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Subject: Re: how'd we get here (or where is this)?

Posted by [Wayne Parham](#) on Sun, 01 Jan 2012 00:28:09 GMT

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Yeah, you're right. I found this path three decades ago and never looked back. There are other design types that have come and gone, the darlings of the day for audiophiles. But in this approach, I've never wavered. It's the best way to build loudspeakers for high-fidelity, in my opinion.

I was lucky, I suppose, because I sort of stumbled across this design approach. I liked Klipsch speakers as a kid, but didn't like their warts. They were powerful, but could be harsh. When I decided to take that design concept but use better drivers, I found night-and-day better sound.

I ditched the folded basshorn, opting for the simpler expansion formed by the walls extending away from the apex of the corner. The extra efficiency provided from an exponential throat expansion wasn't needed for home hifi, and removing the folds that formed this expansion prevented the problem of having vocals going there. Pushing that Klipsch horn to 400Hz made vocals pretty wooly sounding. My corner speakers, with 22xx series JBL drivers and constant directivity horns, sounded so much better and had the advantage of sounding good everywhere in the room, not just directly on-axis.

I realized that there were two features that contributed to the success of my early corner speakers, first being the quality drivers and second being the constant directivity created by the expansion of the corners. They formed a waveguide for the midbass and lower midrange, and when paired with constant directivity HF horns, one could achieve constant directivity through the whole audio band, from the Schroeder frequency upwards. These became the key features of all my designs.

The evolution of these designs, for me, was iterative, mostly stepping back into radial horns to replace the spitty CD horns I originally used. I also optimized the crossover, and came upon a crossover design approach that I think is as close to ideal as can be found, while at the same time being sort of templated. It's not a generic crossover, because you have to dial it in for the drivers chosen. But since the constant directivity cornerhorn loudspeaker layout is standardized, the crossover topology could be standardized too.

I played around with different midrange configurations over the years, mostly as an academic and not reflectors. Some had direct radiating mids, some just forward-facing, others with mids in front and in back, some even omitted the midhorn and ran the rear-firing midwoofer up through the midrange band. In spite of the many variants, the truth is most of them worked well and sounded really good. I think the key was the quality parts and corner placement.

The current model is the perfected design because it uses a midhorn to set the pattern at the higher end of the midrange and allows the walls to assist down low, where the horn isn't acoustically large enough. This lets the design have cake and eat it too, since it keeps the sound that.

The matched-directivity two-ways are also an evolution, a branch of the same family tree of loudspeakers. This design approach borrowed from the JBL 4430, having a direct radiating midwoofer that is crossed-over to a constant directivity horn at the point where the midwoofer directivity collapses to match that of the horn. These cannot provide constant directivity down low, but it is at least uniformly collapsing so there is no abrupt change in directivity, and therefore, no off-axis ripples in response. The power response is uniform, therefore the room's reverberent field is uniform. This is a close second to perfect constant directivity, and it has the added benefit of not being limited in placement options to room corners.

Like the constant directivity cornerhorns, the matched-directivity two-way loudspeaker is a standardized type, and drivers are placed in specific locations. So here again, this standardized consistency allowed me to optimize a crossover topology that works with any suitable drivers. Of course, as with the constant directivity cornerhorn, some component values are nudged up a little or down a little for the drivers chosen, to optimize the crossover and dial-in the forward lobe. But the basic crossover topology is the same between models.

So, yeah. This is a road I've traveled for a long, long time. It's like the road between home and school, the one you walked every day for years. It's so familiar you knew every little nook and cranny, all the details of the asphalt, all the cracks and crevices. That's how this design approach is for me. It's kind of my baby.

I've heard other designs that I enjoyed, but none so much as this one. It gives the best sound, the best coverage and the most powerful presentation. It is the best approach I've ever heard.