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Subject: Re: horn surfaces

Posted by [Wayne Parham](#) on Sun, 09 Jan 2005 09:40:04 GMT

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I think if surface aberrations are small enough, they won't matter. But if they're large relative to wavelength, then they will alter wave propagation and have an effect. Where there are places in a horn that flare angle changes rapidly, diffraction causes a change of wave propagation. This can be at the throat, the mouth or anywhere in between. If the diffraction causes two wavefronts to be generated and to co-mingle, there can be interactions and possibly destructive interference which cause response irregularities. Even without interactions, rapid changes in directionality cause uneven response due to the fact that the driver's total energy is focused more when DI is high and spread out more when it drops. At the mouth, dispersion control is ultimately lost at some low frequency as the sound bends around it. There are a variety of methods used to combat these kinds of irregularities, and to reduce anomalies in dispersion and response. Some use radiused transitions. Some use absorbent foam at transitions. Some use hybrid horn shapes. These things are used in an attempt to reduce ripples in response and directivity and other anomalies like pattern flip and astigmatism.

Diffraction Applet

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