Subject: PiAlign RS1354?
Posted by craigha@attbi.com on Wed, 02 Jan 2002 13:04:30 GMT
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First off thanks to Wayne and the others that havebeen answering my questions. I would like to builda Theater 4 Pi when I can afford the parts. In themeantime I have a pair of Radio Shack 1354 driverson the shelf and some time to build a speaker. Iwant to try a PiAlign'ed cabinet with a full range 1354and a Motorola 1038 piezo for HF fill.I'm using these parameters for the 1354:Fs 51, Vas .5 ft3, Qts .46, Qms .537, Qes 3.46,Pd 40W, Re 7, Diam. 4.75, Xmax 0.1 (??)From PiAlign I got: Vol. .23ft3, Fr 46From Box Plot: Alpha 2.2, H 0.9The Box Plot alignment was: vol. .8ft3, Fr 44 HzAlpha .62, H .97The Box Plot alignment Amplitude plot has -3dB at 40Hzand a flat 0dB line from 60Hz up.The Pi Alignment Amplitute plot has -3dB at 70 Hzand a hump from 90-250Hz.Some questions:1) Am I entering things correctly?Assuming this is correct2) Why the differences in the 2 alignments? How will the sound compare?3) How are the cylindrical port sizes determined for each alignment? This has got me confused.Tia, Craig

Subject: Re: PiAlign RS1354?
Posted by Wayne Parham on Thu, 03 Jan 2002 00:53:19 GMT
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BoxPlot uses a different algorithm when you press the "Align" button. You'll notice that the PiAlign box is usually larger for very low Q drivers and smaller for high Q drivers.

Subject: Port length calculator
Posted by craigha@attbi.com on Thu, 03 Jan 2002 11:24:49 GMT
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Thanks Wayne. I'm getting more comfortable using PiAlignand BoxPlot. Here is an attempt at a port length calculator.From Loudspeaker Design by Vance DickasonFor a tubular vent flush-mounted on a speaker,calculate the length by:Lv = ((1.463*(10**7)*(R**2)) / ((fB**2)*VB)) - (1.463*R)Lv = length in inchesfB = tuning frequency in HzVB = box volume in cubic inchesR = radius of the vent in inchesMy favorite calculator is the Python interpreter. AWindows version is available at:http://www.activestate.com/Products/Download/Get.plex?id=ActivePythonI wrote a function to calculate port length for me:def portlen(diamInches,tuningFreq,boxVolCubFt): radiusInches = diamInches / 2.0 cubInchConv = 12.0 * 12.0 * 12.0 boxVolCubInch = boxVolCubFt * cubInchConv num = 1.463 * (radiusInches * radiusInches) * (10000000.0) denom = (tuningFreq * tuningFreq) * boxVolCubInch term1 = num / denom term2 = 1.463 * radiusInches len = term1 - term2 print 'calc port len diam.=',diamInches,'freq=',tuningFreq,'vol=',boxVolCubFt,'len=',len return lenExample output:calc

port len diam.= 0.5 freq= 54.0 vol= 0.23 len= 0.423228647155calc port len diam.= 0.75 freq= 54.0 vol= 0.23 len= 1.2265769561calc port len diam.= 1.0 freq= 54.0 vol= 0.23 len= 2.42441458862calc port len diam.= 1.5 freq= 54.0 vol= 0.23 len= 6.0035578244calc port len diam.= 2.0 freq= 46.0 vol= 1.0 len= 2.53815084366calc port len diam.= 3.0 freq= 46.0 vol= 1.0 len= 6.80808939824calc port len diam.= 4.0 freq= 46.0 vol= 1.0 len= 13.0786033746

Subject: Re: PiAlign RS1354?
Posted by Otor on Thu, 03 Jan 2002 13:44:13 GMT
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Hi Craig,I calculated Pi Align for RS-1354 some time ago, but not built them.Where I was confused was a really small port dimensions.In the Pi align, there is another factor to be considered, whichis the ratio Qe = Lp^2/Ap. For RS-1354 in 0.234 cu ft Pi aligned box tuned to 41.6 Hz, this ratio is 2.206. The only possible port dimension I found is Dp=0.414" and Lp=0.545" - not a huge port, it risks to produce some noise, IMHO.I do not understand exactly how important is to keep this ratio close to calculated Qe value. What's more important: use such a smallport or make the port bigger and then keep right values for Qe or rather for Fre?O'tor

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Subject: PiAlign
Posted by Wayne Parham on Thu, 03 Jan 2002 21:03:15 GMT
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Making the system resonant frequency correct is most important, but then again, having a port that is inappropriately sized isn't good either. Sometimes - and particularly with very small cabinets - PiAlign compromises one or both of these in order to keep the port size manageable. It usually makes the same compromise I would make, because the program essentially automates the decisions I would make. But in cases where the cabinet is exceedingly small, it tends to compromise resonant frequency more than I would.
