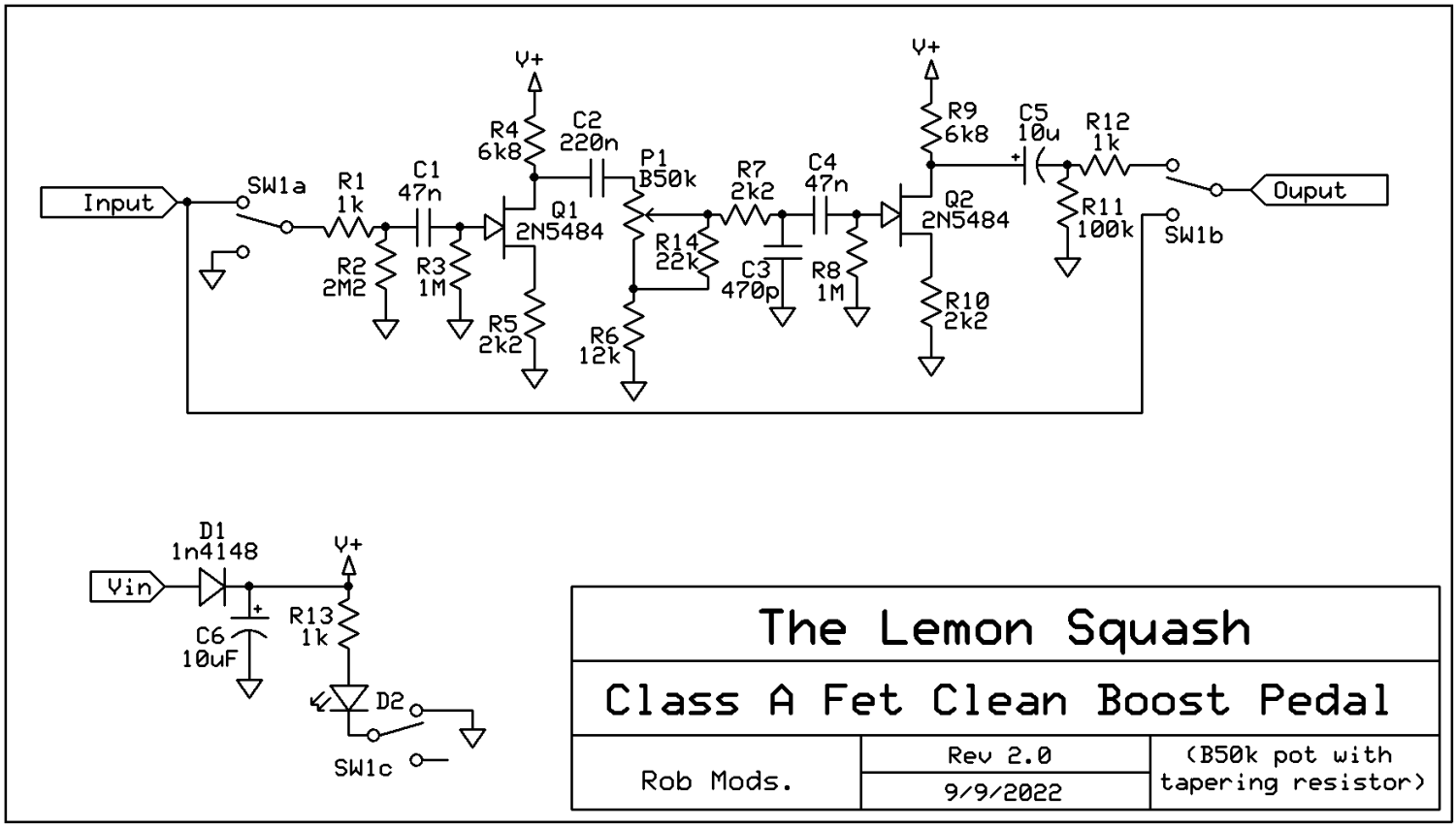
Rob Mods Simple Fet Clean Boost (September, 2022)

Here's a DIY classs A fet clean boost pedal.

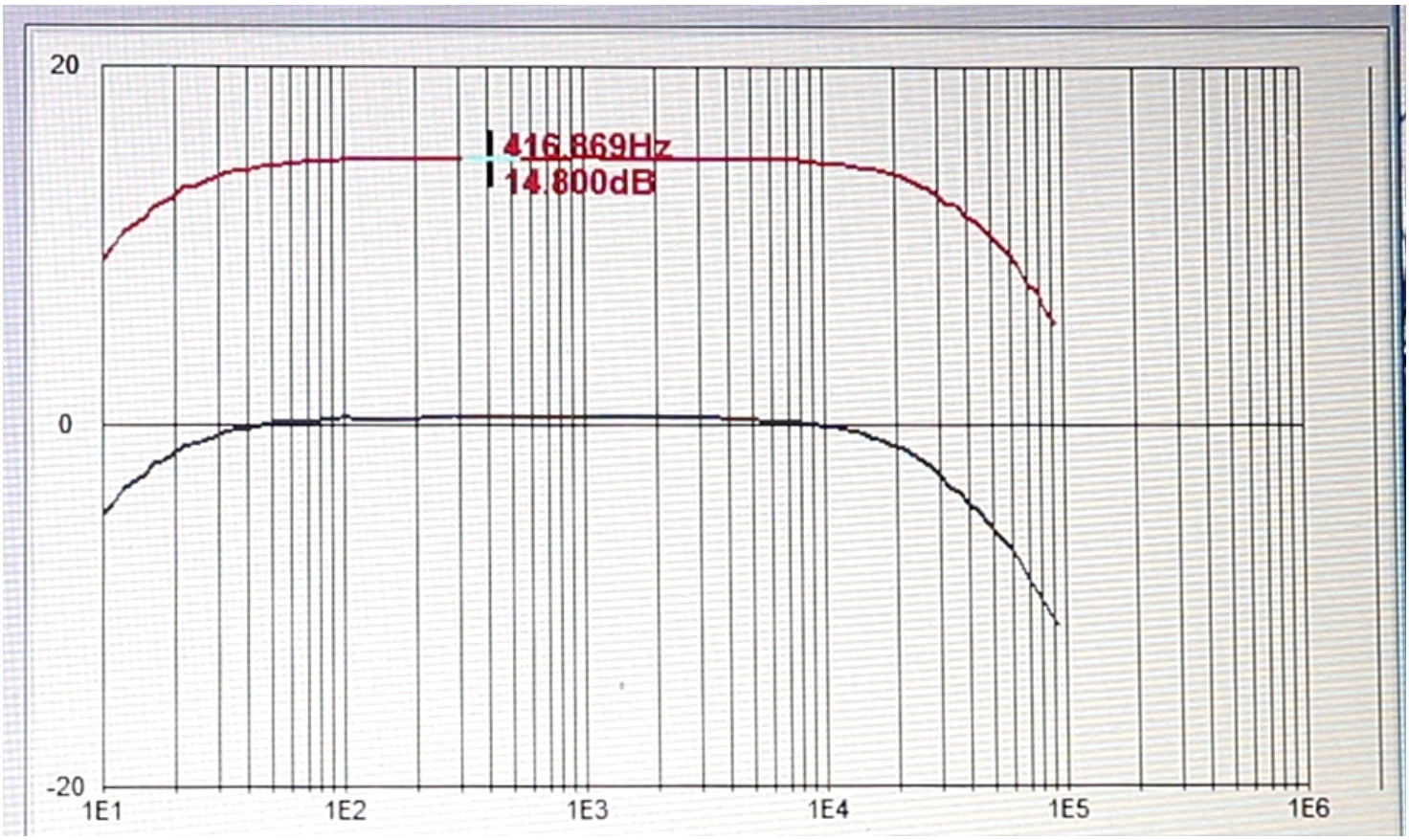


Each fet is wired as a common source amplifier, and will typically make 6-8dB of gain each. I chose 2N5484 fets because they are still commonly available as through-hole parts. Since each fet stage reverses the signal phase, using two means the output of the pedal is in phase with the input. (This is important for pedal design since they are sometimes used in parallel or stereo signal chains.) Another advantage of using two stages is that the “Boost” pot (actually an attenuator) is buffered by the second stage.

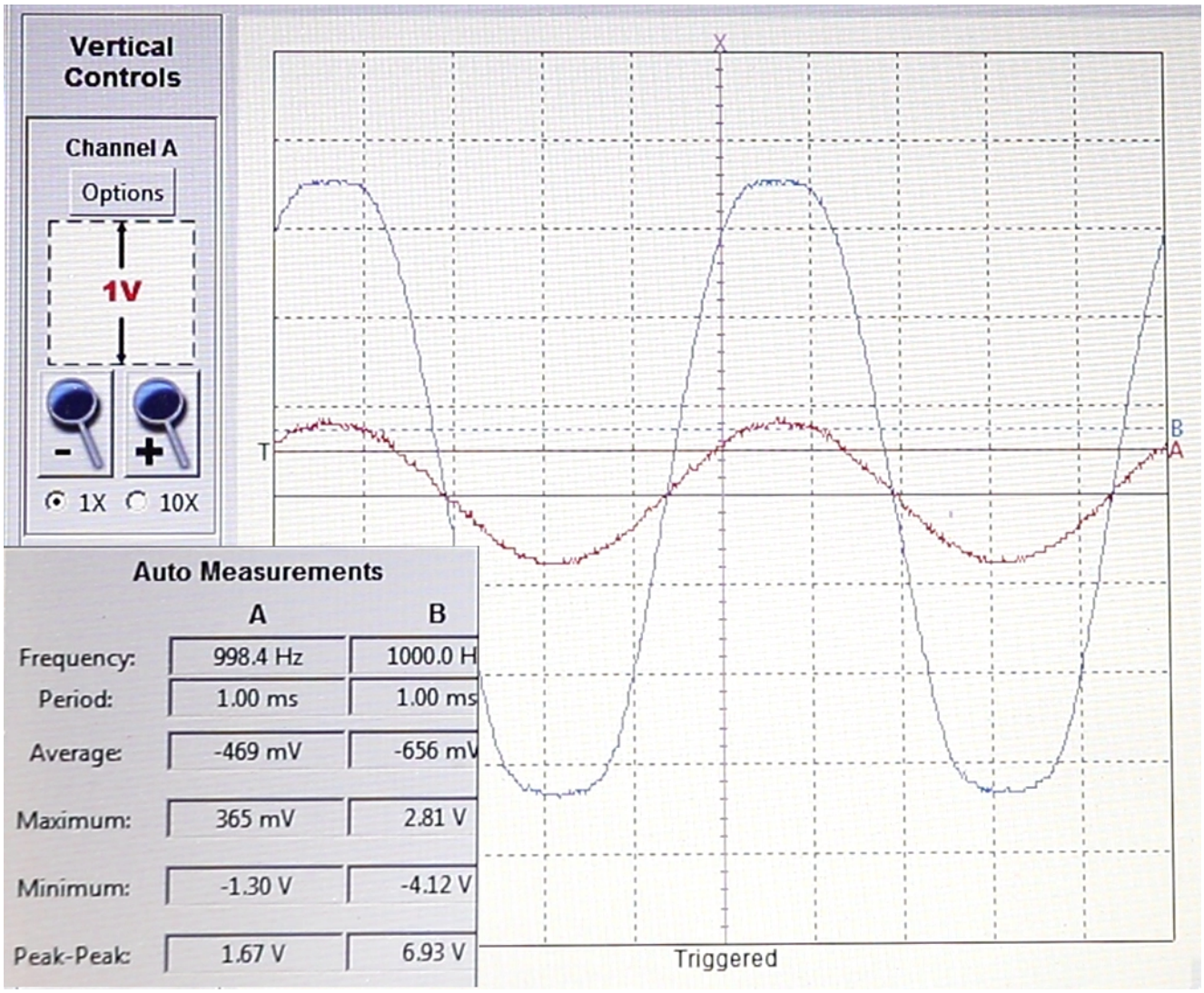
The values shown will work fine, but since fets have a huge parameter spread even between devices from the same batch, in the video I set up a breadboard test jig with R3,4 & 5 to optimise the headroom. With V+ at 8.4v (there is typically a 0.6v drop across D1), the voltage at the drain (pin 1 for the 2N5484) should be close to 5v. You can either leave R3,4 & 5 in place and test a batch of fets, or as I did in the video, adjust R5. I used a B5k pot, measured the resistance, then used the closest fixed resistor in the prototype. (Ovbiously, the test was also done for Q2 with R8, 9 & 10.)

R2 and R11 pull the input and output to earth so the bypass switch doesn't pop. R13 limits the current through the status light. In keeping with the design, I used a 3mm yellow LED and ended up with a 470 ohm resistor since it wasn't quite bright enough.

C2, P1 and R6 form a high pass filter. R7 and C3 form a low pass filter. These limit the gain to audio frequencies. Here is a bode plot from the prototype with the boost pot fully clockwise.

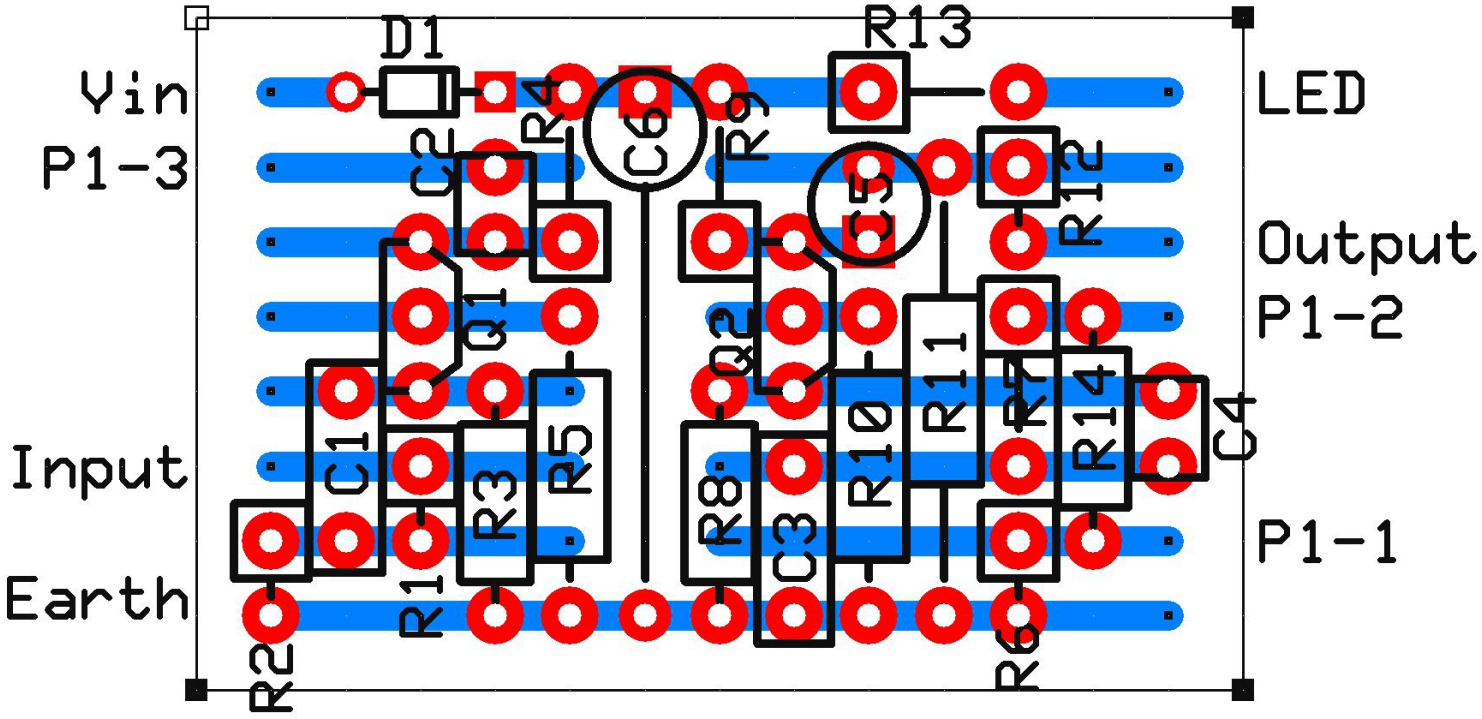


The prototype showed just under 7v peak-to-peak before clipping.



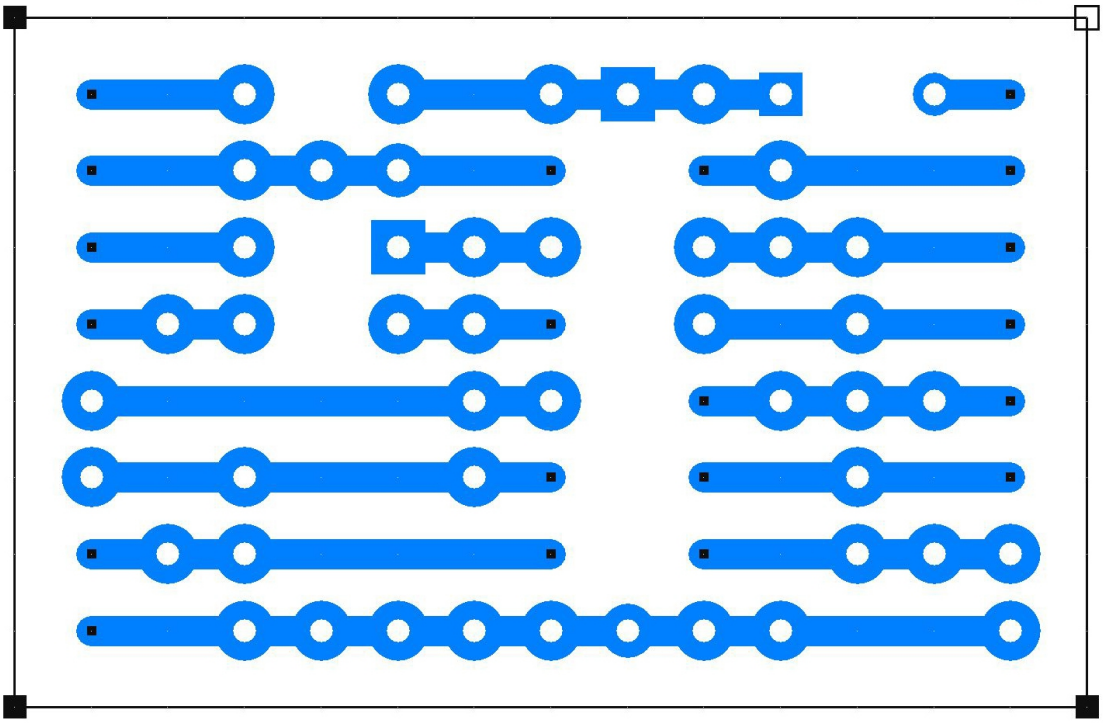
In the video I found that using a B50k with a tapering resistor (R14) gave the most even sweep of gain adjustment.

Here's the final stripboard layout.

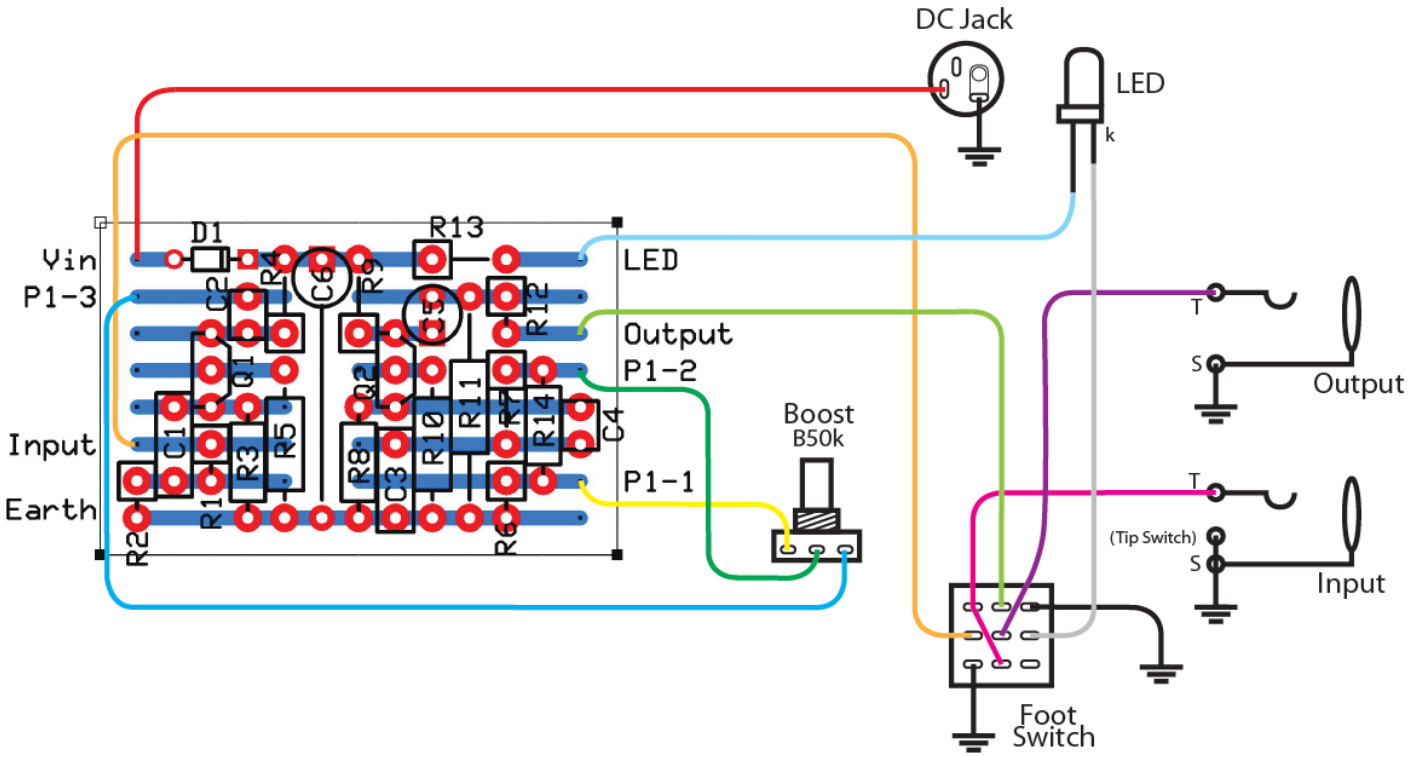


It is only 34mm x 21mm. The parts are fairly cramped, and several resistors have to be installed standing up. C2 should be a monolithic type. C4 is prefered as a monolithic, but other types could be used with their legs bent underneath slightly.

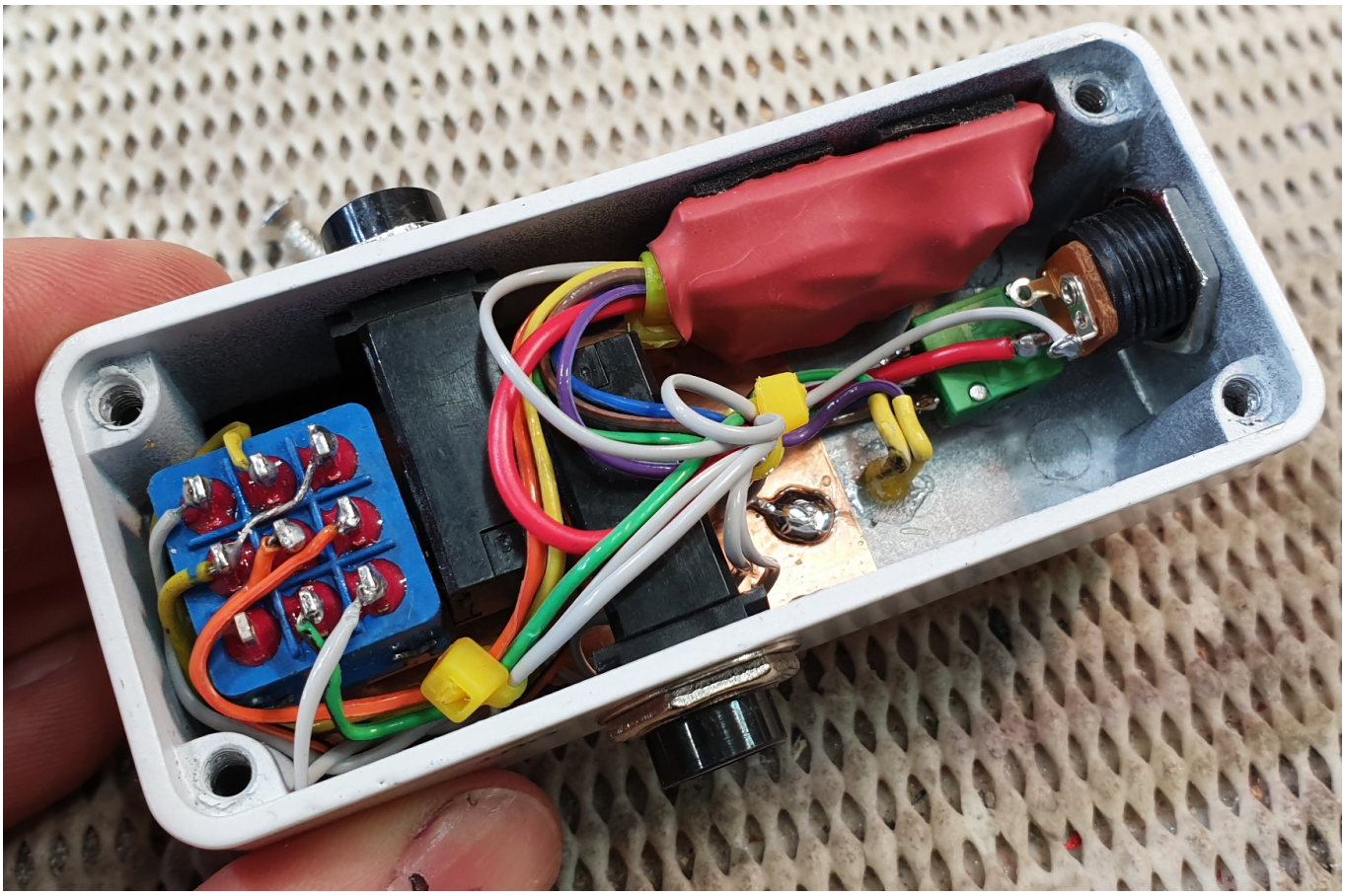
Here's the rear view.



My prototype was wired with the standard 3P3T true-bypass stompswitch.



With the low profile jacks I used (Altronics #P0097), and the 9mm pot, it was relatively easy to fit the circuit and parts into the small enclosure (Hammond 1590A style).



For my prototype, I used a pre-painted white enclosure. The white finish was poor and I needed to rub it back with 1200g to remove excessive orange peel and quite a few specks of grit in the paint. For the graphics I used water transfer decal sheet.

After printing it needs to be sealed with a coat of lacquer before it can be wet. I used clear decal sheet for the small labels on the sides. For the main graphic I created a decal that covers the whole top, and printed it on white decal sheet. The artwork was coated with 3 coats of semi-gloss clear Dulux Duramax.

Rob Mods, Sept 2022