Subject: Re: A heretical tip from a heretic.
Posted by Bill Fitzmaurice on Sat, 10 Apr 2004 12:29:27 GMT
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Actually John Sheerin has done some sims that show what happens in a round bend quite nicely. He'd be a good addition to this forum. At low frequencies, say 200 Hz or less where the wavelength is 5 feet long or more, the wave doesn't see the bend as an obstacle at all, so a reflector serves no purpose. Problems generally arise in typical cabinet sizes at 400 to 500 Hz, precisely where other designers have run into problems they've tried to cure with flat reflectors with varying degrees of success. Most have thrown up their hands in defeat when they couldn't get usably flat response above 500 Hz from folded horns, blaming their woes on the supposedly insurmountable 'mass rolloff' obstacle. This is really a cop out, as the Fhm calc has nothing to do with folded horns per se anyway, but if you tell a lie often enough sooner or later it takes on the ring of truth, right? At high frequencies/short wavelengths where the bend is an obstacle you don't want to 'bounce' shorter wavelengths off reflectors, as your illustration shows. This is what Huygens postulated, and he was wrong. If you imagine the wavefront as a group of particles across the width of the pathway, rather than one particle as you show it, what happens after they bounce off a reflector is that they lose their cohesiveness as a wavefront, emerging at various angles of phase and cancelling each other out, killing HF response. With rounded bends, specifically with large inner radii, the bend doesn't reflect at all, but instead serves as a true waveguide that allows the wave to pass through relatively intact, rather than being broken up. Again, I don't have an illustration of how it works, but Sheerin has some very good ones. Oddly enough, after he posted those at the AA forum, the outraged cries from one source in particular that my folded horns couldn't possibly work as advertised ceased. Still waiting to hear from Ed Dell on the question of permission to reprint my articles, otherwise I'm ready to go on the site.