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Subject: Re: Crossover choices

Posted by [Wayne Parham](#) on Wed, 17 Jan 2007 15:24:02 GMT

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The best way to approach this, in my opinion, is to crossover where directivity is matched. The 2226 is 15" diameter and has radiating surface area of  $132\text{in}^2$  or about 11.5" diameter. At  $45^\circ$  off-axis, it will be about -6dB around 1200Hz. By 2400Hz, the midwoofer's pattern will have narrowed so that it is -6dB at  $22.5^\circ$  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  $90^\circ$  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  $90 \times 40$  horn has DI of 11 and a  $60 \times 40$  horn has DI of 12.5. That makes DI matching of a direct radiator to a  $90 \times 40$  horn occur a little above 1 wavelength and a  $60 \times 40$  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  $90 \times 40$  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  $60 \times 40$  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. More info about crossovers and driver spacing

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