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Joined: Jan 10, 2006
Posts: 138
Location: slovenia
VCF buzzing problem
Subject description: Wildcat VCF1 / 4622 VCF

building the wildcat, i'm moving on the next module, the VCF1. again, i need help from you guys.

the problem:

the filter works pretty much as it should. VC control of cutoff frequency is okay, the resonance also works as it should. HPF and LPF inputs.

but, there's a constant buzz at 100Hz (i think), and it's very audible.

i have also tried CV controlling the cutoff with a potentiometer, straight off GND and +12V, the low-freq buzz is always there (but the high-pitched noise isn't, so that one's not an issue)

i checked all the resistor values (with the schematics, the BOM list is completely wrong), all the capacitor values, i have replaced the LM13600 and LM3046 and checked all transistor types (using just 2N3904 and 2N3906). everything is as it should be.

one thing i'm not really certain though, are the non-polarized capacitors. i used ceramic and copied values for the 4 caps in the filter stages from the EFM 4622 VCF schematic (now offline) - 0.1uF. this should be okay, right?

so, anyone, any ideas where to look?

thanks!

RF
Joined: Mar 23, 2007
Posts: 360
Location: Northern Minnesota, USA

How good is your power supply?

Peake
Joined: Jun 30, 2007
Posts: 586
Location: LA, CA

Yves seconds the power supply as a source of that very 100Hz issue:

<http://yusynth.net/Wildcat/noise-module.html>

"These overtones correspond to residual ripples from the +12V rail."

He evidently had this problem in the noise circuit. Hope this helps, or that someone else has a quick fix.

yusson
Joined: Nov 24, 2005
Posts: 239
Location: France

Hi

OK I did have those problems either, first of all, forget about the HP input, it is not designed as it should and it is mostly responsible for those humming issues. It also impairs the behaviour of the filter in LP mode. On my first Wildcat board I tried to solve this problem of humming, I added a 15V zener diode and a 100uF/25V capacitor connected between the ground (0V) track and the power track that feeds in the HP subcircuit, I drilled the PCB as close as possible to the HP subcircuit (see pictures below). This solved the hum issue alright but then I found that the Low-pass mode was not behaving as I had expected. This has to do to the very low impedance at the emitters of the transistors Q1 and Q2. This is tricky issue, I tried to change the value of capacitor C7 as explained by Osamu Oshuyama here (<http://www5b.biglobe.ne.jp/~houshu/synth/Vcfv0212.GIF>) but was never satisfied actually. My definitive solution to the problem was to... GET RID... of the HP section which was causing all the trouble. As soon as I disconnected this by removing C4 and C5 and ... SHAZAM... the Low-pass filter started behaving as expected !!! Therefore on my second board I did not populate the HP sub-section and the Low-pass filter behaved nicely with no hum either (no need there to add the extra zener and filtering cap). If I need a HP filtering I use VCF2 which is perfectly efficient!

By the way be sure to use a LM13600 not a LM13700, I obtained much better results with the LM13600.

yusson
Joined: Nov 24, 2005
Posts: 239
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By the way do not use ceramic caps for the ladder.

Yves

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awesome! Yves, you always have the answer

i'll remove C4 and C5 and see what happens! yeah, i'm using a LM13600, everywhere on the board actually.

ceramic caps - do you maybe know what should change in sound if i change the caps to polyester?

btw - if the power supply is that dirty, shouldn't something be done about that as well?

yusson
Joined: Nov 24, 2005
Posts: 239
Location: France

kokoon wrote: btw - if the power supply is that dirty, shouldn't something be done about that as well?

I think a simple thing to do is to replace the straps that connects the subcircuit to central power rails by small 10 ohm resistors with 10uF filtering caps immediately after. This helps to get rid of some of the noise. The problems are less due to the power supply itself. They are rather due to some design mistakes of some modules (noise generator and VCF1 HP subcircuit). I have not experienced problems with the other modules. I strongly suggest that you apply the mods shown on my site concerning the RING MODULATOR and the Sample & Hold which are also poorly designed.

Concerning the caps, the polyester caps are better matched and it is important in order to obtain a real 24dB/oct slope and the right phase shift to produce a good resonance.

Yves