

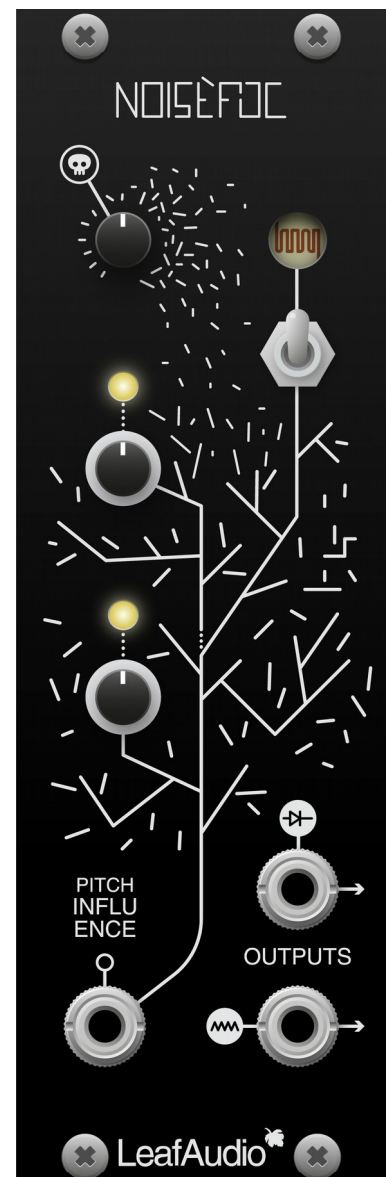
LeafAudio[🍁]

Noisefoc

Experimental Oscillator

Manual

Version 1.1 – KW33'2019



First things first

RTFM

Please do yourself and us a favor and read the manual! If you only spend a tenth of the time we invested in writing, you will be able to operate the device perfectly. In case you are sitting in front of many tiny components: Please read the instructions for the DIY kit first!

Intended Use / Basic Function

The Noisefoc is designed to operate within a modular synthesizer (Eurorack standard). Noisefoc is an oscillator for audio frequencies, chaos or weird control voltages.

Safety Instructions

The Noisefoc module is not intended for operation in or under water or at high humidity. Conductive and/or corrosive liquids, gases, aerosols or vapours may damage or destroy the equipment, regardless of its operating condition. The same applies to fires or temperatures above 85°C/185°F. The Noisefoc is designed to operate on a symmetrical DC voltage of +/- 12V, +12V DC or 9V DC battery.

A suitable power supply unit is absolutely necessary for operation, which provides a safe extra-low voltage that is galvanically isolated from the mains supply.

Avoid mechanical stress, shocks or strong vibrations.

Always use signal sources and/or sinks for the Noisefoc that meet the levels and requirements of the Eurorack standard. Never connect headphones or consumer hi-fi devices to the module!

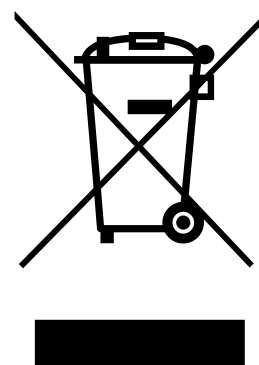
Contact / Responsible

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Disposal

For private households: Information on Disposal for Users of WEEE

This symbol (figure on the right) on the product(s) and / or accompanying documents means that used electrical and electronic equipment (WEEE) should not be mixed with general household waste. For proper treatment, recovery and recycling, please take this product(s) to designated collection points where it will be accepted free of charge. Alternatively, in some countries, you may be able to return your products to your local retailer upon purchase of an equivalent new product.



Disposing of this product correctly will help save valuable resources and prevent any potential negative effects on human health and the environment, which could otherwise arise from inappropriate waste handling.

Please contact your local authority for further details of your nearest designated collection point.

Penalties may be applicable for incorrect disposal of this waste, in accordance with your national legislation.

For professional users in the European Union

If you wish to discard electrical and electronic equipment (EEE), please contact your dealer or supplier for further information.

For disposal in countries outside of the European Union

This symbol is only valid in the European Union (EU). If you wish to discard this product please contact your local authorities or dealer and ask for the correct method of disposal.

Please think of our planet! Repair, resale or
upcycling are always better than final disposal.

Specifications

Width:	8 HP/TE, w/4 Schroff-Holes
Depth:	35mm (1,4"), single PCB
Weight:	70g (2,4oz)
Power demand:	+12V rail: 25mA -12V rail: 0mA
Frequency range:	Unpredictable, somewhere between 20Hz – 20kHz
Tracking linearity:	Absolutely none!
Waveforms:	From pulse to unpredictably weird
Controls:	Skull (Power Starving) Frequency A (OSC-String 1) Frequency B (OSC-String 2) OSC 3 Fix/Light-Control Switch
I/Os:	Pitch influence input Resistor summed output Diode summed output

Thanks

THANKS for purchasing the Noisefoc and supporting us!

A few words about our philosophy: In contrast to many other DIY manufacturers, we produce our front panels and printed circuit boards in Germany, local companies pay local people salaries and comply with the high local environmental regulations. We see this as a contribution to the environment and the economy - locally and globally. Furthermore, we only use high-quality materials and durable parts. Practices such as planned obsolescence are a red rag for us. We hope that our customers will appreciate this and support us in doing so, even if it costs us and them slightly more.

Installation

But before we start: Safety first! Please disconnect your Modular System from mains power.

Secondly, ensure your bus board complies with the Eurorack standard (connector pinout and voltage) and the power supply has sufficient power.

Double check the polarity of the ribbon cable and its proper connection (direction and offset). The red cable must be attached to the -12V rail, both on the bus board and on the module side!

After you connected everything, double checked it and closed your system so no power lines can be touched by your hand, turn on your system and test the module.

We do not accept any responsibility for damage to the module or system caused by improper installation.

Usage

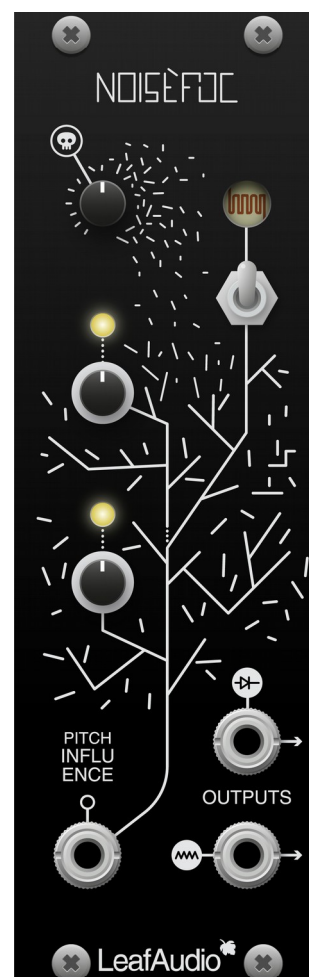
The operation of the Noisefoc is quite simple, but weird. It is based on a CMOS 4093 logic IC which acts as a simple oscillator (OSC) here. This is what makes it a brilliant beginner kit, you can easily understand the basics of the circuit and even bend it. The components are not too expensive and hard to destroy.

It features two parallel OSC-strings, which are mixed together via diodes on the upper output and via resistors on the lower output, what results in a different sound effects.

OSC-string 1 consists of a single OSC and its pitch can be controlled by the upper potentiometer, it has a corresponding LED to display its frequency.

OSC-string 2 features two OSCs in series. The pitch of the first is controlled by the lower potentiometer and by the CV input, titled 'pitch influence'. It also has a corresponding LED. The first OSC 'gates' the second one, whichs pitch is controlled by a fixed resistor value or the light depending resistor (LDR), depending on the position of the switch. So you can play it with light/darkness.

Now the weird thing starts when using the 'Skull knob', which is actually a so called power starving function. Its normal position is fully left. Then the whole voltage, coming from your bus board is used to power the circuit. When turning it further to the right, the power is starved, means the circuit gets too less power and freaks out, which is specially interesting when pitch controls are set to higher frequencies. To name it: dentist drill, screaming and death sounds or sound base for bells, percussions and hi-hats when using additional VCAs and ADSRs.

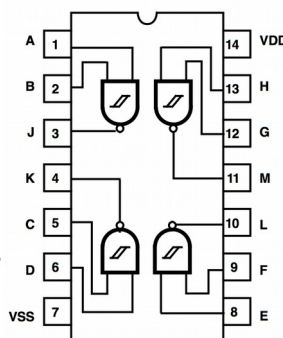


Pitch influence takes incoming CV signals, such as keyboard CV, LFO, ADSR etc. and uses them to influence the pitch of OSC-string 2. But depending on the settings, (specially when using 'Skull'), it is absolutely unpredictable what happens. Forget linear tracking, please!

Tech Details

As said before, Noisefoc is based on a CMOS 4093 logic IC, featuring Schmitt trigger inputs and inverters on the output. It is a so called NAND Gate, a logical function of a combined NOT and AND = NAND.

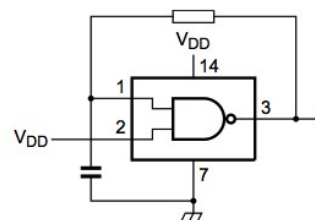
Each of the four gates has two inputs, which 'read' the voltages. If they cross a certain threshold, they are seen as positive = 1 or negative = 0. If both inputs are positive, the AND function says 'switch the power on' but the inverter, which is the NOT function, say 'fuck you, do the opposite'.



INPUT		OUTPUT	
A	B	A NAND B	
0	0	1	
0	1	1	
1	0	1	
1	1	0	

Logical functions like that have a so called truth table. Here you see the truth table of the NAND gate.

Actually for creating an OSC, you need a feedback path from the output back to the input, using a capacitor (C) and a resistor (R) like seen in the next picture. By the values of R and C you can control the frequency of that so called astable multivibrator. The output of a gate alters between 0 and 1, and ready is your simple square wave OSC!



For the 4093 you need a DC voltage up to 15V (VDD on the picture) and ground (VSS on the picture) and you are ready to go. Another popular CMOS logic IC is the 40106, featuring 6 inverters. If you experiment with that kind of devices, you should use a 9V battery and never something connected to wall outlets. All that stuff happens on your own risk.

This explanation might not be perfect but maybe it gets you started. If you want to know more about that kind of stuff, just google for some of the terms, used here. There is a very good book called 'Handmade Electronic Music' by Nicolas Collins which is full of this DIY devices and ideas.