Icarus

TONE2

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If you have any difficulties installing or using Icarus, please contact us by visiting our website.

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Credits

Development: Markus Krause
Programming & Graphics: Markus Krause
Thanks go to: Family and friends, all sound-designers & beta testers and of course all Tone2 customers for their continued support.

■ Installation & Authorization procedure

Together with the download link from Share-it you have received attached to the product delivery email a keyfile named 'Icarus3.t2k'.
This file contains your personal serial number & name and is used to unlock the full version.

Installation PC & Mac

1. Close your host (Logic, Live, Cubase, etc.)

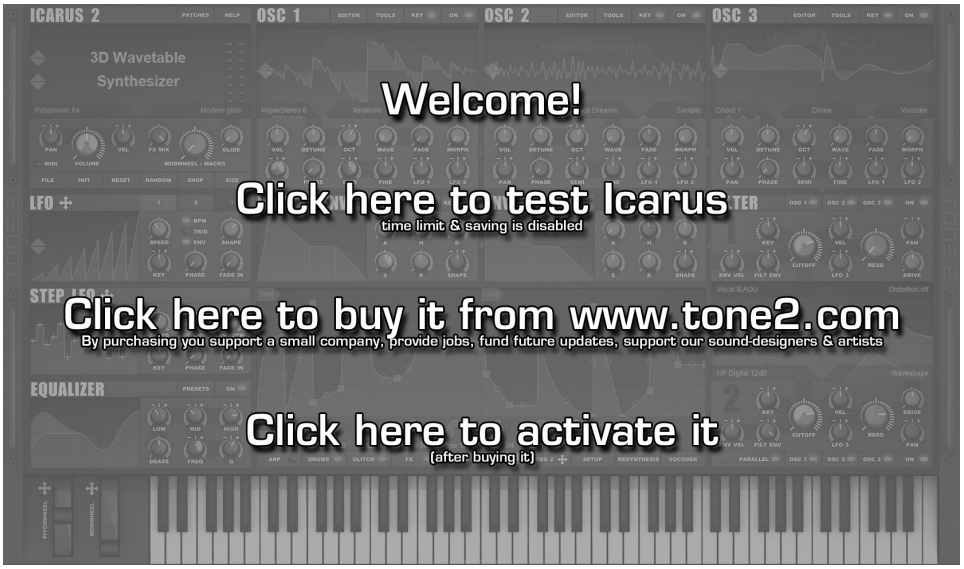
2. Install the full version of the plugin.

3. Open your host program

4. Do a plugin re scan in the host if it does not list Icarus 3 by default. Detailed instructions on how to perform a rescan can be found in your host's manual

5. Open Icarus 3

6. Click on the “Click here to activate it” part of the screen.



Click on the “Click here to activate it”, browse-to & select your Icarus3.t2k keyfile

7. Browse-to & select your keyfile 'Icarus3.t2k' to activate the full version

8. Restart the plugin. Note that some host programs may require a complete restart.

■ Welcome to Icarus 3

Icarus is a wavetable synthesizer, equipped with a high-end quality sound engine. An engine that is flexible as well as offer an enormous number of features, yet remains easy and intuitive to work with. We call Icarus a '3D wavetable synthesizer', because we expanded the wavetable concept, allowing you to cross-blend waveforms, with an additional dimension for morphing.
Next to its wavetable capabilities it also offers resynthesis, true stereo architecture, hypersaw oscillators, a wavetable editor, modular effects, a vocoder, dual filter section, programmable arpeggiator and a comfortable patch browser. Which is why Icarus is one of the most powerful synthesizers on the market.

■ Resynthesis

Working with conventional resynthesis methods you need a deep knowledge of sample editing to achieve good results, doing consuming pre-processing with a sample editor as well as require precisely tuned samples.
We have taken care of these problems and developed completely new algorithms. Icarus' resynthesis works on nearly any kind of audio material, is very easy to use and provides you with high quality results. Simply click on the button - select a wav file - wait for some seconds and Icarus will automatically create a patch, which sounds very similar to the original sound. Optionally you can use the morph modes or the wavetable editor to further shape your sound.

■ Effects

Tone2 Icarus comes with a flexible effects section. Three Modular slots, each with 60 different effect types. You can create your own custom effects, which can be saved & loaded separately. The flexible routing allows you to route single oscillators to different effects.
The innovative ducking mode can change the dry/wet mix of delays and reverbs dynamically, resulting in a more transparent mix. The additional feedback section allows you to route the output back to the input, this way you can create completely new effects, like a delayed-phaser or a feedbacked vibrato.
An additional EQ and a limiter is provided to make your sound sit right in the mix. We developed innovative microtuning algorithms, which make chords sound more fat, harmonic and warm.

■ Oscillators

Icarus is a '3D wavetable synthesizer', we expanded the wavetable concept, allowing you to cross-blend waveforms, with an additional dimension for morphing. You can use any of the 64 different 'morphmodes' to further shape the sound of your wavetables: Waveshaping, time-stretching, pitch-shifting, granulizing, stacking, PWM, formant shifting, BPM syncing, phase distortion, reversing, ringmodulation, sync, rearranging, FM, spectral editing, looping, denoising, mixing,... - literally anything is possible.
Icarus offers three oscillator blocks with stereo architecture. Each oscillator block itself again can contain up to 10 detuned hypersaw oscillators.

We've expanded the popular hypersaw concept with a stereo architecture, precise phase control, punch and the ability to make single oscillators play chords.
38 different modes are available, including, hypersaw, supersaw, stereo hypersaw, unison, stacking, chords and flanging.
The hypersaw modes can be combined with any kind of wavetable and morph mode.

■ Filters

Tone2 Icarus comes with a powerful, modular filter section. Two blocks, each equipped with true stereo architecture and a multi-mode filter.

62 different sounding filter types are available: Vocal, fractal, analog, digital, resonator, EQ, ring modulation, amplitude modulation, FM, phaser, comb, physical modeling, multi-mode, resampling, …
All filters offer the highest possible sound quality, many of them exclusive to Icarus.
The animated display offers an immediate visual overview of the filter's frequency response, making it easy to understand and tweak the filters.
Flexible routing allows you to route every oscillator individually to filter1, filter2 or bypass.
Additionally, two distortion sections, each with 9 different modes allow you to further shape the sound.

■ Vocoder

Icarus contains a high-end quality vocoder module with 1024 bands. It's very easy to use: Simply click on 'Vocoder' and select a wav file containing speech, Icarus will analyze this file and automatically create a patch.
Optionally, apply one of the morph modes to further shape your sound. Playing the sound forwards, backwards, formant shifting, time-stretching and looping is also possible.
The vocoder sound is automatically stored within your patches and songs, you won't have to worry about managing these additional files on your hard disc.

■ Arpeggiator

Almost a synth by itself, the arpeggiator section holds the key to all of your arpeggio needs. It provides you with the tools to set up & use your own arpeggios, in a way that is both powerful and easy.
Working with the arpeggiator is very simple, just lay down your notes inside the note sequencer and select the play direction. The arpeggiator also supports advanced features such as chords, glides, swing & shuffle, split, matrix integration, as well as giving you very precise control over note-sorting, play direction and velocity.
Don’t feel like programming your own patterns? Use one of the built-in patterns or load one of the many external pattern presets to use as a starting point.
Working with an arpeggiator should be fun and inspiring, the arpeggiator in Icarus is as fun and inspiring as it is powerful, flexible and easy to use.

■ Sounds

With a powerful and sonically versatile approach to audio production, Icarus provides you with truly outstanding new sounds.
Icarus comes with an astounding sound collection of production-ready sounds designed by professional sound designers. A comfortable patch browser is provided to give you an instant overview of the available categories and sounds, together with an on-screen keyboard to audition them from within the patch browser. Picking the sound you want is as easy as it can be. Icarus is ready for any type of music you play!

■ Interface

The user-friendly interface makes tweaking accessible to everyone, regardless of skill level or experience. All controls provide you with visual feedback, making it easy to understand and tweak the synthesizer. The animated displays and tool tips instantly visualize what the filters, the LFOs, the envelopes and the oscillators are doing.
With different color schemes available for the interface and with several instances of the synthesizer loaded at the same time, it's even possible to show single instances with different colors. Helping you to keep an overview when working on a complex project with many instances of Icarus.

■ Wavetable editor

You can use the built-in wavetable editor to create your own wavetables or to edit one of the many stock wavetables that ship with Icarus.
Using only a mouse-click, a smart wavetable generator allows you to generate an infinite number of completely new and musically useful wavetables. Or even use the mouse to paint your own waveforms.
The spectral editor turns Icarus into an additive synthesizer, giving you detailed control over the partials and phase. It is possible to drag & drop waveforms or wavetables into the editor or oscillators.
The wavetables are stored within your patches and songs, so you don't have to worry about managing any additional files on your hard disc.
Many common wavetable & waveform formats are supported and it is possible to import and export wavetables from-and-to other synthesizers.
A large, professional set of tools are available, giving you a comfortable and efficient way to edit waveforms and wavetables. This includes basic features like, cutting, mixing and filtering, as well as advanced tools like, denoising, enhancing, resynthesis, vocoder, spectral modification and phase manipulation.
Icarus' flexible, compact and open file format allows sound designers & artists to easily create their own soundsets, waveforms and wavetables.

■ Modulation

Modulation is where the true power of a synthesizer emerges. By using the modulation matrix, Icarus allows you to connect dozens of modulation sources to all-important sound parameters.
Want to use an LFO to wobble your filter? Simply set the proper assignments inside of the modulation matrix and you're on your way.
Modulate almost any parameter well up into the audio-rate speed, from internal modulation sources like the LFOs, to a wide variety of MIDI messages. We've also included midi-learn, so assigning CC's is as simple as a right-click and a knob-turn.

Modulation can be as simple or complex as you want it to be. Icarus’ modulation system is there to provide whichever modulation routing you require to create your perfect sound.

■ CPU

CPU load is always an important factor to consider, especially in light of today's complicated multi-track projects. We made sure that Icarus is as easy on your CPU as possible. Icarus offers a rich, deep sound, the very best sound quality, AND low CPU usage. What is the advantage of good sound quality if it consistently brings your system to a halt with a mere single instance of the synth?
The low CPU requirement ensures that you can easily use multiple instances of the synth without overloading your project and without the need to render tracks right in the middle of a creative session.

■ User Interface

The Icarus user interface is designed to make patch designing and editing intuitive and fun. All the sound editing parameters are kept on a single page so that you can see the signal flow without getting lost in multiple tabs and pages.

The UI (User Interface) is larger than most software synthesizers and resize-able to your preferred size. Once your patch is built you can switch off the editor view leaving just the basic controls to save screen real-estate, simply click the Size button inside Icarus' Main section and select one of the 'Hide Editor' options from its menu.
Animated displays give you visual feedback so you can instantly see and hear the results of your actions.
Context sensitive tool-tips explain the function of the control that you're currently tweaking. The user-friendly and accessible interface makes tweaking easy for anyone, regardless of skill level or experience.
The customisable interface allows you to select your favorite color scheme. Having several instances of Icarus loaded at the same time, it's even possible to display single instances each with different colors. This helps you with keeping the orientation, when you're working on a complex project containing many tracks.

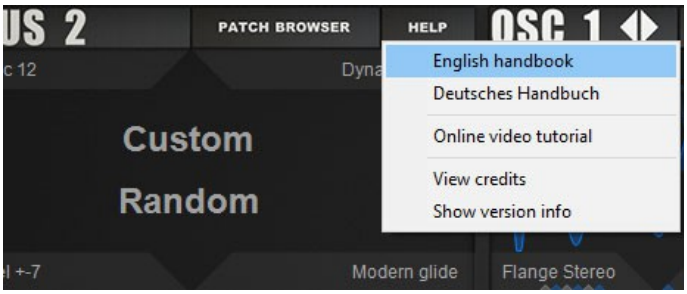
■ Main controls

The main section features the general performance options, like pitchwheel, velocity, playmodes and glide settings.

■ Patch Browser

On top of the main section you'll find the Patch Browser, which offers a browser from which you can navigate patches and their categories as well as test play them using the added keyboard. More on the Patch Browser can be found in the patch browser chapter.

■ Help menu

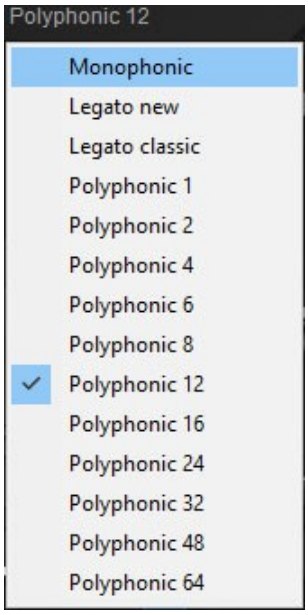


The Help menu offers links to the synth's manual as well as the online tutorials. The synth's credits are also found here.

The Show version info will display which Icarus version is installed.

■ Play mode selector

Play mode sets the number of voices (and how they are handled) available to the current patch and how Icarus reacts to you playing your keyboard controller. It can be set to Monophonic, legato and several Polyphonic modes. Having lower settings will use less CPU, more will increase CPU load but may be needed for certain patches to sound well (no voices being cut off or unnatural sustains)



- **Monophonic** – This mode sets the polyphony to 1 note (monophonic) which mimics the way the classic analogue synthesizers of the past behaved.

- **Legato new** – The punchy sounding Legato new is suitable for modern music.
  When you play a key, no gliding will occur – the oscillators will immediately play the new note. As soon as you release the second key the oscillators will glide.
  The glide knob controls the glide speed of the oscillators. If you set the Retrig (Re-trigger) option for the Envelopes to off, the Envelopes will also be re-triggered when you release a key.

- **Legato Classic** – This is a classic Legato. When you play the first key no gliding will occur. As soon as you press another key the oscillators will glide.

The glide knob controls the glide speed of the oscillators. If you set the Retrig (Re-trigger) option for the Envelopes to off, the Envelopes will also be re-triggered when you release a key.

- **Polyphonic 1-64** – These are Polyphonic play-modes similar to what you know from conventional synthesizers.
  The number represents the number of voices that are available. When this limit is reached the engine softly fades out voices without any clicks. If you use unison (2X or 4X), the number of voices is automatically multiplied by 2 or 4. This way voice management is taken care of for you automatically. In most cases 6 or 8 voices will suffice.

  Should you notice that the CPU usage is too high you can reduce the number of voices or switch off any oscillator unison options.
  The glide knob controls the glide speed of the oscillators. In Polyphonic mode polyphonic gliding is supported. Gliding always occurs if the glide knob is set to a value larger than 0.

■ Micro-tuning mode

Icarus probably comes with the most advanced micro-tuning section currently available on the market.
Micro-tuning is a subtle effect which enhances chords. It does not have an effect on mono or legato sounds. When micro-tuning is active, certain notes are slightly pitched up or down to achieve a more harmonic sounding chord.

Piano tuners and organists did experiments for more than one hundred years to find good settings, we have analyzed and enhanced their results further.
With classic instruments like organs it is not possible to change the tuning of the voices during playback, however this is possible in Icarus. The 'Dynamic' modes analyze your chords in real-time and detune the voices in a subtle way.

Is this difference audible?

The most easy way to hear the difference is to initialize a patch which uses a single sawtooth. Select 'INIT > Init patch' from Icarus' main section menu. The default patch is already initialized with 'Dynamic Silky' as micro-tuning mode. Press two keys on the keyboard and play a minor third (3 halftones) and mayor third (4 halftones) as chord. You will hear a beating with slow modulation. Now press two keys on the keyboard and play an octave (12 halftones). Again you will hear a beating with a very slow modulation.
Now switch off the micro-tuning by selecting 'Standard tuning', which is used by conventional synthesizers. Press two keys on the keyboard and play a minor third (3 halftones) and mayor third (4 halftones) as chord. You will hear a more disharmonic sound with a very fast beating. Now press two keys on the keyboard and play an octave (12 halftones) and you will hear a static and thin sound with no modulation at all.

The following Micro-tuning modes are available:

- **Standard Tuning** – No micro-tuning is used. This mode is used by most conventional synthesizers. Use this mode for monophonic and legato sounds.

- **Dynamic Thirds** – A subtle improvement of the standard tuning. Minor thirds (3 halftones) and mayor thirds (4 halftones) are slightly enhanced.

- **Dynamic Thirds+** – An improvement of the standard tuning. Minor thirds (3 halftones) and mayor thirds (4 halftones) are moderately enhanced.

- **Dynamic Just** – Minor thirds (3 halftones), mayor thirds (4 halftones) and fifths (7 halftones) are heavily processed. The frequency of the beating is minimized. This mode is extreme and can sound 'out of tune', but it can be useful for organs.

- **Dynamic Silky** – Minor thirds (3 halftones), mayor thirds (4 halftones) and octaves (12 halftones) are moderately enhanced. This mode has a warm and silky sound with a slower beating and is a great choice for chords and sounds with slightly detuned oscillators. This innovative mode is exclusive and not available in other synthesizers.

- **Dynamic Valotti** – We extended the famous Valotti tuning with dynamic octave spreading. This mode has a very lively sound. The beating speed of chords varies. It is a good choice for sounds with moderately detuned oscillators and for analog emulation. This mode is exclusive and not available in other synthesizers.

- **Dynamic Subtle** – Like 'Dynamic Silky' but with less extreme settings.

- **Dynamic Octaves** – Standard tuning with dynamic octave spreading. Thirds and Fifths are not affected.

- **Valotti** – The classic Valotti tuning one of the most popular modes for classic music and organs. This mode has a lively sound. The beating speed of chords varies.

- **Valotti Fat** – We extended classic Valotti tuning with a subtle octave spreading. Maybe someone else already did this before.

- **Young** – The Young tuning is quite popular.

- **Werckmeister 3** – Many Organists prefer Werkmeister 3. It is popular for classic music.

- **Young-Sorge, Kirnberger 3,Neidhardt & Hammer** – These historical modes are well known. We think that Valotti and Werkmeister 3 sound better, but feel free to use them if you like them. There are a lot more microtuning modes and variations out there, but we think that quality is more important than quantity.

- **Sinus 7cent, 5cent**– These modes are not well known, but we think that they sound good and really deserve to get some attention. They sound similar to Valotti.

- **Stretch Light** – Standard tuning with subtle octave stretching. Some pianos are tuned this way.

- **Stretch Medium** – Standard tuning with octave stretching. Many pianos are tuned this way.

- **Stretch Heavy** – Standard tuning with heavy octave stretching.

- **Stretch Valotti** – Valotti tuning with octave spreading.

■ Glide Mode

Glide Mode manages the glide mode options. The glide knob found inside the Main Section controls the glide speed of the oscillators. Gliding occurs if you set the glide knob to a value larger than 0. Inside the Glide Mode menu you can select from one of the several Glide modes that Icarus offers:

- Modern glide – A linear pitch sweep between notes. In most cases this will be the most musically useful sounding mode.
- Vintage glide – A logarithmic pitch sweep between notes which sounds more like 'analog' synthesizers. This mode lowpass filters the pitch of the oscillators. As a result you get faster gliding at the beginning and slower gliding when the target pitch is reached.
- Variable glide – The speed of the glide depends on how far the distance between the two notes is. A glide over several octaves will take longer than gliding to a neighboring note.

■ Glide control

The glide knob controls the glide speed of the oscillators. Gliding occurs if you set the glide knob to a value larger than 0. Inside the Glide Mode menu you can select from one of the several Glide modes that Icarus offers

■ Pitchwheel menu

- **Off** – Switches the Pitchwheel off. This is sometimes preferred if you assign modulation to the pitchwheel.
- **Pitchwheel +-1 / +-48** – Switches the range of the Pitchwheel to a value of +-1 up to a range of +48.

■ Pan control

The pan control allows you to position the synth's sound in the stereo field (left-middle-right)

■ Volume control

The Volume knob controls the master volume for Icarus.

■ Vel control

The Vel (velocity) knob controls the amount of keyboard velocity applied to the volume.

■ FX Mix

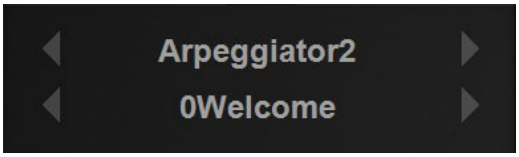
The FX Mix knob controls the Dry / Wet setting for Icarus' effects section.

■ Macro

The Macro control transmits MIDI Continuous Controller 1 messages (modulation wheel) when modified. Controlling this knob with your mouse does the same job as moving the modulation wheel on your keyboard controller.
The Modwheel knob also acts as a visual indicator for your modulation wheel. By default, MIDI Continuous Controller 1 is used to change, or 'morph' between one timbre and another.

■ Patch display

The patch display displays which patch is currently loaded. From here you can also easily navigate-to & load new sounds, using any of the four arrow shaped buttons inside the Patch display window to navigate / switch to different patches or patch categories.

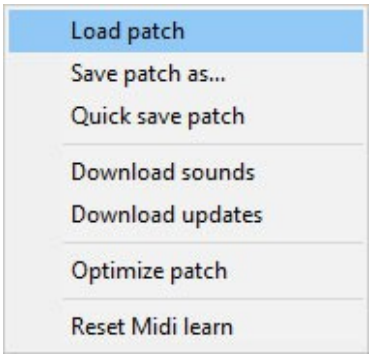


- **Arrow Left** (left of the Patch name) – loads the previous patch in the current patch category
- **Arrow Right** (right of the Patch name) – loads the next patch in the current category
- **Arrow Left** (left of the Category name) – loads the previous patch in the current patch category
- **Arrow Right** (right of the Category name) – loads the next patch in the current category

■ Main section menu

■ File menu

The file menu offers several patch load & save options as well as Download, Optimize patch options and the Midi-learn reset.



- **Load patch** – Loads a patch from disk
- **Save patch as** – Opens a file dialog to save the current patch to file
- **Quick save patch** – The preset file inside the current category (within icarus_sounds) is overwritten.
- **Download sounds** – This takes you to Tone2's website where you can buy additional sound banks to be used with Icarus.
- **Download update** – This will take you to Tone2's download section from which you can download Icarus updates.
- **Optimize patch** – This removes unused wavetables and modulation matrix slots to enhance performance and save hard disk space.
- **Reset Midi-learn** – Select this option to remove / reset all previously learned midi CC assignments.

■ Init menu

- **Init patch** – This option initializes all of the synth's settings to their default values.
- **Init Matrix** – Initializes the Modulation Matrix settings to their default values.
- **Init MSEG1** – Initializes MSEG1's settings to its default values.
- **Init MSEG2** – Initializes MSEG2's settings to its default values.
- **Init Filter 1** – Initializes Filter 1's settings to its default values.

- **Init Filter 2** – Initializes Filter 2’s settings to its default values.
- **Init Glitch-Sequencer** – Initializes the Glitch-Sequencer’s settings to its default values.

- **Init Drums** – Initializes the Drum sequencer’s settings to its default values.

■ **Reset**
Resets the current patch.

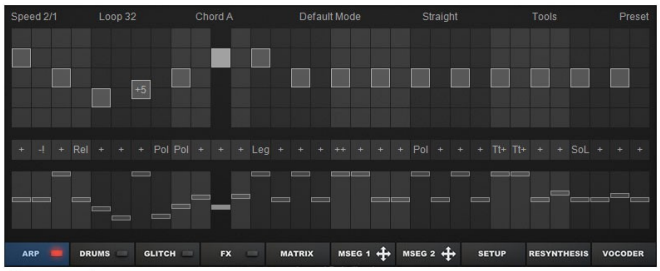
■ **Random**
Random – This option randomizes all synth settings.

■ **Shop**
The Shop button will take you to Tone2's sound shop, where you can purchase new soundsets or expansions for Icarus.

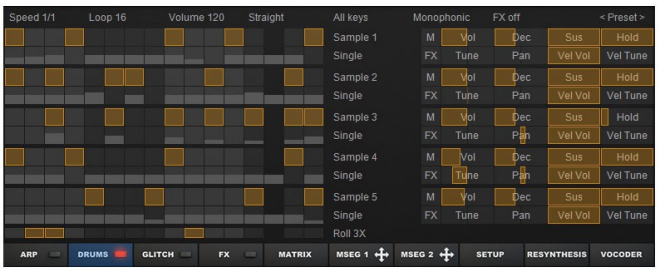
■ **Size menu**
The size menu offers you 12 different GUI size options for switching Icarus' interface to your preferred setup / size.

■ Main menu

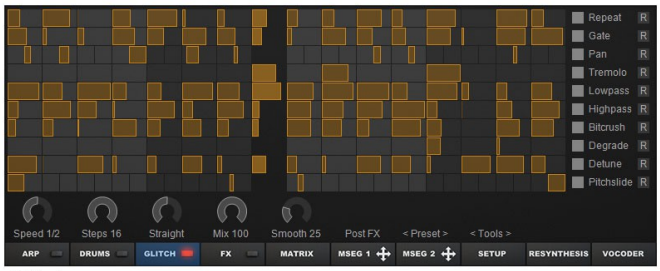
The Main menu offers on / off buttons, as well as access to various sections within Icarus. Namely the Arpeggiator, Drum-sequencer, Glitch-sequencer, the Effects section, Modulation Matrix, Multi-Stage Envelope Generators and the Setup page. Also included are the Resynthesis & Vocoder menus which are further described in the Resynthesis, Vocoder sections below.



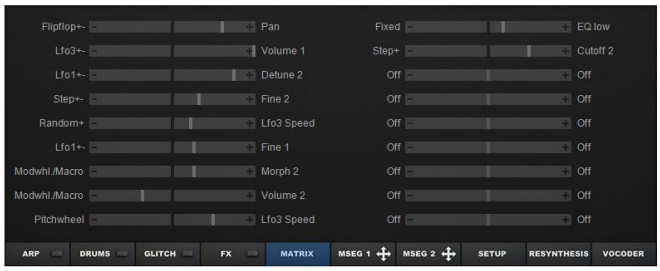
Arpeggiator



Drum-sequencer



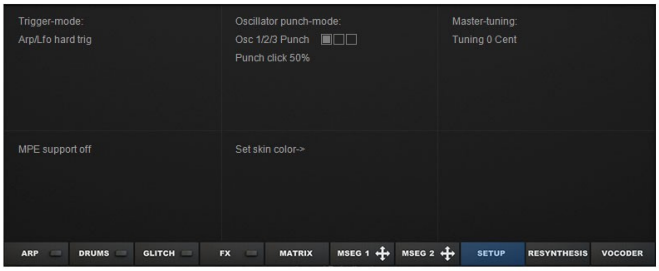
Glitch-sequencer



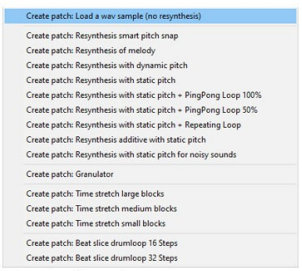
Modulation Matrix

MSEG1

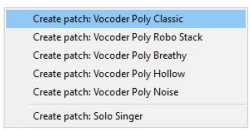
MSEG2



Setup



Resynthesis menu



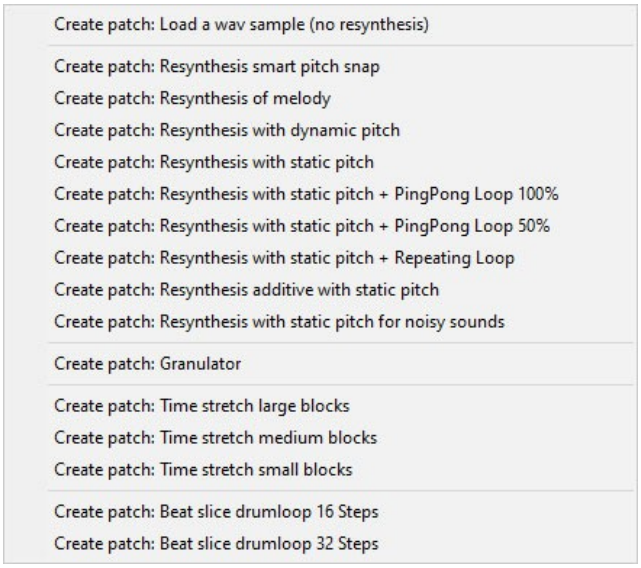
Vocoder menu

■ Resynthesis menu

Icarus comes with a powerful resynthesis feature. Resynthesis means that a sound of your choice is analyzed and reassembled within the synthesizer. Unlike conventional sampling, where the sample is just a simple copy of the original sound, the resynthesized sound is a completely new, but similar sounding patch rebuilt from the scratch.

Icarus 3 includes a new feature capable of resynthesizing melodies.
Resynthesis of melody imports complete phrases or melodies in wav format, automatically programming a patch that sounds very similar to the original.
It reprograms the melody in the arpeggiator and creates a wavetable with the harmonic content of the patch. After which the patches can be further tweaked, time stretched or modified.

With resynthesis there are many things possible, which are impossible with conventional samples or which can not properly done with them.



- Variable Pitch shifting
- Variable time stretching
- BPM syncing
- Time freezing
- Forward and backward playback with variable speed
- Formant shifting (eliminates the 'Mickey Mouse' effect on vocals)
- Morphing

There are many synthesizers out there, which are advertised to be capable of 'resynthesis'. However the results that these products give are mostly poor: They produce heavy rumble and artifacts when a sample isn't tuned exactly, they fail with chords, they fail with voices, they fail with many natural sounds, they fail with pitch slides and they are difficult to use. We have taken care of these problems.

How to resynthesize a sample

Click on the Resynthesis button to open its menu, select your preferred Resynthesis option and load a short wav sample of your choice...

TIP
- Use single sounds, avoid melodies, unless you use 'the Resynthesis of Melody' option.
- Try to avoid samples with other instruments or percussion in the background.
- Recordings from monophonic sounds give better results than chords.
- The sound quality of the processed wav file should high.
- Use 16 bit mono files with less than 2 seconds length.
- If you use very large files the processing time will be also very long.

...wait for a short moment. The synth created a new patch. OSC1 contains a wavetable which contains waveforms that have been resynthesized from your wav file. LFO1 now controls the WAVE position of this wavetable.
TIP Apply a Morph Mode to change the sound.

TIP Combine the Vocoder and Formant Morph Modes for formant shifting on vocals.

TIP You can resynthesize wavetables without automatically creating a new patch in the Tools menu of the oscillators.

The following resynthesis options are available.

- **Create patch: Load a wav sample (no resynthesis)** – Loads a wav file without applying resynthesis.

- **Create patch: Resynthesis smart pitch snap** – Resynthesize using Smart pitch snap enhances the sound quality. Select a wav file and it automatically creates a synthesizer patch that syncs to BPM.

- **Create patch: Resynthesis of melody** – Imports a complete phrase or melody in wav format, automatically programming a patch that sounds very similar to the original. It reprograms the melody in the arpeggiator and creates a wavetable with the harmonic content of the patch. After which the patches can be further tweaked, time stretched or modified.
- **Create patch: Resynthesis with dynamic pitch** – Automatically creates a patch which sounds similar to the original one. This mode analyses the pitch information of the patch and programs the STEP LFO with a pitch envelope.

- **Create patch: Resynthesis with static pitch** – Creates a patch using static pitch which sounds similar to the original one. The default mode which gives the best results if the sound's pitch doesn't matter, otherwise use the dynamic pitch option.

- **Create patch: Resynthesis with static pitch + PingPong Loop 100%** – Similar to 'Resynthesis with static pitch', but uses a PingPong 100% LFO to loop the wavetable. The loop uses a sawtooth LFO to reloop at the end of the sample.

- **Create patch: Resynthesis with static pitch + PingPong Loop 50%** – Similar to 'Resynthesis with static pitch', but uses a PingPong 50% LFO to loop the wavetable. The loop uses a sawtooth LFO to reloop at the end of the sample

- **Create patch: Resynthesis with static pitch + Repeating Loop** – Similar to 'Resynthesis with static pitch', but uses the PingPong LFO to loop the wavetable. The loop uses a sawtooth LFO to reloop at the end of the sample

- **Create patch: Resynthesis additive with static pitch** – Works like the default Resynthesis, but removes all phase information and detuning from the sample. As a result you get the cold sound known from additive synthesizers.

- **Create patch: Resynthesis with static pitch for noisy sounds** – Works like the normal resynthesis, but sometimes gives better results with very noisy sounds like flutes.

- **Create patch: Granulator** – Creates a wavetable using granular synthesis. With granular synthesis a sample is divided into small 'grains' with a window function.

- **Create patch: Time stretch large blocks** – Loads a sample and timestretches or pitchshifts it using large blocks. Large blocks produces less artifacts, but has less precise timing. Change the LFO1 Shape to a triangle for a forward and backward playback. Change LFO1 Speed for a faster or slower playback of the sound. When you set Speed to 0 you can time freeze the sample. You can use the WAVE knob to change the start offset of the sound. The pitchwheel changes the pitch of the sample without affecting the playback speed.

- **Create patch: Time stretch medium blocks** – Loads a sample and timestretches or pitchshifts it using medium blocks. Medium blocks is the default mode. Change the LFO1 Shape to a triangle for a forward and backward playback. Change LFO1 Speed for a faster

or slower playback of the sound. When you set Speed to 0 you can time freeze the sample. You can use the WAVE knob to change the start offset of the sound. The pitchwheel changes the pitch of the sample without affecting the playback speed.

- **Create patch: Time stretch small blocks** – Loads a sample and timestretches or pitchshifts it using small blocks. Small blocks has more precise timing, but also more artifacts. Change the LFO1 Shape to a triangle for a forward and backward playback. Change LFO1 Speed for a faster or slower playback of the sound. When you set Speed to 0 you can time freeze the sample. You can use the WAVE knob to change the start offset of the sound. The pitchwheel changes the pitch of the sample without affecting the playback speed.

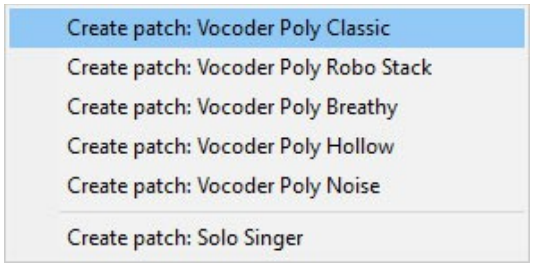
- **Create patch: Beat slice drumloop 16 steps** – Cuts a sample into 16 waveforms and creates a patch which plays a BPM synced loop.

- **Create patch: Beat slice drumloop 32 steps** – cuts a sample into 32 waveforms and creates a patch which plays a BPM synced loop.

■ Vocoder menu

The vocoder module of Icarus offers the highest possible sound quality: It has over 500 bands and ultra fast envelopes.

Click on the Vocoder button, select 'Create patch: Vocoder Poly Classic' and select a vocal sample or a drumline in wav format.
A complete vocoder patch is created instantly. Use the LFO1 Speed knob to change the playback speed of the vocoder. Use the Morph knob to shift the formants up and down.



TIP If needed, apply Tools→Modify Wavetable: Maximize Volume for one or several times to boost the volume.

The following Vocoder options are available:

- **Create patch: Vocoder Poly Classic** – A classic vocoder sound with a sawtooth as carrier wave. A good choice if you want to play chords.

- **Create patch: Vocoder Poly Robo Stack** – The 90s robotic vocoder sound known from

many old Freestyle recordings. It uses two stacked sawtooths as carrier wave.

- **Create patch: Vocoder Poly Breathy** – A unique, breathy sounding vocoder which is only available in Tone2 Icarus. A good choice if you want to play chords.

- **Create patch: Vocoder Poly Hollow** – A vocoder with a squarewave as carrier. It has a hollow sound.

- **Create patch: Vocoder Poly Noise** – A vocoder with noise as carrier. It sounds like whispering.

- **Create patch: Solo Singer** – Creates a monophonic patch which sounds like the famous 'Cher' record 'Do you believe'.The 'Cher effect' means that singing phrase is overprocessed with an autotune processor to achieve an artificial sound. Use the GLIDE knob to control the speed of the legato. Use the Morph knob to shift the formants up and down.
  TIP Play legatos (2 keys are pressed, one is released)

  TIP You can make it sound even more artificial if you apply Tools→Modify Wavetable: Enhance Spectrum'

TIP **What Is a vocoder?**

Simply put, a vocoder puts the ‘characteristics’ of one sound onto another. Originally designed in the 1930s as a method of encoding a person’s voice for secure communication over a telephone network, it found a home in modern music during the 1970’s.

A more detailed explanation goes like this. A vocoder needs two inputs, a carrier and a modulator. The tonal characteristics of the modulator are impressed onto the sound of the carrier. The modulator is usually a voice, drum loop or other percussive sound. This sound is passed through many parallel filters to create a ‘signature’ of the modulator from the frequency content and volume of the frequency components. This multi-frequency, time-varied ‘signature’ is then used to filter the carrier which is usually a frequency rich sustained sound (like chords played using a sawtooth wave). If you use a voice as the modulator the output sounds like the sawtooth wave modulated by the filter created by the voice

■ Patch Browser

The Patch Browser provides an easy way to browse and listen to all of the sounds Icarus ships with. With an info pane to display information about the patch and a ranking system to tag your favorite patches.

- **Type:** Displays the current patch category / type of patch.
- **Patch:** Displays the list of patches available in the currently selected category.
- **Info:** The Info window displays all information on the selected patch, e.g. used playmode, synthesis type, etc..

To exit the Patch Browser, click on the X button (top right of the screen)

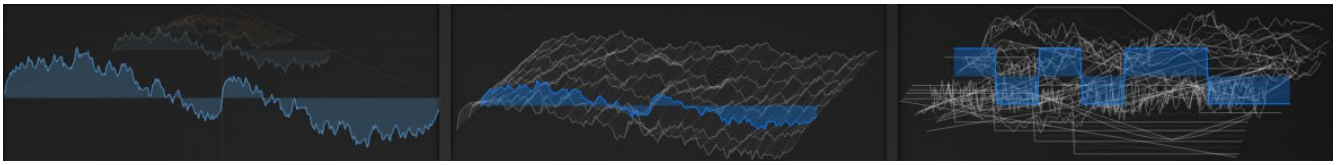
TIP Icarus banks and presets can be organized with your standard file browser. In the Icarus_sounds' folder you'll find the different banks as seen in Icarus'
Both the folders and the .fxp patch files contained inside can organized / renamed and the changes will be displayed the next time you start Icarus.

■ Oscillators

Icarus' oscillators generate tones through a multiple of different methods which can later be further shaped using the filters and effects processors.
Each of the three available oscillators offer a range of synthesis methods along with different play modes, wavetables & wave modifiers. The oscillator section holds a lot of controls so an explanation will be given for each section.

■ Waveform display

The waveform display is used to provide visual feedback on which waveform is loaded and displays the loaded wave(table) Any changes to the waveform are automatically updated & displayed here.
By left-clicking within the waveform display you can switch between the different ways a wavetable or wave is displayed.



Oscillator controls

The oscillator controls are the standard functions you'll use to control an oscillator, like Volume, Pan, Octave….
The three oscillators have the same general controls.

- **Vol** – This controls the volume of the oscillator.
- **Detune** – This controls the amount of detuning applied to the oscillator.
- **Oct** – This control allows you to select the pitch octave at which the sample will be played back, with a range of 8 octaves to choose from: 4 up for the positive values and 4 down for the negative values.
- **Wave** – Runs through all waveforms in the wavetable.
- **Fade** – When WAVE is modulated by LFO1 or another source the waveforms of the wavetable are cross-blended. The FADE knob controls how this cross-blending is done.
  If the knob is set to 0, the synthesizer will switch between the waveforms without any cross-blending. This gives a hard, clicking sound and reduces the CPU load. When FADE is set to 100% the waveforms are smoothly crossfaded. A value of 50% is a combination of both. It can help to enhance the expression and clarity of the wavetable.
- **Morph** – The morph knob adjusts the way the selected morph mode affects the wavetable. Morph modes are selected using the Morph mode menu (found just above the morph knob) and are processed in realtime, this means that you hear all changes immediately and you can route any modulation source to MORPH within the matrix.
- **Pan** – The pan control allows you to position the sound in the stereo field (left-middle-right)
- **Phase** – The phase control changes the start phase of the oscillator's waveform.
- **Semi** – Semi changes the oscillator tune in semitones.
- **Fine** – This knob controls the fine tuning of the oscillator. The range is plus or minus 100 cents.

There are 100 cents per semitone.

- **LFO1** – The LFO1 knob is used to determine the amount of modulation LFO1 should apply to the Wave control.

- **LFO2** – The LFO2 knob is used to determine the amount of modulation LFO2 should apply to the Morph control.

TIP Saving CPU

If you don't need an oscillator in a patch – turn it off. You will save CPU processing power. The same goes for any filters you don't need. If you don't need it, turn it off!

Oscillator Playmodes

Icarus features a large amount of oscillator playmodes, just beneath the waveform display on the left you'll find the Play Mode menu.
Note that once a play mode is selected, visual feedback in the shape of multiple arrows will show the amount of oscillator detuning.

- Playmodes

    - **Mono** – Single oscillator. This is the classic mode which is used by conventional synthesizers

    - **Stereo** – Stereo mode.

- **HyperSaw**

    - **HyperSaw 3, 5, 7, 9** – Several detuned oscillators play at the same time. Unlike conventional Hypersaw synthesizers, the Hypersaws in Icarus are phase optimized. This means that the amount of beating is minimized statistically. As a result you get a sound which suffers from less gain peaks and has more bottom. The Hypersaw oscillators of conventional synthesizers use only sawtooths. In Icarus you can combine this mode with any kind of waveform or wavetable. The detune knob controls the amount of detuning.

    - **SuperSaw** – Ninedetuned oscillators play at the same time. This mode provides the classic 'Trance' sounds from the late 90s. Unlike conventional synthesizers with Supersaw you can combine this mode with any kind of waveform or wavetable. The detune knob controls the amount of detuning.

- **Stereo Hypersaw**

    - **HyperStereo 4, 6, 8, 10** – Several detuned stereo oscillators play at the same time. The oscillators are phase optimized. This means that the amount of beating is minimized statistically. As a result you get a sound which suffers from less gain peaks and which has more bottom. The detune knob controls the amount of detuning.

- **Unison**

    - **Unison 2x** – Two detuned oscillators are stacked. The detune knob controls the amount of detuning.

    - **Unison 4x** – Four detuned oscillators are stacked. The detune knob controls the amount of detuning.

    - **Unison 4x Stereo** – Four detuned stereo oscillators play at the same time. The detune knob controls the amount of detuning.

- **Stack**
    - **Stack 2:1 Octave** – Two detuned oscillators are stacked. The second oscillator plays one

octave higher. The detune knob controls the amount of detuning.

- **Stack 3:1** – Two detuned oscillators are stacked. The second oscillator plays one octave and a fifth higher. The detune knob controls the amount of detuning.

- **Stack 4:1** – Two detuned oscillators are stacked. The second oscillator plays two octaves higher. The detune knob controls the amount of detuning.

- **Stack 5:1** – Two detuned oscillators are stacked. The frequency of the second oscillator is five times higher. The detune knob controls the amount of detuning.

- **Stack 3:2 Fifth** – Two detuned oscillators are stacked. The second oscillator plays a fifth higher. The detune knob controls the amount of detuning.

- **Stack 5:2** – Two detuned oscillators are stacked. The second oscillator plays 2.5 times higher. The detune knob controls the amount of detuning.

- **Stack 4:3 Quart** – Two detuned oscillators are stacked. The second oscillator plays 1.33 times higher. The detune knob controls the amount of detuning.

- **Stack 5:3** – Two detuned oscillators are stacked. The second oscillator plays 1.66 times higher. The detune knob controls the amount of detuning.

- **Stack 5:4 Major** – Two detuned oscillators are stacked. The second oscillator plays a major third higher. The detune knob controls the amount of detuning.

- **Stack 6:5 Minor** – Two detuned oscillators are stacked. The second oscillator plays a minor third higher. The detune knob controls the amount of detuning.

- **Fifth Oct** – Three detuned oscillators are stacked. The second oscillator plays an octave higher. The third oscillator plays an octave and a fifth higher. The detune knob controls the amount of detuning.

- **Octave 4x** –Two detuned oscillators are stacked. The second oscillator plays one octave higher. The detune knob controls the amount of detuning.

- **Octave 4x Stereo** – Four detuned stereo oscillators are stacked. The second pair plays one octave higher. The detune knob controls the amount of detuning.

- **Autochord**

    - **Third Maj/Min** – Two detuned oscillators are stacked. The second oscillator plays a minor or major third higher. The detune knob controls the amount of detuning.

    - **Third Maj/Min 2** – Three detuned oscillators are stacked. The second oscillator plays an octave higher. The third oscillator plays a minor or major third higher. The detune knob controls the amount of detuning.

    - **Third Maj/Min 3** – Three detuned oscillators are stacked. The second oscillator plays an octave higher. The third oscillator plays an octave and a minor or major third higher. The detune knob controls the amount of detuning.

    - **Chord 1** – Plays a major or minor chord. The detune knob controls the amount of detuning.

    - **Chord 2** – Plays a major or minor chord and one octave lower. The detune knob controls the amount of detuning.

- **Flanger**

    - **Flange 3x** – Three slightly detuned oscillators are stacked to achieve a flanging effect. The detune knob controls the modulation speed.

    - **Flange 5x** – Five slightly detuned oscillators are stacked to achieve a flanging effect. The detune knob controls the modulation speed.

    - **Flange Stereo** – Six slightly detuned oscillators are stacked to achieve a stereo flanging effect. The detune knob controls the modulation speed.

- **Tuning**

    - **Semi** – Single oscillator is playing, the detune knob controls the semitones.

    - **Interval** – Single oscillator is playing. The detune knob controls the harmonic interval. If it is set to 0 it will play the base frequency. Higher values result in a frequency which is 2,3,4,5,6,7 or 8 times higher.

    - **Pitch** –Single oscillator is playing, the detune knob controls the pitch.

■ Wavetable menu

This menu is used to select which wavetable the current oscillator should use. External wavetables can be loaded using the Tools menu found on top of the Oscillator panel.
The two arrow shaped controls found on top-next to the oscillator label are used to navigate forward / backward through the Wavetable list.
Once a wavetable is loaded you can use the Wave knob to run through the wavetable, or likewise position your mouse over the waveform display to use the mousewheel to run through the wavetable.

Left-clicking on the waveform / table display will change the way the wavetable / shape is displayed.

Once a wavetable is loaded a small arrow inside the wavetable name field will display the current position within the wavetable.

Morphmodes

The morph modes are different playback modes for the wavetables. The morph knob varies the way how the morph mode affects the wavetable. Next to the WAVE knob it provides another dimension to change the oscillator's sound.
No other synthesizer offers as many playback modes for wavetables as Icarus does. All morph modes are processed in realtime, which means that you hear all changes immediately and you can route any modulation source to MORPH and WAVE within the matrix.

Once a morph mode is selected a small arrow inside the morph mode name field will display the number of quantized steps.

TIP You can apply an unlimited number of morphs to the wavetable! As a result you'll get easy access to literally an unlimited number of different wavetables.
This feature is unique to Icarus and not available in any other synthesizer. Most morph modes can be pre-rendered to a wavetable by using the Tools menu, use:
'Tools → Apply Morph → Apply Morph to wavetable' or 'Tools → Apply Morph → Apply Morph Sweep to current waveform'
As soon as you pre-rendered the MORPH, the playback mode will switch to 'None / Partial' and you can apply another Morph mode.
You can undo your changes with 'Tools → Undo/Redo Wavetable edit'.
TIP As soon as you pre-rendered a morph to a wavetable you can use WAVE to morph, use LFO1 knob to modulate the morph and use FADE to define whether you want a quantized or smooth transitions.

TIP When you move the MORPH knob you will notice audible stepping on some morph modes (Bandlimit, Ringmod, Bandpass, ...). This stepping is useful for many sounds. If you want smooth transitions select 'Tools → Apply Morph Sweep to Wavetable'. Set the 'FADE' knob to 100. Then use WAVE for a smooth transition.

The following Morph modes are available.

None / Partial – This is the default mode for wavetable playback. If the value of the MORPH knob is set to 0 the original wavetable, without any changes applied, is played back. Larger values remove partials from the signal.

> TIP When you move the MORPH knob you will notice an audible stepping. If you want smooth transitions select 'Lowpass fade' as morphmode instead.
>
> TIP This mode offers the highest sound quality and doesn't need much CPU. You should use this mode, except you want to morph the wavetable in realtime or except the case that you are using morphmodes which use fixed formant frequencies.

■ **PW / PhaseDistort**

- **PW** – Applies pulsewidth modulation to the oscillator. MORPH controls the pulsewidth. When MORPH is set to 0 it will remove all even harmonics. As a result a sawtooth will be turned into a square wave. When MORPH is set high values a sawtooth will be turned into an impulse.

- **PhaseDist PW** – Phase Distortion with pulsewidth control is applied to the oscillator. Unlike the morphmode PW it does not change the waveform when MORPH is set to 0.

  TIP Select a square wave as waveform and set the LFO2 knob to 100 and MORPH to 0 for classic PWM.

- **PhaseDist Saw** – Classic Phase Distortion which is mostly known from the old Casio synths. It morphs a sine wave to a sawtooth.
  TIP Select a sine wave and set the LFO2 knob to -100, MORPH to 100.

- **PhaseDist Squ** – Classic Phase Distortion which morphs a sine wave to a square wave.

- **PhaseDist X2** – Phase Distortion which morphs a waveform to a waveform with double frequency.
- **Mirror** – Mirrors the waveform in the middle. When MORPH is set to 0 it will remove all even harmonics. As a result your will get a hollow sound.

- **Grunge** – Adds additional harmonics to the oscillator.

TIP If you want smooth transitions select 'Tools → Apply Morph Sweep to Wavetable'. Set the 'FADE' knob to 100. Then use WAVE to morph the sound.

■ FM

- **FM Sine** – The wavetable is FM modulated with a sine wave oscillator.

  TIP Use the FM Sine modes together with a sine wave or another dark waveform. Use the LFO2 knob to modulate.
  Note that the FM modes in Icarus are real frequency modulation, not PM (phase modulation). Nearly all conventional 'FM' synthesizers (except Tone2 Nemesis) in fact do only PM, which is more easy to process, but doesn't give musically useful sounds on complex waveforms.

- **FM Sine 2x** – The wavetable is FM modulated with a sine wave oscillator with double frequency. It has a hollow sound.

- **FM Sine 3x** – The wavetable is FM modulated with a sine wave oscillator with triple frequency. It has a bell-like sound.

- **FM Square** – The wavetable is FM modulated with a square wave oscillator.

- **FM Saw** – The wavetable is FM modulated with a saw wave oscillator.

- **FM FM<-Osc3** – FM (PM) between Icarus' own oscillators.
  Select FM←Osc1 inside of oscillator2's Morphmode menu to modulate Osc2 with Osc1.
  Or FM←OSC3 inside of oscillator1's Morphmode menu to modulate Osc1 with Osc3.

■ Sample

- **Sample** – Single sample playback, note that wavetable controls will not have an effect in this mode.

- **Sample Loop** – Looped sample playback, note that wavetable controls will not have an effect in this mode.

- **One Shot Wave** – This mode play the waveform of the oscillator only for a single time. It is useful to add transients to the attack sound of a patch. It can also be used to build drum sets with short samples.
  TIP Icarus can handle very complex waveforms. It's even possible to load short samples (less then 2048 samples samplelength) as a waveform to a wavetable. Simply drag&drop a wav file to the 3D display of the oscillator. You can also use 'Tools->Load Waveform to

current WAVE position'.
TIP There is a 'Drumset' patch within the Templates directory which makes use of these features. We included several 'Drumset' wavetables to Icarus. Every waveform in these wavetables contains a separate drum sample. The MORPH knob selects the sample.

TIP It's even possible to map different waveforms / samples to different keys on the keyboard. Load a 'Drumset' as wavetable then select 'Key C C# D...' as matrix source, select 'Wave 1' as matrix target and set 'matrix send' to 100.

■ Harmonic

- **Harmonic Key** – A partial morph with smooth transitions and key tracking.
  TIP Use the LFO2 knob for cool morphs.

- **Harmonic** – A partial morph with smooth transitions. The sound of the wavetable will change in a way that the frequency content sounds similar, no matter what key you press on the keyboard.
  TIP Use the LFO2 knob for cool morphs.

- **Hollow1-4 Key** – A partial morph with smooth transitions and key tracking. It has a hollow sound.

- **Hollow** – A partial morph with smooth transitions and a hollow sound. The sound of the wavetable will change in a way that the frequency content sounds similar, no matter what key you press on the keyboard.
  TIP With Hollow modes use the LFO2 knob for unique filter sweeps.

■ Formant

- **Formant** – This mode is useful for speech synthesis, synced sounds and sweeps. The sound of the wavetable will change in a way that the frequency content sounds similar, no matter what key you press on the keyboard.
  Low values of the MORPH knob result in a darker sound, high values result in sounds with lots of energy in the high spectrum.
  TIP Use the LFO2 knob for cool morphs.

- **Formant Cross** – Similar to Formant, but with a softer sound.

- **Vocoder** – This mode is intended to be used together with wavetables created by the vocoder. however it is not limited to this purpose and can give interesting results with other wavetables.
  In this mode the sound will change in a way that the frequency content sounds similar, no

matter what key you press on the keyboard. It does eliminate the 'mickey mouse effect' which is known when you you play back a vocal sample with high pitch and gives you independent control over pitch and formant frequency.
Low values of the MORPH knob shift the formant frequencies down and result in a devil-like voice. High values shift the formant frequencies up and give a smurf-like sound.

TIP Click on the Vocoder tab, select a Vocoder mode and load a vocal sample to create a vocoder wavetable. Then use the MORPH knob to alter the sound.

- **Granulator** – This mode can be used to pitchshift or to timestretch samples. This mode is intended to be used together with wavetables created by the granulator in the resynthesis section. However it is not limited to this purpose and can give interesting results with other wavetables. The MORPH knob controls the pitch of the sample which is played back.

  TIP Click on the Resynthesis tab, select Create Patch: Granulator and load a sample to create a granulator wavetable. Then use the MORPH knob to alter the sound.

Filtered

- **Lowpass Fade** – A spectral lowpass filter with at least 80dB is applied to the wavetable. Unlike conventional filters it doesn't suffer from phase shift and gives extremely precise results. It has a very unique sound and is excellent for punchy bass sounds with lots of pressure. This filter is exclusive and only available in Tone2 Icarus and Tone2 Nemesis.
  TIP Use the LFO2 knob and MORPH to modulate the filter cutoff.

- **Highpass Fade** – A spectral highpass filter with at least 80dB is applied to the wavetable. This filters is exclusive and only available in Tone2 Icarus.

- **Highpass** – A steppy spectral highpass with over 120dB(!) is applied to the wavetable.

- **Bandpass 1oct** – A steppy spectral bandpass with over 120dB(!) and one octave bandwidth is applied to the wavetable.
  TIP If you want smooth filter sweeps select 'Tools->Apply Morph Sweep to Wavetable'. Set the 'FADE' knob to 100. Then use WAVE to control the filter cutoff.

- **Bandpass 2oct** – A steppy spectral bandpass with two octaves bandwidth is applied to the wavetable.
  TIP If you want smooth filter sweeps select 'Tools->Apply Morph Sweep to Wavetable'. Set the 'FADE' knob to 100. Then use WAVE to control the filter cutoff.

- **Bandstop 1oct** – A steppy spectral bandstop with over 120dB(!) and one octave bandwidth is applied to the wavetable.

- **Bandstop 2oct** – A steppy spectral bandstop with over 120dB(!) and two octaves bandwidth are applied to the wavetable.
- **Sine Fade** – Crossfades the waveform to a sine wave.
  TIP You can use this if a waveform doesn't have enough 'bottom' or doesn't sound 'warm' enough.

- **F0 Cut Fade** – Removes the first partial.
  TIP You can use this to make a waveform sound more bright.

■ **AM / Ringmod**

- **Ringmod Key** – Ringmodulation with key tracking applied to the wavetable.

- **Ringmode Fade** – Ringmodulation with a fixed frequency applied to the wavetable. The sound of the wavetable will change in a way that the frequency content sounds similar, no matter what key you press on the keyboard.
  TIP This mode sounds similar to a filter sweep. Use the LFO2 knob and MORPH to modulate the 'filter cutoff'.

- **Ringmod** – Ringmodulation with key tracking and stepping applied to the wavetable.

- **AM Key** – Amplitude modulation with key tracking applied to the wavetable.

- **AM Fade** – Amplitude modulation with a fixed frequency is applied to the wavetable. The sound of the wavetable will change in a way that the frequency content sounds similar, no matter what key you press on the keyboard.
  TIP Use the LFO2 knob to modulate it.

- **AM** – Amplitude modulation with key tracking and stepping is applied to the wavetable.

- **AM←OSC3** – Amplitude Modulation between Icarus' own oscillators.
  Select AM←Osc1 inside of oscillator2's Morphmode menu to Amplitude Modulate Osc2 with Osc1.
  Or AM←OSC3 inside of oscillator1's Morphmode menu to Amplitude Modulate Osc1 with Osc3.

■ **Waveshape**

- **Waveshape** – A waveshaper is applied to the wavetable which gives FM-like sounds.
  TIP Use the LFO2 knob to modulate it.

- **Shape←OSC3** – Waveshaping between Icarus' own oscillators.

Select Shape←Osc1 inside of oscillator2's Morphmode menu to Shape Osc1 with the waveform of Osc2. Or Shape←OSC3 inside of oscillator1's Morphmode menu to shape Osc3 with the waveform of Osc1.

■ **Sync**

- **Sync Squ Key** – Applies hard sync with key tracking to the oscillator. This mode is useful for synced sounds and sharp sounding sweeps.

- **Sync Squ** – Applies hard sync to the oscillator. This mode is useful for speech synthesis, synced sounds and sweeps. The sound of the wavetable will change in a way that the frequency content sounds similar, no matter what key you press on the keyboard.

- **Sync Saw Key** – Applies hard sync with key tracking to the oscillator. This mode is useful for synced sounds and sharp sounding sweeps.

- **Sync Saw** –Applies hard sync to the oscillator. This mode is useful for speech synthesis, synced sounds and sweeps. The sound of the wavetable will change in a way that the frequency content sounds similar, no matter what key you press on the keyboard.

  TIP Use the LFO2 knob to modulate and for cool morphs.

■ **Comb**

- **Comb 2x** – Applies a comb filter with 2 stages to the oscillator.

- **Comb 3x** – Applies a comb filter with 3 stages to the oscillator.

  TIP Set the LFO2 knob to 100 and MORPH to 0 for beating strings.

■ **Stack / Chord**

- **Stack Octave+** – Stacks an oscillator and another one which is one octave higher. MORPH controls the amount of phase shift between both oscillators.
  TIP Set the LFO2 knob to 100 and MORPH to 0 to get interesting sounds.

- **Stack Octave-** – Stacks an oscillator and another one which is one octave higher and 180 degree phase shifted. MORPH controls the amount of phase shift between both oscillators. When MORPH is set to 0 it will remove many even harmonics. As a result this mode has a more hollow sound then 'Stack Octave+'.
  TIP Set the LFO2 knob to 100 and MORPH to 0 to get interesting sounds.

- **Stack Harmon+** – Stacks an oscillator and another one which is two, three, four, five, six,

seven or eight times higher. MORPH controls the harmonic relationship between both oscillators.
TIP If you want smooth transitions select 'Tools->Apply Morph Sweep to Wavetable'. Set the 'FADE' knob to 100. Then use WAVE to morph the sound.

- **Stack Harmon-** – Stacks a 180 degree phase shifted oscillator and another one which is two, three, four, five, six, seven or eight times higher. MORPH controls the harmonic relationship between both oscillators. This mode has a more hollow sound then 'Stack Harmonic+'.

- **Stack Power** – Stacks several oscillators which are two, three and four times higher.
TIP Use this mode together with sinoid waveforms to build organs.

- **Chord 2x** – Two stacked oscillators play a chord. The MORPH knob selects the type of chord, like major, minor, fifth,..

- **Chord 3x** – Three stacked oscillators play a chord. The MORPH knob selects the type of chord, like major, minor, fifth,..

- **Interval** – Shifts the base frequency of the oscillator. The MORPH knob selects the harmonic relationship (1x-16x). This mode can be useful for building custom chords.

- **Jodel Chip** – Plays a very fast arpeggiator to mimic a chord. This effect is known from the chiptunes on vintage computers like the C64. MORPH controls the type of chord. We called this mode 'Jodel' because Tone2 is a company from Bavaria.
TIP Set the OCT knob to 0 or -1 to lower the speed of the chord.

■ **Noise**

- **Noise White** – Plays white noise.

- **Noise Pink** – Plays pink noise. Pink noise has more energy in the low spectrum.

- **Noise Tuned** – Plays noise, which base frequency follows the key that you currently play.
TIP Use this oscillator for the percussion of chiptunes.

■ **Lofi**

- **Spirit** – The pitch of the oscillators is frequency modulated with noise. This mode gives a breathy sound. MORPH controls the amount of detuning.
TIP Use this mode to build choirs and to make voices sound more natural.

- **Analog** – The oscillator sounds like an analog one. It has a muffled sound and suffers from drift and saturation. MORPH controls the amount of distortion.

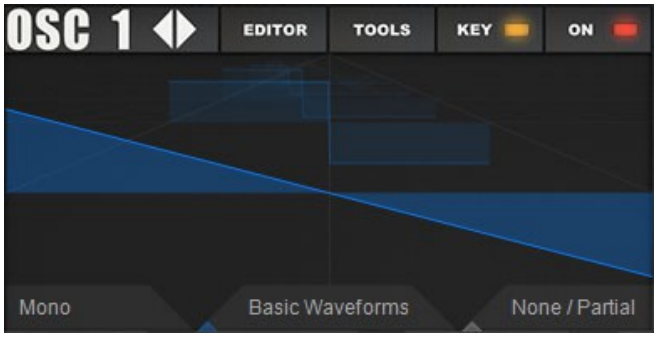
TIP Select a sawtooth as waveform and use this mode together with the analog filters for an authentic emulation of vintage synths.

- **Downsampling** – The oscillator is played back with a lower sample rate. As a result the sound quality is reduced. It has a characteristic 'digital', but also interesting sound. Morph controls the amount of undersampling.
  TIP This mode only need very low CPU. It can be used to reduce the CPU requirements without much quality loss as long as you don't overdo it.

  TIP With high MORPH values this mode can be used to create droid-style vocaloids.

- **Aliasing** – The oscillator is played back in an ugly way with a lower sample rate. As a result the sound quality is reduced and disharmonic frequencies are added. It has a characteristic 'cheap digital' sound. MOPRH controls the amount of undersampling.
  TIP This mode can be used for effect sounds or if you want to mimic the sound of cheap digital hardware.

■ Oscillator menu



The Oscillator menu offers access to several main oscillator controls as well as the Wavetable editor and the Tools menu

■ Wavetable navigation arrows

The two arrow shaped controls found on top-next to the oscillator label are used to navigate forward / backward through the Wavetable list.

■ Wavetable Editor

The editor button opens the Wavetable editor, which can be used to further manipulate and shape your wave & wavetable. More on this in the Wavetable Editor chapter.

■ Tools menu

The Tools menu provides access to a host of Wave(table) load, save & edit options as well as Vocoder and Resynthesis load / save / generation options. Options are further explained below.

■ **Reset**

- **Reset all Oscs** – Resets all oscillator settings (Oscillator 1,2,3) and loads the default wavetable.
- **Reset current Osc** – Resets the current oscillator settings and loads the default wavetable.

■ **Copy**

- **Copy current Osc to Osc1** – Copies all settings from the current oscillator to oscillator 1.
- **Copy current Osc to Osc2** – Copies all settings from the current oscillator to oscillator 2
- **Copy current Osc to Osc3** – Copies all settings from the current oscillator to oscillator 3.

■ **Undo/Redo Wavetable Edit** – Use this to compare & undo changes made with the Tools menu.

Load / save

- **Load Wavetable** (N*2048 samples, Icarus, Serum, Falcon) – Loads a wavetable which has the Icarus wav format (N*2048 samples) to the currently selected oscillator. It does also
  TIP You can also drag & drop an Icarus wavetable to the 3D display of the oscillator to load it

- **Load Waveform to current WAVE position** – Copies all settings from the current oscillator to oscillator 2 Loads a waveform to the wavetable slot, which is selected by the WAVE knob. A waveform is a wav file with 2-2048 sample length and contains a single cycle waveform. If you load a larger wav file a waveform is automatically resynthesized from the middle of this sample.
  TIP Icarus can handle very complex waveforms. It's even possible to load short samples (less than 2048 samples sample length) as a waveform to a wavetable. This can be useful to build a drum set or for transient attack sounds.

  TIP Icarus supports drag & drop of one or several wav files to the 3D display of the oscillator. When you use drag & drop the waveform is loaded to the wavetable slot, which is currently selected by the WAVE knob.

- **Save Wavetable** – Dumps the wavetable of the currently selected oscillator to disc.
  Icarus wavetables are compatible with many other synthesizers and audio editors, also from other companies. While many audio companies encrypt their wavetables to prevent that they can be copied we think that wavetable synthesis can only make a step forward if there is an interchangeable, open and well documented file format that anyone can use and edit.
  An Icarus wavetable is in the common wav file format (16 bit mono) and contains all waveforms in series. Each single-cycle waveform is exactly 2048 samples long. A wav file containing a wavetable with 3 waveforms has a length of 3 x 2048 samples. A wavetable can consist of 1 to 256 waveforms.
  TIP Icarus can create an unlimited amount of wavetables!

Create Wavetable

- **Synthesize a random Wavetable** – The wavetable of the currently selected oscillator is replaced with a new one. Use the WAVE knob to select the currently played waveform.
  TIP A wavetable can contain also just one single waveform. Then it can't be morphed with the WAVE knob, but it can be imported to a slot of a wavetable.

  TIP You can save a wavetable, use an external editor, modify it and load it back into Icarus.

  TIP If you want to export not the complete wavetable, but a single-cycle waveform use

'Tools->Trim Wavetable: Pick current waveform' to create a wavetable with only one waveform first. Then save the wavetable.
TIP For quick access to your own wavetables you can add your own custom files to the factory content of Icarus. When Icarus is loaded all wavetables within the Icarus_wavetables directory are scanned and displayed within the oscillators.
The Icarus wavetables are stored as wav files within the Icarus_wavetables directory. On PC this directory can be found within your vstplugins directory. On Mac it is within Library/Audio/Plug-ins.

TIP Icarus patches are in fxp format. The fxp files contain the current patch setting, but do also contain the wavetable data.
The wavetable data is also stored directly within your songs. You don't have to care or be scared about the content of the Icarus_wavetables directory. Even if you should accidentally delete all factory wavetables, your songs and all Icarus patches will not be broken and continue to work.

■ Resynthesis

- **Resynthesis smart pitch snap** – Analyzes a wav file and resynthesizes a wavetable. The wavetable of the currently selected oscillator is replaced with the new one. Smart Pitch snap enhances the sound quality. Select a wav file and it automatically creates a synthesizer patch which syncs to BPM.

- **Resynthesis stat pitch** – Analyzes a wav file and resynthesizes a wavetable. The wavetable of the currently selected oscillator is replaced with the new one.
TIP Click on the RESYNTHESIS button and select 'Create patch: Resynthesis' to create a complete patch which sounds quite similar to the original wav file.

  TIP Use mono wav files in high quality. If the original sample sounds crappy the results of the resynthesis will also sound crappy.

  TIP Once you resynthesized a wav file you can use the WAVE knob and LFO1 to time-stretch it.

- **Resynthesis additive** – Works like the previous one, but removes all phase information and detuning from the sample. As a result you get the cold sound known from additive synthesizers.
TIP You can use the spectral editor to change the partials and turn Icarus into a complete additive synthesizer!

  TIP Click on the RESYNTHESIS button and select 'Create patch: Additive Resynthesis' to create a complete patch which sounds quite similar to the original wav file.

- **Resynthesis for noisy sounds** – Works like the normal resynthesis, but sometimes gives better results with very noisy sounds like flutes.
- **Resynthesis Note=C4→C0** – In these modes Icarus doesn't detect the pitch of the samples automatically. The sample that you load must be tuned exactly to C4,C3,..
  TIP This mode can be useful if you recorded synthesizer sounds.

- **Granulator** – Analyzes a wav file and prepares a wavetable for the use with the Granulator Morph Mode. The wavetable of the currently selected oscillator is replaced with the new one.
  TIP Click on the RESYNTHESIS button, select 'Create patch: Granulator' and select a sample to create a complete granular patch instantly. Use the Lfo1 SPEED knob to change the speed of the sample. Use the MORPH knob to change the pitch of the sample.

Vocoder

- **Vocoder Saw** – Analyzes a wav file and prepares a wavetable for the use with the Vocoder Morph Mode. The wavetable of the currently selected oscillator is replaced with the new one.
  The vocoder module of Icarus offers the highest possible sound quality: It has over 500 bands and ultra fast envelopes.
  TIP Click on the VOCODER button, select 'Create patch: Vocoder' and select a vocal sample to create a complete vocoder patch instantly. Use the Lfo1 SPEED knob to change the speed of the vocoder sample. speed of the sample. Use the MORPH knob to change the pitch of the sample.

  TIP Use 'Vocoder' as Morph Mode and the MORPH knob to change the formant frequency.

  TIP You can apply 'Tools→Modify Wavetable: Maximize Volume' for one or several times to boost the wavetable's volume.

- **Vocoder Square** – Is like Vocoder Saw mode, but the resulting wavetable has a hollow sound. Use this mode to emulate a vocoder with a square wave as carrier.

- **Vocoder Silky** – Is like the Vocoder Saw mode, but the resulting wavetable has a silky sound.

- **Vocoder Noise** – Is like the Vocoder Saw mode, but the resulting wavetable has a noisy sound. Use this mode to emulate a vocoder with noise as carrier.

■ Trim Wavetable

- **Pick current waveform** – Only the waveform which is selected by the WAVE knob remains. All other waveforms within the wavetable are thrown away.
  TIP A wavetable, which contains just one single waveform, can't be morphed with the WAVE knob. Use 'Tools→Extend Wavetable: Add one slot' to extend the wavetable with one additional waveform slot.

  TIP If you want to export not the complete wavetable, but a single-cycle waveform use 'Tools→Trim Wavetable: Pick current waveform' to create a wavetable with only one waveform first. Then save the wavetable.

  TIP If your patch only uses a single waveform which is part of a large wavetable, you can use this function to reduce the size of your songs and the size of the fxp after saving.

- **After current waveform** – All waveforms behind the one selected by the WAVE knob are thrown away.

- **Before current waveform** –All waveforms before the one selected by the WAVE knob are thrown away.

■ Extend Wavetable

- **Add one slot** – Adds an additional slot to the end of the wavetable.
  TIP A wavetable, which contains just one single waveform, can't be morphed with the WAVE knob.

■ Modifiy Wavetable

- **Tone warmer 1.5dB/Oct** – Reduces the volume of high harmonics.
  TIP Use it for a more 'analog' and warm sound or if a wavetable sounds too 'sharp'.

  TIP You can apply this for several times for an even more warm sound.

- **Tone brighter 1.5dB/Oct** – Boosts the volume of high harmonics.
  TIP Use it for supersaw sounds or if a wavetable sounds too muffled.

  TIP You can apply this for several times.

- **Silky** – The wavetable sounds more silky and noisy.
  TIP Use this for string sounds.

- **Square** – All even harmonics get removed. As a result a sawtooth will be turned into a hollow sounding square wave.
  TIP If you don't like the results you can undo it with 'Tools→Undo/Redo Wavetable edit'.

- **Denoise** – Noise is removed from the wavetable. Sometimes the resulting wavetable does have more 'character'
  TIP If you don't like the results you can undo it with 'Tools→Undo/Redo Wavetable edit'.

- **Add Noise** – Adds some garbage to the wavetable.
  TIP You can apply this for several times for more intensity.

- **Optimize phases** – When you morph trough a wavetable with the WAVE knob you sometimes can hear some rumbling or detuning. After applying this one rumbling is the reduced and the detuning is removed.

- **Enhance Spectrum** – The resulting wavetable mostly has more 'character'.

- **Maximize Volume** – Waveforms with low volume are boosted.
  TIP You can apply this several times for more intensity.

■ Apply Morph

- **Apply Morph to Wavetable** – This is a very powerful feature which is unique to Icarus and not available in any other synthesizer. It allows you to apply an unlimited number of morphs to a wavetable! As a result you get an easy access to an literally unlimited number of different wavetables.
  All morph modes can be pre-rendered to a wavetable by using 'Tools→Apply Morph to Wavetable'. The currently selected value of the MORPH knob is used as a parameter for the rendering. After rendering the old wavetable is replaced with a new one.
  The playback mode will switch to the default 'None / Partial' which doesn't alter the sound anymore. Please note that the morphing is done with the WAVE knob instead of the MORPH knob now. Get ready to apply another Morph mode!
  TIP You can undo your changes with 'Tools->Undo/Redo Wavetable edit'.

  TIP Use the FADE knob to define how steppy transitions between waveforms are.

- **Apply Morph Sweep to current Waveform** – This one works similar to the previous one, but with a little different rendering parameters.

The waveform which is currently selected by the WAVE knob is picked. A wavetable with many waveforms, which replaces the old one, is created. The first slot sounds like the MORPH knob set to 0, the last slot sounds like the MORPH knob set to 100.
The playback mode will switch to the default 'None / Partial' which doesn't alter the sound anymore. Please note that the morphing is done with the WAVE knob instead of the MORPH knob now. Get ready to apply another Morph mode!
TIP You can undo your changes with 'Tools→Undo/Redo Wavetable edit'.

TIP Use the FADE knob to define how 'steppy' transitions between waveforms are.

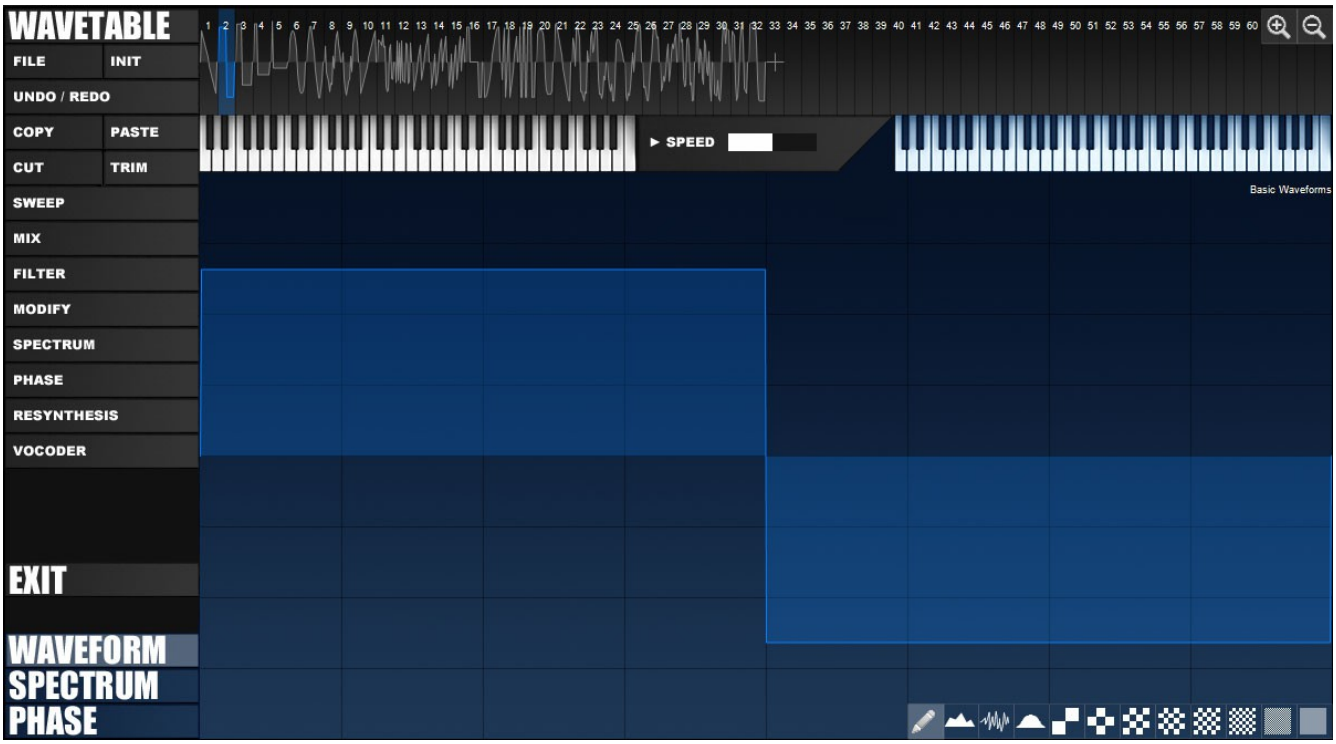
TIP You can use this feature to create smooth filter sweeps and soft transitions for Morph modes which are 'steppy' like 'Bandpass 1oct'.

■ **KEY**
Switches the oscillator's keyfollow mode to On / Off.

■ **ON**
Switches the current oscillator to On / Off.

■ Wavetable editor

The Wavetable editor offers a wide range of tools and options to edit your wavetable using waveform, spectrum and phase editors. With the help of these tools you can further shape your wavetable or single wave any way you want to.



The editor screen is split into several sections, which we'll describe in more detail below.

■ Wavetable Strip Display

The Wavetable Strip display provides you with an easy overview of your wavetable, displaying all of the wavetable's slots. An Icarus wavetable contains all waveforms in series and consists of 1 to 256 waveforms.
Select a single waveform by clicking inside the wavetable strip. The currently selected and displayed waveform is blue. You can also select a block of several waveforms if you click on the wavetable strip and move your mouse, the selected waveforms are blue or red, the currently displayed waveform is blue. To add a new slot click on the plus sign at the end of the wavetable. The magnifier icons found on the top right allow you to zoom in or out of your wavetable.

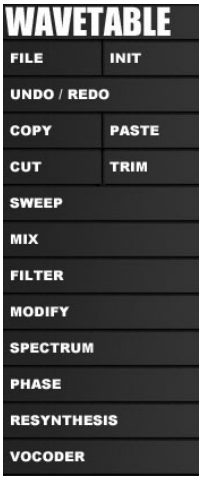
Just below the wavetable strip, two preview keyboards are provided to listen to either the complete wavetable or currently selected wavetable slot, the left keyboard is used to play the wavetable, whereas the right keyboard will only play back the selected slot.
A speed control (found in the middle of these keyboards) is provided to set the wavetable's playback speed.

Drag & Drop
You can drag & drop a wav file which contains a wavetable, waveform (a wave with a single cycle waveform - 2048 samples length or less) or audio data to a slot of the wavetable strip. Icarus will load the waveform to that specific slot.
You can also drag & drop several wave files which contain single cycle waveforms (2048 samples length or less) to a slot of the wavetable strip. Icarus will replace all slots, followed by this slot with the new waveforms.
You can INIT a new wavetable (Create Wavetable: Saw Square Sine) and then drag & drop several waveforms to the first slot to create a custom wavetable.

Drag & Drop on waveform display
If you drag & drop a waveform to the large blue waveform display, Icarus will load the waveform to the currently displayed wavetable slot.
You can also drag&drop several wave files which contain single cycle waveforms (2048 samples length or less) to the waveform display. Icarus will replace all slots, which are following the currently displayed waveform, with the files.

■ Wavetable Tool & Options section

The Tool / Options section gives you access to all wavetable edit, file and initialization functions.
Use the tool section to create & edit your own wavetable or import a wavetable from disc.



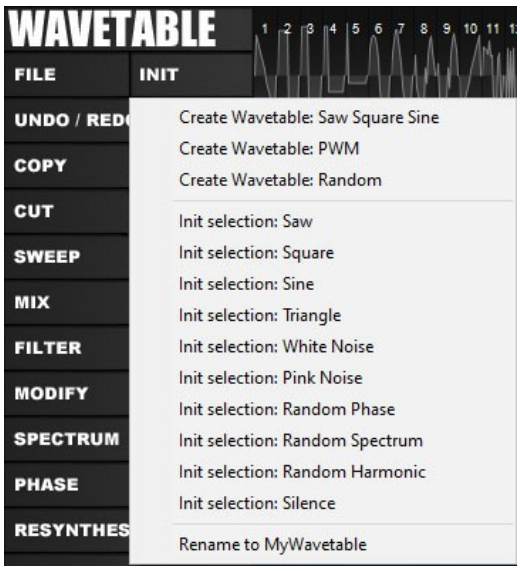
The following tools & options are offered.

- ■ **File** – The file menu contains all wavetable / wave load and save options.
  - **Load Sample / Wavetable (N*2048 samples, Icarus, Serum, Falcon)** – Loads a wavetable in the Icarus wav format (N*2048 samples)
    It also works with wavetables from synths like Serum or Falcon.
  - **Load Single Waveform to selection (Icarus, Galbanum,..)** – Loads a waveform to the selected wavetable slot.
  - **Save Wavetable** – Saves the wavetable to disc. Icarus wavetables are compatible with many other synthesizers and audio editors from other companies.

An Icarus wavetable is in the common wav file format (16 bit mono) and contains all waveforms in series. A wavetable can consist of 1 to 256 waveforms. Each single-cycle waveform is exactly 2048 samples long.
A wav file containing a wavetable with 3 waveforms has a length of 3 x 2048 samples.

- **Save Waveform** – Saves the currently selected waveform to disc.

- **Init** – The Init menu contains several initialization options.



  - **Create Wavetable: Saw Square Sine** – Creates a three slot Wavetable that contains a Saw, Square and Sine wave.
  - **Create Wavetable: PWM** – Creates a Wavetable using PulseWidth Modulated waves.
  - **Create Wavetable: Random** – Creates a randomized Wavetable.
  - **Init Selection: Saw** – Initialises the currently selected Wavetable slot to a Saw wave.
  - **Init Selection: Square** – Initializes the currently selected Wavetable slot to a Square wave.
  - **Init Selection: Sine** – Initializes the currently selected Wavetable slot to a Sine wave.
  - **Init Selection: Triangle** – Initializes the currently selected Wavetable slot to a Triangle wave.
  - **Init Selection: White Noise** – Initializes the currently selected Wavetable slot to a White Noise wave.
  - **Init Selection: Pink Noise** – Initializes the currently selected Wavetable slot to a Pink Noise wave.
  - **Init Selection: Random Phase** – Randomizes the Phase values for the currently selected Wavetable slot.
  - **Init Selection: Random Spectrum** – Randomizes the Spectral values for the currently

selected Wavetable slot.

- **Init Selection: Random Harmonic** – Randomizes the Harmonic values for the currently selected Wavetable slot.

- **Init Selection: Silence** – Insert Silence into the currently selected Wavetable slot.

- **Rename to MyWavetable** – Rename the current wavetable name to MyWavetable.
  TIP Save a wavetable with the file name of your choice and reload it to get a name of your choice.

- ■ **Undo / Redo** – Use the Undo / Redo button to compare and undo changes that you made within the editor.

- ■ **Copy** – Copy the currently selected Wavetable slot.

- ■ **Paste** – Paste your copied slot to the currently selected Wavetable slot.

- ■ **Cut** – Cuts the currently selected Wavetable slot (note that you can still paste the cut out slot back into a new slot)

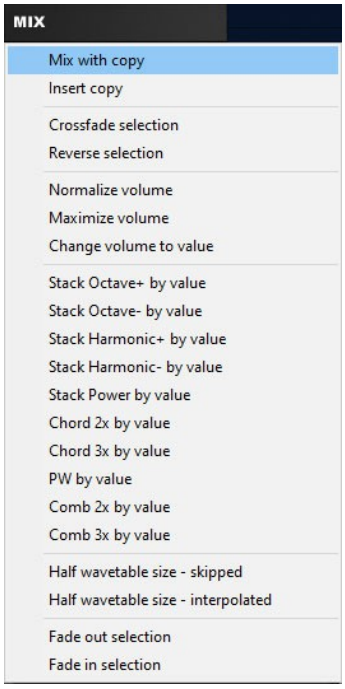
- ■ **Trim** – Trims the Wavetable back to include only the selected waves. (if needed use the undo button to undo this)

- ■ **Sweep** – The waveform currently selected by the blue box is picked and a morphing wavetable with many waveforms is created, replacing the old wavetable. You can find a detailed description of the different morph modes in the 'morph Modes menu' section of this handbook. The first slot of the sweep sounds like the MORPH knob set to 0, the last slot sounds like the MORPH knob set to 100.

  TIP You can undo your changes with 'Tools->Undo/Redo Wavetable edit'.

  TIP You can use this feature to create smooth filter sweeps and soft transitions for Morph modes which are 'steppy' like 'Bandpass 1oct'.

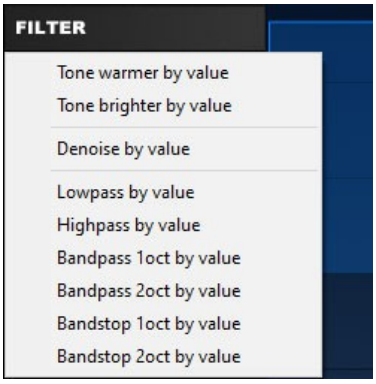
- ■ **Mix** – The mix menu offers several mix functions, combined with a slider control to determine how much of the function is applied. Mouse-click on the Mix button to open the Mix menu and use the slider control to set the amount.



  - **Mix with copy** – Mix the copied data with the selection (use the Copy button to first copy your data)
  - **Insert copy** – Insert the copied data at the current selection point.
  - **Crossfade selection** – Crossfades the selected data.
  - **Reverse selection** – Reverses the selected data.
  - **Normalize volume** – Normalizes the selected data's volume.
  - **Maximize volume** – Applies a maximize process so waveforms with low volume are boosted
  - **Change volume to value** – Changes the volume (Use the value slider control to set the amount)
  - **Stack Octave+ by value** – Stacks an oscillator with another oscillator, one octave higher. (Use the value slider control to set the amount)
  - **Stack Octave- by value** – Stacks an oscillator with another oscillator, octave higher and with 180 degree phase shifted. (Use the value slider control to set the amount)
  - **Stack Harmonic+ by value** – Stacks an oscillator with another oscillator, two, three, four, five, six, seven or eight times higher. (Use the value slider control to set the amount)
  - **Stack Harmonic- by value** – Stacks a 180 degree phase shifted oscillator with another oscillator, two, three, four, five, six, seven or eight times higher. (Use the value slider control to set the amount) This mode has a more hollow sound than 'Stack Harmonic+'
  - **Stack Power by value** – Stacks several oscillators, two, three and four times higher. (Use the value slider control to set the amount)
    TIP Use this mode together with sinoid waveforms to build organs.

- **Chord 2x by value** – Two stacked oscillators play a chord. (Use the value slider control to set the amount)
- **Chord 3x by value** –Three stacked oscillators play a chord. (Use the value slider control to set the amount)
- **PW by value** – Applies Pulse-width Modulation. (Use the value slider control to set the amount)
- **Comb 2x by value** – Applies a comb filter with 2 stages. (Use the value slider control to set the amount)
- **Comb 3x by value** – Applies a comb filter with 3 stages. (Use the value slider control to set the amount)
- **Half Wavetablesize size – skipped** – Dumps half the wavetable, keeping only the first half.
- **Half Wavetablesize size – interpolated** – Dumps half the wavetable, interpolated.
- **Fade out selection** – Applies a fade out to the selected section.
- **Fade in selection** – Applies a fade in to the selected section.

• ■ **Filter** – The Filter menu offers several filter functions, combined with a slider control to determine how much of the function is applied. Mouse-click on the Filter button to open the Filter menu and use the slider control to set the amount.



- **Tone warmer by value** – Reduces the volume of high harmonics, making the selection sound warmer (Use the value slider control to set the amount)
- **Tone brighter by value** – Boosts the volume of high harmonics, making the selection sound brighter (Use the value slider control to set the amount)
- **Denoise by value** – Applies a Denoise process to the selection where noise is removed from the wavetable (Use the value slider control to set the amount)
- **Lowpass by value** – Applies a Lowpass filter to the selection (Use the value slider control to set the amount)

- **Highpass by value** – Applies a Highpass filter to the selection (Use the value slider control to set the amount)

- **Bandpass 1oct by value** – Applies a steppy spectral one octave bandwidth filter to the selection (Use the value slider control to set the amount)

- **Bandpass 2oct by value** – Applies a steppy spectral two octave bandwidth filter to the selection (Use the value slider control to set the amount)

- **Bandstop 1oct by value** – Applies a steppy spectral one octave bandstop filter to the selection (Use the value slider control to set the amount)

- **Bandstop 2oct by value** – Applies a steppy spectral two octave bandstop filter to the selection (Use the value slider control to set the amount)

- ■ **Modify** – The Modify menu offers several modifier functions, combined with a slider control to determine how much of the function is applied. Mouse-click on the Modify button to open the Modify menu and use the slider control to set the amount.

  - **Saturate by value** – Saturation is applied to the selected wave(s) (Use the value slider control to set the amount)

  - **Bitcrush by value** – A bitcrush process is applied to the selected wave(s) (Use the value slider control to set the amount)

  - **Downsample by value** – The selected wave(s) are downsampled (Use the value slider control to set the amount)

  - **Add Noise by value** – Noise is applied to the selected wave(s) (Use the value slider control to set the amount)

  - **Ringmod by value** – Ringmodulation is applied to the selected wave(s) (Use the value slider control to set the amount)

  - **AM by value** – Amplitude Modulation is applied to the selected wave(s) (Use the value slider control to set the amount)

  - **Sync Square by value** – Applies hard sync to the selected wave(s) Useful for synced sounds and sharp sounding sweeps. (Use the value slider control to set the amount)

- **Sync Saw by value** – Applies hard sync to the selected wave(s) Useful for speech synthesis, synced sounds and sweeps. (Use the value slider control to set the amount)

- **Waveshape by value** – Waveshaping is applied to the selected wave(s) (Use the value slider control to set the amount)
- **FM Sine by value** – The selected wave(s) are FM modulated with a sine wave oscillator. (Use the value slider control to set the amount)

- **FM Sine 2x by value** – The selected wave(s) are FM modulated with a sine wave oscillator at double frequency. Which provides a hollow sound. (Use the value slider control to set the amount)

- **FM Sine 3x by value** – The selected wave(s) are FM modulated with a sine wave oscillator at triple frequency. Which provides a bell like sound. (use the value slider control to set the amount)

- **FM Square by value** – The selected wave(s) are FM modulated with a square wave oscillator. (use the value slider control to set the amount)

- **FM Saw by value** – The selected wave(s) are FM modulated with a saw wave oscillator. (use the value slider control to set the amount)

- **Harmonic by value** – Applies a partial morph with smooth transitions. (use the value slider control to set the amount)

- **Hollow1-3 by value** – Applies a partial morph with smooth transitions and hollow sound. (use the value slider control to set the amount)

- **Hollow Double by value** – Applies a partial morph at double frequency, with smooth transitions and hollow sound. (use the value slider control to set the amount)

- **PhaseDist PW by value** – Applies Phase Distortion with pulsewidth control to the selected wave(s) (Use the value slider control to set the amount)

- **PhaseDist Saw by value** – Applies Phase Distortion to the selected wave(s) Morphing a sine wave to a sawtooth. (Use the value slider control to set the amount)

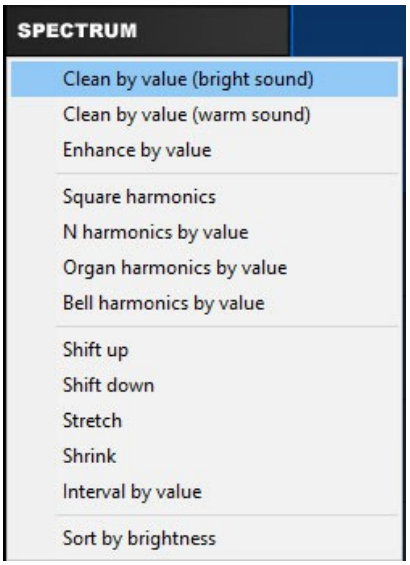
- **PhaseDist Square by value** – Applies Phase Distortion to the selected wave(s) Morphing a sine wave to a square. (Use the value slider control to set the amount)

- **PhaseDist Double by value** – Applies Phase Distortion to the selected wave(s) Morphing the wave to a wave with double frequency. (Use the value slider control to set the amount)

- **Mirror by value** – Mirrors the waveform(s) in the middle. (Use the value slider control to set the amount)

- **Grunge by value** – Adds additional harmonics to the selected wave(s). (Use the value slider control to set the amount)

- ■ **Spectrum** – The Spectrum menu offers several spectrum edit functions, combined with a slider control to determine how much of the function is applied. Mouse-click on the Spectrum button to open the Spectrum menu and use the slider control to set the amount.



- **Clean by value (bright sound)** – Cleans the selected wave's spectrum. The resulting wave(s) usually sounds more 'bright'. (Use the value slider control to set the amount)

- **Clean by value (warm sound)** – Cleans the selected wave's spectrum. The resulting wave(s) usually sounds more 'warm'. (Use the value slider control to set the amount)

- **Enhance by value** – Enhances the selected wave's spectrum. The resulting wave(s) usually have more 'character'. (Use the value slider control to set the amount)

- **Square harmonics** – Every second harmonic is set to 0. It gives a hollow sound. A sawtooth is turned into a square wave.

- **N harmonics by value** – All harmonics except every Nth one are set to 0. Value defines the gap distance. It gives a hollow, bell-style sound. (Use the value slider control to set the amount)

- **Organ harmonics by value** – All harmonics except the power of N^M are set to 0. Value defines the gap distance. It gives an organ-style sound. (Use the value slider control to set the amount)

- **Bell harmonics by value** – All harmonics except the power of N are set to 0. Value defines the gap distance. It gives a bell-style sound. (Use the value slider control to set the amount)

- **Shift up** – All harmonic are moved upwards. It results in a bright sound one octave higher.

- **Shift down** – All harmonic are moved downwards. It results in a darker sound.

- **Stretch** – All harmonics are duplicated and the spectrum is stretched. It results in a brighter sound.

- **Shrink** – Every second harmonic is removed and the spectrum is shrinked. It results in a darker sound.

- **Interval by value** – Creates a harmonic interval. With a value set to 0 it will play the base frequency. Higher values result in a frequency 2,3,4,5,6,7 or 8 times higher. (Use the value slider control to set the amount)

- **Sort by brightness** – Sorts waveforms by their harmonic content. It can be used to create wobbles

- ■ **Phase** – The Phase menu offers several phase edit functions, combined with a slider control to determine how much of the function is applied. Mouse-click on the Phase button to open the Phase menu and use the slider control to set the amount.

- **Set to 0** – Sets the selection's phase to zero.

- **Set to value** – Sets the phase(s) to a specific value. (use the value slider control to set the amount)

- **Invert** – Inverts the selection's phase.

- **Silky Static** – Modifies the selection's phase to sound more silky.

- **Silky Add** – Modifies the selection's phase to sound more silky.

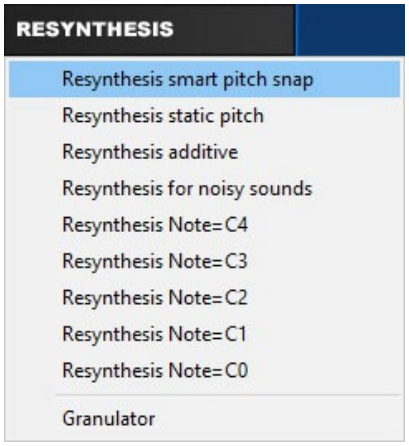
- **Noisy by value**– Modifies the selection's phase to sound more noisy.

- **Sweep by value** – Applies a phase sweep to the selection. (use the value slider control to set the amount)

- **Reverse** – Reverses the selection's phase.

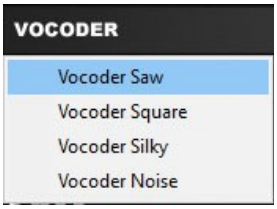
- **Optimize phases to reduce rumble** – When you morph through a wavetable with the WAVE knob you sometimes hear some rumbling or detuning. The Optimize phases.... option reduces rumbling and detuning

- ■ **Resynthesis** – Resynthesizes and creates a wavetable from an imported sample.



  - **Resynthesis smart pitch snap** – Resynthesize using Smart pitch snap enhances the sound quality. Select a wav file and it automatically creates a synthesizer patch which syncs to BPM.
  - **Resynthesis** – Resynthesize uses the default mode, which gives the best results for most sounds.
  - **Resynthesis Additive** – Works like the default Resynthesis, but removes all phase information and detuning from the sample. As a result you get the cold sound known from additive synthesizers.
  - **Resynthesis for Noisy sounds** – Works like the normal resynthesis, but sometimes gives better results with very noisy sounds like flutes.
  - **Resynthesis Note=C4** – Resynthesize from a sample tuned to C4.
  - **Resynthesis Note=C3** – Resynthesize from a sample tuned to C3
  - **Resynthesis Note=C2** – Resynthesize from a sample tuned to C2
  - **Resynthesis Note=C1** – Resynthesize from a sample tuned to C1
  - **Resynthesis Note=C0** – Resynthesize from a sample tuned to C0
  - **Granular** – Creates a wavetable using granular synthesis. In granular synthesis a sample is divided into small 'grains' with a window function.

- ■ **Vocoder** – Creates a Vocoder Wavetable using an imported sample.



  - **Vocoder Saw** – Creates a Vocoder Wavetable using a Saw wave carrier.
  - **Vocoder Square** – Creates a Vocoder Wavetable using a Square wave carrier.
  - **Vocoder Silky** – Creates a Silky Vocoder Wavetable.

- **Vocoder Noise** – Creates a Vocoder Wavetable using a Noise wave carrier.

■ Editor / Display Mode

The Editor / Display mode buttons allow you to switch between these editor modes.

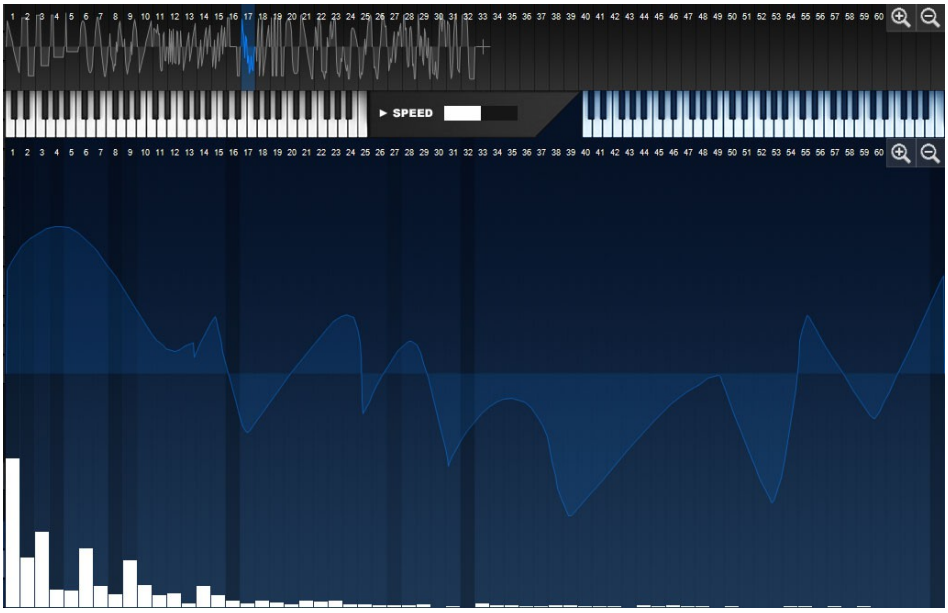
- **Exit** – Exits the Wavetable editor and switches back to the synthesizer.

- **Waveform** – Switches the editor to Waveform mode. Inside Waveform mode you can edit the raw waveshape. A complete set of draw tools are provided (bottom left of the wave display) to help you edit your waveform, a description of these tools is found in the Wave/Spectrum/Phase display section.

- **Spectrum** – Switches the editor to Spectrum mode. Inside the spectrum mode you can change the amplitude of each partial.

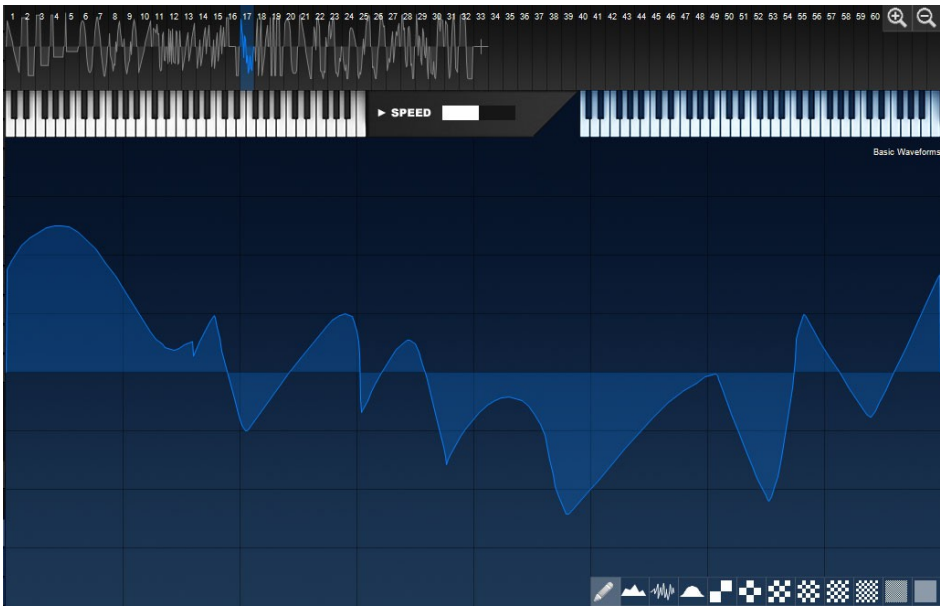
- **Phase** – Switches the editor to Phase mode. Inside Phase mode you can directly edit the phase spectrum, which can add breathiness, detune harmonics or help make organic timbres.

■ Wave / Spectrum / Phase Display



The Wave / Spectrum / Phase Display section allows you to directly edit, as well as provide you with a visual display of, the current waveform(s)
The type of editor display is switchable by either clicking on the Waveform, Spectrum or Phase button.

In Waveform mode an additional Toolbar with draw tools is provided to help you further edit your waveform.

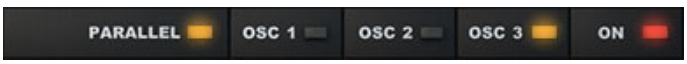


■ Filter

Icarus' filter section has two identical filters, each with an excellent range of filter types to sculpt your sound. These filter types range from traditional analog Low Pass, High Pass, Notch and Band pass filters, up to digital ones like Vocal, Phaser, Ringmod, Comb and Fractal filters. A large number of these filter types are exclusive to Tone2 and not available in any other product.

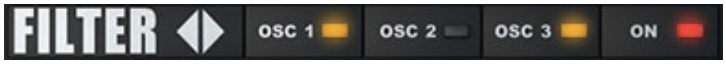
Filter types are selected by clicking on the filter name label, a menu will open from where you can select one of the 62 filter types.

The filters can either be routed in parallel or in series. When routed in parallel the output from each filter is independently sent to the next stage in the audio chain (the Insert Effect).



In serial mode, the output of Filter 1 is sent to the input of Filter 2. To switch between parallel / series mode, click the Parallel button found at the bottom of the filter section. When the button is in the 'on' position the filters are in parallel, in the off position the filters are in series.

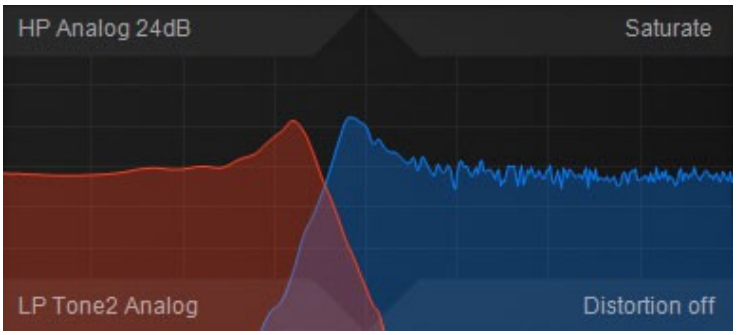
■ Filter menu



- **Filter < >** – Use these arrows to easily step navigate through the available filters. (note that this function is only available for filter 1)
- **OSC 1** – Routes Oscillator 1's output to this filter.
- **OSC 2** – Routes Oscillator 2's output this filter.
- **OSC 3** – Routes Oscillator 3's output this filter.
- **ON** – Switches the filter on / off.

- **Filter Reset / Copy menu** – Click on the Filter label to show a menu with filter Reset and Copy options. Reset will reset a filter to its default filter settings (12dB Digital LP) Copy will copy all current settings from one filter to the other filter.

■ Filter display



The filter display displays the real time shaping of the filter as you alter the Cutoff and Resonance parameters. The horizontal axis show frequencies from lowest to highest, while the vertical axis represents the gain. This gives you immediate visual feedback on your actions. Click on the filter name to select a filter type from the context menu.

Click on the filter name to select a filter type.

Here you have a selection of both classic analog-style as well as digital filters in low pass, band pass and high pass variations, with multiple slopes – 12dB, 18dB and 24dB.
In addition to the analog filters, various EQ filters are available as well as the more unusual filter types such as the Phaser, Combs, Vocal filter, etc.

Icarus also features a range of exotic filter types, like Vocal, Phaser, Resample, Ringmod, FM and Fractal filters. Four special Resonator filter types to be used for Physical Modeling purposes are also featured (Phys String, Phys Flute, Phys Odd & Phys Even)

■ Filter controls

- **CUTOFF** – The Cutoff control knob changes the frequency at which the filter character changes relative to the filter type.

- **RESO** – The Reso (resonance) control knob increasingly alters the characteristic of the filter the more this value is increased. In traditional analog-style filters (low pass, high pass and band pass filters), the resonance control makes the cut off point more pronounced by increasing the volume of the Cutoff frequency.

- **KEY** – The key knob is a bi-polar control that determines how the note played on the keyboard affects the filter cut off frequency. At positive values above 0, higher note values will increase the cut off frequency. At negative values below 0, higher note values will decrease the cut off frequency.

- **FILT ENV** – The filter envelope control knob determines how much influence the filter envelope has on the Cutoff control and in which direction. Positive values over 0 will increase the filter cut off value as the envelope outputs a positive value. Negative values under 0 will decrease the cut off value as the envelope outputs a positive value.

- **ENV VEL** – The velocity control knob determines how much of the filter envelope is applied based on its velocity value.

- **VEL** – The cutoff velocity control determines how much influence velocity has on the cutoff control. Positive values over 0 will increase the filter cut off value, negative values under 0 will decrease the cut off value.

- **LFO3** – LFO3 is a hardcoded modulation control which controls how much of LFO3's modulation should be applied to the cutoff control.

- **VOL** – Volume control.

- **DRIVE** – The drive control knob increases the amount of extra gain to the oscillator audio signal before it enters the filters. This can drastically change the characteristics of the filter. There are different drive 'models' that can be selected in the filter display:
    - **Distortion off** – No drive is applied.
    - **Saturate** – A distortion with very soft saturation. It has a warm and analog sound.
    - **Soft Clip** – A distortion with soft clipping. It has a warm and analog sound.
    - **Hard Clip** – A distortion with aggressive, hard clipping. It has a bright sound.
    - **Rectify** – Rectify hard-clips the signal and mixes the processed signal back in with the original sound.
    - **Bitcrush** – This is a bitcrusher effect which is modeled after old digital equipment with a low bit rate. Think of the early digital samplers with 8-bit sound.
    - **Warp** – A distortion that sounds like a guitar amp.
    - **Waveshape** – A waveshaper which adds an FM-type timbre to the audio.
    - **Ripple** – A waveshaper which adds ripple to the signal. It has bright sound.
    - **Volume** – Changes the volume of the filter output. This mode is useful to control the balance, if you use two filters routed in parallel.

TIP Remember that as you increase the Env control you'll probably need to turn down the Cutoff otherwise you won't hear much of the envelope affecting the cut off. However, you'll need to increase the Cutoff if you want to use negative Env amounts

TIP About the basic filter types

In a Low Pass Filter (LPF), the Cutoff control will set the frequency at which the filter begins to 'close' and allow less and less of the higher frequencies through. When the frequencies are high enough past the cut off point, no more sound will be allowed through the filter.

A High Pass Filter (HPF) allows high frequencies to be heard, but blocks the lower frequencies. It is frequently used to create hi-pitched whistle sounds, and piercing synthesizer leads.

A Band Pass Filter (BPF) allows the frequencies within a specific range to be heard, and blocks out all the other frequencies above and below it. It can be used to create a variety of effects, from the subtle to insane! Also, the filter's *slope* is important. Basically, *slope* is the amount of attenuation at certain frequencies. We usually discuss slope in terms of decibels per octave.

The lower the dB per octave, the more 'gentle' the filter sounds. e.g. a 12dB per octave filter will remove 12dB of harmonics per octave above the filter cut off frequency.

■ Envelopes

The envelope section has four envelopes which can be used to modify many of Icarus' parameters. Two of the envelopes are 'hard-wired'; the Volume Envelope is fixed to control the Amplifier and the Filter Envelope controls the Filter, both auxiliary envelopes can be freely assigned using the Modulation Matrix.

Both the Volume and Filter Envelope are displayed by default, inside the Filter Env. Section you'll find two tabs (Aux1 & Aux2) to switch to the auxiliary envelopes.

The envelope section has a dynamic display that shows the shape of the selected envelope. Click inside this display to open a list of preset envelope shapes or to reset the envelope to its default settings.

The following controls are used for the envelopes:

- **Retrig** – Switches the envelope trigger mode to normal or special.
- **A** – This controls the attack time of the envelope.
- **H** – This specifies the hold time of the envelope.
- **D** – This controls the decay time of the envelope.
- **S** – This sets the level of the sustain section.
- **R** – This sets the release time of the envelope.
- **SHAPE** – This specifies the shape of the envelope curves. The values are from 0 which is a linear curve or pure straight line, up to 9 which is a logarithmic curve or a curved line.

Note: within each Envelope section (top of the ENV) you'll see a cross shaped icon, this is used for assigning drag & drop modulation, more about this can be found inside of the Modulation Matrix chapter.

TIP Click inside the Envelope display to open a list of pre-set envelope shapes or to reset the envelope to its default settings.

TIP **What is an envelope** An envelope generator allows a synthesizer to mimic acoustic instruments' properties of changing volume and timbre over time. Traditionally, an envelope generator produced a control voltage that varied over time which could be used to automatically change the filter cut off or amplifier volume. There are many different types of envelopes but the most common one is known as an ADSR which is an acronym for Attack, Decay, Sustain and Release which describes the four controls of the envelope. Another variant is the AHDSR which is an acronym for Attack, Hold, Decay, Sustain and Release. The AHDSR is used in Icarus.

A description of these are as follows.

Attack – Is a time value which states how long it takes for the envelope to go from zero to maximum peak when a key is pressed.

Hold – Is a time value which states how long it takes for the envelope to wait at maximum peak value.

Decay – is a time value which states how long it takes for the envelope to drop to the sustain level.

Sustain – Is a level value which states the highest value while the key is being held down after the Attack, Hold and Decay stages.

Release – Is a time value which states how long it takes for the the envelope to drop back down to zero after the key has been released

■ MSEGs

The Multiple Segment Envelope Generators (MSEG) provide more complex modulation envelopes, a graphical representation of the envelope generator output allows for precise adjustment of the envelope and its parameters.

The envelope appears as a grid with series of points joint by lines / curves representing the different stages of the envelope, each of its points with independent time, level, and slope values.
Any number of points can be add in to the envelope and the segments linking these points can be linear or curved. With a variety of sync and snap-to functions it is easy to use the MSEGs to create complicated rhythmic patterns.

■ How to use the editor

Creating and editing the envelopes is done by adding, moving, removing points and adjusting curves of the envelope sections between each point.
Please note that points are displayed using a small square icon, sections are displayed using a small circle.

Creating new points: new points are created by double-clicking anywhere within the envelope, once a point is created it is represented by a small square. Note that each time a new point is created a section between 2 points will also be created (represented by a small circle)

Deleting points: double-click on an existing point to delete it.

Moving points: move a point by highlighting the point you want to edit (a small circle will appear around the point) left-click and drag-move the point to its new destination.
Bending section: bend a section by highlighting the section you want to edit (a small circle will appear around the section handle) left-click and drag-move the section to bend its curve.

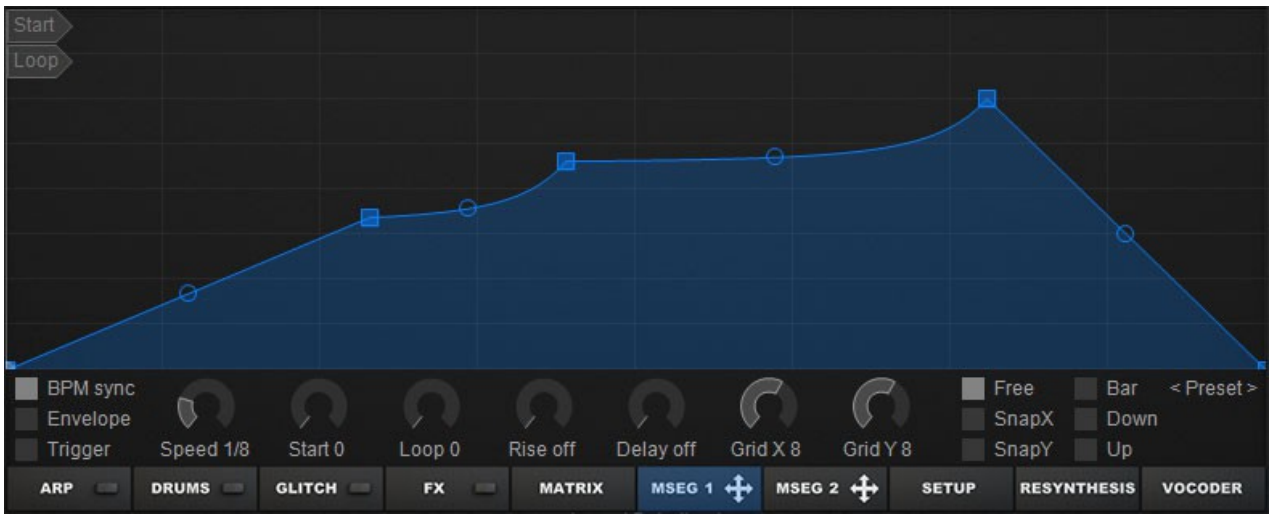
Bend all sections up / down: hold Alt+left mouse to click on a section and bend all sections at once.

Draw rectangles: use Shift+left mouse to draw square shapes, note that the size of the square shapes is determined by the Grid X setting, the higher its value the smaller the square drawn.

Move points on Grid: use Alt+left mouse to move a point along the locked Y axis. Note that if a point is off grid Alt+left mouse will first snap move the point to its nearest Y grid axis.

Using the Loop option the MSEG can be looped between any two points, i.e. once you play hold a key, the envelope will keep repeating the looped stages until you release the key.
Use the Loop dial to set your loop point (represented by a 'loop' label inside of the envelope display)

MSEG Controls



- **BPM sync** – Switches on the BPM sync mode for the envelope, in BPM mode the speed range will be displayed in multiples of the host tempo (e.g. ½ is half of your host's speed) In non BPM mode range will be shown in Hertz (Hz)

- **Start** – Adjusts the position from which the envelope should start.

- **Loop** – Adjusts the looping point for the envelope.

- **Rise off** – Adds a fade-in.

- **Delay** – Sets the amount of time the envelope is delayed once a note is played.

- **Grid X** – Adjusts the X axis grid size.

- **Grid Y** – Adjusts the Y axis grid size.

- **Free** – In Free mode single points are created by clicking anywhere within the envelope.

- **Bar** – In Bar mode square shapes are created by click-hold dragging the left mouse button anywhere within the grid.

- **SnapX** – Snap to the Grid's X axis

- **SnapY** – Snap to the Grid's Y axis

- **Down** – Draws / edits the segment(s) to a downward curve.

- **Up** – Draws / edits the segment(s) to an upward curve.

<Preset>

The Presets menu offers several envelope related load / save / reset options.

- **Load** – Loads an envelope template from disk.
- **Save** – Saves an envelope template to disk.
- **Reset** – Resets the envelope to its default settings.

Note: Once saved to disk your own saved MSEG presets will show up inside this menu. MSEG presets are saved to '\Icarus_data\Icarus_mseg\'

■ LFOs

LFO is an acronym for Low Frequency Oscillator. LFOs are oscillators that operate below the threshold of human hearing (20 Hertz). They are used as modulators and are assigned in the *Mod Matrix.*

Icarus has three identical LFOs and a Step LFO. The waveform display shows a visual representation of the waveform. The Step LFO looks slightly different and will be explained separately.

Choosing a shape for your LFO is easy, right-click inside of the LFO display and a list with predefined shapes will open.

After selecting a shape it can be further edited using the shape and phase knobs.

- **LFO 1,2,3 tabs** – The tabs select which one of the three LFOs is displayed for editing.
- **SPEED** – This knob controls the speed of the LFO. The range depends on the Mode:

- **In BPM Mode** – The range will be shown as a multiple of the host's tempo. e.g. 1/2 BPM is half of your host's tempo, 4 BPM is four times your host's tempo.

- **In non-BPM Mode** – The range will be shown in Hertz (Hz). The range is 0.02 Hz to 440.1 Hz

- **TRIG** – Trigger mode, which will restart its cycle with every new note that is played.

- **ENV** – Switches the One Shot envelope Mode On / Off.

- **Shape** – Adjusts the current shape.

- **Key** – Sets the amount of key follow to use.

- **Phase** – This will adjust the starting position of the waveform.

- **Fade in** – This control adds a fade-in.

■ Step LFO

The Step LFO uses a Multi-Stage Envelope in which you can set up your own shape by dragging envelope points. Simply left or right-click on one of its points and drag it to the desired location.

Like LFOs, a step LFO doesn't produce any sound in itself, a step LFO is used to modulate another sound parameter to achieve cyclic modulations (changes) of this parameter over time, according to the Speed knob settings.

Please note that the step LFO is always synced to your host's tempo.

Available controls are:

- **SPEED** – This knob controls the speed of the StepLFO. The range depends on the Mode:
    - **In BPM Mode** – The range will be shown as a multiple of the host's tempo. e.g. 1/2 BPM is half of your host's tempo, 4 BPM is four times your host's tempo.
    - **In non-BPM Mode** – The range will be shown in Hertz (Hz). The range is 0.02 Hz to 440.1 Hz
- **TRIG** – Trigger mode, which will restart its cycle with every new note that is played.
- **ENV** – Switches the One Shot envelope Mode On / Off.
- **Smooth** – Smooths the steps' shape.
- **Key** – Sets the amount of key follow to use.
- **Phase** – This will adjust the starting position of the waveform.
- **Fade in** – This control adds a fade-in.

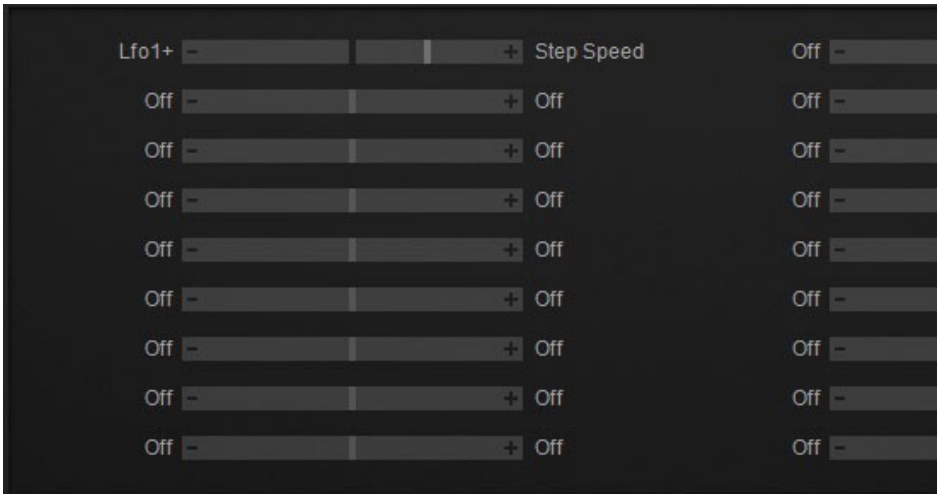
Note: within each LFO section (top of the LFO) you'll see a cross shaped icon, this is used for assigning drag & drop modulation, more about this can be found inside of the Modulation Matrix chapter.

■ Modulation Matrix

The Modulation Matrix (Mod. Matrix) allows you to assign modulators such as LFOs or envelopes to different destinations (such as the filter, amplifier or even other modulators).
Icarus' modulation system supports drag & drop for assigning matrix entries, which works like this:

- Left mouse click-hold the cross icon found inside one of the modulator sections, you'll see a red line appear.
- Drag this line to the target you want to assign the modulator to, the line should now turn from red to green.
- Let go of the mouse button and your modulation is created, the Modulation Matrix will open to display your new modulation.

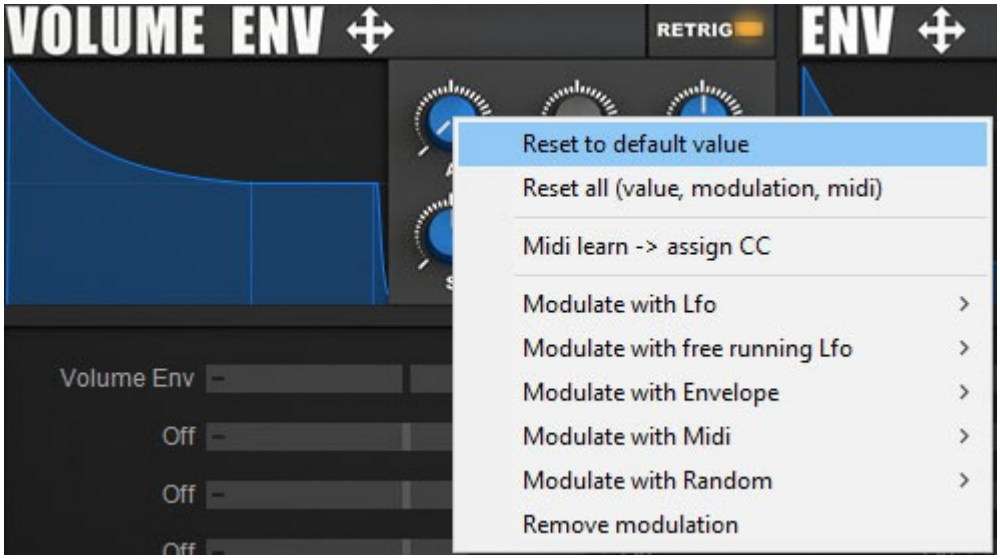
Left mouse click-hold and drag the red line to your preferred target, the line will turn green, let go of the mouse button and your modulation is assigned.



The Modulation Matrix now displays your newly created modulation.

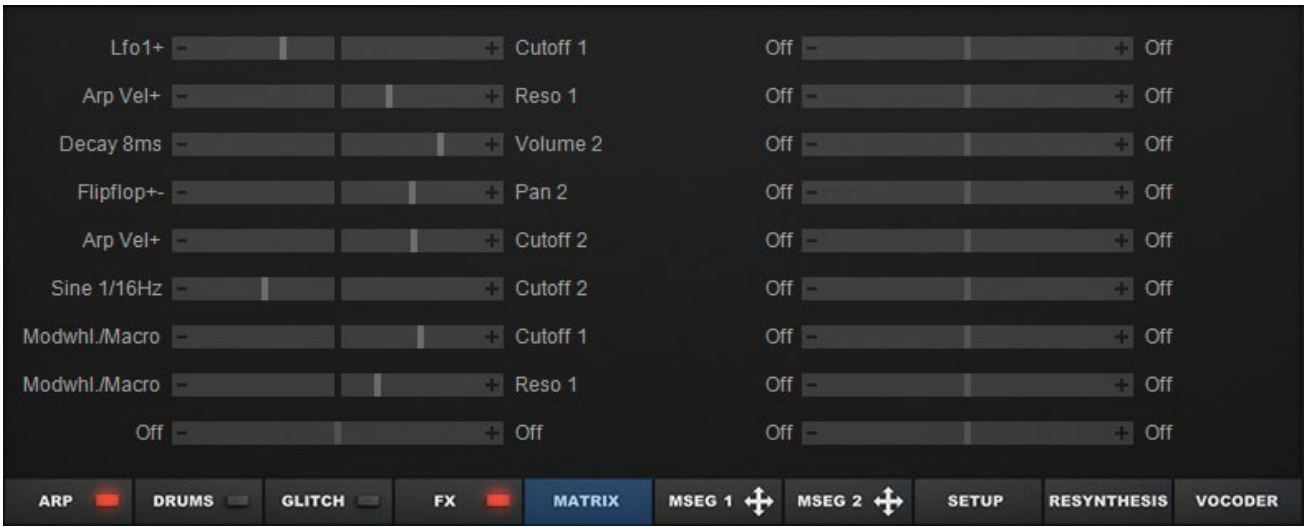
After assigning modulation to a control the modulation amount / range will be displayed in a lighter color within the knob (clipping will be shown in red)
Should you want remove its modulation; right-click on a control and click on "remove modulation" to remove it.
Hovering the mouse over a knob will show its current parameter value and modulation source.

Modulation can also be assigned by right-clicking on knobs and choosing your modulation path from its context menu. From within this menu it's also possible to Reset Values or midi-learn controllers.



- **Reset to default value** – This resets the control to its default value
- **Reset all (value, modulation, midi)** – This resets the control to its default value, clears any modulation assigned to it as well as removes any midi CC assigns to this control.
- **Midi learn → assign CC** – Activates Midi learn for this control.
- **Modulation menus** – These menus contain all modulation destination options.
- **Remove modulation** – This will remove all modulation tied to this control.

Matrix



The modulation Matrix has 18 slots you can use to make 18 modulation assignments. The procedure for assigning modulation is very simple:

1. Click on the left side of a modulation slot and pick a modulator (modulation source) from the drop-down menu. This modulator is what will cause the modulation or changing effect.

2. Click on the right side of the modulation and choose a target (destination) from the drop-down menu. This is what gets affected by the modulation or changing effect.

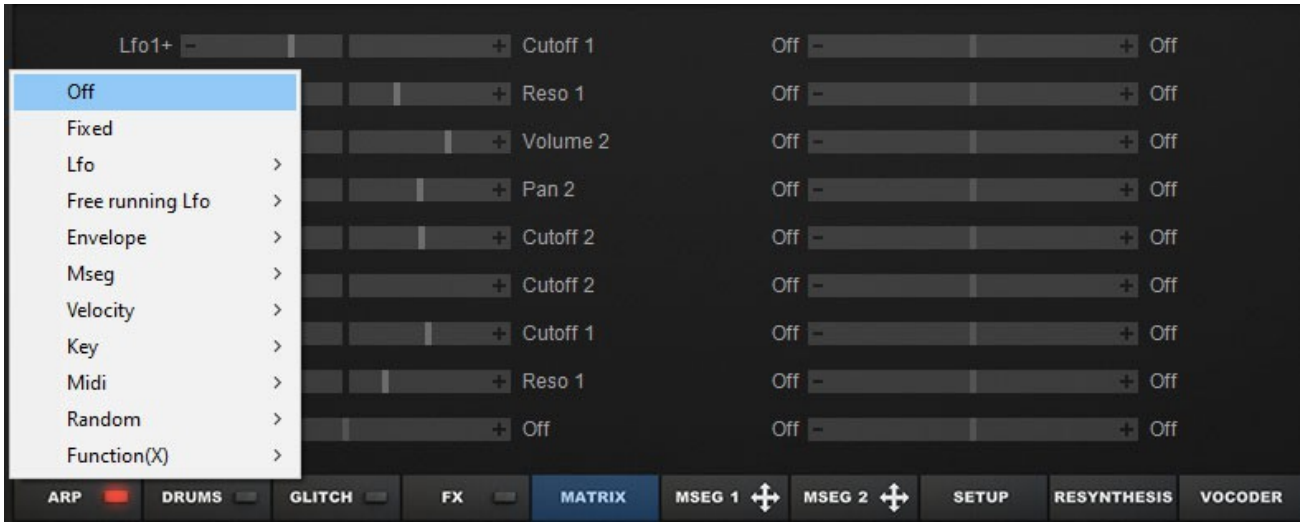
3. Drag the modulation amount control to increase / decrease the modulation amount value. This is how much modulation gets sent to the destination. The lower the value the more subtle the effect.

If needed the modulation matrix can easily be reinitialized by using the Init menu found in Icarus' main section. Simply click on the Init button and choose "init Matrix" from its menu,
this will reset all modulation matrix controls to their original off settings.

■ Modulation Source menu

If you left-click on one of the modulation source areas on the Matrix display, the modulation sources menu appears.

- **Off** – No modulation source selected. This is the default selection.



- **Fixed** – This option uses a static fixed value as the modulation source. The value is taken from the Modulation Amount parameter. This option is useful if you need a parameter offset to any modulation destination.

■ LFO

- **LFO1+** – LFO1 in unipolar mode, only uses LFO1's positive values.
- **LFO1+-** – LFO1 in bipolar mode, this uses LFO1's negative and positive values.
- **LFO2+** – LFO1 in unipolar mode, only uses LFO1's positive values.
- **LFO2+-** – LFO2 in bipolar mode, this uses LFO1's negative and positive values.
- **LFO3+** – LFO1 in unipolar mode, only uses LFO1's positive values.
- **LFO3+-** – LFO2 in bipolar mode, this uses LFO1's negative and positive values.
- **Step+** – Uses the Step LFO in unipolar mode using only positive values.
- **Step+-** – Uses the Step LFO in bipolar mode using both positive and negative values.

- **Free running LFO**

    - **Sine1/64Hz – Sine16Hz** – Uses a sine shape as modulation source, the amount of Hz denotes the modulation speed used.

- **Envelope**

    - **Vol Env** – This selects the Volume Envelope as the modulation source. Although the Vol Env is hard-wired to the amplifier, it can also be used to modulate another destination at the same time.

    - **Filt Env** – This selects the Filter Envelope as the modulation source. Although the Filt Env is hard-wired to the Filter, it can also be used to modulate another destination at the same time.

    - **Aux1 Env** – This selects the Auxiliary 1 Envelope as the modulation source. Unlike the Vol Env and the Filt Env the Auxiliary Envelopes are not hard-wired to anything so they must be routed in the Mod Matrix for their effect to be heard.

    - **Aux2 Env** – This selects the Auxiliary 2 Envelope as the modulation source.

    - **Key Pressed** – Applies an On / Off Gate modulation; i.e. on key press its value is 1, on release it's 0.

    - **Key Pressed-** – Applies an Off / On Gate modulation; i.e. on key press its value is 0, on release its 1.

    - **Decay8ms-16s** – Decay will use an internal envelope to modulate, available are envelopes that run from 4 milliseconds to 16 seconds, as well as an impulse for very short modulation tasks, such as a very snappy or sharp attack sound.

- **MSEG**

    - **MSEG1 +** – This selects Multiple Segment Envelope Generator 1 as the modulation source, in unipolar mode using only its positive values.

    - **MSEG1 +-** – This selects Multiple Segment Envelope Generator 1 as the modulation source, in bipolar mode using both negative and positive values.

    - **MSEG2 +** – This selects Multiple Segment Envelope Generator 2 as the modulation source, in unipolar mode only using its positive values.

- **MSEG2 +-** – This selects Multiple Segment Envelope Generator 2 in bipolar mode.

- **Velocity**

  - **Velocity+** – Uses the positive Velocity values to modulate

  - **Velocity+ -** – Uses both the positive and negative Velocity values to modulate.

  - **Arp Vel+** – Applies the arpeggiator's velocity steps as modulation source using only positive values.

  - **Arp Vel+-** – Applies the arpeggiator's velocity steps as modulation source using both positive and negative values.

- **Key**

  - **Key** – This will use the note value of the key you play on your keyboard controller as a modulation source. A low note will generate a low number, a high note will generate a high number.

  - **Key split high** – Assigns the high keys of a keysplit to be used as modulation source.

  - **Key split low** – Assigns the low keys of a keysplit to be used as modulation source.

  - **Key C C# D….**– Key C C# D….– Every C-key will return 0 as source value, a C# key will return 1/12, D will return 2/12, B will return 11/12….

  - **Key Octave** – Similar to Key C C# D…, but with octaves.

- **Midi**

  - **Modwhl./Macro** – This will use the modulation wheel from your keyboard controller or Macro knob on Icarus' GUI as a modulation source.
    Note that you will only change the value if you move the modwheel / Macro knob, otherwise the value will be static (which will be the last value transmitted by the modwheel / macro control).

  - **Pitchwheel** – This will use the pitchwheel from your keyboard controller as a modulation source.

  - **Aftertouch** – This will use the channel aftertouch messages from your keyboard controller as a modulation source. Please check the operating instructions of your keyboard

controller to see if it generates aftertouch information. Not all keyboard controllers do.

- **Breath** – Responds to Breath controller as modulation.
- **Foot** – Responds to Foot switch controller as modulation source.
- **MainVol** – Responds to Main Volume controller (CC#7) as modulation source
- **Expression** – Responds to Expression controller (CC#11) as modulation source.
- **Hold** – Responds to Hold pedal (sustain) On/Off (CC#69) as modulation source.
- **Poly Aftertouch** – This will use the polyphonic aftertouch messages from your keyboard controller as a modulation source. Please check the operating instructions of your keyboard controller to see if it generates polyphonic aftertouch information. Not all keyboard controllers do.
- **CC16 - CC19** – Responds to CC#16 to CC#19 (continuous controllers) as modulation source.

■ **Random**

- **Random** – This option selects a new random value when a key is pressed on your keyboard controller. Note that the value will be static until you play a new note when a new random value will be created.
- **Flipflop** +- – This option 'flips' between two values. The value is determined by the Modulation Amount. e.g. a Modulation Amount of 10 would 'flip' between +10 and -10. However, the parameter that is going to be modulated acts as a value offset.
- **White Noise** – This option generates white noise. This is a continuously varying random value.
- **Pink Noise** – This option generates pink noise. This is a continuously varying random value.

■ **Function(X)**

- **X*X** – Uses the X multiplied by X value modifier as modulation source.
- **Sqrt (X)** – Uses Squareroot X value modifier as modulation source.
  Filter
- **Filter (X)** – Uses the filter X value modifier as modulation source.

- **Limit (X)** – Uses the Limit X value modifier as modulation source.

■ Modulation Destination menu

If you left-click on one of the destination areas on the Matrix display, the modulation destination menu appears.

The menu options are.

- **Off** - No modulation destination selected. This is the default selection.
- **Volume** – The volume of the current layer.
- **Pan** – Selects the Master Panning control .

■ **Osc1-3**

- **Octave** – Selects the Master Octave (Osc1, OSC2, OSC3)
- **Semi** – Selects the Master Semitone setting.
- **Pitch XL** – Selects the Master Pitch XL.
- **Pitch** – Selects the Master Pitch.
- **Fine** – Selects the Master Fine control.

■ **Osc1**

- **Wave 1** – Selects the Wave setting of Oscillator 1.
- **Morph 1** – Selects the Morph setting of Oscillator 1.
- **Volume 1** – Selects the Volume setting of Oscillator 1.
- **Pan 1** – Selects the Pan setting of Oscillator 1.
- **Octave 1** – Selects the Octave setting of Oscillator 1.
- **Interval 1** – Selects Oscillator 1's Interval, shifting the base frequency of the oscillator. The

modulation slider selects the harmonic relationship (1x-16x). Useful for building custom chords.

- **Semi 1** – Selects the Semitone setting of Oscillator 1.
- **Pitch XL 1** – Selects the Pitch XL control setting of Oscillator 1.
- **Pitch 1** – Selects the Pitch control setting of Oscillator 1.
- **Fine 1** – Selects the Fine Tune setting of Oscillator 1.
- **Detune 1** – Selects the Detune setting of Oscillator 1.

■ **Osc2**

- **Wave 2** – Selects the Wave setting of Oscillator 2.
- **Morph 2** – Selects the Morph setting of Oscillator 2.
- **Volume 2** – Selects the Volume setting of Oscillator 2.
- **Pan 2** – Selects the Pan setting of Oscillator 2.
- **Octave 2** – Selects the Octave setting of Oscillator 2.
- **Interval 2** – Selects Oscillator 2's Interval, shifting the base frequency of the oscillator. The modulation slider selects the harmonic relationship (1x-16x). Useful for building custom chords.
- **Semi 2** – Selects the Semitone setting of Oscillator 2.
- **Pitch XL 2** – Selects the Pitch XL control setting of Oscillator 2.
- **Pitch 2** – Selects the Pitch control setting of Oscillator 2.
- **Fine 2** – Selects the Fine Tune setting of Oscillator 2.
- **Detune 2** – Selects the Detune setting of Oscillator 2.

■ **Osc3**

- **Wave 3** – Selects the Wave setting of Oscillator 3.

- **Morph 3** – Selects the Morph setting of Oscillator 3.
- **Volume 3** – Selects the Volume setting of Oscillator 3.
- **Pan 3** – Selects the Pan setting of Oscillator 3.
- **Octave 3** – Selects the Octave setting of Oscillator 3.
- **Interval 3** – Selects Oscillator 3's Interval, shifting the base frequency of the oscillator. The modulation slider selects the harmonic relationship (1x-16x). Useful for building custom chords.
- **Semi 3** – Selects the Semitone setting of Oscillator 3.
- **Pitch XL 3** – Selects the Pitch XL control setting of Oscillator 3.
- **Pitch 3** – Selects the Pitch control setting of Oscillator 3.
- **Fine 3** – Selects the Fine Tune setting of Oscillator 3.
- **Detune 3** – Selects the Detune setting of Oscillator 3.

■ **Filter1**

- **Cutoff 1** – Selects the Filter Cut Off setting of Filter 1.
- **Reso 1** – Selects the Filter Resonance setting of Filter 1.
- **Drive 1** – Selects the Filter Drive setting of Filter 1.
- **Filter1 Env** – Selects the Filter 1 Envelope setting.
- **Filter Balance** – Selects the Filter Balance setting, this lets you to control the balance between filter 1 & filter 2.

■ **Filter2**

- **Cutoff 2** – Selects the Filter Cut Off setting of Filter 2.
- **Reso 2** – Selects the Filter Resonance setting of Filter 2.
- **Drive 2** – Selects the Filter Drive setting of Filter 2.

- **Filter2 Env** – Selects the Filter 2 Envelope setting.

- **LFO1**
  - **LFO1 Speed** – Selects the Speed setting of LFO 1.
  - **LFO1 Phase** – Selects the Phase setting of LFO 1.
- **LFO2**
  - **LFO2 Speed** – Selects the Speed setting of LFO 2.
  - **LFO2 Speed** – Selects the Phase setting of LFO 2.
- **LFO3**
  - **LFO3 Speed** – Selects the Speed setting of LFO 3.
  - **LFO3 Speed** – Selects the Phase setting of LFO 3.
- **Step**
  - **Step Phase** – Selects the Phase setting of the Step LFO.
  - **Step Speed** – Selects the Speed setting of the Step LFO.
- **Volume Env**
  - **Vol A** – Selects the Volume Envelope's Attack control.
  - **Vol H** – Selects the Volume Envelope's Hold control.
  - **Vol D** – Selects the Volume Envelope's Decay control.
  - **Vol S** – Selects the Volume Envelope's Sustain control.
  - **Vol R** – Selects the Volume Envelope's Release control.
- **Filter Env**
  - **Filter A** – Selects the Filter Envelope's Attack control.

- **Filter H** – Selects the Filter Envelope's Hold control.
- **Filter D** – Selects the Filter Envelope's Decay control.
- **Filter S** – Selects the Filter Envelope's Sustain control.
- **Filter R** – Selects the Filter Envelope's Release control.

■ **Aux1 Env**

- **Aux1 A** – Selects the Aux1 Envelope's Attack control.
- **Aux1 H** – Selects the Aux1 Envelope's Hold control.
- **Aux1 D** – Selects the Aux1 Envelope's Decay control.
- **Aux1 S** – Selects the Aux1 Envelope's Sustain control.
- **Aux1 R** – Selects the Aux1 Envelope's Release control.

■ **Aux2 Env**

- **Aux2 A** – Selects the Aux2 Envelope's Attack control.
- **Aux2 H** – Selects the Aux2 Envelope's Hold control.
- **Aux2 D** – Selects the Aux2 Envelope's Decay control.
- **Aux2 S** – Selects the Aux2 Envelope's Sustain control.
- **Aux2 R** – Selects the Aux2 Envelope's Release control.

■ **Matrix Send**

- **Matrix 1-18** – Selects the Modulation Amount setting of Modulation Matrix slot 1-18

■ **EQ**

- **EQ low** – Selects the Equalizer low control setting.
- **EQ high** – Selects the Equalizer high control setting.

- **EQ mid** – Selects the Equalizer mid control setting.
- **EQ mid Freq** – Selects the Equalizer mid Freq control setting.
- **EQ mid Q** – Selects the Equalizer mid Q control setting.

■ **FX**

- **Fx1 Mix** – Selects the FX1 Mix control as destination.
- **Fx1 Par1** – Selects the FX1 Parameter 1 control as destination.
- **Fx1 Par2** – Selects the FX1 Parameter 2 control as destination.
- **Fx1 Par3** – Selects the FX1 Parameter 3 control as destination.
- **Fx1 Par4** – Selects the FX1 Parameter 4 control as destination.
- **Fx2 Mix** – Selects the FX2 Mix control as destination.
- **Fx2 Par1** – Selects the FX2 Parameter 1 control as destination.
- **Fx2 Par2** – Selects the FX2 Parameter 2 control as destination.
- **Fx2 Par3** – Selects the FX2 Parameter 3 control as destination.
- **Fx2 Par4** – Selects the FX2 Parameter 4 control as destination.
- **Fx3 Mix** – Selects the FX3 Mix control as destination.
- **Fx3 Par1** – Selects the FX3 Parameter 1 control as destination.
- **Fx3 Par2** – Selects the FX3 Parameter 2 control as destination.
- **Fx3 Par3** – Selects the FX3 Parameter 3 control as destination.
- **Fx3 Par4** – Selects the FX3 Parameter 4 control as destination.

- **Feedback** – Selects the Feedback control as destination.
- **Effect Mix** – Selects the Effect Mix control as destination.

X:=Value – Selects the X:=Value destination.

■ Modulation Matrix: value modifiers (X:=Value)

Icarus gives you the option to use a modifier on the source value, this allows for a smoother control over the original source (e.g. smoothing an LFO shape) often giving better results than using direct modulation.
This modifier approach uses four modulation sources called: Filter(X), X*X, Sqrt(X) and Limit(X)
X=Value, as well as the destination target called X:=Value

For example say we want to use LFO1 with a square wave to modulate the Filter Cutoff, however, instead of the direct LFO1 > Filter Cutoff Modulation Matrix option we'll use a modifier to get a smoother result:

1. The first thing to do is to set up our LFO settings; go into Icarus' LFO section, the default LFO shape is the Tri<>Square, so turn the shape control all the way to the right to change the shape from a Triangular to the Square shape.

2. Set LFO1 to use the following settings: BPM: On and Frequency: 2/1CLK.

3. Next, we'll assign a modulation source to our destination X=Value. Go into the Modulation Matrix and on the first line assign LFO1+- to the destination X=Value, set the value slider to almost full.

4. Now we'll assign one of our modifiers to Filter Cutoff; on the second matrix line go to the Source menu>Function(X) and assign Filter(X) to Cutoff 1 and set its slider to again almost fully to the right.

You should now hear the LFO modulating the Filter Cutoff parameter using our Filter(X) modifier.

If you play a little with the Filter(X) matrix line values you can adjust the amount of modifying applied. What Filter(X) does in this case is to apply a low pass filter to the value of X. In other words, in the first line we declared that the LFO1+- function was X and in the second line we told Icarus to use the Filter(X) modifier to further modify X's value.

Even more interesting is that you can also modulate the matrix line containing the modifiers.
For example, drop in an Aux1 Env > Matrix2 on matrix line 3, set matrix line 2 to a value of 0, and your modifier suddenly is being modified by Aux Envelope1. It's a very cool but handy way to apply subtle or smoothed modulation.
Apply for example the X modifier to a volume gate (use the Step LFO for this) and change the amount of gating applied over time. This way you can switch between a hard & soft gated volume.

There are four modifiers available.

• **Filter(X)** – Filters values, very handy to use with LFO shapes, or for example trance gates to shape the type of volume gate used.

• **X*X** – Can be used to further shape modify envelopes, for punchier envelopes for example.

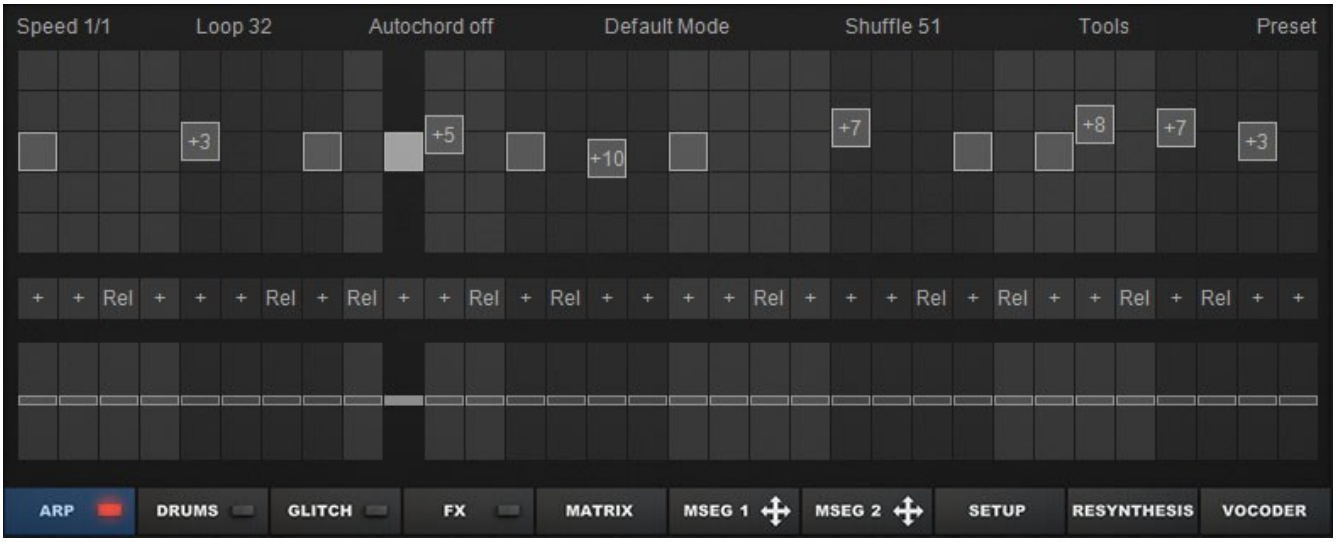
• **Sqrt(X)** – Also very good to further shape modify LFO / Envelopes with.

• **Limit(X)** – Can be used to limit a the amount of modulation by clipping its value within a certain range set with the value slider.

TIP You can use Modulation Amount as a destination if you wish to use a Mod source to control the amount of modulation of a parameter, e.g. use the Modwheel to control the amount of vibrato assigned to another modulator.

Note that the Modulation Amount for Slot1 is 0. This value is modulated by the Modwheel, which is assigned in Slot2. Negative Modulation Amount values are useful if you wish to reduce the value of a parameter with positive modulation. e.g. you can lower the vibrato if when you use the Modwheel.

■ Arpeggiator



Almost a synth by itself, the arpeggiator section holds the key to all of your arpeggio needs. It offers a way to set up your own arpeggios that is both powerful and easy to work with.
We developed smart algorithms which return melodies that are more useful musically than conventional arpeggiators.
Working with the arpeggiator is extremely simple. Just lay down your notes inside the note-sequencer as you normally would and select the play direction.
Click inside the Arp grid to insert notes, left click-hold a note to move it up or down the grid to edit to semi notes.

The arpeggiator also supports optional advanced features such as autochords, polyphonic playback, pitch slides, legato, swing-shuffle, split, matrix integration and it gives you very precise control over note-sorting, play direction and velocity.

Don’t feel like programming your own patterns? Use one of the built-in patterns or load one of the many external pattern presets to use as a starting point.

■ Arpeggiator menu

■ **Speed menu** – The speed menu is used to set the arpeggiator’s tempo (in CLK)

■ **Loop menu** – The loop menu is used to control the amount of steps the arpeggiator should run, or on which step it should stop.

■ **Octave / Chord menu** –The arpeggiator supports playback over several octaves as well as automatic chords.
To make the arpeggiator play over several octaves click on 'Octaves off' and select 2,3,4 or 5 octaves

instead. When you select '3 Octaves' it will play C2 C3 C4 as soon as you press the C key. The 'Chord', '5th', and 'Third' modes automatically create chords when you press a single key. You can combine all 'Octave' and 'Chord' modes with the 'Stack' Arpeggiator mode. In Stack mode a whole stacked major or minor chord will be triggered when you hit a single key. It is released when you release the key. Make sure that you don't forget to switch to 'Polyphonic' in Icarus' Main Section panel.

- **Play mode menu** – Switches the arpeggiator to a specific play mode. The following modes are available:

    - **Default** – uses the default play mode.

    - **Bypass High Keys** – Switches the arpeggiator to keyboard split mode. Low keys will use the arp to playback and higher keys will play normally.

    - **Stack Chord** – This mode works together with the Chord option found in the arp menu. It uses the selected chord and lets you play that chord using a single key.

    - **Dual Layer** – Switches the arpeggiator to Dual Layer mode. In Dual Layer mode OSC1 plays the arpeggio while OSC2 plays a chord without the arp. You can set this up using the Keysplit High / Low routed to Osc volumes inside of the Modulation Matrix.

    - **Low keys only** – Only the low keys will be used to playback the arp.

    - **High keys only** – Only the high keys will be used to playback the arp.

- **Swing / Shuffle menu** – The Swing / Shuffle menu allows you to add swing or shuffle to your arp pattern. Its default setting is straight – when click-held & dragged up shuffle is increased, when click-held & dragged down the amount of swing is increased.

    Straight: When set to its middle position: Straight, all step events are aligned straight to the tempo grid.

    Swing: When set to a lower position: Swing lets you create various ‘swing’ effects. By increasing the amount of swing, step events will have a greater swing groove.

    Shuffle: When set to a higher position: Shuffle has a specific 8th note rhythmic feel. It is based on triplet subdivisions of the beat rather than on dividing each beat perfectly in half (a.k.a. straight 8th notes).

■ **Presets**

- **Load** – Loads an arpeggiator pattern from disk.
- **Save** – Saves your arpeggiator pattern to disk.
- **Reset** – Resets the arpeggiator pattern to its default values.
- **Arpeggiator preset list** – Displays a list of available arp presets (found inside of the “Icarus_arps” folder.

Note: Once saved to disk all of your own saved Arp templates will show up inside this menu. Arp presets are saved to ’\Icarus_data\Icarus_arps\’

■ **Tools Menu**

- **Set direction** – Sets the arpeggiator mode.
- **Shift / Rotate notes** – Shift / Rotate the Arp steps.
- **Quantize** – Quantizes the Arp steps.
- **Initialize** – Initializes random patterns

■ Pattern sequencer

The Pattern sequencer is where all the action happens. Here you will tell the arpeggiator which pattern to follow and set up which notes it should use.
The pattern sequencer is represented by a grid of 32 steps. The horizontal line represents the arp sequencer step number, the vertical line is used to set which octave / semi note that step should use. To switch a step On / Off click on one of the steps. Whenever a step is switched on, it will play back a note. When a step is switched off, the last active note will be held until the next active step.
To set which octave a step should use, click within the 4 octave vertical range of the step. To select semi notes, click-hold & drag the step up or down.

■ Note sorting / Play direction / Special commands

The 'Arp Order' row is located below the sequencer note grid. This row gives detailed control on how the arpeggiator handles the incoming notes.

The 'Arp order' command always refers to the current arpeggiator slot.

■ **Play direction up**

+ (up: CEG CEG) - Sets the play direction of the current slot to 'up'. When you play a chord with three notes (C E G) it will start with the lowest note C. After that it will continue with the middle note E. As soon as the highest G has been played it will restart with the lowest note C. You can set the play direction of all 16 slots to + by selecting 'Load' -> 'Set direction up'.

++ (two up) - Like +, but instead of one it goes two notes up.

+! (classic up: CEG CEG) - Like +, but without the 'smart melody' algorithm. In this mode the arpeggiator behaves as in conventional synthesizers. The (mostly uncomfortable) effect is most obvious when you set 'Arp Note semi' in the grid to various values. You can set the play direction of all 16 slots to +! by selecting 'Load' -> 'Set direction classic up'.

■ **Play direction down**

- (down: GEC GEC) - Sets the play direction of the current slot to 'down'. When you play a chord with three notes (C E G) it will start with the highest note G. After that it will continue with the middle note E. As soon as the lowest note C has been played it will restart with the highest note G. You can set the play direction of all 16 slots to - by selecting 'Load' -> 'Set direction down'.

- - (two down) - Like -, but instead of one it goes two notes down.

-! (classic down: GEC GEC) - Like -, but without the 'smart melody' algorithm. In this mode the arpeggiator behaves as in conventional synthesizers. The (mostly uncomfortable) effect is most obvious when you set 'Arp Note semi' in the grid to various values. You can set the play direction of all 16 slots to -! by selecting 'Load' -> 'Set direction classic down'.

■ **Play direction alternate**

+- (alt up: CEGE CEGE) - Sets the play direction of the current slot to 'alternate up and down'. When you play a chord with three notes (C E G) it will start with the lowest note C and go 'up'. After that it will continue with the middle note E. When the highest note G is played it will change the direction to 'down' and the middle note E will follow. When the lowest note C is reached it changes the direction to 'up' again. You can set the play direction of all 16 slots to +- by selecting 'Load' -> 'Set direction alt up'.

-+ (alt down: GECE GECE) - Sets the play direction of the current slot to 'alternate down and up'. When you play a chord with three notes (C E G) it will start with the highest note G and go 'down'. After that it will continue with the middle note E. When the lowest note C is played it will change the direction to 'up' and the middle note E will follow. When the highest note G is reached it changes the direction to 'down' again. You can set the play direction of all 16 slots to -+ by selecting 'Load' -> 'Set direction alt down'.

■ **Repeat last note**

REP (same note again) - Repeats the note played in the previous slot.

■ **Random note**

? - Plays a random note

■ **Chords**

Tt (chord with 2 notes) - Plays a chord with two notes.

Tt+ (Go up and play a chord with 2 notes) - Like + followed by 2

Tt- (Go down and play a chord with 2 notes) - Like - followed by 2.

Tr (chord with 3 notes) - Plays a chord with three notes

Tr+ (Go up and play a chord with 3 notes) - Like + followed by 3

Tr- (Go down and play a chord with 3 notes) - Like - followed by 3

Pol (Play a chord with all notes) - Plays a chord containing all keys that are currently pressed.

■ **Resort notes**

SoL (start with the lowest note) - Forces a resorting of the notes and the lowest note is played. It can be musically useful to place this command in slot 0 or slots that you want to attenuate. As a result the melody created by the arpeggiator appears less 'chaotic'.

SoH (start with the highest note) - Forces a resorting of the notes and the highest note is played. It can be musically useful to place this command in slot 0 or slots that you want to attenuate. As a result the melody created by the arpeggiator appears less 'chaotic'.

■ **Release**

Rel (release) - Triggers the envelope's release phase.

■ **Legato**

Leg (legato) - When the < is placed in a slot the arpeggiator does not trigger a new note. Instead of this it glides from the currently played note to the new one. This command only applies if the current and the last note are different. So a combination with 'Arp note' set to one of octave higher / lower is useful in most cases.

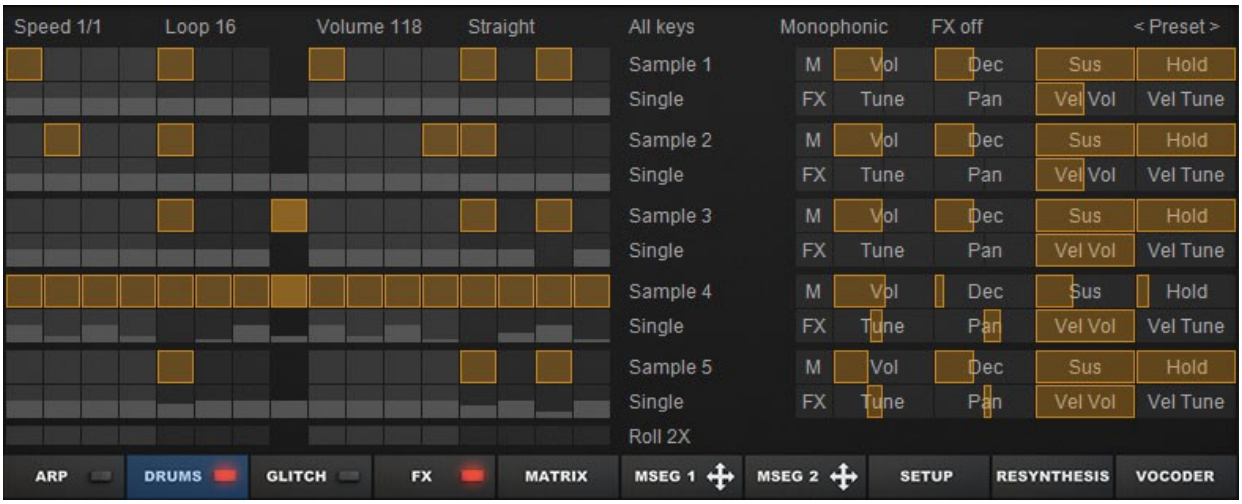
■ **Pitch glide and legato commands**

/X (glide X halftones up) - This glide behaves like you would be moving your pitchwheel up. It raises the pitch for X halftones till the next slot. It does not care about the previously or currently played note like the legato.

\X (glide X halftones down) - Behaves like moving your pitchwheel down. It lowers the pitch for X halftones till the next slot. Does not care about the previously or currently note like the legato.

■ Drum-sequencer

Icarus includes a pattern based drum-sequencer from which you can import samples and program a percussive layer to use with your Icarus sounds.
Use the drum-sequencer solo in full sync with your DAW or combine your own beats with one of Icarus' many synth features, mixing its oscillators, the arpeggiator and split-modes to build one big workstation like patch. The drum-sequencer comes with a host of features to make both programming and playing sequences as easy as possible.



The drum sequencer comes with 5 drumtracks, each track capable of loading-playing a sample. Including 16 steps as well as controls used for further shaping and play options.
Beneath each step you'll find a velocity bar which can be used for velocity to volume and / or velocity to Tune settings.

A sequencer track with all its settings.

The grid is where you program your percussion, each track includes 16 steps (4 x 4) where you add, remove, or alter events in the grid. Once a sample is loaded click on one of the steps to enable / disable the sample play for that step.
The bars displayed below each step represent that step's velocity value, drag it up / down to edit its value, how velocity is handled is changed inside of the tracks' velocity settings: use the VEL VOL value slider to assign velocity to volume, and / or use it to change the sample's tuning by changing the VEL TUNE value. A volume control is provided to edit the sample's volume, as well as a pan control to position the sound in the stereo field (Left-Middle-Right)
Next to the volume control you'll find the sample's envelope controls, namely Decay & Release (Dec), Sustain (Sus) and Hold.

Finally the Tune control is used to tune your sample, Mute and FX controls are provided to mute the sample or for adding FX.

■ **Grid menu**

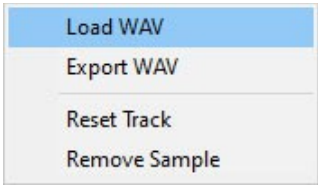
The Grid menu is used for adjusting grid speed and setting the amount of active steps, also included are the main volume and grid swing / shuffle settings.

- **Speed menu** – The speed menu is used to set the sequencer's tempo (in CLK)
- **Loop menu** – The loop menu is used to control the amount of steps the sequencer should run, or on which step it should stop.
- **Volume** – Volume is used to set the Drum-sequencer's main volume.
- **Swing / Shuffle menu** – Allows you to add swing or shuffle to your sequencer pattern. Its default setting is straight – when click-held & dragged up shuffle is increased, when click-held & dragged down the amount of swing is increased.

■ Track controls

■ **Sample menu**

The sample menu is used for loading & exporting your samples, also included are options to Reset the track and Remove (Unload) the sample for that row.



- **Load WAV** – Loads a Wav file from disc.
- **Export WAV** – Exports the Wav file to disc.
- **Reset Track** – Resets the track to its default settings
- **Remove Sample** – Removes and unloads the sample

TIP Drum sequences and their samples are saved inside of your patch so no need to stress over lost or missing samples, simply save your Icarus patch and you'll find everything back the way it was the next time you load your project or patch.

■ Sample Playmode

- **Single** – Plays the sample a single time (default mode)
- **Loop** – Plays the sample looped
- **Key** – Enables key-tracking for the sample. If several keys are pressed it automatically resolves the played chord and plays the base note.
- **Keyloop** – Loops the sample and enables key-tracking. If several keys are pressed it automatically resolves the played chord and plays the base note.
- **Bass** – Like Key but limited to a one octave range.
- **Bassloop** – Like Keyloop but limited to a one octave range.
- **BPM fit** – Resynthesizes the sample to fit the BPM, use this with for example when you load a drumloop sample.

- **Mute button** – Mutes the track.
- **Vol** – Controls the volume for this sample.
- **Dec** – Controls the Decay-Release time.
- **Sus** – Controls the Sustain level.
- **Hold** – Controls the hold time.
- **FX** – Switches FX On / Off for this track. Note that FX send needs to enabled (inside the sequencer's top menu: FX Send)
  Once FX send is enabled FX3 inside of the FX section will be named FX Drum, which also

needs to be switched on.

- **Tune** – Tunes the sample.

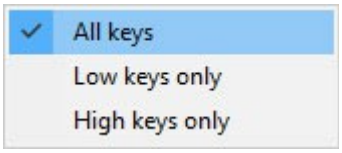
- **Pan** – Controls the pan (Left-Middle-Right)

- **Vel Vol** – Controls the amount of Velocity to Volume, velocity is set using the velocity bars inside of the sequencer.
  TIP You can use the Velocity to Volume settings to choke samples (choke enables you to cutoff a sample more abruptly)
  Just set the Vel Vol slider to 100, change the play mode to Monophonic (i.e. only one voice per sample will play) and insert your steps inside of the Grid. Now add extra steps after each active step and set their velocity value to zero, your sample will now end each time the sequences hits a zero velocity value step.
  Note that you're taking advantage of the 'one voice only Monophonic mode' here, hence why it only works in Monophonic mode and not Release & Overlap modes.

- **Vel Tune** – Controls the amount of Velocity to Tuning, velocity is set using the velocity bars inside of the sequencer.

■ Top menu

■ **Split mode**

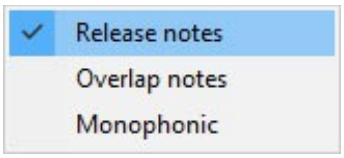


- **All keys** – The Drum-sequencer will play on all keys.

- **Low keys only** – The Drum-sequencer will only play on the lower keys.

- **High keys only** – The Drum-sequencer will only play on the higher keys.

■ **Sequencer play modes**



- **Release notes** – Notes played will release as soon as the next note event happens.

- **Overlap notes** – All played notes will overlap.

- **Monophonic** – Played notes will end as soon as the next note starts.

■ **FX send**

Use the FX send control to determine the amount of effects sent in the Drum-sequencer, note that for this to work you need to enable one of the track's FX buttons. Once FX send is enabled you need to

enable the FX Drum inside of the FX section.

For example, I want to have a reverb effect on my snare drum (Snare 6; loaded in track 1)

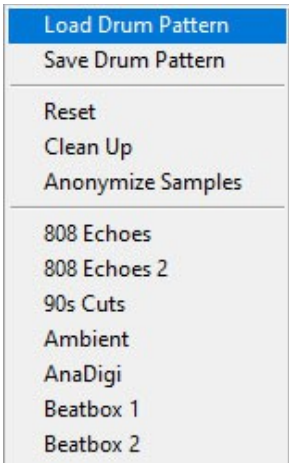
- First enable the FX button inside of the track you want effects on.

- Click on the FX send control (default label is FX off) and set it to a value higher than 0, in our example it is set to 75.

- After that go into the FX section, you should now see a section named FX Drum, click on 'FX Drum On' to switch the section on. Insert a Reverb effect and if all went well you should now hear a reverb effect on the snare drum. Note that if you do not see the FX Drum section but instead the default FX3 section, you need to enable the FX Send inside of the Drum-sequencer.

■ **<Preset>**

The <Preset> menu offers several preset related load / save / reset options.



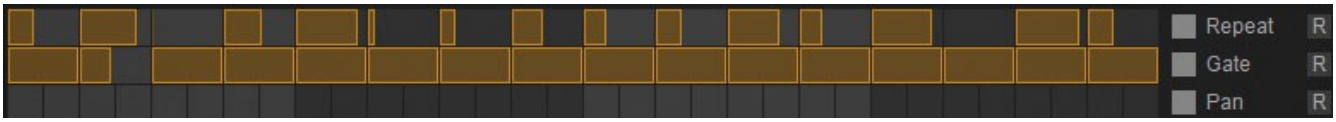
- Load Drum Pattern – Drum pattern from disk.
- Save Drum Pattern – Saves a Drum pattern to disk.
- Reset – Resets the Drum-Sequencer to its default settings.
- Clean Up – Removes all samples that are not in use and cleans up the patterns.
- Anonymize Samples – Renames the used samples to anonymous short names, often handy if sample names are too long for proper display.
- Presets list. Note: Once saved to disk your own saved patterns will show up inside this menu. Drum patterns are saved to '\Icarus_data\Icarus_drums\Drumpatterns'

■ Glitch-sequencer

The Glitch-sequencer is a rhythmic based sound modifier that adds multiple glitch suitable effects to further mangle and beef up your sounds.
A glitch refers to small imperfections, clicks and other types of errors inside of a sound, also called glitches. What a Glitch-sequencer does is use these in an organized rhythmic way to enhance your sound.
The Sequencer consists of a grid with 10 rows, each row representing a different type of effect, with 16 steps per row. You can apply either one or several effects at once to each step, with a large amount of effects being available, namely: a Repeater, Gate, Pan, Tremelo, Lowpass & Highpass filter, Bitcrusher, Degrader, Detune and Pitchslide effect. Its possibilities are almost limitless, from subtle glitch effects to completely destroying your sound.

Click on a step inside of the grid next to the effect you want to apply to that step, in the example above we've added the Gate effect to all 16 steps and edited step 2 to apply a gate effect.
Hold Control+left-click to automatically set the step to half of its full value.

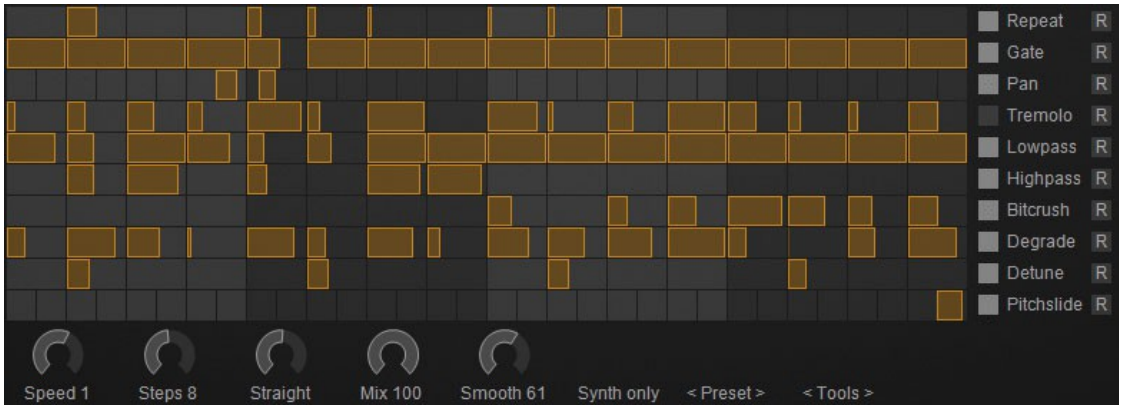
In our next example we've also added the Repeat effect with different repeater settings on all 16 steps.



By adding more effects and fine tuning how much of the effects are applied you can build all kinds of rhythmic glitch sequences. Effects are turned On / Off by clicking their respective boxes. The R buttons next to each effect randomize effect values for each of its 16 steps.

- Glitch Effects

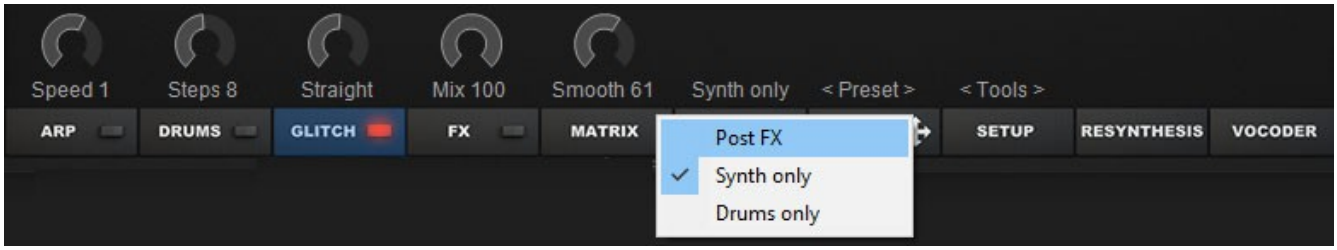
  - **Repeater** – Uses part of the input signal and repeats it several times. The amount of times the signal is repeated is determined by the value set inside the step.
  - **Gate** – Applies a gate effect, its step value determines how low the signal is muted.
  - **Pan** – Positions the sound in the stereo field (Left-Right)
  - **Tremelo** – Applies a tremelo effect.
  - **Lowpass** – Low pass filter, the cutoff frequency determined by the value set for that step.
  - **Highpass** – High pass filter, the cutoff frequency determined by the value set for that step.
  - **Bitcrusher** – Reduces the bit resolution with the amount set for that step.
  - **Degrader** – Reduces the sample rate based on the amount set for that step.
  - **Detune** – Detunes the step.
  - **Pitchslide** – Applies a pitchslide to the step.



■ Glitch Sequence options

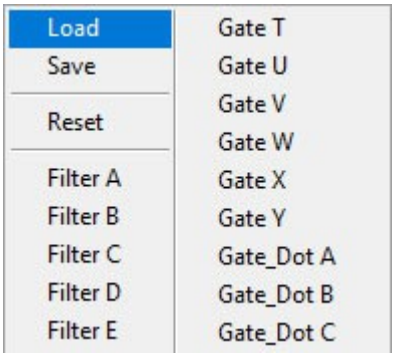
- **Speed** – Sets the speed used to play the glitch sequence.
- **Steps** – Defines the amount of active steps inside of the sequencer.
- **Straight** – The Straight / Swing / Shuffle menu allows you to add swing or shuffle to your sequence pattern. Its default setting is straight, when click-held & dragged up shuffle is increased, when click-held & dragged down the amount of swing is increased.
- **Mix** – Controls the balance between the input and processed mix, values lower than 100 will mix the original non processed signal back in.
- **Smooth** – Controls the smoothness, used to avoid clicks or get a rougher sound.

■ **Route** – Controls at which point inside the signal path the Glitch-sequencer is inserted.



- Post FX – Inserts the sequencer at the end of the signal chain; Synth, FX & Drums are processed.
- Synth only – Inserts the sequencer after the Synth; Synth & FX are processed.
- Drums only – Inserts the sequencer after the Drum-sequencer; Only drums are processed.

■ **<Preset>** – The <Preset> menu offers several preset related load / save / reset options.



- Load – Loads a Glitch-sequencer pattern from disk.
- Save – Saves a Glitch-sequencer pattern to disk.
- Reset – Resets the Glitch-sequencer to its default settings.
- Presets list.

Note: Once saved to disk your own Glitch patterns will show up inside this menu. Patterns are saved to '\Icarus_data\Icarus_glitch\'

■ **<Tools>** – The Tools menu offers several edit tools for the sequencer.

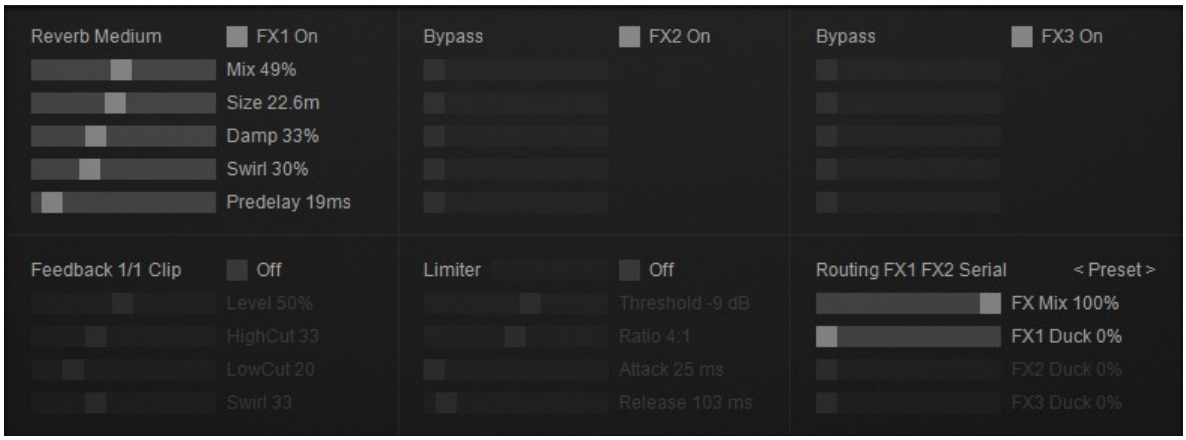
- Rotate left – Shifts the sequence one step to the left.
- Rotate right – Shifts the sequence one step to the right.
- Clean unused slots – Cleans all unused slots, i.e. rows that are not active will be reset to their default values.

■ FX

The FX section consists of three effect slots, a feedback feature as well as a limiter section.
No less than 60 effects are available from the FX section, ranging from Reverb, Delay, Chorus, and Phaser, to Tremelo, Vibrato, Distortion, Amp-Simulation, Multiband Distortion, Bitcrush, Degrader and Compressor.

Click on the FX Tab to go to the effect options screen.

Click on the FX1 button to switch on the effect slot and on the bypass label to open a listing of available effects to select one.



Once you selected an effect, the available parameters will update accordingly inside its FX display window. The parameters can be changed by click-and-holding your left mouse button and dragging the bar.

■ Feedback

The Feedback feature allows you to control the amount of signal fed back into the FX's input.

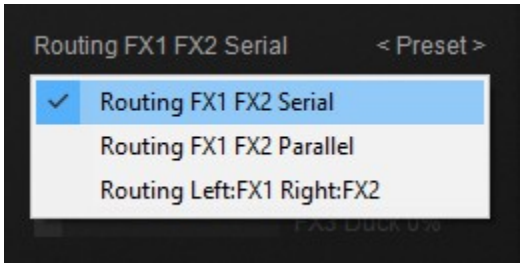
■ Limiter

The limiter section applies gain reduction to attenuate (reduce) transients and dynamics, it can be used to stop the signal from clipping or distorting.

- **Threshold** – Sets the point (Threshold) at which the automatic volume reduction is applied.
- **Ratio** – Determines how much the volume is reduced versus how far above the threshold the signal is.
- **Attack** – Adjusts how quick the volume is reduced once the input exceeds the threshold.
- **Release** – Adjusts how long it should take before the volume returns (released) to its original value when the input is no longer above the threshold.

■ FX Routing

Inside the Routing menu you'll find several options having to do with how the effects are routed or applied to the signal, click on the Routing FX… label to see it offer the following options:



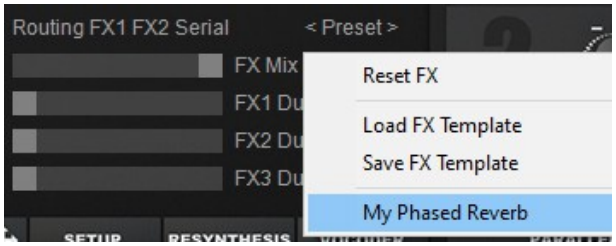
- **Routing FX1 FX2 Serial** – The dry output of the synthesizer is sent to FX1. Mix1 controls the dry / wet mix of FX1. The mixed signal is sent to FX2. Mix2 controls the dry/wet mix of FX2.

- **Routing FX1 FX2 Parallel** – The dry output of the synthesizer is sent to FX1. Mix1 controls the dry/wet mix of FX1. The dry output of the synthesizer is also sent to FX2. Mix2 controls the dry/wet mix of FX2.

- **Routing Left:FX1 Right:FX2** – In this mode the synth's left dry signal is send into FX1, the synth's right dry signal is sent into FX2.
  TIP This mode can be used to assign two different effects to two different oscillators. First select two different effects for FX1 and FX2, for example a reverb and chorus. Then set the PAN knob of OSC1 to -100 to pan it left and set the PAN knob of OSC2 to +100 to pan it right. Now OSC1 will be processed with a reverb and OSC2 will be processed with a chorus.

■ <Preset>

The <Presets> menu offers several effect related load / save / reset options.



- **Reset FX** – Resets all effect slots to their default settings.

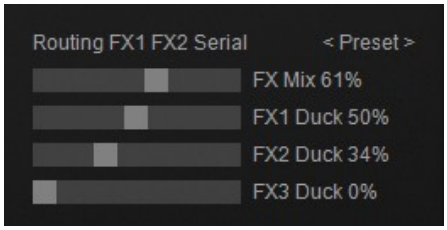
- **Load FX Template** – Loads an effect template from disk.

- **Save FX Template** – Saves an effect template to disk.

Note: Once saved to disk your own FX templates will show up inside this menu. Templates are saved to '\Icarus_data\Icarus_effects\'

FX controls

The FX mix slider controls the wet / dry balance of the effect section, note that this slider is linked to the FX MIX knob inside the main section.



The FX1, FX2, FX3 Duck sliders provide a Ducking mode control that help make the mix sound more transparent.
Especially with long Reverbs and Delays you frequently face the problem that a part of the delay tail overlaps with a currently played note. As a result it either 'messes up the mix' with 'too much effect mix' or the delay effect is nearly inaudible, because the mix level had to be reduced a lot.
To solve this problem we introduced a ducking feature which allows a higher effect mix without making the synth sound 'over effected'.

Effect types

Reverb

- **Reverb Medium** – Simulates a medium room with lots of diffusion.
- **Reverb Big** – Simulates a huge room with lots of diffusion.
- **Reverb Plate** – Simulates a plate reverb, which uses an electro-mechanical transducer to create vibration in a large plate of sheet metal.
- **Reverb Glass** – Simulates a bright room which absorbs low frequencies.
- **Reverb Dark** – A darker type of reverb.
- **Reverb Infinite** – A reverb with an infinitely long reverb tail (great for Pads, FX and Ambient tracks)
- **Reverb Feedback** – A reverb with feedback with a metallic type of sound.
- **Reverb Spring** – Simulates a hardware spring reverb system, which uses a transducer at one end of a spring and a pickup at the other, similar to those used in plate reverbs
- **Reverb Trance** – A reverb specifically tailored for Trance based music styles.
- **Reverb Cheap** – A cheap type reverb sound like those found in cheaper or older hardware FX units.
- **Reverb Gated** – A gated reverb that syncs to the BPM rate, works best for drums or

arpeggiator sounds.

- **Reverb Gated Echo** – A gated reverb with a delay that syncs to the BPM rate.
- **Reverb Decay** – A decaying reverb that syncs to the BPM rate.
- **Reverb Reverse** – A reversed reverb effect.
- **Reflections** – When size is set to 0 it can be used to simulate early reflections, larger values sound like a chaotic echo.

Delay

- **Delay Wide** – A broad sounding delay with Hi and Low Damp filters
- **Delay Fat** – A fat sounding delay with detuning. In this mode the mix knob controls the amount of feedback.
- **Delay Diffuse** – A fat sounding delay with diffusion and detuning. It has a silky sound.
- **Delay Band** – Filtered stereo delay synced to your host's tempo. The frequency bandwidth gets more and more narrow over time. Useful for classic psychedelic sounds from the 60's.
- **Delay Classic** – A classic Stereo delay synced to your host's tempo.
- **Delay Dual** – A double delay. Delay times for the left and right channel can be changed individually.
- **Tape Delay** – A delay effect based on the classic Tape Delay hardware units, which used magnetic tape as their recording and playback medium.
- **Multitap** – Very powerful multistage delay with rhythmic beats. Also includes a number of pingpong types and a reverse delay mode.
- **Pingpong** – A tempo synced delay which alternatively pans from left to right.
- **Echo / Slapback** – A slapback delay effect, which uses a mixing of the original and delayed sounds to creates an effect similar to doubletracking.
- **Resonater** – A resonator delay effect.

- **Chorus**
    - **Chorus** – A warm stereo chorus with a rich sound.
    - **Smart Unison** – Creates the sound of several detuned stereo voices, with very low CPU demands
    - **Ensemble** – Simulates a large number of detuned voices playing at the same time. Adds richness and movement to sounds. Very useful for vocal pad sounds.
    - **Vibrato** – Detunes the sound with an LFO.
    - **Vibrato stereo** – Detunes the sound with an LFO, can be used instead of chorus if a tight timing is needed.
    - **Rotary** – Simulates a rotary speaker / Doppler effect made famous by the Hammond organ.
- **Phaser**
    - **Phaser** – Creates a series of peaks and troughs in the frequency spectrum. The position of the peaks and troughs is modulated so that they vary over time creating a sweeping effect.
    - **Phaser Stereo** – A stereo phaser with a vocalic sound.
- **Flanger**
    - **Flanger** – Peaks and notches are produced in the resultant frequency spectrum related to each other in a linear harmonic series. Creates a sweeping effect.
    - **Flanger Stereo** – Peaks and notches are produced in the resultant frequency spectrum related to each other in a linear harmonic series. Creates a sweeping effect.
- **Panning**
    - **Autopan** – An automatic panning effect.
    - **Surround Pan** – A surround panning effect.
- **Equalizer**

- **EQ High Cut** – A High-band (High Pass) equalizer effect.
- **EQ Low Cut** – A Low-band (Low Pass) equalizer effect.
- **EQ Param** – A parametric 3-band equalizer.
- **Laser Punch** – Adds additional punch to the sound. Use it with a sawtooth to create a zapping 'Rubber Bass' type of sound.

■ **Distortion**

- **Saturate** – A saturation effect.
- **Soft Clip** – Provides a soft clipping effect.
- **Hard Clip** – Provides a hard clipping effect.
- **Rectify** – Hard-clips the signal and mixes the processed signal back in with the original sound.
- **Bitcrush** - A lo-fi (low fidelity) digital audio effect.
- **Warp** – A warp distortion effect.
- **Waveshape** – Waveshaper effect.
- **Ripple** – A Ripple distortion effect.
- **Amp Sim** – Simulates a guitar amplifier.
- **Multiband Distortion** – A multiband distortion effect.

■ **LoFi**

- **Degrader** – Sample rate reduction effect.
- **Multiband Degrader** – A sample rate reduction effect that operates on multiple separate bands.
- **Noise** – A noise effect with the options to add White, Pink noise, Crackle or Hum to your signal.

- **Stereo Imaging**

    - **Stereo Width** – Spreads the panorama from mono to surround

    - **Surround Encode** – Dolby Prologic II compatible surround encoder. It is also useful to add a more spatial effect to your stereo recordings. If you encode to 'Back' the channel will come from the rear speaker if you play your song on a surround system. The sound remains fully stereo compatible.

- **Dynamics**

    - **Tremolo** – Modulates the amplitude with an LFO.

    - **Compressor** – Boosts the volume of lower volume notes, while capping the louder ones, giving a more even level of volume.

    - **Gate** – Applies a rhythmic volume gated pattern to the sound.

■ EQ

The EQ section gives a broad tone control over the synth's output, its three controls give a boost or cut over the low, middle and high frequencies. Changes to frequency curves can also be freely edited using the mouse, simply left-click within the frequency display and drag up or down to change its settings. Click on the On button to switch the EQ section to on or off.

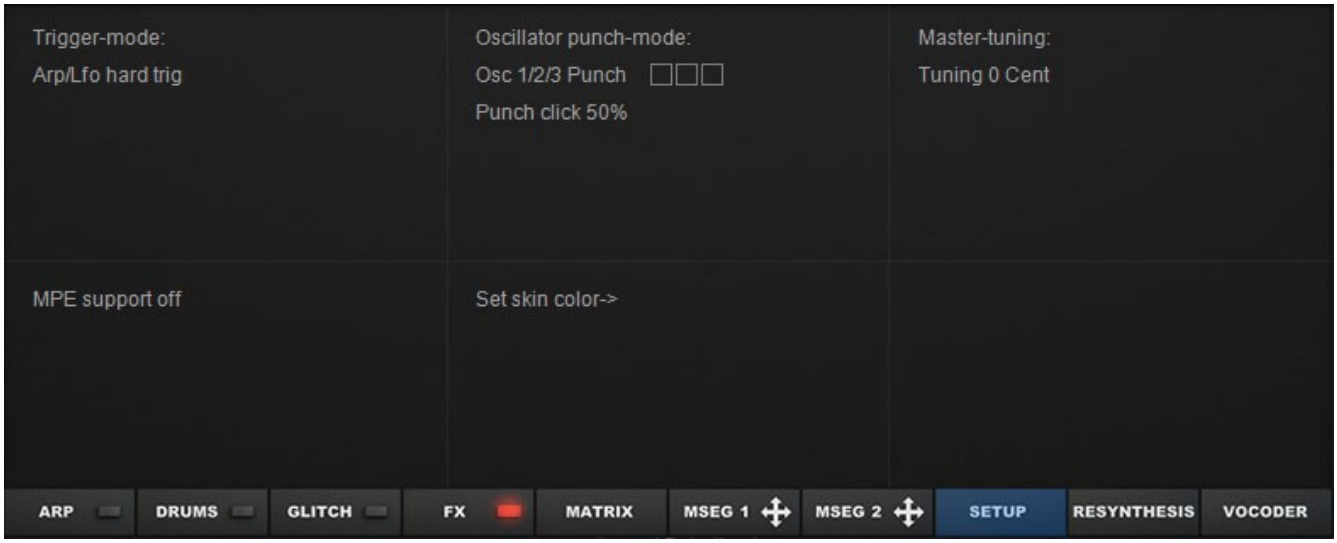
■ EQ controls

- **Low** – Adjusts the lower frequencies. Set to the middle position it's function is by-passed.
- **Mid** – Adjusts the middle frequencies. Set to the middle position it's function is by-passed.
- **High** – Adjusts the higher frequencies. Set to the middle position it's function is by-passed.
- **Dbass** – Equalizes non-linearities of the human ear, making the patch sound thicker and louder, without raising the overall volume.
- **Freq.** – Shifts the EQ Mid Frequency.
- **Q** – Adjusts the EQ's bandwidth: number of frequencies that will be cut or boosted.

Use the EQ presets menu to select from a range of equalizer pre settings.

■ Setup

The setup section in Icarus covers the general settings like Trigger modes, Oscillator punch settings, Skin preferences, MPE support and the Master Tuning control.



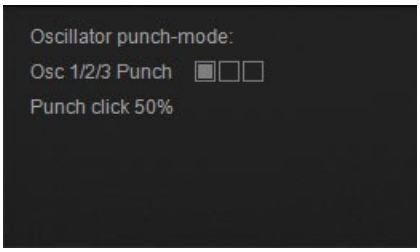
■ Trigger-mode

The trigger mode menu allows you to control which Arpeggiator / LFO synchronization settings will be used by Icarus.

- **Arp/Lfo hard trig** – Uses Hard Trigger mode for the arpeggiator & LFOs.
- **Arp/Lfo Free** – Uses Free Running mode for the arpeggiator & LFOs.
- **Arp/Lfo Soft hard** – Uses Soft Hard mode for the arpeggiator & LFOs.
- **Arp/Lfo Soft trig** – Retriggers monophonic LFOs after 1 second of silence.
- **Arp/Lfo Classic trig** – Allows to set free mode for every LFO individually.

■ Oscillator punch-mode

The oscillator punch-mode section gives you the option to add an additional punch / click to the attack portion of the sound. The option can be switched on separately for each oscillator and fine tuned with the Punch Click menu (Punch Click 12% > Punch Pump 800%)



■ Master-tuning

The Master tuning controls the master tuning used in Icarus.

■ MPE Support

This option switches on MPE support for Icarus. MPE, stands for MIDI Polyphonic Expression. MPE uses MIDI that allows multidimensional controllers (MDCs), such as the ROLI Seaboard and the LinnStrument, to control multiple parameters (such as pitch bend, vibrato, timbre, volume) of every single note separately.

Note! only enable this if you connected an MPE device.

■ Set skin color>

The skin color menu allows you to set or change the color scheme used by Icarus, simply click open the menu and select your preferred scheme, Icarus will instantly adjust to the new colors.