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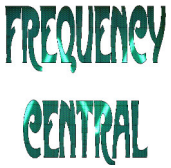
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Author	Topic: So why haven't we got a Moog transistor ladder envelope filter project then? (Read 5623 times)

frequencycentra
Posts: 4629

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Rick - FC>UK

🌐

So why haven't we got a Moog transistor ladder envelope filter project then?
« **on:** July 11, 2010, 11:05:26 AM »

Here's a selection of Moog transistor ladder filter schematics gleaned by using the search function:

http://dropmix.xs4all.nl/rick/Emusic/Moog/moogvcf_schematic.gif
http://files.muziq.be/schematics/moog_904a.gif
http://www.elby-designs.com/asm-2/vcf2/vcf2-filter-asm2-cct.pdf
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http://www.fantasyjackpalance.com/fjp/sound/synth/synthdata/16-minimoog/001/911-filt-print-circ-schem.gif
http://www.freeinfosociety.com/electronics/schemview.php?id=952

So why haven't we got a fabby-dabby Moog transistor ladder envelope filter project on the forum? Jeez, do I have to do-it-myself?

It'll need a charge pump for +/-9v power.............

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....and now I'll etch your PCBs too....PM me!

JKowalski
Posts: 1137

Chris S.

🌐

Re: So why haven't we got a Moog transistor ladder envelope filter project then?
« **Reply #1 on:** July 11, 2010, 11:18:50 AM »

SYNTHGEAR

Sorry, due to bandwidth costs, we do not allow hotlinking of images or audio files

Please visit us at www.SynthGear.com

Apparently.... It's pretty popuar... 😆

Maybe you should team up with that guy for a handy reference.

Why not do it yourself? You could adapt it to single supply.

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frequencycentra
Posts: 4629

FREQUENCY
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Rick - FC>UK

Re: So why haven't we got a Moog transistor ladder envelope filter project then?
« **Reply #2 on:** July 11, 2010, 11:28:48 AM »

Quote from: JKowalski on July 11, 2010, 11:18:50 AM
Why not do it yourself? You could adapt it to single supply.

Hey that's MY arm!

From what I've read, 9v isn't going to cut the mustard in this case

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....and now I'll etch your PCBs too....PM me!

JKowalski
Posts: 1137

Chris S.

Re: So why haven't we got a Moog transistor ladder envelope filter project then?
« **Reply #3 on:** July 11, 2010, 11:49:50 AM »

Quote from: frequencycentral on July 11, 2010, 11:28:48 AM
> **Quote from: JKowalski on July 11, 2010, 11:18:50 AM**
> Why not do it yourself? You could adapt it to single supply.
>
> Hey that's MY arm!
>
> From what I've read, 9v isn't going to cut the mustard in this case

Well, I didn't mean 9V specifically. 18V...? Buffered op amp Vref?

That's a weird circuit, now that I look at it again. It's refreshing to see something new and original in circuit design.
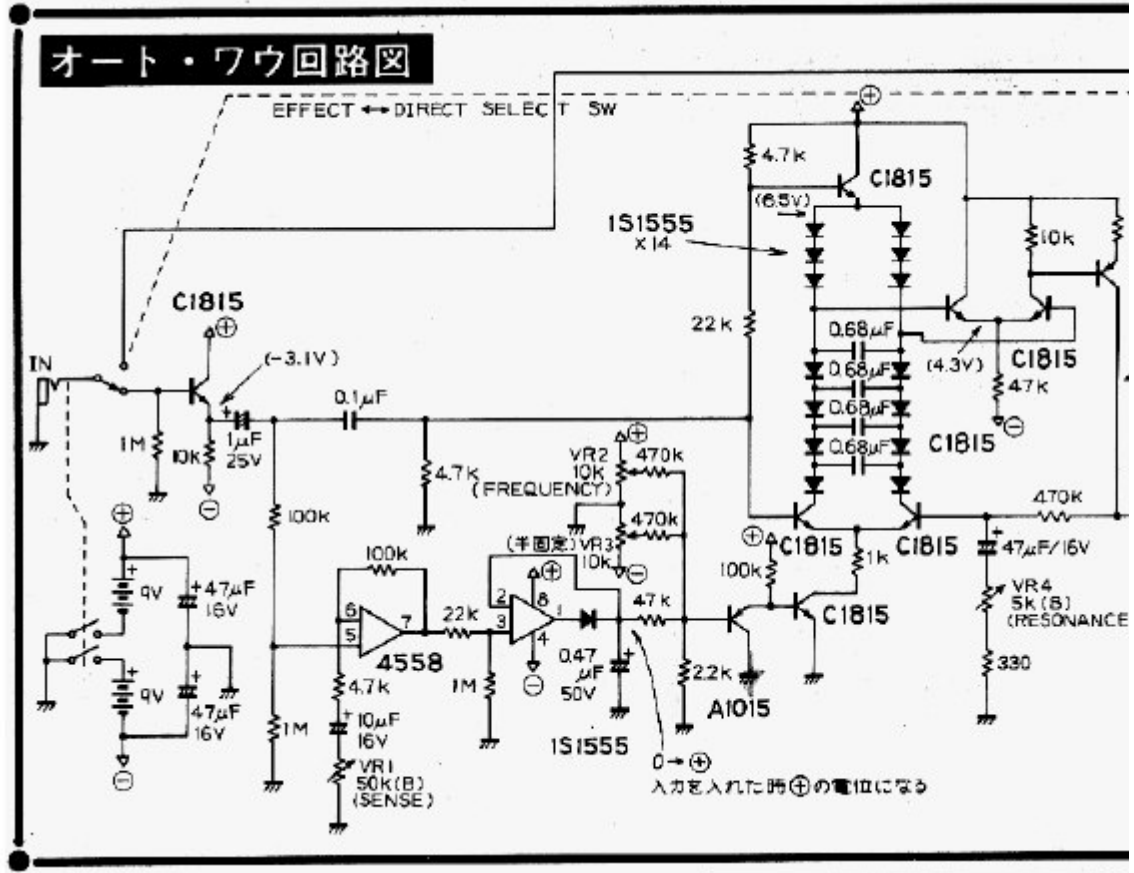
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Mark Hammer
Posts: 18227

Re: So why haven't we got a Moog transistor ladder envelope filter project then?
« **Reply #4 on:** July 11, 2010, 12:13:28 PM »

Here's an old Japanese 4-pole diode-ladder effect from the late 70's. I have the layout for it as well, but it won't fit in a 1590BB.

🖳 Logged

mph
Posts: 31

Regis

Re: So why haven't we got a Moog transistor ladder envelope filter project then?
« **Reply #5 on:** July 11, 2010, 02:02:54 PM »

There is also this schematic:
http://yusynth.net/Modular/EN/MOOGVCF/index.html

The pcb is quite small, but it runs on +/- 15V regulated PSU of course.
It is mandatory to match the trannies in the ladder, so it requires a very precise multimeter.

I have this module fitted in a "work in progress" modular and it sounds very nice.
Then it will just need a CV pedal or and enveloppe follower to be used with the guitar (I have made a small circuit from the Formant Modular Synth to do that job).

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R.G.
more
Posts: 12615

Re: So why haven't we got a Moog transistor ladder envelope filter project then?
« **Reply #6 on:** July 11, 2010, 02:45:50 PM »

I messed with it quite a bit for a while. It's voltage hungry and can have lots of hiss if you're not careful.

A four-pole active lowpass implemented another way works almost as well. For instance, using two LM13700s to do four single pole lowpasses is nice, if also a bit hissy, but it does work from ground and +9V well enough.

State variable filters set up as lowpass with a high Q work well too.

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R.G.

Herblock's Law: If it's good, they'll stop making it.
(Herbert Block)

JKowalski
Posts: 1137

Chris S.

Re: So why haven't we got a Moog transistor ladder envelope filter project then?
« **Reply #7 on:** July 11, 2010, 04:40:40 PM »

Quote from: R.G. on July 11, 2010, 02:45:50 PM

> I messed with it quite a bit for a while. It's voltage hungry and can have lots of hiss if you're not careful.
>
> A four-pole active lowpass implemented another way works almost as well. For instance, using two LM13700s to do four single pole lowpasses is nice, if also a bit hissy, but it does work from ground and +9V well enough.
>
> State variable filters set up as lowpass with a high Q work well too.

I suppose that's a lot of diode drops to get over! It does seem like modern methods (what, this was mid 60's?) would render this obsolete, but then again it is said to have "characteristic distortion"... 😵

Mark, what effect is that? Do you have any information on the completed unit? Looks like... envelope controlled... Hmm

Maybe the best route to go in this project is a transistor array chip...? Well matched, less space hungry?

« *Last Edit: July 11, 2010, 04:44:30 PM by JKowalski* »

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caress
Posts: 1181

brian hamilton

Re: So why haven't we got a Moog transistor ladder envelope filter project then?
« **Reply #8 on:** July 11, 2010, 05:20:57 PM »

Quote from: JKowalski on July 11, 2010, 04:40:40 PM

> Maybe the best route to go in this project is a transistor array chip...? Well matched, less space hungry?

LM394 for a matched pair at least?

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http://www.smallsoundbigsound.com

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petemoore
Posts: 18495

Re: So why haven't we got a Moog transistor ladder envelope filter project then?
« **Reply #9 on:** July 11, 2010, 05:26:53 PM »

So why haven't we got a fabby-dabby Moog transistor ladder envelope filter project on the forum? Jeez, do I have to do-it-myself?
  I'd be more inclined to foster interest if I knew anything about it.
  It'll need a charge pump for +/-9v power

As Yet Unrated

..I have a couple floating linear 9v supplies available.
RG seems to think there are other ways, to...
What's this thing actually do? [besides be an intersting choice for a temporary tatoo ?

« *Last Edit: July 11, 2010, 05:30:19 PM by petemoore* »   Logged

Convention creates following, following creates convention.

JKowalski
Posts: 1137

Chris S.

Re: So why haven't we got a Moog transistor ladder envelope filter project then?
« **Reply #10 on:** July 11, 2010, 10:03:35 PM »

Quote from: petemoore on July 11, 2010, 05:26:53 PM

> *So why haven't we got a fabby-dabby Moog transistor ladder envelope filter project on the forum? Jeez, do I have to do-it-myself?*
> I'd be more inclined to foster interest if I knew anything about it.
> *It'll need a charge pump for +/-9v power*
> ..I have a couple floating linear 9v supplies available.
> RG seems to think there are other ways, to...
> What's this thing actually do? [besides be an intersting choice for a temporary tatoo ?

Looking it up, it was first developed as an adjustable low pass filter for a moog synth. Kind of an odd sound, not so sure I would like to use it that much, but it's interesting and may pique someones interest.

Quote from: caress on July 11, 2010, 05:20:57 PM
Quote from: JKowalski on July 11, 2010, 04:40:40 PM

> Maybe the best route to go in this project is a transistor array chip...? Well matched, less space hungry?

> LM394 for a matched pair at least?

Don't they make matched quad arrays?

« *Last Edit: July 11, 2010, 10:07:04 PM by JKowalski* »   Logged

R.G.
more
Posts: 12615

Re: So why haven't we got a Moog transistor ladder envelope filter project then?
« **Reply #11 on:** July 12, 2010, 09:21:46 AM »

Quote from: petemoore on July 11, 2010, 05:26:53 PM

> What's this thing actually do? [besides be an intersting choice for a temporary tatoo ?

It's a lowpass filter, but one which has four time constants all at the same frequency, and both gain and feedback. That means the following in terms of frequency response:
- A single R-C lowpass has a rolloff slope which declines at -6db per octave; that is, after the critical frequency, output halves for each doubling in frequency. This is not a terribly fast rolloff.
- Each additional R-C lowpass section you add increases the ultimate rolloff slope by another 6db per octave. But they load each other down and interact. You can do better by buffering each section from the others to eliminate the loading. This gets to being lots of circuitry.
- A lowpass with resonance (the gain and feedback give you this) can produce a peak right at the rolloff frequency which then dives for minus infinity after the peak. This sounds rather like a bandpass with a low pass added to it. Conceptually it is the same.

A lowpass withe peaking is kind of an ideal wah filter, as it lets through the fundamentals of the notes, but gives you the bandpass "wah" resonance on the harmonics in the human vocal range. The Vox wah is in fact a two pole lowpass filter with peaking.

A four pole lets you have sharper peaks, and the ladder setup lets you have an exponential control characteristic, which is important for musical sounding controls in a synth context.

It never hit me til now, but for effects use, I bet you get 90% of the advantage of the ladder by using only two poles, not four. That reduces the voltage requirements a bit and might make a decent 9V only circuit for guitar pedals. Hmmm. Have to work on that.

Logged

R.G.

Herblock's Law: If it's good, they'll stop making it.
(Herbert Block)

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slacker
Posts: 3931

Ian M. - England

Re: So why haven't we got a Moog transistor ladder envelope filter project then?
« **Reply #12 on:** July 12, 2010, 10:13:28 AM »

There's a simpler version using diodes instead of transistors and some other good stuff in this thread http://www.diystompboxes.com/smfforum/index.php?topic=60127.0

« *Last Edit: July 12, 2010, 10:18:53 AM by slacker* »

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I got 350 heads on a 305 engine, I get ten miles to the gallon,
I ain't got no good intentions - Zip City - Drive By Truckers

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frequencycentra
Posts: 4629

FREQUENCY
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Rick - FC>UK

Re: So why haven't we got a Moog transistor ladder envelope filter project then?
« **Reply #13 on:** July 12, 2010, 11:28:43 AM »

The Moog filter is a bit of a holy grail in the synth world, very much desired and highly thought of. I've got one in my DIY modular synth, built using TBA331 transistor arrays and BC550's for the ladder - works very well. Certainly has a characteristic sound different to OTA 4 pole filters. I have no envelope follower in my modular system to 'simulate' a Moog style envelope filter, so I guess I'll have to breadboard one and hook it up.

Diode ladder filters are inferior in my book, I have one in my Synthi A clone, possible the weakest filter I have. I'm pretty blessed with synth filters. Curiously, while doing a bit of reseach I came across transistor ladder and diode ladder phasers, of which I was not previously aware: http://www.musicsynthesizer.com/Diode%20Phaser/Diode%20Phaser.html I'm now intrigued with the idea of a diode ladder phaser - more fodder for the breadboard!

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Mark Hammer
Posts: 18227

Re: So why haven't we got a Moog transistor ladder envelope filter project then?
« **Reply #14 on:** July 12, 2010, 11:42:04 AM »

Well, I guess the question that must be asked is whether the "weakness" of diode-ladder filters, in comparison to transistor ladder, bumps them **below** more pedestrian fare like 2-pole op-amp or OTA-based, or whether it positions them as more desirable than 2-pole, but just not as tasty as transistor-ladder.

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frequencycentra
Posts: 4629

Re: So why haven't we got a Moog transistor ladder envelope filter project then?
« **Reply #15 on:** July 12, 2010, 11:47:49 AM »

FREQUENCY CENTRAL

Rick - FC>UK

A filter league table? 😊 That's difficult. And ironically my favourite filter is the Oberheim SEM multimode which is only 2 pole but bursting with character. Mine has outputs for each mode, panning the lowpass to the left and the highpass to the right makes for some monster filter sweeps. I also have two Roland 4 pole OTA filters which I sometimes use in series for 8 pole, or in combination to make highpass and bandpass. But as far as FAT goes, the Moog somehow rules the airwaves.

« Last Edit: July 12, 2010, 11:50:47 AM by frequencycentral »

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PRR
Posts: 2564

Paul R. - Maine USA

Re: So why haven't we got a Moog transistor ladder envelope filter project then?
« Reply #16 on: July 13, 2010, 10:26:41 PM »

> for effects use, I bet you get 90% of the advantage of the ladder by using only two poles, not four.

The early synths could make some AWFUL RACKET with harmonics all up the audio spectrum. Sharp-corner squares, narrow pulse-widths.

Real music isn't like that.

And "normal" musical instruments can't make those sharp corners. Body-wood, pipe diameter, reed inertia, string mass and damping, pickup.... there's at-least 1 or 2 poles of high-cut already.

You didn't always need a 4-pole on an Arp or eMu (never touched the Moog) modular synth, but when you did you DID.

Agree that if a peak then 2-pole drop (~~14dB down the first octave) isn't enough for "normal" music instrument sources, then you are using the wrong instrument for the wrong sound. (Anyway for the CD you can always fix it in ProTools.)

P.S.: I know the Arp did not use Moog's ladder, did not have OTA, did have 4-pole, but it has been a while and it is much too hot to remember how they did it. I may be remembering two 2-pole filters in one module, easily slaved together?

Logged

StephenGiles
Posts: 5043

Re: So why haven't we got a Moog transistor ladder envelope filter project then?
« Reply #17 on: July 14, 2010, 07:19:26 AM »

Far better to use 2 batteries, as I always say. They always work, but then size of box is of no consequence to me. EH used a different VCF in the Crashpad, and that used a very tasty sweep generator if you'd care to look!

http://www.4shared.com/photo/1DEj4onP/EHcrashpad1.html

« Last Edit: July 14, 2010, 09:08:15 AM by StephenGiles »

Logged

If you don't go when you do want to go, then when you do go you'll find that you've gone.

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frequencycentra
Posts: 4629

Re: So why haven't we got a Moog transistor ladder envelope filter project then?
« Reply #18 on: July 19, 2010, 11:50:52 AM »

FREQUENCY CENTRAL

Rick - FC>UK

Just a little progress in the reseach to report. Yves Usson put me onto this variation:

http://www5b.biglobe.ne.jp/~houshu/synth/moritaVCF76.gif

......which implements highpass in addition to lowpass, without the 'bad behaviour' which results in mixing the unfiltered and filtered signals together, out of phase with each other, into a mixing opamp. By mixing the unfiltered and filtered signals prior to the resonance loop any naughtyness is avoided. I had noticed some inconsistencies with the Moog filter in my DIY modular when configured as a HP using a mixer and inverter - constantly had to retune the mix to achieve highpass (do we call that null offset?).

So now to decide upon the envelope part, this link was in a recent thread here, which seems interesting:

http://sound.westhost.com/appnotes/an001.htm

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frequencycentra
Posts: 4629

FREQUENCY CENTRAL

Rick - FC>UK

Re: So why haven't we got a Moog transistor ladder envelope filter project then?
« **Reply #19 on:** July 19, 2010, 11:52:29 AM »

Quote from: StephenGiles on July 14, 2010, 07:19:26 AM
> EH used a different VCF in the Crashpad, and that used a very tasty sweep generator if you'd care to look!
>
> http://www.4shared.com/photo/1DEj4onP/EHcrashpad1.html

Stephen, why haven't you mentioned this before? 😁

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