Subject: Adire Tempest horn sub
Posted by Kramer on Mon, 06 Sep 2004 16:10:41 GMT
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On the array forum, Dan Wiggins and Jim Griffin discussed the science behind near field arrays. It is interesting, so go look if you haven't seen it already. I took another look at Adire Audio after that and the Tempest horn sub grabbed my attention. Do any of you have experience with this sub? It might have been overlooked because it looks like it might be one of the best hornsubs going.
Tempest horn sub

Subject: Re: Adire Tempest horn sub
Posted by Bill Fitzmaurice on Mon, 06 Sep 2004 18:31:53 GMT
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Same reply as at the Speakers forum: it's an obsolete design that can be beat by a number of others. You can get equivalent performance from cabinets far smaller, or far better performance from equivalent sized cabinets.

Subject: Re: Adire Tempest horn sub
Posted by Kramer on Mon, 06 Sep 2004 22:04:14 GMT
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So I guess Enzyte is right, size matters. LOL

Subject: Re: Adire Tempest horn sub
Posted by Bill Fitzmaurice on Tue, 07 Sep 2004 12:18:48 GMT
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The main problem here is that horns work best when you use a small driver with a large horn. This design does the opposite, using a large driver in a box that's too small to allow a proper development of the horn. Back when this design came out in the early '70s it was useful, since back then you didn't have long throw high BL tens and twelves, and you had to use a fifteen by default; as limited as the design was it was better than a reflex box in terms of extension and SPL, so it had value in pro-sound where a 50Hz F3 is useful. But todays drivers have pretty much rendered the whole idea of using a 15 in a horn loaded box to the heap. Smaller drivers allow more horn from the same size box, with an attendant increase in performance.

Subject: Size matters
Posted by Kramer on Tue, 07 Sep 2004 19:17:03 GMT
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-Not an Enzyte commercial-Question:Where is the happy medium here? If horns work best when using a small driver, why not just keep getting smaller? Go down to a 4" driver. Don't stop there, go with 2".The problem is that the smaller you go, the further you must thrust the cone. Seems to me the compromise is size of box verses depth of bass. This is basically the same compromise as a non horn bass speaker.That brings me back to thinking size matters.

Subject: Re: Size matters
Posted by Bill Fitzmaurice on Tue, 07 Sep 2004 20:28:04 GMT
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If you could get a 4 inch driver with an Fs of 35Hz and six inches excursion it would have the ability to outperform a 15 in an equally sized enclosure. Right now that isn't possible. But someday? What I can say for sure is that using a ten I get the same performance as a 15 or 18, or 21 for that matter, from a considerably smaller box. On the other hand, if the boxes are the same size with equal mouth sizes they have the same radiating area, while the longer horn made possible by the smaller driver and smaller chamber required to house it gives a longer pathway for a lower Fc and a higher acoustical impedance for both lower extension and higher SPL.

Subject: Re: Size matters
Posted by Kramer on Tue, 07 Sep 2004 20:47:11 GMT
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Somehow there seems to be part of the picture missing here. I was kidding, but from what you are saying, it looks like you would rather have the smallest driver possible for subs. Would you use a tiny, heavy, high thrust woofer? What about so called doppler distortion?
http://www.audioroundtable.com/Speaker/messages/240.html

Subject: Re: Size matters
Posted by Mike.e on Tue, 07 Sep 2004 23:09:53 GMT
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Nothing missing.note: not THE SMALLEST driver.but Smaller,One that has enough Vd, 10/12" units have enough thesedays.Xmax getting into the inches!Rear chamber size becomes a

problem with 18" units etcThere just isnt a point when compactness is requiredIm only using my jbl 2226 on a horn because i own it already and want to use it. a new 10" will achieve much the same SPL on a horn,with compactness and only slightly reduced output

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Subject: Quite right.
Posted by Bill Fitzmaurice on Wed, 08 Sep 2004 12:28:01 GMT
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Yes, a horn works best when as much cabinet space as possible is devoted to the horn and not to the driver/rear chamber pushing it, so smaller is better as far as the driver is concerned. But getting the requisite driver specs won't allow you to go beyond certain limits. I can get what I need for pro-sound from a ten, but not an eight. I can get what I need for HT/Autosound from an eight, but not a six. That's not to say that these size limitatations might not go down someday if, again, someone comes up with a four that has a six inch Xmax and will stay linear with 300 watts input. I'm not holding my breath on that one. But even two years ago an appropriate eight for a horn loaded sub wasn't really out there, and now at least one (MCM 55-2421)is. Thanks to this driver I now have a horn loaded sub that is not only 10dB more sensitive than a ported box loaded with a 15, at 3.3 cu.ft. it's smaller too.

Subject: Doppler distortion
Posted by Kevin Jordan on Wed, 08 Sep 2004 14:52:47 GMT
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Kramer makes a good point. If woofer size goes down, excursion must go up. The horncan be made smaller, but will it really be better? Math is not my strong suite, but as adesigner, maybe you can tell us the doppler distortion % of 15", 12", 10", 8" and 6"drivers at the excursion required to make 35hz and 140hz notes simultaneously?This would be an interesting comparison to make.Rgs,Kevin

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Subject: Re: Doppler distortion
Posted by Bill Fitzmaurice on Wed, 08 Sep 2004 18:18:38 GMT
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There of course is a point at which excursion induced distortion makes a smaller Sd impractical, but on the other hand driver sourced distortion is so much less in a horn than in other speaker types that it's a rather moot point. When you consider that a driver in a horn running at 12dB higher sensitivity than in a direct radiator is going to have 1/16th the excursion demand for the same SPL the Doppler factor doesn't seem such a big deal. In very high excursion situations

you're also probably talking about a subwoofer, and in that case the 140 Hz scenario is also moot, since you're not likely to be crossing over at higher than 100 Hz, preferably no higher than 80 Hz, anyway. Doppler can be quite a significant factor in the higher frequencies, but like many other factors once you get below the directional frequencies it is generally insignificant.