Subject: Audibility of Phase
Posted by Wayne Parham on Mon, 30 Jun 2003 16:39:01 GMT
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Mike Baker sent me an excellent article today about the audibility of phase in loudspeakers, written by Rod Elliot. I had planned to make the next little tidbit be about push-pull woofers, 'cause they are on my mind these days. But I'll save that one for next time. This article is worth posting. I'll also accompany it with another that has a slightly different view, to round out the subject and make it as objective as possible.Audibility and Musical Understanding of Phase Distortion, by Andrew HonPhase, Time and Distortion in Loudspeakers , by Rod ElliottEver since I first thought about this issue, I've always come to the conclusion that phase is of limited concern except where it manifests itself as a frequency anomaly or as an audible echo. In a perfect world, our speakers would be point sources and this wouldn't be an issue. A future technology may one day be able to develop sound using a infinitely small radiating monopole. But until that time, we use technologies that generate sounds from various positions and through electronics with various phase shifts. This surrounds us with sound having infinite phase angles.What I think is really at issue is the obvious presence of marketing spin from at least two different "camps." One school of thought says time alignment is of paramount importance, and the other says it's a little more subtle.One group of advocates places a great deal of importance in loudspeaker time alignment. My view is that companies that focus heavily on time alignment are often those that use it as a marketing tool. The usual claim is of a product that preserves phase coming from multiple sound sources, usually by physical positioning of the sound sources. Most align so that voice coils are in the same plane, but others use more sophisticated methods. Still, all such methods can provide only approximate alignment, at best.The other camp believes that small phase shifts are of reduced importance in the illusion of reproduced sound accuracy. I think most audio manufacturers strive to make a product that duplicates a recorded event exactly the same as the original. But some also acknoledge the fact that phase movement is inevitable with current technologies. And the idea is that small phase shifts aren't audible as long as the phase shift isn't rapid, and doesn't cause a response anomaly or noticable echo.This view boils down to the idea that small phase differences are subtle and pretty far down on the list of important specifications. It's sort of like optical illusions where an absense of certain visual clues make something appear different than it really is - We just don't see them. In much the same way, we should understand that the illusion of audible accuracy involves some aspects more than others, and not be self-deceived either way.The two articles linked above describe some of the "hows and whys," what's important and what's not and some of the things that can be done about each of them. I think they give a pretty good feel for the issue, and will help anyone designing or building their own speakers to decide what they feel is important to do.