
Subject: Re: Measurement signal types

Posted by [Keith Larson](#) on Mon, 11 Feb 2008 09:15:30 GMT

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Hello Constantine and Wayne

I have been meaning to get back over here to post a response for several days now but have been both busy and distracted.

Yes, having multiple signal types is a definite advantage when dealing with non-linear systems that respond differently to varying levels and signal types.

A tweeters for example might be sensitive to low frequency signals mechanically biasing the diaphragm. The step/impulse signal is the most low frequency energetic while white noise is the least. It might therefor make sense to use a white noise signal to test a tweeter. Or, maybe not if you are looking into these effects. That is, suppose you have a 40Vrms 300Hz signal and a first order tweeter crossover at 3Khz. The tweeter would see that 300Hz signal at only -20dBV or 4Vrms. Do you suppose that tweeter might sound just a little strained?

Another example I like to point out is driver TS parameters, since these vary quite a bit with drive level. I have for example, seen the Fs of a totally broken in driver drop by more than 30% by simply changing the AC drive level. Since most manufacturers put out specifications at one drive level (and BTW, what is it?), we set out to produce a continuum of TS parameters with respect to drive level.

Continuing with drivers, consider that suspension and voice coil mechanical offsets induce a polarity dependency. You might for example consider white noise as safe. However, white noise *does* contain at least some low frequency energy and therefor will mechanically bias a driver. Others, like the step function are far more obvious as you can easily see a cone moving inward or outward. On the other hand, a chirp is somewhere between these extremes. In this case the DC bias occurs over each half sine period since the +/- half wave that follows is not symmetric. The bottom line is that all non sine signals can produce weird results, and sometimes all you have to do is flip the test leads!

I guess the question comes down to this: Is having the extra signal types an advantage? For me, tickling a problem and making it worse is sometimes more informative than trying to make it go away. Understanding the nuances can however be as one friend puts it, "like trying to take a sip from a fire-hose"

Best regards,
Keith Larson
