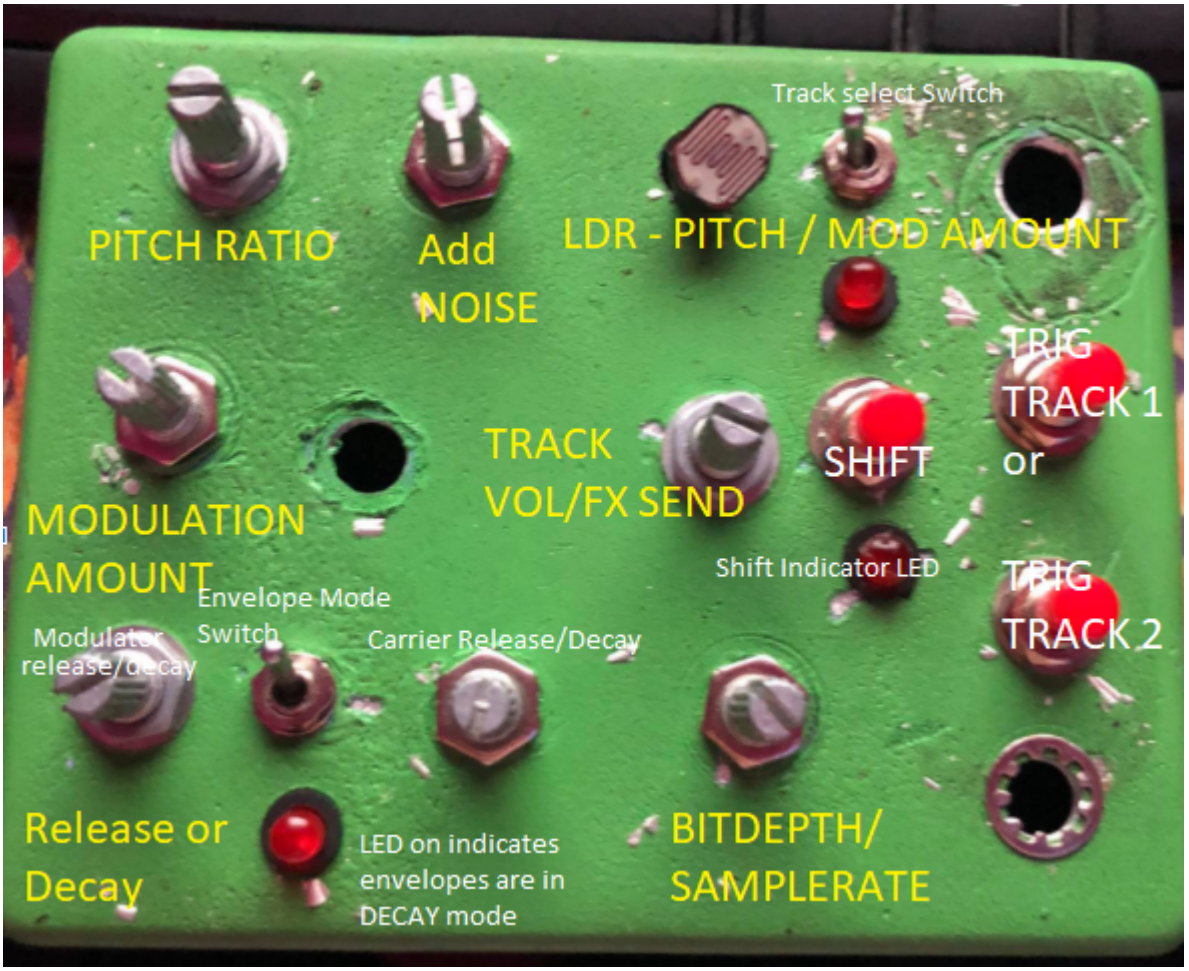
The Green FM Monster is a sawtooth wave based frequency modulated synthesizer designed to make nasty drum or percussive sounds. Two different tracks of a sawtooth waveform with a set pitch ratio runs through an envelope with its own release / decay controls and through an amplifier into the modulation inputs of another sawtooth waveform which runs through a mixer, where noise can also be added and then sent through an envelope, split to a dry mix and then a wet bitcrushed mix. One track can be manipulated at a time using the onboard controls. Later MIDI CC will be added to all the parameters so the box can essentially be used with any device capable of midi.

Using the pitch ratio knob allows the user to dial in a frequency for the modulator waveform that is relative to the carrier waveform's pitch. The main pitch is controlled with the LDR, until the shift button is switched on in which case, the LDR and Modulation Amount switch place and the LDR is now modulation amount while the second potentiometer becomes the Pitch.

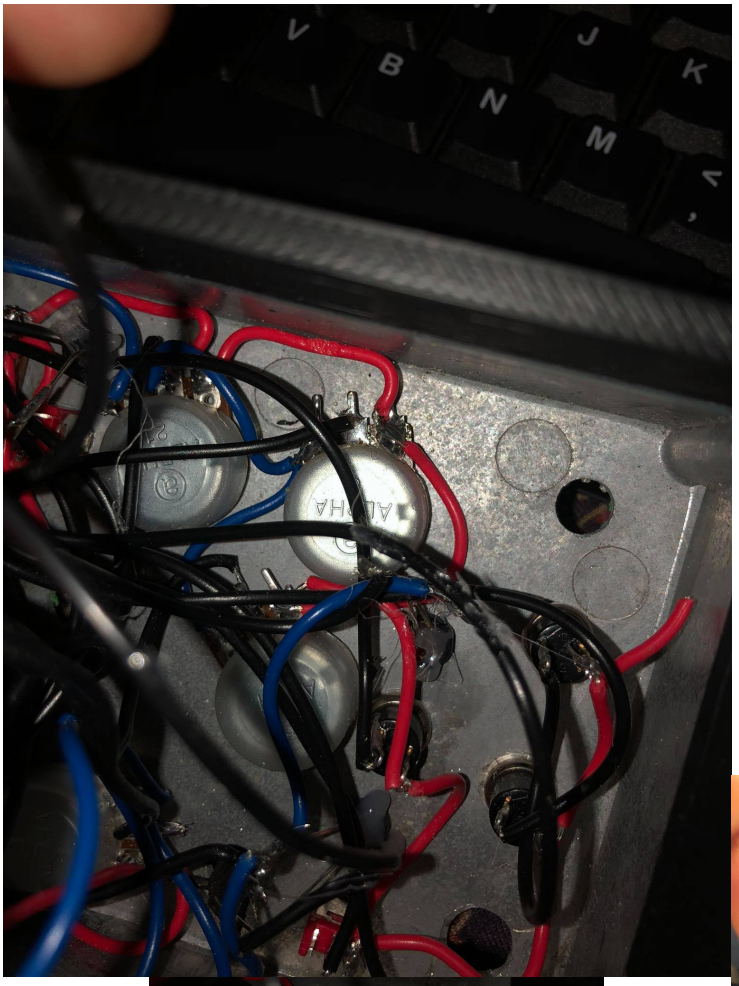
Flicking the first switch at the bottom of the unit allows you to switch between release mode or decay mode, in release mode sustain is set to full and only release time can be changed. In decay mode the LED will be lit, sustain is set to zero and release set to 1 millisecond while the two pots switch to change decay time data. There are two knobs for envelopes, the leftmost is for the modulator while the knob found in the center is for the carrier.

Using the switch up the top allows us to toggle between which synth tracks parameters are being manipulated, and the LED is there to indicate if we are on track one or two (it is lit if we are in track two).



In the future, using a printed circuit board to make a more reliable device, implementing TRS midi in and thru and CC control over parameters would make this a more usable and integratable device.

The building process was not hard, I began deciding where I would like to place my various sensors in the enclosure with drawings and then by placing the components on top of the enclosure itself. Then drilled holes and started to place my pots inside and chained all the around all 7 pots the blue cables for ground to one side and red cables for 3.3v to the other side, and then a cable from the wiper pin ready to be soldered into the corresponding pin on the Teensy board.



I soldered an extra long header socket to a vero board so I could use the teensy audio shield with sockets on the underside and place the Teensy 4.1 with header pins on the top side.

I didn't do the tidiest job of this, because I was rushing myself to get it all completed. In the future I would like to perhaps design a PCB to tidy all of this up and make it all a whole lot more reliable.