FilterFreak

Creative Resonant Filtering

User's Guide

Version 5 : For Mac and Windows

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Figure 1: FilterFreak 2's Control Panel and Tweak Menu - Rhythm Mode

THE BASICS - ABOUT FILTERFREAK

FilterFreak was designed to be an infinitely customizable resonant filter plug-in bringing together the sounds of classic filter hardware with added controls and flexibility. Since its initial release in 2004, FilterFreak has become a go-to tool for producers and musicians when they need the fat analog sound of classic filters in their productions. From the sound of funky envelope followers such as the Mutron III, to the undulation of the Morley WahWah, or creating Sci-Fi sample-and-hold effects, FilterFreak is capable of all the classic sound-shaping you can think of. FilterFreak can create the huge resonant LFO sweeps of hardware such as the Sherman FilterBank, and can be tweaked synth-style with ADSR controls.

But FilterFreak goes beyond what can be accomplished in the world of hardware with an added Rhythm Mode allowing custom patterns (interchangeable with other Soundtoys plug-ins) to be created and locked to MIDI information. You can create auto-wah patterns or adjust the swing/shuffle feel using the Groove control. FilterFreak's Analog Styles give you control over the saturation qualities of the filter types. Drive your signal hard in any of the style types and you will hear the same classic saturation of analog circuitry. FilterFreak was designed from the very beginning to take resonant filter sound alteration to a whole new level.

FilterFreak's installation also includes FilterFreak2, a twin plug-in with not one but TWO independent filters, which can be run in either serial or parallel. Each filter contains a wealth of easily accessible and highly tweak-able parameters. FilterFreak allows you to fully unlock your creativity; it not only sounds and responds like classic analog hardware, but also opens up a new world of control and customization.

So let's dive in and learn more!

Figure 2: FilterFreak 1's Main Control Panel - LFO Mode

INPUT AND OUTPUT LEVEL

The Input and Output level controls are used to either boost or attenuate the input or output of FilterFreak. The default setting of the controls approximates "unity gain" (what goes in also comes out the same level) and should provide the best overall "normal" sound quality when set to these levels.

The LED-style indicators located beneath the Input and Output knobs provide a visual display of the input and output signal levels. The yellow LED indicates that the signal is 6dB below clipping. The red LED indicates maximum signal level, and possible audible clipping (which you may or may not wish to have as part of your sound).

These controls are particularly useful with the different Analog Style algorithms (found in the Tweak Menus for each mode), allowing you to adjust the amount of saturation and distortion present in FilterFreak.

Figure 3: Output LED indicating maximum signal level

THE FILTERFREAK CONTROL PANEL

COMMON CONTROLS

The controls that you will see in FilterFreak are dependent upon the modulation mode that FilterFreak is currently in. There are a few controls in FilterFreak that are basic, common controls and will appear in multiple modes. We'll discuss these controls first and then breakdown each unique modulation mode (and associated controls) individually.

MIX

The Mix control is used to set the balance between the filtered sound created by FilterFreak and the dry (unprocessed) signal. The Mix control provides a convenient means of setting just the right balance between the dry and effected signals in FilterFreak.

We recommend running FIlterFreak as a channel insert to avoid any potential phase cancellation that may result from running the plug-in as a send effect, utilizing the Mix knob to control your desired wet/dry signal balance. A setting of 100 percent will give you pure filtered sound, and a setting of 0 percent will give you only unfiltered sound. If you are using FilterFreak on an Aux Send / Return the mix control can simply be placed at 100 and the amount of the effected sound controlled using the return fader.

FREQUENCY

Frequency is one of the most important controls in FilterFreak and determines what area or region of the overall sound spectrum FilterFreak will change. The influence that the Frequency control has on the resulting sound will be largely dependent on the setting of the Shape knob. When the Shape knob is set to "Lowpass", the Frequency knob will be used to set the cutoff frequency of the filter, denoting where along the audio spectrum the Lowpass effect will occur.

With Shape set to Lowpass, any harmonics in the sound that are lower than the Frequency knob setting are essentially passed through the filter unaffected (hence the name). Any harmonics in the sound that are higher than the Frequency knob will be attenuated. So setting the Frequency knob to its maximum value (20 kHz) will pass the entire audio signal mostly unaffected. Setting Frequency to its minimum value (20 Hz) will pretty much make the signal disappear.

Of course most of the really cool effects available with FilterFreak happen when the Frequency is twisted and moved across the sound spectrum (manually, with MIDI control, or automation). For even cooler effects you can also use FilterFreak's extensive built-in modulation section to automatically change the filter frequency in a multitude of different and bizarre ways.

RESONANCE

The Resonance control works in conjunction with the Frequency knob and greatly enhances the effect of the filter by boosting the harmonics that are located close to the Frequency setting. As you change the frequency of the filter, the harmonics close to the cutoff frequency are exaggerated, "picked out", and become more pronounced. This gives the filter that squeaky, wheezy sound. Cranking the Resonance control all the way up will drive FilterFreak into oscillation (it will actually create a signal): responding in the same manner as hardware analog filters would. FilterFreak is capable of all the filter squeal, screech, and wiggle you expect.

A Word of CAUTION: extreme Resonance settings can create VERY high signal levels, high enough to cause damage to speakers if the volume is high enough. You may want to turn down the output level of FilterFreak before experimenting with any high resonance values.

MOD

The Mod control is key to controlling the "depth" or amount of modulation applied to the filter's frequency. The higher the Mod knob setting, the greater the modulation depth and the greater the filter sweep. The lower the Mod setting, the lower the amount of sweep or modulation. Keep in mind that how the filter is swept will be based on the type of modulation signal selected.

SHAPE

The Shape control allows you to select the type of filter to be applied to the signal and comes in four distinct flavors: "LPF" (Lowpass), "BPF" (Bandpass), "HPF" (Highpass) and "BRF" (Band Reject / Notch Filter).

If you're not already familiar with the shape types we will discuss each next. However, the best way to understand how the different filter shapes sculpt sounds is to run some audio though FilterFreak, select and adjust each shape, and listen to the changes.

The shape of the filter will be shown to the right of the control graphically in the Filter Response Display.

LPF - LOWPASS FILTER

The Lowpass Filter shape will remove or reduce any harmonics above the selected Frequency setting. This type of filter shape is very common and is used in most synths and effects.

The Minimoog® made use of a 24db per octave lowpass filter, allowing resonance to be boosted without losing too much low-end info. The sound is unmistakable once you hear it.

BPF - BANDPASS FILTER

The Band Pass filter shape is like a cone that will pass or "pick out" the harmonics in the sound both above and below the frequency setting, passing a "band" of frequencies. As you get further away from the center frequency the harmonics are reduced depending on how wide or thin the filter's band is. The Resonance knob controls how wide or narrow this band is; the lower the resonance, the wider the band and the higher the resonance, the thinner the band.

HPF - HIGHPASS FILTER

The Highpass shape is the exact opposite of the Lowpass shape and works in reverse; it passes the harmonics in the sound above the frequency setting and attenuates and removes the harmonics that are below the frequency setting. In other words, a highpass filter removes the bass frequency content from a sound.

BRF - BAND REJECT / NOTCH FILTER

The BRF or Band Reject Filter is essentially the opposite of the Bandpass Filter in that only a specific range of frequencies are targeted, allowing the rest of the material to pass through unaltered. Also referred to as a Notch Filter, the BRF is very useful in taming/eliminating a specific frequency range, either for effect or to manage problematic frequencies.

POLES

The Poles control determines how strongly harmonics will be filtered out and affected either above or below the set frequency. This is also referred to as how "steep" the filter is.

Each pole is equal to a specific gain reduction change, corresponding to the gain of harmonics that are one octave away from the cutoff frequency. So in a 1 Pole LP filter the harmonics one octave above the cutoff frequency will be lowered by 6dB. Additionally, filter Poles usually come in pairs, i.e. 2, 4, 6, and 8 Pole etc. The more poles there are, the greater the attenuation of the harmonics that are one octave above or below the setting of the Frequency knob (depending on the type of filter).

The lower the number of Poles, the more gentle (less steep) the filter's slope will be with the effect being more subtle and smoother. The higher the Pole setting, the steeper the filters slope will be and the effect being more pronounced. The most common filters are 2 or 4 poles which have 12 and 24dB slopes respectively. A filter with 6 or 8 poles will result in a very pronounced, effect-laden sound. Of course FilterFreak offers you this option for more extreme filtering affects. The Pole settings and the associated slope of the filters are listed on the next page for your reference.

POLES

2 poles:

12 dB / octave
(harmonics one octave from the Frequency are lowered by 12dB)

4 poles:

24 dB / octave
(harmonics one octave from the Frequency are lowered by 24dB)

6 poles:

36 dB / octave
(harmonics one octave from the Frequency are lowered by 36dB)

8 poles:

48 dB / octave
(harmonics one octave from the Frequency are lowered by 48dB)

TWEAK BUTTON

The Tweak Button (located below the Input/Output controls) provides access to a whole new world of adjustable parameters that grant the ability to modify the fundamentals of FilterFreak's virtual filtering circuit in all modulation modes. Upon pressing the Tweak Button the slide-out Tweak Menu will appear. The wealth of variation options in this menu make FilterFreak the most flexible and sonically vast filter effect ever.

Figure 4: The Tweak Button: your key to more awesomeness

CHOOSING A MODULTATION TYPE/SOURCE

FilterFreak includes a number of different modulation options selected under the small white button below the Rate knob. When it comes to modulation, the more sources you have, the better. The available modulation modes available in FIlterFreak are:

- LFO
- Rhythm
- Envelope
- Random
- Step
- ADSR

The currently selected modulation mode will appear as text above a beige push-button. To change modulation sources, click and hold on the push button below the currently displayed mode. This will bring up a small selectable menu listing all modulation modes. Select the desired mode with your cursor and release the click. You will notice that the name above the button will change (as will the parameters in this area of the front panel). Though the button name will change to reflect the selected type of modulation, the function of this button remains constant.

Figure 5: The Modulation Mode Menu

Figure 6: After changing Modulation Modes

THE FILTERFREAK CONTROL PANEL - LFO MODE

Figure 7: FilterFreak 1's Main Control Panel - LFO Mode

LFO MODE

The "LFO" mode stands for Low Frequency Oscillator. An LFO creates a repeating waveform (usually with a selection of various wave shapes) that oscillates at a rate between 0 and 20Hz. This is why it is referred to as a "Low" frequency oscillator as 20Hz is still considered pretty slow in comparison to an audio signal. However, the FIlterFreak LFO has a slightly wider range and can go as fast as 100 Hz. Modulating the filter with a repeating LFO can provide the "Auto-Wah" effect as well as many other equally ubiquitous sounds depending on the modulation type, wave shape, filter, resonance, etc.

LFO Mode uses all of the common controls described on pages 8-11 and adds new controls to the center section of the panel; **Rate** and **Shape.**

RATE

The Rate knob controls the speed or rate of the LFO's sweep and is displayed in Hertz. A sweep rate of "1 Hertz" (1Hz) means that the LFO modulation will repeat once per second. As we mentioned, the maximum setting of the LFO in FilterFreak is 100 Hertz (100Hz) meaning it will repeat 100 times per second. Modulating the filter at this speed is pretty darn fast and can create interesting "side bands" that are very disharmonious and 'clangy'. The resulting sound is similar to that of a Ring Modulator and can be a useful effect. It is worth noting however that at such high Rate speeds the sound of the original signal will often be completely warped and rather unrecognizable.

SHAPE

Shape is a selection menu that includes several common types of wave-shapes (Sine, Triangle, etc.), but also allows for custom shape presets to be loaded. From the Shape Menu we can also edit shapes in the Shape Editor found in the slide-out Tweak Menu.

LFO MODE TWEAK MENU

For additional control options, the Tweak Button can be pressed (underneath the Input/Output controls) to reveal the slide-out Tweak Menu. FilterFreak's different modulation modes all have unique Tweak Menu layouts based on the parameter options available in each selected mode. These added controls offer complete customizability of the filter functions for each mode. We'll discuss the LFO Mode's Tweak Menu controls starting on the next page.

Figure 8: LFO Mode's Tweak Menu

FREQ MOD

Freq Mod controls to what degree the selected modulation signal will modulate the filter's frequency (depth), and is set in octaves. Setting this control to "1.00 oct" means that the maximum modulation will increase and sweep the filters frequency up to one octave above the Frequency setting whereas a setting of "-1.00 oct" will sweep the filter frequency up to one octave lower than the Frequency knob setting.

The knob is center justified with the 12 o'clock position being "0", or no modulation. Turning the knob clockwise or inputting a positive number into the numerical field will add positive modulation. Turning the knob counter clockwise will also add modulation but in a negative direction. The available values are "-10.00 Oct" to "10.00 Oct". The current setting of the Freq Mod control will be shown in the LCD-style display below the control knob. Values can also be entered in manually using this display window.

When the Freq Mod control is set to "0" (12 o'clock) NO modulation will be applied to the Frequency regardless of the setting of the front panel Mod knob.

RES MOD

Res Mod allows for control over the filter's resonance by controlling the strength of the resonant peak. By default this control is set at zero with positive knob values increasing the amount of modulation (and negative values decreasing it). The Res Mod parameter has a significant affect on the overall character of the resonance especially when the Resonance control is set to higher values.

The current setting of the Res Mod control is displayed in the LCD-style readout below the control. Values can also be entered into this display manually.

LEVEL MOD

Level Mod works in conjunction with the Res Mod control in determining the overall level of applied modulation.

Level Mod also features an LCD-style readout window that works in the same manner as those in the Freq Mod and Res Mod controls.

L/R OFFSET

The L/R Offset control is a static frequency offset between left and right channels allowing you to create various types of stereo effects depending on the setting of the knob. Please note that this control only affects mono-to-stereo inserts.

With the knob set to 12 o'clock the filter effect on both the left and right sides will be identical. However, as you turn the L/R Offset knob clockwise from the 12 o'clock position, or input a positive value into the number field (from 0 to 2 octaves), the frequency of the right channel will be increased relative to the left channel. This can create some dramatic and very wide stereo effects. These complimentary changes in the left and right channels create the illusion of greater stereo width and separation.

Negative values for the L/R Offset will make the right channel have a lower frequency setting relative to the left channel.

L/R MODE

For L/R Mode, when the "Normal" setting is selected, the modulation is the same for the left and right channels . When set to "Flipped", left and right channel modulation is the inverse of each other creating a swirling panning effect in stereo. Much like L/R Offset, L/R Mode only has an affect on audio when a mono-to-stereo instace of FilterFreak is used.

ANALOG STYLE

There are 7 different available Analog Style algorithms that determine the saturation characteristics applied to the audio signal:

- **Clean** - Maximum non-distorted range, hard clip
- **Fat** - Smooth low-frequency distortion
- **Squash** - Similar to above but more compressed
- **Dirt** - Smooth broadband saturation
- **Crunch** - Exaggerated high-end clipping
- **Shred** - Lots of asymmetrical clipping
- **Pump** - Extreme pumping compression

THE FILTERFREAK CONTROL PANEL - LFO MODE TWEAK MENU

THE SHAPE EDITOR

It is extremely easy to create entirely new LFO shapes in FilterFreak using the built-in Shape Editor. You can use one of the Shape Presets (found in a menu all the way to the right of the Shape Editor) as a starting point or you can begin with the default Sine wave that will appear in the Editor window.

You'll see that the default Sine wave shape has three small points attached: one at each end and one at the apex of the curve. You can begin changing this shape by adding a new point which will happen simply by clicking anywhere inside the editor. To remove a point, hold down the option key while clicking the desired point with your mouse.

You can change the shape of the waveform line by clicking and dragging points. Up, down, all around: anywhere you want to go. Releasing the mouse click will set the current shape. You can create as many points on the waveform you like and use the "grab/move" operation to reposition any of the points. Extremely complex wave shapes can be created using this tool.

NAMING / SAVING CUSTOM SHAPES

Once you have begun editing a shape you will see that the readout in the Shape Preset Menu to the right changes automatically to "Custom". When you have edited your custom shape to your heart's content, you can save it by pressing the retro floppy disk "Save" button located to the right of the Shape Preset Menu display. Once saved, the new shape will appear in the Shape pop-up menu under the Preset menu entry and can be selected as previously described.

SMOOTHING

The Smoothing control allows you to round out the edges in the wave shape between the points. When smoothing is set to zero (no smoothing), the waveform will have a stair-step appearance and will jump abruptly from point to point. By increasing the Smoothing control you can modify the abrupt changes and smooth out the transitions between points by varying amounts. When set to its maximum value the waveform will be completely smooth.

SMOOTHING MODE

The Smoothing Mode determines the "shape" of the smoothing that will be used to connect the points. This further increases the variety of waveforms you can create within the Shape Editor. The Smoothing Mode choices are as follows:

Lin - Points are connected using straight lines (linear).

Sin - Produces a sinusoidal-like waveform (sine), which is very smooth.

Exp - Produces a "scooped", curved waveform where the curve is not even but kind of "rises quickly", similar in shape to those used in an exponential analog ADSR envelope

Sym - Produces a curved shape that is even and symmetrical.

Rev - Produces a reverse scooped waveform shape that rises slowly and falls back quickly.

Figure 9: FilterFreak 1's Main Control Panel - Rhythm Mode

RHYTHM MODE

Rhythm Mode is a much more sophisticated version of the LFO Mode and provides the means to sync the LFO (regardless of the shape) to a specific tempo. By using Rhythm Mode you can produce complex filter modulations that can be programmed in very musical and rhythmic ways. Rhythm Mode uses all of the common controls discussed on pages 6-10 but adds in some tempo and rhythm specific controls.

TAP TEMPO

Tap Tempo does what it says; start tapping on the grey button and it will determine the BPM tempo of your tapping. This control is useful not only in determining the BPM for live tracks not recorded to a click track but also for finding the appropriate "feel" for your modulation. The toggle switch next to the BPM readout syncs the tempo to the project's MIDI tempo.

RHYTHM

The Rhythm control lets you select a rhythmic transition rate. This defines the rate at which rhythm pattern will change from one position to another. For example, if you select "1/2 note", FilterFreak will move to the next position every half note. Clicking on this control will bring up a menu that lets you select from a variety of beat lengths. You can also create custom patterns using the Rhythm Editor found in

RHYTHM (continued)

the Tweak Menu (which we will begin discussing on the next page).

Note that when you select or create a custom rhythm, the Rhythm control will display the words "Custom" or the name of the custom Rhythm. When a custom rhythm is selected it dictates changes to the filter operation (instead of Rhythm Mode's controls).

SHAPE

The Shape control is used to select from the list of available built-in LFO wave shapes. FilterFreak includes all of the standard LFO shapes you would expect such as sine, triangle, square, etc. FilterFreak also includes a method for you to create you own custom shapes with the Shape Editor. Custom shapes are controlled in the slide-out Tweak Menu just like in LFO Mode.

GROOVE

The Groove control allows you to impart a 'groove' feel to the rhythm pattern in one of two flavors: Shuffle and Swing. Setting the knob straight up at 12 o'clock is the 'zero' setting and no Shuffle or Swing feel will be imparted on the filter pattern. Groove control adjustments create shift either forwards or backwards to the "even" beats towards a triplet type groove.

As you turn the knob counter clockwise towards "Shuffle", an increasing amount of shuffle feel will be added to the modulation. As you turn the knob clockwise from the center "0" setting an increasing amount of swing feel will be imparted on the sound. The amount of Shuffle or Swing dialed in with the knob will be relative to the currently set Rhythm. Groove settings are imparted on the signal regardless of the type of modulation used, the rate, or the rhythm setting.

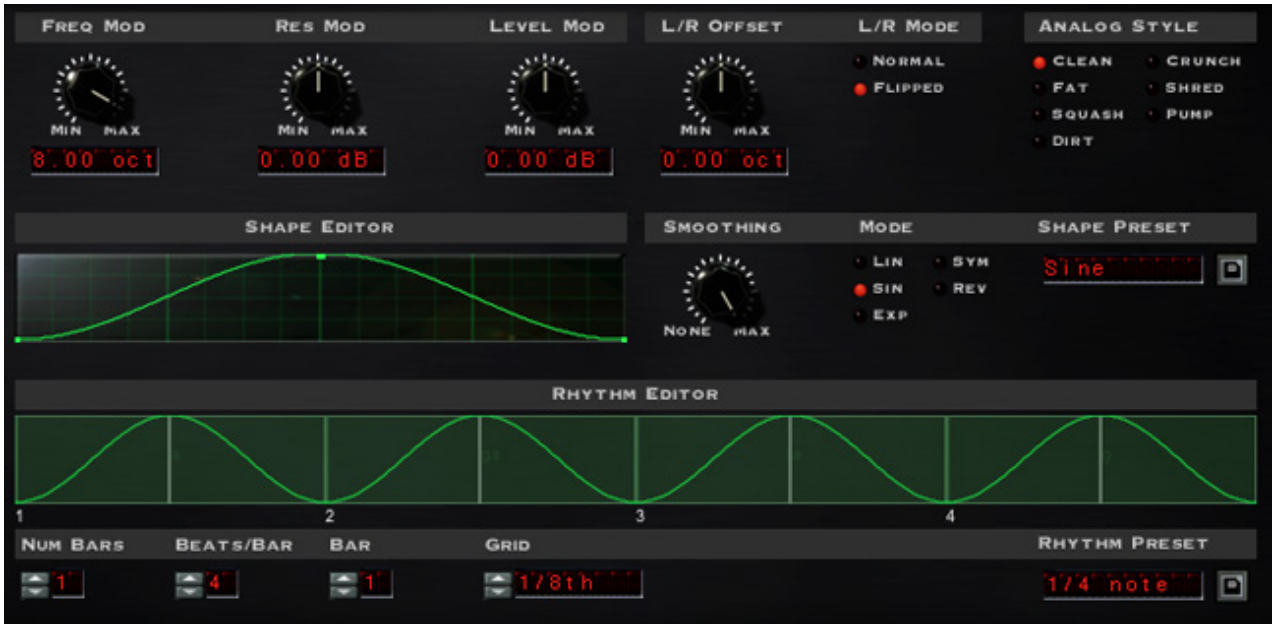

Figure 10: Rhythm Mode Tweak Menu

RHYTHM MODE TWEAK MENU

Since Rhythm Mode is essentially a more sophisticated version of LFO Mode, it makes sense that they would share similar controls. Indeed this is the case for Rhythm Mode's Tweak Menu which features the same control layout as in LFO Mode but with the addition of the Rhythm Editor at the bottom of the menu. If you're not already familiar with the controls found above the Rhythm Editor, glance back at the LFO Mode Tweak Menu section on pages 12-17.

THE RHYTHM EDITOR

The Rhythm Editor section allows you to create completely unique rhythm patterns for FilterFreak. The main editor window (with the green pattern lines) works in a very similar manner to a drum machine pattern editor. You will notice the vertical dividing lines in the editor window; these can be selected by clicking on each section to add or remove. What is added or removed is determined by the settings of the selection menus below the editor. We can remove any section to replace it, but we must have an available length of "blank" pattern space to add a section.

For example, in Figure 11 above we currently have the editor window

THE RHYTHM EDITOR (continued)

set up for 1 bar, 4 beats per bar, and the grid sectioned by 1/8th. By default, the basic rhythm pattern is one bar long and is shown in the rhythm display, though multiple bars can be created and edited. For each selected event in the rhythm pattern, one entire cycle of the LFO Shape will be triggered and played. So, if we click on the first division it will remove that first 1/8th beat curve. Now, if we select 1/16 under the "Grid" menu and click again in that section (now blank), we can add in new 1/16th modulations, and can fit two of them in the available 1/8th space. However, if we instead switch the "Grid" menu to 1/4, you will see that we cannot add it unless we also remove the 2nd divider in the editor window. This is because we need that adequate length of "blank" pattern space to add modulation.

The Rhythm Editor is extremely helpful in generating dynamic rhythmic patterns that can move along with your songs. Your filter patterns are no longer static but can vary in complexity and modulate in very musical and rhythmic fashions.

There are four modifier menus that are located directly beneath the editor window. The first two (Num Bars and Beats/Bar) can be thought of as setting up your rhythm to match the song as we are determining the number of bars the pattern should entail as well as how many beats per bar.

The next menu, Bar, is used to select one bar at a time (for patterns that are longer than one bar) to edit in the editor window.

Finally the Grid menu determines the spacing of added LFO shapes to the pattern. When you click in an empty space in the editor window, the length of the LFO added will be determined by what appears in the Grid menu display and not by the length of the available space in the editor.

RHYTHM PRESET

The Rhythm Preset menu allows for pattern presets (factory as well as user-defined) to be loaded into the Rhythm Editor and also allows for new patterns to be saved by clicking on the retro floppy disk "Save" icon. This will open up an operating system Save Menu and prompt for a name with which to save your preset under.

Figure 11: Saving a pattern

THE FILTERFREAK CONTROL PANEL - ENVELOPE MODE

Figure 12: Envelope Mode Control Panel

ENVELOPE MODE

Envelope Mode employs an envelope follower that, well, follows the volume level of the input signal and dynamically controls the amount of filter modulation based on volume changes in the input signal. Envelope Mode works great on dynamic signals that change in volume in rhythmic ways like guitar or drums.

The same common controls from LFO and Rhythm Mode are also used in Envelope Mode (common controls are covered in detail on pages 7-11). Envelope Mode also adds in a few new controls in the center section of the Control Panel which we will discuss next.

THRESHOLD

The Threshold knob works similar to the threshold control on a compressor. It defines at what volume the envelope follower will start 'tracking' the volume changes in the input signal. As the input level rises above the threshold, the envelope follower 'follows' the signal and will modulate the frequency accordingly. The farther above the threshold level and the louder the input signal, the more the filter will be modulated. As the signal falls below the threshold level no modulation occurs.

It is important to adjust the Threshold based on the type of input audio and the amount of modulation you wish to achieve. Setting the Threshold very high will only modulate the phase at the loudest peaks but setting it too low can cause the phase to be overmodulated.

THE FILTERFREAK CONTROL PANEL - ENVELOPE MODE

GAIN

The Gain knob works together with the Threshold control, and is similar to the ratio control on a compressor. It determines the overall "sensitivity" of the envelope follower, and is used to boost any signal that exceeds the setting of the threshold control. This can be very useful when you are using either a very high threshold, or slow attack settings. At the highest gain settings the envelope follower will begin to function more like a gate, turning 'on' when the input goes above the threshold, and turning 'off' when the signal goes below. At lower gain settings the envelope follower will be more touch-sensitive and dynamic.

ATTACK

The Attack knob controls the how fast the envelope follower will react to an increase in signal level. A fast setting will cause the envelope follower to react very quickly to transients, and will produce a very dynamic, staccato-like filtering effect. Setting the Attack knob to a slower setting will smooth out and lengthen the attack response from the envelope follower. The resulting filter effect will be very hazy and lazy.

RELEASE

The Release knob controls how fast or slow the filter will react to the input signal as it decreases (the opposite of the Attack knob). Again, a faster release setting will produce a more dynamic effect, and slower release times will produce a slower, smoother effect as the sound decays.

ENVELOPE MODE TWEAK MENU

Envelope Mode's Tweak Menu utilizes the same first row of controls found in LFO Mode. If you're not already familiar with the controls found in this first section of the Tweak Menu, glance back at the beginning of the LFO Mode Tweak Menu section on pages 13-17.

Figure 13: Random Mode Control Panel

RANDOM MODE

Random Mode produces a waveform that jumps from one value to another at each cycle (sometimes referred to as Sample and Hold). This type of effect is most known either from sci-fi movies (used to create those 'futuristic' bleeping and chirping computer sounds) or from Emerson, Lake, and Palmer's *Brain Salad Surgery* where it was coupled with a resonant filter. FilterFreak offers a few twists so that its sample and hold feature can be synced to the tempo of your music.

Random Mode's Control Panel layout is comprised entirely of controls we have seen in previous modes. Random Mode is most similar to Rhythm Mode, but does away with pattern controls as those are assigned randomly based on the set rhythm.

Random Mode's Tweak Menu will also look very similar when opened as the controls are the same first row of controls found in previous modes. If you need a refresher on any of the Tweak Menu controls, take a look back at pages 13-17 for more detail.

THE FILTERFREAK CONTROL PANEL - STEP MODE

Figure 14: Step Mode's Control Panel

STEP MODE

Step Mode combines the sample and hold effect with an envelope follower. Instead of changing to a new value at a specific set rate, a new random value is created in response to a trigger. This works really great on drums and other highly percussive signals, and can be used as a creative, dynamic effect that varies with each audio event.

TRIGGER

Step Mode introduces the Trigger control, which is very similar to the Threshold control. Much like with Threshold, the real-time audio level will display red in the white notches surrounding the knob. You can set the Trigger level by turning the control's pointer to the threshold, based on the incoming audio level, where you would like the filter modulation to occur. Or, the Manual Trigger button can be used. Pressing this button (or sending MIDI data) will cause a trigger event. Note that the audio must be below the threshold for a Manual Trigger event to occur. To turn off audio based triggering (if you're using MIDI or manual triggering), set the threshold of the Trigger knob all the way up.

STEP MODE TWEAK MENU

Step Mode's Tweak Menu is the same first row of controls found in previous modes (and discussed on pages 13-17).

THE FILTERFREAK CONTROL PANEL - ADSR MODE

Figure 15: ADSR Mode Control Panel

ADSR MODE

ADSR Mode is a recreation of the standard envelope generator found on most synthesizers. If you're new to synthesis technology, ADSR stands for Attack, Decay, Sustain, and Release, which happens to correspond to the four knobs in this mode.

With ADSR Mode you can define a specific envelope shape that will be used to modulate the filter each time it receives a trigger based on the level of input signal. This is quite a bit different than the Envelope mode whose shape changes and responds dynamically to the input signal.

On a keyboard synth, the ADSR envelope is triggered each time you press a key. In FilterFreak, the ADSR is triggered either by pressing the Trigger button, by receiving a MIDI note event, or when the input signal exceeds the Threshold setting.

On the next page we'll discuss the individual Attack, Decay, Sustain, and Release controls found in ADSR Mode.

A (ATTACK)

The Attack knob determines how fast the envelope will increase to its maximum value once it has been triggered. The lower the setting of the Attack knob, the faster the attack time. As you increase the setting of the Attack knob, the attack time will get longer/slower (like increasing the Smoothing parameter). Keep in mind that the possible modulation level goes from a hypothetical 0 to 100 , so the attack time determines how fast the envelope modulation signal will move from a level of "0" to a level of "100".

D (DECAY)

Once the Attack has reached its maximum value, the envelope moves to the Decay stage and the modulation signal "decays" then until the Sustain value is reached. The Decay knob controls the speed or length of the decay time. The lower the setting of the Decay knob, the faster the decay time will be. Conversely, the higher the setting of the Decay knob the longer the decay time will be and the longer it will take to reach the Sustain level.

S (SUSTAIN)

The Sustain knob controls at what level (between 0 –100) the envelope will "hold" or sustain at as long as the Trigger button is held down, or, as long as the input signal is above the Threshold setting.

R (RELEASE)

The Release knob adjusts the time it takes for the envelope signal to move from the Sustain level back to a "0" level once the Trigger button is released, or after the input goes below the Threshold.

Figure 16: FilterFreak 2's Control Panel - LFO Mode

FILTERFREAK 2

By now, you are probably wondering what this other plug-in is doing in your Soundtoys folder, the one titled 'FilterFreak 2'. Well, FilterFreak 2 uses the same processing framework as FilterFreak but provides TWO separate filters that can be used together to create an even greater set of filtering effects (mono-to-stereo instances of the plug-in will split Filter 1 to the left and Filter 2 to ther right). All of the previously discussed parameters also apply to FilterFreak 2, you're just going to see double for each control panel!

The filters themselves are identical but can be set independently of each other. You can combine a lowpass with a bandpass, a notch with a highpass, a lowpass with highpass, etc. to create all sorts of different filter sounds. There are a few additional controls in FilterFreak 2 that allow you to manage the interplay between the two filters, and we will explain those in this section.

PARALLEL / SERIAL MODE TOGGLE SWITCH

This toggle switch determines how the incoming audio signal is to be fed through FilterFreak 2's dual filters.

In **Parallel** mode the input signal is sent through each filter individually and the outputs of the two filters are then mixed together. In this mode each filter affects the sound individually and there is no real interaction between the two filters.

In **Serial** mode the input signal is first sent through Filter 1, and that output is then fed into Filter 2. In this mode, Filter 1's signal is re-processed by Filter 2 and the filters will interact with each other to create combined filtering. Depending on the type of filter and Poles selected and their settings it is actually possible to make the sound completely disappear.

PARALLEL / SERIAL MODE TOGGLE SWITCH (continued)

Serial Mode can create some truly otherworldly sounds but can also get pretty overwhelming when Resonance is set to higher values. This can create some VERY loud peaks so please use caution as experimentation with high resonance values can potentially damage speakers if done at full volume.

LINK

Switching on the Link switch links the Frequency, Resonance, and Gain controls of the two filters together. Once the Link switch is activated, moving any of these knobs on either filter will move the corresponding knob on the other - in the same direction and by the same amount.

Please note that depending on control settings it is possible that nothing will change on one of the filters. For example, if a particular setting on Filter 1 is set about half way and the same control on Filter 2 is set to maximum, turning up Filter 1's control will have no effect as that control value is already as high as is theoretically possible (having been set at maximum on Filter 2). Now, if you were to turn down the value of that control on Filter 2, the corresponding knob on Filter 1 will move as it now has room to move. This is something to be mindful of when utilizing the Link feature.

TWEAK MENUS

FilterFreak 2's Tweak Menus all feature control parameters you will be familiar with from working with FilterFreak 1. The control layouts are the same for each mode, the only difference being additional controls (labeled 1 or 2) for modifying each filter individually. So for example, we will see instead of one Level Mod control, a Level Mod 1 and another labeled Level Mod 2.

Like FilterFreak1, FilterFreak2 has a single modulation source, but can get more varied and interesting effects by using different modulation amounts for the two filter sections. You can even set the direction of the modulation for Filter 1 to move in one direction while having the modulation for Filter 2 going in the opposite direction. This can be used to create really interesting vocal-like "Wah" sounds.

All individual controls work in the same way that they did in FilterFreak 1. If you need a refresher on any of the control details, please refer back to the relevant section of this manual for FilterFreak 1.

Figure 17: FilterFreak 2 in LFO Mode with expanded Tweak Menu

SUPPORT INFORMATION

Now that you've taken the time to learn all about FilterFreak, have fun, experiment, and make greatness! If our plug-ins helped you take your production to the next level, let us know, we'd love to hear from you and what you were able to create with our software.

If along the way however you should run into any hiccups or anything unexpected, we offer free technical support for all registered users.

Our FAQ contains many helpful answers. you can find it at:

http://support.soundtoys.com

If you need further support you can find our Customer Support contact form at:

https://www.soundtoys.com/forms/support

You can also reach our support staff by e-mail at:

support@soundtoys.com

If neither of those options work for you, our office can be reached via telephone at:

1-800-COOL-EFX

Please have the following information available to help assist our support team:

- The product version and serial number
- The version number of your audio system (e.g ProTools 11.2.1, Cubase 8.0.5, Logic 10.2.0, Cakewalk Sonar X3)
- Your interface/hardware (e.g. Mbox Pro, Apogee Quartet, RME Fireface, etc.)
- Your computer and operating system info (e.g. MacPro OS X 10.9.5, Windows 7 SP1, Windows 8.1, etc.)
- A detailed description of the problem

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