

Waves – Morphoder

Software Audio Processor

User's Guide



Chapter 1 – Introduction and Overview

The Waves Morphoder is a digital audio processor of the Vocoder type. The vocoding engine allows two audio signals to be combined using one source as a modulator and another source as the carrier. For example, using voice as the modulator input and a synthesizer as the carrier, the result would be that the synthesizer will “talk” and actually say the words spoken by the voice. In the same way you can use a drum track as your modulator and the result will be a rhythmic keyboard track in perfect sync with the drum tracks events.

Waves developed the Morphoder to offer outstanding sound quality featuring great intelligibility and punctuation that is very easy to achieve. The Waves Morphoder offers a built-in eight-voice polyphonic synthesizer that can provide the carrier signal, and also the possibility to route other sources and designate them as the modulator or carrier signal according to your needs.

By default the Morphoder will launch with the Internal synthesizer selected as the *Carrier signal* and the track input as the *Modulator signal*. So if you insert this plug-in over any vocal track, all you have to do is press play and play the morphoder’s musical keyboard and it talks!

Classic vocoding is just one of the tricks this pony has to offer. The creative possibilities with this plug-in are vast. There are many interesting sounds possible. For example, you can use the Morphoder as an emulator for the classic Electric Guitar TalkBox effect. Also radical pseudo-reverberation effects can be achieved by modulating the internal noise generator. Percussive keyboard tracks can be achieved literally by combining a keyboard carrier sound with a percussive modulator. Rhythm guitar will also work wonderfully.

More than just an audio processor or virtual instrument, this plug-in is actually both, allowing you to “morph” any two signals into one with sonic clarity that is beyond what we have heard in reference vocoders in software or hardware.

The Morphoder is indeed a high quality audio processor, but it’s also just a lot of fun. Many of the people who heard the Morphoder immediately related to its sound and a common reaction was simply a smile. We certainly hope the Morphoder will make you smile too, and will provide you with a lot of useful processing.

Chapter 2 – Using the Morphoder

ROUTING YOUR SOURCES

To properly use the Morphoder within your favorite host application, the first step is to identify your *Modulator* signal. This is important because the Morphoder does not have means to generate an internal Modulator, although it does have a built-in synthesizer to provide an internal carrier signal. When you instantiate Morphoder on any track, that track's signal will be routed as the plug-in's modulator signal. The modulator signal can be any signal such as speech, drums, guitar or even rapid noise or bursts. This signal will provide the Morphoder with means to construct a filter, which will then be applied to the carrier. This will make the carrier sound a little bit like the modulator in its dynamic spectral properties. In simpler words, the Carrier will adopt the Modulator's EQ.

Using the Morphoder within your favorite host application is quite simple. When the Morphoder is instantiated it will load with its Internal Synth as the selected carrier source and the track signal as the modulator. This is a convenient starting point and once you begin playing, you should hear some low-level modulated noise. If you don't hear anything, that's probably because there is no signal present at the modulator input, or the signal is very weak. If you have any meaningful signal in the track you should hear it modulating the noise generator and clicking on any of the keyboard's buttons should introduce the modulated internal carrier sound.

The Morphoder allows you to route the modulator and carrier in other ways such as using one of the track's channels as the carrier and the other as the modulator. In some host applications, one path or the other can be routed through an external sidechain key (see the **readme** file to know which host applications support external sidechain with your version of Waves Morphoder).

ADJUSTING THE SOUND

Auditioning

The foremost condition for adjusting the sound is being able to audition it properly. For this we recommend choosing a section that has signal in both the Modulator and Carrier paths and playing it looped. Also, you can select a portion that has a modulator signal and set the Carrier to the Internal synthesizer, engage the sustain control, and press a note or a few notes on the keyboard at the bottom of the plug-in.

Following any of the examples above, you should be hearing the Morphoder output as set in the output section.

Adjusting Character and Color

The first control to set is the *Pressure control*. This control will add gain to low level signals until their energy nears the top bit and then begin to apply compression. You can't go wrong, just listen and set the amount of pressure that sounds good to you.

The *Formant ratio control* initiates at 1.00 which is the natural Formant, in which case the filter will be the same as "Learned" from the dynamic spectral properties of the modulator. Higher values will make the whole filter slide up the frequency range and the result will be a squeakier sound. For example, "Aaaah" will become more "Eeeeh". Lower values will have the opposite effect and make the sound more boomy: "Aaaah" will sound more like "Ooooh".

The *Smoothing and Release controls* both affect the time that it takes the filter to adjust dynamically. The Smoothing is apparent when the modulator is continued and the Release works when the modulator pauses. For speech signals you can say that Smoothing is responsible for the filter decay response *within* words while the Release is responsible for the filter decay *between* words. The Smoothing value has a critical effect on the intelligibility of speech where lower values provide higher intelligibility. The release control resembles a reverb tail decay and can reach a value of infinity, in which case the last filter shape will hold infinitely or as long as there is a carrier signal present. Many times it makes sonic sense that both will have similar values, but creative and special sounds can be achieved by having opposite settings etc. It is recommended that you play around a little bit in order to get to know these controls.

The Morphoder offers a 5 band parametric EQ to adjust the color of your Morphoded sound. The adjustment can be carried out by dragging the grab marker on the graph or by adjusting each numeric value box beneath the graph.

In the Output mixer controls, jack up the gain in the modulator fader and confirm that you are hearing the signal that you designated as the modulator. Now apply gain to the Carrier fader and check that you are hearing the incoming carrier signal.

Using the Internal Synthesizer and Keyboard Control.

Morphoder includes an eight-voice polyphonic synthesizer. It is designed to be controlled via the mouse and the GUI keyboard, or by a MIDI Keyboard controller. This functionality is not always available. It depends on the specific plug-in version and host.

Click the GUI keyboard with the mouse to play notes. To the right of the keyboard there is a sustain control that switches between normal mode and sustain mode. In normal mode = Sustain Off, notes will start playing at mouse click and stop at mouse release. In sustain mode = Sustain On, notes will start

playing at mouse click and remain on until the next click on the same note, or when switching sustain off. You can also Click and drag the mouse to get a glissando.

The keyboard can be used to write automation and the written automation can be further edited. If you want to edit the keyboard automation, it is important that you understand the internal voices structure of this synthesizer.

Internally the synthesizer has eight voices. All voices share the same synthesizer sound, and each voice can play a different note. From the editor automation point of view, each of these voices will appear as an independent automated parameter. The automation for each of the voices shows the note this voice plays at any time, where the minimal value is note *off* and any other value means the note is *on*.

When you play the keyboard using the mouse, the first note hit will activate Voice 1, the second, Voice 2 etc. up to eight voices. When eight voices are active, further clicks will not activate more voices and will be ignored until a voice is freed. When you record automation you can later see the automation curve for each voice separately and edit it further.

Chapter 3 – Controls and Displays

MORPHODER CONTROLS

The Morphoder GUI is arranged in five logical sections:

On the left is the *Source selection controls* section. This is the area where you select the signal source of the modulator, carrier, and properties of the internal synthesizer and noise generator.

In the middle is the *EQ Contour Controls* section.

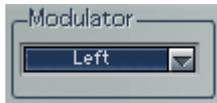
To the right of the *EQ Contour Controls* are the *Morphing Properties Controls*. Here you adjust properties of the morphing process related to time, frequency and dynamics.

On the right is the output mixer section, including faders and solo/mute buttons for each signal, and the output VU meters. Using these you can monitor and adjust the final mix between each of the signals involved: the original modulator, the original carrier, the morphed noise, and the morphed carrier.

On the bottom is the *synthesizer keyboard control*.

Source selection controls

MODULATOR SELECT: Track (for mono), Left, Right, Left+Right, SideChain (where available). Default: Track.



This control allows you to select the signal to feed the Modulator input of the Morphoder. The popup menu options will change according to the channel configuration. For mono sources you will usually select the Track input as the modulator signal. Where supported*, you will be able to route an external signal similar to using a key or sidechain input. Stereo components allow you to select the sum of the channels or just the Left or Right channels as the modulator signal.

CARRIER SELECT: Synth, Left, Right, Track or SideChain (Where available). Default: Synth.



This control selects the source for the Carrier signal input of the Morphoder. The popup menu options are similar to those in the Modulator select popup and will change contextually in a similar way with two exceptions:

- You will be able to select the Internal Synth as your carrier, which will actually be the default state of the plug-in.
- The Track input will show in Stereo allowing you to route a true stereophonic carrier signal that does not apply to modulator signal.

NOISE GENERATOR



The Morphoder offers a built-in Noise generator to “breed” the Carrier with an airy sound. When mixed with the carrier signal, this can be very effective for the sound of morphed speech sibilance. The noise generator is always available and always on, but the amount of noise to mix will be controlled in the Mixer section. The noise controls here are for filtering the otherwise wideband white noise.

Filter: Hi-Pass, Low-Pass, Off. Default: Hi-Pass.

This control allows you to select the filter that you want to use on the Noise generator.

Freq: 16 to 16000Hz. Default: 250Hz.

This control specifies the cutoff frequency for the selected filter. For Hi-Pass or Low-Pass this will be the frequency at -3dB rolloff of the slope.

SYNTH SELECT: Carrier 1 to 10. Default: Carrier 1.



The synth select popup control simply selects one of the 10 factory-provided synth sounds. All of the provided internal synth sounds are provided as is, to be shaped, warped and filtered by the modulator filter and envelope only. You can use the Carrier solo button to audition the synth as stand alone, but keep in mind that the sounds provided were specially designed to be vocoded and the real reference is how they sound while they are morphed with the Modulator rather than on their own.

TUNE: 220 to 880. Default: 440.

The tune control allows tuning the internal synth with a 1Hz resolution.

SPREAD: 0.0 to 1.0. Default: 0.0.

The spread control works in conjunction with the number of voices activated in the synth. A spread of 0 will play the stereo carrier notes on top of each other without any stereo spread. Activating spread will apply rotation to each voice, spreading them across the stereo stage, depending on how many voices are playing.

Sound Characteristics Controls

EQ Contour Controls.



The Morphoder offers 5 bands of EQ to set the color of the morphed sound (note: the EQ acts only on the Morphed sound, and not on the original modulator or carrier, even if they are mixed to the final output).

The Lowest band is a Low Shelf, the highest band is a High Shelf and the three mid bands are bells. All bands have fully paragrahic controls and the overall EQ curve is displayed in the Morphoder graph. The Q control adjusts the Slope of the Shelf filters and the width of the Bell filters. The EQ controls are all visible at all times and offer the same controls in five EQ band strips.

G - GAIN: ± 30 dB. Default: 0.0dB.

This control sets the boost or cut gain of the filter.

F - FREQUENCY: 86 to 16020. Defaults: 1=258, 2=689, 3=1804, 4=4478, 5=11046.

This control defines the frequency of the specific band filter.

Q: 0.26 to 6.50. Defaults: Shelves = 2.00, Bells = 1.00.

The Q factor adjusts the slope for shelves and the width for bell filters. The higher the value, the steeper or narrower the filters will be and vice versa.

ON/OFF: Default: On.

This control turns the specified band parameters on or off. It is handy for A/B comparison of a certain filter's effect on the overall sound contour.

Sound Character Controls



In addition to the EQ Contour controls the Morphoder offers 4 sound properties controls to shape the sound.

PRESSURE: 0.0 to 50.0dB. Default: 20dB.



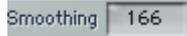
The Morphoder imposes on the carrier both the frequency and dynamics contour of the Modulator. Thus, the dynamics of the morphed signal is actually a superposition of the dynamics of both the modulator and carrier. The Pressure control serves to gradually eliminate the modulator's dynamics contour. This is basically done by applying compression/limiting to the modulator signal before morphing. We use the term Pressure because it best describes the resulting sound quality of the morphed signal.

FORMANT: 0.50 to 2.00. Default: 1.00.



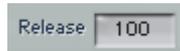
The Formant ratio control shifts the modulator's frequency contour up or down, before applying it to the carrier. Since the pitch property is set by the carrier, this will mostly affect the formant of the modulator. For example, if you are using a speech modulator, a value of 1 will be the natural formant while higher values will shift the formant upwards and vice versa.

SMOOTHING: 60 to 800. Default: 100.



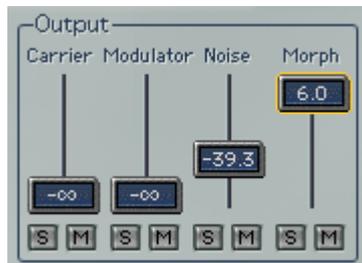
This control defines how smoothly the filter tracks the frequency contour of the modulator. Lower values sound more choppy but retain high intelligibility and high values sound more reverberant and somewhat blur the intelligibility. We found that the name “Smoothing” is perfect for this control as it describes the perceptual effect of this control.

RELEASE: 50 to Infinity. Default :120.



Just like smoothing, the release control will set the time it will take the filter to fade out in the absence of a meaningful modulator. For example, when you have a modulator with long pauses, a normal vocoder will not output any sound during the pause. With the release control, you can tell the Morphoder how long to take in releasing the filter up to infinity, which will simply hold the last constructed filter until the modulator returns.

Output Mixer Section



The Morphoder has a four-fader output mixer. Each fader adjusts the gain of one of the Morphoder paths and has Solo and Mute controls for quick monitoring and A/B auditioning.

CARRIER: $-\infty$ to 0.0dB. Default: $-\infty$.

This control sets the Mix of the carrier source to the plug-in’s output.

MODULATOR: $-\infty$ to 0.0dB. Default: $-\infty$.

This control sets the Mix of the Modulator source to the plug-in’s output.

NOISE: $-\infty$ to 0.0dB. Default: -30 dB.

This control sets the mix of the modulated noise generation to the plug-in’s output.

MORPH: $-\infty$ to +6dB. Default: 0.0dB.

This control sets the mix of the modulated carrier to the plug-in’s output.

Keyboard Control:



KEYBOARD: Four octave Note On/Off. Default: all notes off.
The Keyboard provides an interface to play the Morphoder's internal synthesizer as explained in chapter 2.

SUSTAIN: On/Off. Default: Off.
This control switches between Normal and Sustain modes of the keyboard controller.

Waves Morphoder V5.0

MIDI control enhancements

In Version 5.0 the Waves **Morphoder** becomes a true virtual instrument!

In all supported host applications (*see list below), you can open the **Morphoder**, assign a MIDI track output it, and "play it" live from a MIDI controller, or from a MIDI track using pre-recorded MIDI data.



A new control labeled "MIDI" has been added to the left of the keyboard. When the "MIDI" control is off, **Morphoder** ignores all MIDI communication and performs exactly as it did in V4.

When the "MIDI" button is on, **Morphoder** adds the ability to connect its internal carrier synthesizer to a MIDI control source. Please note that automation recording of the keyboard will be disabled when the "MIDI" button is on (in order to prevent conflicts and duplicity of MIDI and automation information upon playback). However, automation reading of previously recorded keyboard automation will continue as usual. Automation recording of all other parameters will also remain the same.

You will notice that when "MIDI" is on, the GUI (Graphical User Interface) keyboard will change its behavior in Sustain mode so that it will not be possible to release a pressed key by pressing it again. Instead, you must turn off the Sustain mode. (Simply click the Sustain button to turn it off)

The MIDI control supports the common commands of Note On, Note Off, Note Velocity, Sustain Pedal and Pitch Wheel. The Pitch Wheel can go up or down by 200 Cents (a whole step in either direction).

With "MIDI" on, Velocity is now available via MIDI only, so the GUI keyboard plays all notes at the same volume, while with a MIDI controller each note will play according to the note velocity played on the keyboard or from the recorded sequence.

*The MIDI control support for **Morphoder** is implemented in:

- DAE – Native and TDM.
- VST – In accordance with the VSTi specifications.
- DX – In accordance with the DXi specifications.
- MAS – Digital performer native API.
- AU – **Morphoder** is controlled as an Audio Unit - Music Effect.

In most host applications the way to use this feature is straightforward and also backward compatible with existing sessions.

Any instance of **Morphoder** launched will create a MIDI port to the host application. After opening one or more instances, the relating MIDI ports will show up as selectable MIDI track outputs.

What are you waiting for? Plug your MIDI keyboard or any other MIDI controller into your computer workstation, and jam away with the new Waves **Morphoder V5.0!!!**