Subject: Building YOUR single driver speaker:
Posted by akhilesh on Wed, 17 Mar 2004 16:07:48 GMT
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HI Everyone,Just thought i'd summarize the tweaks I have done to my single driver, and sort of capture the little bits of knowledge I have gleaned from luminaries. Of course, it's just my 2 cents, YMMV, and every other cliche you can think of. 1. If you are starting out, then the CHOICE of driver is VERY important (duh). Are you a skilled wood worker or have money to spend with a skilled woodworker? Then you may want to think of a complicated horn design. In that case one of the fostex drivers (or if you are loaded a more expensive driver like the Lowther) may be the way to go. If you do do that, cost would be around $2-3,000 and if it's your first project, it;s probably not wise to spend it. If you want to spend less, then a simple bass reflex box is easier (cheaper) and often has less coloration than a horn design. If you do a BR box, then driver Q is important:Qts of at least 0.3 is good, and a bit higher is even better. Lowthers are usually out (Q is too low). Try one of the bigger fostexes. Basically, you want a driver that goes from about 50 HZ (lower is better) to at least 10-12 K cycles (higher is better). Efficiency is important, and a higher efficiency driver is better. 2. After you choose the driver you need to make sure you have the box calculated & designed according to the T/S parameters of the driver.3. Then make the box or get a carpenter to make it. 4. After you have the driver fitted in and running, you will notice the following, hopefully: great midrange, but could use more bass, and maybe rolled of at the top. This is what I noticed with my driver, esp. when compared to my Khorns. 5. The biggest improvement in my setup (a stephens 80FR driver, which is vintage, but resembles a fostex 8 inch) was the addition of a supertweeter. This was a HUGE improvement. The soundstage was sudeenly huge, deep, and decay of instruments was phenomenal. Large instrument ensembles became uncompressed. For a super tweeter we need to match efficiencies as closely as possible (or use a voltage divider), and a first order high pass filter is best. You will need to experiment and blend it. I used a VIFA tweeter (95 db eff, goes till 25,000 cycles) from parts express, and have settled on a 2.0 uf value for the cap. 6. My next tweak was a contour circuit (thanks martin for your friendly goading to try this!) that emphasized the bass frequencies relative to the other frequencies. This is basically an inductor & a resistor in parallel and then in series with the driver. I settled on 2.2 mH and 2.5 ohms. Lots of experiemntation is required to get it right...but it's real fun! You may have to decrease the value of the supertweeter high pass at this point too, though i did not have to. The contour circuit created more bass, and much more body in the below 600 HZ region. With this, the bass is very satisfactory, and i don't need a sub woofer at all. 7. After the contour circuit (i have called it a BSC circuit in other posts) and more importantly the super tweeter, my system sounds the best I have ever heard it. I also tried a zobel circuit (it made my system sound too flat and it lost some "life") and a straight voltage divider to the driver. The contouring circuit worked best for me. AS an aside, I asked Jim & Phil to come by and hear the driver, and at that time, it has a zobel circuit on (NOT the contouring circuit fellas, becuase i was using an inappropriate inductor). I still consider the system a single driver, because frequencies until 14,000 cycles are handled by one driver (this is the cutoff point for the super tweeter). For those of us worried about phase shifts, i wouldn;t worry. I can;t hear them, and i suspect almost no one can. The improvement in sound is so huge with the supertweeter & contour circuit, that any perceived phase shifts are pretty much negligible. Imaging, etc is actually better now. Everything is in balance. I LOVE it. If you want to get started with minimum hassle, then a) classic audio sells a fostex 206E driver in a 1.3 cubic foot box which actually is almost the right optimal dimensions for the driver (though i don;t know about the port in their cabinet)b) madisound sells a horn cabinet kit with fostex driver &

a fostex supertweeter that is a SCREAMIN deal, though i have yet to see it reviewed. Hope this helps us get started, if we are looking. And let me assure you, a single driver systems does have the "magic". My Khorns, which are touted as being "alive" now sound a little more dead than my single driver set up....and I STILL LOVE MY Khorns, but thgis should give you an idea of how good the single driver setup can be. -akhilesh

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