Subject: Re: Does sensitivity MEAN coloration?
Posted by Wayne Parham on Thu, 15 Jan 2004 16:17:22 GMT
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Hi Akhilesh!Breakup modes are caused by cone flex. When the diaphragm moves as a rigid piston, it acts pretty much like a single mass/spring system. But when the cone begins to flex like ripples on a pond, it begins to act more complicated, like several smaller masses and more rigid springs are included in the system.Really, no loudspeaker is immune, high efficiency or low. Breakup modes are due mostly to diaphragm material and construction geometry. As you can imagine, a very rigid material will shift the breakup modes higher, but then they will break away more violently, having resonances with higher amplitide or Q. Less rigid materials might breakup sooner but with more damped modes. And the geometry of the cone can be used to set its breakup characteristics too.There are those that try to limit loudspeaker operation to pistonic modes, and there is merit to that, but it is difficult and expensive. Most large-format cone drivers have their first flex below 500Hz, and even small cones usually flex by 1kHz. Dome tweeters are usually rippling in the top octave or the one below it. So avoiding breakup modes requires multi-way configurations.Some designs embrace breakup modes and build drivers that have controlled flex behavior. The whizzer used on some drivers exploits breakup modes to extend high frequency response. Even without the use of a whizzer, controlled breakup modes are responsible for high frequency performance of many drivers, of both cone and dome shapes.It's really all about creating a convincing illusion. Certainly one wants to have a loudspeaker that makes an accurate signal reproduction, and I believe that the more accurate, the better. But perfection is a goal that probably won't be reached, and so the creation of a convincing illusion is a more realistic objective.Wayne