

# E2.03 – Orange Sunshine Effects Pedal

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Faculty Advisor: Dr. C. R. Compeau



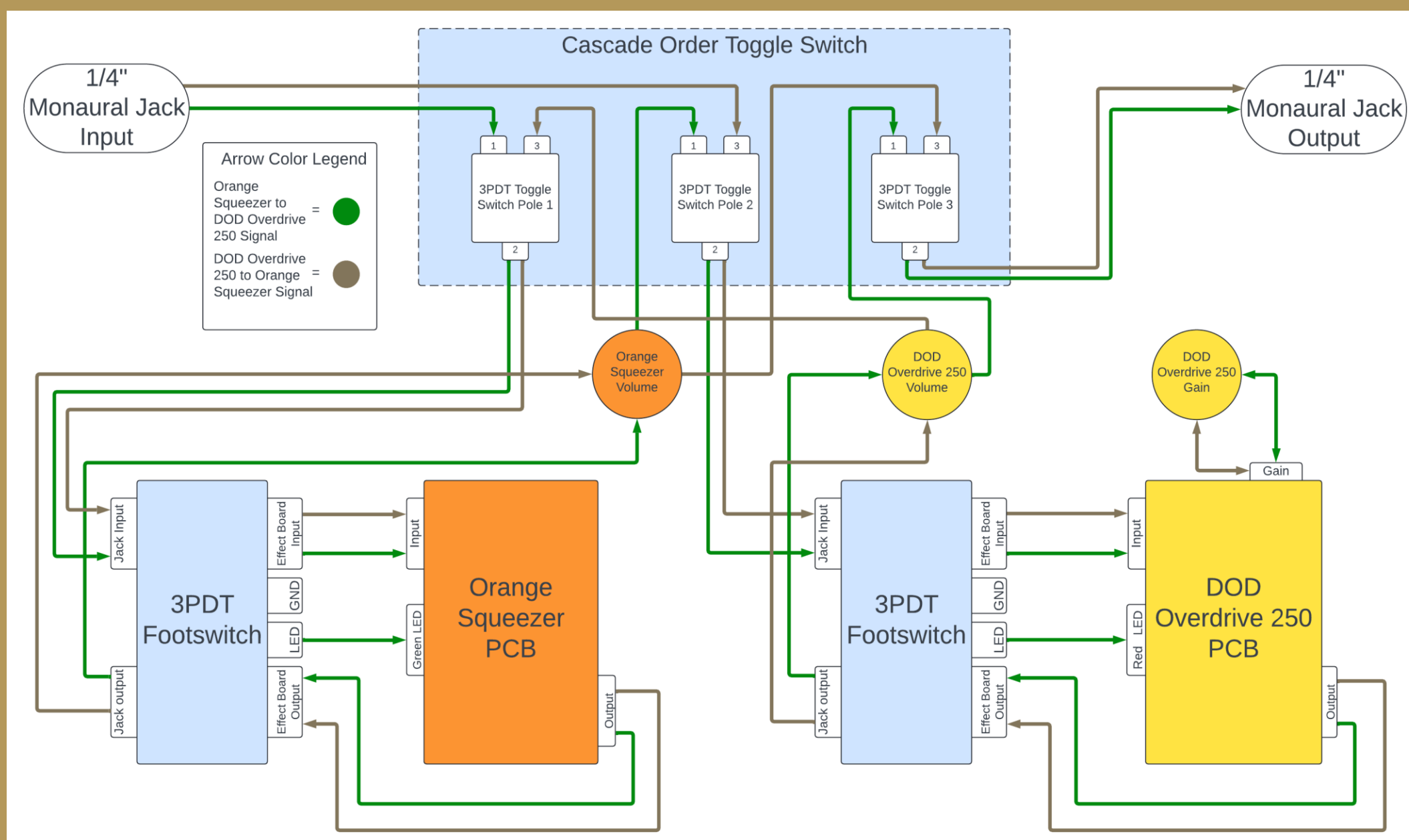
## Overview

Guitar effects pedals are used to modify the sonic output of a guitar, producing desirable tones. Our project takes two effects, a compression effect and a distortion effect, and combines them into a single pedal. The signal can be routed through both effects, one effect, or can be fully bypassed.

## D2 Requirements

- Simulations of Orange Squeezer and DOD Overdrive 250
- Custom Guitar Pedal Effects Enclosure
- Custom Printed Circuit Board (PCB) Designs with True Bypass Footswitches
- Stretch Goal: Toggle switch to change cascade order
- Project Demonstration

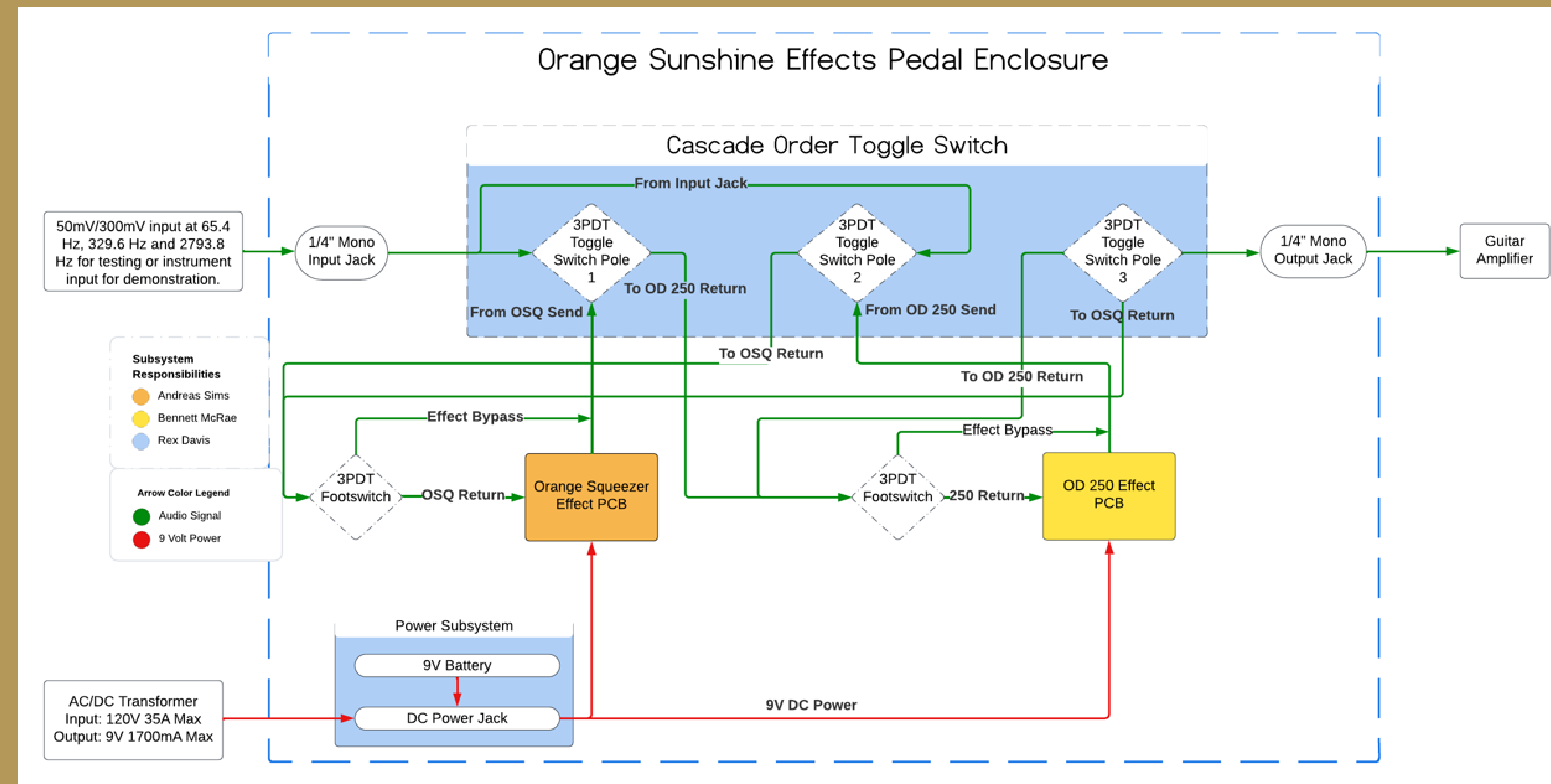
## Signal Routing Block Diagram



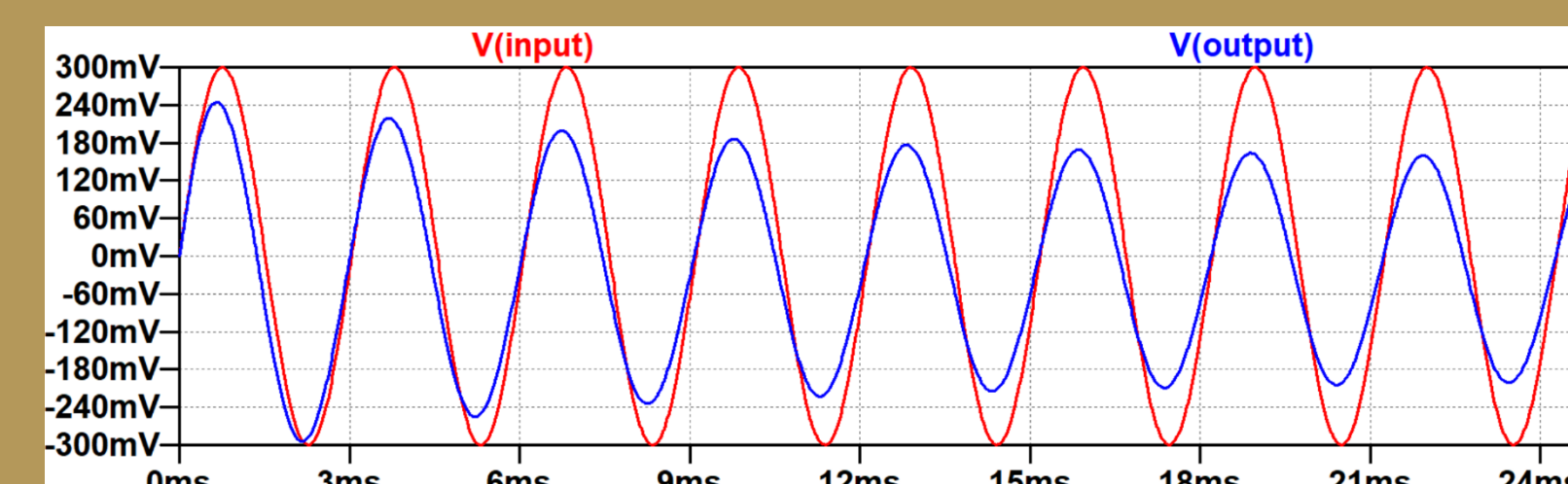
## Characterization

Parameter	Orange Squeezer	DOD Overdrive 250
Current Draw	9.52 mA	9.54 mA
Input Impedance	1.38 MΩ	1.5 MΩ
Output Impedance	8.1 kΩ	14 kΩ
Total Harmonic Distortion	0.58 %	39.1 %
Signal to Noise Ratio	37.5 dB	51.9 dB

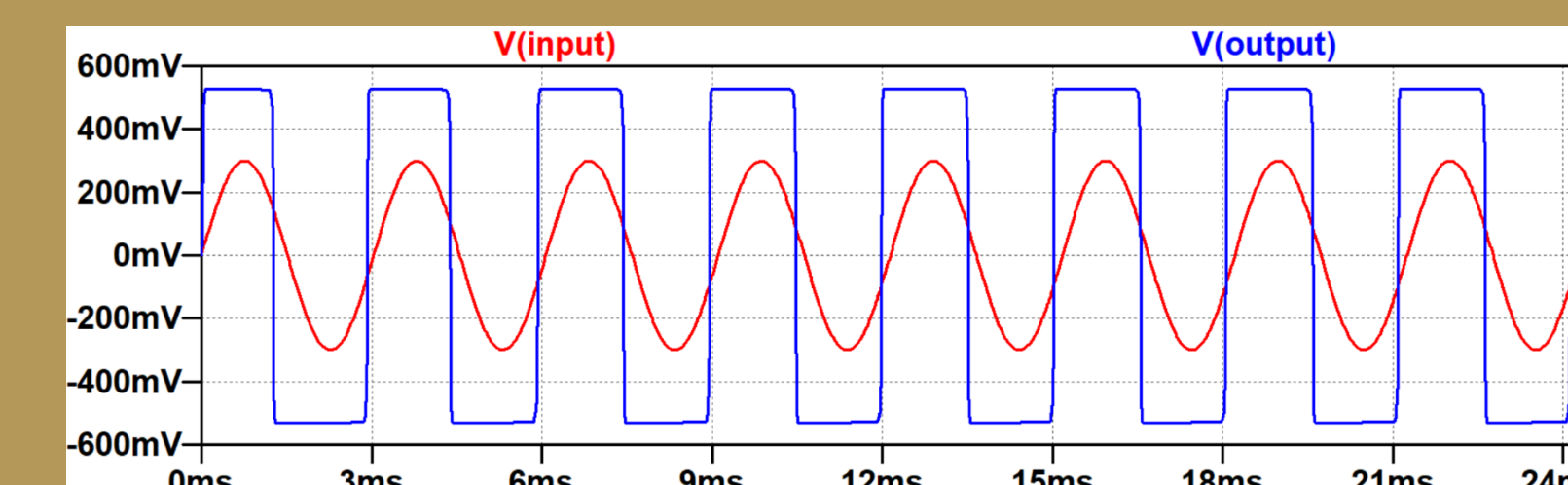
## Top-Level Block Diagram



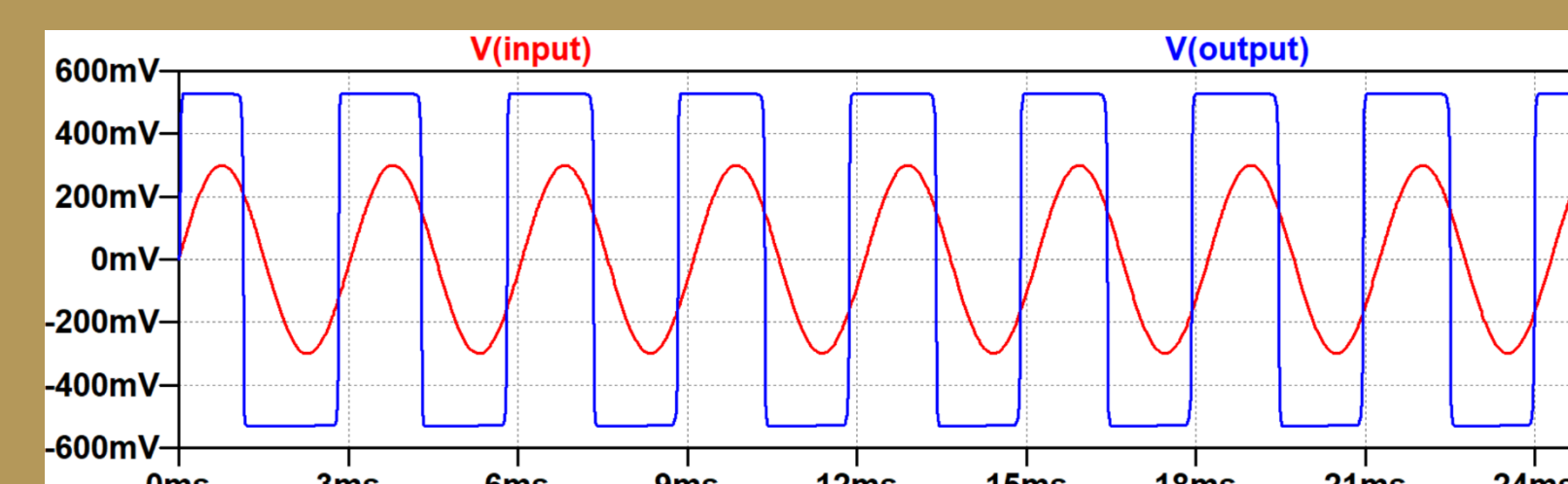
## Effect Input/Output Waveforms



Order: Orange Squeezer Only

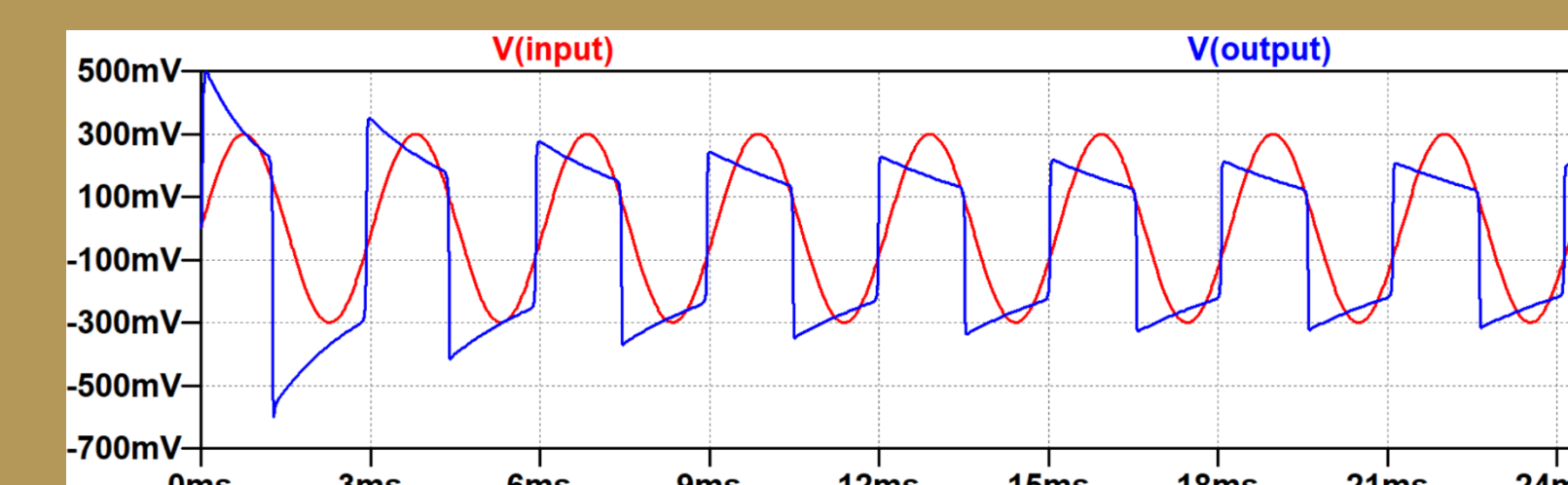


Order: DOD Overdrive 250 Only



Order: Orange Squeezer to DOD Overdrive 250

- Figures display input/output waveforms at amplitude of 300mV and frequency of 329.4 Hz.
- Top pane in each figure was simulated in LTSpice. **Input** is shown in red, and **output** in blue.
- Bottom pane in each figure are actual waveforms measured on oscilloscope. **Input** is shown in yellow, and **output** in green.
- **Order** indicates which effect is engaged, and what order effects in when both are engaged.



Order: DOD Overdrive 250 to Orange Squeezer

## Meet the Team

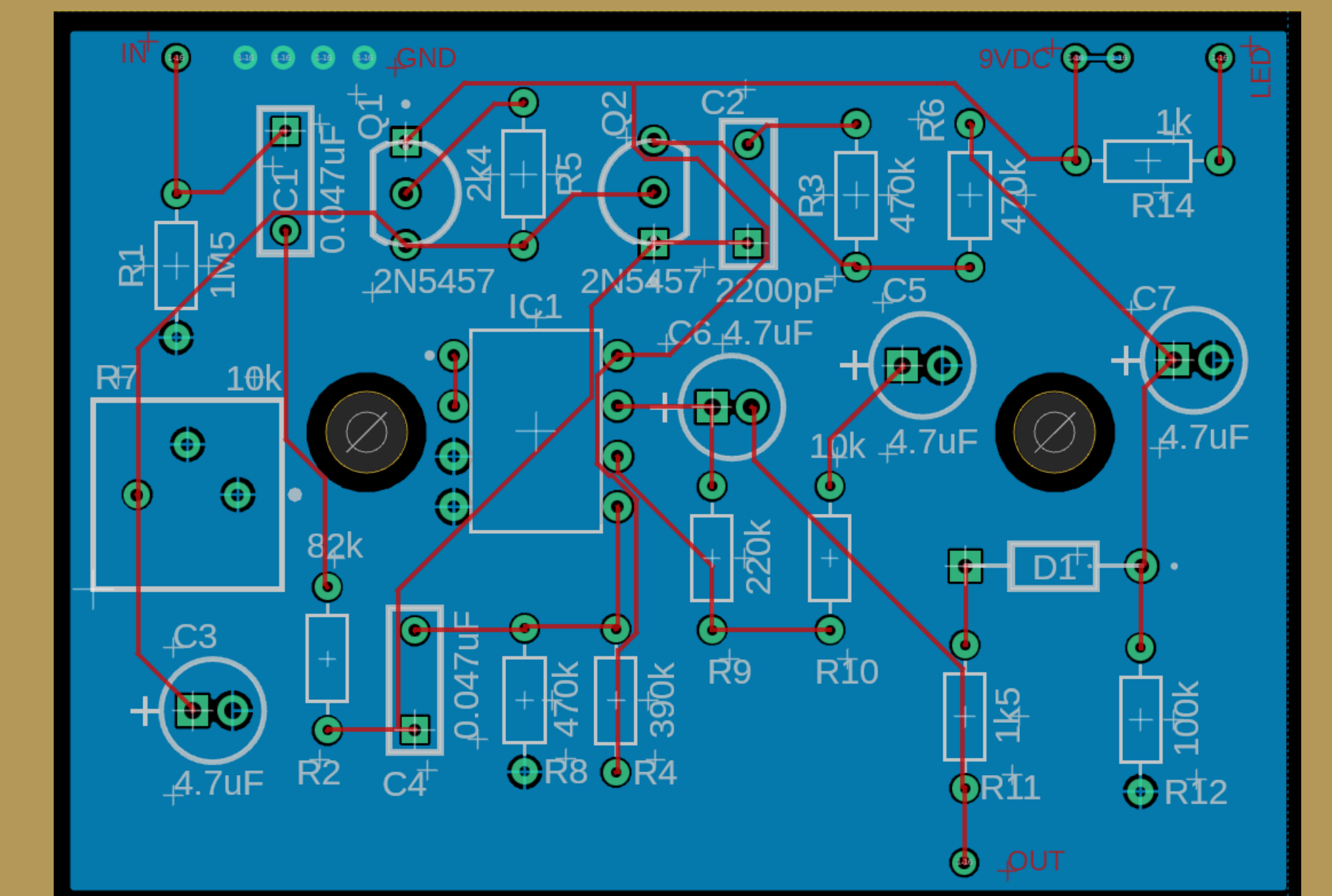


Rex Davis

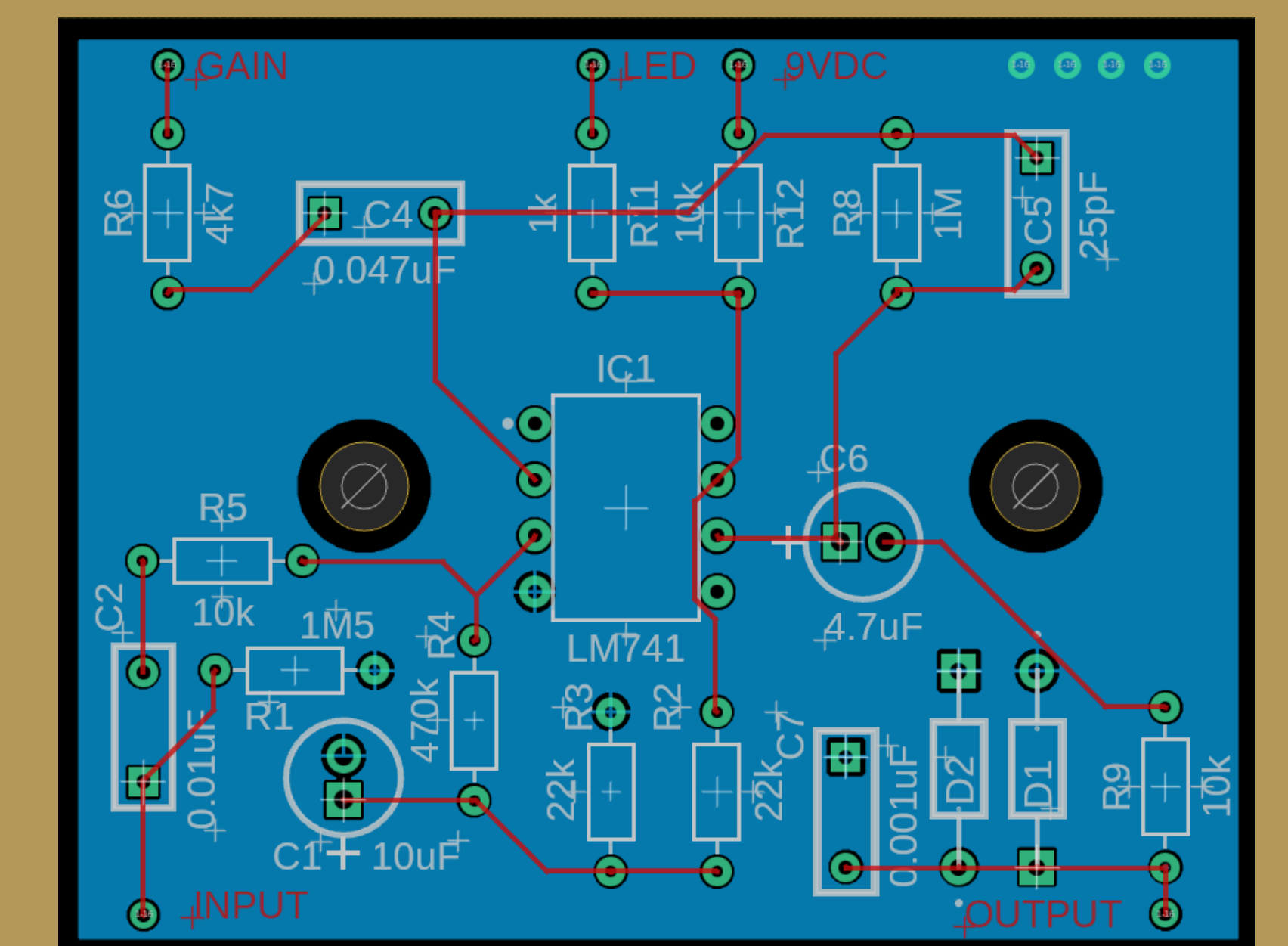
Andreas Sims

Bennett McRae

## PCB Designs



Orange Squeezer Fusion360 PCB Model.



Overdrive 250 Fusion360 PCB Model.

## Acknowledgements

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