Micro VCO v1.0 – User Guide

This is the setup and user guide. The unit is designed for a monophonic Analog synthesizer.

The module is designed and sized for **Eurorack** systems. You will need a 16 pin **Eurorack** power ribbon connector with –12/0/+12 which is connected to a synth power supply. You will also need a trimmer adjustment tool, a digital volt meter, a frequency counter and, if possible, an oscilloscope.

Calibrating the MICRO-VCO as a precision VCO (see below for use as an LFO)

If you bought PCBs or a kit, you should only need to calibrate the unit once. If you bought a pre-built and tested unit, you can skip this section. Power up the device and allow it to warm up for 15 minutes.

1. Set R27 HF Trim to 0. This is done by turning the screw counter clockwise until it hits the end stop. A quiet click can be heard.
2. Disconnect all CV sources from the inputs.
3. Set the coarse and fine tuning controls to their center position.

4. Put a frequency counter on the SIN output.
5. **Offset adjustment:** Adjust R1 Offset until the frequency is 16.35Hz.
6. Connect a CV source such (as a keyboard controller CV) into the 1V/octave jack.
7. **VOLTS/OCTAVE adjustment:** Repeatedly play two notes that should be one octave apart at the low end (say C2 64 Hz and C3 132 Hz) and adjust R17 (V/Oct) until the frequency of the high note is exactly double that of the low note. Check the frequency of other notes separated by one octave. Fine tune R17 until the best tracking is obtained.

   TIP: If the high note is flat, turn R17 to make it flatter still. This reduces the gap between the two notes. Then, while playing the lower note, turn the FINE tune panel control to the required lower frequency (e.g. 64Hz) and check both notes again.
8. **High Frequency trim:** Repeatedly pay two notes one octave apart at the high end (say 1200 Hz and 2400 Hz) and adjust R27 HF trim until the frequency of the high note is exactly double that of the low note. Check the frequency of other notes separated by one octave. Fine tune R27 until the best tracking is obtained.
9. Tune the VCO using the coarse and fine pots until the output frequency corresponds to a known keyboard note. e.g. C4 = 261.63 Hz.
10. Repeat the adjustments until you have the tracking as close as possible to 1V per octave.
11. **SINE SHAPE:** Using an oscilloscope or audio output adjust R16 Sine Symmetry and R2 Sine Round until the best, balanced, least distorted sine wave is obtained.

Calibrating the MICRO-VCO as an LFO

If you bought PCBs or a kit, you should only need to calibrate the unit once. If you bought a pre-built and tested unit, you can skip this section. Power up the device.

1. Set R27 HF Trim to 0. This is done by turning the screw counter clockwise until it hits the end stop. A quiet click can be heard.
2. Disconnect all CV sources from the inputs.
3. Set the coarse and fine tuning controls to their center position.
4. Use a mixer/amplifier to listen to the SQUARE output.
5. **Offset adjustment:** Adjust R1 Offset until the frequency is 1 beat per second. You can make this smaller or larger to customize the range of the LFO.
6. **SINE SHAPE: Turn up the frequency to get an audio sine wave.** Using an oscilloscope or audio output adjust R16 Sine Symmetry and R2 Sine Round until the best, balanced, least distorted sine wave is obtained.