

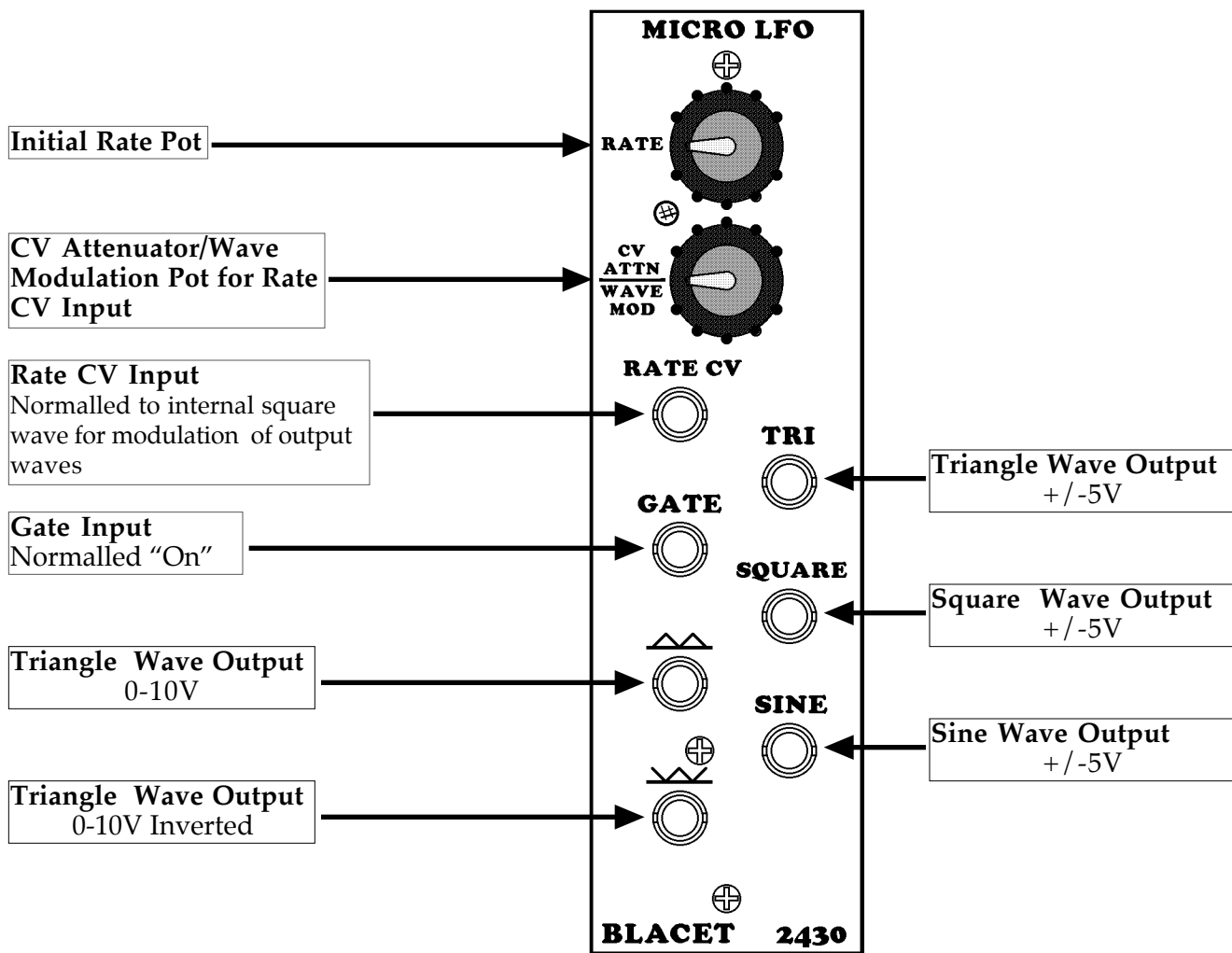
# Introduction

The LFO2430 is a “basic”, voltage controlled low frequency oscillator (LFO). This type of module is great for adding low frequency modulation to any VC controlled module. For instance, vibrato when used with an oscillator.

Waveforms available include triangle, square, sine and two “above zero” waveforms especially useful for panning with our VCA2410.

The Rate CV input is normalled to an internal square wave. This allows you to modify the standard waveforms just by turning the CV Attn/Wave Mod pot. For instance, the square wave out will become a narrow pulse, and the triangle waves become ramps. Feeding any of the output waveforms back into this input will also result in many unusual waves.

A PCB DIP switch allows selecting LFO rates of 80S to 350 Hz or 15M to 32 Hz.



## Controls and Operation

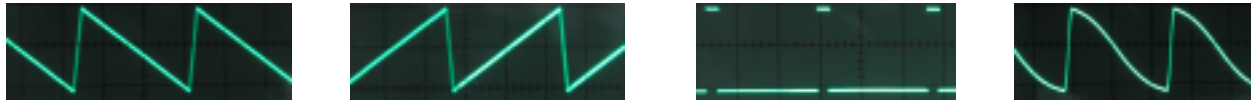
**Rate Pot:** Sets the initial frequency of the LFO.

**Range DIP switch:** (located on PCB) Select short or long LFO ranges. 80S to 350 Hz or 15M to 32 Hz

**Rate CV Jack, CV Attn/Wave Mod Pot:** External CVs can be scaled using this pot. Note that external waves or waves from the LFO itself can be used here. Note that any external input will also effect the LFO frequency so that adjustment of the Rate pot may be necessary.

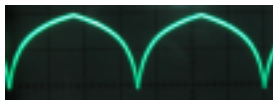
With no input, an internal square wave is normalled to the jack for wave modulation. This will result in narrowing pulses on the Square output and increasing sawtooth shape to the triangle waves. The Sine output will become a "curvy" saw. The screen shots below show maximum modulation:

Triangles, Inverted Triangle, Square, Sine

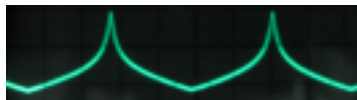


Plugging LFO waveforms into the Rate CV jack will result in the following waveforms.

Inverted Triangle Out with Triangle Modulation



Triangle Out with Sine Modulation



Sine Out with Triangle Modulation



You can also use any external waveform or mix of waveforms. For example, use a MX module to mix the Square and Triangle outputs back into the LFO. Observe the Sine or 0-10V Triangle waves on a 'scope. The MX "Square" channel will control the slew of the wave, while the "Triangle" channel will control the wave ramp from linear to log/antilog!

**Gate Jack:** This input is normalled to allow free running. When an input is desired, use a positive voltage to turn on the waveforms and ground to reset and turn off the waves. Note that some waves reset to mid levels, not to ground. See below.

**Tri Jack:** Outputs a triangle wave of +/-5V. Resets to ground.

**Square Jack:** Outputs a square wave of +/-5V. Resets to ground.

**Sine Jack:** Outputs a sine wave of +/-5V. Resets to ground.

**Two "above ground" Tri Jacks:** Outputs two out of phase 0-10V triangle waves. Resets to +5.

Note that at the highest frequencies, this circuit design may result in some significant offset voltages above ground or +5V when the LFO is reset.

**Power Input Connector J8:** This PCB connector requires a source of regulated +15Vdc and -15Vdc power to run the module. Use a Blacet PS500 supply or the equivalent.

**Connections to J8 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.

## Safety Information

The use of any audio equipment requires some care to avoid potential damage to the hearing of the operator or their audience. Even short term exposure to high audio levels can lead to temporary hearing loss and ringing in the ears. Repeated exposure can eventually lead to permanent hearing problems.

Your ears have to last you all your life; take a few precautions to keep them happy so that you can enjoy music even when you are older!

- When using mid to high volume levels, be aware that the ear will lose sensitivity at some point, causing you to turn up the volume to compensate. In an extended session, this can happen repeatedly, until the volume is quite high and potentially dangerous.