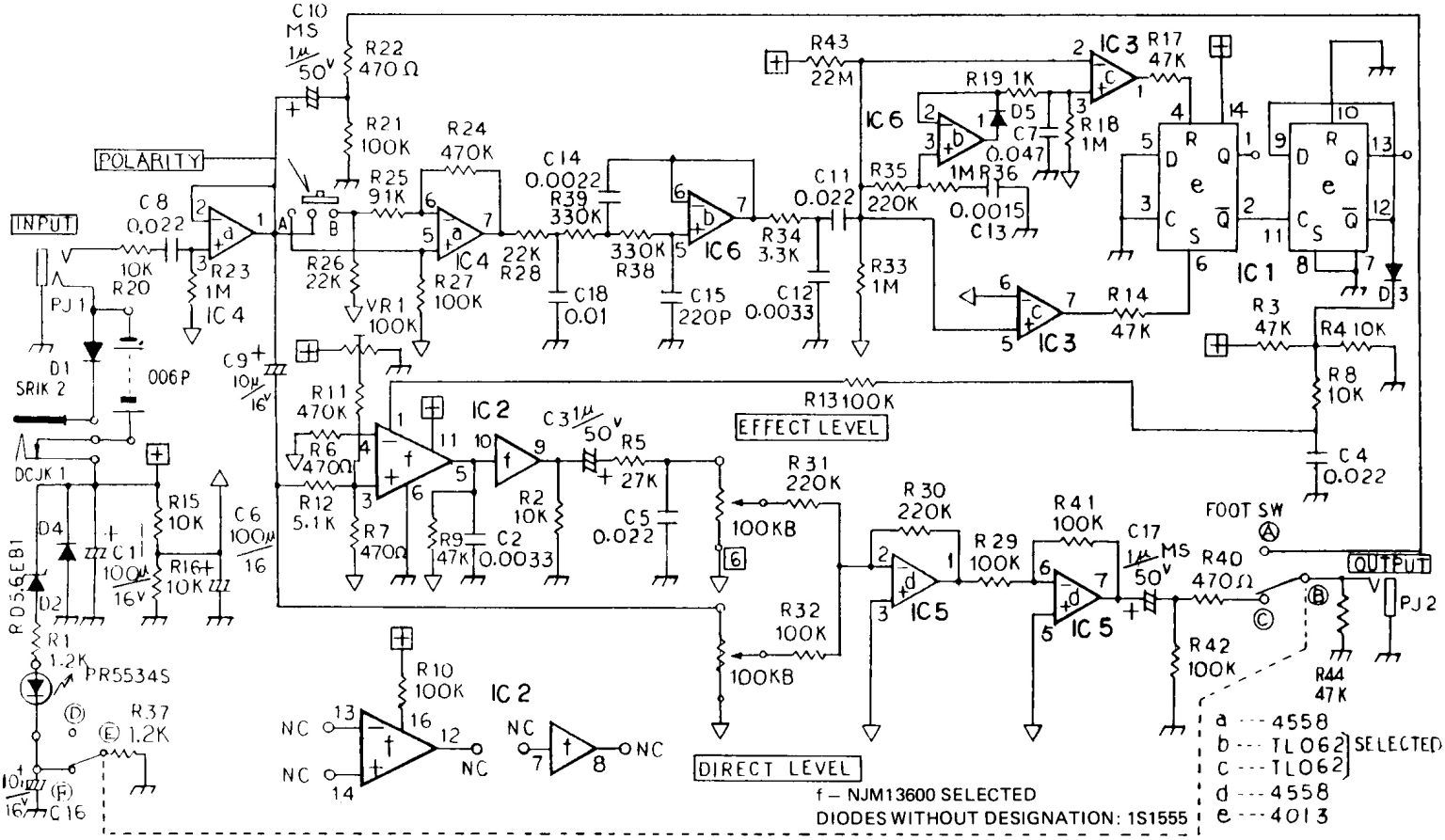
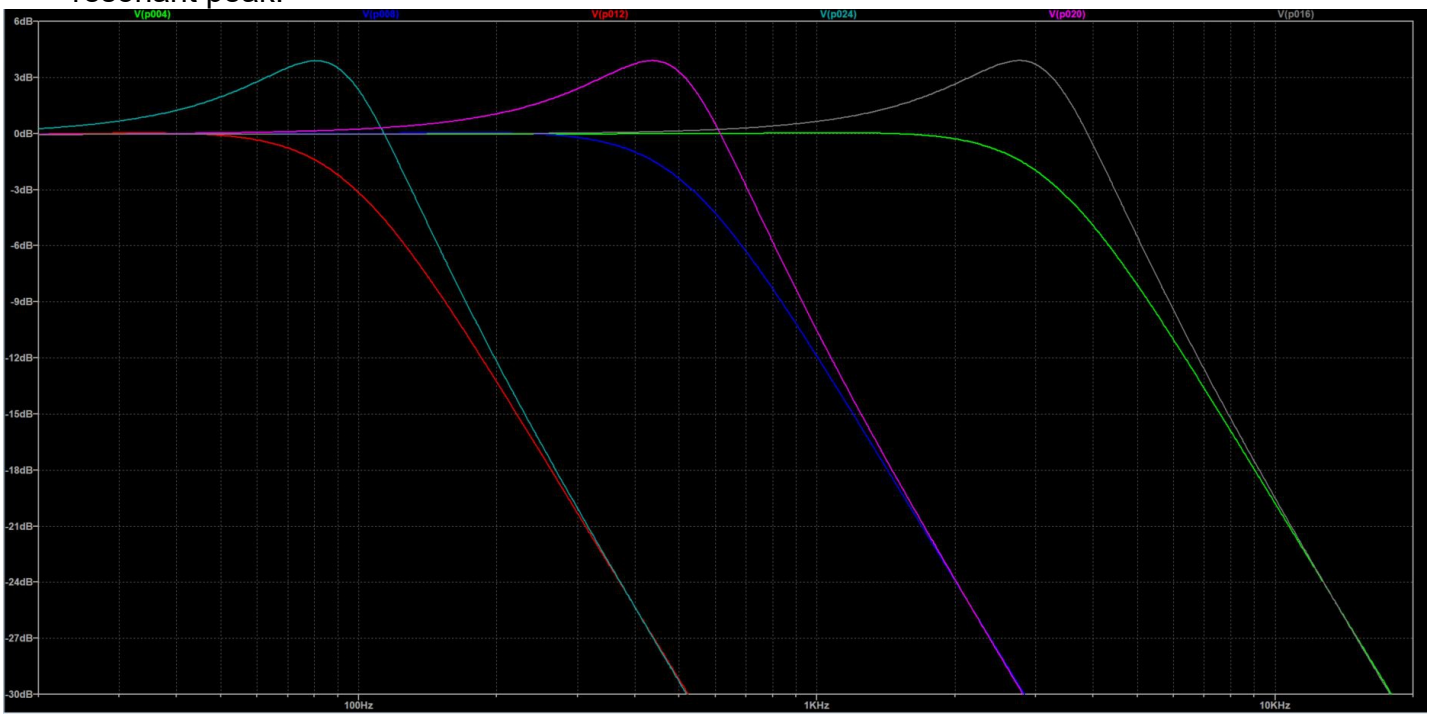
Vintage Yamaha / Korg Octave Pedal Filter Mods
(June 2021)

I recently modified my vintage Yamaha OC-01 octave pedal. The same pedal was sold by Korg around the same time, as the “OCT-1”

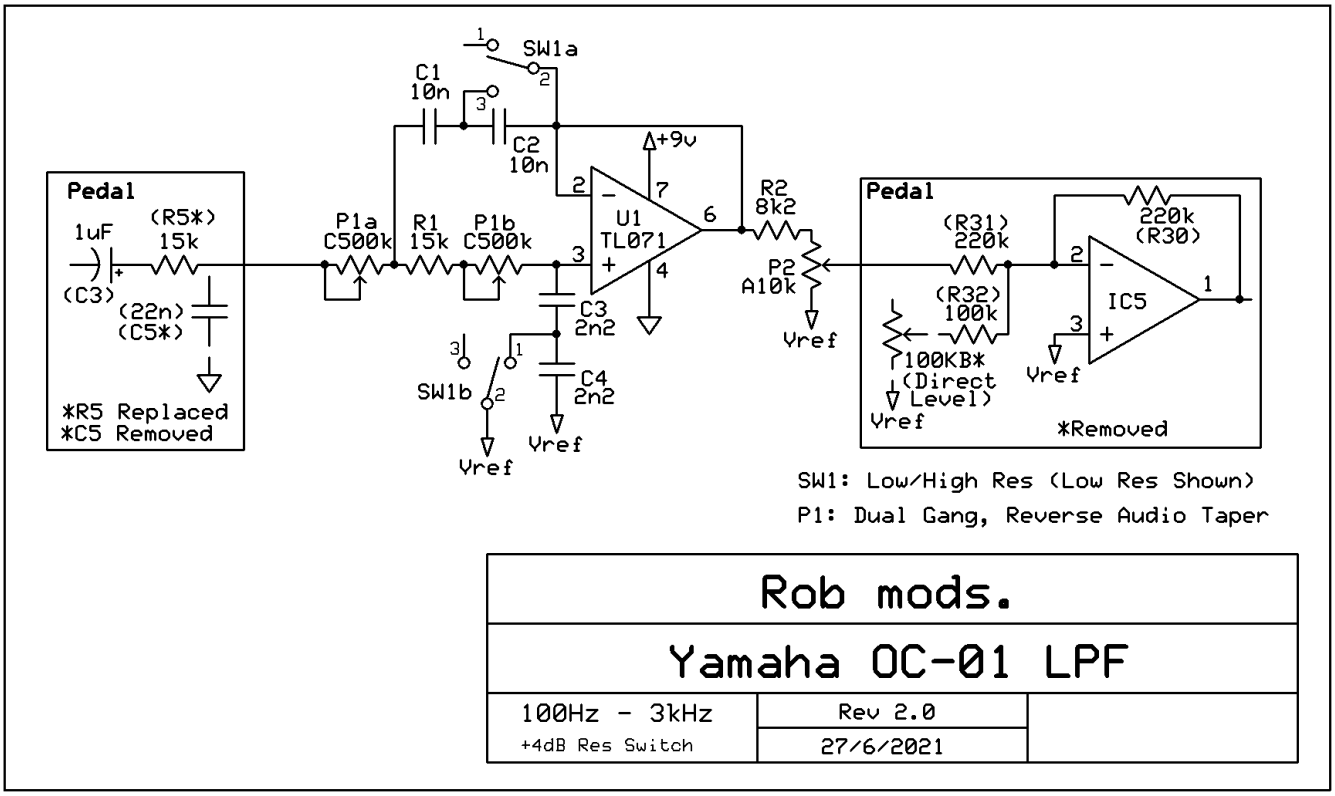


Initially, the plan was to remove the RC low pass filter formed by R5 and C5, and replace it with an active sallen-key low pass filter with a frequency sweep pot and high-resonance switch. Since the effect alone contains both the original and octave sounds, I never used the “Direct Level” pot. So I decided to remove this control and replace it with the frequency adjustment from the new filter. And since the “Polarity” switch seems to make little or no difference to the effect, I decided it would be repurposed as the resonance switch for the new filter.

The filter sweeps from approximately 100hz to 3khz and has a switch that creates a 4dB resonant peak.

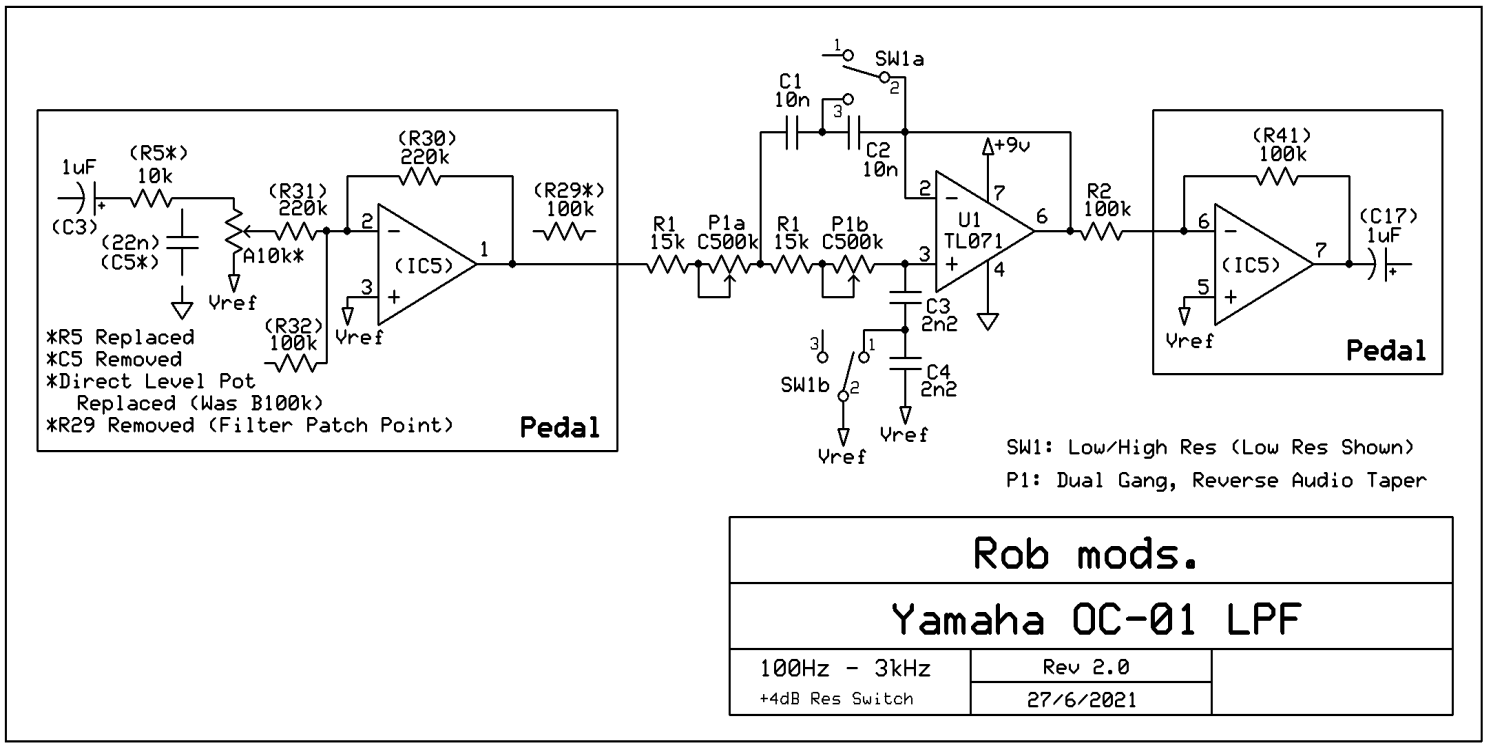


Here's a diagram of how it was initially installed in the pedal.



C5 was removed, and R5 was replaced with a 15k resistor which becomes part of the new filter. The original “Direct Level” pot was removed, which leaves R32 dangling. This essentially converts IC5's first op amp from a virtual earth mixer, to an inverting buffer with a 220k input impedance. I also repaced the “Effect Level” pot with an A10k pot as a master volume. The 8.2k resistor (R2) attenuates the signal by 5dB.

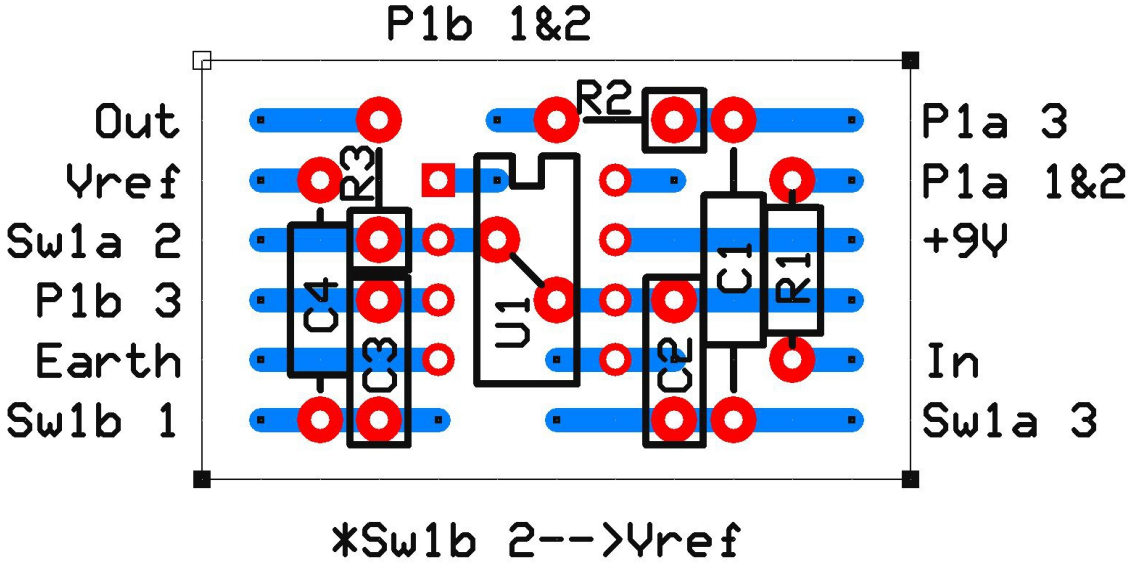
This all works well, but after I posted the video, I realised there was a better place to put the filter.



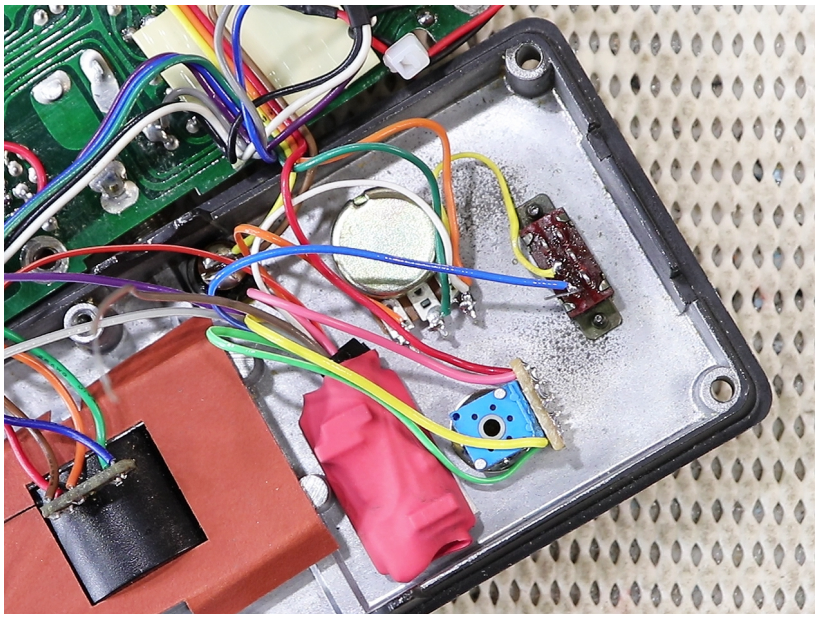
The output signal from IC2 (the OTA) is very high. It's 11dB hotter than the input. It is better to have the attenuator (volume control) before the filter instead of after (as is the case with the first diagram). The 10k resistor that replaces the original R5, along with the new A10K volume pot attenuates the signal by at least 6dB (with the volume pot maxed). This reduces the chance of over-driving the buffers or the new filter. (FWIW, the second channel of IC5, with R29 and R41 forms an inverting buffer. This is because the virtual earth mixer inverts the signal, and this inverting buffer is needed to invert it back! It is best practice to have the output of the pedal in phase with the input.)

Between these two output buffers is an ideal place for the new filter. Removing R29 gives two vacant solder pads which become patch points to send to, and return from, the new filter. However, R29 has to be replaced (with R2) for the output buffer to function properly.

I made the filter on a small piece of stripboard.

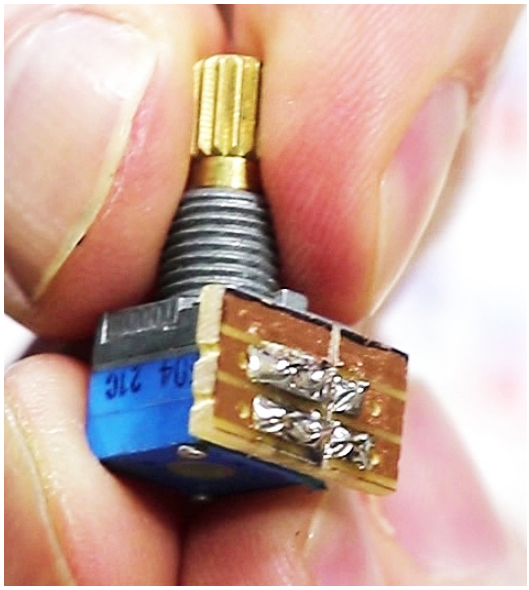


It is only 15mm wide to fit in the pedal. I also used small MKT caps to keep the height below 10mm, since the top half of the enclosure is only 13mm deep.



The circuit was covered in heatshrink and installed with double-sided tape under the front face of the enclosure. The orange wire from the original circuit board carries the Vref to the original pots. It was twisted with the yellow wire from the switch ("Sw1b-2") and the Vref wire from the filter board (white) and soldered to the anti-clockwise lug of the volume pot. The original wires from the switch were removed, then two were soldered together to hardwire the pedal in the "B" polarity setting. These were covered in heatshrink and left in the pedal in case I want to return the pedal to stock in the future.

The frequency control is a dual gang C500k pot. (The same as I used modding my OC-2.) Only a mini 9mm pot will fit under the effect circuit board. I used a small piece of stripboard to solder the four wires to the pot.



Rob Mods. June 2021.