Carrollton High School
Troian Triremes

Non–ROV Device Design

Our Non-ROV profiling float uses an acrylic tube that is 4' in diameter and 27' in length. The container's design not only allows for a strong and see-through housing for our internal pieces but also allows for easy water sealing along its ends and being relatively easy to dis– and reassemble. On the end of the float's exterior tubing is a 9.5 cm wide Kwik Cap that both further waterproofs the interior as well as it will immediately open if there is a large build up of pressure within the device.

The float is powered by a single 14.8V LiPo battery connected to an XT60 plug connector containing a voltmeter tha then connects directly into the Raspberry pi. The parallel wiring system was employed to both allow for the potential easy replacement of the battery and other parts as well as avoiding a complete shutdown of the system if something were to go awry. The float is powered by a LiPo battery due to its reliable, leak proof, and maintenance free nature. From the battery, power travels through a 15 amp fuse before passing through a watertight switch on the exterior of the float. From the switch power travels to the Raspberry Pi which acts as the sole communication and control center for the float with the upper deck.
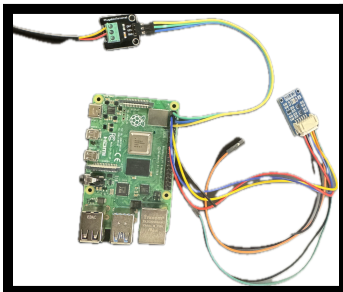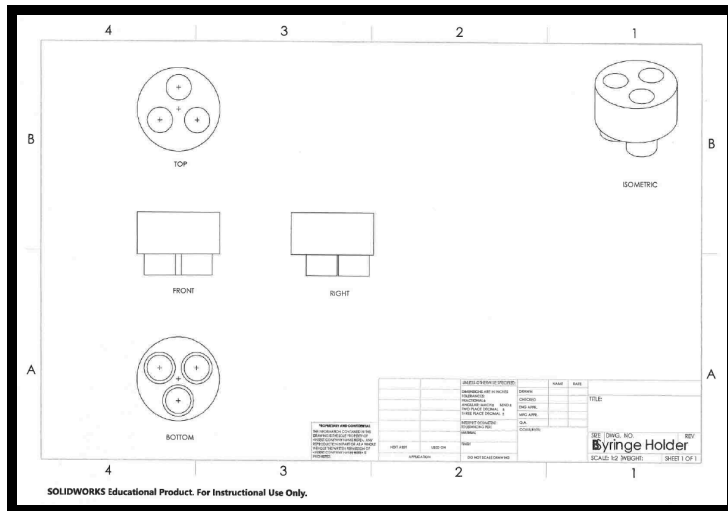

Raspberry–pi used for Trireme float
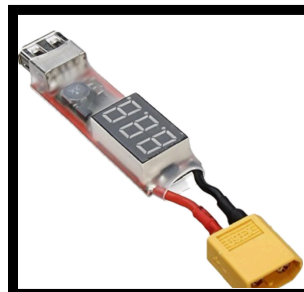
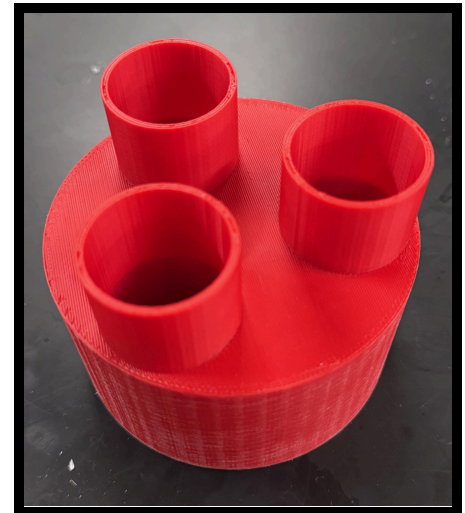XT60 plug connector with voltmeter

14.7 V LiPo battery used

The float contains 3 tightly secured 60mL syringes that act as its buoyancy engines. These syringes are pulled up and down by a threaded bolt controlled by a small stepper motor mounted tightly to the frame of the float.

CAD rendering of the syringe holder for the 60 mL syringes to be 3D printed.

3D printed syringe holder from CAD rendering

Three syringe dynamic machine attached to a stepper motor connected to the Raspberry–pi control system