

# WFM OSCILLATOR

## USER GUIDE



### Wave Form Mutator

The WFM Oscillator's continuously variable waveform allows you to explore the potential of waveform mutation. The addition of a VCA on the WFM output introduces the possibility of modulating the amplitude of a mutating wave.

Or, think of the WFM circuit as a welcomed addition to what is already a fully featured analogue VCO. Besides the unique waveshaper, you also get linear & exponential FM, Hard Sync, and PWM.

### Technical specifications

- 8hp
- 35mm depth
- 65mA/+12v, 65mA -12v current draw
- reverse power polarity protection

1 FREQ knob provides coarse tuning of the output frequency.

2 FM input, attenuator & switch for linear or exponential frequency modulation of all 3 outputs. The Fm input is AC coupled.

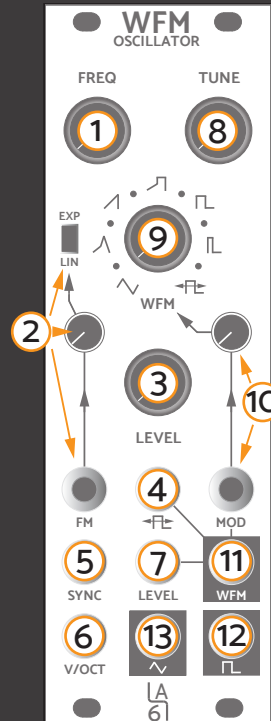
3 LEVEL knob acts as an amplitude control of the WFM output, or as a DC offset when a signal is present at the LEVEL input.

4 PWM input modulates the pulse wave of the WFM output.

5 SYNC input acts as a hard sync on the falling edge of the input.

6 V/OCT input for external control of the output frequency.

7 LEVEL input controls a VCA on the WFM output. Unipolar CVs can be used for traditional VCA operation, or bipolar signals for amplitude modulation..



8 TUNE knob provides fine tuning of the output frequency.

9 WFM knob controls the wave shape present at the WFM output, moving clockwise, the output morphs from triangle to saw to pulse, and ends on a variable pulse width output.

10 MOD input & attenuator receive a CV signal to modulate the WFM output's wave shape. A 0-5v signal will sweep from triangle to variable pulse.

11 WFM output wave shape is controlled by the WFM knob and MOD input & attenuator

12 PULSE output is a fixed duty bipolar pulse wave. Useful for syncing 2 WFM VCOs.

13 TRIANGLE output is a bipolar signal useful for audio rate modulation of a second WFM.

### The WFM Circuit

The WFM's waveshaper is an adaptation of the RSF Kobol's waveform crossfader. The original circuit has been left intact apart from minor changes. As such, it accurately mimics the Kobo's waveshaping sound, as well as its quirks.

When modulated at audio rates, the timbres generated can be similar to those of a traditional wavefolder. Dialing in the WFM knob and MOD input attenuator creates a wide range of unique harmonic spectra.

Further, by patching up two WFM oscillators, you effectively create a complex VCO, with the LEVEL of the modulator acting as the modulation index of the carrier.

The DC bias fluctuations present in the original Kobo circuit have mostly been eliminated from the WFM's final output, but you may still encounter some offset when amplitude modulating the triangle wave. Also as per the original circuit, the triangle wave of the WFM output is roughly half the amplitude of the other waves.