Calibration

General

The 810's VCO is calibrated to track at 1 V/octave over a range of approximatley 6-8 octaves within a tolerance of ±5 cents. When troubleshooting pitch and tracking issues ensure that you are using an accurate 1 V/octave CV source that is not subject to loading by being fanned out through multiples.

When self-oscillating the VCF is calibrated to track at 1 V/octave over a range of about 3 octaves starting at around middle C (261.6 Hz).

The pitch of both the VCO and the self-oscillating VCF will drift over time as the 810 warms up. About 20 minutes after warm up the VCO pitch should remain stable to within a few cents of the initial frequency.

From time to time the VCO and VCF may need to be calibrated. More detailed instructions for calibration are available on the 810's Github page:

http://github.com/minisystem/810

VCO

Allow the VCO to warm up for at least 10 minutes before begining calibration. Connect the output of the VCO to the input of a digital tuning device (Mordax DATA, DAW VST/AU tuner plugin, chromatic guitar tuner, etc.). Set the RANGE switch to position 2 and use the TUNE control to set the pitch to C1 (32.7 Hz). Set the RANGE switch to position 5. The pitch should read C5 (523.3 Hz) ±5 cents. If the pitch is outside this range, use an electronics trimming tool or a small flat bladed screwdriver to turn the SCALE trimmer located below the TUNE knob on the front panel. Start with just half a turn or so, until the pitch changes by a few cents. Note the direction you turned the trimmer and the reading on your tuner. Set the RANGE switch back to position 2 and read the pitch, switch back to position 5 and adjust the trimmer, repeating this procedure until the pitch at positon 2 and position 5 are 5 octaves apart within 5 cents or less.

VCF

Connect an accurate 1 V/octave CV source to the VCF MOD1 input and turn the attenuator fully clockwise. Connect the output of the VCF to the input of your digital tuning device. Turn both the IN 1 and IN 2 knobs fully counter clockwise and turn the Resonance knob fully clockwise. With 0 V applied to the CV input, adjust the Frequency knob so that the pitch is middle C (261.6 Hz). Increase the CV to 3 V and read the pitch. It should be 3 octaves higher within -10 cents. Use the VCF SCALE trimmer next to the VCF IN 1 jack on the front panel to adjust the scaling. Switch the CV back to 0 V, ready the pitch, switch back to 3 V and adjust the SCALE trimmer. Repeat these steps until the pitch at 0 V and the pitch at 3 V are 3 octaves part within 10 cents.

NOTE: filter tracking at 1 V/octave does not have the same range or stability as VCO 1 V/octave tracking.