Subject: Help with crossover: Bipole surround speaker
Posted by Kim Schultz on Sun, 05 Oct 2008 13:18:58 GMT
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Hi.I´m about to put the finishing touches on four dipole speakers.These speakers will be used as surround left, right and surround back.The speakers have one Eminence Beta 8A woofer and two BMS 4524 1" drivers, mounted on 18Sound XT120, it is a 21 Litre ported cabinet tuned to 60hz.Eminence Beta-8ABMS 4524 1" driver18Sound XT120 HornThe last couple of days I´ve read alot about matching directivity both in the vertical and horisontal plane, but don´t know how much this means in a dipole speaker.I have thought of a crossover freq. about 2khz, but I´m not sure how to hook up the compression drivers.They need a bit of top end eq, and if I hook them up in series for a 16ohm load, I don´t know if they have enough sensitivity to be eq´ed flat.

Subject: Re: Help with crossover: Bipole surround speaker
Posted by Wayne Parham on Mon, 06 Oct 2008 16:55:00 GMT
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The issue is caused by interactions between drivers and the nulls and lobes produced.  A dipole uses this very process to introduce directivity.  Opposing phase on each side of the dipole form front and back lobes with side nulls where the two opposite phases cancel.Other sound sources will interact too, making lobes and nulls of their own.  The issue is essentially one of path length.  Where path lengths between sound sources are equal, sound combines constructively.  As you move in a direction that makes one sound source closer than the other, you eventually may cross a point where conbination is destructive, forming a null.  The wave interaction is constructive as

destructive.  So in the room, there are pockets of energy lobes and some dead spots, called nulls.  The position of these lobes and nulls is set by driver positions and phase.

Subject: Re: Help with crossover: Bipole surround speaker
Posted by Kim Schultz on Tue, 07 Oct 2008 09:00:25 GMT
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Hi Wayne.I can see in my post that I wrote both bipole and dipole, but the speaker will be used as a bipole, and maybe I´ll try dipole just for fun.The distance from the midwoofer and the horns are about 4,5cm, that´s a 1/4 wavelength of 1900hz.Do you think I should use a crossover of 1900hz instead then ?And what about putting the horns in series or in parallel ?

Subject: Re: Help with crossover: Bipole surround speaker
Posted by Wayne Parham on Tue, 07 Oct 2008 17:59:08 GMT
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Bipole will be nice, in that it will help distribute bass sound sources, which in turn will average room modes and smooth the sound field.Above that, I think crossover and driver position should be set to put the lobes and nulls where you want them.  The idea is to put the lobes where the people are, and the nulls outside, perhaps even using them to punctuate the horn pattern near lower cutoff.
Baffle spacing, phase angles and time alignment, revisited

Subject: Re: Help with crossover: Bipole surround speaker
Posted by Kim Schultz on Mon, 13 Oct 2008 12:43:38 GMT
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This weekend I decided to put together a test crossover instead of reading more crossover theory It it a simple 12dB Linkwitz Riley @ 2000Hz with the horns in series and a 3,3uF HF compensation cap over the 17dB damping circuit.The first listening tests are promising, now it´s time to get out the measuring gear, to see what the polar response looks like.