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.