

## Introduction

The VCO2100 is a highly accurate and stable voltage controlled oscillator module that responds to a one volt per octave control input.

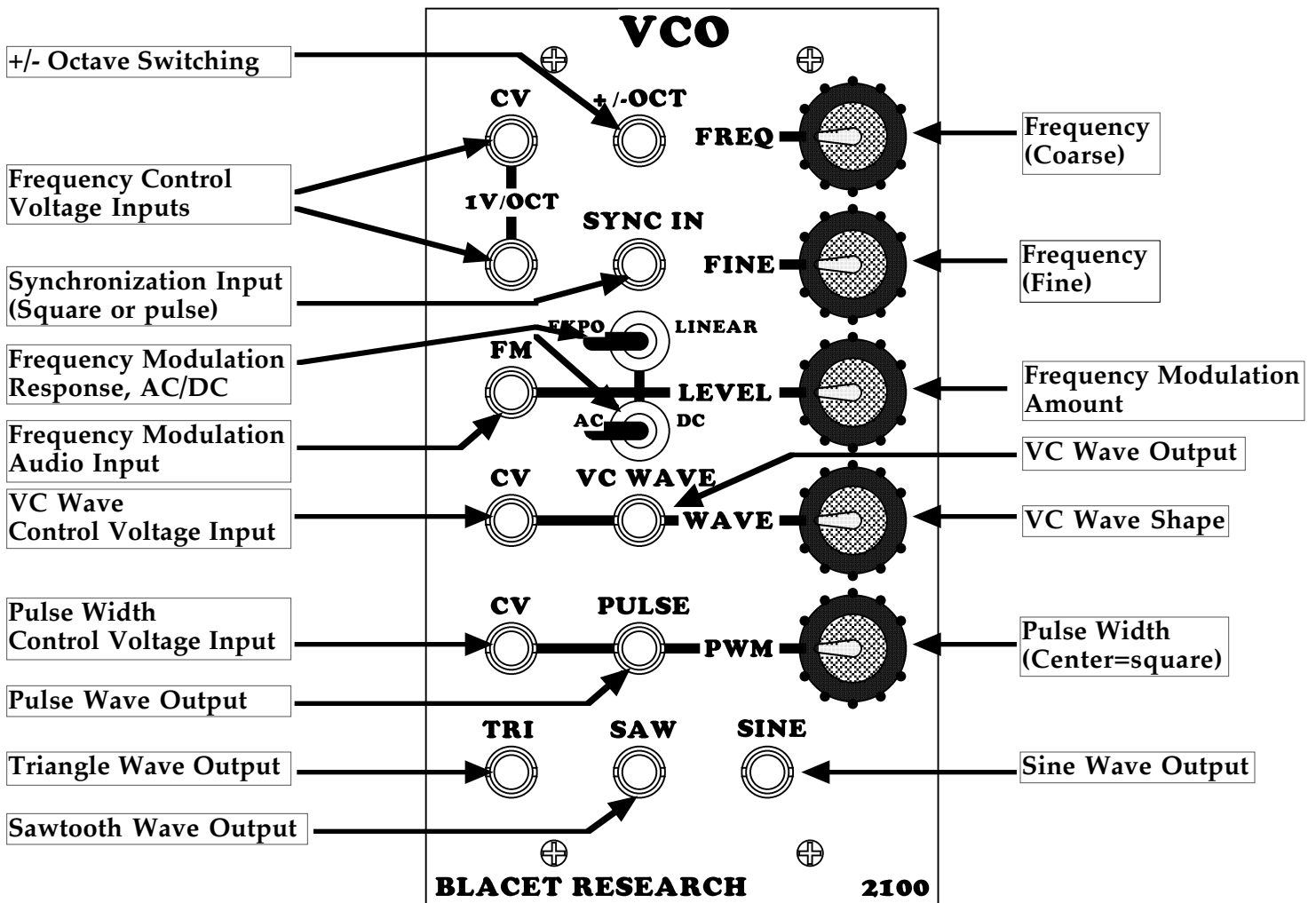
Five different waveforms are generated across the ultra audio, audio and sub audio range. Sine, triangle, sawtooth, pulse and VC wave are all simultaneously available. The VC wave uses a control voltage to morph from a triangle wave to various highly distorted square waves. The pulse waveform has a width CV input which can be swept from extinction through square to extinction.

The sawtooth wave has been especially designed for optimal use with the Mini Wave Module.

Frequency Modulation can be applied to the FM input which can be switched to a linear or exponential response and AC or DC coupling. This input has an attenuator.

The sync input can be used with a pulse wave to have oscillators lock together when they are close in frequency.

The +/- Octave input allows precision switching up one octave with a CV > +2.5V or down one octave with a CV < -2.5V. An on board tune button connects to the + octave circuitry, providing a convenient resource for calibration.



## Controls and Operation

**Warm Up Time:** All analog oscillators will drift a few Hertz as power is applied. This is due to the individual components warming up at different rates as voltage flows through them. A portion of this voltage is converted to heat and will effect the actual part values in a small way. Allow at least five minutes for warm up and resist the urge to tweek the Fine tune pot during this time. After warmup, a very minor adjustment of the Fine tune knob may be necessary.

**Freq. (coarse tune) and Fine Tune:** Freq. sweeps the entire usable range of the VCO. Fine covers about one-half octave.

**Sync In:** Insert a pulse or square wave from another VCO to have the VCOs lock together when they are close in frequency.

**CV 1V/OCT:** There are two jacks that allow precise control of the VCO. One of these might typically be attached to a MIDI-CV converter or a keyboard with 1V/oct output. The other jack can be used for vibrato, for example.

**+/- OCT:** This jack allows precise octave switching with a +/- control voltage. When the CV is greater than +2.5V, the VCO will jump up one octave. When the CV is less than -2.5V, the VCO will jump down one octave.

**FM Input, Expo/Linear Switch, Level Control Pot:** External audio or waveforms from the same VCO can be used for frequency modulation which causes interesting changes in the output wave. Using the Linear switch setting will result in less frequency shifting of the VCO. The amount of FM is controlled by the Level pot. The FM input can be directly (DC) or capacitively (AC) coupled.

**VC Wave CV input, VC Wave Output, Wave Pot:** At minimum CV in or with the Wave pot turned FCCW, the VC Wave output is a triangle wave. With increasing CV or pot rotation, the wave will assume a more squarish shape. The wave modulation circuit uses unsymmetrical diode clipping with green and white LEDs. The CV is designed to be in the range of 0-10V. Negative control voltages will attenuate the waveform and may be used for envelope functions. You can also feed any of the VCO waveforms back into the CV input.

**PWM CV input, Pulse Wave Output, PWM pot:** Applying a +/-5V CV or turning the pot will alter the pulse width from off at -5V to an increasing pulse width. With no CV and the pot centered, the wave will be a square wave (on time = off time). Increasing the pot rotation or applying a positive CV will cause the on portion of the wave to increase until it is on all the time. At this point, no sound will be generated.

**Power Input Jack J13:** A source of regulated +/-15Vdc power must be supplied to this PCB jack to run the module. Note the current requirements in the "Specifications" section.

**Connections to this jack should be made only when the power supply is OFF and the connector must be positioned correctly on the pins.**

As using the wrong supply can cause damage to the unit, please contact us if you have any questions! Do not attempt to use "wall warts" to power the module.