



# HEXERACT

BY AUDDICT

USER MANUAL

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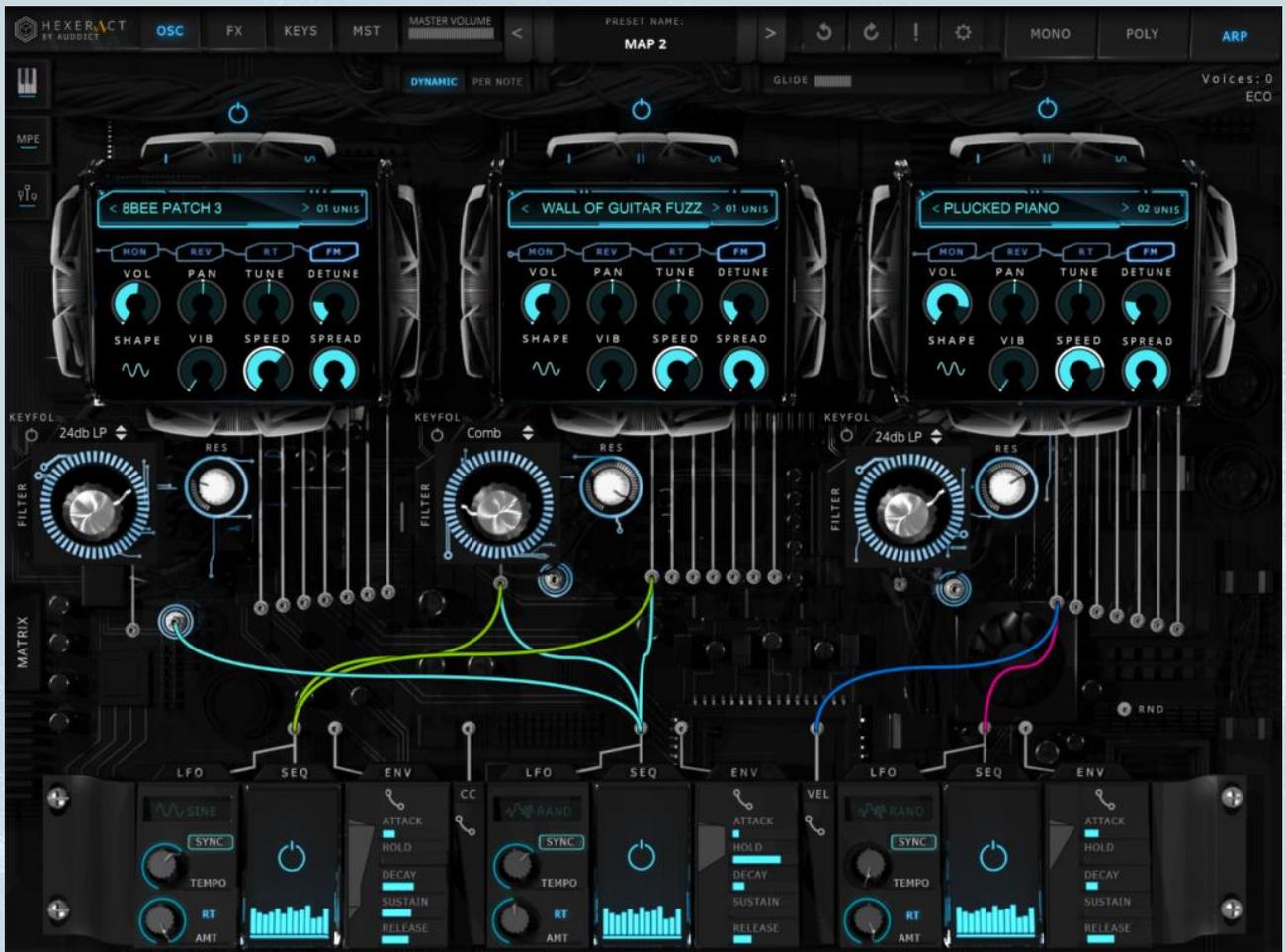
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## INTRODUCTION

### ABOUT HEXERACT

Hexeract is a limitlessly powerful software synth, which has vastly expanded the potential sound palette for composers, producers, songwriters and all other artists. Create sounds with Hexeract that you never before believed possible, with enough capability, material, modules and controls to experiment indefinitely and infinitely.



Never before have the true essence and complexity of modular synthesis, and the best of organic recordings/samples been combined in such a capable and mighty fashion.

With Hexeract, you have before you a powerful and capable software synthesizer, multiplied with the added dimension of organic recordings, leading to sonic possibilities not even remotely paralleled by any software

or hardware currently available. Create sounds with Hexeract in seconds which, even if replicable manually, could potentially take hours of manual sound design and editing.

Explore the vast possibilities through our demo tracks available at [www.hexeractsynth.com](http://www.hexeractsynth.com) with videos, specs and more descriptions for some of the finer intricacies. The true artistry however, lies ultimately with you. We've created and given you this amazing tool, and look forward to seeing you do your part as the artist, and hearing the amazing creations that you come up with using Hexeract...



## HOW TO USE THIS MANUAL

This manual is set out with the installation instructions and troubleshooting first, followed by user interface instructions, covering all parts of the synth on the surface and explaining where everything is and how to use the controls. The separate sections and controls are then gone over in further in-depth sections later in the manual, with tips and tricks at the end, examples throughout etc.

## INSTALLATION

Please see below for the full instructions on installing Hexeract in either Windows or Mac (standalone and plugin versions), and ensuring everything is correctly linked up, with samples correctly extracted and linked to.

Once you place your order, you will receive download links for the following sets of files:

- Hexeract .exe file (for **Windows** users)
- Hexeract .pkg file (for **Mac** users)
- Hexeract Resources .hr1 file (contains all samples – used just after installing main application to install samples – do not delete after correctly installing samples)

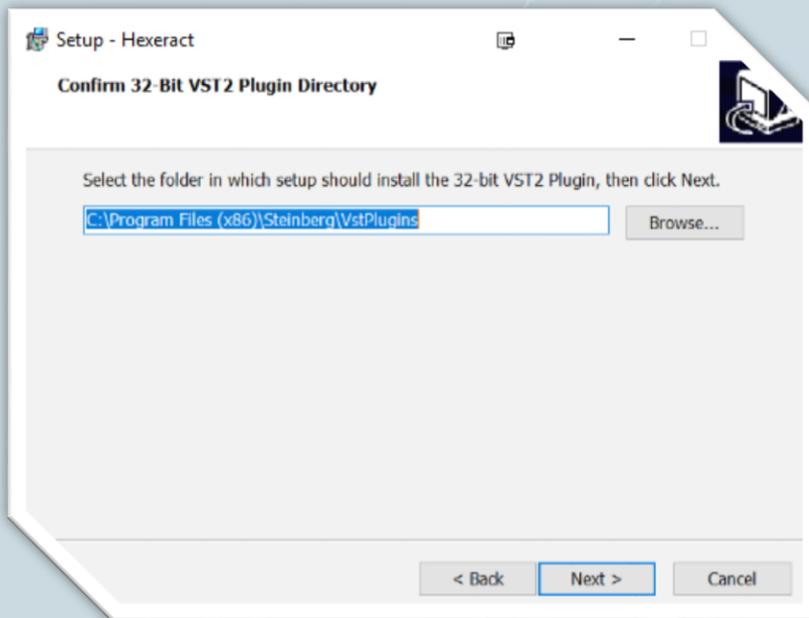
These installers will allow you to install both the standalone versions of Hexeract, as well as all plugin versions for you to load into your DAW.

You can use any standard zip extracting program (recommended: Winrar for windows, and UnRar for mac) to extract **all** files. We'd recommend extracting all files before attempting installation to a safe and accessible location. After installation, you can delete the downloaded files, although we'd recommend keeping them stored somewhere for fast re-installation if required. Please do not delete any of the files until you have successfully completed sample installation from within the Hexeract interface.

## WINDOWS INSTALLATION

If you are installing Hexeract on a windows machine, after successfully extracting all files from the Hexeract zipped folder, open the **Hexeract Installer \*.\*.exe** file, and follow the instructions on the screen.

You will be immediately prompted to choose a location for the 32-Bit VST2 plugin, and the 64-Bit VST2 Plugin. If you have a preferred location for these, you can alter the destination, otherwise leave the default settings. It's important to know where the VST Plugins are installed, so you can point to them later in your DAW if necessary.



Follow through with the installation until it is complete, and you will be able to open Hexeract for the first time. You'll be presented with a dialogue to register your copy. Simply enter your e-mail address that you used to purchase, along with the serial key you received with your download links for Hexeract after checkout.



After licensing your copy, please scroll down to the “installing samples” sub header below, to correctly install the sample library content for Hexeract.

## MAC INSTALLATION

If installing Hexeract on a Mac, you’ll need to open the **Hexeract.pkg** file and follow the installer through. You can use UnRar or UnRarX to extract the rar/zip files.

To install samples, please see the section below titled **Installing Samples**. The process is the same on Mac as it is in Windows.

## OFFLINE AUTHORIZATION

On the offline computer on which you would like to activate Hexeract, click **Generate License File**. An OfflineActivation.json file with your credentials will be created. This option is only presented when no internet connection is available.

Transfer this file to another computer with a working internet connection, and then go to <https://register.hise.audio/activate/>

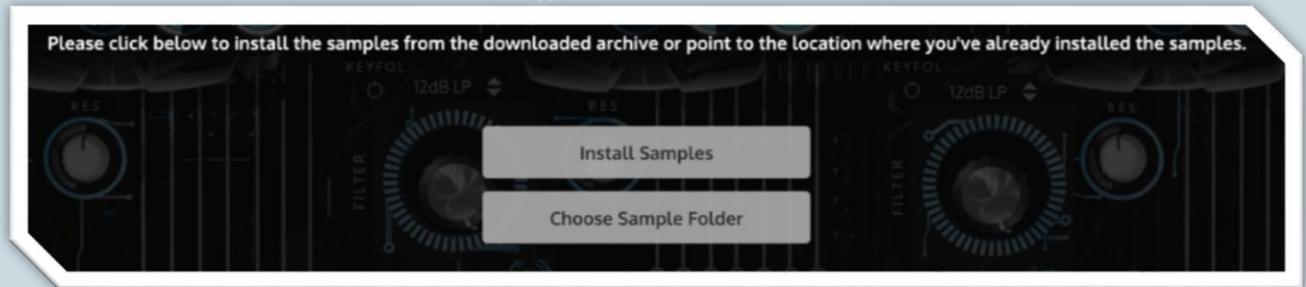
You can upload the license file **OfflineActivation.json** there and the server will return a license file (.license/.license\_x64) which you can use to activate Hexeract.

## INSTALLING SAMPLES

After successfully installing and licensing Hexeract for the first time, you will be asked whether you want to install samples, or choose the sample directory.

If you are running Hexeract for the first time, it is **very important** that you click **Install Samples** at this stage, as the **Hexeract Resources** file needs to be unpacked into the directory of samples.

Only select **Choose Sample Folder** if you are one hundred percent sure that you have previously installed Hexeract, and know exactly where you have extracted the samples from the **Hexeract Resources .hr1** file. You’ll need to restart the plugin for these changes to take effect, after navigating to the correct directory and pointing Hexeract to it.



The process for installing samples is relatively simple. After clicking **install samples**, you will be asked to select the **Hexeract Resources .hr1** file that you downloaded after your purchase. Navigate to this file and select it.

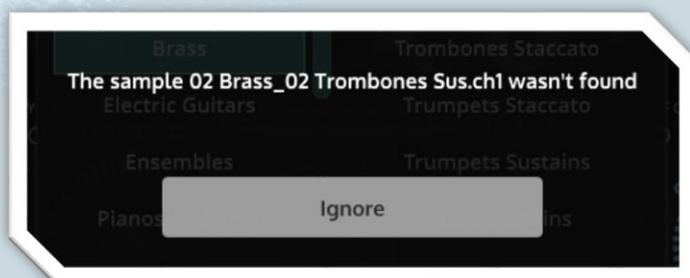
The next dialogue will ask you to choose the location that you want to install your samples to. At this stage, you can navigate to a custom folder (especially if you'd like to install to another drive), otherwise leave the default option, and hit **OK**.

The next dialogue box will give you the option to alter your choices of sample destination once more, as well as the option to automatically delete the **.hr1 file** after installing samples, as it will no longer be needed. We'd recommend keeping this file somewhere, in case you somehow lose your samples directory, and need to quickly re-install and extract everything.

Once you're happy with your choices, hit **OK**, and the installation process will begin. Once this is all finished, you'll need to re-start Hexeract, and you're good to go!

## INSTALLATION TROUBLESHOOTING

### The Sample \*\*\*\*\*.ch1 wasn't found.



The usual cause for this, is that the user had clicked on **choose sample folder** after first installing Hexeract, instead of **install samples**. This message will display when you try to select one of the sampled instruments as one of the oscillators' sound sources.

### Windows Fix

First close Hexeract. Open the start menu, type %appdata%, and hit enter. You'll be presented with a windows explorer window, where you should find and double click on a folder called **Auddict**. Delete the **Hexeract** folder inside, and re-open Hexeract.

You will now once again be given the opportunity to click **install samples**. Click this, and follow the instructions to install samples in the **Installing Samples** section of this walkthrough (above).

### Mac Fix

To fix this same error on a mac, make sure Hexeract is closed, open finder, and navigate to the following directory:

**~/Music/Auddict/Hexeract/Resources/**

... and delete the file called **linkOSX**.

Re-open Hexeract, and this time choose the option **install samples**, and follow the instructions further up in this guide titled **Installing Samples**.

## FILE LOCATIONS

When installing Hexeract, a new directory is automatically created:

**Windows:** ... \Users\USERNAME\AppData\Roaming\Auddict\Hexeract

**Mac:** ... ~/Music/Auddict/Hexeract/User Presets

Where your user presets, as well as a few other files are stored. If you wish to completely uninstall Hexeract, you must manually delete this folder after uninstall. Be sure to back up any custom presets that you have created before deleting this folder if you think you may want to use them again in the future.

The "User presets" folder contains all presets, both factory-included and custom. Simply copy this folder to back up your presets, and they can be added back at a later time, or/and on another system.

Presets created on older versions of Hexeract can be used on later versions, but presets created on later versions of Hexeract may not work on older versions. Please ensure you have updated to the latest available version.

## LIST OF SAMPLED INSTRUMENTS AND SYNTH WAVEFORMS

Below is a list of all included sampled instruments and synth waveforms, grouped by their categories.

- **Custom**
  - **Custom Sample (Select your own .wav file)**
  - **Sine**
  - **Triangle**
  - **Saw**
  - **Square**
- **Acoustic Guitars**
  - **Acoustic Muted**
  - **Acoustic Finger**
  - **Acoustic MajCho**
  - **Acoustic MinCho**
  - **Acoustic Picks**
  - **Nylon Guitar**
- **Brass**
  - **Horns Sus**
  - **Trombones Sus**
  - **Trombones Stacc**
  - **Trumpets Stacc**
  - **Trumpets Sus**
  - **Tubas Sus**
- **Electric Guitars**
  - **Guitar Wall PCs**
  - **Clean Neck MajCho**
  - **Clean Neck MinCho**
  - **Clean Neck**
  - **Clean Roadster**
  - **Crunchy MajCho**
  - **Crunchy MinCho**
  - **Crunchy SC**
  - **Fuzz**
  - **Wall of Guitar Fuzz**
- **Ensembles**
  - **Ensemble Huge Stacc**
  - **Mid Soft SBW**
  - **Mid Big Loud SBW**
- **Pianos and Keys**
  - **Plucked Piano**
  - **Pipe Organ**
- **SFX**

- **Ambient Air Fifths**
- **Ambient Air Min7**
- **Ambient Light**
- **Ambient Warm**
- **Ambient Air 9s**
- **Cave Shots**
- **String Stabs**
- **Blare Button**
- **Deep Rumble**
- **String Risers**
- **String Falls**
- **Acoustic Scratches**
- **Hammerforte**
- **Pljonks**
- **Rubber Thumpers**
- **Ac Bass Thuds**
- **Deep Detune**
- **Knuckle**
- **Metallic Thuds**
- **Wood Taps**
- **Strings**
  - **Cello Harmonics**
  - **Cello Sustain**
  - **Cello Tremolo**
  - **Viola Solo Harmonics**
  - **Viola Solo Spiccato**
  - **Viola Solo Sustains**
  - **Viola Solo Tremolo**
  - **Viola Solo Trills ST**
  - **Viola Solo Trills T**
  - **Violin Solo Sustain**
  - **Violin Solo Tremolo**
  - **Violins Harmonics**
  - **Violins Spiccato**
  - **Violins Tremolo**
- **Traditional and World**
  - **Tamburica Small**
  - **Tamburica Large**
  - **Tamburica Trem**
  - **Indian Flute**
  - **Chinese Flute**
  - **Peruvian Pipes**
- **Vintage Synths**
  - **8Bee Patch 1**
  - **8Bee Patch 2**

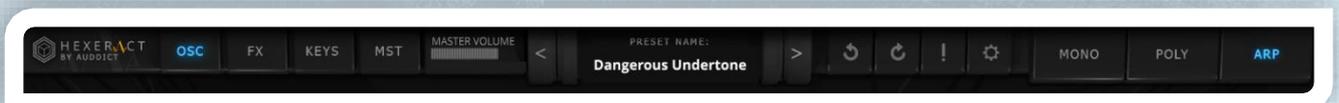
- **8Bee Patch 3**
- **8Bee Patch 4**
- **8Bee Patch 5**
- **8Bee Saw Unis**
- **8Bee Saw**
- **8Bee Square Unis**
- **8Bee Square**
- **8Bee Triangle Unis**
- **8Bee Triangle**
- **Oracle 5 FM Multi**
- **Oracle 5 FM Unison**
- **Oracle 5 FM**
- **Oracle 5 Pulse 7**
- **Oracle 5 Saw Det**
- **Oracle 5 Saw**
- **Oracle 5 Square 5**
- **Oracle 5 Sqr Unison**
- **Oracle 5 Tri Unison**
- **Oracle 5 Triangle**
- **Oracle 5 Warm**
- **Oracle 5 with Noise**
- **TREK Saw**
- **TREK Square**
- **TREK Square 2**
- **Vocals**
  - **Ethnic F Vox Aah**
  - **Ethnic Vox Mm**
  - **Ethnic Vox Ooh**
  - **Soprano Aah**
  - **Soprano Ooh**
- **Woodwinds**
  - **Bassoon Staccato**
  - **Bassoon Sustain**
  - **Bassoon Trills ST**
  - **Bassoon Trills T**
  - **Clarinet Flutter**
  - **Clarinet Staccato**
  - **Clarinet Sus**
  - **Clarinet Trills ST**
  - **Clarinet Trills T**
  - **Flute Staccato**
  - **Flute Sus**
  - **Flute Trill ST**
  - **Flute Trill T**
  - **Oboe Flutter**

- **Oboe Staccato**
- **Oboe Sus**
- **Oboe Trills ST**
- **Oboe Trills T**
- **Piccolo Flutter**
- **Piccolo Stacc**
- **Piccolo Sus**
- **Piccolo Trills ST**
- **Piccolo Trills T**
- **Percussion**
  - **Epic Drums**
  - **Marimba**
  - **Xylophone**

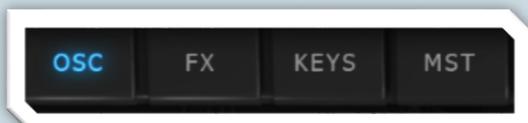
## USER INTERFACE OVERVIEW

### THE GLOBAL TOOLBAR

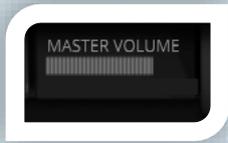
Sitting right at the top of the Hexeract interface, and visible at all times, is the **Global toolbar**, from which you can access information about your version of Hexeract and its license, navigate around Hexeract's various tabs, choose performance modes, select presets and more.



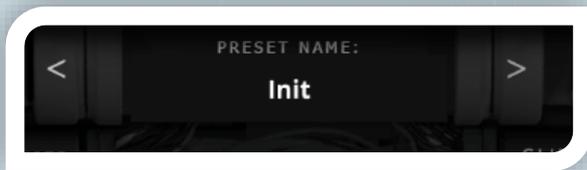
Clicking on the logo in the top left, where **HEXERACT BY AUDDICT** is written will bring up a small display showing your version number and license details.



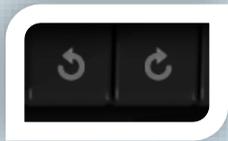
The **OSC**, **FX** and **MST**, buttons are used to switch between three editing windows. **OSC** opens the main synthesis window, containing the oscillators, filters and modulators. **FX** opens the tab of effects racks, where various different effects can be added to each oscillator. **MST** opens the final master tab, where you are presented with options for a four-band parametric master EQ, master compressor, limiter, as well as a master effects rack.



The master volume slider can be used to adjust the volume of the entire patch.



This is the preset display. The left and right arrows to each side of the selected preset name can be used to quickly scroll through presets. Clicking on the preset name display will bring up the presets window.



The left and right curved arrows are the undo/redo buttons.



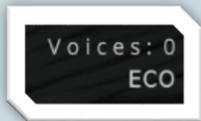
This is your panic button. If you find yourself in a stuck-note situation, (where a single note is mistakenly held on by the synth and you cannot get it to release), hit this button, and it will cancel everything out.



The small gear icon can be clicked to access Hexeract's settings menu, where you can access and change audio and MIDI settings.



**MONO, POLY and ARP** are the buttons used to change between the three main performance modes. MONO is for monophonic playing, POLY is for polyphonic playing and ARP is for performing using the arpeggiator module.



The small display just beneath the **Global Toolbar** on the right displays the number of active voices, as well as an **ECO** button, which – when activated – further limits the number of voices per oscillator to save on computer resources.

It's worth turning this on and off when working with patches with high voice counts. You may find when turning **ECO** on doesn't change your sound much, but will save some CPU power better spent elsewhere.

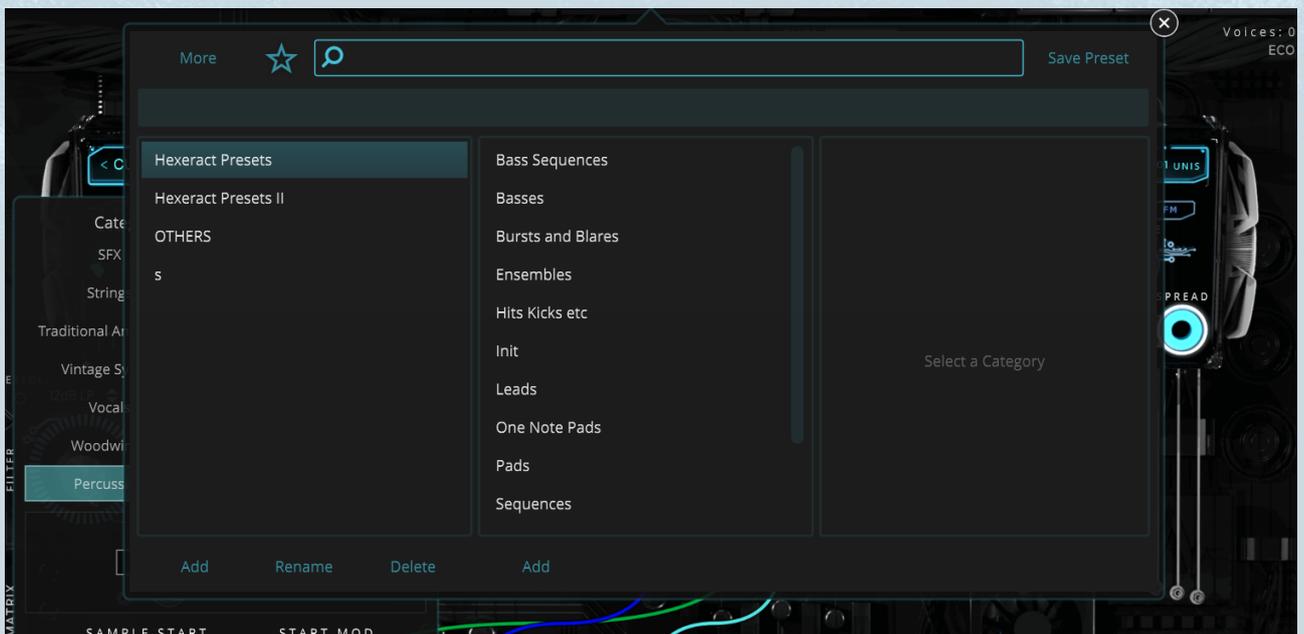
There is also a "glide" slider (only applicable for "mono" mode) just below the global toolbar on the right:



Turning up the slider increases glide, turning it down decreases it, all the way to zero, which is no glide at all. Using the ARP or polyphonic mode will bypass pitch glide completely.

## PRESET BROWSER

To open the preset browser, click on the preset name/display in the **global toolbar**, and the window pictured below will appear. If you have only just installed Hexeract, or installed Hexeract and not created any of your own presets, you will only see the factory installed presets. If you have created presets, they will all be accessible via this window.



The **preset browser** gives access to all presets including factory included presets, user presets, as well as options to add, re-name and delete presets and their folders. You can also import and export presets, mark favourites, and quickly bring up the location of **user presets** on your hard drive.

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## PRESET FOLDER, IMPORTING AND EXPORTING

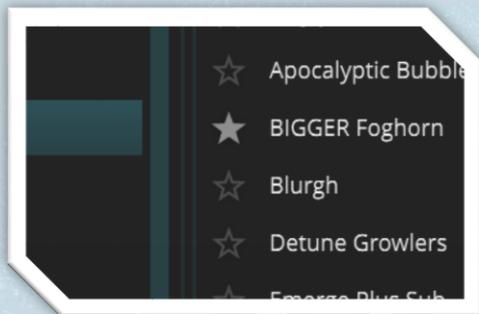
Clicking on **more** in the top left presents the option to **show preset folder** (open the user presets folder on your machine, so you can do things like manually import or copy preset files to transfer to another machine or other years).

You can also **import** and **export** your entire preset collection for transferring them to another machine, backing everything up during a system restore or Hexeract re-install, or for sending presets to other users.

---

## FAVOURE/STARRED PRESETS

To "**fav**" a preset, select the preset in the far right corner, which you'd like to star, and click on the little star to its left. If the star on its left is already filled in, it has already been starred, and is in your favourites.



To automatically see and access only your starred presets, click on the blue star icon, just right of the **more** button, in the top left of the preset window. All starred presets will be automatically shown and everything else filtered out, for quick access to all your favourite presets.

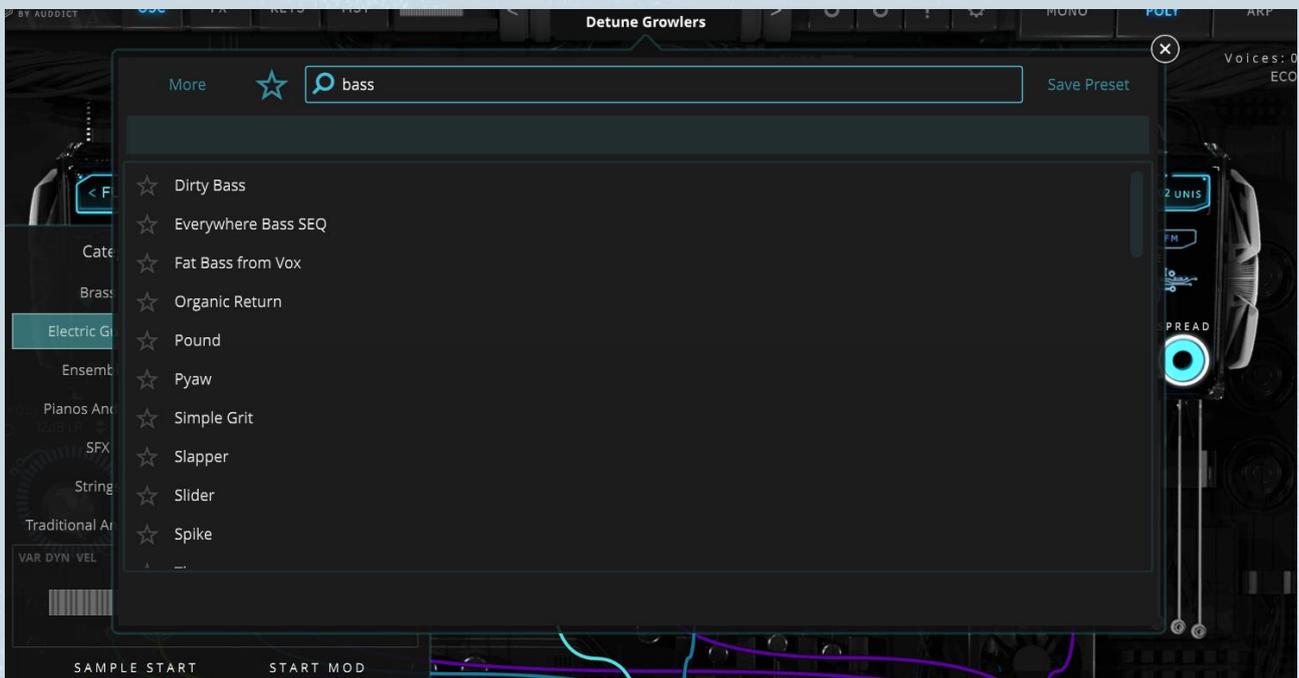
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## SEARCHING PRESETS

To search presets by a keyword or phrase, type your search term(s) into the search bar, and either hit *enter* on your keyboard, or click the little blue magnifying glass icon.



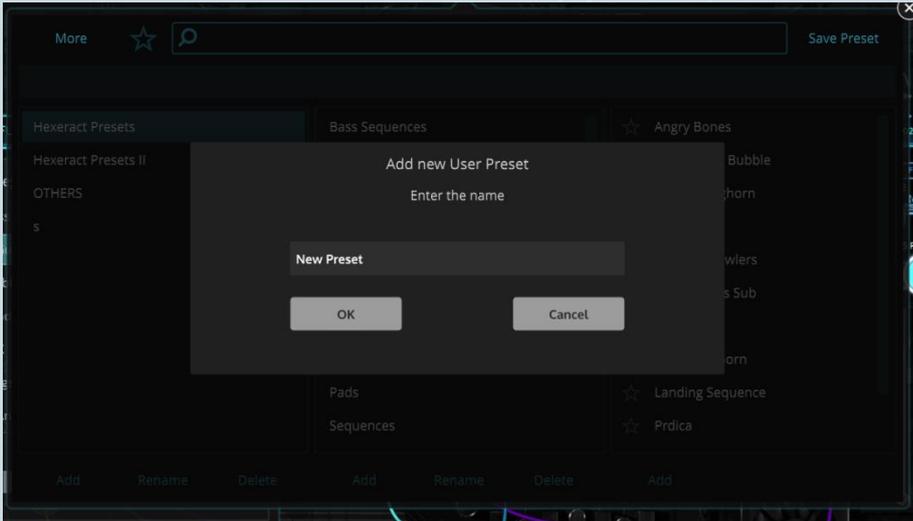
All presets showing partial or full matches (including if their parent folder contains the search terms) will be displayed, as shown below.



## SAVING, ADDING, RENAMING AND DELETING PRESETS AND THEIR FOLDERS

If you load up an existing preset, modify it, and click **save preset** in the **preset browser** (top right), you will overwrite the currently selected (and displayed) preset with the current patch in Hexeract.

To save a patch you've created as a new preset, Select the categories in the left and middle column in which you'd like to save it, and click **ADD** just beneath the right column.



You will be prompted to name the preset. Once you do so, the preset will be saved and appear in the folder you elected to save it in. If you make further changes to this preset and would like to save the changes, simply re-open the **preset browser**, and click **save preset**.

To re-name or delete either a specific preset or an entire folder of presets, click the preset or folder you'd like to remove, and then select either **rename** or **delete** just below its column. Similarly, if you would like to add a new folder/category for presets, select **add** in either the first or second column (depending on what tier you'd like to create the folder on), and enter the name of the category/folder.

## ADJUSTING CONTROLS AND PARAMETERS

There are many functions and controls in Hexeract. Here are the various ways you can control them.

The various knobs and sliders in Hexeract (pictured below) can be clicked and dragged to turn them up and down. Holding **CTRL** (insert mac) when clicking and dragging will allow for more precise adjustment.



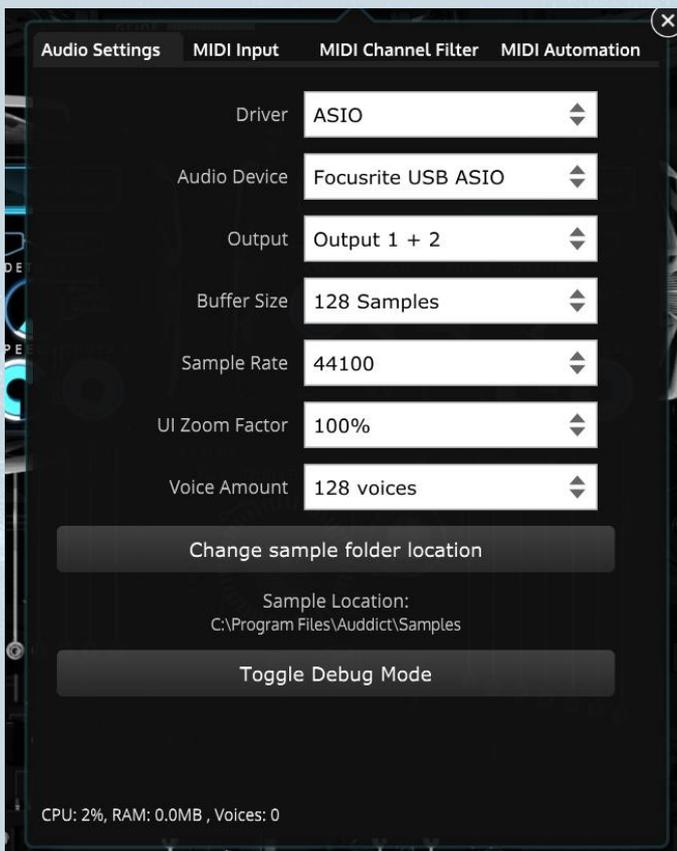
Shift and clicking on these controls will allow you to specify and type in a numerical value if there are exact numerical parameters you'd like to specify.

You can also adjust a parameter by simply moving your mouse so it hovers over the control, and turning the scroll wheel up or down.

Right clicking on a parameter will bring up the option to **MIDI Learn** that particular control.

## SETTINGS

Clicking the gear icon in the **Global Toolbar** will bring up the settings panel, where you can adjust audio and MIDI settings.



## AUDIO SETTINGS

This tab allows you to adjust your driver and device settings, as well as buffer and sample rate size, UI size etc.

It is always recommended to use an **ASIO** driver. If you have a dedicated audio interface, select **ASIO** driver, and under **Audio Device**, make sure you choose your interface's dedicated driver. You can select your outputs below (usually wherever you have plugged your monitors in).

Increasing the buffer size can help if you start to get glitches in the audio. You will increase the latency but performance will improve.

**UI Zoom Factor** can be used to increase or decrease the interface size. If you have a very small 4k display without scaling enabled, for example, you may want to increase this value. If the interface feels small, increase the zoom factor gradually until it looks comfortable to use – and similarly, if the interface feels too big, you can decrease the UI zoom factor, although we wouldn't recommend going below 100%.

**Voices** set the max number of simultaneous voices that can be played at once per oscillator. If you find that you want a higher voice count per oscillator, simply increase this - although the default 128 is pretty high already. If you hear any artifacts or glitch in the sound, try to decrease the **Voice** count to see if it remedies the problem.

If you moved your Hexeract sample content to a different location from where you installed it, and need to re-point Hexeract to these samples, click on **change sample folder location** to do this. Below this button, you can see that the current location is displayed.

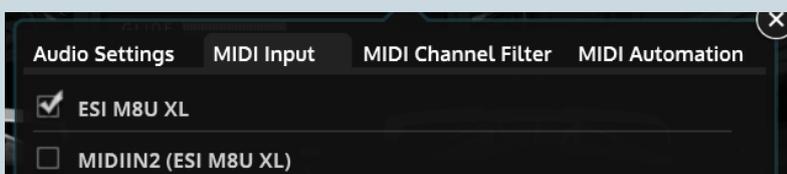
At the bottom of the settings panel is a CPU and RAM usage display. The CPU shows usage of a single core only, as well as only displaying peak values – so should not be taken as an indicator of general CPU usage, as this would be a much lower number. In testing, many instances of Hexeract have been run inside large DAW projects very successfully.

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## MIDI SETTINGS

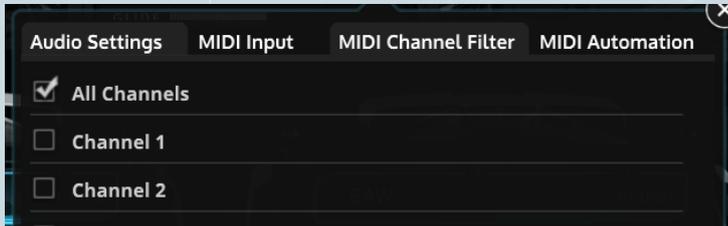
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### MIDI INPUT



The **MIDI Input** tab can be used to access your list of available MIDI inputs (controllers etc). If the MIDI device which you'd like to use to control Hexeract does not have a checked box next to it, click the little box to activate it – a tick will appear in the box, and you are good to go!

## MIDI CHANNEL FILTER



The **MIDI Channel Filter** tab can be used to filter incoming MIDI channel data. If you'd like Hexeract to only respond to certain MIDI channels, uncheck the **all channels** checkbox, and check only the channels you'd like Hexeract to receive.

## MIDI AUTOMATION

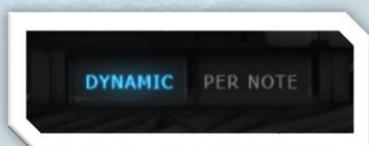
When you right click on a control and choose **MIDI Learn**, move a control and make a connection, this connection will automatically be added to the **MIDI Automation** tab, along with controls to adjust this modulation. This panel is covered later in further detail.

## OSC TAB

The **OSC** tab (accessed by clicking **OSC** in the **Global Toolbar**) holds the oscillators/sound sources, filters and modulators, and is where the bulk of the sound synthesis and design process will take place.

The "OSC" tab is where your oscillators/sound modules are, as well as where the main bulk of your sound designing and patching will take place. Here you can adjust various controls, route modulations, access the modulation matrix (matrix button, pictured below on the bottom-ish left hand of the interface), and more.

## DYNAMIC AND PER-NOTE MODE



"These two modes allow you to create modulation connections in two different ways. The **dynamic** mode is how you'd expect a normal modulation connection to work. The signal from the modulator is passed through to the parameter you want to modulate, and it reacts as expected, depending on how you've set the intensity and invert properties in the matrix.

When **dynamic** is selected (blue), all modulation connections created – whether via the patchbay or modulation matrix – will be set to **dynamic** mode, and remain this way. Similarly, whilst **per-note** mode is active, any connections created will be created in the **per-note** mode.

The **per-note** mode, allows you to create connections which behave in a per-note sample-and-hold-like fashion. Every note that is played grabs all parameters at that instant in time, and remains there – and this all happens on a per-note basis, hence the name. So if you activate **per-note** mode, and route a fast, random LFO to an oscillator, turn on the arpeggiator, turn the tempo up, and play something, you'll notice that each little note is played and remains in its own random place in the stereo field. This is great for creating randomness, and in this particular example, wide, granular sounds.

## OSCILLATORS



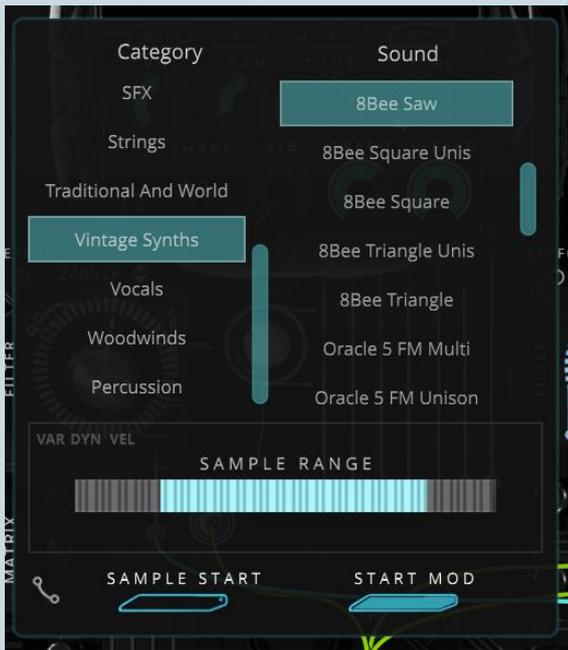
There are three oscillators at the top of the GUI. Each oscillator can be set to produce either a standard synth waveform (saw, square, sine, sawtooth, triangle) or load one of Hexeract's included multi-sampled instruments.



These power buttons can be used to turn each oscillator module on or off, so you can use one, two or three at a time. The power button also allows you to turn off other oscillators adjust one or two in isolation. In the **FX** tab, these buttons also exist above each oscillator's respective effects rack, so you don't need to switch tabs just to mute certain oscillators.



Clicking on an oscillator's **display screen** (shown above), will bring up a menu from which all Hexeract's sampled instruments and synth waveforms can be selected (as well as your own custom sample).



On the left, you can choose a category of instruments, and select your instrument or synth waveform from the **sound** column on the right. Full list of samples included in this manual (see contents).

You can also use the little blue arrows to either side of the current sound source/waveform's name to quickly scroll between sampled instruments within the selected category.

Click and drag **\*\* UNIS** to adjust the number of unison voices playing at once per note. Setting this – for example – to 04 as shown in the picture, will mean that four layers of that sample will be played when you press a note. This allows for the creation of very thick sounds, but it is important – when using multiple unison voices with samples – to also increase the **start mod** slider, which can be accessed from the sound sources menu (shown directly above) – accessed by clicking an oscillator's display screen.

The **start mod** slider sets a time range from which random sample starts will be chosen on a per-voice basis. This means that when you layer multiple iterations of the same sample, each voice will start at a different point in the sample, and you won't get any phase cancellation, but instead, a lush and warm layered sound.

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## CUSTOM SAMPLE

To choose a custom sample, scroll to the top of the categories column, and select **custom**. Then choose **custom sample** from the **sound** column on the right. You'll notice that the display changes at the bottom of the panel, prompting you to right click in the area and select your custom sample from wherever you have it saved on your system. You can also drag and drop the sample straight into Hexeract – just drag it into the little box prompting you to right click and it will load up the waveform of the sample.

Hexeract supports all standard audio formats, including WAV, AIF, FLAC, CAF (on macOS), OGG, and even MP3. Loop points are only supported with AIFF and WAV files, however.



In this panel, you can either set “pitch track” to off – in which case the sample plays at the same pitch regardless of which key you press (its natural pitch of course), or turn it on, to stretch the sample over the keyboard by pitch.

Hexeract will attempt to automatically detect the pitch; however this may not always work, so you can manually set the pitch of the sample in the small drop down box to the right of “pitch track” and have it map correctly.



When an oscillator’s sound source is set to a sampled instrument, the display above (visible when clicking on an oscillator’s display screen/instrument name) shows certain information about the current selected sampled instrument.

### **VAR DYN VEL**

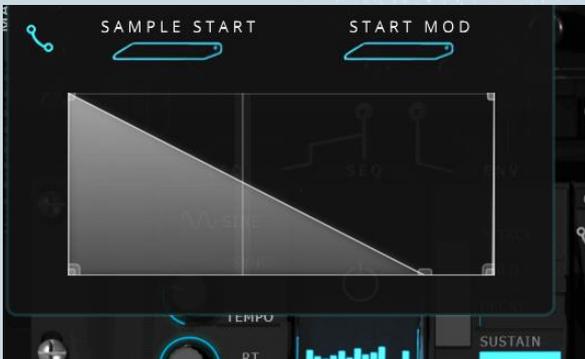
These stand for variations, dynamic layers and velocity layers. When one or more of these are blue, it indicates that the current sampled instrument has either multiple repetitions per note (known also as round robin variations), dynamic layers (crossfade-able by MIDI CC1 or the mod wheel) and velocity layers. Velocity layers are usually user by shorter articulations such as spiccato strings, where the louder dynamics are achieved by a higher velocity (playing harder on your MIDI controller) and the softer notes are achieved by playing softer (mapped to a lower velocity range).

The **Sample Range** display indicated the range of sampled notes for the selected instrument. The light blue keys are true-sampled keys (usually the full natural range of an instrument). Any keys outside this area are

pitch stretched. It's interesting to experiment both within the natural ranges of an instrument, and with the pitch stretched areas, as they can also yield interesting results. (See tips and tricks section at the end of this manual for a way to mess around with the natural and pitched stretched ranges of the sampled instruments).



This button opens the note-number to volume modulator for that oscillator. This table allows you to adjust the volume of the oscillator depending on the key played, which is very useful for creating patches where you want different oscillators to sound at different levels (or not at all) for certain parts of the keyboard. For example – you like the piccolo sounds up high, but don't like how they sound at lower ranges, but want the bassoons to be heard at the lower part of the keyboard, but not up top.



With the above settings, the oscillator is loudest at the bottom of the keyboard range, but gets progressively quieter as you play higher and higher, finally ending in complete silence for the very top of the keyboard range.

When you press a key, a line indicator will show where that key is on the table, so you can fine-adjust volume levels exactly where you need them.



In the example above, you can see how we can create completely selective ranges per oscillator. The oscillator here plays at full volume up to just below half of the keyboard range, and above this, does not sound at all.

*Quick tip: You can be extremely selective with this tool. Try creating a sequencer with three oscillators playing, and adjust the note-to-volume tables so at each random small chunk of notes, you hear a different oscillator. This is great for creating very sporadic/random and even some potentially psychotic sounding sequences.*



Each oscillator has a row of four buttons, and three panels of controls. Try switching between the sets of controls by clicking the three buttons at the top of each OSC.



The top row of buttons consists of four on/off controls for mono-izing the sound, reversing the samples, setting the oscillator to release-trigger mode, and turning FM on or off.

The first set of knobs contains the controls; volume, pan, tune, detune, vibrato shape, vibrato, speed and stereo spread (voice dependant). Clicking the tab-switch arrow (pictured above) will allow access to a secondary panel of controls (pictured below), containing an oscillator's dedicated amplitude ADSR envelope, as well as a transpose wheel, FM amount, FM (transpose by octave – FM pitch moves with the played note), and **FMFINE** (detunes the FM).



## FILTERS

Each oscillator has its own dedicated filter just below.



The large knob controls the filter's cutoff frequency, and to the right is a slightly smaller knob labeled **RES** which adjusts the filter curve's resonance.

Slightly to the top left of the large filter cutoff knob is the **keyfol** button. Click on it to activate key following, and the cutoff frequency will follow the note you play. This is very helpful for an even sound across the whole range of notes/pitches.

Just above the cutoff frequency knob is a little display showing what sort of filter curve or type is selected. Clicking on this will bring up a menu of filter types to choose from:

- 6dB Low Pass
- 6dB High Pass
- 12dB Low Pass
- 12dB High Pass
- 24dB Low Pass
- Notch
- 12dB Band Pass
- Ringmod
- Comb

## MODULATION PANEL AND PATCH BAY

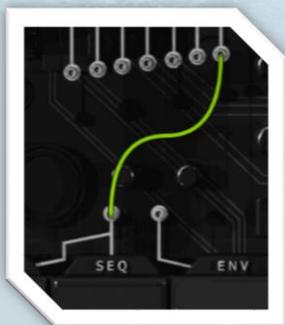


The bottom section of the **OSC Tab** holds the modulation panel, virtual patch bay and access to the modulation matrix. There are two main ways to add modulation connections in Hexeract. One is via the **modulation matrix** (covered below), and the other is to connect virtual patch cables from modulators' outputs to carriers' inputs.

In the image below, the modulators' outputs are circled in red, and the carriers' (modulate-able parameters) inputs are circled in green.



To create a connection, click and drag from any modulator's output, to pull a cable, drag it to the input of the parameter you'd like to modulate, and release. You'll have noticed that when you click to drag a cable, the inputs' labels will appear, so you can easily see what is what. Scrolling over each input will also cause the respective control – if on an oscillator – to highlight.



To the left is a connected virtual patch cable.

If you'd like to change what the modulator in a connection is, you can simply click at the top of the patch cable, where it connects to the target/input, and drag it to a new target.

Right click on a patch cable to remove it.

## MODULATION MATRIX

The other method for adding modulation connections in Hexeract is to create them from within the **Modulation Matrix**. This can be accessed by clicking the **Matrix** button on the left edge of the GUI where the virtual patch cables exist.



Matrix button – click to open and manually edit connections, as well as assign extra modulation connections not available via virtual patch cables.

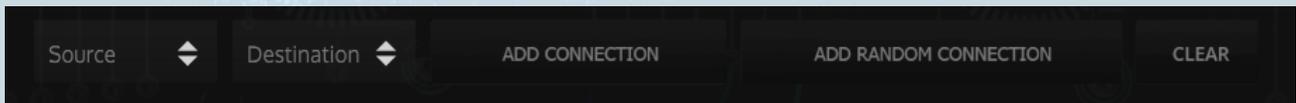


The image above shows the **Modulation Matrix** window, where all modulator-carrier connections – whether created in the matrix or in the virtual patch bay – are displayed, each with its own respective row. The

**Modulation Matrix** provides more options in the way of both possible connections (not all create-able in the patch bay) and adjusting/editing your connections.

### Adding a Connection

To add a modulation connection in the **matrix**, use the drop down menus and functions at the bottom of the **matrix** window – pictured below.

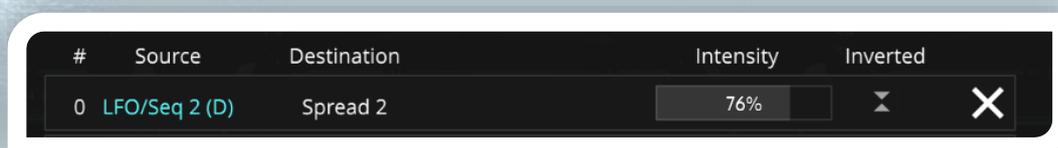


Click on **source**, to choose a modulator, **destination**, to choose what parameter you would like your decided source/modulator to affect, and once you are happy with your choice, click **add connection** to create the modulation connection. You will notice that a connection is created as a row in the matrix table above. Any connections which are possible to create both in the **virtual patch bay**, and in the **modulation matrix**, will be displayed both with a row in the **matrix**, and as a cable in the **patch bay**, irrespective of the method used to create them.

There is also an **ADD RANDOM CONNECTION** button. Clicking this will add a random modulation connection, where Hexeract will choose any possible source and destination. This is a great way to experiment both when creating sounds, and adding things to already great patches to see what possibilities might have slipped your mind!

### Further Adjusting a Connection

Once a modulation connection is made, as shown above, a row for that connection displaying the source, destination, connection number, intensity and inversion status is created.



Once your connection is made, you can adjust the intensity of how much the modulator affects the target. Just click and drag the percentage slider (or alternative click once and type in the percentage value manually).

You can also invert the effects of the modulator on its target by clicking the little invert icon so it turns blue (two opposite arrows – also looks similar to an hourglass).

## Clearing all Connections

You can remove all modulation connections by clicking the **Clear** button at the bottom right of the **Modulation Matrix** window.

## FX (EFFECTS) TAB

The "FX" tab allows you to add different effects (Chorus, Degrader, Delay, Equalizer, Phase, Reverb, Saturator, Stereo Width and Overdrive) to each sound source/oscillator individually.

Each virtual effects rack corresponds to an oscillator rack-1 (left rack) to osc-1, rack-2 to osc-2 and rack-3 to osc-3. You'll also notice that you can turn individual oscillators on and off from the **FX Tab** as well, so you don't need to keep switching to and from the **OSC Tab** to mute oscillators and work on a single oscillator's FX rack in isolation.

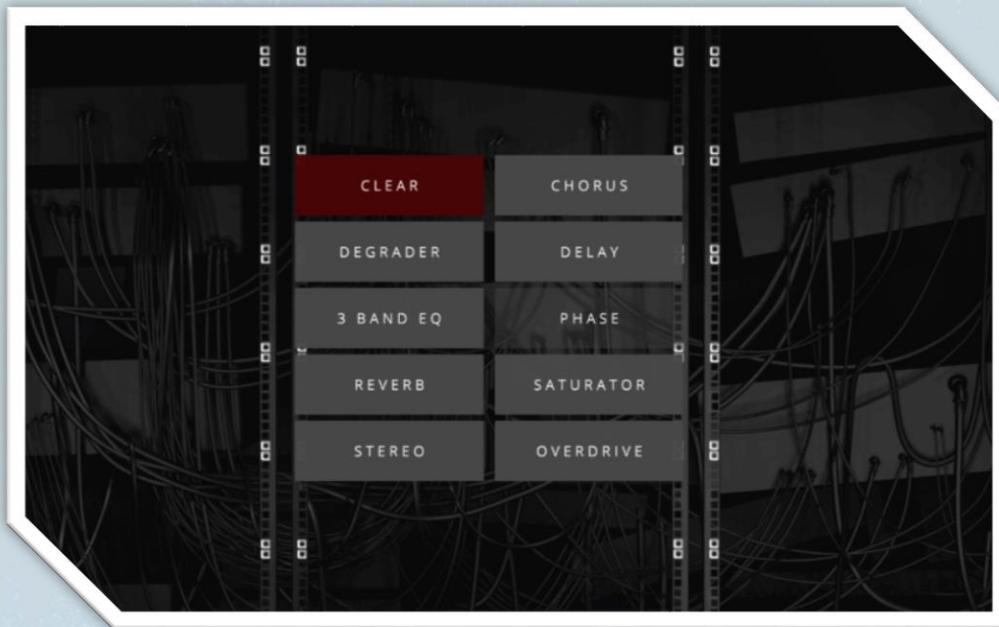


## ADDING AN FX MODULE

By default, all **FX racks** are empty, each containing eight slots in which you can add any effect (with the exception of **PHASE** – explained in detail later in the manual in the main **FX Tab** section).

As you mouse over each slot, you'll see that it is highlighted automatically. Clicking on an empty slot (or right clicking on an occupied slot) will bring up the list of possible effects, as well as **bypass** and **clear** buttons.

Click on any of the listed effects to add it to that slot in the rack. The effects chain runs from top to bottom, so effects that are higher in the rack will affect the signal earlier in the chain, before any effects beneath it in the rack.



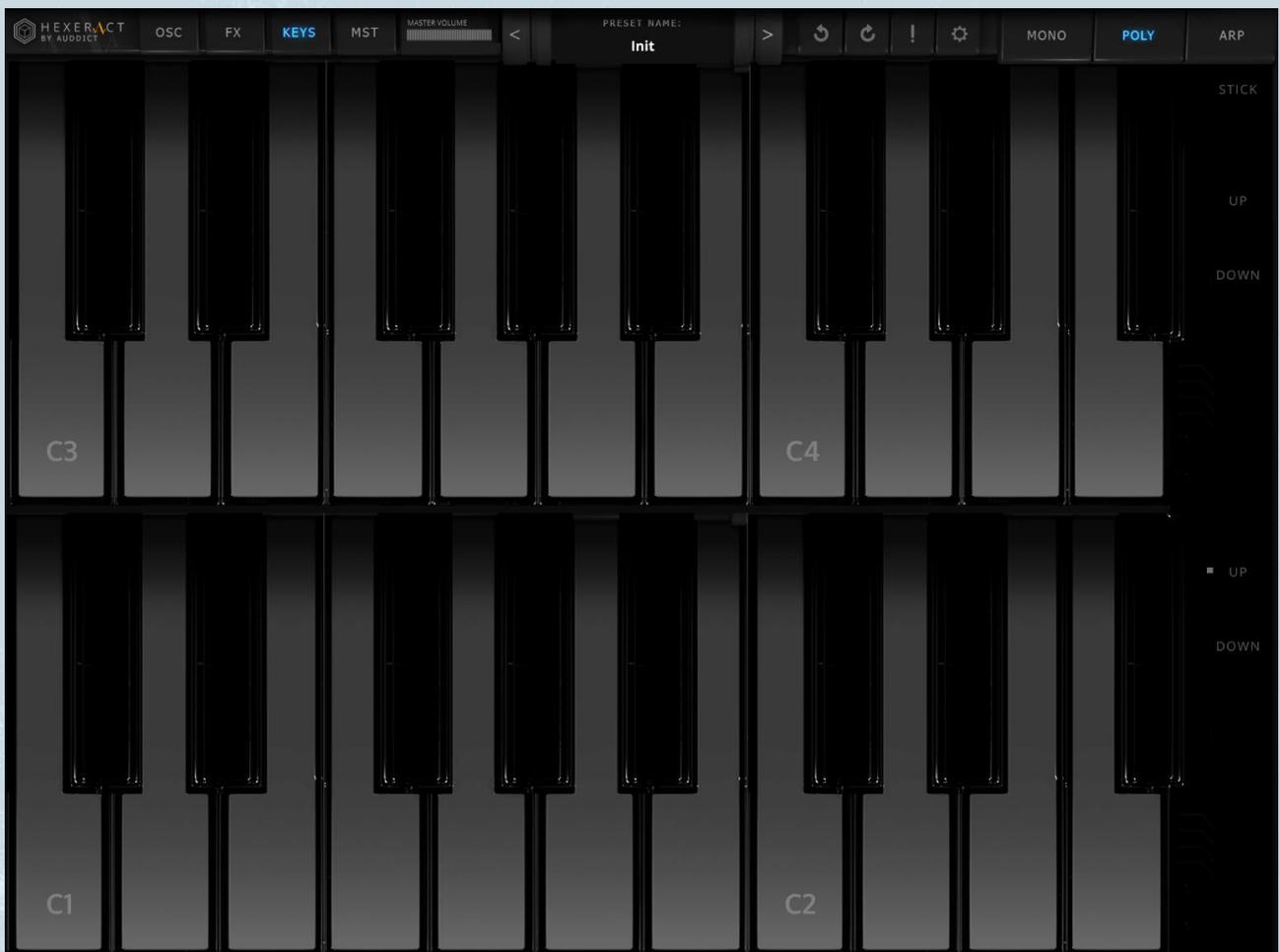
Once you have added an effect module, you can click on the small power-button icon in the top left to easily bypass it, or remove it completely by clicking the "x" in the top right. Controls on these effects can also be MIDI-learned – simply right click a control and select **MIDI Learn**.



*Note: **PHASE** can only be added to slot four (counting from the top) in each rack.*

## KEYS TAB

This tab is only particularly useful if using the iPad iOS version of Hexeract, as a means of performing, although it is still a great idea to purchase a controller to plug into your iPad and control Hexeract. Any performance mode using just the iPad screen is limited due to size, and a larger keyboard or other control will allow you to quickly access a broader range of notes, velocities, MIDI CC controllers etc.



The space is optimized for iPad, and two keyboards (individually transpose-able) allow for a larger accessible range when performing using this mode. The **UP** and **DOWN** controls to the right transpose the keyboard they are beside up or down an octave when pressed.

**STICK** – when activated will cause any pressed keys to stay pressed until pressed again to release them. This is beneficial for the iOS version on iPad, as it allows you to leave some keys pressed down, and then visit the other tabs to edit the sound, whilst hearing your changes in real-time. The keys can be held in any mode i.e. polyphonic or ARP. It can help a lot when designing sequences in **ARP** mode.

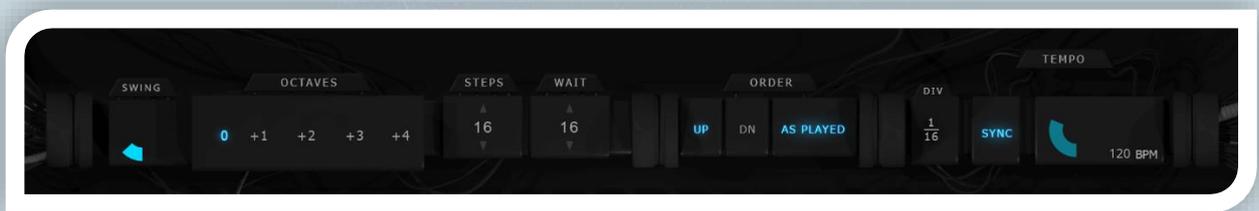


## ARP (ARPEGGIATOR) TAB

The third performance mode, after **MONO** and **POLY**, is **ARP** – the arpeggiator module. This module allows you to create sequences which are triggered and loop when you hold a note or set of notes down.

The **ARP** performance mode can be activated by clicking on **ARP** in the top right of the **global toolbar**. This button is also used to get to the arpeggiator tab from another tab (e.g. **OSC** tab).

The controls in the toolbar just below the **ARPEGGIATOR** title can all be used to tweak and change how your sequences play – the order, transposition (both by octave and on a per-step basis), order of notes, number of steps and offset, swing and tempo controls.



These controls are looked at in more detail in the dedicated **Arpeggiator** section later in this manual. Below is an explanation for how to use each of these controls.

**SWING** – Raise for more swing (offset every second note in time)

**OCTAVES** – Transposes the pressed notes in the sequence up by a certain number of octaves

**STEPS** – Number of steps in the sequence

**WAIT** – How many steps the arpeggiator should count before resetting itself

**ORDER** – Turn these buttons on and off in various combinations to alter the order of how the notes you play are played in the sequence.

**DIV** – Set the note division value for a single step in the sequence

**SYNC** – Sync the arpeggiator's tempo to your DAW's tempo

**TEMPO KNOB** – Turn sync off to manually adjust the tempo of the sequencer

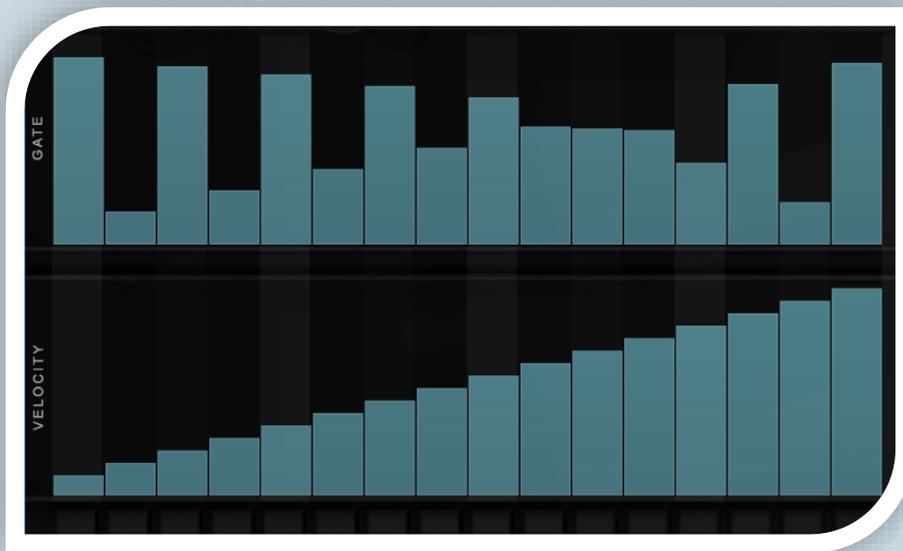


The small numbers above each step can be used to transpose that particular step up or down by +/-24 semitones. The step will transpose whichever note that would normally sound at that step up or down by whatever value you choose.

Click and drag the number up or down to alter the value.

*Quick tips on usage of the transpose step control – The face-value and obvious usage of this would be to input a sequence or pattern of notes which can be played with a single note. The advantage of this is that your sequence can be easily transposed and played in different keys by simply holding down different notes.*

*Alternatively, things can start to get really interesting if you combine holding chords down with transposed steps. Harmonically, things may get noisy very quickly, which may be what you're after – but sometimes you can make some very interesting harmonic discoveries this way!*



The two rows of step sliders are controls for the gate-length and velocity of each step. You can click on a slider and drag up or down to set its value. Clicking once anywhere in the slider will automatically snap the slider to your mouse position. You can also right click and drag across multiple sliders to draw an even gradient/line.

Gate-length controls how long the note is held, throughout the duration of the step – in terms of percentage of a single step length.

Velocity, by default, is not routed to anything, aside from sampled instruments which have multiple velocity layers. In this case, lower velocities in the arpeggiator will correctly trigger their respective velocity layers. Velocity can, however, be routed to any valid carrier-input from the modulation panel.

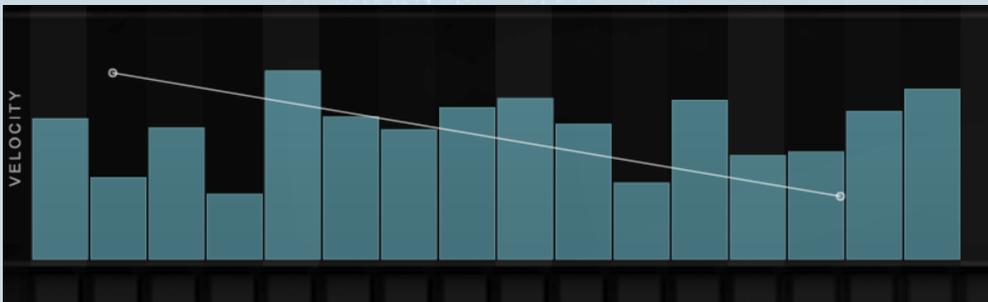


To route velocity, simply go to the **OSC** tab, and pull a virtual patch cable from the modulation output of **VEL** to whichever carrier input you'd like it to send the signal to/which parameter you'd like velocity to control/affect.

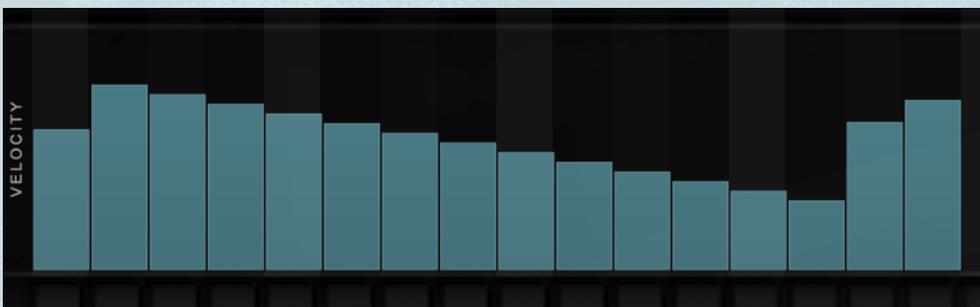
You can also do this via the modulation matrix, by setting **velocity** as the source, and set the destination to whatever parameter you'd like velocity to control.

See the **modulation matrix** and **virtual patch bay** sections of this manual for more information on routing modulators to carriers.

*The image below shows how to draw straight line/smooth gradients between steps by right clicking and dragging. Right click on a single step and drag the line across to where you'd like the line/gradient to end.*



*Below – Result when releasing mouse – a straight smooth gradual decrease in velocity from step to step. - 1*



## MST (MASTER) TAB

The final "MST" section provides master dynamics options (compressor and limiter), a master EQ (four band parametric), master reverb (convolution), as well as a master FX section where you can add effects to the overall combined sound of the three oscillators. Click either **DYN** (to access the compressor and limiter) or **EQ** (to access the four band parametric EQ). Turn either on and off quickly with the power icons just next to the buttons, on either side of the title **Master EQ**.



### Performance Modes

In the top right you have three performance modes – mono (one note at a time), poly (polyphonic playing for playing more than one note at a time, such as chords or harmonies) and “ARP”, which is a very functional and capable arpeggiator.



## OSC TAB

As mentioned in the user-interface overview; this tab will likely be where you spend the bulk of time sound designing and editing your patch. Each section and control will now be explained in detail as to what its function is specifically, and how it works, as well as examples of how it might be used.



## OSCILLATORS

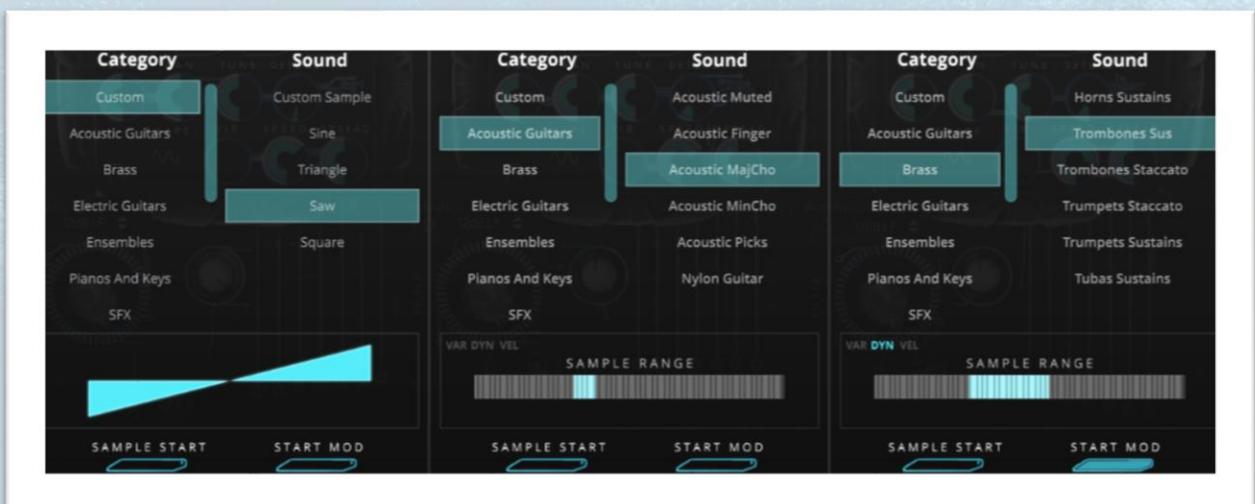
There are three oscillators/sound sources (from now on referred to just as "oscillators"), in which you select your starting sound from a list containing synthesized basic waveforms (SINE, TRIANGLE, SAW, SQUARE), and a vast array of detailed sample sets (full list of samples set out earlier in this manual), containing anything from real vintage synth waveforms, to note-by-note sampled entire orchestras and ensembles. Use the blue power buttons above each oscillator to turn them on or off.

Typically, the sampled instruments take up only a few mb (if that) of RAM each, and the total size of the factory-included sample content, combined, is just over 1GB. This can easily and understandably be misinterpreted as a small amount of sample data; however nothing could be further from the truth. Our samples were compressed using a new form of audio compression to bring the size down as much as possible. Furthermore, the samples were all manually edited and tailored to make the absolute most of this compression, resulting in many GB of audio material being compressed into a monolith of just over 1GB.



## SOUND SOURCE DISPLAY AND SELECTION

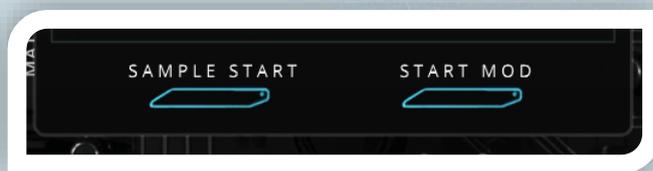
Click on the name on the display to access a menu which allows access to the vast list of sample sets as well and synth waveforms available.



You can also use the left "<" and right ">" buttons to scroll through the sound sources one at a time.

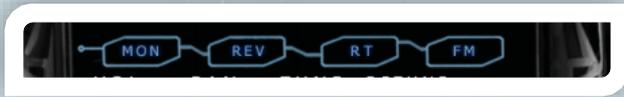


- **UNISON VOICES** – This allows you to select anywhere between one and eight unison voices, which helps to thicken up the sound, as well as open up further possibilities of detuning these voices or spreading them over the stereo field. One very special thing about this synth is its ability to create thick textures in this way by running real samples through these features in the place of normal synth waveforms (although these are also available in Hexeract). In the sound source menu, accessed by clicking on the current sound's name in the display, you have two further controls:



- **SAMPLE START** – Adjust the sample start offset by up to 1000ms – very useful – for example – if you like the body and decay of a sound, but don't want to use the attack, or want to trim it a little. Just play the note repeatedly whilst adjusting the slider until you're satisfied. An example of a situation in which this might help nicely is if you want to add a filter with a quick pluck-like envelope to a sound, but the sound itself has a bit of a messy attack. The result might not come across quite right if the attack is weird and noisy, but if you trim the attack, you can find a nice clean spot in the sample to allow the filter and its envelope to speak.
- **START MOD** – This feature is one of many little diamonds available in Hexeract, as it provides the key to adding the same thickness to a sampled instrument as you'd get when increasing the voice count of a synth's waveform oscillator. If you've already tried selecting a sampled instrument as a sound source, and increasing the unison voice count, you might notice a very ugly phasing sound, caused by multiple very slightly out-of-phase copies of the same sound. The "start mod" slider allows you to offset these voices from one another, the same as offsetting the phase of each voice in other synths to up the voice count without the nasty out-of-phase effect. This thickening effect is best used on sustained sounds, but alternatively can also be used interestingly with pluck-like and other shorts sounds to create strange granular/glitch effects. Try loading something like an acoustic guitar pluck, increasing the voice count, and sample start slider.

## TOP ROW OF BUTTONS



- **MONO** – If you select a stereo sound/sample set, this will collapse the sound to mono. A neat tip on why you might want to use this function... if you select a stereo sound, and want to add many unison/doubling voices and spread them over the stereo field, it is a good idea to mono-ize them first, as you'll get a nice even spread of sound. On the other hand, leaving the sounds in stereo can also yield different and equally use-able sonic/stereo shapes!
- **REV** – If you have selected a sample set, this will reverse the samples. Obviously reversing something flat and sustained in timbre and dynamic, this won't really change the sound, but if you select a sample set with any sort of interesting attack/transient/shape, this can create some interesting sounds!
- **RT** – “Release Trigger”, sets the oscillator so that it is triggered only with the release of a key. Particularly useful for creating interesting combinations of sounds with other oscillators so you hear the attack of a piano key, with perhaps the decay of another instrument like an acoustic guitar.
- **FM** – Activates frequency modulation. There are further controls to adjust and tweak amount, octave and de-tune of the FM, covered further later in this guide.

## FIRST TAB OF KNOBS



- **VOL** – Adjusts the volume of that particular oscillator.
- **PAN** – Adjust panning from left to right of the oscillator.
- **TUNE** – Tune the oscillator sound up or down by two octaves.

- **DETUNE** – Detune the oscillator’s voices from each other evenly. Has no effect is the oscillator is set to “01 UNIS” (one voice only), as there are no voices to de-tune from each other. This knob essentially sets the space between pitches of each voice relatively.
- **VIB** – Amount of vibrato on the oscillator – essentially a dedicated LFO to tune.
- **SHAPE** – Shape of the vibrato LFO. Click to bring up popup menu of shapes.
- **SPEED** – Adjust speed of the vibrato/LFO.
- **SPREAD** – Adjust the amount of stereo spread between the oscillator’s unison voices. If only one voice is used, this control has no effect

## SECOND TAB OF KNOBS

Switch tabs with this button:



- **ATK** – Adjust the amplitude attack of the oscillator. This is the time it takes from the amplitude to go from zero to full when you play a note.
- **DEC** – Adjust the amplitude decay of the oscillator. This is the time it takes for the level of the sound to go from full - as soon as the attack stage has completed - to the set sustain level.

- **SUS** – Adjust the amplitude sustain of the oscillator. This is the level that the sound will stay at after the attack and decay stages, until you release the key. If, on the other hand, you have the oscillator set to “RT” (release trigger), the sustain value is irrelevant.
- **REL** – Adjust the release of the oscillator. This is triggered once you release a key and defines the amount of time that it takes for the sound to go from the level it was at, to zero.
- **TRANS** – Transposes the oscillator up or down by +/-12 semitones
- **FM** – Adjusts the amount of frequency modulation applied to the oscillator (only functional if the FM button in the top row of buttons is turned on. The dedicated frequency mod per oscillator uses a signal with a frequency of the played key’s standard pitch, so the signals “resonate” well together. For completely manual FM – use an LFO with the tempo turned right up into the audible range.
- **FMOCT** – Adjusts the octave of the modulating frequency.
- **FMFINE** – Detune the modulating frequency.

### Dedicated Oscillator ADSR envelopes vs ADHSR envelopes on the Mod Panel

Dedicated:



Mod Panel:



The dedicated ADSR is the first in the chain – always, so if you have it set as above, with the envelope on the mod panel routed to an oscillator’s “volume” input, the release will have no effect, as the first dedicated ADSR has already chopped off the oscillator voice’s releases.

Think of it as having two envelopes in a real modular synth, and the dedicated envelope comes first... the sound out of the *dedicated* ADSR comes out, and goes into the second one, meaning that in the case above, there is no release for the second ADSR to work with. The attack however, would be affected by the second ADSR, but not the first, in this case. The reason is, the first ADSR has a short attack, almost no time at all, so the second ADSR has something to work with.

Most of the time, there won't be a reason to route the envelope from the mod panel to the osc's volume, as it already has an envelope doing just that. The situation in which you would want to do this, is if you want to take advantage of the mod panel envelopes' "HOLD" function. To ensure that the dedicated envelope ADSR does not get in the way of the mod panel envelope, and that you can control the entire envelope of a sound from the mod panel, set the dedicated envelope controls on an oscillator to:

- Attack: 0
- Decay: doesn't matter, as sustain will be at max
- Sustain: max
- Release: max (voices are overridden and killed after the release period the same way with the mod panel envelope, so you don't have to worry about stray voices continuing in silence, unheard in the background eating up your CPU power. Once a voice reached silence, it is terminated!)

### Hexeract version 1.1.0 introduced:

- Dedicated popup for each envelope generator, as well as additional parameters; hold and attack curve.
- Visual graph representation of the envelope shape.
- Drop down menu for quickly assigning the envelope to common targets.



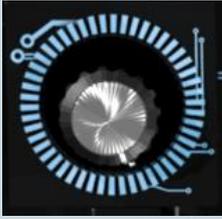
## FILTERS

Each oscillator has its own dedicate filter below it, with a large cutoff knob, resonance control, "keyfol" button and filter curve select.



### List of controls

- **Cutoff**  
Adjust the cutoff frequency for the filter curve. The large main black knob.



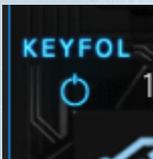
- **KEYFOL**

Sets the filter curve to follow the midi note being played, which helps get a nice even sound across all keys and pitches. For example, if you turn "KEYFOL" off (default), and set the filter cutoff to around 200hz, playing a note with a fundamental pitch much higher might not even be heard. Turning "KEYFOL" on will set the filter cutoff value to adjust to each note (on a per voice basis of course), so each note comes out with the same timbre. There are of course, cases in which you'd want this, and cases in which you'd wouldn't, and it all depends on what sort of sounds you are creating and the context!



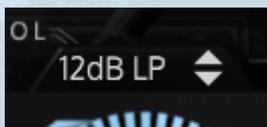
- **Resonance**

The little white knob to the right of the filter cutoff knob allows you to adjust the resonance of the curve. Careful if pushing this beyond around 6 if you like your ears, slowly does it!



- **Filter Curve Menu**

- Select your type of curve from this menu. 12dB HP (high pass) 6dB HP, 12dB LP (low pass) and 6dB LP. The higher 12dB curves have a steeper gradient of effect over the frequencies at and past the cutoff point, so will obviously have a "stronger" cutoff sound, as opposed to the more "gentle" 6dB curves.



Select your type of curve from this menu

## FILTER CURVES AND TYPES

Below is a list of filter curves and types included, and a short explanation for what each one does:

- **6dB LP, 12dB LP and 24dB LP** – “LP” stands for **low-pass**. A low pass filter curve filters out/attenuates frequencies above the frequency you set your cutoff knob to, and leaves the frequencies below untouched (hence – “low pass” – the low frequencies pass through the filter untouched). Of course, it is worth noting for anyone new to, or studying synthesis, that with a physical analogue filter, or possibly even a digital one emulating an analogue filter, no frequency passes through completely untouched. All parts of the sound are coloured in some way, and this is part of where we get analogue “warmth” from. Worth mentioning and being aware of, but of course does not apply to Hexeract.

The number before “**LP**” indicates the steepness or gradient of the attenuation curve. The cutoff frequency is the point at which the frequencies start to be attenuated. A 6dB LP filter – for example – will attenuate frequencies above the cutoff at a rate of 6dB per octave, which is a much gentler sound/effect than a 24dB LP filter, which cuts off the frequencies at a rate of 24dB per octave, above the cutoff frequency.

Turning up the resonance will create a gain boost at the cutoff frequency.

- **6dB HP and 12dB HP** – “HP” stands for **high-pass**. A high pass filter does the complete opposite to a low pass filter. It filters the frequencies below the cutoff frequencies, and lets frequencies above the cutoff “pass through” untouched. The same principles described above apply in terms of attenuation curves.
- **Notch** – The notch filter will attenuate frequencies at the cutoff frequency. Turning the resonance up and down will adjust the level of attenuation.
- **12dB BP** – “BP” stands for “band-pass”. This filter allows through only a small band of frequencies at where you set your cutoff frequency. Turning the resonance up creates a gain boost at the cutoff frequency value.
- **Comb** – The comb filter is a filtering technique created by applying a slightly delayed version of the audio signal to itself.
- **Ringmod** – Multiplies the incoming signal with a sine wave generator set to the cutoff frequency. The resonance knob – in this mode – is the gain of the sine wave (full left means no gain, full right is 0dB)

## CUTOFF FREQUENCY MODULATION

These filters are designed for fast modulation, which immediately presents the opportunity to do “filter cutoff frequency modulation” by modulating the cutoff of a filter at a speed within the audible frequency range. To do this, drag a virtual patch cable from the LFO you want to use, to the filter cutoff connector, and turn up the “tempo” (make sure “sync” is off) into the audio-frequency range (20Hz and up). Try holding a key, and gradually turning up the “tempo” from 20HZ to experiment with the range of different timbres.

Altering the position of the “resonance” next to the filter (little white knob to the left of cutoff), the “amount” (AMT) on the connected LFO or the “intensity” at the applicable connection in the modulation matrix, will alter the amount of cutoff-frequency-modulation that is audible, in three different sounding ways.

### **EXAMPLE SCENARIO**

We discovered that the TUBAS SUSTAINS sound particularly awesome with cutoff frequency modulation. If you load them up into an oscillator and patch the LFO to the cutoff, you can then gradually turn up the “tempo” knob until the Hz value starts to resonate nicely with the note you are playing, because the modulation rate will approach the fundamental, or a close harmonic of the held note.

This method can be used to find subtle sweet spots with this effect, if so desired. Adding yet another LFO to the same filter, and not quite setting it to exactly the same frequency, rather, something close, gives a very nice effect, full of harmonic content, warmth and movement.

### Example diagram:



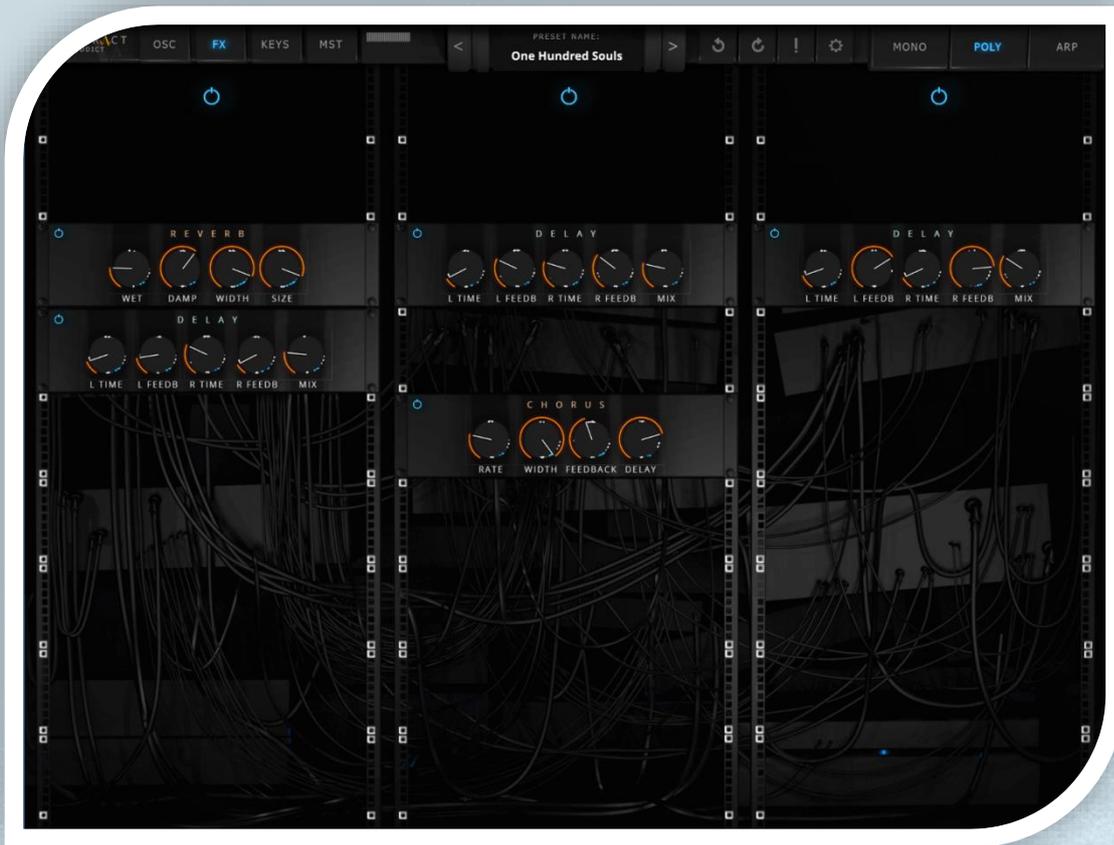
LFO's tempo and AMT set (left to right):

- **LFO 1**
  - TEMPO: 36.3Hz
  - AMT                54%
- **LFO 2**
  - TEMPO            38.7Hz
  - AMT                67%
- **LFO 3**
  - TEMPO 37.2Hz
  - AMT                100%

This effect can be used to even add sub-harmonics to your sound, or normal harmonics at frequencies above the fundamental, giving yet another timbre option with which to help a deep bass cut through in a mix. There are no rules though, just experimentation and preference!

## FX TAB

This tab contains a virtual effects rack, where you can interactively add effects modules into different slots. Any effect can be added any number of times to any slot, with the one exception of the “phase” effect. This can only be added to slot 4 of each oscillator, and is also a potential modulation target (very useful!) in the modulation matrix.



Clicking on a slot will bring up the following menu, from which you can choose which effect you'd like to insert.



At this stage, each column of FX corresponds to each oscillator, and all OSC's sounds are, at this stage, still separated from one another – row 1 is for adding effects to oscillator-1, row 2 for oscillator-2 and row 3, oscillator-3.

The effects run in order from top to bottom, so if you insert a delay in the first slot at the top for OSC 1, and a reverb anywhere beneath it, the audio passes first to the delay, and then to the reverb. Putting the reverb above the delay, for example, will have a very different sound, as the reverberated signal/mix will be fed into the delay instead.

## MODULATION PANEL

At the bottom of the OSC tab, you will find the modulation panel, containing all manner of different modulators, which you can use to add movement to your sound. Modulation can range from a simple LFO to filter to add a bit of frequency movement to your sound, to multiple layers per parameter of modulating even into the audible spectrum, which can have all manner of different effects.



## LFO MODULES

There are three pairs of LFO's and sequencers:



By default, you will notice that the “init” patch loads with the blue power buttons on the sequencers on (blue). The sequencers and LFO’s are arranged in pairs, and therefore have a single modulation output. You can choose whether either the LFO’s signal, or the sequencer’s signal is sent from that particular output by turning the sequencer on or off via the large power button (above on the right).

When this button is fully blue (on), the sequencer is the active modulator, and the LFO to its left is turned off. To use the LFO as the modulator instead of the sequencer, simply click the sequencer’s power button again to turn it off (the power button will turn grey).

Choose your LFO shape (default set to sine) by clicking and selecting from the drop down list:

- **Sine**
- **Triangle**
- **Square**
- **Saw**
- **Random**

Use the “**sync**” button to sync to your DAW’s tempo, and the **tempo knob** will automatically lock to subdivisions of your project’s set tempo. Turn “sync” off to have access to the full speed range of the LFO, and turn up to enter into the audible frequency range.

“**AMT**” controls amplitude of the LFO, and therefore, how much it affects whichever parameter it is routed to.

A few ideas - move an LFO’s tempo into the audible spectrum (20hz and above), routed to:

- **Filter cutoff** – Explained in a little more detail in the “filters” section of this manual. Lots of fun to be had here!
- **Volume** – This is amplitude modulation
- **Pan** – This is basically stereo amplitude modulation, when the LFO is a square wave. The amplitude of the left and right channel go from zero to full in perfect alternation, hence, stereo AM ☺
- **Tune** – Frequency Modulation. Each OSC has a dedicated FM, but there is much to be said about subtle amounts of FM, but multiple layers of it.
- **De-tune** – Very cool - add a few unison voices (make sure to turn up sample mod if using samples), set the detune up – halfway is nice. Very useful for creating dirty lead sounds. Used in combination with a sound that has plenty of harmonics like a sawtooth wave, this will work very nicely, but we’ve also found it works well with weird experiments on deep warm sounds such as tubas, and it turns the church organ sample instrument into a rock organ sounding instrument!
- **Vibrato** – Interesting – adds a sort of “grit” to the vibrato, analogue sounding in a weird way!

- **Vibrato Speed** – With the vibrato turned up a little (obviously if the vibrato knob is set to zero, this will also not affect the sound), this can create some very interesting and un-stable pitch wobbles. Add some vibrato (halfway), turn the speed to full, and route an LFO sine wave with the tempo up halfway and amount on 100% to the “vibrato speed”, and you’ll be reaching for your fly swatter ;) You could even take this a step further, and set a slow LFO to pan with a pair of headphones, for a true mosquito VR experience!
- **Spread** – weird spatial effects when adjusting the tempo knob – can definitely see use for this in any sounds that warrant a nice wide stereo image with plenty of stereo movement.

The **RT** button stands for **retrigger**. When this is turned on, every time you play a key, it will automatically reset the LFO to the beginning of its wave. When turned off, as long as a note is held, subsequent notes will not affect the LFO’s wave position. The LFO will continue to oscillate, ignoring further note triggers.

## SEQUENCERS

As previously mentioned, LFO’s and sequencers come in pair. Each pair can be set to send either the LFO signal, or the sequencer’s signal, beside it.

To activate the sequencer module, make sure the large power button is blue (turned on). If it is off, it will appear grey, and you can turn it on by clicking it.

Click the little sequence diagram at the bottom of the button (shown below) to open the sequencer tab, where you are presented with further options, as well as the option of using either a traditional step-sequencer, or a custom curve.



*Click this button to open the sequencer settings (shown below)*

## STEP-SEQUENCER MODE



The step sequencer can have a sequence length of 1, 2, 4, 8, 16 or 32 steps.



*32-Step Sequencer*

To adjust the number of steps, click on the number below **Step Amount**, to make a selection.

**Smoothing time** sets the amount of smoothing between steps (or in the case of the custom shape – covered in the next section – smoothing between points and peaks).

You can copy sequences from the arpeggiator, or other sequencers by clicking the little icons below **Copy from**. To copy the sequence from sequencer-2 – for example – click on the 2SEQ icon, and the steps will automatically be updated to match sequencer-2. **ARP VEL** will copy the steps from the arpeggiator tab's **velocity** steps, and **ARP GATE** will similarly copy the steps from the arpeggiator's gate sliders/steps.

## CUSTOM SHAPE SEQUENCER MODE

To switch a sequencer to **custom shape** mode, click the icon below:



The sequencer will automatically change to allow you to draw custom shapes and curves. To insert a point on the curve, click anywhere within the table, and drag to move the point around. Right clicking a point will remove it.

Mouse over a point and move the mouse wheel to adjust the curve of the line just leading up to it.



You can click the button below to turn looping on and off

## CUSTOM SHAPE - TEMPO, AMOUNT, LOOP AND RE-TRIGGER

When the sequencer module is activated, the controls on the LFO beside it affect the sequencer instead. So **tempo** will alter the tempo of the sequencer, **AMT** will affect the amplitude of the signal sent (amount of modulation), and **re-trigger** will also decide on re-trigger settings for the sequencer, and whether it fires from the beginning every time a new note is played.

There is also a **loop** function for the custom shape. When turned on (blue), the custom shape will loop as long as a note is held down. If **loop** is de-activated, the custom shape will play when a note is pressed, and once it completes a cycle, simply stop at the end and remain at the final value/level. This provides the opportunity to craft more intricate attack shapes.

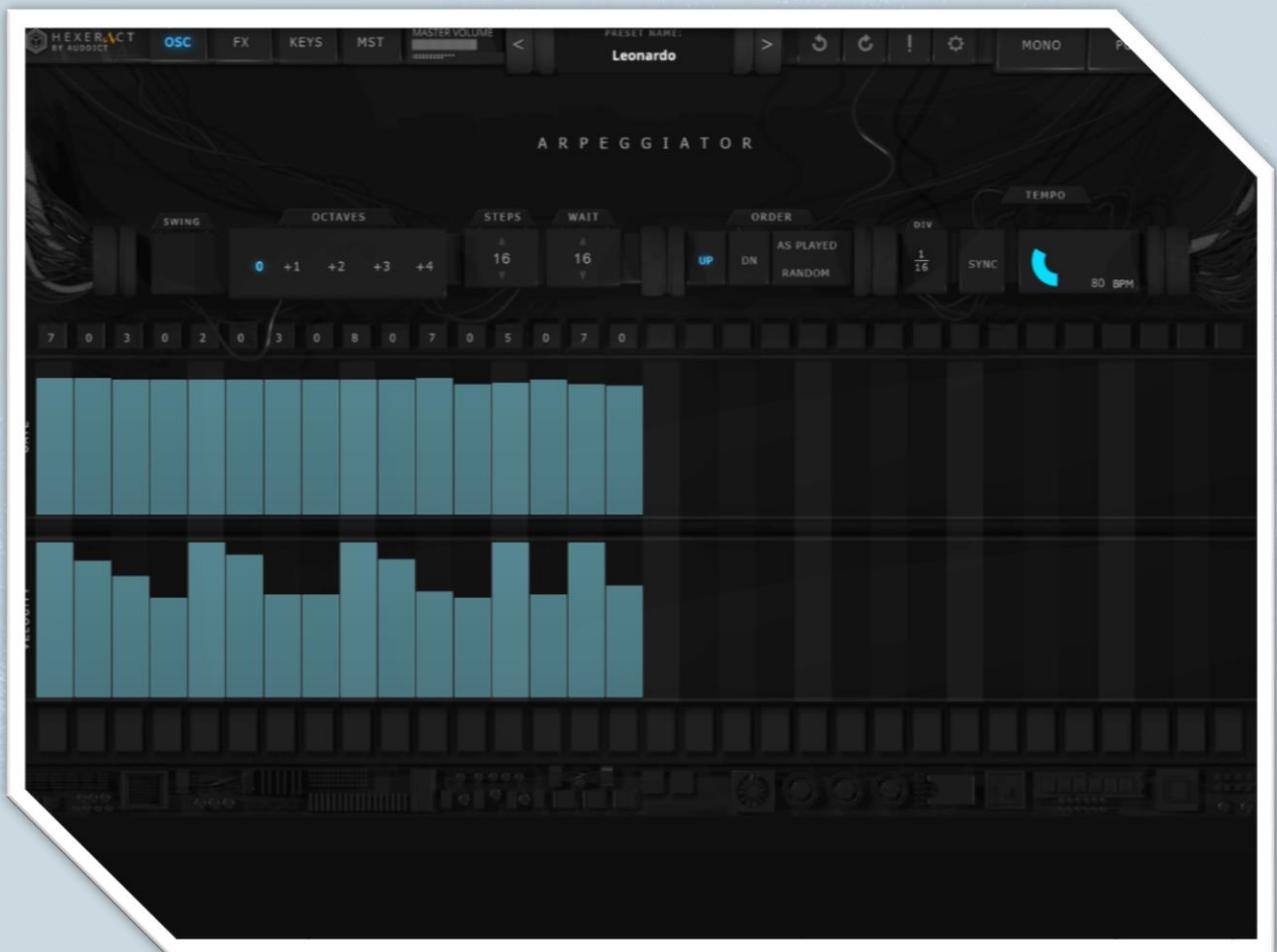


*Loop button (blue when activated, grey when disabled)*

*Quick tip: Custom shape sequencers are great for things like crossfading between oscillators. Use two or three oscillators in a patc, each with its own custom shape, and set them so that they fade in and out from each other to create patches with lots of movement.*

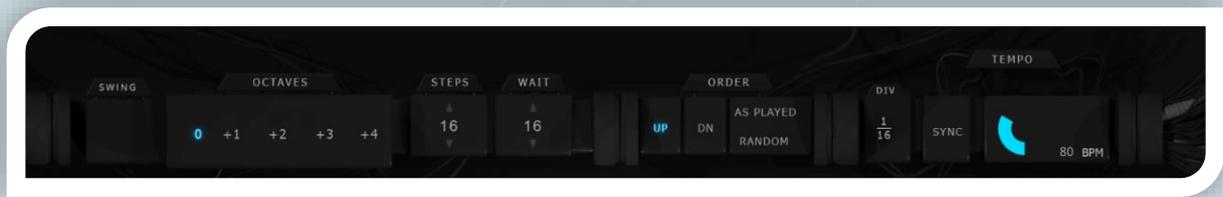
## ARPEGGIATOR

Included with HEXERACT is a fully fledged and powerful arpeggiator module. This allows you to create intricate sequences which can be played in more complex and varied ways. On the surface – the ARP includes rows of sliders for the gate length and velocity of each step, as well as an interval/transpose value per step. There is also a swing knob, an “octaves” tool which plays the sequence across different octaves, a step number control (up to thirty-two), a “wait” function (discussed later) which can create complex rhythmic tweaks and syncopation, “order” controls, note-division (tempo – sets a the steps’ individual note division length), “sync” for syncing to DAW tempo and a tempo control. When using the sequencer modules in the OSC tab, you can also copy the step settings from the ARP in a single click.



### The ARP Toolbar

This toolbar contains the majority of controls used to tweak and edit your arpeggiator sequence settings.



## Swing

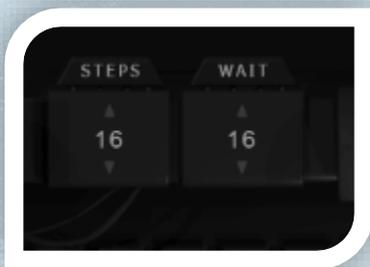


The “Swing” wheel offsets every second step forwards in time. This allows anything from subtle unsettlement in rhythm (useful for “humanization”), to dotted rhythms, and beyond.

We’ll skip the “Octaves” settings for now, as part of how this functions, relates to the “order” function, which should be understood first.

## Steps and Wait

Drag each value to set the number of steps, and the number of “wait steps”. The number of steps is fairly straightforward, and represents the length of one full cycle of your sequence.



The **wait** function allows you to set an alternative number of steps, which the arpeggiator counts before resetting itself to the beginning of the entire sequence. You can use this to either quickly shorten your sequence without losing your step data that you’ve spent time inputting, or set it to a higher number, to create further interest and variation to your sequence. Setting the **wait** number to the next odd or **prime number** above your number of sequence steps can create disjointed sequences which will throw off the rhythm/pulse/hook in interesting ways.

## Examples

Steps set to 4, wait set to 3.

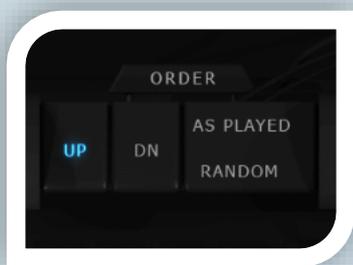
The sequencer will use the first three steps, and ignore the fourth, as you have told it – by setting **wait** to **3** – to wait three steps each time before resetting to the beginning.

Steps set to 8, wait set to 13.

The sequencer will play one full cycle, return to the beginning as expected, and continue counting past **8**, until **13**, which falls at step **5** of the second cycle. Once it reaches step **5**, it will reset to the beginning and start again, repeating the process. Playing this to a click will offset the sequence at different beats each time, and give a great sense of variation and rhythmic trickery.

## Order

The order buttons can be turned on and off in different combinations, to control the order of notes you hold down.



The combinations are listed below:

- **UP** only – Notes are played from lowest pitch to highest
- **DN** only – Notes are played from highest pitch to lowest
- **UP and DN** – Notes are played from lowest pitch highest, and then back down to the lowest
- **UP and AS PLAYED** – Notes are played in the order they were pressed
- **DN and AS PLAYED** – Notes are played in the reverse order they were pressed
- **UP DN and AS PLAYED** – Notes played in order they were pressed, then in the reverse order they were pressed
- **RANDOM** – Notes held down are played in a completely random order

The **order** controls also affect how the **octaves** settings control the sequence.

## Octaves

This function will play the sequence/set of notes (or note) that you play across various octaves, depending on the number you select. By default, this is set to zero, which effectively means the function is off.



The order of which octave the sequence is played at is affected by the “order” functions later in the toolbar – combinations and how they all work together are listed later in this section. For now, change the order settings so that only “up” is selected, and “dn”/“as played” are grey and off.

In this case, if you play a D minor chord of **DFA**, the arpeggiator will loop as follows:

#### **D-F-A-D-F-A-D-F-A-D-F-A etc**

If you set the **octaves** to **+1**, and hold the same chord down, the arpeggiator will play a sequence of **DFA**, then play that same set of notes an octave above, before returning to the original octave and repeating the process. Setting the **octaves** to **+2** or higher will cause the sequence of held notes to be played at the normal octave, the octave above, and then the octave above that (increase **octaves**) to adjust how many octaves up the sequence goes.

#### **Behaviour of “Octaves” in relation to “Order” settings**

The **order** settings will affect the order that each octave is used for a single run of the sequence.

- **UP** only – Playback as above – lowest pitch to highest at each octave.
- **DN** only – Playback starts from the highest octave set and progresses an octave at a time.
- **UP and DN** – The sequence plays at the lowest octave, progressing up. Once it reaches the highest octave set, it then returns one octave down at a time.
- **UP, DN and AS PLAYED** – The sequencer plays the held notes in the order they were pressed on the way up, and in the reverse order they were pressed on the way down.
- **RANDOM** – The sequence changes octave completely randomly within the specified range (+1 will keep it at the played octave/notes, +2 will add the octave above, +3 plus the octave above that etc)

**UP and AS PLAYED** and **DN and AS PLAYED** behave the same in terms of the **octaves** as they would without the **AS PLAYED** activated. The order of the notes however, is affected (see **order**).

It is important to remember that once the full number of **steps** in your sequence is played to the end (e.g. in a thirty two step sequence, the sequencer reaches step thirty two), the entire sequence will reset – including **octaves**.

## DIV



This controls the value of each step's time value/beat division. Includes dotted and triplet notes.

## SYNC



Activate this to sync to your DAW's tempo.

## TEMPO

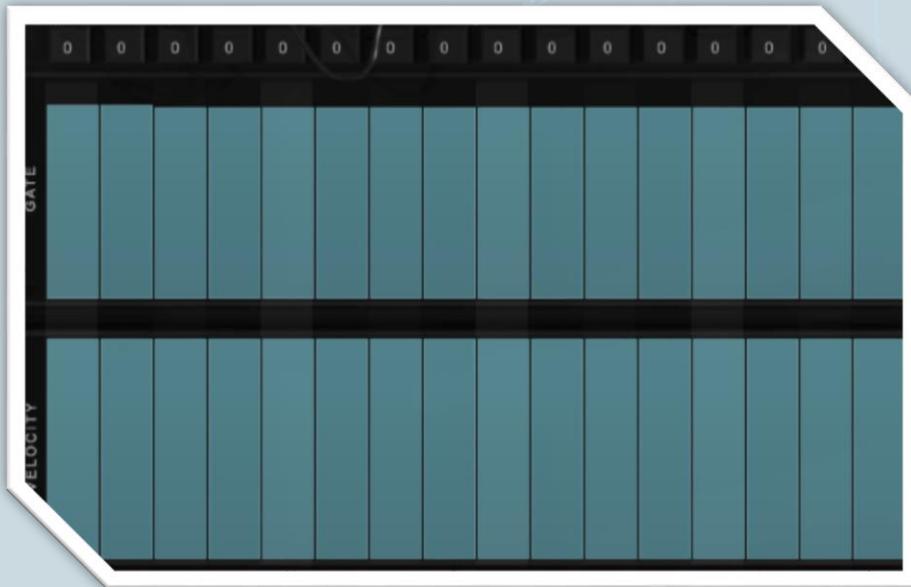
If sync is not activated, you can manually control the tempo of the sequence using this knob.



## Step Display Controls

The two sets of sliders allow you to set both the gate length of each step's played note. The slider represents a percentage % of the entire step length/division in the sequence.

The lower set of sliders allows you to set a velocity value per step. This can be further routed to modulation targets from the OSC tab's **patchbay** or **modulation matrix**.



### Interval Transpose

Above each active step is also a small number, which allows you to transpose each step's note number up or down by +/- 24 semitones. This is useful for creating entire sequences that can be played on a single note, therefore easily transposed, or adding a bit of pitch chaos to your patch!

## MIDI LEARN AND AUTOMATION

There is a MIDI CC modulation connection from the virtual patch bay, but you can also right click on a control, select **MIDI Learn**, and move the control you want to assign to that particular control.

You can do this for any number of controls to a single MIDI CC number.

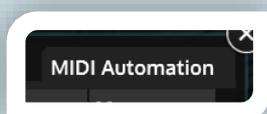
### MIDI Automation

Once you assign a MIDI CC number to a control on HEXERACT in this way (using right-click and **MIDI learn**), you can adjust how that MIDI CC affects the control from the **MIDI Automation** panel, that can be accessed

by clicking on the settings gear icon in the global toolbar,



and clicking



.The **MIDI Automation** tab will open (pictured below).

CC #	Parameter	Inverted	Min	Max
1	OSC1 Filter Cutoff	Normal	20.00	20000.00
1	OSC2 Filter Cutoff	Normal	20.00	20000.00
1	OSC3 Filter Cutoff	Normal	20.00	20000.00
11	LFO1 Tempo	Normal	0.03	100.00
32	ENV1 Sustain	Normal	-100.00	0.00
32	ENV2 Sustain	Normal	-100.00	0.00

- The **CC#** column shows the affecting MIDI CC number.
- **Parameter** shows which control on **HEXERACT** is being affected by that MIDI CC.
- **Inverted** shows whether the modulation is inverted or not. When set to **Normal**, turning the assigned MIDI CC controller down will turn the **HEXERACT** parameter/control down too, between the assigned **Min** and **Max** values. Clicking on **Normal** will change the value to **Inverted**. This will invert the modulation, and turn the HEXERACT parameter up when the MIDI control is turned up, and up when the MIDI control is turned down.

A simple but interesting use for this is blending between two oscillators. Set the same MIDI control to control both oscillators' volumes, but change one so that it is **inverted**. Turning the MIDI control which you assigned to the volume parameters will now cause it to blend between the two oscillators, as turning the control up will turn one oscillator's volume up, and the other oscillator's down. Likewise, turning the MIDI control down will reverse this process, and turn one oscillator down, and the **inverted** one up.

- **Min** and **Max** set the minimum and maximum values of the assigned parameter. This is essentially the lowest possible value that you want the control to go to – nothing below, and the highest value you want it to go to – nothing above. Turning the assigned MIDI CC controller all the way down, will turn it to the **Min** value, and turning it all the way up will bring the control to the assigned **Max** value.

Needless to say, turning the MIDI control up and down will cause it to move the assigned HEXERACT parameter evenly and proportionately between the **Min** and **Max** values.

A simple use for this would be if you'd like a MIDI CC to control the filter cutoff of an oscillator, but you only like how it sounds when the cutoff is between 500Hz and 2000Hz. Setting the **Min** value to 500, and the **Max** value to 2000, will ensure the filter cutoff moves only between these values, even when the MIDI CC is turned all the way up, and all the way down.



## MPE SUPPORT

**MPE (MIDI Polyphonic Expression)** is an extension of standard MIDI which allows control of multiple parameters on a per-note basis via special controllers (such as the ROLI seaboard), via MPE-compatible software.

Each note is assigned it's own individual MIDI channel, so that each note can be individually, multidimensionally controlled. MPE controllers allow you to assign various gestures (such as slide - sliding your finger up/down whilst holding a note) to a parameter(s) for a whole new level of modulation possibilities and control.

Hexeract now has full support for MPE compatible devices and a dedicated MPE gesture modulation system.

Name	MIDI Message	Description
Slide	Pitchbend	A horizontal movement on the MIDI controller.
Glide	CC #74	A vertical movement on the MIDI controller.
Press	Aftertouch	The force that is applied to the note.
Stroke	Velocity	The velocity with which you hit the note.
Lift	Release velocity	The pressure level when the note is released.

Any of the above gestures – in Hexeract – can be assigned to various modulation targets, allow per-note modulation control. You can - for example - assign "press" to cross-fade between dynamic layers, for a very natural control over the dynamics of a multi-dynamic orchestral patch.

This would be a more tame approach. Assigning various different gestures on a single patch and assigning things like FM and the waveshaper as targets can start to make things crazy.

## HOW TO USE MPE IN A PRESET

1. Click on the MPE button to enable MPE mode.



2. Add MPE gestures to one of the modulation targets by either clicking on "Add MPE modulation" or right click a knob that allows MPE modulation (similar to MIDI learn).

## THE MPE MODULATOR TABLE



Below is a list of all available MPE parameters in the table, which can be adjusted as needed.

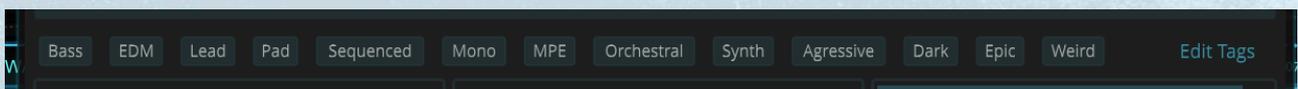
Column	Description
Target	The modulator target.
Meter	A real time representation of the modulation value/position.
Gesture	The type of gesture that controls this modulator: Slide, Glide, Press, Stroke or Lift
Mode	By default, the MPE modulation is polyphonic, but you might want to use a monophonic mode (Legato or Retrigger) if the modulation target is not polyphonic itself (eg. when modulating a master effect) or if you want this particular behavior.
Intensity	This controls the strength of the modulation that is applied to the signal. Normally the range is from 0 to 100%, but when the modulation target is pitch, it is in semitones.
Curve	A preview of the modulator's curve that can be edited by clicking on the row.
Smoothing	This applies a low pass to the modulation signal to smooth out the edges.
Default	The default value that the modulation value will be set to when the voice is started.

Clicking on a row opens an editor for the curve, as well as a graphic showing the last seconds of the modulation signal, so you can have visual feedback for how the modulator works. You can right click on the graph to change the speed/freeze the current state.

Pressing ESC will close the editors and delete to remove the current connection.

## MIDI TAG SYSTEM IN PRESETS

Hexeract 1.1.0 includes a tagging system in the presets. At the top of the preset browser window, you will see a row of predefined tags. Clicking on one or more of these tags will open a list of presets that match the selected tags, for easy browsing. You can add tags to your own presets by clicking "edit tags", selecting your preset, and turning on the tags that you want to apply to it. Once you have finished adding tags, click "edit tags" again to exit edit mode.



## POLYSHAPE FX

With Hexeract version 1.1.0, a waveshaper is included, which applies sinusoidal (multiplies the signal with a sine wave) shaping.



The sinusoidal shaping hardly amplifies the signal, but adds harmonics that create interesting sounds that go from subtle harmonic enhancement, through mechanically defective tones, to total destruction, depending on the gain factor.

The waveshaper works best on material which has a simple harmonic spectrum, like sine waves, clarinets or marimbas.

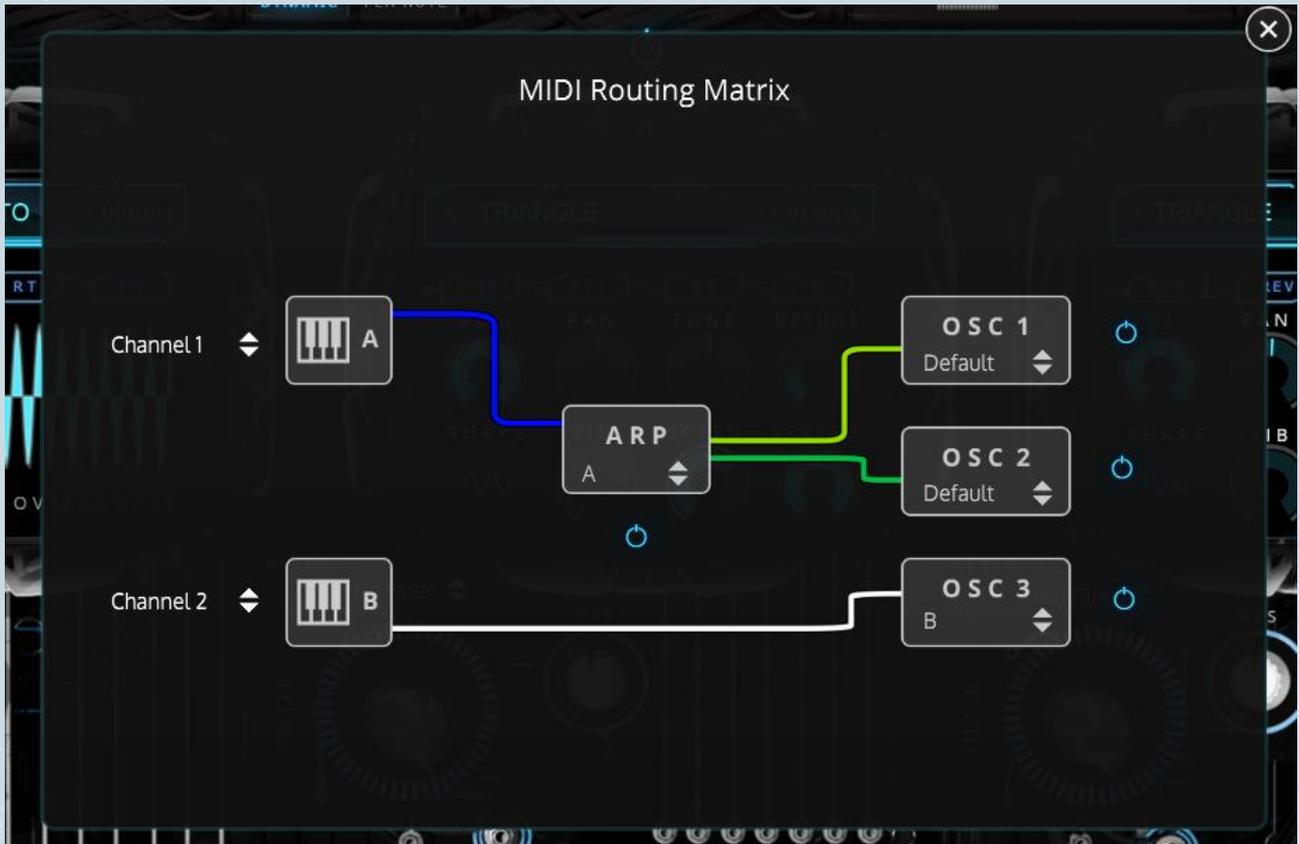
The drive parameter can be fully modulated from within the modulation matrix e.g. add a velocity modulator with subtle drive (<20dB) to enhance the dynamics or modulate it with a quick envelope to simulate a pluck excitation.

You can apply/turn on oversampling to remove any potential artifacts from aliasing.

## MIDI ROUTING MATRIX

### Features

- Modular MIDI routing matrix
- Create multitimbral patches
- Route arpeggiator to selected oscillators only
- Signal flow graph with visual indication



### How it works (Non-MPE mode)

There are two input sources which represent the virtual keyboards on the KEYS page. You can select a MIDI channel for each keyboard to filter the incoming MIDI data. The default is "omni", which accepts data from all channels.

All MIDI targets (ARP, OSC 1 - 3) can be assigned to one of the two keyboard inputs.

The arpeggiator can be bypassed by setting the source of an oscillator to only "A" or "B" instead of "default". This can be used to combine arpeggiated sounds with unarpeggiated chords.

### How it works (MPE mode)

The two MIDI keyboards represent MPE zones, which are MIDI channel ranges (the upper keyboard from 2 - 8, the lower from 9 - 16).

For each target, you can decide which MPE zone should be assigned to it

Unlike in non-MPE mode, the arpeggiator cannot be bypassed because it uses the same MIDI channels as the incoming notes. This is necessary so that the MPE gestures still work on arpeggiated oscillators.

*- To Be Continued -*