

VCS3

DUAL FILTER/OSCILLATOR

Users Guide

SOUNDFREAK

LICENSED BY ELECTRONIC MUSIC STUDIOS (CORNWALL)

Important Notice

Turn your case's power off when installing or removing this module and when plugging or unplugging its connector.

The connector is keyed and must be used in the allowed direction only, otherwise, it may damage the module and the rest of the system.

Use the module only in a safe and controlled indoor environment, far from heat sources, liquids, moisture, and everything that can fall outside the definition of "common sense".

Tech Specs

All the inputs and outputs are buffered.

Voltage range I/O 0-10 V

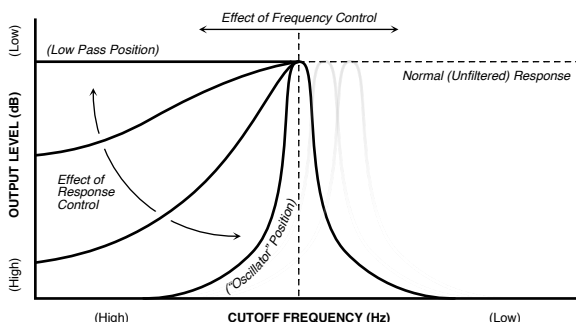
Audio I/O 10 V_{pp} maximum, depending on the frequency.

I — Overview

Our Dual Filter/Oscillator packs two identical VCS3 filters in one module. Both sections are identical, so we will expose its parameter once.

The VCS3 featured a low-pass filter with variable resonance. It had two main parameters: Frequency and Response. The Frequency set the cut-off frequency (i.e., the point at which the filter begins to remove the higher frequencies), while the Response set the filter's resonance. In its original design, only the Frequency parameter was voltage controllable. In our module, both the Frequency and the Response are voltage controllable, thus expanding the circuit's expressiveness without compromising its iconic sound.

The filter's resonance, called Response, emphasised the cutoff frequency and attenuated the lower frequencies. At higher Response settings, the filter became a narrow, self-oscillating band-pass filter, which produced a pure sine wave that could be used as an audio signal per se, hence the name of Filter/Oscillator.



Before 1974, the filter had a slope of 18 dB/octave; after 1974, the filter's slope became 24 dB/octave.

II — Inputs and Outputs

The inputs and outputs listed below refer to each section, and they are listed from left to right and from top to bottom.

Input (Tini-Jax) These are two audio inputs that allow you to patch up to two separate audio sources straight to the filter. The VCS3 used a matrix board to route the signal through its various sections: it was thus possible to feed any treatment unit with as many sound sources as needed. When translating the Envelope Shaper to the 4U format, we wanted to preserve this feature to a certain degree.

Frequency (banana) This input accepts a control voltage to change the cut-off frequency. It features a knob to attenuate the CV signal.

F.M. (Tini-Jax) This input also controls the cut-off frequency, but it accepts audio signals. It features a knob to attenuate the modulating signal.

Response (banana) This input accepts a control voltage to control the Response parameter. It features a knob to attenuate the CV signal.

Output (Tini-Jax) These sockets output the filtered signal. When the filter is self-oscillating at high Response levels, it can output a pure sine tone even with no external signal patched to the inputs.

III — Controls

Slew This switch is quite a common modification on vintage EMS units and changes the response of the filter/oscillator to fast modulations of its cut-off frequency. When set to the lower/upper position, a time constant filters the incoming modulation signal and “smoothens” it.

Frequency CV amount Scales the CV patched to the Frequency banana input to control the filter's cutoff frequency.

Response CV amount Scales the CV patched to the Response banana input to control the filter's resonance.

DB This is another common modification for vintage units and changes the filter slope, or how much amplitude reduction the filter applies to the frequencies above the cutoff frequency. 24 dB/oct is a steeper slope than 18 dB/oct since every octave above the cutoff frequency will be reduced by 24 dB instead of 18. As we said in the overview, the units manufactured before 1974 had an 18 dB/oct filter, while from 1974 onwards EMS switched to a 24 dB/oct model

Frequency It is the main filter parameter and defines the filter's cutoff frequency. When the filter is self-oscillating, it defines the frequency of the sine tone.

Response Defines the filter's resonance and behaviour. When set to 0, or the Low Pass position, the filter does not resonate. Increasing the Response value will result in a higher emphasis on the cut-off frequency and a lower presence of the lower portion of the sound spectrum (the higher portion remains unaffected, i.e., filtered out)