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Subject: Tuning below Fs with JBL 2226H?  
Posted by [Omholt](#) on Mon, 21 Jan 2013 09:53:03 GMT  
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I'm considering building two bass units in vented boxes for a two channel setup. I want something that can be crossed over in the 200-250 Hz region. The JBL 2226H is considered a fine driver for midbass.

At the same time I would like good output down to about 25 Hz.

The plan would be to start with two stacked drivers on each side and increase with three or four later if it's needed.

If the cabinet is large enough, using several drivers on each side and I have enough watt, is tuning to around 25 Hz problematic and a compromise? The Fs of 2226H is 40 Hz.

Is it better to use a driver with lower Fs? What would be recommended in that case.

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Subject: Re: Tuning below Fs with JBL 2226H?  
Posted by [Wayne Parham](#) on Mon, 21 Jan 2013 15:27:57 GMT  
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The JBL 2226H is one of my all-time favorite midwoofers. And it is capable of producing subwoofer output too, but it is not optimized for that purpose. Most of the things that make it great - its motor structure with shorting rings, it's highly damped cone, it's efficiency - all work best above 50Hz.

So while you can make a good subwoofer using JBL 2226H drivers, I would prefer to use JBL 2235 or JBL 2245 woofers instead. They are tuned for subwoofer use. Another option is the LAB12, which allows me to build a very competent subwoofer in a 4ft3 box, which is much smaller than what is required for the JBL subs. The LAB12 sub is not as efficient though, naturally, because size is king where subs are concerned. According to Hoffman's Iron Law, the only way to get efficiency and deep bass extension is to use a large box.

Still, since the most important thing for good quality bass is to use several distributed subs placed around the room, I find it pretty important to have subs of reasonable size. I think some people would think even 4ft3 is large, and so for them, 8ft3 to 10ft3 cabinets are out of the question, especially in multiples. But for me, 4ft3 subwoofers aren't too large. I run a pair of them flanking the mains, and another pair behind the seating area, and this gives incredibly smooth bass response throughout the room.

Room modes, multisubs and flanking subs

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Subject: Re: Tuning below Fs with JBL 2226H?  
Posted by [Omholt](#) on Mon, 21 Jan 2013 16:10:22 GMT  
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Thanks for the reply.

So basically it can work quite good, but it's not optimal for subwoofer range and there are better options for that.

I have been recommended JBL 2234 as a first choice for this (or 2235 as a second option), but they seem practical impossible to get hold of. Or am I wrong?

Starting with four units, I will have the possibility of trying the multiple subwoofer approach as well. From what I've tried up till today though, I have had problems with integrating woofers in the back of the room. The bass hits the back of the chair, so I end up feeling it. Maybe the room is too small for that.

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Subject: Re: Tuning below Fs with JBL 2226H?  
Posted by [Wayne Parham](#) on Mon, 21 Jan 2013 17:27:30 GMT  
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The 2234 is the exact same as the 2235, except the 2235 cone is 35 grams heavier. It is literally the same speaker with a 35g mass ring added, specifically to increase bass extension. So I personally would prefer the 2235 over the 2234 for subwoofer duty. But either driver can be used to good effect.

I suppose the real problem is the 2234 and 2235 are both out of production, so you would have to buy them used and have them reconed. This is not so bad though, because reconed JBL 22xx drivers are good as new, provided factory recone kits are installed by a competent technician. They're designed to be serviced, and factory support is good.

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Subject: Re: Tuning below Fs with JBL 2226H?  
Posted by [Omholt](#) on Mon, 21 Jan 2013 18:00:50 GMT  
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You also mentioned the JBL 2245 which is an 18" driver.  
I would prefer 15" due to size, but would open to 18" too if it works better.

What about the JBL 2242 which is easily available? Fs of 35 Hz, so a little lower.

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Subject: Re: Tuning below Fs with JBL 2226H?  
Posted by [Wayne Parham](#) on Mon, 21 Jan 2013 19:04:28 GMT

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The JBL 2242 is an awesome prosound sub. But for home hifi and home theater, I would prefer the JBL 2245. Then again, the 2245 is no longer available, so the 2242 might be a better choice, simply because of that.

These are all prosound drivers, and all are suitable as prosound subs. In a 10ft3 cabinet tuned to 30Hz, the 2245 is flat as a ruler, strong all the way down. The 2242 in the same cabinet has a bit of an EBS alignment, which is fine. Both are awesome. Still, if I had them both available to me, I personally would prefer the 2245.

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Subject: Re: Tuning below Fs with JBL 2226H?  
Posted by [Omholt](#) on Mon, 21 Jan 2013 20:21:24 GMT  
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Thanks you again. 2245H could be option instead of 2226H. Should work better for the deepest frequencies.

Do you have experience with B&C drivers? A little lower sensitivity and will need more power which could lead to higher power compression, but overall they look promising.  
<http://www.bcspeakers.com/product.php?id=162>

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Subject: Re: Tuning below Fs with JBL 2226H?  
Posted by [Wayne Parham](#) on Mon, 21 Jan 2013 21:04:26 GMT  
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Yes, I've used B&C drivers. In fact, I am currently using one of their compression drivers in my line of loudspeaker products. Their woofers are also good, but I don't think they're as good as JBL.

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Subject: Re: Tuning below Fs with JBL 2226H?  
Posted by [Omholt](#) on Tue, 22 Jan 2013 15:58:16 GMT  
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Isn't lobing an issue when stacking bass drivers where distance is greater than 1/4 of the wavelength? If it is, crossing over as high as 200 Hz would be problematic. And that's the same for spread out units too.

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Subject: Re: Tuning below Fs with JBL 2226H?  
Posted by [Wayne Parham](#) on Tue, 22 Jan 2013 16:21:08 GMT  
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Lobing from acoustically distance sources is undesirable, that is true. It is to be avoided where possible, and outdoors or in very large areas, you want point source summing, which is

summing loses meaning. The reflections are out of phase with the direct sound. Even a single source gets interference from its reflections, which are nearly as loud as the direct sound. The result is deep notches at some points in the room, with hot spots in between them.

Sound energy distribution is like a checkerboard of hot and dead spots, and the pattern is frequency specific. At low frequencies, in what is called the modal region, there are large, widely spaced nodes. As frequency goes up, the number of nodes increases and distances between them become smaller. Eventually - at the Schroeder frequency, approximately 200Hz or so - the nodes become so closely spaced they cannot be distinctly identified. This is where the energy distribution becomes more of a statistically averaged sound field.

Room modes are the reason to use a multisub configuration. It is done to smooth the sound field at low frequencies by making sound in the modal region act more like the statistical region. For more information, see the link below:

[Room modes, multisubs and flanking subs](#)

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Subject: Re: Tuning below Fs with JBL 2226H?  
Posted by [Omholt](#) on Sat, 20 Jul 2013 09:59:39 GMT  
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I ended up buying JBL 2226J drivers. Though 2242 would probably be a better choice for the lowest frequencies, I think six 2226J will do well in that regard too. And I have the flexibility of crossing them high, which was important to me. All are getting separate cabinets (120L) and driven by powerful Abletec ALC1000 class D amps. I should get great response down to about 30 Hz, which is sufficient for music.

The cabinets should get here before middle of august.

#### File Attachments

1) [005 \(Medium\).JPG](#), downloaded 3231 times

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Subject: Re: Tuning below Fs with JBL 2226H?  
Posted by [Wayne Parham](#) on Sat, 20 Jul 2013 14:50:20 GMT

I'm particularly found of 2226 drivers as midwoofers. Plenty of 'em used for subs too. Good catch!

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