Subject: Re: Definimax 4012HO - End of Life
Posted by Wayne Parham on Mon, 04 May 2020 17:47:35 GMT
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I agree with you, 100%. Those B&C midwoofers are really nice. It's a wonderful top-notch in the

I also agree with you on the Delta Pro. It's a good driver, and worth the small additional cost over the entry-level midwoofer option. It is also higher in sensitivity, so the R1/R2 values need to be populated specifically for that driver compliment. This makes the overall sensitivity as high as the

that option, but when used with flanking subs, the extension isn't needed.

Standing wave modes on larger full-range speakers are always a potential problem, as you've seen in your modded box. My cabinet design efforts were more extensive and difficult as a result.

Smaller cabinets and subwoofers are much easier to design, because standing waves don't line-up in the lower midrange. In smaller boxes, the standing waves shift up into the overtone region where insulation on the walls does a good job damping them. In subs, midrange isn't presented so they can't develop standing waves. But large full-range boxes need a little more tender loving care in the design phase, because they are prone to developing standing waves in the lower midrange where they are difficult to deal with.

What I've done is to model the modal behavior within the loudspeaker cabinets, much like modeling room modes. Several years ago, I purchased license to Martin King's spreadsheets to help analyze internal standing waves. I used them to design my larger model full-range loudspeakers, adjusting the size and shape of the box and setting the position of the midwoofer and the port for minimum standing wave anomalies.

manipulate where I put the driver and port in the box. Sometimes just moving the midwoofer or

benefited from adjustment of both cabinet dimensions and driver and port positions.

I am not sure if Martin King is still selling his spreadsheets or not. But you might be able to use the same kinds of tools used to model room modes. The potential problems I see with that approach is the size of the loudspeaker cabinet is small compared to the size of a room, so the tool may not allow the right size chamber to be created. Also, room modes are below 200Hz or so, and we need to analyze the chamber modes over an octave above that.

So if I were going to try to find modal analysis tools to help me look at the cabinet, I would try to find ones that could model chambers down to 2ft3 with each dimension only being a foot to a few feet long. I would also look for tools that could analyze frequencies up to 500Hz. I wouldn't care whether it could go above that, because damping material placed on the walls of the cabinet is able to absorb the sound pretty well at higher frequencies.

What you want to look for is where the "hot spots" are, especially in the 100-500Hz range. We can't have any in this range in the same location as the midwoofer or the port. If a mode exhibits a pressure maxima where the driver or the port are, it will result in a peak at that frequency.

And finally, you'll find that fiberglass insulation that spans the cross-section does wonders for damping midrange frequencies too low to be damped by insulation attached to the inside walls of the cabinet. That's the trick for damping lower frequencies - Space the insulation away from the walls where it can damp pressure nodes better at those frequencies.