



explodelay

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A fourier transform is placed in a delay loop to explode signals into bursts of noise. Separate control is provided over spreading across the spectrum and randomising phase to produce a variety of effects from distortion to temporal aliasing, subtle harmonic ripples in comb filter applications, controlled unidirectional shifts with filtering, and constant feedback reimagining.

Of course, exploding signals into bursts of noise effectively describes classic delay technology.

design

The buffer parameter is intended to be as integral to timbre in this effect as the delay time or feedback amount. It will vary in effect if you change the host sample rate. The effect of the buffer ranges from frequency to time depending on the setting.

The overall design of explodelay accomodates the cpu intensive fourier transforms. Mono operation is included in order to conserve cpu when appropriate, and an option to turn off the spectral spreading if only phase processing is preferred. Calculations are performed using single precision instead of double precision floats, being both efficient and fitting the timbral character. With initial input, explodelay may be enjoyably used as a signal generator in the manner of classic delay effects.

delay parameters

Maximum delay time is 4 seconds or 262141 samples. A button to double (then halve) the delay time is suggested for use in performance. The delay may be tempo synced to host.

filter parameters

Canonical filter structure includes low, band, high and bypass modes. Cut ranges from no to extremely steep slope filtering. Lower settings are preferred with bandpass mode otherwise the signal is limited to an extremely narrow band. The bandpass slope response was kept to conform when transitioning with the low and highpass filter modes.

Filtering can be used in combination with spectral spreading to specify the direction delayed frequencies propagate in.

spectral parameters

Polar transform of spectral data via fourier analysis avails the signal as an array of magnitude and phase values ("bins") associated with frequencies situated periodically along the spectrum. Both the lowest frequency bin and the frequency resolution are defined as samplerate / buffer (nyquist is defined as $n / 2$). Lower frequencies are summed as an offset value. Longer buffers extend further into transformation of lower frequencies.

Randomising the phase data affects the frequency of the signal component relative to the bin value. At higher phase settings and longer buffer settings, this is perceived more as temporal distortion or reverb like smearing. More subtle applications may enhance or animate static signals.

The first slider on the GUI, scale, simply controls the range of both the phase and spread sliders at once, so that the signal can be smoothly transitioned to both settings. Set the scale at it's highest position to use the full range of both parameters.

Both phase and spread have a unique and overt timbral effect. Precise setting has strong specification of timbral blooming using high feedback. Hold [ctrl] while adjusting sliders for finer resolution. A relatively dramatic range of effects are possible using the varying slope of the filter in combination with frequency redistribution.

There are two additional modes for the spectral functions: an off mode, which only applies the phase parameter and deactivates the cpu intensive spread function, and a boost mode, which uses inaccuracies produced by a computational approximation to generate noisier spectral evolution. The boost mode may produce tones similar to mp3 encoding at longer buffer lengths, which is perceived more as noise at shorter lengths. It makes it noisier.

*** gain structure ***

Spectral spreading is performed by smoothing the spectral contour then reamplifying it to the original signal power. This processing has some function for limiting feedback and some similarity to overdrive. Off mode does not include this process so it exhibits different timbral propagation characteristics than the other output modes.

Floating point error due to the additional gain transformation can lead to signals that overload. As this happens so gradually in practical use, there is no internal limiting. Do not leave the room unattended with feedback set at maximum.

The persistence of feedback is dependent on these errors and other factors. It was decided that propagating frequencies are dropped at the spectral terminii, which would otherwise result in buildups at nyquist and dc offset. Some settings produce feedback response patterns that proceed through a number of discrete timbral stages before decaying.

output parameters

Hermite interpolation produces the highest signal quality if delay time is modulated. If delay time is static, turning interpolation off conserves cpu and improves fidelity. Modulation in this mode will add high frequency content.

Stereo processing and output can be opted as cross stereo mode, which routes the delayed output of each channel to the opposite channel. Signals without overt stereo separation can be panned to one side to emphasise the cross channel mode. The pan controller functions in stereo and cross modes. It can be deactivated to precisely center the input for convenience.

No expression of guarantee is issued with this product, please demo before purchase to ensure suitability.

Explodelay VST was realised with the SynthEdit SDK - www.SynthEdit.com

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