Subject: piAlign software and figuring Zmax
Posted by juanstein on Fri, 27 Apr 2001 16:06:10 GMT
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Hi Wayne -- I have been experimenting with your piAlign program and a few different drivers. I looked at the TAD 1602, but that was a huge cabinet solution. The TAD 1601c at 102 dbW/m turned out to be a very attractively sized enclosure. I have a few details I was interested in having explained. The dimensions generated seemed to follow a 1 x 2 x 4 pattern, therefore, to compensate for internal displacement of physical objects inside the cabinet, such as the magnet and basket, and whatever cross-bracing is there, do you simply keep the 1/2/4 ratio and increase the dimensions until the additional volume is accounted for? Is the volume enclosed by the vent structure and inside the vent already included in the box dimension calculation, or is that another volume that must be added back into the cabinet dimension?Can you find Zmax from mechanical parameters? Thanks for any clarification (I have more questions for another thread).John

Subject: Re: piAlign software and figuring Zmax
Posted by Wayne_Parham on Fri, 27 Apr 2001 17:24:00 GMT
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PiAlign suggests a 4 cubic foot cabinet tuned to 37Hz for the TAD 1602. So the Pi cornerhorn bass bin for it is a little over three feet tall. Bracing, wood thickness, the port and drivers inside displace some volume, so the cabinet is made large enough to compensate.About finding Zmax from electro-mechanical parameters, I never really thought about it but, yes, you should be able to backsolve Zmax when other parameters are known. You might check the popular T/S modeling programs and see if any of them calculate an electrical impedance chart.

Subject: Re: piAlign software and figuring Zmax
Posted by juanstein on Fri, 27 Apr 2001 21:48:31 GMT
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Hi Wayne!Since you brought up the subject on the high efficiency forum, is the port length calculated by piAlign the corrected length Lc for the port volume? ;P If not, how can a humble soul determine the correction factor?Also, I was looking for some idea as to trade-offs among different port shapes. That thread where you posted was on that, but turned into a whole lot of nothing other than a discussion on port pipe resonance. Do you have a preference due to turbulence considerations or cross width standing waves (should be quite high in frequency, out of the passband)?Since the enclosure doesn't care WHERE the port is, could one just make a hole (rectangular) in the enclosure and mount the port at 90 degrees to the hole externally (port's on the back). Is there a problem using a side-excitation with a compression wave? It changes a few

parameters for a transverse wave (em). With the right angle turn, I can see a problem with where do you consider the box to end and the side chamber to begin. Making the enclosure wall very thin at that point should(?) help. Otherwise you have the chamber created by the enclosure thickness before entering the resonant chamber.I know it sounds like a pain, but an externally mounted length could be easier to adjust. Waddayathink?

Subject: Port shapes
Posted by Wayne_Parham on Fri, 27 Apr 2001 23:29:31 GMT
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PiAlign calculates uses the port length corrected for area. The dimensions it gives are appropriate for inside dimensions of what should be used in the loudspeaker. You can see the corrected length formula used on the PiAlign document.About different port shapes, I typically use cylindrical when I can, and rectangular when I can't. The PiAlign program will calculate either one. Sometimes the optimal cylindrical port is not of a size that is readily available. So when that happens I sometimes use a rectangular port. If the port is short enough, sometimes I just glue wood panels onto the baffle to build up thickness to the required port length, then drill through at the needed diameter with a hole cutter.As for standing waves, they aren't a problem if dimensions are acoustically small. But if used to high enough frequency, then cabinet will start developing standing wave modes. The port can do this too. That's what the insulation inside is for. It's usually sufficient to cover three internal sides with R11 or R13 insulation, but larger cabinets are usually better with insulation spanning the cross-section too. Cross-braces are a convenient place to put spanning insulation like that.
