
Subject: Re: Compact version of 6Pi / 7Pi
Posted by [Wayne Parham](#) on Sat, 21 Jun 2025 15:47:24 GMT
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That's really cool! I really like the appearance of your design.

And as we've discussed - and you've elaborated upon here - the bass bin in my constant-directivity cornerhorns is not particularly sensitive to dimensional changes. It doesn't run very high in frequency, so we don't have the potential standing wave problems that we might if bandwidth were wider.

The bass bin alone is really a very simple device. Its whole significance is being acoustically close to the apex of the corner. It uses no compression and really doesn't have a front chamber. It has a "rear chamber" but that's really just a slightly overdamped vented cabinet.

All we are getting from this design is a sound source that's acoustically close to the apex of the corner, so the walls act as "vertical ground planes" rather than reflectors. And having those walls be vertical ground planes forces the radiation to be quarter-space and directed into the room.

To clarify, it does have a "front chamber," as you've observed. But it's acoustically insignificant. A front chamber in most horns provides a little bit (or sometimes a lot) of low-pass. It doesn't do that in my design. It's more just a positioning device - the whole bass bin is essentially just that.

As for the rest of your design - I love it. Looks really cool!

Choose your woofer and bass bin tuning based on whether you like the Italian B&C 12PLB100 or the American JBL 2226H. That's really the only difference between the six Pi and the seven Pi models.

I think the only one other thing I might add is your comments about extending the waveguide. I think that's what you were saying when you talked about "scaling up the compression horn to the size of the midhorn," yes?

The H290C waveguide really benefits from baffle-mounting. It helps it reduce waistbanding, which is the narrowing of the radiation angle at the bottom end of its passband. So your version A drawing would help there.

The midhorn and tweeter waveguide are more tightly coupled than the bass bin and the midhorn. What I mean by that is the crossover between midhorn and tweeter keeps their forward lobe phased properly so their vertical nulls are located symmetrically above and below, approximately matching the horn flare angle.

The midhorn and bass bin overlap in the upper modal region, between about 100Hz and 200Hz. The midhorn goes as deep as it'll run, and the bass bin has a slow, shallow first-order low-pass. The whole idea is sort of like what is done with flanking subs, in that the sound sources are interacting with the room in its modal region.

I say "sort of like flanking subs" because of the blending aspect. Also, flanking subs do mitigate higher frequency room modes. But they are primarily used to mitigate SBIR, which is caused by reflections from nearest boundaries. The worst offender is usually the wall behind the speakers.

They smooth higher frequency room modes by adding more sound sources, similar to multisubs but used higher in frequency. Those higher frequency modes are usually worst from the first-order vertical axial mode, but also include higher-order modes and tangential and oblique modes.

In constant-directivity cornerhorns, higher-frequency vertical room modes are mitigated by the overlap of the midhorn with the bass bin. So we aren't expecting them to provide radiation that would result in clean verticals in free space. Quite the opposite. They aren't in free space.

We are expecting to add more vertical sources in the overlapping region to mitigate the vertical axial modes, which occur higher in frequency than the other axial modes.

The horizontal axial modes are the ones that cause low frequency problems, and you'll want to incorporate multisubs to mitigate those. You can put a pair of subs in the opposite corners, or elsewhere in the room, far from the mains. They'll give extra extension and low-frequency modal smoothing.