

Date: Fri, 30 Aug 2002 15:35:47 -0000
From: "fc9ca2"
Subject: VCF 8E

I am new to this 'synth DIY' stuff (newly interested, that is), and I am not nearly as electronics savvy as perhaps I could be. but, I am really interested in putting together a filter and have a few questions to ask. is it possible to put together this particular kit (the dual MS-20 type filter) for use as a standalone filter? of course it is.. but, is the only issue getting power to it?

also, is this a high-quality filter truly in the tradition of the MS-20? I really have only a vague understanding of how resonant analog filters work at this point. what kind of filter is employed here? do any of the filter kits use an IC for the filter? does anyone have any sound examples of this or any of the other assembled kits in action? I guess my main concern is whether or not the filter sounds "good" to me...

well, that ought to do it for now. I didn't frame my questions very well but maybe somebody can help me out..

thanks!
tim

From: " Dave Magnuson "
Subject: RE VCF 8E

I have several of EFM's filters (VCF2, VCF6, VCF8). Each has a unique sound of it's own. The VCF6 and VCF2 are both ladder filters... rather smooth sounding and very "musical". I prefer the VCF2 over the VCF6... it has a little more character to my ears, but their sound is definitely similar. (The VCF6 is a diode ladder, while the VCF2 is a transistor ladder). The VCF2 is based on Moog designs, while the VCF6 is based on EMS design (I think). VCF6 can also behave rather TB-303-ish (the cutoff slope is different, but the sound is still similar)

The VCF8 (Sallen-key filter) by comparison is edgy and "harsh". That's harsh in a good way. It adds a cutting tone to the signal, especially with higher resonance settings. When set to just barely self-resonate, it has a wicked, evil tone.... great for sound mutilation. Works very well for a lead sound that you want to have very forward in the mix. I've never laid my hands on an MS-20, so I can't comment on how accurate it is... but the VCF8 is definitely one of my favorite modules. A trick with the VCF8 is to get it barely into self-resonance and FM the filter cutoff with an audio signal... tasty stuff.

All of these filters are "high quality"... just different from each other. Each of them could be used as a stand-alone filter (so could VCF1, VCF12, etc). I actually just built a 2U rack-mount stereo VCF2... I love it. I added an LFO and gate-extractor so the EG's can fire on loud input signals (the gate extractor is just a comparator with variable threshold voltage that's hooked to the env follower output). The VCF 8 doesn't have the built in envelope generator / envelope follower like the VCF2, but that could be added with other kits. A DEG2 from EFM could be used as EGs or retrigger and act as LFOs... envelope followers are pretty simple, and could be built on proto-board. It would make a great stand-alone filter box. If you wanted to keep things simple, you could simply put a VCF8 in a box with a powersupply... depends on what you want.

One of these days I'll put some audio clips of various EFM patches online... Everyone wants to hear these things, and there's not many samples online that I'm aware of. I just can't ever seem to find a spare minute lately.

PS: I notice you say you're not an electronics guru... be forewarned that EFM kits come with VERY minimal assembly instructions. Basically a schematic, a few corrections and a possible faceplate layout. The rest is up to you. So if you're not really good at following schematics, I'd consider building a more beginner-oriented project first. There are some nice kits from Paia, Blacet and others that have very complete step-by-step directions, and they're all totally compatible with the EFM kits (same powersupply requirements and signal/CV levels). I've seen quite a few beginners get in over their head on the EFM list, and then sell their partially completed kits because they can't figure out how to complete them. Just trying to make sure you're aware of the skill level involved before you jump in and buy something. The list is helpful if you have problems... but a total beginner is likely to have some major difficulties. But, only you know exactly what your skill level is, so sorry if these all seems obvious to you. well, I've rambled enough. Back to the solder fumes...

Date: Sat, 30 Nov 2002 00:10:56 -0500

From: harrybissell

Subject: Taming the wild VCF8

Howdy all...

... as you know (if you've been here since before the beginning...) I've had some issues with the VCF8... a...s it goes into oscillation. The resonance amplitude is unlimited, and probably way more than the signal you were putting into it... Here's my new mod. There is a 47K resistor going from the output to the input of the resonance OTA. (actually a 47K / 1K divider). I add a 10K resistor in series with the 47K... on the upstream side of that divider (connected to the audio output)... These two resistors can be stood up in the air.. with the leads twisted at the top. Use the same PCB holes where the 47K 'was'. Then make a chain of three - back to back silicon diodes (the same way the stock MS-20 did it.

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and solder this network from the junction of these two resistors to ground. Lots of ground points right on the edge of the PCB pick the one best for you. This mod is strong enough to live in mid-air without hacking any traces (although i did ;^)

The 10K resistor stops the load of these diodes from clipping the output signal... at this point in the resistor divider, the signal is high enough so that when self-oscillation starts... the input at this point limited to 2.1V (three diode drops). At the OTA input its only 44mV... low enough to keep the OTA happy-camper ;^)

Experiment with different diodes. I found that one diode was too much clipping, a red LED was better (about 1.4V)... and three diodes worked best for me. Too much

I'm building a module from this filter that will allow the sections to be in series or parallel... with a 'spread' control that adjusts how far apart the two filters are... so that you can get bandpass and notch responses from a HPF / LPF pair. This will have the features of the Moog Filter Coupler.

I'm almost starting to like this filter now... using both halves in series with different resonances can give nice touch-tone and sci-fi effects. Sweeping the filter up and down at the self resonance point... I'm

flashing back to "Forbidden Planet"
H^)
harry

Date: Sat, 14 Dec 2002 02:20:03 -0000
From: "paia2720 "
Subject: Mods to VCF8e

I'm hoisting a schematic to the site of my mods for the VCF8e. One change is adding two back to back zener diodes along with a run cut and jumper to take the input to the resonance VCA from the other side of the DC blocking cap (like the original Korg schematic) This will allow symmetrical clipping. You can use diodes, LEDs, zeners whatever in the place of the zeners I show. I found 5.1V to give nice high resonance but limit the self-oscillation amplitude to about the same level as the signal. The second mod can be done without the first. It allows the current source to go all the way to OTA shutdown... extending the lower range of the filter sweep. Set the Initial Frequency trimpot to the point where the OTA "just opens" or you will get a DC thump when it shuts down. This mod is also appropriate for the VCF1 (state variable filter)... and I've done it to all of mine. enjoy enjoy.
H^) harry

Date: Mon, 4 Aug 2003 19:26:32 +0800
From: "Benjamin Riggs"
Subject: vcf8e

hi all, i just recently powered up my vcf8 module. so far it works except for a few quirks. the last i need help with.
1) the resonance control was very sensitive, but after changing r13/r38 to 10k (as posted earlier) the control became much more behaved.
2) when the filter is self oscillating, the oscillation level is much higher than the input signal level. i have seen harrys zener diode mods which should fix this problem.
3) i have a vco3d. input to the filter from the pulse output of my oscillators and the filter operates as expected. input the saw into the filter, and the resonance control no longer seems to work in LP mode. i can turn the res all the way to max and very little resonance seems to exist. no input at all and the filter self oscillates as expected.
4) besides the shape of the waveform, the only thing that i can see that is different about the waveforms is the saw has a DC offset. another one of harrys mods links the input to the res OTA at the other side of the output cap (c5/c8). i expect that this would remove any DC offset in the feedback path. does this solve my problem?
help with this problem would be much appreciated.
B

Date: Mon, 4 Aug 2003 09:40:21 -0700 (PDT)
From: Harry Bissell Jr
Subject: Re: vcf8e

Hi Benjamin

3)The pulse amplitude is too high. If you overdrive the filter the resonance will seem to be a lot lower... I have an

attenuator in front of the filter and by changing the level of signal driving the filter I get a lot of different effects.

4) The sawtooth of the VCO3 has a DC offset to begin with... that might cause the offset.

I made the change to the output OTA because the zeners were not clipping symmetrically, due to the offset. If you don't do the zener clipper, you prlly don't need to change the output section.

H^) harry

Date: Wed, 6 Aug 2003 04:00:52 +0800

From: "Benjamin Riggs"

Subject: Re: vcf8e

In my recent toying with this filter, i tried placing a 47uF cap (to remove the DC offset) at the LP input to the filter.

Seems to fix my problem. The saw still overdrives the filter, but the filter now seems to behave as it should.

Looks like the DC offset on the saw was overdriving the filter a bit too hard

What kind of caps should be used in the VCF8e? I've been reading that bypass caps should be ceramic...bypass caps are the ones used directly in front of the +/- power right (C1 and C2)? Also should C3,C4,C6,C7 be something other than ceramic disc?

-dustin

tomg

Posted 11/28/2003 12:33:38 AM

Ceramics are fine for C3,4,6,7 prefered for C1,2.

Tom

fadeddata USA

Posted 11/28/2003 03:35:06 AM

So I take it Ceramics are prefered for all of the bybass caps on all the other modules aswell?

Good stuff to know there is so many opinions on what caps should be used where...

Ok this question was asked before but I can't remember...

Does Q4 & Q5 go the way of the diagram or the way of the pins? I checked the schematic and I think (if it's supposed to mirror the otherside) that they go the way of the diagram...any thoughts here?

-dustin

tomg

Posted 11/16/2003 10:07:38 PM Ê

Huh? I missed the question entirely... There are no official modifications to the vcf8e. Well... I should officially change R11 and R36 (now 47K) to 100K but I am drifting... No it should be built as shown at least until you get it going anyway. Then you can modify if you want. Harry's mods are in the user files. I have restored almost all of the files now.
Tom

fadeddata USA

Posted 11/17/2003 12:08:26 AM

Ok hope this makes sense normally(in my mind?) the center pin on a transistor pushes forward towards the rounded area of the transistor body but on the board you have to push it back so that the center pin goes toward the flat part of the transistor body(otherwise it doesn't look right to the pcb drawing). This only happens on Q4 and Q5 it seems that the hole positions are upside down to the PCB drawings. Maybe I can ASCII this... (this is what all the transistor layouts looklike on the board...)

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vs.

(...except Q4 and Q5 do this)

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Also Q6's picture is upside down (properly)
I'm probably just screwy in the head ;)
-dustin

tomg

Posted 11/17/2003 12:50:26 AM Ê

Don't worry about the hole positions. They do actually connect the right bit's together provided you are using the right (2n3906)transistors. It just seems backwards because you aren't used to seeing it done that way. Really...
Tom

fadeddata USA

Posted 11/17/2003 6:27:50 PM

That's all I needed to know thanks Tom...
Dustin