Subject: Re: diffraction, is it important?
Posted by Wayne Parham on Thu, 11 Oct 2001 18:04:18 GMT
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Diffraction is important, but like anything else, it depends on the specifics to know what is at play. Some diffraction is bad, some is OK and some is even good. Diffraction is a useful feature for pattern control, for example. Diffraction slots are commonly used in tweeters to widern their coverage angle. Bad forms of diffraction are those that cause response ripples. As an example, destructive interference caused by two different point sources will create response ripple, with different peaks and dips at different listening positions.As for the matter of baffle spacing, this is probably more a matter of radiation angle and baffle step than diffraction. At low frequencies the baffle is acoustically small, so sound radiates in all directions. At high frequencies where the baffle is acoustically large, the baffle forces radiation only towards the front. That makes it louder in front because sound is directed more towards the front than the back. This means there is a narrowing of the radiation angle as a function of frequency.The transition from freespace to halfspace radiation occurs where wavelengths are about the same scale as the baffle. If the baffle is symmetrical and the driver is right in the center, the transition is sharper than if the baffle is asymmetrical and the driver non-central. This is because the center-mounted driver on a symmetrical baffle has the same distance from driver to edge in any direction. So offset mounting makes the narrowing of the radiation angle from freespace to halfspace a little more gradual.