Subject: Re: Help please ... from the bottom up
Posted by Wayne Parham on Tue, 30 Jun 2009 21:15:22 GMT
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This is a pseudo-anechoic measurement, so the bass isn't shown. The towers have nice, deep, full bass though. To put numbers on it, f3 is 40Hz and f10 is about 30Hz.

Its impedance curve is very benign, works well with tube amps. All my speakers are this way. They're all high-efficiency designs that have impedance characteristics that work well with tube amps.

one, two, three and four are all just boxes with a few holes cut in them. You can literally cutout the pieces to build one in a half hour, and have the box completely assembled in an hour. Most people wouldn't race through it like that though, and take a little more time.

entirely trivial, mostly because these models include a midhorn. There are also more parts, more things involved. But still, as horn loudspeakers go, these are relatively simple designs, all straight sided horns that are pretty easy to cut and fit. They're made that way both for their directivity and

another few hours for assembly. The beginner will likely cut and try a few midhorn panels before they get some that fit the way they want.

Things like routed grooves for recessed driver mounting are nice extra touches that aren't necessary, but add to the aesthetics. That adds to build time. Same with the finish. You can use all butt joints and paint the box and it will sound just as good as if you use mitered edges and/or add exotic wood veneer and a dozen coats or hand rubbed tung oil. Painted finishes take a day or two, but hand rubbed tung oil takes a day drying time between coats. So as you can see, time to finish is mostly determined by the quality of finish.

You didn't ask, but I'll give you some personal impressions and comparisons between models. Others may have a different take, but this is how I feel about each of the speakers in the line. I designed each and every one with an intended purpose, and each were done with passion. They're all perfect for their intended application, in my mind. Each represents the best choices I could make for the goals they were intended for.

made to sound great and be satisfying to listen to (and look at). I will say this though - My own

room modes.

speakers. They do magic like no other speakers I've ever heard. Sadly, my main listening room isn't right for cornerhorns so they are in my office. I listen to them a lot there too, but they're really just for background music. I'm always working when I use them, not doing critical listening. It does tend to improve the quality of my work, because I am not eager to leave the office.

rooms, bedrooms, anywhere that a good quality secondary system is desired. They're also perfect speakers for a starter hifi for high-school or college kids. Response is flat and these speakers have a pure sound. Crystal clarity without sounding shouty. Bass response is good below 100Hz, but not by much.

some of my larger models. This model sounds just like the one and two in the midrange and treble, but it has deeper, fuller bass.

excellent directional characteristics, with almost the same response off-axis as on-axis. You can move left or right of the loudspeaker as much as 45° and they sound very much the same. Likewise, movement up or down is acceptable and response stays the same within over a 40° arc, above and below the speaker 20°. No speaker with a cone woofer and soft-dome tweeter can come anywhere close to this, in fact, many other speakers with horns that boast constant directivity don't do this well.

I didn't chose the HF horn solely because of its constant directivity, in fact, I've tended to use radial horns and other similar flares like what are now starting to be called waveguides. My loudspeaker designs are whole system designs, not overly optimized in one area at the expense of others. So for example, I've never used a constant directivity horn with sharp edges for pattern control. Mine are all very smooth, providing nice horizontal coverage and well behaved verticals.

where horizontal directivity matches. This happens at the frequency where the woofer has begun to beam, typically around 1kHz for woofers of this size. For that reason, the woofer selection is critical - it must be capable of smooth midrange sound. The cones must be well damped. The crossover is carefully designed with the geometry of the speaker in mind to set the vertical nulls out far enough above and below the speaker to give a nice large clean forward lobe. All in all, it's a very good design approach, in my opinion, combining good directional characteristics, high efficiency and low distortion in a relatively small package.

the audio band, at least down to the Schroeder frequency where room modes begin to dominate.

the reverberent field, as perfect spectral balance as you could have. They also are physically situated back into corners where they are somewhat unobtrusive, even with their larger size.

midhorn and can be placed in a corner, like the cornerhorns. This forces the radiation pattern into an eighth-space pattern, just like the cornerhorns. The midhorn driver is reflex loaded in the bass range, so it doubles as a woofer.

Placement of these speakers is part of their magic. More information can be found in the following threads. There are some other links in the thread too, so be sure and follow through.
Matching directivity in the vertical and the horizontal planes
Imaging, placement and orientationAt the low end of the band, I employ overdamped alignments in all my speakers. What this means is the rolloff is slow and gradual, much like a sealed box speaker. Venting gives a bit deeper extension and it reduces excursion, which tends to reduce distortion. Those are reasons enough to use venting, even if overdamped like a sealed box.

Vented cabinets have more phase movement in the bottom octave than sealed cabinets, but room modes tend to swamp the response below the Schroeder frequency anyway. This makes the moving phase of a vented cabinet completely irrelevant indoors, so the added bass extension is a benefit for which there is no penalty.

I like to add subs to the larger models in order to further reduce room modes as well as increase extension. Being high efficiency designs, they have trade-offs in terms of size verses extension. A 3ft3 to 5ft3 box is not necessarily a small box, but for a high efficiency speaker, it's not that big either. You'll definitely have output to 40Hz, but it's rolled off. Nice smooth rolloff, bass enough to sound good without subs but perfect for blending with subs. Makes for a nice upgrade path. Build the mains first, add subs later. More information about the multi-sub configuration can be found in the following link:
Posts about the Multi-sub configuration on AudioRoundTable.com