

F-1: STEREO LOWPASS FILTER

1 Introduction

Thank you for purchasing our *F1: Stereo Lowpass Filter*.

This no-compromise, all-analog transistor ladder filter is built from high-end components. It includes many modern touches like stereo (or dual-mono) operation, selectable filter slopes, precisely matched left/right channels and temperature compensation for accurate tracking.

We made this module because we love stereo sound. We love the phase and sound-stage information that it carries and we think it's a shame that most modular systems typically mix everything down to mono before running the sound through a mono filter at the end of the signal path. We hope this product can be the beginning of a change toward stereo modular synthesis.

Beyond modular synthesis, you can also use the *F1: Stereo Lowpass Filter* to breathe analog life into your old drum machines, digital synths, virtual instruments or even apps on your smartphone or tablet. And we have included many useful touches like selectable 12/18/24 dB/Oct. filter slopes and our innovative Stereo Offset control to make sure you have lots of sonic options at your fingertips.

This filter is fully compliant with the Eurorack standard and plays nicely with all of your other Eurorack modules. It is especially amazing when paired up with our *M4: Advanced Stereo Mixer*, since you get the complete foundation for no-compromise stereo modular synthesis with CV control of nearly everything!

Thanks again for buying this product. We have put a lot of love into designing and manufacturing it and we hope you will use it to make your best work yet.

Sincerely,
- The People of Strange Science Instruments

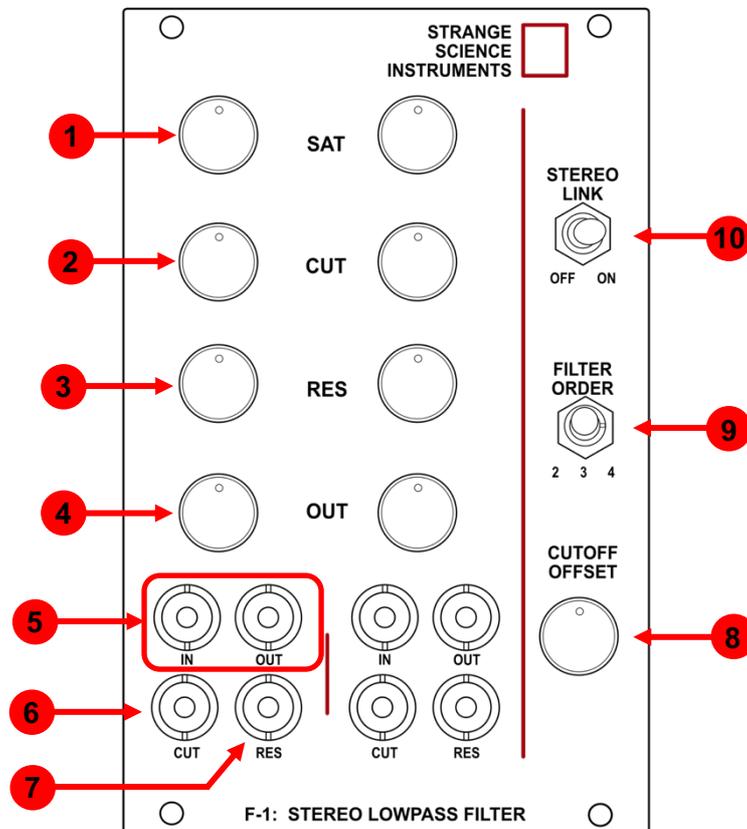
2 What's in the Box

- F1: Stereo Lowpass Filter Module
- 16-pin to 16-pin power cable
- Red M3 Screws (x4)
- Protective washers (x4)
- Printed Quick Start Instructions

3 Key Features

- Tightly Matched Stereo Filter with Moog-inspired transistor ladder design
- Stereo Link mode when working in stereo or dual-mono if you need two separate filters
- Filter Order switch lets you select 2, 3 or 4 pole filter slope (i.e., 12, 18, 24dB/Octave)
- Cutoff Offset knob for wild stereo or formant-like effects
- CV control of both filter Cutoff and Resonance for each channel
- CNC machined, infilled aluminum front panel (no silk-screen)
- 16HP wide
- 41 mm depth (rail-to-back)
- Made in the USA

4 Controls and Connectors



Front Panel

1. **SAT (Saturation)** – This knob sets the input gain level for each channel. Unity gain is at the "12:00" position and turning beyond this point lets you overdrive the channel to achieve varying degrees of analog distortion. You can filter the overdriven sound with the CUT knob.
2. **CUT (Cutoff)** – This knob sets the filter cutoff frequency of each channel. Cutoff frequency can also be controlled simultaneously via control voltage (see no. 6 below). Note that the slope or "steepness" of the filter is set by the Filter Order switch (no. 9).
3. **RES (Resonance)** – This knob sets the filter resonance amount of each channel. Resonance can also be controlled simultaneously via control voltage (no. 7). Note that the sound and character of the resonance is dependent on the Filter Order setting (no. 9) and this module can achieve self-oscillation under some settings.
4. **OUT (Output)** – Sets the output level for each channel. This means you can overdrive the input by turning up the SAT knob while reducing overall output levels to avoid excessive output. Conversely, you can create a very clean filtered sound by driving the input lightly and turning up the output knob to make up for the reduced output level.
5. **IN and OUT** – These jacks are the input and output of each corresponding filter channel.

6. **CUT (Cutoff CV)** – This jack lets you use control voltage (CV) to set the Cutoff frequency of the filter channel. This input works in conjunction with the CUT knob (see #2 above) and both controls can be used simultaneously. In other words, you can always adjust the filter manually even if a control voltage is being used to set it.
7. **RES (Resonance CV)** – This jack lets you set the filter resonance amount using control voltage (CV). This input works in conjunction with the RES knob (see #3 above) and both controls can be used simultaneously. In other words, you can always adjust the resonance amount manually even if a control voltage is being used to set it.
8. **CUTOFF OFFSET** – This knob lets you introduce a deliberate offset between your two filter cutoff frequencies. When the knob is in the detented "12:00" position, the two cutoff frequencies are matched. If you turn the knob clockwise or counter-clockwise, the two cutoff frequencies are pushed away from each other. You can use this knob to create some very interesting stereo effects when working in stereo, formant-style effects when working in dual-mono, or in many other as-yet-imagined scenarios. Experiment and have fun!
9. **FILTER ORDER** – This switch lets you select between two, three, or four pole (12, 18 or 24 dB/octave) operation on the filter. Each of these modes affects the sonic characteristic of the module, so it's like getting three different filters in one.
 - **2nd order** - A "well-behaved" sound with a gentle 12dB/octave slope and no self-oscillation. A great choice when you need something that is not extreme-sounding.
 - **3rd order** – Provides a more aggressive 18dB/oct. slope without self-oscillation. This is perfect when you want a 24dB/oct.-like sound but don't want self-oscillation.
 - **4th order** - Aggressive filtering with sharp 24dB/oct. slope *and* self-oscillation. This is the classic "Minimoog" filter sound that is loved by many synthesizer aficionados.
10. **STEREO LINK** – When this switch is set to ON, the **left** channel knobs and CV-inputs control both channels (the right-channel controls and CV inputs are ignored). This lets you use one set of knobs or CV inputs to easily control *both* channels of the filter. When Stereo Link is switched OFF, the left and right channels work independently, effectively giving you two separate lowpass filters in one module.

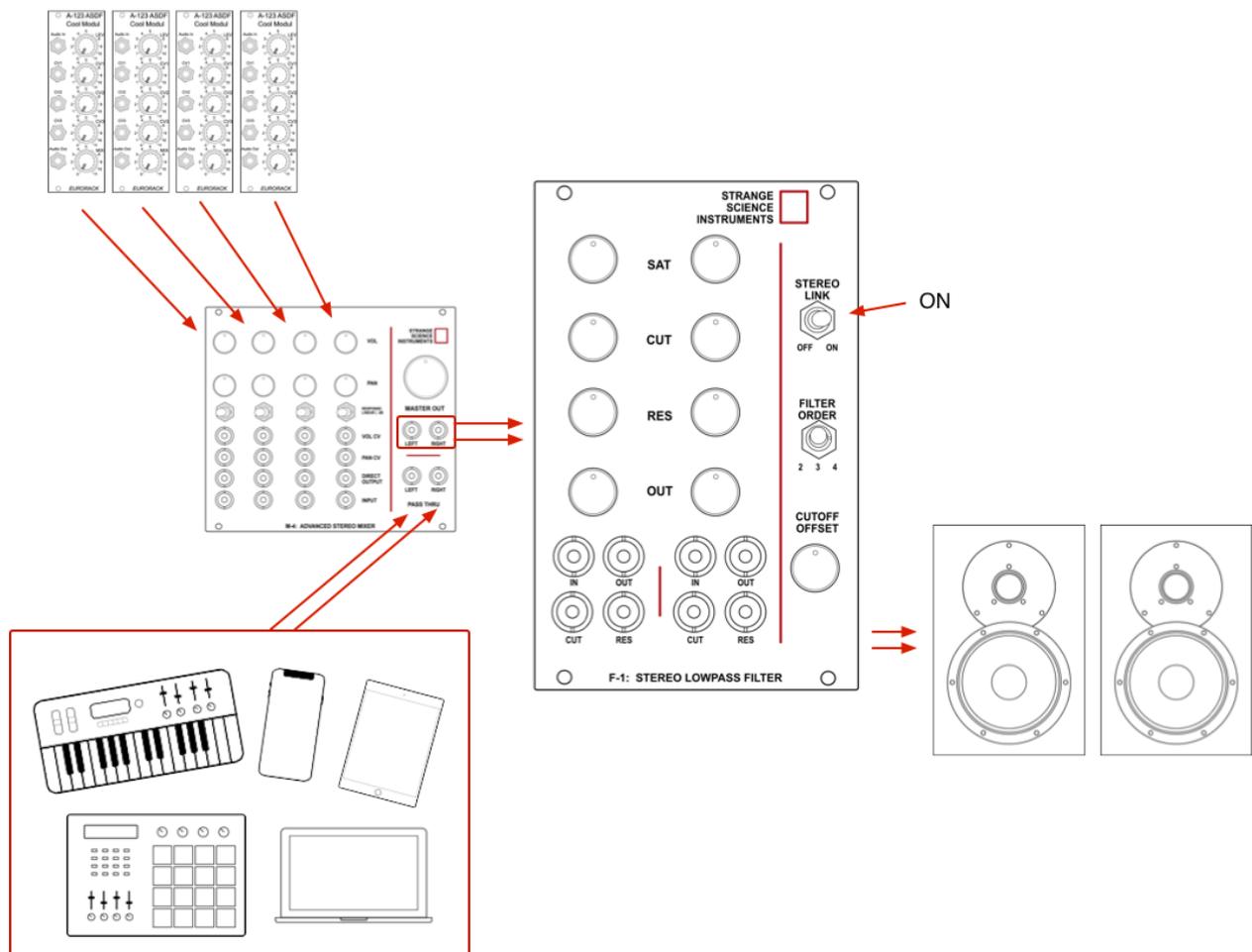


Caution

Switching the STEREO LINK switch ON and OFF can potentially cause sudden and loud changes in volume, depending on how your various controls are set. Please keep this in mind (i.e., take a look at your settings) before flipping this switch to avoid exposing yourself to loud sounds!

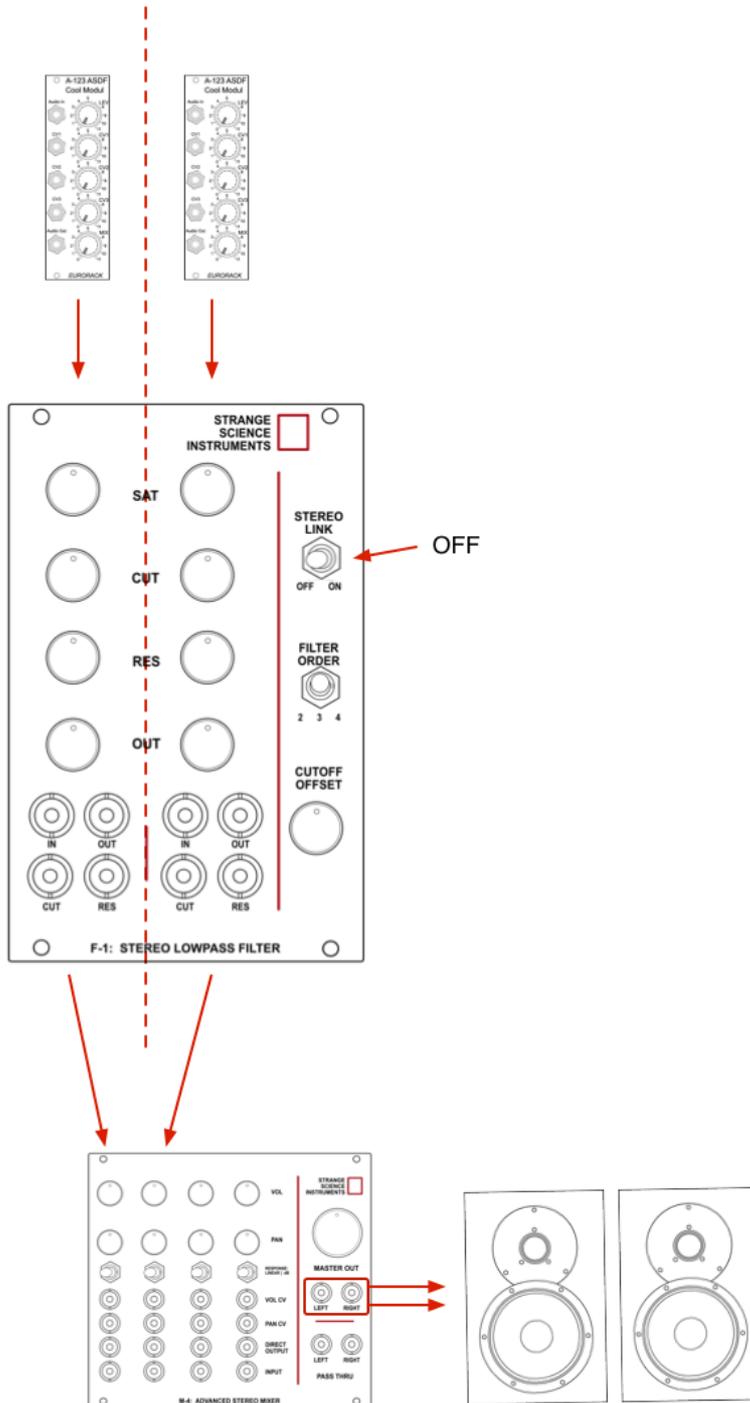
5 Using the F1: Stereo Lowpass Filter

Modular synthesizers can, of course, be used in countless ways and are only limited to the imagination of users like you. Which is to say the possibilities are endless! So please consider the scenarios below as first steps of how you can using your F1 filter. We're sure you can come up with many other creative uses, and we hope you'll share them with us.



Scenario 1: F1 as a stereo “master” filter

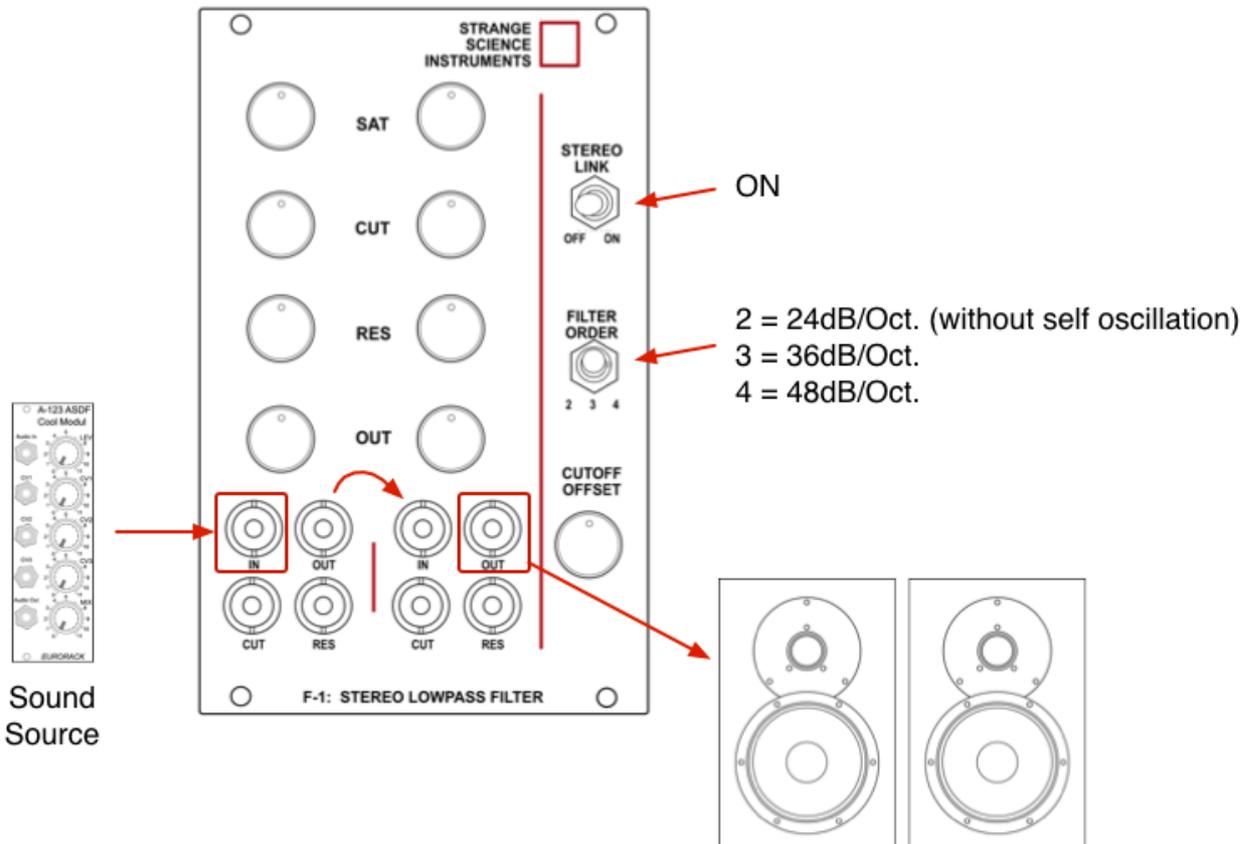
If you have a stereo mixer (especially a CV controllable one like our *M4: Advanced Stereo Mixer* as shown above) you can run the mixed stereo output of the mixer through the F1 filter before sending your sound off to your speakers or recording interface. This lets you use the F1 module as a master filter. Simply make sure the STEREO LINK switch is set to ON and use the left channel knobs or CV inputs to control both sides!



Stereo Mixer (Optional)

Scenario 2: F1 as two mono filters

Sometimes, you just need two mono filters. Not to worry—F1 has you covered. Just switch STEREO LINK to OFF and you have two separate lowpass filters that you can use as you would use any other filters. With this setup, you can run your oscillators or other sources through the two F1 channels and send the filtered sounds on to other modules, speakers, or a recording device.



Scenario 3: Create an “extreme” (24/36/48 dB/Oct.) mono filter!

Remember that the F1 module has two filters inside and there is nothing preventing you from connecting the output of the first filter straight into the input of the second filter. This technique lets you convert the stereo F1 module into three new types of mono filters: 24 dB/Oct. (without self-oscillation), 36 dB/Oct., and 48 dB/Oct!

- Use a patch cable to connect the output of channel 1 to the input of channel 2.
- Set the STEREO LINK switch to ON
- Set the FILTER ORDER to select your slope. In this scenario...
 - ... Selecting “2” gives you a 24 dB/Oct. filter, but without self-oscillation
 - ... Selecting “3” gives you a 36 dB/Oct. filter, again, without self-oscillation
 - ... Selecting “4” gives you a 48 dB/Oct. filter with tons of self-oscillation
- Since STEREO LINK is activated, you can use the left channel knobs and CV inputs to control both filters simultaneously. This is very convenient since you don’t need to use up a buffered mult module in order to split your CV signal and send it to both channels.
- Keep in mind that the CUTOFF OFFSET knob still works in this configuration and can provide even more sonic options to you. For example, by using this knob to move the slightly peak-y resonances of each filter, it is possible to create some interesting “formant like” effects. Get creative and explore the sonic options!

6 Legal Notices

Strange Science Instruments verifies that a properly constructed modular system, based on commercially available cases, power supplies, power distribution boards and a coherent selection of modules meets the requirements defined by international certification bodies.

In the paragraphs that follow, Device refers to the F1: Stereo Lowpass Filter module, properly installed, powered, and patched as part of a system.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.



This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

This device meets the requirements of the following CE standards.

- EN55032. Electromagnetic compatibility of multimedia equipment. Emission requirements.
- EN55103-2. Electromagnetic compatibility - Product family standard for audio, video, audio-visual and entertainment lighting control apparatus for professional use.
- EN61000-3-2. Limits for harmonic current emissions (equipment input current ≤ 16 A per phase).
- EN61000-3-3. Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection.
- EN62311. Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz - 300 GHz).



Manual version: 1.00

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