

Music Unfolding SubRingFM Audio Unit User Guide



Requirements:

OS X 10.6 or higher is required. SubRingFM requires an Audio Unit (AU) capable host. A host that supports Cocoa user interfaces (UI) for AU's is needed. Please check SubRingFM's operation in your host of choice for suitability before purchasing.

Installation:

SubRingFM can be installed in any of the standard Audio Unit component locations. These are commonly /Library/Audio/Plug-Ins/Components and ~/Library/Audio/Plug-Ins/Components (where "~" stands for the user's home directory). Drag SubRingFM.component into the Components directory and relaunch your AU host software. The included presets also need to be installed into one of the standard locations (/Library/Audio/Presets/MusicUnfolding/SubRingFM and ~/Library/Audio/Presets/MusicUnfolding/SubRingFM). If you already have a MusicUnfolding directory in your "Presets" directory, then drag the SubRingFM directory into this location. If not, drag the MusicUnfolding directory that contains the SubRingFM presets directory into the "Presets" directory.

Introduction:

First, a quick introduction to the editing controls for SubRingFM. All controls are set using the same knob. Click the desired control readout to select and then move the knob to control. The active (selected) control is indicated by the green end caps. The knob works with a circular control motion. The closer to the center you are dragging the knob, the rougher the increments. Moving farther out makes the increments finer. You can even click the surface of the knob and drag out of the surface of the knob and then move in a circular motion if you want finer control. To set a parameter to an exact value, double click the parameter readout. This brings up a text box where the parameter value can be set exactly. Double-clicking the knob sets the selected parameter to its default value. The knob will act with a linear, logarithmic, or power response depending on the parameter that is selected.

The controls also support click-and-drag directly on the surface of the readout. Clicking-and dragging in a vertical direction changes the parameter values. Dragging in a horizontal manner causes the value to change ten times slower. The control behavior (linear, log or power) is the same as it is while using the knob for parameter control. In addition, hovering the mouse over the control and using the scroll wheel also changes the control value. If you have a mouse with a horizontal scroll wheel motion, scrolling horizontally changes the parameter value with 10 times finer control.

The colors of the parameter displays can be changed in the preferences/registration panel. To bring up the panel, click on the name tag/badge for the AU. Select the colors of your choice and then to see the new colors in effect, you must close and reopen the AU. The preference is applied in all hosts for a given user. Note that these color preferences apply to all of the Twister series AUs. Setting your color preference in one will apply this preference to all of the Twister AUs.

Description:

SubRingFM is a ring modulator. It also has two filters for shaping the sound. It also has a suboctave generator. And, the oscillator can be manipulated using FM.

The ordering of the effect is "Pre Ring Filter," "Ring Modulator," "Post Ring Filter," and then finally, "Suboctave Generator." If you already know what a ring modulator is, that pretty much tells the story, except for the plot twists. We'll describe that below. If you haven't played with ring modulators before, the idea is pretty simple even if the result is pretty strange. Input a signal with a frequency f_{in} and a ring modulator frequency f_{ring} , then the output will be the sum and difference of these two tones. If either of the two tones contains overtones, then the output will contain all of the cross term sums and differences. That's the reason for the pre and post filters on SubRingFM. You can use the

pre-filter to reduce the number of harmonics in the input signal and use the post-filter to shape the resulting tone.

Now for the twists. The ring modulator oscillator in SubRingFM is an FM oscillator. So, the resulting output can be made to contain a very complex set of frequencies. This can then be shaped using the post-filter to get a really wide range of sounds. After this stage, some of the dry signal can be mixed back in. Then a suboctave generator is applied.

Let's take a quick look at the modulation oscillator. The formula for the oscillator is $o(t) = \sin(f + M \sin(n f))$ where M is the "FM Modulation Index" parameter and n is the "FM Modulation Factor" parameter. Usually, these will be integers. But, they don't have to be. On the other hand, this is one of those cases where very precise values can make a big difference. Double-clicking the parameter readouts for "FM Modulation Index" and "FM Modulation Factor" will allow you to enter an exact value. The presets have some examples of what various values will do.

The Parameters:

Ring Modulator Tone: The fundamental frequency of the ring modulator oscillator.

FM Modulation Factor: Oscillator parameter as described above.

FM Modulation Index: Oscillator parameter as described above.

FM/Dry Mix: This allows you to mix some dry signal back in before the suboctave generation.

Suboctave Level: Amount of suboctave signal that is mixed in to the wet signal.

Pre Ring Filter Type: Sets the type of filter to apply to the input signal before ring modulation.

Pre Ring Filter Frequency: The cutoff frequency of the pre filter.

Pre Ring Filter Resonance: The resonance of the pre filter.

Pre Ring Filter Drive: The drive or distortion level for the pre filter.

Post Ring Filter Type: Sets the type of filter to apply to the input signal after ring modulation.

Post Ring Filter Frequency: The cutoff frequency of the post filter.

Post Ring Filter Resonance: The resonance of the post filter.

Post Ring Filter Drive: The drive or distortion level for the post filter.

Dry Level: Amount of dry signal to mix in at the final stage. Note that this and the amount of dry signal mixed in at the FM/Dry mix stage sets the total for dry signal.

Wet Level: Amount of wet signal to add to the final mix.

Hints:

- You will usually want to keep the "Pre Filter Drive" low – between 0.0 and 0.333.
- Setting "FM Modulation Factor" and "FM Modulation Index" both to zero will provide a pure sine to use for modulation.
- Setting "FM Modulation Index" to a value between 0.5 and 0.75 provides for some nice weird sounds.

- You will almost always want the "FM Modulation Factor" to be an integer. Non-integer values will show up in the oscillator display as a slanted center line. This indicates that oscillator's fundamental isn't actually the tone that you've set. It may still be what you want though. Setting this value to something non-integer can provide some interesting effects.
- Setting the "Ring Modulator Tone" to values less than about 10.0 Hz makes the effects sound more like a tremolo effect.