Switch
Battery	9 Volt Battery QTY 2
Range	750m (2461ft) with DTI-300, STI-350, or VADR Receivers
Operating Life	ATT-400, ATT-400/1KM, ATT-400/6KM: 6 Months Stand by or 360,000 Replies in Transponder Mode. 4 Days in Pinger Mode ATT-400EL: 18 Months Stand by or 1,000,000 Replies in Transponder Mode. 12 Days in Pinger Mode
Operational Depth	100m (328ft)
Housing Material	ATT-400, ATT-400EL: Delrin and glass-filled polycarbonate; O-ring sealed ATT-400/1KM, ATT-400/6KM: Anodized Aluminum; O-ring sealed
Dimensions	ATT-400, ATT-400/1KM, ATT-400/6KM: 23cm x 6.4cm (9.0in x 2.5in) ATT-400EL: 30cm x 6.4cm (12.0in x 2.5in)
Weight	ATT-400: In Air: 0.75lbs (0.34kg) In Water: Positively Buoyant ATT-400EL: In Air: 1.4lbs (0.63kg), In Water: Positively Buoyant ATT-400/1KM, ATT-400/6KM: In Air 3.85lbs (1.1kg): In Water: 2.36lbs (1.1kg)

Specifications are subject to change

2.2 SPECIFICATIONS UNIQUE TO THE ATT-400EXT

Table 2-2 ATT-400EXT External Power Transponder Specifications

External Power Requirements	18-36VDC(24VDC Nominal) @ 2Amps
Connector	Subconn MCIL2F with 6m mating cable assembly with locking sleeve.
Range	750m (2250ft) with DTI-300, STI-350, or VADR Receivers
Operational Depth	100m (328ft)
Housing Material	Delrin and glass-filled polycarbonate; O-ring sealed
Dimensions	23cm x 6.4cm⌀ (9.0in x 2.5in⌀)
Weight	In Air: 0.45Kg (1 lbs.), In Water: Positively Buoyant

The ATT-400EXT functions the same as the ATT-400 Target Transponder except the unit is externally powered from a secondary source. All other functions are the same.

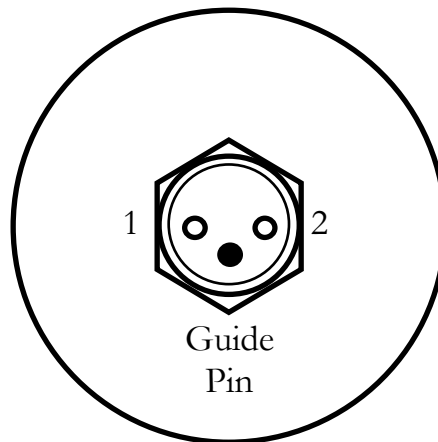


Figure 2-1 Connection Detail
ATT-400 End cap with face
view of SubConn Male
connector part number
MCIL2F.
Pin 1 +24VDC
Pin 2 – Common

2.3 SPECIFICATIONS UNIQUE TO THE ATT-400IK-SW/WTO

Table 2-3 ATT-400IK-SW/WTO Power Loss Transponder Specifications

Connector	Subconn MCIL2F with .6m(24in) mating cable assembly with locking sleeve.
Range	750m (2250ft) with DTI-300, STI-350, or VADR Receivers
Operational Depth	1000m (3280ft)
Housing Material	T6 Anodized Aluminum; O-ring sealed
Dimensions	23cm x 6.4cm $\varnothing$ (9.0in x 2.5in $\varnothing$)
Weight	In Air: 0.82Kg (1.83 lbs.), In Water: Positively Buoyant

The ATT-400IK-SW/SWO functions the same as the ATT-400 Target Transponder except the unit is externally activated. All other functions are the same.

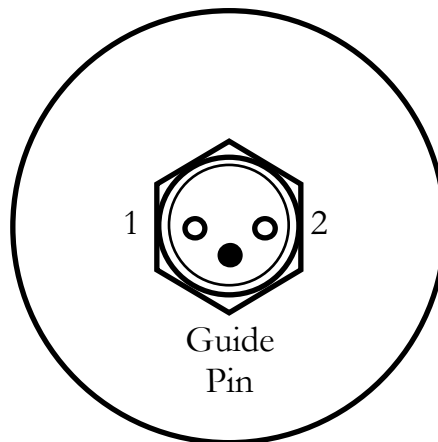


Figure 2-2 Connection Detail ATT-400
End cap with face view of SubConn
Male connector part number MCIL2F.

When unit is submerged short pin 1 and pin 2 together to activate the unit

OPERATIONS & INSTALLATION NOTES

3.1 Introduction

The ATT-400 Series Acoustic Target Transponder is a small self-contained acoustic device that can operate as a transponder or a free running pinger. Using a water switch, the ATT-400 activates once it is placed in the water and shuts down when removed from the water. It operates in both fresh and salt-water environments.

A Rotary-switch on the board allows the operator to select what mode to place the ATT-400 in (transponder or free-running pinger) and to select which of the eight different frequencies (from 27khz to 34khz) to transmit in.

If set up in the transponder mode the ATT-400 will remain activated from up to six to eighteen months, based on model, while it waits to receive a coded interrogation signal from a transponder interrogator. In the free-running pinger mode, the ATT-400 will activate once immersed and continuously send a signal from 4 to 12 days, based on model. Because it can be programmed to operate on eight different channels, the operator can mark and relocate eight different locations simultaneously.

3.2 Unpacking

When opening the shipping cartons, 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 particular 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.

3.3 Setting the ATT-400 Transmit Frequency Using the Rotary Switch

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



Figure 3-1 ATT-400 Disassemble

- Orient the ATT-400 assembly so the rotary switch is located as shown below.

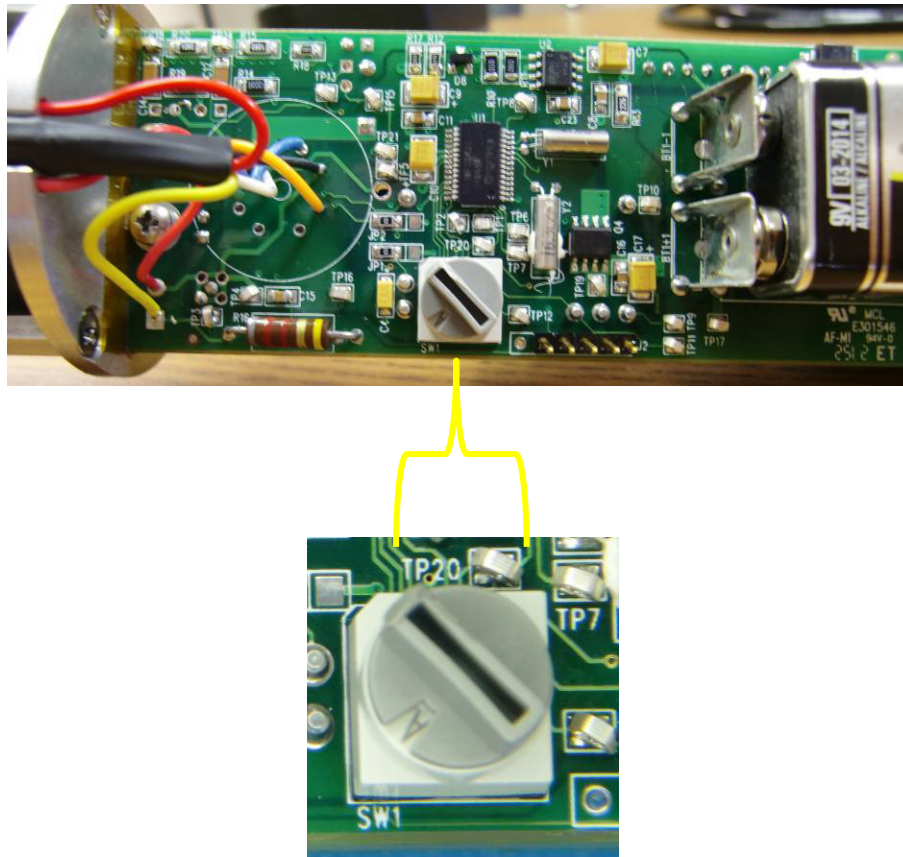


Figure 3-2 Channel Select Switch

- Set the switch positions of SW1 to the position for the desired channel and/or frequency (Table 3-1).

Table 3-1 Channel Select Switch Settings

Mode	SW Selection	CH#/Frequency
Transponder	0	CH1/27kHz
Transponder	1	CH2/28kHz
Transponder	2	CH3/29kHz
Transponder	3	CH4/30kHz
Transponder	4	CH5/31kHz
Transponder	5	CH6/32kHz
Transponder	6	CH7/33kHz
Transponder	7	CH8/34kHz
Pinger	8	27kHz
Pinger	9	28kHz
Pinger	A	29kHz
Pinger	B	30kHz
Pinger	C	31kHz
Pinger	D	32kHz
Pinger	E	33kHz
Pinger	F	34kHz

ATT-400 MAINTENANCE

4.1 Maintenance

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

- Wash the exterior of the equipment with fresh water and mild detergent. Pay particular attention to cleaning film build-up from 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 Replacing the ATT-400 batteries

The batteries in the ATT-400 transponder should be replaced after six to 10 months, based on model, or prior to each use. To change the ATT-400 batteries follow this procedure:

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



Figure 4-1 ATT-400 Disassembly

- Remove the old batteries (two or six based on model) and install the new battery as shown. Note the battery terminal orientation before making connection. Insure the battery terminals are fully seated.



Figure 4-2 ATT-400 Battery Connections

- Rotate the transponder assembly and repeat the same steps for the opposite side. When completed the assembly will look as shown.

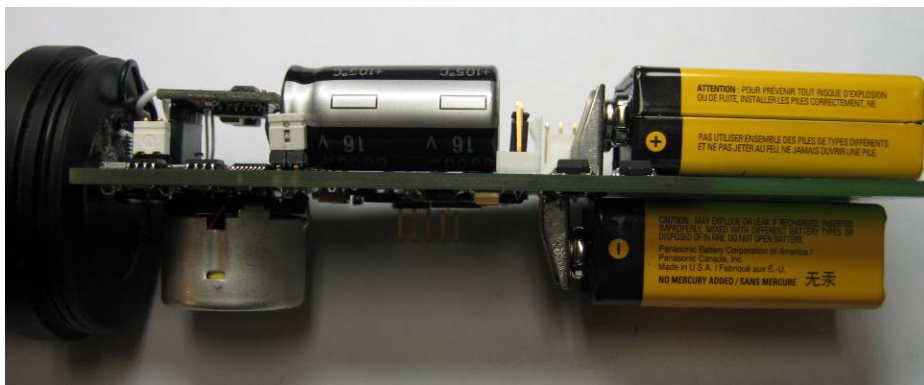


Figure 4-3 ATT-400 Battery Installation

- 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 by reversing the order of disassembly.