Neutron Particle Emitter

Creative Rack Extension Effect for Propellerhead Reason

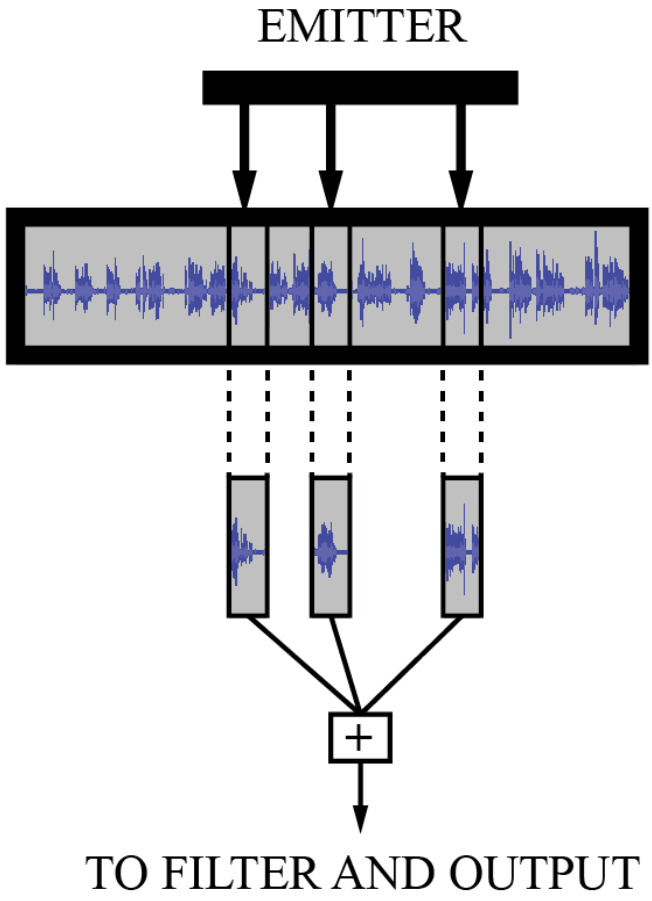
Version 1.1.0

SOUNDLOVE

Overview

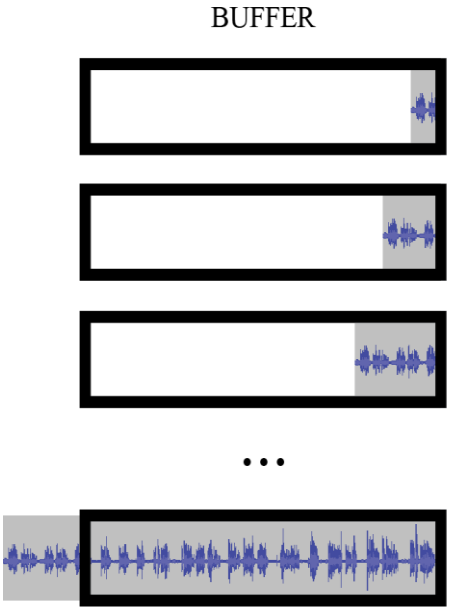
Neutron is a creative effect that brings basic granular synthesis to the Reason rack. Neutron can transform sound into harsh grit, pops, and clicks, and chop sound into small staccato pieces. But it can also blend several seconds of sound into a single continuous, slowly evolving, mushy soundscape. Neutron is capable of creating a huge range of widely different effects that are difficult to achieve with the Legacy devices in Reason, and tweaking its controls often yield surprising and delightful results.

Neutron has two main features: a *sound buffer* and a *particle emitter*. Each particle extracts and shapes a very short piece of audio from the sound buffer. The result is sent through a resonant filter and an amplifier before it is passed on to the audio out sockets.



The Sound Buffer

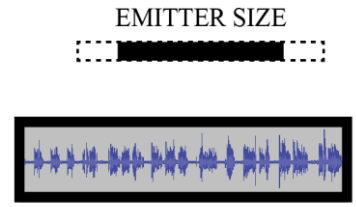
The sound buffer holds eight seconds of audio. Audio samples are "shifted" into the sound buffer from the right. Another way of saying this is that the buffer slides across the audio samples towards the right.



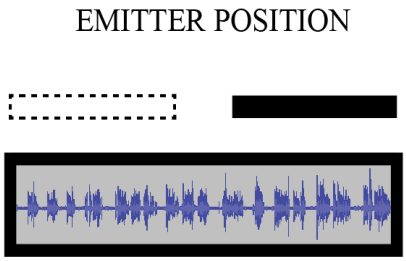
By default, sound is sent to the buffer continuously, just like in an ordinary delay effect. If you flip the *hold* switch, however, the buffer is frozen. The group of amber lights at the lower left front panel provides an overview of the contents of the sound buffer.

The Emitter

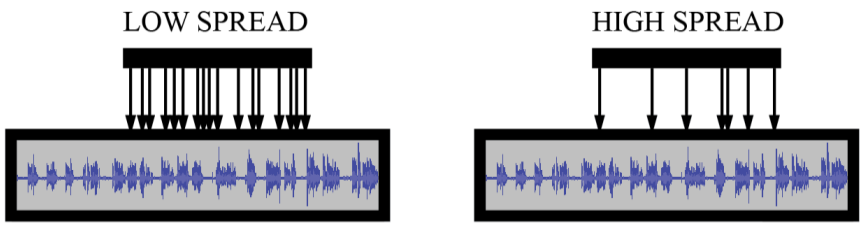
The particle emitter has variable *size* and *position*. These two properties determine where in the sound buffer particles will be created. When the emitter is at its widest size it will create particles that extract bits of sound from across the entire sound buffer, which means that the sound you hear will be pieced together from the last eight seconds of input. When the emitter is at its smallest size, the sound you hear will be extracted from a small piece of the buffer.



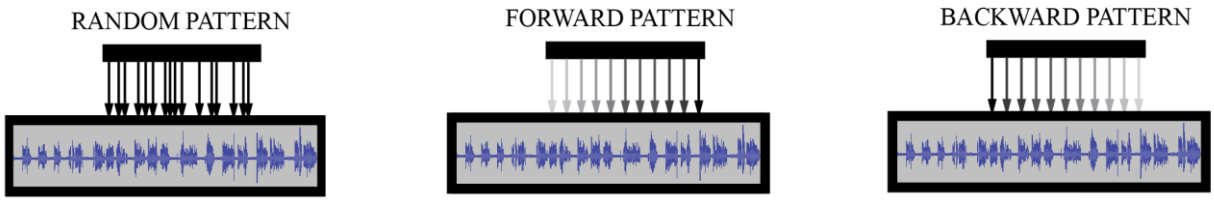
If the position is at the front of the buffer, the particles will extract sound from close to the present. Conversely, when the position is at the back of the buffer, the particles will extract sound from about eight seconds back in time.



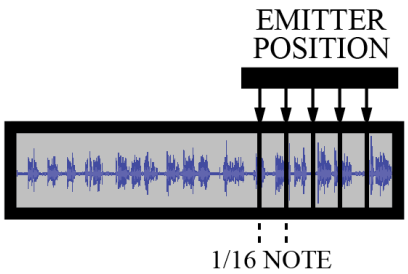
The emitter also has a *spread* property, which controls the rate at which particles are created. When this property is small, the interval between particles is short, which gives the impression of a continuous stream of audio. When the spread is large, the interval between particles is longer, which causes the output to become choppy, with clicks and pops.



The *emission pattern* property gives you more detailed control over where along the emitter's range the particles will be created. When the pattern is set to *random*, each new particle will be created at a random point within the emitter's range. When the pattern is set to *forward* or *backward*, the particles will "sweep" through the emitter's range.



The final emitter property, *sync*, can be used to create effects that are synchronized with the tempo of the incoming sound. When sync is active (non-zero), the position of the particles will be constrained to points in the buffer that are a multiple of Reason's tempo and time signature. If, for example, Neutron's sync knob is set to 1/16, particles will be constrained to intervals of length equal to 1/16th note. The spread and pattern properties of the emitter are not modified by the sync setting.



The group of red lights on the lower left part of the panel provides an overview of where particles are created.

Particles

The particles generated by the emitter can be manipulated by changing their *pitch*, *type*, and *lifetime*.

The pitch property creates pitch shifts of the output sound, either continuous or in semitone steps (+/- one octave). You use the CONT switch to change between continuous and semitone step mode.

The type property selects the amplitude envelope used to extract audio from the sound buffer. Changing the type results in slightly different overtone and noise characteristics.

The lifetime property controls the lifetime of the particles, that is, the length of sound extracted from the buffer by each particle. A long lifetime preserves the most of the sound extracted from the sound buffer, while a short lifetime creates static and crackles.

Filter, Mix, and Gain

The filter is a resonant low-pass filter that you can use to remove high frequencies from the sound extracted by the particles. The filter has two properties: *cutoff frequency* and *resonance*. A high cutoff value will preserve the audio as-is, while a low cutoff value will remove higher frequencies from the audio. The resonance property controls the resonance of the filter; at high values the filter becomes self-resonating.

The *dry/wet mix* knob controls how much of the original input signal that should pass through Neutron. If you set the knob to 100% dry, you will only hear the input signal. Conversely, if you set it to 100% wet, you will only hear the signal as processed by Neutron.

The *gain* knob controls the amount of amplification that Neutron should apply to the output signal. The small *boost screw* next to the gain knob can be used to give the wet signal an additional gain boost of up to +3dB.

The Back Panel

In addition to the usual audio in/out sockets, the back panel of Neutron also contains CV inputs for most of its properties. This allows you to control them from, say, a Matrix Pattern Sequencer.

Automation

All properties in Neutron are automatable, that is, they can be controlled from a MIDI controller (if you have one attached to Reason) and/or be recorded to the sequencer. This allows you to fine-tune how Neutron behaves over time. In fact, the key to getting the most out of Neutron is to vary its properties while audio is playing. Do not forget that you can "explore" the components of the audio buffer when you have frozen it!