Subject: FR Measurments of Line Arrays
Posted by Branwell on Thu, 23 Jun 2005 14:23:17 GMT
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Hello,I am building my first set of line arrays and was wondering if measuring their FR to setup the XO is the same as when one measured point sources ?.Thanks,Branwell

Subject: Re: FR Measurments of Line Arrays
Posted by Earl Geddes on Fri, 24 Jun 2005 22:46:41 GMT
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This is a complex question, but in general the answer is no. You need to know what 'field" you are in. If you measure in the near field and calculate a Xover based on this, then the far field will be incorrect. To get a correct far field you need to measure in the far field. If you only listen in the near field then you could do the crossover for the listening point, but there is no guarantee that it will be correct at other locations. In fact it is just about guaranteed that it won't.For the best coverage of this topic see my book.

Subject: Re: FR Measurments of Line Arrays
Posted by Eric J on Tue, 28 Jun 2005 00:22:27 GMT
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If you have build this for your living room listening environment, more than likely unless you have an enormous room, you are in the near field. For Prosound, a different matter.eric j

Subject: Re: FR Measurments of Line Arrays
Posted by Earl Geddes on Tue, 28 Jun 2005 01:04:54 GMT
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It depends on the height of the array and on the frequency. The near field varies with frequency so yes, it is pretty certain that you are in the near field at higher frequencies, but not at all certain that you are in the near field at low frequencies. Thats what I don't like about arrays. With my speakers I know that I am never in the near field at any frequency.

Subject: Always trade offs
Posted by Eric J on Tue, 28 Jun 2005 10:23:52 GMT
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There are always trade offs. I happen to like the trade offs of array systems over point sources, but nothing is every perfect.

Subject: I don't agree
Posted by Earl Geddes on Tue, 28 Jun 2005 11:32:41 GMT
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I am not sure what "tradeoffs" you are refering to. In what way would you claim that, in a small room, a line array (I assume you are talking about a line) has an advantage? In large PA systems there is one having to do with the power capability of using multiple cabinets, but in a small room I do not see the advantages that an array offers.

Subject: Troll?
Posted by Eric J on Tue, 28 Jun 2005 13:28:47 GMT
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Excuse me....just a small question. This is a board specifically for those who want to use line arrays. Why are you trolling the board with your views? Why don't you go to one of the audio boards which has your view?Why bother wasting your time being a troll here?Just FYI, assuming that you are not a troll, and really want to know: reasons:1. Higher sound pressure levels, 2. reduction of distortion as power is dispersed among several drivers, 3. higher power handling attained, 4. much widers sound stage, 5. near constant sound levels throughout the listening room, 6. an image sweet area as opposed to a sweet spot, 6. much much greater dynamic level recreating the live event much more effectively. And if, as in proaudio, you use electrical crossovers and separate amps the for mid/woofer array, the tweeter array, and the subwoofer, you will hear something really spectacularly like the real performance, and very much different than a single spot speaker. I suggest that you go to James R. Griffin (PHD)'s white paper on "design guidelines for practical near field arrays".eric j

Subject: Re: Troll?
Posted by Wayne Parham on Tue, 28 Jun 2005 14:25:34 GMT
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I don't think that's fair. I respect Jim Griffin a great deal and I also respect Earl Geddes a great deal. You may not agree with Geddes comments, but it isn't like he said "arrays suck." Dr. Geddes simply made the statement that he doesn't see an advantage in small rooms. Maybe he means rooms that are too small for the array. With a little more specificity, you might find you actually agree with him.In his book, Audio Transducers, Geddes investigates arrays and describes their directivity and acoustic behavior. So it isn't as if he were new to these concepts.
 Audio Transducers, by Dr. Earl Geddes

Subject: Most of the discussion centers
Posted by Eric J on Tue, 28 Jun 2005 14:29:11 GMT
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A lot of discussion centers around this white paper by James Griffin, PHD.Perhps you could read it and then discuss it with Dr. Griffin:http://www.audiodiycentral.com/resource/pdf/nflawp.pdferic J

Subject: Re: Troll? maybe not!
Posted by Eric J on Tue, 28 Jun 2005 14:34:23 GMT
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Wayne,I'm no expert, but in so many words he did say Line Arrays Suck.I would hope that he could clarify his statement with something of substance. For him to say that he didn't know of any ways that they worked, when even non audio engineers know lots of ways that they are really superior (and some ways they are not), sounds like a troll. Perhaps Dr. Geddes and Dr. Griffin could have a substantive discussion that would enrich us all. Taking pot shots at line arrays on a line array discussion board is called Trolling. A rose is a rose no matter what. I may in fact agree with him too, if he could only take a little time to enlighten us peons with advanced degrees in other subjects than audio engineering.Thanks.eric j.

Subject: Re: Most of the discussion centers
Posted by Wayne Parham on Tue, 28 Jun 2005 14:44:22 GMT
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This discussion is whether the measured response of a single driver should be used for crossover calculations of an array. Earl answered that it should not, which I believe was probably a good response. I think Jim would have said the same thing. The geometry of the array is critical, because there are transition frequencies set by the positions of the drivers.At very low frequencies, where all drivers are within 1/4 wavelength of each other, an array acts as a point source. At medium frequencies, each pair of drivers is within 1/4 wavelength, but the ends are

further. The array becomes directional at this point. And at high frequencies, each driver is further than 1/4 wavelength, and complex comb filtering results in dense interference. Through each transistion, the frequency response and directivity will be affected and the system will act differently in each of these frequency ranges. A single driver just has collapsing DI and that's it.Honestly, I think you, Jim and Earl are probably all on the same page here, but semantics and maybe lack of specifics cloud the discussion.

Subject: Re: Troll? maybe not!
Posted by Wayne Parham on Tue, 28 Jun 2005 14:48:53 GMT
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Earl sometimes writes in a manner that looks tactless, but that's just his style. He might say he simply doesn't mince words.If an array is used above the frequency where driver spacing is greater than 1/4 wavelength, dense interference results. Jim Griffin would agree that sucks. So specificity is required in any discussion like this.One thing is for sure, and that is a single driver measurement is not sufficient to develop a crossover for an array. Array geometry information is required.

Subject: Re: Most of the discussion centers
Posted by Eric J on Tue, 28 Jun 2005 14:55:52 GMT
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When you say very low frequencies, what frequencies do you consider "very low".Using Dr. Griffin's white paper, I've been careful to watch the side of the speakers, their closeness, and the appropriate crossover frequency. Its not all that hard, even for a fella who has taken any math since 1965. Additionally, I'm of the belief that the critical mid range area of 300-3000 should remain as un bombed out by cross-overs as possible. This also figures into my "calculations".My array crossed over to a sub woofer electronically at 24 db slope at about 80 hz. What I appreciate with Dr. Griffin, is that he takes the time from his busy university schedule to explain things to non-technical people so we can build better speakers. I enjoy this discussion, but I often wish that people would not autmatically assume that everyone here is an audio engineer.thanks,eric j.

Subject: MODERATION IS MORE THAN READING POSTS
Posted by Eric J on Tue, 28 Jun 2005 15:05:43 GMT
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Wayne,My mother in law claims that she has a right to say what the things she means. The reality is that she just says mean things.Nobody has a right to be a troll and then claim that its just their

way (I know you said that and Earl did not.) I'm getting tired of people who take their belief that its their rightful place: on email lists, on message boards, on the highways, etc. Last night at Borders book shop there was some lady who stepped in the front of a line of fifteen people who had patiently waited. Nobody even pointed the end of the line to her. They just "took it" from her.No one has a right to be tactless to others, and excuse it by calling it "their style". On message boards, this is how flame wars start, and its how moderators can limit conversation to a select few of the elite, and exclude conversation from everyone else. And don't tell me I don't know. I spend too much time moderating and encouraging a message board with more than a 1000 participants, in another field altogether. I've had to tell or remove posts from people who are quite famous and clearly giants in the field because they made tactless comments, that caused people to leave the message board because of them.eric j

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Subject: Re: Most of the discussion centers
Posted by Wayne Parham on Tue, 28 Jun 2005 15:12:12 GMT
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I agree with you about speaking to your audience, no matter what you are discussing. So I appreciate Jim's ability to describe a technical subject in non-technical terms.I mentioned three frequency ranges where arrays act differently. One is very low frequencies, where all drivers in the array are within 1/4 wavelength of each other. The next is where adjacent drivers are within 1/4 wavelength, but the array length is greater than 1/4 wavelength. And then the next is when each driver is further than 1/4 wavelength from each other.There are also room interactions. The floor acts as a reflector, so your lowest driver acts like there is one below it, twice the distance to the floor. The whole array is mirrored that way. The array's directionality at high frequencies tends to mitigate this, but as frequency goes down, it becomes more apparent. And if the array is positioned too close to a side wall, that will reflect it too, acting like a horizontal array.

Subject: Re: MODERATION IS MORE THAN READING POSTS
Posted by Wayne Parham on Tue, 28 Jun 2005 15:26:32 GMT
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I agree with you completely. No one wants a bully, and it isn't tolerated on ART. This messageboard is for beginners and experts alike. I personally don't like it when a person is made to feel stupid and so they don't participate. Mob rule is no way to run a place like this, at least not in my opinion.I'm not the moderator of the Array forum, but I do have the same concerns as you. I share your sentiments, 100%. That's really why I jumped in here. I was just hoping to help out a bit.

Subject: Thanks for your help
Posted by Eric J on Tue, 28 Jun 2005 15:58:07 GMT
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Well, Then I must thank you for sharing and assisting with the posts. I hope Dr. G reads it, and can share a set of reasons which allows and encourages discussion.Thanks again,eric j.

Subject: Thats why I post rarely
Posted by adavis464 on Fri, 01 Jul 2005 16:13:15 GMT
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I'm not an expert but I'm not a beginner.I use these forms to look to see if there are a group of people that are thinking what I am as far as design.Then ask a question for help in that area.Most of the time one answers (the question must be below them)or you get berated for being an (Moron!).The doctor is trying to sell a book but if he's going to take the time answer a post answer it or don't post BECAUSE THATS TROLLING Regards Tim P.S.Try sharing we all play better that way

Subject: Re: Thats why I post rarely
Posted by Wayne Parham on Fri, 01 Jul 2005 16:48:31 GMT
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I personally didn't think Earl was pushing his book. He made mention of his book because there is a chapter on arrays, but he didn't post a link. I'm the one that did that.

Subject: Re: FR Measurments of Line Arrays
Posted by Rick Craig on Fri, 08 Jul 2005 03:38:42 GMT
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The multiple drivers in an array will behave differently than they would in a point source design. Typically the woofers will need a lower crossover point which is why I prefer using a ribbon that will cross in the 1-2K area. This is true even for the 5-5.5" drivers and in some cases the upper end response of a 7" woofer is as good or better than the smaller drivers. I have some ideas as to why this happens but the C-T-C theory tells us the opposite that the smaller drivers should behave better.While I have a great amount of respect for Earl I think there's still quite a bit that's not fully understood about the performance of line arrays in a typical home listening environment. Most of the original theory was based on large venues and until Jim Griffin did his paper there was very

little information for home audio applications. I've found what things work best after building several arrays and my advice would be to measure,listen,measure,listen...Rick

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Subject: Dr. Geddes Position
Posted by Earl Geddes on Mon, 18 Jul 2005 20:29:14 GMT
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EricI must admit to being more than a little annoyed by the posts in this section. Normally I find it best just to ignore these kind of comments but since you asked here is my position. And I will be frank.First lets be clear that I am an expert. I have expertise in virtually ever subject on this web site and in many I have an extreme expertise, in some, I am widely held as the expert. So when I choose to respond it is with an expert opinion, not a novice or an amatuer. This, I would think, would make my responses valuable. I find it annoying when my time is taken for granted and even criticized. This seems foolish to me if not a little disrepectful.I don't always give a complete answer as the time does not permit (nor does anyone I would presume). Sometimes my answers are brief and I reference other work - not only my own. But, if I were to ask a question and an expert posted aresponse wherby I could find the answer, I would be apreciative. It would make no difference to me what-so-ever who the author of the reference was. What difference could it make? If it is a personal reference does that make it any less useful?Was I trolling? I have no idea, I am not sure I even know what it means. I responded to a question of mutual interest with a short answer and a relevent reference. To me it was the gentleman who got perturbed because I was playing in HIS sandbox that is really the pathetic one. These messages always have the author posted. If you don't like my style then don't read my posts. I am not "butting in" simply because the choice to read my post is the readers - no one is forcing them to read it.These kind of discussions run a very real risk of driving the experts away simple beacuse of these kinds of petty issues. Why should I feel guilty about be an expert? Why should I be criticized for the same?Earl

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