Date: Sat, 26 Oct 2002 23:09:52 -0400
From: harrybissell
Subject: Re: LED ladder....

Hiya Kids...
Did you build your VCF6 diode ladder with sockets where the MAD1108 were supposed to go ???
If you DID, good. go to the head of the class.... ;^P
then take two DIP package LED Bargraph chips and stick them in there...
what do you think ?
I'm not sure the sound is drastically different... It DOES work well and its fun to watch the bars light up.
I shorted out the very top segment, so there is ONE LED off the top of the ladder (in place of two diodes)... so the
voltage drop is not as great there...
Try it. Maybe I'll kick in some different color ones... there are some that have multi colored segments... Hmmmm.....

H^)
harry

Date: Sun, 27 Oct 2002 13:35:46 -0500
From: harrybissell
Subject: Re: LED ladder....

So if you don't have MATCHED LEDS in the ladder it will really work screwy. I wanted to use multicolor LEDS like four green/four yellow/two red... and see if it made any difference. I'm presuming that the resistance at a given current might be different, so the corner frequencies might move in strange fashion as you sweep...
... but I have only ONE multicolor, so I tried it... with the ladder halfs unbalanced the DC errors as you sweep are HUGE, so remember that if you have troubles with DC offset (of course you KNEW that didn'tcha...)
Maybe later I'll try again

H^)
harry

Date: Tue, 29 Oct 2002 21:38:53 -0500
From: harrybissell
Subject: Re: The Boards are in!

The LED ladder is not harsh at ALL... I bet you would be hard pressed to tell any difference. I'm working on some other mods in this regard...
I figure if the ladder does NOT sound very different... I've failed.
But it still LOOKS cool. More to come soon

BTW... VCF6: Spice simulation suggests that the capacitor in the resonant feedback would be better at a LOT bigger than the 10uF... I'd suggest 100uF. You could deliberately make that cap smaller... which will put a boost in the bass response (at all filter settings)... Maybe your cup of T ???

H^)
harry

Date: Mon, 4 Nov 2002 00:16:32 -0500
From: "elmacaco"
Subject: Re: VCF6

Harry, what do you (and spice) mean as better with higher cap? stability? more resonance?
Break it down for me like the good old days ;)

Eduardo

Date: Sun, 03 Nov 2002 13:48:30 -0500
From: harrybissell
Subject: Re: VCF2

allrightey... (these comments are for VCF6)

The ladder filter will have a flat rolloff with resonance at minimum... lets call that level 0dB.

As you increase resonance, the peak stays at 0dB and the passband (level below cutoff) drops... the higher the resonance, the more the drop.

In the ideal case (with perfect feedback) this area will be a flat line... with the cap 'too small' it varies from a flat line near the resonant peak... then curves up to near 0dB at very low frequencies....

in other words... the resonant feedback path does not have flat response.. it looks like a hipass filter in the feedback path... the smaller the DC blocking cap, the more pronounced the effect.

To put it an other way... its a DC blocking cap, right ? Should block DC and pass everything else. 100uF will do that... 10uF is on the edge (lowest frequencies are boosted)... smaller is an 'effect' for sure.

I'm going for classic flat response... but it might just sound good in some cases to make this cap smaller deliberately... you might like it.

H^)
harry

Date: Mon, 04 Nov 2002 23:31:13 -0000
From: "fdisynth"
Subject: Switching caps at VCF6? (was Re: VCF2)

Hi all. I would like to know if it would be possible to install a switch on the VCF6 so one can choose from three (or more?) different capacitor values in order to have the standard response plus the other suggested. For instance 100uF - 10uF (std) - .1uF or even .01uF Would this be problematic? (--->we are making leads "longer" by having the selected cap far from main circuit, switch leakage...) Thanks to all.(excuse me if too obvious)

f *

Date: Mon, 04 Nov 2002 22:35:52 -0500
From: harrybissell
Subject: Re: Switching caps at VCF6? (was Re: VCF2)

> If you are talking about the resonant feedback blocking cap... I'd say yes it would be no problem.
> The best way would be to put the smallest cap always in the circuit, then parallel the other caps across it with the switch.
> You'll need to put (I'd say) a 1 megohm resistor across the switch contacts... so there is one megohm in series with the caps that are not in the circuit. this would prevent NASTY pops when you flip the switch. I'd suspect this will not change the overall response very much... I'll try it in the simulation.
> Try different cap values first... then decide. I don't know if you will like the different sound. Since I made my cap 220uF from the start (after trying 10uF) I'd guess that I didn't like the stock sound...
> I'm also finding that careful matching of diode pairs makes the filter a LOT better than random picked diodes... I made a constant current source with an LM334 set to 1mA... then match for forward drop. Closer the better. I pick up the diodes with a mini-hook so that the temperature of my hand does not change the voltage drop. The current in the diodes runs from about 3uA to 1mA so I've matched on the high side... maybe a lower current would be better ?????
>
> H^) harry

Date: Wed, 04 Dec 2002 20:01:51 -0000
From: "fdisynth"
Subject: OTAs in VCF6 and VCF8

> Hi Tom.
> Can be possible and of any beneffit to use LM13700 instead of the LM13600 on your VCF6c and VCF8e?
>
> Thanx,
> Fernando

Date: Wed, 4 Dec 2002 16:46:32 -0800
From: "tomg"
Subject: Re: OTAs in VCF6 and VCF8

> I like the 13600s better....I have tried all 3 including the NE5517...
>
> Tom

Date: Wed, 11 Dec 2002 13:44:01 -0000
From: "the19thbear "
Subject: vcf6c

> hi...
> does the vcf6c selfosc, or does it need some tuning? if. what?
> thanks.

Date: Mon, 16 Dec 2002 13:37:41 -0000
From: "the19thbear "
Subject: vcf6c pots!

HELP: does it matter what kind of pots i put in the vcf6c?..LIN or LOG? and can i make a mix..(i happen to have some 50k lin and some 50k log allready and don«t want to buy new ones) and are ALL the pots 50K including the one ON the board? AND is there a way to get the vcf6c to selfosc? if, how? hope that the answers aren«t too obvious... i«m new! thanks!

Troels

Date: Mon, 16 Dec 2002 21:44:15 -0500
From: harrybissell
Subject: Re: vcf6c pots!

Hmmm... mine self-oscillates...???
I'd try matching the diodes (in horizontal pairs... closely) and use good capacitors (polystyrene preferred) and as close a tolerance as you can get (I've got 2%)
I'm using the 2SC1583 pair in place of Q1 - Q2
My C9 is 220uF nonpolar... Make this cap bigger for sure if you want good self-oscillation to low frequencies.

H^)
harry

Date: Tue, 17 Dec 2002 00:42:44 -0800
From: "tomg"
Subject: Re: vcf6c pots!

does it matter what kind of pots i put in the vcf6c?..LIN or LOG? and can i make a mix..(i happen to have some 50k lin and some 50k log allready and don«t want to buy new ones)

A: I use linear for just about everything....even places where you would normally see a audio taper.

ALL the pots 50K including the one ON the board?

A: Yes.....FFR....The pot on the board is called a trimmer.

is there a way to get the vcf6c to selfosc? if, how? hope that the answers aren«t to obvious... i«m new! thanks!

A: Turn up the resonance control?? Are you having problems?

Tom

Date: Tue, 17 Dec 2002 17:08:09 -0500
From: harrybissell
Subject: Re: vcf6c

Hah. Your e-mail was almost fininshed on my computer at work when the garbage truck hit the power pole ;^P
You match diodes for forward voltage drop at some constant current. I made a small circuit using an LM336 current source and a couple of resistors (just followed the data sheet application) and I set it to about 200uA (this is in the midrange of current in the VCF6).
Match the diodes as close as you can get them...maybe a millivolt or so. like 670mV , 671mV
the value does not matter as long as horizontal pairs (on the schematic) are matched. Better if they ALL match, but it is the left-right pairs that really count.
You cannot TOUCH the diodes because your body temperature will hose the reading badly. I use those mini-hook jumpers... and fish the diodes out of the bin, box, paper plate... by grabbing with the hooks and never touching. Match them all in one sitting, with room temperature not changing either (no drafts, no dog breathing on them...).
Measure a few to see where they mostly fall... then I take a big peice of cardboard with squares drawn on it (chessboard) and stack diodes that measure the same on the same squares (all 670mV, 671mV, 672mV....) when you get enough pieces of any value, you are done :^)

H^) harry

Date: Fri, 20 Dec 2002 10:45:12 -0000
From: "the19thbear "
Subject: vcf6c

ok... i have now BUILD my vcf6c...
and this time it wont selfosc..hehe... i can get it to selfosc if i feed the output of my adsr to Q cv in on the vcf...
seems that i cant manually turn up the resonance to full, only with aid of an adsr!? and this only works if i have the vco-out cable connected to vcf in, it should be able to selfosc without any input? right?... and the filter is pretty noisy... ill go home and check everything again but if anyone has any comments/help, it would make me HAPPY! sorry if the questions are stupid/obvious... but im new:)

thanks
troels j¿rgensen

Date: Sat, 21 Dec 2002 05:12:07 -0000
From: "kc8jnh "
Subject: incorrect voltage (or maybe OTA) to ruin the day

i finally finished up my vcf6c to power it up and find that turning the cutoff back and forth produces absolutely no effect on the signal. the resonance seems to work fine (although it just barely self-oscillates. doesn't seem anywhere near where it should be). anyway, after going back and checking everything a few times, i started digging through old emails on the list to see what sort of problems other people had with their filter. here are a couple things i found, would they have anything to do with my problem, perchance?

1) somewhere a long while back, tom mentioned that 15 volts wouldn't do for the filter. i'm not sure if he was talking about the vcf6c. anyway, i'm running this off 15 volts instead of 12. could the problem be here?

2) i think tom also mentioned that a bad ota could screw things up like this. would a faulty one produce this sort of symptoms? also, how critical is it that i install an ic socket for my ICs? i know that you're not supposed to mount the Ics directly on the board, but i was lazy and did it anyway. i tried to make the joints quickly, to keep the chip from getting too hot, but maybe that's not enough.

david

Date: Sat, 21 Dec 2002 00:35:28 -0500
From: harrybissell
Subject: Re: incorrect voltage (or maybe OTA) to ruin the day

Hiya: (inline)
If the resonance works (sort of) and the signal gets through the filter... the OTA is probably good.
If the filter will not tune... look for a mistake around Q3-Q4. Did you get the NPN and PNP in the right places ???
I run +/-15V with no problems.
I made C9 much bigger to get better self-oscillation. My VCF6 would not oscillate at low frequencies. I made it 220uF nonpolar.
I added a .001uF cap across R10 to kill a very high frequency oscillation when the filter is opened all the way up at high resonance. This is NOT required and won't help you (yet) so make it work first... then make it work better.
I always use IC sockets. Not to protect the IC... but to protect the board in case I like to remove the IC. Sometimes its useful to swap in a new IC... or sometimes I bend ONE pin out of a socket as a test point up to "that point"
Can't guarantee the OTA is good... but inability to tune the filter has nothing to do with the OTA....
H^) harry

Date: Sat, 21 Dec 2002 10:10:23 -0000
From: "the19thbear "
Subject: vcf6c

hmm.... sounds like we have kind of the same problems..? what happens if you put voltage control to q cv in(i use adsr out).. mine starts to selfosc when i do that.. (just barely without) and as i mentioned in the last note.. it only selfosc with an audio signal connected, but also works fine if i turn down the volume of the signal.. same thing with your filter? i had the same problems with the cutoff, but found out it was the connections to various pots that was the issue..mayby thats your problem to? is your filter quite noisy?.. mine is!.
hope somebody can help us both!(or ill just have to check everything again)

Date: Sat, 21 Dec 2002 13:59:31 -0500
From: "elmacaco"
Subject: Re: vcf6c

Did you guys tune the filter with the cut off Trim pot first? it might help.
set the resonance at full and the cutoff pot somewhere in the middle and turn the trim pot for a while and see if you don't here oscillation. If you need a CV it sounds like your trim pot is offsetting the cutoff pot to a level before oscillation.

Date: Mon, 23 Dec 2002 13:52:26 -0000
From: "the19thbear "
Subject: vcf6c

hmm.... still havent fixed the vcf6c... but fixed some wiring problems, so its not so noisy anymore! still have problems
with selfosc.. i use a 50k pot for the freq, and 50k for Q, BUT 47k for CV1 and CV2.... could that knock out the balance
for selfosc?..

thanks! and happy holydays!

Date: Mon, 23 Dec 2002 17:54:47 -0000
From: "kc8jnh "
Subject: Re: vcf6c

i got my vcf6 working, finally. i'm actually not sure what was wrong. most likely it was a faulty connection, although i did find that i had to short out the place where the trimmer pot would have gone to the negative rail (since i did away with the actual pot itself). mine is self-oscillating pretty nicely (both before and after doing harry's mods), and that's with no CV input at all, so i'm doubting that using 47ks on your CV inputs matter much here. they'd only attenuate your voltage, i believe. anyway, thanks everyone for the help! it's nice to have a different filter color alongside a bunch of moog-clones.

now i'm on to try debugging a couple other modules. i finished a dual ADSR and a final mixer, and neither seem to be working fully. the ADSR works, but not at all like a conventional EG would. at any rate, i actually built two, and i'll be getting around to hooking up the second one later today, so i'll be able to compare and see if they have the same problems.

david

Date: Mon, 23 Dec 2002 13:03:24 -0500
From: "elmacaco"
Subject: Re: Re: vcf6c

You did away with the trimpot?

did you replace it with a resistor or something?

I don't see why anyone would want to be rid of a tuning trimpot on their filter.

19thbear, No those pots will not make a difference. did you try tuning the trimpot?

I sound like a trimpot maniac over hear, but it's good to rule that out.

Can you pass audio through the filter?

Ed

Date: Mon, 23 Dec 2002 23:08:03 -0000
From: "kc8jnh "
Subject: Re: vcf6c

hi ed,

i originally installed the trim pot, but found that it was unnecessary. the circuit didn't need any more voltage, so i would have had it turned down all the way anyway. when i realized this, i just removed the pot and rewired the negative rail directly to R17. not saying this will work for everyone, but it did it my situation.

David

Date: Tue, 24 Dec 2002 11:43:49 -0500
From: "elmacaco"
Subject: Re: Re: vcf6c

good work! save that trimmer for another day!

Date: Mon, 30 Dec 2002 11:55:23 -0000
From: "the19thbear "
Subject: vcf6c

its me again.... i finally got the vcf6c to selfosc (c8 not properly soldered)... but with an extra unwanted bonus! the "hum" from my powersupply is very loud through the headphones.. almost as loud as my other oscillators.the powersupply is a very cheap one, it is noisy, but the "hum isnt that loud at all on all my other modules.. i have checked all the connections.. hope you guys can help me out... (again)
thanks... troels j¿rgensen

Date: Mon, 30 Dec 2002 17:29:16 -0000
From: "emmaker "
Subject: Re: vcf6c

Check your grounds and make sure they are all connected properly. Wiggling wires and seeing if the hum changes is a good sign a ground isn't hooked up.

Jay

Date: Thu, 20 Feb 2003 11:59:12 -0000
From: "the19thbear "
Subject: vcf6c help

Hi.... i thought that i got the vcf6c working, but then it died again!.. i changed the capacitors, and transistors, but still.. it doesnÕt work.. my vcf reads +15 volts at pin3 AND at pin4 of ic lm13600, and according to the schematic on the ele4music pages, it should read +15V at pin 3 and -15V at pin 4,, but it doesnt! is this a mistake in the schematic or in my vcf? any suggestions?, i thought that the ic was maybe toast, because of my not-working filter, but if pin 4 reads +15V, the ic shouldnÕt be the big problem!
anybody got some "measuring points, with certain voltage references"? so i can see whatÕs broken? or any suggestions?
anything!

thanks troels j¿rgensen

Date: Wed, 04 Jun 2003 12:00:07 -0000
From: "the19thbear"
Subject: vcf6c

anybody knows how to reduce the vcf6c«s self osc? not the frequency, but when it begins to oscillate.. if i turn up the "Q" barely halfway, it starts oscillating.. i want a bit more q "action", before the oscillation starts. thanks.

Date: Wed, 04 Jun 2003 23:26:32 -0000
From: "toneboy22"
Subject: Re: vcf6c

Hey 19th,
Here's a few ideas: sounds like your voltage-to-current converter(Q5) is sensitive.
1)easiest: increase R21, 220K, to 470K or so.
2)or: increase R24 from 10K to 20K or 30K.
3)check gain(Hfe or beta)) of Q5. Maybe install one with lower beta.

Oh, check 2 make sure Q5's e-b-c are oriented correctly! cheap digital meters sometimes have transistors testers. will be able to tell e-b-c polarity as well as relative beta. get that filter Qin' tb

Date: Fri, 06 Jun 2003 14:51:03 -0000
From: "toneboy22"
Subject: Re: vcf6c-chapter2

Hey 19th,
just thought of something else re your early filter oscillation.....
check out your "Q" pot. Is it linear or logarithmic?? measure with an analog ohm meter. If mid rotation is 1/2 pot value, it's lin. If changes really quickly on 2 of the terms, it's log. AFN tb

---

Date: Thu, 24 Jul 2003 22:28:52 -0000
From: "Fernando"
Subject: diode matching for VCF6

Hi Harry et al,

I found this simple circuit to match diodes at ThePeasant's site.
http://www.angelfire.com/electronic/epeasant/circuits/diodemch. gif But...
I don't know what I'm looking for when matching diodes. I know it's important not to touch the diodes because of temperature variation, but that's all (not too much)
Any help on using this circuit to match VCF6 diodes?
Thank you!!!

Fernando

Date: Sat, 26 Jul 2003 13:55:56 -0400
From: harrybissell
Subject: Re: diode matching for VCF6

I used a small constant current source... and matched at a single point in the middle of the current range (maybe 100uA). You could match at several points for uhhh... better matching ? but what benefit it might have (sonically) I don't know. I do not recommend trying to find film capacitors in the 220uF range. Use non-polar electrolytics. You can get film caps this big... I got a 2800uF at 900V... it weighs about 30 lbs and would be real hard to panel mount :^P
The only caps that would benefit from matching would be the four caps in the ladder. If you can find polystyrene (now rare in this high a value) and you could find 1% as well... they would be VERY hard to fit in the layout. Mine are mounted on end (vertical). I like this filter. I finally got it mounted in the modular.
H^) harry

Date: Sat, 26 Jul 2003 11:25:18 -0700
From: "John L Marshall"
Subject: Re: diode matching for VCF6

I like the idea of connecting a bunch of diodes in series then measuring the drop across each one. Current is guaranteed exactly equal through each diode. This procedure might work especially well if you want to check the drop at several different points. The supply voltage will need to be higher but not that high; maybe 26 V for 30 diodes. Take care, John