

**ALM-Ø18**

**'MUM M8'**

**- Operation Manual -**  
(v0.1)



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# Introduction

'MUM M8' is an 8hp Eurorack low pass filter building on the filter design used in the classic Akai S950 12 bit sampler with the addition of resonance, voltage control, clipped saturation and a dedicated VCA.

The low pass filter gives the recognisable super smooth vacuum like tone sucking sound which works magic on complex sources. The addition of clipped overdrive and intentionally aggressive self oscillating resonance compliment the smooth filter core by juxtaposing it into more wasp like territory with acidic squeals and a more gritty sound.

Mum M8 features dual voltage control with attenuation (and inversion) of filter cut off and voltage control of resonance together with dual audio inputs - one of which includes a VCA to with the capability to aid overdriving signals into the filter core.

The filter core is a 6th Order Butterworth switched capacitor type design featuring an analog core but controlled by a high speed digital clock. This produces the characteristic smooth sounding filter but, as with the original S950, has a relatively high minimum cut off as to avoid 'clock bleed' into the filter output from the digital control. This minimum cut of point (and introduction of bleed if required) can be controlled via trimmers on the rear of the module (see calibration chapter). It is not unusual for there still to be some low level artefacts from the clock present, particularly during filter sweeps - these add to the filters character.

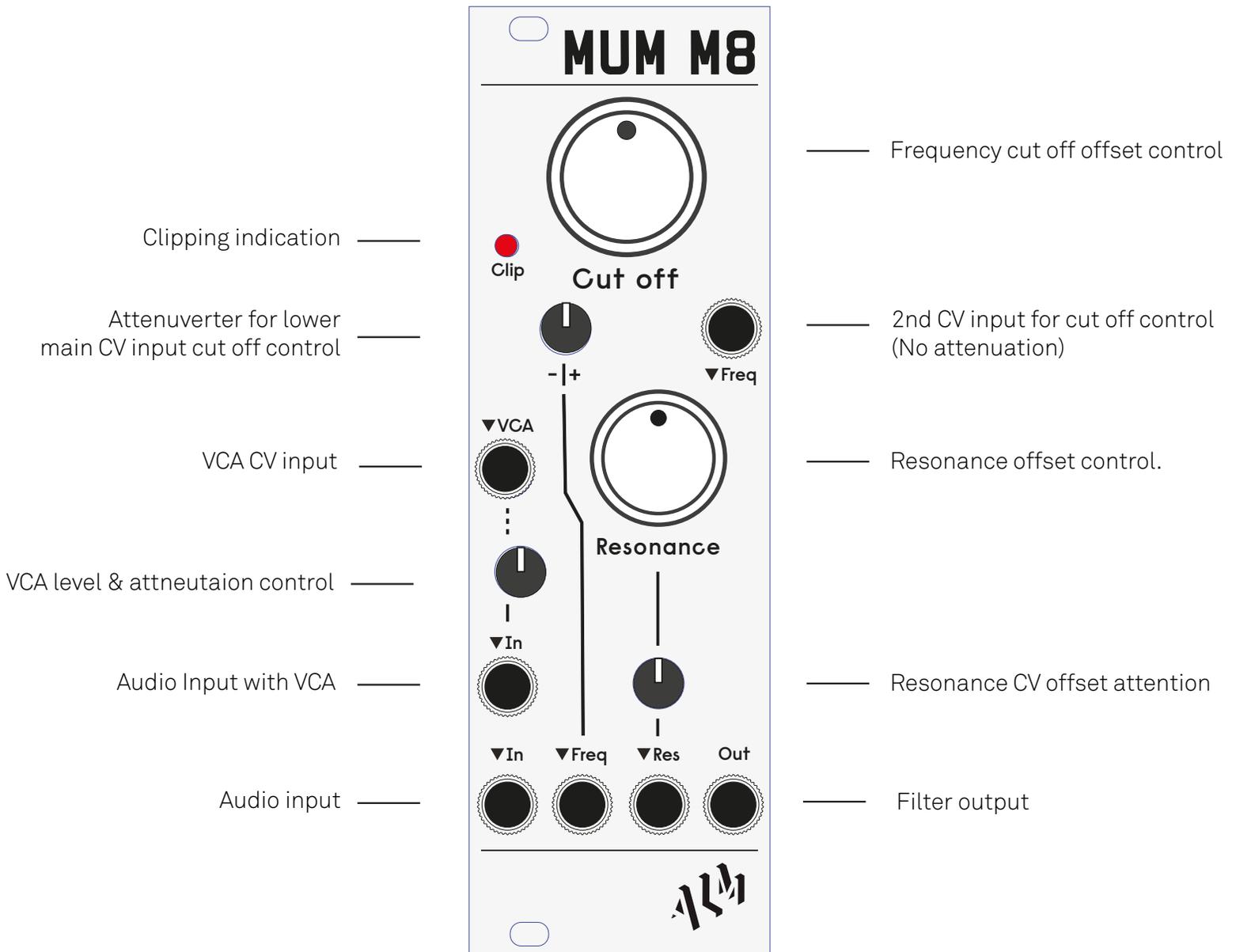
The motivation for the module came from discussing filters in classic samplers with the artist Jack Adams - aka Mumdance. Jack suggested investigating the S950's filter well known as for it use in classic use in early jungle and hardcore. From that point onward Jack provided inspiration, help and feedback in the development of the filter. Big up Mumdance.

## Technical Specifications

- Supply: +/-12V
- Current Draw: +12v 40ma / -12v 40ma
- Size: 8 *HP*
- Depth: 32mm (*including power header*)

# Core Operation

## Panel Layout



## General Usage

An audio signal is patched into either 'In' input. The upper input is controlled by a VCA which can amplify signals into the the filter core. (and thus aid clipped distortion/saturation to occur). With nothing patched into the VCA input, the thumb control will control the audio input level - when patched in it acts as at attenuation control. The audio signals will then be mixed and pass through the filter core output on the 'Out' jack on the bottom right of the module.

The filter core has both a controllable cut off frequency and resonance. The cut off frequency offset can be controlled manually via the large white knob and by means of voltage control through the the two 'freq' inputs. The bottom 'freq' input has an attenuversion control allowing both attenuation and inversion of the control signal. All CV inputs and knob offset are combined together to set the final filter frequency cut off. Resonance is controlled manually via the smaller knob control and via the 'Res' input and associated attenuator. The resonance can get particularly aggressive going into self oscillation with the control past 12 o'clock.

# Calibration

There are two trimmers on the rear on the module which can be used to adjust the minimum cut off frequency for the filter. Because of the filters architecture, too low a cut off frequency will introduce high pitched noise into the audio signal (from the filters controlling clock signal).

The top trimmer (marked 'FREQ OFF ADJ') sets the 'base' cut off frequency - i.e the cut off will effect the main control knob on front of module turned full counter clockwise and no CV inputs patched. The lower trimmer (marked 'FREQ MIN ADJ') hard limits the minimum frequency of the filter (from knob or cv input). The trimmers are adjusted with a small flat head screwdriver.

To calibrate;

1. Turn filter knob full counter clock wise (CCW), Resonance knob full CW - so filter is in self oscillation.
2. Turn top 'FREQ OFF ADJ' trimmer full CCW. Turn lower 'FREQ MIN ADJ' trimmer full CW. You should now hear no resonance but the clock noise.
3. Turn 'FREQ OFF ADJ' CW until you can hear just resonance and so that the clock noise has subsided (approx 1/4 to 1/3 of a turn)
4. Turn 'FREQ MIN ADJ' CCW to just before the point it affects the resonance frequency.

Note the module is pre calibrated at the factory but by all means adjust to taste!

# Limited Warranty

From the date of manufacture this device is guaranteed for a period of 2 years against any manufacturing or material defects. Any such defects will be repaired or replaced at the discretion of ALM. This does not apply to;

- Physical damage arising from mistreating (i.e. dropping, submerging etc).
- Damage caused by incorrect power connections.
- Overexposure to heat or direct sunlight.
- Damage caused by inappropriate or misuse.
- Use of incorrect or non official firmware

No responsibility is implied or accepted for harm to person or apparatus caused through operation of this product.

By using this product you agree to these terms.

# Support

For the latest news, additional info, downloads and firmware updates please visit the ALM website at <http://busycircuits.com> and follow @busycircuits on twitter.

Please send any questions or comments to [info@busycircuits.com](mailto:info@busycircuits.com)

