

# outer vst

Outer is a rapidly developed initial platform for chaos or strange attractor audio synthesis using coupled oscillators. Three oscillators are summed with individual gain controls, the result is filtered and applied to the phase of each oscillator. This development was followed by other synthesizers expanding the method, but this initial platform has its own unique properties and timbral possibilities.

Given this, the user interface and parameters are very straightforward.



The pitch of the second and third oscillators are set as ratios of the fundamental using Freq 2 and Freq 3. The Mix parameters trim the amount of feedback from each oscillator. Mod is the global trimmer for feedback amount. The feedback is filtered through a multimode filter using state variable forms by Robin Schmidt and ladder forms by neotec.

## oscillator modes

To make this build as useful as possible, a selection of oscillator modes alter the configuration of the oscillators:

- |        |   |
|--------|---|
| mode 0 | outputs = oscillators 1 and 2   |
| mode 1 | outputs = oscillators 1 and 3   |
| mode 2 | uses waveshaping cosine approximation, producing slightly different harmonics (outputs 1 and 2) |
| mode 3 | modifies waveshaping method for more harmonics (outputs 1 and 2)                                |
| mode 4 | 2 oscillator form   |
| mode 5 | 2 oscillator plus third "oscillator" from sum of modulation (no phasor)                         |
|        | outputs - oscillator 1 and sum  |
| mode 6 | 2 oscillator form of mode 2   |
| mode 7 | 2 oscillator form of mode 3   |

Certainly there are other architectures that may better suit this method, this initial build offers a point to continue from.

## output modes

The two oscillator outputs are combined in several ways using the Balance parameter, so that it is not a simple case of osc 1 = left and osc 2 = right,

cross	left fades 1 to 2, right fades 2 to 1, so middle position is mono
mono a>b	mono output fades 1 to 2
m>m-s1	mono (1) fades to mid-side (1-2, 1+2)
m>m-s2	mono (1) fades to mid-side (1+2, 1-2)
st>m-s1	stereo (1, 2) fades to mid-side (1-2, 1+2)
st>m-s2	stereo (1, 2) fades to mid-side (1+2, 1-2)
st>diff	stereo (1, 2) fades to difference (2-1, 1-2)

## modulation

Modulators experience a small latency as modulation targets, eg. lfo1 assigned to lfo1 rate is delayed by one buffer.

Outer (and synths released concurrently) include the same modulation options: two lfo modules (the lfo has sixty contours and a separate manual) and one of my standard modulation envelopes. The envelope has separate trimmers to shape the attack and decay/release stages, applying either concave or convex forms. The central position indicates a linear contour.

The envelope also includes a "pickup" selector for the attack stage, which opts between constant rate and constant time. Normally, the attack stage picks up the envelope release at the same rate. The second option is for the attack segment to use a fixed time instead of a fixed rate, so that even if the envelope is retriggered early in the release stage, when the envelope is still very high, it will still take the same amount of time for the envelope to reach the peak, which may be more suitable for eg. percussive timbres.

## tune parameters

The lower right portion of the gui includes parameters for temperament. These accommodate special interest applications. It is advised that if you do not use temperament intentfully in composition, to leave these settings at "equal" and "440". Using other temperament configurations is only pertinent in relation to the temperament setting of other instruments, experimenting with them will only change the tuning by a very small amount.