

E1.02 - OrangeBreaker

Kendel Eckhart (PM), Eduardo Camara-Hidalgo, Zach Parker, Logan Ridge
 Dr. C.R. Compeau



Project Overview

- Simulate and construct two solid-state analog effects pedals from provided schematics, both with custom PCBs
- Characterize the electrical performance.
- Fabricate a stompbox enclosure to house both effects.
- Demonstrate operation at common frequencies and signal amplitudes of a guitar.

D1 Requirements

- Simulations
- Breadboarding
- Component Values
- Build in ready-made PCB
- Characterization Plan
- Demonstration of effect pedals independently

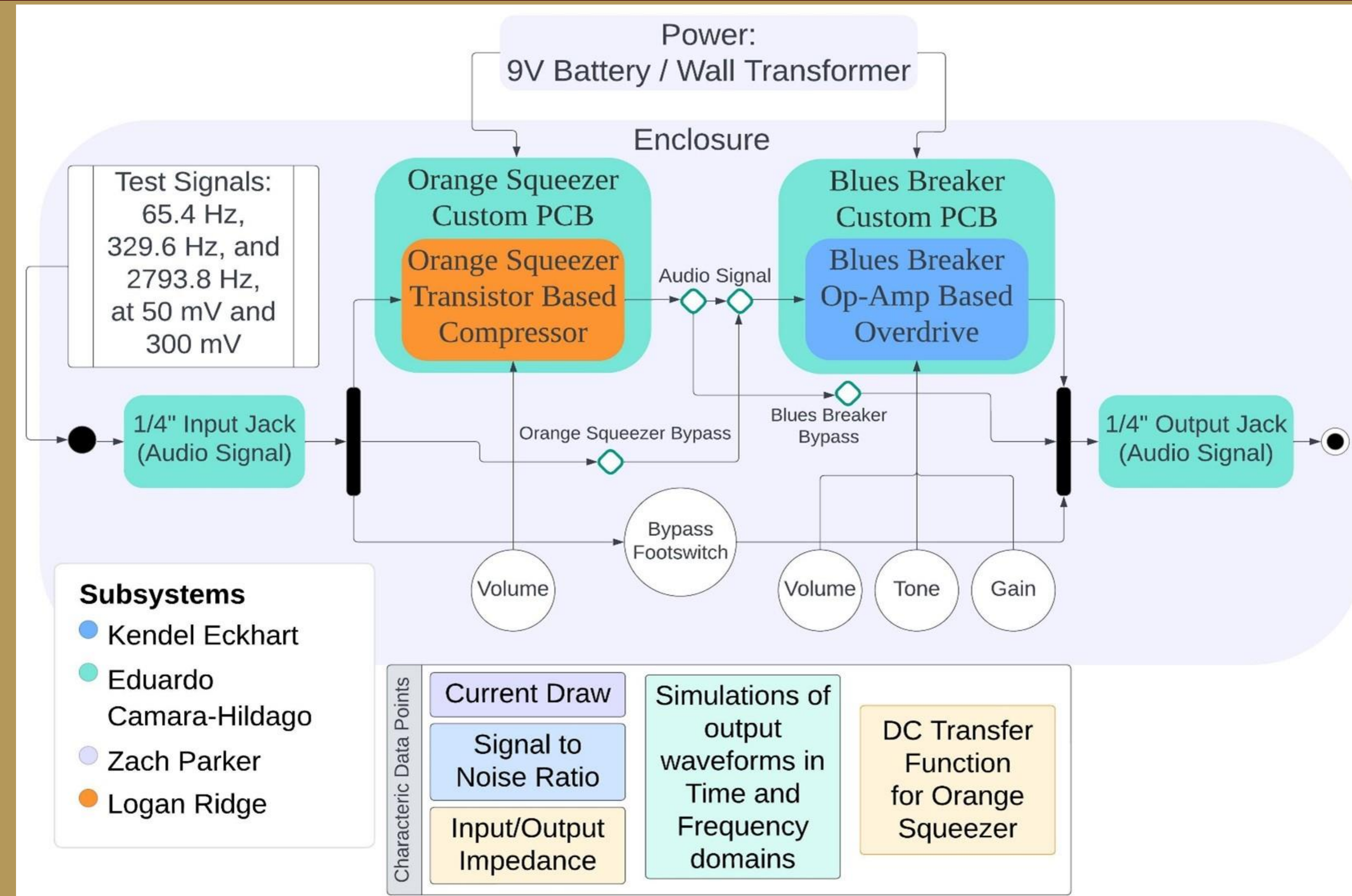
Characterization Parameters

- Current draw (minimum battery life with an alkaline 9V battery)
- Simulations & Measurements of output waveforms in both Time and Frequency domains as a function of Input Frequency and Amplitude
- Input & Output Impedance
- DC Transfer Function (Orange Squeeze Only)
- Total Harmonic Distortion (THD), Including percentages even vs. odd
- Signal to noise ratio (SNR)

D2 Requirements

- Custom PCBs with bypass
- Full Characterization
- Custom Enclosure Housing Both Effects
- Project Demonstration

Top Level Block Diagram

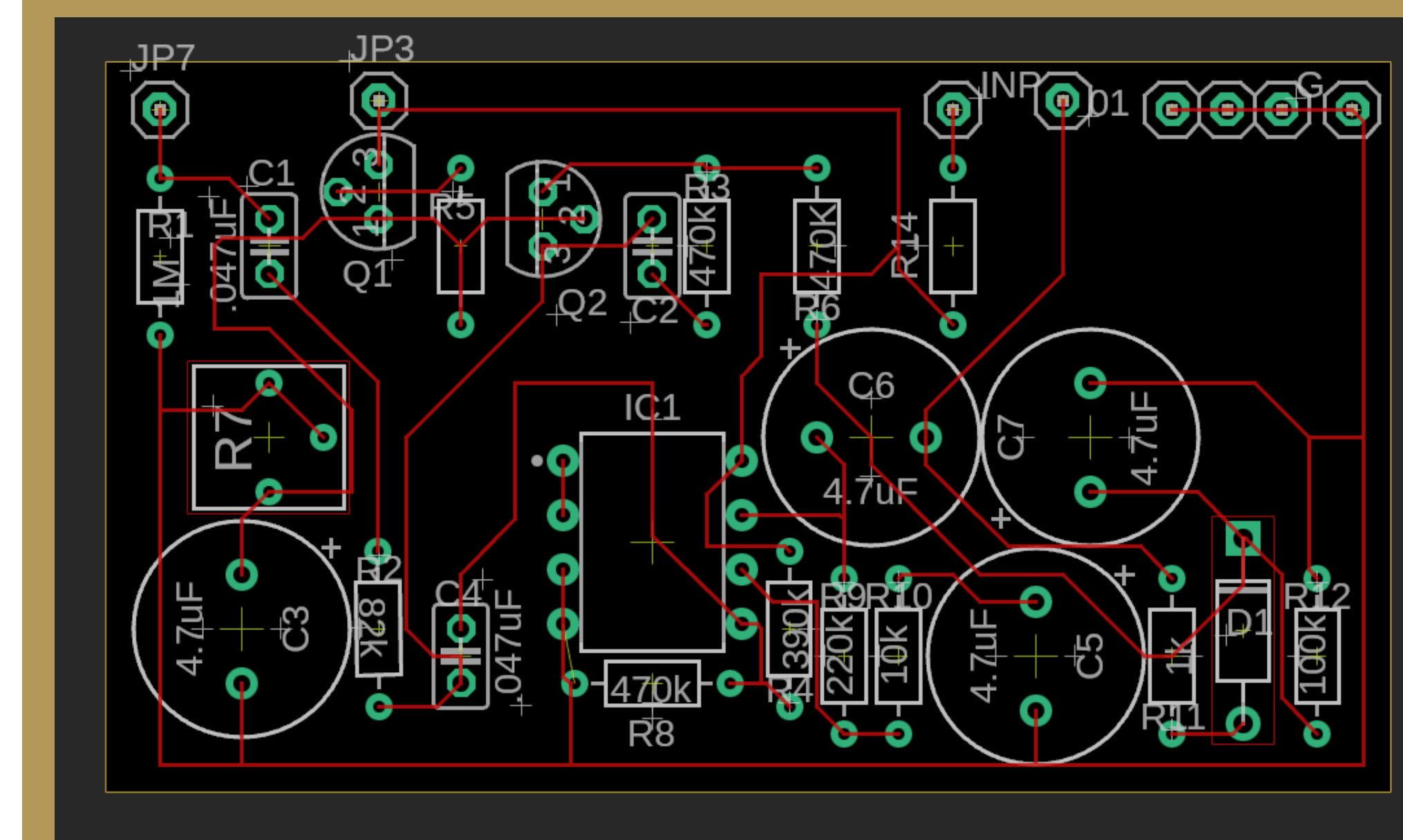


Meet the Team

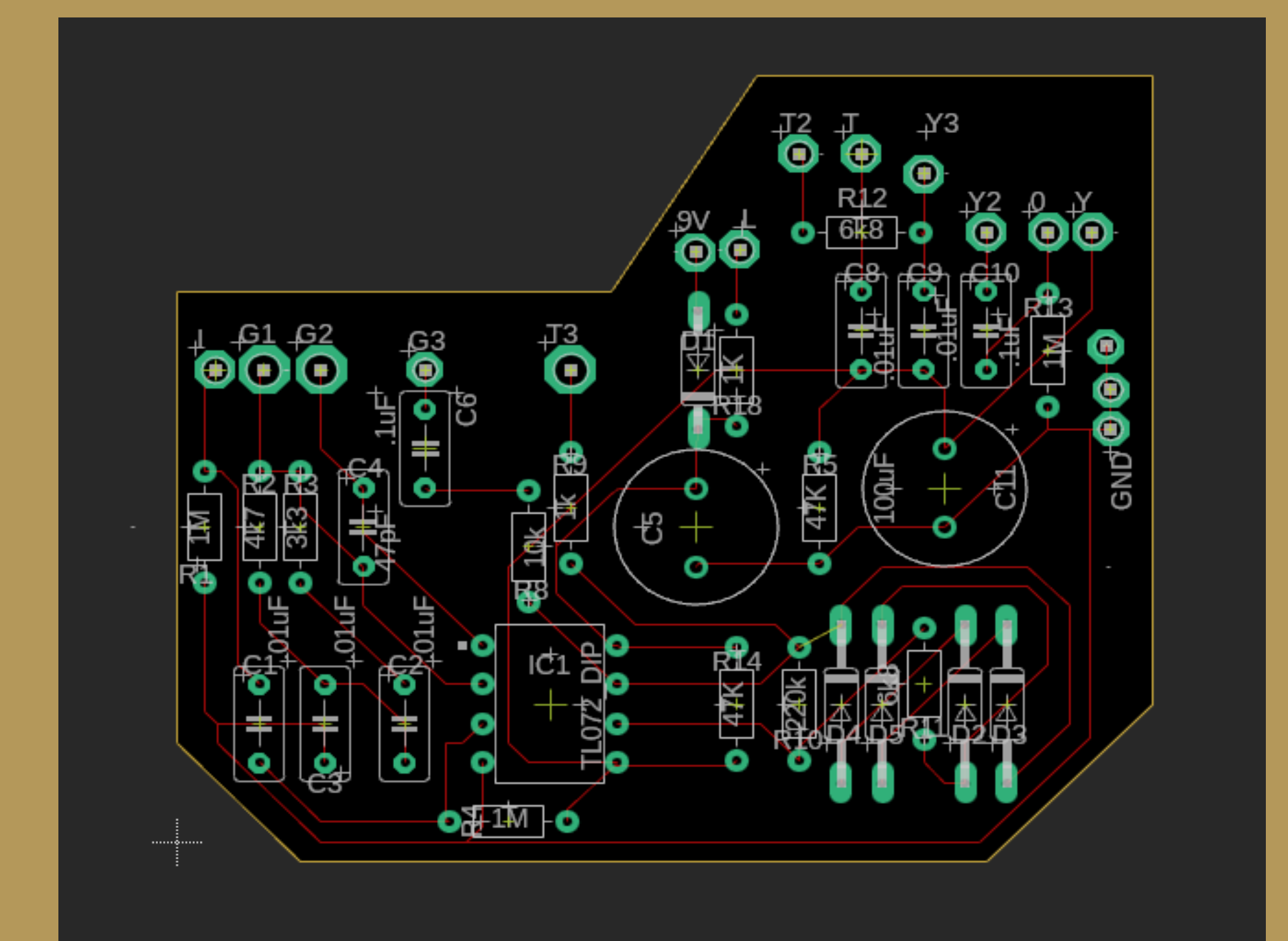


From L-R: Eduardo Camara-Hidalgo, Kendel Eckhart, Zach Parker, Logan Ridge

PCBs

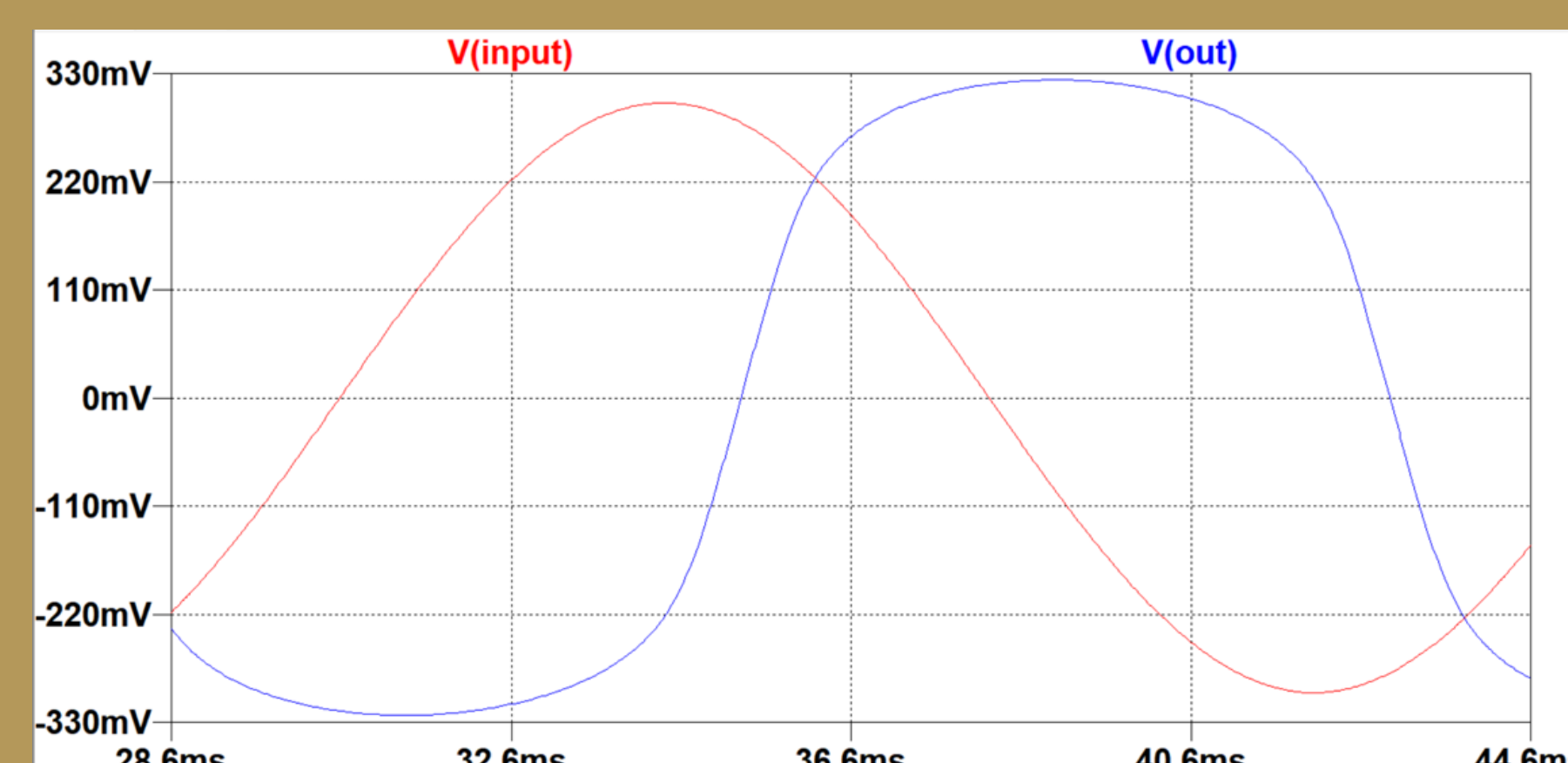


Orange Squeezer v1.0

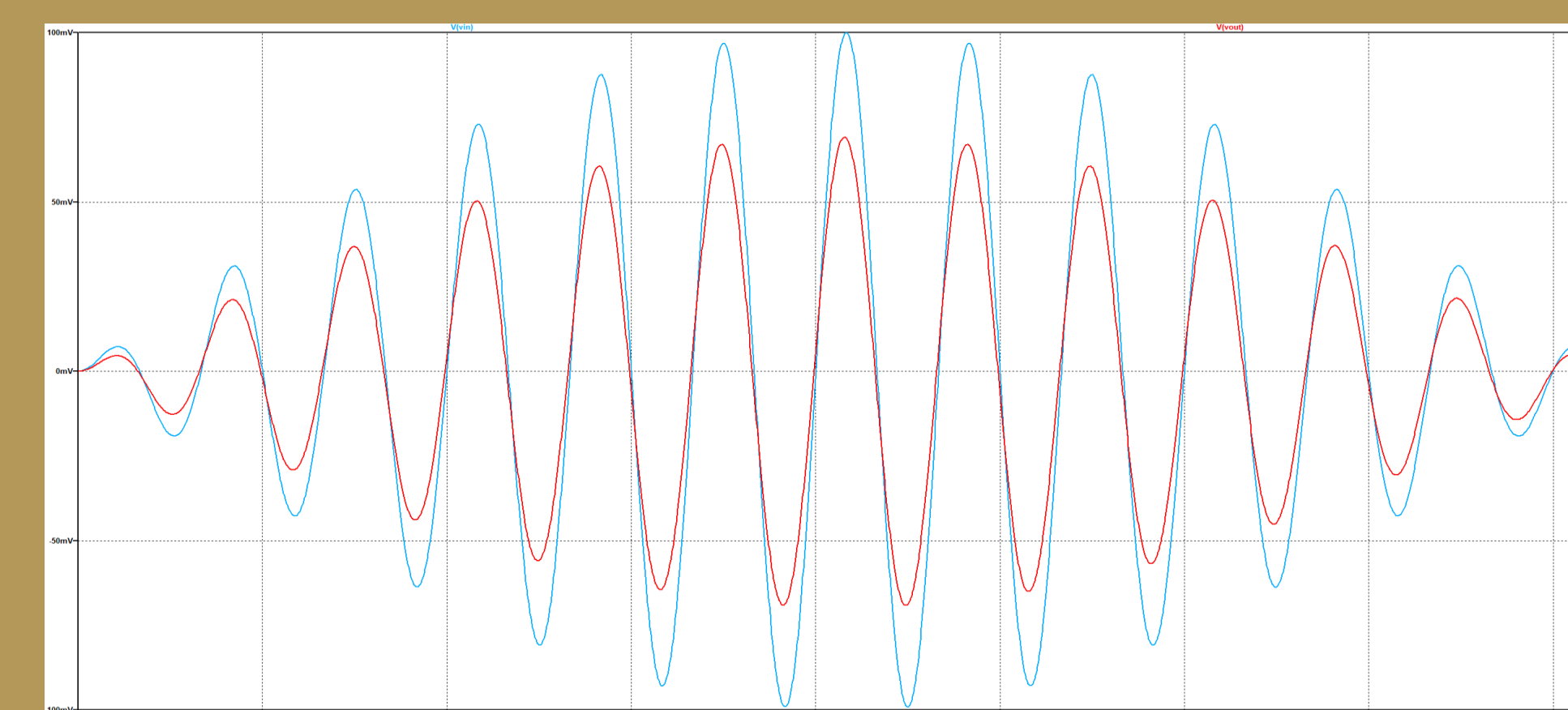


Blues Breaker v1.0

Simulation Waveforms

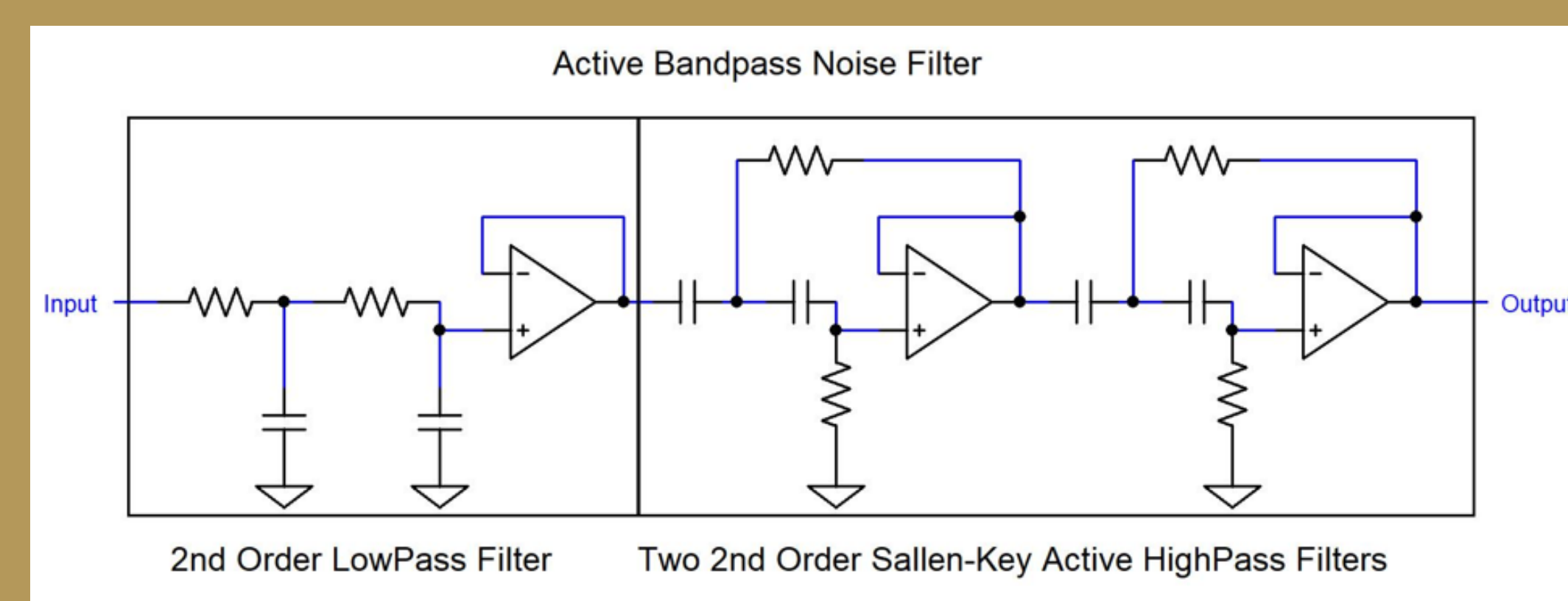


Blues Breaker Distortion

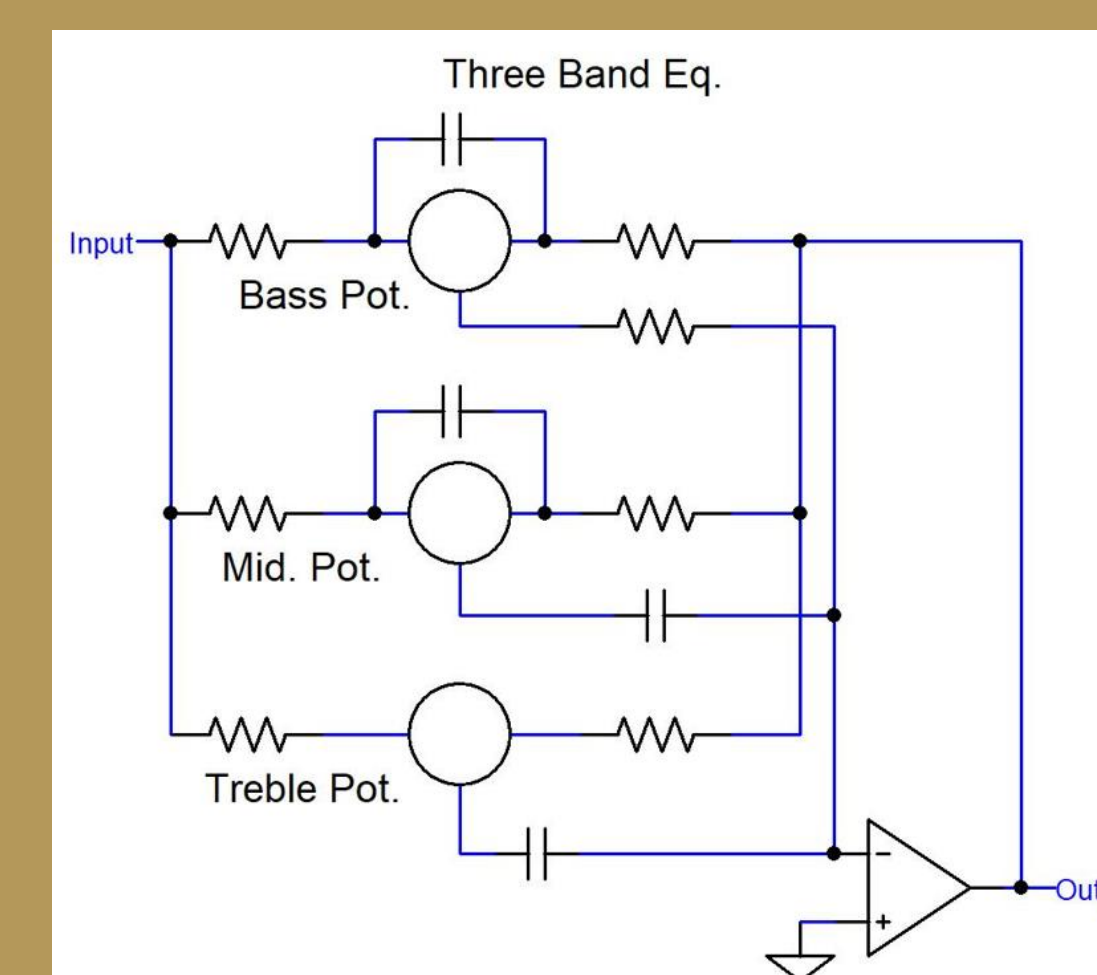


Orange Squeezer Compressor

Stretch Goal Designs



Active Filter on the input to reduce noise.



Three Band Eq. for additional tone control.

Acknowledgements

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