flight of harmony

Parasite Antifilter

WTF Eurorack Module
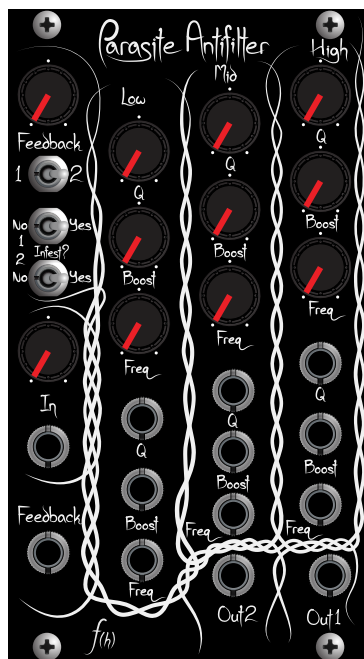v1

fig.1: Parasite Antifilter front panel.

Components

1	Assembled Parasite Antifilter waveshaping module
1	DC power cable – 9" Ribbon cable (Doepfer standard 10-pin – to – 16-pin)
4	M3x0.5x6mm Stainless-Steel machine screws
4	M3 Nylon washers

Specifications @ ±12VDC

Width	14hp	
Depth	43mm / 1.75"	
Supply Voltage	±12VDC	
Supply Current (max draw @ ±12V)	I_{+12V}= 80mA	I_{-12V}= -20mA
Max. Input Voltage	±5V / 10V_{p-p}	
Max. Output Voltage	±5V / 10V_{p-p}	
Input & Ouput (I/O) coupling	Direct	
Output Impedance	1kΩ	
Control Voltage (CV) inputs	±5V / 10V_{p-p}	
CV input coupling	Direct	
CV input impedance	10kΩ-1MΩ	
Low frequency band	35Hz-150Hz	
Mid frequency band	120Hz-550Hz	
High frequency band	500Hz-2.2kHz	

FYI

As with all f(h) products, the Parasite Antifilter was engineered towards maximizing functionality while keeping cost as low as possible. If some aspects of the unit seem awkward, it is most likely due to this. The goal is to make unique, useful, enjoyable, and affordable instruments, not just hoover[1] out your bank account.

And remember: every instrument has its quirks and unexpected aspects, so RTFM[2]! All the way through! Specific quirks are mentioned in the description of the particular feature they apply to, so please read this through <u>before</u> emailing!

What is it?

Well, it started out as a VC parametric equalizer[3], but it sucked. Really bad. I decided to trash the idea and sent the original prototype to the Great Wizard for them to play with since we had been chatting about it. The subsequent findings were completely the opposite of what I found – not about the filter part though, that still sucked. It turns out the Parasite Antifilter is a ridiculously fun and useful drone source, drum generator (especially kicks, snares, and blocks), distortion and fuzz, absolute sonic wreckage device, coloring mixer, formant generator, and so on. We keep finding more uses for it each time it's fired up. It particularly excels at "thickening" external drones and other sounds.

Ostensibly, the Parasite Antifilter is a 2nd-order cascaded parametric equalizer. **Out1** is from the first stage, **Out2** is from the second stage. Both can be used simultaneously for a stereo-esque signal. The **Feedback** knob controls amount of output fed back to the input, and the **Feedback** toggle chooses if it's from **Out1** or **Out2** (see fig. 2).

The "**Infest**" switches apply a partial feedback to the related stage, which creates greater instability and general carnage. **Infest 1** affects the first stage, **Infest 2** the second.
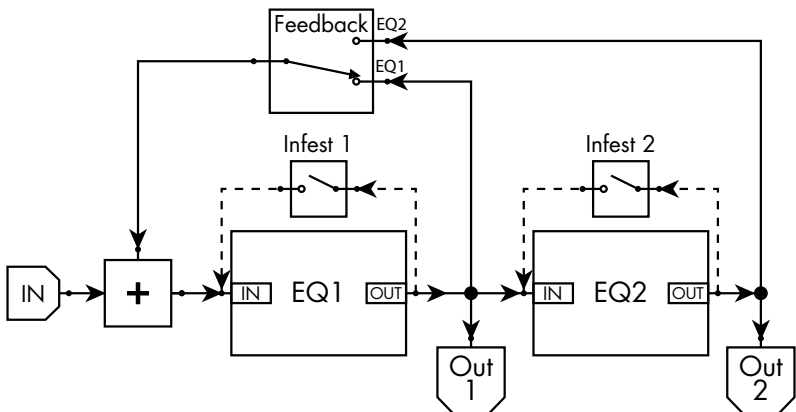

fig. 2: Parasite Antifilter flowchart.

1) Hoover is a company that manufactures vacuum cleaners.
2) RTFM = Read The F*cking Manual!
3) See explanation in the Controls and Behavior section.

Why cascaded? Cascading/series/daisy-chaining identical filters doubles the filter effect, so it provides a much greater range of sounds and possibilities.

Even more than with other f(h) gear, the Parasite Antifilter is built out of sweet spots. Every nudge of a knob can completely change what is happening. I believe Parasite is what led to MxR Frost commenting something to the effect of "The trademark of f(h) modules is thinking it's broken and wondering if it even works, then touching a knob and realizing 'Oh, it works just fine'."

Each bank (Low, Mid, High) affects the others and are not *wholly* independent, but each can be made unstable and used individually as an oscillator. As an oscillator, they can be fully unstable and free-running, or on the verge of instability to be triggered by an impulse[4] signal.

Another interesting feature is the Parasite Antifilter's "capacitor" or "charging" behavior in some settings. You will discover that some behaviors and effects take a bit to "charge up" and happen, and then can persist for quite some time after you change the settings. This lead to a lot of confusion when trying to recreate sounds during testing but not getting the same results; we found we occasionally had to set it to its starting settings and wait a few seconds for the energy to build up and create the effect again.

The Parasite Antifilter is not about instant gratification. It requires patience and exploration, but it is definitely worth it!

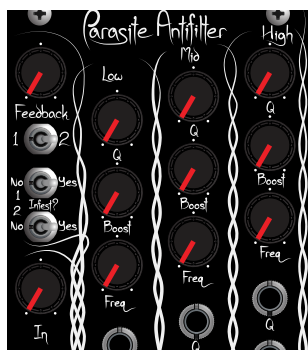## Controls and Behavior (fig. 3)

fig. 3: Controls.

Routing controls:

In: Input level attenuator. Clockwise (CW) to increase, counterclockwise (CCW) to decrease.

Feedback (knob): Amount of output fed back to input of 1st stage; from zero to 100% Clockwise (CW) to increase, counterclockwise (CCW) to decrease. Increasing feedback quickly increases the instability of the system.

Feedback (toggle switch): Selects which stage output is fed back to the input.

Parametric Equalizer band controls:

A parametric equalizer (EQ for equalizer from here forward) is a multi-band filter that allows to you adjust multiple parameters of each band, as opposed to a graphic EQ that only allows adjustment of one parameter (the gain) per band.

While the Parasite Antifilter's capacity as a straightforward parametric EQ is mediocre at best, it still *is* one, so understanding how the controls function is very useful in understanding how to explore its aberrant behaviors/what the hell the damn thing is doing:

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4) Impulse meaning a signal with a sudden edge, like a pulse, square, or saw.

Q: Q[5] is an often-misunderstood measurement that is commonly interpreted in multiple ways, two of which will be focused on here. The original meaning of Q is how *under*damped a resonator is. Another way to think of it is how *unstable* a system is: higher Q = more unstable, i.e., how likely it is to resonate when energized. The second relevant interpretation is that Q is the *inverse* of bandwidth, i.e., more Q = less bandwidth = narrower band (fig. 4).

The takeaway here is, as you increase **Q** (turn the knob CW), the filter window (the space under the bump) becomes smaller, focusing on a narrower band of frequencies, and is increasingly likely to resonate/ring/oscillate. Decreasing **Q** (CCW) makes it cover a broader range, but less strongly, so it becomes more stable.
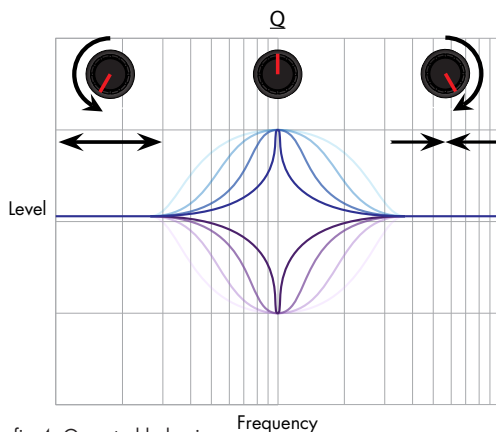

fig.4: Q control behavior.

Boost: Boost is how much gain is applied or removed from the band. CW increases gain, CCW decreases gain (fig. 5).
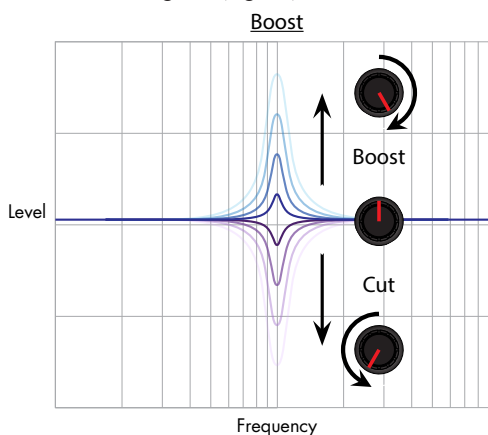

fig. 5: Boost control behavior.

Freq: Adjust the center frequency of the band (what frequency is at the center of the band, or bump) (fig. 6). Each band has a range it covers, with a little

5) A shortening of the full term "Q factor".

overlap:

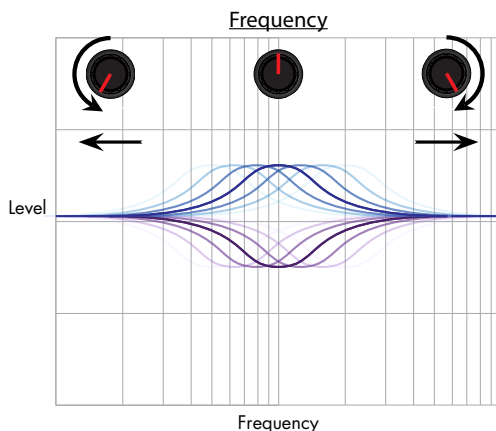- Low: 35Hz–150Hz
- Mid: 120Hz–550Hz
- High: 500Hz–2.2kHz

Frequency

fig. 6: Frequency control behavior.

Jacks

fig. 4: Jacks.

Note: all jacks accept any signal within eurorack standard levels.

In: Audio signal input. You can try CV here, not sure what it'll do though. By the way, you can double the feedback shenanigans if you patch one of the outputs here in addition to the internal routing.

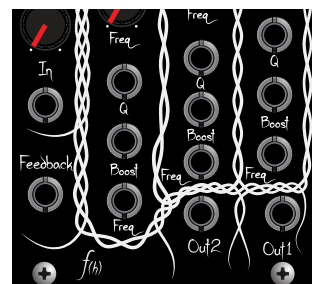Feedback: CV control of the internal **Feedback** VCA[6] level. CV is summed with the **Feedback** knob level.

Q: CV control of the internal **Q** level. CV is summed with the **Q** knob level. An excellent alternate audio input and output.

Boost: CV control of the internal **Boost** level. CV is summed with the **Boost** knob level. An excellent alternate audio input.

Freq: CV control of the internal **Freq** level. CV is summed with the **Freq** knob level.

Outputs:

The two output jacks provide different versions of the same signal, so they can be used for a pseudo-stereo effect.

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6) Voltage-Controlled Amplifier

<u>Out1:</u> Output of 1st EQ stage.

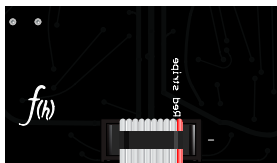<u>Out2:</u> Output of 2nd EQ stage.

Power

fig.8: Power cable orientation.

The power connector header is a 2x5/10-pin shrouded box header which accepts the standard Doepfer power cable. This header style is polarized, meaning the connector can only be inserted one way, to prevent connecting the power backwards and damaging the unit (this assumes that you are using the cable supplied with the module).

Looking at the rear of the module, the negative supply (red stripe) is on the right, positive supply is on the left (see fig. 8). Yes, the text saying "Red stripe" is reversed, but it is in the correct location. I didn't notice it until writing this part of this manual.

Stuff

As alluded to earlier, this module would not have exist if not for the questionably-divine intervention of the ineffable Great Mountain Wizard. All praise to their wisdom, assistance, and devious perspicacity!

Further gratitude and indebtedness to the f(h) Inquisitors for testing and evaluation!

A big thank you to those who have sent in suggestions and comments, keep them coming!

Comments, samples, suggestions, complaints to: flight@flightofharmony.com

We have a Discord server! Contact me at the address above for an invite link.

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http://www.flightofharmony.com

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