

Re: Noise Source with Limiter ?

Source: <http://sci.tech-archive.net/Archive/sci.electronics.design/2004-10/4859.html>

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On Sat, 16 Oct 2004 15:59:24 -0400, Mike Monett wrote:

- > *You are describing a clipper, which is a limiter with offset. If you*
- > *set the offset to zero, you get transitions with random timings*
- > *between one and zero. This is from a main property of Gaussian*
- > *noise, where it spends 50% of the time on one side or the other of*
- > *the mean. Basically a square wave with random periods and zero avg.*

The main property of Gaussian noise is a Gaussian distribution. You can read about it at Eric Weisstein's MathWorld:

<http://mathworld.wolfram.com/GaussianDistribution.html>

That page links to the Normal distribution:

<http://mathworld.wolfram.com/NormalDistribution.html>

Weisstein remarks that, "... physicists sometimes call it a Gaussian distribution..." The same could be said of engineers.

There is no property of a Gaussian random variable that requires it to have zero mean. In fact, there is an explicit parameter in the Normal distribution that specifies the mean.

The amplitude distribution of your square wave has only two values, and can't be Gaussian. The distribution of zero crossing periods can't possibly satisfy your own definition, since the time can't be negative.

>*From previous discussions, I have a good idea that what you're describing*
is the distribution of the 1 and 0 sequence lengths at the output of a sampler following the limiter. This is much different than the amplitude distribution at the output of the limiter.

— Mike —