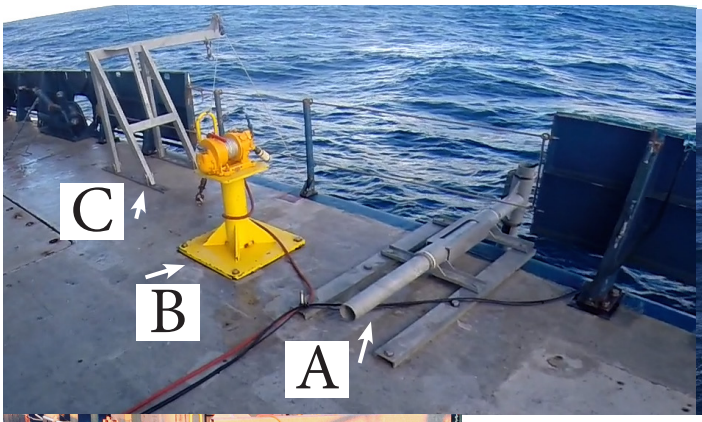
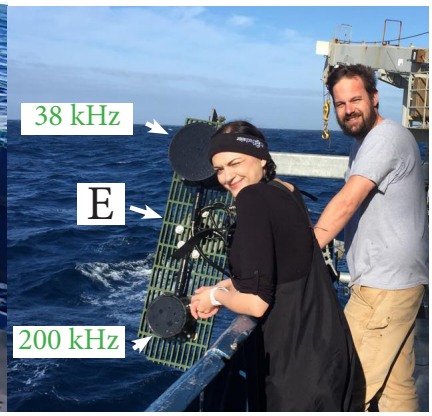
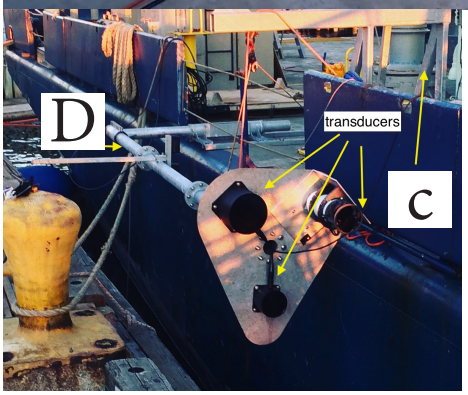
The Rotating Universal Mounting Pole (RUMP) and BioSonics Echosounder

The transducer mounting pole consists of three primary elements:

A) Deck plate which includes the pivot and t-joint
B) Air-tugger (must be supplied by boat).
C) Winch boom that is also used to secure the pole during transit
D) Pole that is comprised of 5 individual 4’ sections
E) Transducer mounting plate which attaches to the end of the pole.







The BioSonics echosounder consists of 9 items in 2 cases:

1) DT-X echosounder in grey pelican case (case a)
2) 38 kHz transducer in 10” diameter aluminum housing (case a)
3) 200 kHz transducer in 6” diameter aluminum housing (case a)
4) Multiplexing cable (case a)
5) Deck cable (case a)
6) Power cord (case a)
7) Ethernet cable (case a)
8) Battery box with charger (case b)
9) Laptop
10) External back-up drive

Shipping:

RUMP

The entire system can be shipped in a custom-built wooden crate that is 6'x6'x'8' and weighs roughly 1500 lbs. It can also be shipped as individual parts.

The largest item is the boom/winch stand (C) which stands roughly 4 feet tall, has a 2.5'x3.5' footprint, and weighs approximately 250 lbs.

The pole (D) is built in 5 sections, each weighing about 100 lbs.

The deck plate (A), when assembled, is approximately 6'x2.5' and weighs about 250 lbs. It can be disassembled into two 5' C-beams, a 2'x2' plate with pivot, and a 6' t-pole.

The new transducer plate (E) is made of fiberglass grating that is 1.5" thick and about 4'x2', weighing less than 20 lbs.

BioSonics Echosounder

Items 1-7 are shipped in a large pelican case which weighs 170 lbs.

The battery box (8) is a wheeled "Husky" tool box with external power receptacles and battery selectors. The box weighs about 180 lbs.

The Laptop (9), charger and external drive (10) are sent with the PI in a laptop bag.

Mounting location:

The RUMP can be mounted either on the starboard or port side forward of the thrusters. It is best not to mount it under, or right behind, any lab/engine water outflow because the bubble caused by water falling into the sea will introduce noise into the measurements. It is important not to mount the RUMP too close to the thrusters, again because of the bubbles.

The deck plate (A) and boom (C) are built to accommodate the standard 2'x2' on-center bolt pattern. The 1" deck bolts are to be supplied from the ship.

All hardware for the boom, pole and mounting plate are included with the RUMP. It is, however, best that I install the RUMP, set up the BioSonics and train a volunteer on data acquisition and simple trouble shooting.

Operation:

In the current configuration, the RUMP is used to deploy a pair of BioSonics transducers (38 kHz and 200 kHz). The transducers are attached to a series of 1" deck cables that have a total length of about 60'. The echosounder is contained inside of a pelican case that should be mounted inside of a bay or lab, but does not have to be kept dry. The echosounder communicates and logs data on a laptop, which is connected via a 50' Ethernet cable. The unit

is powered by a pair of 12V DV deep cycle batteries that are mounted inside of a rolling case with a built in charger. The charges can be plugged into the ships 120V AC power.

Deployment:

Once ship has come to a stop, a thick layer of dish soap is to be spread over the face of each transducer. This prevents bubble from adhering to the transducers. The pole is then lowered via the air-tugger and secured using two Kevlar/wire stays. Once secure, the echosounder is powered up and data acquisition is started on the the laptop. The transducer pole has been tested up to a ship speed of 6 knots. Do not exceed this speed.

If deploying in heavy seas, the pole may need to be lowered to ensure that the transducers remain in the water. If the winds are strong enough that bubbles are visible in the upper 1 m of the ocean's surface, the data will likely be of very low quality and it is best to lift the pole and secure it to the boom. In my experience, this occurs at winds speeds in excess of 30 knots.