



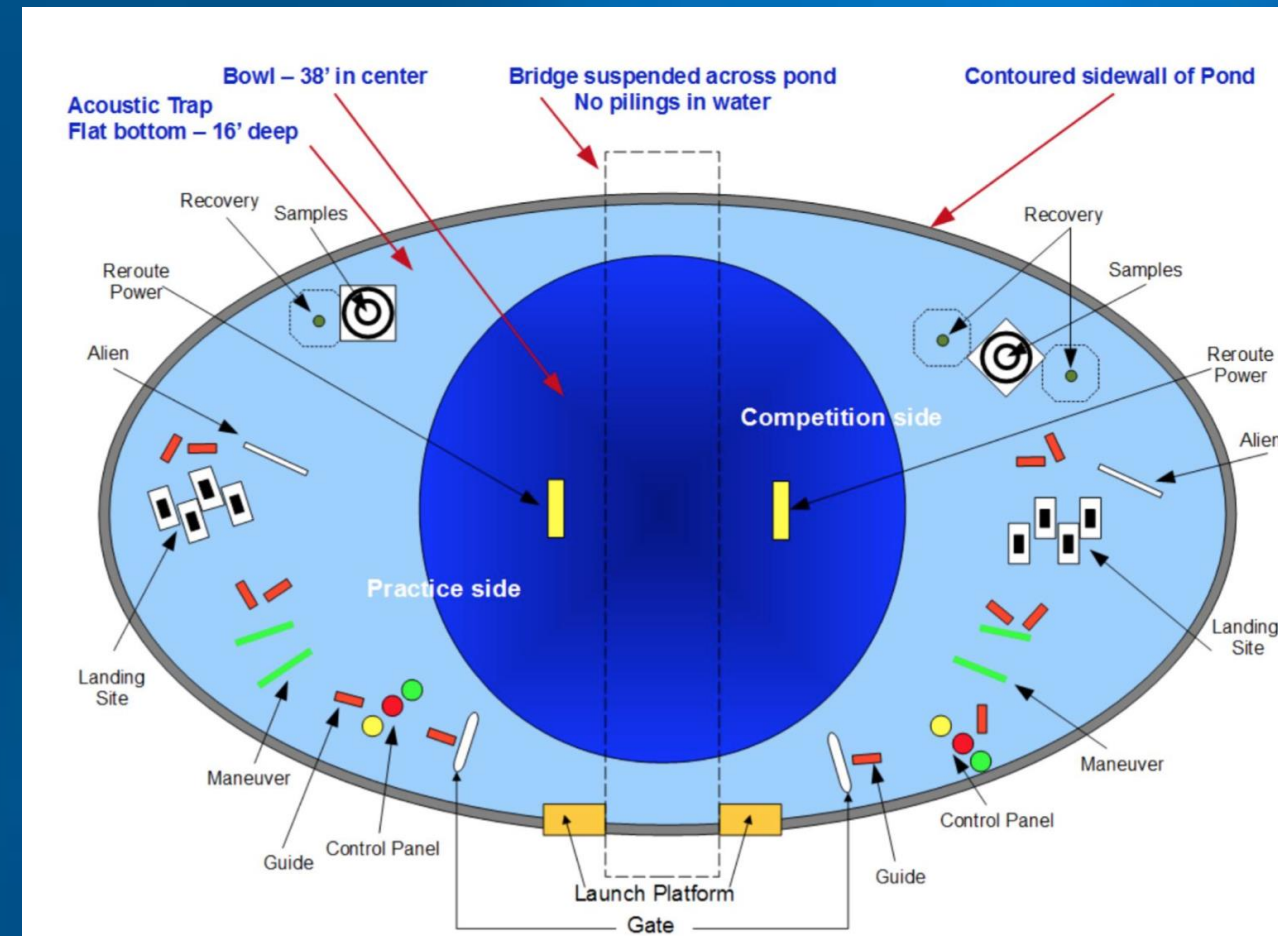
Design and Development of an Autonomous Underwater Vehicle

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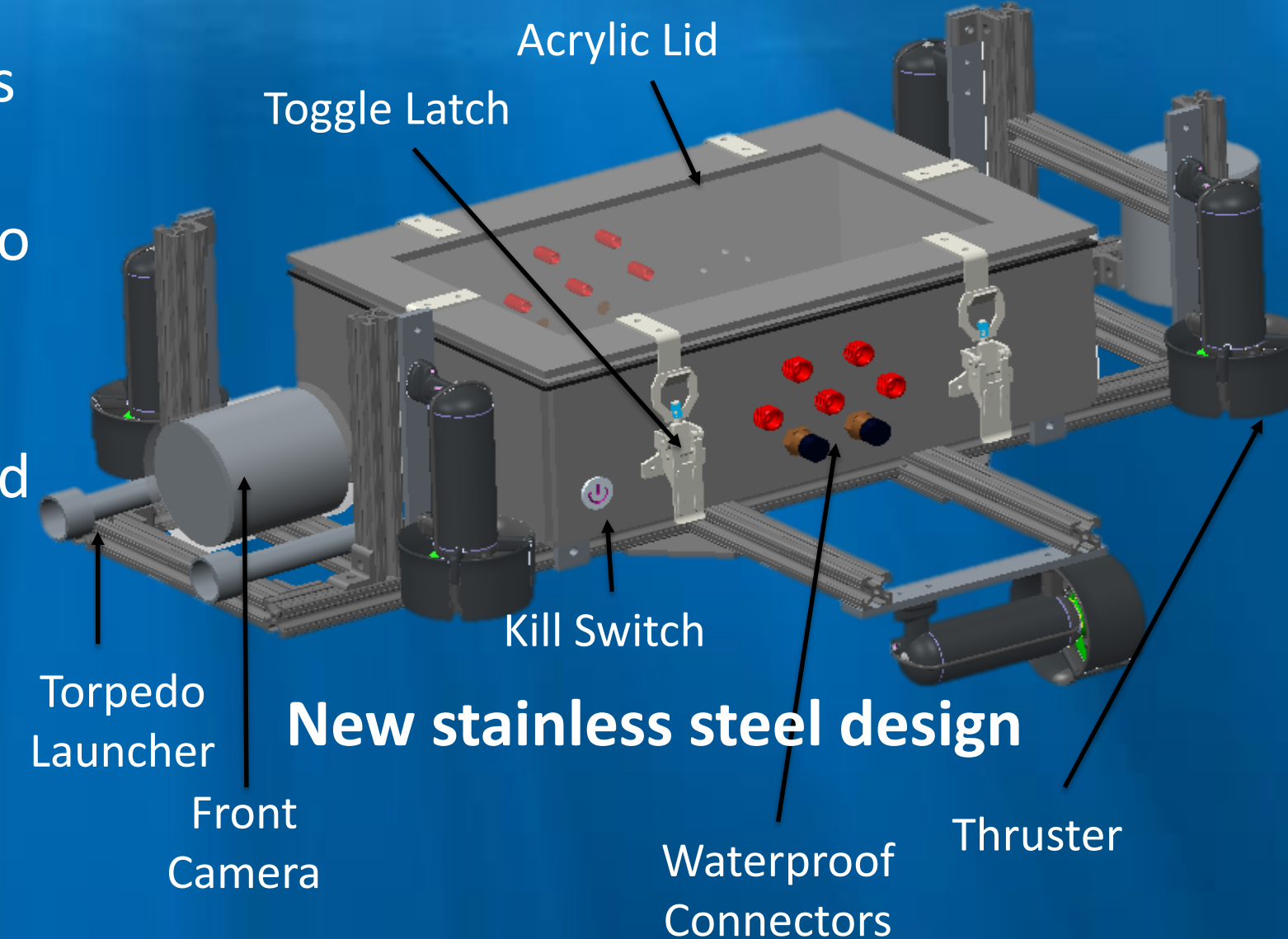
Background

- Competition hosted by AUVSI in San Diego, CA (July 2016)
- Competition tasks: color/shape recognition, change depth/direction and speed, ability to grab/place items with object detection
- Design an autonomous submarine to perform a series of challenges at the AUVSI RoboSub Competition



Hull Redesign

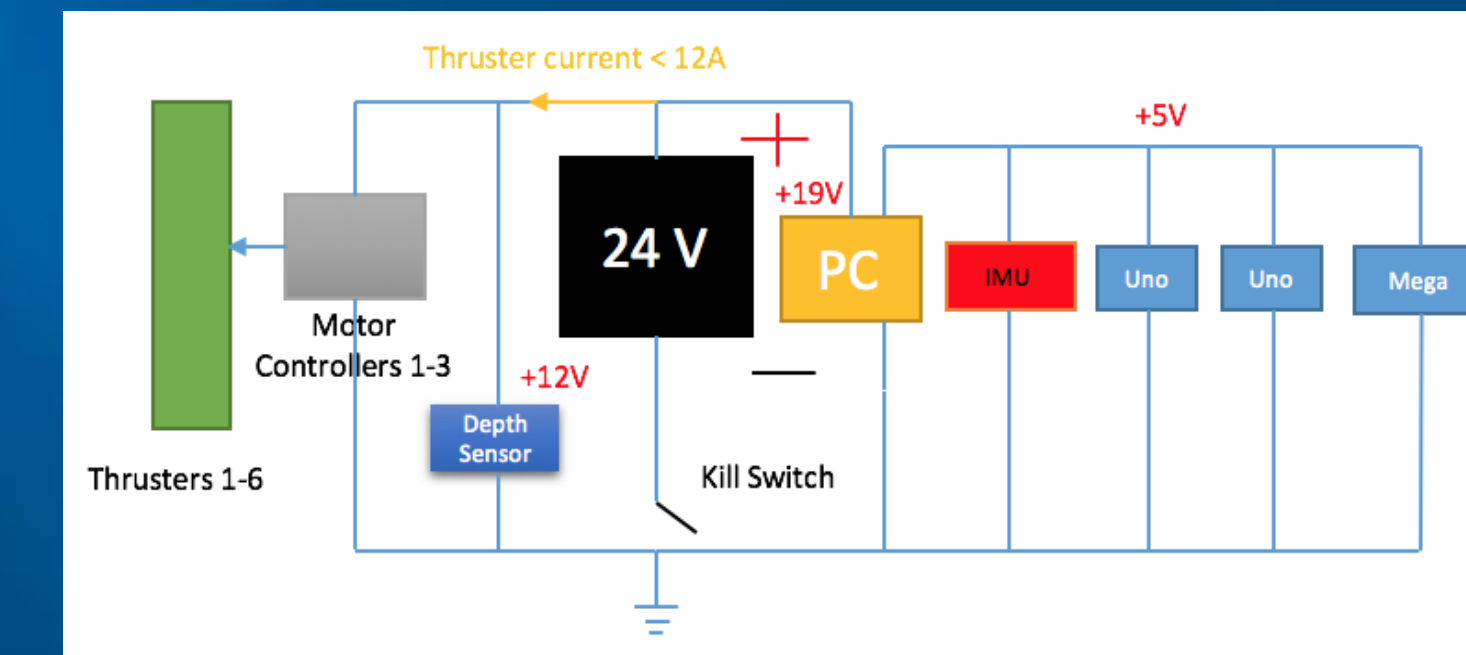
- Toggle latches for accessibility to electronics
- Pneumatic torpedoes and gripping mechanism
- Modularized connections



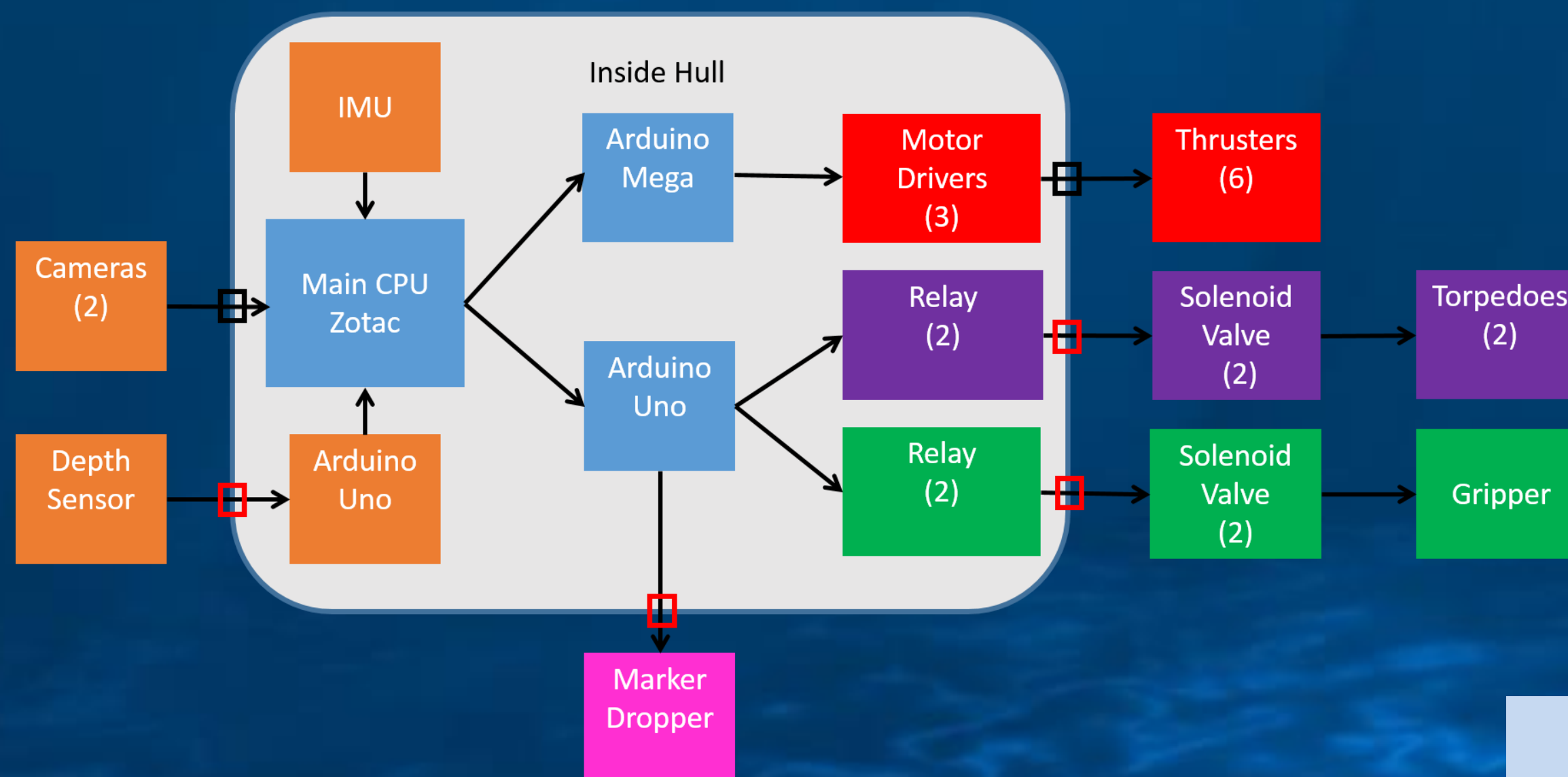
Electrical Design

- Implemented black boxes for electronics to organize and optimize space usage
- New batteries combined with voltage regulators to power entire system

Power Systems

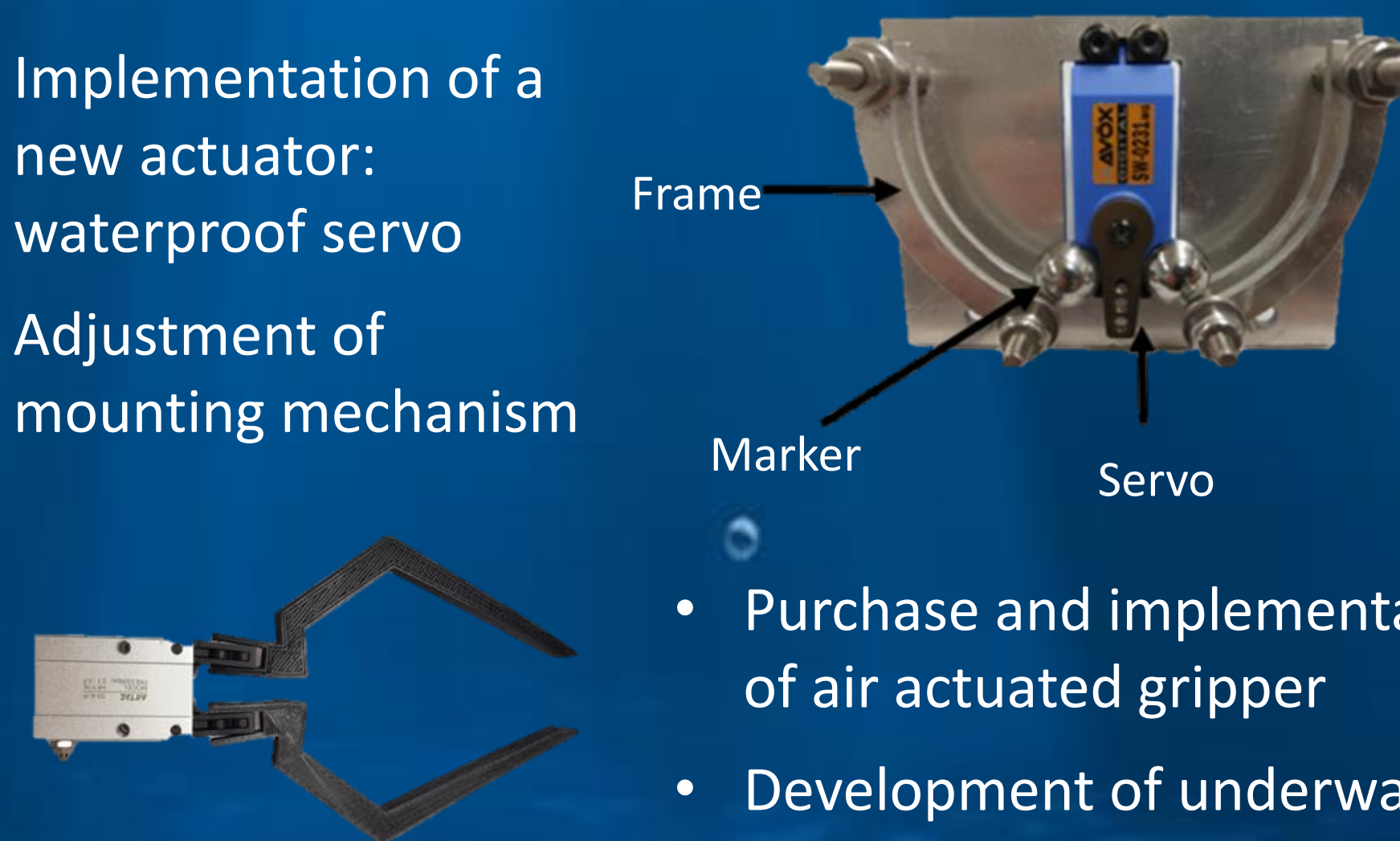


Signal Schematic



Marker Dropper and Gripper

- Implementation of a new actuator: waterproof servo
- Adjustment of mounting mechanism



- Purchase and implementation of air actuated gripper
- Development of underwater end effectors

Torpedo Development

- Developed CAD model
- 3D print CAD in abs plastic
- Negative plaster mold made of 3D printed piece
- Urethane rubber cast made for high density projectile
- Embedded magnet to hold projectile in place



CAD Torpedo Molded Torpedo

Updates and Repairs

- New air piston, tubing replacement, air tank replacement, and new air regulator
- New connectors, new latches, redesigned torpedoes

Operation Status

- Cameras: able to detect colors and orientation as well as track location of the objects
- Stabilization: Inertial Measurement Unit (IMU) able to output orientation data based off of its position
- Subsystems operational
 - Pneumatics
 - Thrusters
 - Marker Dropper



Electronics Organization

Future Teams Objectives

Task	Notes
Update Thrusters	Optional
Update Cameras	Optional
Install Hydrophones	Buoy Task
Image Processing	For Mission Tasks