# Final Project Report - Rangefinder

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Period 5

My final project was to build and program a rangefinder using Arduino.

A rangefinder is a device used to calculate the distance between it and an object. It does this by sending out a wave, either sound or radio, and the wave bounces off an object. The rangefinder then measures the time between the wave being sent and the wave being received. Rangefinders are an integral part of both RADAR and SONAR systems, and are also used by military snipers to accurately calculate the distance between the sniper and their target.

This rangefinder uses sound to calculate distance, and displays it in centimeters and inches on an LCD screen. Below is the schematic for the rangefinder found on the link provided. The website also provided an open-source code that I used.

Link to Website: https://diyhacking.com/arduino-ultrasonic-range-finder/
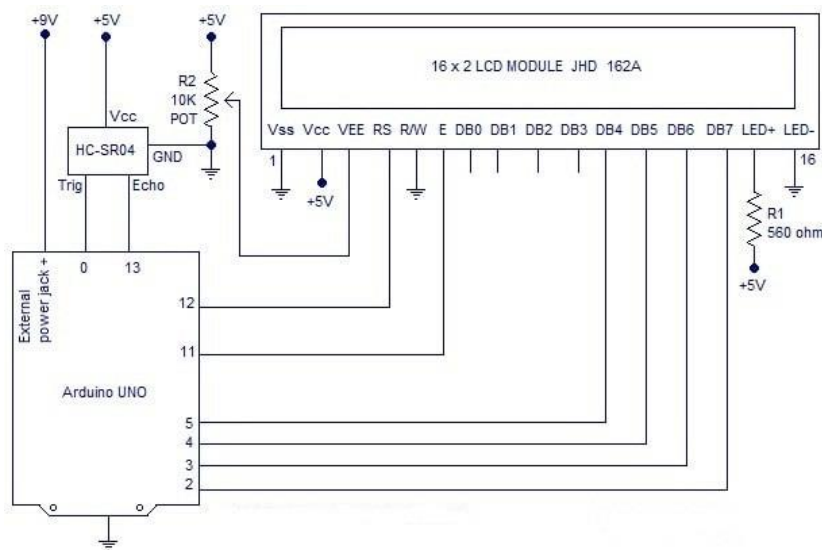
I then used a code provided by a website to program the rangefinder, but slightly modified it to print values to the serial monitor in the Arduino Program.

After building the rangefinder, I discovered that it did not work. I checked the wiring and the code, and it seemed to be fine, so I took it to the Fab Lab San Diego to troubleshoot with help from the staff. I discovered that I had mismatched several wires, and also that the potentiometer was not turned up all the way. After troubleshooting, the rangefinder was tested, and worked.

The rangefinder works exceptionally well. In testing, it was able to calculate the distance to an object with great accuracy (about 1 cm) with a maximum range of about 200cm. I feel that the project, despite its initial mishaps, is a success.

Materials used:

- Arduino Uno Micro Controller (Sunfounder Uno R3)
- Numerous jumper cables (Both male-to-male and male-to-female)
- HC-SR04 Ultrasound sensor By Sunfounder
- JHD162A 16×2 Alphanumeric LCD By Arduino
- Cardboard Box
- 2 440-pin Breadboards
- Arduino Genuino Uno Computer Program (download from Arduino.com)
- USB adaptor cable
- HP Notebook PC (for code and power)
- Tape

Additional Photos