

Music Unfolding M3 Audio Unit User Guide



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Requirements:

OS X 10.4 or higher is required. M3 requires an Audio Unit (AU) capable host. A host that supports Cocoa user interfaces (UI) for AU's is needed. Please check M3's operation in your host of choice for suitability before purchasing.

Installation:

M3 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 M3.component into the Components directory and relaunch your AU host software. Please refer to the installation instructions included in the M3 distribution for information about how to install presets.

To register M3, go to the Music Unfolding online store. After you have made the payment for M3, a registration number will be sent to you by email. This usually only takes a few minutes. Once you receive the registration number, copy the entire license string. It will be of the form "MU-M3-XXXXXXXXXXXX-YYMMDD".

Bring up M3 in your Cocoa-capable host. Clicking on the M3 badge/logo brings up the registration panel. Make sure the text box is active and then press the paste button. If the string has gone into the text box correctly, click the "Enter License" button." If the license is accepted as valid, the message will change to indicate that you are registered. If the string is rejected, please ensure that you've copied the entire string and that it doesn't include any leading spaces. Once the registration number is accepted, you need to get your host to reload the AU. In GarageBand, you can do this by setting the plugin slot that M3 is in to "None" and then reselecting M3. The intermittent audio silence from the demo version will now be gone. In some hosts it may be necessary to quit from the host and relaunch, to pick up the registration in the audio portion of the AU.

Introduction:

M3 is a distortion effect. It consists of two wave shapers (B, E), two parametric EQ's (A, F), a delay (C), and an envelope/MIDI controlled formant wah section (D).



For most settings, the path through the effect is A -> B -> C -> D -> E -> F. The order of sections C and D are reversed in two modes. In general terms then, A works as a tone control, B and E are cascaded distortion sections and F is a final EQ stage useful for things like speaker/cabinet frequency response emulation. In other uses, section A can be thought of as a way to overdrive certain frequency ranges more than others and section F can be used as a "presence" control.

Parametric EQ's:

The sections labeled A and F are displays. To edit the parametric EQ settings, double-click the surface of the display. This brings up the editing window as shown below.



There are two buttons in the lower left of the editing screen. The top button resets all of the gains to 0 dB. The bottom button closes the editing window. There are five filters: Low shelf, high shelf and three peak/cut. They are set using the round control points. Click on the point and drag to set the gain and frequency. The slope or Q for the filters is set by holding the “alt” key and clicking and dragging on the point. The level of the slope or Q is indicated by the red circular level meter on the point. If you have a scroll wheel, pointing the cursor at the point and rolling the scroll wheel will also control the slope/Q setting. Holding the "ctrl" key while dragging puts the control into fine adjust mode. Clicking and dragging with a right mouse also works for a fine adjust.

Wave Shaper:

The wave shapers are composed of three parts—the curve itself, gains (pre and post), and filter models. There are four knobs and one mode switch on each of the wave shaper sections.



The knobs to the left of the mode switch control the filter settings for the different modes. We'll look at these in a moment. The knobs to the right of the mode switch are gain controls for the wave shaper. The first of the two is a pre gain control. It ranges from negative infinity to 20 dB. The default setting is a gain of 0 dB. Double clicking any control knob returns the setting to its default value. The second of the two knobs is a post wave shaper level control. It ranges from negative infinity to about 6 dB. The pre gain sets the drive into the wave shaper and the post level is primarily used for level attenuation after the stage.

The center mode switch selects between five different oversampling levels and filter models that apply to the wave shaper. The current mode is displayed on the wave shaper response screen. The modes and their effects are

Mode	Wave Shaper	Over-sampling	Filter Model	Knob 1	Knob 2
"-"	off	off	off	-	-
"A"	on	off	Resonant Low Pass	Q	F
"B"	on	2x	Low Pass	Q	F
"C"	on	2x	Contour	Q	Gain (Adds peaks at 600 and 1200 Hz with gain set by Knob 2)
"D"	on	4x	Resonant	Q	F (Set wah pedal drive effect)
"E"	on	8x	Contour	Q	Gain (Adds peaks at 400 and 1000 Hz with gain set by Knob 2)

When the wave shaper is off, the signal bypasses the wave shaper itself. Note that the pre and post gains are still applied. This can be useful for controlling the drive into the second wave shaper.

All of this does nothing without the wave shaper to work on. The wave shaper display screen is just a display to give feedback about what the wave shaper is doing to your signal. The input signal to the stage is measured before the wave shaper. Then the display shows what a sinusoid of this amplitude will look like after the wave shaper is applied (the display ignores the filter model but includes the pre and post gain).

To edit the wave shaper itself, double-click the wave shaper display window. This brings up a new editing pane. Notice that the pane is located so that the controls are still available. There are three buttons on the display. The "X" button closes the pane. The "/" button resets the wave shaper to a straight one-to-one response. The third button toggles the display to a zoomed state for easier editing of some curves.



There are faint grey lines on the display. These lines indicate the 1.0 amplitude levels. The blue line is the wave shaper curve. You edit the curve using the red and yellow points. The x-axis is the amplitude of the input signal to the wave shaper. The y-axis is the output level of the wave shaper. So, a straight line of slope one has no effect on the signal. There are three filled curves displayed on the screen. They are red, green, and blue. Different colors occur because of the overlap. These curves are set to input amplitudes of 0.5 (-6 dB), 1.0 (0 dB), and 1.5 (3.5 dB). They show the response of sinusoids at these levels to the wave shaper curve with the pre and post gains applied. They are useful for showing what the wave shaper curve is going to do with your sound.

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The curve is composed of two Bezier curve segments. The segments are fused in the middle in a way that restricts the curve so that it is continuous and differentiable (or, so that it is smooth enough to sound good). In addition, there is a third, straight line segment after the red point. The slope of this segment is set by the slope of the final Bezier segment at the red point—again, this makes the curve smooth.

The red point is the only point that can be moved along the x-axis (horizontal). The yellow points are restricted to move in the y-direction. The movement of these points is very similar to editing the EQ curve points. Click a point and drag. The right mouse button or holding the "ctrl" key with the left (normal) mouse button invokes a fine control movement. Holding the shift key while moving the red point, restricts its motion to the y-axis (vertical). Holding the "alt" key restricts the motion to the x-axis (horizontal).

Basically, you need to play with this. What appear to be small changes visual, can have drastic effects on the distortion.

If you have a favorite wave shaper curve, you can probably draw it using M3.

You can draw really weird curves. Really weird curves usually make really weird distortion, which may be just what you want.

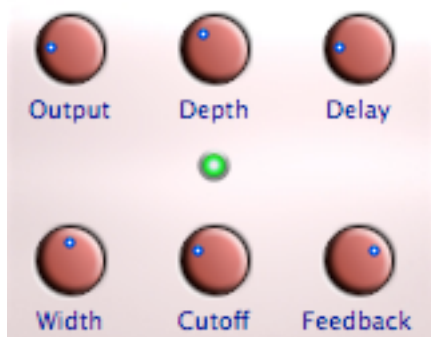
It's usually a good idea to set the slope of the line segment at the end to be near to flat. Not only does this protect against run-away gain, but it tends to provide the saturated distortion you want when you either "dig in" to the strings or really push the pre gain levels.

The final point is that there are two of these. You can use the first to really drive the second. Or, you can use the two contour/filter sections to really play with the character of the distortion. Or, you can set up two overdriven wah filters with an oscillating formant section in between (with a good dose of delay too).

Controls:

All knobs are controlled by a linear motion. Up and to the right increases the control. Down and to the left decreases. Holding the "ctrl" key or dragging with the right mouse button, moves the knob with a fine control. Double-clicking a knob returns it to its default setting.

There are two sections of controls. The top section (on the silver part of the unit) controls the delay and final output level.



"Output" is a final output level. It runs from 0 to 2 in linear gain. Once again:

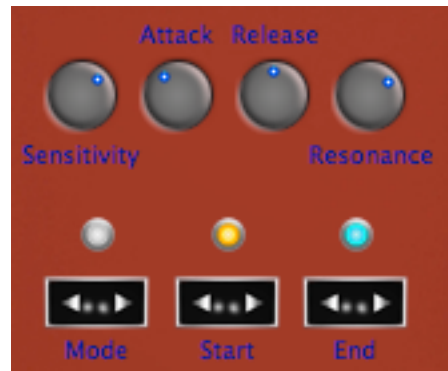
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The rest of the knobs in this section control the delay unit. The delay is turned off by setting the "Depth" to zero. (The light is red when the delay is off.) The "Delay" is set from 0 to 2 seconds. The knob's action is nonlinear. It is more sensitive in the short delay region and increases more rapidly in the large delay region.

The delay is filtered with a low pass filter. The "Width" and "Cutoff" controls set the values for this low pass filter. The "Depth" control sets how much delay signal is added to the output signal. The "Feedback" control sets how much delayed signal is added back into the delay. The "Depth" and "Feedback" controls are independent.

The second section of controls are on the red section of the body.



The mode switch selects between five modes for the formant filters. The "clear" light indicates that the formant section is turned off. A light blue color indicates the auto-filter mode is selected with the delay section before the formant section. A green light indicates that the formant section is under MIDI control with the delay section before the formant section. An amber light indicates the formants are auto-filter with the delay after the formant section. The final setting, red light, indicates that the formants section is MIDI controlled with the delay section after the formant section.

What does this section do?

M3 has 10 different formant filter settings. Each of these formant settings can be set to the start or end position. So, you have a 10 by 10 array of settings to play with. The "Start" and "End" switches let you click through the settings. The "Resonance" control sets the formant filter resonance.

MIDI Control:

When in MIDI control modes the formant filter sweep is controlled by MIDI controller 11. This is the "Expression" MIDI control. Stick this on a MIDI expression pedal. It's fun! MIDI control 12 can be used to set the "End" formant setting. The MIDI controls listen universally. That is, on all 16 channels to every MIDI input device. Also, M3 makes itself available as a "virtual" MIDI destination with the name "M3 Audio Unit."

Auto Control:

This mode is similar to other auto-filter controls. The "Sensitivity" sets the level that the input signal need to hit to trigger the filter action. The "Attack" setting sets the time for the rise from the start formant to the end formant and the release sets the duration for the return. One potential difference from other auto-filters is that when the signal is above the "Sensitivity" level, the effect constantly oscillates over the formant sweep. This allows you to set the Sensitivity to zero and just let the formants sweep over the Attack and Release durations. Combined with the delay and different wave shaper settings, some pretty wild effects are possible.

Finally:

Clicking on the "M3" logo,



brings up the registration panel.