Subject: What Exactly Is A Waveguide?
Posted by AudioFred on Fri, 11 Dec 2009 13:46:06 GMT
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Waveguide speakers have become popular recently, and listening to Duke Lejeune's or Earl Geddes' speakers makes it immediately apparent why that's happening. But I'm not sure what a "waveguide" is, and how it differs from a "horn". Is a waveguide just a type of horn? Is a bi-radial horn like the Eminence H-290 a "waveguide"?

Subject: Re: What Exactly Is A Waveguide?
Posted by Wayne Parham on Fri, 11 Dec 2009 14:20:33 GMT
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Waveguides are horns that use smooth contours like quadratic or oblate spheroidal flare profiles. They do not use diffraction as a wave shaping device. Their advantage is their lack of sharp edges within the flare, as those create discontinuities that cause ripples in impedance and response. They also do not suffer from astigmatism and increased diffraction, like the Mantaray and BiRadials do. The disadvantage of a waveguide compared to a diffraction horn is they cannot control the pattern as well as a horn that incorporates diffraction, so at the highest and lowest frequency extremes, the pattern from a waveguide will begin to beam.

Waveguides ARE horns
Constant directivity tweeter horns and waveguides
DI-matched two-way loudspeakers
By the way, the H290 horn isn't BiRadial, that's a JBL trademark. A BiRadial horn is sort of like a Mantaray in that it uses diffraction to control the wavefront. An H290 horn creates uniform directivity without using diffraction so it is what could be called a waveguide. Peavey calls their quadratic flare a "horn" too, although its shape makes it a waveguide as well.