

SPECTRAL

The logo for Spectral Machine. The word "SPECTRAL" is in a blue, sans-serif font with a gradient. The letter "A" is replaced by a colorful, multi-faceted diamond shape. Below "SPECTRAL" is the word "machine" in a bold, black, sans-serif font with a reflection effect. A small "TM" trademark symbol is to the right of "machine".

machine™

1.0X SOFTWARE USER'S GUIDE

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VST Plug-in Technology by Steinberg.

Credits

Spectral Machine: Xavier Amatriain (design and programming), Alessandro Saccoia (programming and additional effect design), Sophia Poirier (original framework code), Earl Vickers (design, some prototype code, etc.)

Spectral Machine Manual: Earl Vickers

Beta Testers: Joakim Fahlstrom, Jeremy Lee, Elvar Aron, Andrew Lansley, Shaun Mettam, Matthew Large, Ed Parnell, James Monroe, Pete Martin, Ray Brunelle, others.

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1 INTRODUCTION

Welcome to Spectral Machine!

Spectral Machine™ is an advanced frequency-domain multi-effects plug-in. Like SFX Machine, Spectral Machine wraps a great deal of power and flexibility inside an easy-to-use interface.

But unlike time-domain plug-ins like SFX Machine, Spectral Machine starts by converting the audio into the frequency domain using a Fast Fourier Transform (FFT). This gives us direct access to the signal's frequency spectrum, enabling a number of effects that simply would not be possible in the time domain.

Spectral Machine effects include:

- Delay Spectral Bands
- Spectral Freeze
- Sample & Hold
- 3 AM
- 3-Band Filter
- Spectral Peak/Notch
- Oscillating Peak/Notch

plus the following effects that work with monophonic sources such as solo voice or a single-voiced instrument (such as saxophone, etc.):

- Pitch Shift
- Harmonize
- Pitch Quantizer
- Pitch Isolate
- Sine / Noise
- Spectral Shapeshifter
- Vibrato
- Robotization

Created with music and sound design professionals in mind, Spectral Machine makes it easy to select and modify effects with just a few mouse clicks.

Minimum System Requirements

The Macintosh version of Spectral Machine requires:

- **A PPC or Intel Macintosh**
- **OS X 10.4** or higher
- About 100 MB available RAM (in addition to that required by your system, host software, etc.)
- About 100 MB available hard disk space
- A VST or Audio Unit host program

The Windows version of Spectral Machine requires:

- **Windows XP, Vista, or 7**
- About 100 MB available RAM (in addition to that required by your system, host software, etc.)
- About 100 MB available hard disk space
- A VST host program

For a list of suitable VST and Audio Unit host programs, see <http://www.sfxmachine.com/spectralmachine/requirements.html>.

Precautions



Use this sound design appliance only for its intended use as described in the manual. No user-serviceable parts inside. Opening the case can expose you to impedances in excess of 50,000 ohms. Do not use Spectral Machine while bathing. Never stick tongue to this appliance in subfreezing weather. Avoid bashing head repeatedly into Spectral Machine, smashing it into a million pieces, and welding the pieces to your body with a blowtorch.



Seriously, the main precaution here is: take care of your ears. If you blow out your speakers, you can buy new ones, but ears are not easy to repair or replace.

This applies to **any** audio software or hardware. In particular, use speakers instead of headphones if possible, and if you must use headphone, avoid prolonged use. Learn the signs of ear fatigue, and take a break when everything starts sounding the same. If your ears begin to ring, that's often a sign that you're listening to sounds that are too loud or listening for too long.

2 QUICK START

Installing Spectral Machine (Mac version)

To Install Spectral Machine for Macintosh:

1. Double-click on the Spectral_Machine_1.0x.dmg file. A disk image file called "Spectral Machine" will appear on your desktop, and a window called "Spectral Machine" will open.
2. In the Spectral Machine window, you will see an installer file, a Read Me file, and a user guide. The installer file is called "Spectral_Machine_1.0.mpkg".
3. Double-click on the "Spectral_Machine_1.0.mpkg" icon to launch the installer. The installer will take you through the remaining steps.
4. Read the Introduction, then click "Continue."
5. Read the Read Me file. Click "Continue."
6. Read the Software License Agreement. Click "Continue", then click "Agree" to accept the terms of the agreement.
7. Select a destination disk (you must choose your Mac OS X system disk) and click "Continue."

Note: If at this point you receive an error saying, "You are not allowed to install the software in the default location," that means one of two possible things: (1) You are not an administrator for that computer (in which case you need to ask an admin, most likely the owner of the computer, to install the software), or (2) if you are an administrator (which is most likely the case if you own the computer), then this means that your system has permissions errors. To correct them, launch Disk Utility (located in /Applications/Utilities), click on your system disk in the list on the left, click on the First Aid tab, and then click on Repair Disk Permissions.

8. Select the desired installation type, i.e., Easy Install.
9. Click "Close." You're done!

The installer will create two items:

- the Spectral Machine Audio Unit plug-in
(placed into /Library/Audio/Plug-Ins/Components/)
- the Spectral Machine VST plug-in
(placed into /Library/Audio/Plug-Ins/VST/)

The plug-ins should not be moved from their default locations.

Installing Spectral Machine (Windows version)

To Install Spectral Machine for Windows:

1. Double-click on the SFX_Machine_Pro_1.0.exe file. This will launch the installer.
2. Read the Introduction, then click "Next."
3. Read the Software License Agreement. Click "I accept the agreement" and then click "Next" to accept the terms of the agreement.
4. Locate the folder where you would like to install the VST plug-in. The proper location can vary depending upon the VST host application you are using, but usually the proper location is in a folder called VstPlugIns. Some hosts know to look in the "Program Files\VstPlugIns" folder, so that is the default location. Consult your VST host application's documentation to determine where you should install the plug-in file. Once you have selected a location, click "Next."
5. Next you will be presented with a summary of your installation options. Click "Install" to begin the installation.
6. The final screen will tell you whether or not the installation was successful and also give you the option to view the Read Me file. Click "Finish." You're done!

The installer will create two items:

- the Spectral Machine VST plug-in
(placed in your VST host application's VstPlugIns folder)
- a Read Me document
(placed in the same location)

Authorizing Spectral Machine

This plug-in will operate in demo mode until it is authorized. In demo mode, the sound output will momentarily drop out every 30 seconds.

To authorize Spectral Machine:

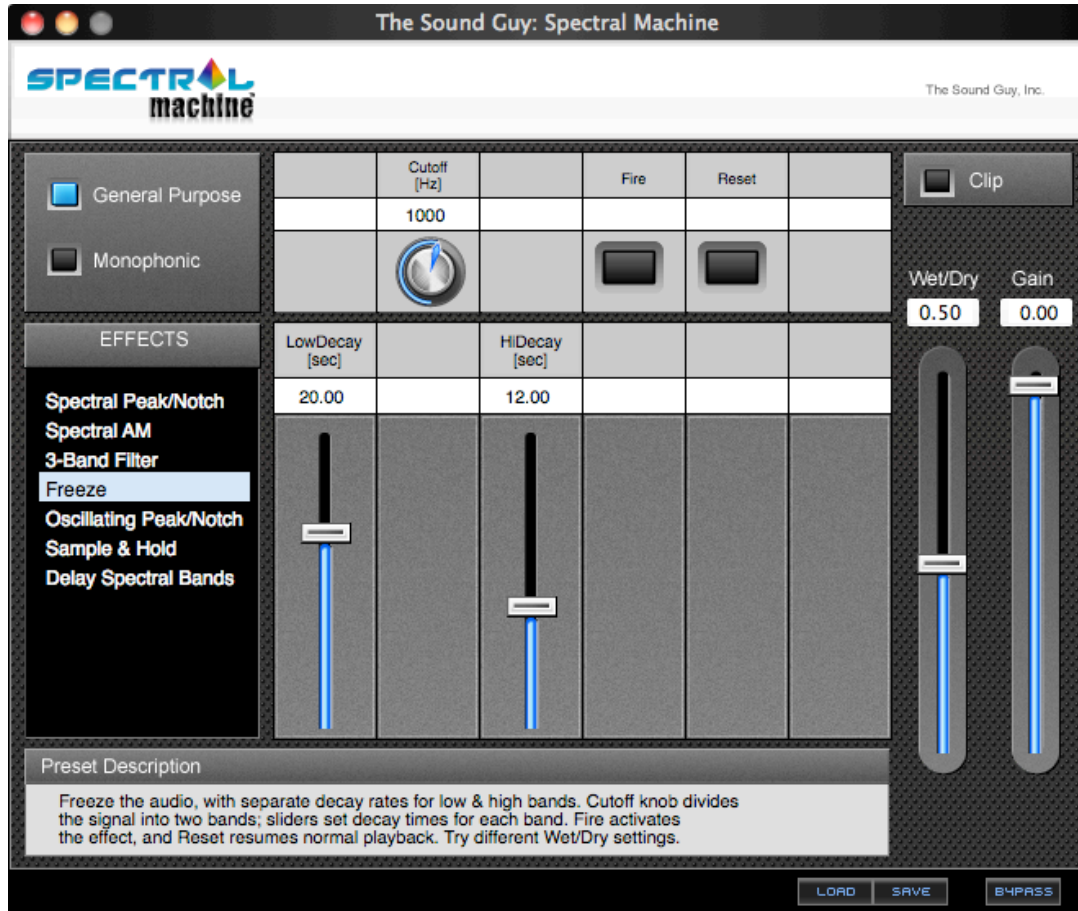
1. Launch your VST or Audio Unit host application.
2. Select "Spectral Machine" from the appropriate menu or sub-menu (for example, "VST Plug-Ins", or "Audio Unit Plug-Ins -> The Sound Guy").
3. When Spectral Machine appears, you will be prompted to enter an authorization code.
4. After purchasing the software on-line, wait for an email from the payment processing company, share-it.com. Locate the 20-digit authorization code and copy it to the clipboard.
5. Paste this authorization code into the auth code prompt in Spectral Machine.

If you have encounter any problems in using Spectral Machine, check the Frequently Asked Questions section at the end of this manual, or check the FAQ page of our website.

3 OVERVIEW

User Interface

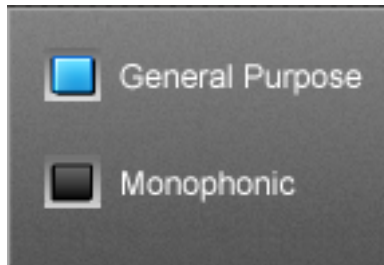
After instantiating Spectral Machine, you will see the user interface, which allows you to select and modify the factory effects and hear what they do to your audio.



To use Spectral Machine:

1. Select *General Purpose* or *Monophonic* effect type
(For polyphonic sources, select *General Purpose*)
2. Select an effect from the *Effects* menu
3. Read the explanation and tips in the *Preset Description* field
4. Adjust any of the circular knobs, vertical sliders or buttons, or type the desired parameter value.

General Purpose and Monophonic Effects



There are two types of effects: *General Purpose* and *Monophonic*. *General Purpose* effects, as the name implies, can be used for any type of audio signal. While you may get more musical results by applying Spectral Machine to individual tracks or submixes (stems), rather than complete mixes, *General Purpose* effects can be applied to either.

Monophonic effects, on the other hand, should *only* be applied to monophonic tracks; that is, tracks containing a single monophonic source, such as solo voice, saxophone, etc. This is because *Monophonic* effects rely upon tracking the pitch of the input signal, and polyphonic sources have multiple pitches at once. So, **unless you like the unpredictable and often unpleasant results, avoid processing polyphonic sounds with *Monophonic* effects.**

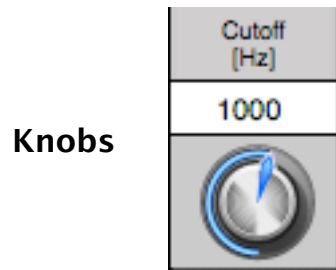


“Monophonic” should not be confused with “monaural” (one channel). *Monophonic* refers to the number of sources, not the number of channels. A stereo recording of solo clarinet is monophonic. A one- or two-channel recording of a 6-string guitar or an 88-key piano is generally polyphonic.

Monophonic effects will most often be used on human voice, but they can also be applied to single-voiced orchestral instruments, etc. And recall that you can use any of the *General Purpose* effects with either monophonic or polyphonic sources – some *General Purpose* effects, such as **Delay Spectral Bands**, are very nice with vocals.

Spectral Machine Effect Controls

Each Spectral Machine effect has one to six vertical columns, each of which may have zero, one, or two controls: knobs, sliders, or push buttons.



The circular knobs are used to control parameters such as:

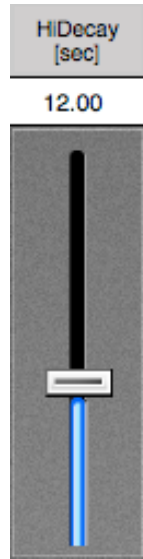
- filter frequency (Hz)
- bandwidth (Hz)
- low-frequency oscillator (LFO) rate (Hz)
- decay amount (%)
- transposition amount (semitones)
- pitch correction (discretization) amount (semitones)
- voicing threshold (%)
- spectral shape shift amount (Hz)

The knobs are controlled using a linear motion, not a circular motion. Hold down the mouse button and drag it up or to the right to increase the value; drag down or to the left to decrease the value. Holding down the shift key lets you fine-tune parameter values.

You can also type the desired value into the value field immediately above the knob (e.g., 1000 in the illustration above).

Often frequency knobs are used to define crossover frequencies between bands for a multi-band effect. See **3-Band Filter** or **Delay Spectral Bands** for examples of this.

Sliders



The vertical sliders are used to control parameters such as:

- gain (dB)
- modulation depth (%)
- decay time (seconds)
- hold time (milliseconds)
- delay time (milliseconds)
- voicing threshold (%)
- pitch correction rate (%)
- robotization pitch (%)

To get finer resolution, you can hold down the shift key while adjusting the sliders. You can also type the desired value into the value field immediately above the slider (e.g., 12 in the illustration above).

Push Buttons



Buttons are used to Fire and Reset the **Spectral Freeze** effect.

Spectral Machine Global Controls

The global controls (*Wet/Dry* and *Gain*) control whatever effect is currently selected.

Wet/Dry Slider

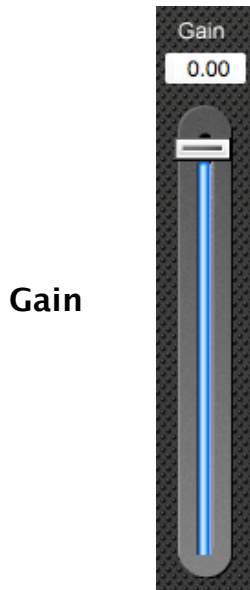


The *Wet/Dry* slider controls the proportions of the processed (“wet”) and unprocessed (“dry”) signals in the output.

Set *Wet/Dry* as follows:

- 1.0: Only the processed signal will be heard
- 0.5: 50/50 mix of processed and unprocessed
- 0.0: Only the unprocessed signal will be heard (same as bypass)

Note that some effects sound best with *Wet/Dry* set to 1.0 (100% wet), while others sound best with 0.5 (50% wet) or various intermediate settings. Also, some may sound best with just a slight amount of dry signal (e.g., 0.9); others may benefit from only a slight amount of processed signal (e.g., 0.1). Experiment to see what sounds best for your audio.



Gain

The *Gain* slider controls the amount of attenuation applied to the output. The *Gain* values are in decibels (dB). The highest gain is 0 dB (scaling the signal by 1.0 = no change); the lowest gain is $-\infty$ (scaling the signal by 0.0 = no output).



If Spectral Machine detects clipping (which can cause harsh, distorted sounds), the Clip Light turns red. To keep this from happening, lower the *Gain* slider, or adjust other parameters that may be causing excessive gain. Click on the red Clip Light to reset the indicator.

4 EFFECTS

General Purpose Effects

Delay Spectral Bands

The screenshot shows the SPECTRAL machine software interface. The top left features the logo and the text "The Sound Guy, Inc.". The main interface is divided into several sections:

- General Purpose:** A checkbox that is checked.
- Monophonic:** A checkbox that is unchecked.
- EFFECTS:** A list of effects including "Delay Spectral Bands" (which is selected), "Spectral Freeze", "Sample & Hold", "3 AM", "3-Band Filter", "Spectral Peak/Notch", and "Oscillating Peak/Notch".
- Parameters:** A table of settings for the selected effect.
- Wet/Dry:** A slider set to 1.00.
- Gain:** A slider set to 0.00.
- Clip:** A checkbox that is unchecked.

LoFeedbk [%]	Low Cutoff [Hz]	MIFeEdbk [%]	Hi Cutoff [Hz]	HiFeEdbk [%]
30.00	500.00	30.00	2000.00	30.00

LoDelay [ms]	MIDelay [ms]	HiDelay [ms]
2000.00	2050.00	2000.00

Preset Description:
Independent delay on three frequency bands. Split into three bands using the two Cutoff knobs. Sliders control the delays; Feedbk knobs control the feedback. Try various Delay times and Wet/Dry settings.

The **Delay Spectral Bands** effect lets you apply separate delays to three frequency bands; it also lets you control the amount of feedback for each band.

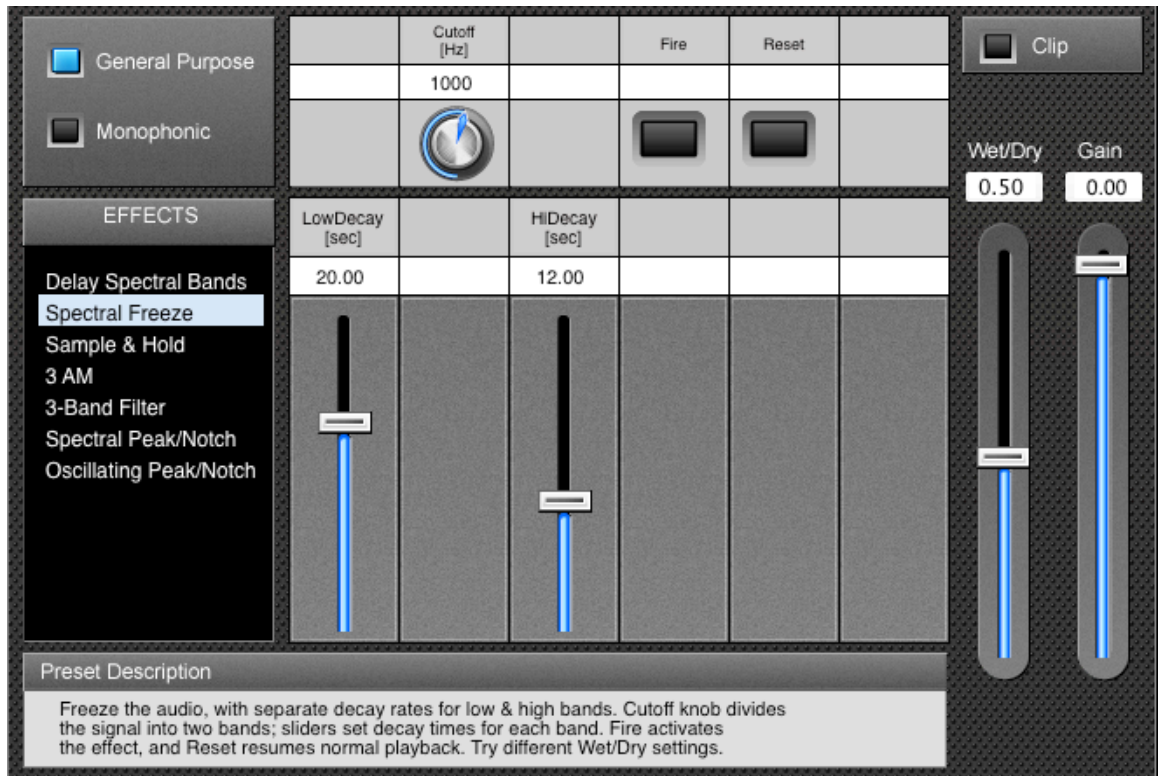
To use the Delay Spectral Bands effect:

1. Set the Low and High *Cutoff* frequencies (Hz) to split the spectrum into three bands
2. Set the desired *Delay* time (milliseconds) for each band. If you're using feedback, you may want to start by setting all the bands to a longer *Delay* time, such as 1000 ms.

3. If you want feedback for one or more bands, specify the *Feedbk* amount (%) by which that band should decay before feeding back.

You will generally want to set the *Wet/Dry* slider to 1.0 for this effect.

Spectral Freeze



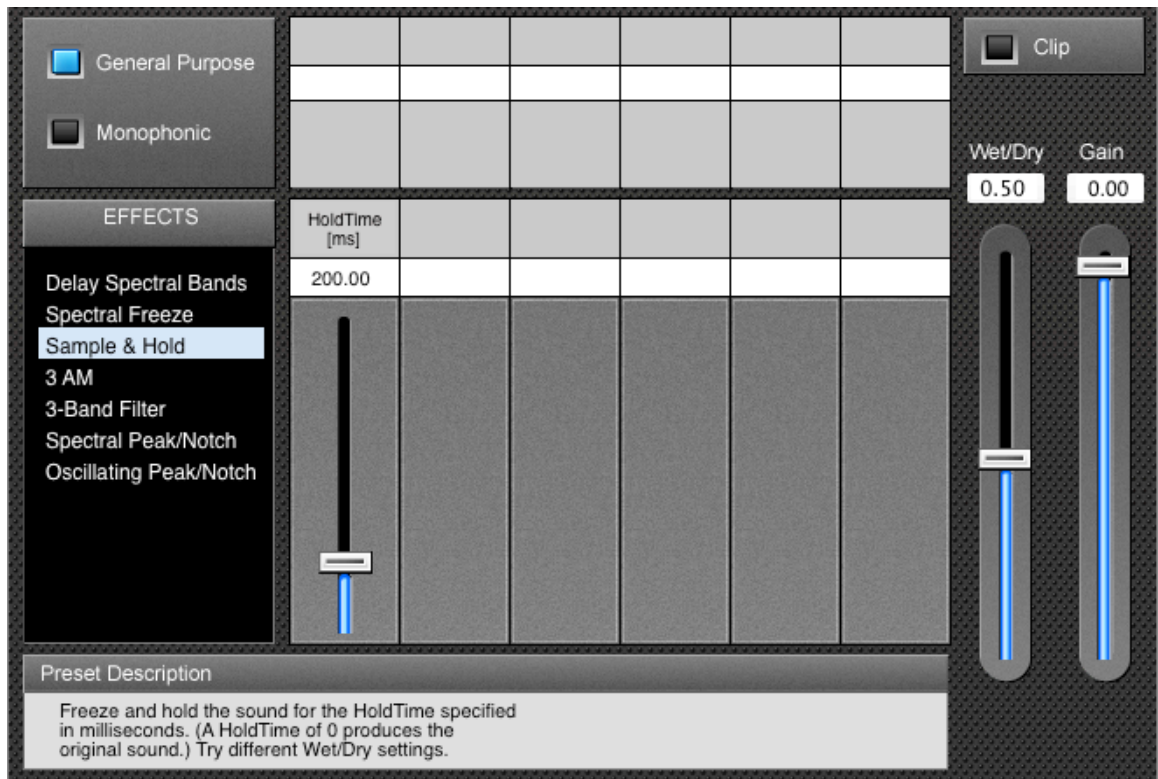
The **Spectral Freeze** effect lets you “freeze” the audio, with separate decay rates for the low and high frequencies. (You may want to use shorter decays at high frequencies, to match what happens with normal reverberation.)

To use the Spectral Freeze effect:

1. Set the *Cutoff* frequency (Hz) to separate the frequency spectrum into low and high bands. For each band,
2. Set the desired *Decay* time (seconds).
3. Click *Fire* to freeze the current instant of sound
4. Click *Fire* again if you want to freeze the sound from the new instant
5. Click *Reset* to stop the freeze effect

Experiment with different *Wet/Dry* slider settings for this effect, depending on whether you want to hear the unfrozen audio continuing behind the frozen audio.

Sample & Hold



The **Sample & Hold** effect is similar to the Freeze effect, but it automatically refires at the specified interval.

To use the Sample & Hold effect:

1. Set the desired *HoldTime* (milliseconds)

Experiment with the *Wet/Dry* slider settings for this effect – some nice results can be obtained by mixing in some dry sound.

3 AM

General Purpose

Monophonic

Clip

Wet/Dry 1.00 Gain 0.00

EFFECTS

- Delay Spectral Bands
- Spectral Freeze
- Sample & Hold
- 3 AM**
- 3-Band Filter
- Spectral Peak/Notch
- Oscillating Peak/Notch

LoRate [Hz]	Low Cutoff [Hz]	MiRate [Hz]	Hi Cutoff [Hz]	HiRate [Hz]
4.00	500.00	6.00	2000.00	8.00

LoDepth [%]	MiDepth [%]	HiDepth [%]
25.00	30.00	20.00

Preset Description

Modulates the amplitude spectrum for a tremolo effect. LFO Rate controls the modulation speed in Hz; Depth controls the modulation amplitude. Set Wet/Dry to 1.0.

The **3 AM** (3-band amplitude modulation) effect provides individual control of the amplitude modulation in 3 frequency bands for a multi-band tremolo effect.

To use the 3 AM effect:

1. Set the desired cutoff frequencies (Hz) to separate the frequency spectrum into bands. For each band,
2. Set the *LFO Rate* (modulation rate, in Hz), and
3. Set the *LFO Depth* (%)

You will generally want to set the *Wet/Dry* slider to 1.0 for this effect.

3-Band Filter

The screenshot shows the Spectral Machine software interface. The top left features the 'SPECTRAL machine' logo. The top right corner displays 'The Sound Guy, Inc.'. The interface is divided into several sections:

- General Purpose:** A checked checkbox.
- Monophonic:** An unchecked checkbox.
- EFFECTS:** A list of effects including 'Delay Spectral Bands', 'Spectral Freeze', 'Sample & Hold', '3 AM', '3-Band Filter' (highlighted), 'Spectral Peak/Notch', and 'Oscillating Peak/Notch'.
- Parameters:** A table with columns for 'Low Cutoff [Hz]', 'Hi Cutoff [Hz]', 'LowGain [dB]', 'MidGain [dB]', and 'HiGain [dB]'. The values are: Low Cutoff: 500.00, Hi Cutoff: 3000.00, LowGain: 0.00, MidGain: -18.00, HiGain: 0.00. Below the table are three vertical sliders for LowGain, MidGain, and HiGain.
- Wet/Dry:** A slider set to 1.00.
- Gain:** A slider set to 0.00.
- Clip:** An unchecked checkbox.
- Preset Description:** A text box at the bottom stating: 'Adjust the gain of each band separately. Define the three bands with the two Cutoff knobs. Use the sliders to apply a different gain to each band. Set Wet/Dry to 1.0, and reduce the output Gain if needed to avoid clipping.'

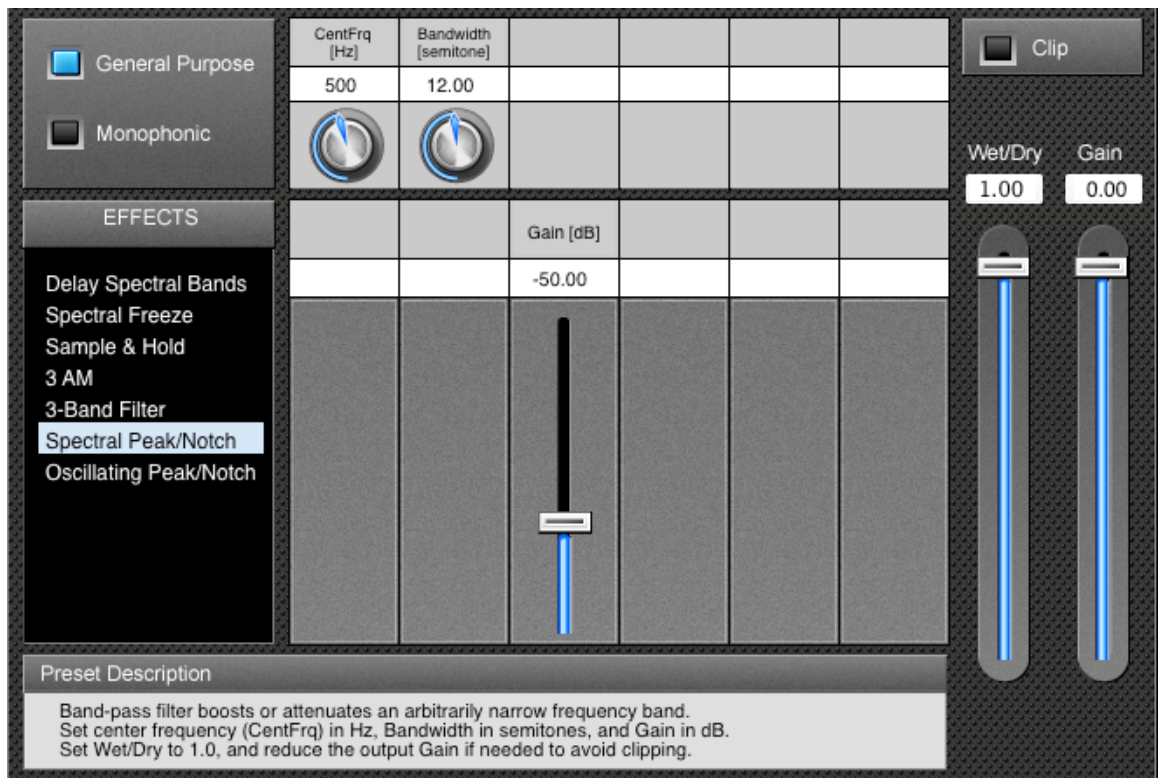
The **3-Band Filter** effect splits the audio into three bands and lets you adjust the gain of each band independently.

To use the 3-Band Filter effect:

1. Set the Low and High *Cutoff* frequencies (Hz) to separate the frequency spectrum into bands. For each band,
2. Set the desired *Gain* (dB).

You will generally want to set the *Wet/Dry* slider to 1.0 for this effect. If you boost one or more bands, you may want to reduce the output gain to avoid clipping.

Spectral Peak/Notch



The **Spectral Peak/Notch** effect lets you boost or attenuate an arbitrarily narrow frequency band around a specified frequency. For example, you could use this to notch out a 50 or 60 Hz electrical hum.

To use the Spectral Peak/Notch effect:

1. Set the desired center frequency (*CentFrq*, in Hz)
2. Set the desired *Bandwidth* (semitones)
3. Set the desired band *Gain* (or attenuation) (dB)

You will generally want to set the *Wet/Dry* slider to 1.0 for this effect. If you boost the band, you may want to reduce the output gain to avoid clipping.

Oscillating Peak/Notch

The screenshot shows the Spectral Machine software interface. The top left features the 'SPECTRAL machine' logo and 'The Sound Guy, Inc.' text. The main interface is divided into several sections:

- General Purpose:** A checked checkbox.
- Monophonic:** An unchecked checkbox.
- EFFECTS:** A list of effects including Delay Spectral Bands, Spectral Freeze, Sample & Hold, 3 AM, 3-Band Filter, Spectral Peak/Notch, and Oscillating Peak/Notch (which is highlighted).
- Parameters Table:**

CentFrq [Hz]	Bandwidth [semitone]	Rate [hz]	Gain [dB]	Depth [%]
1000	12.00	0.20	-48.00	50.00
- Wet/Dry:** A slider set to 1.00.
- Gain:** A slider set to 0.00.
- Clip:** An unchecked checkbox.

At the bottom, a 'Preset Description' box contains the following text: "Peak/Notch with an oscillating center frequency (CentFrq). Set Bandwidth in semitones and the desired Gain/attenuation. Rate controls oscillation frequency; Depth controls how wide the oscillation is (100% oscillates between 0 and CentFrq x 2)."

The **Oscillating Peak/Notch** effect is similar to the **Peak/Notch** effect, but with an oscillating center frequency.

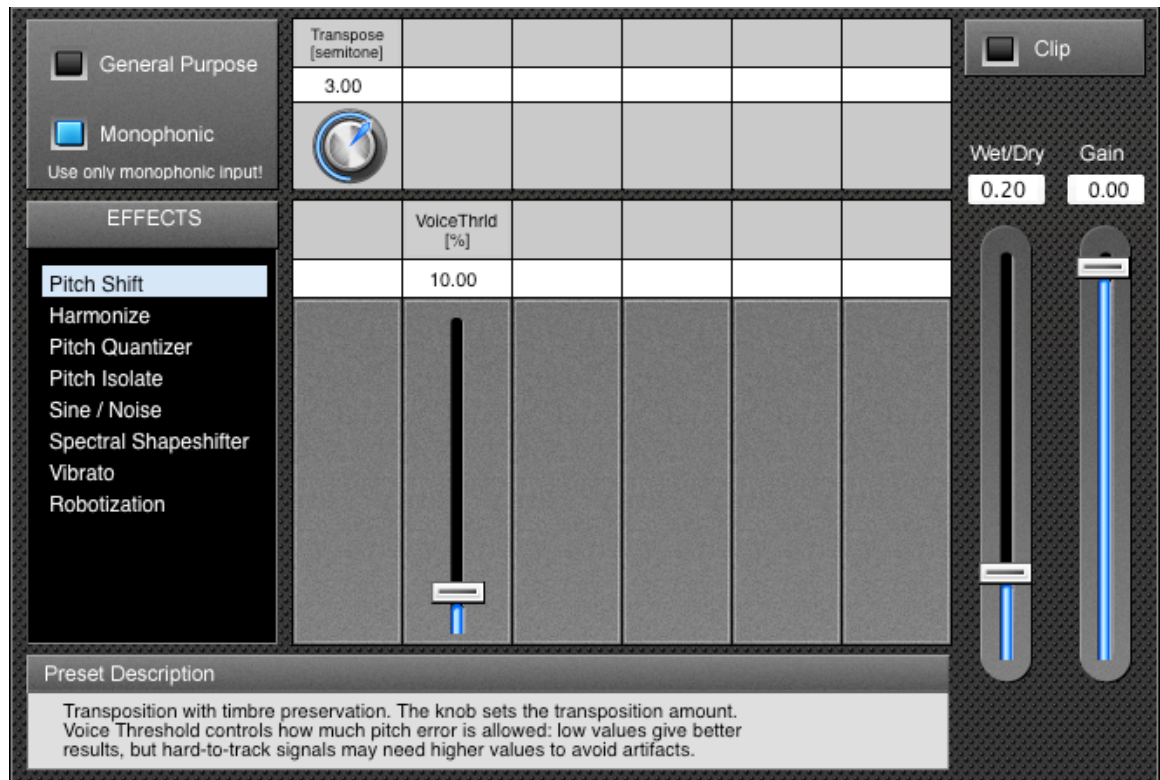
To use the Oscillating Peak/Notch effect:

1. Set the desired center frequency (*CentFrq*) (Hz)
2. Set the desired *Bandwidth* (semitones)
3. Set the desired band *Gain* (or attenuation) (dB)
4. Set the modulation *Rate* (Hz)
5. Set the modulation *Depth* (%)

You will generally want to set the *Wet/Dry* slider to 1.0 for this effect.

Monophonic Effects (for use ONLY with monophonic sources)

Pitch Shift



Pitch Shift is a frequency-domain transposition effect with timbre preservation.

To use the Pitch Shift effect:

1. Set the desired transposition amount (semitones)
2. Adjust the *Voice Threshold* slider (%) to control how much pitch error is tolerated. Low values generally give better results, but hard-to-track signals will need higher values to avoid artifacts.

For the basic pitch shift effect, set the *Wet/Dry* slider to 1.0. If you also want to hear the original (dry) sound, lower the *Wet/Dry* slider to the desired amount.

Harmonize

Pitch1 [semitone]			Pitch2 [semitone]		
-5.00			3.00		

Gain1 [dB]	Delay1 [ms]	Gain2 [dB]	Delay2 [ms]
-30.00	3.00	-30.00	6.00

Wet/Dry: 0.75
Gain: 0.00

Preset Description
Given a single original solo voice, add two accompanying voices with different pitch, gain and delay values.
Lower Wet/Dry to hear three voices at once.

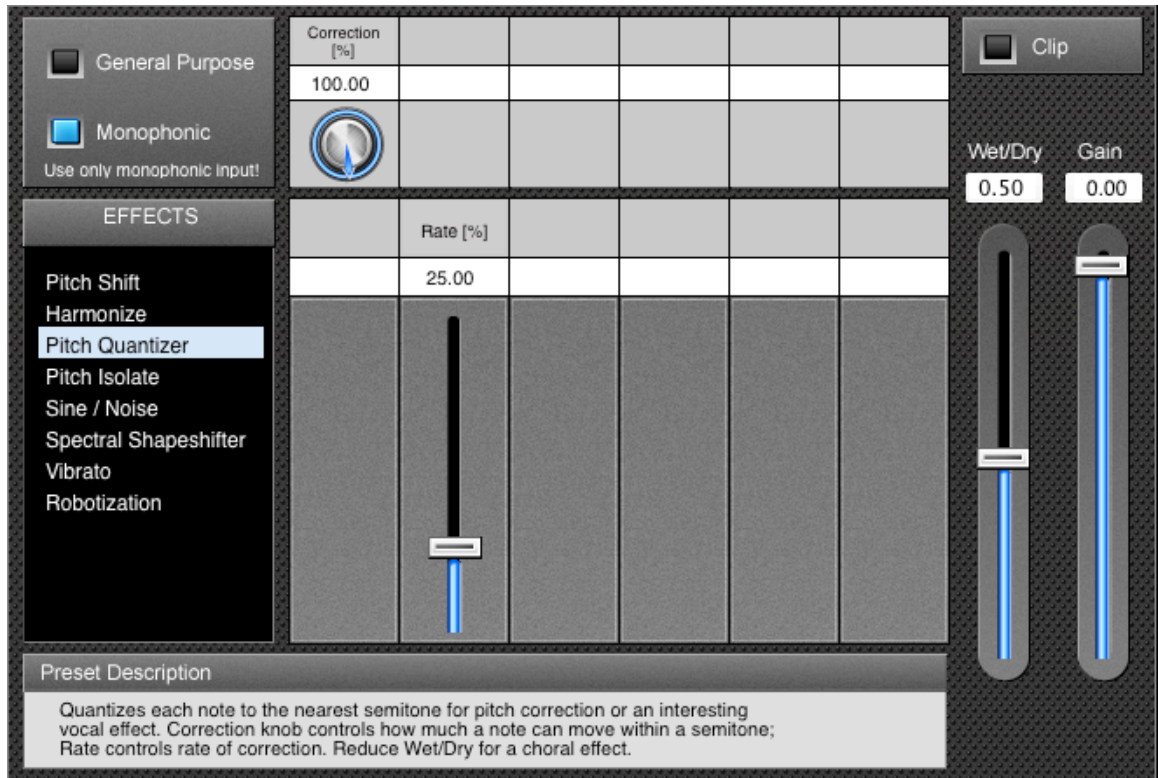
Harmonize is a multiple transposition effect with timbre preservation (similar to **Pitch Shift**, but with additional bands).

To use the Harmonize effect:

1. Set the desired *Pitch* shift amounts (semitones). For each one,
2. Set the desired *Gain* (dB), and
3. Set a *Delay* (milliseconds), if desired.

To hear three different pitches at once, set the *Wet/Dry* slider to a desired value less than 1.0.

Pitch Quantizer



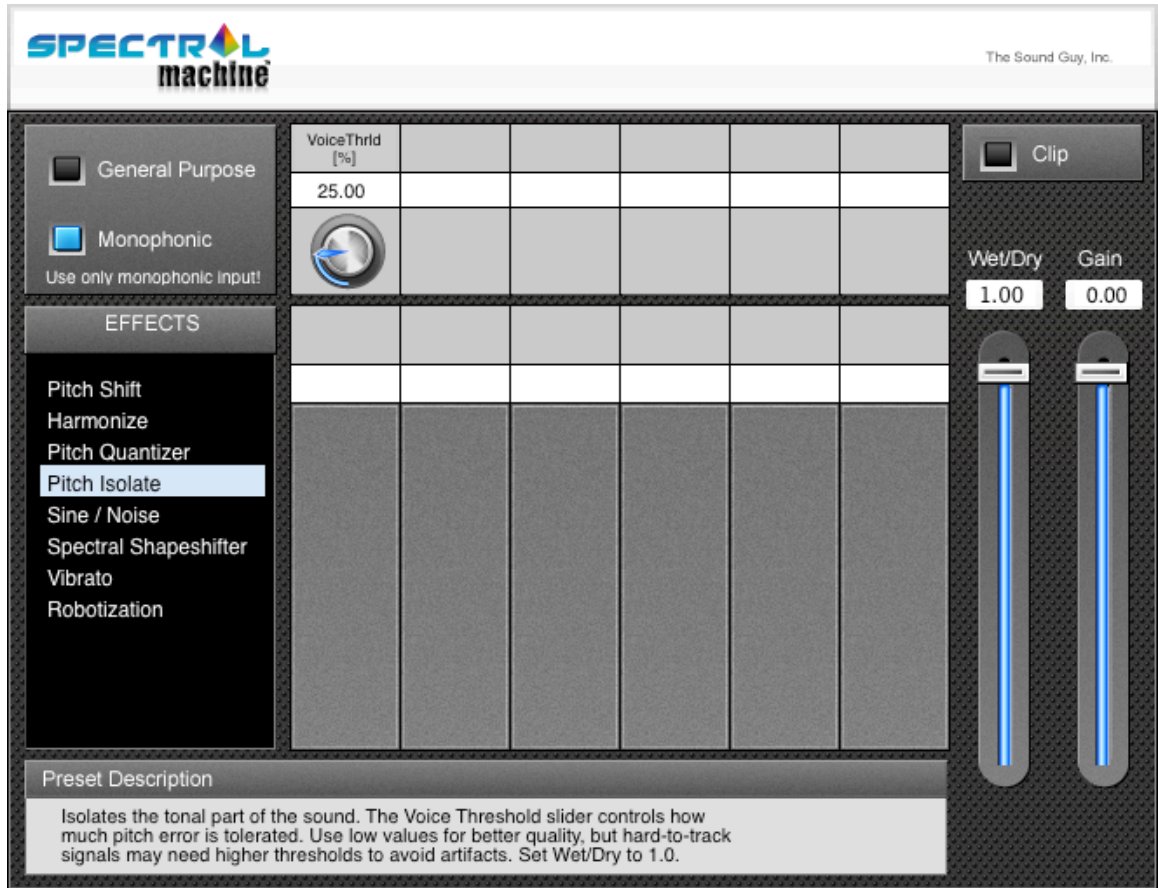
Pitch Quantizer nudges each note to the nearest semitone, for pitch correction or for an interesting artificial vocal effect.

To use the Pitch Quantizer effect:

1. Set the desired *Correction* amount (%) – this defines how much a note can move within the semitone range.
2. Set the desired *Rate* (%), to control how fast the pitch correction can occur.

For the pure **Pitch Quantizer** effect, set the *Wet/Dry* slider to 1.0. For an interesting artificial choral effect, set *Wet/Dry* to a lower value.

Pitch Isolate



Pitch Isolate isolates the tonal sound from the rest of the sound (noise-like sounds and transients).

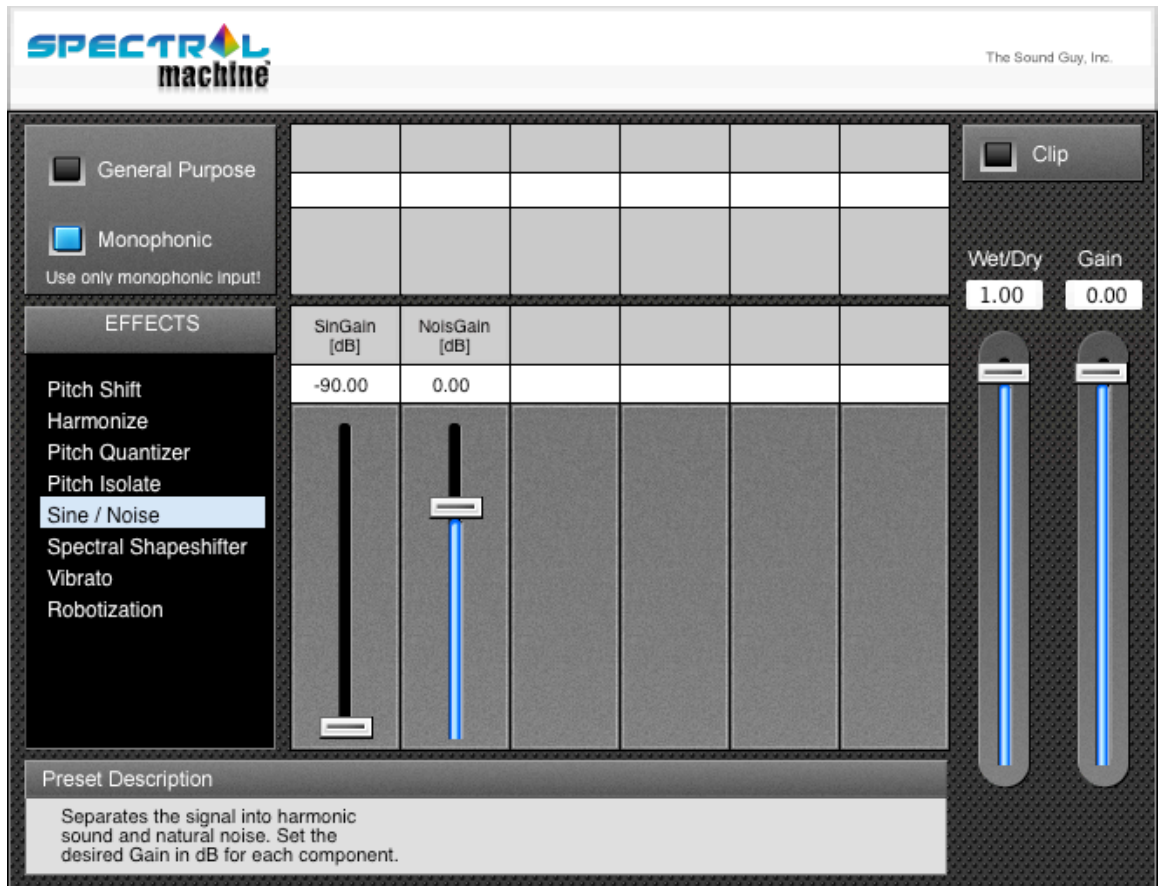
To use the Pitch Isolate effect:

1. Set the desired Voice Threshold slider (*Voice Thrd*) to control how much pitch error is tolerated.

In general, use low values for better quality; however, some hard-to-track signals may need higher thresholds to avoid artifacts.

For this effect, you will generally want to set the *Wet/Dry* slider to 1.0.

Sine/Noise



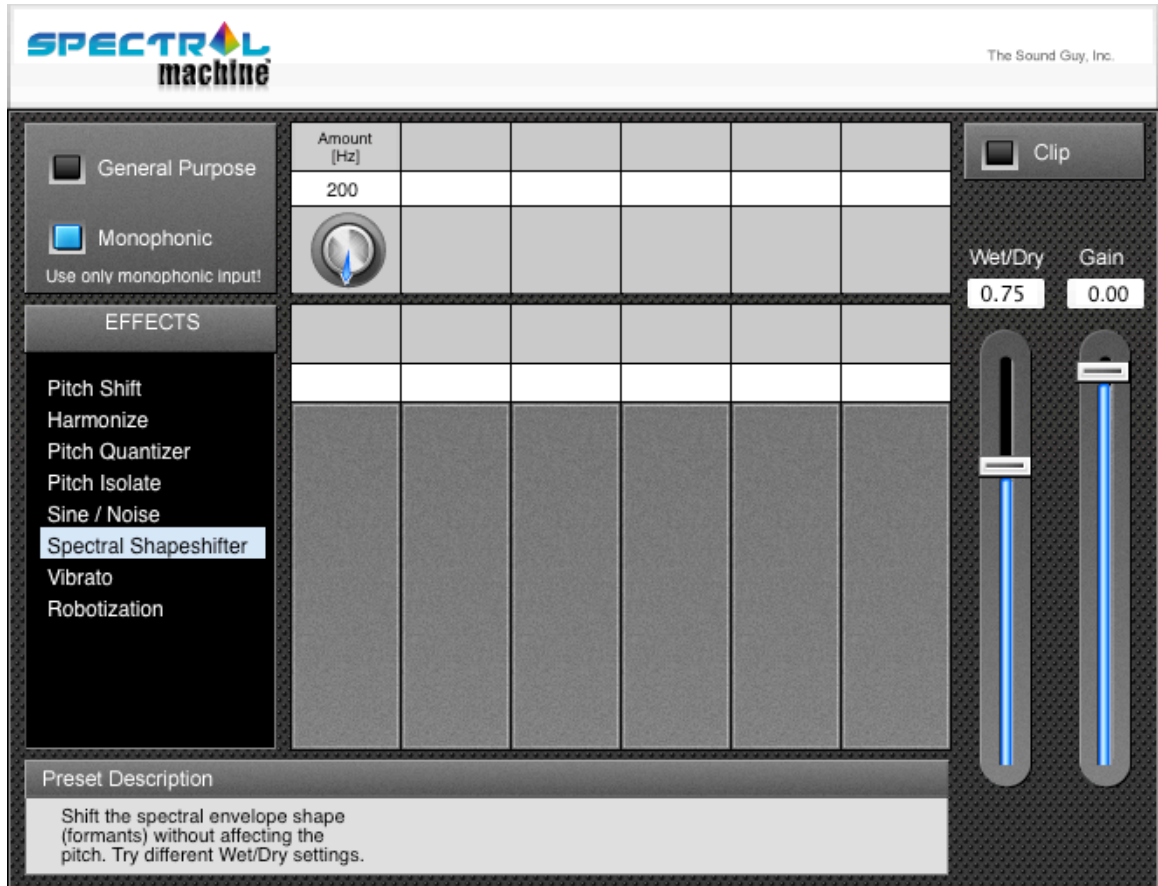
Sine/Noise gives you independent control over the sinusoidal (tonal/pitched) and residual (noise and transient) components of the sound.

To use the Sine/Noise effect:

1. Set the desired *SinGain* amount to control the level of the sinusoidal components
2. Set the desired *ResGain* amount to control the level of the residual (noise and transient) components

For this effect, you may want to set the *Wet/Dry* slider to 1.0, or try different settings.

Spectral Shapeshifter



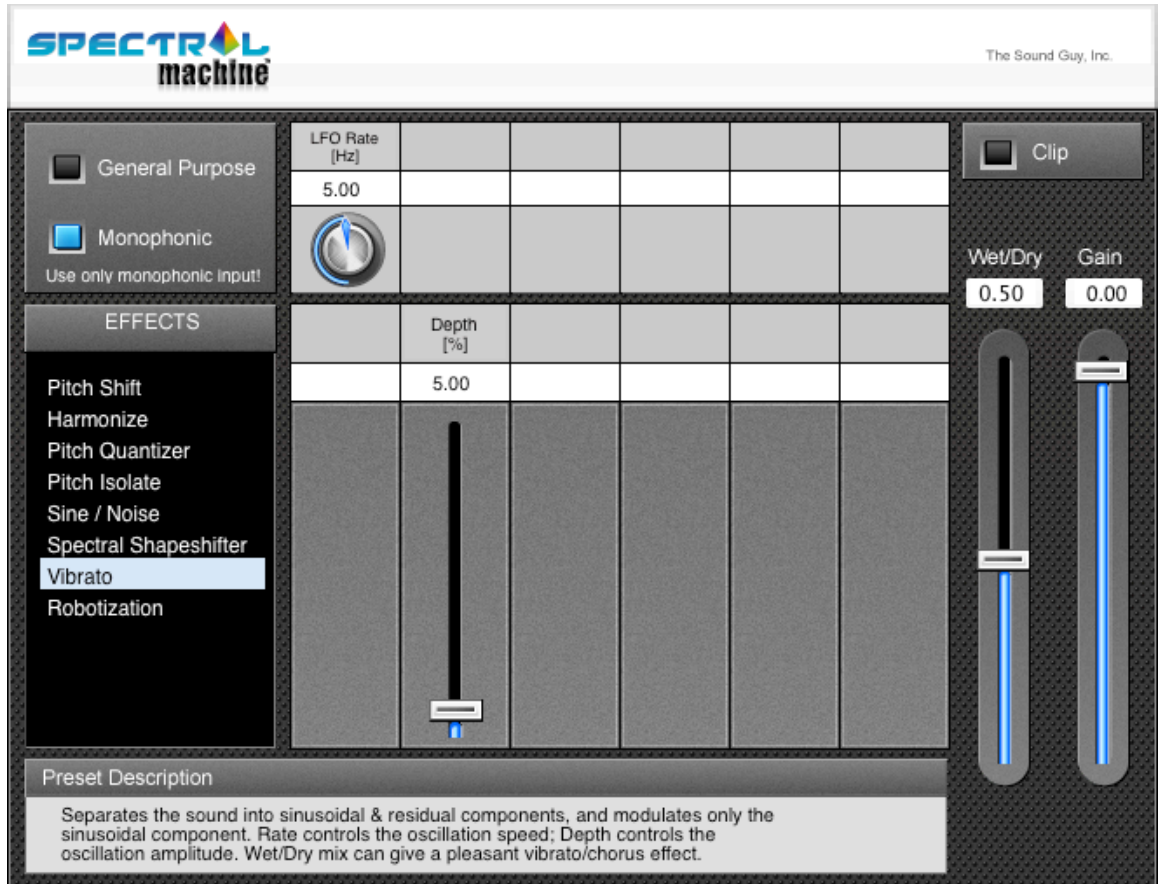
Spectral Shapeshifter lets you change the shape of vocal formants (spectral envelope) without affecting the pitch.

To use the Spectral Shapeshifter effect:

1. Set the desired *Amount* (Hz)

For this effect, you may want to experiment with different *Wet/Dry* slider settings.

Vibrato



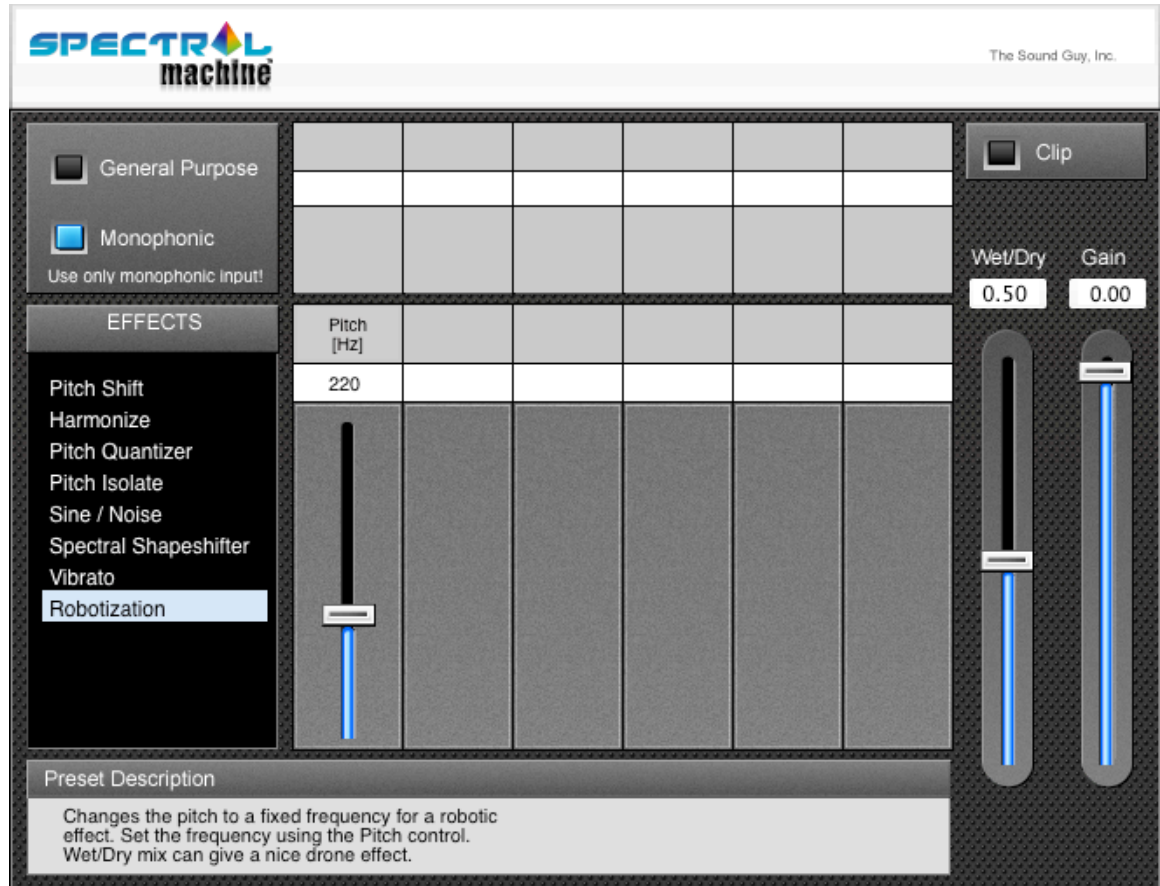
Vibrato separates the sound into sinusoidal and residual components and modulates only the sinusoidal component.

To use the Vibrato effect:

1. Set the desired *LFO Rate* (Hz)
2. Set the desired modulation *Depth* (%)

For this effect, you may want to experiment with different *Wet/Dry* slider settings. A mix of Wet and Dry can give a pleasant vibrato/chorus effect.

Robotization



Robotization changes the pitch to a fixed frequency for a robotic effect.

To use the Robotization effect:

1. Set the desired *Pitch* (Hz)

For this effect, you may want to experiment with different *Wet/Dry* slider settings. A mix of Wet and Dry can give a pleasant drone effect. You may want to set the *Pitch* to a suitable drone frequency, such as the key of the song or the frequency of the 5th, etc.

Loading a Preset

To load a Preset:

FREQUENTLY ASKED QUESTIONS

What keyboard shortcuts and little-known features I can use?

You can fine tune the slider and knob values by holding down the shift key while clicking on the body of the slider or knob.

Also, you can click on the body of the slider to make the indicator scroll instantly toward the mouse cursor.

How can I save and load presets?

To save a (modified) preset:

Most host applications include extra buttons and controls in every plug-in's window (or sometimes in the plug-in menu). You should see a button called "save" or "S", or maybe a menu called "file" or "presets" in which you'll find a menu item for saving a preset file. It varies from app to app, but it's generally similar in all cases.

After invoking that control, you should be greeted with a window asking for a file name and location for the preset file. Enter a name and location and press the "Save" button (or "OK" or whatever the window says). For maximum compatibility, save VST presets with a .fxp extension, and save Audio Unit presets with an .aupreset extension.

To load the preset you just saved:

Look for a control in the plugin window called "load" or "L" or something like that (depending on the host program).

After invoking that control, you should be greeted with a window asking you to find the location of the preset file that you would like to load. Find it and press the "Open" button (or "OK" or whatever it says).

To save a new bank of presets (VST only):

Look for a "save bank" control. (The name may vary from one app to another.)

After invoking that control, you should be greeted with a window asking for a file name and location for the preset bank file. Enter a name and location and press the "Save" button (or "OK" or whatever

the window says). For maximum compatibility, save VST presets with a .fxb extension.

To load the preset bank you just saved (VST only):

Look for a "load bank" control. (The name may vary from one app to another.)

After invoking that control, you should be greeted with a window asking you to find the location of the preset bank file that you would like to load. Find it and press the "Open" button (or "OK" or whatever it says).

Note that not all host programs support loading and saving of preset banks.

How can I automate parameter control using MIDI?

Your MIDI-capable host program or automation device should automatically expose the following controls:

“Control 1–6” for the knob or push–button in the top row of Spectral Machine

“Slider 1–6” for the sliders

Wet/Dry

Gain

The values that show up in the automation are always in the range of 0.0 to 1.0, which map to the real range of the control in the current preset. It is up to the host program to establish the mechanism for interpreting MIDI CC and updating the plug–in parameters. Please see your host program’s manual for specific details.

I lost my authorization code. How can I recover it?

Please go to the Customer Care Center page at <http://shareit1.element5.com/ccc/index.html?publisherid=33250> and click on the "My Account" button.

Alternatively, you can always e–mail us at support@sfxmachine.com.

GLOSSARY

aliasing

A type of distortion caused by sampling at too low a sample rate. To avoid aliasing, the sample rate must be at least twice the highest frequency in the sound.

AM

See “Amplitude Modulation.”

amplitude

Amplitude refers to the relative height of a waveform. A sound’s loudness is a function of its amplitude.

Amplitude Modulation

A modulation method in which the amplitude of one wave (the “carrier”) is controlled by the amplitude of another wave (the “modulator”). Unlike Ring Modulation, Amplitude Modulation uses a modulator that is unipolar (i.e., always positive). In Spectral Machine, the AM modulator is automatically converted to a unipolar signal.

Low-frequency AM results in volume control or tremolo effects. Modulator frequencies that are themselves in the audio range result in sum and difference sideband tones that were not necessarily present in either the carrier or the modulator.

artifact

An unintended side effect of a technological process.

bandpass

A bandpass filter passes an area around the specified cutoff frequency and rolls off (attenuates) frequencies to either side.

carrier

An audio signal controlled by another signal (the “modulator”). The term is usually applied to AM and FM synthesis.

channel

An audio signal pathway. Spectral Machine uses a maximum of two channels, Left and Right.

clipping

An amplitude distortion that occurs when signal levels try to exceed the available amplitude range. The tops and bottoms of clipped waveforms are typically squared off, generating frequencies that weren't in the original signal.

cutoff frequency

For lowpass and highpass filters, the cutoff frequency specifies the dividing line between frequencies that get passed by the filter and frequencies that get attenuated (rolled off). For bandpass filters, the cutoff specifies the center frequency of the band that gets passed.

cycle

One complete repetition or oscillation of a waveform. Frequencies are commonly measured in cycles per second.

dB (decibel)

A common unit for measuring audio levels. It uses a logarithmic scale, which roughly corresponds to how the ear hears differences in amplitude.

depth

See "modulation depth."

DSP

Digital Signal Processing. Digital samples and analog voltages are both abstract representations of sound; digital signals are simply a different type of analogy, in which the signals are quantized both in time and amplitude and are represented by a series of numbers.

feedback

An effect that occurs when the output of a DSP process is fed back into the input. Interesting effects can result when you delay a signal, feed it through a non-linear process such as a filter or power distortion, and route it back to the input. See "feedback loop."

feedback loop

The feedback loop is a central principle of cybernetics, from the flush toilet to the steam engine. Any system that functions by talking to itself incorporates a feedback loop.

Positive feedback loops result in a snowball effect, with the signal being re-amplified each time through. Negative feedback loops, such as thermostats, adjust themselves to achieve a self-regulating balance.

See “Ouroborus.”

field

See “value entry field.”

filter

A process that modifies a sound by passing some frequencies more readily than others, changing the spectral balance of the sound.

filter frequency

See “cutoff frequency.”

FM

See “Frequency Modulation.”

formant

A peak in the frequency response of a vocal tract or musical instrument. Different vowel sounds are characterized by the position and shape of their formants. The human vocal tract typically has five formant regions.

frequency

The repetition rate of a sound, typically measured in cycles per second. A sound’s pitch is related to its frequency.

Frequency Modulation

A modulation method in which the frequency of one wave (the “carrier”) is controlled by the amplitude of another wave (the “modulator”).

Low-frequency FM results in vibrato. Modulator frequencies that are themselves in the audio range result in the generation of sideband tones that are not necessarily present in either the carrier or the modulator.

harmonic

A single frequency component of a sound. Also called “overtone,” or

“partial.” The timbre, or tone color, of a sound may be characterized by its harmonic content. A 100 Hz sound that is high in harmonic content (for example, a sawtooth wave) will have harmonics at 200 Hz, 300 Hz, 400 Hz, etc.

Hertz (Hz)

Cycles per second. A 60-Hertz hum has 60 repetitions of its waveform every second.

highpass

A highpass filter passes the frequencies above the specified cutoff and rolls off (attenuates) the lower frequencies.

host program

The host program is the program that Spectral Machine plugs into; for example, Cubase or Peak.

inharmonic

Frequency components are said to be inharmonic if they occur at frequencies that are not integer multiples of the fundamental, or base frequency.

Stretched strings, notably piano strings, produce sounds that are slightly inharmonic because the higher partials are somewhat sharp. FM and other techniques can produce extremely inharmonic sounds.

LFO

A Low-Frequency Oscillator, generally used for adding vibrato or tremolo or otherwise controlling an audio signal. “Low-frequency” implies frequencies below the audio range (20 Hz — 20 kHz), i.e., frequencies low enough that they aren’t heard as a tone.

lowpass

A lowpass filter passes the frequencies below the specified cutoff and rolls off (attenuates) the higher frequencies.

modulation

The control of some aspect of a signal, for example its amplitude or frequency, by another signal.

modulation amplitude

The percentage by which a signal is scaled before it is used to

modulate another signal. If the modulation amplitude is 100%, the modulating signal is unchanged; its full range is used to control the destination signal. Also called “modulation depth.” Increasing the modulation depth will cause a “deeper” vibrato, tremolo, etc.

modulation depth

See “modulation amplitude.”

modulator

A signal that modulates or controls another signal (the “carrier”).

monaural (mono)

A sound with only one channel, as opposed to “stereo.”

Pressing the Mono Preview button will cause Spectral Machine to preview a stereo sound using only the left channel.

monophonic

A single melodic line without accompaniment; for example, solo voice. Spectral Machine’s monophonic effects should only be used with solo voice or solo instruments – they will not sound good with polyphonic instruments (piano) or mixes.

noise

1. A complex sound made up of a broad spectrum of non-harmonically-related frequencies.
2. Any euphony-impaired sound, often arbitrarily discriminated against on aesthetic grounds.

oscillator

A signal source that produces a specified waveform at a specified frequency.

Ouroboros

Jungian archetype symbolizing feedback. Originally appeared in Egyptian art of a snake consuming its own tail; more recently reflected in Apple Computer’s street address, 1 Infinite Loop.

See “feedback.”

parameter

A numerical value used to control some aspect of a Spectral

Machine effect.

pitch

A psychoacoustic phenomenon that is closely related to but not synonymous with frequency. Pitch is the subjective property that lets us compare whether one sound seems “higher” or “lower” than another.

The pitch of a sound can be ambiguous or ill-defined. What is the pitch of a chord, a click, white noise or silence?

polyphonic

Music in which several melodic voices are playing at once.

Q

A parameter that controls a filter’s roll-off slope and the (inverse) width of its resonant peak.

For a bandpass filter, the Q is the ratio of the filter’s center frequency to its bandwidth. For example, if the filter’s cutoff frequency is 500 Hz and its bandwidth is 50 Hz, its Q is 10.

quantization

The process of limiting a value to one of a discrete number of values; for example, representing an audio sample as a 16-bit integer. Sampling also involves quantizing time, by sampling at discrete intervals.

resonance

A spectral peak in the response of a filter, the body of a musical instrument, etc. If an external disturbance (for example, an earthquake) happens to match the resonant frequency of an object (for example, a house), the resulting vibration can be greatly amplified.

sample

A number representing the amplitude of a signal at a given instant in time.

sample-and-hold

A sample-and-hold samples a signal at a specified time interval. It holds the output at that level until the end of the hold time and then

grabs another sample. This process is also called “downsampling.”

sample rate

Sample rate describes how frequently an analog audio signal is sampled as it is converted into a series of numbers.

44.1 kHz is the standard sample rate for compact disks; 48 kHz is often used with digital audio tape (DAT) recording; 22.050 kHz is frequently used for games and multimedia.

A higher sample rate allows a higher frequency response. In order to accurately reconstruct a sound, the sample rate must be at least twice the highest frequency in the sound.

sampling

Sampling, or analog-to-digital conversion, is the process of converting an analog signal to a series of digital samples (numbers).

selection

The original audio source signal that is selected in the host application before invoking Spectral Machine. Various host programs may refer to a selection as a region, a track, a clip, etc.

semitone

The interval between two adjacent notes on a piano keyboard. One semitone equals 100 cents.

sideband

An additional frequency produced as a result of a modulation. AM, FM and Ring Modulation can all generate sidebands that are not necessarily present in either of the original signals.

signal

A symbolic representation of a sound; an electrical current or series of numbers used to signify acoustic vibrations. “Signal” can also refer to “control voltages” or modulations, electronic messages that may or may not themselves be audible.

The beauty of modular synthesis is the way that sounds and modulations can both be expressed as signals and can, therefore, be used interchangeably, modulating things they have no business modulating.

signal-to-noise ratio

A measurement of the amplitude of the desired sound as compared to the background noise level.

sine wave

A smooth waveform whose spectrum consists of a single frequency. A sine wave has a pure flute-like tone.

spectrum

By analogy with the example of light, which can be split into its constituent colors, an audio spectrum is the representation of a sound's harmonic content in terms of its component frequencies.

stereo

Stereophonic; having two audio channels.

timbre

A sound's tone color, which is a function of its harmonic content.

tremolo

A low-frequency variation in a sound's amplitude envelope.

value entry field

A box that allows you to enter a numerical value. In Spectral Machine, all values may be entered as floating point numbers, though the decimal point is not required. Also referred to as a "text edit field."

vibrato

A low-frequency variation in a sound's frequency envelope.

white noise

By analogy with white light (composed of equal amounts of all visible light frequencies), white noise is a sound composed of an equal mix of all audible frequencies.

FOR MORE INFO

For the latest information about Spectral Machine, go to <http://www.sfxmachine.com/spectralmachine> .

For technical support, e-mail support@sfxmachine.com. We aim to provide insanely great tech support; please do your part by reading the friendly manual.

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