Subject: Helmholtz formula
Posted by Wayne Parham on Fri, 13 Jul 2012 03:11:47 GMT
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15" x 15" x 15" would be a nice box size for that woofer.

But PiAlign won't calculate a port for that box. It was designed to recommend a cabinet size, used mostly for mains cabinets really. It's literally a 1970s program. Not that electro-mechanical alignment software is or even needs to be more modern than that, but still, my point is that is a single-purpose design tool.

You could calculate the port using standard Helmholtz formula. That will be plenty for a sub, no need to do any more analysis.

Subtract the volume displaced by the driver and wood thickness. Without offset, a 15" x 15" a 15" box is 3375in3. If you use 3/4" wood, that will reduce it by about 9003 to ~2450in3. Estimate the volume offset by the woofer at 250in3. That leaves volume at ~2200in3. So calculate Helmholtz frequency using that volume, using the formula below:

Here's a little BASIC program that will calculate the formulas for you:

```
10 INPUT"Enclosure Volume";VE
20 INPUT"Diameter of Port";PD
30 INPUT"Length of Port";PL
40 VB=VE*1728:PI=3.1415926535:AP=PI*((PD/2)^2):LC=PL+((8*PD)/(3*PI))
50 FR=(13548/(2*PI))*(AP/(VB*LC))^.5
60 PRINT"Fr =";FR;"Hz."
70 GOTO 10
```

You can verify the Helmholtz frequency if you wish. Measure impedance and look for the minimum between the peaks to find the Helmholtz frequency.