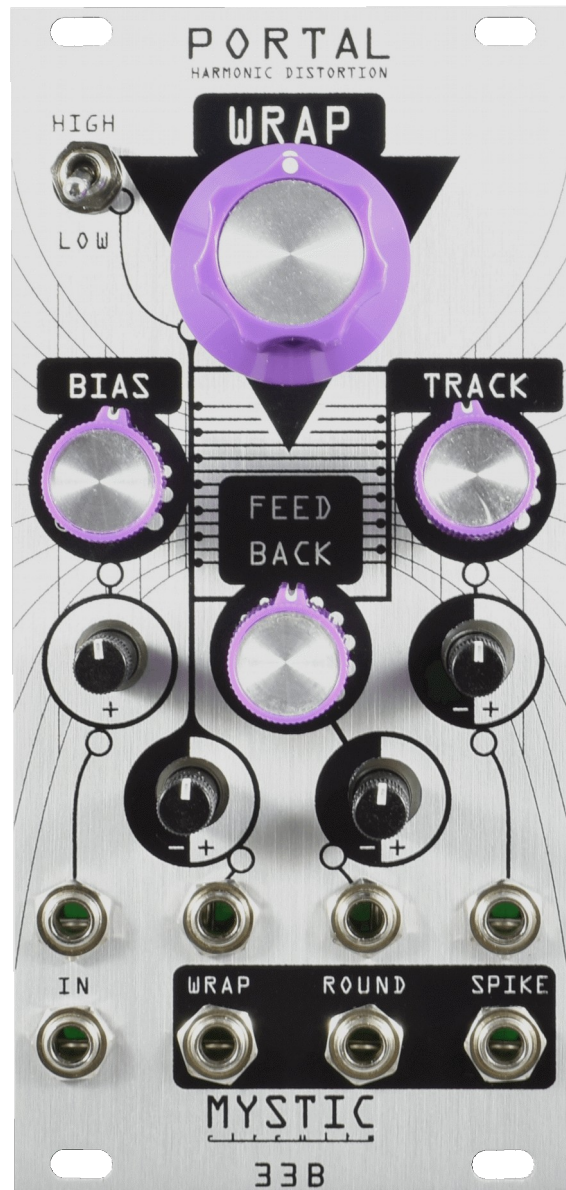


PORTAL Official Manual





Portal is a wave wrapping harmonic distortion. Similar to a wave folder, Portal multiplies the harmonics of a signal going through it. Unlike a wave folder, once the input has hit the threshold voltage the output will jump to zero instead of folding back on itself, creating a sharp transition almost like the wave has traveled through a portal. When fed with a triangle or sawtooth this can create an effect similar to oscillator sync, but without the need for a second modulating oscillator. When fed with complex audio sources the results are devastating, turning just about anything that goes through it into mad screams from another dimension.

Portal is an unruly beast and requires some knowledge of its processes to be tamed. Users are encouraged to read the entire manual to gain some insight on how each of the functions and CV inputs effect the outputs. If any questions are left unanswered please do not hesitate to get in touch through the Mystic Circuits website contact page.

OUTPUTS

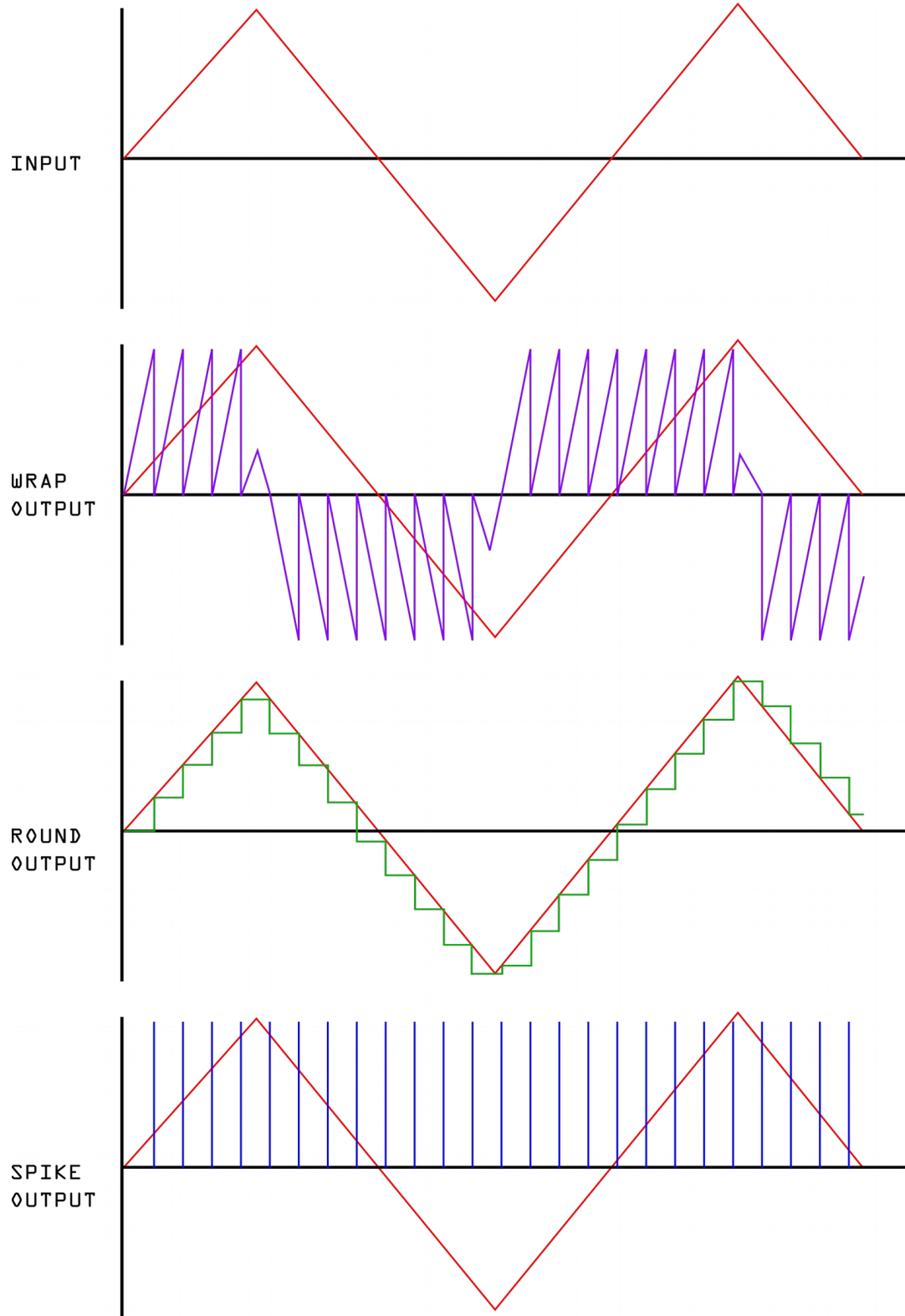


Portal offers three very different flavors of distortion which are simultaneously available and respond to all four CV inputs. The audio input for all three is on the bottom left corner of the module.

WRAP is the main output of the effect and offers an approximation of a modulo function achieved with analog circuitry. This means that once the input signal hits a certain threshold voltage, the output signal will be reset back to 0. This is the loudest and squelchiest of all three distortions, with extra layers of bright harmonics added to your input signal. This output flattens the dynamics of signals going through it, meaning that a quiet sound will be boosted to the same signal level as a loud sound but louder sounds will have more harmonics added. This is because the harmonic content of the wrap output is determined by the “slope” of the signal coming in, higher slopes means more wraps and therefor more harmonics. This output can easily wrap an LFO into an audio rate signal to make modulation audible, this is actually a good way to understand what it is doing to audio rate signals. This output is DC coupled but due to the use of an analog sample and hold will drift over time if the input signal’s slope is low enough not to reset the wave wrapping circuit.

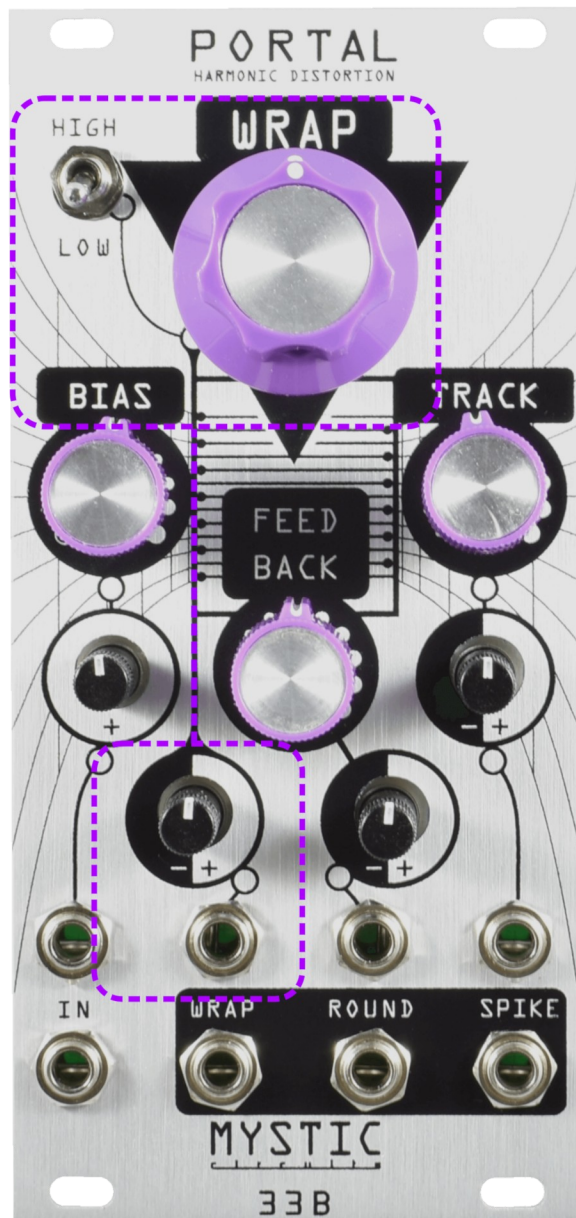
ROUND is an integer division of the input signal resulting in a stair-step like approximation of its shape. This output retains the most bass frequencies of any of the three and is also the most subtle. The effect is similar to a bit crusher or quantizer but achieved with completely analog circuitry. This input is unique in that it takes its input only from the audio in and therefore does not add the bias or feedback signals to its input. This means that the effect can be modulated in ways that only effect the stair-step behavior and not the shape of the input signal.

SPIKE is the strangest and also the quietest of the three outputs. Spike gives a tiny trigger whenever a new harmonic is generated on the wrap output, turning the audio input into a stream of cracks and pops that can still be identified as coming from the audio source. This output is excellent for triggering clock dividers or pinging envelopes but can also be a nice source of high frequencies to layer on top of one of the other Portal outputs. The spikes may be too small to trigger some digital devices that expect a 10ms pulse



Please note that due to the unruly nature of analog circuitry your signals will usually not look quite like this but each graph should give you an approximation of what each output looks like under ideal conditions.

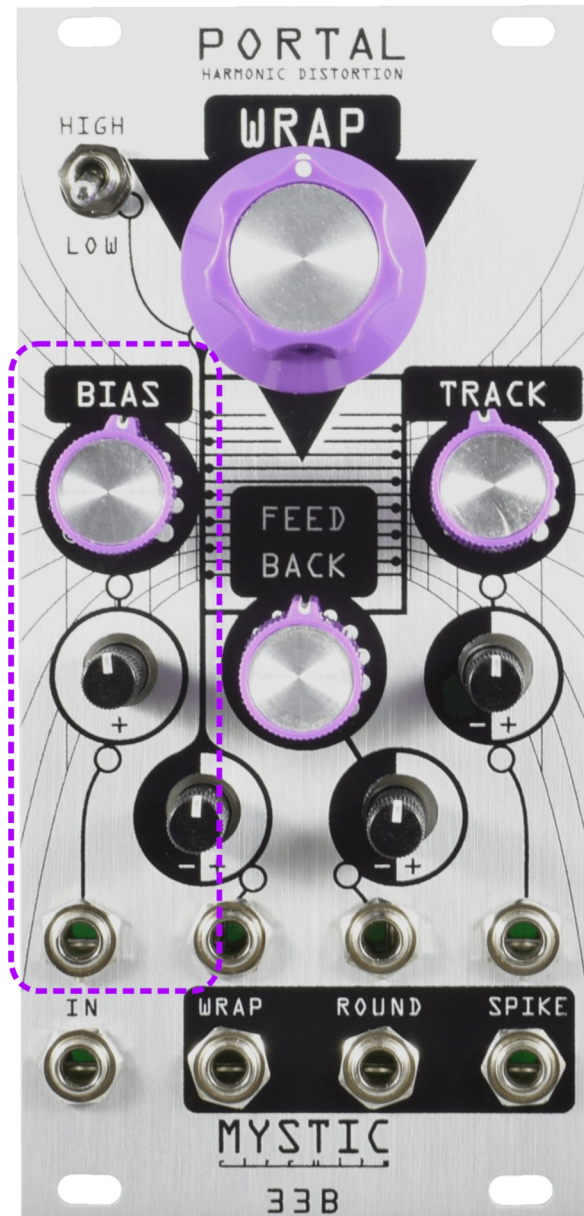
WRAP CONTROL



WRAP is the main control for the entire effect and therefore has the largest, silliest knob. This control determines how many times the input audio will be wrapped around, determining how many harmonics are created. The attenuverter for the wrap control is unlabeled but is connected with a rod to the body of the wrap triangle. The high/ low switch determines the overall range of wraps, with the low switch setting limiting the maximum wrap amount by roughly a factor of 10. Generally you can expect the “low” setting to wrap a +/- 5V signal about 5 times and the “high” setting to wrap that same signal about 50 times. When wrap is all the way down your input signal will be completely attenuated but the “wrap” and “round” outputs will probably have a DC offset due to the internal sample and holds remembering their last sample value.

The wrap control also sets the size of the “stairsteps” for the round output as well as the number of spikes generated per input cycle on the spike output.

BIAS CONTROL

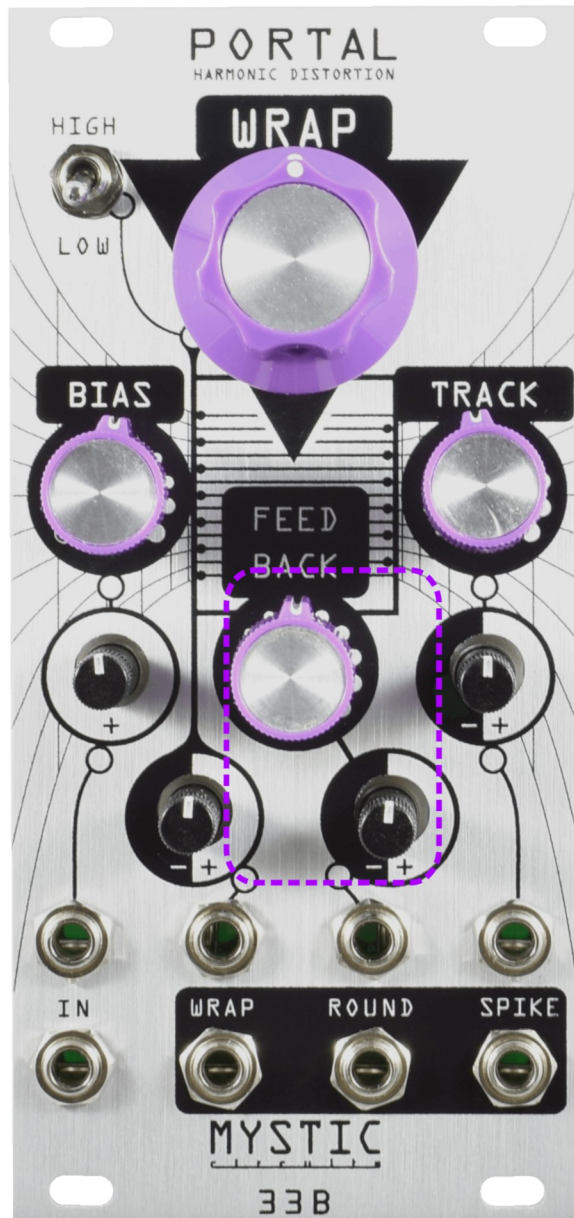


BIAS is a simple DC offset to the input of the wrapping effect, allowing a secondary signal to be blended with the main audio input. This signal bypasses the “wrap” input VCA and therefore its wrap amount is set with the Bias CV attenuator. Bias is a bipolar knob, meaning that it has the greatest effect at both fully clockwise and counterclockwise settings and the least effect at noon. At these extreme settings the audio input can be pushed into the voltage limits of the device and clipped, causing a pleasant distortion and boost in volume on the output of the wrap effect. This input is also the only CV input with an attenuator and not an attenuverter since attenuverters very rarely attenuate all the way to silence and the input is very sensitive to small signals.

This input does NOT add to the round output but does influence the sampling behavior. This is useful for using the round output as a downsampler by providing a clock oscillator to the bias input and setting the wrap control all the way to zero. This way the sampling is completely controlled by the bias input and not by the signal being wrapped.

At extreme bias values the spike output will generate a larger pulse with a PWM like effect.

FEEDBACK CONTROL

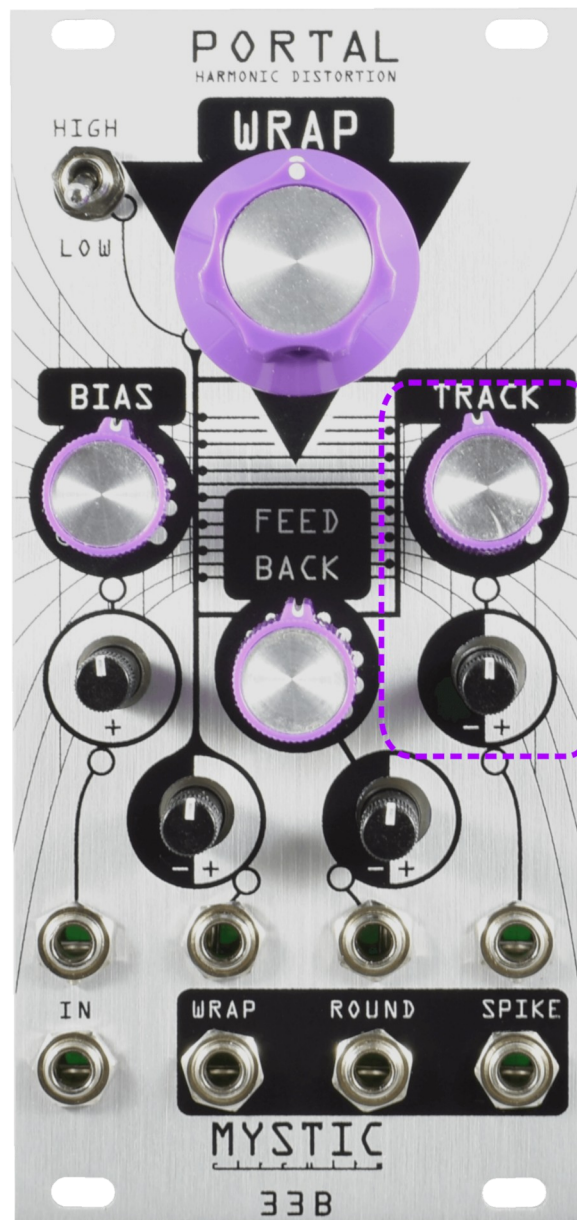


FEEDBACK quite simply wrap output back into the wrap circuit's input with a feedback amount that is voltage controlled. Up to about 12 o'clock this will increase the maximum number of wraps achievable by the effect, from 12 o'clock to 3 o'clock this will add self-oscillation and busts of noise as well as generally increasing the chaotic behavior of the effect. From 3 o'clock to fully clockwise the wrap output will be pushed all the way into ultrasound, choking your sound from being audible but creating quite a chaotic scream in frequencies just above human perception. Using a (preferably analog) down-sampler will bring these sounds back into the audible frequency spectrum.

The feedback signal is not added to the input of the round effect but will decrease the step size to a value that is smaller than achievable by simply putting the wrap control at max.

Feedback also adds quite a few more spikes to the spike output.

TRACK CONTROL



TRACK is the oddest and subtlest of all four controls. It basically controls the lag time that it takes for the wrap output to catch up with its input signal, causing the effect to perform better or worse. At fully counter-clockwise the track control will turn the wrap and spike outputs off completely while making the round output pass a clean signal. This is by design and allows the effect to be silenced easily. Your dead zone may go all the way up to roughly 9 o'clock, this is also by design and takes into account different power supplies having larger or smaller dead zones, sometimes causing the effect to not turn off completely when track is fully counter-clockwise. If this is the case for your module please use a small regular-head jewelers screwdriver (preferably a non-conductive plastic or ceramic one) to adjust the “track” trimmer resistor on the back of the module (it is a blue square with a screw sticking out of it). Turning this control clockwise will increase the dead zone size but limit the overall range of the parameter, turning it counter-clockwise will decrease the dead zone size but also decrease the useful range of the knob. You are encouraged to tweak this control to your taste but please be careful if using a metal screwdriver while the module is on as a slip-up where the screwdriver touches any part of the circuit board besides the trimmer can cause a short circuit and damage the circuitry.

Track can cause the round output to round increasing and decreasing waves by different amounts. It also can widen the size of spikes coming from the spike output at settings right before the dead zone.