PhaseMistress

Analog Phase Shifter

User's Guide

Version 5 : For Mac and Windows

soundtoys

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Figure 1: The PhaseMistress Control Panel and Tweak Menu - Rhythm Mode

THE BASICS - ABOUT PHASEMISTRESS

PhaseMistress was designed to offer you an all-encompassing set of phase-shifting tools, expertly modeled from the most sought-after hardware units. An extensive amount of research and development went into creating the wealth of features and modes that make PhaseMistress the most complete phase-shifting effects plug-in available. PhaseMistress sounds and responds in the same manner as a physical analog phaser would, but also includes powerful new tools for creating endlessly customizable effects. To help illustrate just how capable PhaseMistress is, let's take a look at the history of phasing effects and highlight some of the legendary sounds available to you inside of this plug-in.

The original phase-shifting effects were an attempt at electronically recreating analog tape flanging (an effect created by mixing the output of two analog tape machines playing the same track, only slightly out of sync) using integrated circuits. Early effects designers attempted to model the 'out of sync' part of the flanging effect by using something called an analog phase shift circuit. The result wasn't exactly tape flanging in the classic sense (as an actual flanging effect also requires a short modulated delay), but sounded very cool in and of itself and would begin to be utilized in unintended ways by some pioneering musicians (we'll get to this part of the story in just a bit).

A phaser or phase shift effect is created by altering the phase of the audio, (similar to a delay, but with frequency variation) and mixing this phase-shifted sound back in with the original signal. The resulting phase cancellation produces a wonderfully musical sounding set of "notches" at musically related frequencies in the original sound. By sweeping, or modulating the phase-shifted signal, the notch frequencies are moved up and down the frequency spectrum thus creating that classic swooshy and swirly phase-shift sound.

In 1968, a Japanese company by the name of Shin-ei created a footpedal operated phase-shifter called the Uni-Vibe. The Uni-Vibe was designed to recreate the Doppler-effect sound of a Leslie rotating speaker. Remember the pioneering musicians I referenced in the last paragraph? Well, a young ex-pat American guitarist found the lush, swirling sound of the Uni-Vibe to sound a little better on guitar than the organ. That lad's name: Jimi Hendrix. And the rest, as they say, is history.

Phasers became very popular with guitarists during the Psychedelic '60s, and by the 1970s phase-shifting effects were being used on drums, keyboards, and in motion picture and television production. Analog phasers work on the principle of having a series of phase shift all-pass filters (or 'stages') in their design that produce phase shift through the circuit. As you add stages to the phase shift "circuit" (resulting in more notches), the overall "strength" of the phase shift effect increases and becomes more prominent. In addition, the number of stages significantly affects the overall tonal character of the phased sound. A two-stage phaser will be very "washy" and wet (think of "Machine Gun" by our friend Jimi, Robin Trower's "Bridge of Sighs", or the opening guitar on Dark Side of the Moon's "Breath"). The totally cool phased drum sound on Led Zeppelin's "Kashmir" from Physical Graffiti was created with a 4 stage phaser that provided a much more pronounced effect. So it kind of stands to reason that 6, 8, 10 and 12 stage phasers

each sound progressively more pronounced.

You may have noticed that all of these examples are even number combinations. Virtually all analog phaser designs stuck to even-numbered patterns. Odd numbers result in a totally different sound, more stuttered and effect-laden, and for whatever reason the vast majority of manufacturers did not incorporate odd-numbered stages in their designs. PhaseMistress, on the other hand, allows you to pick any number of stages between 2 and 24 including all odd numbers. This expands the tonal palate exponentially allowing you to make an even number of even or odd sounds, an odd number of odd or even sounds as well as making really odd sounding even phasers - and so on and so forth.

The properties and designs of a wide range of classic units were studied in-depth while we were creating PhaseMistress. We needed to make sure that their signature rich, warm, and silky analog sound was reflected in the software just as it exists in the physical world. Many of the presets designed for PhaseMistress are faithful recreations of sounds generated from hardware such as the Shin-Ei Uni-Vibe, the MXR Phase 90, Maestro PS-1A, Electro-Harmonix Small-Stone, Eventide Instant Phaser, and the Mutron Bi-Phase (among many others). These phasers and the phasing effect in general have been used by literally hundreds of artists and on thousands of albums. It remains one of the most used studio effects to this day. PhaseMistress takes this legacy to a new pinnacle of flexibility and ease of use, offering an unprecedented amount of phasing effects of the highest possible quality in one plug-in.

THE PHASEMISTRESS CONTROL PANEL

Figure 2: The PhaseMistress 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 PhaseMistress. 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 also determine the amount of saturation and distortion present in PhaseMistress, based on the Analog Style in use (found in the Tweak Menu, which we will discuss later). You can crank either the Input or the Output to create distortion; and distortion combined with phasing can be lots of fun! If you saturate the input stage (by turning up the Input level), the distortion and harmonics added by the increased saturation will be filtered by the phase effect. If you saturate the output stage by turning up the Output level, the signal will be phased first and the distortion and harmonics will be added post-phasing.

Generating audible distortion pre or post-phaser colors the resulting audio in different ways and there are a lot of sonic variations available combining input and output saturation. The greater the harmonic content, the more pronounced the phasing effect will be. Overloading the input will increase the presence and appearance of the phasing effect. Conversely, most guitarists plug into a phaser before going into their distortion but in this case the subtleties of the phasing effect will be less pronounced as it is distorted. It's important to note that the input and output level only affects the phased signal and leaves the dry signal unchanged.

COMMON CONTROLS

The control layout you will see in PhaseMistress is dependent upon the modulation mode that the plug-in is currently in. However, a few of the parameters are basic, common controls that appear in every mode. We'll discuss these controls first and then breakdown each unique modulation mode (and associated controls) that you will find within PhaseMistress.

MIX

The Mix control is used to set the balance between the shifted sounds created by PhaseMistress (and Input/Output control settings) and the dry signal. The Mix control provides a convenient means of setting just the right balance between the dry and effect signals in PhaseMistress.

For example, if you're using PhaseMistress on an Aux Send/Return configuration, you may want to leave the mix at 100% and use the fader on the return to control the amount of the effected sound. If you are using it "in-line" and sending the signal right through PhaseMistress, chances are you will want to set the Mix knob at 50% or less depending on the type of shifted effect being used.

The amount of dry vs. affected signal is very dependent on the type of phasing effect being used, how pronounced you want the effect to be, and how you want the sounds to sit in your mix. As with most things in the world of audio there is no right and wrong. However, because of the stuff we just mentioned you may find it preferable to use PhaseMistress as a channel insert and use the Mix knob to determine the mix between the dry and filtered sound.

FREQUENCY

The frequency knob on PhaseMistress allows you to set the mid point of the phase notches. It determines the frequency along the spectrum where the phaser effect will be "centered" (this is also often referred to as the "initial" setting).

There are a few things that will often affect where you might want to set the Frequency:

- *The type of input signal or instrument to be phased (is the track bright, bass heavy, or midrange focused?).*
- *The type of phasing effect being used, i.e. soft and thin with little resonance (we'll get to that) or deep, wide and resonant.*
- *The "type" and "depth" of the modulation being used to sweep the phaser.*

To hear how changing the Frequency alters the sound, first turn the

FREQUENCY (continued)

"Mod" knob (discussed shortly) all the way down and twist the Frequency knob from the lowest to highest setting. You will hear the standard phaser effect across the full frequency spectrum. Most commonly the Frequency knob should be set to a specific setting somewhere midway between the lowest and highest setting with an LFO or envelope added to modulate the frequency.

So to get your standard phasing effect try setting the Frequency knob at 12 o'clock and then bring in some modulation with the "Mod" knob (set it to 11 o'clock) and set the Rate fairly low, (say around 7 o'clock). You can then move the Frequency knob to "tune" or bias the phasing effect. There's no right or wrong setting, it's all relative to your source material and the sounds you are hoping to achieve.

Of course most of the really cool effects available from PhaseMistress happen by moving the Frequency knob around and recording the changes with automation or, more likely, using PhaseMistress' extensive built-in modulation section to automatically modulate the phase effect in a multitude of wonderful and bizarre ways.

RESONANCE

The Resonance control greatly enhances the effect of the phase shift effect by creating "resonant peaks" in each of the notch filters. This boosts and enhances the harmonics contained in the input signal that fall around each of the notches. As you increase the Resonance control, the harmonics falling into and around the various notches are exaggerated, "picked out" and become more pronounced. This significantly enhances the phasing effect giving it a much sharper, "churning" quality. Cranking the Resonance all the way up will drive PhaseMistress into oscillation and can actually obscure the input signal as the filters in the phase effect are creating a signal on their own.

It is also important to note that the number of stages and the phase (positive/negative) of the resonance (located under the Tweak menu and discussed shortly) will significantly impact the character and overall tonal quality of the resonance and greatly increases the variety of phasing effects available in PhaseMistress.

A Word of CAUTION! – Extreme settings of the Resonance control can create VERY high signal levels, enough to possibly damage speakers if the volume is way up. You may want to turn down the output level of PhaseMistress when experimenting with cranking up the Resonance control. It is a powerful control and you have been warned, okay?

MOD

The "Mod" control determines the amount of modulation signal that will be used to sweep the phaser Frequency. Turning up Mod will increase the amount of modulation and determine how far the frequency will be swept either above and/or below the center frequency. The amount of Mod used will often be dependent on where the Frequency knob is set as well as the type of modulation signal being used. Usually the faster the modulation the less Mod you will want to use as phase shifting can create a "vibrato-like" effect and make the signal sounds out of tune.

Please note: The Mod knob on the front panel is directly linked to the Freq Mod parameter located under the "Tweak" button. The total available modulation depth as well as the direction of the modulation is set by the Freq Mod parameter in the Tweak Menu (based on having the Mod knob full up). The front panel Mod knob allows you to "scale" the amount of available modulation based on the Freq Mod setting. This will be covered in greater detail when we discuss the Tweak Menu (starting on page 14).

STYLE MENU

The "Style" menu gives you access to dozens of different virtual phasing 'circuits' with a click of the mouse. Each style setting has a completely different tonal shape and can be used to quickly change the overall sound and character of PhaseMistress, while still preserving the modulation, frequency, resonance, etc.

The included styles in PhaseMistress are based on phase characteristics of classic, real-world hardware as well as completely unique styles exclusive to PhaseMistress. Switching between styles will change the resulting sound to a great extent. Think of each entry in the Style menu as a different piece of gear, analogous to switching between a Maestro Phaser, an MXR Phase 90, Mutron III, etc.

You can also create your own very own custom phaser Style by clicking on the Style Edit button (slightly below and right of the Style Menu) which will open the slide out Style Edit Menu.

AUDITIONING STYLES

The best way to hear what different Styles sound like is to set the front panel settings to a nice, default baseline and then step through the various Style settings. As you cycle through the each of the Styles, listen for the changes in the overall sound of the phaser effect.

AUDITIONING STYLES (continued)

The front panel parameter settings suited best to auditioning the different Styles is as follows:

- **Mix** = 50% or 100% depending on where you have PhaseMistress inserted.
- **Frequency** = 12 0'clock
- **Resonance** = 9 o'clock
- **Depth** = 12 o'clock
- Select the standard PhaseMistress preset call "STYLE TRYER" (this will insure that the Tweak Menu settings, described in a bit, are set to "default" values)

You will find a wealth of Style options to choose from, based on classic hardware as well as completely new styles of phasing unique to PhaseMistress. Style presets are named in some instances based on either the name of the original hardware (such as "DOD 201" or "Trine") or based on key aspects of the stages or phase used (or sometimes, just the way it actually sounds like "Scoopy"). For instance, the "Rezo 6 Low" is a 6 Stage, high intensity, modern phase with resonant peaks tuned more towards the bass frequencies.

MODULATION

The Modulation indicator serves as a visual reference of the phasing process. The blue LED-style indicators will light up in relation to the current position of the phase sweep from left to right and back again. Adjusting the rate control will result in the most notable changes in the Modulation indicator, as it will move rhythmically to the rate specified.

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 PhaseMistress's virtual phasing 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 PhaseMistress the most flexible and sonically vast phase shifter made to date.

Figure 3: The Tweak Button: your key to more Awesomeness

CHOOSING A MODULTATION TYPE/SOURCE

PhaseMistress includes a number of different modulation options that can be selected using the small button at the bottom of PhaseMistress's center section. The available modulation modes available in PhaseMistress are:

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

The currently selected modulation mode will appear as text above the 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. You will notice that not only does the name above the button change, so does the control panel layout. Though the button name will change to reflect the selected type of modulation, the function of this button remains constant: to change modulation modes.

Figure 4: The Modulation Menu

Figure 5: After changing Modulation Modes

Figure 6: LFO Mode Control Panel

LFO MODE

LFO Mode stands for Low Frequency Oscillator Mode. An LFO creates a repeating waveform 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 PhaseMistress LFO has a slightly wider (and more useable) range that can go as fast as 100 Hz. LFO Mode modulates the phase position by repeating a wave pattern at a specific rate. LFO Mode utilizes all of the common controls mentioned earlier on pages 8-11.

RATE / SHAPE

Since LFO Mode is based around the repetition of a waveshape, we only require two additional controls to manage it: Rate and Shape.

Rate controls the frequency at which the modulation occurs. This control ranges from 1Hz (or one cycle per second) up to 100Hz (100 cycles per second).

Shape is a selection menu that includes several common types of waveshapes (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 which we will discuss starting on the next page.

Figure 7: LFO Mode's Tweak Menu

FREQ MOD

The Freq Mod determines both the direction of the modulation applied to the Frequency parameter as well as defining the maximum depth that can be applied when the front panel Mod knob is turned all the way up. 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"

As an example, a setting of "8.00 Oct" means that the modulation applied to the Frequency will modulate the frequency of the filters in a positive manner and that the maximum depth available when the Mod knob on the front panel is turned all the way up is "8" octaves above the front panel Frequency setting. This was used as the "default" setting when we created the various Mode presets but may be set quite differently as you create your own presets.

Conversely, if you set the Freq Mod to a negative setting of say "-5.00 Oct", the modulation applied to the Frequency will modulate the frequency in a negative manner with the maximum modulation available being minus 5 octaves with the front panel Mod knob turned all the way up.

Again, if you set the Freq Mod to "0" (12 o'clock), NO modulation will be applied to the Frequency regardless of the setting of the front panel

FREQ MOD (continued)

Mod knob. It is really important to note that the Freq Mod parameter is highly interactive with the front panel Frequency and Depth knobs. There is also a polarity reverse switch next to the control. This switch can be used to quickly "flip" or reverse the direction of the modulation being applied by the Freq Mod control.

RES MOD

Res Mod determines the number of resonant peaks independently of the number of Stages. The Res Mod parameter has a significant effect on the overall character of the resonance when the Resonance control is turned up. Various mixtures of Stage settings and Res Mod settings can often impart very drastic changes in the overall tonal quality of the phase effect.

Setting the Res Mod to the lowest setting of "Norm" is a standard setting and will automatically set the number of resonant peaks for the selected number of Stages, as would be typical in the majority of phaser circuit designs. As you change the number of Stages, the number of resonant peaks are automatically set. Alternately, setting the Res Style to a different number than the number of Stages allows you to create completely new and previously unavailable virtual phasing circuits and create a plethora of truly unique phasing tones. There are a LOT of variations that can be achieved with different combinations of Stages and Res Style settings.

Res Mod also features a polarity reverse switch next to the control. This switch can be used to quickly "flip" or reverse the phase of the modulation being applied by the Res Mod control.

RES OFS MOD

The Res Offset Mod control allows you to modulate the Resonance Offset parameter with whatever modulation source is currently in use (LFO, Envelope, etc). The Res Offset Mod knob is also center justified meaning that when set at 12 o'clock, no modulation is applied to the resonance. Turning the knob clockwise or typing in a positive number will modulate and increase the Resonance Offset (counter-clockwise for negative values).

It is important to keep in mind that the setting of the Resonance Offset (Resonant Frequency) in the Style Edit Menu defines the "default" starting point for the Resonance Offset modulation. Positive modulation will increase the Res Offset from the value set in this menu whereas negative modulation will decrease from the Resonance Offset. You can modulate the Resonance Offset inversely from the modulation of the Resonance or the Frequency and by a specific amount.

RES OFS MOD (continued)

The polarity of the Res Offset Mod control can be quickly reversed by the sector switch next to the control. This switch can be used to quickly "flip" or reverse the direction of the modulation being applied by the Res Ofs Mod control.

L/R OFFSET

The L/R Offset knob is a little different than the other knobs as it allows you to create various types of stereo phase signals depending on the setting of it. In the simplest terms, the L/R Offset control is a static frequency offset between left and right channels.

With the knob set to 12 o'clock the phasing 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), the frequency of the right channel will be increased relative to the left channel. This can create some dramatic and very wide stereo effects. Extreme settings can make the phasing effect swirl around in the stereo field in a way that feels as if your eardrums are being sucked right out of your head!

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

The L/R Mode control alters only the modulation. When the "Normal" setting is selected, the modulation is the same for the left and right channels. When the switch is reversed, left and right channel modulation is the inverse of each other creating a swirling panning effect in stereo.

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

Figure 8: LFO Mode's Shape Editor Section

SHAPE EDITOR

It is extremely easy to create entirely new shapes in PhaseMistress using the built-in Shape Editor. You can use one of the shape presets as a starting point or can begin from the default Sine wave that will appear in the Editor window.

You'll see that 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 point.

You can change the shape of the waveform line by dragging on clicked 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 as you like using the "grab/move" operation to reposition any points. Extremely complex wave shapes can be created this way.

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.

Figure 9: Saving a new Shape Preset

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 decrease the abrupt changes between the points and smooth out the transitions by varying amounts. When set to the 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 LFO Shape Editor. The Smoothing Mode choices are as follows:

Linear - Points are connected using straight lines

Sine - Produces a sinusoidal-like waveform, 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 10: Rhythm Mode Control Panel

RHYTHM MODE

Rhythm Mode is a much more sophisticated version of 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 phase modulations that can be programmed in very musical and rhythmic ways. Rhythm Mode uses all of the common controls discussed on pages 9-12 but adds in some new 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 the pan position will change from one position to another. For example, If you select "1/2 note", PhaseMistress will change phase 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 Step Editor found in the Tweak Menu

RHYTHM (continued)

(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 (if previously saved). When a custom rhythm is selected it dictates changes to the phase 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. PhaseMistress includes all of the standard LFO shapes you would expect such as sine, triangle, square, etc. PhaseMistress also includes a method for you to create you own custom wave shapes, allowing virtually limitless sonic modulation possibilities. Custom shapes are controlled in the slide-out Tweak Menu.

GROOVE

The Groove control allows you to impart a 'groove' feel to the phase effect 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 phasing pattern. Groove control adjustments create a 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.

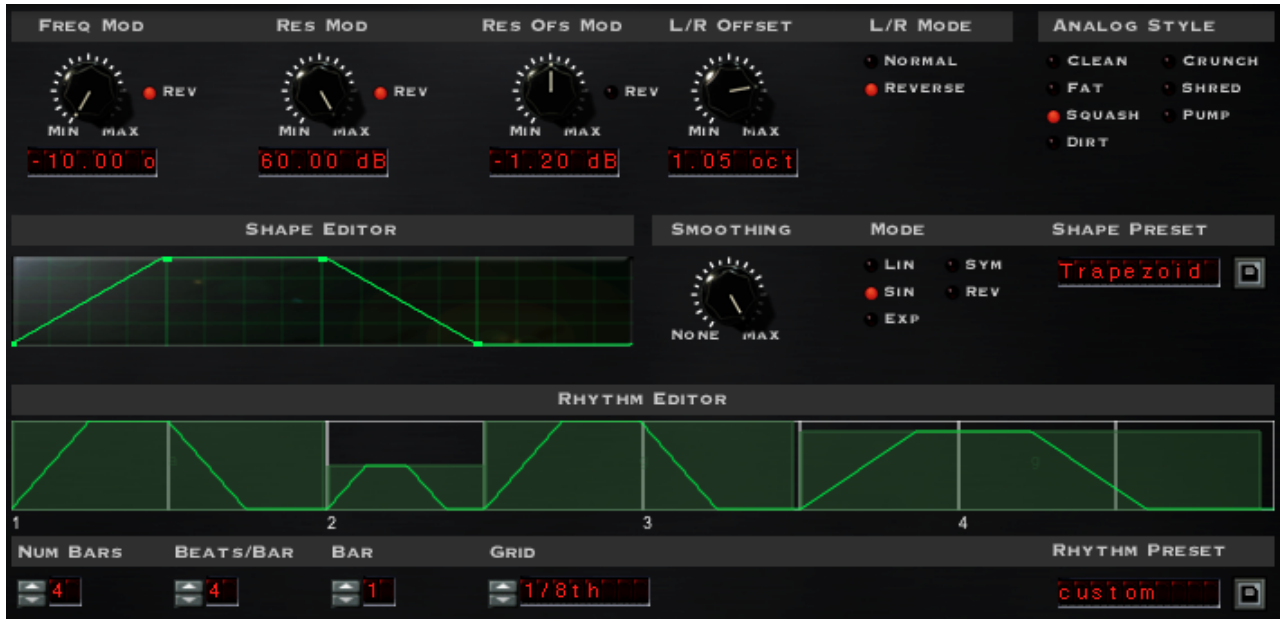

Figure 11: Rhythm Mode Tweak Menu

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 17-18.

THE RHYTHM EDITOR

The Rhythm Editor section allows you to create completely unique rhythm patterns for PhaseMistress. 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 added or removed by clicking on each section. 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 to add a section.

THE RHYTHM EDITOR (continued)

For example, in Figure 12 we currently have the editor window set up for 1 bar, 4 beats per bar, and the grid sectioned by 1/8ths. 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 long 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 phasing 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 avaiable 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.

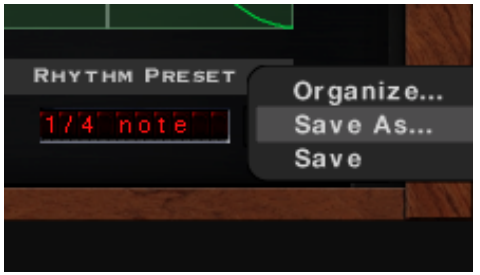

Figure 12: Saving a pattern

THE PHASEMISTRESS CONTROL PANEL - ENVELOPE MODE

Figure 13: 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. You can create envelope controlled phasing effects and a whole lot more using this mode.

The same common controls from LFO and Rhythm Mode are also used in Envelope Mode (common controls are covered in detail on pages 8-11). Envelope Mode does add 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' that signal and will modulate the frequency accordingly. The farther above the threshold level, the more modulation will occur. 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 become overmodulated.

THE PHASEMISTRESS 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 set threshold. 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 falls below. At lower gain settings, the envelope follower will be more responsive and dynamic.

ATTACK

The Attack knob controls how fast the phase effect 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 phasing effect. Setting the Attack knob to a slower setting will smooth out and lengthen the attack response of the envelope follower, the resulting phase effect will be very hazy and lazy.

RELEASE

The Release knob controls how fast or slow the phase signal 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, with slower release times producing a smoother effect as the sound decays.

ENVELOPE MODE TWEAK MENU

Envelope Mode features a slide-out Tweak Menu accessible by selecting the Tweak Button located underneath the Input/Output controls.

Envelope Mode's Tweak Menu consists of the same first row of controls found in LFO and Rhythm Mode (Freq Mod, Res Mod, Res Ofs Mod, L/R Offset, L/R Mode, and Analog Style). For a detailed look at each parameter, refer back to pages 14-16 of this manual.

Figure 14: Random Mode's Control Panel

RANDOM MODE

Random Mode (also known as Sample and Hold) produces a waveform that jumps from one value to another at each cycle. 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. However, it is an especially cool effect when applied to phasing and PhaseMistress offers a few twists so that the sample and hold sound can be synced to the tempo of your music.

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 tempo of projects that weren't 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.

SMOOTHING

The Smoothing control allows you to round out the edges in the wave shape between added points. The Smoothing knob works much in the

SMOOTHING (continued)

same way as it does in the LFO Mode Tweak Menu (discussed back on page 18) and can be used to smooth out transitions between the random values. A setting of zero equals no smoothing and the values will jump from one to the next. The maximum setting will give you a smooth, constantly changing random phase variation sometimes referred to as the "drunken walk".

RHYTHM

The Rhythm control lets you select a rhythmic transition rate. This defines the rate at which the phase will change from one position to the next. For example, if you select "1/2 note", PhaseMistress will change phase every half note. Clicking on this control will bring up a menu that lets you select from a variety of beat lengths.

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 (if previously saved). When a custom rhythm is selected it dictates changes to the phase operation (instead of Rhythm Mode's controls).

RANDOM MODE TWEAK MENU

Random Mode features a slide-out Tweak Menu accessible by selecting the Tweak Button located underneath the Input/Output controls.

Random Mode's Tweak Menu consists of the same first row of controls found in LFO and Rhythm Mode (Freq Mod, Res Mod, Res Ofs Mod, L/R Offset, L/R Mode, and Analog Style). For a detailed look at each parameter, refer back to pages 14-16 of this manual.

THE PHASEMISTRESS CONTROL PANEL - STEP MODE

Figure 15: Step Mode's Control Panel

STEP MODE

Step Mode combines the Sample and Hold effect from Random Mode with an envelope follower. So, instead of changing to a new value at a specific set rate, a new random value is triggered when any of the following occurs:

1) *You press the Trigger button.*
2) *A MIDI signal activates the Manual Trigger.*
3) *When the input signal exceeds the set Threshold.*

This works really great on drums and other highly percussive signals, and can be used to create a creative, dynamic effect that varies with each audio event.

TRIGGER

As mentioned in the last paragraph, the Trigger section includes a Manual Trigger button (much like with Tap Tempo) as well as a variable Trigger knob that works just like the Threshold control does. The real-time audio level will display as 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 a transition to occur.

SMOOTHING

The Smoothing control allows you to round out the edges in the wave

SMOOTHING (continued)

shape between added points. The Smoothing knob works much the same as it does in the Tweak Menu (discussed back on page 18) and can be used to smooth out transitions between the random values. A setting of zero equals no smoothing and the values will jump from one to the next. The maximum setting will give you a smooth, constantly changing random phase variation sometimes referred to as the "drunken walk".

STEP MODE TWEAK MENU

Step Mode features a slide-out Tweak Menu accessible by selecting the Tweak Button located underneath the Input/Output controls.

Step Mode's Tweak Menu consists of the same first row of controls found in LFO and Rhythm Mode (Freq Mod, Res Mod, Res Ofs Mod, L/R Offset, L/R Mode, and Analog Style). For a detailed look at each parameter, refer back to pages 14-16 of this manual.

Figure 16: Control Panel layout in ADSR Mode

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 control knobs in this mode.

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

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

TRIGGER

The Trigger section includes a Manual Trigger button (much like with Tap Tempo) as well as a variable Trigger knob that works just like the Threshold control does. 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 modulation to occur.

THE PHASEMISTRESS CONTROL PANEL - 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 (similar to 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.

Note that if you do not want a decay to occur, you can turn the knob all the way up.

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.

ADSR MODE TWEAK MENU

ADSR Mode features a slide out Tweak Menu accessible by selecting the Tweak Button located underneath the Input/Output controls.

ADSR Mode's Tweak Menu consists of the same first row of controls found in LFO and Rhythm Mode (Freq Mod, Res Mod, Res Ofs Mod, L/R Offset, L/R Mode, and Analog Style). For a detailed look at each parameter, please refer back to pages 14-16 of this manual.

THE PHASEMISTRESS CONTROL PANEL - STYLE EDIT MENU

Figure 17: The Style Edit Menu

THE STYLE EDIT MENU

The Style Edit Menu gives you the ability to alter the included phasing 'circuits'. The listed styles are a combination of emulated vintage gear and PhaseMistress exclusives. Each setting has a completely different tonal shape and will drastically alter the overall sound and character of PhaseMistress independent of any other applied settings. Once a selected style has been modified the selection will default to "Custom", the last entry in the list. Modified styles are saved along with the PhaseMistress preset information, not separately as rhythm patterns or custom shapes are.

STAGES

As previously discussed in the "About PhaseMistress" section, the number of stages in the circuit is perhaps the most important parameter in any phaser design. The Stages control determines the number of phase shift stages present in PhaseMistress (from 2 to a maximum of 24).

The most common phaser circuits consist of even-numbered stages of 2, 4, 6, 8, 10, and 12. The intensity and resonance of the phasing effect increases with the number of stages, so a 2-stage phaser would be the most transparent while a 12-stage would be more pronounced.

STAGES (continued)

The Stages control allows for odd-numbered circuits as well, a true rarity in the world of analog phasers. As a general rule, odd numbered circuits will sound quite different from even-numbered ones. You will find that odd-numbered stages will impart inherent lowpass filtering into the signal as well as sounding a tad more stuttered and effect-heavy.

RES MODE

Res Mode determines the number of resonant peaks independently of the number of stages in the circuit. Res Mode has a significant effect on the overall character of the resonance, especially at higher settings.

Setting the Res Mode to the lowest setting is the "standard" setting that you will find in existing phaser circuit where the number of resonant peaks matches the stages. Res Mode allows for the resonant peaks to no longer be tied to the stages, and this control allows for completely new phasing circuits to be designed by you.

RES OFFSET

The Res Offset control tunes the frequency of the resonant peaks relative to the frequency of the notches. Decreasing the Res Offset tunes the peaks more towards the bass frequencies relative to the notch frequencies. The effect of adjusting Res Offset will be obvious so long as some amount of the main panel's Resonance control is dialed in.

COLOR

The Color setting also plays a part in how the resonance interacts with the notches. "Classic" provides the most common type of response where notches get weaker as feedback or resonance is increased. "Modern" on the other hand, preserves those deep notches. The Color setting is tough to describe, so it is best to A/B the two against your source material to find the appropriate setting.

INTENSITY

The "High" intensity option utilizes steeper peaks and valleys in the phase signal, resulting in a more intense effect versus the "Normal" option. The "High" setting makes any phaser circuit more pronounced.

PHASE

The Phase switch determines the polarity of your phasing circuit, either Positive (most common) or Negative. In general, a positive setting will provide more bass in the effect whereas a negative setting will have a thinner sound with less low end information.

RES PHASE

The Res Phase switch is very similar to the Phase switch but in this case it determines the polarity of the notches. As with the Phase switch, in general, positive values will provide for stronger low end and a fuller sound.

SUPPORT INFORMATION

Now that you've taken the time to learn all about PhaseMistress, 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

CORPORATE CONTACT

Soundtoys, Inc.
PO Box 528
Burlington, VT 05402

Phone: 802-951-9700
Fax: 802-951-9799

soundtoys