HMS SeaBots

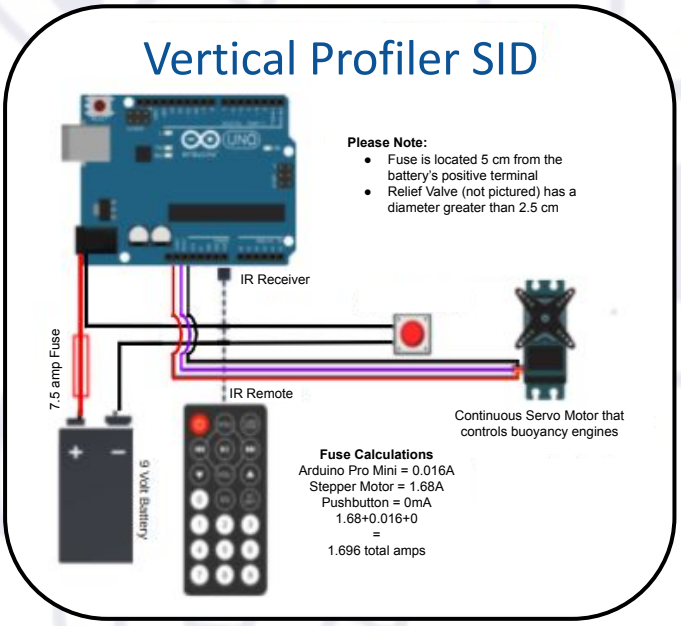
Harrington Middle School, Mt. Laurel, NJ 08054 U.S.A.

GO-BGC Float

In Task 3.1 *MATE Floats!*, our company was asked to design and construct an operational vertical profiling float. We first began brainstorming several ways to create this. One option was to utilize motors and manually control the float. However, our company decided that using a buoyancy engine would be the best option for a few reasons. One, it would be more challenging. Two, if we were successful, we would earn more points, and three, it would provide our team with a great learning experience. A buoyancy engine is a device that alters the buoyancy of an object by moving water around internally, creating a change in density. Our company took full advantage of that, utilizing a syringe and a stepper motor to release and take in water.

The syringe is controlled via stepper motor, which is autonomously controlled by an Arduino Pro Mini. All of these components are controlled by a 9V battery. When on command (by a IR remote), the Arduino sends a command the stepper motor, expanding the syringe, which in turn sucks water in. The syringe expands when the stepper motor spins a screw, expanding the screw. Finally, the stepper motor spins in reverse, closing the syringe.

In terms of safety requirements, our vertical profiling float strictly follows the safety requirements created by the JSO. For example, there is an 7.5A in-line fuse that protects any components from short circuiting or overheating due to excessive amperage. Also, all electrical components are kept far from water, may that be distance, or in a water-tight enclosure. In addition, we have a pressure valve at the top of our float, in case there are any toxic fumes that may be caused by the power source



Vertical Profiling Float SID
Credit: Nithilan

Vertical Profiling Float
Photo credit: Gabe