Subject: Re: Biamping-xovers-12, 18, or 24db/oct?
Posted by Wayne_Parham on Fri, 22 Jun 2001 04:45:43 GMT
View Forum Message <> Reply to Message

Selection of crossover slope is all about excursion and summing. The higher the slope, the greater bandstop rejection there is. So a high-order slope on a the high-pass filter of a midrange or tweeter can increase its power handling capacity, for example. The ability to stop low frequency content from reaching the HF driver will prevent over-excursion at high power levels.Higher orders also increase the phase shift as you approach the stop band. The rolloff is faster, and accompanying this is a faster phase change. Of course, frequency-dependant attenuation is greater too, so the signal content with the most phase shift is what is most attenuated. The problem the designer has is knowing what frequency and slope to choose given a particular baffle spacing between drivers, or vice versa.Crossover design is a balancing act, one that requires a mutual effort in loudspeaker layout, so the two are designed together, as a system. Failure to access the interactions properly can (will) cause a cancellation notch in the crossover band. Since there is actually no way to prevent this at all frequencies and all positions, the careful designer chooses where to place the cancellation notch. Certainly, one seeks to prevent it from happening on the forward axis, and the best designs place it far out off-axis, ideally outside the radiation angle of the speaker. This approach requires horn drivers with controlled directivity, of course.You can't really say one crossover slope is better than another, without knowing all the specifics of a design. The whole goal is to split the signal into frequency bands each driver can safely cover, and to give them all signals that will combine coherently in the acoustic realm. This involves a lot of factors besides electrical phase, including acoustic phase, driver position and desired directivity and coverage angle.