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Subject: Directionality Index

Posted by [Wayne Parham](#) on Wed, 16 Apr 2003 01:15:11 GMT

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You're right about drivers directionality increasing as frequency goes up. As frequency rises, the radiator becomes larger than the wavelength of the sound it generates. It ceases to act like a point source and starts becoming directional. Horns are normally much more directional than direct radiators. But when a direct radiator starts to beam because of its size, its directionality index nears that of a horn. Because of this, you can design a speaker that mates two subsystems where their directionality is roughly equal. That's pretty much what large format two-way systems do. Check out the AES paper called "Improvements in Monitor Loudspeaker Systems," written by David Smith, Don Keele and John Eargle. It talks about this kind of design. Chapter 3 of Augsperger's "Sound System Design Reference Manual" also discusses this subject, and pages 3-4 and 3-5 are specifically about the directionality of circular radiators, i.e. cone drivers.

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