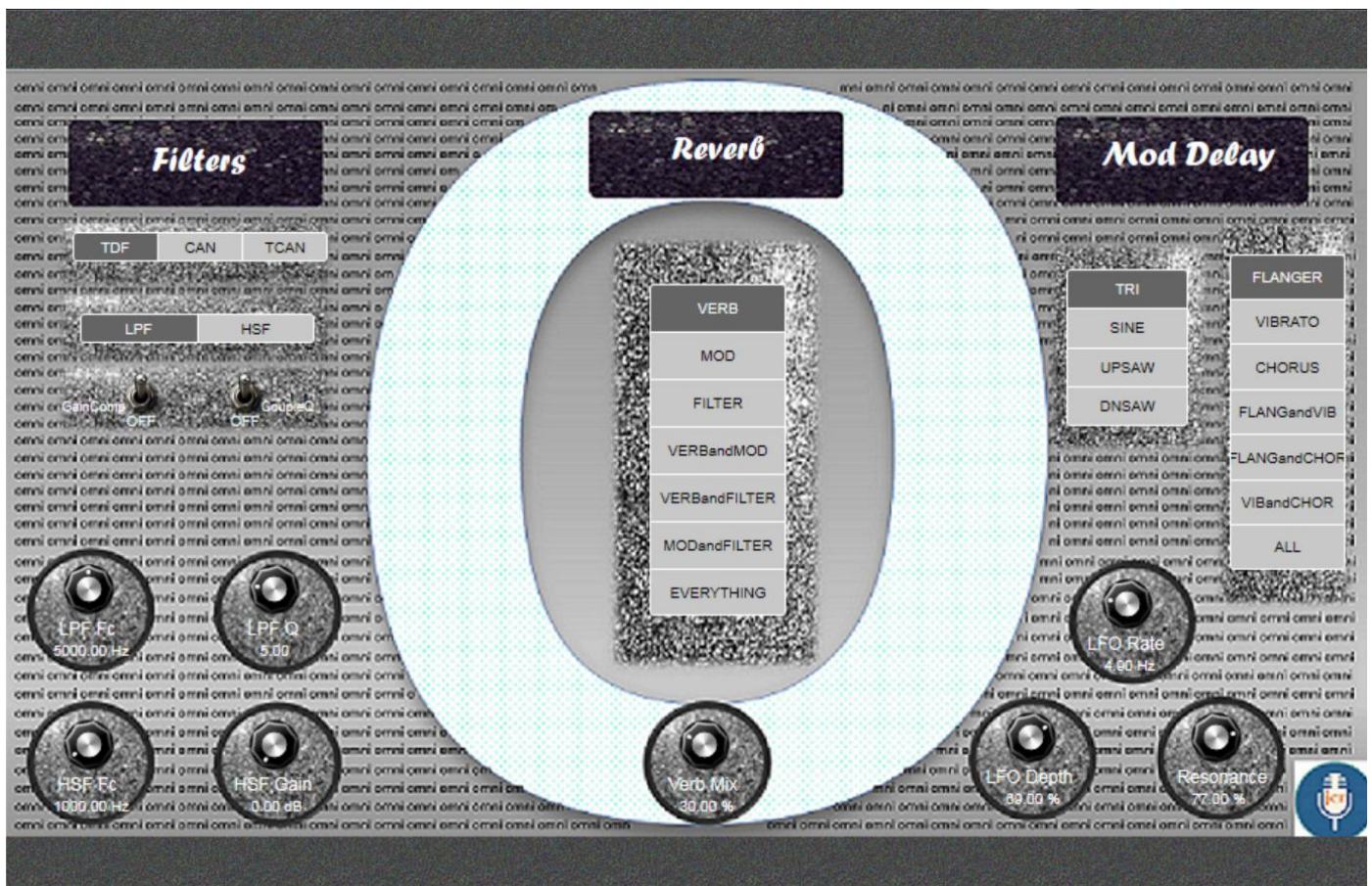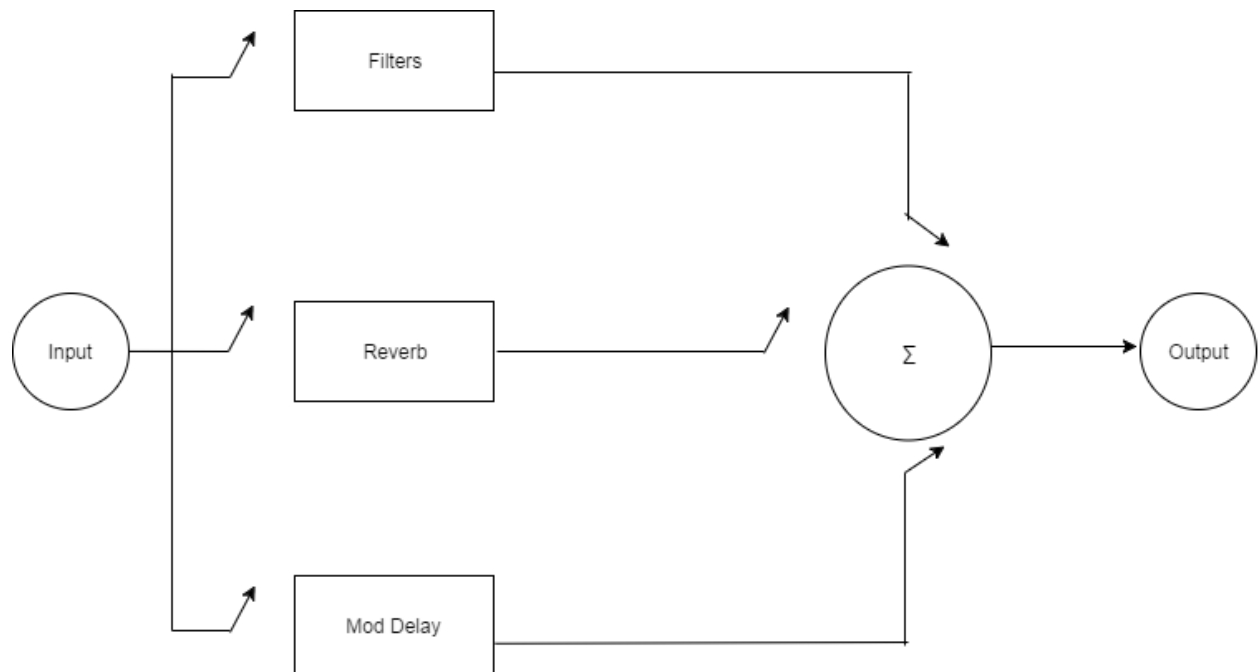Jamie Robinson

MMI 503

Will Pirkle

Final Project

Overview:

My "Omni" plugin is three plugins in one (hence, the name "Omni," meaning "all"). It is a combination of a dynamic filters plugin, reverb, and a mod delay plugin. The user has the option to toggle between all three or use any combination. When using a combination, i.e., reverb and mod delay, you are still able to individually control both the reverb and the mod delay.

```
Input ──┬──→ Filters ─────────┐
        │                     ↘
        ├──→ Reverb ──────→ ( Σ ) ──→ Output
        │                     ↗
        └──→ Mod Delay ───────┘
```

Dynamic Filters:

The "Dynamic Filters" section of Omni consists of a dynamic low pass filter (LPF) and a dynamic high shelving filter (HSF). With the LPF, the user can change the cutoff frequency as well as the Q value. In addition, the user can toggle a Gain Compensation button. When activated, the bass level drops. There is also a Couple Q button. When this button is not activated, the user can chose whatever Q value he/she wants. When the button is toggled, the cutoff frequency and Q value move with each other, so when the cutoff frequency increases, the Q will increase as well. The user can also toggle between different biquad structures.

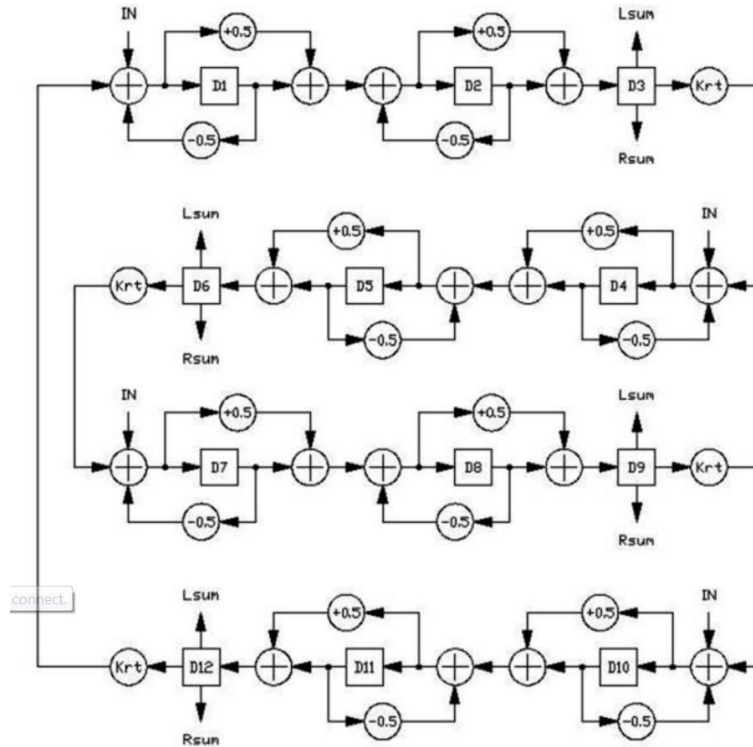When HSF is activated, the user is able to control its cutoff frequency and gain.
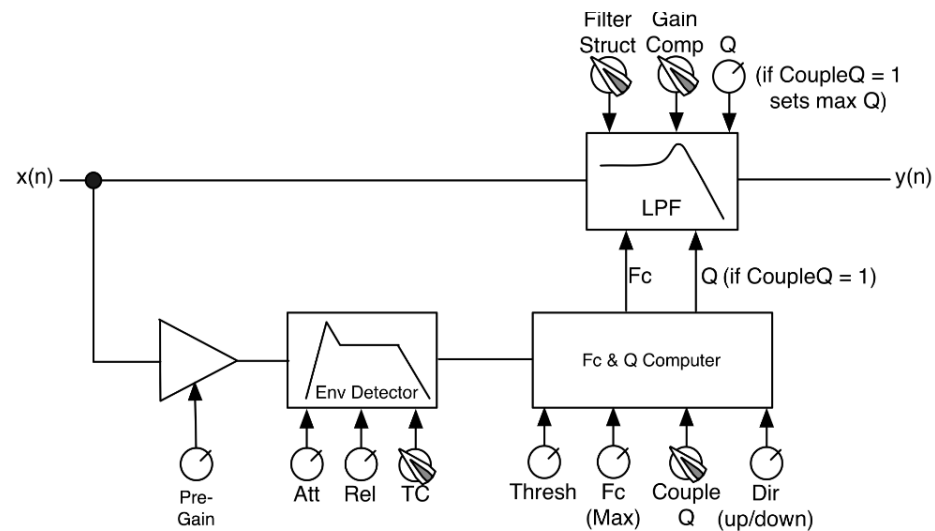
Low Pass Filer Toggle On
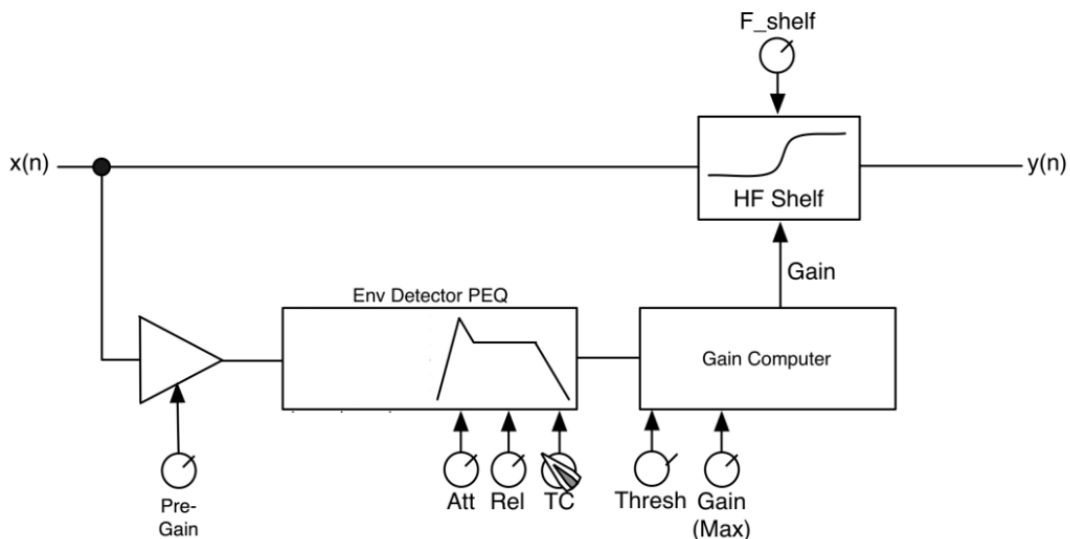
High Shelving Filter Toggle On

Reverb:

The reverb tank is made up of a series of all pass filters and delays. More specifically, it is four blocks of two all pass filters followed by a delay. That can be seen in the following block diagram:

In order to recreate this tank in the reverb section of the plugin, there are a total of 16 knobs for the loop. There are two knobs for each all pass filter, and one for each output delay. The all pass filters have delay knobs (in mSec) and G knobs (no units). The output delays each just have one delay knob (in mSec).

Dattorro's Reverb module helped me to set the value for each knob. He said to choose value that are generally prime numbers that are not related, as to not have random large spikes. After much trial and error, I finally found a reverb sound that I deemed the best. So the user doesn't mess up the sound I created, the reverb portion of the plugin only has one knob: a wet/dry mix. After all, it is said that the best plugins only have one knob!

APF1 Delay	APF1 G	APF2 Delay	APF2 G
17.00 mSec	0.67	18.50 mSec	0.00
APF3 Delay	APF3 G	APF4 Delay	APF4 G
51.00 mSec	0.50	18.50 mSec	0.00
APF5 Delay	APF5 G	APF6 Delay	APF6 G
3.00 mSec	0.50	29.00 mSec	-0.50
APF7 Delay	APF7 G	APF8 Delay	APF8 G
37.50 mSec	0.66	74.00 mSec	-0.50
Out Delay 1	Out Delay 2	Out Delay 3	Out Delay 4
10.50 mSec	6.50 mSec	6.50 mSec	0.30 mSec

Mod Delay:

In the Modulation Delay section of Omni, an LFO wave is mixed with the original input to create the initial mod delay. The user can decide what wave shape the LFO oscillator should be. He/she can choose between triangle, sine, up-saw, and down-saw. The user controls the rate and depth of the LFO.

There are several different mod delay options to choose from. The "original" three are flanger, chorus, and vibrato. All three of these options are similar in that the LFO and delayed and combined with the input. The difference is simply the amount of delay time between each option. Flanger has the shortest delay time, and vibrato contains the longest. In addition, the user can choose to add resonance to the flanger effect. The user can also choose any combination of these three effects, including flanger and vibrato, flanger and chorus, vibrato and chorus, or all three at the same time. With these combinations, the same LFO controls both effects, so the user is not able to control individual rates and depths of separate LFOs.