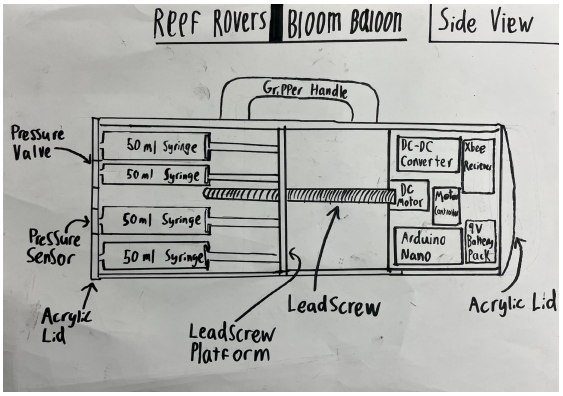

There is the real and ever-growing challenge of creating a float that can address current world problems that are facing us today such as climate change, and we are supposed to monitor this. With this, we have to come up with a float that is able to do monitoring of areas in different spots around the world in order to be able to collect meaningful data for research.

The first part of the float is the enclosure, which consists of a 30cm long and 11.5cm diameter acrylic tube by bluerobotics. The acrylic enclosure has a 10cm internal diameter chamber where electronics may be housed. The enclosure is divided into two sub-sections. On the top half, there is the section where the electronics are housed.

This uses a 9V NiMH battery pack, where electricity is sent past a 7.5 amp fuse, and toward a DC-DC 9 to 5 volt converter. The 5V line then travels to an Arduino Nano, where it communicate with the control box wirelessly using an Xbee module. Once this message is received, the arduino sends a signal to the Cython motor controller, which then sends that to the DC motor. You can see an image of the DC motor in Figure 3. The DC motor also receives a 9V signal from the battery itself. Once the DC motor begins to turn, a lead screw pushes a platform of syringes up or down to flood 4 syringes , 50 ml each, with water or evacuate them of water, controlling the buoyancy of the Float.

The bottom half is where the syringes are held. The syringes are held in this spot because this is where they will always have free access with water, and will always be guaranteed to only be pumping in water. Not only is this good as a spot for pumping the water in, but also this maintains stability underwater as the dense water is kept near the bottom of the device. Another benefit of this is that should one of the syringes leak, the likelihood of water contracting electronics are far less than if the syringes were to be above the electronics.

In order to complete the tasks of the float, it needs to be repositioned by the ROV. The ROV is to have an attachment point to the float via the grabber arm. The float is then transported to the location of the float tasks with the robot. Once it is there, the ROV releases the float, where the float is able to freely communicate with the pilot via the xbee. The float is then given inputs/instructions from the pilot to begin the task. Once begun, the syringes are filled with water, increasing the density of the float relative to the water outside of it, causing it to sink. This is where it then interacts with the on-board pressure sensor. The pressure sensor verifies this change in depth, allowing the next stage of the process to occur, the lifting of the float to the surface.

In order for safety to be ensured on the float, a 7.5 amp fuse has been installed to prevent any kind of unexpected level of current from reaching the system, which shall be avoided in order to ensure operator safety. A custom acrylic valve with double o-rings is attached to the lid of the device to release the pressure with a diameter of 2.5 cm.