Subject: Re: Pi-aligned line array?
Posted by Wayne Parham on Tue, 17 Dec 2002 03:37:40 GMT
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PiAlign will calculate a cabinet size for multiple woofers, but it is concerned with box tuning for the bottom octave, and not for higher frequency performance. The assumption is that crossover will be done before interactions become significant between the multiple woofers.Phase issues in line arrays become more apparent at higher frequencies, because of the distances involved. If multiple woofers are driven by the same signal, there will be no phase interaction between woofers at the lowest frequencies. The frequency where interaction becomes significant is determined by the distance between drivers, and when you get to a point where wavelength becomes close to the distances between them, the speakers will begin to beam and lobes will form.For frequencies above the point where the system begins to form lobes, sound becomes directional, specifically, it is strongest at positions where the distances between the listener and drivers are equal or multiples of a wavelength. Other positions will cancel out, where where the distances between the listener and drivers are equal or multiples of a half-wavelength, so directionality can be controlled by the positions and phase of the drivers. This is the basis for arrays, and why they are generally built as vertical arrays rather than horizontal arrays - to keep distances equal along the horizontal plane.So basically, if you're just wanting to build a system with two or four woofers, you can do this pretty easily provided you are willing to crossover low. That avoids the issue of interference, and the drivers act in unison, as a single source. But if you're wanting to run the speakers at higher frequency, then you'll want to put them in a straight vertical line, so that the distance between listeners and each driver is the same.