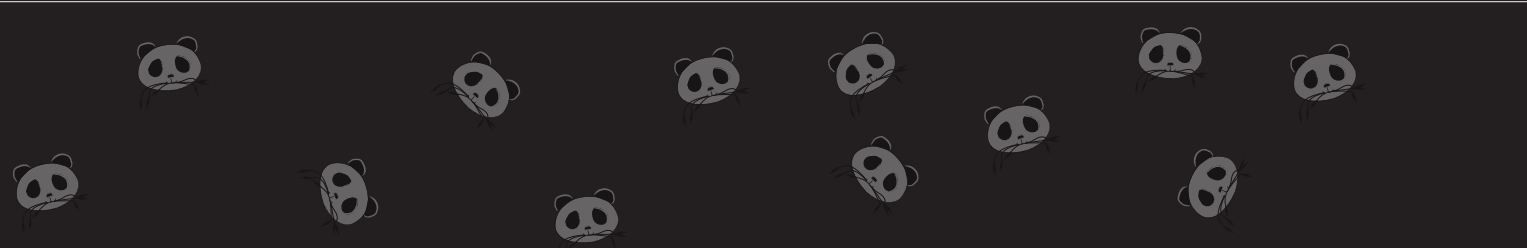


OPERAT USER MANUAL





INTRODUCTION:

Operat is a highly functional, analog oscillator with a multitude of blendable modulation features, making it a module that is just as good as a collaborator as it is a solo module. Operat offers four basic waveshapes that are blendable via an internal mixer, offering a sine, triangle, saw and square wave.

These waves not only have their individual output, but they additionally have their own individual mixer with CV inputs for introducing complexity at an early stage, use it as a VCA or for amplitude modulation! The square wave's pulse width can be modulated via the PWM control, CV input with three different flavors to choose from for adding variety to PWM.

The Sync input can act as hard or soft sync to force Operat to any other VCO's base frequency, a desirable effect to modulate with the additional exp FM input. Modulate the internal mixer's final output with either AM or RM for metallic timbres, and a blendable dry/wet control allows you to determine how much of the effect is heard.


Thru-Zero FM/PM producing a wide range of timbres that can be introduced with the symmetry parameter, offering subtle sonic shifts to in-your-face aggression. Operat can act as a VCO or LFO, making it just as great of a tonal source as much as a modulation source.

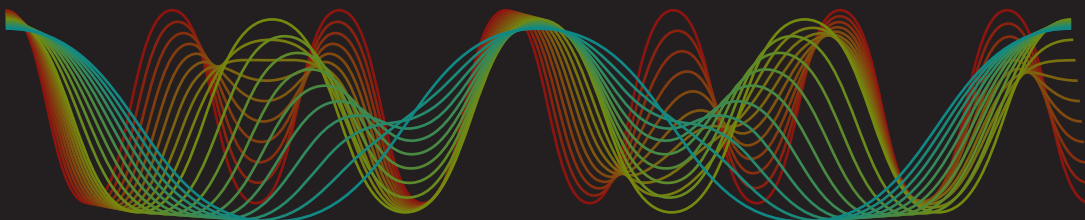
INSTALLATION:

- * Disconnect your synth from the power source.
- * Double check polarity from the ribbon cable, unfortunately if you damage the module by powering in the wrong direction it will not be covered by the warranty.
- * After connecting the module check again you have connected the right way, the red line must be on the -12V





- (A) MIX output
- (B) Square signal out
- (C) Ramp signal out
- (D) Triangle signal out
- (E) Sine signal out
- (F) V/OCT input
- (G) PWM CV input
- (H) AM-RM Mod input
- (I) AM-RM input signal
- (J) TZ-FM|PM input signal
- (K) EXP FM input signal
- (L) AM input for the Square signal
- (M) AM input for the Ramp signal
- (N) AM input for the Triangle signal
- (O) AM input for the Sine signal
- (P) Sync input
- (Q) Hard or Soft sync switch
- (R) LFO or VCO switch
- (S) Square signal mix level
- (T) Ramp signal mix level
- (U) Triangle signal mix level
- (V) Sine signal mix level
- (W) TZ modulation amount
- (W1) Modulation Symmetry and waveform inversion 
- (W2) TZ-FM or PM switch
- (X) PWM amount
- (X1) PWM configurations
- (Y) AM-RM crossfade
- (Y1) AM-RM amount
- (Z) Coarse
- (Z1) Fine Tune



Operat is a new-generation voltage controlled oscillator with different modulation inputs.

Focused on additive synthesis by combining and feeding external signals to it, can achieve a wide range of complex waveforms.

The outputs include triangle, sine, sawtooth, pulse with PWM and 3 different configurations

Four-channel mixer with linear control VCA's sums sine, triangle, saw, pulse waveforms plus AM-RM circuit with crossfade and amount control. It provides unprecedented temperature-compensation, with careful attention paid to the improvement of the triangle waveform compared to previous generation VCO circuits.

Both soft, hard sync is provided.

Through-zero FM / PM can be achieved with a selector switch, with an amount control also modulation Symmetry.

Symmetry adjusting inverts the signal useful for LFO duties.

Audio rate signals or low-frequency signals can be chosen with a switch.

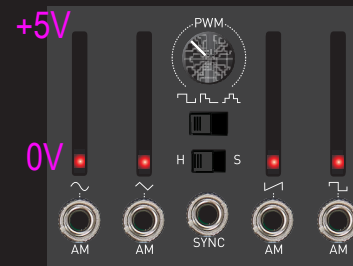
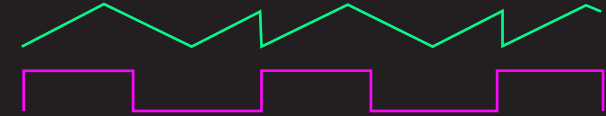
SOFT SYNC input will cause the triangle to switch from falling to rising. The synchronization is "soft" in that it only occurs within a narrow part of the oscillating cycle.



Hard sync occurs at any point in the oscillating cycle.

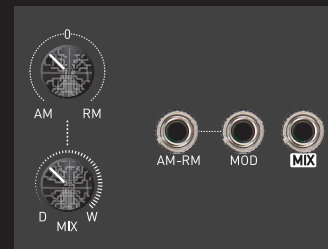
The HARD SYNC has two modes of operation.

If held high it stops the oscillator. This can be used to force the VCO to stop and wait for some future event. If a short pulse is used, for example, then hard sync will only occur on a fast rising edge (e.g., square, pulse, or falling saw) and will immediately force the triangle to begin rising.



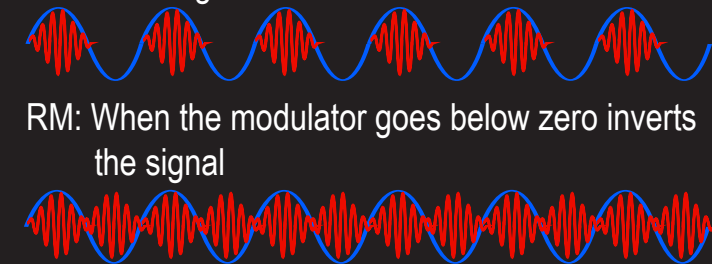
Four channel mixer with linear control VCA's sums sine, triangle, saw, pulse waveforms expecting external unipolar signals to mute them eventually with high events.

Each input expects +5V to max and 0V to close them.



AM-RM mix circuit expects bipolar $\pm 5V$ signals
AM: When the modulator will go below zero mutes the carrier signal.

RM: When the modulator goes below zero inverts the signal

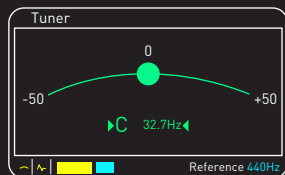


CALIBRATION:

Set Symmetry pot in the middle, Coarse, Fine Tune pots to minimum.
Connect the CV out from your sequencer to V/OCT input, send
the SINE out to your DAW.

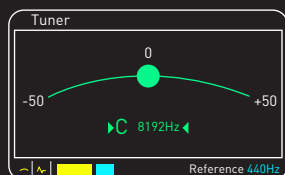
In your DAW open tuner VST to monitore notes.

Send C1 from your sequencer, in your DAW monitor the output while
turning the multiturn trimmer to read C1.



DAW

Send C9 from your sequencer, monitor your DAW to read C9
while turning the multiturn trimmer to read C9.



DAW

Send C1 again from your sequencer, monitor your DAW to read
C1 while truning the multiturn trimmer marked C1.

Repeat the proccess as much as needed until you finish to adjust.

