Final Report

1. Introduction
   • **Problem Description**
     - The purpose of our project is to pinpoint the location of a sound source. We also wanted to explore our electret microphones and amplifying circuits.
   • **Design Concept**
     - Our design uses 2 microphones and a motor to locate the sound. One microphone is used to take sound samples in each direction and determines which direction contains the loudest sample. Then after the direction is determined the two microphones will sample for a few seconds, and the two samples will be compared to get a phase delay which will be used to determine the distance of the sound.

2. Design Description
   • **Block Diagram**

   ![Block Diagram](image)
• Circuit Schematics

Motor Driving Circuit

Switch Circuit

Microphone Circuit
3. **Results**
   - So far we are able to locate the direction of the sound consistently, but we have not finished determining the distance of the sound source. We got the microphones and the amplifier circuits to work pretty efficiently, but that took most of our time.

4. **Future Work**
   - We plan to finish the project in time to show it for EOH. What we have to do is first finish the distance calculations. After we are able to accurately locate sound sources we will have a laser pointer that points to the spot where the sound is coming from. Once all that is built and coded we will work one making it look compact and aesthetically pleasing. Our microphone circuits are pretty sensitive to any sound so we will probably build a bandpass filter around a high frequency that isn’t present in our environment.

5. **Conclusion**
   - **Lessons Learned**
     - The hardest part of this project was building the microphone-amplifier circuit. Figuring out how the amplifier worked didn’t take much time, but the microphone took some time. At first we couldn’t get the microphone to be sensitive to sounds and the signal was barely differentiable from the noise. We fixed this by changing resistor values to get the best signal amplitude. Once we got both circuits to work we put them together, but for some reason the amplifier wasn’t reading the output of the microphone. This was fixed when we biased up the non-inverting side of the amplifier by a volt. Once we got the hardware working, the software was easy, but time consuming. And we are still finishing the software.