

Module Width: 12hp
Module Depth: 22mm
Current draw: ~35 mA, neg.,
~35 mA, pos.

TWINPEAK

epoch
modular

INTRODUCTION

TwinPeak is a 12db voltage controlled filter designed by Rob Hordijk. The filter includes a “wave folding” circuit that allows change to its response-curve—from low pass to variable width band pass and in between. This response morphing capability is based on the “inverse-parallel” principle for low pass filters, where two filters with identical gain can be combined to create a band pass curve but with two separate peaks at the corners of the pass band. It is this same principle that forms the basis of the Twin Peak Resonator in Hordijk’s Blippoo Box as well as his own 5U-18db module.

This set up offers distinct advantages over a low pass/high pass-series configuration. E.G., in band pass mode, with the curve knob fully clockwise, the cutoff frequencies of the filters can be crossed and, regardless of which is tuned higher, the filter output will be a band pass response. In either case, all frequencies below the cutoff of the lower tuned filter are suppressed or subtracted from the filter output. Drawing on this same functionality, we can also set the pass band to near zero bandwidth with both filters tuned in unison, regardless of the cutoff frequency.

The inverse parallel architecture of this filter allows for a wide array of nuances and gradations within its response domain. But what truly sets this filter apart is its exceptional resonance—ideal for creating warm, percussive ringings and bell-like effects. The TwinPeak is specially designed to tilt momentarily into self-oscillation when pulsed waveforms (even gates, triggers or one-shots) are used as audio inputs.[†] These pings have a longer duration at low frequencies, e.g.; when either peak is tuned to approximately 200hz, it will sustain for 4 to 5 seconds.

When the module is used in this way each complementary filter has a separate, tunable ping. In full band pass mode, where the TwinPeak is at highest resonance, each ping represents the two peaks on either end of the pass band. This dual-pinging action adds another interesting dimension to the filter’s sound as the pings can be tuned and detuned together, in ways that mimic basic two-string frequency dynamics and the primitive, “sensory beats” of Helmholtzian physics.

This is a unique and high quality filter that allows for many subtle possibilities and nuances. It works great with audio frequency signals, particularly at lower resonance settings, while higher resonance settings are ideal for creating pings and other percussive effects. This being said, the module’s two inputs and level/fade control allow one to mix between low frequency and audio rate signals. Going this route and modulating the filter’s resonance elicits outlandish cross-fertilizations, disclosing new, hybrid spaces that blur its functional dichotomy.

* When the frequency of Peak B is higher than Peak A the polarity of the filter output is inverted.

† So, in effect, one can create a broad range of melodic and percussive effects simply by coupling the module with a step sequencer and envelope generator.



MANUAL CONTROLS

Peak Cutoff Knobs: The two knobs at the top of the panel (Peak A and Peak B) are the manual cutoff frequency controls for each sub-filter. You will notice that they have some pop to them, as simply turning either knob, sans input, produces a ping, much like inputting a pulse would.

Peak Mod Knobs: Underneath the Peak Cutoff Knobs, on either side of the panel, you will find these attenuverting controls for the two sub-filters. As you can imagine, Peak A Mod and Peak B Mod each correspond to the

designated Peak Cutoff Knobs above them, and to the CV inputs at the bottom left of the panel. Each of these is tuned to approximately 1V/O when turned fully in either direction. Center position is the virtual null, turned clockwise the knob functions as an attenuator while turning from center to left inverts the polarity of the CV signal.

Dual Mod Knob: To the left of the panel, underneath the Peak A Mod knob, you will find this logarithmic attenuator. This control allows modulation of the cutoff frequency for both sub-filters. This is a deeper modulation control (.5V when fully clockwise) and is ideal for punchy envelope type effects, as it can cut sizable chunks out of the pass band and create much more drastic modulation of both filters.

Res/Ping Knob: This one should be more or less self-explanatory. When turned fully clockwise the filter is at max resonance and will have the longest ping duration. As noted, the lower half of the knob (from 8 o'clock to 12) is particularly useful for audio rate signals, while the upper half is generally designated for pinging the filter. On the other hand, do not let this stop you from experimenting beyond these general guidelines, but do know that when at max resonance, audio rate signals may create undesirable clipping and distortion, particularly higher amplitude signals, anything above 12 Volts, peak to peak (See LVL Fade control below)

Curve Knob: Located below the Dual Mod Attenuator, this knob controls the "wave folding" function of the TwinPeak. Turned fully clockwise you will have a low pass response at the output. In this case, controlling the cutoff frequency of Peak A (whether manually or via CV) will be the dominant means of sculpting sounds. However, due to the "pop" described above—tweaking and modulating Peak B controls will still be audible, only the corresponding sub-filter will not accept any signal from the filter inputs.[‡] So this is certainly not your typical low pass filter, as internal modulations from sub-filter B will still add accents and nuances to the final output signal. Needless to say, things stand to get a lot more interesting as one turns this knob to the right and more noticeable changes emerge within the filter's response. To get an idea of how this works, running an audio rate signal into either input, turn the Curve knob and both manual Peak cutoff controls fully clockwise and then slowly dial back the curve control to Low Pass position. You will notice that the output level and frequency spectrum grow from virtual silence (which defines the 12db band pass curve) to a gradual increase in both the volume and frequency spectrum of the sonic content until you reach the limits that define the low pass curve. This exercise briefly displays the transition between the two polar responses, however it is in between them that you will gain access to the broader sonic palette that this module is capable of producing.

LVL/Fade Knob: This knob can serve as either a cross-fader or individual level-control for inputs 1 and 2. Its function is quite simple. When a signal is placed in input 1, turning the knob from its fully counter clockwise position, left to right, will raise the input level from virtual null to the maximum at the opposite end. Conversely, the level of input 2 is increased by turning the knob from right to left. When both inputs are used, the same dynamic applies. The farther the knob is turned away from either input, the stronger that signal will be in the Filter's input mix.

CV CONTROLS

1V/O CV: Controls both sub-filters. Tracking is not perfect, 5 octaves at 1 or 2% tolerance.

D-MOD: CV Input for Dual Mod Attenuator. Approx. 0.5V/O when fully open.

MOD A: CV Input for Peak A Mod Attenuator.

MOD B: CV Input for Peak B Mod Attenuator.

RES CV: Controls the amount of resonance or damping of the filter. Also creates a very nice bandwidth modulation effect with manual control at lower settings. This CV actually merits some additional discussion. It is intended primarily for use with envelopes, LFOs, sample and holds or step sequencers. Audio rate signals, aside from being useless here, are not very pleasing to the ear. Within a complex patch, this may not be noticeable. But, generally, use of audio rate signals for modulation will result in what sounds like bleed-through, although technically it is not, but that requires a lengthier explanation.

WARRANTY:

Modules come with a one-year warranty for parts and repair (proof of purchase/invoice required), providing there are no obvious signs of abuse that would indicate malfunction is due to "external trauma" or that the user accidentally reversed the polarity of the power supply.

Please contact us at epochmodular@gmail.com before returning an item, as we reserve the right to purchase shipping through our own accounts to ensure the best possible price. If you bypass this procedure then you may be liable for the cost of shipping to us, however, if your module falls under the warranty, we will still cover the cost of shipping back to you.

[‡] Pulsed inputs will create only one ping in this setting.