
Subject: Re: And now for something a bit more realistic

Posted by [Jim Griffin](#) on Fri, 07 Jul 2006 01:32:23 GMT

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Greg, I'll try to answer below. 1) I will listen with these speakers roughly 9-10 feet apart and 9-12 feet from the listening chair, and I am only concerned with the sound while seated, not caring about standing listeners... Eventhough you are sitting while you are listening, I strongly suggest that the design be such that it operates in the near field. Please read the Near Field Line Array White Paper to understand that we want to have long enough lines to create a near to far field transition beyond the estimated listening distance. To many benefits to the near field arrangement. Hence, I'm suggesting your woofer and tweeter line be long enough for this requirement. 2) So I think I only need four Fountek NeoCD 2.0 ribbons in each speaker, again running 6kHz on up. I'm thinking 6 to 9 of these ribbons to achieve the near field listening distance criterion. 3) Still waiting for someone to convince me that the Jordan JXr 6HD is not the ultimate starting point for a line array speaker, so until then I will stick with this idea and since the driver and frame is 3" tall, stack 9 of them in each array for a line length of 27 inches, which is a little short of ideal but will probably still deliver a much more dynamic sound than point source systems employing similar drivers. The Mark Audio site shows a recommended sealed cabinet volume that has an Fb of around 150Hz, so I would probably cross over just above that, maybe around 220Hz to help keep things clean down there. I'm not in love with the small Jordans for this application. The issue is that it takes a boat load of them and they are expensive. The issue is that in a line array application you have to cross them to tweeters as the combing and sensitivity roll off will eat your lunch on the high end. Furthermore, they don't go low enough to prevent you from needing both a woofer array and likely a subwoofer. Thus you might windup with a 4 way speaker. I'm thinking a two way with mid-basses and ribbon tweeters with perhaps a sub woofer. Therefore, what I suggest is a midbass woofer array crossed to the ribbon line in the 1500 to 2000 Hz area. You may need to use a subwoofer for the lowest band (say 20 to 40 or perhaps 60 Hz). More about that the about 2000 Hz crossover point later on. The Seas Excels woofer line is perhaps the best (lowest distortion) series of woofers on the market. Dr. Linkwitz uses the 8" version in his Orion design if you read his website. For this application I like the W15 or the W18 versions of the Seas Excel drivers for the mid-bass woofers. If you use a high slope active crossover and cross low, then the mag cones can be easily tamed. The new Nextel cone drivers have more reasonable out of band less adventures to worry about so that is another way to go. 4) Keeping everything in one cabinet, how about a total of eight Seas W18E001 6.5 inch woofers, two above the mid/tweet array facing front and two below, with two sets of two mirror imaged on the back of the cabinet, for bipolar bass (and no BSC circuit required...), and if I am not mistaken their specs actually make them good candidates for MLTL cabinet design. I commented on the Excels. You would need 10-12 W15's per side or 8-9 W18's per side depending on what you choose for my suggested design. You can use parametric EQ to extend the low end of the woofer line to get into the 30 Hz low end roll off in most rooms. For really large rooms one or two subwoofers can handle the 20 to about 60 Hz area. I don't like the bipolar (or even dipolar for that matter) design for a line array application as you have too many placement constraints (for both bipolar and dipolar) or need more EQ (dipolar case) to get any bass. I really like sealed box woofers as they can handle transients without significant time delay as you get snappy response and excellent match from the midwoofers to the ribbons. The dipolar case necessitates wide baffling and/or heavy EQ and large displacement drivers to light the bass candle. A line array isn't a good use of

MLTL cabinets as you have a bunch of drivers on each side and MLTL boxes are just too big vs. either vented or sealed alignments. 5) I would go active between the woofer and mids, and passive between mids and tweets, and go Pass DIY for the amps, and now I think I would have a great small to medium size room line array for around 5-6k in parts. The parts for the design that I suggesting runs in the \$4000-4500 area for the drivers. I really suggest that you think about a DEQX unit in your future eventhough it may not be in your budget. The DEQX unit calibrates the time, phase, and amplitude across the entire frequency band while allowing room corrections to adapt the speaker system to the listening room. It does three way crossovers, makes all the mesasurements you need, acts as a preamp, equalizer, DAC, and more. The mid-bass to ribbon crossover in this case can be as high as 300 dB/octave slopes (that is a brick wall) so you minimize crossover region issues. I typically use 48 or 96 dB/octave numbers. Plus the DEQX does linear phase filters for the crossovers so you get seamless transitions between driver lines with no smearing at all. Rick Craig has a design on his website that comes close to what I suggest and your needs. It is the Alexandrite model and he has specs and plots on its performance on his site at the link. I have a line array (see photo) that does a lot of what you want made from CSS WR125S midwoofers and Aurum Cantus G3i-130 ribbons. I'm using a DEQX crossover with it. Several folks heard it at the recent GPAF show. Jim
Selah Audio Alexandrite
