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Posted by [Wayne Parham](#) on Mon, 08 Nov 2004 19:50:37 GMT

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You are right that the rear chamber in the LABhorn is very small, and the air behind it plays a significant role. Another way of looking at it is the small sealed chamber shifts the resonant frequency so that motor chamber resonance is in the passband of the horn. It is set to create a peak at lower cutoff which augments output. This is sometimes called reactance annulling. However, what is significant about this new horn is the push-pull plenum, which counteracts motor asymmetry. There is nothing in the LABhorn design that deals with this. It is well-known that the cause for harmonic distortion is primarily due to asymmetries in the motor assembly, not the mechanical suspension or pneumatic loading. That is why shorting rings are used in low-distortion drivers - They counteract the major cause of asymmetry, which is flux modulation. Another way to counteract it is the push-pull plenum arrangement. There are many things a horn does that reduce distortion, but it cannot address flux modulation. There is no mechanism to restore symmetry. Horns reduce excursion and reduce bandwidth, both of which reduce distortion components. But asymmetry is not reduced by horn loading, so the push-pull plenum has been added to address this. If a woofer with a sufficiently large shorting ring were used, that would do it too.

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