
Subject: Why do you not use summed bass for flanking subs?

Posted by [j0nnyfive](#) on Mon, 28 Jan 2013 21:15:45 GMT

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Hey Wayne!

I couldn't find a specific answer to my question (sorry if you've already addressed this).

I'm wondering what would happen if you sent summed bass to the flanking subs? The situation might be if a person bought 2 subwoofers and wanted to flank them (for aesthetic reasons as well), and wanted to hear all the bass their movies were producing. What is the difference between sending only a copy of the flanked main, and sending the whole summed signal? Would the summed signal not contain a copy within? Would there be some negative effects from sending the summed signal? If said person was only running 2 channel, and the other channels are somehow "summed" into those 2 mains anyway, then would sending the summed signal not be practically the same thing as sending a copy? I know I'm getting way out there, but could you clarify this issue for me?

Thanks again!

Subject: Re: Why do you not use summed bass for flanking subs?

Posted by [Wayne Parham](#) on Mon, 28 Jan 2013 22:47:45 GMT

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I suppose you could send a summed signal to flanking subs, and it would probably work pretty well in most cases.

The problem is that lower-midrange content panned hard left or hard right would go to both flanking subs even though only one of the mains would receive the signal. So the lower midrange coming from the flanking sub on the "off" side would probably sound unnatural to most people. It would sound like a rumbly "echo" on the wrong side.

Flanking subs get the lowest part of the vocal range, almost enough to be able to make out words if volume is high enough. They're designed to generate output well above 100Hz, up to 150Hz and sometimes higher.

The first two octaves from a piano come from flanking subs. Lots of instruments play in this range - See the red and orange areas in the chart below. All of the red and most of the orange comes from flanking subs. Since they are sent a low-passed copy of the main speaker they are flanking, and since they are fairly close together - just a few feet away - the mains and their flanking subs blend seamlessly and give the impression of a single sound source. But it only works as designed when the flanking subs are sent a low-passed copy of the mains they're flanking.

So anyway, try using the summed signal and see what you think. It's an easy experiment. Just setup the subs flanking the mains, and set the LFE channel crossover to a fairly high frequency. I think in most cases, it will sound fine that way. Most times, the mains get a signal that is pretty

similar at bass and low midrange frequencies. But those rare moments where low-midrange content is panned hard-right or hard-left will probably be noticeable to you, and drive you to lower the low-pass frequency for the LFE channel.

That's the right thing to do for a traditional subwoofer, of course. You want the low-pass filter set no higher than 80Hz or 100Hz. That's true for distributed subs in a multisub arrangement too. Only the red areas in the chart below get sent to traditional subs and distributed subs. But flanking subs serve a little bit different purpose. They're run higher than normal, and so can be localized if they're too far away from the main speaker they're flanking.

File Attachments

1) [instrument_frequency_chart.jpg](#), downloaded 7880 times

Subject: Re: Why do you not use summed bass for flanking subs?

Posted by [j0nnyfive](#) on Mon, 28 Jan 2013 23:49:00 GMT

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Gotcha! Thanks for that explanation!

Now, I'm more of a movie man than music man. The center channel tends to be pretty important (as you know). I feel that I would instinctively want the center to have a flanking sub. What would you think about a flanking sub for the center channel only? If you were setting up a home theater, do you still feel that left and right flanking subs are more important than a flanking sub for center channel? I've read that most dialogue and music goes to the center channel (I'm not sure how true this is).

Are you coming from more of a music angle in your prescriptions or are you music/theater neutral? I'm 85% movies/ 15% music (in my interests). It is kinda nerve-grating when music lovers use the phrase "It's just for movies so it doesn't matter... etc etc". lol YES IT DOES! Can you tell me your thoughts on this? Thanks again!

Subject: Re: Why do you not use summed bass for flanking subs?

Posted by [Wayne Parham](#) on Tue, 29 Jan 2013 00:09:20 GMT

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A flanking sub for the center channel would definitely improve it, yes. Best results would be from using flanking subs on all front mains.

Subject: Re: Why do you not use summed bass for flanking subs?

Posted by [j0nnyfive](#) on Tue, 29 Jan 2013 02:24:16 GMT

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Excellent.

How would having three flanking subs up front and one LFE sub in the back factor in to the "if you have four subs, it 'almost' doesn't matter where you put them"? (I bet you saw that one coming)

The reason I'm asking is because the "four subs max" advice doesn't necessarily assume you will have 3 on one wall or that you aren't using the summed channel. What's your gut reaction to this?... you're going to tell me to shut up now aren't you? lol
Thanks! (This is all going somewhere for me believe it or not!)

Subject: Re: Why do you not use summed bass for flanking subs?

Posted by [Wayne Parham](#) on Tue, 29 Jan 2013 16:00:48 GMT

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If the four subs - the three flanking subs and the single distributed sub - were all sent the same signal content, then they would do a good job of modal smoothing throughout the modal range. They would fall into the category of "if you have four subs, it 'almost' doesn't matter where you put them".

On the other hand, if only one or two were sent the same signal content, well, I think that's pretty much self-explanatory.

If there were no limits to budget or constraints on placement, I would probably run a pair of distributed subs in addition to the flanking subs. But the whole distributed subs thing is a matter of "more is better with diminishing returns". So there is improvement just having the one distributed sub in addition to the flanking subs, and depending on content and layout, it may be excellent, no other subs needed.

Subject: Re: Why do you not use summed bass for flanking subs?

Posted by [j0nnyfive](#) on Tue, 29 Jan 2013 20:43:52 GMT

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Gotcha. I'm either going to do 3 flanking subs or none (soffit mount). This is way into the future, but I'm planning now. Thanks!

Subject: Re: Why do you not use summed bass for flanking subs?

Posted by [zheka](#) on Tue, 29 Jan 2013 21:25:32 GMT

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I found what maybe a potential compromise.

I still use summed signal.

I set crossover on the AVR fairly high - 160-200Hz. I then add 1st order low pass filter at a lower frequency (80-100Hz) directly in the DSP for my front subwoofer amplifier.

I found that even with attenuated output the sub is still effective at modal and interference smoothing yet does not muddy the sound stage or at least has lesser potential for doing so.

what do you think?

Wayne Parham wrote on Mon, 28 January 2013 16:47

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Subject: Re: Why do you not use summed bass for flanking subs?

Posted by [Wayne Parham](#) on Tue, 29 Jan 2013 22:10:04 GMT

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I think if it works, then it's a good solution. Modal smoothing with dense interference is as much an art as a science. I mean, there's "science" in it, of course, but we're mitigating interference problems rather than solving them, so it's a solution that has many possible paths. Whatever makes the modal range act more like the statistical range is what we want.

Flanking subs and distributed subs have some similarities and some differences. The main similarity is that sound sources are blended. The difference is flanking subs are pretty much tied to the mains they're flanking but distributed subs are not.

Down low, you really can put sound sources all over the place - random, ordered, symmetrical, asymmetrical - and you can expect it to work pretty well. If you optimize source positions with measurements, all the better. Smoothing can be accomplished very nicely, and there is no chance of localization as long as the subs are low-passed below 100Hz.

The transition region is a little different because you can't put the helper woofers "just anywhere". They can't be far away, and they probably need to be symmetrical with respect to the mains. They need to be close to the mains, but far enough away to mitigate the self-interference notches from nearest boundaries. And the low-pass frequency has to be high enough to blend in the transition region, but low enough to let each of the mains become point sources from the Schroeder frequency upwards.

Essentially what we're doing here is making an array of speakers that is large and spatially-distant at low frequencies and becomes smaller and closer-spaced at transition frequencies. As the frequency rises into the statistical range, the array is faded out leaving only the point source mains.

Subject: Re: Why do you not use summed bass for flanking subs?

Posted by [j0nnyfive](#) on Wed, 30 Jan 2013 18:23:07 GMT

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Thanks for the information guys! This is a pretty complex issue. Especially when money IS an object. I have learned from reading these discussions that it takes much measuring and planning. When the time comes, I will be doing much measuring and planning.

My takeaway from this is:

1. Buy 2 subs, experiment, measure, listen, enjoy.
2. Maybe get another sub, experiment, measure, listen, enjoy.

3. Maybe get psychiatric hel... another sub, repeat, enjoy.

I can't wait! Thanks!
