Subject: Open Baffle Visaton B200 & Eminence Delta
Posted by benzene on Tue, 09 Jun 2009 08:28:01 GMT
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I just completed an open baffle project. But it doesn't sound right. Especially some prominent echo on the mid high freq and mid high freq is quite bright.
My baffle dimension is 20" x 52", with 2" thickness. The configuration on each side is:
1 pc Fountek NeoCD2.0 Ribbon Tweeter
1 pc Visaton B200
2pcs Eminence Delta 15A

I'm using Behringer DCX2496 active crossover, running 2 ways, tweeter & B200 1 way coupled by capacitor of 1.22uF & 2pcs Delta another way.

Attached photos for your reference.

Would like to ask what type of crossover to use, which order, what freq to cross at & other essential setting to look at?
Or is it due to other factors, like driver or room?
Need advice.

Thanks.

File Attachments
1) Pi Forum 1.jpg, downloaded 22753 times
2) Pi Forum 2.jpg, downloaded 24186 times
3) Pi Forum 3.jpg, downloaded 21594 times

Subject: Re: Open Baffle Visaton B200 & Eminence Delta
Posted by Wayne Parham on Tue, 09 Jun 2009 14:48:43 GMT
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Do you have any measurements?

Just guessing, I'm thinking the midrange driver might have some breakup that could be worked around, possibly with a narrower passband (via crossover). I'm also wondering if the two woofers are covering the same band, if the frequency is high enough there is interference.

Any way to make some measurements?

Subject: Re: Open Baffle Visaton B200 & Eminence Delta
Posted by benzene on Tue, 09 Jun 2009 15:10:32 GMT
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Wayne:
Thanks for your reply. What type of measurement is needed?
I'm not sure if this additional info is useful.
I'm using the DCX2496 active crossover, crossover type is L-R12 for both ways, crossing at 1kHz, also tried crossing at 1.6kHz & 2kHz.
I'm using 1.5w tube amp for the high freq & 300b tube amp for powering the 4pcs Delta 15A.

I'm sorry to have to ask you, what can cause the midrange driver to breakup?
Is the freq crossing too high, i guess the crossover type & which order does affect the sound, is it?
Any advice?
Thanks.

Subject: Re: Open Baffle Visaton B200 & Eminence Delta
Posted by Wayne Parham on Tue, 09 Jun 2009 18:39:55 GMT
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Cone breakup is caused by the cone flexing at high frequencies instead of moving as a rigid piston. At low frequencies, the surface of the cone is rigid but at high frequencies, it develops ripples across its surface.

If the cone is well damped, the ripples won't be too intense at any one frequency or group of frequencies. If the cone is well damped, then response is relatively smooth even above the pistonic range. If not, there are large peaks and dips in response.

The way to find out is to do a frequency response measurement. You'll need a microphone and a computer. There are some really nice packages out there to do loudspeaker measurements that don't cost too much. Two I use are WTPro from Smith & Larson and LMS from LinearX. There are many other good products out there in the hundreds to low thousands price range (USD).

One good way to start is free, but does take a fairly good investment of your time to learn. It's called Speaker Workshop. Download and install this program, and use an inexpensive Panasonic capsule microphone (less than $10.00 USD) and you can begin to make measurements. You may need a mic amp, but maybe not. (Depends on your computer sound board).

Acoustic measurements are really important if you want to do a good job. You can sometimes design a decent pair of speakers without measurements, but you're depending on reliable data from the manufacturer and it takes a lot of modeling and calculation. Working with measurements is much easier, and if the measurements are accurate, you have something extra, not available from the manufacturer - You have the influence of the physical relationships between drivers, their spacing, the cabinet (if used) and all other things specific to your implementation. This information is extremely valuable when setting up your crossover.

One more thing I'd suggest:

Take your speakers outdoors and listen to them. Indoor reflections may be making your speaker sound too bright. If they sound good outdoors, you may want to put some things in the room that absorb sound. Could be things that fit into your decor, or it may be specialized acoustic

treatments like absorbent wedges. That's for you to decide.

But I think whether or not the room needs treatments, I'd like to know what measurements look like. That will tell you what your raw drivers are doing, and how their interactions play out. Measurements outdoors will tell you how the speaker acts in an anechoic (reflection free) environment, and that's important because it reduces the complexity of the DUT. (You won't be measuring drivers PLUS room - just drivers.) That will ensure any peaks you see are from the raw drivers themselves, or from an interaction between them. Indoors, I would expect to see some peaks and dips from room reflections, and you'll probably want to deal with those separately. Measurements outdoors will just help you know what's what.

Subject: Re: Open Baffle Visaton B200 & Eminence Delta
Posted by benzene on Thu, 11 Jun 2009 09:40:19 GMT
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Wayne:
  You're absoultely right! Doing the fequency response measurement seems to be very beneficial for me too. I'm grateful that you've provided such a great & detailed explaination to me, now i know what i must learn to do.
As for this measurement to be done, i'll hunt for the mic & install those software. Hopefully i can get it done asap & report the frequency response result to you.
While looking for this measurement tools, i covered the Visaton B200 with some book while it's playing & realized it sounded better, therefore i'll try to swap to different driver to substitute the Visaton B200 temporarily and see if that's the cause of this problem.
As for bringing the speakers outdoor, it will be tough for me as it's currently at my attic floor and it's quite heavy.
Thanks so much, Wayne

Subject: Re: Open Baffle Visaton B200 & Eminence Delta
Posted by SteveBrown on Tue, 23 Jun 2009 18:11:46 GMT
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What about matching effiencies between the tweeter, mid, etc? The reason I ask is that the mid, being open baffle picks up 6db (right?) of efficency and so it makes sense that damping the sound of it a bit might bring it into line with the rest of the components. Just a thought. Then again, I could be all wet.

Subject: Re: Open Baffle Visaton B200 & Eminence Delta
Posted by benzene on Mon, 29 Jun 2009 14:34:40 GMT
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Steve:
The tweeter is 98dB & Mid driver is 97dB. Anyway, while trying to get the right mic & software to

do the measurement as advised by Wayne, i've swapped the full range driver from Visaton B200 to Coral 8A-40, which is 93dB, i coupled both mid & high with 1.22uF capacitor, running 1 way (high freq), and low freq for 2pcs 15" drivers. High freq with +1.0dB gain. Now sounds better, maybe what Wayne said is true, the B200 driver is not well damped. Have to investigate further though.
Thanks so much, Steve!