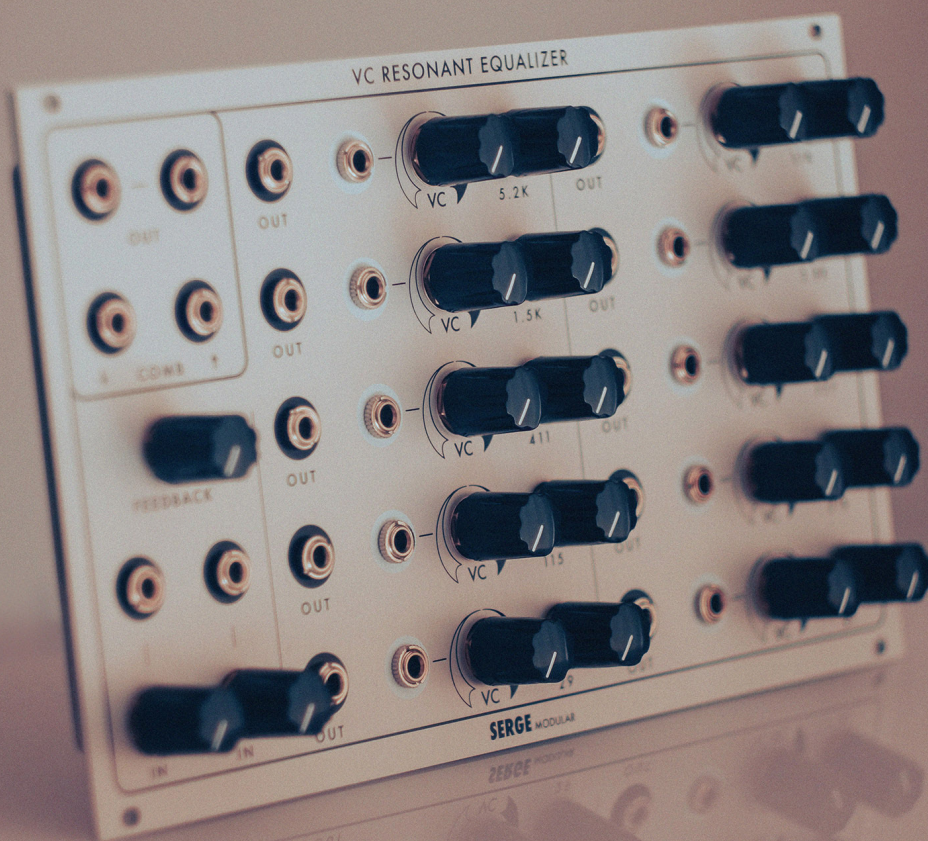


**SERGE**

# VC RESONANT EQUALIZER

FOR EURORACK



USER MANUAL

V 1.0

RANDOM\*SOURCE

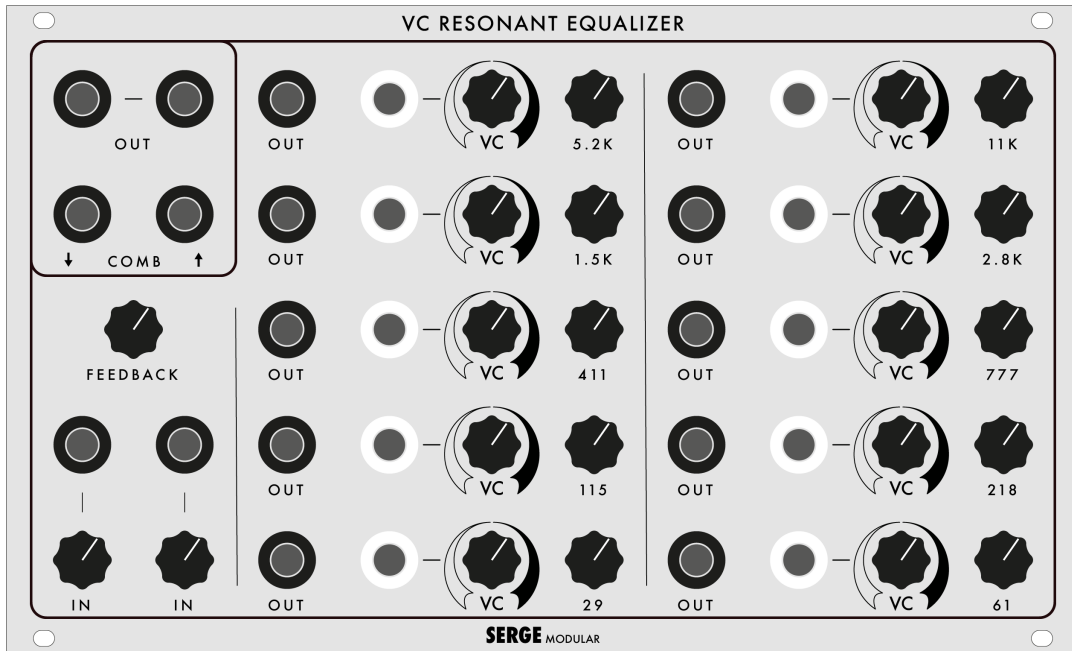
# VCRESEQ

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# VCRESEQ

## Installation

Always turn the eurorack case off and unplug the power cord before plugging or unplugging any eurorack power cable. Do not touch any electrical terminals when attaching any eurorack power (bus board) cables.

The Serge VCRESEQ is an electronic music module requiring about 220mA of +12VDC and 200mA of -12VDC regulated voltages and an appropriate power connector to operate. It must be properly installed into a eurorack format modular synthesizer system case.

POWER YOUR CASE OFF before installing the module. Please use the power cable provided to connect the small end of the power cable to the module: RED STRIPE to “-12V”, as indicated on the back of the module. Carefully install and secure the module in your case. Power on and your module should be ready to go now :-)

Please beware: Powering the module on anything more (or less) than +/-12V is not recommended and may damage the module. Feeding any of the inputs (or outputs) with voltages outside a +/-12V range may damage the module. This type of damage is not covered under warranty.

## How it started

The legendary Serge Resonant EQ is a filterbank with ten bands, designed for electronic sound synthesis and processing, providing formant peaks and valleys similar to those found in acoustic instruments. It is one of the most unique sounding modules with an enormous spectral range. Since its creation around 1979 (as part of the fourth generation of Serge modules), however, the filter bands could only be controlled manually—with one knob for each band. For decades, fans of the Serge ResEQ have lusted for a voltage-controllable version, something that seemed technically hardly feasible.

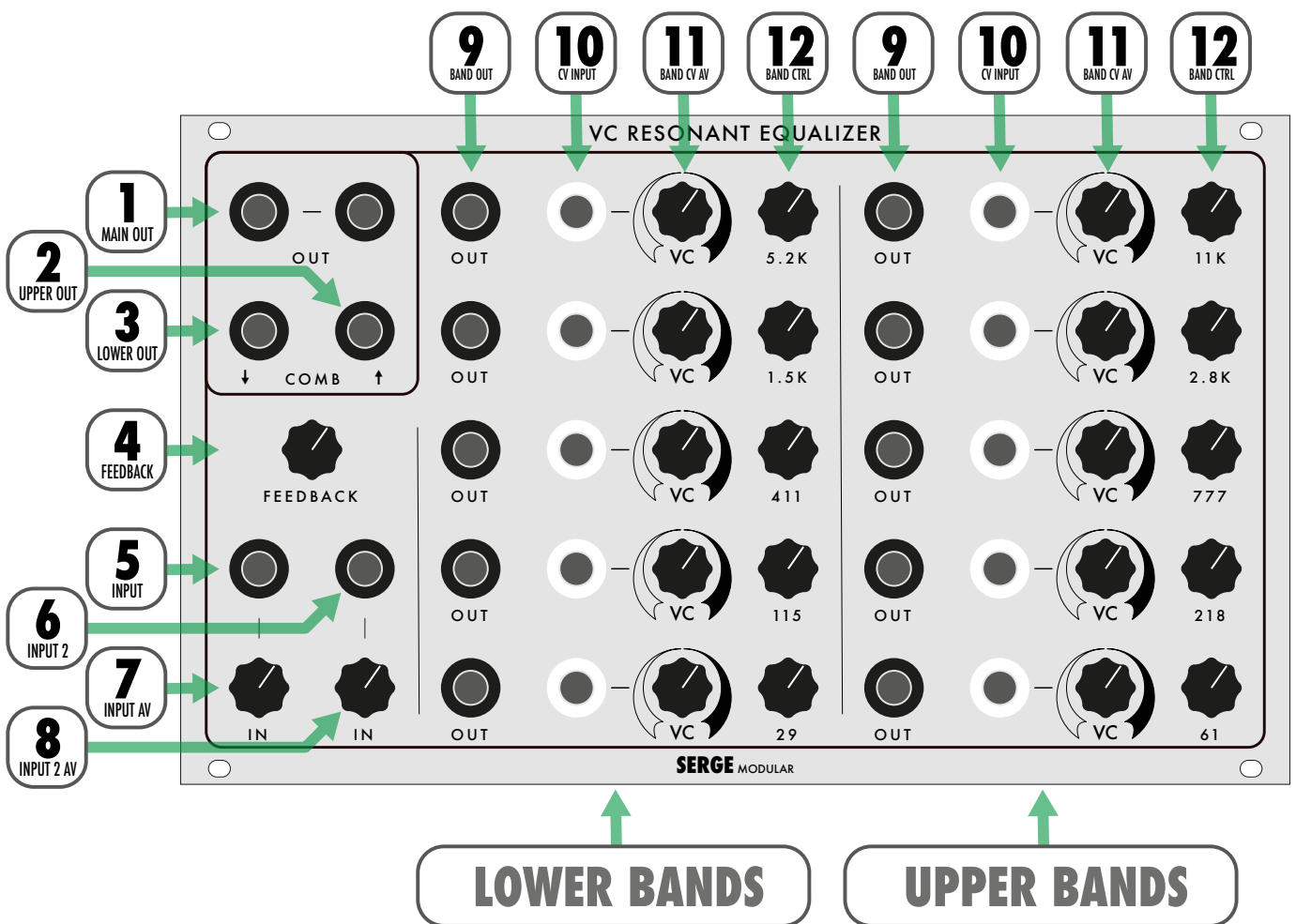
Finally, about 45 years after the initial development of the ResEQ, we have been able to close that gap. The new VCRESEQ is based on the exact original Serge circuitry, but adds for each band:

- a voltage control (CV) input,
- an attenuverter (CV processor) to make that control more versatile,
- an individual output.

Both the CV inputs and the band outputs can be creatively abused, e.g. by using audio signals as CV or patching the individual output(s) back.

# Overview

The VC RESONANT EQUALIZER (VCRESEQ) is a unique ten-band filter designed specifically for electronic sound synthesis and processing. Except for the top and bottom frequency bands, the bands are spaced at an interval of a major seventh. The Resonant Equalizer is designed to produce formant peaks and valleys similar to those in acoustic instruments. The VCRESEQ module is split into three sections: input and output (including feedback) on the left and two groups of filter bands, each comprising 5 basically identical filter controls:



- 1. MAIN OUT(S) Two (identical) outputs that provide the sum of the lower bands (3) and upper bands (2). **Beware: output level can go very high into clipping / distortion - up to 24Vpp(!) depending on input level, feedback and band control settings! This is also true for the COMB outputs (2 and 3).**
- 2. UPPER OUT COMB output for right side: sum of the 5 alternating filter bands (“upper”) at 61 Hz, 218 Hz, 777 Hz, 2.8 kHz, and 11 kHz.
- 3. LOWER OUT COMB output for left side: sum of the 5 alternating filter bands (“lower”) at 29 Hz, 115 Hz, 411 Hz, 1.5 kHz and 5.2 kHz.

Please note that there is no sharp separation between the bands, moving any band control knob (or applying CV to that band) will have an influence on both COMB outputs.

- 4. FEEDBACK** Controls how much of the main out **(1)** is being sent back to the module. Beware: can lead to very drastic results!
- 5. INPUT 1** Audio Input to the circuit. Accepts DC and AC coupled signals.
- 6. INPUT 2** Additional Audio Input. Accepts DC and AC coupled signals. Gets mixed with Input 1.
- 7. INPUT 1 AV** Attenuator control for Input 1 **(5)**. Allows to set the level of the incoming signal to counter balance feedback.
- 8. INPUT 1 AV** Attenuator control for Input 1 **(6)**. Allows to set the level of the incoming signal.

## Band Practice

The VCRESEQ differs from other equalizers in that each band can be set to be resonant. Moreover, there is interaction between the bands - how a single band shapes the sound usually also depends on the settings of the neighbouring band(s). The 10 alternate frequency bands are identical in structure:

- 9. BAND OUT** Signal output (AC coupled) of the individual band.
- 10. CV INPUT** Linear control signal input, acts like moving the Band control knob **(12)**, depending on the attenuverter setting.
- 11. BAND CV AV** Attenuverter control: provides for scaling, attenuation and inversion of the CV signal being sent into the CV Input **(10)**. In center position, CV will have no (or hardly any) effect. Please note that overall effect is a result of the CV applied, the position of this knob and the Band Ctrl knob **(12)**, which acts like an offset: when the Band **(12)** is turned up all the way, a positive CV will only have an impact when the attenuverter is set to inverting (left side). Similarly, to positively boost the band with CV, the Band **(12)** knob should be turned down to allow for space to be moved up by the CV.
- 12. BAND CTRL** Controls the response of the frequency band: When the knob is in the middle position, the response at the main EQ Output is flat. When the knob is between the 9 and 3 o'clock position, up to 12 db of boost or cut is set at the band. If the knob is set beyond the 3 o'clock position, the band will become resonant, simulating the natural resonance of acoustic instrument formant structures. Below the 9 o'clock position, increased band rejection is achieved.

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