Subject: Re: 4 pi, oh my!
Posted by Wayne Parham on Mon, 29 Aug 2011 14:57:53 GMT
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The 7° tilt angle you see in the photos of my setup was chosen largely because the first crossovers put the forward lobe angled downward slightly. Not much, like 5° or so. The nulls were about 15° above the speaker and 25° below. That's why I had stands made with 7° angle, making the nulls be at 23° up and 18° down. The crossover has been changed since then, and the forward lobe is more centered. But I kept the stands, because even with the centered forward lobe, I still like some tilt-back.
Crossover optimization for DI-matched two-way speakersThis is very much a perfectionist thing, because that tiny shift didn't make any difference at all. The forward lobe is clean over a very useful range, 90° wide and 40° tall. I've seen "waveguide" speakers with an ultra-thin "strata" lobe, like 15° - only 7.5° above and below the centerline. On those, any shift can move you

speakers have tall enough (40°) vertical pattern to be useful, and HF output outside that falls off pretty sharply, which really helps reduce ceiling slap.
High-Fidelity Uniform-Directivity LoudspeakersPersonally, even with the centerline of the forward lobe pointing straight ahead, I find I still like 3° to 5° tilt-back on the stands. This is just about right to cover floor to standing height at normal listening distance, 5 to 10 feet back. The forward lobe spans about 1.8 feet above and below the centerline at five feet, about 3.5 feet above and below the speaker ten feet back. When you angle it back some, this pattern shifts upward by that amount.

We don't want ceiling slap - it's more objectionable than a floor reflection at high-frequency - but then again, the floor is usually carpeted, so the biggest problem from floor reflection is usually in the lower midrange (which we cure with flanking subs). Still, the floor is a closer boundary than the ceiling, and the speaker is directional enough at HF that even with some tilt-back, you just don't get ceiling slap until you're pretty far away.

So in the end, I like the stands to provide 3° to 5° tilt-back. It helps cradle the speakers too, because they can sit back on the backrest, a lip that's about an inch tall.