Subject: crossover component burn-in:)
Posted by Sam P. on Wed, 27 Feb 2002 13:00:13 GMT
View Forum Message <> Reply to Message

Wayne, What better way to amuse myself while "killing time sanding" the enclosures, than to test/burn-in these new 4 Pi Pro xovers...on the jbl 4648A-8 based HT fronts. Just hooked up the coil (1.0 mH 14 ga.) in series with the 2226J woofers (no cap, OK!), HP is text book 1600 Hz. 3rd order w/ Pi pad/comp of 12 dB, feeding altec 902-8B's on 511's. Initial impression is very favorable in comparison to "normal" 600 Hz. BW's or the series 1200 Hz. 1st order I have also been using, but they both ran the HF "uncomped", just shelved 12 dB. I have some 0.8 mH 14 ga. coils to try later, for use when the 4 Pi Pro's are being tested/put in service. Sam

Subject: 1.0 mH too much choke for dual 2226J's?
Posted by Sam P. on Wed, 27 Feb 2002 15:04:02 GMT
View Forum Message <> Reply to Message

Wayne, some interesting raw in room data, taken on axis at 1 meter, rat meter on tripod, using the temporary coils/xovers.30 Hz. -16 dB33 -1036 - 6 40 - 950 - 860 - 1.570 - 480 - 1.590 0 dbmo100 0200 - 2300 - 1400 0500 - 4600 - 6700 - 8800 - 8900 - 71000 -101600 - 12k - 23k + 14k + 1.55k + 26k + 37k 08k - 39k + 110k - 211k - 212k - 413k - 514k -1015k - 916k - 617k -1018k - 419k +1020k - 4 The 1.0 mH is giving too much attenuation to the DUAL 2226J's, but should be close to what the 2035's will need. The depressed levels between 500 Hz. and 1k were not present without the xover, in prior testing. The 4648A-8's were flat to 1k before...need to swap in 0.8 mH soon. But here's an "honest" in room F10 of 33 Hz. anyway. From 1.6 kHz. to 11k, pretty happy here. And when measured before, these 35480 alum. diaphrams did not have the top end extension of 34647's I also use, so the drop after there is expected. And up high, the rat meter readings are supposed to be "corrected" for accuracy. This is raw, unmanipulated, in room, whatever. After 10k, Pepper got pissed off and started barking...hard on the little needle!!! That's what closets are for :) Driver fore/aft alignment initially was with the HF acoustic center 4.25 inches BEHIND the LF...the drivers relative positions were then slightly adjusted to eliminate any phase difference in the drivers outputs at 1.6 kHz...Sam

Subject: Multiple point sources and destructive interference
Posted by Wayne Parham on Wed, 27 Feb 2002 17:31:29 GMT
View Forum Message <> Reply to Message

It looks like there is destructive interference above 500Hz. This is to be expected from dual woofers operating together in the midrange band. They're really designed to be used as

response appears. It also presents itself at multiples of this frequency. What is happening is dual slit diffraction, and interference patterns form in the listening area. Diffraction effects are present when there is more than one point source separated by distances of this scale. Some places in the room have deep notches in output at certain frequencies.There are several ways to deal with this issue:1. Reduce the number of point sources2. Reduce distance between point sources3. Reduce maximum frequency emitted by point sources4. Reduce overlapping frequency bands of point sources5. Reduce overlapping coverage of point sources using directional controlOK. But that is somewhat academic. So what to do about it?If you want to use dual woofers as mains rather than subs, I would suggest running them as a 2.5-way speaker, basically crossing over one woofer much deeper so it doesn't share the midrange band with the second woofer. Both woofers work together in the deepest bass frequencies but only one covers the midrange band. The natural orientation is to run them vertically, with a large coil on the lower woofer to attenuate output above 100Hz. The upper woofer serves as a midwoofer, and is used through the

Subject: diffraction issues again...
Posted by Sam P. on Wed, 27 Feb 2002 19:43:23 GMT
View Forum Message <> Reply to Message

Wayne, The prior testing w/ the 4648a-8 by itself only showed a mutual cancellation between the woofs at 817 Hz. or so. I didn't like knowing that was there in the first place, but like you said, it's the nature of the dual woofer format. The 1000 Hz. dip when both LF and HF are working is probably mother nature telling me to go back to an earlier config. that is less problematical, i.e. crossing lower. With the 0.8 mH in now, subjectively they sound better. I figured with the 3rd order HF slope, diffraction related problems from co-operating at 1K would not be serious. Even with the anomalies, very listenable, and may still have a overall better presentation than my previous benchmark, the back to back BW's at 600 Hz. Sam yep, those 2226J's could very well find themselves in 4 Pi Pro boxes, probably less trouble doing that than playing with the 2035's. just a 1.4 mH coil? and the 1.6 kHz. HP xovers. done. nah, that would be too easy...

Subject: imaginary dip/measurement artifact
Posted by Sam P. on Wed, 27 Feb 2002 21:03:25 GMT
View Forum Message <> Reply to Message

Wayne, You're a big help. I looked at my measurement setup, and EUREKA, the path diff. between the lower and upper woofs to the mike was...13 or 14 inches. Right in a place where dual slit diffraction would cause a big null. When I tested the 4648a-8 by itself, mike was at the same height as the upper woof, for a path length diff. around 9 inches, that and the woofs being 16.7 inches center to center both are implicated in the 817 dip...but I never looked even higher...measured on axis with the upper woof the system was measuring +/-1dB from 100 to 1000 except for the 817 Hz. cancellation. I've now listened with fixed 12 dB pads on both systems, one set x'd at 600, the other at 1600 does sound a bit thinner, so the level dip from 500 to 1 k is obviously audible. Guess I'll go back down with them. Sam

Subject: Re: imaginary dip/measurement artifact
Posted by Wayne Parham on Wed, 27 Feb 2002 21:45:56 GMT
View Forum Message <> Reply to Message

If there is some reason a 2.5-way system isn't an option, I'd probably cross a dual woofer lower than I would a single woofer. Dual woofer cabinets were really designed to be used as

usually used with crossovers that limit upper frequency to 100Hz or so.

Subject: Re: imaginary dip/measurement artifact
Posted by Adam on Wed, 27 Feb 2002 22:24:26 GMT
View Forum Message <> Reply to Message

I just noticed the two woofer discussion. You could try an MTM design, with a woofer above and below the horn.Adam

Subject: Re: diffraction issues again...
Posted by Wayne Parham on Wed, 27 Feb 2002 22:25:58 GMT
View Forum Message <> Reply to Message

Just a reminder: I think you're getting pretty usable information from your test setup but remember that it's tough to get really accurate information from a Radio Shack SPL meter. The resolution just isn't there. And indoors, you're measuring the room more than you're measuring the speakers. Even measurement systems with time gating are limited indoors, because reflections are too early to gate out. This prevents accurate measurements below midrange frequencies indoors, even on the best measurement systems.

Subject: measurement system DOES suk
Posted by Sam P. on Thu, 28 Feb 2002 11:23:20 GMT
View Forum Message <> Reply to Message

Wayne, I realize the rat meter suks for accuracy, all I'm hoping for is that the readings/calibration is not so crappy that it will change a lot over short freq. ranges. I just hope to see trends, such as in the xover region...great from 1.6 k upward, but depressed below that, usually confirmed by ear. Listening to the 4648's run high, they still sound nice on axis, and to each side of the couch, at 12 feet or so. I think the dual woof array does exibit less vertical dispersion also...where I had the mike at 1 meter may have been too close, and at a larger angle off axis than was appropiate. You are right, in room rat meter is not much help, and "proves very little". But these crude measurements DO seem to identify why the higher crossed pair sounds a bit thin, what I was previously subjectively attributing to level differences and/or room position was shown in the depression from 500 to 1 kHz. I have four different 902-8b's that exhibit the 19 kHz. peaking...none of the other hf systems I've ever checked had that, so IN SOME some cases I think valid conclusions can be made from rat data... I think crossing as high as possible to get the HF farther above the 500 horn cutoff (less distortion), and staying below 800 (less "nasties") puts me pretty well back where I was going before being distracted...to use about 2.5 or 2.2 mH 14 ga. coils, and cross somewhere around 750... I had briefly considered a WWTWW stacked array of 4648a-8 on the bottom, 511 horn in the middle, and a second 4648a-8 above...then I could be the comb filter king of the west... And all I really wanted to do was confirm those recently built 4 Pi Pro xovers work as advertised. They do. Sand, Sand, Sand...

Subject: screwed by geometry,
Posted by Sam P. on Thu, 28 Feb 2002 12:40:21 GMT
View Forum Message <> Reply to Message

After drawing a side view of my mike and driver positions, it seems the dip is really a diffraction/cancellation situation. The mike was about 39 inches high - halfway between the centerline of the 511 and the UPPER woof, which made the path length from each of the two woofs to the mike differ by approx. 7 inches, one-half wavelength at 960 Hz. So it was science, not room ghosts or coil values that were at play after all. Probably would not have been there at a different distance/height...also, above 500 Hz, as the dispersion of the lower woof was narrowing, less energy would have reached the mike that was about 30 degrees away from the lower woofs axis. Sand, sand, sand...