

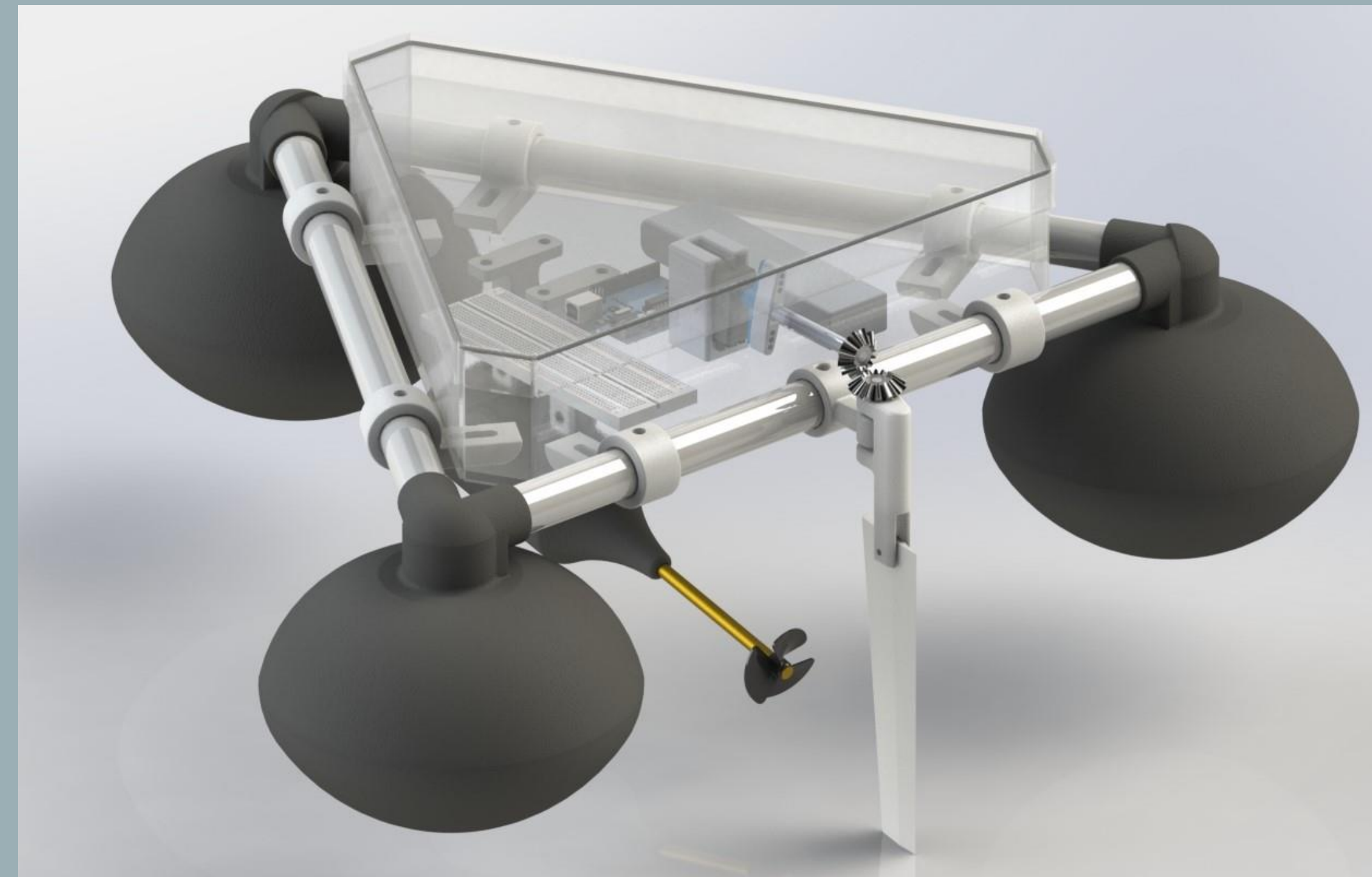


AUTONOMOUS SYSTEMS: DATA TRANSFER BUOY



Purpose

Wirelessly transferring sensitive data creates windows of opportunities in which that data can be stolen. While at sea this has proven to be a major issue for the Navy and in order to mitigate the potential of data theft a hard link connection must be made to transfer data. To remedy this, a buoy capable of maintaining a location out at sea will serve as a data center that can connect to other unmanned vessels and exchange data between the two.



Goals and Objectives

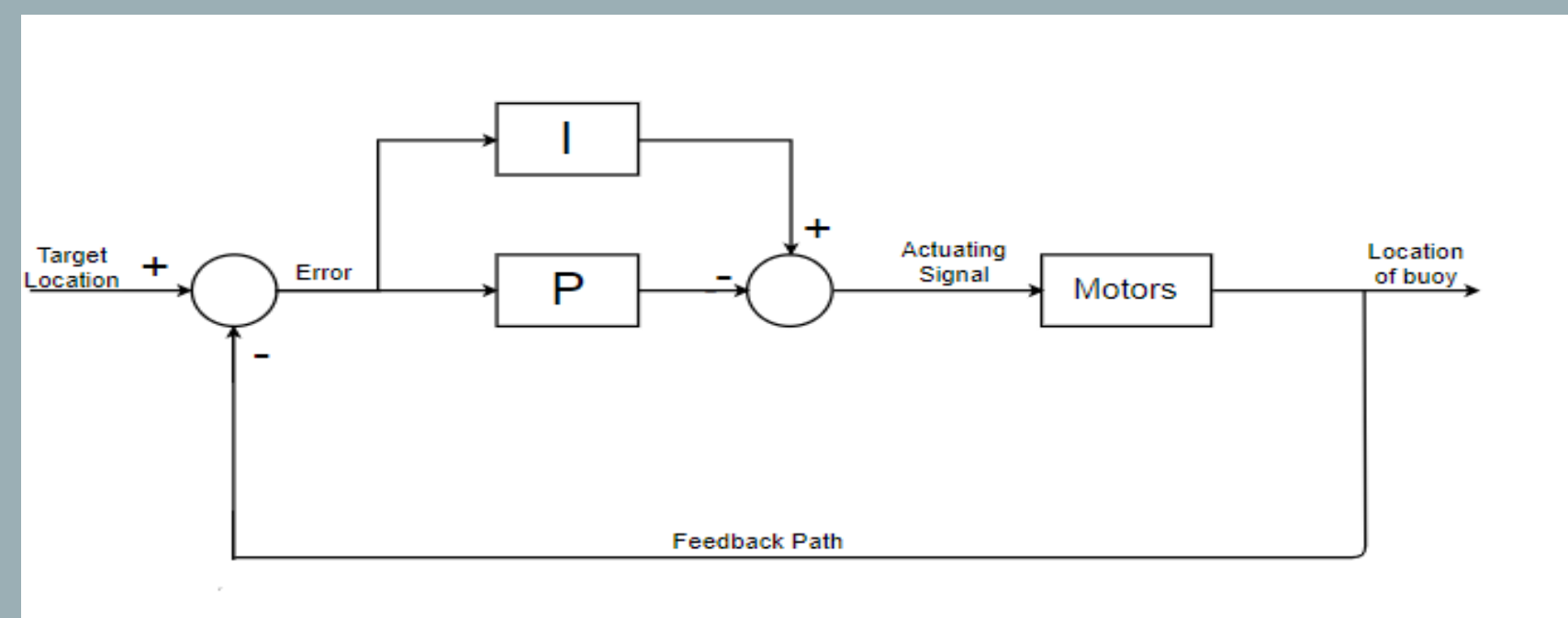
- ❖ Design a buoy able to autonomously maintain set GPS coordinates
- ❖ Develop multiple connection points for unmanned vessels to perform hard link data transfer
- ❖ Log all steps of the mission and locations of buoy and vessels through a GUI

Structural Key Points

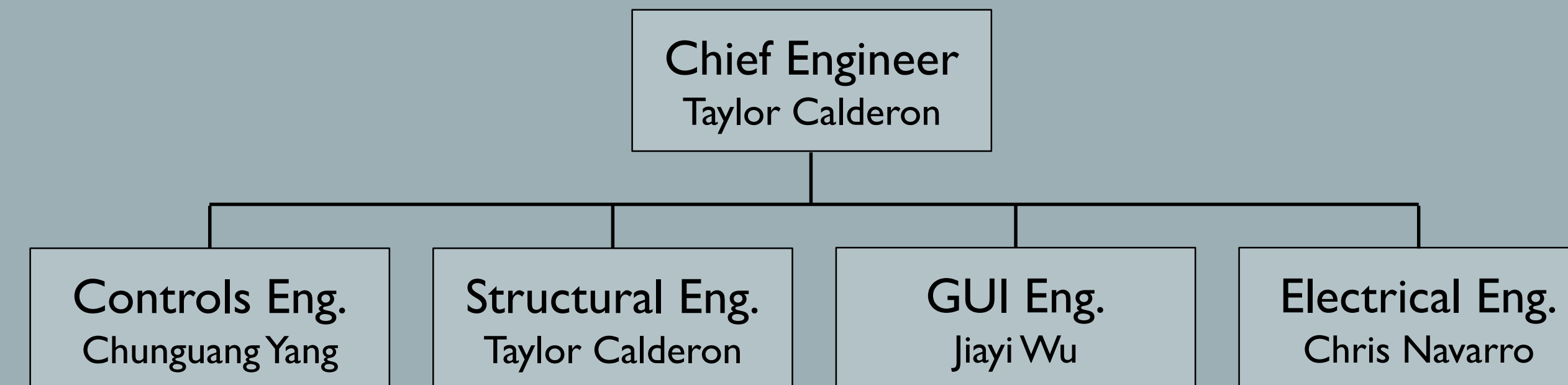
- ❖ The buoy is capable of supporting up to 15 lbs. but optimal weight is around 5 lbs.
- ❖ Light structure made of PVC, PLA, and acrylic allow for easy maneuverability and low cost
- ❖ Disassembly of center platform to allow for modifications and repairs whenever necessary

Control System Key Points

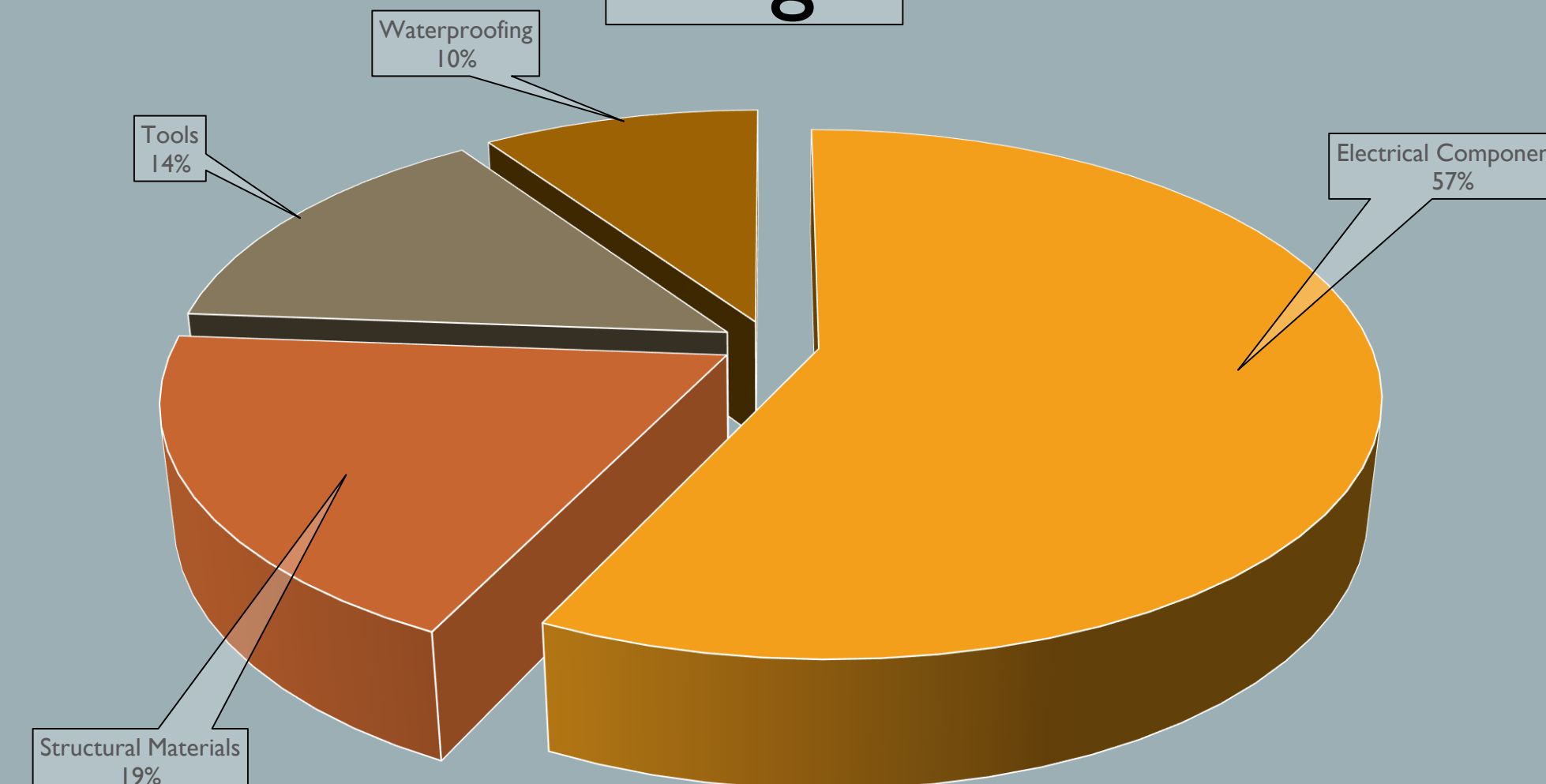
- ❖ System integrates magnetometer and GPS for input of orientation and location
- ❖ Output affects both the speed of one motor and the direction of another motor for rudder control
- ❖ This system allows for the buoy to maintain a ~1m radius while on water



Team Structure



Budget



GUI Key Points

- ❖ Map that displays locations of both the buoy and the vessels travelling toward the buoy
- ❖ One easy click button to send all necessary files to the buoy from ROC
- ❖ Indicator signals clearly display all steps in the mission and whether or not they have been completed

