

nonlinearcircuits

FK1T VCF build guide & BOM

ERROR – There is an error on Vers.2 PCB (NOT on Vers.1), you will need to cut 2 traces and add a jumper wire. It is best to cut the traces before you start building and add the jumper wire when you are installing the vactrols. See pages 5 & 6 for details.

This module has its core based on the Korg FK-1 effects pedal, the rest of it has been re-designed to suit use in a modular synth. Early Korg VCFs consisted of high pass and low pass stages in series these were seen in the 700 and dv800/maxikorg (my all-time #1 factory synth). The FK-1 followed the same topology but used dual vactrols as the variable resistors.

I have only seen youtube demos of the FK-1 and read reviews on it, generally it was considered a bit weedy and thin. One thing I found was that it had 'Brightness' (Q) pots for each stage that actually did very little. I replaced these with fixed resistors and had just one overall Q path back to the input stage. This makes a big difference to the circuit and gets it all wet and squelchy.

The choice of vactrols is of course very important for this module. The dual vactrols of the original have been replaced with 4 singles.

I have built three versions, one with Siliconex NSL-32s and two DIY vactrols with GL5516 LDRs, which have a very low dark resistance of 500k Ω . One of the DIY versions had the LDRs matched and the other didn't. I like my sounds pretty rich and raw, for me the unmatched DIY vactrol version was best, maybe it was a fluke selection....the NSL-32 version the least favorite (but it still worked fine).

So, you may want to experiment with different vactrols and matching to find a configuration that suits you. As I get feedback I will update this build guide or the relevant thread on Muffs. Basically it will work with any single vactrols but its character is very dependent upon which ones you choose. The original pedal had Hamamatsu P873 vactrols which had 1M Ω dark resistance (after 10 seconds) and 200 Ω - 1k Ω on resistance.

BOM

check the part numbers on <http://www.taydaelectronics.com/> to see examples of suitable components

component	quantity	notes	component	quantity	notes
100k pot	4	Tayda: A-1848	2.2nF (222)	2	0805
kobiconn style sockets	6	Tayda: A-865	1nF	1	0805
10 eurorack power connector	1	Tayda: A-198	1M	2	0805
TL074	1	SOIC 0050 pitch	220k	3	0805
single vactrol	4		100k (c)	11	0805
BC857	2	SOT-23	68k	2	0805
BC847	3	SOT-23	47k	2	0805
10 μ F	4	2mm lead spacing	10k (d)	4	0805
1 μ F (105)	1	0805	4k7	6	0805
100nF (104)	2	0805	1k (1)	3	0805
47nF (473)	1	0805	470R	1	0805
33nF (333)	1	0805	220R	1	0805
3.3nF (332)	1	0805	10R	2	thru-hole

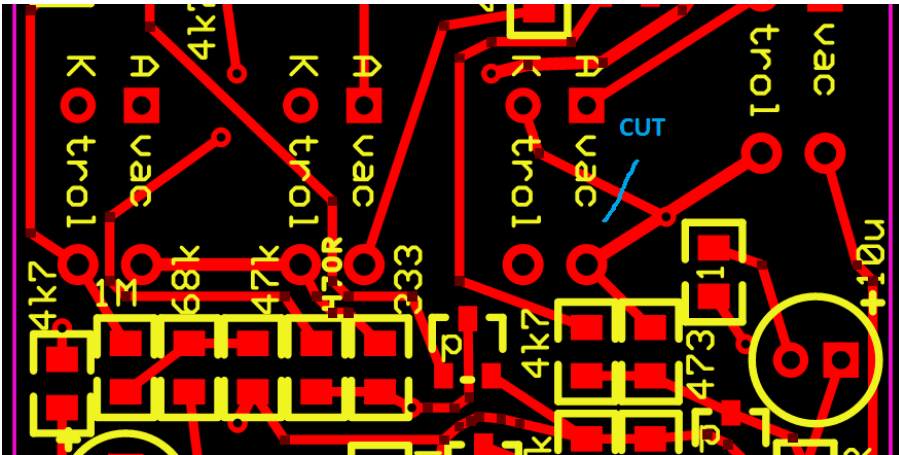
Notes – Some of the screen-printing on the PCB is a bit unclear, especially for resistors marked 'c' (100k) and 'd' (10k), please refer to the PCB image on the next page to check values.

The schematic indicates some mods that can be made to the circuit, if desired.

REQUIRED MOD FOR VERS.2 PCB ONLY – 3 STEPS

Step 1

Top of PCB



Step 2

bottom of PCB

