HORIZON

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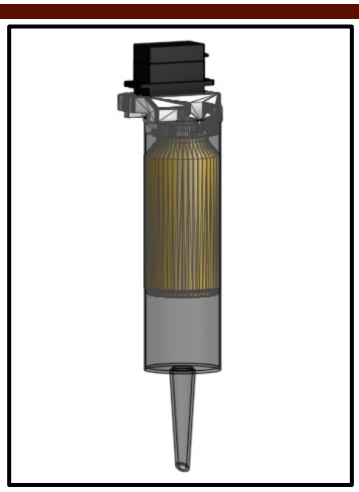
Non-ROV Device Design Document

Our Vertical Profiler: *Cousteau*
Photo Credit to: V. Talreja

Picture of Buoyancy Engine
Photo Credit to: V. Talreja



CAD of Buoyancy Engine
Created by V. Talreja

Safety

Features

- 9V alkaline batteries (non-rechargeable)
- 7.5 AMP within 5 cm of battery positive terminal
- 2.5 cm pressure relief plug

Buoyancy Engine

MTL Horizon's vertical profiler, *Cousteau*, utilizes a buoyancy engine to complete the two required vertical profiles. A buoyancy engine is a device that uses buoyant force to induce controlled sinking and floating. Our buoyancy engine consists of two main components: a syringe and a servo motor. The servo motor moves a makeshift "plunger" which regulates the water intake. As the syringe fills up with water, the mass of the vertical profiler increases. This increase causes it to sink because it becomes denser than the surrounding liquid. When the syringe dispenses the water and fills up with air, it will become less dense than the water around it, causing the profiler to float to the surface. This sinking/floating action is controlled by code written for the servo motor housed inside the vertical profiler.

Communication with Poolside Operation Station

When *Cousteau* is at the surface, it sends data to a cell phone app available at the poolside station. Our custom app constantly checks for incoming signals, and when it receives one, it records the time, date, and our team name/number. This process repeats itself each time *Cousteau* surfaces. Our vertical profiler will complete two profiles in order to meet our client's needs.