Subject: Re: Power handling and compression
Posted by Wayne Parham on Tue, 09 Dec 2003 12:26:40 GMT
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Compression is greater as power is raised. At very low power levels, compression is zero and it rises to maximum at full output. Some of the better drivers only have 3dB or so compression at full power levels of several hundred watts. This is pretty impressive. But you'll also find drivers that have twice as much compression as this at full output.As for the "sound" of different drivers, my take is that they are a simple enough system that you can understand them reductionistically. System behaviour is the sum of its parts, and while some systemic behaviour arises, the system is simple enough that it is easily described and easily predictable. So when you take the electro-mechanico-acoustic properties and examine them, you can describe the speaker with a fair degree of accuracy. The most difficult part to examine reductionistically is cone flex, and even this can be found deterministically with some amount of success. This is relatively chaotic motion though, and so description of a system in chaotic behavior is best seen as averaged because it jumps around a bit.Anyway, the point of all that is that drivers sound different when their properties are different. The system acts a a set of filters, each having frequencies of interest and bandwidth or Q. So a large part of the speaker's character is determined by these filter properties. This is a big reason why two speakers can sound different when they have different specifications but similar quality of build construction.Another set of properties that are very important are motor-related and determine what kinds of distortion and amounts will be present. When you have two drivers that are tuned similarly, but one is of better build quality, this is where you'll usually notice this. A great example if in prosound woofers - many have similar specs but the $500 woofer probably has a more linear magnetic structure than the $150 woofer, and so 2nd and 3rd order harmonics are greatly reduced.And the third set of properties are in cone construction, which determines how and when the cone will flex. Some are designed to extent upper frequency performance, and this is usually done with controlled resonances in cone flex - Controlled breakup modes. These provide extended smooth response up high, but the response in this mode is not as smooth as it is down low. Other devices are built to reduce cone flex as much as possible, but when the cone "breaks away" and begins to flex, it does so rapidly and violently, so they should not be used in this region at all, and must necessarily be used over a fairly narrow bandwidth.These are pretty simple systems, and so tuning of each property is pretty straightforward. I think that's why it is such a popular field for do-it-yourself builders. Lots of fun, ey?