

The **Optomix** is a two channel Low Pass Gate, providing simultaneous voltage control over amplitude and frequency content of a signal. It is in essence, a Voltage Controlled Filter Amplifier (VCFA) that has an extremely organic response to control signals. Additionally, the Optomix offers a summing stage complete with an auxiliary input, allowing for the chaining of multiple units to create larger mixes (this also works well in combination with the modDemix. The **modDemix** features 2 identical direct-coupled balanced modulator circuits that may be used together or independently for Ring Modulation, VCA, Mixer, Signal Multiplication, Voltage Controlled Polarization, Attenuation and more.

**CHANNEL 1 SIGNAL IN:** DC signal input, capable of accepting audio or CV. Range: Up to 18Vpp.

**DAMP CV IN:** DC CV input for the corresponding channel's damping parameter. Normalized to +8V. Range: 0V-8V.

**CONTROL CV IN:** DC, highly sensitive CV input for the corresponding channel's vactrol gate. Normalized to +8V. Range: 0V-8V.

**Channel 1 vs Channel 2:** both channels are identical, except as noted here. If you don't see a description of the Channel 2 parameter, refer to the Channel 1 descriptions for information.

**DAMP ATTENUATOR:** Unipolar attenuator for the Damp CV Input. With nothing patched to the Damp CV In, the attenuator acts as a manual damping attenuator.

**CONTROL ATTENUATOR:** Unipolar attenuator for the Control Input. With nothing patched to the Control CV In, the attenuator acts as a manual control attenuator.

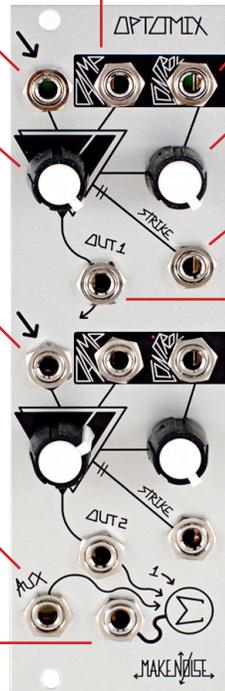
**CHANNEL 2 SIGNAL IN:** DC signal input, capable of accepting audio or CV. Normalized to Channel 1 Signal Out, for series processing. Range: up to 10Vpp (depending on settings and source material).

**STRIKE INPUT:** Gate input for striking or plucking the vactrol. Expects 8V Gate. It acts as a fast attack envelope with slow amplitude response affecting the LPG. Combined with the Damp parameter, Strike allows for the programming of percussive sounds (sharp Attack w/ CV Decay), without the need for a separate envelope generator.

**CHANNEL 1 SIGNAL OUT:** DC output of the signal applied to the input, as pro-cessed by the LPG. Range: 10Vpp (depending on settings and source material).

**AUXILIARY IN:** DC signal input to the Sum circuit, to allow for the chaining of multiple Optomix and modDemix units to create larger mixes. Capable of accepting audio or CV signals. Range: up to 10Vpp (depending on settings and source material).

**SUM OUT:** The sum or mix of all signals processed by the Optomix (Channel 1 & 2 In, and Aux In) is sent out here. Range: 10Vpp (depending on settings and source material).



**CHANNEL 1 SIGNAL IN:** DC signal input, capable of accepting audio or CV.

**CHANNEL 1 LEDs:** LED indication of signal activity in four quadrants. Vertical position represents amplitude and phase of input signal; horizontal position represents amplitude and phase of Carrier CV In signal.

**CHANNEL 1 SIGNAL OUT:** Output of the processed signal from Channel 1.

**CHANNEL 2 SIGNAL IN:** DC signal input, capable of accepting audio or CV. Normalized to Channel 1 Signal Out, for series processing.

**SUM OUT:** The sum or mix of all signals processed by the modDemix (Channel 1 & 2 In, and Aux In) is sent out here.



**CARRIER CV IN:** Determines amplitude & phase of Channel 1 Signal In.

**STRENGTH ATTENUATOR:** Unipolar attenuator for Carrier CV In: Normalized to +5V so that with nothing patched to the Carrier CV In, the attenuator acts as a manual Carrier attenuator. Range: 0V-5V.

**AUXILIARY IN:** DC signal input to the Sum circuit, to allow for the chaining of multiple modDemix and Optomix units to create larger mixes. Capable of accepting audio or CV signals. Range: up to 10Vpp (depending on settings and source material).

**Channel 1 vs Channel 2:** Similar to the Optomix, both modDemix channels are identical, except as noted here. If you don't see a description of the Channel 2 parameter, refer to the Channel 1 descriptions for information.

**Further Information**

**Optomix:** As a VCA, Optomix has a moderate attack response and slow decay response, meaning that it turns on quickly, but takes a while to shut off, yielding a smooth natural sounding decay to almost any sound processed dynamically. The sound is often described as "ringing," and while the circuit is not technically ringing, that does describe many of the sounds possible when using the Optomix to process complex signals generated through FM or Ring Modulation. As a VCF it is a mild, nonresonant Low Pass circuit acting to gently reveal (or hide) the sharper edges of a sound. This characteristic also adds to the "ringing" effect. As the amplitude of the sound decays, there is a simultaneous loss in high frequency content that is similar to the natural loss of energy in idio and membranophonic instruments. The Optomix, being a vactrol-based circuit, will never have the speed or tight tolerances found in many other VCA and VCF circuits. If you seek to program extremely short sounds, clicks, pops and ticks, then the Optomix is not the best choice. What the Optomix does offer is extremely low noise and low distortion and a smooth, natural sounding circuit.

**modDemix:** The ModDemix consist of 2 identical direct coupled circuits that may be used together or independently to process audio or control signals by means of amplitude modulation and the many derivatives of AM such as double/ single-sideband, voltage controlled amplification/ attenuation, voltage controlled polarization or multiplication and of course, ring modulation. The modDemix is a specialized amplitude modulation circuit that could be thought of as a "Thru-Zero VCA," meaning that in addition to the AM, when the Carrier signal (called Carrier CV) changes phase, the resulting signal's phase will flip as well. What makes the modDemix unique when compared to other balanced modulators, is that because it is Direct Coupled, it will perform wonderfully both as an audio rate modulator to implement Ring-Modulation, and as a control rate modulator to implement multiplication of CV. Also, the circuit used will, with ease, turn off around 0V at the Carrier CV In; a characteristic that makes the circuit behave very well as a VCA. Both circuits feed a "Sum" stage, allowing the module to be used as a voltage controlled mixer. The Strength attenuators are "combo knobs," acting as unipolar panel controls. In practice, this means the summing stage can also be a mixer with amplitudes set by the 2 Strength controls. An Aux In allows for chaining multiple modDemix (or Optomix) units to create larger mixes. The attenuator allows for setting the Strength or Level of the incoming signal. When performing ring modulation, adjusting Strength will alter the integrity of the resulting modulated and/or demodulated signal, thus affecting the timbre as well as the amplitude. In most other uses, Strength is directly related to the amplitude of the resultant signal.