Subject: Re: Thanks for the reply
Posted by Wayne Parham on Thu, 10 May 2001 17:44:24 GMT
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All speakers beam at high frequency, depending on their dimensions. Even a 5" midrange will begin to beam above about 3kHz. That's where it's angular coverage has collapsed to a 90 degree cone shape. It will continue to get more and more narrow above this point. So if it is used to, say 5kHz and then crossed over to a dome or ribbon tweeter, then the angular coverage will narrow through the midrange band, and then suddenly widen up again as the tweeter comes online. That's why I am an advocate of DI-matched speakers. If the angular coverage isn't matched, or at least uniformly collapsed, then the spectral balance of the reverberent field will be way off.You mentioned distortion and that's one thing I forgot to talk about earlier. There are several kinds of distortion and potential sources in a speaker, but the one most vulnerable for a DI-matched two-way is cone breakup. A speaker is designed to operate as a rigid piston, but it usually only acts like a rigid piston for a couple octaves or so. Above that point, the cone begins to flex, forming ripples across its surface. If a speaker is used to high frequency, it is important that the cone be well damped. That way, the cone flex resonant modes aren't so severe. Selection of cone material and shape is important, because it determines cone flex damping. You can easily see cone flex resonant modes in a response chart, because they appear as a notch followed by peaks in amplitude at high frequency. These affect both on and off-axis response, so it is important to choose a driver with well behaved breakup modes when using in a DI-matched two-way speaker, as it will be used well past thge frequency where it is moving as a rigid piston.