



Acoustic Horn Company

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# The Horn News

**The News People Listen To.**

May 25, 2008

Hello All,

After some considerable delay, here is another issue of the Horn News.

## **About Bass Horns.**

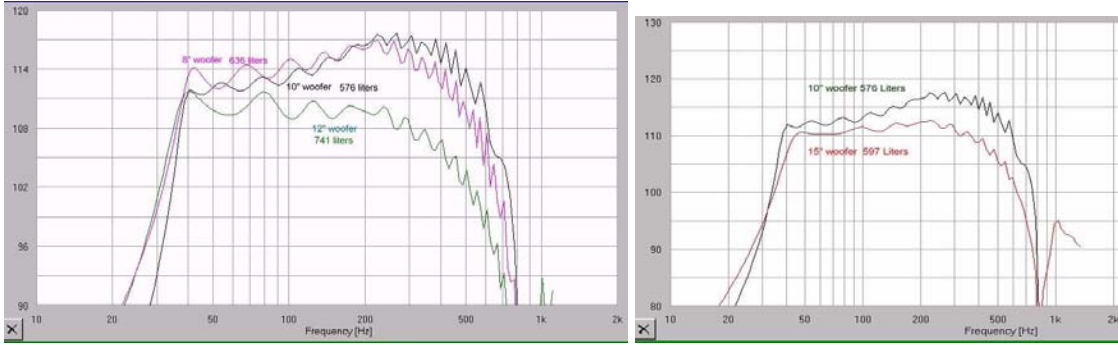
Here are some design factors which effect basshorn design.

One of the most unasked questions is, what effect does the throat have on low frequency horns. One issue is how small a driver you can use for a given target low frequency, and how does this effect efficiency.

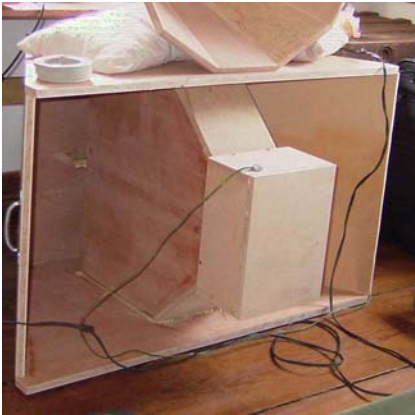
In general you can use between a 15" woofer to a 10" woofer to go down to 30Hz. Smaller than this, the driver does not have enough area before distortion sets in, or the mechanical limits are exceeded.

The only difference between a 12" vs. a 15" is maximum power out put. The 15" will handle more power, and you will get 3dB or so more output. However, as the throat gets bigger, for a given length, so does the gross size of the horn. You could design a 10" woofer optimized, which to 40Hz would be the maxim sensitivity possible. Sensitivity is the SPL at one watt. Over efficiency is maximum power before mechanical limits are exceeded.

See curves.....



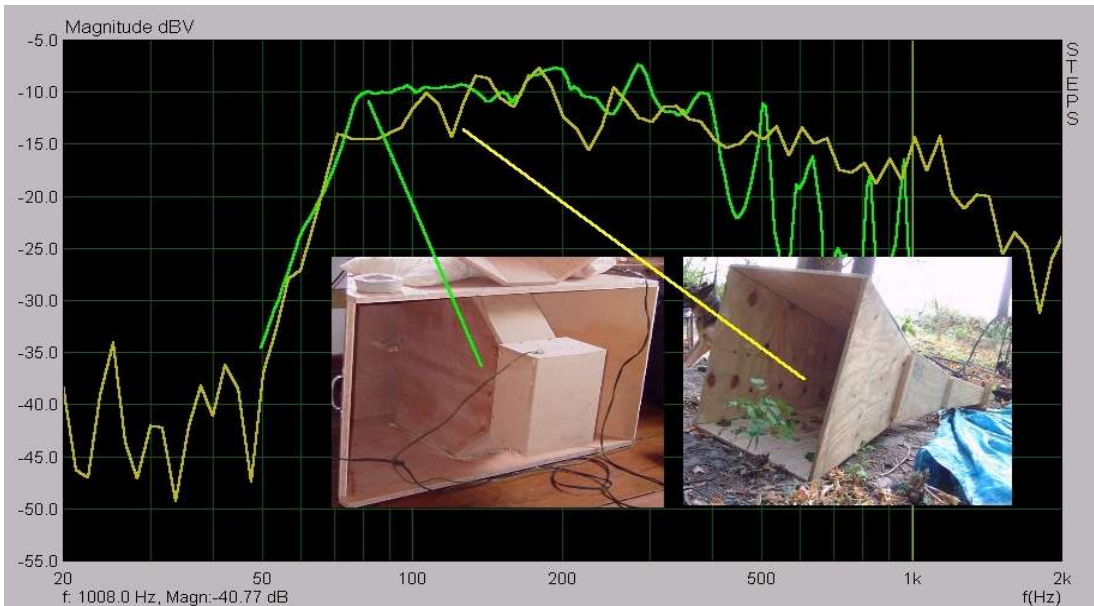
Another question is what happens when you fold a horn, vs. the same horn not folded.



Above are exactly the same horn, one folded, one straight.

Both are driven by B&C 6nd38 6" woofer.

Below is a straight horn 8 feet long, the mouth is 30" x 30", vs a folded horn of same flare profile. It is an exponential horn.



## Why is the folded horn go lower?

It is because the bends add acoustic resistance- creating more load on the woofer. Also, because the horn is roughly like a Bullet tweeter, due to the geometry, the directivity is increased. Finally, the geometry allows better loading to the ground due to the Horizontal rectangular shape of the mouth.

One point however, the sharp cut off of the folded horn, due to phase cancellation of the bends, creates "ringing" or a hollowness to the lower voice. That "W" horn sound.

This is just a snapshot of basshorn design.

I hope this has been of interest. I try to present information manufactures never show, and try to increase the learning of loudspeaker design.

Below is the flare profile for the 10" basshorn, as shown in the simulation above, using the Eminence LAB 10 woofer.

The rear chamber size is 5 liters....

Inter width horn **34.625**

Along X	Area sq.. In.	Width / 34.6"
0.00	5.42	
3.15	6.04	0.17
6.30	6.73	0.19
9.45	7.50	0.22
12.60	8.36	0.24
15.75	9.31	0.27
18.90	10.37	0.30
22.05	11.55	0.33
25.20	12.87	0.37
28.35	14.34	0.41
31.50	15.97	0.46
34.65	17.79	0.51
37.80	19.82	0.57
40.94	22.08	0.64
44.09	24.60	0.71
47.24	27.41	0.79
50.39	30.53	0.88

53.54	34.01	0.98
56.69	37.89	1.09
59.84	42.21	1.22
62.99	47.03	1.36
66.14	52.39	1.51
69.29	58.37	1.69
72.44	65.02	1.88
75.59	72.43	2.09
78.74	80.70	2.33
81.89	89.90	2.60
85.04	100.15	2.89
88.19	111.57	3.22
91.34	124.29	3.59
94.49	138.46	4.00
97.64	154.25	4.46
100.79	171.84	4.96
103.94	191.44	5.53
107.09	213.27	6.16
110.24	237.59	6.86
113.39	264.68	7.64
116.54	294.87	8.52
119.69	328.49	9.49
122.83	365.95	10.57
125.98	407.68	11.77
129.13	454.17	13.12
132.28	505.96	14.61
135.43	563.65	16.28
138.58	627.93	18.14
141.73	699.53	20.20
144.88	779.30	22.51
148.03	868.17	25.07
151.18	967.17	27.93
154.33	1077.46	31.12
157.48	1200.32	34.67