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Subject: Re: Corner Horn positioning "Sweet Spot" for listening...HELP

Posted by [Wayne Parham](#) on Fri, 28 Apr 2006 15:38:39 GMT

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The "sweet spot" is actually a very large area of the room. That's one of the biggest advantages

response is the same as on-axis response. The best listening places are those where the listener is equidistant from the speakers and where the angle between each speaker and the listener is the same. But there is a very wide area where stereo imaging is good and spectral balance is uniform throughout most of the room because of the nature of the design. When the forward axis

very large. The reason this happens is this arrangement tends to naturally balance stereo imaging. Side to side movement has less of a detrimental effect on imaging than it does in other arrangements because as you move closer to one speaker, you move further off-axis. The more distant speaker becomes closer to being straight on-axis. This tends to balance the SPL between each speaker even when you move from side to side. This has a huge positive effect on stereo

band. I know of no other loudspeaker that provides such uniform response at all horizontal angles over such a wide bandwidth. The crossover and the horns used are responsible for much of this, but the room's corner and the speaker's orientation is really key. If the walls from the corner apex continued on indefinitely, then the pattern would remain uniform down to the lowest frequencies but since rooms are confined spaces with boundaries, standing waves develop within the room. This affects how low the energy distribution within the room remains uniform before being modified by room modes. At midrange and higher frequencies, standing wave modes are so densely spaced that the sound in the room acts as a reverberent field. This is the range where the speaker is able to control directivity. There is a point where the standing wave nodes become spaced far enough apart to become distinguishable, and this is called the Schroeder frequency. Below this point, the room is largely responsible for setting the shape of the sound field. Homes with framed drywall construction usually have reasonably good damping at bass frequencies, but small rooms with rigid walls sometimes have noticeable peaks and dips in bass response. It is often beneficial to add a couple of subs to smooth the sound field in the modal range, to average the energy distribution throughout the room at very low frequencies. One thing you can do to gain a very good understanding is to use a room acoustics modeling tool like CARA to visualize how the room is energized at various frequencies. You'll see that there are large wide "pockets" where sound is good and uniform across the frequency band. Framed drywall construction and furnishings tend to damp the room and help make bass uniform. Having a 90° dispersion pattern on the sound sources reduces early reflections, and in fact, the walls become flare extensions, making the room and speaker act as a unit having constant directivity. The end result is a natural sound field that sounds good in a large area, not just in one sweet spot.

Computer Simulation of Room Acoustics