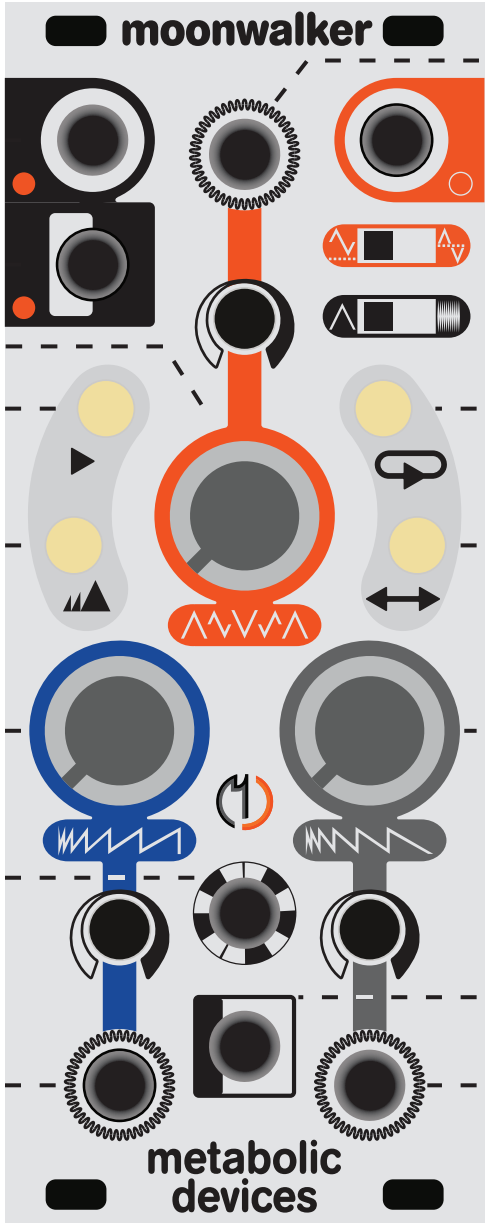
metabolic devices



reference waveform out

not decay out

360° phase offset

manual trigger

hard sync / retrigger

attack time

v/oct input

attack cv input w/ attenuverter

cv input with attenuverter / skew control

phase offset waveform out

phase offset bias mode

low / mid / audio

cycle

reverse / alternate attack & decay

decay time

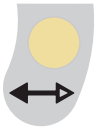
trigger / hard sync / inhibit input

decay cv input w/ attenuverter

phase variable attack / decay generator

phase offset

a short press reverses attack & decay



reference waveform

press and hold to alternate

buttons take effect on the next trigger/cycle so timing is preserved

not decay outputs +5v during attack and steady state

reference waveform

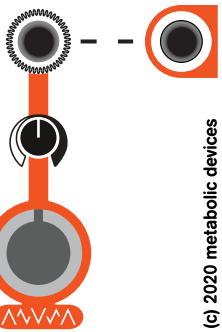
the timing of the attack shifts with the phase so pulse width modulation effects can occur when phase offset modulates

trigger input ignores additional triggers until cycle is finished unless hard sync / retrigger is enabled

when cycle is enabled and hard sync is disabled the waveform will be inhibited as long as this input is high

reference waveform

inhibit pulses



the offset output is half normalled to the phase offset cv input, so zero the attenuverter for normal operation

in unipolar mode with attack / decay equal, the attenuverter skews the shifted output from ramp to triangle to saw, without changing the frequency

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The reference waveform outputs 0v to 10v attack / decay waveform. The point at which the attack rate switches to the decay rate is decoupled from the direction of travel, and moves with the phase offset.

With the phase offset at 0° the rate change is synchronous with the direction change. With the phase offset at 180° the rate change is opposite so the attack portion operates at the decay rate and vice versa. The reference and offset waveforms will always move at the same rate but the direction of travel is independent.

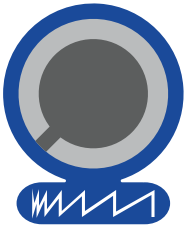
The not decay output goes to +5v after decay of the reference waveform is finished and stays at +5v during steady state and until attack is finished.

Pulse width can be modulated by adjusting attack time but this also changes the frequency.

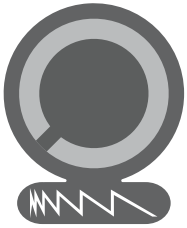
To modulate the pulse width without changing the frequency, start with the phase offset at minimum, set attack time to minimum, and decay somewhere in the middle. Now increase the phase offset and note that the pulse becomes wider.

The phase offset output will produce a waveform whose shape and frequency is defined by the attack and decay times. The phase offset determines the point at which the waveform starts and can be anything from 0° to 360°.

Phase Offset manual control adjusts the starting amplitude and direction of the waveform.



Adjust the attack time here. Shortest time to the left, longest to the right.



Adjust the decay time here. Shortest time to the left, longest to the right.

Unipolar bias mode is selected with the switch in the left position. Bipolar bias mode is selected with the switch to the right.

In Unipolar bias mode, the phase offset waveform is always between 0v and 10v, regardless of the phase offset.

This means you can adjust the phase and the modulation signal will always stay within the useful range as defined at your modulation destination.

With Bipolar mode enabled, the amplitude shift of the phase offset is cancelled so the waveform always starts from 0V.

This means you can completely invert your modulation source without decreasing it's amplitude. The amount of modulation remains constant through the transform.

The overall range of the waveform shifts along with the phase offset. With the phase offset at 0°, the output is 0V to +10V. With the phase offset at 90°, the output is +/-5V. With the phase offset at 180°, the output is 0V to -10V. With the phase offset at 270°, the output is +/-5V but starting direction is down instead of up.

The rate switch changes the range of frequencies Moonwalker can output. Left is Low, center is Mid, and right is Audio.

Attack or decay knobs can change the rates for:

Low from 75Hz to 60 seconds
Mid from 750Hz to 6 seconds
Audio from 500Hz to 20Hz

Additional range beyond these frequencies are available with the use of external modulation sources.

The reduced knob range for audio mode is to make tuning easier through increased resolution. Moonwalker can operate across the entire audio range with use of the Volt per octave input.

Setting attack and decay knobs to minimum is also an easy way to make their values equal, which is important for utilizing the normal to the phase offset cv input as a skew control.

Pressing this button works just like a pulse going to the trigger input, staying high as long as the button is pressed.

Press this button to enable hard sync / retrigger mode.

Enable this button to use Moonwalker as an LFO or audio oscillator.

A quick press of this button swaps the attack and decay times. Press again to disable.

Press and hold this button to alternate between normal and swapped attack / decay times on each successive trigger / cycle. Press and hold this button again to exit alternating mode. When alternating mode is active, the LED will be on or off, corresponding to the swap state.

These button presses will not take effect until the next trigger / cycle, ensuring a seemless transition from one mode to the other.

This input is used to track pitch from a sequencer or keyboard using the standard scale of 1 Volt per octave.

Moonwalker tracks pitch accurately from roughly 5kHz to 15Hz when attack and decay times are equal.

Tracking with unequal attack and decay times is untested and may have reduced performance. To use non-triangle waveforms and track pitch accurately, we recommend using the skew control.

A rising voltage passing above 2.5v will initiate a single cycle of attack / decay when Moonwalker is set to one-shot mode.

When Cycle is active, a voltage greater than 2.5v will inhibit Moonwalkers output, moving it towards 0V at the current rate and keeping it there until the cv falls below 2.5v.

Additional peaks and troughs are added to the waveform at each passing of the threshold. If the input stays high longer than Moonwalkers period the output will be silent and the pulse (or manual trigger button) can act as a kind of mute.

When Cycle is active and hard sync is enabled, a voltage greater than 2.5v will restart the waveform from 0V. Care has been taken to slow down the reset time for Mid and Low frequency modes, to avoid unwanted pops.

A voltage present at a cv input will modulate the parameter it is connected to graphically, typically through an attenuverter

The attenuverter can attenuate the control voltage present at the cv input. Rotate to the right to increase the gain or to the left for a negative polarity version.

The phase offset output is half-normalled to the cv input jack. For normal operation, make sure this attenuverter is nulled in the center position.

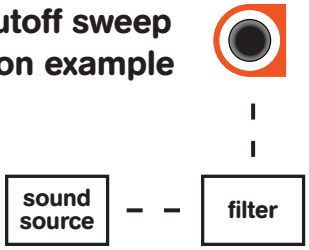
If attack and decay times are equal, the bias mode is set to unipolar and nothing is plugged into the phase offset cv input, this attenuverter will act as a skew control that can change the waveform from a triangle to a ramp or saw, without changing the frequency.

At audio rates, adjusting the skew from Triangle to Saw/Ramp will reveal the individual harmonics, similar to the opening of a low pass filter.

With other settings, adjusting this attenuverter can produce wild variations of the waveform.

Note: this is not a phase modulation input that will change the frequency similar to FM.

filter cutoff sweep inversion example



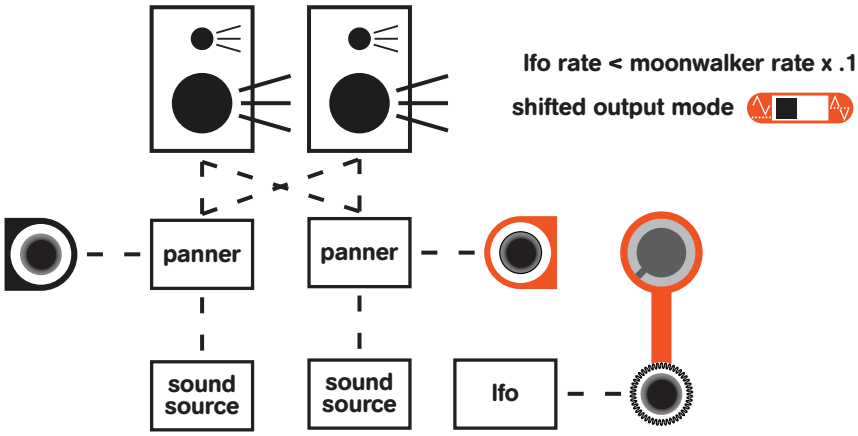
Set Moonwalker to mid frequency range, one-shot (cycle disabled) and unipolar modes.

With the Phase Offset set at minimum, patch the phase offset output into the cv input for the filter cutoff of a sound you are filtering. Trigger Moonwalker with each new note and adjust the attenuator for the desired range of modulation.

Now manually perform a filter sweep using the filter cutoff control on the filter module. Note how the envelope rides on the cutoff frequency and modulates the signal out of the desired range. In many cases, this means the cutoff frequency goes out of the audible range during the envelope and results in time where the sound is static and no modulation is heard.

Set the filter cutoff control to the original position and perform the filter sweep using the phase offset control on Moonwalker. Note how the envelope is folded downwards as the cutoff is increased and with the phase offset at 12 o'clock the envelope is now modulating from maximum to minimum and we've stayed within the desired range.

synchronized --> desynchronized --> synchronized panning



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