Documentation

RANDOM
CHOPPER

v1.0.0

Modulator
Rhythmizer
Distorter

Created by

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VST3®

VST COMPATIBLE

Contents

1 Introduction

Random Chopper is a modulation effect that processes the gain of the input signal using an adjustable modulation curve. As core feature, Random Chopper offers different options to randomize that modulation curve.

Due to the wide range of modulation speed, many options to define the shape of the modulation curve, a lot of advanced settings and not at least because of the randomization options, Random Chopper is not only a simple chopper plugin, but can also be a tremolo effect, a rhythmizer, a distorter, a glitching effect and more.

The original idea for Random Chopper occurred in 2016 due to my practice as music and audio producer. I was looking for an effect that allows really randomized modulation, but could not find one. Thus, I programmed a simple plugin within a month. After using that plugin for nearly two years, in early 2018, I began to work on an improved version of that plugin with a reworked concept. Mid 2019, that new version of Random Chopper was finally released.

2 Parameters

2.1   Modulation Curve Settings

The modulation curve by which the gain of the input signal is modulated consists of a succession of individual cycles. The length of a cycle is determined by the *speed* parameter. Each cycle is divided into an on-part and an off-part. During the on-part, the signal is returned at full gain. During the off-part, the signal is muted or lowered by the amount defined by the *depth* parameter.
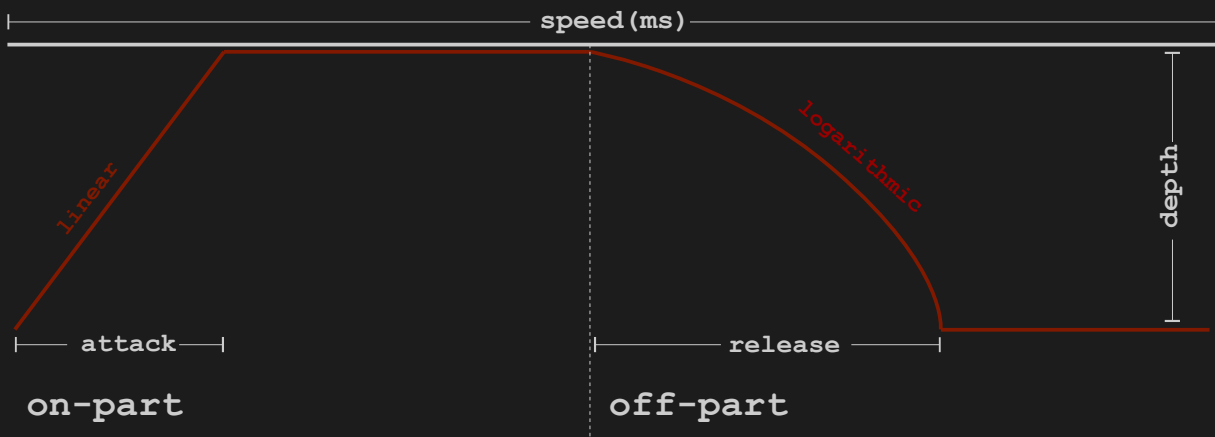
2.1.1   Speed Configuration

The **speed knob** allows you to set the modulation *speed*, i.e. the length of a cycle. The *speed* value is displayed in Hertz (hz), beats per minute (bpm) and milliseconds (ms). You can double-click on the value displays to enter accurate values.

Enable the **musical** option to set the modulation *speed* to note values relative to your host's tempo. **Note**: This will not yet sync the modulation curve to your host. Use this setting in combination with synced launches (see Launch Settings) to sync the modulation curve.

Use the **speed randomization** scale to set the amount of randomization applied to the modulation *speed*. The amount of speed randomization also depends on the setting of the master randomization scale.

speed randomization example
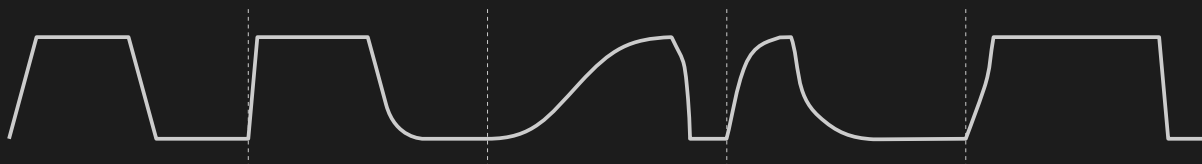
2.1.2   Shape Configuration

The settings on the shape panel allow you to configure the shape of the modulation curve.

- The **attack knob** allows you to set the *attack* of the modulation curve. This is the time needed to arrive at full gain (see the illustration above). For example, an *attack* of 50 means that the modulation curve arrives at full gain at half of the on-part, an *attack* of 100 means that the modulation curve arrives at full gain at the end of the on-part. With an *attack* of 0, full gain is reached immediately at the beginning of the on-part, resulting in an abrupt, square-like attack.

- Similarly, the **release knob** sets the *release* of the modulation curve which is the time needed to reach the minimum gain, in relation to the length of the off-part.

- The **relation knob** allows you to set the length *relation* between on-part and off-part. A *relation* of 0 means that the on-part is as long as the off-part. Turning the knob left (negative values) will make the off-part gradually longer than the on-part, turning the knob right (positive values) will make the on-part gradually longer than the off-part. A *relation* of -100 means that there is no on-part at all, while a *relation* of 100 will eliminate the off-part.

- The shape of the *attack* and *release* are set using the **attack shape** and **release shape** controls. Choose continuously between linear, logarithmic, sinusoidal and exponential *attack/release.*

- With the **stairs knob**, you can transform the modulation curve into a number of single quantized steps, resulting in a stair-like appearance. The value of the stairs knob corresponds to the number of steps.

The parameters explained above are designed to create customized shapes for the modulation curve. For quick access to common shapes, use the **shape selector** which will automatically set the parameters to the right values for sinus, triangle, square, saw up, saw down, stairs up, stairs down or stairs in both directions.

Use the **shape randomization** scale to set the amount of randomization applied to the shape parameters. Randomization applies only to parameters that have been enabled for randomization with the checkbox next to each parameter control. The amount of shape randomization also depends on the setting of the master randomization scale.

shape randomization example

2.1.3   Depth Configuration

The **depth knob** sets the *depth* of the modulation
curve, i.e. how much the signal is reduced during
the off-part. A depth of 100 will mute the signal
during the off-part, a depth of 0 will return the
signal at full gain.

The **depth randomization** scale sets the amount of
randomization applied to *depth*. The amount of depth
randomization also depends on the setting of the
master randomization scale.

depth randomization example

2.1.4   Master Randomization Scale

The **master randomization** scale is used to modify the amount of
randomization for *speed*, *shape,* and *depth* all at the same time. The
total amount of randomization is calculated by multiplying the value of
the master randomization scale with the value of the relevant parameter
randomization scale.
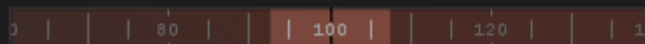
The total amount of randomization is limited to 100%. If the total
amount of randomization is set to a value higher than 100%, this will
not generate higher random numbers, but instead change the distribution
of the random numbers, making high random numbers more likely.

For speed, a randomization value of 100% means that 100% or less of the
original value may be added to or subtracted from the original value,
with regard to the length. If speed is set to 100 ms and randomized
with a randomization value of 100%, the actual speed value will range
between 0 and 200 ms. If speed is set to 100 ms and randomized with
50%, the actual speed value will range between 25 and 75 ms.

For all other modulation parameters, a randomization value of 100%
means that a parameter may be randomized to any possible value. Smaller
randomization values make the randomized parameter values stay closer
to the original value. If a parameter that ranges from 0 to 100 is set
to 50 and randomized with a randomization value of 50%, the actual
values will range between 25 and 75.

2.2   Advanced Settings

2.2.1   Launch Settings

The launch settings are used to tell Random
Chopper when to perform a launch of the modulation
curve. When a launch is performed, the modulation
curve is broken and reset to its *launch position*
(for both channels and all instances, see Multi
Settings). If you are using a sequence for the
generation of random numbers (see Seed Settings),
the sequence is also reset to its beginning.

A launch is indicated by the small light on the launch panel and, if
enabled, by a gray line in the modulation curve display.

Use the **position button** (B/A on the picture) to define the *launch
positio*n. Available options are: beginning of attack (B/A), end of
attack (E/A), beginning of release (B/R), end of release (E/R).

The **sync setting** will trigger launches at musical positions of your
project. This setting is useful if you like to have synced elements
within a randomized modulation curve. If you do not use randomization
and want to sync a modulation curve with musical modulation *speed* to
your host, you can set the sync setting to the same value as *speed.*

The **silence setting** will trigger a launch whenever the input level
falls below the defined threshold. Watch the input meter to find the
right setting.

The **peak setting** will trigger a launch whenever the input signal
exceeds the defined threshold. Watch the input meter to find the right
setting.

Use the **man button** to trigger a launch manually. You can automate the
button to insert manual launches at any position of your project.

2.2.2   Seed Settings

With the beginning of each cycle, random numbers
for the randomization of the modulation parameters
are generated. For the generation of these random
numbers, Random Chopper requires a seed. On the
seed panel, you can choose from three different
seeds. If you choose more than one seed, the
generated random numbers are combined. Choosing no
seed will disable randomization.

The **signal seed** generates random numbers based on the input signal.
There are three modes available for the signal seed:

- **Loosen** generates higher random numbers at lower input signal gain.
  Using this mode, you can for example heavily randomize the
  modulation curve during the reverberation of a sound, while during
  the direct sound, there is less randomization.

- **Stabilize** does the opposite and generates higher random numbers at higher input signal gain.

- **Constant** disables any influence of the input signal's gain on the size of the random numbers.

The **time seed** generates random numbers based on the position of the playback cursor. Thus, with the same algorithm selected, the time seed always generates the same random numbers at the same position. The randomization will be the same every time you listen to or render your project. You can also use a time seed if you want to sync two or more instances of Random Chopper, for example to randomize one track in the same way as another. The three algorithms do not differ in their characteristics but are useful if you want to have further instances of Random Chopper that are not in sync with the others.

The **sequence seed** takes random numbers from a predefined sequence. You can choose between 50 different sequences. The sequence seed can be used to create an arrhythmic, randomized pattern that is repeated using synced launches (see Launch Settings). This is what the pattern random preset does.

The **mono/stereo button** determines whether both the left and the right channel use the same random numbers or individual random numbers are generated for each channel.

2.2.3 Multi Settings

The multi settings allow you to combine up to five single modulation curves (instances) into one resulting, more complex, curve. Each of these single curves has a different modulation *speed* that is proportionate to the modulation *speed* of Instance I, which is the speed set with the speed knob. The shape and depth settings are shared among all curves.

A graphical example with three instances:

Even though all instances have the same base values for shape and depth, the modulation parameters are randomized independently for each instance. Thus, the actual values for shape and depth may differ due to randomization.

The i**nstances knob** defines how many instances (single curves) are used. Setting instances to 1 will virtually disable the multi feature.

The **variation knob** defines the proportion between the modulation speed of Instance I and the other instances. The speed of an instance calculated by multiplying the speed of the previous instance with the *variation* factor.

- An example: setting *variation* to 2 will always double the modulation *speed* of the next instance (as seen in the example above). Assumed that the modulation *speed* of instance I is 10hz, the modulation *speed* of the instances II, III, IV, and V would be 20hz, 40hz, 80hz and 160hz.

- Use round *variation* values like 2, 3, 4 and 5 for musical rhythms, use odd values for arrhythmic modulation curves.

- When *variation* is set to 1, all instances use the same base value for *speed.* The actual modulation *speed* of the instances may still differ due to randomization.

The **weighting knob** defines how much the single modulation curves affect the resulting curve. Turning the knob left (negative values) gives more weight to Instance I, turning the knob right (positive values) gives more weight to the higher instances.

Clicking on the settings button, you find further settings for each instance. The value in the middle of the table (x) allows you to set an additional factor for the speed relation of an instance. The resulting speed relation is shown by the value on the left. The value on the right (%) allows you to add an individual offset for an instance relative to its cycle length.

2.2.4   Post Settings

The **smoothing** algorithm smooths the modulation curve by removing abrupt changes. Thereby, the smoothing algorithm can remove clicking noises that occur due to your shape settings or due to randomization. The smoothing algorithm does not affect clicking noises that are inherently part of the input signal.

HP and **LP** are highpass and lowpass filters. They apply after the mix and output faders and thus affect the wet signal as well as the dry.

The **Limiter** applies after the mix and output faders, too. You can use it to tame strongly varying signals. When the threshold is set to a low value, you can also use the limiter as distortion effect, especially when you raise the output level.

3 Parameter Controls

Knobs, faders, scales, and buttons are all handled using the mouse. While the right mouse button is usually reserved by the DAW and opens a context menu for the parameter, the left mouse button is used to set the value of the parameter.

To change the value of a parameter, click on a control and drag the mouse. Hold CTRL for fine adjustment. Hold SHIFT for stepped adjustment.

Double-click on a control to set the parameter to the default value. Double-click while holding SHIFT to set it to a random value. Double-clicking while holding CTRL opens the value input box.

Hold ALT while clicking on a parameter control to lock or unlock it. Locked parameters will not be altered by random presets (see Presets and Random Presets). Parameters that are principally not affected by Random Presets cannot be locked.

4 Meters and Displays

4.1.1   Modulation Curve Display

The modulation curve display outlines (roughly) the gain modulation curve for the left channel (top) and the right channel (bottom) and indicates launches (see Launch Settings). Click on the display to set how many cycles are displayed and to show or hide launches. You can choose to align the modulation curve display to synced launches instead of cycles. This option will only take effect if synced launches are enabled.

4.1.2   Random Display

The random display graphically represents the generated random numbers, from left to right for *speed*, *attack*, *relation*, *release*, *attack-shape*, *stairs*, *release-shape* and *depth* (instance I and left channel only).

The gray bars represent the raw random numbers generated by the random seed, the red bars random numbers as modified by the randomization scales. Click on the display to open the menu and to show or hide the gray and red bars independently.

4.1.3   Random Visualization

Starting from the seed panel, the generation, modification, and distribution of the random numbers are visualized. You can change the mode of the visualization via the random display menu (click on the random display). Choose from

- **dynamic**, showing the actual amount of randomization for each cycle,

- **static**, showing an estimated average value of randomization (use this, if you are disturbed by the flashing),

- **off**, to disable the visualization.

5 Program Functions

5.1   Top Bar
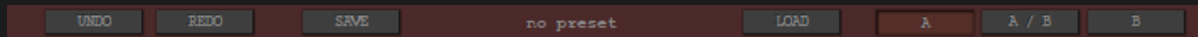
Use the u**ndo** button to undo the last action. The undo history is limited to 10 steps. Use the r**edo** button to redo the last (previously undone) action. Note that the redo history gets lost when you change a parameter.

The buttons s**ave** and l**oad** are for presets(see Presets).

The buttons **A** and **B** hold two independent sets of parameter settings with a separate undo history. Use them, if you like to compare different configurations. If you want to compare more than two configurations, you can use local presets.

The **A / B** button offers the following options:

- **Copy A to B** copies the parameter settings of A to B. The original settings of B are overwritten. They can be restored using the undo button.

- **Copy B to A c**opies the parameter settings of B to A. The original settings of A are overwritten. They can be restored using the undo button.

- **Switch A and B:** Moves the settings of A to B and moves the settings of B to A. Both configurations are maintained but are found under the other letter now.

- **Average to A:** Writes the average of the parameter settings of A and B to A. The original settings of A are overwritten. They can be restored using the undo button.

- **Average to B:** Writes the average of the parameter settings of A and B to B. The original settings of B are overwritten. They can be restored using the undo button.

5.2   Simple and Advanced View

Random Chopper allows you to choose between a simple view which shows only the modulation curve settings and an advanced view that also shows the advanced settings. You can toggle the view mode by clicking on the gray arrow below the input and output meters.

Note: Changing the view does not affect the signal processing. The advanced settings still apply when they are hidden and are also still affected by presets and random presets.

5.3   Info Menu

Click on the Random Chopper logo to open the info menu. The info menu contains the plugin version, copyright notice, license information, and access buttons for the **website** and this documentation (**manual**).

5.3.1   Default Settings

The **defaults** button, which is also found in the info menu, allows you to define default settings for new instances of Random Chopper added to your project:

- The **Advanced Settings** button toggles whether advanced settings are shown or hidden.

- The **Tooltips** button enables or disables tooltips.

- **Scaling** is the default setting for how many cycles are displayed in the modulation curve display (see Modulation Curve Display).

- **Launches** toggles the indication of launches in the modulation curve display (see Modulation Curve Display).

- **Align to sync** toggles whether to modulation curve display is aligned to synced launches (see Modulation Curve Display).

- **Bars** allows you to choose which bars are display in the random display (see Random Display).

- The **Visualization** button allows you to choose the visualization mode for new instances (see Random Visualization).

6 Presets and Random Presets

Random Chopper provides two different types of presets, presets (usual presets) that load a set of previously saved parameter settings, and random presets that set parameter settings including a random factor.

6.1 Presets

Save the current parameter settings to a preset using the **save button** in the top bar. Presets can be saved local, project-intern or global:

- Local presets are available only for the current instance of Random Chopper. Use local presets to save settings that you would possibly like to return to later but that have not much use in other situations.

- Project presets are available for all instances of Random Chopper within the current project. A project preset is what you need when you like to copy settings from one instance of Random Chopper to another. Note: Project presets are lost once you remove the last instance of Random Chopper from the project.

- Global presets are available globally, i.e. for all instances of Random Chopper in all projects no matter which DAW you are using.

- If you find afterward that, for example, a local preset should be available globally, you can do this by simply loading this preset and re-saving it as a global preset.

Load saved presets using the **load button**. The drop-down list shows local presets first, project presets up next and global presets at the end.

Local presets and projects presets are both limited to 10 slots. Delete a local or project preset by holding CTRL while choosing that preset from the preset list (load button). Global presets are unlimited in their quantity and can be deleted by removing the relevant preset file from:

    C:\Users\YourName\Documents\PZAudio\RandomChopper

6.2 Random Presets

Random presets are loaded using the buttons above the speed panel. Since random presets involve a random factor, a random preset will generate different parameter settings every time you load it. Load a random preset as long as you find some good settings, use undo to return to previously generated settings.

You can lock a parameter to protect it from change through a random preset by clicking on it while holding ALT (see Parameter Controls). A locked parameter is shown transparent while loading a random preset.

The following parameters are generally not affected by random presets:

- silence and peak

- settings in the multi setting menu (relations and offsets)

- settings on the post panel

- mix and output

There is space for up to eight additional random presets above the depth panel. Additional random presets can be coded or received from other users of Random Chopper. Random presets need to be installed into the following folder:

    C:\Users\YourName\Documents\PZAudio\RandomChopper

Random Chopper shows random presets in alphabetical order in regard to the filename. To sort your random presets, you can rename your preset files and add indexes, for example:

01FirstRandomPreset.rpreset
02AnotherRandomPreset.rpreset
03SelfCodedPreset.rpreset

6.2.1 Coding Random Presets

Random presets are simple text files in .ini-format with the ending .rpreset. Every random preset file starts with a header-section, for example:

```
[header]
name=DUMMY
fullname=DUMMY PRESET 1
desc=This is a dummy preset
creator=Dummy user
```

name is the name of the preset shown on the preset button, while fullname is the name shown in the tooltip. desc and creator allow you to add further information about the preset that is also shown in the tooltip.

The settings for the parameters launch position, mono/stereo, signal-seed, time-seed, and sequence-seed are done in the no_range-section, for example:

```
[no_range]
launch_pos=0
mono_stereo=rand
seed_signal=0
seed_time=rand
seed_sequence=30
```

A value of 0 means that the feature is turned off. Defining a value higher than 0 will make the preset always use this value (1 stands for turned on for shape invert and mono/stereo). The keyword rand will make the preset choose a random value for the parameter, including the option that it is turned off. Setting no value will not change the parameter and keep the previous settings.

Settings for the other parameters are done in separate sections. In each of these sections, you can define the values fixed, full, min and max. When fixed is set, the random preset will set the parameter <u>always</u> to this value, regardless of whether full, min or max are set. The following code defines a fixed *speed* of 20hz for the random preset.

```
[speed]
fixed=20
```

Unless fixed is set, setting full to 1 will make the preset choose a random value for the parameter out of all possible values. The following code will set *speed* to a random value between 0.1 and 100 every time the preset is loaded.

```
[speed]
full=1
```

Unless fixed or full are set, min and max define the range within which random values for the parameter are chosen. In case you define only min, max is the highest possible value for the parameter and vice versa. The following example will set *speed* to a random value between 10 and 20 every time the preset is loaded:

```
[speed]
min=10
max=20
```

while the following sets *speed* to a value between 10 and 100:

```
[speed]
min=10
```

and the following sets *speed* to a value between 0.1 and 20:

```
[speed]
max=20
```

If none of fixed, full, min and max is set, or if the section for a parameter does not appear at all, the random preset will not change this parameter and keep the previous setting.

Additionally to fixed, full, min and max, in the sections for the shape-parameters, you can set a value for rand to define how the preset handles the randomization of this parameter (whether the checkbox is checked or not), for example:

```
[attack]
rand=1
```

A value of 1 means that the parameter is always randomized in the preset while 0 will turn randomization off. Setting rand to rand (rand=rand) makes the preset choose randomly whether the parameter is randomized or not every time it is loaded.

The following table shows all parameters that can be set by random presets, the name of corresponding section in the random preset file and the range of these parameters.

| Parameter	Section	Range		Comment
speed	speed	0.1	100	in hz, allows decimal numbers.
speed randomization	speedrand	0	100	
attack	attack	0	100	has rand value
release	release	0	100	has rand value
attack shape	attackshape	0	100	0: lin | 25: log | 50: sin | 75: exp; has rand value
release shape	releaseshape	0	100	0: lin | 25: log | 50: sin | 75: exp; has rand
relation	relation	-100	100	has rand value
stairs	stairs	1	12	has rand value
shape randomization	shaperand	0	100	
depth	depth	0	100	
depth randomization	depthrand	0	100	
instances	instances	1	5	
variation	variation	0.5	5	
weighting	weighting	-100	100	
launch (sync)	launchsync	0	22	0: off | 1-4: 4 Bars to 1 Bar | 5-10: $^1/_2$ to $^1/_{64}$, | 11-16: $^1/_2$ to $^1/_{64}$ triplets | 17-22: $^1/_2$ to $^1/_{64}$ dotted.
master randomization	rand	0	200	

7 Installation and Activation

To install Random Chopper, launch the installer executable and follow the instructions on the screen. You can choose in which plugin formats you want to install Random Chopper (currently only VST3).

Run the installer again to repair or change your installation or to uninstall Random Chopper.

The installer will detect automatically when you are updating from a previous version of Random Chopper.

If you did not activate Random Chopper during the installation, you can activate it afterward. To do so, you have to put your key file (called RandomChopper.keyfile) either on your desktop or into C:\Users\YourName\Documents\PZAudio\RandomChopper.

Then, open an instance of Random Chopper and click on the logo to open the info menu. Click on the check button. Random Chopper should be activated now. After the successful activation, you can remove the key file from its folder. It is recommended to keep a backup anywhere on your computer though.
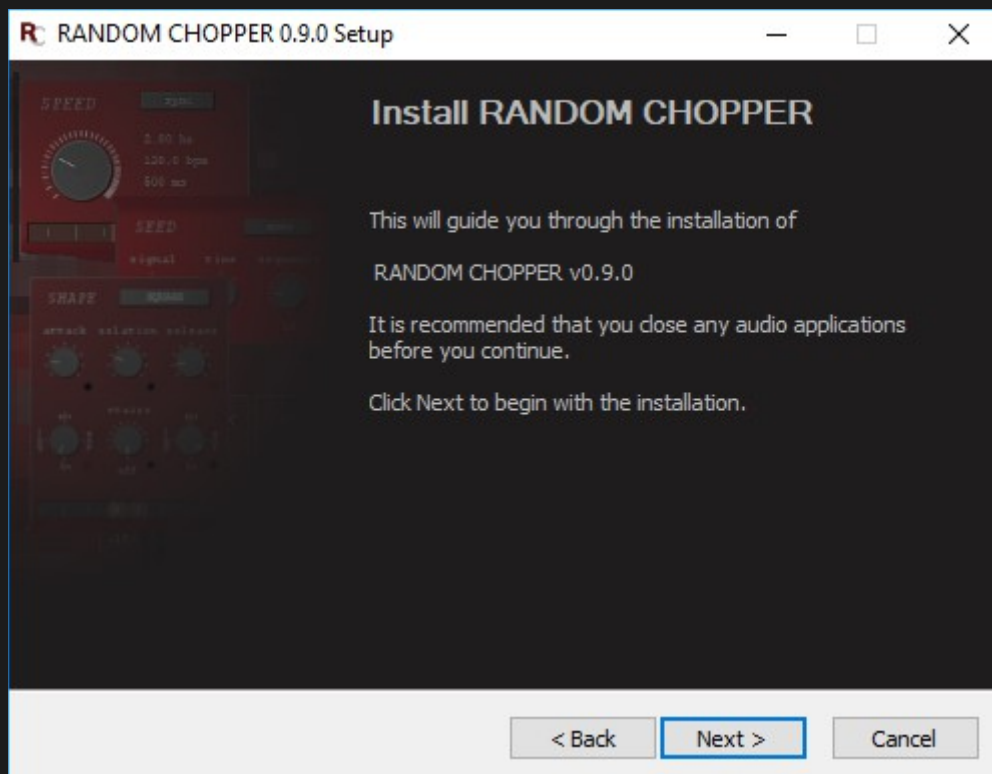
8 Version History

- 1.0.0

9 Known Issues

- The sync function of the launch section works well with meter changes when set to 1 bar or faster, but may introduce some undesired offset (of full bars) after a meter change when set to 2 bars or slower. Since there is currently no fix for this misbehavior, it is recommended not to use synced launches with a setting of 2 bars or slower if your project has meter changes, but instead to set the launches manually.

10 Acknowledgments

Random Chopper was created using Oli Larkins WDL-OL (https://github.com/olilarkin/wdl-ol)

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11 End User License Agreement

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