WERC Task 2. Transpacific Yacht Race – Preliminary Report

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List of all sensors and their purpose:

The team has elected to incorporate three sensors into the design. All sensors will be sourced from Atlas Scientific. Two oceanic sensors measuring water temperature (SKU: PT-1000) and acidity (SKU: ENV-30-pH) will be enclosed within the submerged housing and record data at various ocean depths. A relative humidity sensor (SKU: EZO-HUM) will be incorporated into the mounting component and will record atmospheric data.

Description of how the device will be replaced while in transit, should it get damaged:

For both preliminary testing and in preparation for the final transpacific voyage, the team will consult with a shipping coordinator to receive guidance on the safest way to package and transport the equipment. In addition to this, the team intends on shipping the device a week prior to its due date and is considering including a long-range tracking device to monitor its location. Should it get lost in transit, this will allow the team to be able to coordinate an alternate plan to get it to the designated location on time.

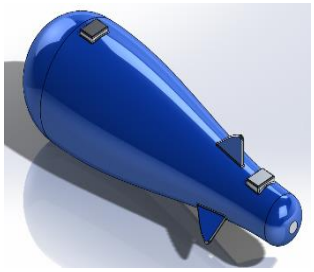
To diversify the project and account for malfunction, the team is working towards creating an alternative attachment system, which will allow for the sensors in the housing and/or mounting system to separate from one another and work independently, should one half of the project fail. In addition, the team is exploring options to provide backup sensors.

Other considerations, such as plans for communication between your data logger and the satellite communication device:

The team plans on creating two data loggers, one for the two sensors in the submersible housing and one for the relative humidity sensor in the mounting component. To record data at various ocean depths, the submerged housing will be attached to a winch, with vertical positions controlled with the use of a stepper motor located within the mounting component. Using a real-time clock, all data will be logged at designated time intervals. While on the voyage, the rate and magnitude at which the depth of the device will change is contingent on research that validates where significant data changes occur. The data collected over various oceanic depths will provide a unique set of data, rather than oversampling the same data across the same depth. The data loggers will communicate via Bluetooth with the provided X2nSat device.

Drawing of the device and a diagram showing how the device will be mounted on the boat:

The following figures illustrate our device design and how the device will be mounted to the boat. Figure 1 depicts the proposed device designed to house the oceanic sensors measuring water temperature and acidity. The temperature and acidity probes will protrude out of the bottom of the housing. Figure 2 presents the system used to mount the device to the boat. The team's mounting device will act similarly to that of a fishing pole. The rail of the mounting device extends out from the rear of the boat and will be attached by either a clamp, magnet, or ratchet strap. Inside the railing is a motor, which controls the ascension and descension of the device, and a humidity sensor. Figure 3 illustrates how the device will be mounted to the boat.



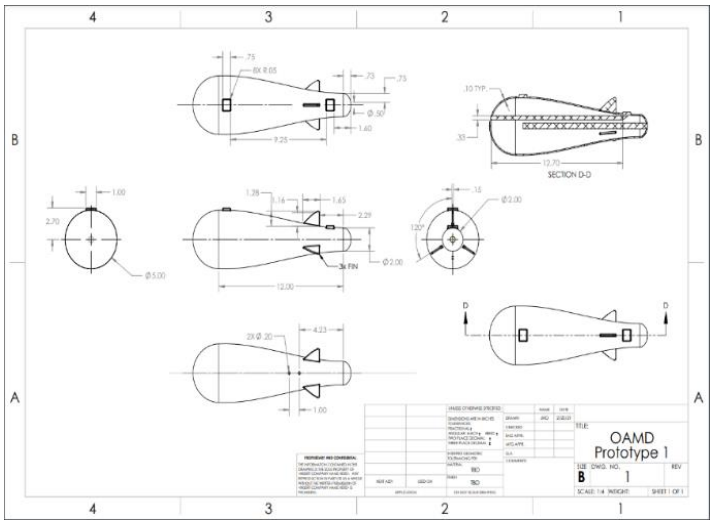
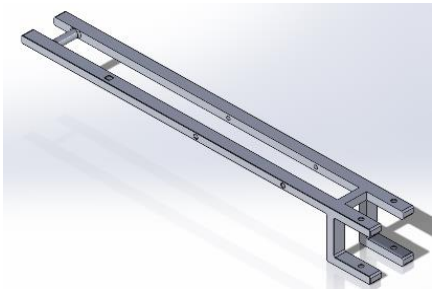
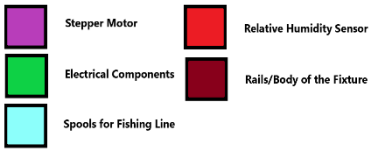
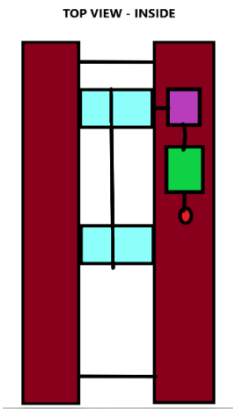


Figure 1. Drawings of the proposed device designed to house the oceanic sensors measuring water temperature and acidity.







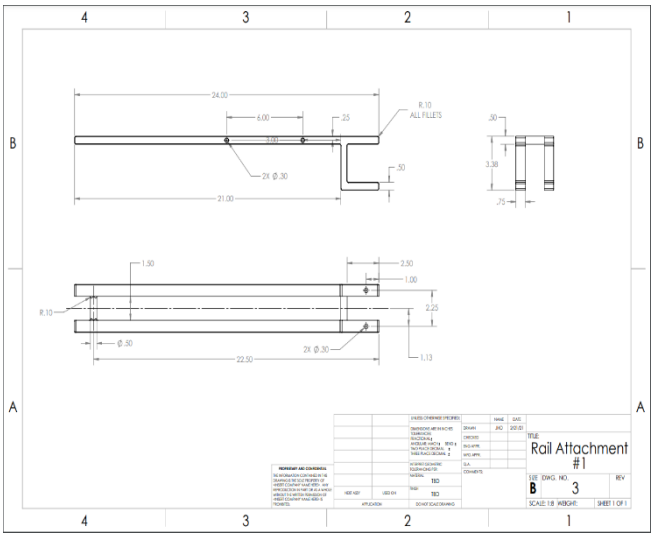


Figure 2. Drawings of the proposed component used to mount the device to the boat.

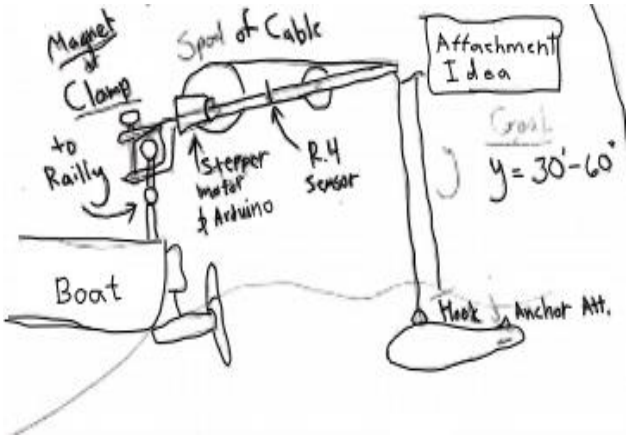


Figure 3. Diagram illustrating how the device will be mounted to the boat.