Posted by Wayne Parham on Tue, 17 Feb 2009 18:26:58 GMT
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I suggest having the midhorn and tweeter angled inward 45°, same as the bass bin. The crossover is actually designed for that placement, with each horn mouth flush. It should look like this:

Using this configuration does three useful things:

1. Early reflections are reduced because the horns' patterns radiate within the wall angle. Since each horn has 90° coverage, orienting them so their forward axis is at 45° prevents the sound from reflecting off either adjacent wall. The walls actually act more like flare extensions.

2. Each horn provides constant directivity, and the walls themselves provide pattern control for the lowest frequencies, all the way down to the Schroeder frequency. This provides constant directivity for nearly the entire audio spectrum. The only region that is not CD is the room's modal region, and that can be made uniform using a multi-sub setup, if desired.

3. The orientation having the forward axis angled inward 45° improves imaging. It naturalizes stereo balance between the two speakers, even for listeners that are not directly in between them.

The speakers generate a pattern with constant directivity, so the forward axis is not critical for maintaining spectral balance. The thing with imaging is actually related to SPL balance between the stereo pair. Having them pointed so their forward axes cross in front of the listening position creates a situation where side-to-side movement causes the furthest speaker to be more on-axis and the closest speaker to be more off-axis. This naturalizes stereo balance between the two speakers, even for listeners that are not directly in between them. Spectral balance is maintained by the speakers' constant directivity and stereo balance is maintained by the orientation of their forward axes crossing in front of the listener.

Imaging, placement and orientation