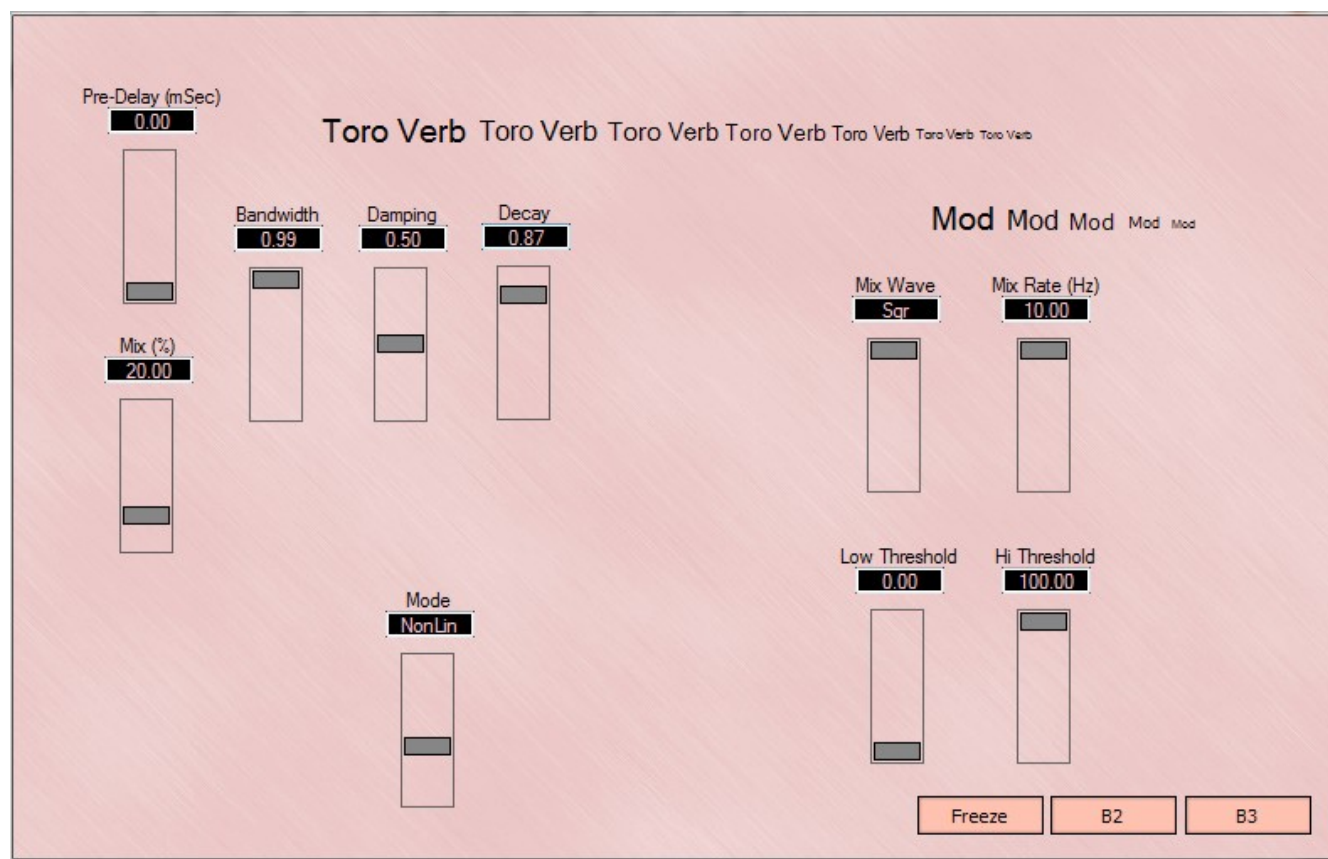


## Toro Verb: User Guide



The Toro Verb is a reverb plugin based on the Dattorro reverb algorithm with some extra functionality to create modulated and non-linear reverberations.

### Controls:

**Pre-Delay:** Sets the pre-delay of the reverb in milliseconds

**Mix %:** Sets the Dry/Wet mix of the reverb with the original signal

**Bandwidth:** A low-pass filter just after the pre-delay

**Damping:** A low-pass filter in the “Tank” stage of the reverb

**Decay:** The decay through the “Tank”, a lower decay means a longer reverb

**Mix Wave:** Waveform for the LFO

**Mix Rate:** Frequency of the LFO

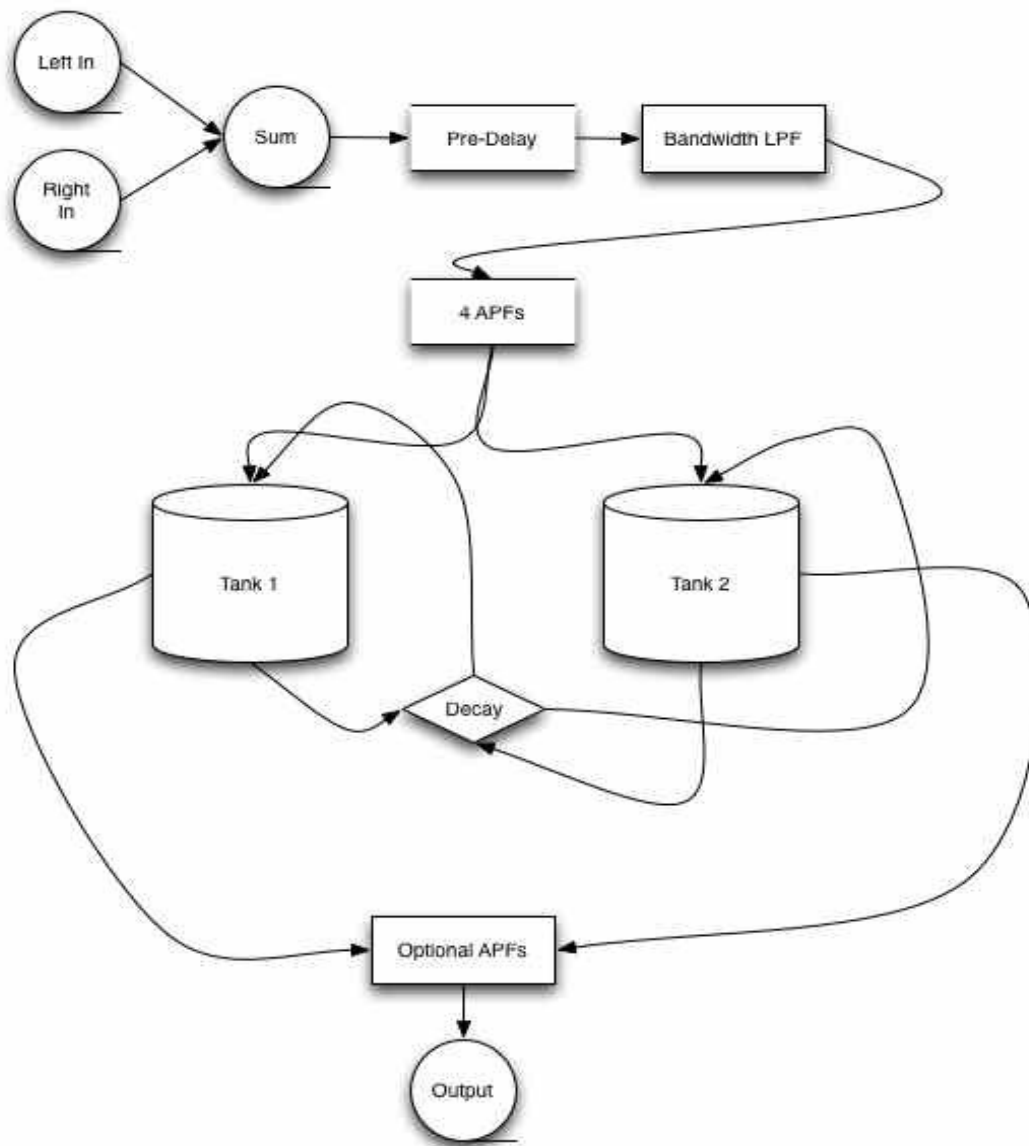
**Low Threshold:** Lowest point during the LFO's oscillation period (point where output of LFO is 0)

**High Threshold:** Highest point during LFO's oscillation period (point where output of LFO is 1)

**Mode:** Select between the four modes of operation (Standard, Non-linear, APFs, Both)

**Freeze:** Creates a freeze effect of intense reverb that latches on and off.

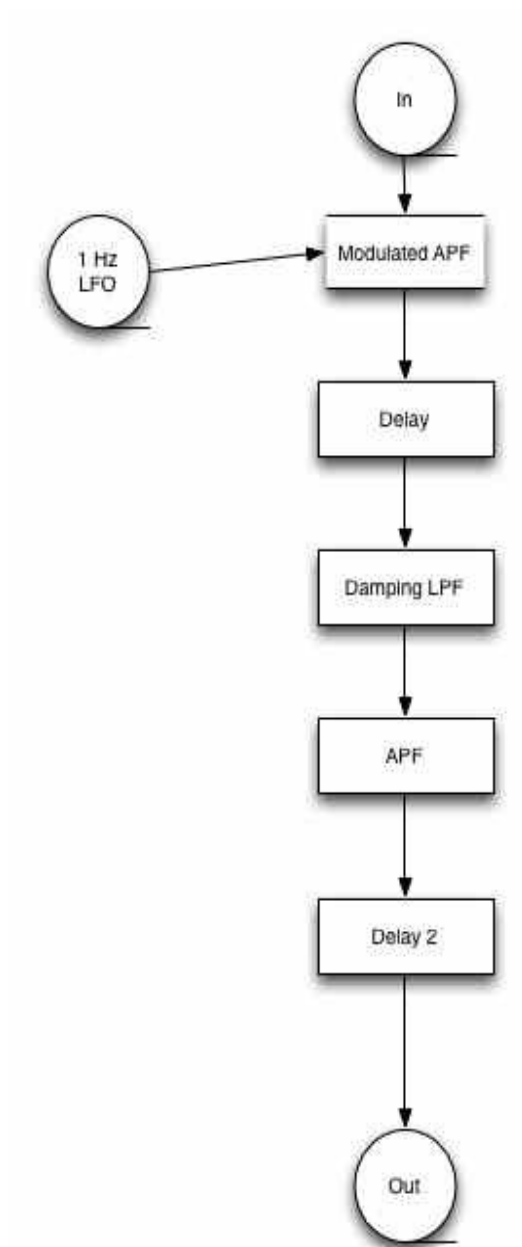
## Operation:



The Toro Verb flow chart (above) shows the signal flow through the plugin. The Input signal spends a majority of its time cycling between two tanks before it is sent to the stereo output.

The next page offers a more detailed look at the inside of the tank.

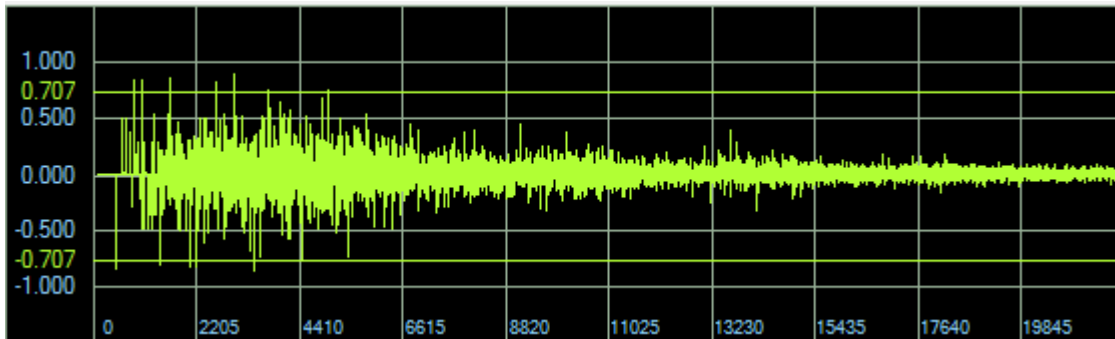
To create a stereo-image, the samples selected to generate the output from the tank are slightly different from the left to the right channel.



One of the two tank circuits shown. A key part of the sound is the first All-Pass Filter that has its delay modulated very slightly by a 1 Hz sine wave. This is true of both APFs in both tanks in the Toro Verb.

## Modes of Operation:

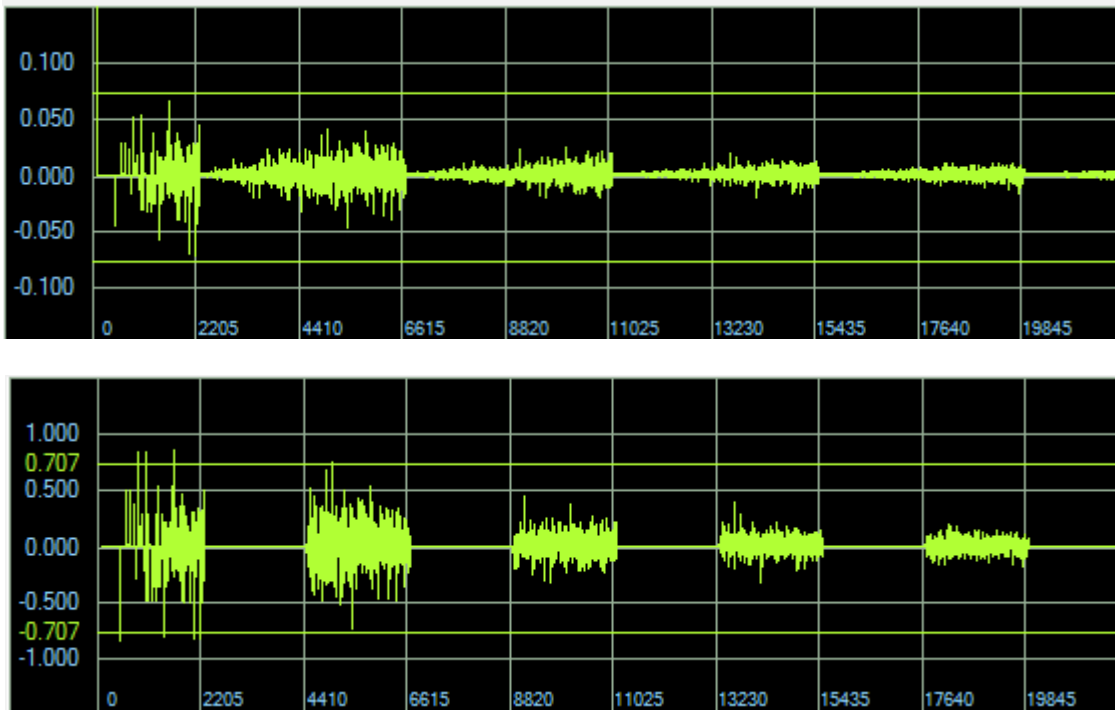
### Standard:



Impulse Response of the Standard Algorithm

The standard setting disables all of the mod parameters (except Freeze) and recreates the original Dattorro reverb sound. This bypasses the Optional APFs shown in the block diagram.

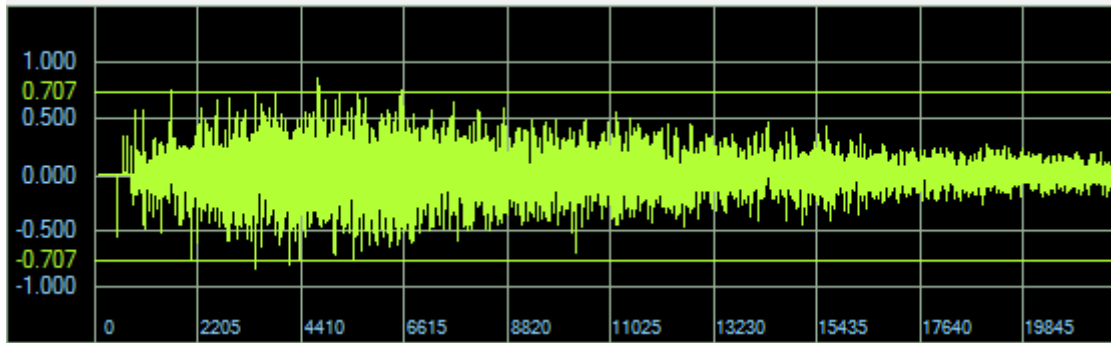
### Non-Linear:



Saw and Square modulated Impulse Responses

The Non-linear setting allows the user to take advantage of the four mod controls to create non-linear reverb sounds by manipulating the Wet/Dry mix.

## APFs:



Impulse Response of the All-Pass Filter Mode

For when there simply isn't enough All-Pass Filter in your life, the APF mode adds 8 additional filters to the equation. Four are routed to the left channel and four to the right, this optional last stage (after leaving the tank) creates a different envelope than the traditional Dattorro algorithm by shifting the loudest portion of the reverb back slightly and creating something resembling an attack envelope. The resultant “wum” sound as the reverb engages creates a different softer textured reverb that is more apparent on longer reverb times.

Note that this setting also disables the mod parameters, like the standard setting.

## Both:

The both algorithm simply engages both the Mod parameters and the extra output All-Pass Filters allowing the user to create a non-linear reverb using the slightly modified algorithm.

## A note on the Freeze:

The freeze mode is achieved by slowly ramping down the decay rate and damping to create a n enourmous reverb. This creates a sort of endless cavernous sound. When unlatched, both the decay and the damping fall back down to 0 to create a harsh cutoff before returning to their originally defined values (slider settings). The ideal way to implement this is engage the freeze at the end of a phrase or before a long pause, and then unlatch before the next phrase begins. However creativity is always encouraged.