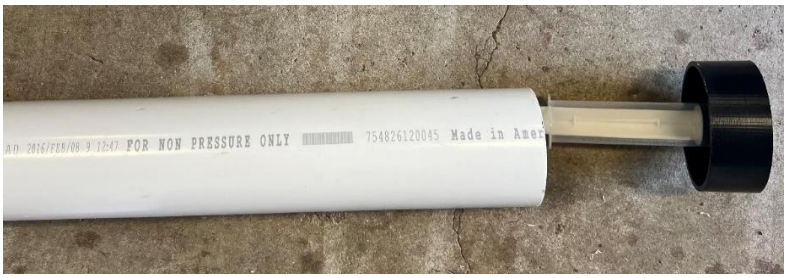
GEARS (General Engineering And ROV Specialists)

Eastwood Schools, Montgomery, AL

Float Design Description

- Designed to collect pressure data during two vertical profiles
    - Transmits data to the Float operator's computer using Wi-Fi
    - Informs Float operator of progress during vertical profiles
- Uses a buoyancy engine composed of:
    - IP54-rated linear actuator drives a syringe to dynamically float and sink the Float
    - Uses ballast of rock
- Housing is primarily composed of a PVC tube (71 cm long and 11.5 cm in diameter)
    - Keeps water out and stands up to pressures of up to 888 kPa
    - Pipe top is capped by a mechanical test cap for easy access to the electronics and tight sealing
    - Capped on end with 3D printed piece
    - A pressure release was included to prevent the device from exploding under high pressure
- Powered by a 12 VDC power pack
    - Composed of 10 NiMH AA batteries
    - Runs through a 2-amp fuse before powering any components
- Onboard electronics are controlled using MicroPython software
    - Uses an ESP32 microcontroller
    - Linear actuator is controlled by the ESP32 through a reversing relay
    - Pressure sensor is connected to the ESP32 to collect pressure data
    - Components are mounted on an internal rack

Rubber Stopper
Photo by Isaac Gibbons



GEARS 2025 Float "Nautilus"
Photo by Paul Flomer