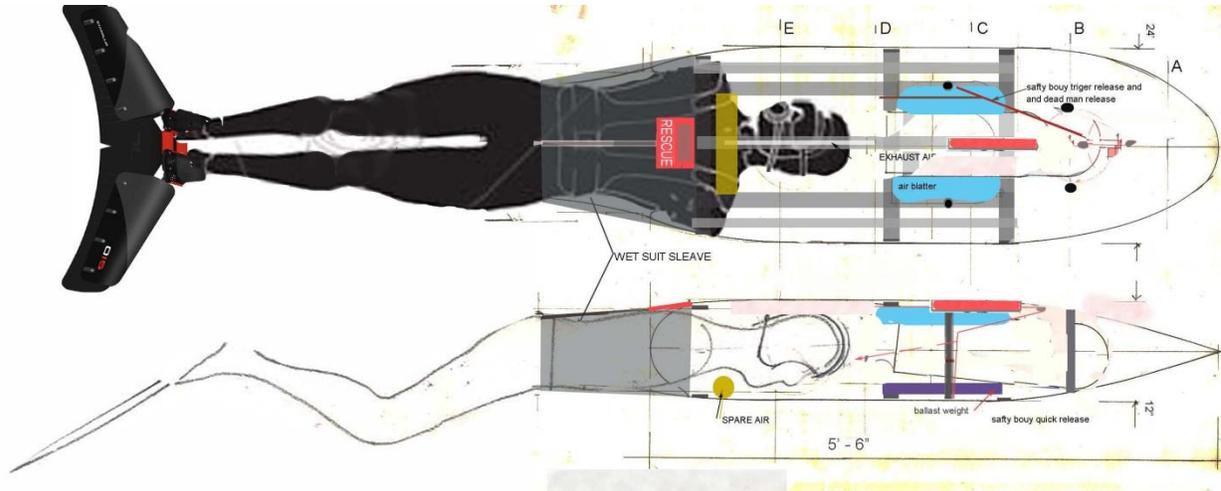


CMU



Human Powered Submarine

The International Human Powered Submarine Race became a unique challenge for our school. Propelled by a Ciamillo Components, Inc. Lunocet fin, and using a clear polycarbonate hull formed to maximize the hydrodynamics of our pilots movement through the water, we hope to set a new record for the fastest self-propelled human under water.

The team:

Nicholas Harrington: Freshmen at CMU studying Mechanical Engineering

Bradley Schneider: Sophomore at CMU studying Psychology

Jayon Wang: Graduate Mechanical Engineer CMU

Andrew Harrington: Barry University junior, helped establish the project and may join the team at the race for extra support .

CONCEPT

Our concept was initially developed as a suit that a swimmer could wear to increase their speed and efficiency while exploring the ocean floor. The Lunocet fin will provide a smooth ergonomic motion that will allow the use of a myriad of muscles. Divers without our sub can reach speeds of up to 8 knots with the Lunocet fin; ultimately, we hope to create a suit that will make you go even faster than that.

TESTING

We are testing our sub in the CMU pool. Most of the alterations that are made, are made to correct for buoyancy and control of the sub while in motion.

Initial tests revealed that we required alterations to the locations of the flotation and ballast. Air supply, modification of pilot positioning, and functionality were quite successful. Every time we put the sub in the water, we come out with a list of modifications. We are planning many more tests to improve the efficiency of our submarine.

RACING CATEGORY

We intend to race our sub in the "1 person non propeller category."

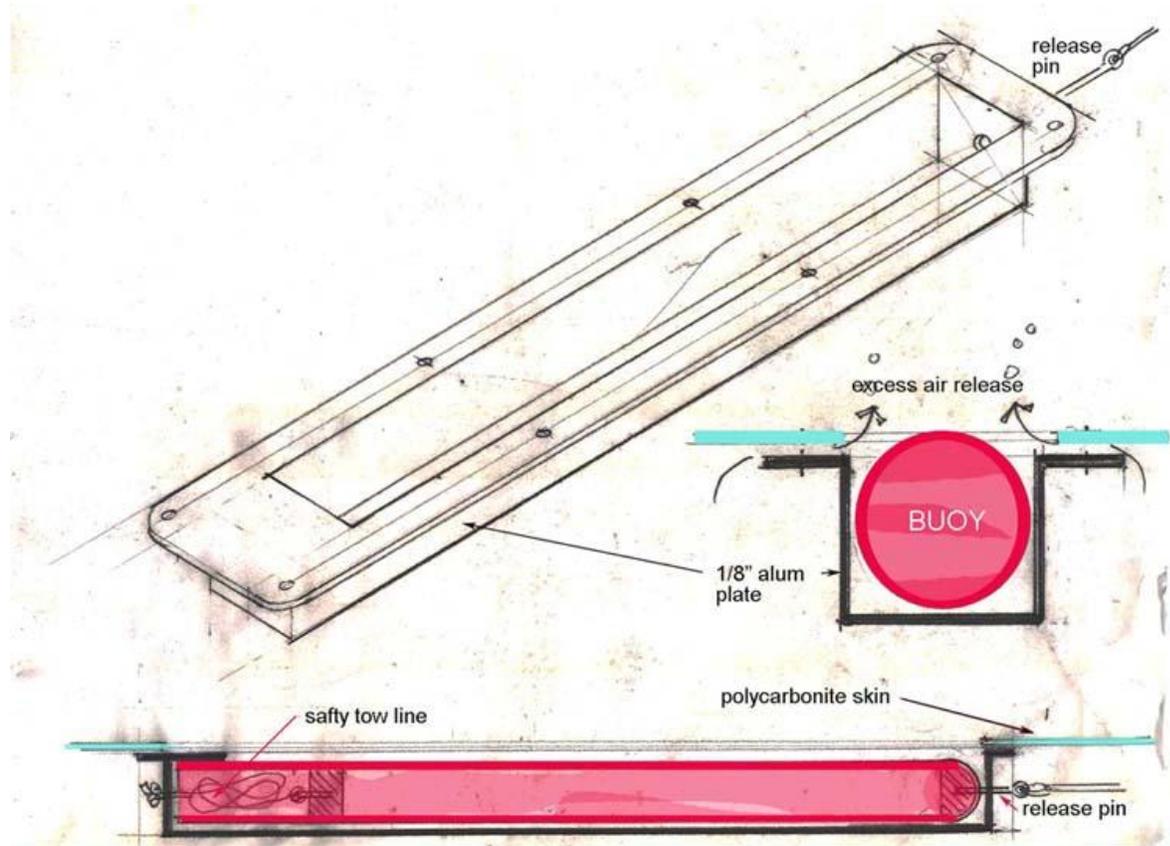
HULL

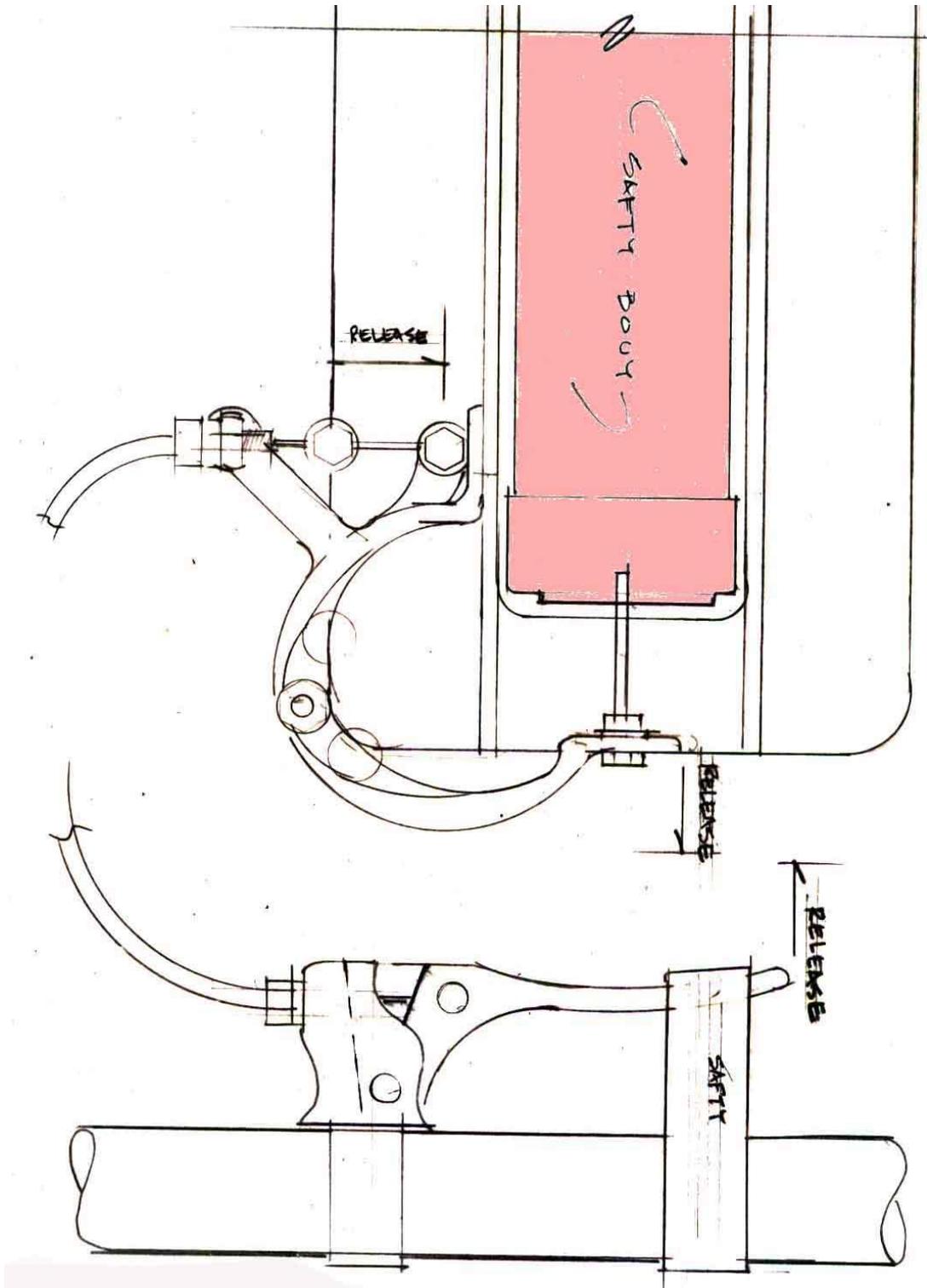
The hull is a clear 1/16 inch polycarbonate helmet, which extends down below our pilot's shoulders. Below the shoulders, it transitions into a breakaway neoprene wetsuit sleeve in order to minimize disturbance to the flow of water past the pilot. The hull houses the SCUBA tank buoyancy bags, ballast, strobe light, safety buoy, and buoy release mechanism.



EMERGENCY BUOY

Our Emergency Buoy is a 1.5 inch diameter by 16 inch float mounted and recessed into the top of the Submarine. A pin attached to a release cord is attached to the inside wall of the sub. This cord is attached to the pilot, creating a dead-man release trigger.





Dead Man release

Buoyancy system

The sub is equipped with an air bladder with a valve which allows the crew to adjust buoyancy just before each race, compensating for the approximate 5 pounds weight loss as the air supply is used..

STROBE LIGHT



SOLAS Life Jacket Light SLX / SLX-II, Automatic Activation PFD Light, SOLAS, USCG & MED Approved

- Bright white flashing light (innovative LED technology)
- Approved to 1999 SOLAS amendments - IMO Resolution 81(70)
 - USCG approval no. 161.012/71/0
 - SOLAS approval no. 161.112/71/0
 - EC Type Approval and MED ("Ship's Wheel" mark) approval from DNV
 - TC 309.080.003

AIR SUPPLY

A 3000-PSI Tank is strapped into the front of the sub with a regulator supplying air to the pilot and a pressure gauge in view of the pilot.

An Emergency air supply will be strapped to the pilot.

PILOT RESTRAINT SYSTEM

The pilot holds onto some handles that are attached to the tank. He is also held in place by the wet suit.

RELEASE LATCH

The neoprene wetsuit sleeve will be attached to the sub with a 3-inch by 4-inch release latch that is built into the neoprene wetsuit sleeve; which, is connected to the hull by a continuous Velcro strip. When pulled, the entire sleeve and diver breaks away from the hull.

