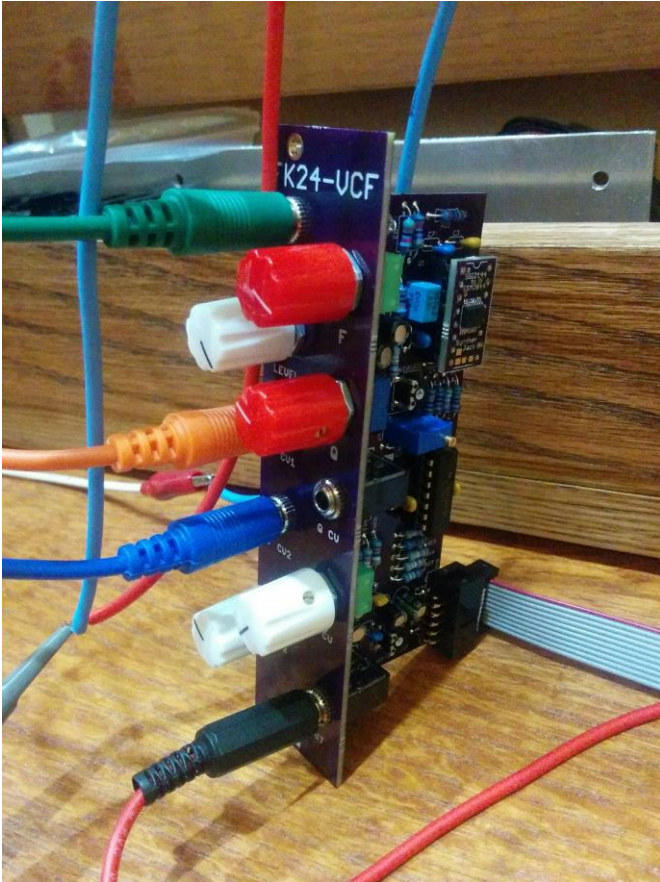


FK24-VCF v1.1 – User Guide

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



The module is designed and sized for **Euro rack** systems. You will need a 16-10 pin **Euro rack** 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.

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.

Calibrating the RESONANCE circuit

1. The resonance circuit is needed to calibrate the rest of the VCF so this is done first.
2. Disconnect all CV sources from the inputs.
3. Set the level control to 0.
4. Set the F control to the center.
5. Set the Q control to FULL.
6. Set R20 Q LEVEL trimmer fully Counter Clockwise
7. Connect the output to an oscilloscope and adjust so that the sine wave is visible
8. Turn R20 Q LEVEL clockwise until the sine wave is 10-12V peak to peak (-5/+5 to -6/+6) .
9. This sets the self resonance amplitude so that self resonance begins at about 50% of the panel control.
10. You can turn the trimmer counter clockwise until the sine wave is 0 amplitude. The VCF will then not self resonate as the Q control is turned up. You will need to do this after the V/OCT calibration is done since the Q sine wave is needed for this.
You can set the trimmer between these two points to fine tune the amplitude of the self resonance.

Balancing the RESONANCE circuit

1. Run a approx 200Hz squarewave into the Input
2. Connect the output to an oscilloscope and adjust so that the square wave is visible
3. Turn the F control to max
4. Turn the Q control to max
5. Turn the level control to max
6. Set R21 Balance trimmer fully Clockwise. You should see the resonance wave on the square wave
7. Turn R21 Balance counter clockwise until the amplitude of the square wave increases and separates the +ve resonance signal and the -ve resonance signal.
8. This setting gives the best balance between the input signal and the resonance signal
You can set the trimmer at different setting to achieve the required balance between input signal and resonance signal

Calibrating the FREQUENCY tracking

1. Disconnect all CV sources from the inputs.
2. Set the level control to 0.
3. Set the F control to the center.
4. Set the Q control to FULL.
5. Set the OFFSET trimmer R14 to its center position.
6. Set the V/OCT trimmer R7 to its center position .
7. Connect the output to a frequency counter and an audio system and observe and listen to the resulting sine wave.
8. Supply 0V to the FCV1 input from a keyboard controller or other voltage source.
9. Adjust the F panel control until the frequency is 100Hz.
10. Supply 2V to the FCV1 input from a keyboard controller or other voltage source.
11. Adjust the trimmer R7 until the frequency is 400Hz.
12. Reduce the FCV1 input voltage back to 0V.
13. Now readjust the F panel control until the frequency is 100Hz.
14. Repeat steps 7 to 12 until the frequency approximately doubles for each 1V increase in FCV1 input without needing to adjust the F control or the trimmer.
15. You can also try 3V = 800Hz, 4v = 1600Hz, 5V = 3200Hz. Try and get the best tracking across the voltage range.
16. TIP: If the high note is flat, turn R7 to make it flatter still. This reduces the gap between the two notes. Then, while playing the lower note, turn the F panel control to the required lower frequency (e.g. 100Hz) and check both notes again.

Calibrating the OFFSET

1. The offset trimmer R14 adjusts the association between the cut off frequency and the position of the F panel control.
2. If you have multiple FK24 VCFs with the same component values and the same calibration, these trimmers can be adjusted to compensate for tolerances so that each FK24 VCF is cutting off at the same frequency when its F panel controls is in the same position as on the other FK24 VCFs.