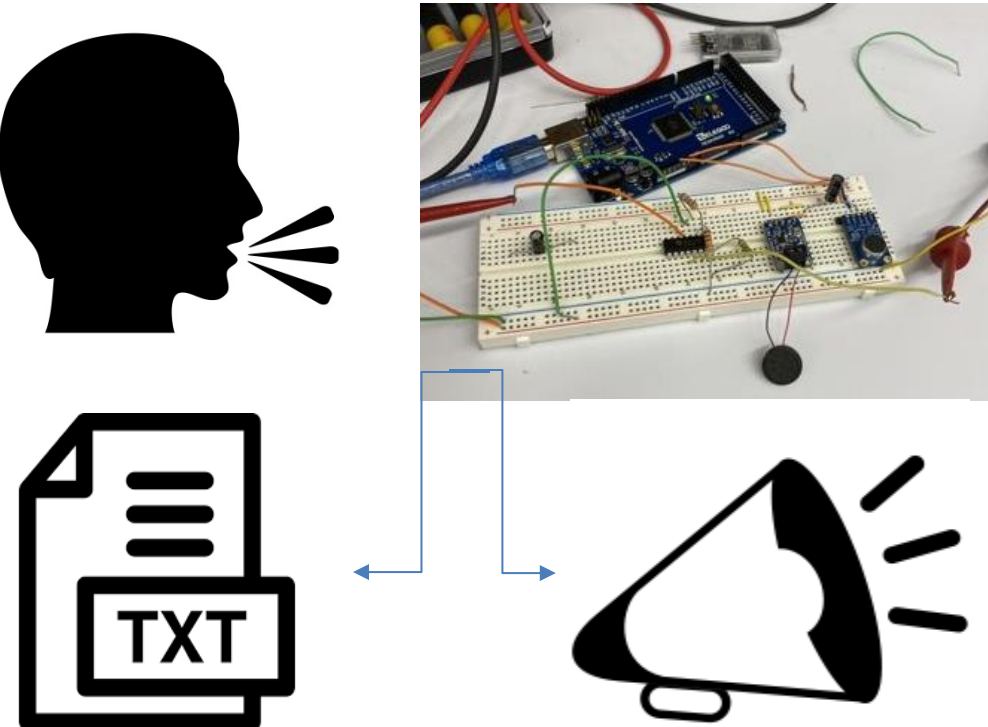# TYVAA

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BACKGROUND

The Idea for TYVAA came about after one of our team members thought about how their grandparents have trouble communicating due to bad hearing. With this issue in mind, we thought of several ways our team could improve communication between them. Our first thought was to simply amplify the users voice but, in case that wouldn't work we wanted a backup way of communication and that is why we also wanted to record their voice to a text file. Since this whole project was about convenience, we also wanted to make the device we were designing portable. Thus, our project TYVAA began development!

PROPOSED SOLUTION

Our initial design involved building an amplifying circuit in which our microphone was the input voltage source that would go through a band pass filter and then that filtered signal would feed into an op-amp that would then lead to a speaker. Our group ended up finding a circuit component that eliminated the need for the band pass filter. It should be noted we did not get our circuit to work properly. For the dictation portion of our project, we would have had the microphone as input. Our voice would feed into a Bluetooth module that would pass our vocal data to the Arduino which would have referenced a dictation library. Then it would have transferred the processed data into a text file. It should be noted that we did not have time to work on this aspect of the project and thus our design idea may be flawed.

SYSTEM DESIGN

Project Tyvaa was created with the intent of helping others, mainly elderly people, to communicate with others around them. To do this, we originally planned to take the input from our microphone, run it through an Arduino's analog to digital converter (ADC) to get data, and then output the same waveform using the Arduino's digital to analog converter (DAC).
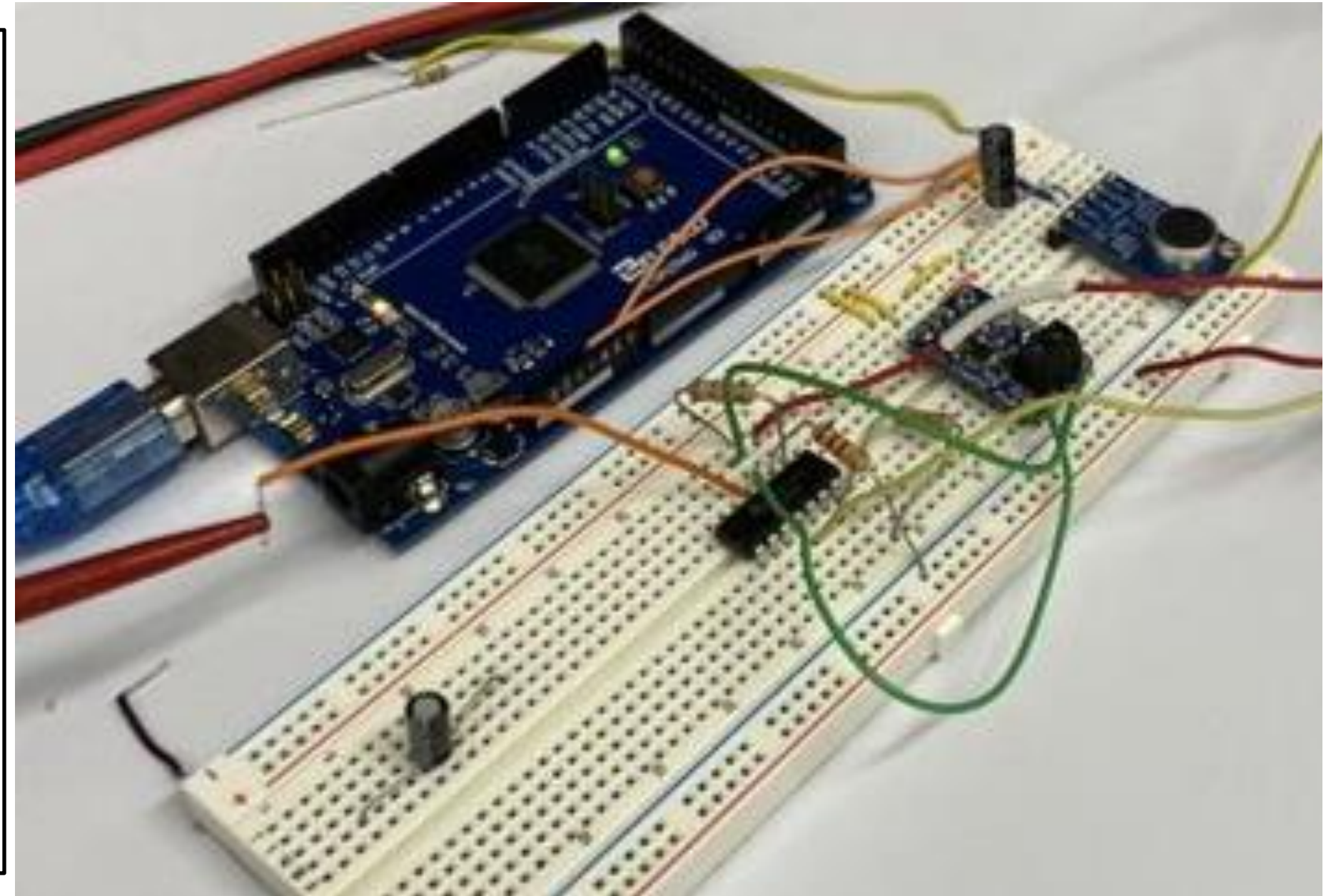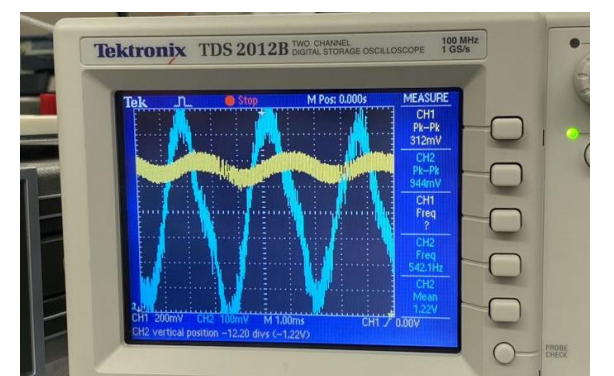

The Electret Microphone Amplifier provided us with reliable data from any incoming sound. The microphone took in sound and returned values corresponding to the sounds input.
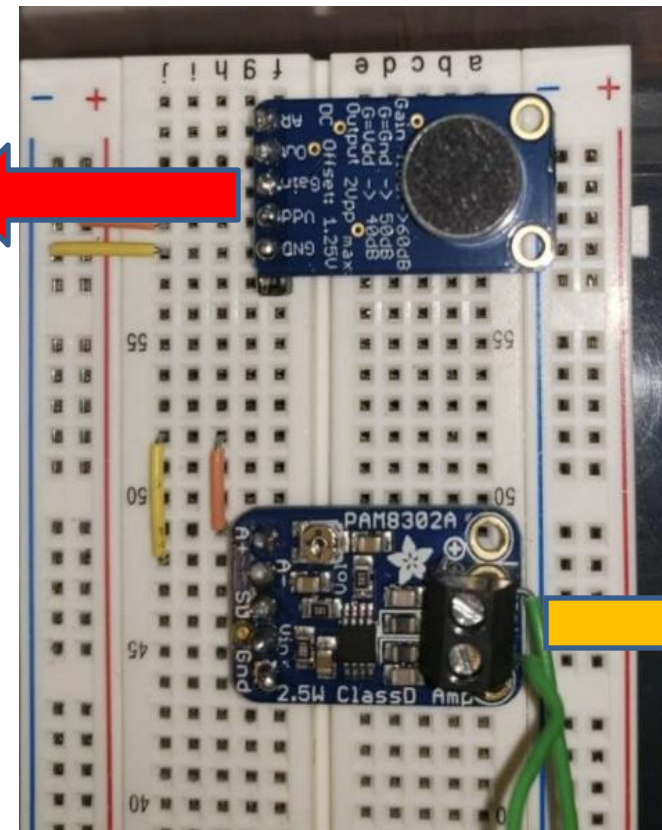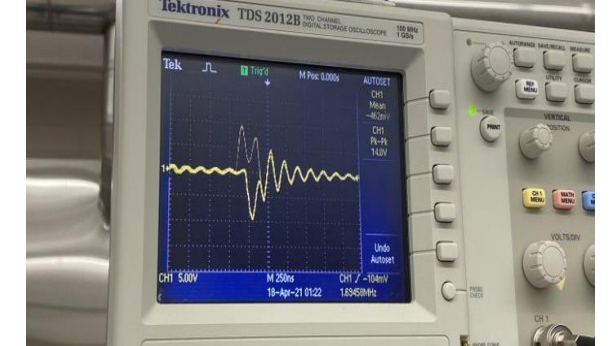

The Class D Audio Amplifier chip was integrated into our circuit to provide a clear output so the speakers can project sound waves to others. The images to the right show how the audio amplifier chip cleared up the output.
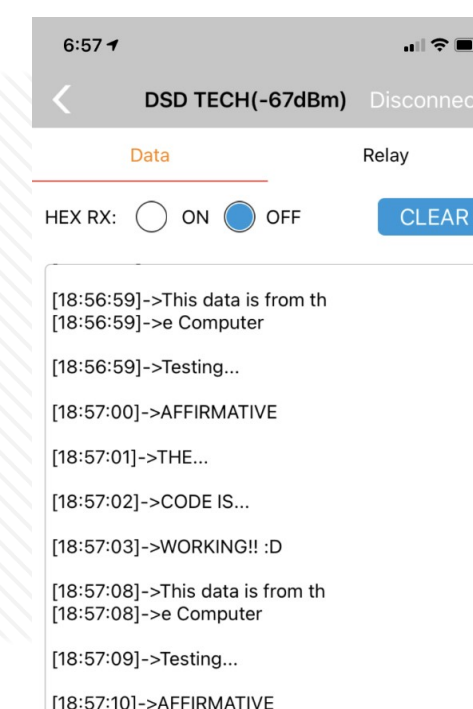
Before Audio Chip

After Audio Chip

The Bluetooth Module's purpose was to receive data from the Arduino and transmit data to a device. Originally for converting to text file via XML dump.

The information would then be transferred to a device that supports Bluetooth 4.0. "This data is from the computer, Testing... AFFIRMATIVE THE... CODE IS... WORKING!! :D"

What we could have done differently

- Start with simulations
- Done more research on more compatable boards
- Done more research on Audio handling
  - feedback, amplifications, proper components

REFERENCES

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