CFM SPT Filter

(Switching Pole Topology Voltage Controlled Filter)

The CFM SPT Filter is a 4 Pole Voltage Controlled Filter, based on the infamous CEM3320 Chip. SPT stands for Switching Pole Topology, referring to the ability of the filters individual poles to be switched between High Pass and Low Pass Topology. This provides a multitude of different filter responses with each pole individually switchable on the fly. In addition to the Pole Topology switches it is possible to offset the pole's centre-frequency. This changes the poles capacitor, adjusting the character of the filter and damping the resonance, the same way certain Japanese Synthesizer manufacturers have done in the past - only now this is in the control of the user and available across all poles. Additionally, circuitry is included to push the feedback loop to the extremities of what the chip can handle while remaining objectively musical.

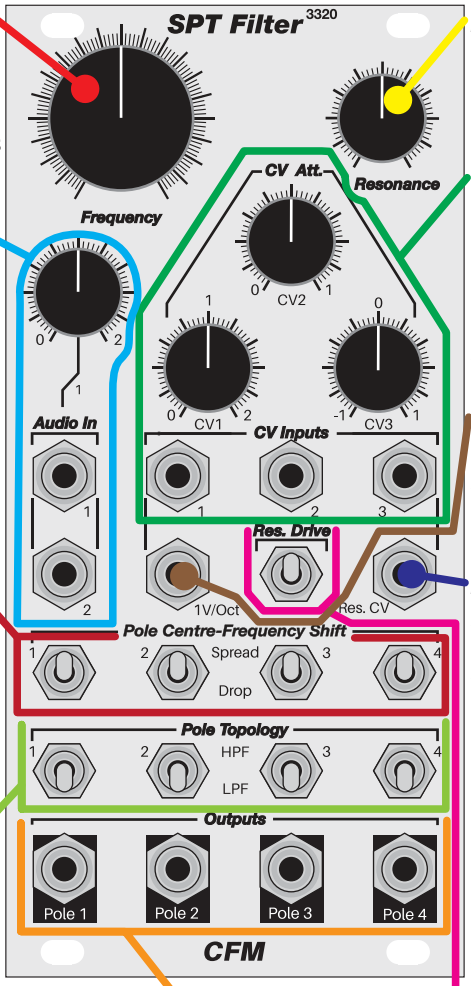
The combination of these irregular controls give the filter a unique character and make it somewhat temperamental - small changes in settings can vary from almost imperceivable to drastic. It is recommended that you get to know your filter personally rather than approach it with expectations.

Frequency

The Frequency Knob controls the cutoff frequency of the filter. Its range is tuned from stock to around 16-16000Hz. This can be offset with a trimmer on the rear. The range will always be ~1:1000.

In 1 & 2

Audio In 1 and Audio In 1's attenuator. This input has a gain of 2, most signals will begin to clip asymmetrically from a gain of around 1.2, but this obviously depends on the level of said signal.
Audio In 2 has no attenuator and a fixed gain of 1.



Pole Centre-Frequency Shift

These switches shift the frequency of the pole down. It is either Dropped (by an octave) or Spread by pre-determined values - for Pole 1: down 2/3rds of an Octave, for Pole 2: down 5/11ths, Pole 3: 1/5th, Pole 4: 1/10th. This shift dampens the resonance and effects the response curve. This feature is inspired from certain classic Roland filters (such as from the TB-303 and the Alpha Juno synths), where one pole has a higher frequency than the other 3. The SPT takes this further by allowing the user to adjust this offset manually.

Pole Topology

The Pole Topology switch changes the poles response from High Pass Filter in the upper position to Low Pass Filter in the lower position. This is done physically, not through the mixing of signals to retain the true character of a high pass and low pass. Selecting different combinations and using the different outputs gives a plethora of different filter responses. Switching individual poles not only affects the response curve, but also the way the resonance behaves, especially with Resonance Drive engaged.

Pole Outputs

These are the filter outputs, in phase and for each individual pole.

Rear

There are trimmers on the rear. I would not advise adjusting these. Contact us for further info. The Bus CV jumper connects the CV Bus in the case to the Frequncy Control.
For warranty information please contact your distributor (or for further info: info@cfmodular.com)

Resonance

The Resonance knob controls the resonance of the filter. Its range depends on the position of the Res. Drive switch.

CV1, 2 & 3

External CV Input to modulate the Cutoff Frequency. CV1 has a gain of 2 when the coresponding input attenuator is fully clockwise; CV2 a gain of 1 when the input attenuator is fully clockwise and CV3 has an Attenuverter with a gain of -1 in the anticlockwise position.

1V/Oct

It tracks. Sort of... tracking is influenced by Audio In, Frequency, CV In, Pole and Resonance settings... so... ;)

RCV

A CV input to control the resonance. Offsets from the Resonance potentiometers position, with an expected range of +/-5V. Bear in mind the CV range of the chip is 0-5V, so with the resonance turned all the way up *any positive external CV input will put the behaviour of the filter into unpredictable territory*. Depending on the other settings, self oscillation may cease at certain frequencies or the filter may cut out/lock up completely - you may also find exactly what you were looking for. However, what that is I cannot tell you.

Res. Drive

The Resonance Drive switch engages additional circuitry in the resonance loop. In the upper position the resonance will be fairly standard and tame. It will not self oscillate and should refrain from letting out any squeals. With the Resonance Drive switch engaged (in the down position) the filter will self oscillate, and the resonance input will be driven around 3-4 times harder. The input signal will also be compensated for, and combined with the resonance feedback loop to avoid amplitude losses in the pass band. The result is a very wild, unpredictable and unstable resonance when pushed, but can be operated in the standard manner at low resonance settings.

The behaviour of the filter depends greatly on the input and resonance levels, as well as the position of the Centre-Frequency and Topology switches.