



Vocal Bender

User Guide



Introduction

Thank you for choosing Waves! In order to get the most out of your new Waves plugin, please take a moment to read this user guide. To install software and manage your licenses, you need to have a free Waves account. Sign up at www.waves.com. With a Waves account you can keep track of your products, renew your Waves Update Plan, participate in bonus programs, and keep up to date with important information.

We suggest that you become familiar with the Waves Support pages: www.waves.com/support. There are technical articles about installation, troubleshooting, specifications, and more. Plus, you'll find company contact information and Waves Support news.

Waves Vocal Bender is a quick and simple tool for manipulating vocals. It lets you alter the pitch and formants of monophonic voice tracks with the option of modulating the controls. All of this is done in real time, which means that you can make creative vocal effects as quickly as you can move your fingers.

Pitch and **formants** are the main characteristics of the human voice. Pitch describes the most prominent tone, also called the fundamental frequency. These frequencies are created by the vocal cords and can be translated to musical notes. Formants are the resonant frequencies (or overtones) that define the timbre of the voice. In humans, formants are influenced by the vocal tract, which includes the throat, vocal cords, nasal cavity and sinuses, the nose, and, of course, the mouth. Formants are unique for each individual, so they enable us to distinguish one person's voice from another's.

Vocal Bender offers many ways to alter and modulate its controls using three different kinds of modulators. You can add modulation to your current setting on most controls, which lets you experiment with time-based manipulations on the human voice and reach unique and creative results.

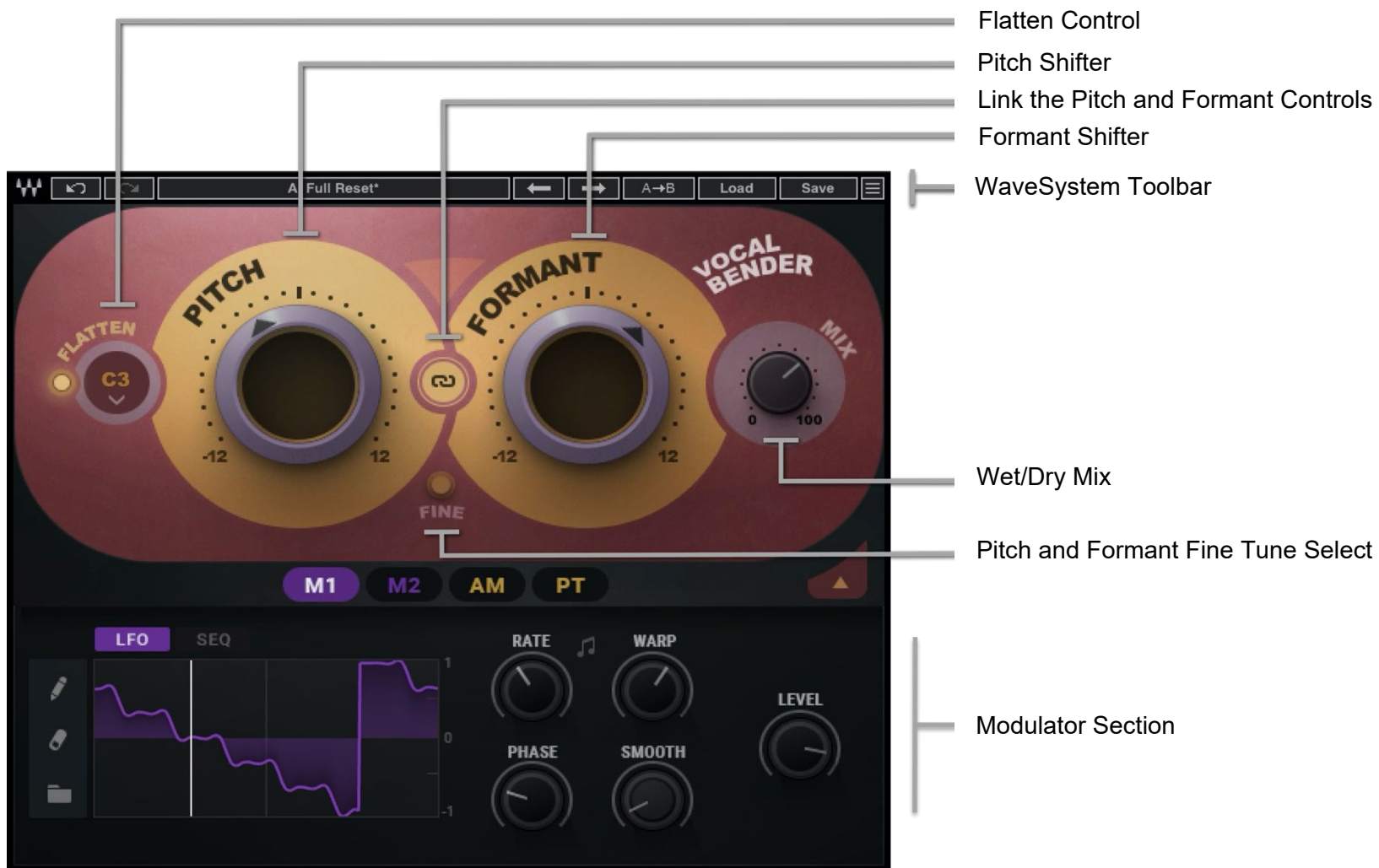
Vocal Bender is designed to process monophonic voice sources: signals that carry only a single voice at a time. A vocalist singing into a microphone is an example of a monophonic signal, whereas a choir or a voice within a full mix is a polyphonic signal. Since Vocal Bender is optimized for monophonic processing, inputting a polyphonic signal may result in artifacts.

Vocal Bender has zero latency, so it is suitable for studio recording and live performances.



Using Vocal Bender

Interface



Controls

Pitch



The Pitch Shift control lets you adjust the fundamental frequency, and hence the harmonics, of the input signal. It does not change the duration of the input signal, so you can set a harmonic offset in real time for doubling effects, without sync loss.

Formant



The Formant Shift is used to alter the tonal character of a voice without affecting the actual notes. It can make a voice sound as if it is coming from a different sized source/person. A negative formant shift makes the voice sound deeper and looser, while a moderate positive formant shift tends to make for a tighter voice. A greater positive formant shift can make a vocal sound childlike. At extreme settings it can, depending on the source, create a squeaky “chipmunk”-like effect.

Resolution of Pitch and Formant Controls



Pitch and Formant can be controlled in two resolutions:

Regular view (Fine Off): -12 semitones to +12 semitones

Fine view (Fine On): -1200 cents to +1200 cents

Use the Fine button to toggle between these views.

Flatten



Flatten forces the entire vocal to the selected pitch. This makes singing monotonic, creating a robot-like effect. This effect can be used in conjunction with pitch modulation to create musical sequences.

Range: C2 to B3

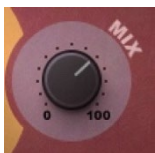


Link the Pitch and Formant Controls



Turn the small knob between the Pitch Shift and Formant Shift controls to adjust both controls together while maintaining any offset. Range is limited by the highest and lowest positions of the Pitch and Formant controls.

Mix



Wet/Dry mix at the output of the plugin.
Range: 0% (dry) to 100% (wet)

WaveSystem Toolbar

Use the bar at the top of the plugin to save and load presets, compare settings, undo and redo steps, and resize the plugin. To learn more, click the icon at the upper-right corner of the window and open the WaveSystem Guide.



Modulating the Controls

Vocal Bender lets you create modulations that can be applied to controls in the plugin.

Assigning Modulators to Controls



You can assign any modulator to the Pitch, Formant, and Mix controls, and to the controls of the modulators themselves. This provides complete flexibility when manipulating a vocal performance.

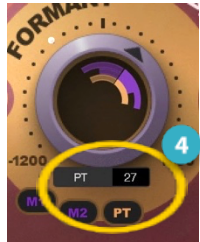
- 1 **Grab and move** a modulator's label. The controls that are available for modulation will be framed in blue once you move a modulator. Every control except Smooth and Offset* can be modulated.

*The Offset control is found only the Pitch Modulation type.

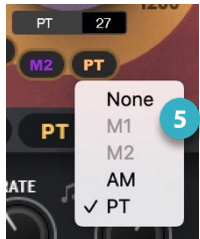


- 2 **Drop** the label of the modulator onto any available control. In this example, "M1" is being assigned to the Formant Shift control. The yellow highlight identifies the active control.
- 3 Once the modulator is dropped on a control, it will appear in the first modulation slot below the modulated control. You can **assign** up to four modulators per control.





4 **Click and drag vertically** over this modulation slot to adjust the modulation depth. A small, color-coded arc inside the modulated control knob indicates the applied depth for that modulator. Just outside the knob is a moving white dot. This describes the range in which the modulator affects the control. If, for example, the control range is -12 to 12 semitones, and the modulation depth is 50%, the values would move between -6 to 6 semitones.



5 You can also assign a modulator from the control itself. Right-click on a slot to open the Modulator Assignment menu. To remove a modulation assignment, right click on the populated slot to open the drop-down menu and select “None.”

Modulation Types



There are four modulators. Each can be assigned to a control for modulation. Specific assignments vary depending on the modulator. This is discussed later.

MOD 1 AND MOD 2

These modulators can be set to LFO or Sequencer. You can determine their Rate and Shape and decide how they are triggered.

ORGANIC MODULATORS

Organic modulators use the input signal itself to create a modulation.

AM, or Amplitude, lets you use the amplitude envelope of the Voice signal to manipulate other controls of the plugin.

PT, or Pitch, extracts the pitch detection from the voice.



MOD 1 (M1) and MOD 2 (M2)

LFO / SEQ



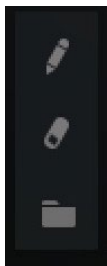
Change the behavior of a modulator by switching it between **LFO** and **Sequencer**. When LFO is selected, the Rate control determines the time it takes to complete a full cycle.



When Sequencer is selected, Rate determines the time it takes to complete a single step.

The sequencer's values are quantized to whole numbers between -24 and +24. Use the Steps drop-down menu (circled) to select the number of steps. Drag a step up or down to increase or decrease its value. Range: 2–16 steps.

SHAPE CONTROLS



Draw (Pencil icon) allows you to manually draw a shape, in either the LFO or sequencer.

Erase (Eraser icon) resets the currently loaded shape to “None.”

Browse (Folder icon) opens a library of factory LFO shapes or sequencer patterns. Click on a shape to replace the one you are currently using. Scroll across the panel to reveal more shape options. To undo, use the arrows on left side of the WaveSystem toolbar, not the host “undo.”



Click on the Folder icon to access the Save and Delete buttons.



Save (Disk icon) adds the current shape to the library as a user-drawn modulator shape to an empty cell.

User shapes appear in blue and factory shapes are purple. You can access the saved shapes at:

Mac: /Users/Shared/Waves/Plug-in Settings/

PC: C:\Users\Public\Waves Audio\Plug-in Settings\

Delete (Trash icon) removes the selected user shape from the shape library. Click the Trash icon, then click on the user shape you wish to delete. You cannot delete factory shapes.





RATE

Sets the rate of the modulator. Display units and range are dependent on the Rate Sync setting.

Range: 0.06 Hz to 30 Hz or 1/64 bar to 8 bars



RATE SYNC ON/OFF

Toggles the Rate knob values. When On, the rate of the LFO is calculated by the Host BPM and is displayed in musical notation. When Off, values are displayed in Hz.

PHASE

Controls the starting position of the modulator.

WARP

Warp the speed of the modulator but keeps the overall timing of the cycle. When Warp value is lower than 1, modulation will start at a slow pace and increase its speed toward the end of the cycle. When set above 1, the pace is fast at start and then slows down at the end. Essentially, this is applying pulse width modulation on the cycle of the modulator.

Range: 0.01 to 100 (a value of 1 is linear)

SMOOTH

Applies smoothing to the modulation curve. Low settings result in distinguishable onsets and may result in clicks. High settings smooth the overall modulation curve, and in some settings may result in very low energy.

Range: 1 to 1000

LEVEL

The overall level of the modulator. When the Level of a modulator is set to 0, no modulation takes place.

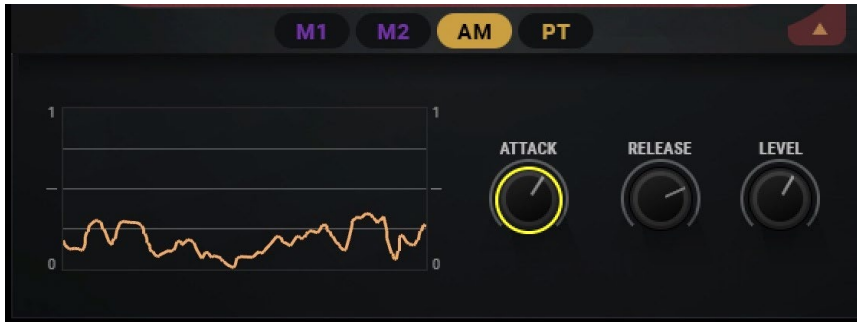
Range: 0 to 1



Organic Modulators

Organic modulators enable you to use the characteristics of the input signal to modulate most plugin controls.

AM (AMPLITUDE)



The Amplitude modulator lets you use the amplitude envelope of the voice signal to manipulate other controls of the plugin. This works much like an envelope follower.

ATTACK

The time it takes the modulator to rise when positive level values are detected.

Range: 0.1 ms to 1000 ms

RELEASE

The time it takes the modulator to fall back to minimum once an attenuation is detected.

Range: 0.1 ms to 1000 ms

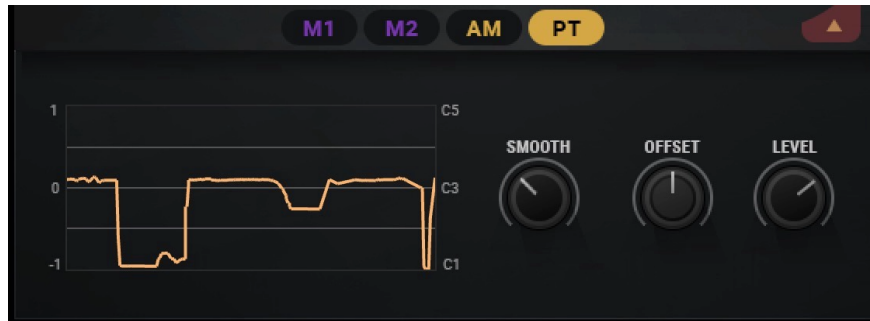
LEVEL

The overall level of the modulator. When this is set to 0, no modulation takes place.

Range: 0 to +2



PT (PITCH)



The Pitch modulator extracts the pitch detection from the voice input signal.

SMOOTH

Sets the time it takes for the modulator to respond to any change in detected pitch. The effect is similar to pitch gliding.

Range: 1 to 1000

OFFSET

Applies a steady offset to the overall modulation curve. It lets you set a “reference note” about which pitch modulates.

Range: -1 to 1

LEVEL

Sets the overall level of the modulator. When Level is set to 0, no modulation takes place.

Range: 0 to +2

