

AMSynths

AM8071 Snow Fall VCF User Manual Diode Ladder Low Pass Filter

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1 Welcome

Thank you for purchasing an AMSynths product.

The AM8071 analog filter module has been designed and hand built in the UK to exacting quality standards. The module uses high quality electronic components and particular attention has been paid to the quality of the audio signal path, stability of the control circuits and the long term life of the product.

This user manual explains the basic functions of the module, as well the historic background to its development, how to install the module and the warranty and support.

AMSynths modules are produced in low volumes, with each module having a unique holographic serial number and a certificate of ownership. You own a rare and beautiful analog synthesizer module that will provide many years of amazing sounds and musical inspiration.

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2 Front Panel



AUDIO INPUTS:

InA, InB

CONTROL INPUTS:

CV1, CV2, CVQ

AUDIO OUTPUTS:

Out

CONTROL POTS:

Signal A (white)
Signal B (white)
Frequency (blue)
Resonance (red)
CVQ Amount (red)
CV1 (blue)
CV2 (blue)

PUSH BUTTONS:

Slope
Lag

LED:

Slope: Green LED
Lag: Green LED

The serial number is on a small silver holographic sticker on the inside of the front panel.

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3 Module Description

The AM8071 is a traditional diode ladder low pass filter similar to that in the EMS VCS3, Roland SH-3, System 100 and the PE Minisonic 2. The filter has a 4-pole ladder with an 18dB like response, thanks to the characteristics of diodes. A fifth pole can be switched in to give a steeper 24dB response using the Slope switch. The control voltages can be smoothed out using the Lag switch, to give a more fluid modulation.

The filter has adjustable Cutoff Frequency and Resonance, along with a resonance CV input, 2x Signal inputs and 2x Frequency Cutoff CV inputs. The panel design is a mix of rotary and slide potentiometers. The filter was developed during the heavy snowfalls across the UK in February 2010, hence the name.

The AM8071 is an excellent sounding Diode Ladder style filter, with the limitations diodes bring in terms of some CV breakthrough but also the advantages in producing classic Sound FX much liked by Tim Blake, Klaus Schulze and J-M-J in the 1970's.



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4 Connections & Controls

The two uppermost jack sockets INA and INB are for connecting audio signals into the input side of the filter, these signals are mixed together. The level of each audio signal can be varied from nil to maximum using the front panel slider potentiometers SignalA and SignalB.

The middle jack sockets CV1 and CV2 are for connecting modulation control voltages into the filter. These signals vary the cut off frequency of the filter, with the front panel slider potentiometers CV1 and CV2 adjusting the amount of modulation.

The next lowest jack socket marked CVQ is for connecting a modulation control voltage into the Resonance of the filter, thereby providing voltage controlled resonance using the CVQ rotary potentiometer.

The lowest jack socket marked Out is the audio signal output of the filter and it is typically connected to a VCA.

The Frequency potentiometer varies the cut off frequency of the filter. At the minimum setting the filter will cut off all frequencies with no audio output and at the maximum setting the filter will pass all frequencies.

The Resonance potentiometer adjusts the resonant peak of the filter from a minimum setting of no resonance, through subtle resonance enhancement to a maximum setting when the filter will break into self oscillation.

The slope of the filter can be switched between 4 and 5 poles by pressing the SLOPE push button. When the LED is lit the filter is in 5-pole mode (sounds like 24dB/octave), when the LED is not lit the filter is in 4-pole mode (sounds like 18dB/octave). The sonic difference between these two modes is subtle. The filter powers on in 5-pole mode.

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The slew of the Frequency control voltage inputs CV1 and CV2 can be switched from zero to maximum by pressing the LAG push button. When the LED is lit the control voltages are slewed by an internal capacitor which rounds off the waveforms making the filter burble. When the LED is not lit the slew is removed and the control voltages are unaltered. The sonic difference between these two modes is significant and very useful. The filter powers on in 5-pole mode.

5 Module Description

The core of the filter is a diode ladder with unmatched diodes and high tolerance 100nF Ceramic capacitors, just like the originals from the 1970's. The input and output signals are buffered using standard Op Amps, with a THAT300 quad transistor array at the base of the ladder for signal input and CV control.

A THAT340 quad transistor array is used to amplify the signals at the top of the ladder, and a standard Op Amp circuit is used to control the cutoff frequency of the filter. Resonance is provided by a FET acting as a variable resistor, controlled by a simple potentiometer.

Voltage controlled resonance is available with an external CV input. Two high quality analog switches on the main PCB are switched on and off from the front panel using momentary push buttons.

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6 Configuration

The AM8071 module occupies 18HP of EuroRack space and is fully compatible with various Euro Rack cases, especially Doepfer. The height of the panel is 128.5 mm and there are four mounting holes at each corner of the module. Four 3mm diameter mounting screws are included with the AM8071 to enable you to securely mount the module.

The module should be connected to the 12V Doepfer style power bus within your case using the included AMSynths multi-way power cable. Ensure the power is OFF before connecting the module and BE VERY CAREFUL to ensure that the power connector to the bus is connected with the red stripe of the cable lined up with -12V (negative 12V). This is standard Euro Rack power connection but be VERY CAREFUL to get this right! Damaged modules will not be replaced under warranty when the power has been misconnected. The power socket on the AMSynths module is keyed so that the cable can only be inserted the correct way and there are fuses on the PCB to protect the electronics if you do make a mistake.

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7 Warranty & Support

Repairs resulting from a defect of the module or its construction process are covered by a one year warranty, with the customer paying transit costs to AMSynths in the UK.

Damage to the module resulting from incorrect power supply voltages, backwards power cable connection, abusive usage, fluid encroachment or out-of specification voltage input are not covered by the warranty and normal service rates apply.

AMSynths implies and accepts no responsibility for undesirable harm to a person or apparatus caused through operation of this device.

If you have questions regarding the use of this module or you need technical support please contact AMSynths via email at sales@amsynths.co.uk.

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8 Specifications

Power Supply:

+12V, GND and -12V standard Doepfer 10 pin connector
RED stripe on power cable is -12V (NEGATIVE 12V)

Current consumption:

TBD

Dimensions:

128.5mm (Height) x 91.3 mm (Width)

Euro Rack Size:

18HP/TE

Panel:

2mm machined aluminum with colour photographic print.

Frequency

20 Hz to 20 kHz

Resonance

0 to self oscillation

Output Impedance:

1k ohm

Input Impedance:

100k ohm