



The Electret Microphone

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What is the Electret Microphone?

An electrostatic capacitor-based microphone

Used to record audio and send analog signal to Arduino

- 20 Hz - 20 kHz frequency response
- Pinout:
 - Ground
 - VCC - 5 V
 - OUT - analog input

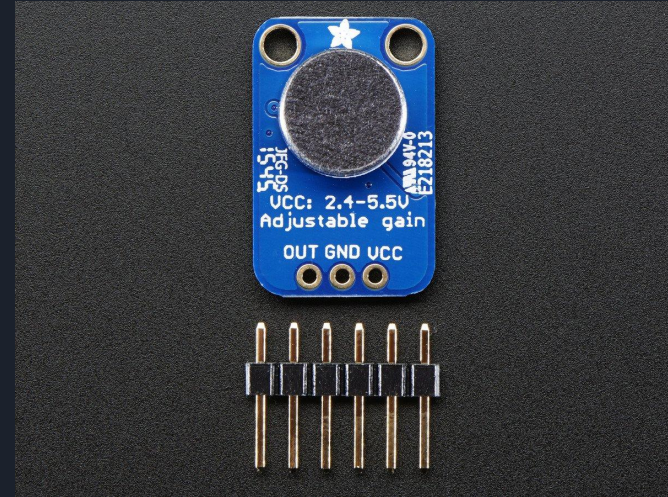


Photo taken from adafruit website

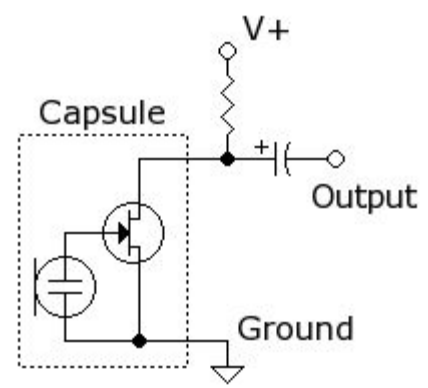
How It Works

Adafruit electret microphone has a built in op amp to amplify signals:

Maxim MAX4466 op Amp

Gain is adjustable from 25x to 125x using connected potentiometer

Typically, a FET/capacitor circuit is used as a preamp



Things to Note

The human range of hearing is about 20hz to 20khz. In order to sample 20hz, you would need to let the microphone run for at least 50ms

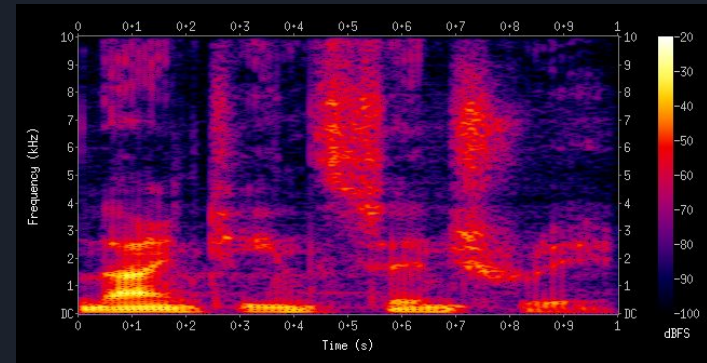
Max sampling frequency of Arduino is 32 kHz, so aliasing will occur for frequencies of 16 kHz+

Can use an FFT (Fast Fourier Transform) algorithm to analyze the frequency spectrum picked up by microphone

Can also use:

DFT (Discrete Fourier Transform)

FHT (Fast Hartley Transform)





Websites Used

- <https://www.norwegiancreations.com/2017/08/what-is-fft-and-how-can-you-implement-it-on-an-arduino/>
- <https://www.adafruit.com/product/1063>
- <https://www.engineersgarage.com/insight/how-electret-condenser-microphone-works>
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