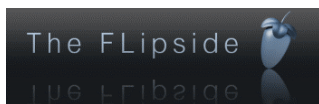




**Octav8r** was developed by **de la Mancha** and **Singing Crane** for the **Flipside Forum**.  
It is a VST effect for Microsoft Windows.



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## Introduction

**Octav8r** is a 7-node pitch-shifter that generates 6 differently pitched stereo versions of the audio input added to a 'dry' non-shifted signal to generate a richly layered sound. Each node has its own volume envelope and variable state filter plus send controls to vibrato, chorus, delay and reverb effects. The envelopes can be triggered by midi, audio gate or in sync with the host tempo.

## Features

- 6 pitch-shifting nodes, with octave shifting (-3 to +3) and semitone shifting (-12 to +12, to 0.001 semitones)
- All nodes have independent volume, pan, ADSR envelope, variable state filter, vibrato, chorus, delay and reverb controls
- Node 0 is the 'dry' audio at incoming pitch, which also has pan, ADSR, chorus, delay and reverb
- Envelopes can be triggered by midi note, audio gate, a tempo-sync loop or bypassed
- Envelope contours can be changed and set to restart or pick-up at retrigger
- Mix level can be adjusted between dry and pitch-shifted nodes
- Each node can be fine tuned for pitch shift method and buffer size
- Each node, envelope and effect can be switched off to save CPU
- Midi CC support and midi learn for most controls
- 38 presets
- Multi-out version for hosts that can support this feature

## Uses

The primary idea of Octav8r is to create multiple pitch-shifted layers of the incoming audio. With some twiddling you can get creative with panning to generate separation around the stereo field, use envelopes to bring each node in and out at different times and use chorus, delay and reverb to make each node sit differently in the mix. You can use the tempo-sync envelope trigger to create rhythmic gating or pulsing and the envelope toggles to make only some nodes modulated whilst others stay constant. Most controls have midi CC and midi learn support, so with some automation or midi knob twiddling, you can make the output really move around.

## Installation

Download the zip file and extract the **Octav8r.dll** file to the folder you have set up as your VST directory. Ensure your host can see Octav8r as an effect and load it as you would any other effect. Just delete the dll if you wish to uninstall.

There is also a multi-out version of Octav8r included in the zip file, where each node is output to a different mixer channel for further separate processing. This multi-out version requires a VST host that can route multi-out effects, such as eXT2. It won't work in hosts that don't support this feature, like FL Studio.

## Controls

All knob controls can be modified by either turning the knob, or entering the required number directly in the display.

### **Nodes**

Nodes 1-6 are pitch-shifting nodes with vol, pan, ADSR, vibrato, chorus, delay & reverb  
Node 0 is as 1-6 but without pitch-shifting, vol or vibrato

Each node can be turned off with the toggle next to its number. This will save CPU cycles, so always turn off unwanted nodes.

Each node can also be fine-tuned for the pitch shift method and buffer window size

### **Method ( I or II )**

I is recommended for small shifts less than 2 semitones

II is recommended for larger shifts greater than 2 semitones

### **Buffer window size (ms)**

Click and drag the buffer window box up and down to change the value of the buffer window. You can change these to alter the smoothness of the shifting depending on your source material. Smaller values may create some ringing, larger values may create some echoes. The overall sound of the plugin can also be made smoother by using different values for each node. Values have been pre-selected for those that sound most 'musical'.

### **Octave (-3 to +3)**

Use to change the node pitch in exact octave numbers

### **Semitone (-12.000 to +12.000)**

Fine pitch shifting between octaves, down to 0.001 of a semitone

### Vol

Controls the relative volume of each node, as a percentage of the summed volume of all 6 pitch-shifting nodes. The sum of all 6 relative volumes is therefore always constant, with the ratio for each node calculated from the sum

$$v1(rel) = v1 / (v1+v2+v3+v4+v5+v6)$$

This is done to maintain a constant output volume even with automation of the volume knobs or node on/off toggles. See the two examples in the tables below for an illustration. In the second table, the vol of nodes 1 to 3 are unchanged, but the increase in volume of nodes 4 & 5 means their relative volume drops to maintain the total volume at a constant 100%

Node	Vol	Relative volume
1	10	50%
2	5	25%
3	5	25%
4	-	-
5	-	-
6	-	-
<b>Sum</b>	<b>20</b>	<b>100%</b>

Node	Vol	Relative volume
1	10	25%
2	5	12.5%
3	5	12.5%
4	10	25%
5	10	25%
6	-	-
<b>Sum</b>	<b>40</b>	<b>100%</b>

### Pan

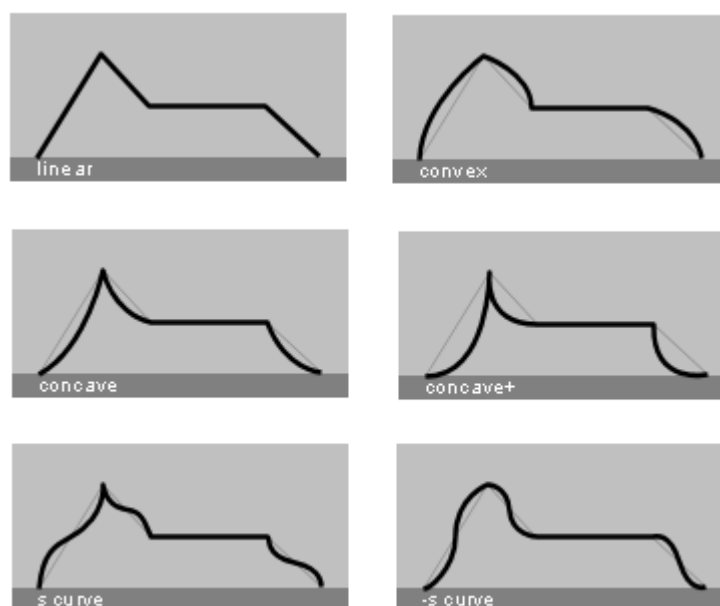
Moves the node output between the left and right stereo channel, 0 = centre

**Envelope** – the envelope of each node can be toggled on/off with the button to the left of the Attack knob. If the envelope is off, then audio passes through unmodulated by the envelope. The envelopes can be triggered by 3 different methods, see **Envelope Trigger Modes** for information on how to trigger the envelope

**Attack, Decay** and **Release** are in milliseconds (ms).  
**Sustain** is a level (0-10) for the volume to be held during the sustain phase.

There are 2 further options for each envelope;

**Contour** – each envelope can be modified to have a different contour for each phase to vary the sound produced. See the diagram below for the choices



Where the choice has two contours (e.g. lin/cave), the first is the attack phase; the second is the decay/release phase

### Retrigger mode

This is the action on the envelope if it is retriggered before it has finished the release phase.

**ReStart** – envelope will restart the attack phase from zero. Gives a more defined retrigger, but may cause clicks on some sound sources

**PickUp** – envelope will restart the attack from whatever level it was on when the retrigger occurred. Gives a smoother retrigger, which may not be audible depending on which phase the envelope was at. Use this mode to reduce clicking if caused by ReStart mode.

[See **Envelope Trigger Modes** for information on how to trigger the envelope]

### Effect levels

Each node has 4 effect levels, **vibrato**, **chorus**, **delay** and **reverb**. These control the amount of that effect on each node. In the case of vibrato, this is the depth of the pitch variation, in the case of chorus, delay and reverb, it is the send level to that effect

[See **Effects** for information on the controls of each effect]

## Envelope Trigger Modes

At the top of the plug-in, there is a drop-down to select the mode for triggering the envelopes. The mode is global and applies to all envelopes, although you can turn off each envelope individually so that only some nodes are affected.

**Off** – all envelopes are bypassed and the volume is not modulated by the envelopes

**Tempo** – the envelopes are triggered and retriggered on a tempo-sync loop (for rhythmic pulsing and gating)

**Audio** – the envelopes are triggered when incoming audio passes a threshold

**Midi** – the envelopes are triggered by incoming midi signals

### Tempo mode

In this mode, the envelope is retriggered continuously on a loop, in sync with the host tempo. This can be used for rhythmic gating or pulsing, or a continuous rise and fall of volume over a longer period of time.

### Beats

In the drop-down box, select in beats, the loop cycle. This is how often the envelope will retrigger. E.g. selecting 0.5 beats means that the envelope will retrigger every half beat (or twice per beat), which will give a gating effect with short envelope cycles.

Under this drop-down, the loop cycle time (ms) is shown for the loop, which is automatically calculated from the host tempo. At 120bpm, 0.5 beats would be 250 ms, so the envelope retriggers every 250ms

### Pulse

Pulse is equivalent to a midi note-on length, imagine it as the length of time you are holding the note down, where upon note-off (end of pulse) the release stage of the envelope comes in. The length of the pulse determines how long the sustain part of the envelope is held

Pulse length = attack + decay + sustain.

If you have an envelope with;

Attack = 20ms

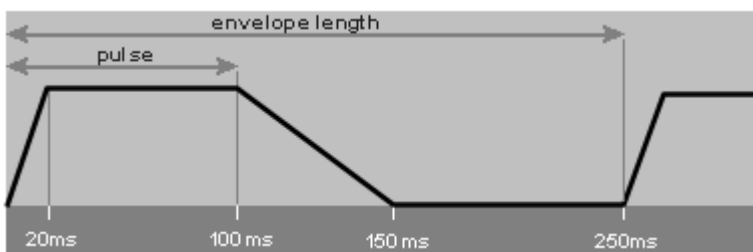
Decay = 0ms

Sustain = 10

Release = 50ms

And you set Pulse = 100ms, then the sustain will last for 80ms (100 – 20 – 0)

Envelope will be active for 150ms, with a retrigger every 250ms



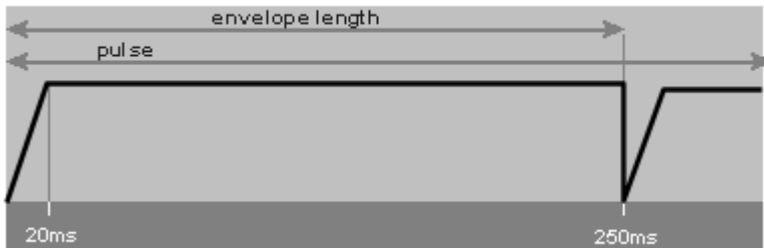
If the pulse is made longer than the loop cycle time, then the retrigger will happen part way through the envelope. In the above example, if the pulse is now made to be 500ms;

Attack = 20ms

Decay = 0ms

Sustain = 230ms (should be 480ms in theory, but is retriggered after 250ms)

The retrigger cuts off the sustain and release. You would need to increase the tempo mode to 2 beats in order to hear the release phase.



Similarly with short loop cycle times, if the attack and/or decay are increased, then the sustain phase may never be reached.

Tempo mode = 0.5 beats (250ms @ 120bpm)

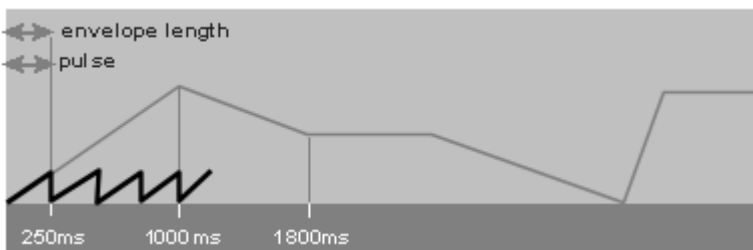
Pulse = 250ms

Attack = 1000ms

Decay = 800ms

Sustain = 6

Release = 1500ms

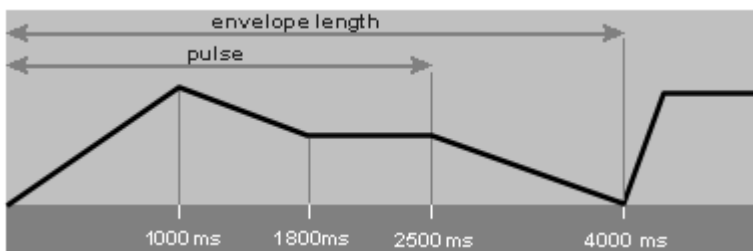


Although the envelope is a theoretically nice long gentle sweep, because it is retriggered every 250ms, it never gets out of the attack phase and will only reach 25% of volume before retrigger.

By increasing the loop cycle time and pulse length, the whole envelope can be heard

Tempo mode = 8 beats (4000ms @120bpm)

Pulse = 2500ms



### Audio mode

Audio mode is intended to trigger the envelope when the incoming audio passes a dB threshold and hold it in sustain until it drops below the threshold (where release phase comes in). This would be useful for non-midi instruments such as a guitar or vocals.

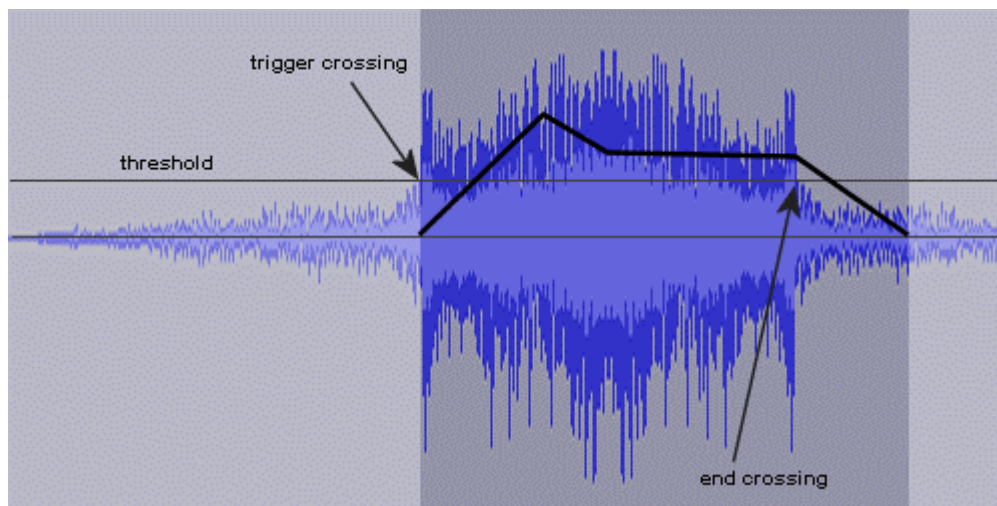
### Gate dB

This sets the threshold in dB where the envelope will be triggered and held until the audio drops below it.

### Hold ms

This is a 'peak hold' setting, which will keep the envelope sustained for the time selected even if the dB level drops below the threshold. It is useful where the incoming audio dB is unstable and you don't want the envelope to release/retrigger for short drops in volume level.

You may need to adjust both settings for your audio to get the envelope to trigger and remain held. Set the gate dB as low as possible to avoid accidental triggering, and the hold as long as possible to avoid unwanted drops/retriggers.



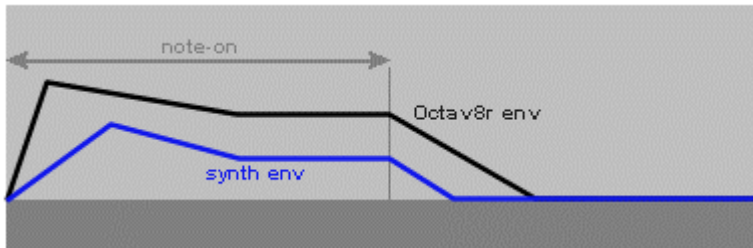
You can see areas on the audio waveform that fall below the threshold during the envelope activation, but these are short in duration and do not become 'end crossings' if the Hold parameter is long enough

### Midi Mode

Midi mode allows you to trigger and hold envelopes using incoming midi notes, as if part of a synth.

Ensure in your host that you have routed the source of the midi notes into Octav8r and each note will trigger the envelope and hold it in the sustain phase until the note is released. The midi could be generated by a synth that is playing and effected by Octav8r, or another synth or midi channel that acts only as an envelope trigger.

If the midi is generated by a synth, then the envelopes of the synth will also determine how long the sound is modulated. If the release of Octav8r's envelopes are say 1000ms, then the release of the synth's own envelopes must be at least 1000ms in order for the Octav8r envelopes to have audio to modulate. If the synth release is very short, say 10ms, then when the midi note is released, the synth will only output audio for 10ms. It doesn't matter how long you make Octav8r's release, if there is no audio coming in to Octav8r, then the release phase will have no audio to modulate.



You can see the synth envelope has a shorter release phase and so this will stop the audio being heard long before the Octav8r envelope has finished

In this case, to get the release phase of Octav8r to be heard, there are two options;

- Increase the synth release envelope so the note is heard longer after note-off
- Use a second source of midi note with shorter notes, so the Octav8r envelope is released earlier than the synth's

### Effects

Each node has controls to determine the amount of effect for that node, but the master effects settings are in the top right of the plug-in. Each effect can be toggled on/off (which can save CPU if not required). To see the master controls for each effect, select the appropriate button with the effect name on.

### Vibrato

This makes the pitch of the node oscillate a very small amount around the main pitch. On each node you can set the amount of pitch change (amplitude) of the vibrato

### Beats

This is the frequency of the vibrato, in sync with host tempo, so the pitch oscillates every beat, twice per beat or 4 times per beat.

### Waveform

This is the LFO waveform for the vibrato, to change the sound. For example, sine will give a smooth vibrato, where square will give a harsher sound.

### Offset

Use the up/on/down arrows to determine the vibrato offset in relation to the master pitch.

Up – the vibrato will modulate the pitch above the master pitch

On – the vibrato will modulate the pitch evenly above and below the master pitch

Down – the vibrato will modulate the pitch below the master pitch

### **Chorus**

This is a 1 voice Chorus effect with modulation

#### **Delay**

The amount of pre-delay in ms

#### **Hz**

The frequency of chorus modulation

#### **Depth**

The depth of chorus modulation

#### **Delay**

This is a tempo-sync delay with feedback damping

#### **Delay time**

In the dropdown menu, select the temp-sync delay time, from 1/8 beat to 8 beats

#### **Feedback**

Increase to have greater number of delay echoes

#### **Damp**

Increase damping will make each echo 'fade' more than the last

### **Reverb**

This is a simple reverb effect, with damping for high frequencies

#### **Size**

This is how deep the reflecting space is

#### **Width**

This is how wide the reflecting space is

#### **Damp**

This is how much the high frequencies are absorbed or damped

#### **Mix**

This is a wet/dry mix, to determine how much reverb is applied globally

### **Midi Learn**

Most controls have been assigned a unique MIDI CC value. See *Appendix* for a table of MIDI CC values

MIDI learn is a simple process that is saved for future sessions

- Press the 'learn' button
- A timer icon appears to show that learning is in progress
- Tweak the control you want to assign to a hardware controller
- Tweak the hardware controller knob/slider/button
- The timer icon should now disappear to indicate learning is complete
- The hardware controller should now be linked to the VST control

Press the 'reset' button only if you wish to reset all previously learned controls

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## Credits

Thanks go to the beta test team especially WhiskeyPriest and brstma for not just testing and bug hunting, but feature ideas and development help. Thanks also to WhiskeyPriest for the GUI ideas and inspiration.

Thanks also to Jeff McClintock for creating SynthEdit and to the 3<sup>rd</sup> party SE module developers, without which this plug-in wouldn't exist.

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### Links

FLipside Forum	<a href="http://www.theflipsideforum.com">http://www.theflipsideforum.com</a>
SynthEdit	<a href="http://www.synthedit.com/">http://www.synthedit.com/</a>
Dave Haupt Modules	<a href="http://www.dehaupt.com/SynthEdit/semODULES.htm">http://www.dehaupt.com/SynthEdit/semODULES.htm</a>
KD Lynch Modules	<a href="http://www.rubyhex.com/synthedit/">http://www.rubyhex.com/synthedit/</a>
Chris Kelly Modules	<a href="http://www.chriskerry.f9.co.uk/">http://www.chriskerry.f9.co.uk/</a>
Scoofster Audio Modules	<a href="http://scp.web.elte.hu/synthedit/modules.html">http://scp.web.elte.hu/synthedit/modules.html</a>

## About the Developers

de la Mancha is a UK based producer of odd-skool breakbeat, downtempo glitchy beats and other assorted bleeps and noises. He also develops freeware synth, drum machine and effect plugins and still finds time to make babies and sleep. You can find his music, plug-ins and other junk at [www.delamancha.co.uk](http://www.delamancha.co.uk)

Singing Crane is a US based musician who dabbles in a wide range of genres and styles. Apart from original music, photography has become a fundamental part in the inspiration and creation process of Singing Crane Audio - [www.singingcrane.com](http://www.singingcrane.com) (S.C. just so happens to also be the founder of The FLipside FL Studio forum)

Sign up for the newsletter if you want to be kept in touch about plug-in releases and updates: [news-subscribe@delamancha.co.uk](mailto:news-subscribe@delamancha.co.uk)

