HIVE

VERSION 1.1

USER GUIDE

u-he

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Introduction

Installation

Go to the [Hive](#) webpage, download the latest installer for MacOSX or Windows, and un–zip the compressed file. Open the **Hive10** folder and start the installer application.

The only demo restriction in Hive is a mild crackling sound at irregular intervals after about two minutes of use — the demo is otherwise fully functional. Those crackles will disappear after you have entered a serial number. For more information, including our terms of use, please refer to the ReadMe file included with the installer. By default, Hive uses the following directories on your hard disk:

Windows

Presets	*...\VstPlugins\u-he\Hive.data\Presets\Hive*
Preferences	*...\VstPlugins\u-he\Hive.data\Support\ (*.txt files)*

Mac OSX

Presets	*MacHD/Library/Audio/Presets/u-he/Hive/*
Presets (User)	*~/Library/Audio/Presets/u-he/Hive/*
Preferences	*~/Library/Application Support/u-he/com.u-he.Hive... (*.* files)*
Resources	*MacHD/Library/Application Support/u-he/Hive/*

To uninstall, delete the plugin files, then Hive.data (PC) or the 'Hive' folders (Mac).

Resources

u-he online

For downloads, news articles and support, go to the [u-he website](#)
For heated debates about u-he products, go to the [u-he forum](#)
For friendship and informal news updates, go to our [facebook page](#)
For u-he presets (payware and free), go to [u-he preset library](#)
For video tutorials and more, go to our [youtube channel](#)

u-he team

Urs Heckmann (code, strategy)
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Michael Dühr (QA, demo tracks)
Howard Scarr (presets, manuals, grump)
Jan Storm (yet more code, framework)
Michael Pettit (videos, marketing)
Viktor Weimer (more support, voice)
Oddvar Manlig (everything else!)

…with thanks to Brian Rzycki for maintaining [PatchLib](#)

User Interface

Here's an overview of the panels, followed by some important information about how to operate Hive. Please read this section thoroughly!
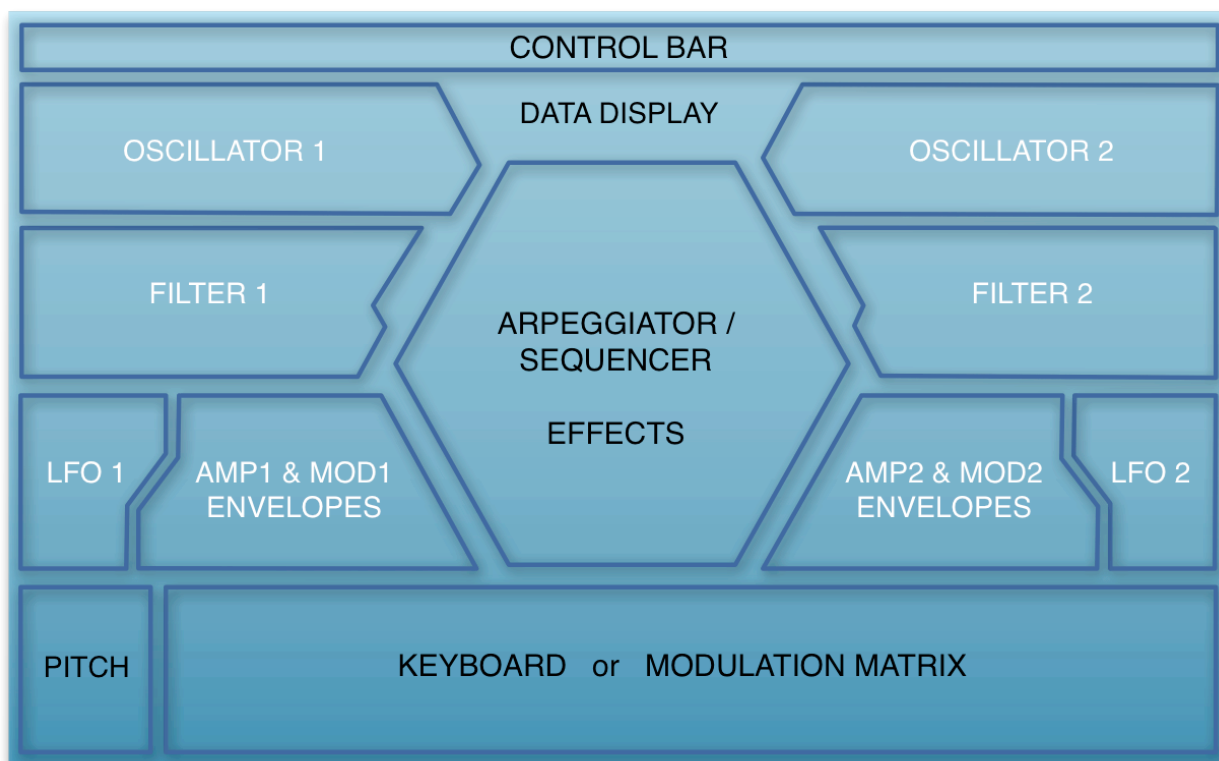

The main area is separated into two equal halves by the large central hexagon, each with a dual oscillator, a filter, an LFO and a pair of envelope generators. This symmetry wasn't just an esthetic decision, it also encourages you to layer two relatively simple voices: a powerful approach to synthesizer sound design with a grand tradition (e.g. Yamaha CS80, Korg 800 DV).

The main oscillators and sub-oscillators can be freely routed to either or both filters, however, and filter 1 can be fed into filter 2. So Hive's signal routing/mixing depends on the filter input selectors and filter volumes — simple!

Knobs, Sliders, Selectors

All controls react consistently to **left-click & drag** by activating the primary function, while a right-click will always open a context menu.

To **fine tune**, hold down a SHIFT key before clicking on the control. To reset a parameter to its default value, either double-click or hold down an **ALT** (Mac) or **CTRL** (PC) key then single-click.
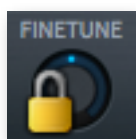
To guarantee that the value of a parameter doesn't change when you switch presets, use the **Lock** function. Right-click on any control and select the first entry from the context menu.

Note: You are still free to adjust the value of a locked parameter at any time!

Panel Presets

To the left of each panel's main label is a button with a triangle symbol — click there to copy, save or load panel presets. Note: The Arp/Seq and Effects panel preset buttons may look different, but they work in the same way.

You will find all your saved panels in the following directory:

Win *...\VstPlugins\u-he\Hive.data\Support\Modules*
Mac *MacHD/Library/Application Support/u-he/Hive/Modules/*

Solo

To the right of each title in the oscillator / sub-oscillator and filter panels is a button labelled '**S**', which stands for **Solo**. Just like on a mixing desk, activating Solo isolates particular modules so you can check how they contribute to the overall sound.

GUI Size

You can resize the GUI by right-clicking anywhere in the background and selecting from the list (70% to 200%). This setting is also available in the Preferences page.

Signal Flow

All grey arrows in this diagram represent stereo signals, and the blue arrows are fixed modulation paths (immediately available without requiring the modulation matrix).
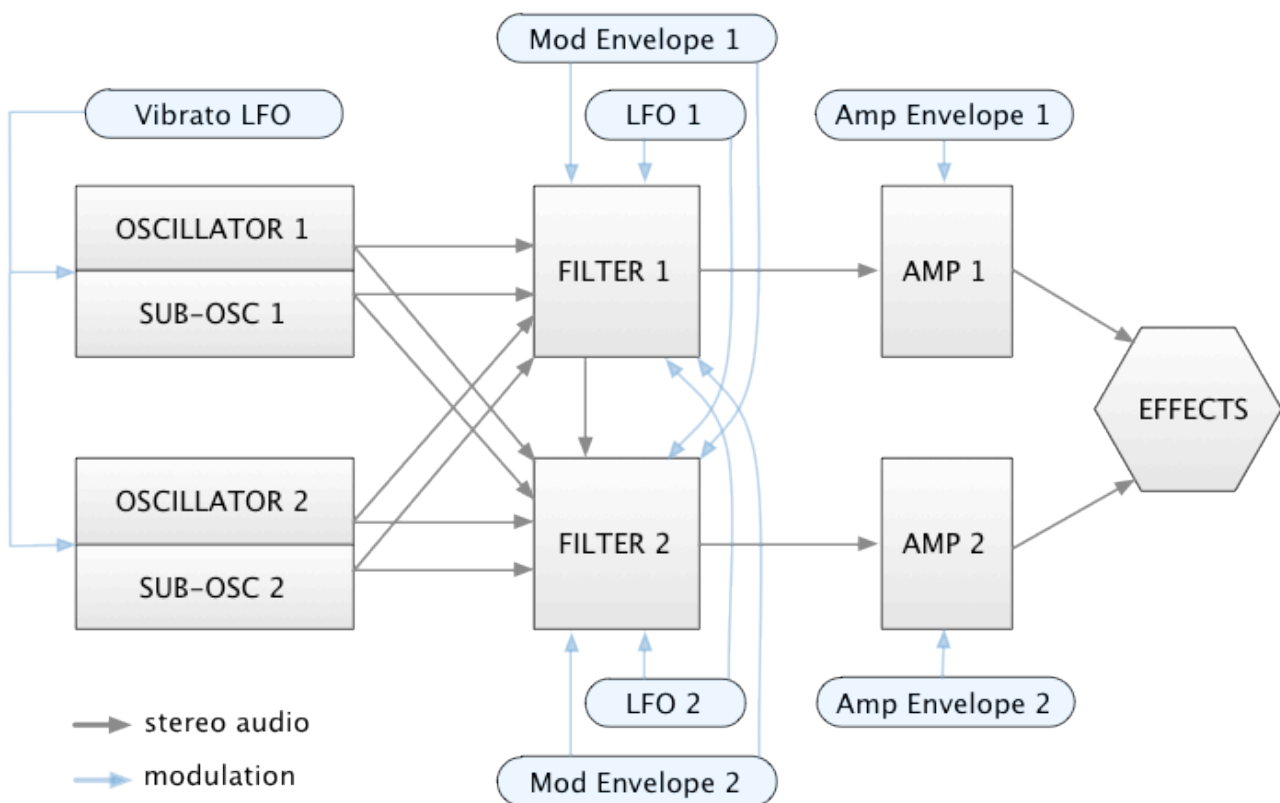
The Preset Browser

Presets

You can load any preset in the current folder by clicking on the data display, or step through presets by clicking on the arrow symbols either side of the data display. Of course Hive also includes a preset browser — click on the **PRESETS** button:

Folders appear on the left, presets are selected in the centre (which is scrollable), and information about each preset appears to the right in the **Preset Information** area.

After choosing a preset you can use the up/down cursors on your computer keyboard to step through the others. Alternatively, you can use the pair of arrows to the right of the data display.

If you can't see anything in the folders area (00 User, 01 Basses, 02 Poly Leads etc.), click on the small square to the left of **Local**.

To exit the browser, click on the **CLOSE** button (which replaces the PRESETS button while the browser is open).

Save

You will want to save your creations somewhere, and we recommend the '00 User' folder. Note: Mac owners will see another 'User' folder at the very bottom of the list.

Make sure that the folder where you want to store your preset is selected, then click on the **Save** button to the right of the PRESETS / CLOSE button.

Give your preset a suitable name, and enter any other details you would like to appear in the information area.
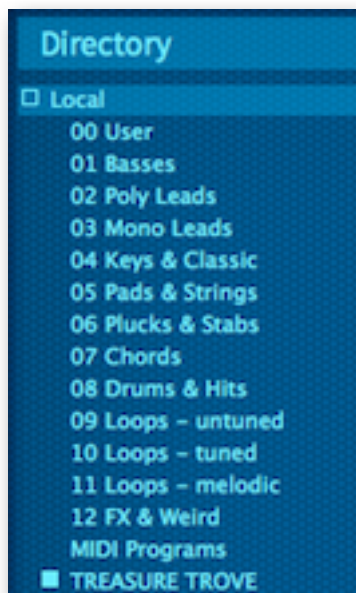
Local

This root folder contains a bunch of 100 presets copied from the various category folders to showcase HIVE's capabilities. While trying them out, please read the information about each preset — especially what the following controls do:

MW = modulation wheel (MIDI continuous controller 01)
BC = breath control (MIDI continuous controller 02)
XP = expression pedal (MIDI continuous controller 11)
AT = aftertouch (pressure)
PB = pitch bender

00 to 12

The folder **00 User** is where you will find the default (initialization) preset `--INIT--` and is the best place to save your own creations. Tip: Just in case you overwrite that one by mistake, there's another copy of --INIT-- in the Treasure Trove.

01 Basses to **12 FX & Weird** are the main category folders.

MIDI Programs

The main preset folder ('Local') also contains a special folder called 'MIDI Programs' — any presets in this folder can be switched using MIDI Program Change messages. For further details, see [MIDI Programs](#).

Treasure Trove

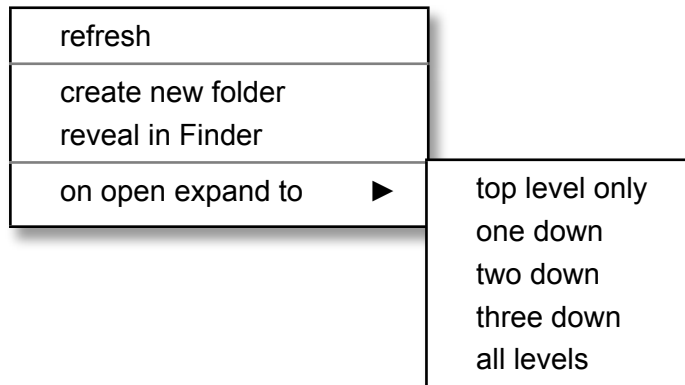This contains over a thousand presets kindly submitted by HIVE fans well before the official release! Note: '1 MC without FX' contains alternative, effect-less versions of all MC presets.

While browsing through the Treasure Trove, please keep volume levels a bit lower than usual. Unlike the factory presets, TT presets haven't been normalized or otherwise edited, and some of them are sure to be much too loud!

Folders Context Menu

Right-clicking in the folder list opens this context menu:

refresh
create new folder
reveal in Finder
on open expand to ▶

top level only
one down
two down
three down
all levels

Select **refresh** whenever the contents of the browser needs updating. This is always necessary after folders or presets have been altered from outside Hive. Simply clicking on any folder in Hive's browser should also refresh the list.

create new folder does exactly that — it creates a new folder inside the current one.

reveal in Finder / **reveal in Explorer** opens a standard OS window so you can use your operating system's file functions to add, rename, move, copy or delete presets. Always remember to refresh afterwards!

The '**on open expand to**' options specify how many levels of nested directories will be shown the next time the browser is refreshed.

Presets Context Menu

Right-clicking in the preset list opens this menu:

make favourite
mark as junk
select all
deselect
show junk
reveal in Finder
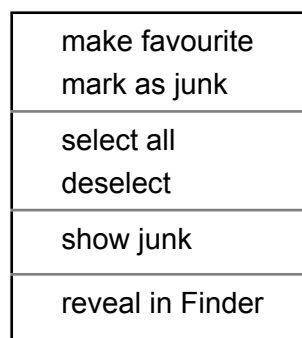
The **make favourite / mark as junk** options are for marking individual presets you particularly like or dislike. Favourite presets appear with a small star next to the name. Junked presets disappear, but can be made visible again via **show Junk**. Of course you can 'un-junk' and 'un-favourite' marked presets.

The **reveal in Finder** or **reveal in Explorer** (depending on your computer) function opens an OS window so you can use on-board file functions to add, rename, move, copy or delete presets. Always remember to **refresh** afterwards!

Select, Drag & Drop

Files can be moved from one folder to another via drag & drop. You can select multiple files by using the SHIFT etc. keys on your computer, or use the select all function to highlight all presets in the folder. To remove all the highlights, choose deselect from the presets context menu.

Performance Control

Pitch bend and modulation wheel as well as at least a few user-definable continuous controllers (CC) are standard on entry-level MIDI master keyboards, while the more capable ones can also send pressure (aftertouch) data.

HIVE responds to pitch bend (**PB**), modulation wheel (**MW**), breath (**BC**), expression (**XP**) and pressure (**AT** = aftertouch)…

As well as pitchbend and modulation wheel, please configure your MIDI hardware to send CC02 (BC), CC11 (XP) and aftertouch (AT) if at all possible. Most of the factory presets were specially programmed for realtime performance using those controls.

While auditioning presets without any specific goal in mind, we recommend exploring the potential of one preset before moving on to the next. Many seemingly 'harmless' presets come to life when you use the mod wheel, aftertouch, breath or expression.

The Control Bar

Along the top, either side of the data display (see below), HIVE's **Control Bar** hosts a range of global parameters plus a few utility functions.
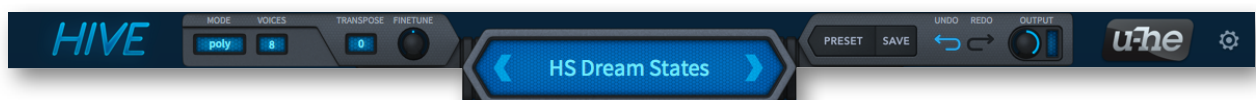
From left to right you will see the following…

Mode (voice mode)

The **poly** mode option means normal polyphonic, **mono** is monophonic with envelope retrigger, **legato** is monophonic without the retrigger. In **duo** mode, oscillator 1 plays the lowest held note while oscillator 2 plays the highest.

Voices (maximum polyphony)

This selector determines the maximum number (2-16) of voices that can play simultaneously before note-stealing occurs. The Voices parameter only applies to **poly** mode, it is ignored in all other voice modes. Setting a low value here can save CPU.
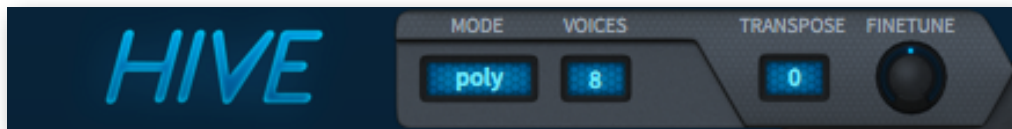
Transpose / Fine Tune

The pitch of the preset in semitones (+/– 24) and cents (+/–100).

Data display

This has several duties, most of which have to do with presets...
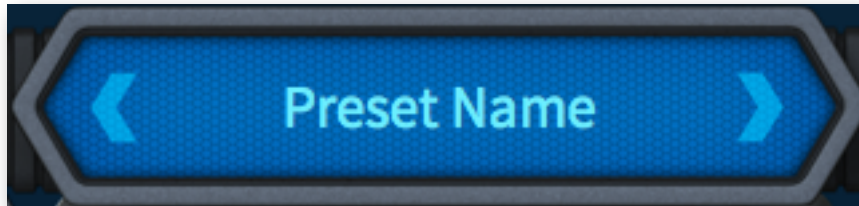
It usually shows the name of the current preset. Clicking on the arrows to the left and right steps through presets. Clicking on the display itself lets you select a preset from the current directory (see preset browser above for a more flexible method).

While you are adjusting something in HIVE, the data display shows the parameter name and value. After a few seconds of inactivity, it shows the name of the preset again.

To the right of the data display are the following controls...

Preset

See the section about the preset browser a few pages back.

Save

Stores the preset into the currently selected folder.

Undo / Redo

Clicking on the curved arrows call **undo** and **redo** functions. Note that you can even undo a change of preset i.e. recall edits made to the previous one!

Output

This is HIVE's main volume control, accompanied by a signal level indicator. To avoid digital distortion, don't let the top (red) line flash.

Most of the factory presets have Output set to 100. Higher values can be used to boost inherently quiet signals up to 'normal' levels.

The u-he Badge

Clicking on the u-he badge opens a popup menu containing links to this user guide, to our homepage, to our user support forum as well as to our presence in various social networks:

> visit u-he.com
> user guide
> support forum
> u-he on Twitter
> u-he on Facebook
> u-he on YouTube

Note: Instead of directly opening the document, selecting **user guide** here highlights the containing folder so you can quickly access other relevant text files.

The Cog Wheel
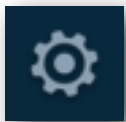
Clicking on the cog-wheel icon opens the global configuration pages where you can assign remote control (MIDI CC) and set various other preferences. For details, go to the Configuration chapter.

Mode Switches / Indicators

Synth Engine (unlabeled)

The row of buttons below the data display select one of three fundamentally different 'characters' that simultaneously affect various parts of Hive…

NORMAL exponential oscillator detune, s-shaped envelope attack, short decay, over-sampled self-oscillating 'ladder' filter model with non-linear resonance.

DIRTY Evenly-spaced oscillator detune, exponential envelope stages, oversampled self-oscillating 'diode ring' filter. Highly non-linear and unpredictable!

CLEAN Slightly wider oscillator detune, linear envelope attack, exponential decay and release, linear (non-distorting) 'state variable' filters, no oversampling.

Link

Between Filter 1 and the hexagon is a LINK button which, when activated, causes all knobs and sliders to the right of the hexagon to 'follow' their counterparts on the left.

Linked controls on the right are marked with a small 'L'. All movement is **relative** i.e. the linked control will not necessarily adopt the same absolute value.

Keys / Modulation Matrix Selector

The three buttons below the hexagon are for switching what appears at the bottom: either the on-screen keyboard or one of the two modulation matrix pages.

For details, see [Keyboard](#) and [Modulation Matrix](#).

Revision | MIDI Activity Indicator | CPU Indicator

At the very top of the hexagon is a narrow information bar containing the plug-in revision number, a MIDI activity indicator and a CPU usage meter:

You might find it difficult to make the CPU meter show anything significant!

Panel Reference

This chapter explains all the elements in Hive's various panels. Read it thoroughly if you want to learn everything there is to know about Hive…

Master Oscillators (OSC)

Hive's oscillators feature Unison, stereo panning and a freely tunable sub-oscillator. This is what the 'master' part of the oscillator panel looks like:

Wave

Sine, **Sawtooth, Triangle** and **Square** options are classic waveforms that shouldn't require further explanation. **Half** and **Narrow** are pulse waves with differing widths.

Pulse sounds similar to Square at first. However, if you modulate the hidden parameter 'PulseWidth' (see list of targets), you can get any static pulse width you like by using Constant as source, or a cyclic PWM effect if you use an LFO as source. See Mod Matrix.

White and **Pink** are the two standard variants of noise: White is bright, Pink is darker.

Unison

Stacking multiple waves (Unison) can result in a much richer sound, especially when they are detuned (see Detune below). Of course more Unison means more CPU load.

Note: Unison only applies to the main oscillator unless the sub wave is set to **like Osc**.

Octave / Semitone

Discrete tuning, +/- 3 octaves for the whole oscillator. Note that the sub-oscillator's 'Semitone' parameter is **relative** to the main oscillator (see below).

Phase Mode

'Phase' is essentially the horizontal position of a waveform. Hive offers 3 phase modes:

Reset   Phase is fixed at 0° — where the wave crosses zero in the positive direction. Use this mode whenever you need robotically consistent attacks.

Random   Phase is set to a random value whenever a note is played. Very organic.

Flow   The phase of a note picks up where the previous one left off, so the phase relationship (and therefore any beating) between oscillators is continuous.

Flow is probably closest to what a classic analogue polyphonic synth delivers, although the difference between Random and Flow can be very subtle.

Note that oscillator phase angle can be modulated — it's a hidden parameter.

Vibrato

The amount of cyclic pitch modulation from the Vibrato LFO. Also applied to the sub-oscillator. Tip: For typical vibrato with depth control via modulation wheel, go to the mod matrix, click on a triangle and select 'Vibrato via MW".

Pan + Width

The Pan knob controls the stereo position of the oscillator (including the sub-oscillator). If **Unison** (see above) is set to 2 or more, the **Width** knob adjusts the stereo width of the signal around that pan position. If Unison is set to 1, the Width control has no audible effect because in that case the oscillator is mono, not stereo.

The rectangular area between the two knobs mainly serves as an indicator for stereo spread, but you can also click+drag it to adjust the Pan and Width at the same time: vertical movement adjusts the panning, horizontal movement adjusts width.

Detune

If 'Unison' (see the previous page) is set to 1, this is a regular fine tune control: Oscillator 1 is tuned up and oscillator 2 down within a range of 100 cents i.e. 1 semitone.

If Unison is set to 2 or higher, the multiple waves are detuned in opposite directions and the sub-oscillator isn't affected (unless it is set to **like Osc** — see Wave below). It might not be obvious, but you can still fine tune the overall pitch of unison oscillators by using a slot in the Modulation Matrix (source = Constant, target = Tune).

Volume

The amount of main oscillator signal sent to the filters. Note that the sub has its own separate volume control. See Setting Volumes.

Sub Oscillators (SUB)

Although they share a panel with the main oscillators, and the frequencies (including modulation) are linked, the sub oscillators are otherwise quite independent…

Wave

The Wave selector of the sub-oscillator offers the same options as the main oscillator but with one addition: **like Osc**. In this mode only, the sub oscillator inherits the Unison and waveform settings from the main oscillator.

Semitone

This is a pitch **offset** relative to the main oscillator. Use SHIFT to fine tune. The default value (double-click) is -12 i.e. an octave below the main oscillator.

Volume

The sub-oscillator's own volume control. See setting volumes.

Filters (FILT)

Before we take a look at individual parts of that panel there's a very important row of buttons (already mentioned in the Mode Switches section a few pages back) that affect HIVE's basic 'circuitry', including the filters…

Synth Engine (unlabeled)

As they also affect envelope shapes, the unison detuning and a few other parts of Hive, the Synth Engine buttons aren't in the filter panel. Instead, they sit in a suitably prominent position between the data display and the central hexagon:

NORMAL   Oversampled self-oscillating **ladder** filter model with non-linear resonance — listen to the tonal difference when you crank up the Input Gain.

DIRTY   Oversampled self-oscillating **diode ring** filter model. Turn up the resonance for interesting, unpredictable results. Also try Input Gain values below 0.00 dB.

CLEAN   Linear i.e. non-distorting **state variable** filter model. This option is particularly CPU-friendly as non-linearities don't need to be calculated, and there's no oversampling.

Back to the filter panels, which look like this:

Filter Input Selectors

The vertical row of buttons labelled **OSC1**, **SUB1**, **FILT1** (filter 2 only), **OSC2** and **SUB2** select which signals will be routed into each filter.

Filter 2 has an extra **FILT1** button, the signal from filter 1 **at full volume**. To use the two filters 100% in series, turn filter 1's volume down to zero and select the **FILT1** button (only) for filter 2.
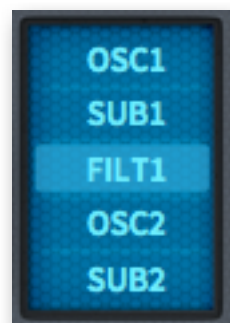
Type

Bypass simply disables the filter circuit. Note that the input switches as well as the Gain and Volume controls all remain functional.

Lowpass types remove high frequencies from the signal. Hive offers the most popular two lowpass 'strengths': **24** dB/octave and **12** dB/octave.

Bandpass filters remove both low and high frequencies, only allowing a narrow band to pass through. This is probably the best choice for 303-style resonant sounds — turn up the Input Gain and Resonance, and try adding some foldback distortion.

Highpass is the opposite of lowpass, as it removes low frequencies.

Bandreject is the opposite of bandpass. It removes a narrow band while allowing lower and higher frequencies to pass through unfiltered.

Peaking is just like Bypass, but with active resonance. Use this mode to accentuate a certain frequency e.g. for massive bass boost or mid 'honk'.

Input Gain

In **Normal** or **Dirty** synth engine mode (see above), the filter's input gain not only controls the input volume, but also the amount of non-linear distortion — an important characteristic of real analogue filters. In **Clean** mode, it simply attenuates or boosts the level. See Setting volumes.

Cutoff

Everybody's favourite synthesizer control, 'Cutoff' is the knob most likely to show signs of wear and tear on old synths! There's something very satisfying about manually sweeping the cutoff, especially with at least a bit of resonance…

Resonance

Resonance is a filter-internal feedback loop that emphasizes the cutoff frequency. In the Synth Engine modes **Normal** and (especially) **Dirty**, the amount of resonance you will hear depends on the signal input — see Input Gain above.

Volume

Simply the filter's output level. See Setting volumes.

LFO

Cutoff modulation from the selected LFO (1 or 2). The knob is bipolar so you can make the filters move in opposite directions without using up a slot in the modulation matrix.

Tip: Set the LFO mode to Gate and experiment with LFO Phase.

Mod Env

Cutoff modulation from the selected envelope (MOD1 or MOD2).

Tip: Turn Cutoff way up and try negative MOD Env values. This can take some getting used to: Experiment with the modulation envelope settings until you are familiar with the 'upside-downishness' of it all!

Key Track

Cutoff modulation from **MIDI note**. At 100%, the cutoff point will track semitones played on your keyboard fairly well. Turn KeyTrack and Resonance up to maximum to check that out. A tiny bit of white noise is enough to get the resonance going.

KeyFollow (the modulation source used by the filter-specific parameter 'KeyTrack') pivots around the E below middle C (MIDI note 52). Like a seesaw, all other notes are modulated up and down by KeyFollow, while the pivot note remains fixed.

Would you like to test that in the modulation matrix? Try this: Set the source to Key-Follow, the target to oscillator Tune. Whatever the amount of KeyFollow modulation, the pitch of that particular E doesn't change at all.

Low Frequency Oscillators (LFO)

Hive has two regular LFOs (low frequency oscillators):

Unipolar (+)

Shifts the LFO wave 'upwards' so that it outputs positive values only. Note that the absolute output level is halved so that the maximum value can't be exceeded.

Waveform

Selects a shape. The options are **sine**, **triangle**, **saw up**, **saw down**, **sqr hi-lo** (square wave starting high), **sqr lo-hi** (square wave starting low), **rand hold** (stepped random wave) and **rand glide** (smooth random wave).

Rate

Shifts the LFO speed relative to the value set by 'Sync' (see the next page).

Phase

Where (within the waveform) the LFO will start whenever a note is played. This setting is irrelevant if 'Restart' (see below) is **random**. Tip: To restart a sine or triangle at the highest point, set Phase to 25.00.

Restart

Selects rules for how LFO phase is reset…

Sync   LFOs of all voices are synchronized to the host, so they all adopt the same phase. Unlike Single mode (see below), the phases can still be modulated apart by a 'polyphonic' source such as Velocity, KeyFollow or Random.

Single   All voices share the same LFO, which is restarted at the next MIDI note after all previous notes have been released.

Gate   Notes restart the LFO for each voice independently at the specified Phase.

Random   Notes restart the LFO for each voice independently at a random phase, ignoring the value of Phase.

Sync

The basic 'speed mode', the Sync parameter offers non-synchronized times measured in seconds (**0.1**, **1s** or **10s**) as well as a long list of values synchronized to song tempo. The latter include dotted times (50% longer) and triplets (3 in the space of 2).

Envelopes (AMP, MOD)

Hive's envelopes are arranged in pairs. The left half controls the amplification (AMP) envelope, while the right half controls the modulation (MOD) envelope:
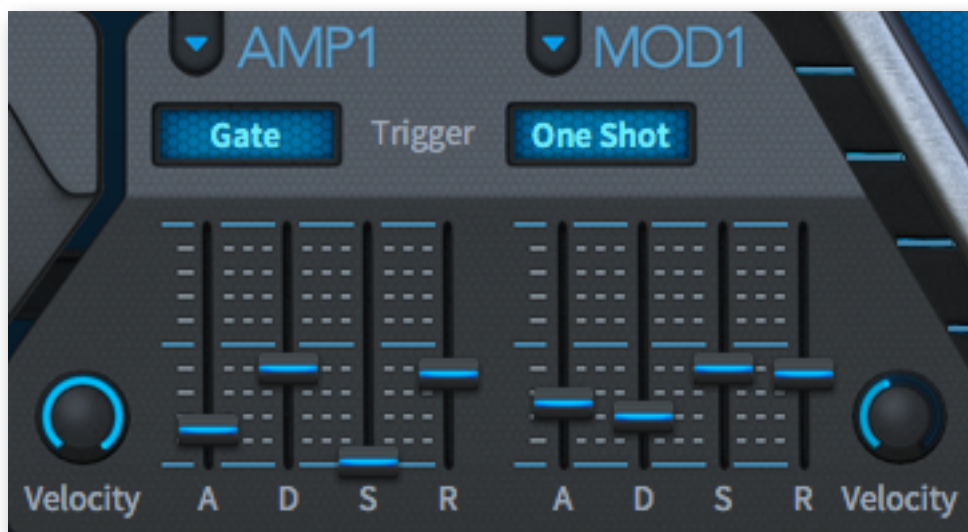
Trigger

The **gate** option is for normal triggering via MIDI notes. Default, standard.

In a **one-shot** envelope the gate length is ignored so it always completes the Decay stage. One-shot envelopes are therefore great for percussion sounds, fly-by effects, certain pads (e.g. 'HS Bloom Pad'). It usually makes sense to set Sustain and Release to minimum In this mode, but you can use higher values to create an interesting kind of 'Hold' effect: Experiment with Sustain at about 50, test extreme Decay values.

The **LFO1** and **LFO2** options retrigger the envelope from one of the LFOs. Unless you want a chaotically delayed trigger, don't set that LFO's Restart parameter to **random**.

A D S R

The 4 sliders control **A**ttack time, **D**ecay time, **S**ustain level and **R**elease time. Note that each of the envelope phases can be modulated in realtime — see Envelope Tricks.

Velocity

How strongly the envelope's output level is affected (modulated) by MIDI velocity.

Glide / Vibrato / Pitchbend

The panel at the bottom left contains several keyboard 'performance' parameters:

Glide

Glide (aka 'portamento') slurs pitch between consecutive notes. Hive has two glide **Mode**s: in **rate** (constant rate) mode the glide takes longer for larger intervals, while in **time** (constant time) mode it doesn't.
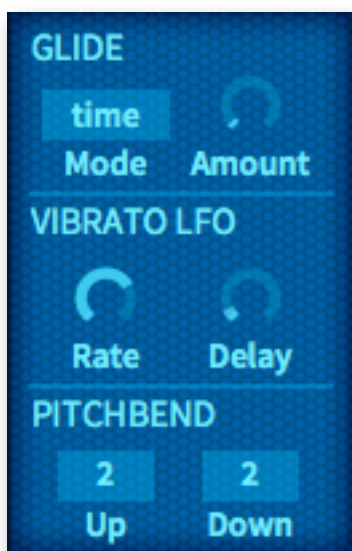
The **Amount** knob sets the glide time/rate for all oscillators and filters (in fact anything that uses key tracking).

Vibrato LFO

A third LFO, hardwired to the oscillators. The **Rate** knob controls the speed and the **Delay** knob controls how slowly it fades in. See also Vibrato in the oscillator panel.

Pitchbend

Most MIDI keyboards include a 'pitch bender' performance control, often a centre-sprung wheel or stick that bends the overall pitch up and down. Hive lets you specify the **Up** and **Down** ranges independently, from 0 to 24 semitones.

Keyboard (KEYS)

The buttons below the hexagon select Hive's keyboard or the mod matrix pages:

The keyboard comes in two flavours, regular keys or 'touch-plate' style. Swap styles by clicking on the small button at the top right of the keyboard, and right-click on that button to set the current style as the default.

The keyboard panel includes the standard left hand controls **pitch wheel** (PITCH), which is centre-sprung and **modulation wheel** (MOD), which isn't. Play notes close to the top for low velocities, further down for high velocities. Double-click on a key to sustain it. This feature is handy for sound design in case you don't have a real keyboard attached, or perhaps for holding a drone while playing live.

Right-click on **KEYS** or **MM1** / **MM2** to set the current state as the default.

Modulation Matrix (MM)

The 12-slot modulation matrix is for connecting modulation **sources** (MIDI controls, envelopes, LFOs etc.) to modulation **targets** (more than 80 options). Two pages of six slots each are switched using the MM1 and MM2 buttons below the hexagon:

All matrix slots have the same structure. Note the two targets per slot:

Both oscillator 1 **Pulse Width** and Filter 1 **Input Gain** are being modulated by LFO1, the depth of which is controlled by the mod wheel (or vice versa — see Via below).

Source

The upper left selector specifies a primary modulation source.

Via

An optional secondary modulation source, 'Via' controls the amount of 'Source' passed on to the two targets. Or vice-versa…

$$\textbf{target} = \textbf{target} + (\textbf{source} \times \textbf{via} \times \textbf{amount})$$

Source and Via are interchangeable: Swapping **LFO1** and **ModWheel** in the above example will make no difference, the effect will be exactly the same.

Targets / Drag & Drop

Right-clicking on a target field opens a menu in which you can select a target parameter. Effect parameters will only appear in the menu while the effect is active.

As Hive has so many available modulation targets, we added an easier alternative to rooting around in the sub-menus: **drag & drop**.

Simply left-click on one of the two target selectors, drag the crosshair onto any target you like (all valid targets are highlighted) and release the mouse button. Tip: Drag the crosshair over all HIVE's panels to see everthing that can be highlighted – you might be surprised at some of the possibilities, especially in the Effects panel!

If you prefer using the menu (right-click on a target selector), check out this useful detail: The most recently adjusted parameter always appears at the very top of the list — which can save one or two mouse-kilometers in the long term.

Pitch modulation, phase modulation, PWM

Not only the knobs, but most of the selectors in the oscillator panels are valid targets for drag & drop modulation assignment! Drop the crosshair onto Octave or Semitone (either one) to assign pitch modulation, or onto Phase for phase modulation.

Similarly, dropping the crosshair onto either of the Wave selectors will give you pulse width modulation. Please note that PWM only works with the **Pulse** wave, and only for the entire oscillator i.e. not separately for the main and sub oscillators.

Arpeggiator & Sequencer

The **ARP & SEQ** button in the hexagon at the top opens a window containing all you need to set up complex arpeggios and sequences…

Clock

The arpeggiator and sequencer share a clock (see the image below) which specifies timing relative to the 'tempo' of the host application (DAW, sequencer).

TimeBase

Selects a basic note division (**1/32**, **1/16**, **1/8** or **1/4**) for the arpeggiator as well as the sequencer. As Hive's clock is always synchronized to host tempo, no absolute times (seconds) are available here.

Sync

'Strict Host Synchronization' causes arpeggios and sequences to align with bars and beats in the host application, so they are not restarted with each played note. Switch this off if you want to restart at any position within the bar.

Multiply

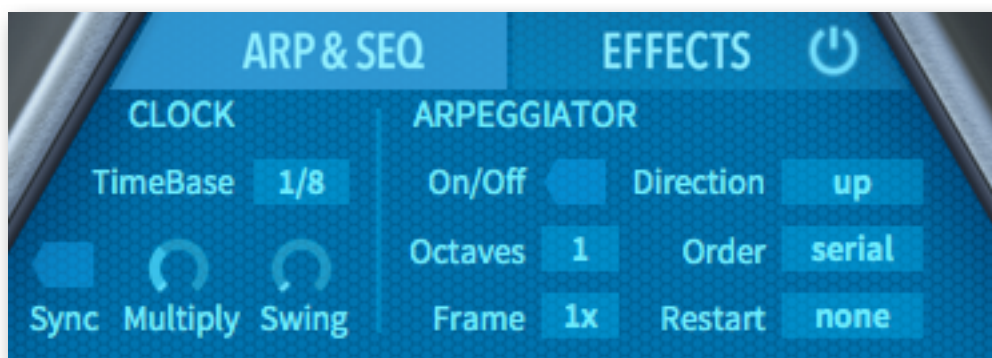This parameter scales the clock speed from 50% to 200%. For triplets, set 75% or 150%, for dotted times set 66.67% or 133.33%.

Swing

Swing factor. 50% = 2:1 (triplet swing), 100% = 3:1 (dotted swing).

Arpeggiator

Hive's arpeggiator has the usual **octaves** and **direction** parameters, but also a few extras that make it surprisingly powerful, e.g. the ability to drive the sequencer.

On/Off

Activates / deactivates the arpeggiator.

Octaves

(**1** to **4**) transposes the arpeggio in octaves according to the set **Order** (see below).

Frame

Driving the sequencer from the arpeggiator (switch them both on) lets you transpose sequences via MIDI notes/chords. It can get… interesting, especially if the arpeggiation doesn't happen for each note i.e. if you run the arpeggiator slower than the sequencer. The **Frame** value specifies how many times slower (from **2x** to **8x**).

Direction

Arpeggio playback order.

played	in the same order as the notes were played
up	from the lowest note to the highest
down	from the highest note to the lowest
up+dn 1	from lowest to highest, then back down again
up+dn 2	same as up+dn 1, but the highest and lowest notes are repeated
random	chaotic order, unpredictable

Order

How/when the arpeggio jumps to the next octave.

serial	plays all notes first, then jumps octaves up
round	like serial, but also jumps down again (Octaves = **3** or **4** only)
leap	jumps octaves at each successive note
repeat	repeats the note in all octaves before playing the next

Note: Depending on the number of notes played as well as the Octave and Restart (see below) settings, some of the Direction and Order options will sound the same.

Restart

This is the number of notes the arpeggiator will play before jumping back to the beginning. The idea behind Restart is to keep arpeggios in 'time' (e.g. 4/4 time), however many or few notes are played.

Available values are **none**, **4** to **10**, **12**, **14**, **16**, **24**, **32**. Experiment with '8' or '16' first. Be aware that if you choose a very low value here, the arpeggio is quite likely to restart before all held notes have been played — notes simply 'go missing'.

The results of arpeggiation also depend on the selected voice mode (see page 9), with overlapping release phases (poly), retrigger (mono), or single trigger (legato and duo).

Sequencer

Below the Clock and Arpeggiator is Hive's 16-step sequencer / modulator / gater, with realtime recording (think SH101) plus a few interesting extras…

OFF | MODULATOR | PLAY | RECORD

The buttons along the top of the sequencer are used for selecting a 'sequencer mode':

The first option (OFF) simply disables it.

In MODULATOR mode, notes are not triggered. However, the CC values (see below) as well as Seq Gate (see Attack and Decay below) can still be used e.g. to modulate cutoff. Note that both Transpose and Velocity are ignored here, as they are MIDI note data.

Select PLAY mode to trigger notes. Like the arpeggiator, the sequence will run whenever notes are being played and will stop when all notes are released.

RECORD fills the data area with transposition and velocity values (including whatever the arpeggiator is spitting out) plus CC data if this is being used (see the next page).

Important: The first recorded note defines 'Transposition = 0'. To prevent overshooting transposition limits while recording, record a fairly central 'root' first, then the complete sequence. Finally, rotate one step to the left (see Rotate below).

Steps

The number of notes (2 to 16) the sequencer will play before restarting. Data beyond this point is unused / ignored.

Gate

Click each step to cycle between **ON**, **TIE** or **REST** (the icon will change accordingly). You can edit several steps at once by dragging to the left or right.

On. A note whose gate length is set by the Gate % parameter (see below).

Tie. The same as On but with gate length set to maximum.

Rest. The note is not played.

Transpose

Per-step transposition within a 4-octave range (**-24** to **+24**).

Velocity

Per-step velocity values. These simply override normal MIDI note velocity unless the Dynamic Velocity switch is activated…

Dynamic Velocity

Multiplies the sequencer's Velocity values with the actual MIDI velocity.

CC

The row of values labelled 'CC' (continuous controller) are used to modulate anything you like in time with the sequence. Select one of the options in the CC selector to the left, use that same modulation source in the Matrix for something dramatic (cutoff, pitch, whatever) and enter values in the CC row. You can even record CC.

Tip: Select the controller you use the least here, e.g. Expression!

Rotate

This pair of buttons shifts the active part of the sequence to the left and right. Why would you want to do that? Because a creatively edited sequence often starts on the wrong beat – it is out of phase with how you are experiencing the melody and rhythm. Use the Rotate buttons to fix that!

Gate %

Sequencer gate time i.e. how long notes are held relative to the clock's TimeBase.

Attack

How slowly the the modulation source **SeqGate** fades in for each step.

Decay

How slowly the the modulation source **SeqGate** fades out for each step.

Note that although Gate %, Attack and Decay can be modulated, these targets do not appear in the matrix menu – you have to assign via drag & drop. Technical reasons!
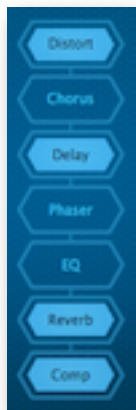
Effects

The **EFFECTS** button at the top right of the hexagon opens a window containing all you need to set up a complex chain of audio effects.

The 'power' icon to the right is an on/off switch for the EFFECTS panel. It is truly global — switch it off and you won't hear any effects, even after changing presets!

Enable / Rearrange

Buttons for each effect are arranged vertically in the centre of the panel.

This order isn't fixed — click and drag up or down to rearrange them. There's nothing stopping you from trying out 'unusual' orders e.g. putting the distortion after the reverb.

Click once to switch individual effects on (highlight) or off (dark).

Distortion

Hive's distortion unit is relatively simple, requiring only a mode selector and 3 knobs…
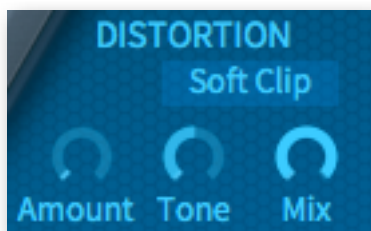
Mode (unlabeled)

Soft Clip	Smoothly compresses peaks in the signal.
Hard Clip	Simply chops off the top and bottom of the waveform.
Foldback	Similar to soft clip except that increasing the gain doesn't slam more of the signal peaks against the limits, but reflects (folds) them back.
Corrode	A sample rate reducer and bit crusher in one. The Amount and Tone controls (see below) are replaced by **Rate** and **Crush** In this mode.

Amount

Input gain control. This effectively sets a threshold above which distortion occurs (and therefore the perceived amount of distortion).

Tone

Bipolar frequency tilt for more bass or treble distortion.

Mix

Dry/Wet balance control. Turning Mix down from the usual maximum preserves more of the original character without affecting the distortion characteristics.

Rate (in Corrode mode)

Reducing ('decimating') the sample rate degrades audio quality: Low values introduce high-pitched 'grit'. At high Rate values, aliasing takes over — you will hear more rough metallic tones than the original signal.

Crush (in Corrode mode)

Bit crush (resolution reduction) amount. Waves become increasingly 'steppy' until they are reduced to clicks or even silence, depending on the input.

Reverb

It looks simple enough, but Hive's plate reverb is surprisingly flexible. It is capable of anything from small resonators (e.g. guitar body or metal tubes) to huge cathedrals…
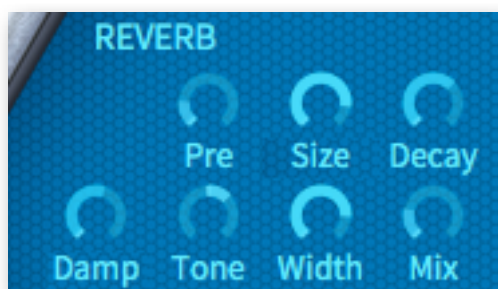
Pre

A single delay before the reverb starts. Especially useful for retaining the presence of the original signal while using lots of reverb. Or as a slap-back delay!

Size

Room dimensions, from sardine can to infinity and beyond. Balance this with Decay…

Decay

Controls reflectivity of the room, essentially the opposite of Damp (see below). Affects how long it takes for the reverb tail to fade out.

Damp

Causes higher frequencies to fade out more quickly than low frequencies, imitating the 'warming' effect of carpets, curtains etc. in a room, or the audience in a concert hall.

Tone

Strong 'tilt' equalizer. Use in combination with Damp to colour the reverb.

Width

Stereo spread of the reverb signal.

Mix

Balance between the original (dry) and reverb signals. At maximum, the dry part of the signal is faded out completely, which lets you use Hive's reverb for strong 'guitar body' type resonances: Set Pre to minimum, and fine tune the Size around 5.00.

Equalizer

Insert the EQ effect wherever you want to cut or boost part of the spectrum, for instance to add some mid-range 'presence'.
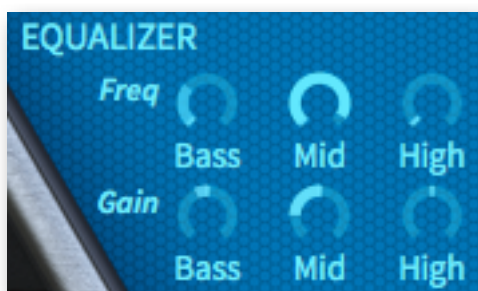
### Low | Mid | High

The 3-band EQ has Low and High shelving filters surrounding a fixed-width Mid band. Each band has a corner Frequency and Gain control, and each band's gain can be set from -15dB to +15dB (i.e. plenty!)

Tip: Where you place the EQ in the effects chain is important. For instance, put the EQ after the Distortion unless your intention is to control distortion characteristics.

Chorus

As effect for synthesizers, chorus has a long tradition. After spring reverb, chorus was the second effect ever built into a commercial synthesizer. Hive's chorus is actually three different models that share a common set of controls:
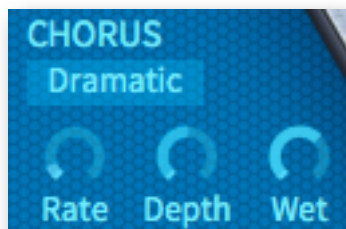
Type

Classic, **Dramatic**, **Ensemble** are based on well-known hardware effects. Ensemble is especially rich: it can turn a raw oscillator into a classic 'string machine' sound.

Rate

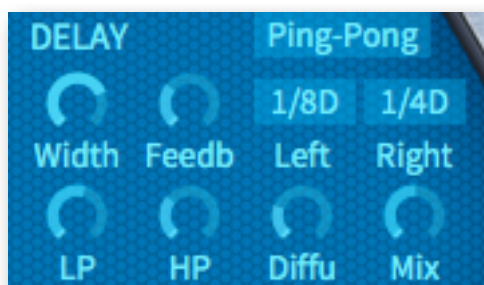The modulation speed. Use low values for slow stereo effects.

Depth

The modulation amount. Set to zero (with Classic or Dramatic) for static coloration.

Wet

Balance between the original and treated signal. Lower values here can be used to add warmth without making the sound too 'washy'.

Delay

Hive's delay unit looks simple enough, but is very 'musical'…

Width
Stereo width of the delay effect.

Feedb (feedback)

Feedback (regeneration) amount — the output signals are fed back into the input for repeating echoes. 100.00 will give you an almost infinite loop if LP is set to maximum and HP to minimum... so try that!

Mode (unlabeled)

The **Stereo** option has the two delays acting independently i.e. there is no cross-feed from one channel to the other.

Ping-pong feeds the left channel to the right then vice versa…

Pong-Ping is the same as Ping-pong except that it starts with the right channel.

Left and Right

Delay times for the two channels, always synchronized to host tempo. **T** means triplet time (3 in in the space of 2) and **D** means dotted (half as long again).

Tip1: For typical extreme stereo, set the Right channel to twice as long as the left e.g. 1/4 and 1/2. Use Ping-Pong if the left channel's delay is shorter, otherwise Pong-Ping.

Tip2: For a fuzzy slap-back effect, set the delay times to 1/32 and 1/16T, turn Feedb down to zero and Diffu up to maximum. You can make the delay times even shorter by negatively modulating the hidden parameter Delay / Time Scale.

LP and HP

Cutoff controls for lowpass and highpass filters within the feedback path. Lower the value of LP for typical damping, increase HP to reduce the bass and mid frequencies.

Diffu (diffusion)

The diffusion parameter makes the delay more 'fuzzy'. When Diffu is set to maximum, the individual echoes sound as if they had been treated with a short reverb.

Mix

Balance between the original and treated signal.

TimeScale (hidden parameter)

Modulate this parameter to shift all delay times away from strict synchronization.

Wow (hidden parameter)

'Wow' emulates the low frequency wobble of old magnetic tape delay units. To adjust the amount of Wow, use Constant as source in the modulation matrix (and of course select Delay / Wow as your target).

Tip: In the Matrix is a panel preset called 'UnWow the Delay'. This not only sets Wow to zero, but also straightens the delay, making it sound quite robotic.

Compressor

Audio compression is a common audio engineering and broadcasting tool. Here's an introduction: http://en.wikipedia.org/wiki/Dynamic_range_compression
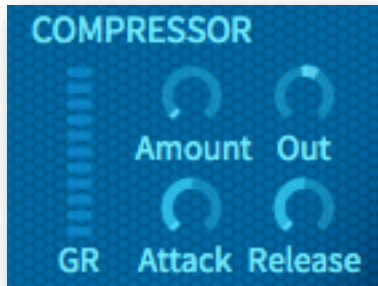
Although dynamic processing is useful in any audio system, compressors are not often found built into synthesizers.

The number of visible controls in Hive's compressor has been reduced to a minimum…

Amount

This knob is a combination inverted **threshold** and compression **ratio** control. With higher values, the signal can get very loud…

Out

Turn this down to compensate for the boost in volume caused by strong compression. Turn Out up to simply boost very quiet signals (keep Amount at zero).

Attack

How fast the compressor reacts to peaks in the signal. Experiment with the Attack and Amount values for maximum 'punch' in percussion sounds, or for the smoothest pads.

Release

Compression 'relaxation' time. This setting isn't quite as important as Attack because the actual release time is semi-automatic.

Gain Reduction (GR)

The vertical row of indicators labeled **GR** gives you a good idea of how much the signal level is being reduced whenever the compressor kicks in. For maximum effect, make sure there is plenty of movement here.

Mix (hidden parameter)

A Dry/Wet mix control for parallel (aka New York) compression.

Phaser

Traditional sweeping effect, stereo, with adjustable resonance (feedback)…
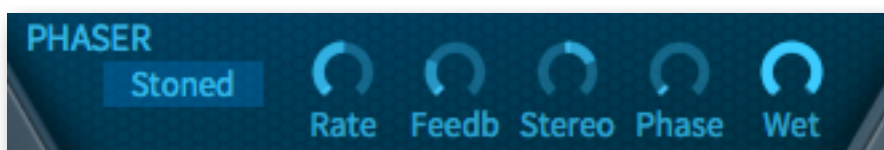
Type (unlabeled selector)

Stoned or **Flanged** — inspired by 2 different hardware units. The Flanged type is more complex (it uses more delays) and is particularly interesting for bright sounds. Note that in Stoned mode the maximum stereo effect is already at +/- 25.

Rate

Modulation speed of the Phaser's own LFO.

Feedback

The amount of resonance. Note: high resonance can create strong bass humps.

Stereo

A bipolar stereo width control. Note that with the 'Stoned' type, maximum stereo width is at +/- 25.00 (this is especially obvious if you turn Feedback way up).

Phase

LFO phase offset, from 0 to 360°.

Wet

Amount of phase-shifted signal, from 0% (completely dry) to 50% Wet.

Depth (hidden parameter)

The amount of modulation from the Phaser LFO. Normally maximum.

Center (hidden parameter)

Phase offset. For static colouration effects, use the 'Constant' modulation source to both minimize the Depth (see above) and adjust the Center.
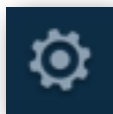
FX Preset

At the very bottom of the hexagon is a large panel preset button which lets you copy/paste, save or load **all effect settings** at once:

Unlike the small panel preset buttons at the top of the other HIVE panels, those in the hexagon show the panel preset's file name.

Configuration

Clicking on the cogwheel icon at the top right opens the **global configuration** pages where you can adjust the window size and brightness and connect HIVE parameters to MIDI continuous controllers.

The 4 buttons are **MIDI Learn** [**L**], **MIDI Table** [≡], **Preferences** [tools] and **Close** [**X**]:

Tip: Right-click within the button area to set the currently selected page as default!

About MIDI CC

Before connecting knobs and sliders on your master keyboard to HIVE parameters (see the next page), it's best to know what a **MIDI CC** is…

CC stands for MIDI **continuous controller** (or **control change**), a multi-purpose message format used for editing and performing presets. CC isn't the only kind of MIDI performance data — there are specific messages for **note on**/**off** (including velocity), **pitch bend** and two kinds of **aftertouch**.

Although the MIDI Manufacturers Association (MMA) was kind enough to leave most of the 128 CC numbers undefined, a few of them have specific meanings that are also recognized by HIVE:

> 001: modulation wheel
> 002: breath controller
> 011: expression pedal
> 064: sustain pedal

You don't need to attach any hardware i.e. a real breath controller or expression pedal to make use of these controllers!

Later MMA revisions even included a bunch of esoteric CC definitions such as 'Celeste Detune Depth', probably at the request of a home organ manufacturer or two. We can safely ignore all such definitions!

Although CC is mainly 'general purpose', please avoid using controllers 120 to 127 as these are reserved for channel mode messages such as Local Control On/Off.

FYI here's the official CC list: http://midi.org/techspecs/midimessages.php#3.

MIDI Learn

The MIDI Learn page is where you can connect MIDI CC (see above) to HIVE parameters. The CC data can be generated by e.g. knobs or sliders on your hardware controller, or by a track in your host sequencer.

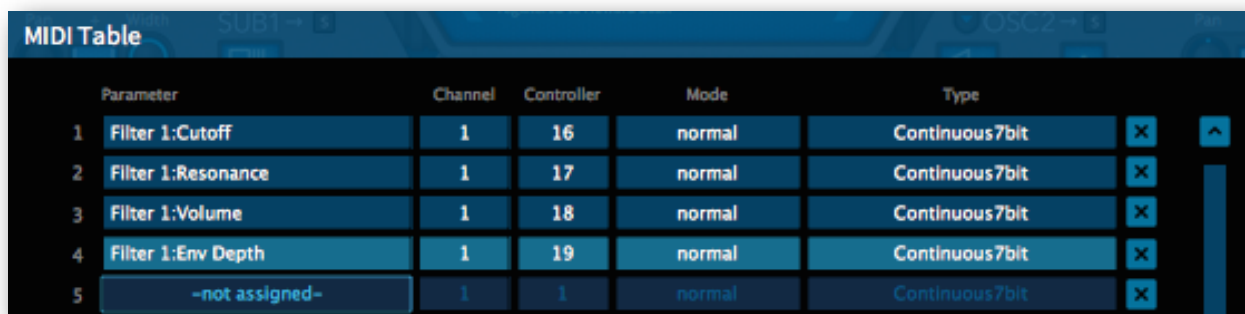Click on the configuration button and select the 'L' MIDI icon:
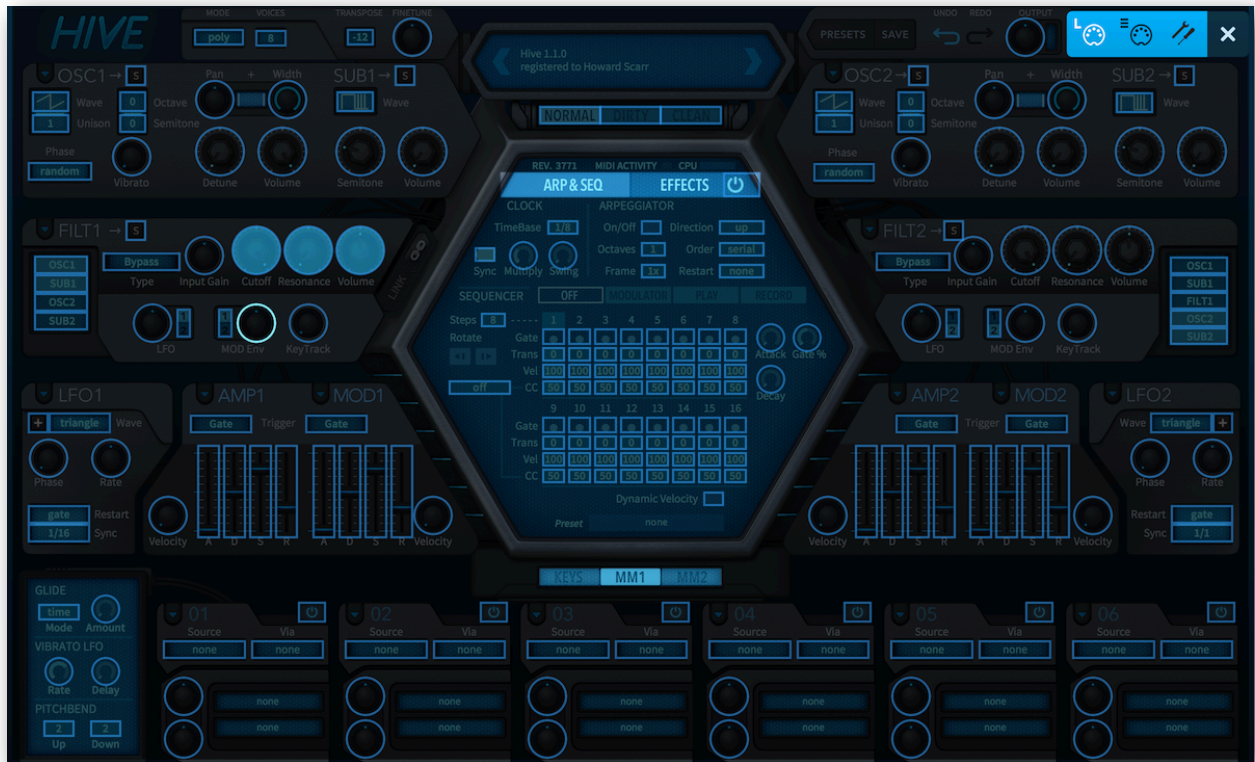
The MIDI Learn window is a translucent overlay, with all MIDI-learnable elements appearing as selectable outlines. Controls that are already connected are filled (like three of the filter knobs in this image), and the outline of the currently active control is highlighted (FILT1 ModEnv in this image).

Try it: Click on the Filter 1 Cutoff knob and send HIVE some MIDI CC data e.g. move a knob or slider on your MIDI controller — and the connection is made. Now switch to the MIDI Table page to check that the new connection is in the list, then exit via [X]. If you don't want the new CC connection to be permanent, go to the MIDI Table page (see below) and remove it.

Note: Some of HIVE's controls won't be immediately available — you might have to select the ARP & SEQ or EFFECTS panel, and the keyboard (which gives you access to the two wheels) or the modulation matrix slots. You don't have to exit the configuration pages first, you can still switch them over from the MIDI Learn page.

MIDI Table

Click on the configuration button and select the '≡' MIDI icon button to open an editable list of all current MIDI CC assignments.

Parameter

The first field displays/selects one of HIVE's many parameters, which are sorted into sub-menus according to module (mainly). Click on the 'ADD' button at the bottom left and experiment with this field, then delete the assignment again by clicking on the small [X] to the right of the line you just created.

Channel / Controller

The next two fields are for MIDI channel and CC number. HIVE is channel-sensitive, so you can map up to 16 channels for a total of about 2000 control assignments.

Mode

Specifies the range and/or resolution of values.

Normal: full range, continuous
Integer: full range, whole numbers only
Fine: 0.01 steps between the two integers closest to the current value

Type

Specifies the type of hardware (by far the most common is Continuous 7-bit).

Encoder 127:   unipolar encoder
Encoder 64:   bipolar encoder
Continuous 7-bit: 7-bit MIDI CC (normal resolution, common)
Continuous 14-bit: 14-bit MIDI CC (high resolution, rare)

Remove

To remove individual assignments, click on the [x] to the right of each line. To remove all assignments, click on the **Delete All** button at the bottom of the window.

Preferences Page

Click on the 'tools' icon to open this page…
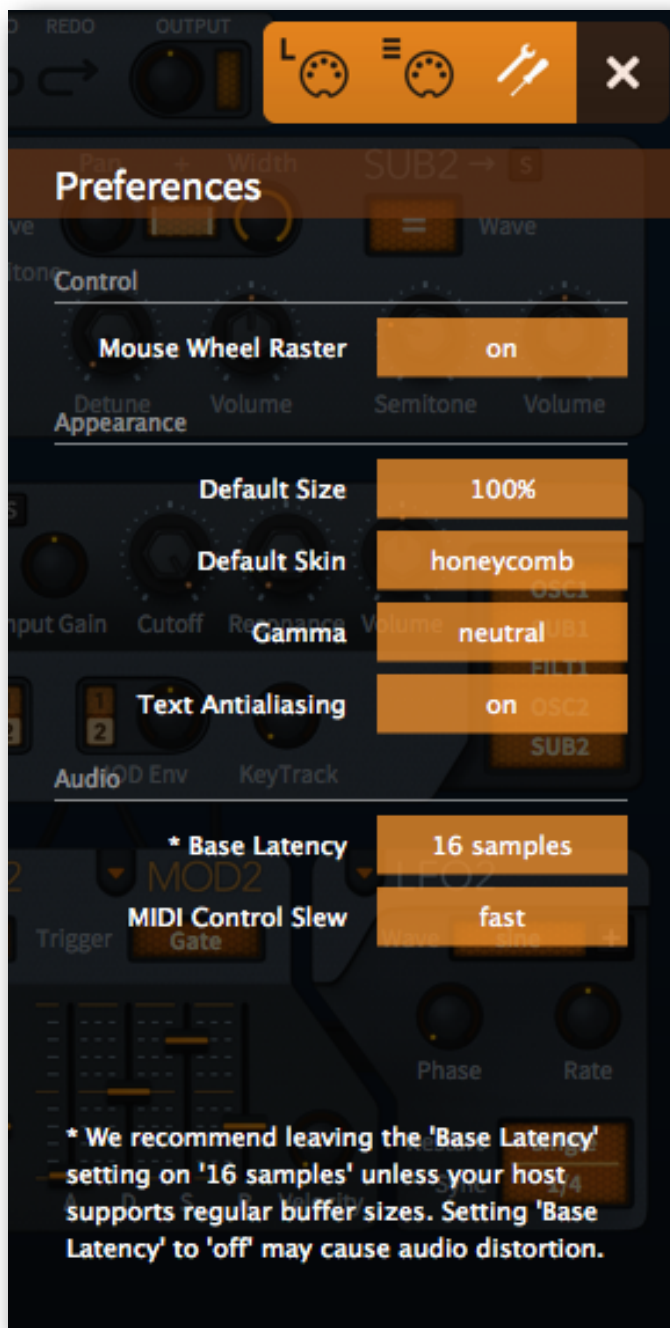
Mouse Wheel Raster

If your mouse wheel is rastered (you can feel it clicking slightly as you roll the wheel), set this option to 'on' so that each little click increments the value in sensible steps.

Default Size

The GUI size for each new instance. You can temporarily change GUI size without opening Preferences by right-clicking in the background.

Default Skin

Sets one of the (currently two) skins as global default.

Gamma

Determines how bright HIVE appears.

Text Antialiasing

Switches the smoothing of labels and values on or off. Normally left on, only in certain cases will switching it off improve readability.

Base Latency

If you are certain that your audio system – hardware as well as software – uses buffers that are a multiple of 16 samples in size (please refer to the respective documentation), you can safely disable Hive's base latency. Otherwise leave it set to the default '16 samples' to prevent crackles.

Note that a new Base Latency setting will only take effect when the host allows e.g. on playback or after switching the sample rate. Reloading Hive will always work.

MORE ABOUT BUFFERS

Internally, Hive processes audio in chunks of n x 16 samples. This so-called 'block processing' method significantly reduces the CPU load and memory usage of all our plug-ins.

If the number of samples to be processed is say 41, Hive processes the first 32 and keeps the remaining 9 in a small buffer (16 samples is enough). Those 9 samples are then processed at the start of the next call... and so on.

The extra buffer is only necessary if either the host or audio driver processes 'unusual' buffer sizes. In the many host applications that process buffers of e.g. 64, 128, 256 or 512 samples (all multiples of 16), try switching it off so that Hive can process latency-free.

MIDI Control Slew

Adjusts the rate of performance control smoothing for Pitch Bend, Mod Wheel, Breath and Expression. Pressure data has a fixed slew rate and is not affected by this setting.

With MIDI Control Slew set to 'off', Hive is more responsive to modulation wheel data (for instance), but can easily sound too grainy. The default setting ('Fast') is a compromise between speed and smoothness.

Inside the Hive

This section starts with a few features that would have filled earlier chapters with 'too much information', followed by a bunch of programming tips and tricks.

Hidden Parameters

To avoid cluttering Hive's GUI with dedicated controls, we relegated a few parameters to the modulation matrix only: Oscillator **Tune**, **Phase** angle and **Pulse Width** (for the **pulse** waveform), delay **Time Scale** and **Wow** as well as phaser **Depth** and **Center**.

To fine tune an oscillator while Unison is active, use **Constant** as the source and **Tune** (drag & drop onto an Octave or Semitone selector) as the target.

A useful side–effect of implementing 'hidden parameters' is that we can add as many modulation targets as we like without making Hive any less easy to use.

MIDI Specialities

MIDI Programs

All presets (up to 128) present in this folder will be loaded into memory when the very first instance of Hive starts. These 'MIDI Programs' can then be switched on the fly via MIDI 'Program Change' messages.

MIDI Programs are accessed in alphabetical order, and their positions in the list need to stay the same. It makes a lot of sense to rename them, e.g. prefix each one with an index '000 rest–of–name' to '127 rest–of–name'.

Unlike regular presets, MIDI Programs can't be added, removed or renamed on the fly. Changes will only take effect after the host software is restarted!

The MIDI Programs folder can contain up to 127 sub–folders of 128 presets each, switched via MIDI 'Bank Select' messages. Notes: The MIDI Programs folder is bank 0, the bank select message is CC#0. If you are using banks, send the Bank Select message before the Program Change message.

Poly Pressure (polyphonic aftertouch)

Hive recognizes polyphonic aftertouch data – each voice is modulated independently.

Multi-Channel MIDI

Hive and all other u-he synthesizers support a growing class of expressive sensor-based instruments (e.g. Haken Continuum, Eigenharp, Roli Seaboard, Linnstrument) that can send each note over a separate MIDI channel. For Hive to respond correctly, your host must be able to route multiple MIDI channels to a single plug-in instance.

While receiving multi-channel MIDI, each voice will react **individually** to the following control messages: Pitch bend, Pressure (aftertouch), Modulation (CC #01), Breath control (CC #02) and Expression pedal (CC #11).

The voice modes **Poly**, **Mono** and **Legato** become practically identical. In each case, Hive behaves like several (up to 16) mono synths set to the same sound. Note that the **duo** voice mode isn't channel-aware i.e. all MIDI channels are merged.

'Single trigger' type modulation sources listen to the channel used by the first played voice. (Caveat: Implementing single triggers in a multichannel context is very tricky — we will need to spend some more time working on this feature).

Tips & Tricks

Setting Volumes

There are several points within the signal path where levels are affected: Oscillator volume, filter input gain and output volume, amp envelope velocity, compressor amount, compressor output, main output.

Where you choose to adjust the overall level can and will affect the sound. As there are no hard and fast gain-staging rules in the digital realm, it's best to trust your ears.

Modulating Pitch

To get perfect semitones using e.g. an envelope, velocity or a unipolar square LFO as your modulation source, simple integers won't do – you need to calculate the amount of modulation more precisely. The formula is **50 / 12 x (interval in semitones)**.

Here are a few values it might be worth memorizing:

```
1 semitone      =  4.17  (50/12 is 4.1666666…)
2 semitones     =  8.33
3 semitones     =  12.50
4 semitones     =  16.67
(5 semitones    =  20.83)
(6 semitones    =  25.00)
7 semitones     =  29.17
12 semitones    =  50.00
```

You can also use this formula for semitone offsets to filter cutoff.

Using Constant

With lots of positive modulation, the cutoff can be too high even if the knob is turned down to minimum (30.00). All is not lost, however – you can take it much further down in the modulation matrix. Select 'Constant' as the source and Cutoff as target, then set a negative amount.

Does the delay sound too wobbly or even not wobbly enough? Go to the matrix, select the panel preset **UnWow the Delay** and adjust the lower of the two modulation amount knobs. The upper knob lets you adjust the overall delay time ('Time Scale') – another hidden parameter itching to be used for more experimental sounds!

For waveform variations, you could set a Phase offset between the main oscillator and its sub–oscillator. Try this:

– Load --INIT--.
– Activate SUB1 in filter 1.
– Tune SUB1 Semitone to 0.00.
– Select the sawtooth Wave (not 'like Osc') and turn SUB1 volume up to maximum. The result is a pair of saws with a 90° phase offset (have a look at the waveform using an oscilloscope).
– In the mod matrix, select the **Phase Control** panel preset and adjust the upper modulation amount while listening carefully. At around -25 or +75 you should hear a perfect octave, with various timbres between those values.
– While moving the amount knob, did you like the PWM–type effect? If so, try modulating Phase with a slow LFO instead of Constant.

Pulse Width Modulation

A chorus–like effect at the oscillator level, PWM is ideal for 'string ensemble' sounds as well as simple but rich–sounding leads and basses.

The first method is regular PWM using a Pulse oscillator and an LFO:

– Load --INIT-- from the User folder.
– Set OSC1 Wave to **Pulse** (the PWM–capable version of Square).
– In the first Matrix slot (01), select LFO1 as the Source.
– Click and drag the crosshair from either of the Target selectors in matrix slot 01 and drop it onto oscillator 1's Wave selector: the Target selector should now read 'Osc1:PulseWidth'.
– Turn the modulation amount up to about 50, play a low note and listen…
– Does the PWM effect sounds too 'square', not smooth enough? Change the LFO wave to Sine and listen again. Also try out different LFO rates.
– Start again, but instead of step 3 load the **PWM via LFO1** matrix panel preset.
– Listen > tweak > listen > tweak > listen… and save your finished preset under a different name i.e. don't overwrite --INIT--.

Here's an alternative method that uses a pair of saw waves with one of them inverted:

- Load --INIT-- from the User folder.
- Tune the SUB's Semitone knob to about 0.20, but leave its Volume at minimum.
- In Filter 1, activate SUB1.
- In the Matrix, select Constant as the source then drag from a Target up to the SUB1 Volume knob. Set the amount to -100 (negative 100) for an inverted sawtooth at maximum volume.
- Listen > tweak > listen > tweak > listen... and save your finished preset under a different name i.e. don't overwrite --INIT--.

Envelope Clicks

At minimum, the attack, decay and release envelope phases are very fast, so notes played with Hive can click as much as (or even a little more than) any real analogue synthesizer. Mild clicking can give notes more rhythmic definition, but if you want to remove it completely, set the amp envelope Attack to at least 1 and the Release to at least 8. Tip: If you set the oscillator Phase mode to 'Reset', all clicks will sound exactly the same unless oscillator phase is modulated. You have complete control!

Tuning to '432'

Instead of the standard 440, tuning A4 to 432Hz has become quite popular recently, especially in the PsyTrance scene. To globally retune Hive to 432Hz, set the FINE TUNE control to precisely -31.76 (using SHIFT), right-click on the knob and lock it.

LFO Tricks

- Try modulating a single target from both LFOs, with various Sync ratios and phases. For instance two square waves modulating oscillator 1 pitch. Or you can use two sawtooth LFOs with opposite polarity to create staircase patterns.
- The LFO waveforms can be skewed via recursive modulation of the Phase or Rate. E.g. set the source to LFO and the target to LFO1 Phase. You can even change the pulse width of a square wave using this method!

Envelope Tricks

- For a more snappy decay, negatively modulate the Decay parameter from the same envelope. Positive modulation has the opposite effect, a convex curve.
- Experiment often with the MOD envelope in 'One Shot' trigger mode instead of the standard 'Gate'. Higher 'Sustain' levels can lead to surprising results!
- For access to some extra LFO shapes in sync with the regular LFOs, set the trigger modes of any unused envelopes to 'LFO 1' or 'LFO 2'.
- Instead of modulating cutoff with velocity in addition to the envelope, try modulating the sustain level of that envelope with velocity.
- Try modulating the vibrato amount with an envelope. You can easily create an initial 'growl' using very fast vibrato modulated by a rapidly decaying envelope.

– Try using two envelopes instead of one (although this can get a bit complicated). For a 2-stage decay, modulate the Sustain of one envelope from the other with a much slower Attack or Decay. For a typical 'cinematic swell', modulate the filter Input Gain or Volume from the other (also with a much slower Attack or Decay). Countless variations on this theme are begging to be investigated. Listen to what happens when you modulate each individual stage of the main envelope, or when you have the two envelopes modulating each other…

Arp & Seq Tricks

– Try recording a sequence with the arpeggiator switched on – a very quick method of turning a simple 3-note chord into a 'rolling' sequence with consistent velocities.

– Vary your sequence length: MIDI-learn the 'Steps' selector, then with a 16-step sequence running, quickly change the number of steps from 16 down to something low e.g. 2 or 3. Watch how the sequence runs backwards until it can comply with the new setting. Keep performing…

– As a modulation source in the sequencer, Pressure is different from the other 'CC' options: the MIDI Control Slew setting has no effect on Pressure data, which always glides between values at the same relatively slow rate.

– If you would like an extra melody running in parallel, and you don't want it to glide, you should try modulating the pitch of one of the oscillators with the sequencer's velocity data. As the velocities are pitch **offsets** it can be difficult to set up.

Alternatively, switch MIDI Control Slew off (see Preferences) and use either Breath or Expression as your pitch 'CC'. See **Modulating Pitch** a few pages back.

Reverb Tricks

– Try setting a very small reverb size e.g. 4.0, very little damping, a long decay and high mix value – you should start to hear comb filter type resonant effects. Start here for typical wind-instrument formants or small resonators (banjo, acoustic guitar, metal canister etc.)!

– In addition to the above, pre-delay will give you a coloured slap-back delay effect.

– Extreme values are a useful source of inspiration. For 'infinite space', set the Size and Decay both to maximum, Damp and Tone to the default values (double-click).

Delay Tricks

– For early reflection effects, set the Left and Right delay times to 1/32 and 1/16T and turn the diffusion up to maximum. Starting from zero, slowly adjust the feedback until it sounds like a cheap reverb effect. Then adjust the LP and HP values to thin out the reverb tail until you reach the dersired ambient effect.

If the current song tempo is very slow, you might have to speed up the delay by negatively modulating its 'Time Scale' with the source 'Constant'…

– Adjusting the delay's Time Scale can also be used to give rhythmic presets some serious swing — see e.g. matrix slot 03 in the 'HS Rotation Shuffle' presets.

Mod Matrix Lists

Sources

Here is a list of all modulation sources available in the modulation matrix.

Internal sources	
Amp 1/2	amplifier envelopes
LFO 1/2	low frequency oscillators
Mod 1/2	modulation envelopes
Seq Gate	sequencer gate (adjust sequencer Attack and Decay)
Vibrato LFO	global low frequency oscillator (not only for vibrato!)

MIDI sources	
Breath	**BC** = MIDI CC#02 (continuous controller number 2)
Expression	**XP** = MIDI CC#11 (continuous controller number 11)
Gate	+100 while a note is being played, otherwise zero (see numeric sources below)
KeyFollow	value derived from MIDI note number, pivots around 'E3'
ModWheel	**MW** = MIDI CC#01 (continuous controller number 1)
PitchWheel	**PB** = pitch bender
Pressure	**AT** = aftertouch, channel or poly
Velocity	MIDI note–on velocity

Numeric sources (%)	
Alternate	alternating extreme (+100, –100, +100, –100 etc.) per note
Random	random value anywhere between –100 and +100 per note
Constant	+100 constant, either for controlling **hidden parameters** (see Target list on the next page) or as an offset e.g. for setting the initial Cutoff even lower (see the first Using Constant tip).

Targets

Here's a list of all modulation targets available in the [modulation matrix](). The lefthand column is what you see in the target selector's context menu, and the righthand column is what you see in each sub-menu.

Targets in **bold red** typeface are 'hidden parameters' which only appear in the modulation matrix, not as regular controls in the main panels. For simple adjustment of these parameters, modulate them using 'Constant' as source.

synthesis targets	
Amp Envelope 1/2	Attack, Decay, Sustain, Release, Velocity
Mod Envelope 1/2	Attack, Decay, Sustain, Release, Velocity
LFO 1/2	Phase, Rate
Oscillator 1/2	Detune, **Tune** (continuous), Vibrato, **Phase** (angle), **PulseWidth** (pulse wave only), Volume (main oscillator), Pan, Width, Sub Tune, Sub Volume
Filter 1/2	Input Gain, Cutoff, Resonance, KeyTrack, Mod Env Depth, Mod LFO Depth, Volume

global targets	
Arp+Seq Clock	Multiply, Swing
Voice	Glide, FineTuneCents
Vibrato LFO	Delay, Rate

effect targets	
Distortion	Amount, Tone, Mix, Rate, Crush
Chorus	Rate, Depth, Wet
Phaser	Rate, Feedback, Stereo, Phase, Wet, **Depth**, **Center**
EQ	Bass Gain, Bass Freq, Mid Gain, Mid Freq, High Gain, High Freq
Delay	**TimeScale**, Width, DryWetMix, Feedback, HighPass, LowPass, **Wow**, Diffuse
Reverb	PreDelay, Damp, Decay, Size, Tone, Width, DryWetMix
Compressor	Amount, Attack, Release, **Mix**, Output

THE END!

honeycomb skin