Subject: Horn Loading
Posted by cddeluca@telocity.com on Fri, 20 Sep 2002 14:03:47 GMT
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I'm hoping somebody here can explain something about horns to me. I've seen comments about how ineffective the typical Altec (eg 816 or 828 enclosure) horn loading in the bass/midrange - statements that the bass cutoff is way too high. What I was wondering is this: isn't the horn cutoff the limit at which the horn effectively loads the driver (impedence matches it to the room)? Below that cutoff, isn't the driver basically a direct radiator (in the case of Altec designs, a typical driver operating in a bass reflex cabinet arrangement)? Is the problem really that the spl level below the horn cutoff will be comparatively too low resulting in a very unbalanced sound? And maybe more to the point, is there any real benefit to horn loading the bass/mid in a domestic environment where the needed "throw" is so very short anyway? I suspect that the "old" Altec cabinets were a necessary augmentation to the driver technology of the time; that all this is moot with modern 15" drivers since all the two-way cinema speakers that I know of use a bass reflex cabinet and do not horn load the bass/mid any longer.

Subject: Re: Horn Loading
Posted by Wayne Parham on Fri, 20 Sep 2002 16:23:03 GMT
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You are right in your assumptions that a horn cannot perform below a frequency determined by its dimensions. And for that reason, bass horns are ineffective unless they are quite large. In many situations, the size requirements make a basshorn untenable. But the Altec VOTT is not a basshorn. It uses a midrange horn and a tweeter horn, and bass output comes from direct radiation using a bass-reflex cabinet.

Subject: Re: Horn Loading
Posted by mikebake on Fri, 20 Sep 2002 18:31:41 GMT
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"I'm hoping somebody here can explain something about horns to me. I've seen comments about how ineffective the typical Altec (eg 816 or 828 enclosure) horn loading in the bass/midrange - statements that the bass cutoff is way too high."It's not too high, just too high for full range horn loading. As Wayne mentioned, the size requirements for low bass are prohibitive in practical use.

However, we are often talking about 80-120 hz and up being horn loaded. Below that many of these type boxes did act as a reflex box, with less output."What I was wondering is this: isn't the horn cutoff the limit at which the horn effectively loads the driver(impedence matches it to the room)?"Yes."Below that cutoff, isn't the driver basically a direct radiator (in the case of Altec designs, a typical driver operating in a bass reflex cabinet arrangement)?"YesIs the problem really that the spl level below the horn cutoff will be comparatively too low (yes) resulting in a very unbalanced sound? (and not necessarily; you may, upon listening decide it's not bad, or you may augment with a subwoofer)"And maybe more to the point, is there any real benefit to horn loading the bass/mid in a domestic environment where the needed "throw" is so very short anyway?"Yes. The "throw" is not what we are after, the efficiency and low distortion, etc. IS"I suspect that the "old" Altec cabinets were a necessary augmentation to the driver technology of the time;"the drivers were fine; they needed to be efficient for the low power amps available then, and they needed the clarity and projection of the horn. The concept is still valid and still very much used today; we just never get away from the size requirements for lower bass"that all this is moot with modern 15" drivers since all the two-way cinema speakers that I know of use a bass reflex cabinet and do not horn load the bass/mid any longer."More to do with space requirements and money, than issues of quality sound reproduction.

Subject: Re: Horn Loading
Posted by steve f on Fri, 20 Sep 2002 23:46:26 GMT
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How about compound loading your delta 15's? The box would have a much smaller volume requirement. Since a sub is crossed over at such a low frequency, the drivers could be mounted face to face.Good luck,Steve

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Subject: Thanks
Posted by cddeluca@telocity.com on Sat, 21 Sep 2002 00:15:42 GMT
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Thank you all for your thoughts on this. I've built some 2-way speakers with Eminence Kappa Pro 15" drivers in a reflex box crossed over at 800 Hz to Altec 806's on 811 horns. To me they sound just great; very "tight" tuneful bass. I certainly do have to pad the HF drivers down substantially,

so I've been bothered by the idea that I ought to build a pair of psuedo-816 cabinets with an equivalent reflex volume to what I have now (about 200 L) to see if I can better match sensitivities and get something even better. Maybe I'll just do it and see what happens, though truthfully I'm concerned about expending money and labor for a less satisfactory result (vis-a-vis the comment about needing to add subwoofers).Thanks again for your thoughts.

Subject: Re: Horn Loading
Posted by Tom Brennan on Sat, 21 Sep 2002 13:06:52 GMT
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Deluca---The VOT cabinets were designed by John Hilliard with the idea of obtaining better time alingment and clearer midrange than was available from the folded basshorn of the Shearer Horn, at that time the best system. Thus the straight basshorn, allowing better upper bass and midrange, and the bass reflex augmentation of the horn. These systems do have a stepped response with the area below 100hz down several db in level. However the quality of the bass is very good. IME an 825 with a 416 (A-7) sounds very good on it's own but an 825 with a 515 needs a subwoofer. I have 825s with 515Bs (A-5) and augment them below 100hz with a pair of JBL 4648 bassbins. The upside of the A-5 is the absolutely finest, most glorious and lifelike upper bass and lower midrange I've ever heard and I've heard alot.The bass drivers used in these VOT systems are still IMO the finest sounding woofers ever made. The only areas in which they are inferior to modern woofs is in power handling, personally I'll take better sound over higher power handling in a home system. :-)The move to direct-radiating bassbins in theaters was driven by several things; the need for deeper bass, size and cost, and the misinformed personal prejudices against basshorns of the guy who was in charge of developing the THX theater standards.

Chicago Horn Speaker Club

Subject: Re: Horn Loading
Posted by stpower on Sat, 21 Sep 2002 14:35:28 GMT
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Tom,I agree with you 100% on all your points made. In the Sept. 1989 Audio magazine a THX article by one of these guys shows a chart supposedly showing the lower distortion of a direct

radiator bass reflex against a VOT horn. But no mention is made of the drivers used, if they were the same for each enclosure, or if they were even woofers designed for the horn they were tested in. I find the A-4 overall sound to be more realistic than the new THX stuff, just not as loud and low in the bass.Regards,stpower