

VCO-1 v1.0a

After assembly, the unit must be adjusted to the 1V/Oct scale. When you play a melody on your keyboard (Midi-interface / Sequencer) you want the VCO to playback exactly that melody and not any strange out of tune stuff. If you have never done it before, this is a bit challenging and we can only give you a rough advice here, as tolerances and the adjustments of both trimmers play a role here. But we'll do our best...

Example: You play a note C1 and want to hear for example 100Hz (depending on the positions of coarse and fine tuning of your VCO), then one octave higher C2 should be 200Hz, C3 = 400Hz, C4 = 800Hz, C5 = 1,6kHz and C6 should be 3,2kHz. If the 1V/oct scale is not adjusted correctly this might not be the case and notes appear out of tune. It's your job now to correct this!

The easiest way is using notes coming from a computer via a Midi-to-Gate/CV interface. Program a series of 2 quarter notes: C1 and C2. Use the CV signal of your Midi-to-Gate/CV interface and feed it into the CV input of VCO-1. Connect the sawtooth output to your monitoring system, so you are able to hear it.

Tipp: Run and monitor the audio through your DAW (Ableton, Cubase...) and throw a tuner plugin into your monitoring channel (there's a free one by [Melda Productions](#)). In a minute this will be useful.

Play your programmed C1 and stop. VCO-1 now got control voltage for the lowest note on its CV input. Set the finetune knob to middle position and coarse tuning to a low note, which you can clearly identify as a note (and not so low, that it appears as a series of clicks).

When you now playback the sequence of 2 notes in octaves C1- C2, VCO-1 will generate some audible notes which hopefully are close to octaves, but they might be not.

There are two blue trimmers on the back. The long blue one, labeled as 'Tune' sets the scale for the lower octaves. The other one, labeled as 'HiComp' corrects the scale for the higher range. You will possibly have to use both, but start with the long one and concentrate on the lower octaves first.

While playing back the 2 notes, you use a screw driver to carefully adjust the long trimmer to the right or the left very carefully, listen what happens and try to find the position where the notes seem to be octaves or 'in tune'.

You have 2 possibilities at this point: a) doing it by ear or b) using a tuner. The problem is, that when you turn the trimmer, the base note also drifts. So if you already adjusted the lowest note to a C on your tuner, it will be something else in the next moment. The best thing is to have a musical ear and adjust it roughly by ear.

Once you managed to adjust the scaling for the lowest octave and they seem to be in tune, the higher octaves still might not be in tune. Use the 'HiComp' trimmer now to adjust this. Program a series of notes C1 – C2 – C3 – C4 C5 and use that now. The reality is: you might have to alter between the two trimmers, change very little things, hear the results, try different things. When the rough part is done, it makes sense to use the tuner.

Finally, once this is done, VCO-1 should be stable over a range of 5 octaves.

If you use Ableton 9, you can download a project which we also use for scaling. Please install the Melda Tuner or insert an other one on the monitoring channel.

www.leaf-audio.com