ToneCore Tremolo

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Introduction

The ToneCore stompbox pedal is a programmable pedal where different effects can be created. The ToneCore is programmed in Assembly, and is compiled into a .CLD file to be downloaded onto the pedal. The ToneCore available to us contains six different knobs for varying use. My chosen effect was the tremolo effect.

Tremolo

The tremolo is a wavering effect, or a small variation in the amplitude of the signals. This is caused by the combination of an audio input with a low frequency oscillator (LFO) output, and recombination with a copy of the original signal. The resulting effect varies depending on the LFO frequency, but should produce a slow oscillating of amplitude.

Process

In this effect, a square wave tremolo was used. In the square wave, the high has a value of one, while the low has a value of the second knob. Before any of the subroutines begin, a location in x-memory is established for a global counter. In order to oscillate back and forth, two thresholds were also established in x-memory, one double the value of the other. When the counter was below the first threshold, the output was a bypass, the full input signal. When the counter passed the first threshold, the output switched to the value of the second knob. Therefore, when the second knob was all the way off, there was no output, and the tremolo sounded as if the signal was turning on and off very quickly. Once the second threshold was passed, the counter reset to zero, and the cycle began again.

The third knob controlled the speed of the counter. The value of the knob was taken in and right shifted 19 bits, to control the speed of the oscillation to reasonable tremolo speeds. As the knob was turned up, the speed of the counter increased, causing the oscillations to speed up.