Subject: A question about open-baffle dipole woofers
Posted by wunhuanglo on Thu, 08 Jul 2004 03:12:29 GMT
View Forum Message <> Reply to Message

Every design I see on the net uses two woofers, facing in opposing directions, wired out of phase, so the cones are traveling in the same absolute direction (as opposed to relative to the driver basket).I assume they're facing in the opposite direction so that the output on either side of the baffle is compose of the wave from one driver front and one driver rear - keeping things symmetric.What I'm wondering is why the use of two drivers? Is it that without two drivers this symmetry of output is lost? Or is it simply that you can halve the necessary driver excursion by splitting it between two drivers?Or put another way, would one huge driver with a long Xmax do just as well?Any insight would be appreciated.
Dipole Woofer Picture

Subject: Re: A question about open-baffle dipole woofers
Posted by Wayne Parham on Thu, 08 Jul 2004 03:48:20 GMT
View Forum Message <> Reply to Message

That arrangement reduces second-order harmonics because asymmetries are what cause second harmonics.If there is something in the motor that causes it to have move slightly more in one direction than the other with the same absolute level input, this asymmetry causes distortion. But if two identical devices are paired this way, the "weakness" in one direction is counteracted by the "strength" of the other driver. So each half cycle has one driver that is "strong" and one that is "weak." The combined result is no net asymmetry and a reduction of second-order harmonics.Flux stabilization rings placed in the motor structure are used to help maintain flux symmetry in the presence of AC from the voice coil, so they are added for the same reason, to reduce second harmonics.

Subject: Re: dipole woofers and harmonics
Posted by wunhuanglo on Thu, 08 Jul 2004 09:06:02 GMT
View Forum Message <> Reply to Message

Is it, then, that second order harmonics are more prominent, more noticable, as you go lower in frequency? I ask because nobody seems conderned from the midbass on up - you only see this in bass applications.

Subject: Re: dipole woofers and harmonics

Posted by Wayne Parham on Thu, 08 Jul 2004 10:28:51 GMT
View Forum Message <> Reply to Message

I see the biggest improvement from shorting rings above 100Hz, probably because they don't have to be as large to be effective. To get reduction in second harmonics down low requires a larger ring.On the other hand, the use of complementary drivers as you've shown works best at low frequencies. At very low frequencies, coupling between drivers in a small chamber is high but as the frequency goes up, the distances involved cause a lack of coupling that reduces the effectiveness of this approach.So I think that's why the push-pull configuration you've shown is found only in bass subsystems. You can use a shorting ring to good effect in midwoofers and midrange drivers. I'm hoping the B12 subwoofer is successful in reducing 2HD below 50Hz and that Eminence is able to provide a good high quality subwoofer with an effective shorting ring, but until someone does, the push-pull idea might be one of the best ways to reduce second-order harmonics at very low frequencies.

Subject: Re: A question about open-baffle dipole woofers
Posted by Mike.e on Sat, 10 Jul 2004 05:26:00 GMT
View Forum Message <> Reply to Message

John sheerin used 2 10" woofers push pull on his hornsub and achieved rather low 2nd harmonics. Using a horn would ensure optimal performance, + push pull,will certainly be beneficial!his site is at the LDSGId love to go push pull but 1 expensive driver,is expensive enough LOLCheers