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Subject: line arrays questions and stuff

Posted by [John MacBain](#) on Wed, 24 Dec 2003 23:16:30 GMT

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I have just finished reading, Design Guidelines for Practical Near Field Line Arrays by James R. Griffin, PH.D. as well, Wavefront Sculpture Technology by Marcel Urban, Christian Heil, and Paul Bauman. These are very informative papers; I highly recommend them to anyone doing research in these areas. Being that I come from a vastly different background, and certainly not one possessing the formal education accredited to these gentlemen, I find myself in the position of having more concerns and questions arise in me as a direct reaction to reading these papers. So in response to this I am going to post on various forums, and to anyone willing to listen, my postulations and questions (a few at a time), so as to not over whelm anyone with my relentless ranting, as well as vowing to read these papers and others over and over again while doing the math as best as I can until I have memorized and understand all this a little better in my own some

in these matters. Radiation as a function of distance Why is the array only being considered flat and convex? Why can it not also be considered, to be slightly concave over a constant curvature? The J array makes sense to me when applied to large audiences as it seems to mimic sound cylinders on a sphere shooting outwards. Which makes me think about shooting a line array system towards the inside of this sphere and their by mimicking an inverse shape on this sphere. Therefore having possibly new useful attributes associated with this type of configuration. It seems to me that most of us experience sound arriving at use from the vertical plane differently then we do from the horizontal plane as far as the arrival times to our ears of the different

negative interrelationship attributes of these concepts being explored as much as I would like to in regards to vertical line arrays and the possible inclusion of some more flexibility in their horizontal expressions. I have put to many monitor positions down to know that: although different characteristics prevail from the vertical and horizontal placement of enclosures, and I know that they are both relevant and useful lay-outs, that we should not exclude them from being addressed

to design a speaker array system that is to be used to recreate and amplify sound for: from small audiences to large audiences (500-10,000), that in considering the propagation of sound waves whether spherical or cylindrical in these forms, and how they can travel accordingly as a function of the frequencies, time and sound shapes being considered as well as by the methods and devices being used to project them. Makes me ask and postulate; That when in considering the differing natures and characteristics that take place in the human hearing and feeling frequency range (20 Hz-20,000 Hz) and how we presently split up this frequency range in order to better address them in smaller chunks to better our results by the various means and devices produced to amplify, control, predict and in some cases simulate them. Why not deal with the passbands more from their own natural reactions to Fresnel analysis and manipulate the results to these analysis techniques separately with in these passbands first and then work towards combining and resolving their differences next? Put the box and physical arrangements in latter type approach. That although these ideas are being applied, I am concerned that some of their implications are not being explored enough in regards to the final products abilities, being derived

perception or the components we assign the attributes we choose to represent these with are being broken down, split up and being looked at in detail enough when applying and mixing these

ideas to line arrays. The differing requirements that become so apparent when we consider the different prorogation characteristics that are taking place in the HF line in comparison to what is taking place down in the LF line and then how the MF line has to marry the two together, but that in truth this is the most important passband the other two are extensions of, and the importance of the quality in this range should be addressed first and foremost. As the middle band it contains the average of its upper and lower passbands, I believe that in these situations (Large 3-5way arrays) the MF's should be leading the dance. I like to think of the LF and HF as special effects that are added on, calibrated and optimized to arrive in time with the MF sources or lines to the intended listeners in their relative positions. On this line of thought is it possible that there could be other ways that are being overlooked and not explored deeply enough that might be better chosen towards optimizing a line array when combined with the differing ways one can split up and manipulate these frequencies of interest both in the digital domain and physically by our component choices along with our lay-out options and then in recombining them towards using and exploring the best tools available to perform these tasks in the ways that are applicable to our targets. Like in the following example: of exploring the use of traditional motors for the LF line (been done) and Planar magnetic drivers for the MF line (being done fullrange, but not as dedicated MF) and ribbon driver on modified waveguides for the HF line (Alcon does it although I think this could be improved). Why? Because they may possibly fulfill many of the individual passband requirements better than what I see being accomplished in these areas. As well as allowing the incorporation of some horizontal element lines into line arrays only to a much smaller degree, but in relative ratio to the vertical element lines and how our ears and brains respond and react psychoacoustically to them depending on where we are in time and space relative to their configuration and placement in this same place. Who knows maybe one day we will be able to hear the sounds as true to the intensions of the composition, regardless of the environment we are listening from? Forwards, sideways, backwards, down is a line from an old song, cool tune

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Subject: Re: line arrays questions and stuff

Posted by [Wayne Parham](#) on Wed, 07 Jan 2004 20:52:54 GMT

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Good stuff, and well written. Have you received other replies in other forums? If so, bring 'em on back here because I don't think there are many forums specifically addressing array speakers. And this is a new one that hasn't received much traffic yet so it could use the exposure. It's a clean slate. Arrays are a requirement for large-scale venues and have been used for decades. Advances in technology, particularly digital processing, have allowed them to be configured similarly to antennas in that beam steering is used. This is no simple task, when you consider the bandwidth of audio is high, that the highest frequencies are 1000 times that of the lowest. Beam steering techniques for radio antennas don't have to deal with a wide frequency spread like this. And that's undoubtedly the hardest thing to do with an array. Midrange wavelengths span from feet to inches, but bass is dozens of feet and treble is fractions of an inch. Fresnel and Fraunhofer diffraction then are complicated issues. If we were talking about a frequency spread of say 20% or maybe even 100%, that would be one thing. But we're talking about a 1000-fold difference between wavelengths in the range.

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