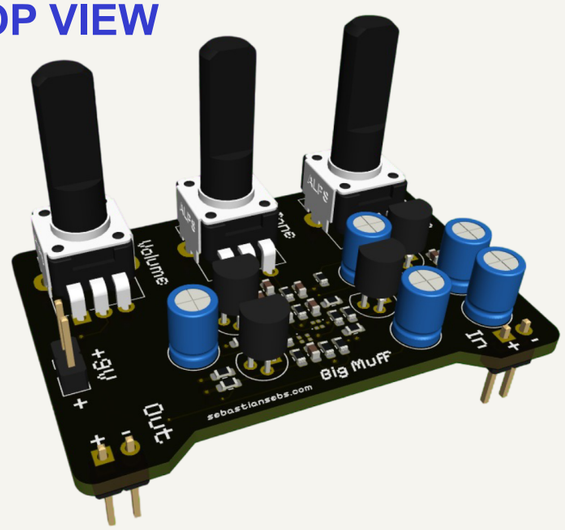
Big Muff

Variant: Final Version

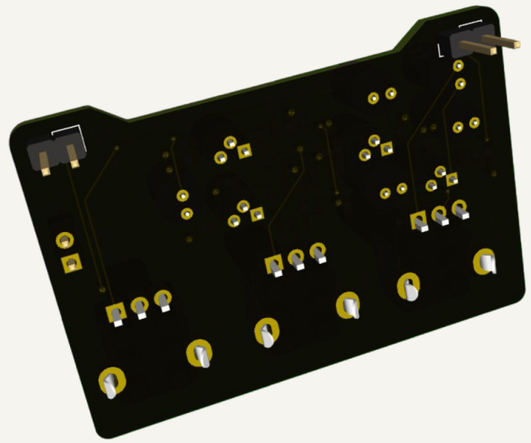
2025-05-22

Rev Final Version

TOP VIEW



BOTTOM VIEW



DISCLAIMER

This project implements a classic Big Muff Pi guitar fuzz pedal, featuring BJT-based amplification stages, and interactive tone shaping using potentiometers (Adjusts Volume, Tone, and Sustain).

For larger capacitance values (e.g., 1uF), we utilized electrolytic capacitors.
For smaller capacitance values (e.g., 470pF, 0.1uF, 0.0015uF, 0.015uF), film capacitors (such as polyester or metallized polypropylene) or ceramic capacitors are preferred.

DESIGN CONSIDERATIONS

DESIGN NOTE: Example text for informational design notes.

DESIGN NOTE: Example text for debug notes.

DESIGN NOTE: Example text for cautionary design notes.

DESIGN NOTE: Example text for critical design notes.

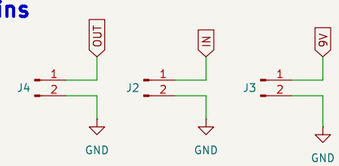
LAYOUT NOTE: Example text for critical layout guidelines.

Final Version 5/22/2025

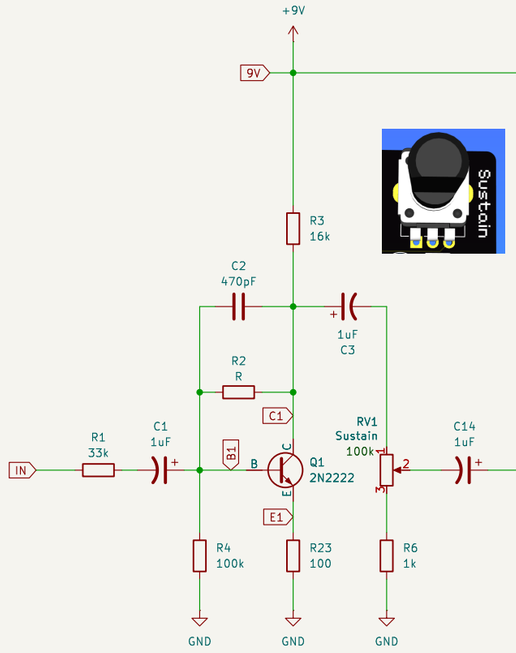
	Comments:	Company: **sebastiansebs.com**		Variant: Final Version
		Board Name: **Big Muff**		Project Name: **Big Muff**
	Sheet Title: Big Muff	File Name: Big Muff.kicad_sch	Designer: Sebastian Silva	Date: 5/22/2025 / Revision: Final Version
	Sheet Path: /		Reviewer: -	Size: **A3** / Sheet: **1** of **2**

[2] Project Architecture

Pins

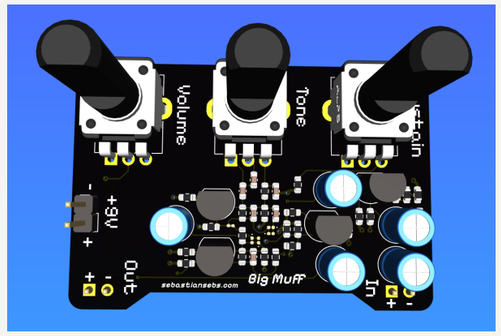


Input Buffer (Pre-Amplifier)

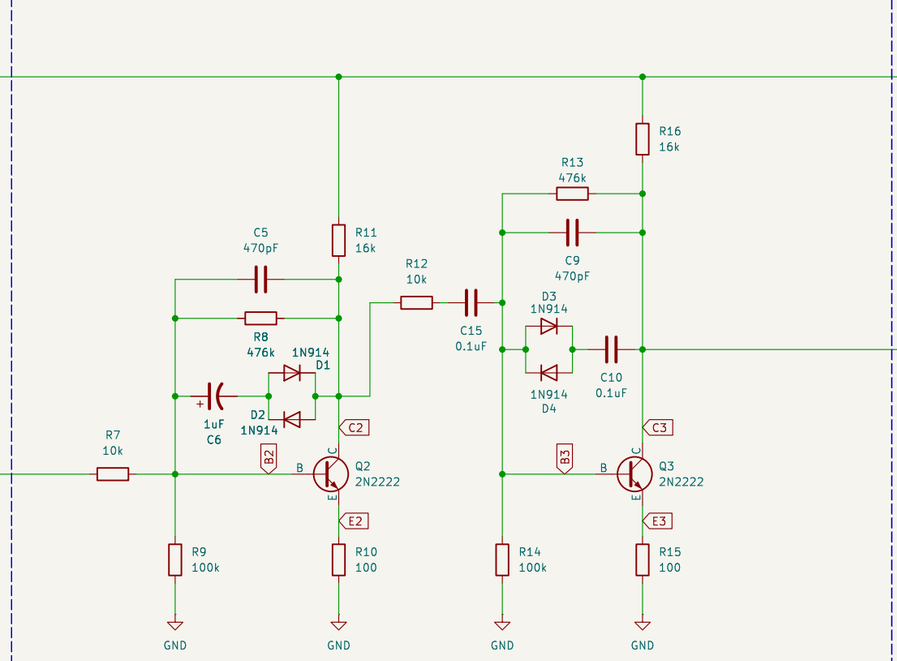


This stage acts as a pre-amplifier/buffer.

The large input resistor R1, along with C1, helps present a high input impedance to the guitar signal. Q1 amplifies the signal, and the emitter resistor R23 (bypassed by C3 for AC) provides stability. C2 and R2 form a filter that shapes the tone early on. The amplified signal is then coupled via C14 to the next stage.



Clipping Stage



The Gain/Clipping part is divided by 2 stages:

For the first Transistor stage. Q2 provides significant amplification.

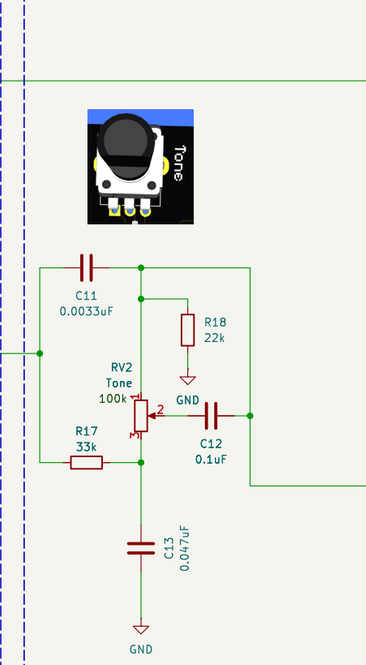
The diodes D1 and D2 are placed in a feedback loop (or across the signal path in some variations) to clip the amplified signal when it reaches a certain voltage threshold, producing the characteristic Big Muff distortion. The resistors R5, R6, R7, and R8 set the bias for Q2. C7 bypasses R9 for maximum AC gain.

For the second Part:

This stage is very similar to the previous Transistor sub-stage, providing further amplification and clipping.

The signal from Q2 is fed into Q3, which amplifies it even more. Diodes D3 and D4 perform another round of signal clipping, contributing to the heavy distortion sound. The capacitor C10, along with the other components form part of a tone-shaping network or feedback loop.

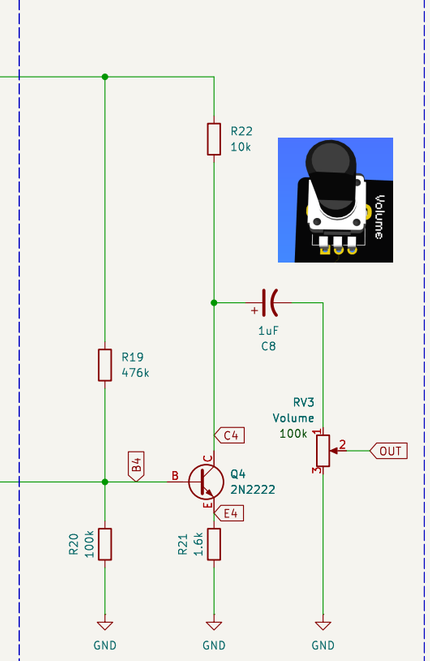
Tone Control



This is the passive "Tone" control section of the Big Muff.

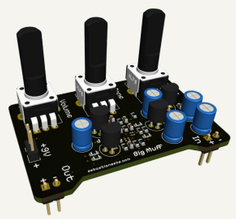
It's a variable low-pass/high-pass filter. As you turn RV2, it shifts the frequency response, allowing sweeping between more bassy (less treble) and more trebly (less bass) sounds.

Output Buffer (Volume Control)



This final stage acts as an output buffer and incorporates the master volume control.

Q4 provides a final stage of amplification and buffering to drive the output effectively. The volume control (RV3) is placed at the output of this stage, allowing you to adjust the overall loudness of the distorted signal.



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