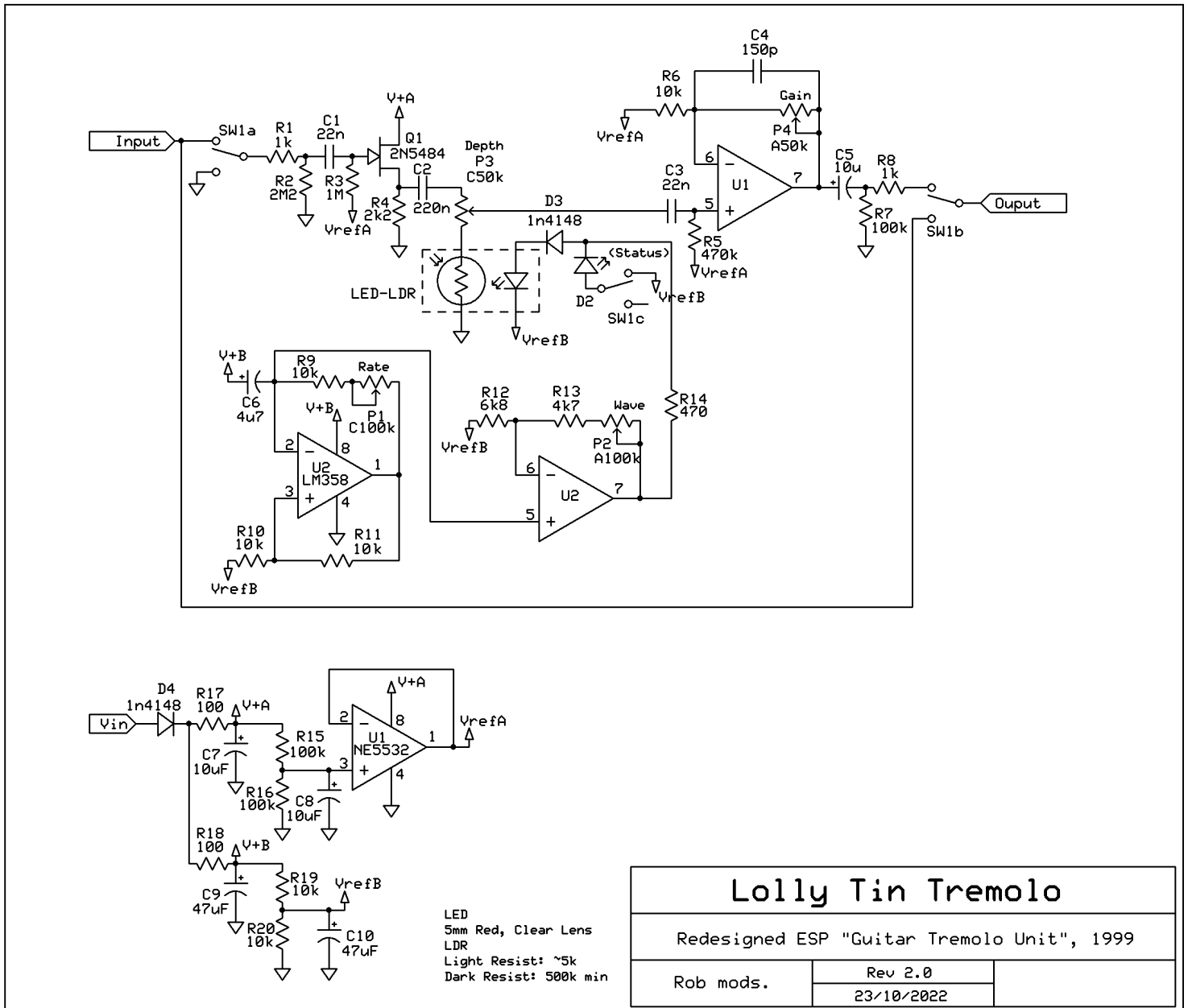


Rob Mods Lolly Tin Optical Tremolo (October, 2022)

Here's a new tremolo pedal design that uses an opto-isolator.



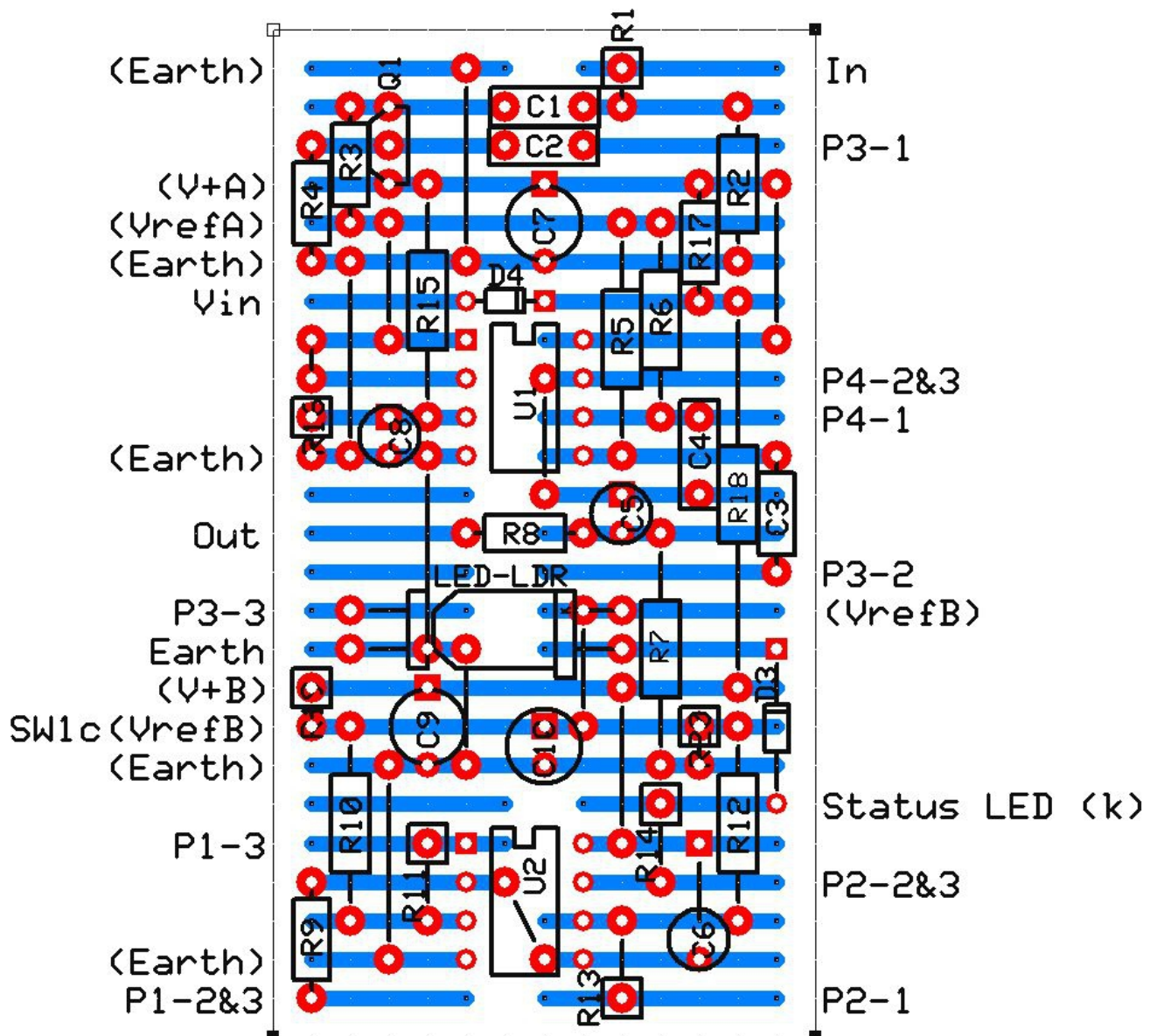
Usually tremolo circuits that use light dependent resistors (LDRs) have them inline with the signal, often as the input resistor to an inverting op amp stage. However, the circuit that was the inspiration for my design has the LDR as the lower part of a voltage divider attenuator. This is more typical of optical compressor circuits, where the fast conductance rise time and slow fall time of typical LDRs create the quick attenuation "attack" and slower "release" times needed. The original circuit can be found [here](#), on the Elliot Sound Products site.

I wondered if this arrangement might yield an audibly different type of tremolo effect, where the front edge of each audio pulse has a soft attack and a comparatively abrupt end.

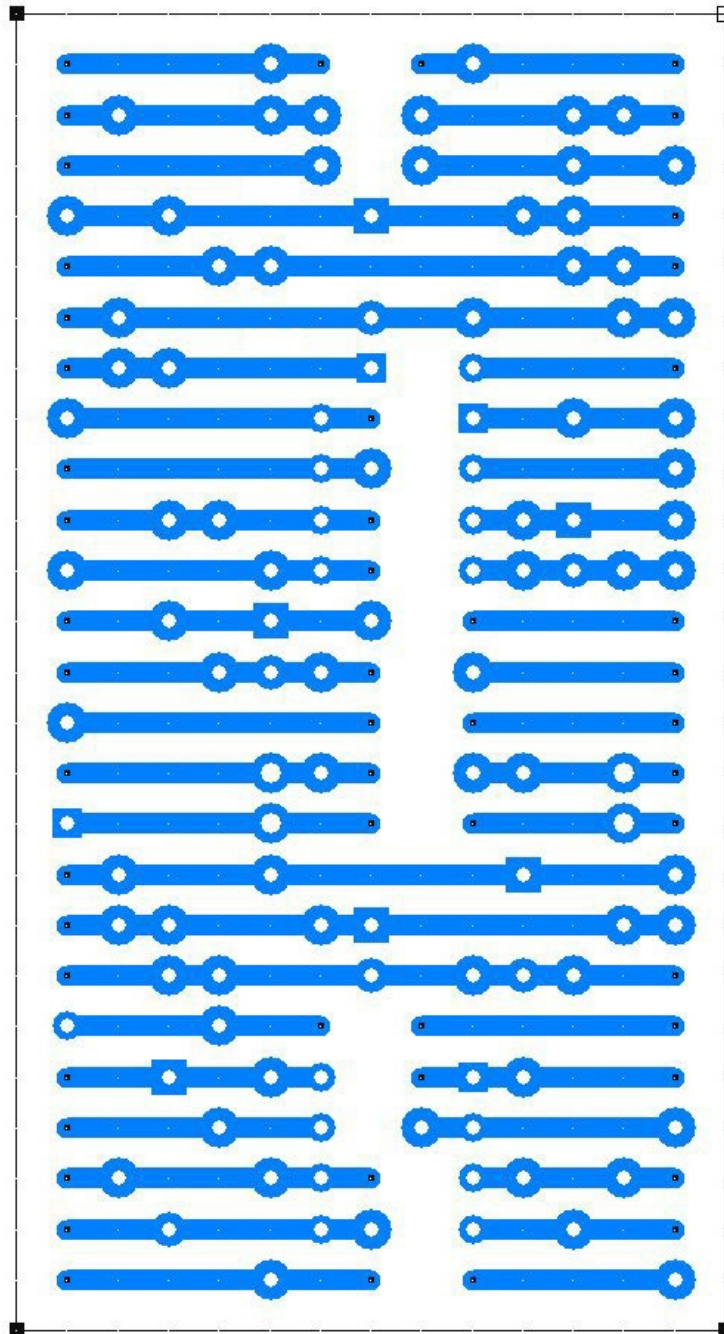
U1 can be almost any low noise audio op amp IC. But the output swing of U2, plus the forward voltage and brightness of the leds are quite important to the function of the circuit. I used water clear red leds with a forward voltage of close to 2v. The status light should be well matched to the led used for the opto-isolator. This is really a project for people who are willing to experiment with leds and LDRs to get the most from the circuit. The current limiting resistor (R14) may also be tweaked.

After some problems with oscillator "tick" finding its way into the audio path, I added a separate V+ and Vref for U2. I also recommend separating the wires that run to the "rate" and "wave" pots from the rest of the wiring.

A third tweak for the second prototype was the use of shielded cable for the input wiring. (From input jack to stompswitch and from stompswitch to circuit board. The earth connection at the upper left strip is if you decide to connect the shield at the circuitboard end, as I did.

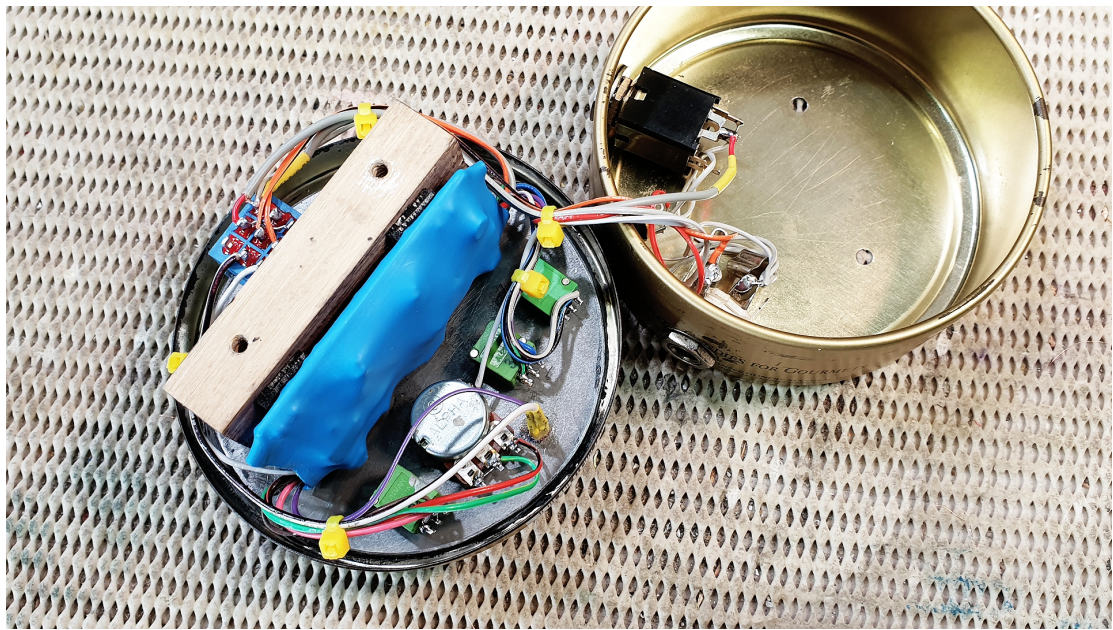


(And the rear view.)



Wiring the input, output, and DC jacks, plus the stomp switch is as per normal for true-bypass operation. However, ***note the unusual wiring of the status light***. Its cathode (k) is wired to R14 and D3, and its anode is switched to VrefB via the stomp switch. This is so it throbs in time with the tremolo's output audio pulses (more or less).

[The video about this build](#) is quite detailed and has demonstration and explanation of how the oscillator works, and how the TR-2 inspired wave control was implemented. The operation of the two leds is similar to clipping diodes in say, a DS-1. The addition of D3 creates asymmetrical clipping and gave a better tremolo effect without decreasing the brightness of the status light.



Rob Mods, Oct 2022