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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 combination 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.

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