

## EXPANDED EFFECTS

The Wavestation now features 8 new effects, numbered 48-55. These include the Mod Pitch Shift-Delay, Stereo Compressor-Limiter/Gate, and 6 Vocoders.

Additionally, the Distortion-Filter-EQ and Overdrive-Filter-EQ effects now feature a modulatable output level.

### DISTORTION - FILTER - EQ

The amount of Distortion/Overdrive is related to the level of the input signal. Using MIDI Volume to change the level of a Performance with these effects will thus also change its timbre. To change the volume of a distorted/overdriven Performance without altering its timbre, use the Level modulation parameter instead.

#### 29 Distortion - Filter - EQ

This effect has a "dirty" sound and "wah" effect. It is effective for solos.

#### 30 Overdrive - Filter - EQ

This is an effect that simulates the overdrive generally used by guitars, and is particularly effective when applied to organs and electric pianos to create guitar-like lines and solos. It also has a "wah" effect.

#### Parameters

<b>Dry/Wet Mix</b>	<b>DRY, 9/1, . . . 1/9, WET</b> Output balance of processed and unprocessed sound.
<b>Footswitch</b>	<b>DISABLE/ENABLE</b> Enables or disables use of EFFECTS SWITCH to turn effect on or off.
<b>Edge</b>	<b>1 to 111</b> Amount of drive.
<b>Hot Spot</b>	<b>0 to 100</b> Controls the center frequency of the "wah" filter. Try modulating this parameter with a pedal or mod wheel for the classic "wah-wah" effect.
<b>Hot Spot mod source</b>	<b>Mod source</b>
<b>Hot Spot mod amount</b>	<b>-15 to +15</b>
<b>Resonance</b>	<b>0 to 100</b> Filter "Q" factor. This controls the amount of "wah" effect.
<b>Level</b>	<b>0 to 100</b> Output level of the effect.
<b>Level mod source</b>	<b>Mod source</b>
<b>Level mod amount</b>	<b>-15 to +15</b>

### Low EQ

**-12 to +12 dB**  
Control for cutting or boosting the low frequencies.  
EQ is applied to the wet signal only; the direct signal is unaffected.

### High EQ

**-12 to +12 dB**  
Control for cutting or boosting the high frequencies.  
EQ is applied to the wet signal only; the direct signal is unaffected.

### MOD PITCH SHIFT-DELAY

#### 48 Mod pitch shift-Dly

This pitch shifter allows the amount of shift to be modulated. The input may be shifted either up or down, and the shifted signal may also be delayed with respect to the original signal, with an adjustable feedback amount. Some applications of this include "whammy-bar" pitch bending and special effects.

#### Parameters

<b>Dry/Wet Mix</b>	<b>DRY, 9/1, . . . 1/9, WET</b> Output balance of processed and unprocessed sound.
<b>Dry/Wet Mix mod source</b>	<b>Mod source</b>
<b>Dry/Wet Mix mod amount</b>	<b>-15 to +15</b>
<b>Delay Left</b>	<b>0 to 490 ms</b>
<b>Delay Right</b>	<b>0 to 490 ms</b>
<b>Feedback</b>	<b>0 to 100</b> This is the feedback amount for the delay lines.
<b>Max Shift</b>	<b>-12 to +12</b> This is the maximum amount of pitch shift, in semitones.
<b>Shift Scaler</b>	<b>1 to 100%</b> This determines the initial amount of pitch shift without modulation, as a percentage of the Max Shift amount.
<b>Shift Scaler mod source</b>	<b>Mod source</b>
<b>Shift Scaler mod amount</b>	<b>-15 to +15</b> If the Shift Scaler is set to 1, only positive modulation will have an effect; if it is set to 100, only negative modulation will have an effect.

**STEREO COMPRESSOR-LIMITER/GATE****49 Stereo comp-lim/Gate**

The compressor provides an automatically controlled volume envelope, which can be used to smooth out the level of a signal (often done with guitars), or to give a sound more "punch" (often done with drums). The ability to use a single FX Bus as the control source allows you to create side-chain effects, linking the compression of one signal to the level of another.

A gate is also provided. Signals of a certain minimum volume (the Threshold amount) "lift" the gate, and are allowed to pass through; signals under that volume are not.

**Parameters**

<b>Control Source</b>	<b>NORMAL, BUS A+B, BUS C+D, BUS A/B/C/D</b> NORMAL uses the input signal to control the compression amount. To allow you to achieve side-chain effects, BUS A+B and C+D use the sum of the two FX Buses to control the compression amount, and BUS A-D use the levels from a single FX Bus .
<b>Control Source Sensitivity</b>	<b>0-10</b> This parameter sets the input level for the Control Source.
<b>Compression Ratio</b>	<b>0 to 100</b> This parameter sets the amount of compression.
<b>Compression Threshold</b>	<b>0 to 100</b> This parameter sets the level at which compression will begin.
<b>Gate Threshold</b>	<b>0 to 100</b> This parameter sets the level at which the gate is lifted, letting the signal through.
<b>Output Level</b>	<b>0 to 100</b> This parameter sets the output level of the compressor.

**SMALL VOCODER 1/2/3/4**

The Vocoder effects superimpose the timbre of one signal (the Modulator) onto that of a second signal (the Carrier). A standard application of this is the "talking" instrument, in which you talk into a microphone and a guitar or keyboard sound is made to mimic the harmonic content of the speech.

Speech effects are the most commonly used application of the Vocoder, and they're what the first vocoders were designed to do; but they are not by far the limit of its capabilities. The Vocoders can modulate one or more Wavestation Patches or Waves to achieve new, dynamic timbres. You can even combine Vector and/or Wave Sequence sounds in this cross-timbral modulation synthesis, and then store them as a new Performance (for more information on this subject, please see the tutorial below).

A vocoder is essentially a combination of a frequency analyzer and a dynamic EQ. The Modulator signal is divided up into a number of frequency bands, and the levels of each of these bands are measured in real time. A dynamic EQ is slaved to the analyzer, following the changes in each band of the Modulator with similar changes in the EQ of the Carrier. This causes the Carrier to assume some of the timbre of the Modulator. It is best for the Carrier to contain a wide range of frequencies, because if there is little or no material in some of the bands to begin with, the EQ will have nothing to alter, and the Vocoder's effect will be diminished.

The more frequency bands which are used, the greater the definition of the Vocoder effect. To achieve the highest quality Vocoder, the two Stereo Vocoder - Delay algorithms use both effects slots; the four Small Vocoder algorithms use the normal effects configuration, making another effect simultaneously available.

The Vocoder may be used with any combination of sounds. Since the designation of Carrier and Modulator is based on the FX Bus, you must make sure that any applicable settings on the Patch FX Bus Assignment page, as well as the Performance Part Detail FX Bus parameter, are configured appropriately.

**50 Small vocoder 1**

This vocoder uses low to mid-high frequency bands. It has a wider band covering the bass range, for enhanced low-end response.

**51 Small vocoder 2**

This vocoder uses mid-low to high frequency bands. It has a wider band covering the treble range, for enhanced high-end response.

**52 Small vocoder 3**

This vocoder uses a number of low to mid-high frequency bands of even width.

**53 Small vocoder 4**

This vocoder uses a number of mid-low to high frequency bands of even width.

**Parameters**

<b>Modulator Bus</b>	<b>A,B,C,D</b> FX Bus used as source for the Vocoder Modulator.
<b>Modulator Bus Sensitivity</b>	<b>0 to 100</b> This sets the input level for the Modulator. If you hear distortion, try turning this value down.
<b>Carrier Bus</b>	<b>A,B,C,D</b> FX Bus used as source for the Vocoder Carrier.

<b>Carrier Bus Sensitivity</b>	<b>0 to 100</b> This sets the input level for the Carrier. If you hear distortion, try turning this value down.
<b>Sibilance</b>	<b>0 to 10</b> Controls the amount of high frequencies from the Modulator (such as vocal consonants, as in "ch" and "ss") included in the mix.
<b>Sibilance mod source</b>	<b>Mod source</b> The default mod source is KEYDN, which allows you to use the Key Down time to gate the sibilance amount.
<b>Sibilance mod amount</b>	<b>-15 to +15</b>

**STEREO VOCODER-DELAY 1/2**

The two Stereo Vocoder - Delays are extremely powerful algorithms, and use both effects slots. When you select one of the Stereo Vocoders for Effect 1 or 2, the other Effect changes to display Stereo Vocoder as well.

For more information on the Vocoders, see the discussion of the Small Vocoders, above.

**54 Stereo vocoder - Delay 1**

This vocoder uses wide frequency bands on the treble and bass ranges, and a number of narrower bands in the mid-range.

**55 Stereo vocoder - Delay 2**

This Vocoder uses a number of bands of even width, across the frequency range.

**Parameters**

<b>Modulator Bus</b>	<b>A,B,C,D</b> FX Bus used as source for the Vocoder Modulator.
<b>Modulator Bus Sensitivity</b>	<b>0 to 100</b> This sets the input level for the Modulator. If you hear distortion, try turning this value down.
<b>Carrier Bus</b>	<b>A,B,C,D</b> FX Bus used as source for the Vocoder Carrier.
<b>Carrier Bus Sensitivity</b>	<b>0 to 100</b> This sets the input level for the Carrier. If you hear distortion, try turning this value down.
<b>Sibilance</b>	<b>0 to 10</b> Controls the amount of high frequencies from the Modulator (such as vocal consonants, as in "ch" and "ss") included in the mix.
<b>Sibilance mod source</b>	<b>Mod source</b> The default mod source is KEYDN, which allows you to use the Key Down time to gate the sibilance amount.
<b>Sibilance mod amount</b>	<b>-15 to +15</b>
<b>Stereo Width</b>	<b>0 to 10</b> Increasing this value causes the stereo effect to become more prominent.
<b>Delay Time</b>	<b>0 to 1000 ms</b>
<b>Feedback</b>	<b>0 to 100</b>
<b>Delay Level</b>	<b>0 to 100</b>

**Cross-Timbral Modulation Synthesis using the Vocoders**

In this simple example, we'll use two Patches to create a hybrid sound. You can use two or more Patches as the Carrier and/or Modulator, simply by setting them to the same FX Bus.

- ☛ Initialize a Performance.
- ☛ Go to the Performance Part Detail page. Select two Patch(es) which you would like to use in your cross-timbral modulation, and place them in the first two Parts of the Performance. It's best to use sounds with a wide frequency range, such as sawtooth-like waves.
- ☛ On the same page, set the FX Bus for the first Part to "A," and the FX Bus for the second to B.
- ☛ Go to the EFFECTS page, and select Stereo Vocoder -Delay 1 or 2 as Effect 1 for the Performance. These effects are so powerful that they require both effects slots, so you'll notice that Effect 2 changes to read Stereo Vocoder - Delay also.
- ☛ Press the soft key FX 1 EDIT, so that you can set up the Vocoder.
- ☛ On the Vocoder edit page, set the Modulator Bus to "A" (which you assigned Part 1 to, above) and the Carrier Bus to "B" (Part 2). This means that Part 1 is the Modulator, and Part 2 is the Carrier, so that Part 1's sound will be superimposed on Part 2's.
- ☛ Try playing the sound!

**More Vocoder Tips**

The Vocoder's Sibilance parameter determines how much of the original Modulator's higher frequencies are heard. If you want to hear more of that sound, turn this parameter up.

In addition to using two sounds to modulate each other, you can try using a single sound to modulate itself. To do this, you can either place the same sound on two Parts (similar to the example above), or simply assign the FX Bus of a single Part to 50/50.

Another interesting application is to use a rhythmic, percussive Wave Sequence as the modulator, and a bright pad as the carrier. The pad will be "triggered" by the Wave Sequence's percussion. This is especially effective when using a sequencer and synching Wave Sequences to MIDI Clocks, so that the Vocoder timbre creates a cool, percolating rhythm track.

**Stereo Vocoder-Delay 1/2 and the Effects Mix**

Since the Stereo Vocoder-Delays can use any of the effects buses for both the Carrier and the Modulator, the routings on the Effects Mix page work slightly differently from those of other effects. Buses A and B can only be routed through the Vocoder; if they are not used as Carrier or Modulator, they are not heard. Buses C and D, however, may be routed both through the Vocoder and as set by the Effects Mix page, which works with the Stereo Vocoders in a couple of special ways.

The Effects Mix Parallel routing functions almost as usual, allowing you to pan C and D across the stereo outputs as if FX 2 were set to the NULL EFFECT. The Effects Mix Series routing is somewhat more altered, so that the Wet/Dry Mix controls how much of the original sounds of Buses C and D are heard, without

affecting the level of the Vocoder output. Wet means that only the Vocoder output is heard, and Dry means that the original sounds are heard at full volume, along with the Vocoder output. This feature allows you to use buses A and B for the vocoder, and simultaneously route buses C and D directly to the stereo outputs. By using buses C and/or D as the Modulator, you can also use the Effects Mix to blend in some of the Modulator's original sound. If you wish to pass through only the high frequencies of the Modulator (a typical vocoder application), use the Vocoder's Sibilance parameter instead.

For more information on the Effects Mix, please see Section 7.2 of the Player's Guide (Effects Buses and Routing), and Effects Mix in the Reference Guide.