

F-16

1.0.1 User Manual

Overview

F-16 is a multi-mode voltage-controlled filter with a frequency response display. It features sixteen modes, resonance compensation, and drive for analog-style soft clipping. You may recognize the modes from the famous Oberheim Matrix 12 filter. The F-16 filter algorithm is a nonlinear transistor ladder circuit model configured in the Matrix 12 multi-mode topology.

Controls

Mode Selection



Clicking on the display provides a popup menu with the available modes. The up and down buttons can also be used to select the mode.

Frequency Controls



- The Frequency knob adjusts the cutoff frequency of the filter.
- The Envelope Amount knob sets how much an envelope input moves the cutoff frequency in octaves.
- The Note Amount knob adjusts how much a note input moves the cutoff frequency in semitones. The note input can come from the note input jack or the Combinator. You must enable Receive Notes in the Combinator settings.

Resonance Controls



- The Resonance knob adjusts the resonance of the filter.

- The Compensation knob adjust the gain compensation, which boosts the gain when there is resonance.

On/Off/Bypass



Bypass – Connects the inputs to the outputs

On – Normal Operation

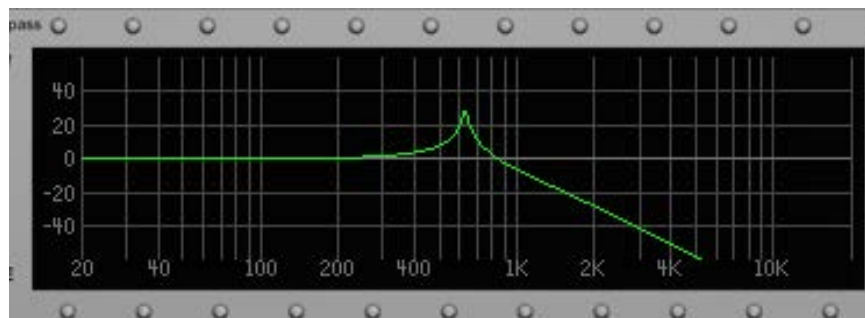
Off – Turns the output off

Quality



The quality switch on the back of the device adjusts the CPU usage. Both algorithms have been carefully tuned. The high setting more accurately simulates an analog circuit.

Display



The display screen shows the filter frequency response. The x axis is logarithmic frequency. The y axis is magnitude in decibels.

Mode



The Mode switch sets the frequency axis to either decades or octaves.

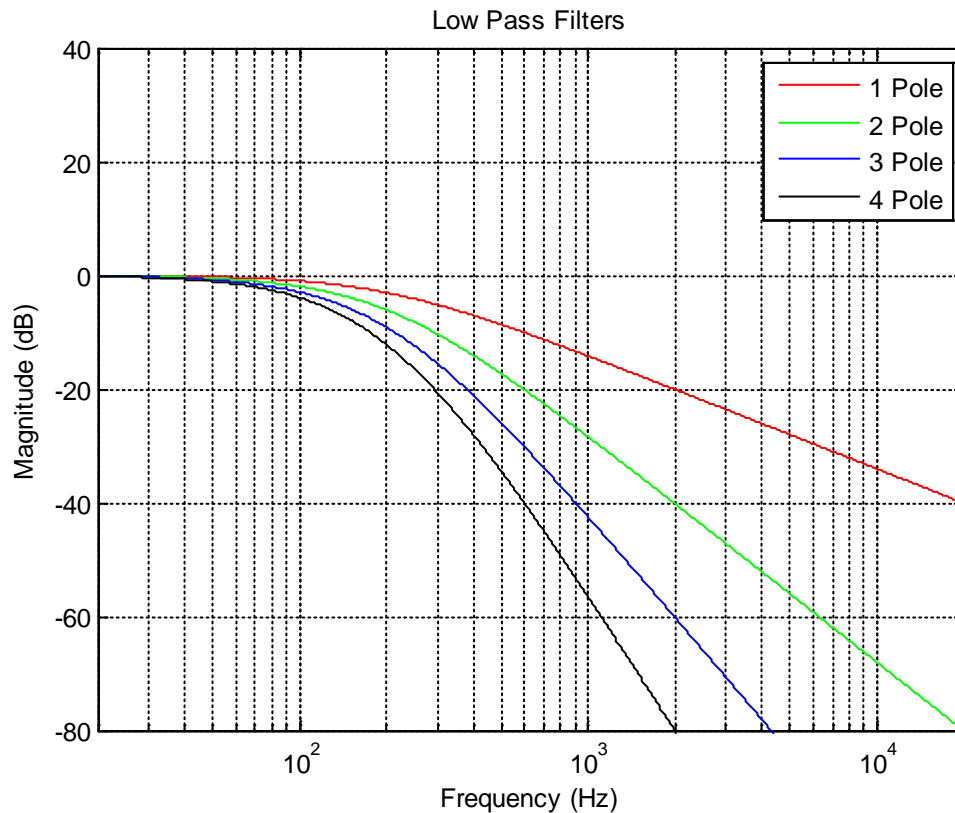
Mouse Interaction

Clicking and dragging on the screen changes the frequency and resonance. This can be used for recording automation or for performance.

Modes

Lowpass Modes

The figure compares the four lowpass filter modes with cutoff set at 200 Hz.



1 Pole Low: A one pole lowpass filter offering -3 dB at the cutoff frequency and 6 dB per octave rolloff.

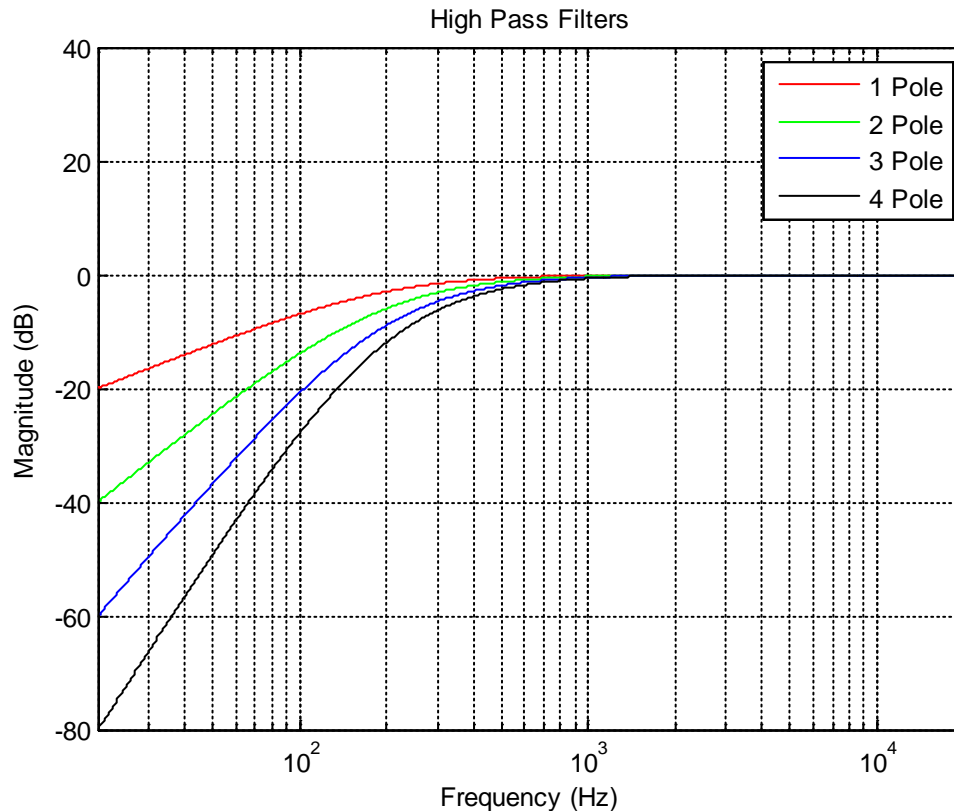
2 Pole Low: A two pole lowpass filter offering -6 dB at the cutoff frequency and 12 dB per octave rolloff.

3 Pole Low: A three pole lowpass filter offering -9 dB at the cutoff frequency and 18 dB per octave rolloff.

4 Pole Low: A four pole lowpass filter offering -12 dB at the cutoff frequency and 24 dB per octave rolloff.

Highpass Modes

The figure compares the four highpass filter modes with cutoff set at 200 Hz.



1 Pole High: A one pole highpass filter offering -3 dB at the cutoff frequency and 6 dB per octave rolloff.

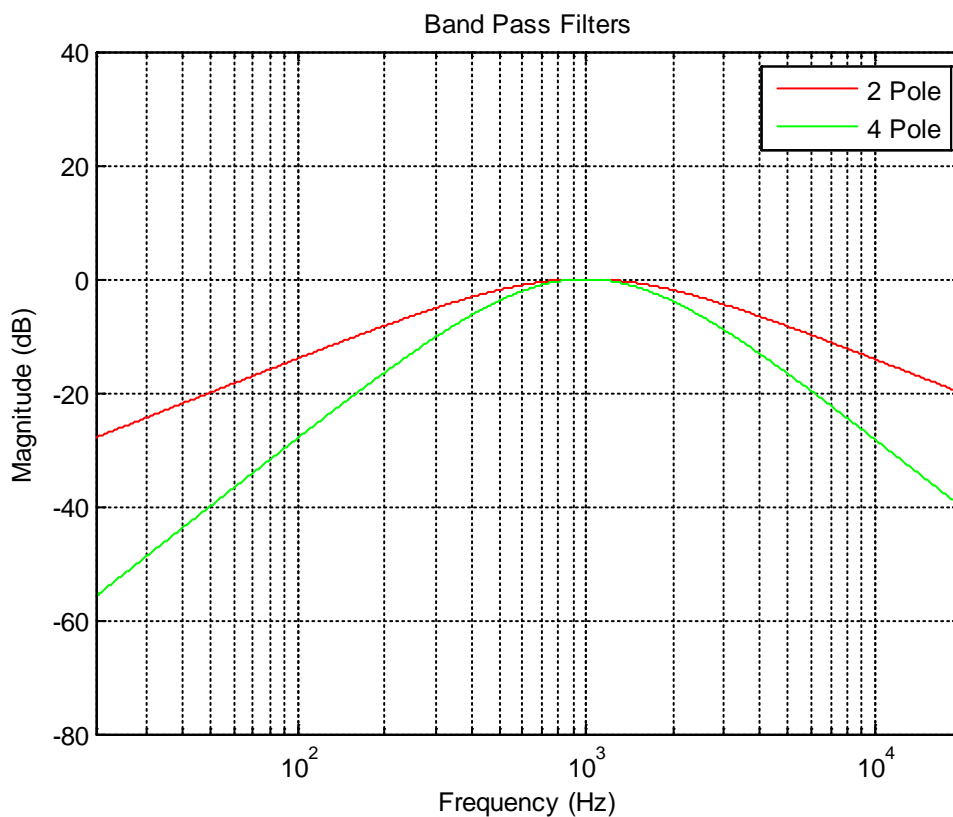
2 Pole High: A two pole highpass filter offering -6 dB at the cutoff frequency and 12 dB per octave rolloff.

3 Pole High: A three pole highpass filter offering -9 dB at the cutoff frequency and 18 dB per octave rolloff.

4 Pole High: A four pole highpass filter offering -12 dB at the cutoff frequency and 24 dB per octave rolloff.

Bandpass Modes

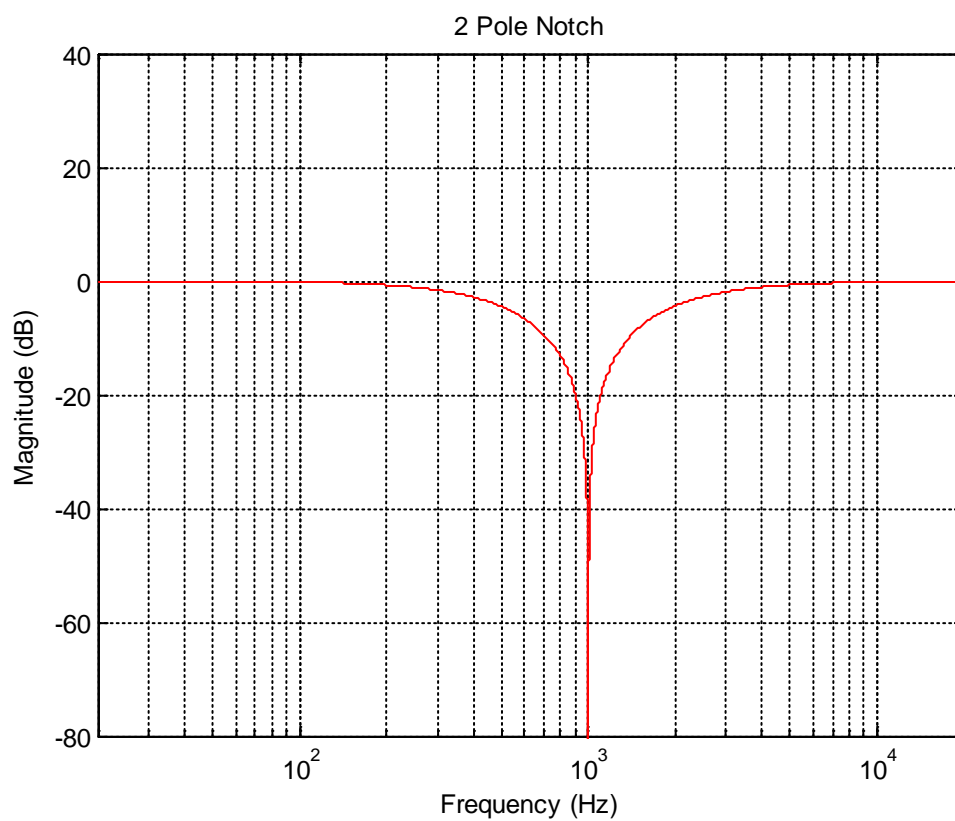
The figure compares the two bandpass modes with cutoff set at 1 kHz.



2 Pole Band: A two pole bandpass filter offering -0 dB at the cutoff frequency and 6 dB per octave rolloff in both directions.

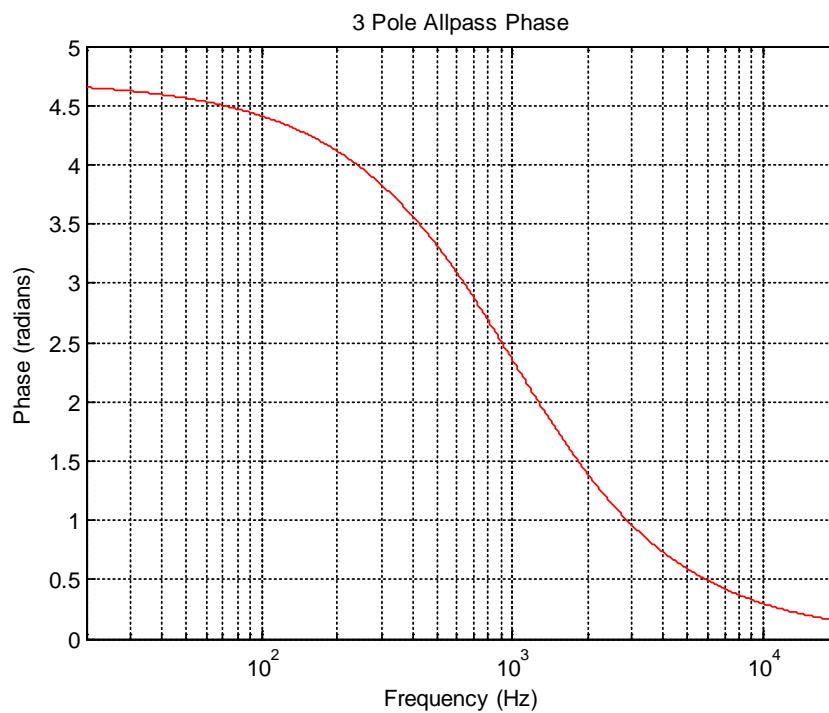
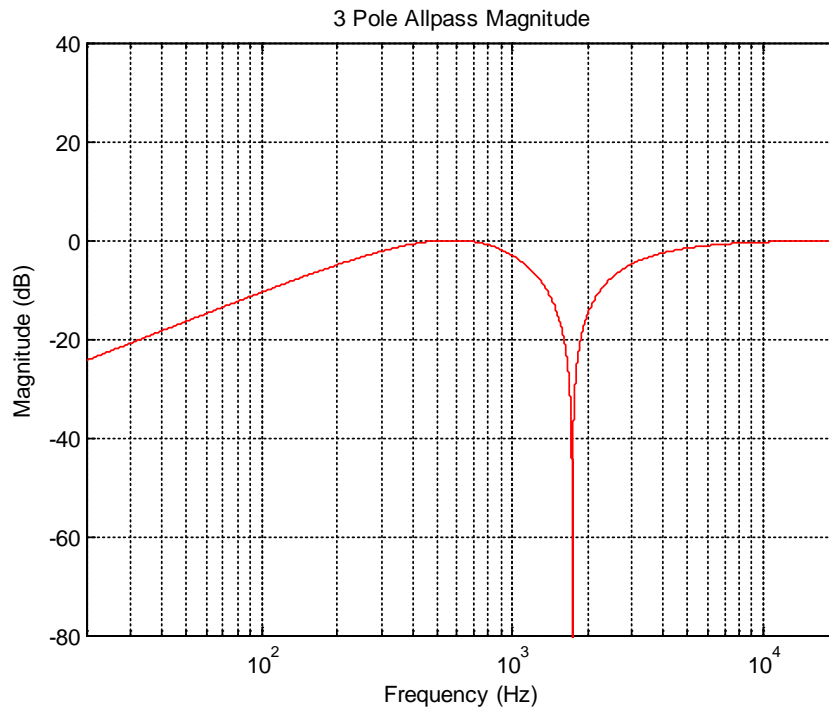
4 Pole Band: A four pole bandpass filter offering 0 dB at the cutoff frequency and 12 dB per octave rolloff in both directions.

2 Pole Notch



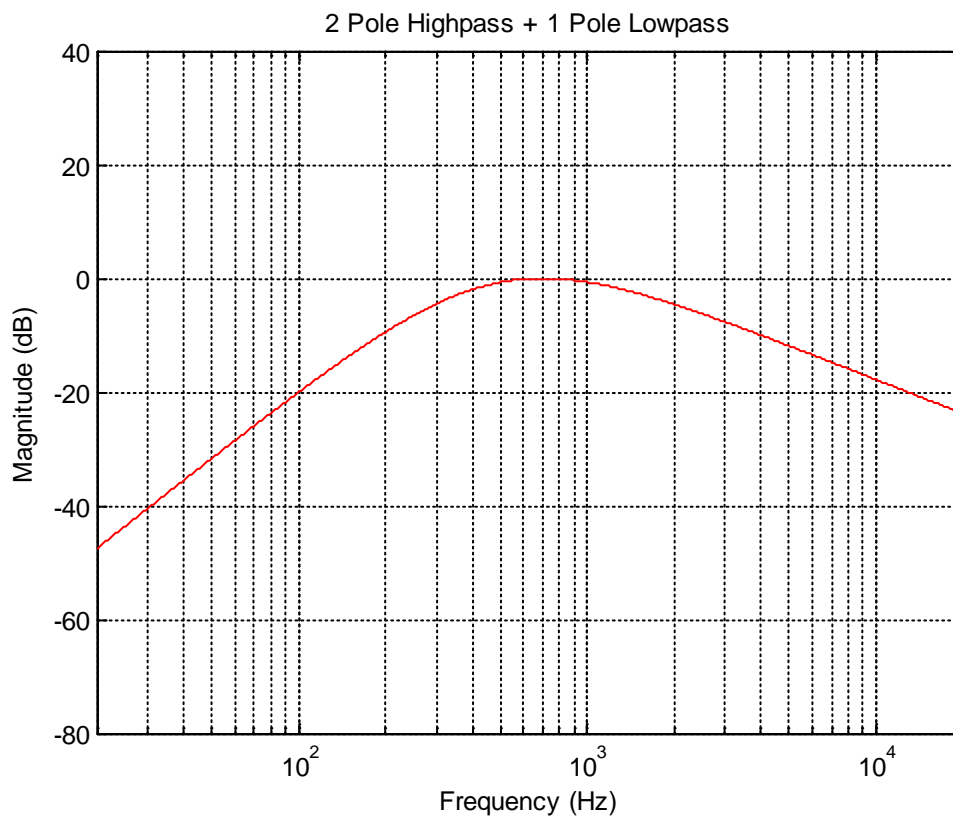
The two pole notch filter offers infinite attenuation at the cutoff frequency.

3 Pole Phase



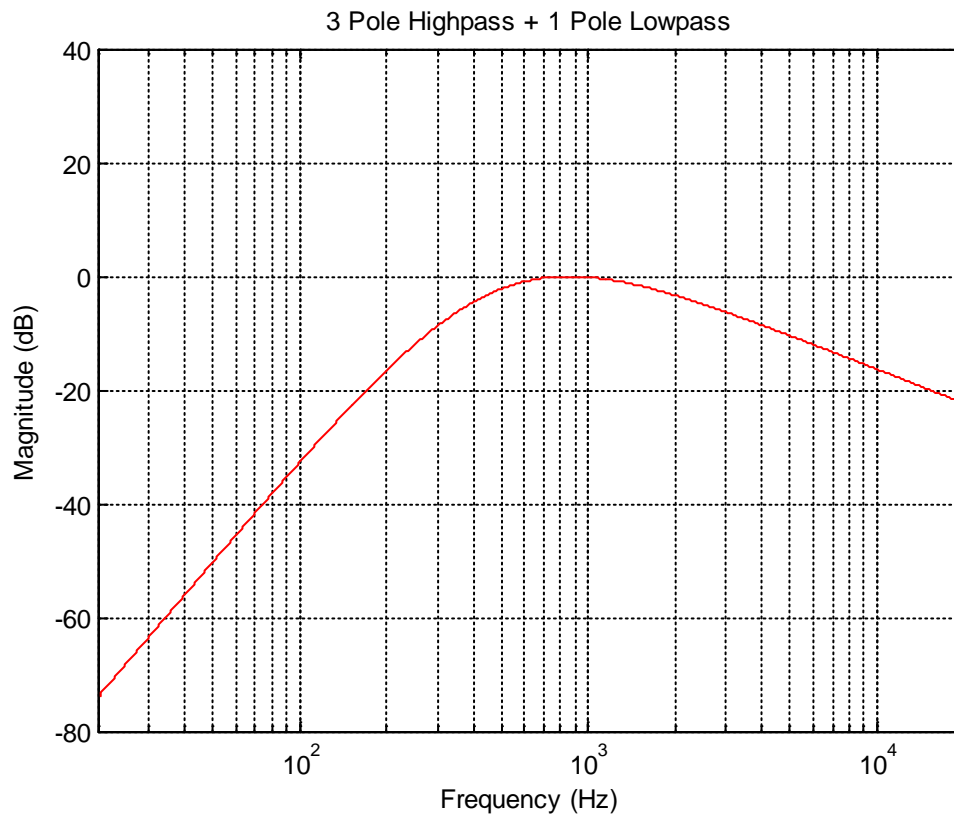
This is a three pole allpass filter. The plots show the filter with cutoff set at 1 kHz.

2 High + 1 Low



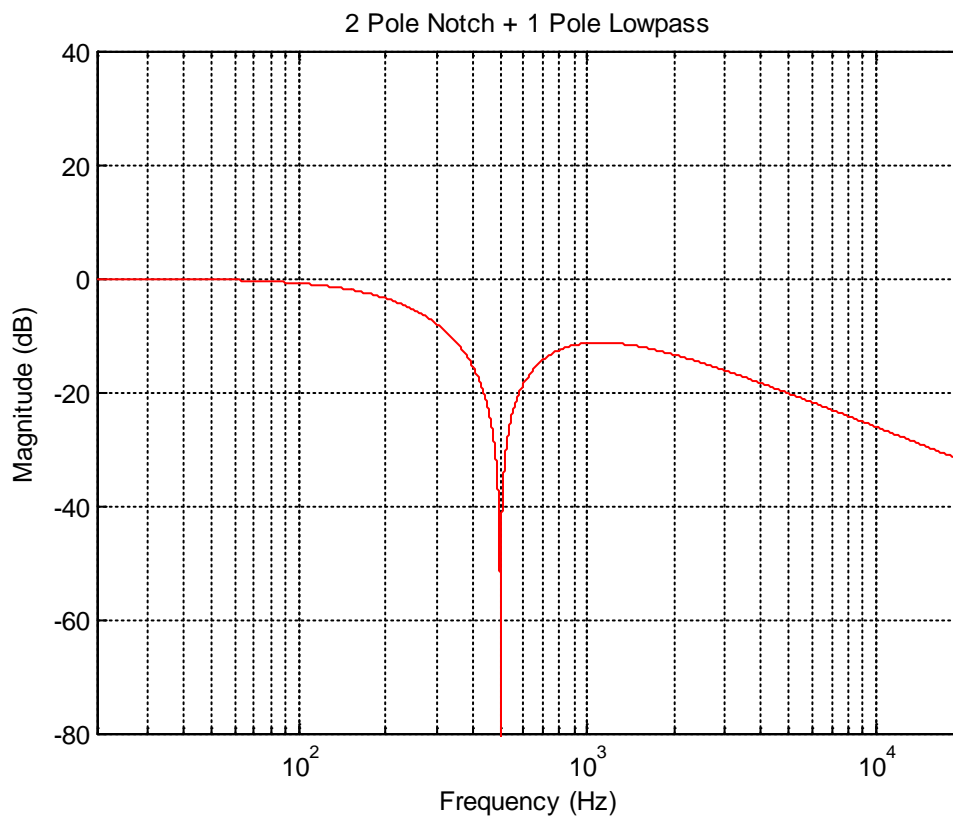
This is a two pole highpass and one pole lowpass combined filter. The rolloff is 12 dB per octave for the highpass section and 6 dB per octave for the lowpass section.

3 High + 1 Low



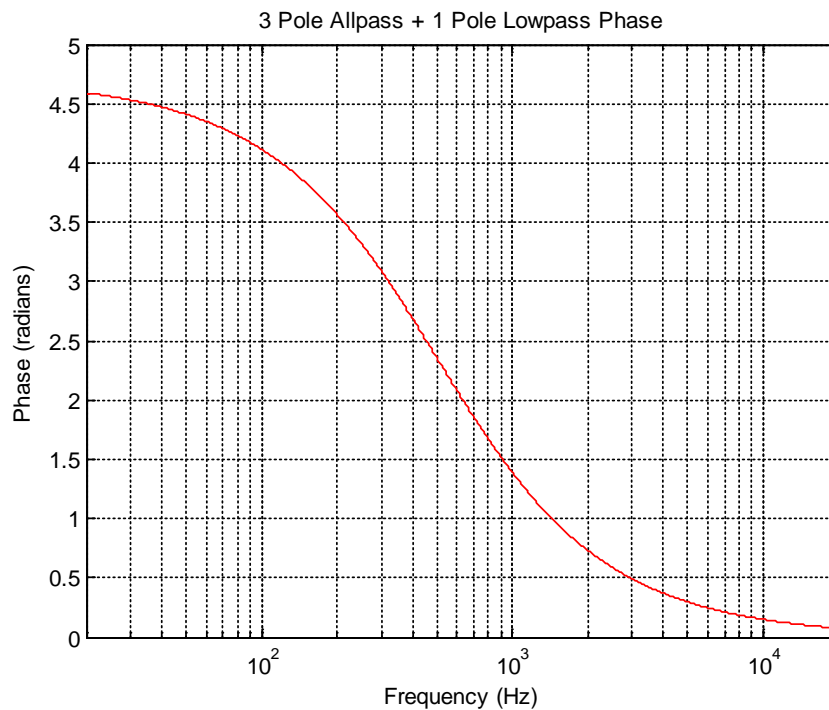
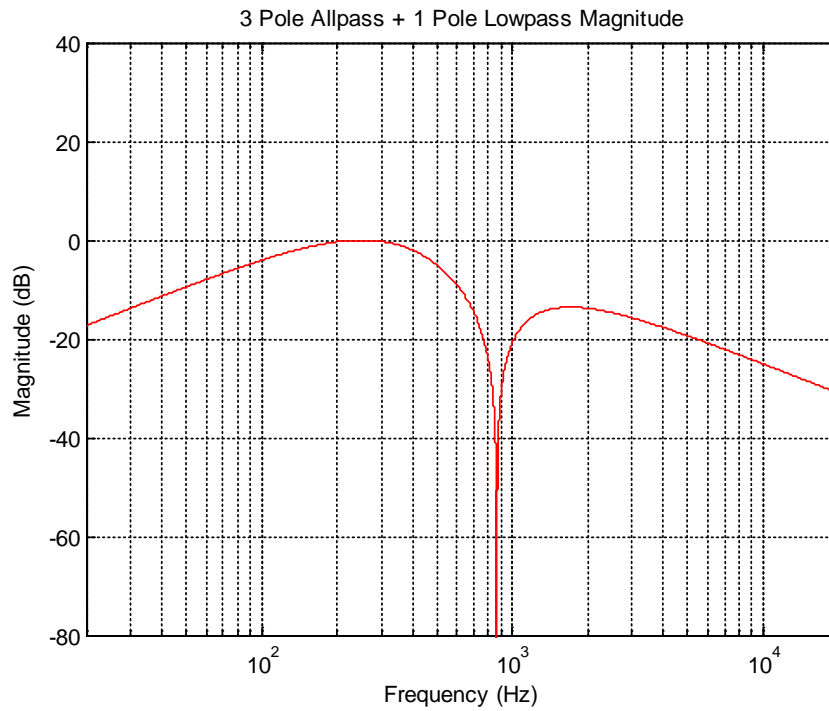
This is a three pole highpass and one pole lowpass combined filter. The rolloff is 18 dB per octave for the highpass section and 6 dB per octave for the lowpass section.

2 Notch + 1 Low



This is a two pole notch and one pole lowpass combined filter. The rolloff is 6 dB per octave for the lowpass section and infinite attenuation at the cutoff frequency, shown at 500 Hz.

3 Phase + 1 Low



This is a three pole allpass and one pole lowpass combined filter with 6 dB per octave rolloff.

Connections

Modulation



The frequency and resonance of the filter can be modulated with CV or audio. The trim knob next to the input controls the amount of modulation.

Note In and Thru



When the Note Amount knob is turned up on the front, the note input adjusts the frequency of the filter. When the input is a PolyCV signal, the eight channels are controlled separately. When the input is a monophonic note signal, all channels respond identically.

Audio Inputs



The main audio inputs are eight stereo channels that go through the filter.

Audio Outputs



The main audio outputs are eight stereo channels that have been processed by the filter.

Envelope Inputs



When the Envelope Amount knob is not zero, the envelope inputs change the cutoff frequency.