

μ-Amp: Boost, Bite, and Musical Compression

A compact, battery-powered onboard preamp designed for magnetic pickups. It can run clean as a boost, or push into a guitarist-friendly 'edge' with a unique gain/feedback control that players describe as lively and touch-responsive.

Magnetic pickup input

DPDT true bypass

9V (optionally 18V)

Built around NE5534

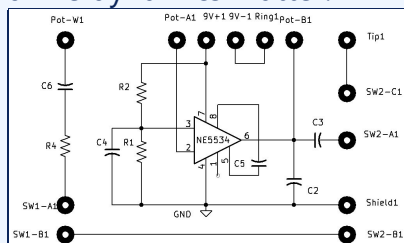
What It Does

- **Clean boost** to wake up long cable runs, pedal chains, or a lazy amp input.
- **Musical drive** that can feel like "sweet grit" rather than harsh fuzz.
- **Touch compression** that responds to pick attack (great for lead lines and sustained chords).
- **True bypass** via DPDT switch—straight pickup-to-jack when off.

Why It Feels Different

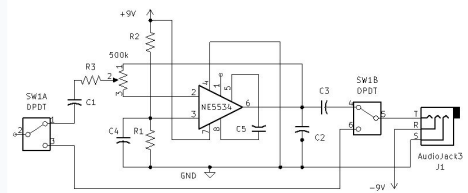
The gain control is not a typical 'volume knob.' The input is injected at the pot's wiper while the pot also participates in the feedback path. Turning it changes more than gain: it changes loop behavior, impedance at the summing node, and how the op-amp approaches its limits, often perceived as "alive" and expressive.

Best use: installed inside the guitar to drive a stage rig confidently - especially where cable length and live dynamics matter.

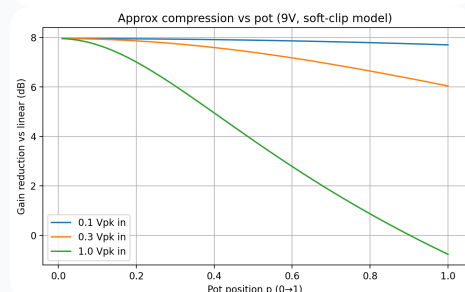
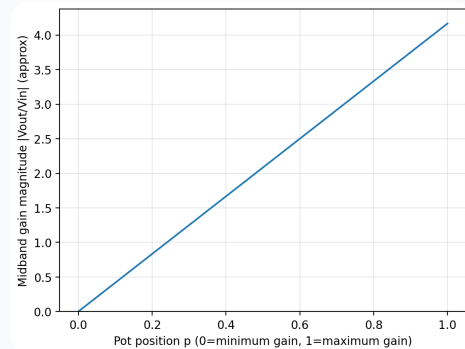


Board schematic.

Schematic Diagram



Characteristics:



How It's Wired (Plain English)

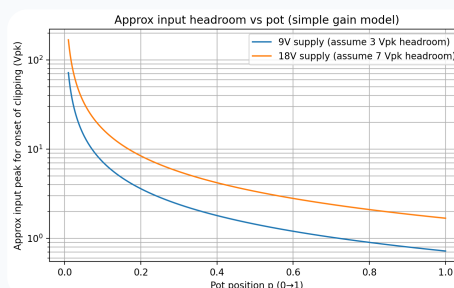
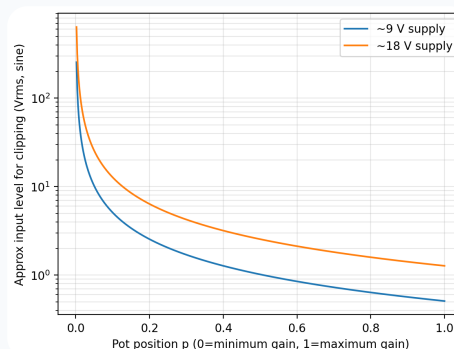
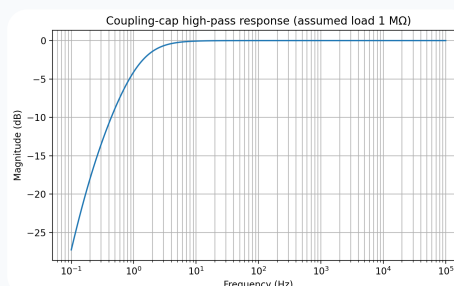
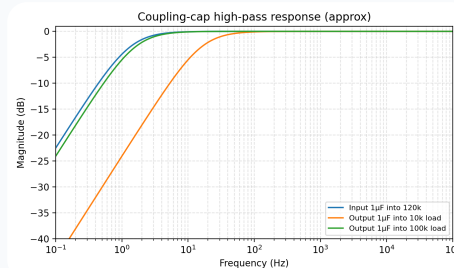
Signal Path

- Pickup input → series resistor (about **120kΩ**) → **1μF** coupling capacitor.
- That signal goes to the **wiper** of a **500k** potentiometer.
- The pot participates in feedback between the op-amp output and the inverting input (pin 2).
- Output is AC-coupled through a **1μF** capacitor to the output jack.
- A stereo jack can disconnect the battery negative when unplugged.

Bias and 'Feel'

- Non-inverting input (pin 3) is biased at mid-supply with a **100k/100k** divider.
- A **0.1μF** cap decouples that bias node to ground for stability.
- Output includes a **0.1μF** cap to ground (a strong contributor to the circuit's character).
- Optional small compensation cap at the op-amp comp pin may be present (value depends on build).

Note: The 0.1μF output-to-ground capacitor is a large capacitive load and can contribute to compression/edge. Layout and wiring quality matter.



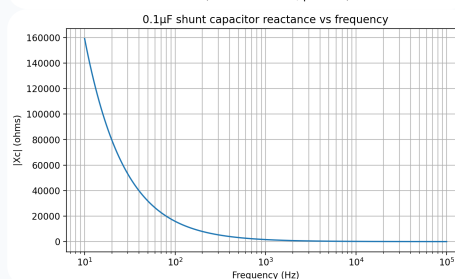
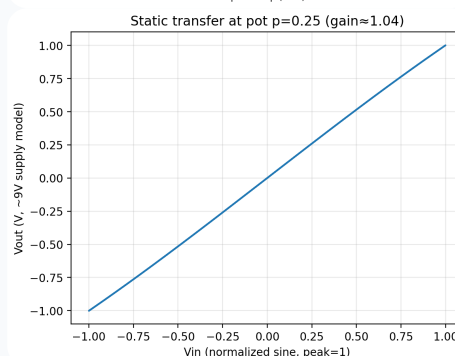
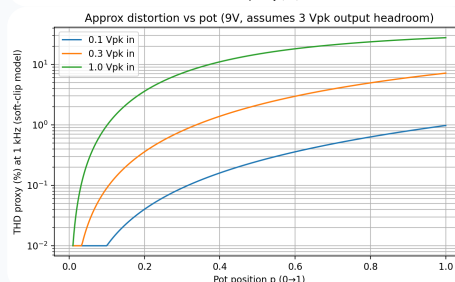
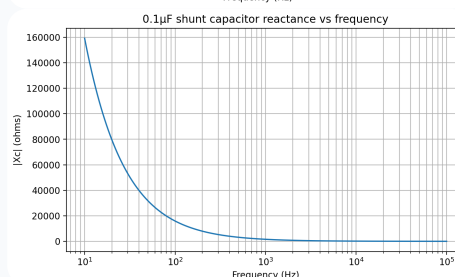
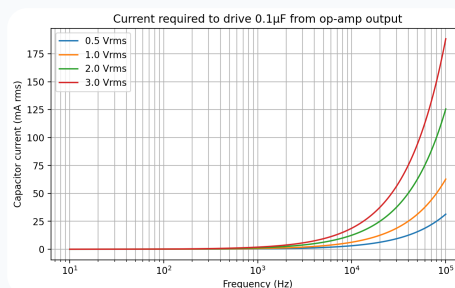
Specifications (Typical / Adjustable)

Power	9V battery (optional 18V with two batteries, more headroom / cleaner boost)
Bypass	DPDT true bypass (pickup straight to output when off)
Operational amplifier	NE5534 introduced by Signetics in 1979
Input	Magnetic pickup (passive)
Gain Range	Approx. $0\times$ to $\sim 4.2\times$ (about +12 dB), depending on pot wiring and component tolerances
Output	AC-coupled to output jack; stereo jack can act as battery disconnect
Cable Compatibility	Designed to comfortably drive typical 10–20 ft guitar cables when engaged

These are practical, musician-focused specs. Exact response depends on pickup, cable, amp input, and control position.

Installation Notes (Tech-Friendly)

- Keep leads short and routing tidy - this circuit can be sensitive to layout because of capacitive loading.
- **Recommended:** add a small series resistor on the op-amp output (e.g., 47–220 Ω) if you want extra stability without losing character.
- Use a stereo output jack for battery negative switching (battery disconnect on unplug).



Testimonial

The μ -amp is unique for some of the material aspects, but mostly the 5534.

The slew rate of the 5534 was 48k which allowed full frequency headroom in the audio range. The electrolytic to ground were filters for squeal and noise.

I must admit there is perceived compression with increased volume, but no limiting roll off like real compressors.

The audio is clean replication of the original pickups, behaving with the tonal and harmonic characters of a Les Paul 1970 windings.

No distorted clipping at all when the amp was in clean mode. I've experienced only one pedal with these characteristics, but it was a clipping compressing OD with many tone controlling aspects with many choices, and that's not always good. The μ -amp is mono dimensional: hit the switch+ volume on 10! I played hundreds of hours with our preamp and it is a fond memory.

Tube amps loved the input voltage and capacitance with a 20' cable!



Metaldude Metaldude
Olympia Conservatory of Music

Ordering Information - send check to:

Delphi O.E.M. Co
 5348 216th Ave SW
 Centralia, WA 98531

FAQ

Is this just a boost?

No; at higher settings it can add a touch-responsive grit and compression that many players find musical, especially for lead work.

Will it change my guitar when bypassed?

In true bypass, the pickup sees the normal cable loading. Cable length (10-20 ft.) will still influence the natural resonance just like any passive guitar.

Should I run 18V?

18V gives more headroom and a cleaner boost. 9V tends to hit the 'character zone' sooner. Two 9V batteries may be used in parallel also to double the battery life.

How do I purchase?

Pre-production orders now being accepted: \$100 each. Boards will be made and shipped when the total orders reach 100 units. Does not include 500k pot. nor stereo jack. Installation required.