

## Re: 24 bit ADC testing

**Source:** <http://sci.tech-archive.net/Archive/sci.electronics.basics/2004-07/0762.html>

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**From:** colin (no.spam.for.me\_at\_ntlworld.com)

**Date:** 07/18/04

Date: Sun, 18 Jul 2004 19:36:47 GMT

"Bob Masta" <NoSpam@daqarta.com> wrote in message  
news:40fa7e96.3426384@news.itd.umich.edu...

> *On Sat, 17 Jul 2004 20:05:42 GMT, "colin"*

> *<no.spam.for.me@ntlworld.com> wrote:*

>

>

> *The virtue of a sinewave is that you can generate a very good one*  
> *quite easily using a Wien bridge, or a state-variable approach.*  
> *Then you can apply as many stages of filtering as needed to get*  
> *the desired purity. The last stage(s) could be purely passive to*  
> *remove any residual active distortion products. There is a temptation*  
> *to do everything in as few stages as possible with really high-Q*  
> *stages, but this can backfire since any component drift will*  
> *detune things so your oscialltor and filter stages are no longer*  
> *at the same frequency... and once you are off-peak of the*  
> *high-Q filter, you don't have much of a filter any more.*

>

> *For a good starting sine wave, consider a 16-bit sound card*  
> *and a signal generator program like my (free) DaqGen.*

>

>

yes i did think of using several stages of filter to clean up the sinewave as you suggest, but as was pointed most dielectrics cause capacitors to change value with voltage, not to forget nonlinearity of ferrites in inductors etc, so these filters would tend to introduce their own non linear errors which would be hard to calculate or compensate for, you could use progressively better components but ultimately the quality of the last stage would have the most effect.

a ramp generator is pretty simple and hence i thought simpler to work out the overall error and even compensate for, also the results are a doddle to interpret.

i just worked out 24 bits has just under 60nv per step for 1 volt range., or 0.000006%

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wich ever signal you generate you could always set the amplitude to cover the botom half of the range then the middle bit then the top bit, then any aparent change in the signal other than the offset is purly down to error in the ADC and any such error should show up. adding an offset shld be posible without introducing any error at all, infact the adc probably can do it

Colin =^.^=