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# FUTURE SOUND SYSTEMS FIL4 TIMBRAL SCULPTOR

The Timbral Sculptor brings together several synthesis elements designed for altering the harmonic content of audio signals at its input. The module is comprised of a multi-mode filter, VCAs, a deadband wavfolder, and a rectifier and Lockhart wavfolder in the resonance path of the filter. The FIL4 therefore can be coupled with one or several oscillators, as well as modulation sources, for a full synthesizer voice.

The Filter component of the FIL4 has been designed to range from clean, low-distortion filtering to chaotic noise generation, particularly through the use of non-linear elements in its resonance path.

## SPECIFICATIONS

Width: 16HP  
Current consumption:  
+12V: 130mA  
-12V: 110mA

## FILTER

The FIL4's multi-mode filter is a -18dB/octave three-pole design based around the SSI2164 IC. When used without the rectifier or wavfolder in the resonance path, the filter behaves "cleanly" with low distortion. The filter will self-oscillate at maximum Resonance, and also has slightly accentuated Resonance at higher Cut-Off Frequency, imitating filters such as that found in the Roland TB-303. This gives the filter a somewhat "bright" sound, particularly when the Cut-Off is modulated by decaying envelopes, etc. 1V/Oct control over the filter's Cut-Off Frequency is available at the Frequency CV1 input, and the Resonance can also be voltage controlled via an attenuverter.

Additional features to this filter begin with the Audio FM attenuverter. This was added to imitate the behaviour of the Korg35 filter, where overdriving the filter core results in slight modulation of the filter's cut-off frequency. On the FIL4, this effect can be taken to the extreme in both positive and negative directions.

In the resonance path of the filter, a rectifier network and/or Lockhart wavfolder can be switched in. These alter the filter's behaviour in dramatic, non-linear ways, with neither stage resulting in its expected sound at the output. The rectifier is switchable between Half-Wave and Full-Wave Rectification, allowing for different flavours of resonance behaviour. The wavfolder wreaks havoc in the filter and produces tones reminiscent of our Spectral Devastator filters. Please note that both the rectifier and wavfolder will prevent the filter from tracking to the 1V/Octave standard.

Each individual state output from the filter is fed through a VCA, courtesy of another SSI2164, and akin to the Cyclical Engine VCO module. The mixed output of this is then passed on to the next component in the Chain, whether that be the Chain Output or the deadband wavfolder named "Timbre".

## TIMBRE

The "Timbre" section is named after a well-regarded deadband wavfolder design, prominent in "West-Coast" designs both young and old. Whilst the Filter section of the Timbral Sculptor belongs to classic subtractive synthesis, the Timbre section can be seen as relating to additive synthesis, as the harder the Timbre section is driven, the greater the number of harmonics that are added to the input.

In the FIL4, the Timbre section can be manipulated using the Drive control (when in Pre configuration) or from the VCAs at the filter's outputs (when in Post configuration). Note that the patchable VCA of the Timbral Sculptor can be employed when the Timbre section is in the Pre configuration to give voltage control over the Drive.

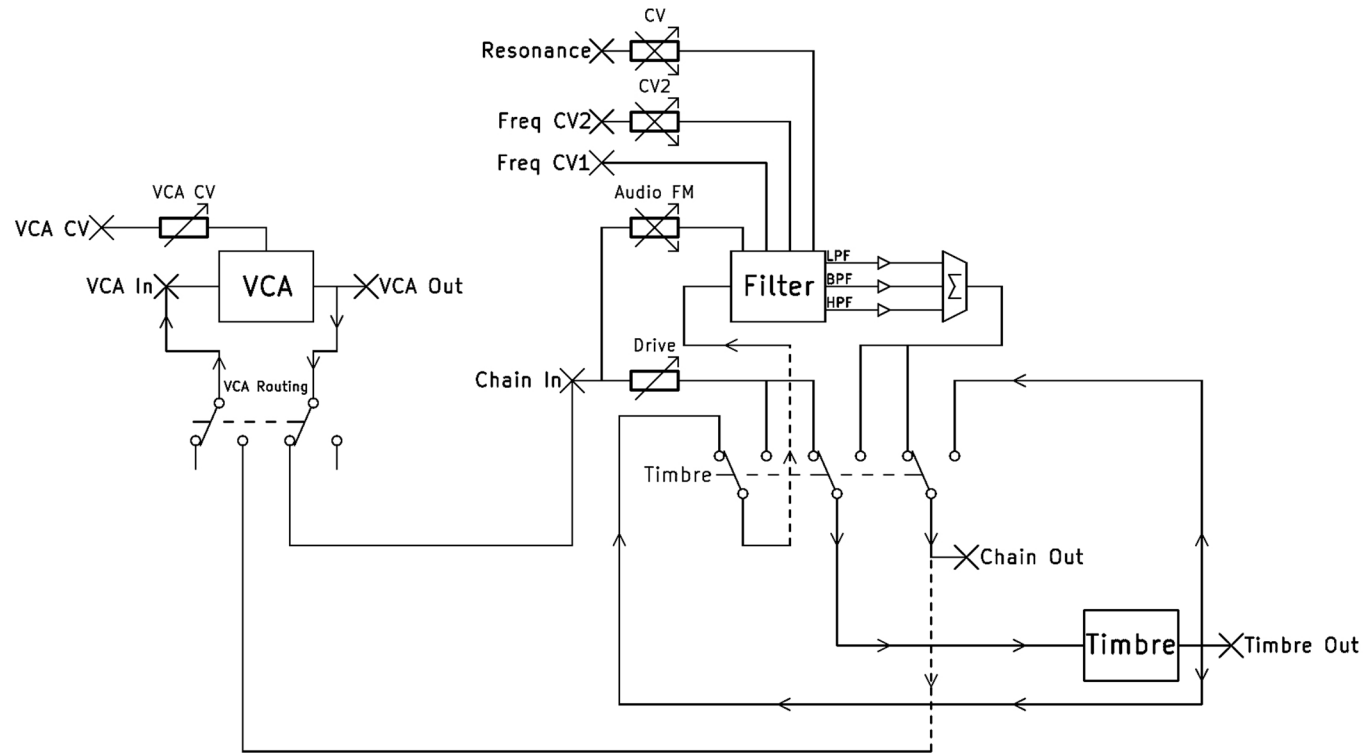
## VCA

The Timbral Sculptor features an exponential-law VCA, which can be used completely independently from the other elements of the module if desired. Otherwise, the VCA can be placed at the beginning or end of the signal chain.

When the Routing switch is in the Input position, the VCA is configured so that audio should be input to the VCA In socket, and the final output of the chain will be present at the Chain Out socket. In this position, the VCA provides voltage control over the amount of Drive into either the Timbre or Filter section.

When the Output position is selected at the Routing switch, the VCA is placed at the end of the signal chain, so audio should be input to the Chain In socket, and the final output will be present at the VCA Out socket. In this position, the VCA takes the more traditional role as found in most standalone synthesizers, providing final control over a sound's dynamics.

# BLOCK DIAGRAM



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