Subject: Loudspeaker phasing: WTF?
Posted by BillEpstein on Wed, 30 Mar 2005 00:03:56 GMT
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I'm looking over the Altec Lansing papers on installation and assembly and Polarity and Phase by Ted Uzzle.First principle is to line up the voice coils of the high and low frequency drivers in the vertical plane. All Altec small aperture compression drivers have their voice coil 1 1/2" back from the driver horn interface.The JBL VC is approx 4 1/2" to the rear of the mounting flange.Therefore, instead of the 2" recess of the 811B flange relative to the 2226 front flange (as the Model 19 design calls for)the 811B should be so far forward on the cabinet that there would be no way to secure it short of calling Nations Rent and getting a small crane!Even the Martinelli Woodhorn projects 4 1/2" in front of the cabinet. Does anyone know what the front to voice coil dimension is for the 416 woofer that would be in a true Model 19? Are the 2 driver voice coils in vertical alignment?

Subject: Re: Loudspeaker phasing: WTF?
Posted by ToFo on Wed, 30 Mar 2005 01:03:21 GMT
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Hi Bill,That's what those horn sleds and trolleys are for. Some folks make elaborate rails with giant wing nuts to lock it down. I've even seen horn boxes with table legs on the front corners. Then they can slide the horn to compensate for different drivers. I wonder about the mids bouncing between the floor and the horn bottom though.(not to mention the ugliness) Would be simple on the A7 cab. Not sure how much difference it makes. Thomas

Subject: Re: Loudspeaker phasing: WTF?
Posted by Wayne Parham on Wed, 30 Mar 2005 04:59:53 GMT
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Speakers should be in vertical alignment if there is no crossover. Once you add a crossover, the phase presented to the speaker changes. That makes a slight time difference in the arrival time of the power developed in the voice coil, which is what makes it move. Another thing that causes a difference in the arrival time is physical offset. Naturally, if one sound source is further from you than another, then its sound will be slightly delayed.It is important to know that the delay caused by the crossover is diferent than the delay caused by physical offset. Delay caused by physical offset is fixed but delay from crossover is variable, changing with respect to frequency. They don't cancel each other, so you can't align the system. But you can make it close enough to limit destructive interference that causes a sharp null at some frequency. That's what is really important.Some suggest offset of one diaphragm in respect to another in order to counteract the delay caused by the crossover. To some degree, this makes sense. I take advantage of these

kinds of relationships to allow flush baffle mounting of horns of various lengths. But I have long thought it was important to make it clear that this is not time alignment.The best you can hope for is to configure the system so that two or more sound sources do not combine to form destructive interference in the target listening position. This is accomplished when sound sources are within about 120° apart, better if within 90°. You can't hope to align them perfectly, but if you can get them within +/-90° in the crossover range, then summing will be good. The idea is to prevent destructive interference from causing nulls in the target listening area.Baffle spacing, phase angles and time alignment, revisited

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Subject: The alternative
Posted by spkrman57 on Wed, 30 Mar 2005 10:52:20 GMT
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Bill,13,5000 / freq(in hz) = wavelengthfor 800hz = 16.875"You want 1/2 wavelength (8.4") distance between the VC's using 2nd order crossover.The 2226 VC is 3" behind the mounting backside.Using 3rd order crossover, I don't know what to do. In the past I have used the same formula and it worked for me.I currently have 2426J on Martinelli horns and trying to figure out where the VC on the 2426 is. On Altec drivers there is a metal band that goes around the driver that lines up with the VC.Ron

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Subject: Phase of various crossover slopes
Posted by Wayne Parham on Wed, 30 Mar 2005 11:31:21 GMT
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Here is a crossover phase chart.

Subject: Play around with this
Posted by GarMan on Wed, 30 Mar 2005 13:09:15 GMT
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Bill,The PCD tool below is a lot of fun to play around with to see the effects of different crossover order and frequency combinations, combined with driver offsets. You can import actual driver response and impedence for the modeling, or just use the default 90dB/w/m, 8 ohm settings.Wayne explained it pretty well below, but it's fun to see it in graph format.Gar.
 Passive Crossover Designer

Subject: location of voice coil in 2426J for alignment pruposes.

Posted by spkrman57 on Wed, 30 Mar 2005 18:10:09 GMT
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Wayne, Where is the voice coil in the 2426 located??? On my Altec drivers there is a metal band where the voice coil resides. If there is no identifier, how far back from the horn flange mounting is it??? There is a metal band on these drivers, but it don't seem where it should be! Ron

Subject: 1.75" forward of the rear cover
Posted by Wayne Parham on Wed, 30 Mar 2005 23:13:07 GMT
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Subject: Re: 1.75" forward of the rear cover
Posted by spkrman57 on Thu, 31 Mar 2005 12:28:39 GMT
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Thanks Wayne, Bill E. is coming out Saturday to listen to my toys and exchange ideas and parts. I currently am running 2226J in 3677 cabinet, and 2426J on Martinelli 650hz wood tractix. PE 1.6 khz hi pass crossover(bypass caps .68 ufd across the 8 and 22 ufd caps on the PE crossover, 33 ohm and 15 ohm resistors with .33 ufd cap for HF comp.Funny thing is I wonder if the crossover caps need some burning in yet as they are sounding kind of forward yet. I started out with a tube amp (Norh SE-9/SEP EL34's), and the sound was a little bit lacking. I then hooked up my Sansui AU-7900 which has been fixed/modded with Black gate caps and such, new outputs and driver transistors. A much better sound presentation. I will leave Bill to report on how they sound after his visit.Thanks again Wayne!!! Ron

Subject: Re: 1.75" forward of the rear cover
Posted by Wayne Parham on Thu, 31 Mar 2005 13:28:00 GMT
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Rubycon says the electrodes change in a Black Gate capacitor during the first 30 hours after a signal is applied. Standard aluminum electrolytics are heated and DC is applied during the final phase of manufacturing to restore the aluminum oxide film cracked during winding. The application of voltage actually repairs the cap. So I would expect something like that happens in Black Gates too.

Subject: Re: 1.75" forward of the rear cover
Posted by spkrman57 on Sun, 03 Apr 2005 14:39:49 GMT
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Crossovers have around 10 hrs time on them now and seem to be softening up a little. I know when I first put everything together and hooked up my tube amp the sound was not as good as I expected. So I am running my Sansui AU-7900 for awhile to get some burn-in time before the tube amps come back out again.I thought my crossovers looked kind of cool until I saw the pics of Bill E's new crossovers that look "super" cool!!!Ron