Subject: Re: Smoothing in Frequency response graphs
Posted by Wayne Parham on Mon, 18 Feb 2008 06:00:13 GMT
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What's the best level of smoothing to use? What kind of measurements should be taken?Those are questions with a lot of right answers and a lot of wrong answers. There is no one right answer for each question, but there are a lot more wrong answers.For me, there are only a few absolutes: 1. If you don't have the right equipment or you don't have experience with test equipment or both, you're better off NOT measuring. The results you get may be wrong and may lead you in the wrong direction. 2. Unless, of course, you're practicing. In that case, it's worth doing but don't necessarily trust your results. 3. You can measure a speaker, or you can measure a room. That's two entirely different things. 4. When measuring a speaker, bass should never be measured indoors. 5. When measuring response in a room, bass must be measured at several locations within the room. 6. Bass measurements should not be smoothed at all. 7. Above 300Hz or so, some smoothing can be used to remove the "grass". But smoothing beyond 1/6 octave removes so much detail pretty much everything looks smooth. 8. When comparing two speakers, the same level of smoothing should be used. Best to compare using the same type of test equipment and test setup. 9. Outdoor ground plane measurements are easiest to get accurate measurements from. Bass response can be measured with the speaker sitting on the ground in a wide open space outdoors. Higher

require you to dig a pit and/or make a false baffle and point the speakers upward with the measurement mic suspended above it. 10. Indoor pseudo-anechoic measurements can be made using some equipment that has gating, but it is only accurate above a few hundred Hertz, depending on the position of the speaker under test, the microphone and boundaries (floor, walls and ceiling). 11. Real-world in-room measurements should be made with the speakers where they will be used. Several measurements should be made throughout the room. This will show room modes and other effects of boundaries like floor bounce notches, etc. 12. In-room measurements should never be used to compare speakers, unless they are gated to remove reflections. If the room is measured, the speaker is not. Room effects swamp almost all other acoustic details that could have been seen specific to the loudspeakers at least at low frequencies in the modal range (below about 300Hz).And the one most important - Listen to the experts. Measurements are not a trivial excercise. You can't just get an RTA and a microphone and expect anything reliable to come from it. I've seen a lot of people do that, and they'd be better off using a modeling program. It would give them more accurate results, particularly below 300Hz. There are a lot of measurement methods, and a lot of ways to get it wrong. For that reason, I'd ask this same question over on the Measurement forum. Maybe Keith Larson will chime in. He's done a lot of work in the field, and I think his input would be very helpful.While there are a lot of wrong ways to do it, but there are a lot of right ways too. There are several good methods, a lot more than what I described above. Maybe some of those methods can be examined in detail in a series of threads.