

# FREQUENCY FILTER

ECE 153B PROJECT PROPOSAL  
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## OVERVIEW

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We propose to design an audio filter that takes as input seven magnitudes of frequency bands and program various modes to increase or decrease the magnitudes of specific frequencies. Once filtered, we will use the buzzer to output the filtered audio. The various filtering modes will be toggled by a button on the LPC board.

## PERIPHERALS

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1. MSGEQ7 & Board  
(<https://rheingoldheavy.com/product/msgeq7-graphic-equalizer-kit/>)
2. Buzzer (On Project Board)
3. Audio input (phone or laptop)
4. Button (On Project Board)

## SOFTWARE DESIGN

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A continuous while loop will receive input from the MSGEQ7 chip. By default the buzzer will output the unfiltered audio until a button interrupt triggers the next filtering mode. The filtering modes will loop back to the default state. For testing, we will input sine waves of increasing frequency and send the filtered waveform to a GPIO pin to measure with an oscilloscope.

## GOALS

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1. Ability to recompose filtered audio and output from the buzzer
2. Play various modes of filtered audio: high pass, low pass, bandpass, bandstop

## GROUP RESPONSIBILITIES

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Brandon focuses on interfacing the LPC buzzer and receiving input from the MSGEQ7. Danielle writes the software in embedded C to filter the audio in various modes and output to the buzzer.

