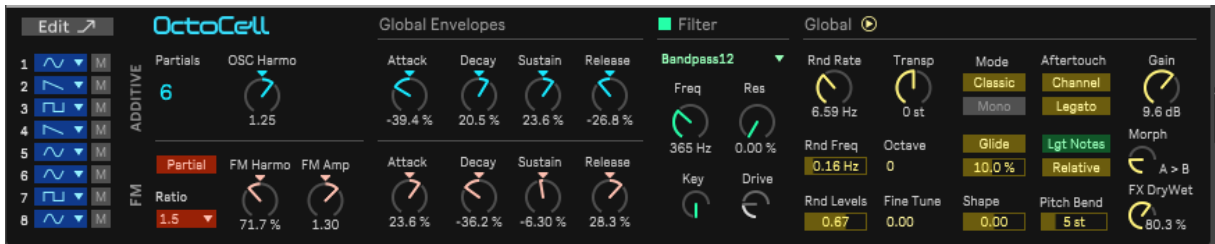


OctoCell



User's manual

V 1.1

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Preamble

The **OctoCell** is a new synthesizer designed by **Michel Geiss** – musician, long-time collaborator of Jean-Michel Jarre and designer of hardware instruments; and **Jean Lochard** – musician, collaborator of the famous **Ircam** (the Parisian music research institute), and co-designer of the **Ircamax 1 and 2** collections.

The **OctoCell** is a hybrid multi-synthesizer. It's compatible with **Live 11** running **Max for Live**. It combines several types of synthesis: additive, FM and subtractive. The device really shines when you combine very "analog" timbres such as the **TOX** preset, with very FM timbres like the **TOY** preset. You can find these in the **Tutorials** folder.

Its original concept and expressiveness, including **MPE** (MIDI Polyphonic Expression) compatibility, make the **OctoCell** a unique and versatile instrument that can be used in all forms of music.

Basically, the **OctoCell** synthesis engine consists of an additive structure of eight oscillators, each with its own amplitude envelope. Since these eight oscillators are organized into additive synthesis elements, they're referred to as **Partials**.

For each oscillator, you have a choice of three waveforms: **sine**, **sawtooth** and **square**. When in sine mode, each oscillator has its own frequency modulation oscillator, with its own envelope. It's a set of eight synthesis cells, hence the name "**OctoCell**".

1.1 *About this manual*

An extensive collection of presets gives you an idea of the diverse range of sounds the **OctoCell** is capable of producing. In addition, the settings in the Device View (at the bottom of the main window) make it easy to create variations to suit your compositions.

If you want to create your own sounds, and experiment with the **OctoCell**'s new approach to synthesis and its unusual features, this document serves as a useful reference. To understand all the **OctoCell**'s features in detail, read through this manual and follow along – you can find all the presets referenced in the **Tutorials** folder.

1.2 *Presets and MPE compatibility*

Several hundred presets for classic MIDI use are provided with the device, along with several dozen in **MPE** mode.

Although some presets have been created specifically for the OctoCell's **MPE** functions, those that use the modulation wheel can also be used in **MPE** mode. To

do this, simply switch from **Classic** to **MPE mode** in the global settings of the Device View (see **3.8.2**). The **Slider** parameter of the **MPE** controller then replaces the modulation wheel.

*Note: In MIDI **Classic** mode the OctoCell also supports **Polyphonic AfterTouch** with keyboards that have this feature. **Ableton Push** controllers can be configured to generate independent AfterTouch for each pad (see the Live 11 manual for details).*

1.3 **Action on settings**

When the **OctoCell** is activated, the instrument's functions are displayed across two windows: the **Device View** where you find the quick action settings, and the **Edit** window where you access the details of the synthesis engine.

By experimenting with the global settings in the Device View you can use the presets as starting points to create endless variations.

Changes to the **OctoCell's** settings are made in the usual way:

- Click and drag to move the knobs or linear cursors with your mouse
- By pressing the **shift key** and using your mouse to make finer adjustments

2 **Synthesis structure**

2.1 **The additive part**

The backbone of the OctoCell is an additive structure consisting of 8 **partials**: a **fundamental** and its **harmonics** from 2 to 8.

*Note: in additive synthesis, the simple elements (sinusoids) that are added to each other are called **partials**. If these partials have frequencies that are integer multiples of the lowest frequency (also called fundamental frequency), they are called **harmonics**. Harmonic 2 has twice the frequency of the fundamental, harmonic 3 three times, harmonic 4 four times, and so on.*

In the **OctoCell**, the number of partials has been deliberately limited to eight to make this additive function easy to manage. Despite this simplicity, you can create very rich and varied timbres.

In the Device View, you can choose the number of active **partials** between 1 and 8. As this parameter affects the CPU load, it's a good idea to use a limited number of partials when creating new sounds.

In the left of the Device View, you can see the waveform of each partial: **sine**, **sawtooth**, or **square**.

The **M (Mute)** button mutes the corresponding signal. You can use this to test different combinations with or without some partials.

2.2 The Envelopes

In the **Edit** window, each block of 8 vertical sliders corresponds to the volume envelope settings of oscillators 1 to 8.

In the **ADD Envelopes** section, each oscillator has a **DADSR (Delay, Attack, Decay, Sustain, Release)** amplitude envelope. The triggering of each can be delayed by the **Delay** setting.

Each envelope has its own amplitude setting, located in the **Morphing** section of the **Edit** window. This is actually a double set of eight volume values – **'Max Amp A'** and **'Max Amp B'**. The **Morph** button in the Device View allows you to blend these two volume sets – turn the knob to the left to bring out set A, or to the right to favor set B. When the knob is in the middle, each of the two sets is equal.

The effect of **morphing** is either static or dynamic through the action of modulation parameters. This is one of the important functions of the **OctoCell** synthesis engine.

The velocity action can affect the **Attack** and **Decay** parameters separately through their **"Vel"** setting, from – 100% to + 100%. Attack time is increased when you set it to positive values and decreased when set to negative values. The same applies to the **decay** time, which is increased with positive values and decreased with negative values. When these are set to 0% the velocity has no effect on these two parameters.

Each ADSR parameter has a **"Rnd"** button that gives you random variations. This allows you to keep changing up a continuous sound, sometimes with pleasant surprises.

2.2.1 Preset T01.

Load preset T01 from the **Tutorials** folder.

The **Partials** parameter shows you how many partials are turned on. In this example, you can see that only one partial is used.



Fig. 1 Selection of the number of partials used

In the **Edit** window, you can see that the settings of the non-activated partials are displayed in dimmed colors. You can modify these, but they won't have any effect until the corresponding partials are activated.

Play the sound produced and select one of the three waveforms.

If you click the **M (Mute)** button, the sound is muted.

In the **Edit** page, set A has only one setting, and **its** volume is set to the maximum.

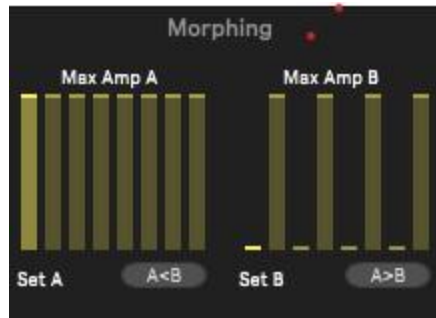


Fig. 2 The Morphing section of the Edit window

If you pull the slider down, the volume decreases.

Try testing out different Attack, Decay, Sustain and Release settings on the first sliders of the ADD and FM Envelopes in the **Edit** window.

*Note: The **Delay** block controls the envelope trigger delay setting. It gets interesting when several partials are active, to offset the delays of the partials against each other. One or more of the delay settings must be set to the minimum, otherwise there will be a latency when playing.*

2.2.2 Preset T02

This preset uses two partials.



Fig. 3 Two partials are activated

Two sliders are now bright in the **Morphing** window (**Max Amp A** block).

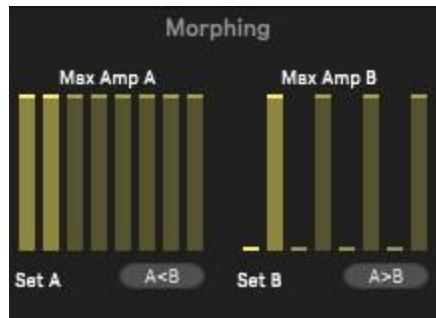


Fig. 4 Two sliders are active in the Morphing section

They represent the volumes of the first two envelopes, shown here at their highest setting on Set A. By adjusting the volumes of these envelopes, both the maximum volume and the Sustain volume will be affected.

2.2.3 Preset T03

In this example, the eight partials are in harmonic relationship (by default). With the increasingly long delay settings for partials one to eight, you hear them appearing in succession, all with the same amplitude.



Fig. 5 Here, the envelope triggering delay times are increasing

In this example the Sustain levels are all at their maximum levels.

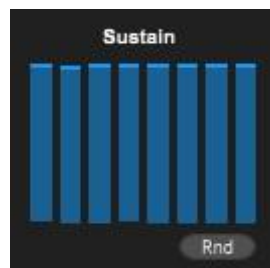


Fig. 6 The Sustain volumes of the T03 preset

You can try other Sustain values to hear a different distribution of harmonics.

2.2.4 Preset T03B

You can see an example of different harmonic distribution in the **T03B** preset:

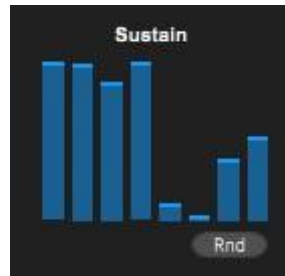


Fig. 7 The Sustain volumes of the T03B preset

You can experiment with harmonic variations by using the **Harmonicity** setting in the Device View. To change the spectral distribution of the harmonics, turn the knob clockwise for expansion, or counterclockwise for compression.



Fig. 8 Setting the harmonicity of the additive part

In the **Edit** window, the **Expert Parameters** let you tweak the partial/fundamental ratios for each oscillator, either by coarse or fine adjustment.

In the example in **fig. 9** the second harmonic has been reduced to the pitch of the fundamental (oscillator 1) and then detuned slightly using the fine setting:



Fig. 9 Setting the frequency ratio for each part in the Expert Parameters section of the Edit window

2.2.5 Preset T04

In this preset, the appearance of the partials is more gradual, with increasingly long attack times from partial 1 to partial 8.



Fig. 10 The progressive attack times between envelopes 1 to 8

Try changing the velocity action setting on the attack times by increasing or decreasing the value in the **Vel** setting at the bottom of the Attack group of sliders. When set to a negative value, the attack times will decrease as the velocity decreases. With a positive value setting the attack times will increase along with the velocity.

The principle is the same for the decay times. With negative values the decay times decrease with the velocity. With positive values, the decay times increase with the velocity.

2.2.6 Preset T05

Waveform one is now a sawtooth and waveform two a square. You can hear the difference in timbre and guess how many combinations are possible by changing the waveforms of the eight oscillators!

2.2.7 Preset T06

This preset is an example of how velocity affects attack times.

In the **Global Envelopes** section in the Device View, you can globally adjust the fixed ADSR parameters of all eight envelope sets to quickly modify a sound. Turn the knobs counter-clockwise to decrease the values and turn them clockwise to increase them.

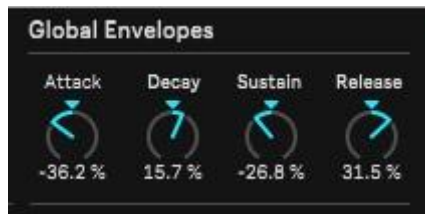


Fig. 11 Global envelope time setting for the additive part in the Device View

2.2.8 Preset T07

Underneath the Attack, Decay, Sustain and Release settings in the Edit window you'll find **Rnd** buttons – these allow you to test random variants.



Fig. 12 Using the Random function and the action of velocity on Decay times

Click the **Rnd** button underneath the Attack group settings several times, listening to the result each time. You can test this function with the presets provided to discover new versions of the sounds that you can save.

You should now have a pretty good idea of how the additive synthesis part of the **OctoCell** works.

2.3 The FM part

FM synthesis allows for the creation of a large number of rich sounds from only two sinusoidal sources. The frequency of the first – the **carrier** – is modulated by the second – the **modulator**. The timbres produced depend on the modulation frequency and its amplitude. When these two modulation parameters vary, the timbres produced change.

The **OctoCell**'s combination of FM synthesis and additive synthesis gives you the possibility to create many different harmonic or inharmonic sounds.

Each of the eight **sinusoidal** oscillators in the additive part can be frequency modulated by its own FM oscillator.

Note: the FM has been deliberately limited to sine mode oscillators. The FM part of the OctoCell can produce a wide variety of timbres, even with this limitation. Because of this design, when the partials have sawtooth or square waveforms, some settings are hidden:

- *In the Device View, the FM section is disabled; it remains enabled if at least one of the partials is in sine mode*
- *In the **Expert Parameters** section of the **Edit** window, the **FM Ratio** settings for all non-sinusoidal partials are disabled and hidden*

2.3.1 Preset T08

In this preset, only one partial is selected in the Device View. All the envelope parameters are at their minimum, except the Sustain of the first oscillator. When you press play, you'll hear the pure sound of a sine wave.

Now, increase the Sustain value on the first oscillator's FM envelope (in red). The more you increase this setting, the richer the timbre becomes.



Fig. 13 Setting the FM Sustain levels for the first partial: on the left a sine wave can be heard, on the right the Frequency Modulation is active

In this example, the FM sustain and amplitude values are stable, so the timbre produced is also stable. The volume of the modulation envelope allows you to control the evolution of the timbre produced by the FM.

2.3.2 Preset T09

Here you have an example of dynamic variation of the timbre by the FM modulation envelope.

In this preset, two decay times are set separately in the additive and FM sections. As in the additive part, you can adjust the maximum amplitude of each envelope in the **Morphing** section.

The **Ratio** value is set to 1.



Fig. 14 The Ratio parameter in the Device View

When the ratio between the frequency of the first additive oscillator and the first FM oscillator is 1, their frequencies are identical. In this case, the values of the frequencies generated by the frequency modulation are in harmonic relationship (x1, x2, x3, etc.) with the carrier (partial).

If you change this value, either by decreasing or increasing it, you will notice that the timbre changes according to the value of the **Ratio**. A whole number value will keep the sound harmonic.

Fractional number values (0.75, 1.25, 1.5, 2.5) allow you to create inharmonic sounds. If you set the Ratio to 2.5, for example, you will hear a metallic sound typical of FM synthesis.

This Ratio setting is global – the ratio between the frequencies of the additive oscillators and the corresponding FM oscillators is changed proportionally in the same way.

In this preset, the **FM Harmonicity** knob is centered and shows a value of 100%.



Fig. 15 FM harmonicity setting in percent

This parameter is a percentage of the Ratio. You can use this knob to change the value continuously – either manually or with a MIDI controller.

To modify the frequency modulation Ratios for each individual partial, head to the **Expert Parameters** in the Edit window.



Fig. 16 FM harmonicity settings for each part in the Expert Parameters section of the Edit window

2.3.3 Partial/Fund

The Partial button switch has two positions: **Partial** or **Fund (fig. 15)**. It lets you quickly produce two types of FM modulations, accessing two different types of sounds with the same setting.

With this button you can set the reference used for FM frequency harmonicity adjustments. Use a minimum of two partials to hear a difference in timbre when this function is activated.

In **Partial** mode, the **Ratio** relates to the frequencies of the partials.

In **Fund** mode, the **Ratio** relates to the frequency of the fundamental of the additive part.

2.3.4 Preset T10

This preset has two partials. Play notes and alternate between **Partial** and **Fund** to hear the differences in timbre.

Next to the **FM Harmonicity** setting, an **FM Amp** setting adjusts the overall amplitude of the FM modulation.



Fig. 17 Setting the harmonicity and overall FM amplitude in the Device View

As with the additive part, in the Device View you'll find global settings to adjust the ADSR parameters of the eight FM envelope sets.



Fig. 18 Setting the global envelope times for FM in the Device View

2.3.5 Dynamics on FM envelopes

As with the Attack and Decay envelopes of the additive part, the Attack and Decay parameters of the FM can be affected (from -100% to +100%) by dynamic keyboard playing. The velocity of a keystroke affects the attack time duration, which is increased with positive values of the setting and decreased with negative values. Velocity works the same way on decay time – it increases with positive values and decreases with negative values. When set to 0% the velocity has no effect on these two parameters.

2.3.6 The T11 Preset

This preset can give you an idea of the effect of velocity on the attack and decay times of both the additive partial and its FM modulation.

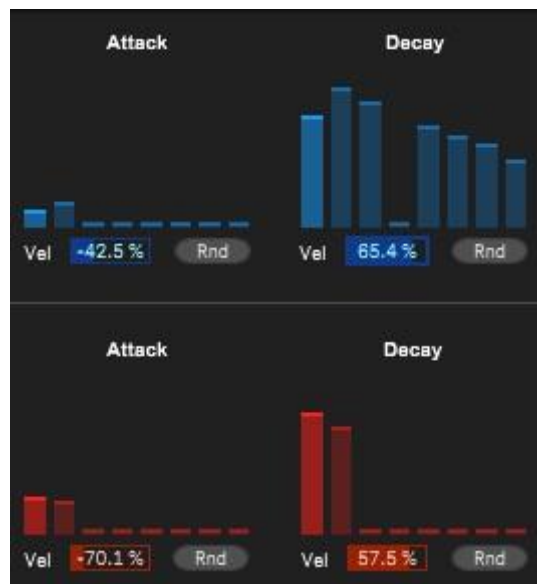


Fig. 11 Attack and decay settings for preset T11

As you will see later, the dynamics can also affect the FM amplitude through an assignment in the modulation matrix.

2.3.7 Preset T11B

When playing the keyboard, you can hear the timbre's dynamics change as velocity affects the amplitude of the FM.

To do this, a velocity percentage is assigned to FM Amp.

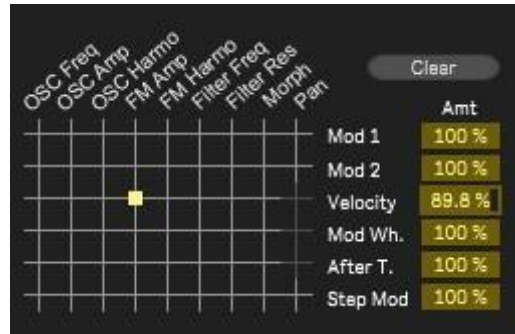


Fig. 20 The assignment of velocity to FM amplitude in the modulation matrix (Edit window)

2.4 Morphing

As mentioned above, the envelope volumes are set in the Morphing section of the Edit window. The two groups of eight settings in the upper half of the window are for the amplitude envelope volumes of the **additive** part.

These are the maximum values that these settings can take. You can explore the range in between these two groups of settings either manually or dynamically through modulations.

The same applies to the bottom half. These two sets are for the FM modulation envelope volumes.

The transitions between groups A and B occur simultaneously for both additive and FM envelopes.

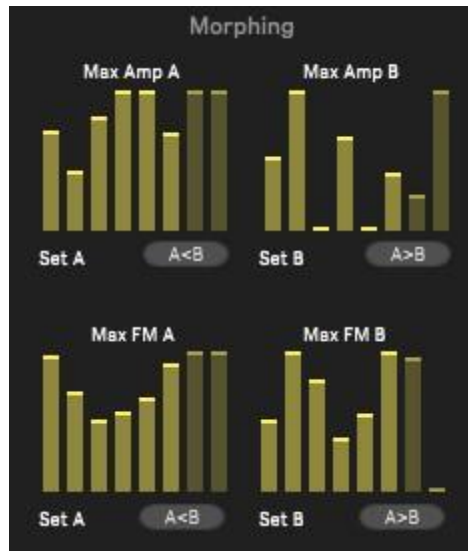


Fig. 21 The Set A and Set B volumes of the additive envelopes (top) and FM envelopes (bottom)

The **A<B** buttons copy the right-hand settings to the corresponding left-hand part, while the **A>B** buttons copy the left-hand settings to the right-hand window.

Load the **T10 preset** again, and try manually controlling the morph setting using the Morph knob on the right edge of the Device View (**A>B**).

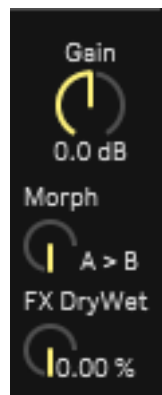


Fig. 22 Manual morphing between Set A and B

This lets you transition between **Set A** of the additive **and** FM amplitudes and **Set B** – the OctoCell’s basic morphing principle.

You can try modifying this setting between its minimum and maximum by playing the same note several times to hear the variation in timbre. As explained above, this changes from parameter set **A** to parameter set **B**.

One of the possibilities of this manual function is to find an intermediate position whose sound you like and save it separately as a new preset. The OctoCell’s morphing is also modulable, which makes it very useful for creating dynamic timbres.

This function is equivalent to transitioning between waveforms, making it comparable to wavetable synthesis.

To hear another example of this, Load the **T0XY preset**. Using the Morph knob, you'll be able to hear a progressive transition between a typical Analog-like sound and a bell-like sound typical of FM.

3 The other elements

3.1 *The filter*

The **OctoCell**'s basic filter is a model of the classic **Ladder filter**, popularized by its use in early Moog synthesizers.

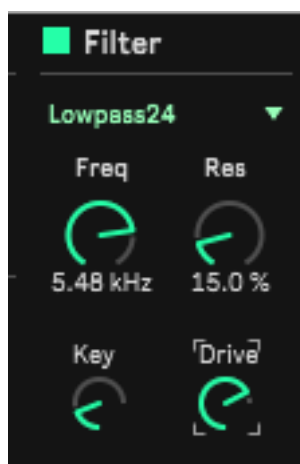


Fig. 23 The filtering section of the global window

It's activated or deactivated by the green button next to the name **Filter**.

Here you can access the following parameters:

- **Freq**: the center frequency
- **Res**: the resonance
- **Key** (for key tracking): the setting for tracking the center frequency by the pitches of the notes played
- **Drive** (overdrive): adds a smooth saturation of the filter with compensation for the usual increase in volume with this kind of effect

Note that the center frequency and resonance of the Filter can both be modulated via the Modulation Matrix.

In addition to the classic 24 dB/Octave **Lowpass24** filter, you can choose between five other types of filters:

- **Highpass12**: 12 dB/Octave highpass filter
- **Bandpass12**: 12 dB/Octave bandpass filter

- **Lowpass12**: 12 dB/Octave lowpass filter
- **Notch12**: 12 dB/Octave notch filter
- **Peak12**: 12 dB/Octave peak filter.



Fig. 24 Selection of filter type

The filter is globally applied to the whole additive/FM chain.

3.2 The Modulation Matrix

The OctoCell **Modulation Matrix** has **six sources** and **nine destinations**. Each source can be assigned to several destinations and several modulations can be assigned to one destination, as in most electronic instruments.

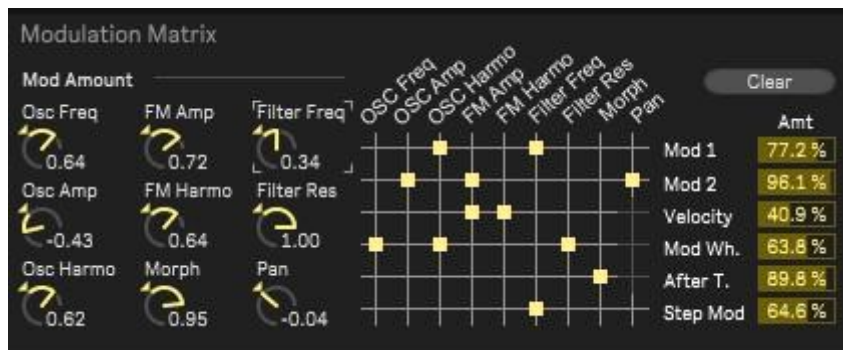


Fig. 25 Example of a modulation matrix configuration

3.2.1 The sources

Here is the list of sources available in the modulation matrix. Their action amplitude can be set from 0 to 100%.

- **Mod 1** (Modulator 1)
- **Mod 2** (Modulator 2)
- **Velocity**
- **Modulation Wheel**
- **Aftertouch**
- **Step Sequencer**

*Note: three modulation sources – **Velocity**, **Mod. Wh.** and **After T.** – can't be assigned to **Pan**. These playing controls weren't well suited to panning and the Vosynth team thought it best to avoid any complications from using them by making them inaccessible.*

3.2.2 The destinations and ranges of action

The following destinations are available:

- **Osc Freq** (frequency of all additive oscillators or global pitch)
- **Osc Amp** (amplitude of all oscillators)
- **Osc Harmo** (harmonicity of additive oscillators)
- **FM Amp** (FM action amplitude)
- **FM Harmo** (harmonicity of the FM)
- **Filt Freq** (filter frequency)
- **Filt Res** (filter resonance)
- **Morph** (morphing between **Set A** and **Set B** in the Morphing section)
- **Pan** (left/right panning)

On the left side of the matrix there's a set of nine setting knobs (**fig. 21**), each corresponding to a modulation destination. As soon as a destination is assigned to a source in the matrix, the corresponding knob is activated.

The amplitude of action on the destinations is adjustable from -1 (negative maximum) to +1 (positive maximum). Negative values result in inverted modulations.

3.3 The two Modulators



Fig. 26 The Modulators section of the Edit window

Modulators 1 and **2** are identical, so only one is described here.

On each modulator you can select from a drop-down list of functions. These consist of combinations of LFOs/ADSR envelope/modulation wheel:

- **Env**: ADSR (Delay, Attack, Decay, Sustain, Release) envelope

- **Sin*Env**: Sine LFO with volume modulated by the envelope
- **Saw*Env**: Sawtooth LFO with volume modulated by the envelope
- **Sqr*Env**: Square LFO with volume modulated by the envelope
- **Sh*Env**: Sample & Hold LFO with volume modulated by the envelope
- **Sin*MW/Sld**: Sine LFO with amplitude controlled by the modulation wheel or the **Slider** controller in **MPE** mode
- **Saw*MW/Sld**: Sawtooth LFO with amplitude controlled by the modulation wheel or the **Slider** controller in **MPE** mode
- **Sqr*MW/Sld**: Square LFO with amplitude controlled by the modulation wheel or the **Slider** controller in **MPE** mode
- **Sh*MW/Sld**: Sample & Hold LFO with amplitude controlled by the modulation wheel or the **Slider** controller in **MPE** mode
- **StpM*MW/Sld**: LFO **Step Modulator** with amplitude controlled by the modulation wheel or the **Slider** controller in **MPE** mode



Fig. 27 Modulation type selection for Modulator 1

When the modulation choice includes an **LFO**, several settings are available:

- LFO frequency
- Retriggering at each new note (**Retrig**)
- Synchronization to the song tempo, in fractions of a note (**Sync**)
- The starting **phase** of the LFO, between 0° and 360° (especially useful with sine and sawtooth waveforms)



Fig. 28 Example of Modulator 1 settings; here the amplitude of the sine LFO is modulated by the ADSR envelope

3.4 *The Step Modulator*

The **Step Modulator** is a bipolar programmable step modulator.

At the center line there is no modulation. Above it are positive modulations and below it negative modulations.



Fig. 29 The Step Modulator in the Edit window

In some ways the Step Modulator can be compared to the Sample & Hold function in the modulation source list. But it differs from it in its settings and in its **Smooth** function for softening the step transitions.

Trigger (trigger mode):

- **Live:** the sequence is played as soon as Live is in **Play** mode, whether there are MIDI notes in the track or not.
- **Note On:** the sequence is played when triggered by MIDI notes – whether already drawn into the track or played via a MIDI controller. It stops when there are no more MIDI notes to trigger it.

Smooth: adjustment of the smoothness of the transitions between steps

Rnd: Gives you a random sequence

Clear: Resets the sequence to 0

Rate: The sequence play speed in note values

Mode: Play direction: forwards (>>), backwards (<<), back and forth (><) or random (**Rnd**)

Steps: The number of active steps, from 1 to 16

To see an example, open **Preset T14** – here the **Step Modulator** acts on the filter frequency in **BandPass** mode.

3.5 *The Spectral Modulator*

The **OctoCell** has a very special global function, based on an observation of acoustic sounds.

The timbres of many instrumental sounds and sung voices are unstable. Spectral analyses show that in addition to variations in pitch and volume, there are also slight

variations in their spectrum. This is part of their richness. They are 'alive', whereas the sounds of most electronic instruments do not have this characteristic.

In the **OctoCell**, the Vosynth team decided to simulate this natural instability by adding an innovative modulation principle in the form of an independent random **LFO**. This LFO acts on both the frequencies of the additive partials and on the volumes of the Sustain.

Usually, once a filter or volume modulation envelope stabilizes on its Sustain value, the sound also stabilizes.

The same thing basically happens with the **OctoCell** – when the partials have reached their Sustain volume and the note is held, normally the timbre produced is stable. This is the result of the sum of the oscillators. The timbre, once stabilized, depends on the volume of each Sustain.

This spectral modulator randomly varies these Sustain volumes, resulting in random variation of the timbre, which can be more or less intense depending on the settings. There is also random variation of the frequencies of the partials.

The result is very different from sounds created using the simple subtractive principle or other types of synthesis. This global modulator is an original feature of the **OctoCell** and allows you to generate rich timbres, especially pads.

In the Device View you'll find a group of three settings:

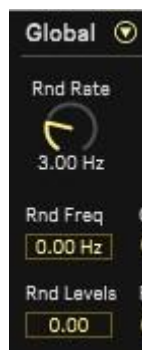


Fig.30 Spectral modulator settings in the Device View

- **Rnd Rate:** random LFO base frequency
- **Rnd Freq:** amount of randomization on the individual frequencies of the partials
- **Rnd Levels:** amplitude of variation of individual additive partials

To get an idea of this effect on a simple timbre, load the **T12 preset** and play some chords. In this preset the effect isn't active.

Load the **T13 preset**. This time the **Spectral Modulator** is active. Play a few chords to hear the effect this function has on the timbre.

3.6 The Sequencer

A tab in the Edit window gives you access to the OctoCell's **Sequencer**. This is a full-featured monophonic sequencer.

It should be added that in MPE mode the sequencer is disabled.

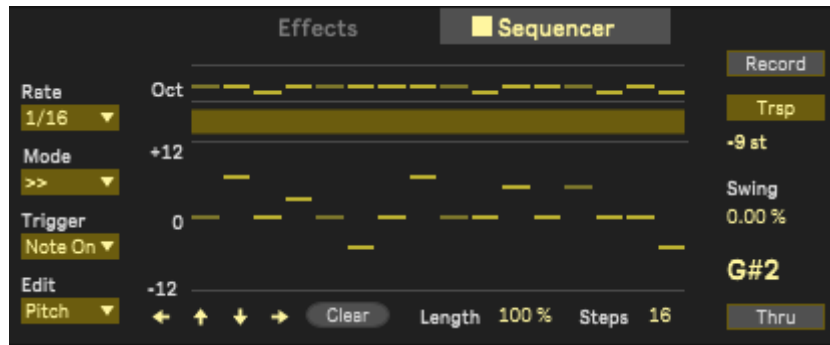


Fig. 31 The Sequencer tab of the Edit window

The screenshot above shows the **Chromium Hits** preset in the **Synth Rhythmic** folder.

Sequencer functions:

- **Rate:** Playback speed in note values
- **Mode:** Forwards (>>), backwards (<<), forwards/backwards (><) or random (**Rnd**) playback
- **Trigger:** Selection of the triggering mode:
 - Note On:** The sequencer is triggered by a MIDI note drawn into the track or played on a keyboard
 - Live:** The sequencer is triggered when Live is in Play Mode, regardless of the notes in the track
 - Step:** Each programmed note is played in order, note by note, with each note met on the track or played on a keyboard.
- **Edit:** Selection of the note editing mode:
 - Pitch:** Pitch of the notes in semitones (-12 to +12), relative to the base note C3. The top line is the octave selection. At the bottom of the window, the up or down arrows transpose the whole set of notes by semitones. The left and right arrows shift the sequence backwards or forwards by one step.
 - Velocity:** Sets velocity for each note, from 0% to 100%.
 - Gate:** Sets the duration of each note; when the duration is set to 0, the note isn't played (silence)
- **Record:** by activating this function, notes can be programmed in steps using a MIDI keyboard
- **Trsp:** Activates transposition mode. The sequences are transposed by the notes of the track or by an external keyboard (the transpositions are displayed under the button, in semitones relative to the note C3)
- **Swing:** Adds Swing from 0% to 100%
- **Clear:** Clears the sequence in the selected Edit mode

- **Length:** Reduces the duration of the notes between 100% (no change) and 10% of the programmed duration
- **Steps:** The number of steps in the sequence, from 1 to 16
- **Thru:** Allows notes to be played over the sequence while it's running

3.7 The Effects section

The **OctoCell** has three types of **effects**, each with adjustable volumes and parameters. The raw sound of the instrument is sent to all the effects.

In the Device View, **DryWet** controls the balance between the raw sound and the affected sound.

Each of the effects can be activated/deactivated by the green button next to the effect name.

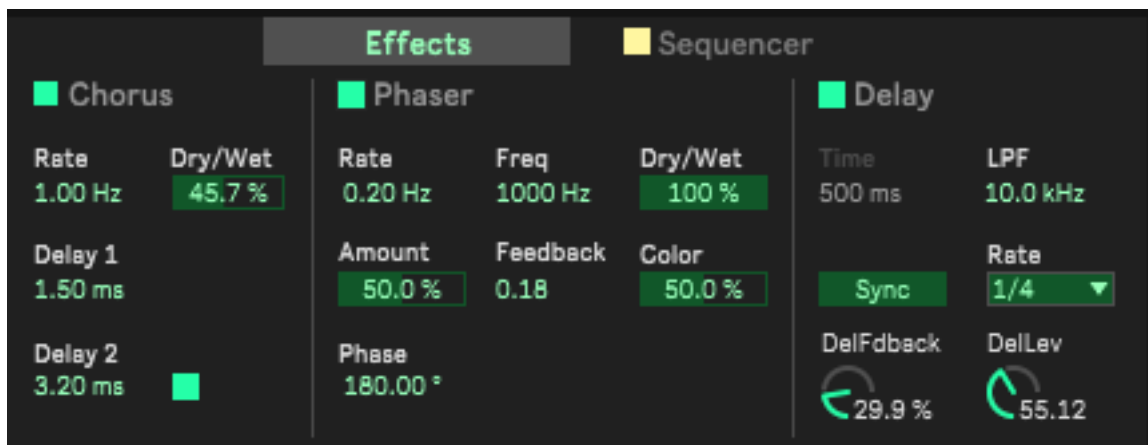


Fig. 32 The effects tab of the Edit window, here all activated

3.7.1 The Chorus

This chorus is composed of two delays with durations modulated by a triangular LFO.

- **Rate:** Speed of variation of the internal modulators
- **Dry/Wet:** Direct/Effect ratio
- **Delay 1:** Basic duration of Delay 1
- **Delay 2:** Basic duration of Delay 2

3.7.2 The Phaser

This is a classic phasing effect.

- **Rate:** Speed of variation
- **Freq:** Center frequency of the effect

- **Dry/Wet:** Direct/Effect ratio
- **Amount:** Intensity of the effect
- **Feedback:** Feedback rate of the effect
- **Phase:** Internal phase shift between the two Phaser elements

3.7.3 The Delay

This is a classic delay effect with filtered feedback.

- **Time:** Delay time in free mode
- **LPF: (Low-Pass Filter)** Cutoff frequency of the low-pass filter for increasingly filtered repeats
- **Sync:** Enabling/disabling of tempo-based delay timing
- **Rate:** Selection of the delay time in note values
- **DelFdbck:** Delay feedback rate – determines the number of repeats
- **DelLev:** Delay volume

3.8 *The Global Section*

This is the part of the **OctoCell** where the play mode settings are located:

- **Transp:** Global transposition in semitones
- **Gain:** Overall volume
- **Octave:** Global transposition in octaves
- **Morph:** Setting for the mix between **Set A and B** envelope amplitudes
- **Fine Tune:** Global fine tuning in cents (100 cents = 1 semitone)
- **Fx DryWet:** Direct/Effects ratio adjustment

Click the arrow next to the **Global** section title to extend the window and access other functions.

Here you'll find two possible operating modes:

- The **Classic** mode for usual MIDI operation
- The **MPE (MIDI Polyphonic Expression)** mode. With a MPE-compatible controller or by using Live 11's Expression View, this allows simultaneous notes to have independent expression.

3.8.1 The 'Classic' MIDI mode

This includes two modes: Monophonic (**Mono**) and Polyphonic (**Poly**). It features the usual **Pitch Bend**, adjustable from 0 to 24 semitones (2 octaves), common to both modes.

3.8.1.1 Mono mode

Mono mode gives you access to several parameters:



Fig. 33 Mono mode on, Glide off

- **Legato:** ON/OFF smooths the transition between notes (MIDI CC 68)
- **Glide:** The transition time between pitches (CC 65)
- **Shape:** This setting determines how gradually the pitch changes between notes when the **Glide** mode is on.



Fig. 34 Mono and Glide modes activated

- **All Notes/Leg Notes**
All notes: **Glide** applies to all notes played
Leg Notes: **Glide** applies only to notes played legato
- **Relative/Absolute**
Relative: The transition time is proportional to the intervals played
Absolute: The transition time is fixed, regardless of the notes played

3.8.1.2 Polyphonic Mode

The OctoCell is an 8-voice polyphony instrument. In Polyphonic Mode, you can use Channel Aftertouch or Poly Aftertouch if your keyboard has this feature.

3.8.2 MPE Mode

The **MPE** button activates the **MPE** mode of the OctoCell. In this mode, the Modulation Wheel is replaced by the **Slider** control parameter generated by compatible MIDI hardware.

MPE-compatible instruments include the Joué (<https://jouemusic.com>), Roli keyboards (<https://roli.com>), Haken Audio's Continuum and Continuum Mini (<https://www.hakenaudio.com>), Osmose, Touché (<https://www.expressivee.com/>) and ERAE Touch (<https://www.embodme.com/product/erae-touch>). See your controller's manual or the Live 11 manual for more information on using MPE controllers with Live 11.

Note: in MPE mode, the note sequencer is deactivated.

4 The CPU load

Unlike many software instruments, the OctoCell doesn't use samples. All the sounds produced are the result of real-time calculations, which require more processing power. This is reflected in the CPU activity display in Live.

This means some sounds you produce will be more CPU-heavy than others. Here are some tips for CPU optimization.

4.1 *The number of partials*

As already pointed out in section 2.1, the number of activated partials has a direct impact on the CPU activity. When programming new sounds, you can try to use as few partials as possible for a lighter CPU load. The concept of the OctoCell is to offer up to eight partials **as a maximum**.

Depending on the performance of your machine, it can't be guaranteed that configurations that use an excessive number of partials will give a good result, especially in busy environments.



Fig. 35 In the Device View, the selection of the number of partials used

That said, if you listen to the music demos, you'll find that even with these limitations, the OctoCell performs well in many contexts.

4.2 Release times

With hardware polyphonic instruments, when you play more than the maximum number of voices available, notes are cut off.

The OctoCell is an **8-voice polyphony** instrument. Any more than eight voices will overload the instrument, which can result in sound drop outs.

The OctoCell's polyphony works in such a way that a voice is only made available when its release cycle is fully completed. When playing notes close together, the maximum available voices can be exceeded and the CPU can increase sharply, causing the sound to cut out.

It's useful to take this into account when programming sounds in polyphonic mode. If long releases aren't essential, you can reduce the global Release times in the Device View, or in the **Release** blocks of the Edit window.

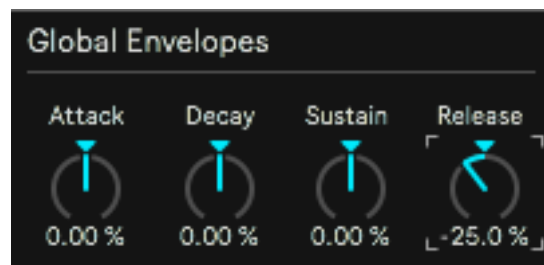


Fig. 36 Reduction of the overall Release in the additive part of the Device View

4.3 Monophonic mode

Given the above, monophonic mode is less CPU-intensive. It can be easily activated on certain leads or presets that use the note sequencer, which is itself monophonic.

To switch to monophonic MIDI mode, activate the arrow to the right of the Global section title in the Device View and click the **Poly** button. You'll see it switch to Mono mode.

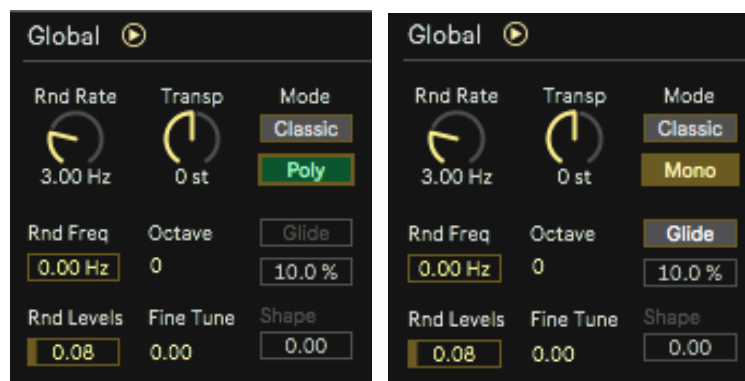


Fig. 37 Selecting the MIDI Monophonic mode in the Device View

4.4 Using the OctoCell Delay or a reverb

If you think reducing the release time dampens your sound too much, it can be increased by using the OctoCell delay, by simulating a reverb through the internal delay settings, or by adding a reverb to your effects chain.

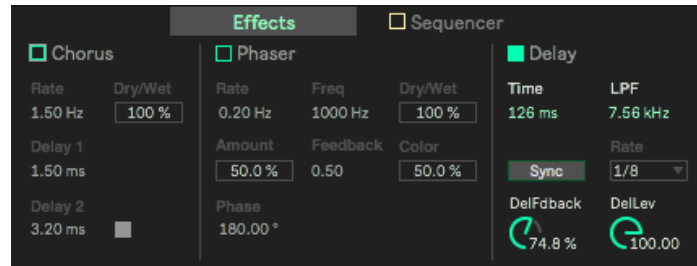


Fig. 38 Using a short delay with high feedback to create a reverb-like effect

Enjoy using the OctoCell!