Subject: Never did fold them in the end
Posted by grindstone on Sun, 14 Apr 2013 20:16:12 GMT
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Meant to cap this old thread long-ago but it never happened. I see the trend going the wrong way, too, so here's a quick dump while I have an opening.

The upshot is that I didn't build the tower as-designed due to height limits--as such, all warts are mine. I simmed a zillion things in Martin's sheets and worked hard to try for a couple more Hz on the bottom. Put the port on the front for the extra couple dB whereever that was...I think I was aiming for max amplitude at ~42Hz or something. Overcooked it a little bit and ended-up throttling the port a little with three layers of fabric from the surplus store stretched over a hunk of gutter guard (aka mammal and grandkid filter) and more fiberglass internally. If I were a proud man, I'd say aperiodicity was a goal and that I Meant to do that. Fact is, the thing lit-up some rooms here and taught me a lot about my house (one placement got my foyer to resonate, somehow, for one, which was wild). It was aligned higher-Q too-low for my place, but better for where it was headed. (And, since the port location will come-up, yup, I did look at about the first 5 box harmonics when choosing that spot).

Because it's a kit, all the heavy-lifting is done, but I still used it to investigate what could be had from going nuts on whatever else was left. I learned a lot. Worked so hard and learned so much building something for a friend that I'll never do it again

I glued 5-sides early and then clamped/unclamped the baffle during all manner of wanking with bracing and lining. Ran them maybe 8-9 months that way, in and out of the system as thoughts of rebuilding different boxes or trying different drivers danced in my head. Ran them side-by-side with 8 other pairs of speakers from OB to tiny monitors to...everything in the place.

First, I used 1/2 (walls) and 5/8 (baffle) particle board as a nod to weight considerations and sought to brace for what was traded in wall thickness. I did diy an accelerometer and a little preamp to mess with that stuff, but honestly, once I figured out how to really listen for pboard walls, the knuckle system worked reliably and I didn't have to wonder about any data. Where I arrived is pretty-much ~6" max unbraced span. Anything else even the knuckle-test reveals. Spent a lot of time comparing to plywood and, if I had to do it over again, I'd go all-plywood if I could swing nice plywood. Still and all, best boxes I've built.

The lining and tuning, as mentioned-above, are interdependent, but I went through several extended sessions running them on their backs and quickly iterating lining configurations. For kicks, I took some Z curves when doing that to see what might've been happening with tuning. The tuning shifts were minimal compared to the voicing of the boxes. I can't recommend the exercise more strongly. Over the course of maybe a year, I did probably four 3-4 hour sessions cycling the same snippets of the same material. (In case anyone wonders, dry bead of RTV was on one box, and I went with rope caulk on the other. Packing tape and clamps for the rest. After having to scrape and 40-grit the RTV out prior to gluing, note-to-self--Never use RTV for that again. I tried weatherstripping once, too, which is fine for short clamp-ups, but has the same problems as the RTV if you leave it mashed into the edges of the box for days).

All I'll say is the exercise is worth the pain and that I have no recommendations; what I can say is

that I'm 100% positive I achieved the best compromise between transient performance and openness. I'm also 100% positive that I got the most out of these boxes and that it will be different for any other box. As long as I'm opining so strongly, I should state that I really believe most big boxes are sorely underbraced and that it's audible and it matters. The problem is that, in a sort of Zen way, you (one) have to hear lack-of-box to hear box. People who run OB or maybe panels or big ribbons get that (but there's so much more going on with dipole vs. omni that it's a bad comparison, maybe). Anyway, I didn't until I heard it. The experience was the same with the lining. I'll never again treat lining so lightly and large effort is worth it. A cross-batt is a good start and the driver placement at somewhere 1/3 or 1/2 helps those modes, but it really is a balance of compromises. I'm not trumpeting my method, my intent is just to be a vocal data point that the effort in bracing and lining is rewarded (even for something so lowly (sic) as a "pro" driver). Get something that's percussion-heavy and something sparse and ambient that has large soundbodies like piano or cello and try to find the happy spot with the lining for both.

In the end, I listened to them the most alongside Cornwalls and tuned to approximate them. They get closer than I'd have thought possible, though in-fairness, it's clear that a 10 inch driver is not a 15 inch driver (mostly in scale of presentation, not amplitude/FR so much). I worked really hard to make piano and cello sound the same Size on these as on the Cornwalls. The large box really helps (and there's no substitute), but lining is part of that as well. The size illusion came-off really-well.

Ended-up bracing the basket legs with aluminum JB-welded-on (and no, I didn't do the A/B vs. the unbraced baskets). In addition, I wrapped each basket leg in a couple-three layers of craft felt (as allowed by clearance). I have done that on other widerange drivers and I threw the works at this thing. Basically, the drivers are economical stamped baskets and I wanted to move the leg resonances higher if I could. I also sought to absorb whatever rearside reflections that could be had. All wank, no data as Zilch might say

Among the many process-related things I learned are that 36-grit really does remove as much as you remember and that Minwax High Performance Wood Filler is stronger than...everything
Much work was done in the garage in the winter and I gained invaluable knowledge about shear strength of frozen yellow glue vs. unfrozen yellow glue. I also learned to not be preoccupied when tightening socketheads in a driver basket as they will summarily punch new holes w/o notice. (I am proud, however, at handling drivers soooo many times over so long a period and not trashing them--some sort of record). I learned that people look at you like you're from the Moon when you ask for "shower pan gasket" despite having a printout of their company offering complete with SKU number in-hand. (I used that red hard rubber and will never do that again, either, btw--my 2c is to just do a nice bead of RTV and let it set-up). That venerable Vifa tweeter is still pretty nice for a dome and I still hate those tiny terminals (early-on, I soldered pigtails on them and had to due to box size vs. cup location). I also learned that 2-yr-old-proofing-heavy grille costs about 5dB past 1kHz (ramping up from no atten at maybe 500Hz). Somewhere in there, I made some switch + pot thing to ping on the driver on the scope to twiddle for source resistance that best-damped the thing, too. This was fun and instructive, but it's another thing I'll not repeat. An SE 2a3 into 5k came pretty-close to right for source Z, but I fudged the tuning looser/boomier for a better compromise on a sand amp. For the first time, I used a heavy roller to put some texture on the thing in anticipation of using the truck-bed black. That worked really well to hide the imperfections. The grille then, had to be a sort of intermediate gray that would work with whichever way he went (to date, he's not decided). I learned a lot about the sympathetic

excitation of whatever other speaker was near these things when running LF tones (that stuff happens and I can't swear if it was aiding or acting as bass trap). Lastly, I learned that it's almost universal that most (non-audio) people expect big speakers to be LOUD and to flap their pants and thump their chests. Perception is a funny thing and that might be an issue for some. I don't know where I read/heard it, but I've since stolen someone's line that you don't have big speakers to make big sounds but rather to make the little sounds.

Sound: Very fun all-weather speaker. Fun is the word I keep coming back-to. For the money on the kit (don't forget soldered XO's are included), it's a ridiculously good speaker if you build a good box and work on the lining. Kudos to Wayne for brewing this. If asked to name a fault, I'd say that the Eminence isn't a res-king, but you have to spend a Lot more to get that w/o losing what this does. Further, some of that is on me for reaching lower as well (i.e., if drivers are relieved of LF-duty, clarity will benefit).

I would say that anyone that can tolerate the size of box that does justice to these things shouldn't hesitate. I ran these all day for a long time and they put a lot of smiles on me. It's possible to get higher-quality bass from this thing than I'd have guessed and I stand educated. Like many Eminence drivers, these things will take a bunch of power, too, and they seem to like a little bit of power. Recommended, and again nice-work, Wayne! My only regret was that I found these after the horn-supply dried-up for the earlier models (seems I have horn-itis and I fear it's quite permanent).

File Attachments

1) empty_w_most_braces.jpg, downloaded 354 times
2) thick_roller.jpg, downloaded 362 times
3) mammal_filter.jpg, downloaded 343 times
4) grille_frames.jpg, downloaded 321 times
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