Subject: Advice please
Posted by David Yost on Mon, 02 Jan 2006 15:11:13 GMT
View Forum Message <> Reply to Message

Hello All:I have aquired some ribbon drivers and a quantity of 6.5" mid/bass units and need help designing a set of 3 arrays for my Trinaural set-up. For those of you unfamiliar with the Trinaural, please see:http://www.ampzilla2000.com/trinaural.htmlWhat I have are a total of 6 30" Gold Ribbon Concepts drivers, which are similar to the BGs in that they are push-pull planar magnetics, supposed to be good from about 300 to 30kHz according to their designer. Along with these came 16 6.5" poly units that appear to be Audax and spec at avg. res of 38 Hz with avg Qt of .45.I want to use the ribbons monopole to keep them near the walls of my smallish room--I don't like to feel crowded by loudspeakers, especially large ones. Also, I would like to use sealed woofer boxes for several reasons, not the least of which is that I intend to eq the bass response a'la Roger Russell's McIntosh designs. BTW, I usually listen at moderate volume levels to Jazz and Classical.So here are my thoughts...please give me some feedback before the sawdust flies....Center speaker is to be 24" wide and 7' tall and about 8" deep with 2 of the ribbons centered vertically one above the other, the ends of which would be aprox 1.5' away from ceiling and floor. This array is to be flanked by 4 of the midwoofers on each side spaced on 24" centers and tucked as close to the 5.5" wide ribbon frames as possible. This would provide the horizontal symmetry I want for the center channel.The L and R side speakers would be the same 24" wide and 7' tall, but would only use a total of 4 each of the mid/woofs to the outside of the ribbons, again spaced on 24" centers.Listening distance would be 11 to 12 feet from the arrays and I forsee using some typr of digital crossover/EQ. Assuming a crossover in the 300-400Hx range at 24-48dB/octave slopes, would the woofer spacing be close enough to avoid audible combing effects at these frequencies? Would I have the "Blooming" problem so oftened mentioned by line array users? Any other problems you see with this design? All opinions and comments are welcome.Many thanks and hope that all have a Happy New Year,David

Subject: Re: Advice please
Posted by Jim Griffin on Wed, 04 Jan 2006 15:00:37 GMT
View Forum Message <> Reply to Message

David,If I were you, I would focus on designing and listening to the left and right speakers before even thinking about a center fill or trinaural. This is especially true for a small room as you have. If you have decent near field arrays, the stereo image will be very broad and diffuse enough that you can likely get by without the center channel fill. Just as you have less sound fall-off per distance for near field sources, the image will have less sound fall off side to side (3 dB per doubling of the distance for near field arrays vs. 6 dB per doubling of distance for point sources). Bottom line in a small room there will be more than an adequate sweet spot for the image--I call it the sweet area. For your case you will need more than just 4 of the 6.5" drivers per side to achieve a near field array. Likely, you will need to have a line length of woofers equal to 6 or even more drivers. I would aim for a woofer line length equal to or greater than the 60" of the two ribbons per side. With the low crossover that you envision you don't have to have the woofers vertically spaced flange to flange so you have a little material between the drivers for internal

bracing and such. Frankly, I would use 8 woofers per side (4 per ribbon) and go from there. As you originally suggested for your center channel design, you could design the left and right speaker to have two symmetrical vertically arrayed woofer lines spaced on either side of the ribbons. To prevent nulls in the horizontal dispersion for this design, you need to keep the horizontal center to center spacing between the woofers as close as you can (much less than a wavelength at the crossover frequency). For example, less assume that you have 6.5" diameter drivers with the same size frames tucked up against the 5.5" wide ribbons. Thus the horizontal c-t-c spacing between the woofer lines would (2 x 6.5)/2 + 5.5 = 12". That is a wavelength at 1130 Hz. Now I realize that you'll need some clearance space between the woofers and the ribbon, but this c-t-c distance should be less than the 24" c-t-c spacing that you suggested.Let us hear what you choose to build.Jim
Near Field Line Array White Paper

Subject: Re: Advice please
Posted by David Yost on Wed, 04 Jan 2006 16:52:22 GMT
View Forum Message <> Reply to Message

Hello Jim,The 24" c-t-c distance I was talking about was vertical spacing of the mid/woofers, which is less than 1 wavelength at any crossover frequency between 300 and 400 Hz. This is why I thought I could get away with only 4 6.5" woofers per side evenly spaced in a 6' line. Am I misunderstanding the driver spacing guidelines in your white paper, or do these guidelines not apply at lower frequencies? Thanks very much for your input,David

---

Subject: Re: Advice please
Posted by RKM on Fri, 06 Jan 2006 02:01:13 GMT
View Forum Message <> Reply to Message

Go for it!My DIY ribbon is similiar: a DIY ribbon of 48 inches with four 7 inch PE ES-180 woofers next to it crossed at 825 Hz. Vertical woofer spacing is 11 inches, ctc. Works fine. I can't find any evidence of comb filter problems.Overall this speaker compares very favourably to my Eminent Technology LFT-VI which is a full 6 foot line source (although its ribbon tweeter is less than the full height).The strictest guideline is ctc should be less than one-half a wavelength at all frequencies that overlap. I'm using a 4th order Linkwitz-Riley crossover (active) to minimize overlap. What type of crossover are you planning on using?

Subject: Re: Advice please
Posted by RKM on Fri, 06 Jan 2006 02:08:51 GMT
View Forum Message <> Reply to Message

Have you considered the relative SPLs of your woofers versus the ribbon? The 30Hz to 300 Hz range needs a lot of Xmax for the same spl. Your Gold Ribbons probably can pump out the spls if they are anything like the B&G planars.What max spl are you shooting for?(As an aside I don't know anything, good or bad, about trinaural--I use a phantom center).

Subject: Re: Advice please
Posted by David Yost on Fri, 06 Jan 2006 05:10:47 GMT
View Forum Message <> Reply to Message

Hello RKM,I am going to biamp so relative eficiencies aren't real important in my case. My understanding is that these Gold Ribbons are not as efficient as the BGs, more like the original Carvers at 82-85 dB/W/m.I am not after very high SPLs...would guess average of 70-75 dB at my seat, roughly 12 feet from the arrays in a 13' x 17' x 8' room with the center array dead against the center of one of the long walls and my listening couch pretty much against the opposite long wall. I just don't have room for the arrays or my ears to do the 1/3 out from the wall routine...would need 20' x 30' room to satisfy my listening distance preferance--maybe one of these days.I didn't know too much about Trinaural either until about a year ago. I read a review in Sensible Sound which was about the most complementary I have ever seen for any audio component anywhere and by a usually very sober objectivist reviewer (David Rich IIRC)...so when I spotted a demo unit for sale at a discount I jumped. So far, I have only been able to use the Trinaural with some older Tannoy monitors, but the improvement in soundstage width and solidity is real and shows great potential. The Trinaural even won Best of Show at a recent CES when paired with VMPS Elixer line sources, so I thought....Thanks for your input,David

---

Subject: Re: Advice please
Posted by David Yost on Fri, 06 Jan 2006 05:28:23 GMT
View Forum Message <> Reply to Message

Hello RKM,You asked: What type of crossover are you planning on using?My first stab at this will be the flexible (but oh so cheap) Behringer crossover/EQ unit...I think it is called DEQ2496. I haven't bought one yet, but they are usually in the $250 range new and delivered. This unit offers options for 6-48 dB/octave crossover slopes at any combination of frequencies with time delays for all channels, 1/3 octave plus parametric eq, auto eq, hundreds of presets and more. The biggest challenge I have heard about with using this (or any digital pro gear) is to correctly match input and output levels with home hi-fi equipment...the pro gear being optimized for a roughly 10-15 dB hotter line out for best S/N. Many folk have complained about harshness and grain when using this unit between say a pre-amp and main amp, but the majority opinion seems to be that when the Behringer is run at full resolution--by upping the preamp-out levels to close to 2-4V and padding down the analog outputs--it sounds just fine. Thanks for your interest and encouragement,David

---

Subject: Re: Advice please
Posted by David Yost on Fri, 06 Jan 2006 05:31:59 GMT
View Forum Message <> Reply to Message

Sorry, this is the crossover I had in mind, the
DCX2496:http://www.behringer.com/DCX2496/index.cfm?lang=ENGDavid
http://www.behringer.com/DCX2496/index.cfm?lang=ENG