Subject: Re: Crossover Question about building line arrays
Posted by Marlboro on Sat, 19 Sep 2009 16:13:02 GMT
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Wendall Evans wrote on Fri, 18 September 2009 19:03Why did you want the midrange to be between 200-3000 and have no crossover in that range? Lots of people use crossovers around 500-1600.

When using electronic crossovers this is less significant. But here is the reason:

"It is not at all uncommon to see systems where the crossover frequency is set right in the middle of what I call the "intelligence band". This is the range of frequencies from 300Hz to 3600Hz, and is extremely important from a psycho-acoustic point of view.

"It is no accident that this is the range of the telephone system (and has been for many years). If we are only to hear a limited range, then this band of frequencies is by far the most important. Just from this we can recognise a person's voice, which musical instrument is being played (even bass instruments!), and - more importantly - what is being said. It contains nearly all the "intelligence" of the sound, which is to say that if this band is "corrupted", intelligibility is greatly reduced.

"So why do speaker manufacturers insist on placing their crossover frequencies within this band of frequencies? The public address (PA) systems used by many rock bands are a case in point - how often does one find that the vocals are completely unintelligible? Mind you, it may also be the case that the band's lyrics just don't make sense, but that's another story altogether.

"Often this occurs because the system is so loud that the amplifiers are clipping badly, but even at lower levels it is quite common. Place a common-or-garden crossover filter right in the middle of the "intelligence band" and this is exactly what will (and does) happen. With phase aberrations and cancellations, this most important frequency range becomes muddied and indistinct causing loss of intelligibility - not only on voice, but instruments as well.

"The effect is also noticeable with some hi-fi speaker systems, except that it usually less pronounced, and it is far less likely that the amplifier will be driven to clipping. Reviewers will often say of a speaker that the vocals seem veiled, or that there is noticeable colouration of either male or female vocals. These effects are often caused by the effects of phase shift around the crossover frequency, coupled with the fact that the crossover frequency falls right in the middle of the intelligence band.

"Should a crossover be unavoidable in this region - due (for example) to available loudspeaker drivers - then the manufacturer must go to great lengths to ensure that "artifacts" created by the crossover are not audible. This often causes greater problems with amplifier loading at the crossover frequency, since impedance dips seem a common problem with many speakers. It will be found that these almost invariably occur at the crossover frequency. "

Read the whole article at:
http://sound.westhost.com

Rod Elliot given permission for posting pieces of his articles but only the home website can be posted as the source. Search through the site for articles, and look for bi-amping, and then search for "intelligence band" and you will find the context this was taken from.