Subject: Re: Subwoofer project update
Posted by Wayne Parham on Wed, 31 Mar 2004 15:40:34 GMT
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I understand that the LABhorn places the motor cooling vent very near to the cabinet, and that this causes some airflow restriction. I've read numerous reports of this, and yet, since there haven't been a rash of failures, the vent seems to be keeping the motor cool. Vent obstruction may be increasing distortion at low frequencies, and so maybe we'll address this as a part of our efforts. But the point is that even though there are some reports of chuffing in the vent, I don't see a lot of overheating failures. Maybe the vent is oversized, or maybe it's just enough.We don't know what vent size is too small, so maybe it's worth building a sample to find out. But then again, we are sure that keeping the vent size large will allow the speaker to breathe better than a smaller one would. A larger vent will also help reduce chuffing, which becomes audible when excursion is high. I have been discussing these and other issues at length with people at Eminence.Jerry McNutt and John Sheerin have analyzed the problem and come to the conclusion that adding magnetic material wouldn't increase flux. The core is saturated, so the only way to increase flux is to add steel. So the existing motor configuration will need a smaller vent to include flux stabilization and meet required T/S specs.That leaves us with two options. One is to decrease vent size and use the existing motor layout with the addition of flux stabilization.The other option is to mount shorting rings in the plates, outside the voice coil. This option would allow the vent to be made larger, but is a major undertaking that would add a couple months development time.So let's cut to the chase. A flux stabilized subwoofer with required T/S specs and a 0.75" ID cooling vent can be made immediately. We would have evaluation units in April and if they met our expectations, we could be taking delivery on production runs in May or early June. Or we could wait for Eminence to tool-up for a version that puts the flux stabilization ring in the plates, allowing the cooling vent to be made larger. This would push back the dates, with evaluation speakers ready around the end of summer. If everything goes well, we'd be looking at late 2nd quarter 2004 for evaluation units and early 3rd quarter 2004 for production units to ship. That puts us into August or September.Since the woofer is designed to be an all-out performance improvement, I tend to not want to cut any corners. I'd rather not decrease the vent size. This subwoofer is intended as no-compromise solution, so I think I'm leaning in that direction. But I've told Jerry that I would let Eminence sit on this for a little while and think about it. I trust these guys, and I value their opinions. They've been successful at solving problems like these, and have the best engineering tools, magnetic FEA and measurement systems to pull it off. I'm confident they'll choose the best direction to go.I also want to get input from Chris Rose and Rob Gault on this matter, because it's a pretty big undertaking. It's big both in technical scope and in production requirements. So I think it is prudent to let them think on this one a while before making any further comments. I'll report back in just a few days.