Subject: Differences between "normal" of "horn"-type active filter.
Posted by _Wim_ on Sat, 04 May 2002 09:16:38 GMT
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Hi I am in the middle of building an active speaker system (actually I have already one but I am not fully satisfied, it consists of a 15 inch Karlson cabitnet and a Cetec-Gauss/Jbl combo) I am planning on building a 4-PI cabinet and using the same motors, which are a JBL 2227H, a Cetec-Gauss HF4000 driver (alnico 2 inch driver comparable to JBL 2445 with a little reduced top end) coupled to a constant directivity 2380A JBL horn. For super tweeters I will be using JBL 2404 "baby cheecks" (I really like JBL motors, but the Gauus drivers I could get reallty cheap)Now i am designing my active filter. First I know I have to compensate for the high frequeny drop of the CD-horns. I did some measurements and tuned the high frequency response flat to 18Khz outdoors, but when I listened inside, the highs were really chattering. Futher investigation revealed that we were indeed flat in the direct field, but the reverbant field (is this to good temr in English ?) had to much high frequence energy. Appertely our brain extract the tonal balcance from the reverbant field, and not from the direct field. So I had to weaken my compensation by 3to4 db.So after this long introduction (sorry for all the reading you had to do), here are my questions :* What else is there to compensate for ? I know about phase alignment, but this I will do the "hardware" way, by putting the driver on the same axis of the woofer. This is possible because a 2380A horn is a really short horn ?* Crossover frequency ? I was considering 500Hz (limit of driver and horn) because I my opinion the high freq driver then start "slowing down" and the mid-bass driver is still "pretty fast". At 800 or hiher the mid-bass (a 15 inch) is pretty slow and the high -frequency driver is really fast. This sudden chage is something you hear quite clearly. But after reading severall post on this asylum the most commen crossover frequency seems to be 800 Hz ? I agree if you are planning to go really loud (PA-use) but for home use....?* Crossover slope. I normally use 12db/octave because in my opnion it sounds more musical then 24db/octave. I have no experience with 18db/octave.I must admit haven't had the time to read Wayne Parham crossover document, maybe many of my question will be answered in there, but I thought I coudn't harm to ask about it also.Thanks for any advice GreetzWim

Subject: Re: Differences between "normal" of "horn"-type active filter.
Posted by Wayne Parham on Sat, 04 May 2002 14:07:43 GMT
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There are several thing to consider when setting up your loudspeaker system and its crossover and contour electronics:1. The electro-mechanico-acoustic response of the driver(s)2. The acoustic filter function of the cabinet/horn/chamber(s)
3. The directivity of each component4. The environmentThe raw driver has its own characteristic response. This is modified by the cabinet and/or horn, if used. But the driver sort of sets the baseline.If a horn is used, it modifies the directivity, usually making it more uniform but not always. Constant directivity horns tend to make the directivity more constant as the name implies. They

usually have straight side walls that set the radiation angle. But they cannot make the pattern consistent through the entire audio band. They lose pattern control at low frequencies and the radiation angle widens, approaching omnidirectional.Horns with narrow throats and expanding flares tend to increase directivity as frequency rises. This is known as collapsing DI, and it serves to provide acoustic EQ. High frequencies are augmented on-axis because they are beamed more narrowly as frequency goes up. But this also serves to reduce off-axis energy at high-frequencies.Direct radiators have collapsing DI also. As the radiated sound frequency gets close to wavelength proportions, the pattern narrows. When the diameter of the radiator is approximately one wavelength across, the pattern narrows to approximately 90 degrees. At lower frequencies it becomes more and more omnidirectional and at higher frequencies the pattern becomes more and more narrow.If the loudspeaker is used outdoors or in any anechoic environment (such as a treated room), then the reverberent field is of reduced energy. The reverberent field is formed by reflected energies, so in an anechoic environment, there is less energy in the reverberent field. In such an environment, off-axis response has less of an impact to a listener on-axis. Certainly, off-axis response is important to a wider audience, but not so much to an on-axis listener in an anechoic environment.But nearly all indoors environments are far from anechoic. The reverberent field energies are hear by the listener even when on axis. If the speaker has peculiar directional response, then the reverberent field may be non-uniform and the sound will be unnatural. So it is best to match directionality between subsystems at the crossover point to avoid abrupt transitions in directionality.

Subject: jblpro site has info about cd eq
Posted by Sam P. on Sat, 04 May 2002 17:55:26 GMT
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Have you tried searching their tech data library, particularly about the 2380? IIRC they have charts posted of the response with the driver/horn w/o EQ, then show after EQ, etc. and explain what is required. Same site has 2404 data, they go up/down in level like a sine wave as freq. goes up, look at the chart...I would be inclined to "get as much milage" from your mid horn as possible, and x the 2404's in as high as you can. The 2227's go higher than 500Hz easily, and you need that mid horn to not be operating down to it's lower cutoff where distortion will be higher, 600 to 800 is a "nicer" place to cross than down right at the horn cutoff. Sam

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Subject: Re: jblpro site has info about cd eq
Posted by _Wim_ on Sun, 05 May 2002 08:11:50 GMT
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HiThanks for the info. I am first going to read the complete crossover document from Wayne. I should have read it a long time ago, but I do not like reading from a pc screen (mine is only a 14 inch which a lousy refrech rate), and printing 80 pages on an old inkjet isn't everything.....Once I have read it completely I will definitely let you all know what road I am going to chose. And I course once I am finished I will let you all know what the results were.GreetzWim