

# Derailer Overview



## 1. System requirements

Derailer is a physical modelling instrument available as a 64-bit plug-in for:

### macOS 10.11 or higher

- Audio Unit (v2 component)
- VST3
- AAX

The AU and VST3 are Universal builds which can run natively on both Intel and Apple Silicon machines. The AAX is an Intel build which can run on Apple Silicon under Rosetta.

### Windows 10

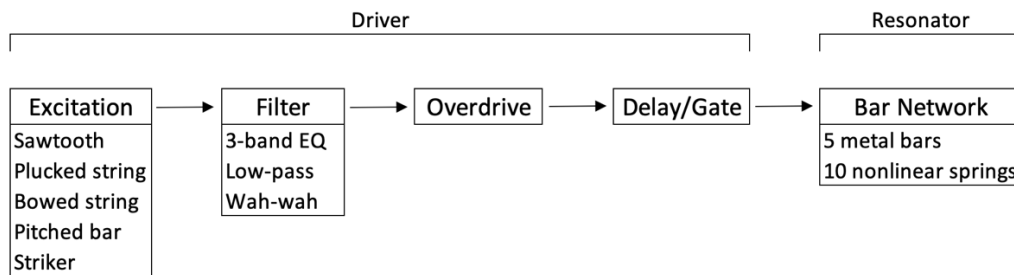
- VST3
- AAX

If Windows Defender stops the installer then click 'More Info' and 'Run anyway'.

## 2. The Model



Derailer uses physical models of 3 basic elements; a string, a metal bar, and a nonlinear spring that is used to connect bars together. The modelling is performed using finite-difference time-domain approximations of the differential equations, calculated in real-time to create the sound. It consists of a **Driver** section that uses a plucked or bowed string, a pitched bar, a sawtooth waveform, or a striker. Then there is a **Resonator** section made from 5 bars and 10 springs, that is driven by the output from the driver. Along with effects, they form the following signal chain:



## 3. User Interface

The UI has 2 main views, Driver and Resonator, which are selected in the top-left corner.

*Driver View*



## Resonator View



In Driver View there are 4 quadrants: Excitation, Filter, Overdrive/Delay/Gate, and Resonator Control. This mirrors the signal path as described above. The last quadrant is also part of the Resonator View, which has the controls for the metal bars and springs that make up the resonator. The presets and notes are at the top section, and there is an information window (the *i* button) selectable at the top right. This window shows the location of the presets and lists the MIDI controls.

## 4. MIDI control

Derailer can be used with either a standard MIDI keyboard, or with an MPE (MIDI Polyphonic Expression) device. MPE mode is selected with the 'MPE' button at the top of the UI.

### Standard MIDI control:

*Velocity:* Force of the pluck or strike, or attack of the bowing.

*Pitch bend:* Pitch of the last Note-On, or when bowing the force of the bow.

*Mod wheel:* Sawtooth tone, position of the pluck or bow on the string, or the force of the striker. It can be switched to control the filter cutoff frequency instead.

*Aftertouch:* Vibrato. This can also be controlled with cc21.

### MPE control: (pitch bend range should be +/-48 semitones on your keyboard)

*Sawtooth:* X-axis is assigned to pitch, and Y-axis controls the tone. Note-On velocity is not used.

*Plucked string:* X-axis is assigned to pitch over +/- a tone, Y-axis controls the pluck/strike position.  
*/Pitched bar* Note-On varies the force of the strike.

*Bowed string*: X-axis is assigned to pitch but can only be moved down a tone, Y-axis controls the force of the bow. Mod Wheel varies the bow position. Note-On velocity is not used.

*Multi-strikers*: The X-axis controls the rate of the multi-striker, and the Y-axis varies the force. Note-On velocity is not used.

### Global MIDI controls:

The following MIDI mappings apply to both standard and MPE modes:

cc22: Striker rate.

cc23: Global spring stiffness.

cc24: Global spring nonlinearity.

cc25-29: Resonator bar gains.

cc104: Randomise the resonator.

## 5. Randomiser

The resonator parameters can be randomised using the 'Rand' button in the centre of the bars. This randomly sets the parameters of each bar and spring connection of the resonator. You can lock a bar so that the randomiser does not change the parameters using the small lock icon.

## 6. Derailer Quad (see this [post](#) for setup details)

Derailer Quad is a special version of Derailer for 4-channel audio setups. The left and right output of each resonator bar are assigned to pairs of channels as shown here:

