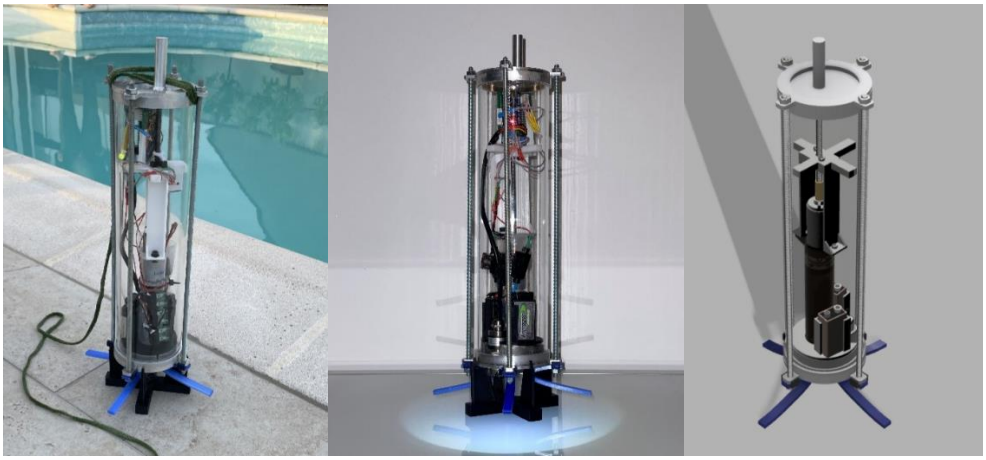
MATE ROV competition
Non-ROV device design (DOC-004)

Marine Advanced Technology Education Remote Operated Vehicule



Structure:

The float is based on an 80x305 mm PMMA tube that is sealed at its extremities by two aluminum covers. O-rings are placed between the covers and the tube. These covers feature holes for the over-pressure valve, the pressure sensor, and the buoyancy system intake. To ensure the proper attachment of these covers, a force distributor has been added to each extremity of the device. These components have a ring shape and feature four holes in which threaded rods will be inserted. Eight nuts tighten the assembly and compress the O-rings. At the bottom of the device are installed four landing skids. These PETG components ensure the smoothness of the contact when the device hits the bottom of the pool.

Buoyancy:

The Float's buoyancy system is a syringe that fills and empties with water, changing the device's density. A high torque electric motor that perfectly fits in the syringe is attached to the syringe's piston. The engine's axle is connected to a threaded shaft and rotates in a nut moving all the system with the piston upward or downward, allowing the syringe to fill or empty itself. Two push switches detect when the syringe is at maximum amplitude.

Electronics:

The Float is powered by a pair of 9V alkaline batteries, one for the double h-bridge and one for the Arduino. There are three 1A fuses, one on the "+" connector of each battery and one on the common ground. An RGB led indicates the steps of the code while diving.