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Subject: Re: 90 deg vs. 60 deg horns

Posted by [Wayne Parham](#) on Mon, 27 Mar 2006 19:11:18 GMT

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I don't care much for horns with that tight pattern when used for home hifi. If you want to try it, you can use the LT250. I'd suggest you might want to shift the crossover a bit higher when using that horn. Then again, 1.6kHz isn't too bad - it's a tad on the high side for a 90x40 horn and a little on the low side for a 60x40 horn. So it will probably work pretty well for both horns, probably suitable

132in<sup>2</sup> or about 11.5" diameter. At 45° off-axis, it will be about -6dB around 1200Hz. By 2400Hz, the midwoofer's pattern will have narrowed so that it is -6dB at 22.5° or so. Directivity isn't a black-and-white thing, but you still prefer the woofer and tweeter DI to be close through the crossover region. To expound a little further, if you crossover a direct radiator to a 90° round horn, directivity is matched when wavelength is approximately equal to the diameter of the radiator. In terms of DI, a direct radiator has DI of 10 when diameter equals wavelength and DI of 16 when diameter equals two wavelengths. A 90x40 horn has DI of 11 and a 60x40 horn has DI of 12.5. That makes DI matching of a direct radiator to a 90x40 horn occur a little above 1 wavelength and a 60x40 horn about 1.5 wavelengths. A 10" driver typically has a radiating surface about 7.5" diameter, 12" driver has about 9" diameter radiator and 15" driver has about 12" radiating diameter. So the frequency where wavelength equals diameter is 1765Hz for a 10" driver, 1500Hz for a 12" driver and 1130Hz for a 15" driver. That makes a 90x40 horn matched to a 10" driver between 2.0kHz and 2.4kHz, a 12" driver between 1.8kHz and 2.1kHz and a 15" driver between 1.3kHz and 1.6kHz. A 60x40 horn is matched to a 10" driver at 2.4kHz to 2.8kHz, a 12" driver at 2.1kHz to 2.4kHz and a 15" driver at 1.6kHz to 1.8kHz.