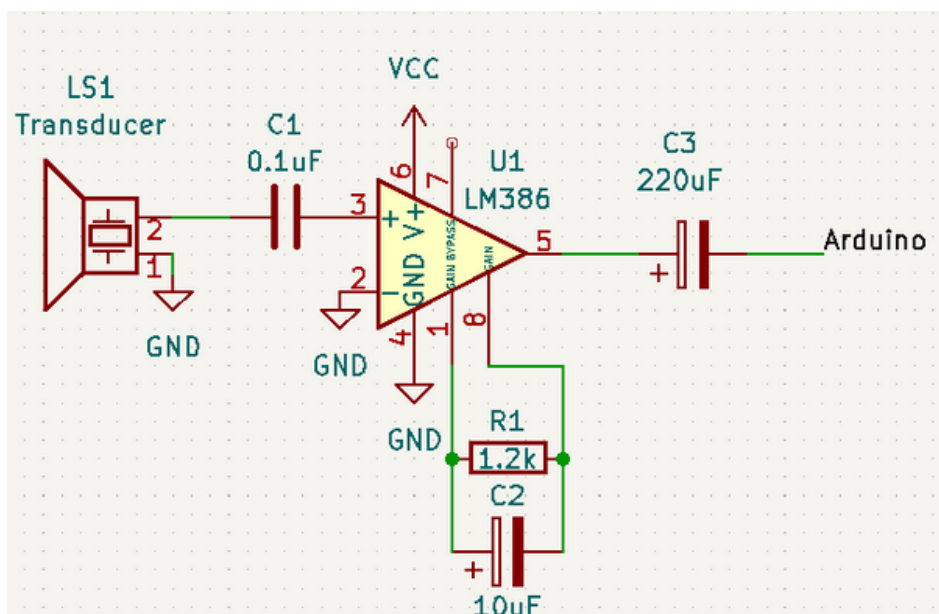


AMPLIFIER

Implementation of ultrasonic anemometer using 4 ultrasonic transducer. here 4 ultrasonic transducers are connected orthogonal to each other with a distance 20cm. A multiplexer is used for switching the transducers.

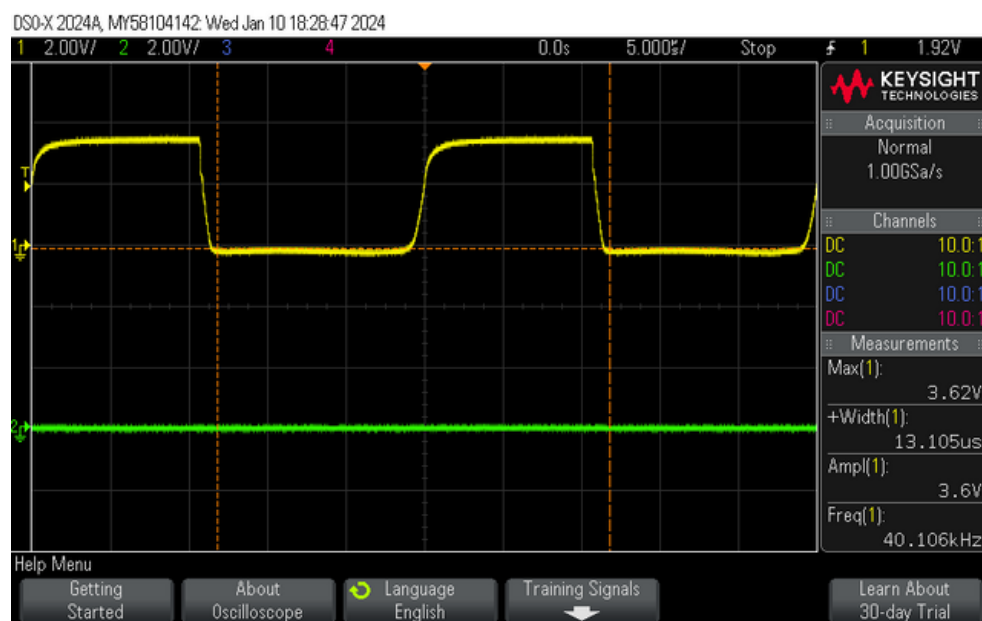
The output signal from the ultrasonic transceivers has to be amplified & conditioned in order for efficient signal processing by the micro controllers. Hence, the sinusoidal waves generated by the transceivers has to be transformed to square waves. We developed an amplifier circuit in order to accomplish this; by utilizing LM386.

LM386: This is a power amplifier designed for use in low voltage consumer applications. The gain is set internally to 20 to keep external part count low, but the addition of an external resistor and capacitor between pins 1 and 8 will increase the gain to any value from 20 to 200.

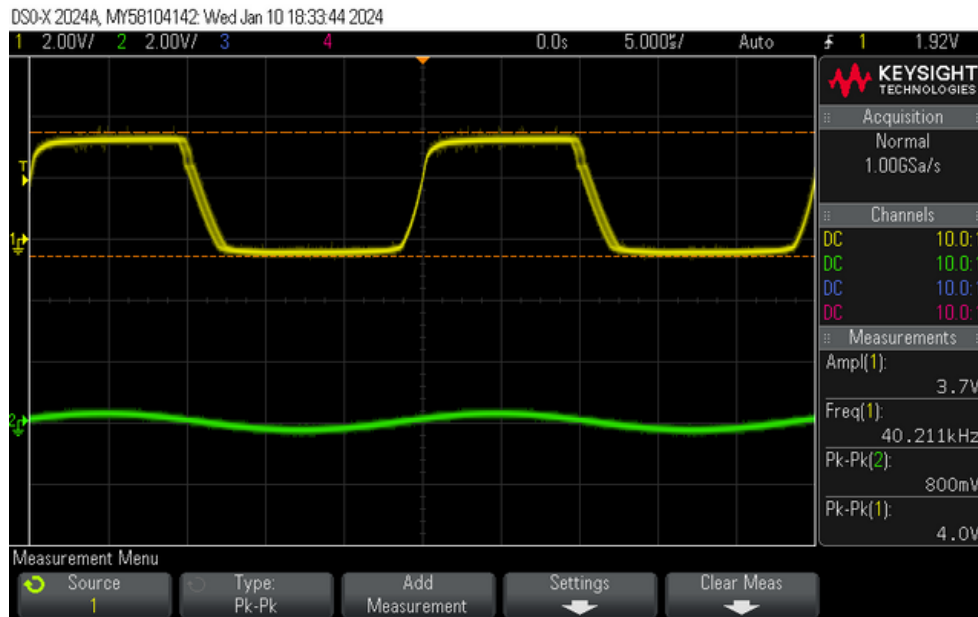


Capacitors are used essentially for coupling and filtering.

- C1 (0.1 μ F): This is an input decoupling capacitor, acting as a DC blocking capacitor that allows the AC signal from the transducer to pass into the amplifier while blocking any DC voltage. Its main function is to prevent any DC offset from the preceding stage from affecting this stage.
- C3 (220 μ F): This is an output decoupling capacitor, often called a coupling capacitor as well. It performs a similar role to C1, allowing the AC audio signal to pass onwards to the Arduino, while blocking any DC voltage from heading into the Arduino's analog input. Its purpose is to prevent the DC operating point (the quiescent current) of the amplifier from affecting subsequent stages or devices.



Also check transmitter to receiver signal strength with and without amplifier. the test results are;



Here the Peak to Peak voltage of receiver using amplifier circuit is approximately 3.9V. Also the Amplitude is 3.6V. Without using the amplifier, got the peak to peak voltage 800mV and amplitude as 330mV.

Based on the previous experiment, receiver to transmitter section has less peak to peak voltage. Now,

