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Subject: Re: Horns and Room Size

Posted by [Wayne Parham](#) on Thu, 21 Oct 2004 06:00:19 GMT

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The thing is that a horn is really a tapered pipe with properties determined by a handful of variables. Three of the main ones that are germane to your point are throat area, mouth area and expansion rate. The throat and mouth are terminating junctions where there is a discontinuity, so that's what distinguishes them. Even if the environment outside the horn is small, the mouth still marks a point where the expansion stops increasing by the flare rate and suddenly opens up. There are a lot of other variables though, and the environment that the horn radiates into is certainly one of them. Another is the chamber that precedes the throat. And the back chamber and the electro-mechanical properties of the driver come into play also. But to address your specific comments about the environment, it most certainly does have an impact, and a large one. Assuming the environment is large, then it can be described by the radiation angle set by the boundaries nearest the sound source. If sound radiates in all directions, like if a speaker is used in wide open space, high above the ground and away from everything, that's called freespace

your very small room may be an example. There is no reason why the radiating angle cannot be

reduces the radiating pattern of a sound transducer so that it is made more directional and stronger in the field desired. There are other things in play also, such as compression before the throat and the expansion rate, but one of the main features of the flare is its radiation angle. So in a very real way, the room becomes a part of the horn and it certainly should be considered when designing or implementing a horn system. A basshorn can be made considerably smaller if used in a constrained environment than it would be if used in freespace.