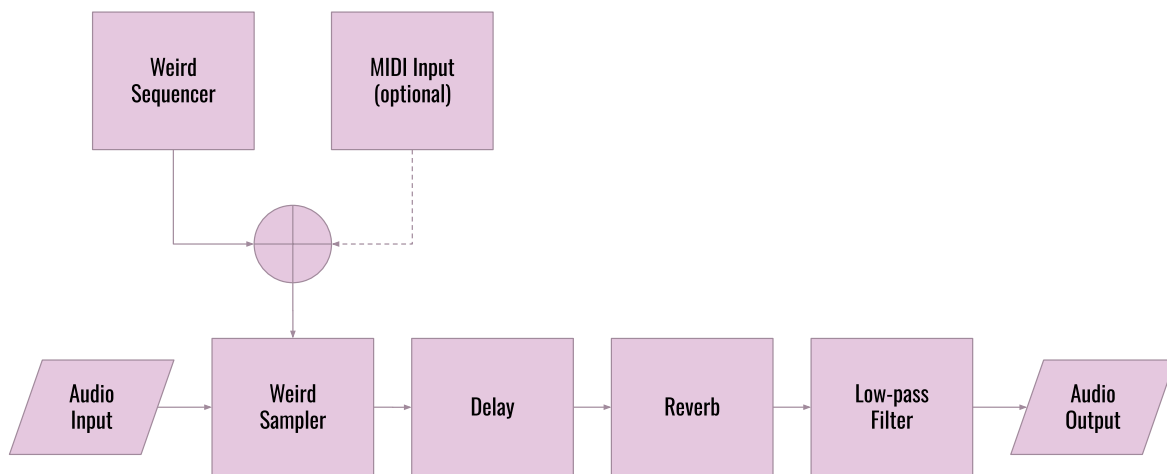


REFRACTIONS

USER GUIDE

REFRACTIONS is a unique audio effect that allows you to sequence live audio. It consists of several components: a sampler, a sequencer, and several end-of-chain effects (delay, reverb, and a low-pass filter).



The sampler is always listening, taking in fresh audio and storing it in memory. The sequencer is also always running, playing back loops of notes that you specify. When a note is played on the sequencer, the last second or two of sound is played back at the correct pitch. This means that all audio from REFRACTIONS will have some delay—exactly how much delay there is will be determined by the GRAIN SIZE knob (discussed below).

SYSTEM REQUIREMENTS

Mac Version

The Mac version requires macOS 10.13 or later. Mac versions exist for the following plug-in formats: **VST**, **VST3**, **AAX**, **AudioUnit**, and **Standalone**.

PC Version

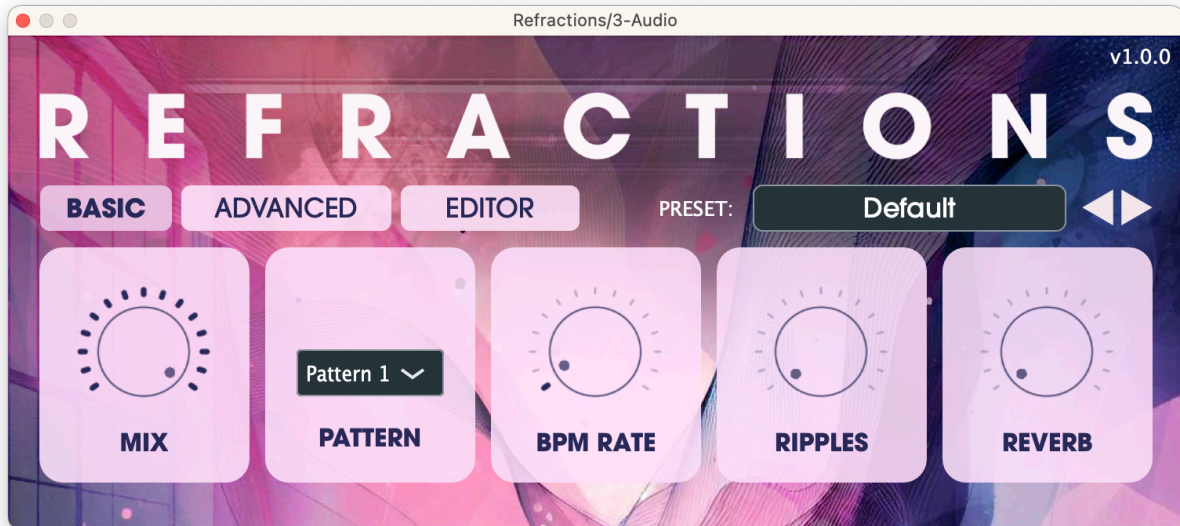
The PC version requires Windows 7 or later: 32-bit or 64-bit. Windows versions exist for the following plug-in formats: **VST**, **VST3**, **AAX**, and **Standalone**.

CONTROLS

The user interface is made up of three views: **Basic**, **Advanced**, and **Editor**.

The “Basic” & “Advanced” Tabs

When you first launch the plug-in, you will be presented with **Basic** view:



The **Advanced** tab contains all the knobs on the **Basic** tab, plus many more:



Here is what each of these controls do:

Mix

The Mix knob lets you control the levels of both the dry (source) and wet signal. When the knob is set to 0, you will just hear the source signal. When the knob is set to 0.5, you will hear the same amount of dry signal and wet signal. When the knob is set to 1.0, you will only hear the wet signal.

Note Shape

This controls the shape of each note. When the knob is at 0, each note will start and stop immediately. When the knob is at 0.5, the notes start immediately, but have a very long release time. When the knob is at 1.0, the notes have a very long attack time and a very long release time.

Grain Size

In REFRACTIONS, each note is made up of sound that was sampled from the input. The grain size controls how much data each note is made of. Consequently, it also controls how far back in “audio history” the sampler pulls from. Rather than being measured in seconds, this control is measured in sixteenth notes relative to the BPM of the sequencer. If you set the grain size to its maximum, a value of 2.0, each note will consist of a looping chunk of audio that lasts two sixteenth notes (one eighth note). By the way, this also means that the perceived delay of the entire effect will also be one eighth note.

As you lower this value, the chunks will get shorter and shorter and will be made up of more and more recent data. As the chunks get really short, the audio will start to sound robotic and, if you set the knob all the way to its minimum, the chunk of audio will be so short that the source material’s original pitch will be completely obscured.

Pattern

Pattern lets you choose from a variety of pre-saved patterns. It’s possible to add new saved patterns to REFRACTIONS using the editor tab. NOTE: If the current pattern has been modified, then the pattern listed on the Pattern control will not match what is currently played back. In order to have them match, you will need to save your current pattern in the editor and select that pattern from the Pattern dropdown.

The currently selected pattern can be automated via the DAW. How you do this will depend greatly on which DAW you are using and is beyond the scope of this guide.

There is also the special **MIDI Input** option that lets you supply your own notes to REFRACTIONS. This is a way of achieving things that the sequencer was not designed for, like playing multiple notes at the same time, or playing very long notes.

Playhead

This controls the order that the sequencer notes play back in. Your options are Forward, Reverse, Random (no-repeat), and True Random. Random (no-repeat) is a special version of Random that makes sure it doesn’t play the same step twice in a row.

BPM Rate

Controls the rate of the sequencer in beats per minute. NOTE: If Host Sync is turned on, and the plug-in is being run within a DAW, then this control will not be editable.

Host Sync

Determines whether or not the plug-in will try to receive its tempo and transport settings from the host DAW. When REFRACTIONS is run as a stand-alone application this control does not do anything.

When this is turned on and the plug-in is being run within a DAW, the sequencer will also restart itself when DAW playback starts and we will try to calculate the correct sequence position based on how far into the DAW timeline it is.

Seq(ue)nce Subdiv(ision)

The control determines what musical timing value each note of the sequencer represents. The default is sixteenth notes. If you've got your tempo locked to your DAW, then this is basically the way that you would control the tempo of the sequencer in order to get musically useful results.

Ripples

REFRACTIONS has a delay effect that comes right after the sampler. The **Ripples** knob controls the volume of the delay effect as well as the feedback level.

Delay Rate

This controls the speed of the delay relative to the current BPM. A value of 1.0 means that the delay is equal to the current **Sequence Subdivision** rate.

Delay Spread

The delay effect can be set up so that it widens the stereo field of the incoming signal by setting the delay times for the left and right channels to different values. This knob controls how far offset they are from each other. Most people will want to set this to a very low value. A value of 0.02 means that the left channel will come 0.01 seconds early and the right channel will come 0.01 seconds late so that the two channels are off by 0.02 seconds.

Reverb

Controls the volume of the reverb effect.

Reverb Type

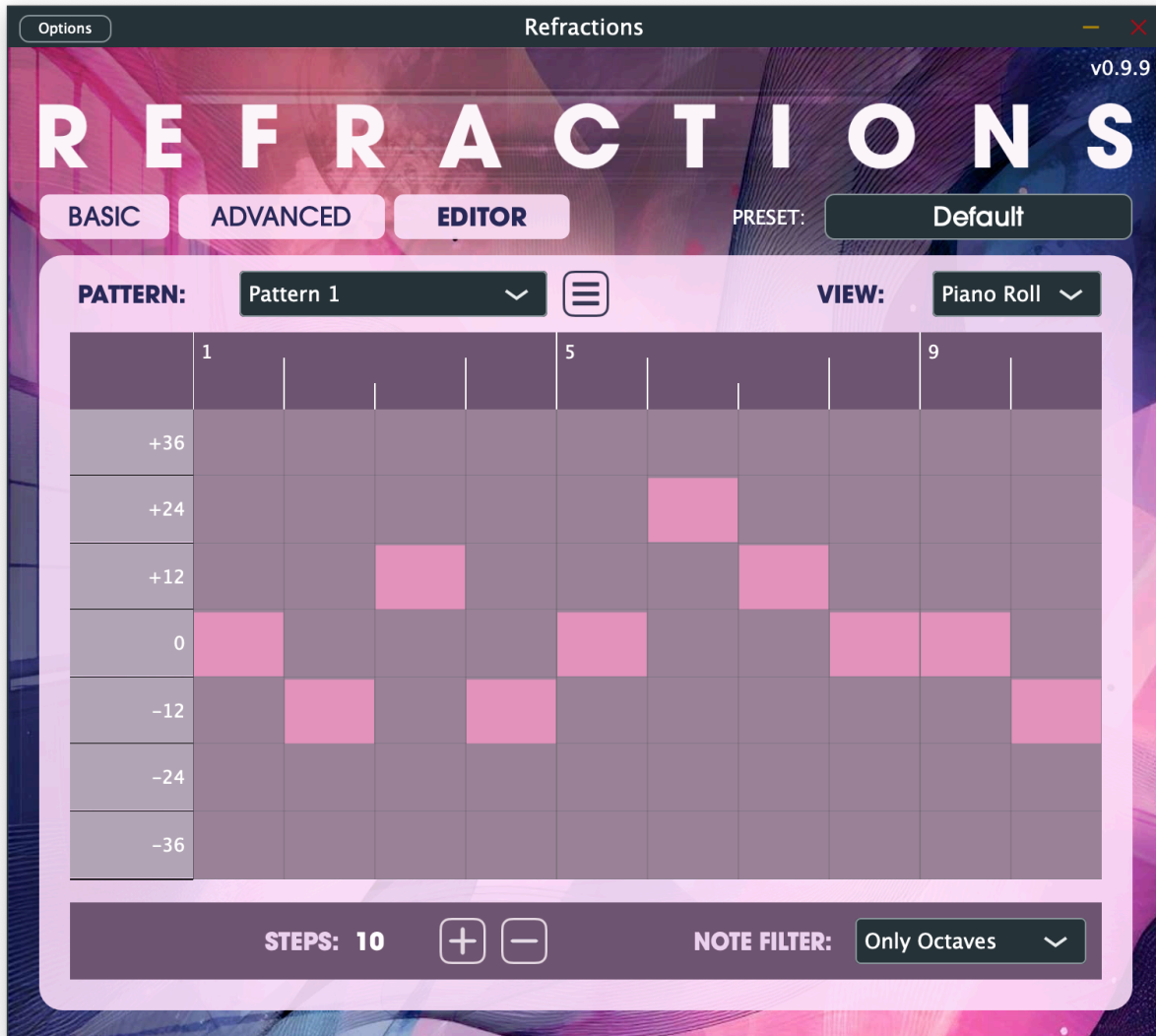
Controls the type and size of the reverb model used.

Lowpass Filter

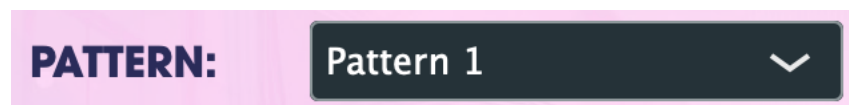
REFRACTIONS has an end-of-chain low-pass filter. This knob controls the frequency for that filter.

EDITOR (SEQUENCER)

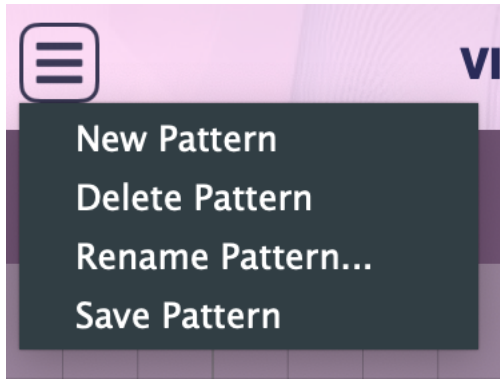
One of the most exciting features of REFRACTIONS is the ability to edit sequences directly. This is accomplished on the **Editor** tab.



At the top of this tab is a selector which lets you choose which pattern is currently loaded:



To the right of that is a menu that lets you save patterns within the pattern menu.

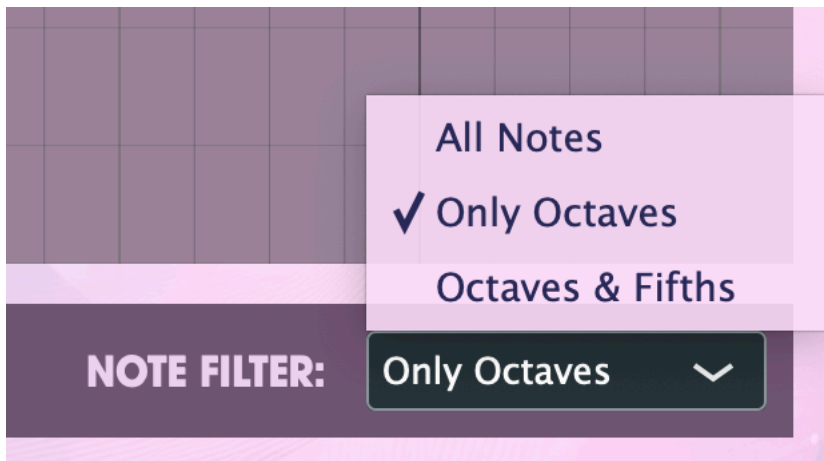


It's worth noting that if you save an overall preset, it will save both the current pattern as well as any knob settings on the **Basic** and **Advanced** tabs. Saving patterns within the pattern menu is mostly useful if you plan to use multiple patterns during a piece of music.

In the top right hand corner of the **Editor** tab you will find the **View** dropdown. This lets you choose how notes are represented. There are two ways of viewing the notes that make up a sequence. The most use view is the piano roll view:

Piano Roll View

In its default configuration, the piano roll view will show only octaves. This is because octaves tend to sound best when you don't know the key of the incoming source material. In order to display all notes, you can use the **Note Filter** dropdown in the bottom right corner of the piano roll window:



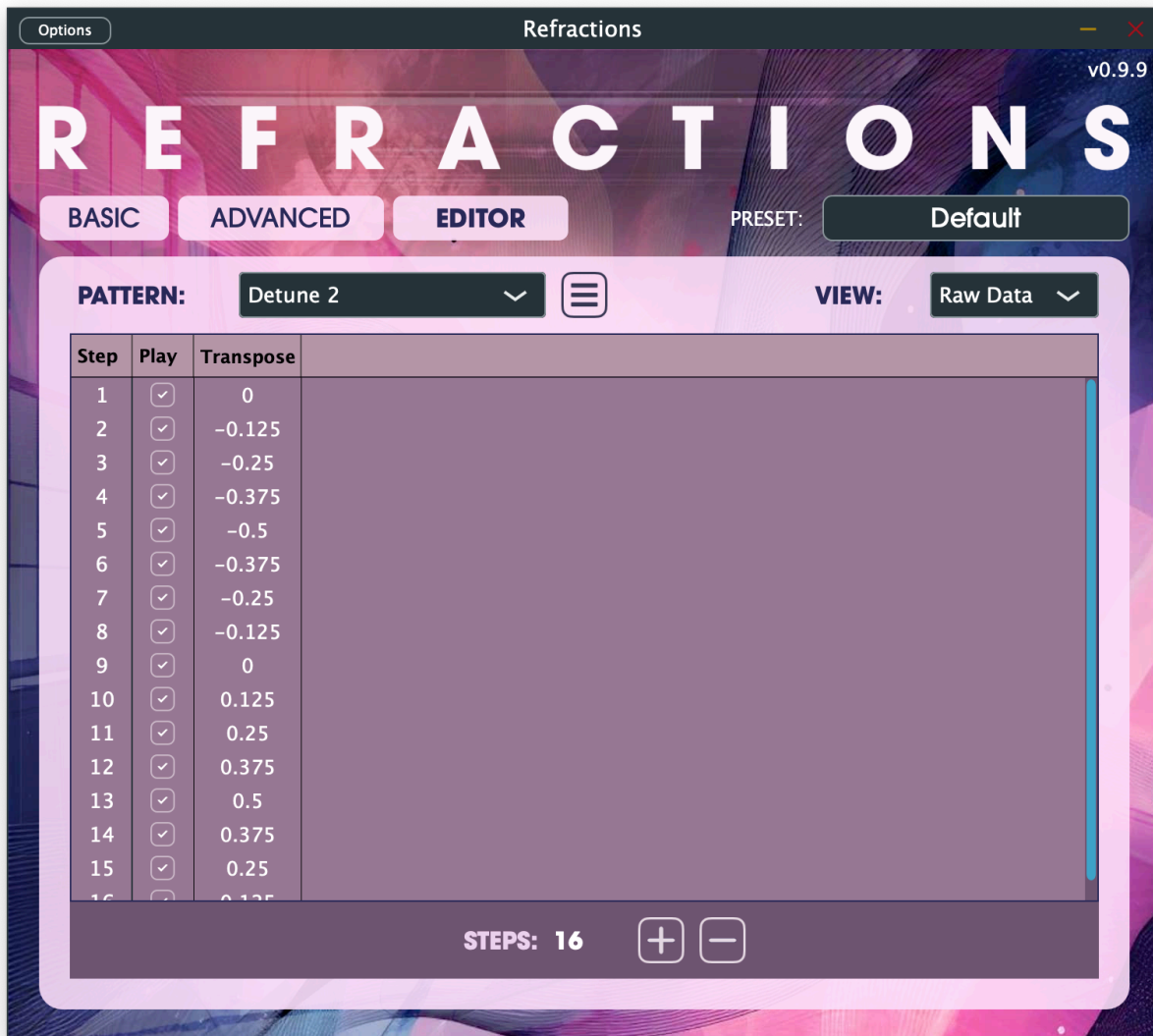
As you can see, it is also offers the possibility of filtering by octaves & fifths, which often yields very nice results.

It's possible to change the number of steps in your sequence by using the steps control at the bottom of your screen:



Raw Data (Grid) View

If you want even more granular control of your sequence, you can switch to **Raw Data (Grid)** View. This allows you to see your sequence as a vertical list. This is especially useful for setting note values that are within the such as those found in the Detune 2 preset:



CONCLUSION

In writing this guide, I've been intentionally vague about how I think you should use the plug-in. The reason for that is simple: I don't want to prejudice you. I myself use it both as a sequencer, as a shimmer effect, and I'm sure there are more uses. This effect arose out of my personal experiments. When I stumbled on something that I just couldn't stop playing with, I knew I had to release it. I hope you enjoy it as much as I have been. – Dave Hilowitz