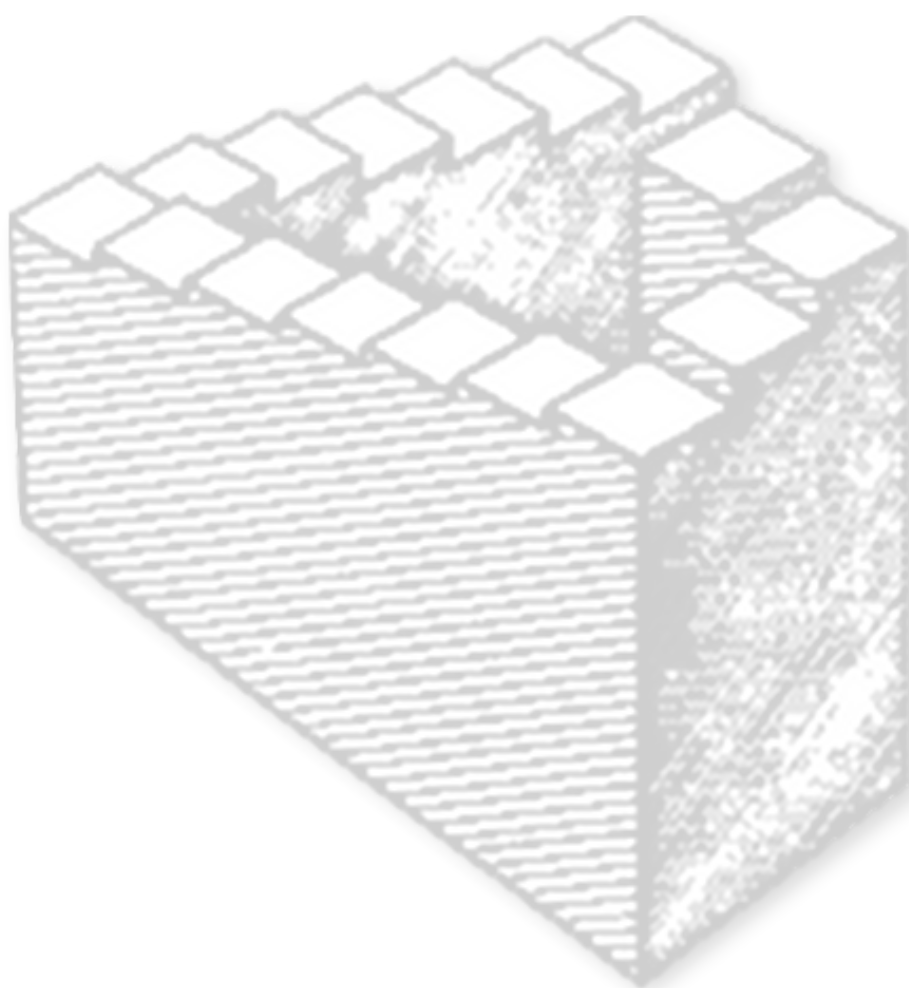


# ENDLESS SERIES

v3 user guide



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## Welcome

Thank you for purchasing Endless Series and supporting independent software development. I hope you enjoy using Endless Series as much as I did making it. Please let me know how you use it and if you make any interesting recordings, I'd love to listen to them.

If you haven't seen them already, there are some resources on my website, mainly audio demos and video tutorials.

Oli Larkin,  
York, UK 2012

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<http://www.olilarkin.co.uk>

<http://olilarkin.blogspot.com/>

<http://soundcloud.com/olilarkin>

<http://www.youtube.com/olilarkin>

## About Circular Pitch Illusions

Endless Series is an experimental effect/tone generator based on the auditory illusion known as The “Shepard Tone/Scale” after Roger N. Shepard who discovered it in the 1960s. Shepard demonstrated that using basic additive synthesis principles it’s possible to create the illusion of a continuously rising or descending chromatic scale. Although Shepard’s scale appears as if it is constantly moving in one direction, in fact, after twelve steps it returns to where it started.

The composer Jean-Claude Risset did further work with circular pitch illusions and created a version based on a glissando rather than a scale (sometimes known as a Risset-Tone), which he used in several compositions.

The theory behind circular pitch illusions involves creating a number of “partials” that are spaced equally in pitch across the frequency spectrum (for instance one octave apart). As the partials rise or fall in pitch, their amplitude is adjusted so that as the higher partials are fading out, the lower partials are fading in. This way the ear is tricked as it focuses on the movements of the loudest partials. It’s often possible to hear this cyclic pattern if you know what your looking for, or if the pitch is changing rapidly, but in the right circumstances the illusion can be very convincing.

There are many sonic variations that can be achieved by varying the basic parameters of the Shepard/Risset Tone. For instance, you can change the partial spacing to make the timbre inharmonic, you can add extra harmonics to each partial to make a richer sound, you can modulate the pitch of the partials. You can also use the same control information that would be used in the additive synthesis model (i.e. N amplitude-frequency pairs) to drive other audio effects such as a filter bank. Some of these processes destroy the illusion but are interesting nonetheless.

Endless Series aims to make it easy to experiment in real-time with these things, which is something that would otherwise be a very laborious process.

## Further Reading

Here are a few textbooks and papers that you might like to look up if you are interested in the theory of Shepard Tones:

- Roger N. Shepard, 1964. *Circularity in Judgements of Relative Pitch*. Journal of the Acoustical Society of America 36 (12): 2346–53
- Diana Deutsch [Ed] 1983. *Auditory Illusions And Audio*, Vol. 31, No. 9. AES Journal Special Edition.
- Risset, J. C., 1989. *Paradoxical sounds*, in M.V. Mathews & J.R. Pierce (Ed.), *Current directions in computer music research*, MIT Press
- Shepard, R., 1999. *Cognitive Psychology and Music*, in Perry R. Cook (Ed.), *Music, Cognition, and Computerized Sound* (pp. 21-32) *Directions in Computer Music Research* (pp. 149-152), M.I.T. Press
- Mix Magazine: *Batman Rides Again: The Dark Knight*: [http://mixonline.com/post/features/audio\\_batman\\_rides\\_again/](http://mixonline.com/post/features/audio_batman_rides_again/)
- Moore, E. R. 1990. *Elements of Computer Music*, Prentice Hall
- Dodge, C. and Jerse. T.A. 1985, *Computer Music*, Wadsworth

## Further Listening / Shepard Tone spotting

And a few examples of its use in music:

- James Tenney – *For Ann Rising*, 1969
- Jean-Claude Risset - *Computer Suite from Little boy (Fall)*, 1968
- Jean-Claude Risset – *Mutations*, 1969
- Marcus Schmickler - *Palace Of Marvels*, Editions Mego 2010
- Computer Music Currents 13 - *The Historical CD of Digital Sound Synthesis*, Wergo, 1995
- Diana Deutsch - *Musical Illusions and Paradoxes*, Philomel, 1995
- Pink Floyd – *Echos Meddle*, EMI, 1971
- Queen – *Tie Your Mother Down / Teo Torriatte A Day At the Races*, EMI, 1976
- Shpongle – *The first revelation - VA - The Mystery of the Thirteen Crystal Skulls*. TIP 2001
- Hidenobu Ito - *Shepard Tone - Shepard Tone EP*, Mo's Ferry 2010
- Various Artists - *RissEP - Chordpunch records*, 2012
- Coleco - *Shepard Tones - Shepard Tones EP*, Skybrid 2011

## Introduction to Endless Series

Endless Series can be used to create classic Shepard/Risset tones using additive synthesis (summing sine waves at different amplitudes and frequencies together). It can also be used as an amplitude/ring modulator using an internal sine wave or the audio input for the carrier signal, which is then modulated with the additive Shepard Tone signal. There are three other FX modes (flanger, phaser and filterbank) which use the same control signals as the tone generator but use different DSP algorithms to generate the sound for each partial based on the input signal.

### Key Features

- Additive tone generator with up to 40 partials
- Circular pitch ring modulator, flanger, filter and 24 stage phaser FX
- Glissando, auto-stepped and MIDI stepped modes
- Many options to tweak harmonicity and timbre
- Stereo detune, phase offset and auto-panning
- Quantise pitches to 14 different scales
- Soft clipping, extra harmonics and noise modulation
- Fast ASR amplitude envelope in MIDI stepped mode
- MIDI reset-able for repeatable output
- Integrated help system
- 32 high quality factory presets
- VST2/VST3/Audiunit/RTAS/AAX plug-in & Standalone formats
- Works with 32/64 bit hosts
- Built in program handling for sharing settings between platforms
- 64 bit internal processing

## **System Requirements**

### **Mac**

- OSX Leopard (10.5) or higher
- 32bit or 64bit VST 2.4, VST3, AU, RTAS or AAX host (for plugins)
- Intel Core2Duo or better CPU

### **Windows**

- Windows XP, Vista or Windows 7
- 32bit or 64bit VST 2.4, VST3, RTAS or AAX host
- Any modern SSE2 capable CPU
- ASIO or DirectSound capable audio interface for standalone version

## Installation

### Mac

Endless Series is distributed on a dmg disk archive. Double click the archive to mount it and then launch the installer. All binaries are 32/64-bit compatible... if your host is 64-bit then the 64-bit version will be used. You can choose which components you wish to install. By default, the plugins will be placed in the following locations, which will make them available to all users on your Mac. Feel free to delete or move them afterwards.

<b>Standalone</b>	/Applications/EndlessSeries.app
<b>Audiounit</b>	/Library/Audio/Plug-Ins/Components/EndlessSeries.component
<b>VST2</b>	/Library/Audio/Plug-Ins/VST/EndlessSeries.vst
<b>VST3</b>	/Library/Audio/Plug-Ins/VST3/EndlessSeries.vst3
<b>RTAS</b>	/Library/Application Support/Digidesign/Plug-Ins/EndlessSeries.dpm
<b>AAX</b>	/Library/Application Support/Avid/Plug-Ins/EndlessSeries.aaxplugin

### Windows

On Windows Endless Series comes as an installer (.exe file). The installer will (optionally) install the VST3 and RTAS plugins in their specified locations. VST2 Plugins can go in different locations and the installer will ask you if the location it obtains from the windows registry is correct or not. The installer will give you the option to install both the 32-bit and 64-bit plugin versions on a 64-bit OS.

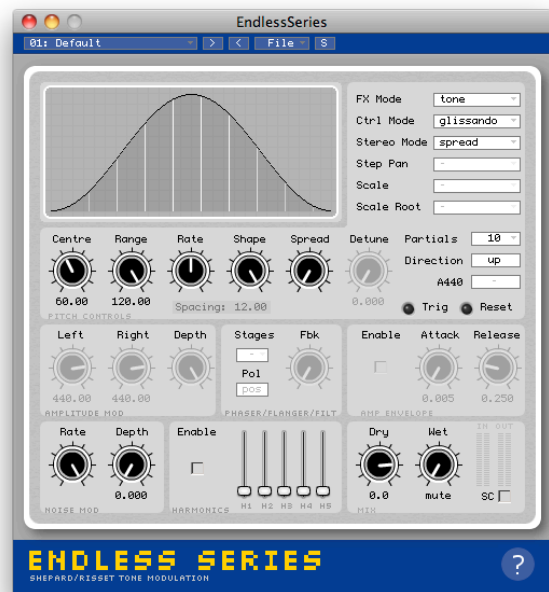
NOTE: the 32-bit plugins are not supported for use in 64-bit host applications! Use the 64-bit versions. There should be no need to “bridge” EndlessSeries.

<b>Standalone</b>	C:\Program Files\EndlessSeries\EndlessSeries.exe
<b>VST2</b>	EndlessSeries.dll <- goes in your x86 or x64 VSTPlugins folders (variable)
<b>VST3</b>	\Program Files\Common Files\VST3\EndlessSeries.vst3 or \Program Files (x86)\Common Files\VST3\EndlessSeries.vst3
<b>RTAS</b>	\Program Files (x86)\Common Files\Digidesign\DAE\Plug-Ins\EndlessSeries.dpm
<b>AAX</b>	\Program Files (x86)\Common Files\Avid\Audio\Plug-Ins\EndlessSeries.aaxplugin



## Getting Started

Endless Series is a midi controlled effect plugin, which can be inserted on mono or stereo audio channels. Most plugin hosts just deal with these the same way as usual effect plugins, but some, notably Apple Logic Pro/ Express, have special requirements – please consult the Host Notes section below if you have trouble getting sound from the plugin.

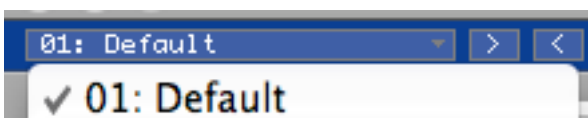


You may need to configure the standalone version to use your desired audio interface

before it will produce sound... please consult the Standalone Controls section below for information about that.

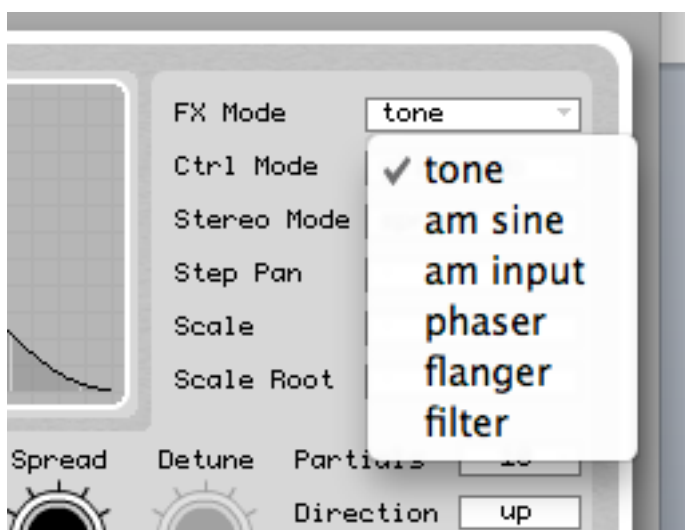
When you first launch Endless Series there are a few controls that you should familiarise yourself with. Firstly, locate the Mix controls, which control the balance of dry and wet signals. By default the plugin will start with the wet signal muted. Turn up the control labelled “Wet” in the bottom right hand corner to hear the initial sound of the plugin (a classic 10 octave Risset tone).

Next you probably want to check out some of the preset sounds...



Click the blue arrows in the top left corner or use the menu to choose one of the 32 built in presets (careful – some of them are loud). You will probably realise that some presets generate sound without any audio input and some require audio input.

There are six different *FX modes* in Endless Series:

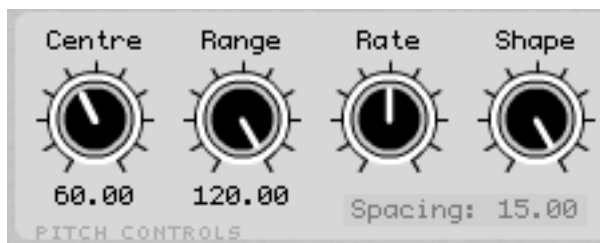


The *tone* and *am sine* *FX Modes* synthesise audio, whereas *am input*, *phaser*, *flanger*, and *filter* process audio... so whenever you want to use those modes you need to have some audio input.

Let's turn the first "default" preset into a descending, harmonic Shepard tone with 8 partials spaced at octave intervals...

- first select the preset named default
- turn up the *Wet* mix control
- change the *Ctrl Mode* to auto-stepped.
- click the *Direction* button to make the scale go down instead of up
- now change the "Partials" to 8

Now you should be hearing an inharmonic timbre (the partials are not yet spaced at octave intervals). The reason for this is that the *Range* setting is set to 120 semitones (10 octaves). The eight partials are equally spaced across this 10 octave range.  $120 / 8 = 15$  semitones = an inharmonic sound.



Endless Series tells you current spacing of the partials so you don't have to get your calculator out (you can also adjust it by ear). We want the spacing to be 12 semitones for a classic harmonic Shepard scale.

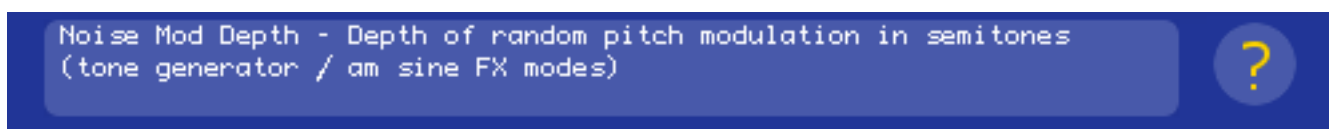
- Bring the *Range* parameter down to 96 - you should see the *Spacing* readout change to 12, and hear the harmonic relationship of the partials.

## Getting Help

If you forget what a particular control does, you can click the question mark in the bottom right hand corner of the plugin, which provides a simple contextual help system.



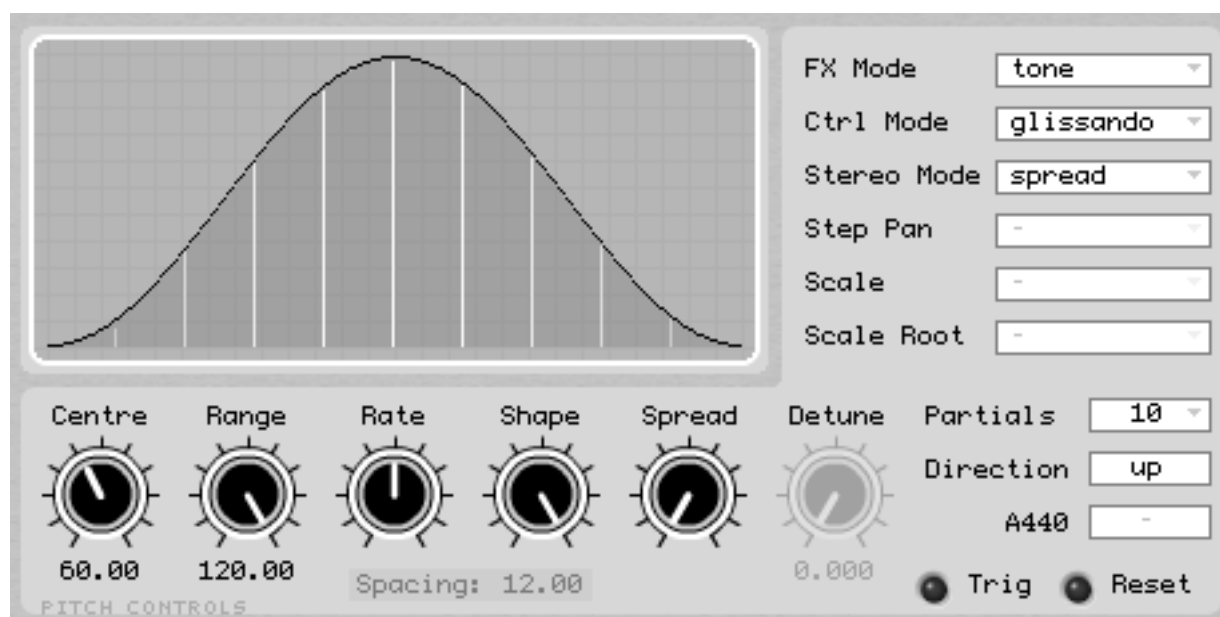
The plugin will display some text for any control that you put your mouse over to briefly explain the function.



## Controls Reference

This section will go through the various controls in the plugin interface and explain their functionality. A few controls behave differently depending on what is selected elsewhere.

### Common Controls



Endless Series combines several different FX algorithms in one plugin, which are driven by the same control data. The common controls affect that control data, and mostly behave the same across all FX Modes.

### Visualiser

The largest display on the plugin interface is a visualisation aid, similar in some ways to a spectral display with linear amplitude on the Y-axis and log frequency on the X-axis. The main difference between this and a spectrogram is that it displays the state of the discrete control data i.e. pitch and amplitude for each “partial” rather than FFT data. The visualiser shows the overall *amplitude profile* – the bell shaped envelope that specifies a partial’s amplitude based on its pitch.

## **FX Mode**

This allows you to choose between tone generator, ring modulator, flanger, filter and phaser effect modes. You will notice that other controls are greyed out depending on what FX Mode is selected.

## **Ctrl Mode**

This determines how the pitch of the partials is incremented or decremented. The control mode will enable/disable other controls depending on its setting.

Choose between

1. *glissando* - automatic glissando (Risset tone)
2. *auto-step* - automatic scale (Shepard tone)
3. *midi-step* - 'manual' – in this mode sending any midi note other than C will cause the scale to advance by one step.

## **Stereo Mode**

*Only works when the plugin has a stereo output*

This gives you two options when the plugin is used on a track with a stereo output.

1. *single* - This means that there is one signal chain and that each partial is panned somewhere in the stereo image.
2. *dual* – This mode means that there is actually a separate audio signal for the left and right hand channels – so you have two separate processors running, and can detune them or offset the phase of the control data (see detune and spread controls below).

## **Centre**

This sets the scale centroid in semitones. The centroid is the mid point of the scale, so if the *Range* parameter is set to 96 semitones (8 octaves) and the *Centre* is 60, then the highest pitch of the that a partial will go will be midi note 108 (C7) and

the lowest will be 12 (C-1). In reality the Gaussian amplitude envelope that dictates the amplitude of the partials, will mean that these pitches are never audible.

## **Range**

The range of the lowest to highest pitch in semitones – this affects the spacing of the partials. The number of partials and the range setting determine whether the tone is harmonic or inharmonic. You can set the range as low as 1., which results in a dense cluster of detuned partials, and can be used for drone sounds.

## **Rate**

The rate of the pitch change, where 0% means no movement and 100% means it takes 2 seconds for a partial to ramp from the lowest pitch to the highest. This control is mapped exponentially, so that you can have more precise control of lower-rates.

## **Direction**

Determines if the pitch ascends or descends.

## **Shape**

This controls the shape of the *amplitude profile* that dictates the amplitude of each partial as it traverses the scale. When you alter this control the plugin is crossfading between two different shaped functions which you can see in the visualiser section... the wider the profile the more you will hear the very high and very low partials, and the louder the overall sound will be.

## **Partials**

*Functions differently depending on FX Mode*

This control sets how many partials are generated in the *tone* and *am sine FX modes*. In these modes it affects the spacing of the partials, and therefore whether

the tone is harmonic or inharmonic (along with the range control). In the other *FX modes*, the number of partials is limited to five. This is because with the other *FX modes* many extra harmonics are introduced into the sound and more partials result in a much denser, noisier spectrum, which can sound unpleasant (in a bad way).

### **Scale Quantise**

*Applies to stepped control modes only*

In the stepped control modes, this control allows you to choose the scale that the pitches of the partials will snap to. Choose *chromatic*, for classic Shepard tones, and other scales for interesting cyclic patterns. Available scales are *chromatic, ionian, dorian, phrygian, lydian, mixolydian, aeolian, locrian, wholetone, m7 9 11 13, dim7, octa 2-1, octa 1-2, major pentatonic, minor pentatonic*.

### **Scale Root**

*Applies to stepped control modes only (except chromatic scale)*

When you are in a stepped control mode this control sets the root note of the scale quantiser. It has no effect when the scale is chromatic.

### **A440 tuning reference**

*Applies to stepped control modes only*

The tuning reference for scale quantiser.

### **Step Pan**

*Applies to stepped control modes only*

*Only works when the plugin has a stereo output*

*Only displayed when stereo mode is set to single*

This control changes the way that partials are panned in single stereo mode...

1. *spread* - partials move from left to right the higher the pitch

2. *alternate* – sound is panned left/right each time the first partial steps

## **Spread**

*Only works when the plugin has a stereo output*

*Functions differently depending on stereo mode*

This control has two functions:

1. If the stereo mode is set to single the spread control sets the stereo width that the partials are panned to.
2. If the stereo mode is set to dual the phase offset sets the phase offset between left and right channels in separate stereo mode

## **Detune**

*Only displayed when stereo mode is set to dual*

Detunes the right hand channel partials by up to 12 semitones (dual stereo mode)



## ***Midi-step mode Amplitude Envelope Controls***



*Only available when control mode is set to midi-step*

In *midi-step* Control Mode an Attack-Sustain-Release envelope can be applied to the sound when a midi message is received. This functions like a midi-gate effect. If you hold down a note the sound will sustain until you release the key. Bear in mind that the envelope/plugin is monophonic, and pressing multiple keys will not trigger extra voices, but will trigger a step in the scale and will retrigger the envelope.

### **Enable**

Enables the envelope generator. The wet signal will be silent until the plugin receives a MIDI note message.

### **Attack**

Sets the envelope attack time in milliseconds.

### **Release**

Sets the envelope release time in milliseconds.

## Noise Modulation Controls



*Only available when FX Mode is set to tone or am sine*

The noise modulation applies a separate, bipolar, linear-interpolated random function generator to the pitch of each partial. It can be used to add some light vibrato/instability to the sound or wild modulation.

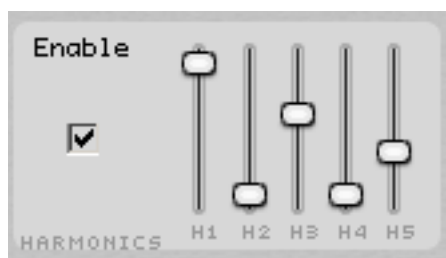
### Rate

This sets the rate of random pitch modulation where 0% is roughly 1Hz and 100% is roughly 3kHz.

### Depth

Sets the depth of random pitch between 0. and 12. semitones (1 octave). The modulation is bipolar.

## Harmonics Controls



*Only available when FX Mode is set to tone or am sine*

Normally each partial in the additive synthesis FX modes only contains energy at one frequency. By turning on the harmonics generator you can varying amounts of the first five harmonics to each of the partials, which can make a much richer sound – note that the overall amplitude of the partial is not changed and is still dictated by the *amplitude profile* so the higher harmonics can cause aliasing/foldover quite easily when the harmonics generator is enabled.

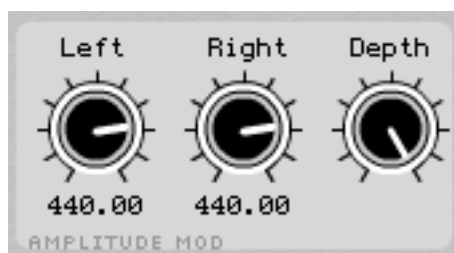
### **Enable**

Turns on the extra harmonics generator.

### **Harmonic Levels**

The five sliders set the amplitudes of harmonics 1 to 5.

## **AM Sine Amplitude Modulation Controls**



*Only available when FX Mode is set to am sine*

When the plugin is in *am sine FX Mode*, the additive synthesis tone from the tone generator is modulated with two sine waves – one for the left channel and one for the right channel. With a sub-audio rate modulation frequency (0.5 to 20Hz) this provides a tremolo effect. Higher frequencies result in a sound typical of a ring modulator effect... audible sideband frequencies are generated around each partial.

### **Left frequency**

The frequency of the left channel sine wave carrier signal. Can be between 0.5 Hz and 1 kHz.

### **Right frequency**

The frequency of the right channel sine wave carrier signal. Can be between 0.5 Hz and 1 kHz.

### **Depth**

The balance of sine wave carrier signals versus the dry sound from the tone generator. Can be used to make the amplitude modulation effect subtler.

## **Phaser, Flanger, Filterbank Controls**



### **Polarity**

*Only available when FX Mode is set to flanger*

This control determines whether the flanger feedback is positive or negative and changes the timbre of the flanger effect. A negative polarity results in accentuation of the odd harmonics in the input signal and at high feedback levels sounds a bit like a square wave. A positive polarity accentuates all harmonics and at high feedback levels this sounds more like a sawtooth wave.

### **Stages**

*Only available when FX Mode is set to phaser*

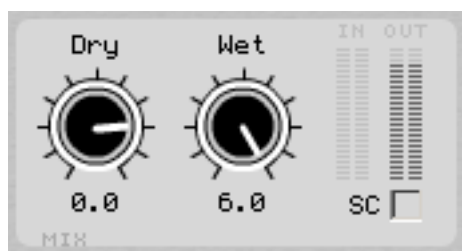
This control determines the number of cascaded allpass filter stages used in phaser FX Mode. Each allpass filter stage adds extra notches to the frequency spectrum and the more stages there are, the more inharmonic the relationship of the notches. With a high feedback setting and many stages the phaser will produce a brittle, ringing sound.

### **Feedback**

*Only available when FX Mode is set to phaser, flanger or filter*

This sets the intensity of phaser, flanger and filter FX modes.

## **Mix Controls and Displays**



### **Dry Level**

Sets the level of the dry signal in dB. Can apply 6dB boost.

### **Wet Level**

Sets the level of the wet signal in dB. Can apply 6dB boost.

### **SC Enable soft clipping**

When enabled this applies a basic soft clipping algorithm to the wet signal. This can be useful to tame signals that are occasionally distorting, or alternatively by pushing the Wet level up it can be used to add a distortion effect that can be useful for creating engine-like sounds.

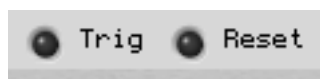
### **IN Meter**

This meter displays the level of the input signal for left and right channels (or for a single input in mono mode).

### **OUT Meter**

This meter displays the level of the input signal for left and right channels (or for a single input in mono mode).

## **Midi Control & Displays**



EndlessSeries can be controlled with MIDI note messages. This facilitates two things: repeatable output and synchronisation. Please consult your plugin host's documentation in order to find out how you route MIDI messages to an effect plugin.

### **Repeatable Output (MIDI reset)**

Normally EndlessSeries is "free running", but this poses a problem – if you are working on a track and you want to mix it, you probably want the sound of the plugin to be the same each time. The way to do this involves sending a MIDI note "C" to the plugin (any octave will do). This works in any *FX Mode* or *Ctrl Mode*. It will reset the phase of the control signals. So typically you might place one "C" note at the beginning of your track. Whenever this happens the *Reset* LED will flash on the plugin's UI.

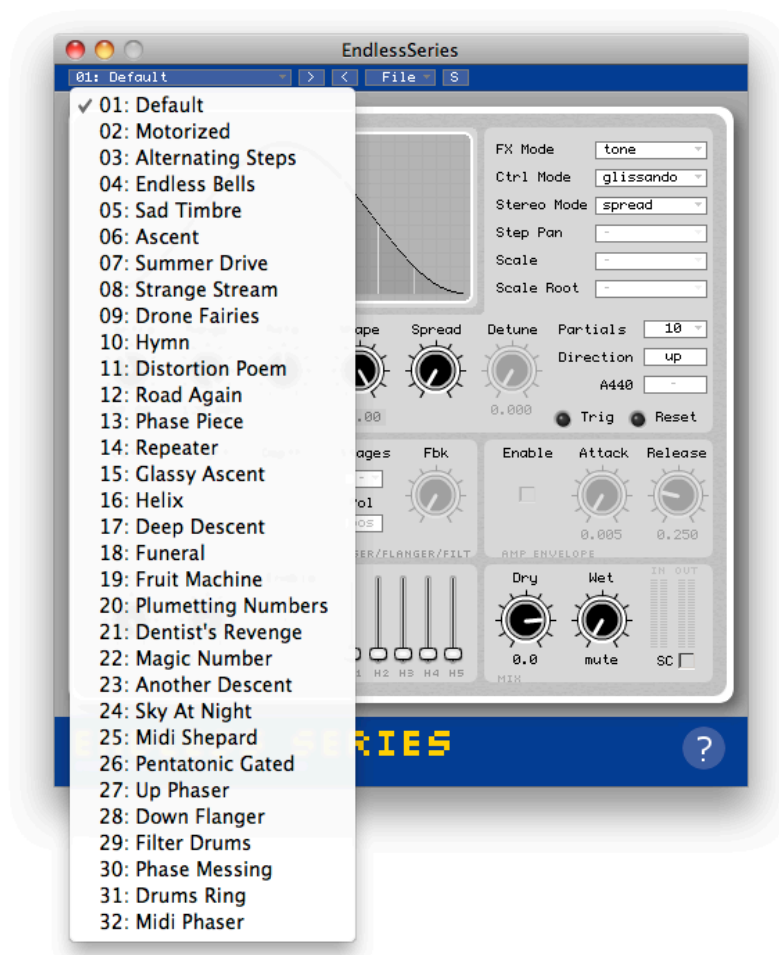
### **Synchronisation**

If you wish to synchronise a stepped scale to something else, you need to set the *Ctrl Mode* to *midi-step*. This means that you can "play" the Shepard scale by sending the plugin MIDI note messages. Any time you send a MIDI note other than "C" the *Trig* LED will flash on the plugin's UI and you should hear the step change. When the number of *Partials* divides evenly into the specified *Range* and you are using a *chromatic* scale, the partials will all step in sync with each other. Otherwise, some partials may only step on certain notes.

When in *midi-step* mode you can also use the ASR Amplitude Envelope (see *Midi-step mode Amplitude Envelope Controls* section above)

## Preset/Program/Bank Controls

EndlessSeries features a built in program/bank manager (the blue bar at the top of the plugin), which means that you can share programs and banks between the various versions of the plugin and with the standalone app. Programs and banks are stored using the VST2 fxp/fxb formats and you should be able to load them using a VST2 host's load/save mechanisms. If you are not using a VST2 host, you can load and save EndlessSeries programs/banks using the built in mechanisms. If you wish to share your programs and banks you should avoid using built in preset mechanisms for AU, VST3 and RTAS plugins, since these will not be compatible with the other versions of the plugin. EndlessSeries' banks contain 32 programs.





## **Program List**

This drop-down list allows you to select one of the 32 programs in the currently loaded bank. By default this will contain the 32 presets. If you wish to rename a program, you can apple-click (MAC) or right-click (WIN) to open a text entry box.

## **Increment/Decrement Program**

The two arrows next to the program list allow you to skip forward and backwards through the 32 programs in the bank.

## **File Menu**

This menu provides four options to load or save both programs and banks.

## **Store button**

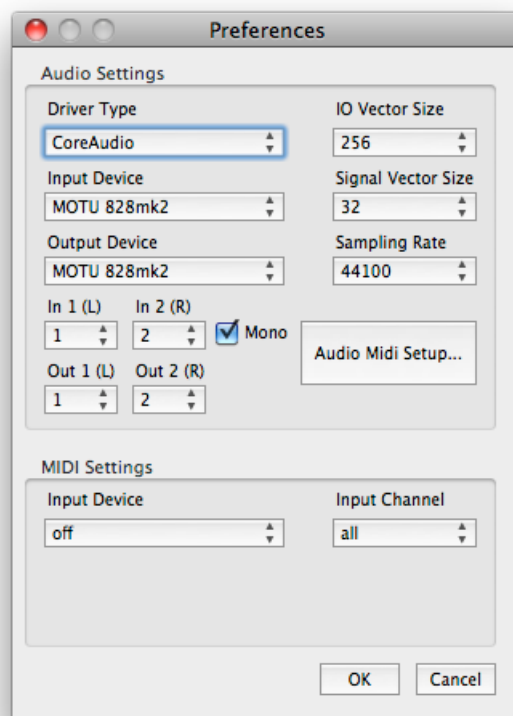
When you are creating programs, you need to inform the plugin that you want to store the current state of the plugin in the current program slot (indicated by the program list). To do this, press the store button.

## **Behaviour of program list in AU/VST3/RTAS/AAX vs VST2**

One thing to remember is that only the VST2 version of Endless Series fully supports “banks” of programs. This means that in the other formats only the current state of the plugin’s parameters will be saved in the host project. In the VST2 version the entire bank of presets is saved with the host project.

## Standalone Controls

When using the standalone version of Endless Series, you need to specify what audio and midi devices to use. You can change these settings in the applications preferences, which is accessible from the application menu on OSX or the File menu on Windows. The choices are remembered when you close Endless Series, but if your devices change (for instance if you disconnect your audio interface), you may need to adjust the settings.



### Audio Settings

#### Driver Type

Select the kind of audio driver to use (currently only CoreAudio is supported on mac, DirectSound and ASIO are supported on windows)

### **Input/Output Device**

The physical device used for IO. Be careful when selecting a laptop's built in microphone input... it could cause feedback!

### **In 1 (L) / In 2 (R) / Out 1 (L) / Out2 (R)**

The physical IO channels used (currently they must be neighbouring pairs)

### **Mono**

Sums the input from In1 and In 2 (useful if you want to play a monophonic audio source through EndlessSeries)

### **IO Vector Size**

The hardware buffer size – increase this setting if you experience audio glitches (higher settings = higher latency but less CPU usage)

### **Signal Vector Size**

Usually you can leave this at 32, but if you need to try and get better audio performance (less CPU usage) you can try a higher value.

### **Sampling Rate**

EndlessSeries supports sample rates up to 192khz if your audio interface supports it. Increase the sampling rate for less aliasing in the very high harmonics/partials (not usually an issue, but may be desirable).

### **AudioMidi Setup / ASIO Control Panel**

This button will launch the OSX audiomidi setup app or you ASIO control panel on Windows.

## **MIDI Settings**

### **Input Device**

Choose the midi input device, on OSX you can choose “virtual input” to create an IAC (inter application communication) driver that will appear as a midi output in other OSX software.

### **Input Channel**

Filter the incoming midi messages to only use the specified channel

## **Host Notes**

This section contains information regarding using EndlessSeries in specific plugin host applications. As a general note for hosts that support multiple plugin formats - It's best just to stick to one format and not interchange between them.

### **Apple Logic Pro/Express**

Usually you should insert Endless Series on an "Instrument Track". It appears in the "midi-controlled effect" menu. The plugin can also be inserted on a normal audio track, but Logic requires such tracks to contain some audio or to be record enabled in order to run FX plugins and you will not be able to send midi messages to the plugin. If you wish to use the tone generator mode on an audio track, you must insert a dummy audio file on the track in question, otherwise the plugin will not generate sound.

### **Avid ProTools**

The RTAS version is supported in Protools 9 or greater, however, the plugin may work on earlier versions. The AAX version will only work in ProTools 10 or higher.

## **Mouse Behaviour**

This section explains the mouse behaviours in the different versions of Endless Series.

### **VST2/VST3/AU/Standalone versions**

- Double clicking a control in Endless Series will reset it to its default value
- Clicking the text beneath a dial will open a text entry dialog
- Shift-dragging a control will allow a finer degree of control

### **VST3 version only**

In recent hosts that support VST3.5, (e.g. Cubase 6, Studio One v2) you can right-click controls in Endless Series and the host will create a contextual dialog for the parameter.

### **RTAS/AAX version**

Endless Series follows the mouse behaviours designated by AVID that should be common to all RTAS/AAX plugins, rather than using the same behaviours as the other plugin formats. Please consult the ProTools documentation for information about these behaviours.

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## **Support Info**

There is a support forum at kvr audio:

<http://www.kvraudio.com/forum/viewforum.php?f=186>

and FAQ here:

<http://www.olilarkin.co.uk/index.php?p=faq>

Please send bug reports, feature requests or suggestions to:

[support@olilarkin.co.uk](mailto:support@olilarkin.co.uk)



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- [Gary Scavone](#) for making RTAudio and RTMidi which are used by the standalone versions of Endless Series
- [DestroyFX](#) for dfx-au-utilities
- Endless Series v3 Beta Testers