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Subject: Re: Other Drivers and stuff

Posted by [Tom Danley](#) on Fri, 02 Apr 2004 13:51:01 GMT

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Hi Wayne

Aside from thumb rule formula linking SPL to horn bandwidth, I have not seen much in print. Most of the experience I have had with this issue was in trying to "fix" it in our levitation sources, ultimately, there is no fix, one simply had to reduce the distance (in wavelengths) traveled at high SPL's. I guess one could say for what we were doing, the answer really was to have a converging sound field that only reached maximum SPL where it was focussed. It was pretty cool though, at the center of focus, the sources could light a cigarette with acoustic friction (at about 165-170 dB). Flux rings had been / are pretty much associated with "more expensive" drivers and the advent of accurate magnetic computer models with experience has made many ceramic structures that were the equal of what one could get with the traditional materials (alnico). On the other hand, as long as the lines of flux are not "pinned" down totally, the magnetizing force in the Voice Coil modulates the set point of the magnetic circuit. The extent it is modulated also is the amount that the magnetic circuits' non-linearity in its BH curve alters the relationship between the two. Interestingly, when I went to work at Intersonics in 1979, the sound source they were using at the time was called a St Clair (developed by the department of mines I think). It was a bar of aluminum, held at the exact center by a thin flange and driven by a shorted turn.. In this driver, the driven coil is wound around the center pole and the bar is set in motion by the "shorted turn" at one end (turned out of the same bar). I had made several tweeters (a small aluminum dome) with this approach, using the edges of the dome as the S.T. and coil wound on the center pole. These worked fairly well and I thought there was a possibility of making a compression driver this way. We applied for a patent on it but after a while there was a budget cutback and the application was abandoned. Some years later, Tannoy was able to get a patent on it although configured as a "coax" driver. Anyway, back when the LAB sub got started, a shorted turn was not something Eminence did normally. They were well aware of it though, at the Bass list BBQ I held in 1996 where I first met both Jerry and Nick McKinney, we did sit around and talk about it and the St Clair source (as Nick was building speakers with them). Sometime later, Jerry went to work for Eminence. A few years ago, when I asked about making the LAB 12, an ST was still not something that they did normally and as I was asking for a pretty strong motor, there was also a question about how long would it take to develop / cost. Also, when I started that project, I really had no idea that people would be using LAB's in homes so getting the last nth of distortion out wasn't a concern. I just wanted to beat the highly (marketed) thought of bass horns in Pro-sound with something a DIY'r could build. Since there was no way to brainwash people into thinking anything (like the big companies do), it had to do this on its demonstrable performance. At least so far, nothing they have tested out performs it. I figured this could only happen by following the computer design and not "horn lore" which said one wanted a low mass driver etc. One wants the right driver for the job not a thumb rule here. It sounded enough different than what most were used to be an occasional issue with some at first. Even the fellow on your forum thought it was "un-musical" and wanted it to sound more like a vented box (funny). Reducing the distortion further is not going to make it sound MORE like what he is used to. We use a variation on the LAB 12 in several products also and when we introduced the Bdeap a year ago, immediately about half were going into big home theaters. Because of the high sensitivity and high power capacity, in the home, this kind of horn is just idling away in the home most of the time. For example in my living room, at the listening position (about 15 feet away) the SPL is about 100dB for a 1 Volt input (2 Bdeaps in a corner). Here (at the listening position), things

buzzing and rattling in the room etc are the primary sources of distortion, not the speaker. On the other hand, many EQ the system to a far lower cutoff than normal and this really drives the system into potential non-linearity. This is the region I hope may be improved by the ST. I should have a pair of our drivers with the ST next week and I will take some measurements and keep you informed. This is exactly like the driver you are talking about too, a LAB12 with shorted turn (in our case the driver had slightly stronger motor). The Turn (the iron it displaced) was accommodated like you mention by closing the vent dia somewhat so this is a change that needs to be examined carefully. Well, I have to run, a busy day and the kids are home on break. Cheers, Tom

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