Subject: More two way questions...
Posted by jeff mai on Mon, 12 May 2003 04:52:21 GMT
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Thanks very much for the details and tips in the thread below, Wayne and mollecon. I've studied a bit further and I have some questions.First for Wayne, The PiAlign document contains some nomenclature I haven't seen. Vad is this the same as Vas? Where do I get Qd from? There are a number of others. If these are merely different names for the standard TS parameters, a translation table would be useful.Second, all of the published alignments like QB3 or SBB4, produce box volumes less than half the size of the 4-5 ft^3 you (mollecon) suggested I might use for a typical high efficiency woofer (I plugged in a JBL 2206, for example.) Am I doing or interpreting something wrong? If not I assume we are deliberately misaligning the box to get more LF extension out of it by sacrificing a flat response, yes? The Loudspeaker Cookbook talks about non-flat alignments, but the examples he shows are all underdamped. I assume you could go the opposite way and overdamp. Is this what we're doing by using a much bigger box?Thanks!Jeff Mai

Subject: PiAlign nomenclature
Posted by Wayne Parham on Mon, 12 May 2003 06:43:45 GMT
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Look at the "readme.txt" file in the distribution archive of PiAlign, as it explains what the input values are, and what they mean. There is also a substitution guide contained therein. Basically, you can use Vas for Vad, Fts as Frd and 1/Qts as Qd.If you carefully examine the suggestions produced by PiAlign, you'll notice a trend.

Generally speaking, most PiAligned cabinets are overdamped or what I would call EBS like. They are also often smaller than the box required for deepest flat response. Specifically, woofers having Qts less than about 0.4 are likely to be slightly overdamped and those with Qts greater than 0.4 are likely to be a little underdamped. Woofers with very high Q above about 0.7 tend to produce a curve that is like a shallow EBS.

Subject: Re: PiAlign nomenclature
Posted by jeff mai on Mon, 12 May 2003 18:34:14 GMT
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Thanks Wayne,I hadn't made it far enough to look at the PiAlign software.I've got more reading to do and may discover the answer eminently, but what would be the advantages of PiAlignment vs.

going for a larger enclosure (say 3 cu ft) for a 2206?Jeff Mai

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Subject: Re: PiAlign nomenclature
Posted by Wayne Parham on Mon, 12 May 2003 20:22:06 GMT
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The advantage of a PiAligned 2206 vs. one that's 3 cubic feet is that the PiAligned cabinet is flat down to its lower cutoff. You can expect this from cabinets of about 0.75ft3 to 1.5ft3 tuned to 60Hz. But if deep bass is desired from the 2206, then other alignments might be considered. An advantage of a larger box is deeper extension. You can expect output down to about 35Hz in a 3ft3 box tuned to 35Hz, but it will be an EBS alignment with the lower bass shelf reduced some 5dB from the midband amplitude. This is a pretty good alignment where deep bass is required from a 2206.One alignment favors full range performance and the other favors deep bass, but both are acceptable design choices. Another good option would be a compromise solution: JBL suggests this in their product documentation - A 2ft3 cabinet tuned to 50Hz.

JBL 2206 specification sheet

Subject: Re: More two way questions...
Posted by mollecon on Tue, 13 May 2003 19:44:20 GMT
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Hi Jeff! Well, quite honestly, my assesments of efficiency/boxsize/bass response was more a qualified guess, albeit based on real life examples. Like two reflex boxes I recently calculated, both with Eminence woofers - one gave -3dB at 50Hz in a ~120 liter (~4.3 cu.ft.) box, efficiency 96-97dB, the other -3dB at 43Hz in a 77 liter(~2.75 cu.ft.) box, efficiency 94 dB. Furthermore, I'm referring to the piston working mode of the drivers, most of which have a rising response as they enter break up in the upper range. Luckily, the room bounderies often compensates in the lower frequency area. The latter means that a loudspeaker may well have a better bass response &/or efficiency 'in room' than calculation reveals, which is just as well... :-) Btw., it's my understanding that many of Wayne's designs are deliberately taking this into account, hence the 'Pi' name.There is a theoretical limit as to how efficient conventional closed boxes or reflex designs can get (about 5% I believe) - & many commercial loudspeakers don't even come near to their theoretical limits even taking their bass response into account (the efficiency limit drops as one extends the bass response in any given box size as I mentioned in the earlier post).
