Subject: Advice building bass cab
Posted by notben on Fri, 20 Aug 2010 16:28:50 GMT
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Hi folks. I'm fairly new to the forum. As someone who has built a set of Pi speakers, I thought I would come here for a little help or advice.

I have all the materials to build a 1x12 Bass guitar cabinet using the Eminence Beta 12 driver: http://eminence.com/pdf/beta-12a-2.pdf

I plan on building the smaller of the bass guitar cabinets that Eminence details in their cabinet plans pdf, its the second cabinet detailed: http://eminence.com/pdf/cab-beta-12a-2.pdf

I am looking for someone with some experience to let me know if I am on the right path with some of the details, or maybe even if someone has built a box for this driver, what did they do.

The cabinet specs list:
Vb = 1.75 cu.ft
V(total) = 1.894 cu.ft
I am assuming the Vb is the inner box dimension and the V(total) is the maximum one could use.
I am using 11 ply birch plywood which is close to .5" and I have used this site to help me reverse engineer my dimensions: http://www.bcae1.com/spboxnew2.htm
I am using the calculator that allows you to input wood thickness, driver size and then use the sliders to instantly see changes to the box volume.

What I have come up with for outer dimensions is:
16" H
18" W
13".0" D

With inner dimensions of:
15" H
17" W
12" D

Giving an internal volume of 1.795 cu. ft.

And I am going to put the two 3" ports on each lower corner. I am not sure how high from the bottom, but I figured I would center them between the driver and the corner of the baffle.

Eminence says this should give a box with a resonant frequency of 54.15hz if you use their design. I don't know how to check if my calculations are matching up.
Also, I wish I could go lower, but I don't want to build a 4cu.ft. box.

So, does anyone know if I have missed interpreted anything on the designs, or can anyone do any other calculations that may make a better sounding box?

Thanks,

Ben

Subject: Re: Advice building bass cab
Posted by Wayne Parham on Fri, 20 Aug 2010 18:20:27 GMT
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Vtotal is based on outside dimensions and Vb is interior dimensions minus offset from driver displacement.

I generally use a Helmholtz calculator to determine the port frequency and then calculate internal standing waves based on distances to boundaries, the internal cabinet walls. More recently, I've used the Martin King spreadsheets to find the influence of internal standing waves. However, if you will only be using the box at low frequencies, you won't need to worry about that. Helmholtz resonance is all that will matter.

Since this is for a bass guitar cabinet, I think you'll probably operate the cabinet at relatively high frequencies but internal standing waves may or may not be objectionable to you. Musical instrument speakers generally have their own distinctive sound. They aren't designed to necessarily be "flat", and rarely are. So I cannot say how you will want to approach that, I can only tell you that internal standing waves tend to become more an issue at higher frequencies, midbass to midrange frequencies on up. That's where port and driver position within the box start to matter.

There are plenty of T/S simulation programs that will calculate Helmholtz frequency and plot predicted response. But if you're curious, here is the Helmholtz formula:

Here's a little BASIC program that will calculate the formulas for you, if you can still find an old BASIC interpreter around somewhere.

```
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
```

Subject: Re: Advice building bass cab
Posted by notben on Fri, 20 Aug 2010 22:18:41 GMT
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Thank you Wayne.
That was the only other thing I could think the Vtotal could be, but I wasn't sure.

I did fine a cool little BASIC compiler that you can run online: http://www.calormen.com/Applesoft/ Your code worked and I am able to calculate the FR.

Although, Eminence specifies two ports for their cab design.

Figuring out the standing waves is over my pay grade. Looking at other 1x12 ported bass cabs, I see some with ports stacked on the the side with the driver off set, so I think I will just try that alignment.

Thanks.