b:art instruments

b:righten

Dual Voltage-Controlled Filter

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Introduction

b:righten is a dual Voltage-Controlled Filter (VCF) designed for Eurorack systems. This versatile filter module provides simultaneous lowpass, bandpass, and highpass outputs, with voltage-controlled cutoff and resonance. With its dual filters and the option to link their controls, b:righten offers extensive sound-shaping capabilities for your modular setup.

The filter is based on the legendary Korg MS-20's design with some added features to improve usability. Through intricate custom circuitry, it was possible to include simultaneous low, band & high-pass outputs and to take the wild resonance of the original filter to a whole new level - all in a tiny 8hp footprint.

The filter can be used as a Stereo module by patching L and R audio inputs to the left and right filter inputs, activating the LINK switch and using the upper CV input that is normalled to the other filter's CV input removing the need to use an active multiple.

Safety Information

Ensure your modular system is powered off before installing the module. Only power on the system once every module is connected and properly installed in your system using the provided screws.

The module uses shrouded headers to minimise the risk of failure due to incorrect power cable orientation, however caution must be exercised to avoid plugging the power cable backwards into the power supply, depending on the model.

Do not expose the module to moisture or extreme temperatures.

Do not operate the module in environments with severe amount of dust in the air.

The module's inputs are protected against electrostatic discharge, but be careful when handling the module itself.

Module Overview

1. Cutoff Knobs
2. Resonance Knobs
3. Primary Audio Inputs
4. Secondary Audio Inputs
5. Secondary V/OCT Inputs
6. Primary V/OCT Inputs
7. Resonance CV Inputs
8. High-pass Outputs
9. Band-pass Outputs
10. Low-pass Outputs
11. VCF Link Switch

Legend

The module is split into two independent filters, with the splitting line going vertically through the middle of the module (top to bottom).

1. Cutoff Knobs

Each filter features a precise cutoff knob. The knob spans the whole audio range.

2. Resonance Knobs

The resonance in the filters uses single LEDs instead of three Schottky diodes in the feedback path, allowing for even greater madness when turning the resonance knob.

Beware: Oscillation starts very early on this module and even the slightest change in the knobs' position can dramatically influence the sound.

3&4. Audio Inputs

The module features two Audio Inputs per filter with a unity-gain mixing stage in the audio input path. Accepted audio levels are 10Vp-p, or -5V to 5V.

The Secondary Audio Input (marked number 4) of the RIGHT filter is normalled to the LEFT filter, meaning that patching audio to the left "IN 2" input copies it to the right "IN 2" input unless the right "IN 2" input is also patched.

5&6. V/OCT Inputs

There are two Frequency CV inputs per filter, following the Volt-per-Octave standard seen in most VCOs. The inputs are summed in a unity-gain mixer before being applied to the internal circuitry.

Accepted CV levels are 0-5V.

The Secondary V/OCT Input (marked number 5) of the RIGHT filter is normalled to the LEFT filter, meaning that patching CV to the upper left "F CV" input copies it to the upper right "F CV" input unless the upper right "F CV" input is also patched.

Legend cont'd.

7. Resonance CV Inputs

The Resonance of the filters can be controlled via CV. Accepted voltage levels are 0-5V.

8, 9&10. Outputs

The module features three simultaneous audio outputs for each filter: Low-pass, Band-pass and High-pass.

Each output is a 10Vp-p output, meaning it swings from approx. -5V to 5V. The output impedances are 1000 ohm for each output.

11. VCF Link Switch

The LINK Switch can be pulled down to link the right filter's Cutoff and Resonance knob to the left's. This allows precise tuning of both filters at once, while maintaining the flexibility of their respective CV inputs.

VCF Calibration

The VCF is tuned to track 1V/OCT while oscillating. Due to its analog nature, it will inevitably fall out of tune with use. When that happens, the following procedure is required to tune the filter cores:

1. Prepare the following equipment: A precise CV voltage source, an oscilloscope, and a small screwdriver.
2. Set the FREQUENCY knob all the way to the left.
3. Set the RESONANCE knob all the way to the right.
4. Make sure the LINK switch is inactive.
5. Measure the frequency of the LOWPASS output.
6. Apply 5.00V CV to the filter's lower CV input.
7. Turn the SCALE trimmer until the measure frequency equals 5 times the frequency measured in step 5.
8. Repeat for the second filter.
9. Repeat the whole process up to three times if more precise tuning is required.

Technical Specifications

Operating voltages: -12V / +12V
Power draw: 57 mA -12V / 55 mA +12V
Width: 8 HP
Depth: 17mm (22mm with power header)
Audio input level: 10Vp-p (-5V/+5V)
CV input level: 0-5V, all CV inputs
Audio output level: 10Vp-p (-5V / +5V)
Output impedance: 1000 ohm

CE

This product was tested and found compliant with the following standards:
EN 55032:2015/A11:2020, EN 55035:2017, EN IEC 63000:2018.
For details, please visit: www.bartinstruments.com/conformity

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