---Please feel free to add/edit as necessary (just in case I forgot something)---

**Controllers:**

Phidget Advanced Servo: Through Pulse Width Modulation (PWM), signals from the computing core could be effectively translated into movements of the DC motor.

Phidget 888/LCD 20x2 Combo Module: The combination module acts as a hub for all components requiring digital or analogue inputs, including the Hall Effect sensor and Depth sensor respectively. In addition to communicating signals from the computing core, the display readout on the LCD was used to indicate the robot’s state as it moves through key sections of the program. Coupled with the console data, this provided an efficient method to troubleshoot the robot.

**Motors:**

Drill (Not sure actual name, DC) Motor: The central motor was salvaged from an electrical drill. Serving as the driver for the worm gear, it was used to adjust the angle of the thrusters, playing a key role in the depth control, especially during the ascent and descent phases.

Thruster Motors (DC): The pair of thrusters serve as the robot’s primary method of locomotion, receiving input from the Phidget controller.

**Sensors:**

Ocean Server Digital Compass: This compact module is used as one of the navigation instruments for the AUV. Being a 3 Axis tilt compensated solid state compass, it also provides readouts to yaw, pitch and roll, making it suitable for our the application of our robot. It interfaces with the computing core via a USB link. The built in accelerometer (for tilt compensation), can also provide redundancy to the readouts from the Phidget 3D module.

Hall Effect Sensor: The implementation of a 4 sensor array on the central motor provides an effective solution to control the robot’s DC motors, while avoiding the high costs of servos.

Phidget 3D: This sensor module provides additional information on the AUV’s state.

* Accelerometer: Measuring both static and dynamic acceleration in all 3 axes, the accelerometer’s input helps in the calculation of the AUV’s speed.
* Gyro: Providing readings of pitch, roll, and yaw, the gyro helps maintain the robot’s orientation underwater.
* Compass: (Not sure if we are using this, given that it is already on the ocean server)

Depth Sensor: The depth sensor provides analogue signals that are polled by the Phidget 888, providing various readings of resistance that correspond to the depth of the robot underwater. It is essential to maintaining navigation control over the z axis.

**Reserved for future use:**

Lasers: Rated at xxmW, these pair of green lasers will serve as the reference points for the AUV’s future camera vision system. The green wavelengths produced chosen ensure the visibility of the lasers at depth, accounting for the loss of color spectrum underwater. In contrast to red wavelengths, which disappear at about 15 ft, the green lasers employed would enable the robot to operate under depths of up to 75 ft.

Robotic Vision System: A camera module was also installed in the Robot for future use, to act as a more advanced navigation instrument. Coupled with the angled lasers, the camera would rely on the parallax effect to achieve higher awareness of its environment, effectively calculating the distance of objects ahead. The robot would also be able to reference objects of specific shapes and colors to better navigate on more advanced challenges.