Re: 22.6us and ~10mips to create pink noise real time

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- *From*: don@xxxxxxxxxxxxxx (Don Klipstein)
- *Date*: Tue, 23 May 2006 05:08:56 +0000 (UTC)

In article <e4tr0p$cm4$1@xxxxxxxxxxxxxx>, Ken Smith wrote:

> In article <4471b70e$0$7104$636a55ce@xxxxxxxxxxxx>,
> Fred Bartoli <fred._canxxxel_this_bartoli@xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx> wrote:
>
> > "Ancient_Hacker" <grg2@xxxxxxxxxxx> a écrit dans le message de
> > news:1148297835.521024.201110@xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
> >
> > > We did use all analog−− the zener (or a transistor E−B
> > > junction reverse
> > > biased) generates the noise. 7 cents, no programming, and
> > > very low
> > > power consumption.
> >
> > But you'll need more than a simple RC filter to mimic 3dB/octave.
> > First order filters give 6dB/o
>
> The filter can be passive but it needs about as many parts as the number
> of octaves.

Somehow, I remember seeing filters that convert white noise to noise that is pink within +/− less than 1 dB throughout the audio spectrum with a bit fewer parts than that... Then again I could have found to be "conveniently simple" a filter circuit with a few resistors and capacitors totalling could have been about as many 10 parts although I thought a bit less than that.

But it is true − converting white noise to pink noise requires a 3 dB/octave slope which for entyire audio spectrum requires several of what I think of as "shelf filters" − flat frequency response at very high and very low frequencies but gain varying inversely with frequency over some range. I have seen impressive "pink noise filter circuits" with three "shelf filter" stages, and somehow I suspect that could use fewer than 10 parts...

Now I try Google and get:

http://www.spectrum−soft.com/news/fall98/pink.shtm

A couple filters, one with 8 parts, and a couple spectral analysis plots with the one from the 8−part circuit being pink noise +/− not much more than .2 dB from 10 Hz to 29 KHz if I did not do any misinterpretations.

http://sound.westhost.com/project11.htm

A more complete pink noise generator circuit, with the filtering achieved by 9 parts and looking good (within a dB) for 10 Hz to 20 KHz and loking like well within half a dB of a straight line throughout most of the audio spectrum.

http://www.qkits.com/serv/qkits/velleman/pages/k4301.asp

A kit, although I did not see a statement of how closely it approximates pink noise nor a circuit showing the number of parts in the filter. But it does appear to be a simple enough kit!

http://www.hobbytron.com/vk4301.html

Similar kit, possible the same one.

http://home.iprimus.com.au/vk3jaj/pinkfilt/pinkfj04.html

An "audio spectrum analyzer pink noise generator" circuit − where I see 9 parts that I see being filter components.

http://home.iprimus.com.au/vk3jaj/pinkfilt/pinkfj07.html

Another circuit with white and pink noise outputs, with the filter section appearing to me to have 9 parts.

− Don Klipstein (don@xxxxxxxxx)
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