Subject: Software for optimizing multi sub parameters
Posted by Jag768 on Mon, 20 Jul 2015 13:05:12 GMT
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I'm finishing up on a project:

- Above modal region a waveguide (dayton 10inch) / 10inch woofer combination for controlled directivity
- 1st order cardiod radation in the transition zone by using a damped u frame
- multi sub (4) for the modal region (omly two shown in image below)

However, I'm having a hard time setting up the four subs. There are endless possibilities. I would really like to try to do a computer based optimisation. I found a tool made by Andy c, however, it doesnt appear to be available.

Does anyone know of software that can optimize multiple subs based on the individually meassured responses?

File Attachments
1) Meten4.jpg, downloaded 6567 times
2) Tops.jpg, downloaded 6479 times
3) Tops2.jpg, downloaded 6729 times
4) Directivity_sonogram.png, downloaded 6520 times
5) Directivity_overlays.png, downloaded 6429 times

Subject: Re: Software for optimizing multi sub parameters
Posted by Wayne Parham on Tue, 21 Jul 2015 02:53:14 GMT
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Great work!

There are software tools made by both Welti and by Geddes for optimizing sub placement. However, all experts agree that the larger the number of subs, the less important individual placement becomes. All experts also agree that once you've reached four, placement becomes

almost irrelevant, provided all subs aren't bunched together.

One sub requires strict placement of both the sub and listener. Two subs also make placement really important. Even three can use optimization, although that's rapidly moving to the point of diminishing returns. By the time you get to four, you almost can't go wrong.

Still, one thing is for sure - You can never go wrong making measurements at various places in the room. One can never have too much information to help guide their choices. It's always better to be able to see than it is to work blind.

Subject: Re: Software for optimizing multi sub parameters
Posted by Jag768 on Tue, 21 Jul 2015 11:50:09 GMT
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Thank you for your quick reply! Here's an overview of my room.

Note the corner sub in the right of the image

Note the sub right of the two main speakers

I'm not getting very good results so far. Here are some measurement results. This is all 4 subs active, measured at the three main listening positions.

After removing the Linkwitz transform EQs that were applied to all (sealed) subs, it got better. However, especially the corner sub doesn't appear to integrate very well. Currently its level is set at -12dB, and phase is inverted. When I get it right for the main listening position, the corner sub sounds out of phase at position 2 & 3 and vice versa.

There are so much possibilities to try, and they work out differently at the various positions. I'm afraid I could spend days without getting it right. I would very much like to try to run a computer based optimization. Do you know whether the software tool made by andy c (link) has ever been made available? It's description looks perfect (the help section)!

File Attachments

1) Listening position.jpg, downloaded 6370 times
2) Room_overview.jpg, downloaded 6302 times
3) All_subs_pos1,2,3.png, downloaded 6204 times

Subject: Re: Software for optimizing multi sub parameters
Posted by Wayne Parham on Thu, 23 Jul 2015 19:56:29 GMT
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Where are your subs located in the room? What kind of subs are they? Is their anechoic amplitude response pretty flat? Is the SPL of each approximately the same?

I ask these things because I usually see smoother response as long as the subs aren't grouped together and as long as all are generating approximately the same SPL.

You know, if you are trying to achieve smooth response in just one position, the easy way to do that is to place a sub very near that position. It makes the direct sound from that sub louder than the reflections.

While I feel it beneficial to relax that requirement using multiple subs, I think it might help as a sort of sanity check. I'd be interested to see what that room looks like with each sub near the measurement mic.

So if you have time, please take four measurements, each one with the mic near one of the subs. Get a meaurement near each sub. I'm just curious.

Subject: Re: Software for optimizing multi sub parameters
Posted by Jag768 on Mon, 03 Aug 2015 20:23:40 GMT
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Will do, need some time to do the measurements!

Subject: Re: Software for optimizing multi sub parameters
Posted by Jag768 on Sun, 16 Aug 2015 15:29:02 GMT
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Andy C was so kind as to provide me with his program. He has put quite some effort in it, and that worked out really well. It works by importing dual channel measurements of 5 listening positions of the 4 subs and mains seperately. It took me a couple runs to get it right. After entering all values into my Hypex DSPs, i did a measurement to check the accuracy of the simulation and it turned out quite accurate.

Main listening position simulated and measured (had to move mic in between):

Position 5 (left mic standing at same spot):

I'm very pleased with the results, it worked better for me than doing it by trial and error myself. The LF sounds well controlled now and when needed powerful. And there's much less variation when you walk through the room.

The red trace is the main listening positions. The four other traces are the other positions

File Attachments

1) Pos1_all.png, downloaded 6121 times
2) Pos1_all_simulated.png, downloaded 6176 times
3) Pos5_all.png, downloaded 6110 times
4) Pos5_all_simulated.png, downloaded 6144 times
5) Multisub_optimizer.png, downloaded 6164 times

Subject: Re: Software for optimizing multi sub parameters
Posted by Wayne Parham on Fri, 21 Aug 2015 02:24:04 GMT
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Congratulations! Good work!
