Ragnarök 2

Custom-built Performance/Lead Synthesizer

Version 2.0

http://www.fullbucket.de/music
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Introduction

Ragnarök is a software instrument plug-in (VST2/VST3/AU/CLAP/AAX) for Microsoft Windows and Apple macOS simulating an existing, custom-built (and therefore one of a kind) hardware analog synthesizer. It is written in native C++ code for high performance even on "lighter" systems. The main features are:

- Up to 64 voices polyphony including portamento
- Unique band-limited oscillator bank
- Additional white noise generator
- Multi-pole zero-delay feedback filter (6–12–18–24 dB/Oct low- or high-pass)
- Two envelopes (ADSR or AD) with exponential slopes
- Low frequency oscillator
- Built-in Overdrive and Chorus effect plus 7 band graphic equalizer
- Cool repeat/pseudo arpeggiator functionality
- All parameters can be controlled by MIDI controllers
- Plug-in supports Windows and macOS

This is version 2 of *Ragnarök*, a largely extended version of the original *Ragnarök* synthesizer. It adds additional Sawtooth oscillators, velocity sensitivity, a Chorus section and more.

Ragnarök is based on the **iPlug2** framework maintained by **Oli Larkin and the iPlug2 team**. Big thanks, guys!!! Without your work it would not have been possible to create a resizable *Ragnarök* user interface.
To resize the plug-in you just grab the yellow triangle at the bottom right of the window and drag it. You can also save the current window size.

If you have trouble with the standard version of *Ragnarök*, please grab the (sound-wise identical) "N" version of the plug-in which is based on the original **iPlug** framework.

Ragnarök... what it is, and what it isn't

Ragnarök is NOT the next big thing in digital synthesis, nor is it a faithfully modeled equivalent of a real hardware analog synthesizer. The *Ragnarök* synthesizer is basically a standard architecture VA-synthesizer, consisting of an oscillator section running into a dynamically controlled filter that is followed by an envelope-controlled amplifier or output section. It has some additional sound-shaping options by means of an Overdrive on the filter output, a Chorus effect, and an additional 7-band static filter (also known as a Graphic EQ).

Where *Ragnarök* shines is in its combination of 4 stacked and (partially) detuned oscillators with a divide-down array that replicates these 4 oscillators over four octaves. This means it can do 4 (partially) detuned oscillators AND 4 octave-tuned oscillators AT THE SAME TIME, the equivalent of 16 oscillators on one voice. The oscillators offer Sawtooth, Square and Pulse waves simultaneously, so even those can be mixed up. In addition to this there is yet another array of Square wave oscillators available that are tuned to an interval (default set at a fifth).

Although the original *Ragnarök* was purely monophonic, modern software technology has made it possible to have a polyphonic version now. This adds tremendously to the usefulness of the instrument.

History

The hardware version of *Ragnarök* was build in the early eighties (by Hans Peter), and solely aimed at using on stage. Hence the "performance/lead" designation on the plugin instrument. In those days, Moog-sounds where still in high demand, and the more oscillators you could stack for a solo-sound, the better it was. A DIY synthesizer kit, called the Chorosynth, played into this idea by delivering the combined stacked and octaved oscillators into a pretty cheap package. However, to keep the price low, there was only an amplitude envelope and no filters whatsoever. It also had no real keyboard but used a stylus on an etched circuit board. The first incarnation of the *Ragnarök* synth was merely the Chorosynth with a bolt-on real keyboard.

After about two years use on stage, the first version was rebuild into a new case, and augmented with several modules from the Elektor Formant Modular synthesizer. It got a very complete multi-pole filter section, real envelope-generators and several other goodies that where available as DIY-kits. Although the Formant Modular was, well… modular, in the *Ragnarök* synthesizer everything was hard-wired for stage use.

After several years the synthesizer was decommissioned and replaced with a Teisco 110F (another beautiful instrument). The hardware *Ragnarök* is still in Hans Peter's possession, but (sadly) no longer in working order.

Collaboration

When Hans Peter (known as CrimsonWarlock on the KVR-forum) asked on the KVR-forum for a developer who would be interested to bring this eighties rarity back to life, secretly he was hoping that Björn (Full Bucket) would take up the challenge. As a user of VST instruments, Hans Peter really liked the stuff Björn was doing, but additionally it seemed that the *Ragnarök* synthesizer was really fitting into the line of stuff Björn had made so far. To cut a long story short; Björn indeed saw this project as a nice opportunity and the resulting collaboration delivered what you are now looking at.

- DSP-coding by Björn Arlt (Full Bucket Music).
- Synthesizer concept, GUI-design and User-manual by Hans Peter Willems (CrimsonWarlock aka TechnoGremlin).
- Additional functional concepts by Björn Arlt.
- Beta testing by **kraftraum** (https://soundcloud.com/kraftraum)
- Patch-programming (default bank) by Hans Peter & kraftraum & Björn.

The original Ragnarök synthesizer – Image courtesy of Hans Peter Willems.

Oscillator Section

The oscillators are actually found in the *Voice Selection Panels* (see next chapter). However, this section has some global setting for the oscillators.

Source Mix

Besides the big stack of oscillators/waves in this synthesizer, there is additional white noise available as a sound source. This caters to percussion sounds, nature sounds (water, wind, thunder), and can add some character to oscillator-based sounds when mixed in subtly.

The Source Mix knob will deliver only oscillator signal when set fully counter clockwise, and only the noise signal when set fully clockwise. In between you can mix both signals to the desired mix-ratio.

Pitch Modulation

This part of the oscillator section has the setting for modulating the oscillator pitch with an LFO (low frequency oscillator) or the filter envelope.

LFO: This sets the amount of the LFO signal, which is basically the depth of the vibrato effect, also known as the modulation depth. Oscillator modulation depth can be set from zero (no modulation) to +/- 12 semitones (one full octave up and down). The waveform of the LFO can be Triangle, Sine, Square, Sawtooth Up/Down, or S/H (random steps).

Envelope: This sets the amount of the filter envelope signal (normal or inverted) modulating the oscillator pitch. Besides "auto bend" effects it is very handy in conjunction with the Hard Sync feature (see *Voice Selection Panels*).

LFO Section

Speed

This sets the frequency of the LFO. The speed can be set between 0.001 Hz and 100 Hz.

Waveform

The waveform of the LFO modulation signal (Triangle, Sine, Square, Sawtooth Up/Down, or S/H) can be selected separately for the oscillators and the filter.

Ramp (rmp)

This is a delay time that makes the LFO signal fade in after a short delay. This makes it possible to create mod-wheel like vibrato and Wah-Wah effects without actually using a mod-wheel.

NOTE 1: As a side-note; the original Ragnarök did not have a mod-wheel and this functionality was used as a substitute for that.

NOTE 2: The LFO signal is also available in the Filter-section for Filter Cutoff modulation. Both Speed and Ramp are affecting the Filter modulation when used there.

NOTE 3: When using the mod-wheel options (see Settings-section) the modulation will take the ramp into account, so no modulation is heard when using the mod-wheel before any set ramp-time.

Voice Selection Panels

The voice selection panels is where the original architecture of the hardware (and the underlying Chorosynth) is most visible, and specific for the sound character of *Ragnarök*. There are separate sections for the waveforms, interval tones and multi-voice option.

Version 2 of *Ragnarök* comes with the additional Sawtooth shape which was highly requested by many users, although it never was part of the original design.

Sawtooth, Square And Pulse Wave

There are four octaves available for all Sawtooth, Square and Pulse waves. You can mix both octaves and waves at will. Stacking the same octave for both square and pulse gives a different timbre than either one of those apart.

Interval

The interval octave buttons add an additional (Square) oscillator for the selected octave, that is by default set to an interval of a fifth. You can change the interval in the Settings section with the Int knob. The interval can also be set to (close to) the base tuning, for additional chorus/phaser like effects.

Multi Voice

This is the most important section of the voices: it handles *Ragnarök's* 3-oscillator spread/detune option for all the voices. By switching on an octave in this section, it will set the Sawtooth, Square and Pulse for that octave (if in use) to three oscillators (instead of one) that are slightly detuned for a big chorus effect. The amount of detuning can be set in the settings section with the Spr. knob. This setting is patch dependent.

Hard Sync

Hard Sync synchronizes the two other Multi Voice and the Interval oscillators to the first oscillator. Thus, it will only give an audible contribution to the sound if one of the Interval or Multi Voice switches are on. The drop-down button above the Envelope knob in the Oscillator section activates (or deactivates) one of the eight (!) Hard Sync modes:

- **OFF:** *Hard Sync* is off.
- **16'+:** The additional two Multi Voice oscillators and the Interval oscillator are hard-synchronized to the very first 16' oscillator (master). The output is composed of the synchronized oscillators' signals **plus** the master oscillator.
- **8'+, 4'+, 2'+:** Same as **16'+** but for the respective selected footage.

- **16':** The additional two Multi Voice oscillators and the Interval oscillator are hard-synchronized to the very first 16' oscillator (master). The output is composed **solely** of the synchronized oscillators' signals (**without** the master oscillator).
- **8', 4', 2':** Same as **16'** but for the respective selected footage.

Note that when Hard Sync is selected, the Envelope will only modulate the synchronized oscillators to allow for the characteristic Synchronization effect.

Filter Envelope & Volume Envelope Sections

The filter envelope generator and volume envelope generator are identical and hard-wired to their respective destinations. The envelope generators are of the traditional ADSR type, meaning Attack, Decay, Sustain and Release. They can be switched from ADSR to AD mode for percussive sounds.

Attack

Sets the attack time of the envelope. This is basically the time it takes for the sound to go to full volume and/or filter cutoff, from the start of a note.

Velocity Sensitivity

The attack time can be modulated by note velocity (slow velocity: longer attack time, high velocity: shorter attack time). This is set via the horizontal slider above the Attack knob. The second slider to the right controls how much velocity controls the amount of overall envelope modulation.

Decay

The decay is the time it takes to fall back to a lower level (of sustain), directly after the attack part reaches its maximum level. Decay is used for example for percussive and brass-like sounds, or anything that needs some sort of peak in the sound or volume.

NOTE: This setting is obviously only doing something if Sustain is set to less then 100% (full right). If sustain is set to full, there is no level to decay to.

Sustain

The sustain level is the level where the envelope will hold, after the two previous stages, when a note is held for a longer time. You can set the sustain from 0% (meaning no sustain but sometimes useful) to 100% meaning the note is sustained at its maximum level of volume and/or timbre.

Release

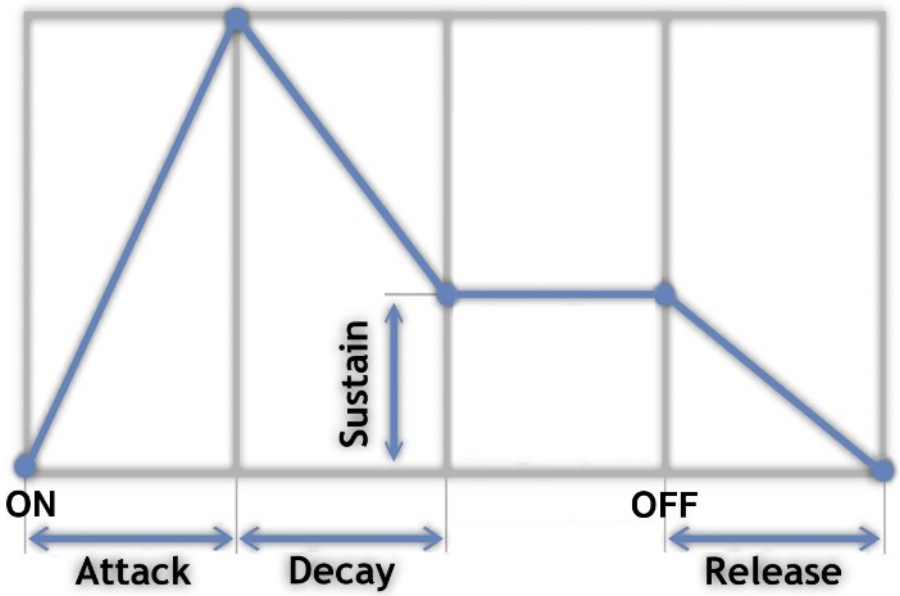
The release time is the time it takes the envelope to fall back to zero, after the release of the note. It is used when we want a sound to (slowly) fade away when the keys are released, instead of abruptly being switched off after the note ending.

ADSR/AD switch

This switch sets the envelope to either ADSR mode (default) or AD mode.

ADSR-mode: The envelope behaves basically as described above. When combined with a zero sustain level you can have a different release based on how long you hold a note. Holding a note will give you the decay time, releasing the note before the decay time is done will go to the release time.

AD-mode: This switches off the sustain level and gives you only the decay time. When combined with a sustain level higher then zero, this switch let you move quickly (performance) between a percussive or a sustained version of the sound.



The typical ADSR-envelope curve.

Dynamic Filter Sections

The dynamic filter is a traditional multi-pole VCF architecture with several modulation options and variable key-tracking. In addition the filter has an overdrive-stage on the output, before going in to the 7-band static filter.

dB/oct. Switch

You can set the filter between 1 and 4 poles, meaning you can choose 6, 12, 18 or 24 dB slope for the filter cutoff. The 24 dB filter sound was made famous mainly by the Moog synthesizers, while 18 and 12 dB are more sounding like (old) Korg and Roland synthesizers. Basically more poles gives a rounder sound while less poles gives a more aggressive and electronic sound.

HP/LP switch

You can choose between a high-pass filter and a low-pass filter (default). Both filter types cater for completely different sounds, especially in combination with the envelope generator.

Cutoff

The cutoff frequency determines the brightness (or lack thereof) of the sound. In combination with modulation by the envelope and/or the LFO, all kinds of very characteristic sounds can be made. The cutoff together with the envelope modulation basically define the fundamental character of a patch/sound.

Velocity Sensitivity

The cutoff frequency can be modulated by note velocity; this is set via the horizontal slider above the Cutoff knob.

Reso

Resonance (Reso) determines how much the frequency at the cutoff point is hyped. High resonance settings gives very aggressive and electronic sounding effects.

NOTE: The filter is capable of self-oscillation.

Key Track

This knob determines how much the cutoff frequency is tracking with the keyboard. When using key track, the filter will adjust the cutoff frequency when playing higher or lower notes. This is mainly used for lead sounds, but can also be very effective when playing polyphonic with high notes and accompanying low notes that you want to sound lower.

Modulation

LFO: This knob sets the amount of LFO modulation for the cutoff frequency. You can use this for Wah-Wah effects and more subtle spectral movement in a sound. The waveform of the LFO can be Triangle, Sine, Square, Sawtooth Up/Down, or S/H (random steps).

Envelope: This knob sets the amount of envelope modulation for the cutoff frequency. This knob has two directions: you can set the envelope signal as normal or as inverted. When the envelope is inverted, all envelope slopes move in opposite direction (attack goes down, decay goes up, etc.).

Output Sections

Overdrive

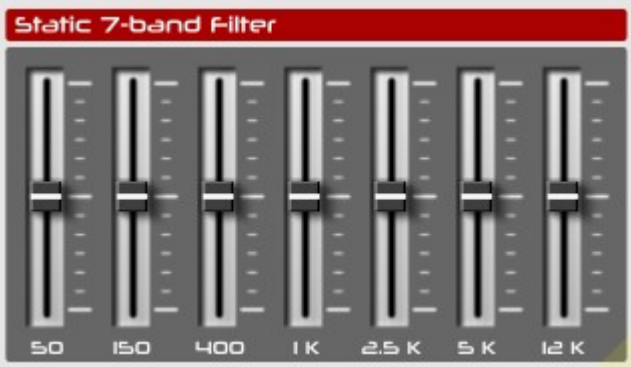
Ragnarök has a nice overdrive stage at the end of the filter, to add some grit and dirt if needed. This gives traditional overdrive/distortion like sounds, but can also be used to get even more aggressive, ring-modulator like sounds when combined with the interval setting for the voice selection.

NOTE: There is only one overdrive that is shared by all voices. This is similar to having an overdive-effect on the output of the synthesizer. The hardware-version of Ragnarök was actually used in combination with an overdrive stomp-box.

Chorus

Right after the Overdrive stage follows a Chorus effect section with two available preset settings. The Chorus is in fact composed of three different modulated delay lines and is capable of producing some intriguing stereo signal.

Static 7-band Filter Section



The static 7-band filter is basically a tuned 7-band EQ. Frequency bands are tuned for sound shaping as opposed to basic equalization duties, although it can obviously be used that way as well.

The filter works and behaves as a normal graphic EQ. The frequency response is flat when the sliders are at the mid-position. Above the mid-position frequencies are boosted, while below the mid-position they are dampened.

NOTE 1: Although there are no modulation options for the 7-band filter within Ragnarök*, all parameters of the synthesizer are externally automate-able.*

NOTE 2: There is only one 7-band filter that is shared by all the voices.

Performance Section

The performance section holds all the settings for keyboard performance (portamento, legato and envelope re-trigger) and external trigger/repeat options.

Portamento

Speed: This knob sets the time it takes to glide from one note to another, when portamento is active (depending on the legato switch, see below).

Legato: With this switched on, you only have portamento when playing legato, meaning holding the previous note while playing the new note. This is most obvious when playing monophonic or with 1 voice set.

NOTE: Ragnarök has polyphonic portamento. However, this is pretty hard to achieve with more then 4 voices, so legato should better be switched off in that case.

Envelope

Mode switch: This sets the trigger behavior of the synthesizer, meaning how the envelopes are being triggered.

- ***Normal*** means that a note plays when a key is played (or sequenced).
- ***Repeat*** sets the key-trigger in repeat from the LFO. The speed of the repeating notes is set with the LFO Speed knob. The length of the repeated notes is set with the Len. knob in the settings section.
- ***Host*** sets the repeat locked to the host tempo. Same as repeat, the length of the repeated notes is set with the Len. knob in the settings section. Also, the host sync can be set to several time signatures with the … option in the settings popup-menu (button besides the Len. knob in the settings section).

NOTE: The repeat and host sync options only sync the tempo of the repeated notes but NOT the exact timing of the notes: this makes for the possibility of creating arpeggiator-like patterns in a performance, based on the timing of the notes played (or sequenced). Try this with any (slow) repeat or host sync and playing notes with different timings (use polyphony) to hear the effect and experiment with the possibilities.

NOTE: The mouse-behavior of this knob is similar to the Filter dB/oct. Switch.

Retrig switch (re-trigger): This switch determines if the envelopes are re-triggered when a new note is played in legato mode. Re-trigger on means that any noted played will re-trigger the envelopes, off means that the envelopes will only re-trigger when all previous notes are released.

NOTE: Retrig also works in polyphonic mode, but might be hard to use with more then 4 voices.

Patch Memory

The patch management section makes it easy to manage and organize patches inside a (loaded) patch bank. Especially when doing sound-design or tweaks, having patch management inside *Ragnarök* makes it simple to name, rename and organize patches.

Browser

Clicking the patch number opens a context menu from where you can select any of the 64 patches.

Prev./Next buttons

Especially for auditioning patch banks, these buttons make it easy to quickly step through the available sounds in a (loaded) patch bank. Previous and Next are self-explanatory.

Menu button

Copy Program: This option copies the current patch to an internal clipboard, so you can paste it into another location in the bank. Handy for rearranging and if you want to start a new patch based on an existing patch, without overwriting the existing patch.

Paste Program: This option is only active if the copy function was used and the internal clipboard holds a copied patch. Using this option will write the copied patch into the currently selected slot.

Init Program: This option will reset all controls to the default INIT setting. The INIT-setting is meant to help when creating new sounds from scratch, and gives a clean slate to start from.

Load Program: If your DAW does not support patch management, you can use this option to load an individual patch in FXP-format.

Save Program: This option let you save the currently loaded patch as an individual FXP-file. Make sure to name the patch first; the FXP-filename is NOT the same as the patch name (although you would probably name them similar).

Load Bank: This option will load a full *Ragnarök* patch-bank in FXB-format. This will replace the default patch-bank in the currently loaded instance only.

Save Bank: This option will save the complete patch-bank from *Ragnarök* into a standard FXB-file.

Restore Factory Bank...

> ***Ragnarök Version 1:*** Restores the Ragnarök version 1 factory program bank.
>
> ***Ragnarök Version 2:*** Restores the Ragnarök version 2 factory program bank.

Select Startup Bank: Select the bank file that should always be loaded when the *Ragnarök* is started.

Load Startup Bank: Load the Startup bank file; can also be used to check what the current Startup bank is.

Unselect Startup Bank: Unselect the current Startup bank.

Default Path For Program Files: Selects the folder where you would first look in to load or save programs or banks.

Global MIDI Settings…

> ***MIDI Thru:*** Set if MIDI data sent to *Ragnarök* should be sent through to its MIDI output (stored in configuration file).
>
> ***Ignore Program Change:*** Set if MIDI Program Change data sent to *Ragnarök* should be ignored (stored in configuration file).

Reload Configuration: *Ragnarök* comes with a INI-file that makes it possible to have a default mapping for MIDI-controllers (also see the manual section: INI-file). This menu-option will reload the INI-file in case you made changes to it and want to use/test it right away.

Save Configuration: Save the *Ragnarök's* INI-file (see section: INI-file).

Window Size…: Change the window size of *Ragnarök.*

Save Window Size: Store the current window size to the configuration file so that it will be restored on the next loading of *Ragnarök.*

Check Online for Update: When connected to the Internet, this function will check if a newer version of the *Ragnarök* is available at fullbucket.de.

Visit fullbucket.de: Open fullbucket.de in your standard browser.

Backwards Compatibility

Using the Load functions of the menu you can also load programs and/or banks of the previous *Ragnarök* version 1 – nothing is lost! ☺

Learn/Unlearn Button

This button helps you "learning" and/or "unlearning" MIDI CC messages to control *Ragnarök's* parameters (see section *MIDI Learn*).

Renaming patches

You can simply rename a patch by clicking in the name-display. ESC-key while editing reverts to the name that was there, ENTER-key writes the changed name into the patch-bank.

NOTE: Writing the patch name into the bank does not mean storing on disk. You need to save the patch/bank to store any changes (name and/or parameters) for later retrieval.

Settings

The settings section contains several options for performance, host-sync and basic settings for the synthesizer like pitchbend-range and base-tuning. There are also setting that influence the spread/detune and interval options in the voice-selection panels.

Vol.

This is just a final output level that sets the amount of signal that is coming out of the synthesizer. With all the voice stacking, filter options and distortion, a sound can get pretty loud and you might want/need to dial it down to prevent the input channel of your DAW from clipping.

Tun. (Tuning)

This is the basic tuning of the instrument. Default tuning is A-440Hz. Tuning is stored for each patch, so you need to (re)tune each patch that you want to use with that tuning.

Len. (Trigger Length)

The knob sets the trigger length (duty-cycle) of the repeat function in the performance section. This is equal to the time a key is pressed if you would repeat a note on a keyboard.

Ste. (Stereo Image)

This knob controls how "wide" the Multi Voice oscillator and the Chorus signals are placed into the stereo image of *Ragnarök's* output.

Int. (Interval)

This knob sets the note interval for the Interval voices in the voice selection panel. Default interval is a fifth. You can tune the interval back to center tuning (and both above or under that) for additional chorus-like effects in addition to the Spread option (see below).

Spr. (Spread/Detune)

This is where the *Ragnarök* magic happens: the knob sets the spread/detune of the three oscillators (for each octave) that you can switch on in the Multi Voice section of the voice selection panels. Detune goes from exact tune to 1 semitone detune where the three voices are detuned at equal distances between
-/+ 1 semitone.

Settings-button [...]

The settings-button opens a popup-menu with several options. These options are also patch-dependant.

Polyphony: This sets the amount of available voices for the synthesizer (1, 2, 4, 8, 16, 32 and 64). Using less voices means using less CPU for the synthesizer. Setting this to 1 voice means the synthesizer behaves as a monophonic synthesizer, which activates all the portamento, legato and re-trigger options in the performance section.

Sync-to-Host Rate: This sets the timing interval in relation to the host-sync trigger (if used). There are many options including triplets.

Pitch Bend Range: This sets the maximum range of the pitchbend wheel, in semitones. Available options are 2 (one whole note), 3, 5, 7 and 12 (one full octave).

Mod Wheel → Filter: This sets the amount of how much the mod-wheel influences the filter-cutoff frequency. The mod-wheel adds or subtracts from the value set by the filter-cutoff knob and the other modulation signals (envelope and LFO). There are four slopes available: 25%, 50%, 75% and 100%.

Mod Wheel → LFO to Osc: This switches the mod-wheel to control the LFO-to-Oscillator behavior. This works in a specific way:

- If the pitch modulation amount is zero, the mod-wheel has no effect.
- If there is a certain amount of pitch modulation set, the mod-wheel modulates between zero and the set amount.
- If there is a ramp-time set, the mod-wheel again will modulate between zero and the set amount of pitch-modulation. However, the mod-wheel takes the ramp-time into account, meaning there is zero mod-wheel influence at the start of the ramp-time, going up to the full pitch-modulation amount at the end of the ramp-time.

Mod Wheel → LFO to Filter: This switches the mod-wheel to control the LFO-to-Filter behavior. This works in a specific way:

- If the LFO modulation (in the filter-section) amount is zero, the mod-wheel has no effect.
- If there is a certain amount of LFO modulation set, the mod-wheel modulates between zero and the set amount.
- If there is a ramp-time set, the mod-wheel again will modulate between zero and the set amount of LFO modulation. However, the mod-wheel takes the ramp-time into account, meaning there is zero mod-wheel influence at the start of the ramp-time, going up to the full LFO-modulation amount at the end of the ramp-time.

MIDI Controllers

Ragnarök is able to read some settings from a configuration file (`ragnarok2.ini`) – the exact location of this file depends on your operating system and will be displayed when you click on "Reload" or "Save Configuration".. After you have edited this INI file in a text editor, you have to reload it using the *Reload Configuration* command from the *File* menu (see section *Patch Memory*).

NOTE: If you don't want automatic MIDI-CC mapping, for example when you want to use the parameter learn function in your DAW, simply remove or comment-out all the mappings in the INI-file.

MIDI Control Change Messages

All parameters of *Ragnarök* can be controlled by MIDI controllers, or more precise: Each MIDI controller (except *Modulation Wheel* and *Sustain Pedal*) can control one of *Ragnarök*'s parameters. The mapping is defined in the `ragnarok2.ini` for example like this:

```
[MIDI Control]
# General Purpose controllers
CC7  = 4  # Volume
CC74 = 28 # Filter Cutoff
...
```

The syntax is straight forward:

```
CC<controller number> = <parameter ID>
```

Given the above example, controller 7 directly controls the overall *Volume* parameter, controller 74 the *Filter Cutoff* etc. As you can see, comments are introduced by the Pound sign (#); they are here just for description purposes and completely optional.

The *parameter ID* of one of *Ragnarök*'s parameters is given in the section *Parameter List* below. Note that the *controller number* can run from 0 to 119, with the exception of 1 (*Modulation Wheel*) and 64 (*Sustain Pedal*); the latter two are simply ignored.

MIDI Learn

The easiest way to (re)assign MIDI controllers to *Ragnarök's* parameters is to use the *MIDI Learn* function. To activate MIDI Learn, click on the LEARN button and wiggle both the MIDI controller and the *Ragnarök's* parameter that you want to link. If you want to unlearn the assignment, right-click the LEARN button (the label now reads "UNLEARN") and activate it. Now wiggle the MIDI controller or the parameter that you want to unlearn.

Parameter List

Ragnarök Version 1 Parameters

ID	Parameter	ID	Parameter
0	Polyphony	30	Filter Envelope amount
1	Portamento	31	Filter LFO amount
2	Legato (Portamento)	32	Filter Key track
3	Pitch Bend Range	33	LFO Rate
4	Volume	34	LFO Ramp time (delay)
5	Master Tune	35	Envelope Trigger mode
6	Spread/detune	36	Envelope Trigger length
7	Interval Tune	37	Envelope Re-trigger on/off
8	Vibrato amount (LFO → Pitch)	38	Filter Envelope mode (AD/ADSR)
9	Square 16 on/off	39	Filter Envelope attack (time)
10	Square 8 on/off	40	Filter Envelope decay (time)
11	Square 4 on/off	41	Filter Envelope sustain (level)
12	Square 2 on/off	42	Filter Envelope release (time)
13	Pulse 16 on/off	43	Amp Envelope mode (AD/ADSR)
14	Pulse 8 on/off	44	Amp Envelope attack (time)
15	Pulse 4 on/off	45	Amp Envelope decay (time)
16	Pulse 2 on/off	46	Amp Envelope sustain (level)
17	Interval 16 on/off	47	Amp Envelope release (time)
18	Interval 8 on/off	48	Overdrive
19	Interval 4 on/off	49	EQ1 Gain
20	Interval 2 on/off	50	EQ2 Gain
21	Multivoice 16 on/off	51	EQ3 Gain
22	Multivoice 8 on/off	52	EQ4 Gain
23	Multivoice 4 on/off	53	EQ5 Gain
24	Multivoice 2 on/off	54	EQ6 Gain
25	Osc/Noise mix	55	EQ7 Gain
26	Filter Mode	56	Sync-to-host Rate
27	Filter Poles	57	Mod-wheel to Pitch modulation (Osc)
28	Filter Cutoff	58	Mod-wheel to Filter LFO modulation
29	Filter Resonance	59	Mod-wheel to Filter cutoff

New Version 2 Parameters

ID	Parameter	ID	Parameter
60	Sawtooth 16 on/off	70	Velocity to Filter Envelope Attack
61	Sawtooth 8 on/off	71	Oscillator LFO waveform
62	Sawtooth 4 on/off	72	Filter LFO waveform
63	Sawtooth 2 on/off	73	Chorus dry-wet mix
64	Oscillator Hard Sync	74	Chorus type
65	Oscillator FM Envelope amount	75	Stereo imaging amount
66	Velocity to Filter Cutoff amount	76	Rate of first Chorus LFO
67	Velocity to Amp Envelope amount	77	Rate of second Chorus LFO
68	Velocity to Amp Envelope Attack	78	Intensity of Chorus modulation
69	Velocity to Filter Envelope amount		

Frequently Asked Questions

How do I install Ragnarök 2 *(Windows VST2 32 bit version)?*

Copy the files `ragnarok2.dll` from the ZIP archive you have downloaded to your system's or favorite DAW's VST2 plug-in folder. Your DAW should automatically register the *Ragnarök 2* VST2 plug-in the next time you start it.

How do I install Ragnarök 2 *(Windows VST2 64 bit version)?*

Copy the file `ragnarok264.dll` from the ZIP archive you have downloaded to your system's or favorite DAW's VST2 plug-in folder. Your DAW should automatically register the *Ragnarök 2* VST2 plug-in the next time you start it.

Note: You may have to remove any existing (32 bit) `ragnarok2.dll` from your VST2 plug-in folder or else your DAW may screw the versions up…

How do I install Ragnarök 2 *(Windows CLAP 32/64bit version)?*

Copy the file `ragnarok232.clap` (32 bit) or `ragnarok264.clap` (64 bit) from the ZIP archive you have downloaded to the `C:\Program Files\Common Files\CLAP` folder. If your DAW supports the CLAP format, it will automatically register the *Ragnarök 2* CLAP plug-in the next time you start it.

How do I install Ragnarök 2 *(Windows VST3 64 bit version)?*

Copy the file `ragnarok2.vst3` from the ZIP archive you have downloaded to your system's or favorite DAW's VST3 plug-in folder. Your DAW should automatically register the *Ragnarök 2* VST3 plug-in the next time you start it.

How do I install Ragnarök 2 *(Windows AAX 64 bit version)?*

Copy the file `ragnarok2_AAX_installer.exe` from the ZIP archive you have downloaded to any of your system's folder and run it. Your AAX-enabled DAW (Pro Tools etc.) should automatically register the *Ragnarök 2* AAX plug-in the next time you start it.

How do I install Ragnarök 2 *(Mac)?*

Locate the downloaded PKG package file in Finder (!) and do a right- or control-click on it. In the context menu, click on "Open". You will be asked if you really want to install the package because it comes from an "unidentified developer" (me ☺). Click "OK" and follow the installation instructions.

What is the plug-in ID of the Ragnarök 2*?*

The ID is **`R a g 2`** .