Subject: Phasing and subsystem delay
Posted by Wayne Parham on Fri, 08 Aug 2003 02:08:45 GMT
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You've asked about having two dissimilar woofers, each having a slightly different delay. Consider also the delays caused by placement too. Delay can be caused by physical or electrical properties or it can be caused by having one sound source further away than the other. In practice, each of these kinds of delays is experienced simultaneously, and they all change with respect to frequency and position. So the situation isn't limited to having different components used to generate the same source - It is also a condition that is developed with similar components placed in different locations.In very large environments, there are almost always a number of sound sources. And there is a lot of area to cover, so coverage becomes the major focus. The installer has to use several subsystems to generate enough sound to be heard everywhere. This causes some interference problems that must be solved. The solutions generally involve placement, orientation and phasing. So in this application, you will find group delay becomes significant.But if your sound system contains just a few speakers in your home, then the distances are probably pretty small and you probably don't need to worry about this too much. A bigger concern is room modes, which are caused by boundary reflections that act like multiple phantom sound sources some distance away. The best thing to do in that case is to emply dense interference to smooth the sound field, and the way to do this is with multiple distributed subs.On the issues that happen when arrays are used for pattern control, you might be interested in paper written by Perrin Meyer called "DSP Beam Steering with Modern Line Arrays." It contains a lot of useful information related to the issues faced, including practical solutions.