BRADEN MEYERS

Design Portfolio

NEXT GENERATION DESIGN JETBOIL

Updated Model

Design Challenge to take a product on the market and update the design and appearance to make a new model that could be considered for the next generation model.

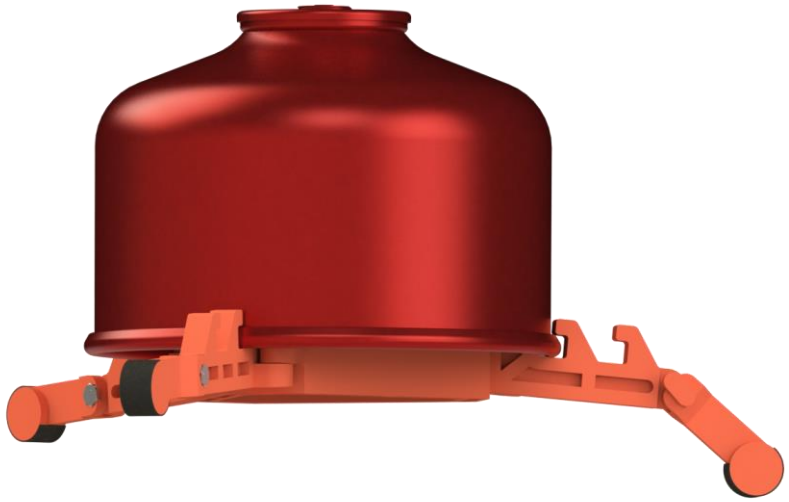
- Solid and Surface Modeling
- Research Customer Feedback
- Ideation, sketching, and planning
- Iteration and feedback

Previous Model

Modifications:

- Velcro Strap that secures lid
- Pivoting legs for Stability
- Slide on Windshield

Leg and Support Modification

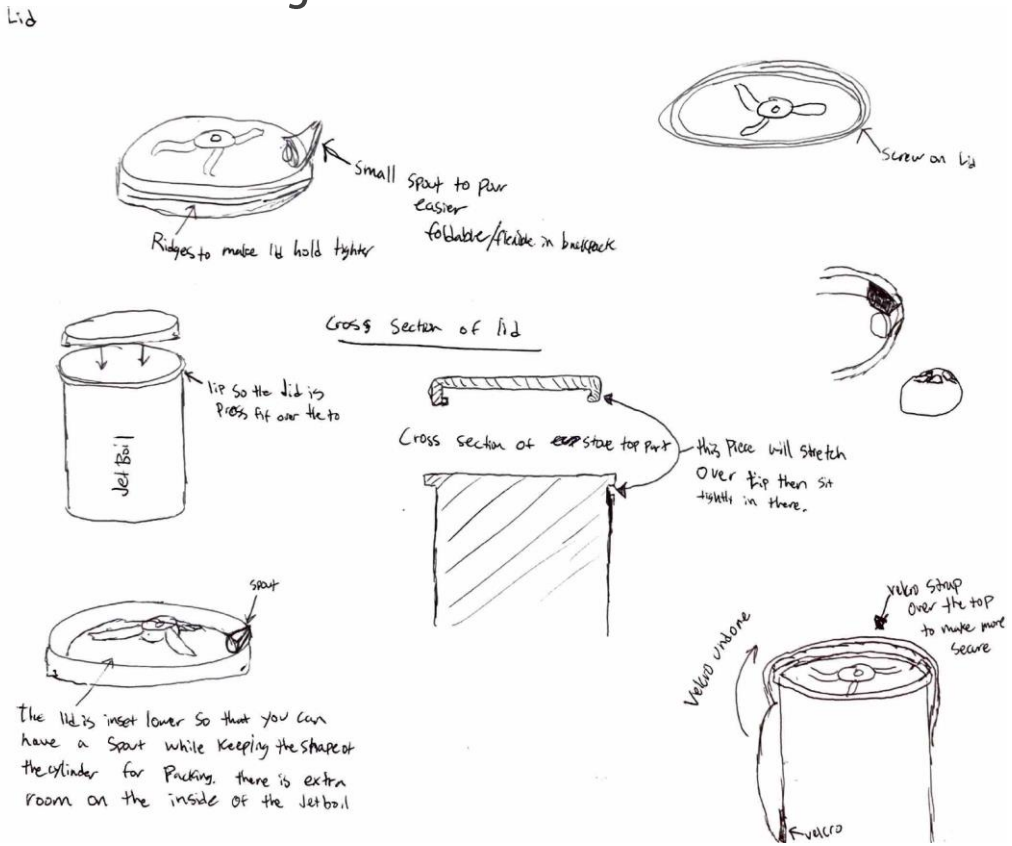


Cross Section View Showing Contents Packed inside Main body

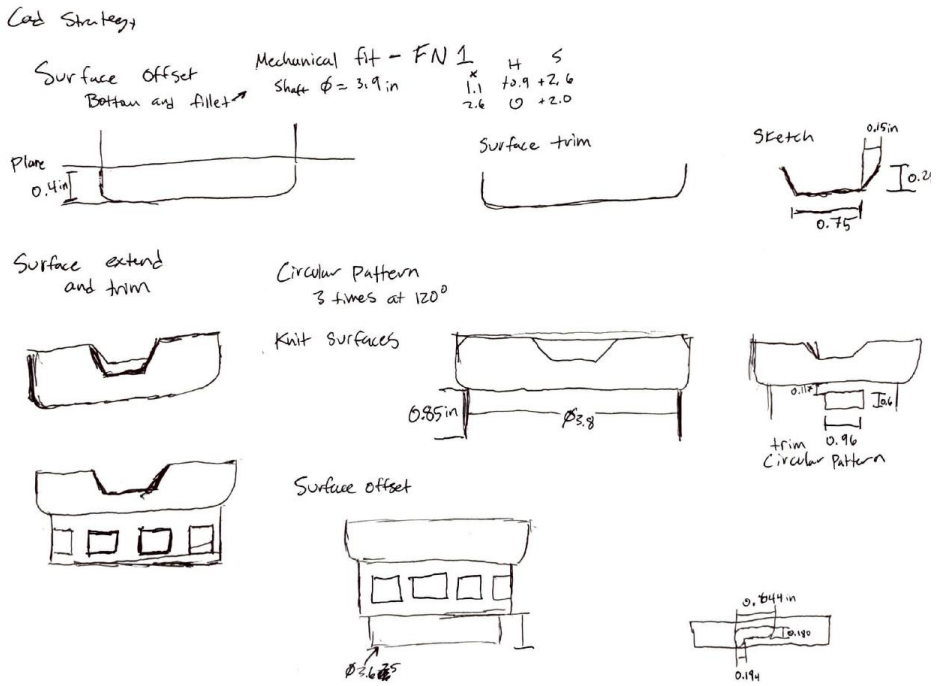
All Parts in Assembly

DESIGN PROCESS

Sketching and Ideation



Modeling Strategy



Modeling and Assembly

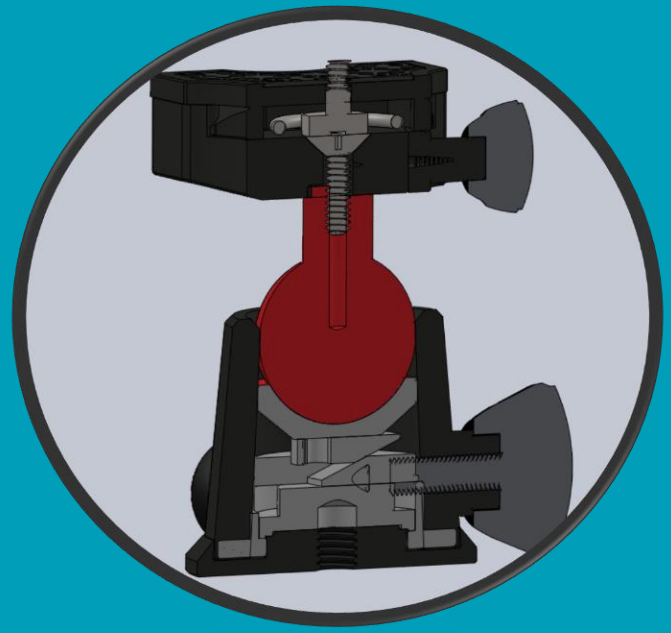
HYDRO FLASK

- Surface Modeling, Master Modeling, and Organic shapes with Lofts and curves
- Robust models so parameters can be adjusted easily and quickly
- Appearances and Decals used for Renders

JOBY CAMERA MOUNT

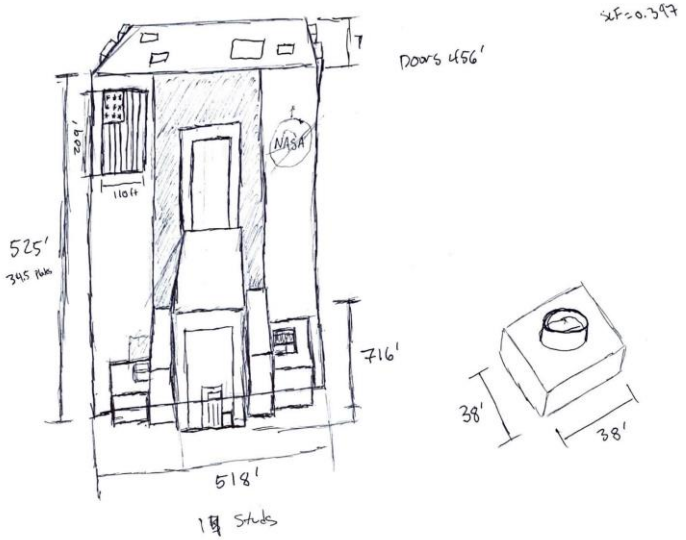
Design challenge:
Given some engineering drawings and parts the models were created with a three-hour time limit

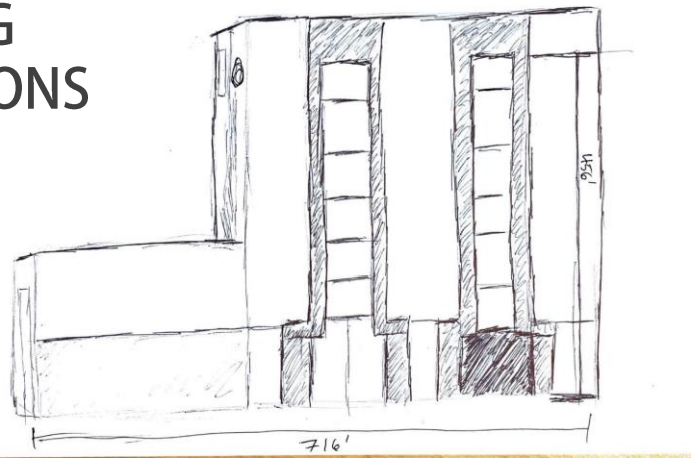
Evaluations on interference and mates. Cross section view shown below



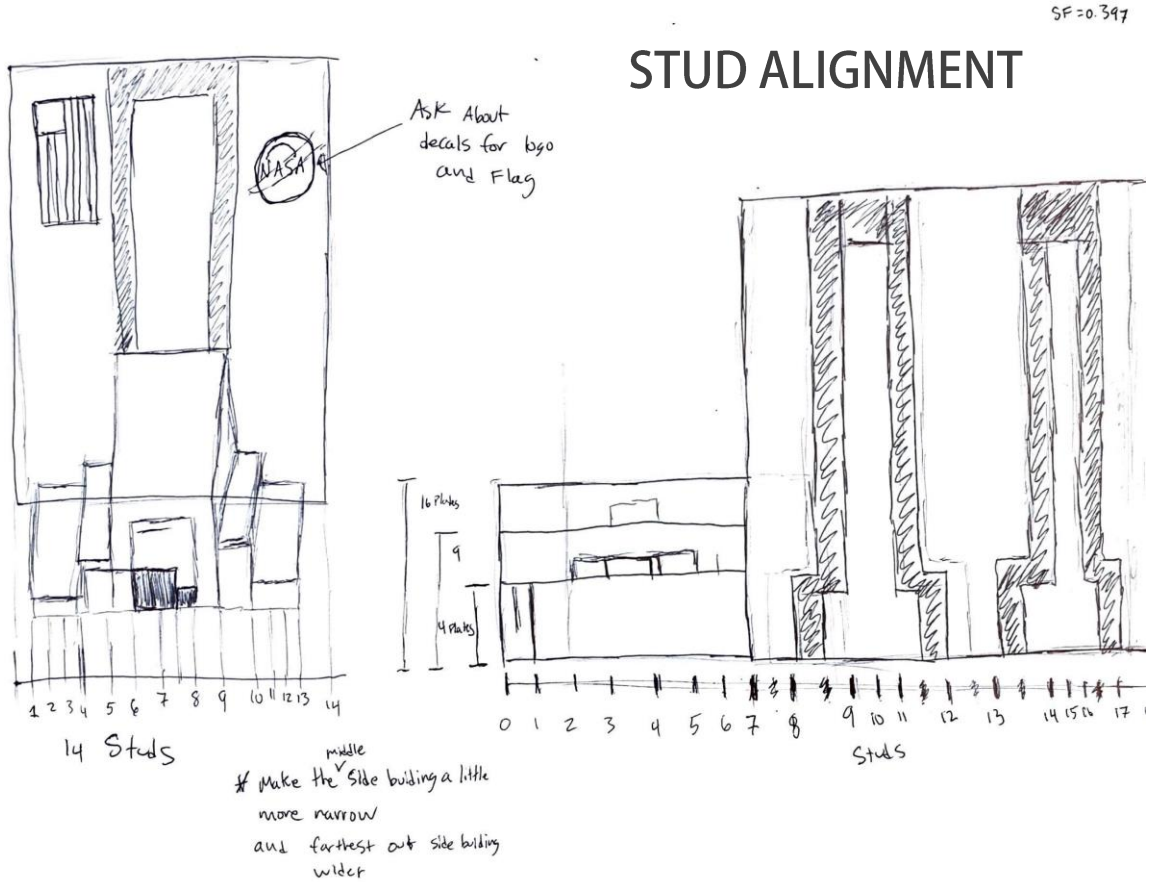
NASA VAB DIMENSIONS AND PROPORTIONS

BUILDING DIMENSIONS





STUD ALIGNMENT



ASSEMBLY LEGO STRUCTURE

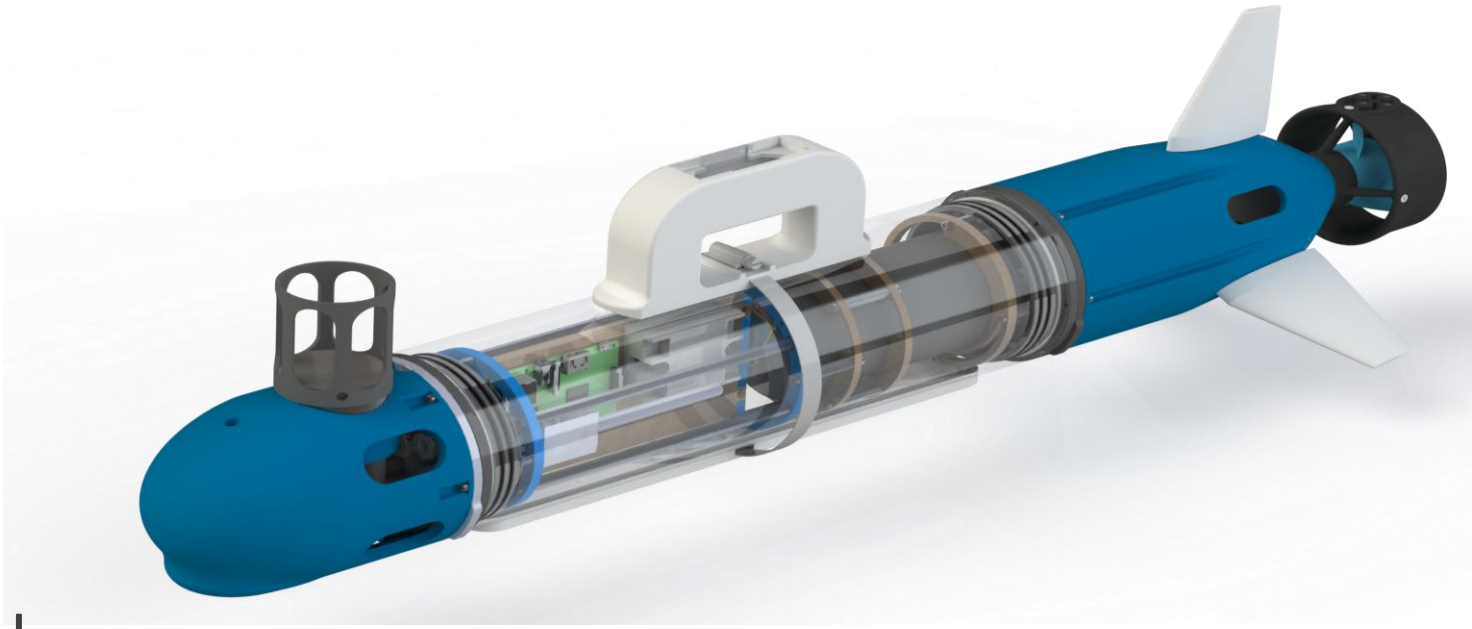
NASA VAB. Image Courtesy of NASA.

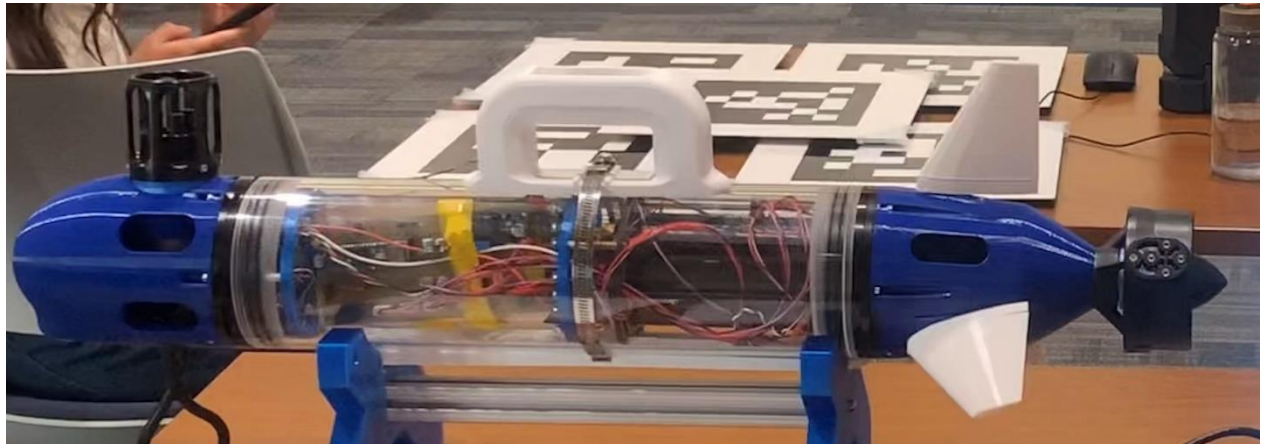
Design Challenge to dimension and assemble a LEGO structure based off a ceartin building

- **Assembly Strategy and Planning**
- **Building Comprised of Repeating Subassemblies that maximize time efficiency**
- **SNOT – Used studs not on top technique to create model that matches the LEGO style**

DREW UV

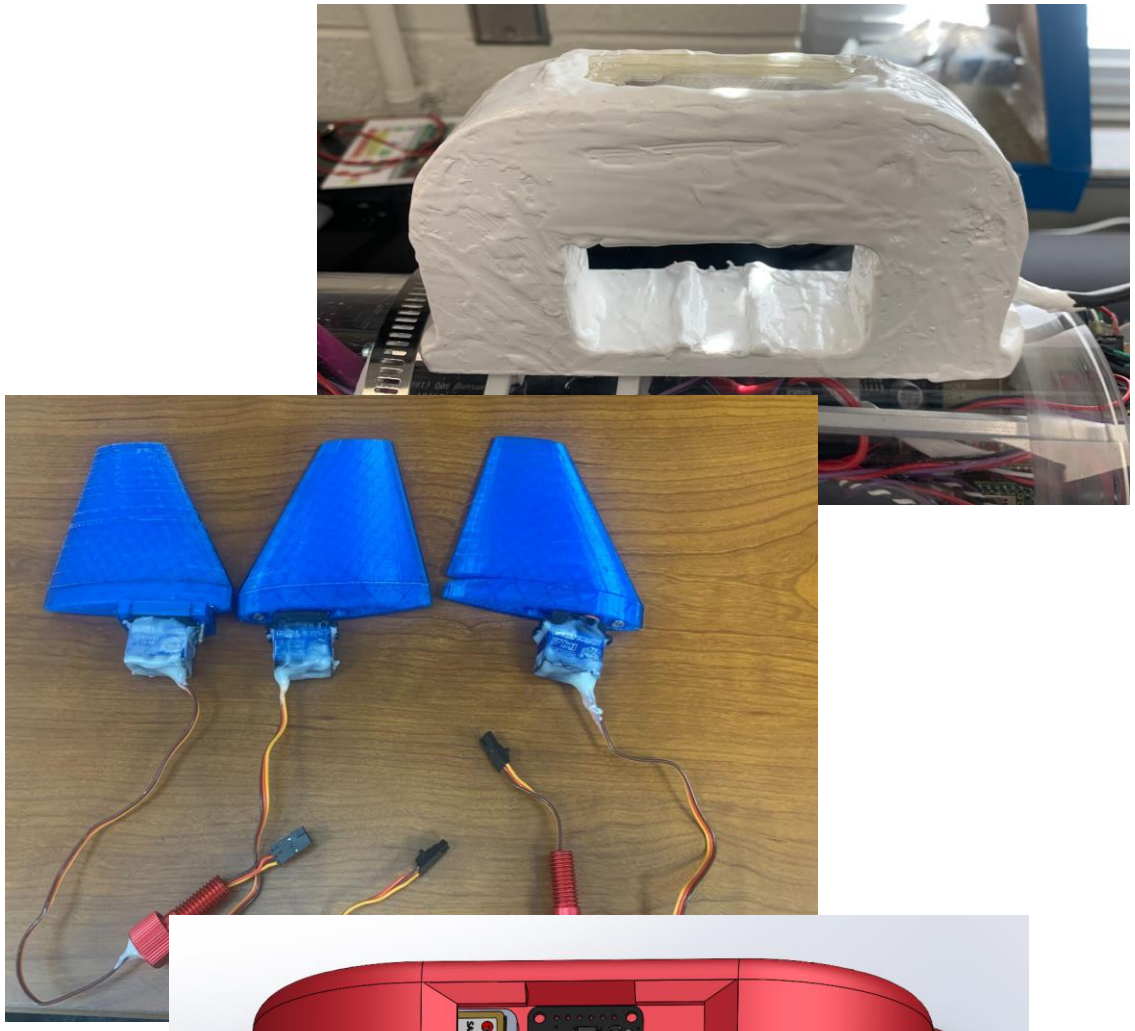
- System development on Autonomous Low-Cost Underwater Vehicle
- Partnered with Naval research base to meet specific underwater terrain aided navigation requirements
- SolidWorks Assembly and Design
- 3D Printing





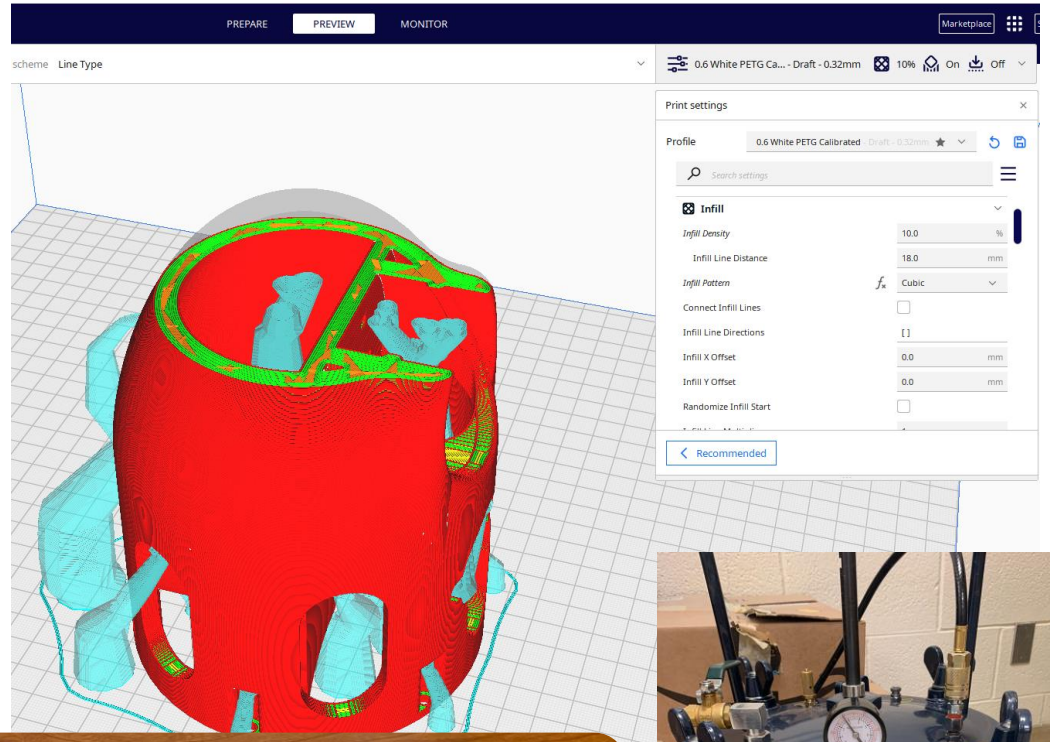
WATERPROOFING

- SERVOS:
  - Waterproof servos are typically very expensive
  - Marine grease on the inside and epoxy covering on the outside
- HANDLE w IMU/GPS:
  - 3D-print post-processing (see next slide) and optimized slicer settings



WATERPROOF 3D PRINTS

- Some 3D objects can be realistically printed with solid plastic infill
- Our identified most important parameters: flow rate, # of perimeter walls, infill density, and Z seam
- Applying a post-process coating can protect problematic edges and vertices

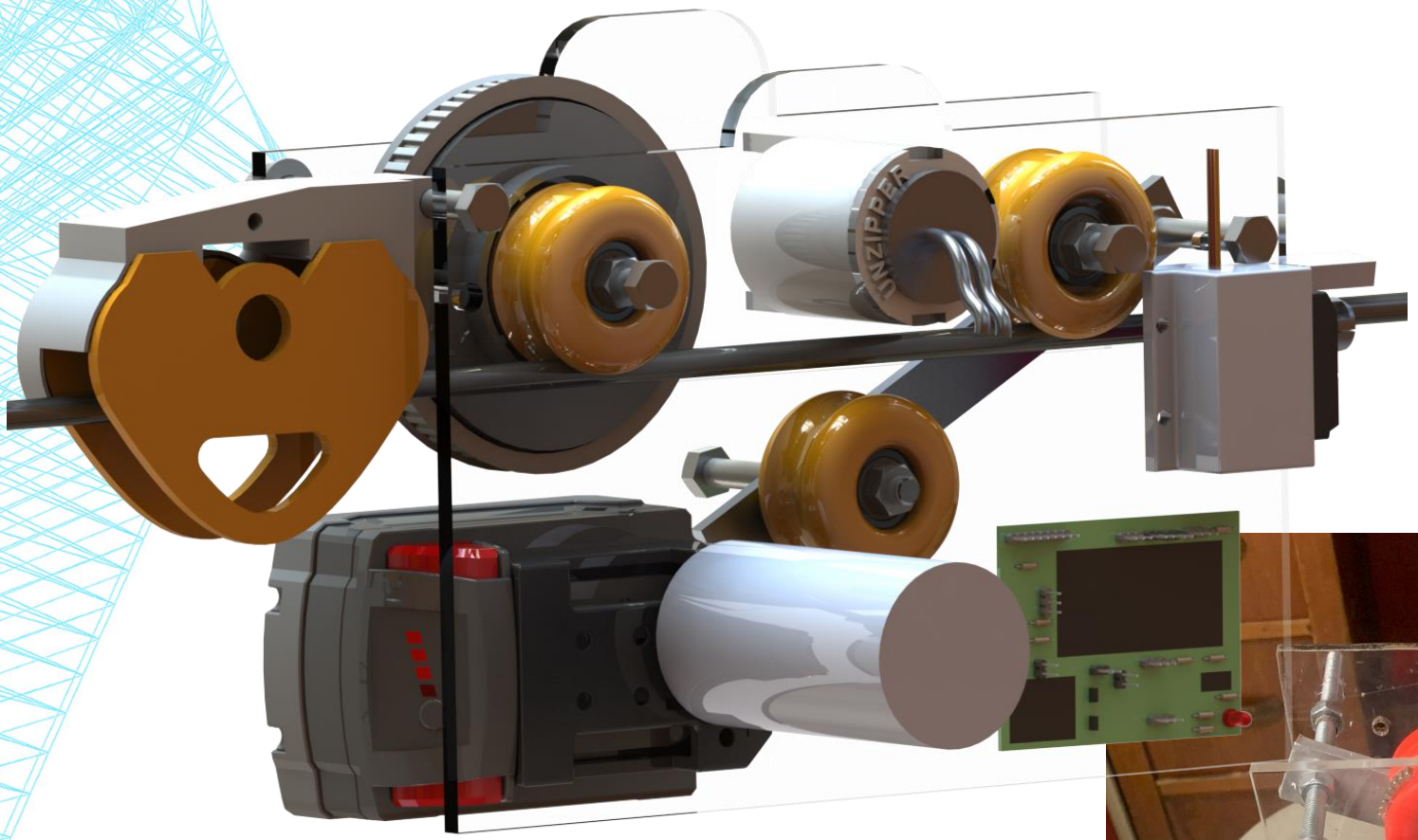


VEHICLE BUOYANCY

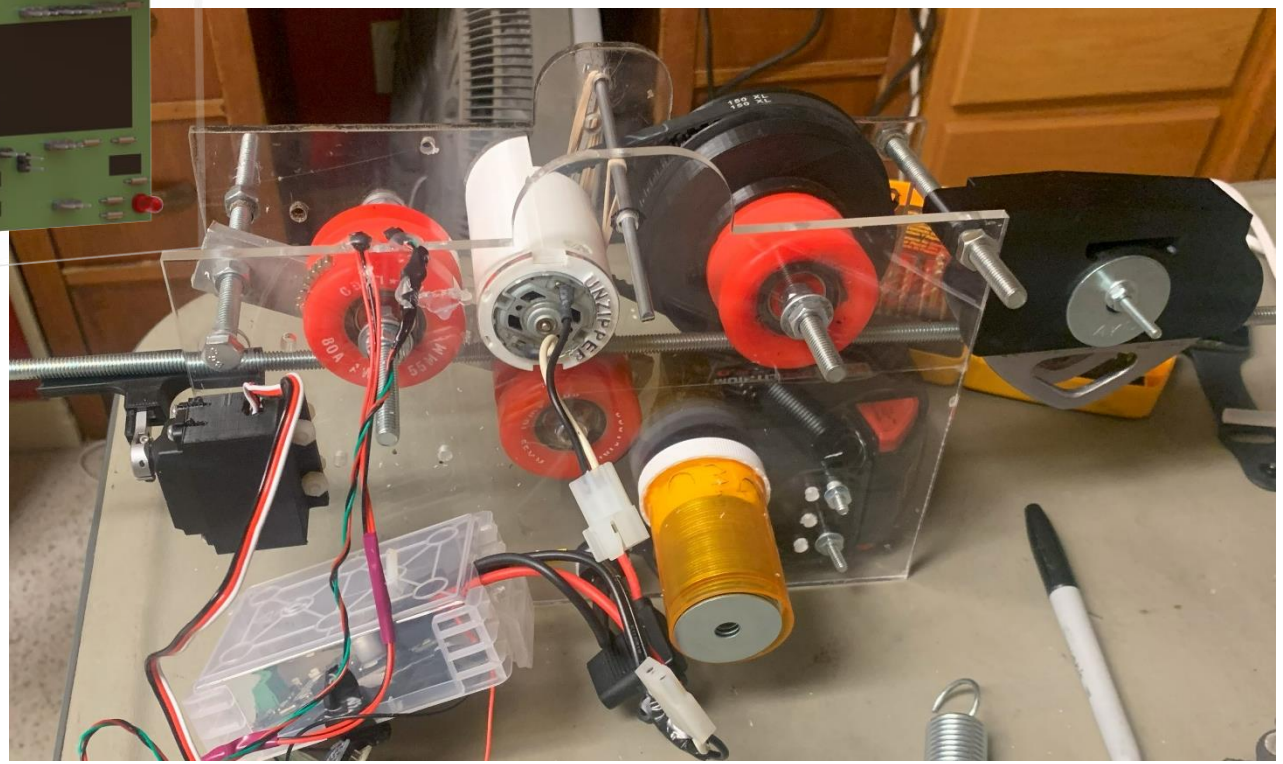
- Ideally, neutrally buoyant with added weight on the bottom to keep it upright
- An easily-adjustable weight system can help in-field calibration
- Up-to-date BOMs can anticipate future problems

Part	Quantity	Weight (g)	Volume (cm^3)	Weight in Water (g)	Boyant Weight (g)	Cost ($)	Website
Acoustic Modem	1	708		508	200	1100	https://www.blueprintsubsea
Acoustic Modem Cable With Pe	1	85.5				199	
4" Enclosure Acrylic	1	1004	4348.53825			458	https://bluerobotics.com/sto
End Plate 5 Holes	1	162					
End Plate 10 Holes	1	212					
O Ring Flanges	2	107					
O Ring Seal	6	2					
Pressure Relief Valve	1	16		9.8	6.2	28	https://bluerobotics.com/sto
Vaccum Penetrator	1	14.3		8.5	5.8	9	https://bluerobotics.com/sto
Switch	1	20.5		14.7	5.8	20	https://bluerobotics.com/sto
Blank Penetrator	4	6.6		4.2	2.4	6	https://bluerobotics.com/sto
Pressure Sensor W/Cable	1	11.4		4.2	7.2	85	https://bluerobotics.com/sto
Potted Penetrator	4	7		4.2	2.8	6	https://bluerobotics.com/sto
Penetrator Nuts	15	3.1				0	
Servo	3	20	10.28			17	https://www.amazon.com/IN
Thruster	1	344		156	188	200	https://bluerobotics.com/sto
Ping Echosounder	1	131.6	54.32			390	https://bluerobotics.com/sto
Hose Clamp	1	39.2				3.758	https://www.mcmaster.com/

ZIPLINE RETRIEVAL SYSTEM

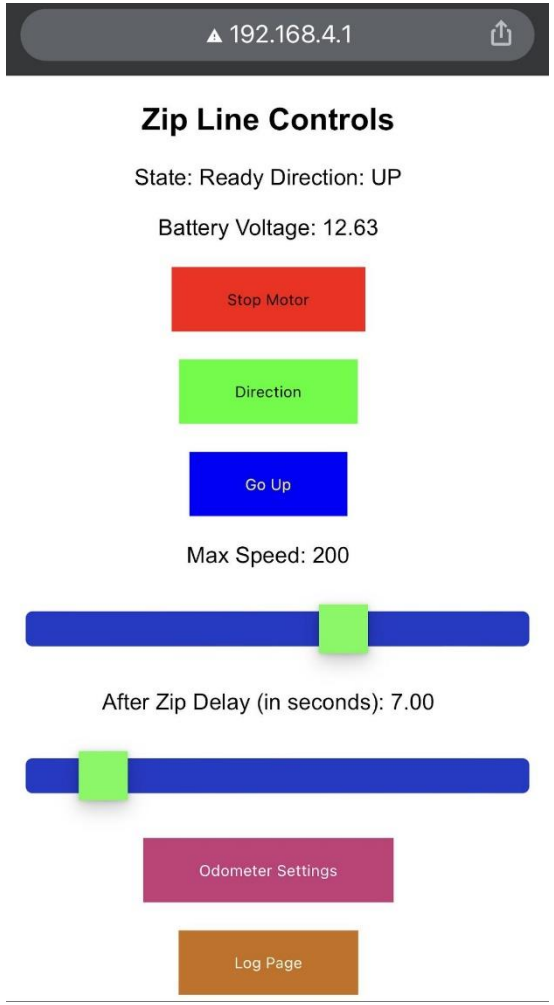


- https://github.com/BradenMeyers/ZipRetrevial

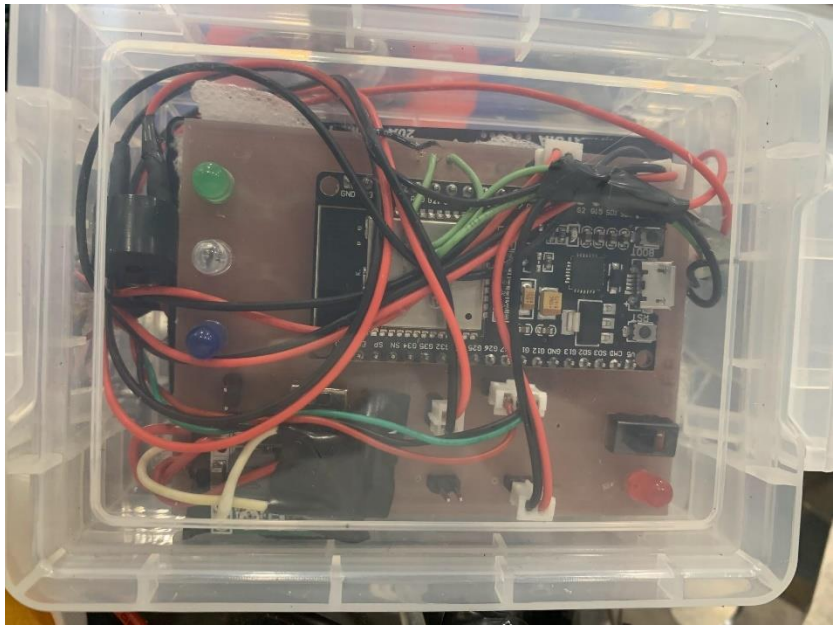


- Product built from scratch
- Spent over 100 hours
- Mechanical, electrical, and software and systems

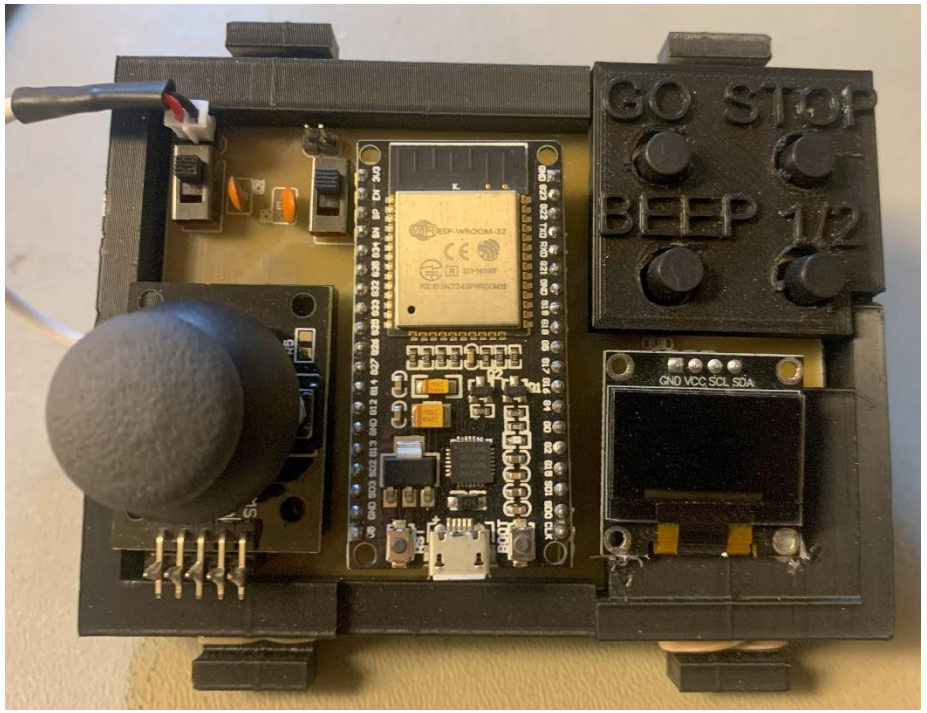
FEATURES



Web Interface



Custom Circuit Board



Custom Remote Control