

Build documentation for:

# VOGUE\*/ECG\*\* VCF/VCA

\*Based on the Moog Rogue VCF/VCA (\*\*with a nod to the Roland TB303)

## FREQUENCY CENTRAL

Rev 1 / April 2013

### Vogue VCF/VCA

Vogue VCF/VCA is based on the Moog Rogue's VCF and VCA. The Rogue probably has the most straightforward iteration of the Moog transistor ladder VCF. In place of the Rogue's VCF CV input section, I've lifted the Moog Prodigy VCF CV input section – considerably simpler than the Rogue's, and gets around having to use a second CA3046. Vogue has two outputs, VCA and VCF, so the module can be used as a VCF and VCA combined, or you can bypass the built-in VCA altogether and use the module as a stand-alone VCF. The VCA CV input is shared with VCF CV input #1, although it is not affected by the attenuator – so you can feed an ADSR into this CV input, attenuate it for the VCF, but still have the VCA kicking out at full gain. I thought this was a cool way to add the extra functionality of the Rogue's quirky VCA without needing any extra panel space!

I have made a few very minor changes to the original design:

- Rogue's VCF CV input section replaced with Prodigy's VCF CV input section.
- The VCA output is HOT! Hell, it'll even run mono headphones. So I have included the original synth's volume control in the form of a trimmer, so the VCA output level can be user defined.
- Added an extra buffer for the VCF direct output.

### Electro Cardiogram VCF/VCA

As an alternative, you can choose to build the PCB into an Electro Cardiogram VCF/VCA. The ECG uses 6 x 3mm red LEDs in place of 6 x BC547 in the filter ladder. Diode ladder filters have a different sound to transistor ladder filters, and if you're gonna use diodes, why not use LEDs and get a free light show too – the LEDs will brighten as you turn up the cutoff of the filter, or when a CV is applied. For maximum visual effect using my translucent red acrylic panels, I like to mount 3 LEDs on either side of the PCB. There are a few other very minor differences between the Vogue and ECG builds (documented below), the inspirations for these changes was the Roland TB303 filter.

So, instead of inserting 6 x BC547 into the ladder, insert 6 x 3mm red LEDs. The anode of the LEDs corresponds to the collectors of the transistors, the cathode of the LEDs corresponds to the emitters of the transistors. In an ECG build, the middle transistors' pads (for the base) are unused. Hope that makes sense! I'll probably end up drawing a snazzy diagram...

### No dedicated sockets and knobs for the VCA?

I included the VCA because:

- it's such a small circuit.
- you can't have enough VCAs.
- it's simplicity, and it's quirky response is part of the sound.

I didn't make the VCA 'fully accessible' with it's own sockets and knobs because:

- I thought it would be neat to have 'instant VCA without much patching' when you need it.
- if you want to use a high end VCA, patch the VCF direct out to a high end VCA!
- If you don't want to include the VCA in your patch you don't have to.



## Bill of materials

100R x 3	33nF x 4	CA3046 x 1	A10K x 2
470R x 1	100nF x 5	CA3080 x 1	A50K x 1
1K x 13	10uF x 4	TL072 x 3	B10K x 3
10K x 3	47uF x 2	BC547 x 7*	All pots are 16mm
12K x 1	220uF x 1	BC557 x 2	Alpha.
15K x 1		3mm red LED x 6**	
27K x 2			1K trimmer x 1
47K x 2		*For ECG build only one	100K trimmer x 3
100K x 7		BC547 is required.	
220K x 1		**ECG build only.	All trimmers are
300K x 1			6mm (Tayda)
430K x 1			
1M x 3			

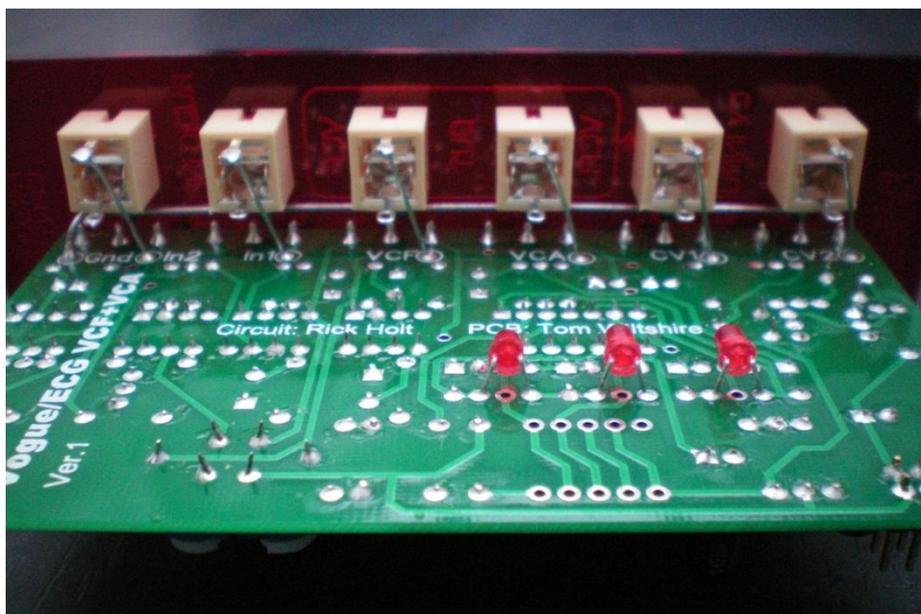
### Calibration

1. Adjust Bias trimmer to sweet spot, ie a nice clean undistorted VCA output. The chances are that that the sweet spot is around the mid position.
2. Turn Emphasis all the way to self oscillation. Play octaves and adjust the Scale until they are spot on.
3. Adjust Freq trimmer until filter is fully closed CCW and fully open CW.
4. Adjust VCA Gain trimmer to taste.

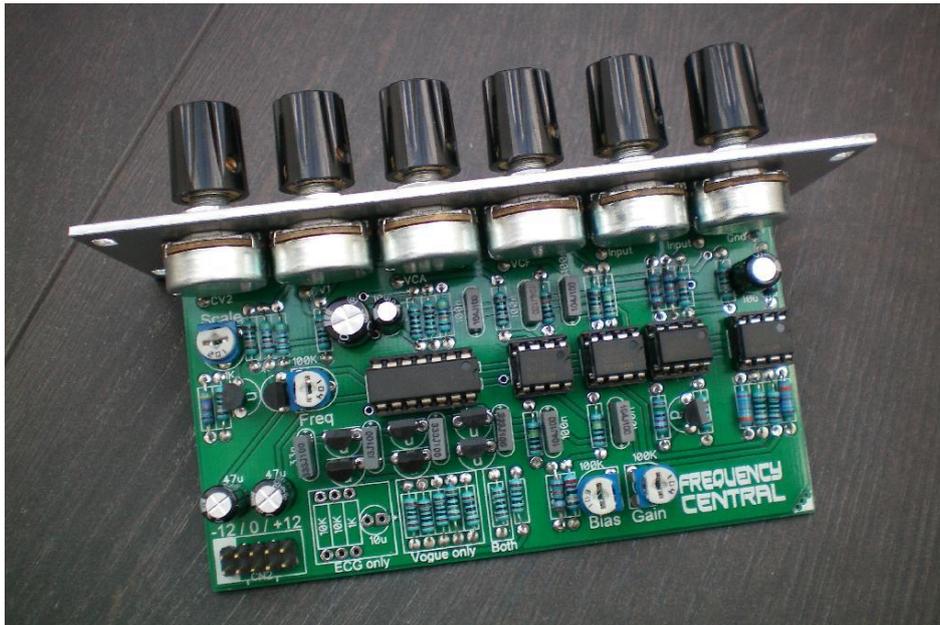
### Underside of the PCB showing:

- Ground bus between sockets and PCB
- Connections between inputs/output and PCB
- 3 x LED (ECG build only)

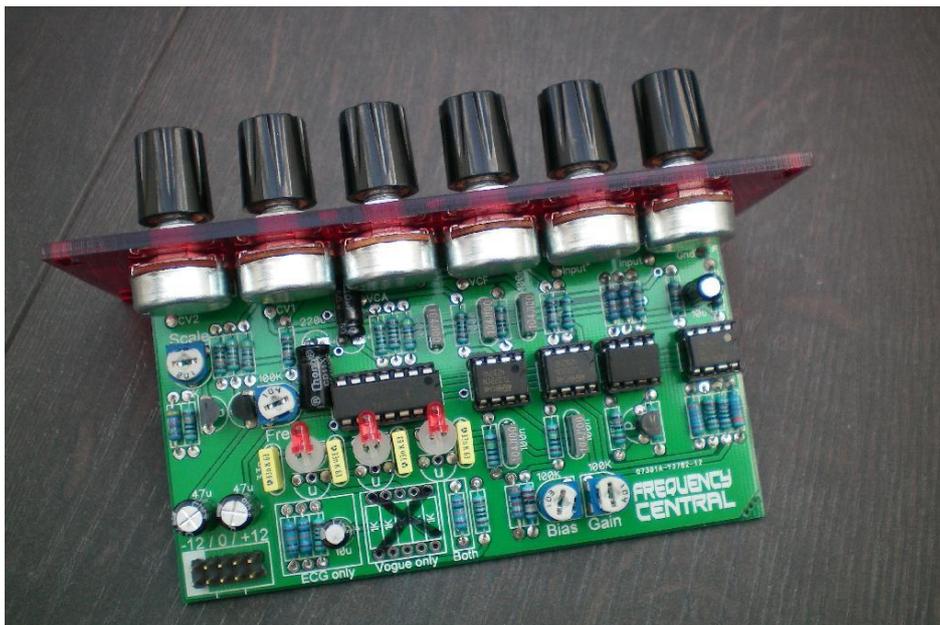
I use solid core for all of the above.



Vogue build:



ECG build:



RDH 20<sup>th</sup> May 2013

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