

# AMSynths

## **AM8109 JP8 VCF User Manual 12 and 24dB/Octave Low Pass Filter**

© AMSynths 2010  
Rob Keeble, Owner & Designer  
Contact: [sales@amsynths.co.uk](mailto:sales@amsynths.co.uk)  
Web Site: [www.amsynths.co.uk](http://www.amsynths.co.uk)

## **Contents**

- 1. Welcome**
- 2. Front Panel**
- 3. Connections & Controls**
- 4. Module Description**
- 5. Configuration**
- 6. Warranty & Support**
- 7. Specifications**

# AM8109 JP8 VCF

## 1 Welcome

Thank you for purchasing an AMSynths product.

The AM8109 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.

Rob Keeble  
Owner & Designer  
AMSynths  
December 2010

# AM8109 JP8 VCF

## 2 Front Panel



### AUDIO INPUTS:

InA, InB, InC

### CONTROL INPUTS:

CV1, CV2

### AUDIO OUTPUTS:

Out

### CONTROL POTS:

Signal A (white)  
Signal B (white)  
Signal C (white)  
Frequency (blue)  
Resonance (red)  
CV1 (grey)  
CV2 (grey)

### PUSH BUTTON:

Slope

### LED:

Red LED

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

# AM8109 JP8 VCF

## 3 Module Description

The AM8109 is a clone of the beautiful Low Pass Filter from the legendary Roland Jupiter 8 analog polyphonic synthesizer that was launched in the autumn of 1981. The Jupiter 8 uses a special Roland filter chip, the IR3109. This is a single chip 2 and 4 pole OTA filter block that Roland first used in the Jupiter 4 in 1980, replacing a discrete version of the filter that uses many more components and takes up valuable PCB space.

The IR3109 chip featured in the next series of Roland polyphonic synthesizer to succeed the Jupiter 4 (due to the small space needed for each analog voice channel), including the Jupiter 6 and 8, as well as the Juno 6/60. It was also used in the Roland SH101 monosynth, various Boss Phasers and Roland guitar synthesizers. The 16 pin DIL chip was eventually replaced in 1984 with the 80017A chip which contains the VCF (as a SMD IR3109 chip) and a VCA. This chip was implemented in the Roland Juno 106 and MKS30.

I have kept the design of the AM8109 to just the LPF rather than replicating the HPF from the Jupiter 8 as well, that's simply because I don't have enough space on the PCB. The AM8109 is an excellent sounding OTA style filter, with the characteristic warmth and powerful resonance of the Jupiter 8.

# AM8109 JP8 VCF

## 4 Connections & Controls

The three uppermost jack sockets INA, INB and INC 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 rotary potentiometers SignalA, SignalB and SignalC.

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 rotary potentiometers adjusting the amount of modulation.

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 filter has been trimmed at the factory to self oscillate at the same level as the filter output signal to ensure that maximum resonance settings do not create excessive signal levels.

The slope of the filter can be switched between 12dB and 24dB per octave by pressing the red push button. When the red LED is lit the filter is in 4-pole mode (24dB/octave), when the LED is not lit the filter is in 2-pole mode 12dB/octave. The sonic difference between these two modes is subtle. The filter powers on in 4-pole mode.

# AM8109 JP8 VCF

## 5 Module Description

The AM8109 is a clone of the beautiful Low Pass Filter(LPF) from the legendary Roland Jupiter 8 analog polyphonic synthesizer that was launched in the autumn of 1981. The Jupiter 8 uses a special Roland filter chip, the IR3109. This is a single chip 2 and 4 pole OTA filter block that Roland first used in the Jupiter 4 in 1980, replacing a discrete version of the filter that uses many more components and takes up valuable PCB space.

The IR3109 chip featured in the next series of Roland polyphonic synthesizer to succeed the Jupiter 4 (due to the small space needed for each analog voice channel), including the Jupiter 6 and 8, as well as the Juno 6/60. It was also used in the Roland SH101 monosynth, various Boss Phasers and Roland guitar synthesizers. The 16 pin DIL chip was eventually replaced in 1984 with the 80017A chip which contains the VCF (as a SMD IR3109 chip) and a VCA. This chip was implemented in the Roland Juno 106 and MKS30.

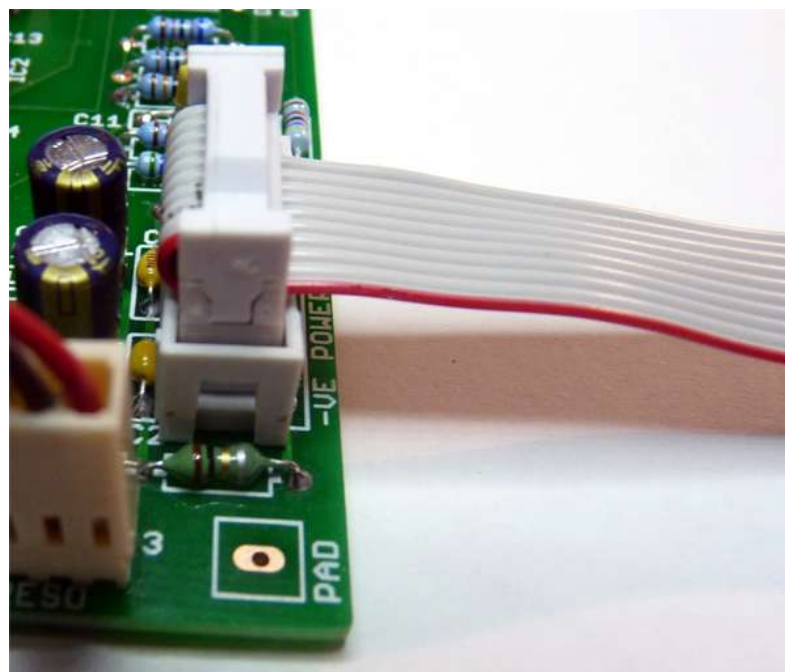
I have kept the design of the AM8109 to just the LPF rather than replicating the High Pass Filter from the Jupiter 8 as well, that's simply because I don't have enough space on the PCB. The AM8109 is an excellent sounding OTA style filter, with the characteristic warmth and subtle resonance of the Jupiter 8.

# AM8109 JP8 VCF

## 6 Configuration

The AM8109 module occupies 14HP 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 AM8109 to enable you to securely mount the module into your rack.

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.



## 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](mailto:sales@amsynths.co.uk).

# AM8109 JP8 VCF

## 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 70.8 mm (Width)

Euro Rack Size:

14HP/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