FLOAT-*VAMPIRE SQUID*

NON-ROV DEVICE DOCUMENTATION MATE 2022 - DOC-004

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Rovotics' float Vampire Squid (Figure 1) is used in task 3.1 to perform two vertical profiles of the underwater environment independently. Vampire Squid consists of two waterproof containers, one which houses the batteries and another which houses the float's buoyancy engine. Two sets of batteries power Vampire Squid: four AA alkaline batteries that power Vampire Squid's motor-driven buoyancy engine and a single 9V alkaline battery to power Vampire Squid's onboard microcontroller, an Arduino Nano (Figure 2).

Vampire Squid's battery compartment contains both the AA alkaline battery pack and the 9V alkaline battery in a secure battery holster near the top of the compartment. At the bottom of the battery compartment is a 2.5cm rubber pressure release plug that allows the compartment to open freely when pressure develops inside the housing. The AA battery pack and 9V battery each have a 5A fuse attached 4 cm from their positive terminals. Three power wires from the battery compartment connect to the buoyancy engine compartment (Figure 2).

Figure 1, *Vampire Squid*

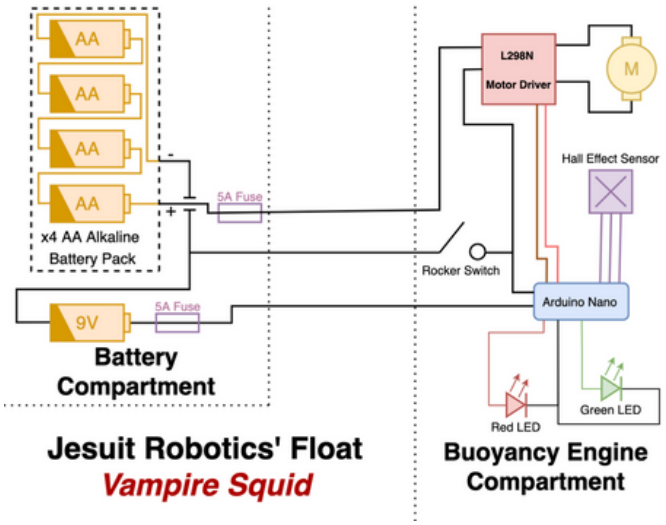

Figure 2, NON-ROV device SID

Vampire Squid's buoyancy engine compartment contains four components: the Arduino Nano, the Hall Effect sensor, and the motor-driven syringe. The Arduino Nano is connected to the Hall Effect sensor, which detects magnetic fields outside the Vampire Squid. It can be deployed and subsequently activated by a magnet attachment on Manatee's pneumatic gripper. Once activated, the Arduino Nano communicates with the onboard motor driver, which uses power from the AA alkaline batteries to drive the motor forward and backward. The motor rotates a lead screw attached to the syringe, moving the piston in the syringe up and down. This movement of the syringe's piston moves water into and out of the internal syringe.