Subject: Controversy on tweeter's positioning
Posted by JPH on Fri, 25 Apr 2008 12:29:27 GMT
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Now that i've come up with a very good sound sysytem with the RS 8 line arrays from Rick : bi amping + powered subs all with behringer Xover, I've been pushing the speakers around to find the best placement in my room (wich is not a very easy task) specially when you have to switch the placement of the left and right speakers to find if the tweeter line would be better positioned inward ou outward.I definetly prefer the outward position although most recomment the opposite, specially for better image , but I haven't noticed an improvement in the image with tweeter line inwards , but the overall sound seems better the opposite way . I still dont understand the theory behind the tweeter line in or out difference and if any delay should be used for the outer driver's line wichever it is , and if theoretically it is better to keep the speakers facing 90 degrees forward or better give them a small tilt to the listening position , I really cant hear the difference very mush but I opted for the tilt position I am mentally more confortable with it , or does it very much depend on the room boundaries and volume/acoustics ?JP

Subject: Re: Controversy on tweeter's positioning
Posted by Rick Craig on Fri, 25 Apr 2008 18:05:44 GMT
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With the Behringer you can adjust the delay for either cabinet position. The location of the side walls will influence the amplitude of the later arrivals so that could be a factor in which positioning you prefer.The lobe will always be present with a passive crossover and it may or may not favor positioning the tweeters on the inside. Some have stated that a lower crossover point will eliminate the lobe but that's not true and can be easily proven with a few measurements. The only way to eliminate it with a passive crossover is to make the layout symmetrical with tweeters in the center flanked by a line of woofers on each side.

Subject: I hate educating you Rick. I really do.
Posted by Danny Richie on Sat, 26 Apr 2008 23:15:24 GMT
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But even more so I hate seeing misleading information being spread to those that really would like to learn something here. I guess you can be an indirect beneficiary.If a true ribbon tweeter like the Fountek's are used then you are limited to a crossover point no lower than about 2kHz. Even that is really pushing it. Anything below that really lets the ribbon get out of control and distortion will shoot up pretty dramatically. With that as a fixed variable the wavelength at the crossover point will be 6" or less. With wavelengths that short they will began to cancel each other out from about 20 degrees or so off axis. This also depends on how well they are in phase at the crossover point

to begin with. One direction could be worse than the other. One way or another though they will begin to cause a dip in the response in the off axis. Whether the crossover is passive or electrical makes no difference. What can help some is a steeper slope (higher order crossover). A steeper crossover will allow the cancellation to be more confined to a more narrow region centered at the crossover point. A lower order crossover that allows the woofer to play up higher in range will allow cancellation to take place more so in the ranges above the crossover as well, and have a wider band of cancellation. Adjusting the toe in or toe out can keep the listener more in line with a sweet spot to minimize these effects, but unfortunately the off axis responses also contribute to the total in room response. If there is a dipped area in the off axis then there can also be a dipped out area in the side wall reflections. Obviously I am the one you are referring to when you state: "Some have stated that a lower crossover point will eliminate the lobe". However, that is quite true. Line sources like the LS-6 and LS-9 do use a low crossover point and off axis measurements to 40 degrees in either direction show little to no loss at all in output from driver cancellation. Specifically the LS-9, with its crossover at 850Hz, has great off axis responses. The 850Hz range has a wavelength that is 16" long. So while a 2 or 3 inch delay from driver offset does have an effect with wavelengths that are less than 6", it has no effect at all on the lower wavelengths as the degree of phase rotation is considerably less. This lower crossover point maintains constant and even off axis responses that contribute to an overall much smoother in room response, and better imaging as well.

Subject: Re: I hate educating you Rick. I really do.
Posted by Rick Craig on Sun, 27 Apr 2008 06:09:12 GMT
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ROTFL

Subject: Re: I hate educating you Rick. I really do.
Posted by Danny Rickie on Mon, 28 Apr 2008 19:53:00 GMT
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> Obviously I am the one you are referring to when you state: "Some have > stated that a lower crossover point will eliminate the lobe".Must hit your head a lot when you enter rooms....

Subject: Re: In simple terms
Posted by JPH on Sat, 03 May 2008 12:57:53 GMT
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Hello DannyThanks for the detailed response I like that !However beeing a non pro and just a

beginner I wonder how important it is to compensate for delays and what is the sounding distortion that results from unajusted lines delays ? I do get some boxiness in female voices and sometimes in male voices , where do I have to look for the problem and correction ?Why dont you have your LS6 and LS9 on your site ? soon I'll be interrested in the LS9 !!!JPH

Subject: Thanks for asking good questions
Posted by Danny Richie on Sat, 03 May 2008 23:26:08 GMT
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JPH>"However beeing a non pro and just a beginner I wonder how important it is to compensate for delays and what is the sounding distortion that results from unajusted lines delays ?"The result of drivers not being in phase very well is not distortion in the traditional sense, though one could consider it a distortion of the input signal as output levels no longer resemble the input level. I am speaking metaphorically here. If you can put two and two together you can get this. Follow along. I will lay a trail of bread crumbs that you can follow and along the way, you'll get it. Lets take some normal two way mini-monitor and lets measure a bunch of them in the vertical off axis. This will be just like measuring a line source in the horizontal off axis. If we move one direct we get closer to the tweeter and in the other direction we get closer to the woofer. Most horizontal measurements are made at 0 (on axis), 10, 20, 30, and 40 degrees off axis. We are not even going to go that far with these mini-monitors in the vertical off axis. Measurements will be on tweeter axis at 1 meter. Then the microphone will be moved vertically only 4" at a time. Again, this is far less than typical horizontal off axis measurements so keep that in mind. Percentage wise this is a little less then 6 degrees per measurement. So the degree of vertical off axis angles are only 6, 12, and 18 degrees off axis. So this is like taking a horizontal off axis measurement on a line source at 0 (on axis), 6, 12, and 18 degrees off axis. Lets look at those measurements now of some well know mini-monitors. There are two pages of measurements. Check the vertical off axis measurements. http://www.stereomojo.com/Small%20Speaker%20Shootout%202007/StereomojoSmallSpeakerShootout2007Measurements.htmandhttp://www.stereomojo.com/Small%20Speaker%20Shootout%202007/StereomojoSmallSpekerShootout2007MeasurementsPart2.htmCan you tell by these measurements which one had a lower crossover point? I'll give you a hint. It is the one with the least amount of cancellation in the vertical off axis. JPH>"I do get some boxiness in female voices and sometimes in male voices , where do I have to look for the problem and correction ?"The heart of the mid-range is in the 300 to 500Hz range and is likely completely covered by your woofers. So the crossover region is not as likely to be the problem or cause of the boxiness. Some metal cone drivers exhibit this problem, and you just can't fix it. It can be caused by the damping material, or lack there of, and its ability to absorb standing waves in the box. It could also be caused by a panel resonance that is added its own coloration. Bracing and resonance control materials like No Rez might be the answer if that is the culprit. JPH>"Why dont you have your LS6 and LS9 on your site ? soon I'll be interrested in the LS9 !!!"I had a pretty good handful of people interested in those so had to offer kits to all that were wanting them and had been wanting them. I did so for a short period only then directed everyone else to AV123 for completed speakers. I actually sold out of them pretty quickly and still have a few people waiting on more drivers to arrive so that they can purchase kits. I have enough drivers coming to fill those orders and about a dozen or so more. When those are gone, they are gone. Again I will direct everyone else to AV123 for completed speakers. If you want to get on the list then you should do so quickly before

they are all gone. LS-6 kits are $1,995 and LS-9 kits are $2,695.

Subject: Re: Thanks for asking good questions
Posted by JPH on Sun, 04 May 2008 23:07:39 GMT
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Thanks for the detailed and informative response .What is your opinion on biamping with digital xover , my experience tells me it is by far better than passive xover , and the use of subs for the very low HZ (having in mind the LS9) just want to go for the best.

Subject: Re: Thanks for asking good questions
Posted by Danny Richie on Mon, 05 May 2008 17:32:34 GMT
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Bi-amping with a digital crossover has it's pros and cons. Everything being equal the all digital crossover has the edge. It gives you a ton of flexibility and keeps all of those passive components out of the signal path. However, you are limited to the quality of the D/A converters used for each channel. My standard D/A converter with mods cost me about $2,000. It easily is in the cost no object performance category. The D/A converter in those digital crossovers aren't even in the same ballpark. The difference is big.

Subject: Re: Thanks for asking good questions
Posted by JPH on Mon, 05 May 2008 18:20:17 GMT
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If asked to compose a system that will be emplemented by steps costing between 5000 and 6000 $ including : a pair of kits line arrays , a digital Xover and a D/A converter and powered subs ! what would you recommend (consider DEQX or not).That is the non compromise system I am looking for , maybe some other people out there are also looking for it !!! That is a project I am looking forward to do .JPH

Subject: Re: Thanks for asking good questions
Posted by Danny Richie on Tue, 06 May 2008 01:04:59 GMT
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If it were me, I'd put more money into the electronics and use passive networks on the speakers.

Subject: Re: In simple terms
Posted by Rick Craig on Thu, 15 May 2008 01:31:19 GMT
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JPH,The delay function allows you to keep the drivers in phase because the time arrivals are different for the ribbons versus the woofers. The Behringer was designed for pro audio applications where this is very important; otherwise, the sound won't be coherent at the listening position. As far as your issues with vocals it could affect that but without being there I can only speculate. The amount of delay used will also vary depending on whether you measure with the ribbons on the inside or outside. A lower crossover point doesn't change things because the arrival time between the two drivers remains the same. One advantage of your active crossover is that it doesn't add any inductive or capacative phase shift like a passive crossover will.
