Installation

In order for the plugin to work, the folder in which this document is in needs to be named Binaural_Synthesizer_Resources and it needs to be on the desktop of your computer. Inside the folder there should be this document and various text files that can be seen below.

highBandAmplitudes_left	21/04/2022 15:27	Text Document	40 KB
highBandAmplitudes_right	21/04/2022 15:27	Text Document	41 KB
lowBandAmplitudes_left	07/05/2022 13:55	Text Document	40 KB
lowBandAmplitudes_right	21/04/2022 15:27	Text Document	40 KB
midBandAmplitudes_left	21/04/2022 15:27	Text Document	39 KB
midBandAmplitudes_right	21/04/2022 15:27	Text Document	39 KB
subBandAmplitudes_left	21/04/2022 15:27	Text Document	41 KB
subBandAmplitudes_right	21/04/2022 15:27	Text Document	41 KB
x_coordinates	22/04/2022 16:11	Text Document	44 KB
y_coordinates	22/04/2022 16:11	Text Document	44 KB
z_coordinates	22/04/2022 16:10	Text Document	42 KB

The plugins are in this google drive link:

https://drive.google.com/file/d/14CnPk1RW310ggaiL577og6EJfLi1Ty75/view?usp=sharing

To import the plugin into your DAW of choice you need to extract the files from the zipped folder and move either the AU or VST3 file into the appropriate folder. For Windows, move the VST3 file to:

Program Files/Common Files/VST3

For Apple OS move the AU file to either:

Macintosh HD:/Library/Audio/Plug-Ins/Components

Macintosh HD:/Users/[Your Username]/Library/Audio/Plug-Ins/Components

Then inside your DAW run a plugin scan and the plugin should be able to open up ready for use.

Using the Synth

The synth is monophonic so can only play one note at a time.

The setup of the synthesizer section is fairly standard for a subtractive synthesizer having 3 oscillators, a low pass filter, and an envelope.

Each oscillator has its own positioning in the 3d space which can be modulated with an LFO.

To enhance the binaural effects, a convolution reverb and stereo delay work well.
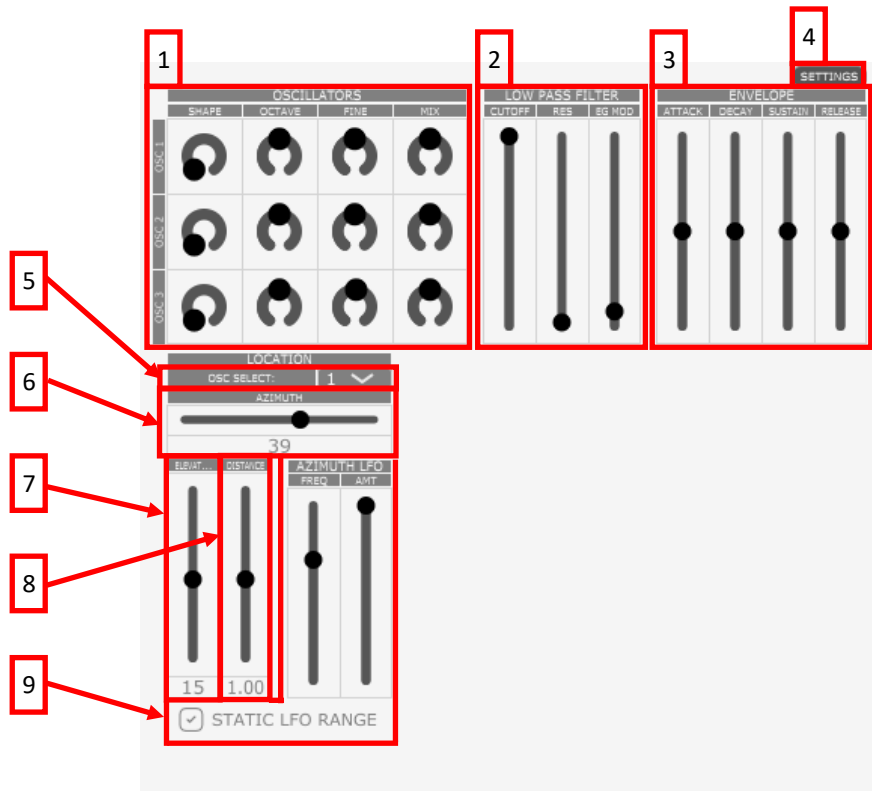
1). Oscillator Section

The synth has 3 oscillators; each with a shape (sine, saw, triangle, square), octave, fine tune, and mix control. Each oscillator has its own row with each column being designated a different control.

Note: The rotary controls are horizontal and vertical drag as opposed to control of the circle along the track.
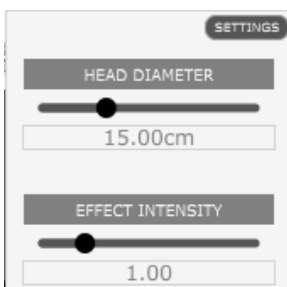
2). Low Pass Filter

The filter section is fairly standard with control of the cutoff frequency, the resonance of the filter, and the amount that the envelope modulates the cutoff frequency.

3). Envelope Generator

ADSR envelope generator controlling the amplitude of the output signal and the filter cutoff frequency.

4). Binaural Effect Settings

When the settings menu is open it allows a personalisation of the binaural effect.

The head diameter is the distance between the user's ears. 15cm is average and will create the most realistic effect. However, for a more pronounced effect, going up to the unrealistically large heads (eg 50cm) can be effective.

The effect intensity alters the Q of the binaural filtering. A higher intensity will narrow the filters and make a more pronounced effect.

5). Oscillator Location Select

Each oscillator has its own location in the binaural space. This menu allows you to choose which oscillator location is being altered in the location section of the synthesizer.

6). Azimuth Control

The azimuth is the horizontal angle at which the sound source is located. See Azimuth LFO for information keeping a static azimuth angle.
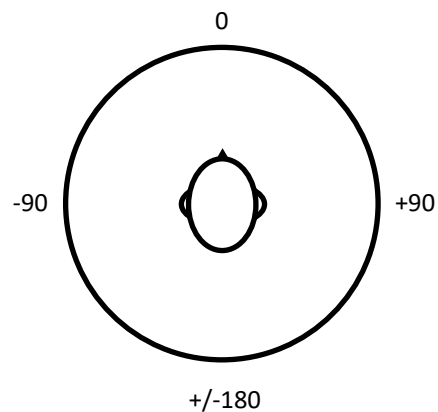
This figure illustrates at which angle the sound source is in relation to the slider value.

7). Elevation Control

This controls how high up the sound source is. There are 31 angles to chose from with lower values being lower down and higher values being higher up.

8). Distance Control

Controls how far away the sound source is from the user. This changes both the amplitude of the signal and the timings in which it reaches each ear.

Note: Having a short distance can amplify the signal drastically at certain angles therefore it is recommended to adjust this with the current oscillator mix being low to avoid clipping.

9). Azimuth LFO

This is an LFO to change the azimuth angle. The LFO can either be set to have static range or a global range. When the static range is enabled with the tick button, the sound source changes about the azimuth slider position. The sound source will then change azimuth within the LFO amount range. The figure below shows the sound source in blue and the range that the sound source will moves left and right between.
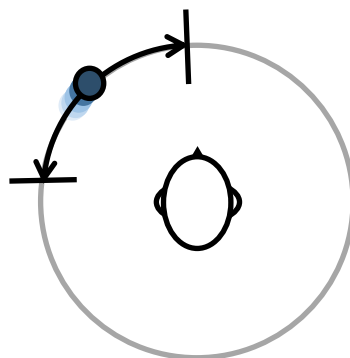
If the LFO has been set to global (the static LFO box is unticked) then the azimuth slider is removed and the sound source is in constant rotation around the user. The movement can be changed from clockwise to anti-clockwise and vice verse with the clockwise button.

In order to have a completely static azimuth, the LFO must be static and the LFO amount set to minimum – the azimuth is then only set by the azimuth slider.

EDIT: There is now a one location button. This allows all the oscillators to have the same sound source. When ticked all the oscillators will come from the same location as set on oscillator 1.