

# MANIC



MANUAL V1.0

APOLLO VIEW 

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## LIMITED WARRANTY

Apollo View Modular Ltd warrants this product to be free from defects in materials or construction for a period of one year from the date of purchase (proof of purchase/invoice required).

This warranty does not cover any damage caused by misuse of the product, or any unauthorised modification of the product.

Apollo View Modular Ltd reserves the right to determine what qualifies as misuse at their discretion. Examples of misuse include, but are not limited to:

1. Exposure to extreme heat or moisture
2. Malfunction resulting from wrong power supply voltages, backwards or reversed Eurorack bus board cable
3. Issues related to third party products
4. Any condition resulting from incorrect or inadequate maintenance or care.
5. Damage resulting from misuse, abuse, negligence, accidents or shipping damage.
6. Dissatisfaction due to buyer's remorse
7. Normal wear and tear
8. Damage to the product caused by excessive physical force or abuse of the product, removing knobs, changing faceplates

This warranty does not cover any other causes determined by Apollo View Modular Ltd to be the fault of the user, and standard service rates will apply.

Apollo View Modular Ltd agrees, at its option during the warranty period, to repair any defect in material or quality or to furnish a repaired or refurbished product of equal value in exchange without charge (except for a fee for shipping, handling, packing, return postage, and insurance which will be incurred by the customer). Such repair or replacement is subject to verification of the defect or malfunction and proof of purchase as confirmed by showing the model number on the original dated sales receipt.

Apollo View Modular Ltd implies and accepts no responsibility for harm to persons or apparatus caused through the operation of this product.

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## INTRODUCTION

### WHAT IS IT?

In collaboration with DivKid, Manic introduces an exploration of dual channel mono, mono to stereo or true stereo modulation and sound shaping within a sleek 8HP module designed for both creative freedom and technical precision. Each Channel offers precision linear VCA functionality with traditional unipolar amplitude control or bipolar behaviour for complex ring modulation effects. While we all need more VCAs! The secret sauce lies in the post VCA shape outputs.

The Shape1 output features TanH soft clipping and Serge-style wavefolding, while Shape2 boasts hard clipping alongside a Buchla-style wavefolder. The contrasting topologies between the Left and Right Channels unlock dynamic stereo-widening effects, making the stereo image both expansive and mesmerising. While the circuits are different, they have been tweaked to provide variance for creating stereo images from mono sources while also working with stereo inputs for a balanced, yet enhanced stereo spread.

Designed to excel with both audio and CV signals, Manic effortlessly processes incoming signals for a wide range of uses. Its intuitive layout ensures immediate hands-on control, making it ideal for live performances and studio experimentation.

## SPECIAL THANKS

Ben Wilson

Thomaas Banks

Chris Meyer

Jason Lim

Jimi, Mathew, Tash & Diarmuid

[DivKid](#)

[Thomaas Banks](#)

[Learning Modular](#)

[Instruo](#)

[Glasgow Synth Guild](#)

## MANIC TECHNICAL BACKGROUND

To fully appreciate the capabilities of MANIC, an understanding of its technical components is crucial. Each feature—from the function of the VCAs to the creativity of its shaping outs—is built with technical precision and sonic flexibility in mind. MANIC’s design focuses on clarity, control, and versatility, ensuring that whether you’re working with dual mono, mono-to-stereo, or true stereo setups, you have the tools to shape the sound with studio-quality fidelity. Additionally, while the VCAs, clippers, and wavefolders excel with audio, they are equally adept at processing control voltages, inviting both practical and creative CV/modulation applications.

### VCA

At the core of any sophisticated modular setup lies the VCA — an indispensable tool for sculpting sound. Whether managing the amplitude of audio signals or controlling the intensity of CV modulations, a VCA provides precision handling of signal flow. MANIC takes this a step further by offering not just one but two VCAs, allowing for dual mono, mono-to-stereo, or true stereo functionality. This dualism presents vast possibilities, from independent Channel control to synchronised stereo shaping, ensuring that each modulation or audio signal can be tailored with exacting detail.

### BIPOLAR VCA

In MANIC, the Bipolar VCAs function as both a ring modulator and a four-quadrant multiplier. Traditionally, a ‘ring modulator’ is a circuit that creates modulation effects by multiplying two signals together, resulting in sidebands — frequencies that are the sum and difference of the ‘carrier’ and ‘modulator’ signals — while the original input carrier and modulator signals’ frequencies are suppressed. This circuit’s name was derived from the ring-like arrangement of diodes in its classic analogue implementation. The phrase is now often used interchangeably with ‘four-quadrant multiplier,’ which describes the mathematical operation of multiplying two bipolar signals across all four combinations of their polarities. Although MANIC’s Bipolar VCAs do not utilise a diode ring, they emulate the essential characteristics of ring modulation, generating rich harmonic content and complex textures. The added functionality of Input Bias control in MANIC allows for the deliberate reintroduction of the original ‘carrier’ signal, granting users an expanded spectrum of creative patching for both audio and CV.

Amplitude Modulation (AM), while similar to Ring Modulation in generating sidebands, differs in that it allows both the carrier and the modulator signals to pass through rather than cancelling them out. To achieve AM with MANIC, engage the Unipolar VCA mode and modulate it with another audio-rate signal. This capability means MANIC can produce both AM and RM. Furthermore, by adjusting the Input Bias while in Bipolar mode, you can seamlessly transition between RM and AM characteristics, blending the tones to taste.

## INVERTER

An inverter is a simple yet powerful circuit that reverses the polarity of signals, offering a unique way to distribute control voltages. In the context of MANIC, this capability unlocks new dimensions in modulation by allowing opposing CVs to circulate within the system. This promotes innovative differential modulation techniques and can delve into the intriguing effects of phase cancellation. One of its practical uses in audio includes subtracting the fundamental frequency from one of the clipping or wavefolding outputs, though this does require an additional mixing stage.

## TANH CLIPPING

TANH clipping, derived from the hyperbolic tangent function, introduces soft clipping into the signal path. This form of clipping saturates the signal in a gradual, more musical manner than hard clipping. MANIC harnesses this characteristic to produce warm, rich harmonics akin to the smooth distortion found in vintage analogue gear. The TANH clipping on MANIC is carefully calibrated to enrich the audio without overpowering the original signal's essence, making it ideal for subtle warming of your tones and more pronounced compression or tube gain-like effect applications.

## HARD CLIPPING

In contrast to its soft counterpart, hard clipping truncates the signal abruptly, resulting in a more aggressive and pronounced distortion. MANIC's hard clipping is adept at generating a raw, cutting sound that can define rhythmic edges or introduce harmonic complexity. This effect is particularly effective in creating a percussive impact or bringing a synth line to the forefront of a mix.

## SERGE STYLE WAVEFOLDING

Serge-style wavefolding enriches the sound by adding harmonics through 'folding' the waveform to create a complex series of peaks and troughs. Comparable to additive synthesis in its richness and complexity, this technique allows MANIC to offer a broad spectrum of tonal variations, from subtle nuances to dramatic transformations. Faithful to the original Serge design, yet enhanced for modern application, MANIC's Serge-style wavefolding circuit has been optimised to reduce noise, thereby improving the signal-to-noise ratio and ensuring increased stability and performance within the Eurorack environment.

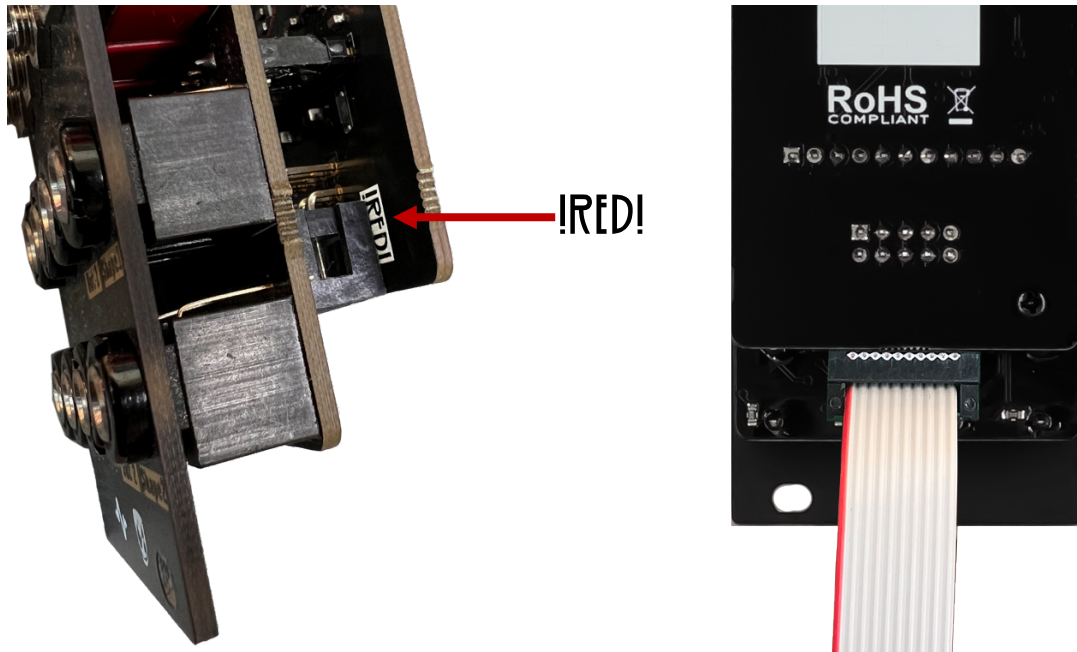
## BUCHLA STYLE WAVEFOLDING

Embracing the West Coast synthesis philosophy, Buchla-style wavefolding in MANIC prioritises timbral expression, sculpting the waveform in a unique way that distinguishes it from the Serge method. It emphasises a different harmonic series and overtones, producing a versatile range of sounds, from ethereal bells to deep, resonant basses. The Buchla wavefolding circuit in MANIC has undergone similar enhancements to minimise noise and maximise stability and performance, offering a robust and dynamic tool tailored to the nuanced needs of contemporary sound design.

## INSTALLATION MANIC

### POWER

Before installing Manic, ensure your Eurorack system is powered off. Manic is supplied with a 10-pin to 16-pin power cable. Carefully align the 10-pin end with the 2x5 pin header on the module. The shrouded power header is on the inside of the bottom of the rear PCB, for space saving making the module skiff friendly.



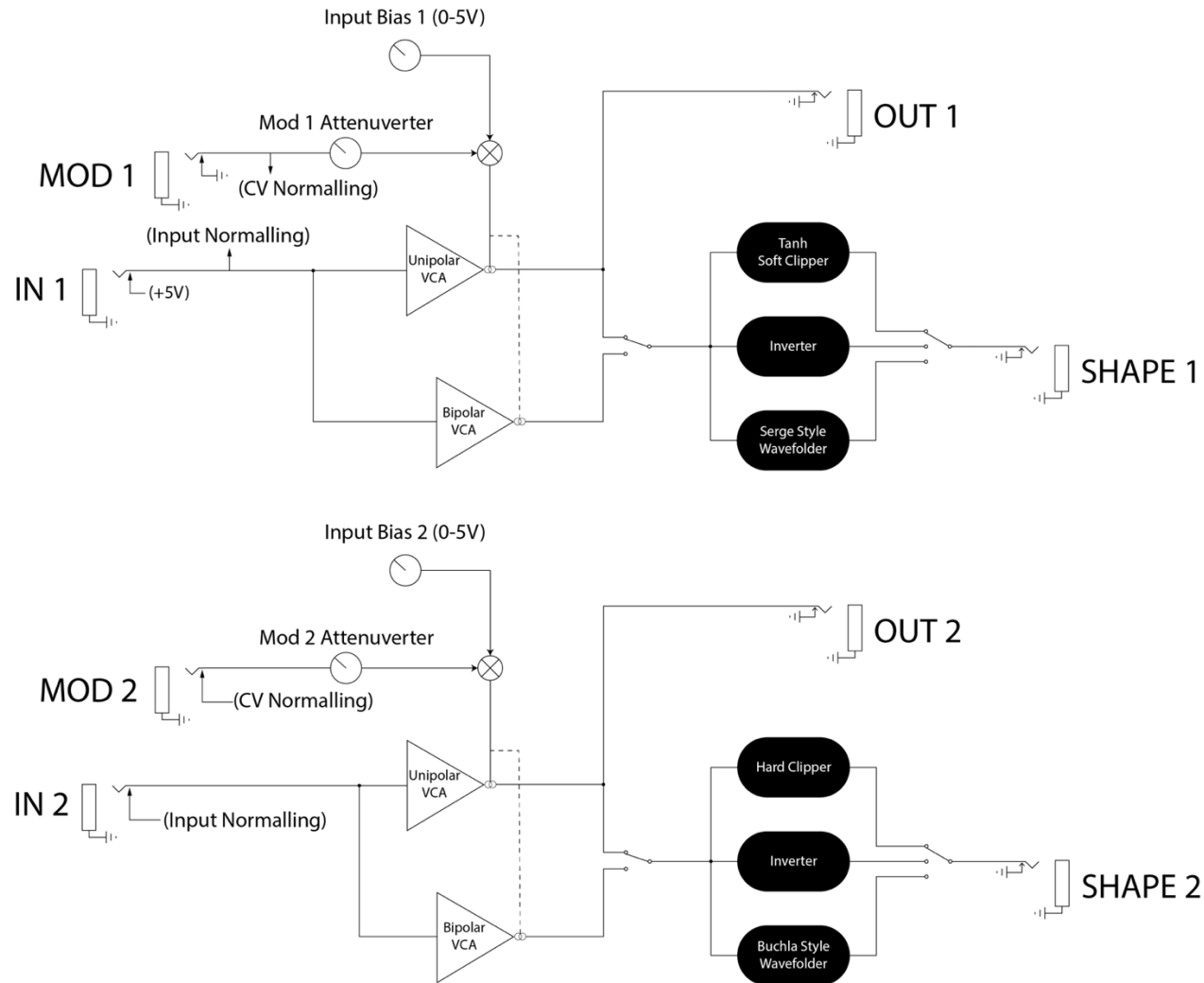
Align the power cable such that it fits into the shrouded header with the key fitting the lock. When looking at the module from the rear, the red stripe of the power cable should be on the left.

Next, find an 8 HP slot in your Eurorack case for Manic. Connect the other end of the power cable to your Eurorack power supply, ensuring the red stripe aligns with the -12V rail. With the power connection established, mount the module into your case using the appropriate screws and power on your Eurorack system.

The module has reverse protection diodes, which will divert the reverse current to ground in case of incorrect installation.



**BLOCK DIAGRAM**



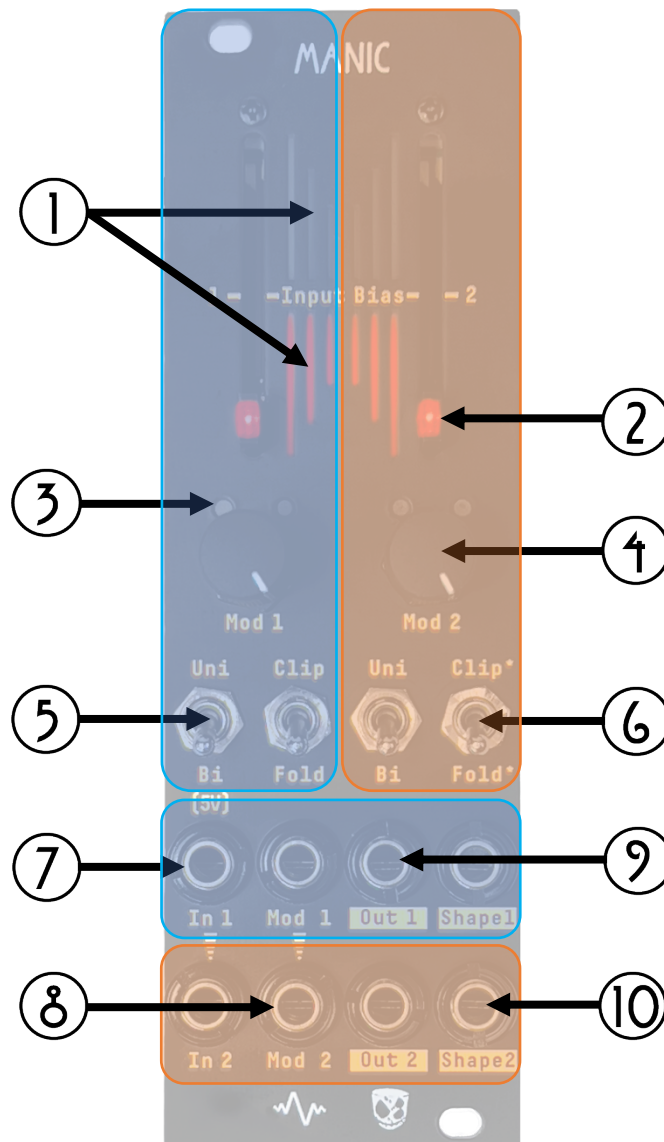
## MANIC FUNCTIONALITY

KEY

Blue - Channel 1 (Left)

Red – Channel 2 (Right)

- |   |                             |
|---|-----------------------------|
| 1. VCA Output Polarity LED Indicators       | 6. Shape Output Mode Toggle |
| 2. Input Bias Sliders (Gain)                | 7. Audio Inputs             |
| 3. Modulation Input Polarity LED Indicators | 8. CV Modulation Inputs     |
| 4. Modulation Input Attenuverters           | 9. VCA Direct Outputs       |
| 5. Unipolar/Bipolar Toggle                  | 10. Shape Outputs           |



## VCA OUTPUT POLARITY LED INDICATORS

These LED indicators display the polarity of the waveform output from each VCA Channel. The LED panel is divided into two main sections: Channel 1 on the left and Channel 2 on the Right. Each Channel section is further divided into an upper and a lower area. The upper area lights up when the waveform is positive, indicating a positive polarity and the lower area illuminates when the waveform is negative, indicating a negative polarity. The brightness of the LEDs increases with amplitude (Bias/Gain). When processing Bipolar CV signals, you will see the sections upper and lower illuminate individually. When processing audio rate signals through the VCA, both sections, upper and lower, will appear to be illuminated at the same time, as both sections are alternately illuminated faster than the eye can discern.

## INPUT BIAS SLIDERS

These provide manual control over the Gain of each VCA section. When in Unipolar VCA mode, maximum attenuation of the signal is with the slider in the lowest position at the bottom of the travel. When in Bipolar VCA mode, the maximum attenuation occurs at the midpoint of the slider's travel, as indicated by the line "1 – Input Bias – 2". Sliding the slider up from here increases the Gain, similar to Unipolar VCA behaviour; sliding the slider down from the centre increases the Gain but additionally reverses the polarity of the Output signal. The voltage supplied by the sliders is 0V to 5V in Unipolar mode and -5V to +5V in Bipolar mode. NOTE: the VCAs can be driven hard with higher voltages than this range via the CV Modulation Inputs. (See CV Modulation Inputs)

## MODULATION INPUT POLARITY LED INDICATORS

These LEDs indicate the polarity of the incoming signal present at the Mod Inputs. The two LEDs sit above each Mod attenuverter correspond to that Channel. The Left LED per Channel is the Negative polarity indicator and the Right LED is the Positive polarity Indicator. Sending positive unipolar envelopes to open the VCA will only illuminate the Right Positive LED. Sending bipolar CV signals will indicate both. Note this behaviour is modified by the Mod Attenuverters. If the Mod attenuverter is in a clockwise position from 12 o'clock the above behaviour is true. If the Mod attenuverter is in an anticlockwise position from 12 o'clock, it will invert the above behaviour.

## MODULATION INPUT ATTENUVERTERS

The Mod 1 & Mod 2 knobs provide nuanced control over the incoming CV signals, allowing for both attenuation and polarity inversion. Optimised for a 0-5V control voltage range, they enable precise modulation depth adjustments, ensuring unity gain when a 5V signal is present. While designed for standard Eurorack levels, they can also accommodate and benefit from higher voltage signals, offering extended dynamic range and intensity for modulation effects. The Mod 1 input is normalled to Mod 2, allowing a single CV source to modulate both Channels simultaneously. For independent control, inserting a cable into Mod 2 disconnects this normalled path.

## UNIPOLAR/BIPOLAR TOGGLE

This two-position ON-ON toggle switch selects the VCA mode for each Channel. Unipolar mode is with the toggle switch in the upper position and Bipolar in the lower position. Unipolar mode is standard VCA operation, which will preserve the polarity of the incoming signal at the VCA output. Bipolar mode is also known as ring mod or a four-quadrant multiplier. Manic uses independent circuits for the Unipolar and Bipolar circuits for each Channel. Flipping the toggle switch simply selects which VCA output (Unipolar or Bipolar) is used per Channel.

## SHAPE OUTPUT MODE TOGGLE

This is a three-position ON-ON-ON toggle switch that selects which Shape circuit is routed to the Shape output for each Channel. In the upper position, the Clipping circuit is routed to the Shape output (Tanh clipper on Shape 1 and Hard clipper on Shape 2). In the middle position, the Inverter signal is routed to the Shape output. In the lower position, the Folding circuit is routed to the Shape output (Serge style folder on Shape 1 and Buchla style folder on Shape 2).

## AUDIO INPUTS

In 1 (Left) & In 2 (Right) - These are DC-coupled, so they can handle CV signals as well as audio. The Left input is automatically routed (normalled) to the Right if no Right input is patched, providing a mono-to-stereo functionality. Connecting a cable to the Right input will override this normalling feature. Without any signal patched, +5V DC is normalled to the input. This means if you adjust the Input Bias Slider or CV, the Mod Inputs a continuously variable voltage from 0V to +5V, which is output from the VCAs. This can be used as a DC offset voltage around the system. This voltage range can be inverted to 0V to -5V by either patching out of the Inverted Shape Output or by using Bipolar VCA mode with the slider at the bottom of its travel and patch from the VCA Direct Out.

## CV MODULATION INPUTS - THESE GO TO ELEVEN!

These inputs are designed to accept not just CV signals for shaping dynamics but also audio signals for exploring Amplitude Modulation (AM) and Ring Modulation (RM) effects. Whether you're working in stereo or dual-mono setups, these inputs are normalised to ensure synchronised control across Channels. For distinct RM or AM textures, simply feed an audio signal into these inputs. While the Bias sliders operate within a 0-5V range, MANIC's CV inputs can handle up to  $\pm 11V$  (the sum of the slider and CV Input signal) before being internally clamped to avoid unwanted distortion. This extra voltage headroom allows users to drive the Clipping or Wavefolding stages harder to their full sonic potential, letting you crank it up to eleven—literally!

## VCA DIRECT OUTPUTS

The direct outputs provide the raw signal from the VCA before it enters any further shaping stages. This allows users to utilise the pure VCA-modulated signal for further processing in their modular setup. Whether employing the clean processing of the Unipolar mode or the intricate modulation of the Bipolar mode, these outputs deliver the processed signal in its most fundamental form.

## SHAPE OUTPUTS

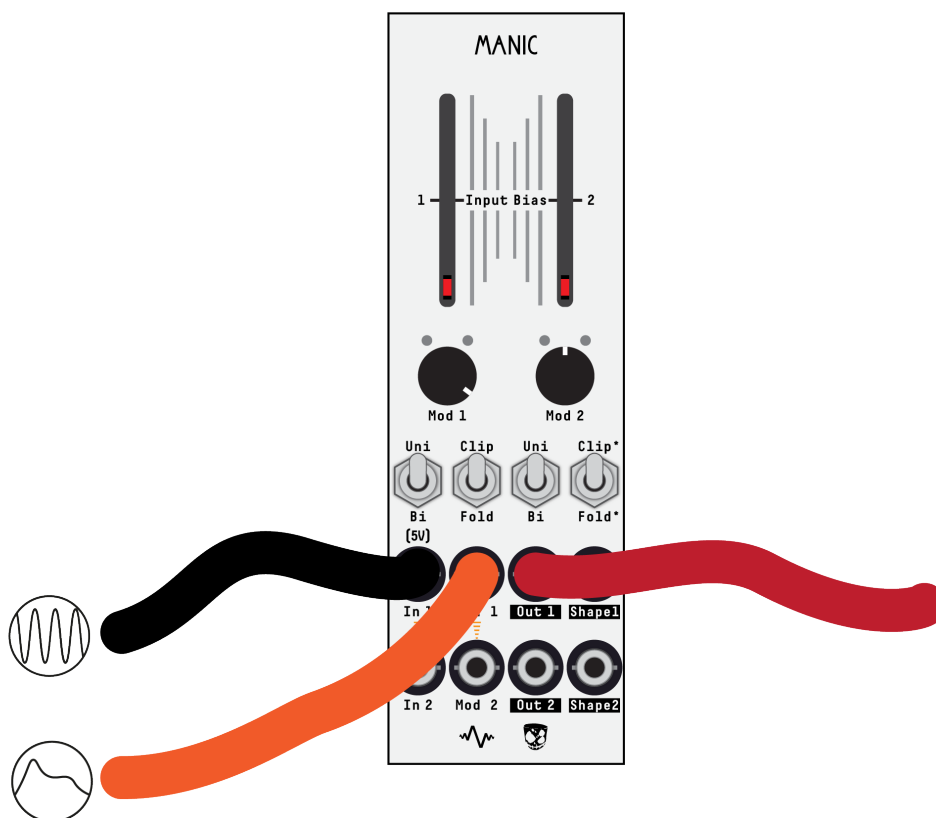
Each Shape output delivers the signal post-processing from the selected shaping circuit. Depending on the position of the Shape Output Mode Toggle, users can access the crisp and responsive clipping circuits or delve into the rich harmonic textures of the folding circuits, or the inverted polarity of the VCA direct output. These outputs are the creative culmination of MANIC's processing, offering shaped and sculpted signals ready for musical or creative application.

## PATCH EXAMPLES FROM THE VIDEO

[Full Video Link](#)

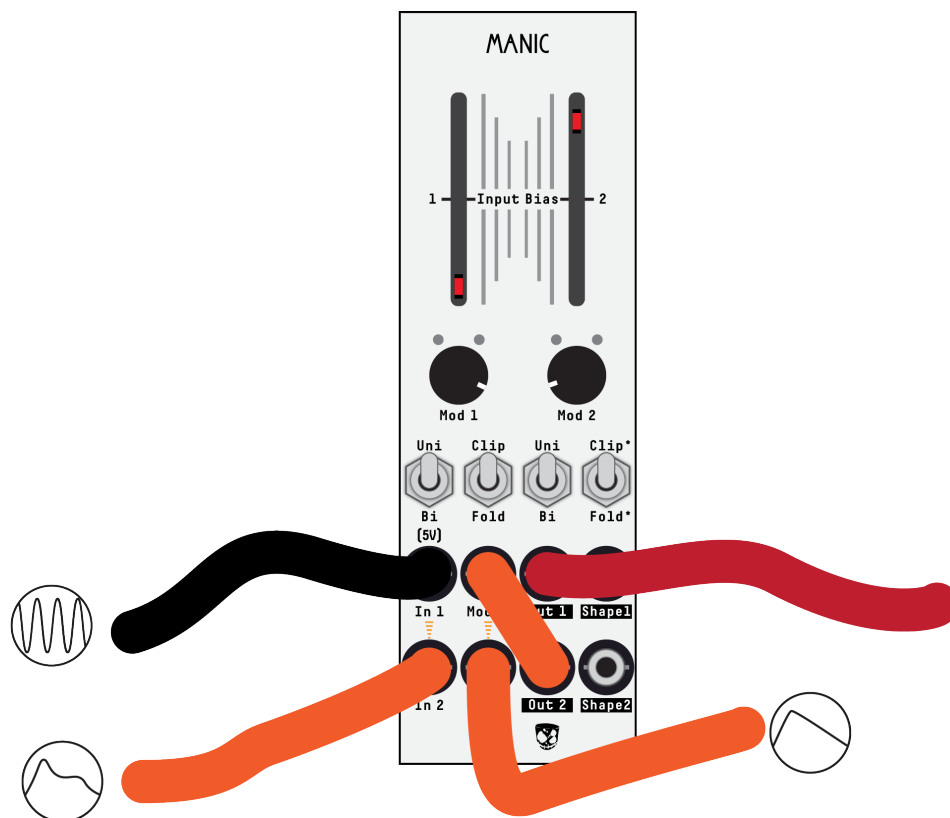
### PATCH 1A - VCAs FOR AUDIO CONTROL

[Video time stamp \(4:56\)](#)



Undoubtedly, the most common use of a VCA is to control the level of a synth voice with an envelope. We'll start by patching that here. First, switch the Channel of Manic to UNI (unipolar) behaviour for standard VCA use. Patch an audio signal into the Channel input and keep the input bias control down to ensure no sound is present at the output. Patch an envelope into the modulation input and turn the mod depth control clockwise from the centre to modulate the audio level with an envelope.

PATCH 1B – USING VCAs TO MAKE COMPLEX MODULATION SIGNALS

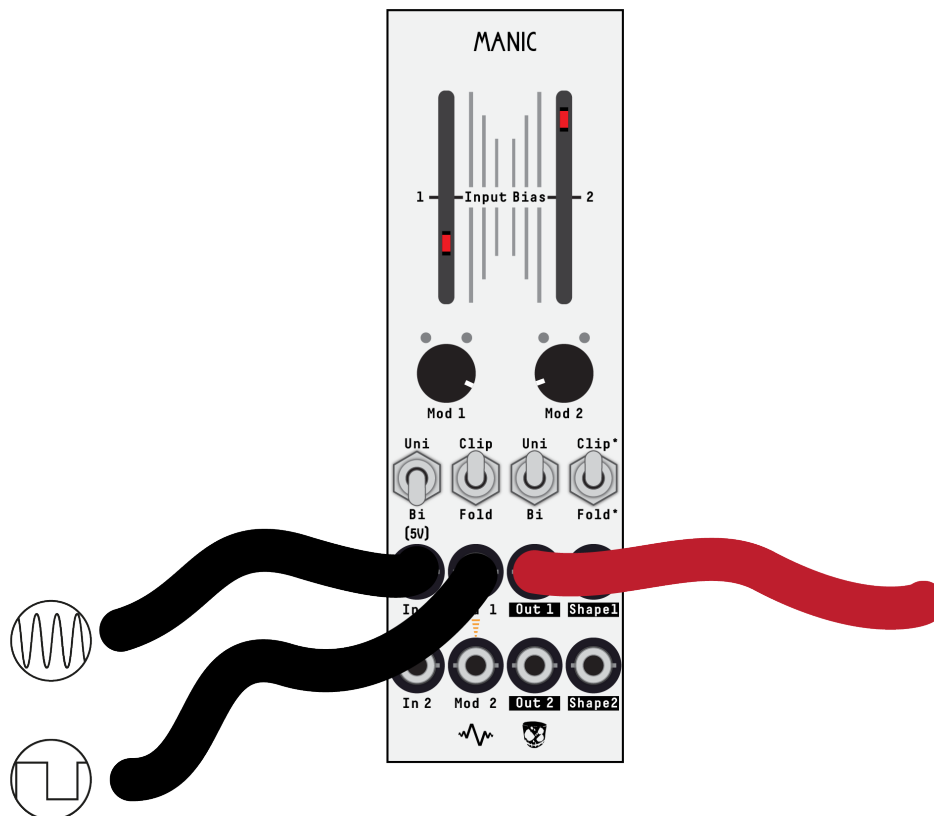


We can also use VCAs to modulate modulation with other modulation signals. We'll do that here to create a more interesting modulator for our audio. Using the next Channel on Manic again turn the VCA behaviour switch to UNI. Patch in the original envelope to the VCA input and patch in a secondary modulator into the modulation input. Adjusting the input bias control will set how much manual level the input has in the output, and adjusting the modulation depth knob will control how much you modulate your modulation.

In this example, we're using our main envelope as the VCA input and a quarter-note decay envelope as the modulation signal. Turning up the input bias fully sets the VCA to let the envelope at the input through at full level. Then, using the modulation depth control to invert (turning fully anticlockwise), we create a ducking effect within our main envelope.

Finally, patching your newly modulated modulation into the mod input on the first VCA and use this control your audio signals.

## PATCH 2A – RING MODULATION AS A VCO EXPANDER

[Video time stamp \(7:56\)](#)

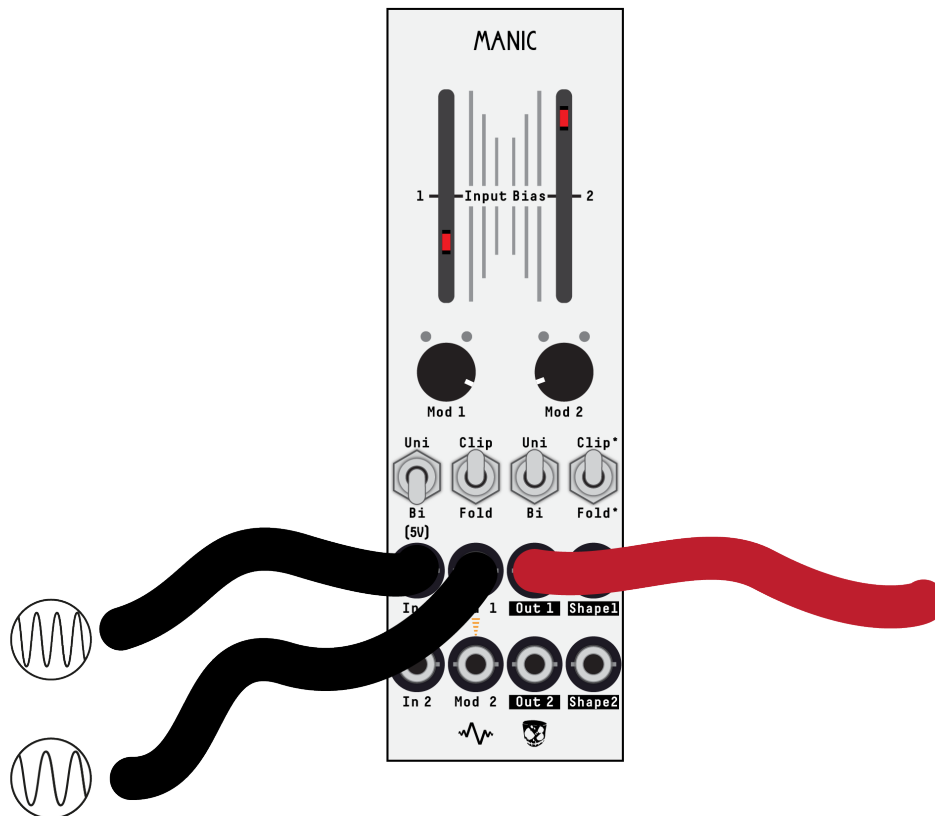
Ring Modulation is often a misunderstood effect, often thought of as a clangorous set of overtones from a retro sci-fi era. But they're incredibly flexible processing for manipulating audio and CV. In this first ring modulation example, we'll use a single VCO with ring modulation to create new waveshapes.

Start by patching a sine wave into the input on Manic, switch the VCA behaviour switch to Bi for bipolar behaviour (aka ring modulation) and patch a sub square wave into the mod input. Adjust the input bias and modulation depth controls to taste. Creating new waveforms as you adjust the controls.

To expand this further, or if your VCO or system doesn't have a sub-octave square, patch different waveforms into input and modulation input. Any VCO with multiple waveform outputs will work here.



PATCH 2B – GOING BEYOND CLASSIC RETRO RING MOD TONES



Using two different oscillators, patch their sine wave outputs into the input and modulation input on Manic. Set the VCA behaviour switch to BI, centre the input bias control and turn up the mod depth fully and this gives you classic ring modulation tones.

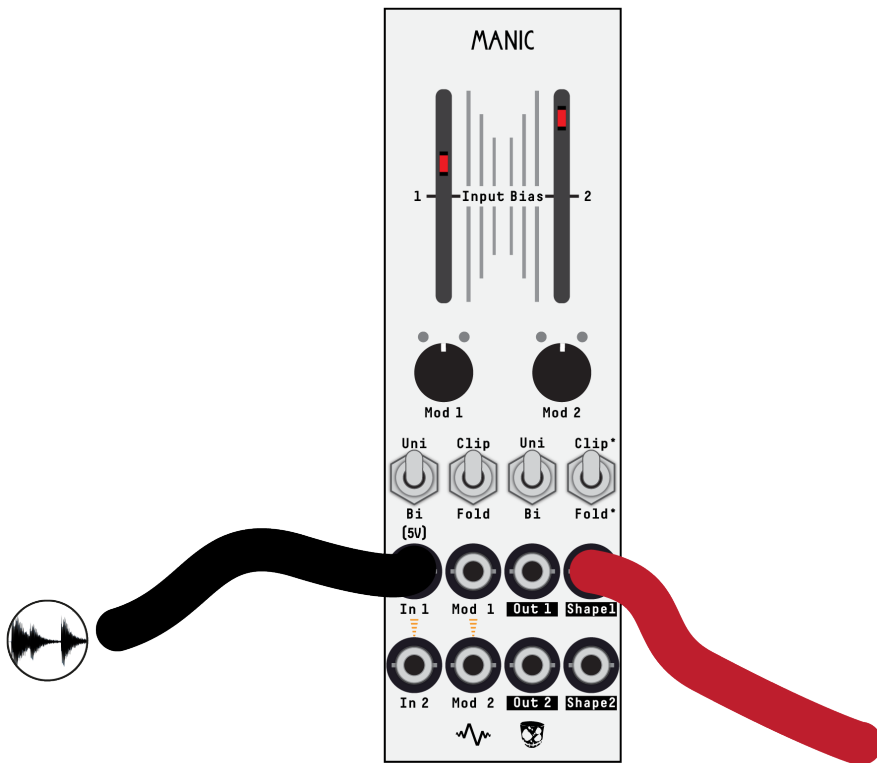
Adjusting the tuning of VCOs to compliment each other musically, typically octaves and fifths work well as intervals between the oscillators.

Right away Manic presents an advantage here over a basic ring modulation module, By turning up the input bias you can blend in the fundamental tone and frequency of the input that isn't present in the ring modulated output. This is great for added weight and low end to the ring modulated overtones.

You can lock things in musically by patching sync between the oscillators, and here, we push our sound further by taking the output from the shape section and engaging clipping for a ring modulation into the clipping process that brings in a range of new and exciting timbres.

PATCH 3A – A CHARACTERFUL DRUM BUS

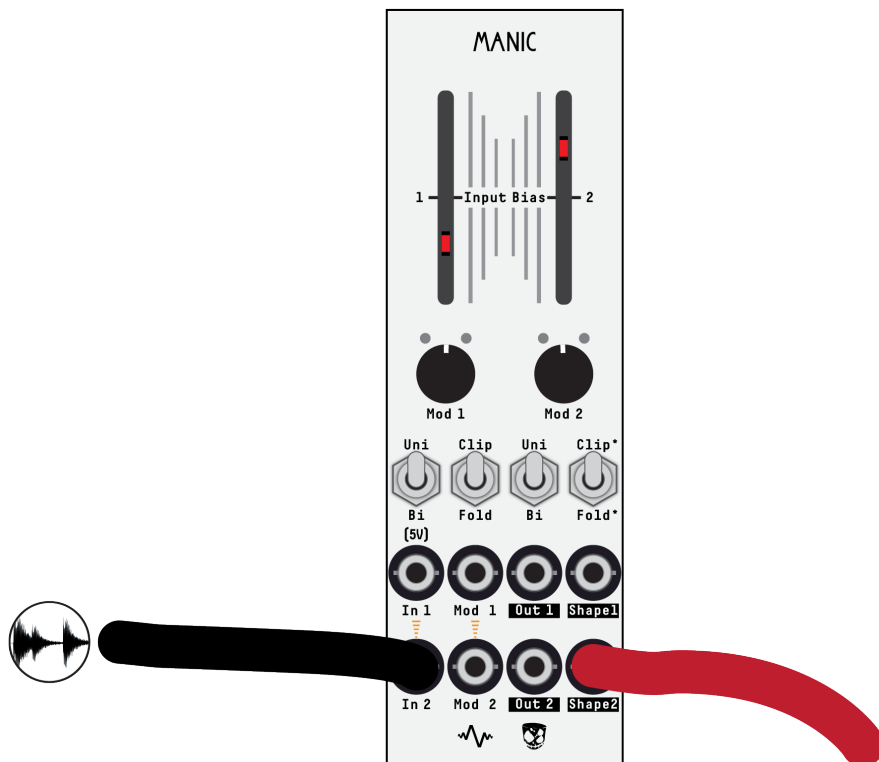
[Video link \(10:58\)](#)



Here's a really simple one. Take your mixed drum section and input that to Manic Channel 1. Patch the shape output and switch the shape to clipping. On Channel 1 this is a TanH style soft clipper, which gives a compression style, classy saturation feel to beats that's very responsive to input level.

Turn up the input bias to dial in the level and clipping to taste. To further this patch, try using rhythmic envelopes of envelope follower CV signals into the mod input and use that to accent or duck (like a compressor) the beat at the input.

PATCH 3B – BITING CHARACTER FOR BASSLINES

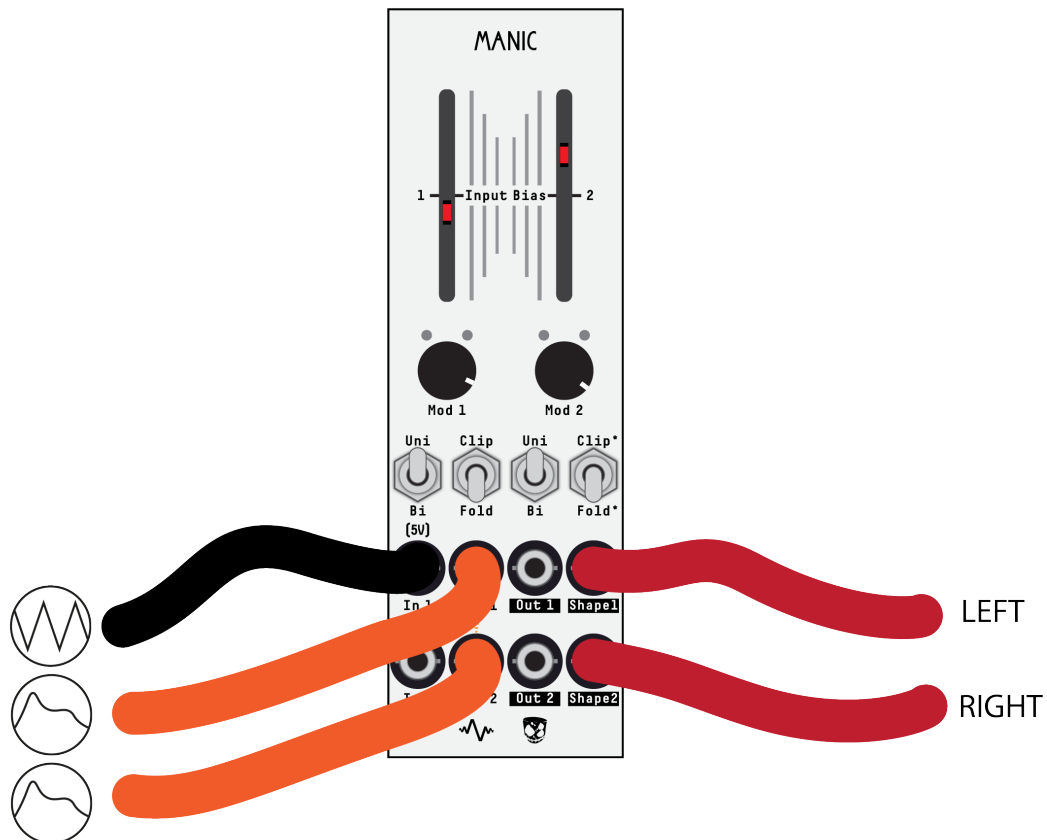


Another simple one here exploring the clippers and here we'll use the hard clipper on Channel 2 to saturate a bassline.

Patch your synth voice into the input of Channel 2. Take the output from the shape out and switch the shape behaviour to clipping. On Channel 2 the clipping is a hard clipper, full of character for a synth voice and it really chews on resonant filter sweeps.

You can expand this by patching modulation into mod input, try using envelopes with positive mod depth control or envelope with inverted mod depth to duck the sound in time with a sequence.

## PATCH 4 – STEREO WAVEFOLDING!

[Video link \(13:49\)](#)

Due to the normalised inputs patching a stereo output from a mono source is really simple with Manic. Patch an oscillator output (we recommend sines or triangles, but saw waves fold really nicely too) into the Channel 1 input on Manic and patch the Channel 1 shape output into a mixer and pan that hard left and patch the Channel 2 shape output into a mixer and pan that hard right. The two outputs of Manic here form our stereo signal. Set both shape switches down to wavefold.

To start with, move the input bias controls to shift the input level through various stages of folding. Now add a single modulation source (envelopes work well) to the Channel 1 mod input. Adjust the mod depth control on both channels to create a balanced (or mismatched for a tilting fold effect) fold behaviour. The difference in the two fold types on the shape outputs (Serge style on Channel 1, Buchla style on Channel 2) will create a stereo image from a mono source here.

Any difference in modulation will emphasise the stereo nature of the patch, in this example we had two simple decay envelopes playing from different random gates patched into the two mod inputs. Sometimes both channels would modulate or just one or the other. Create accents in the stereo image as well as some notes that modulate fold together in a more unified manner.

To expand the idea, patch the Manic outputs into a stereo filter, VCA or low pass gate to close down folded outputs.

MANIC  
MANUAL V1.0

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