Subject: Listening distance from speaker
Posted by Rapid on Thu, 25 Jan 2007 19:53:31 GMT
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Hello,What determines the minimum distance you need to sit at to get good sound? Some people claim that you can sit closer to smaller speakers. Is that due to midrange/tweeter diaphragms being closer to each other and being able to sum good at a smaller distance? Just guessing...Take for example a 15" speaker with 90x90 1" waveguide and a 5" speaker with dome. Do you need to sit further away from the 15" speaker, and why?Cheers,Mattias

Subject: Re: Listening distance from speaker
Posted by Wayne Parham on Fri, 26 Jan 2007 16:36:10 GMT
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There's farfield sound, nearfield sound and too-damn-close sound. What I mean is, when you are very close to a speaker, the angle between you and the woofer is so much different than the angle between you and the tweeter that it is obvious there are two sound sources. Even if the distances are equal and summing is good, the fact that the two bands of sound are coming from two different places is obvious. This is only a problem at very close range, generally within a foot or two, depending on the size of the speaker. Smaller speakers can be listened to from a closer range because the sound sources are closer together.

Subject: It depends...
Posted by Duke on Sat, 27 Jan 2007 06:21:55 GMT
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The ear is extremely poor at resolving the height of a sound source below 500 Hz. It's still not very good at 1 kHz, but from there its vertical acuity increases rapidly and peaks around 4 kHz. That being said, most crossovers aren't brick-wall filters, and most large-diameter cones have serious on-axis peaks between 1 and 2 kHz. Crossover type can make a difference too, from what I recall.So, at the risk of over-generalizing:1. The lower the crossover, the closer you can sit.2. The closer the vertical distance between the drivers, the closer you can sit.3. The steeper the crossover slope, the closer you can sit.4. The smoother the out-of-passband response from the woofer, the closer you can sit.5. Even-order crossovers integrate a bit better at close range than do odd-order crossovers.I'm sure this is incomplete, but it's a start.Regarding the example you give, in most cases I'd expect the 5" plus dome to work better up close simply because the angular separation between the drivers is so much less. However, with a suitable crossover the 15" plus waveguide just might work better up close. Perhaps the ideal for ultraclose range is a coaxial driver.Duke

Subject: P.S....
Posted by Duke on Sat, 27 Jan 2007 06:24:41 GMT
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I closed my previous post with the suggestion of a coaxial for ultraclose range listening. I'm experimenting with several coaxials right now - shoot me an e-mail if you'd like to know which one I like.Duke

Subject: Re: It depends...
Posted by akhilesh on Wed, 31 Jan 2007 13:12:29 GMT
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3. The steeper the crossover slope, the closer you can sit.HI Duke,Intuitively, I would have thought the less the lsope the closer you can sit, since the sound will be more "blended between the 2 drivers, whereas, if the slope is steeper, the sound is "more obviosuly split" between the 2 drivers. So, given constant spacing in both cases, if case 1 has a woofer & mid crossed at 500 Hz (say) with a 12 db slope, the sound may blend in better than case 2, where the slope may be 24 db. I say thin in the context of eh Altec VOTT setup...do you think making the slope steeper between the dome & the horn makes the sound more coherent or less, at smaller listening distances?BTW, I use a 24 db slope in my system, and cross it at 1500hz, but I kow the traditional passive Altec Xover uses 12 db & crossed at 800 Hz. -akhilesh

Subject: PS
Posted by akhilesh on Wed, 31 Jan 2007 13:13:45 GMT
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Sorry about the typos. And that should be cone & horn, of course, not dome & horn...sorry!-akhilesh

Subject: Re: It depends...
Posted by Duke on Wed, 31 Jan 2007 21:19:31 GMT
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Well I may be incorrect, but my (admittedly limited) experience suggests that hearing high frequencies come from the mid/woofer cone is the primary distraction, and the steeper the slope the less high frequencies will be coming from the mid/woof. Also, when a steep slope is used the crossover frequency can usually be lower because the tweeter is better protected. As an example

from another frequency realm, subwoofers with a steep-slope upper cut-off do a better job of "disappearing" than subwoofers with a gentle-slope upper cut-off, again because if we can hear the upper frequencies (even at reduced volume) we can better locate the sound source. I recently had the chance to compare plate amps with 12 dB/octave and 24 dB/octave high pass filters, and the latter enabled me to cross over almost an octave higher before the subwoofer's location could be detected.Duke

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Subject: Re: It depends...
Posted by Wayne Parham on Wed, 31 Jan 2007 22:46:48 GMT
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I think the crossover for subs is very important because of this. Any midbass coming from them gives directional clues, and also can potentially become a summing problem due to being further

and tweeter, in my experience, it's a balance. I think first and foremost, summing should be good. Directionality should be matched. Both of these are somewhat dependent on crossover frequency and slope.If the loudspeaker is physically large, then each subsystem is probably further apart than a smaller speaker. For example, the midrange driver of a midhorn is probably further from the tweeter in a large horn speaker than the midwoofer is from the tweeter in a small mini-monitor with a 6.5" woofer and a 1" dome tweeter. To me, it stands to reason that localization of sounds from the mini-monitor would be difficult even just a few inches away. The horn might need a few feet to integrate properly. Then again, the horn probably sounds just fine 30 feet away, whereas the mini-monitor might be straining.Some would offer the coaxial arrangement as a solution that allows large horn sound with the close-up integration of the mini-monitor. It definitely removes the problem of having a vertical stack, but I've never found one that I could live with the compromises it brings. Not to say there aren't some good coax and multi-driver horn/manifold setups out there. There are some really nice ones. They just aren't my cup of tea.

Subject: Re: It depends...
Posted by Duke on Wed, 31 Jan 2007 23:56:04 GMT
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Two problems I see with high efficiency coaxials: First, the relatively long throat for the high frequency driver (which is typically mounted to the back of the low frequency magnet); and second, the less-than-optimum "mouth" of the "horn". B&C has a couple of coaxials with shorter throats than normal, achieved by using the same magnet for both driverss. I think this is what Tannoy does, and I wonder if the Tannoy patent has expired or something, or maybe B&C is licensing. Not much that can be done about the "mouth" issue, except to listen off-axis. I'm playing with the 12" B&C common-magnet coaxial and like it so far. Just wish it wasn't so darn expensive!Duke

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Subject: Re: It depends...
Posted by Wayne Parham on Thu, 01 Feb 2007 00:07:27 GMT
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Yep, yep. I agree. I've noticed you and I agree about just about everything. Looking forward to seeing you in May!!!

Subject: Re: It depends...
Posted by Duke on Thu, 01 Feb 2007 07:01:56 GMT
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And I agree to see you in May, too!Duke

Subject: Re: It depends...
Posted by akhilesh on Thu, 01 Feb 2007 12:36:23 GMT
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That makes sense! Thanks guys. A steeper slope clearly allows subs to go up higher & tweeters to go down lower. The issue is: what if we are using drivers that don;t need the sub to go up too much (for example suppose someone is trying to cross a sub at 50 hz, becuase their "full range" speaker system supposedly performs well to 40 hz> Should they corss the sub at 50 hz with a shallower slope, or at 80 hz with a steeper slope? Of course, issues like IM distortion, room effects all come into play, and eachsituation has its own solution, but you see my point? Similarly, what if the tweter (or horn) can go all theway down to 500 HZ, but one is still crossing it much higher. Should one then cross it at a steeper slope or a shallower slope? Again, I think each situation has its own solution. IN general, I agree with Duke, steeper is better. I'm just trying to justify my recent purchasr of a BBE bs48 guys!It allows slope adjustment, and I wasgoing to try with my 3 different active systems to see what slopeworks. -akhilesh