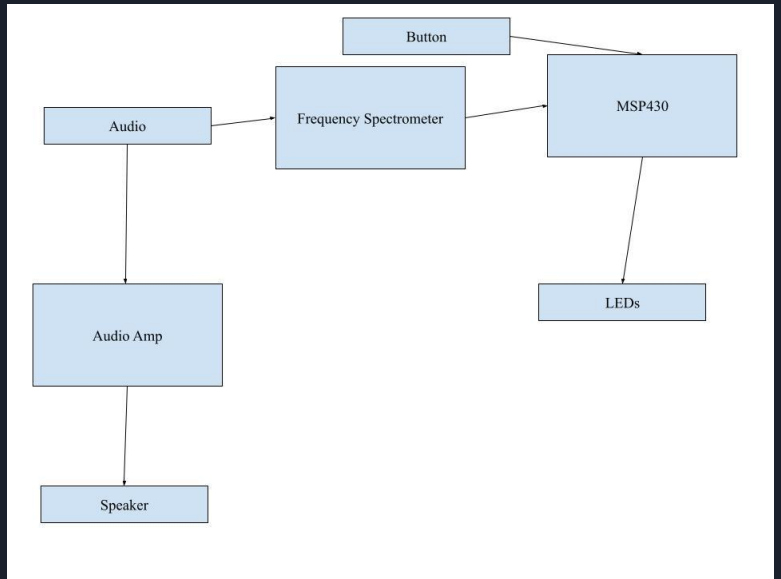
ELEC 327 Final Project

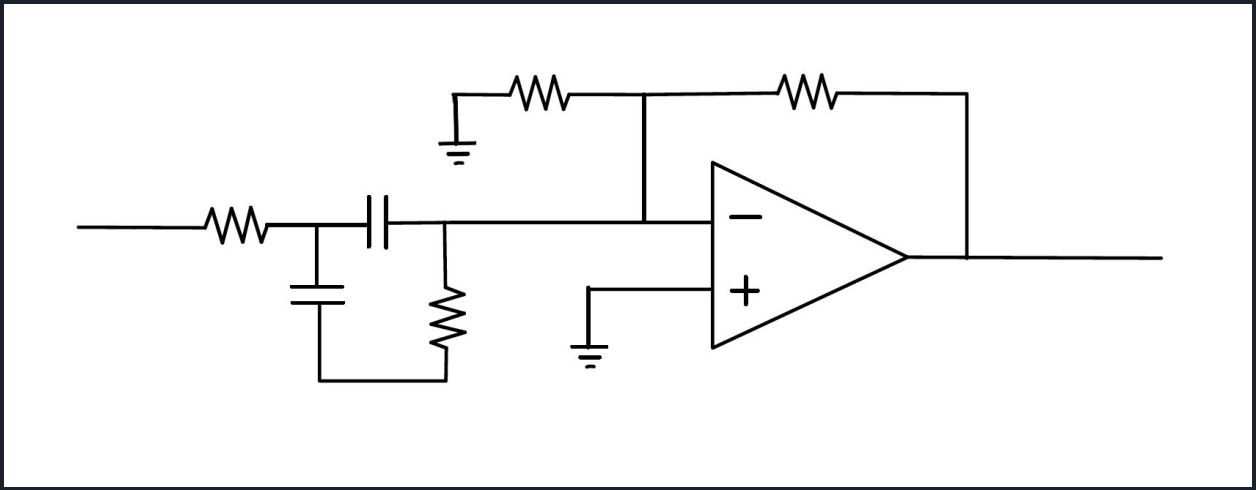
By John Reko, Peter Humphreys, and Sean Hamilton

Light Up Speaker

- Low power speaker that has LED light display
- LED light display is controlled by MSP430
- Frequency spectrometer is built to utilize ADC



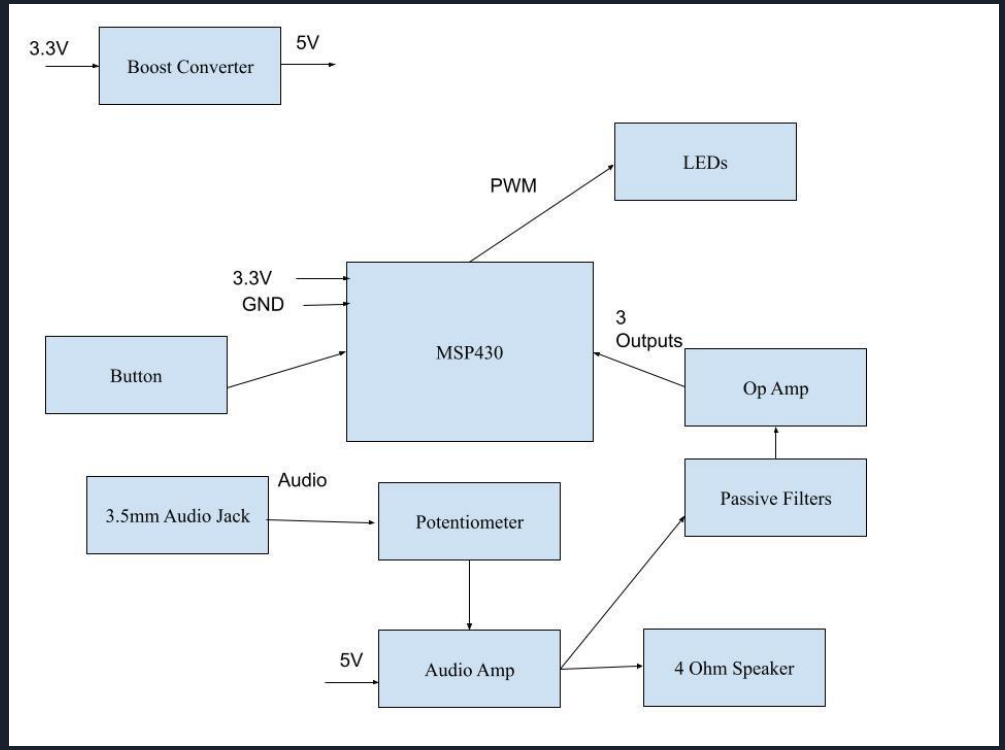
Bandpass Filters



MSP430G2553

- Standard Voltage, Ground, Reset, and Test connections
- Audio Inputs p1.0, p1.1, p1.2
- Button Input p2.2
- Data Output p2.5

Board Design

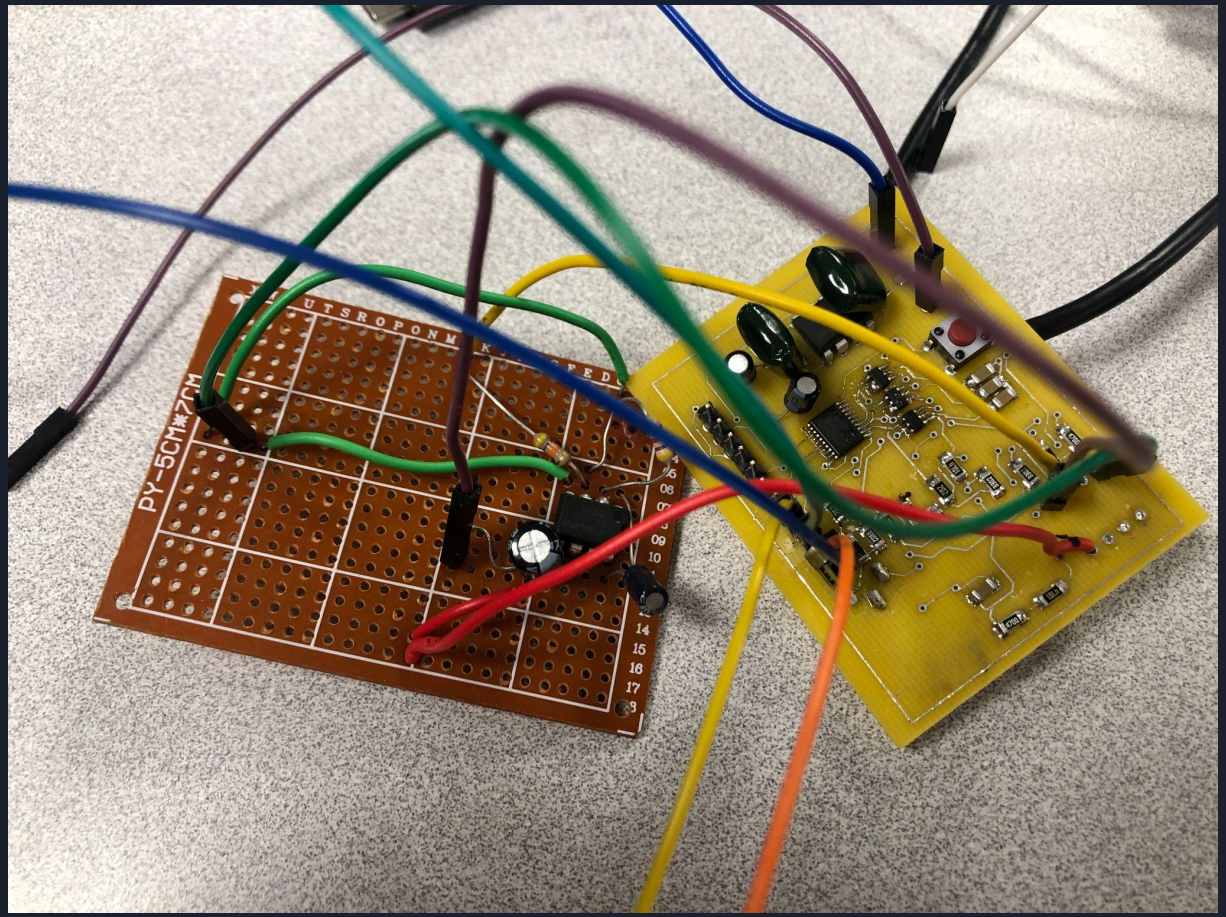


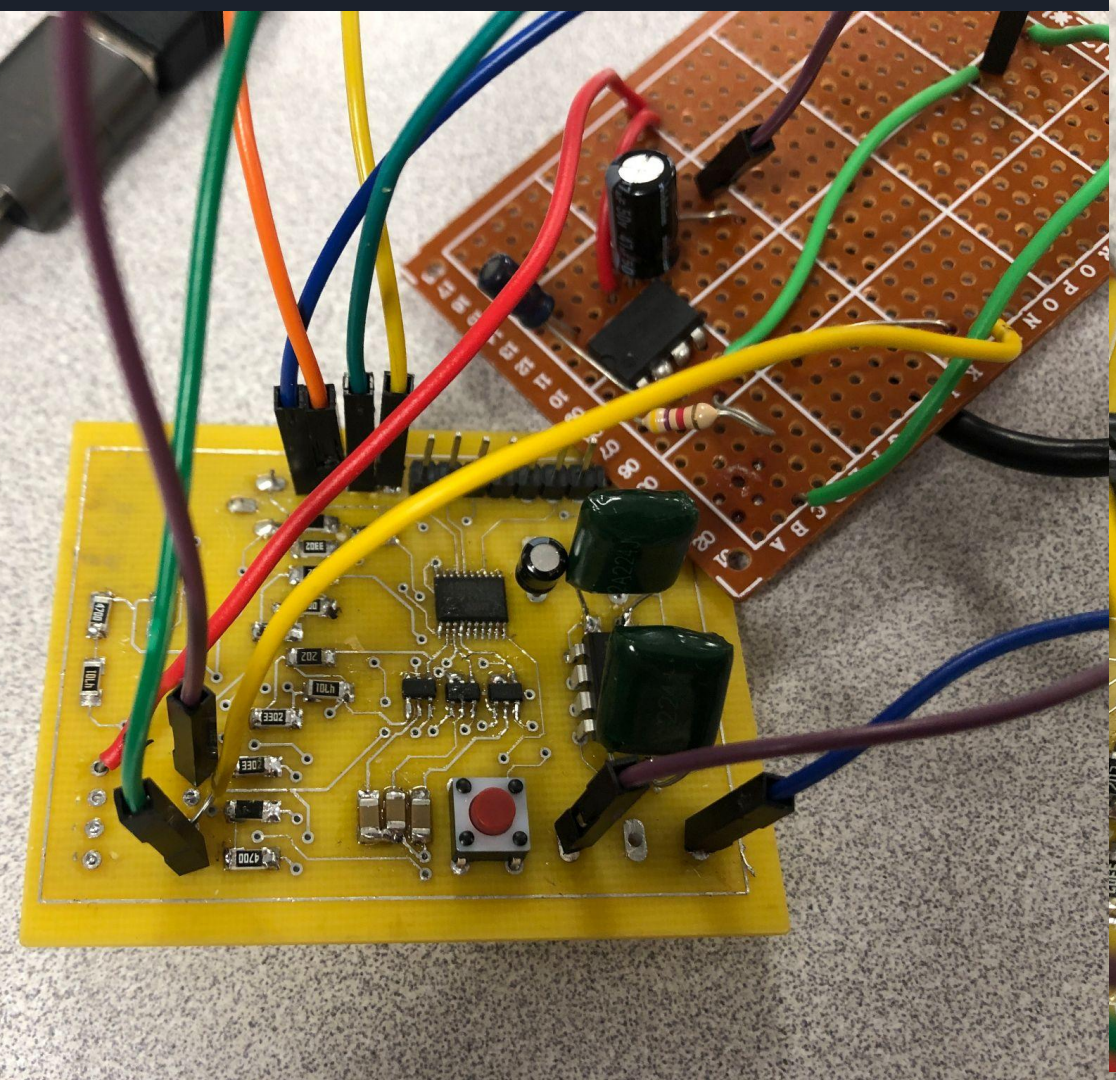
Code Implementation

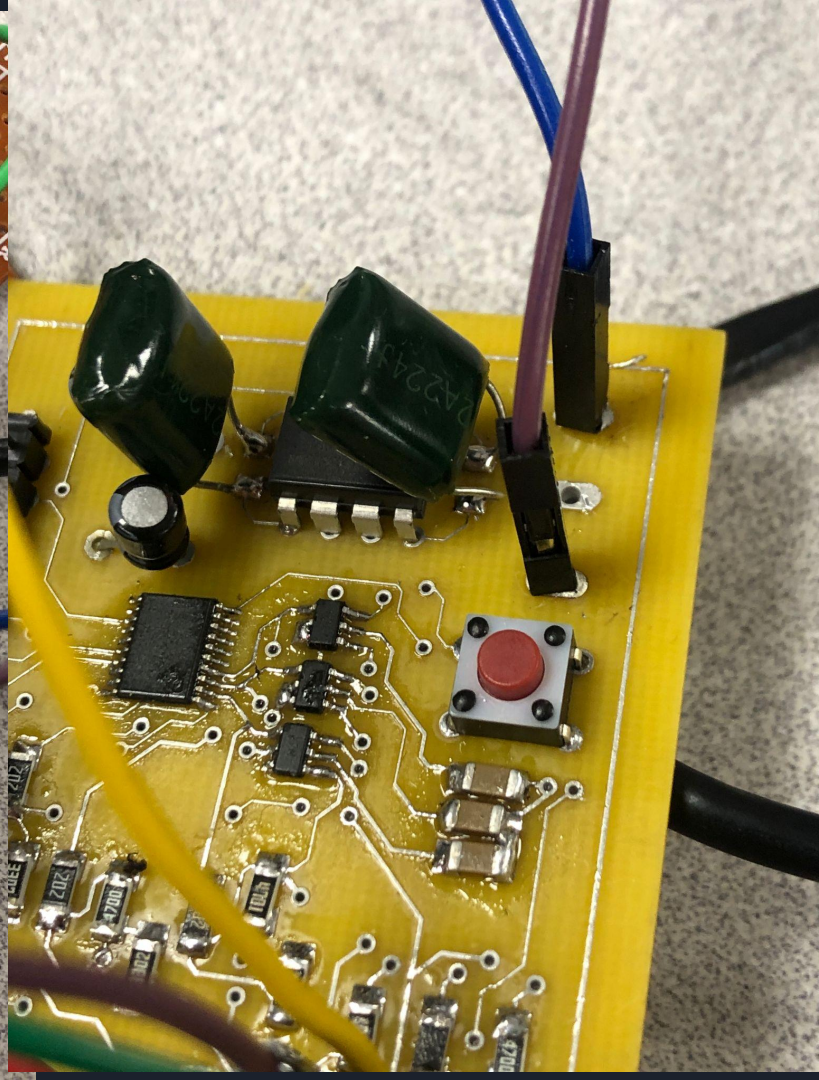
- Activate circuit using button for a toggle switch
- If toggle is activated then continuously read ADC outputs from MSP430
  - This comes through on 3 different pins which can allow for control of programmable LEDs if used in conjunction with SPI
- Use ADC output to set the value of the duty cycle of the PWM wave

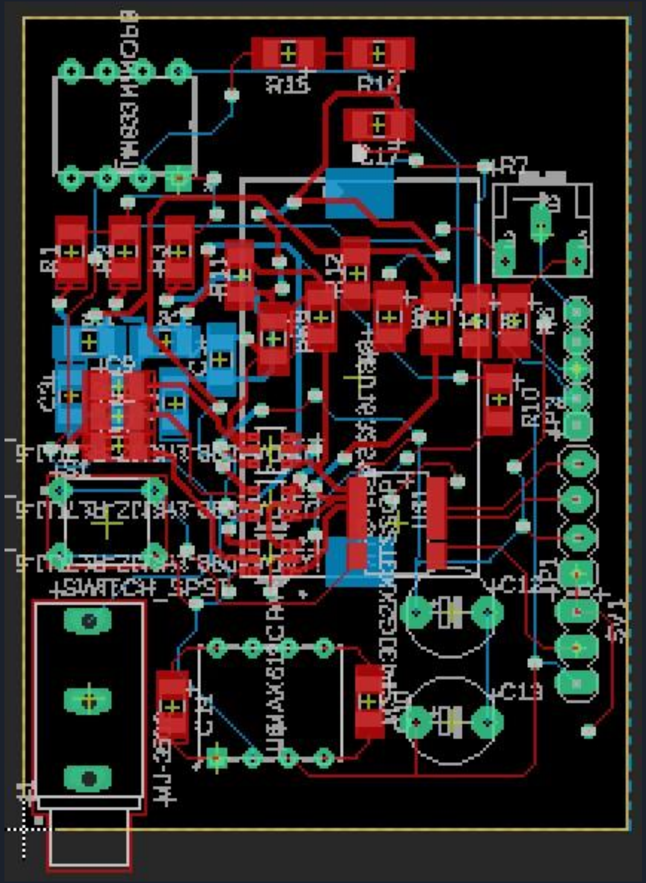
Errors

- Components
  - 3.5 mm audio input would not properly propagate signal to our PCB
  - Op-Amps did not yield expected voltage gains which led to adjustments in design of feedback network to accommodate
- Board
  - No shorts to ground but sometimes input signals would seemingly be filtered down to true harmonics
  - When using the launchpad, connecting both VDD and Ground caused the ground of the board to sit at a constant 3.3 V
    - Unsure why this happened
- LED Strip
  - We planned to use a ws2812b LED strip, but initially thought we could use PWM to adjust the LEDs
  - After further research, we realized we needed to use SPI to make them work, but it was too late to adjust our PCB design


PY-5CM*7CM






R15
R17
R7
+SWITCH_SPST
C12
C13