

FSH (Filter Sample & Hold Replica) Instructions

Version 2019 August 25

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This is a replica of the **Maestro Filter Sample/Hold**. Referred to as **FSH** in these documents. This exact circuit with the same PCB and enclosure (with different graphics) was also released as the **Oberheim Voltage Controlled Filter**. Both were released in the mid to late 1970's. This pedal has a great Envelope Follower Filter (sometimes known as voltage controlled filter or auto wah) and has a cool Sample/Hold (S/H) setting as well.

Keep in mind that Sample & Hold circuits were originally designed to be used on a synthesizer oscillator output which, when S/H is engaged, typically is set to an entirely different ADRS (Attack, Decay, Release Sustain) sound than a guitar output has. Due to the very nature of this effect, **a lengthened sustain sound is needed** to hear the S/H at its best. In order to get the best S/H sound on guitar, it is recommended that you place it after a compressor or distortion/fuzz (some volume boost may help as well) in your signal chain. Any compressor that has a "Level" or "Volume" control will work. Also distortion or fuzz before it will usually give a better sustained sound that will work well.

Setting the Trimmers

You have to set the trimmers by ear. It takes a bit of time, but it's not difficult to tune it in. The two trimmers only affect the Sample & Hold (S/H) function (mode). Set the toggle switch in S/H mode. The Range control setting has no bearing on the S/H sound, so the setting of the Range knob doesn't matter. It's best to turn the Speed

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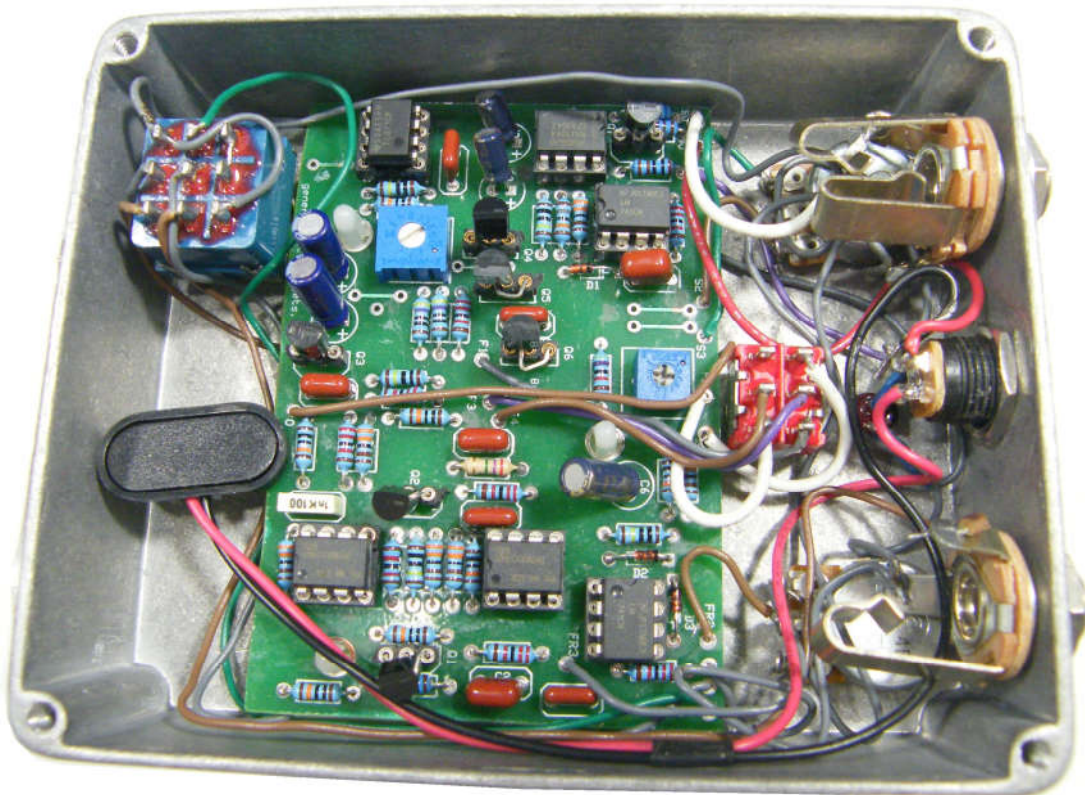
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Knob up pretty high (fast) when you are setting the trimmers so that you can hear the effect at its best. Plug the unit in and hit guitar notes to hear the sound. You will need some long sustain from your input for ease in setting it up, so you may have to precede the unit with a fuzz or heavy overdrive sound. You will have to tweak both trimmers in combination. Tune them to what sounds best to your ear.

Use the project documents provided, starting with the General Build Instructions. Refer to the **FSH Project** for reference.

Here's a photo of the insides of the FSH. Note the photo below is of the prototype and has some inline transistor sockets that are **not included in the kit**.





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Here are some voltage readings that may be helpful if you have problems with your FSH build. **Please note that some of the voltages have a negative value.** Note that you may not get these exact values, but this is a general guideline.

Component	Location	Voltage
IC1 (CA3080)	Pin 1	0v
	Pin 2	0v
	Pin 3	0v
	Pin 4	-8.8v
	Pin 5	-8.2v
	Pin 6	-1.2v
	Pin 7	9.0v
	Pin 8	0v
IC2 (CA3080)	Pin 1	0v
	Pin 2	0v
	Pin 3	0v
	Pin 4	-8.8v
	Pin 5	-8.2v
	Pin 6	-1.2v
	Pin 7	9v
	Pin 8	0v
IC3 (LM741)	Pin 1	-9.0v
	Pin 2	0v
	Pin 3	0v
	Pin 4	-9.0v
	Pin 5	-9.0v
	Pin 6	-0.1v
	Pin 7	9.0v



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	Pin 8	0v
IC4 (LM741)	Pin 1	-9.0v
	Pin 2	0v
	Pin 3	0v
	Pin 4	-9.0v
	Pin 5	-9.0v
	Pin 6	0v
	Pin 7	9.0v
	Pin 8	0v
IC5 (LM741)	Pin 1	-9.0v
	Pin 2	(Oscillates)
	Pin 3	-5.4v
	Pin 4	-9.0v
	Pin 5	-9.0v
	Pin 6	-8.0v
	Pin 7	9.0v
	Pin 8	0v
IC6 (MAX1044)	Pin 1	9.0v
	Pin 2	4.5v
	Pin 3	0v
	Pin 4	-4.5v
	Pin 5	-9.0v
	Pin 6	4.5v
	Pin 7	7.3v
	Pin 8	9.0v
Q1	Collector	9.0v
	Base	0.05v
	Emitter	0.6v



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Q2	Gate	-1v
	Source	0.05v
	Drain	9.0v
Q3	Collector	0.5v
	Base	0v
	Emitter	-8.0v
Q4	Collector	-9.0v
	Base	-0.1v
	Emitter	-0.1v
Q5	Gate	0v
	Source	Oscillates 1.0v
	Drain	-7.0v
Q6	Gate	9.0v
	Source	-2.6v
	Drain	Oscillates 1.0v
Q7	Collector	9.0v
	Base	9.0v
	Emitter	9.0v

Comments and questions are welcome and can be sent to info@generalguitargadgets.com