Mezcal is a collection of 4 essential Analog Utility circuits that work both with Audio and CV signals. It consists of a Buffered Multiple with 3 outputs, a Half/Full Wave Rectifier and an Inverter to transform audio and CV signals in many interesting ways, a 3 input Unity mixer/Averager for mixing cv or audio signals without clipping and a Bipolar Output Comparator with an additional NOT (-) output. The Comparator can be used to extract gates from given inputs with the added ability of varying the width of those gates by modulating the threshold voltage. By means of input normalization among all sections, the top Input (arrow) is routed to all the below Input (arrow), allowing Mezcal to deliver lots of different output signals from only one input signal!

Features:

- 4 Audio/CV Analog Utility Circuits

- Buffered Multiple with 3 outputs

- Half/Full Wave Rectifier and Inverter

- 3 input Unity mixer with a gain of 1/3 for each channel (Averager)

- Bipolar Comparator with extra NOT (inverted) Output

- Input Normalization. Each section Input is normalled to the Input of the below section
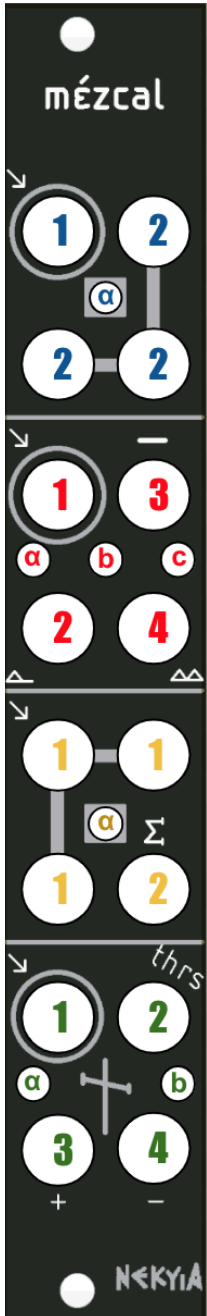
Tech Specs:
Depth: 25mm. Skiff Friendly!
Power: 33mA @+12V / 34mA @-12V
4hp

Installation

Before installing this module disconnect the power from your system! Double check the polarity of the ribbon cable! The red stripe should be aligned with the -12V rail, on both the module (***white line***) and on the bus board.

User Guide:

1. Signal Input.

2. Buffered Outputs carrying copies of the Input signal.

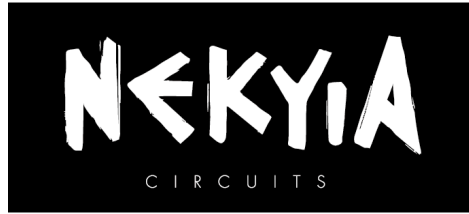**a.** Bipolar Input signal indicator.

1. Signal Input.

2. Half Wave Rectifier Output. Removes only the negative part of the Input signal.

3. Inverter Output. Inverts the phase of the Input signal by 180°.

4. Full wave Rectifier Output. Inverts the negative part of the Input signal into positive.

a. Half wave Rectifier signal indicator **b.** Inverted signal bipolar indicator **c.** Full wave Rectifier signal indicator.

1. Signal Inputs. The arrow Input signal is normalled to the Input signal of the above section.

2. Sum Output.

a. Bipolar Sum Output signal indicator.

1. Signal Input.

2. Threshold Input. The default Threshold value is 0V.

3. Comparator Gate Output (+/- 5V).

4. NOT Output; Comparator Inverted Output (+/- 5V).

a. Comparator Gate Output indicator **b.** NOT Output indicator.

Tips & Tricks

- *The Buffered Multiple* section is essential to avoid voltage drop when distributing a signal to different destinations. For example, you can distribute a note CV to 3 Oscillators without causing any tuning issues.

- *The Half/Full wave Rectifier* and Inverter section is very useful to transform a bipolar signal to unipolar as well as invert it. However, this section has a lot more versatile uses like creating new complex LFO waveforms, waveshaping and adding distortion to audio signals, as well as doubling clock or frequency of the Input signal. Also, the Inverter in combination with Buffered Multiple or Unity Mixer can offer interesting patches such as to make a stereo version of a mono audio signal or to convert a LP filter to HP.

- *The Unity mixer* will sum the 3 Input signals with 1/3 of their original gain in a way that 3 cv/audio signals at 10Vpp each will result in a 10Vpp Sum output if plugged all together. Each of the inputs will be individually seen as a third of their max value at the output. This is particularly useful for avoiding clipping when mixing cv/audio signals.

- *The Comparator* outputs can be useful to trigger envelope generators, pinging low pass gates or providing a clock source. The Comparator can work as a level detector; it produces a positive gate when the input signal even slightly surpasses the level of the Threshold signal input. The NOT output carries the inverted version of the Comparator Output. If the Threshold input is not patched, the default threshold value is set to 0V so the Comparator Output stays high because even the slightest glitch on the Comparator input is higher than 0V. To use the comparator with an input signal you can set any fixed DC voltage to the Threshold input and observe the output. If two AC voltages are used, the Comparator will deliver gate variations whenever the two voltages match in value. Also, sidechain effects or Panning can be achieved through the NOT output since it always carries the opposite of what the (+) output does! Finally, achieving pulse-width modulation of Comparator gate outputs is possible by modulating threshold level. Patching any Wave out of an Oscillator on the Input will result in a Pulse wave and Pulse-width modulation can be achieved by modulating threshold level.

- You can break the input normalization of a channel by patching a signal to its input.