Subject: Re: High output basshorn
Posted by Wayne Parham on Wed, 03 Nov 2004 20:32:17 GMT
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Hi Graeme,It is just an idea, really. I had Eminence working on a low distortion subwoofer, but there were complications that kept that project from coming together. Using rings the size of their Magnums wouldn't reduce distortion at the lowest frequencies and re-tooling to make a speaker with a larger ring would be costly. They aren't interested in that right now, saying "We can still get those sales today with the LAB 12 even if the improved product doesn't exist."There is another way to decrease motor asymmetry, and therefore reduce second harmonics. That is to use two similar motors arranged in a push-pull configuration. My thinking is to mount drivers so they pressurize the front chamber in a slot loaded push-pull arrangement.This configuration greatly reduces 2nd order harmonics entering the throat. Of course, horn loading reduces excursion, which also reduces distortion. But at high excursion, the harmonic components are there and are acted upon by the horn, just as if they were intended signal components. The folds of a basshorn attenuate higher frequencies, but harmonics within the passband are still passed through and acted upon by the horn. That's the reason why I'd like to decrease distortion entering the throat. Basically what I'm thinking is that the horn and folds reduce distortion, but reducing it at the motor too increases performance that much more.I suppose there is no reason the LAB12 or HL10 or other similar drivers could be used in this configuration to make smaller horns. But I'm thinking that a pair of 1000 watt 15" drivers might work. With the motor chambers and front chamber being roughly 18" deep, there is still room enough for 8 feet of path length within a 4x4x2 foot box. That should support output down to about 35Hz. Below that, it's a direct radiator. But in this case, the direct radiators are slot loaded push-pull devices, so they should cancel harmonics and provide low distortion output even at the deepest frequencies.I know that down low, excursion will be the limit. But with larger radiators, displacement is greater even at lower excursion levels because there is more surface area. So between the increased thermal power handling and the larger radiators, this may balance out. I'll have to run the numbers and see. This is still sort of a conceptual thing. Once the project gets nearer to completion, I suppose the acid test will be to beat 'em up and see what falls out. One suggestion was to plug the box into the 120v AC line. I know that when I was talking to people about the B12 flux stabilized woofer, they were telling me that there were numerous reports of LAB12 thermal failures. No driver is immune, and certainly something like that is going to be pushed very hard. So it's not surprising, and really shouldn't be seen as anything other than what it is. But the point is that the LAB12 is a 500 watt device, and certainly a pair of 1000 watt devices can handle more heat.