Subject: Re: To measure or not to measure (and what good is it anyway?)
Posted by Wayne Parham on Thu, 05 Feb 2009 04:28:33 GMT
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Excellent questions.I think good measurements are extremely helpful, truly mandatory for proper optimizations. Without measurements, you're really just guessing. One can go to great lengths to model the system mathematically, and that's a good way to estimate or approximate things. You can do a lot with a model. But nothing beats accurate measurements. Whether you're trying to optimize a loudspeaker design or an in-room installation, good measurements are important.The good news for the serious DIY'er is good measurement equipment is relatively cheap these days. A $1000 investment buys measurement equipment that's better than anything available in the pioneering days of audio, even up to the 1970's.That said, I've seen a lot of people over the years trying to quantify things with tools that weren't up to the job. An improperly taken measurement, or a measurement with inaccurate or uncalibrated equipment can give false readings. The novice is then armed with a false sense of security, thinking he knows things he really doesn't. So in some cases, a model is better than a measurement.One must know what they're looking for too. That sort of goes hand in hand with learning how to measure - knowing what to measure. It's tempting for the novice to take a new piece of test gear and measure everything in sight, posting charts that really say nothing. That's probably one of the most common things I see these days. An indoor measurement done without proper gating, for example.Generally, if you're trying to measure a loudspeaker, you want to do it anechoically or pseudo-anechoically. You want to know what the speaker is doing, not the room. So either measure it outdoors or indoors with gating to ignore reflections. This requires some knowledge of boundary conditions and reflections, of free-space, half-space (ground plane) and how to calculate time to first reflection.If you're trying to measure a room, you want an averaged measurement. An RTA may suffice for that, but I'd prefer having something a little more sophisticated with gating capability. That way, you can decide to gate or not, to average or not. Some might measure only at the listening position but I prefer to measure at several points, to know what is happening throughout the room, or at least at several places in the listeneing area. You can then develop a database of information that shows energy distribution at all frequencies, at all positions in the room. This can be seen in high resolution, or it can be averaged to find overall trends.