

Q-Boat I

Assembly and Operating Instructions



The Oceanscience Q-Boat I is a remotely controlled electric boat designed for easy sensor deployment. It has two 12VDC motors and a top speed near 1.7 mps. The Q-Boat is configured to accept optional Hydrolink radio modems. A generous space for data electronics is located below deck. Following are instructions for set up and operation of the boat with a standard ADCP.

Battery Installation

The Q-Boat I uses a single high-energy 12V 30Ah NiMH battery. The battery is nestled in a fiberglass bracket below the main deck hatch and strapped in place with Velcro straps. Be sure the main power switch is off when loading and unloading the battery (See Figure 1).

Control Electronics

The QB-I is operated using a commercial off-the-shelf Futaba transmitter/receiver or the

Oceanscience Vessel Control System. Please refer to the controller manual for instruction.

The onboard Vessel Control Unit (VCU, see Figure 2) holds a speed controller and control radio receiver. The VCU also provides a 12VDC auxiliary power port for powering standard instrumentation equipment (including data transmission radios).

Operation

Caution: The propellers turn at over 1500 RPM. There is extreme danger of injury if they are touched or otherwise contacted while operating. Always stay clear of the propellers when batteries are onboard.

Oceanscience recommends that you familiarize yourself with the control system operation before deployment.

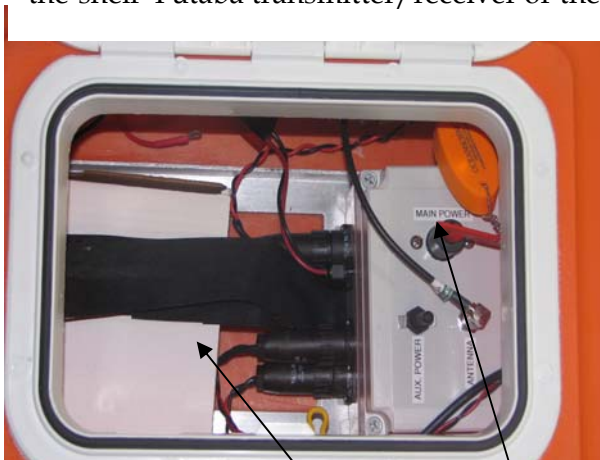


Figure 1. Battery(s) Power Switch

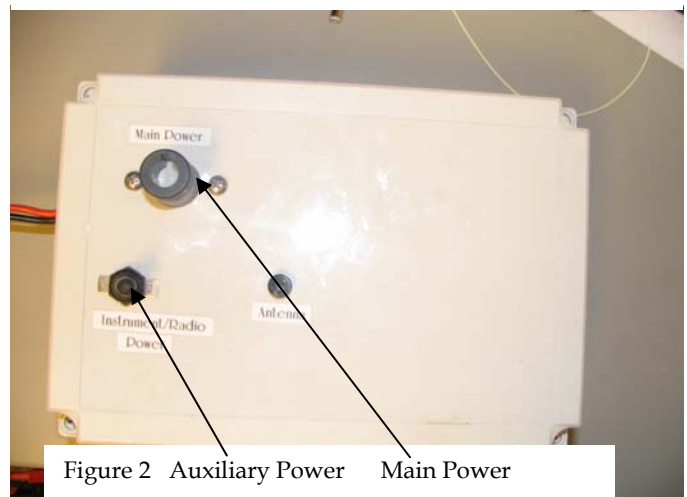


Figure 2 Auxiliary Power Main Power

Controller Range Test

Before deploying the boat, test the controller range by powering up, confirming operation, and then walking away from the boat while an observer at the boat confirms continuous contact. Be sure to check onboard antenna connections and to fully extend the handheld controller antenna.

Other Tips

Before deploying in fast rivers or dangerous situations, thoroughly familiarize yourself with the way the boat responds to the controls. When the boat is outbound, it will respond to control signals much as expected. When inbound (heading towards the handheld unit) the same control signals create an opposite response. During inbound transit, it will help to leave the settings unchanged and to hold your attention constantly on the boat.

Without sufficient practice, the usual first response in an emergency inbound maneuver is likely to be opposite the desired direction.

Make small changes with the throttle and steering controls. They are sensitive and gentle operation is all that's needed to make the boat respond.

To prolong the life of the motors and propulsion system, accelerate slowly and gently. The rudder servo consumes a lot of power; minimizing rudder use will extend the power endurance.

Power Up Process & Deployment

Caution: Follow the correct power-up process to avoid mishaps. Always activate the handheld controller first. Activating the on-board power switches with the handheld controller turned off could instantly activate the rudders and props to pre-set speeds. This is potentially dangerous.

Step 1. Before powering the boat, confirm that

the handheld controller/wireless helm is turned on, the props are clear, no one is standing near the boat, and that the control sticks are in neutral.

Step 2. Turn on the on-board power switches. Note the two switches on the lid of the electronics box in Figure 2: Main Power and Auxiliary Power switch (forward). *The main power switch does not have to be on for the auxiliary switch to provide power to the auxiliary port.*

Step 3. Before launching the boat, test forward and reverse propeller operation to ensure correct function. Move the rudder control (left joystick) back and forth to make sure that the rudder is working and that it doesn't bind at either lock. When ready to deploy, we recommend backing the boat away from the shore to minimize the potential for prop damage.

Installing the ADCP

With the ADCP looking downward and sitting on its cap, install the 1/4-20 x 3" mounting studs: insert the studs from above and install a lock washer and standard nut on the bottom, leaving no more thread than necessary protruding from the bottom of the nut. (see Figure 4). Install a hex nut from the top, using wrenches to snug both nuts against the instrument flange. This will leave about 3/4" of thread protruding upwards to pass through the instrument mounting plate and receive the wing nuts and lock washers.

Attach the mounting plate to the instrument, and place instrument with mounting plate attached into the well on the Q-Boat. Adjust for height with standoffs if needed and secure the mounting plate to the boat. Connect the instrument cable to the ADCP and internally to the modem.

Driveline Maintenance

The Q-Boat is shipped with prop shafts fully greased. For optimum performance and leak prevention it is important that they remain so. The shafts have grease fittings for regular service. Replenish the grease at least once a week when the boat is being used, and before any deployment following an inactive period. Use lithium trailer axle grease (a grease kit is included; replacement grease may be obtained at a marine supply store).

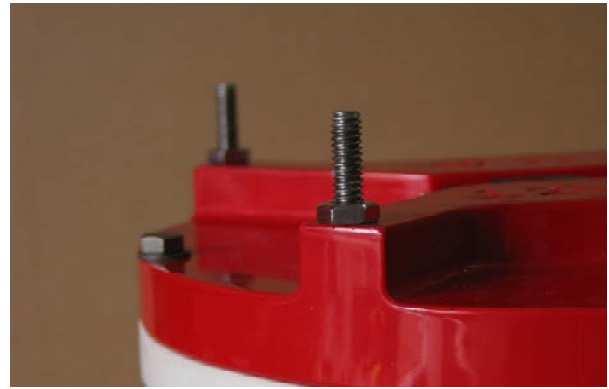


Figure 4. ADCP with mounting bolts installed.

Battery Charging

The Q-Boat 1 uses a 12V 30Ah NiMH battery to provide three sources of power: 12V propulsion, 12V instrumentation, and 4.8/6V power for on-board radio controller/rudder servo power. The 30 AH battery uses a specialized charger and the charging instructions should be followed closely. *NOTE: At no time can the battery be charged with the 3-1 discharge cable attached.* The charger should require a minimum of 15 hours to charge with the charger rate selector switch in the 1.9A position. Spare propulsion batteries may be purchased from any local battery distributor. A 12V AGM battery with between 30 and 40 AH capacity is an acceptable alternative.. Chargers for these batteries may also be purchased locally.

Hand-held Controller

The handheld controller/wireless helm uses its own batteries that need to be maintained and properly charged. Batteries and charger are provided. Please refer to the controller manual.

