

Analog Circuit Design - Midi Sequenced Filter



(I) Introduction

Hifiboom aka Analog Circuit Design proudly presents you the Midi Sequenced Filter for the scope platform. While looking quite simple it's a very complex device giving you a huge amount of options to filter audio or synth source material. It works best with pads, strings and other long synth lead, bass sounds, but you can get great results also with drumloops and percussive stuff.

The filter is controlled by a midi input which you can drive by almost any midi source surely also by scopes virtual midi sources.

Thus that the filter is sequenced by external midi data, you have the advantage to use the sequencing structure you are used to in your favorite host sequencer, yet still getting very tight to clock sequenced filter lines.

Now read the manual carefully and enjoy this new device.

Regards,

A handwritten signature in black ink, appearing to read "Jan Phant", with a long horizontal stroke extending to the right.

(II) Connecting the device

To use the filter, a midi source should be connected to the midi input of the filter. Secondly you have to connect some audio as source material to the stereo inputs of the filter. You can see an example for a proper connection in the picture below.



When you are using one midi source simultaneously for multiple destinations, you have to select the midi channel the filter is listening to. Use the channel selector.

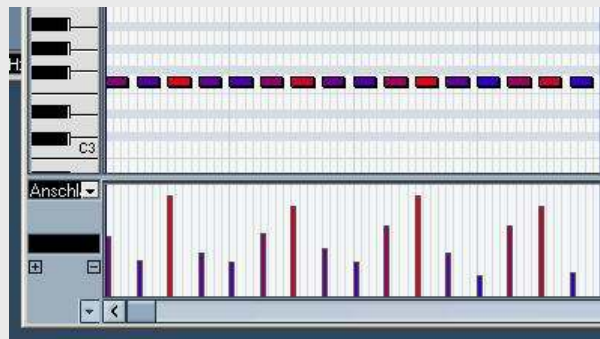
Select the same channel on your midi source for example your favorite sequencer. If everything is connected properly you can check midi activity by sending some midi notes to the device. If the green LED is blinking you have done it fine.

Finally connect the outputs to a destination, f.e a scope mixer



(III) Pattern

As mentioned earlier the filter is controlled by midi patterns from an external midi source. Here you can see a typical control pattern for the filter in a host based sequencer software.



The note pitch is unimportant, but the filter can be controlled by velocity and aftertouch to change the cutoff and resonance over the time individually and generate very lively sequences. You will learn in the following chapters how to use this feature properly.

(IV) Features Part 1 – Central functions

In the center of the device you`ll find the central control over the filter :
The main cutoff control potentiometer and a second potentiometer for main resonance control.



Additionally you`ll find a switch between two filtermodes, the first one (I) is the 4422 filter, an new and aggressive custom made 12dB distortion type filter and the second one (II) is a 24dB CW Lowpass Filter. Switching between filters need some time to unload the other one. Actually this saves some dsp power and should not be a workflow killer. 😊

(V) Features Part 2 – Cutoff Control

The device is split into two sections.:

The left side panel is dedicated for controlling filter cutoff, that we now will look closer at:

A played midi note triggers the Envelope1. You can setup the envelope style by the 4 ADSR pots.

When you setup A->0,D->0,S->max, R->0, you have somewhat like a standard gate.

When you set higher attack and lower sustain, you get A more sweeping gate and so on..... just try a bit.



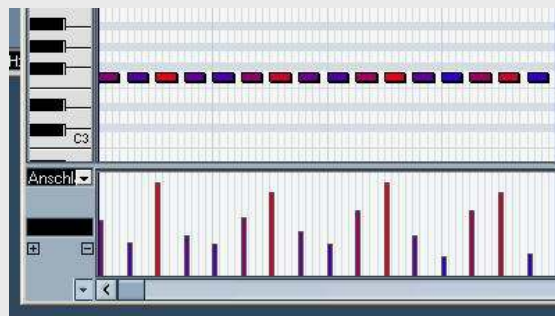
Additionally you find a slope knob for decay/release which leads from linear to exponential fadouts.

The most important control is the Velocity Sensity control, it lets you control if and how much the velocity is controlling the cutoff frequency:

Left side-> velocity has no influence on cutoff frequency , Right side-> full control through velocity

(V) Features Part 2 – Cutoff Control

Now lets look back at the sample pattern



The filter is open when it receives a midi note . How it opens up is represented by the attack value.

The fade out is represented by the release,

If vel sensity is set to minimum, all notes do lead to the same basic cutoff frequency, which is dialed in on the main cutoff potentiometer described in chapter IV.

If vel sensity is set to higher values the velocity can control/modulate the main cutoff frequency and the boring sequence is getting alive.

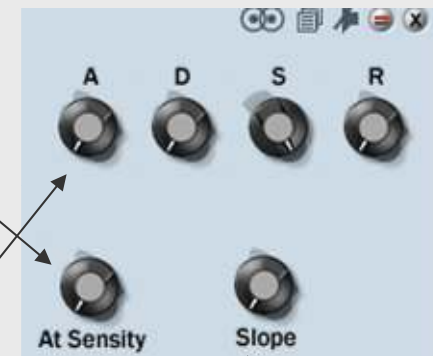
At maximum setting you gain full control over the cutoff via the velocity and can achieve extreme *floorshaking* filtering sequences, which can make your neighbours go mad.

(VI) Features Part 3 – Resonance Control

The right side of the panel holds control elements for the second part of the filter, the resonance.

Here you find similar control features like on the left side. Most important difference, the resonance is being controlled through aftertouch midi data.

When you set AT Sensity to minimum, the whole sequence has the same amount of resonance. When you set it to maximum, you can fully modulate the resonance through aftertouch data.



Again you also find potentiometers to control Envelope2 (ADSR) and SLOPE.

Notice that these features only work with filter type I, for filter type II, the settings are ignored and the resonance is always set to what you dial in on the master resonance knob. To sum it up: Filter type II cannot be modulated by aftertouch.

(VII) Features Part 4 – Experimental mode – hardware filter control

The experimental mode is dedicated for hardware modular users, that may wanna try out their analog hardware filter, being controlled by gate CV.

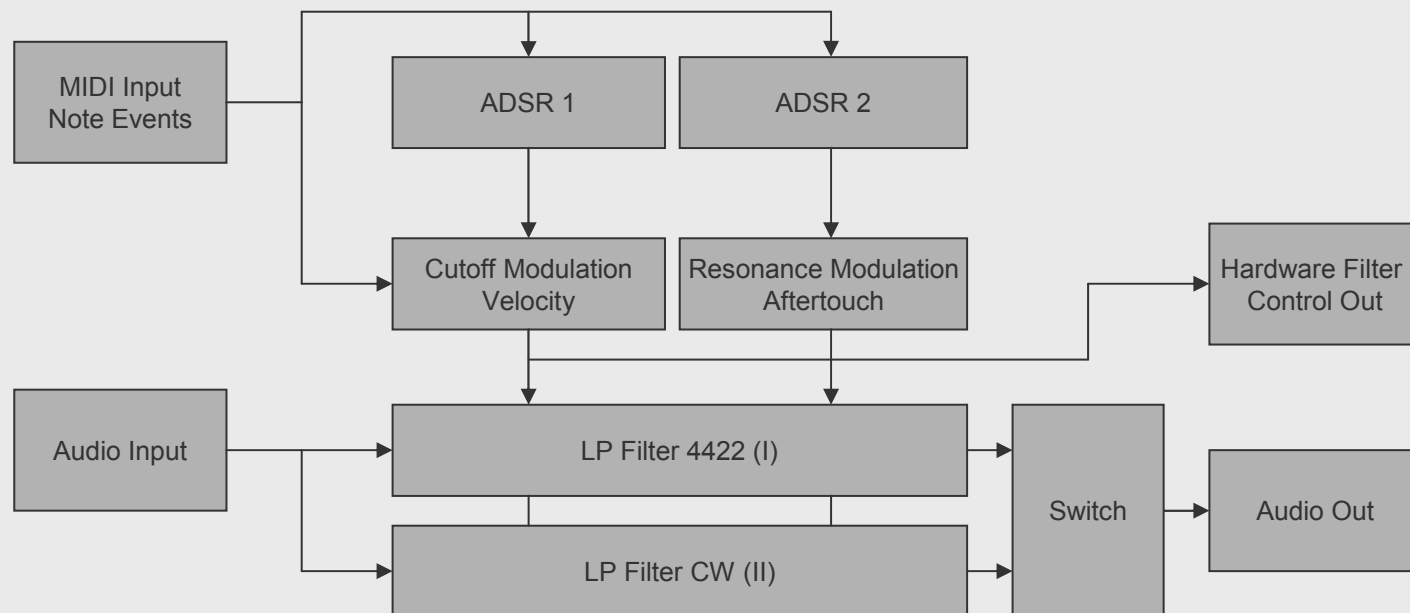
Please notice that this feature has not been tested yet, so it may not work correctly. The idea is that a users with an analog filter with CV inputs may try this feature and report an eventual success.

You find two outputs on the device. ExCf holds the gate CV signal to control Cutoff and ExRe is sending the gate CV signal to control Resonance.

Connect at least the ExCf to a scope analog output, which is connected physically with the filter CV input of the hardware filter.



(VIII) Circuit Layout



(IX) Version History

Version 1.0 – no preset handling, LED select bug 😊