CALIBRATING WERKSTATT-01

***CLICK HERE** for video calibration instructions.*

The 20-pin expansion header on the Werkstatt-01 brings many of its important CV Ins and Outs to the front panel. The Werkstatt-01 CV Expander converts most of these to grounded 3.5mm jacks that can be used with other CV-equipped analog gear.

***NOTE:** Your CV Expander (Rev B) is for use with the included Werkstatt-01 synthesizer and is not designed for use with earlier versions of Werkstatt-01 (Rev A).*

NOTE:

You must remove the front panel of your Werkstatt-01 and calibrate it to properly respond to a 1V/Octave external control voltage.

The **VCO EXP IN** connection point on the **PATCHABLE HEADER** can be set to receive 1V/Octave control signals. This calibration is performed using the Variable Resistor trim pot [VR5] labeled **VCO EXP TRIM**. It is located on the **PRINTED CIRCUIT BOARD**, below and to the right of the VCO Pitch potentiometer.

1

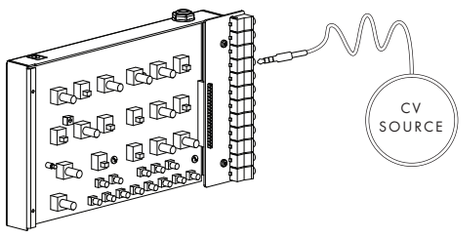
Remove the faceplate, and screw the CV Expander back down for grounding.

2

Plug Werkstatt in and wait 15-20 min for the circuits to warm up

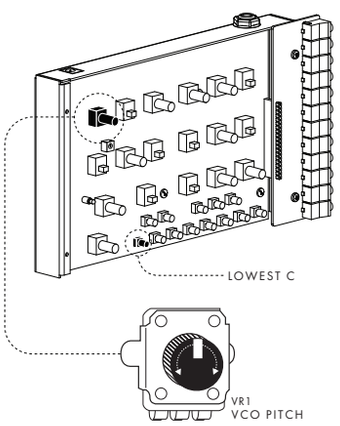
3

Choose which external device will be your CV Source and connect its **PITCH CV** output to the **VCO EXP FM** input on Werkstatt-01 using a 3.5mm cable.



4

Press the lowest C on the Werkstatt's keyboard, then send 0V from your CV source and use the **VR1 VCO PITCH** knob to tune to a C using a tuner, or tune by ear to match a well calibrated reference instrument that is also driven by your CV source.

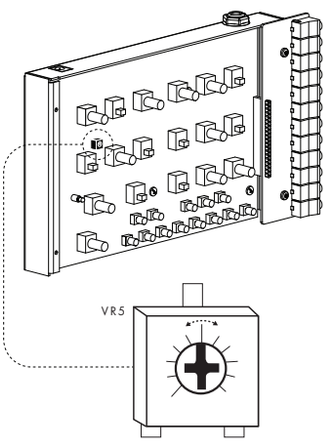


***NOTE:** If it's not obvious what 0 volts is on your CV source, a good way to figure it out is to send notes from your CV source while gently turning VR5 on your Werkstatt. You should hear the Werkstatt's pitch moving up and down as you turn VR5. When you reach a note on your CV source with which turning VR5 no longer produces an audible change in Werkstatt, you have found 0V. Typically this will be a C note on your CV source.*

***TIP:** As you turn the VCO FREQ knob approaching your target pitch, achieving a "locked-in" tuning will require **very fine adjustments** to the FREQ knob. Be prepared to proceed with patience and a steady hand as you finalize this calibration.*

5

Send 3V (3 octaves higher) from your CV source to the Werkstatt and now gently adjust the trimmer VR5 on the Werkstatt PCB until your tuner shows a C 3 octaves higher than the C you had at 0V, or once again until you have a solid unison with very slow beating beating against your reference instrument's note.



***NOTE:** The final position for VR5 will be somewhere near the center of its travel (and not at either extreme). Turning VR5 past it's stopping point can damage the component and hinder calibration.*

***TIP:** As you turn VR5 knob approaching your target pitch, achieving a "locked-in" tuning will require **very fine adjustments** to VR5. Be prepared to proceed with patience and a steady hand as you finalize this calibration.*

6

Repeat steps 4 and 5 to ensure consistent tuning between octaves.

7

If this doesn't yield accurate enough tuning across the range, try the same process alternating between 0V and 5V, and this should increase the accuracy of the calibration.

A NOTE ABOUT 1V/OCTAVE CV

In analog circuits, not all CV Outputs are designed the same. It is very possible that when the Werkstatt-01 Pitch CV input is calibrated to one source of a 1V/octave CV, it may respond slightly differently to a different source of 1V/octave CV, especially if that source is driving multiple loads, or if the source is not calibrated accurately. You can re-calibrate your Werkstatt-01 or the source of 1V/octave CV depending on the situation or your preference.