



VERBOS ELECTRONICS

Haas Zone Processor



In 1951 Helmut Haas wrote the paper *On the Influence of a Single Echo on the Intelligibility of Speech*, describing the psychoacoustic effects of delay on sounds. Since the paper describes short delays, “The Haas Effect” generally refers to delays shorter than 50mS. The **Haas Zone Processor** enables the effects in this range, including chorus, flange, phase cancellation, doubling, ADT, waveshaping and others.

At the core is a multi-tapped digital **Delay Bank** largely influenced by vintage studio processors including the Marshall Time Modulator. **Tap1** can be switched and swept from less than 1mS up to 20mS. **Tap2** is chained from the output of **Tap1**, adding an additional 1mS-20mS. **Tap3** ranges from 9-42mS. In addition to having their own full volume outputs, all 3 delay taps can be blended with the **Dry** input signal in a voltage controlled mixer.

Also included is a **Bandpass** filter built from a 2 pole hipass followed by a 2 pole lowpass. **Bandwidth** can be swept from very narrow all the way to full bandwidth. **Frequency** can be swept across the full audio range and voltage controlled through a bipolar attenuator.

To the left is a Voltage Controlled **Oscillator**, similar to the modulation side of a Complex Oscillator. Included is a **Triangle**, **Square** and **Sawtooth** wave that range from 0-10v. The **Frequency** can sweep from more than 1 minute per cycle all the way up to audio range and tracks volt/octave.

There is an envelope **Follower** on the input and both it and the triangle output from the **Oscillator** are normalised to the **c.v. inputs** on the **Delay Time**. The output of **Tap3** is normalised to the input of the **Bandpass** filter and the output of the **Bandpass** filter is normalised to the **Feedback In**. Through tweaking the **Delay Time**, **Oscillator Frequency** and **Bandpass Frequency** multiple resonance points can be accentuated. The **Haas Zone Processor** is intended to be used as an effect, inside a patch as a waveshaper or as a voice on its own.

28HP • 325g • +12v 110mA • -12v 55mA

VCO outputs

mix output

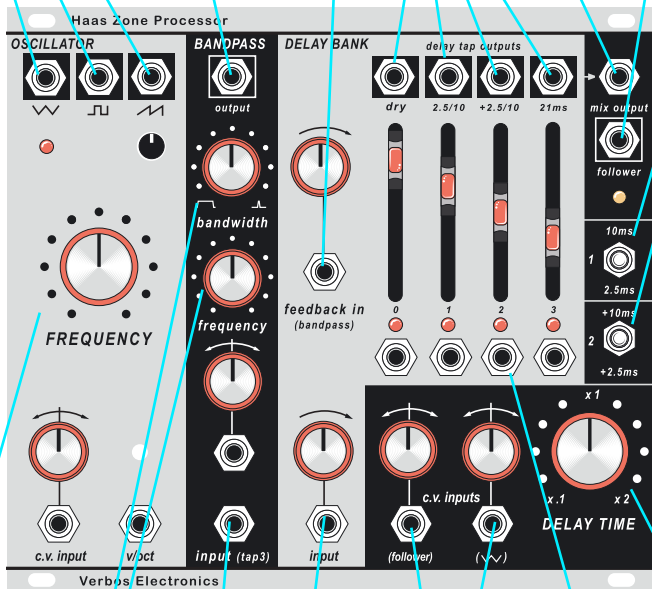
Tap1 and Tap2
range switching

feedback input

bandpass filter out

direct outs

follower out



bandpass frequency
& bandwidth controls

delay input

mixer level controls

delay time

delay time C.V. ins

bandpass filter
input

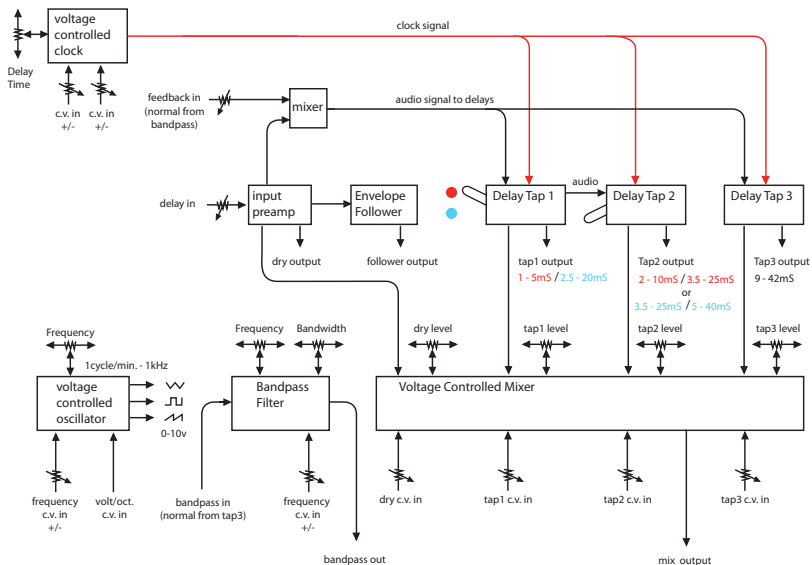
oscillator frequency
control



VERBOS ELECTRONICS

designed and assembled in Berlin, Germany

Block Diagram



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