Triton Robotics Company
Non-ROV Device Design

Charybdis Float
RANGER Class
MATE 2024 World Championship

Mechanism: Buoyancy Engine
Power: (2x) 12VDC Alkaline Batteries (8xD-cell batteries + 8xAA-cell contained in battery holder) [ELEC-NRD-001/003/004]
Fuses: (3x) 7.5 Amp ATO mini blade fuses both positive battery wires + common negative battery terminal within 0.05 m [ELEC-NRD-005]
No cameras [ELEC-NRD-002]
Battery Compartment Pressure Relief Plug [ELEC-NRD-006]
Float electrical SID submitted as separate document and also included in Company Safety Review [ELEC-NRD-007]

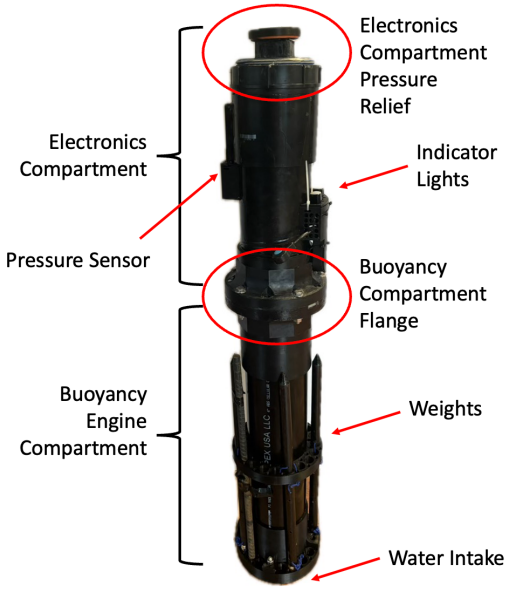

Diagram of Charybdis Float.
Photo: Lipson

Charybdis is a two-compartment vertical profiling float that utilizes a buoyancy engine for movement. The buoyancy engine consists of a linear actuator paired with a 500mL syringe tube and a custom-printed syringe head.

Basics: Our float has a 0.17m max diameter and is 0.96m long. The frame is made extruded 4” ABS pipe and custom-designed and printed ABS.

Electronics: Our custom wired electronics are centered around a Raspberry Pi, Arduino Nano, and a relay. We separate communication from control, giving us the full processing power of both of these devices on one task. We also include a 12VDC to 5VDC converter to meet the voltage needs our Raspberry Pi and other electronics. **Fuses:** The positive power and common ground wires are fused with 7.5A ATO mini blade fuses < 5cm away from the sources. **Pressure Relief Plug:** We have a 2.6cm holed pressure relief valve for safety, as per MATE guidelines.

Operations: Our float communicates with our mission station over Bluetooth. The mission control station can send strings of commands covering one or more profiles. The float moves the actuator accordingly. Whenever the mission station and the float connect, the float relays all the data back to our mission station. This data is then graphed using custom code to visualize our profiles.