Subject: stuffing a horn?
Posted by Adam on Tue, 06 Jul 2004 02:17:27 GMT
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I had an interesting thought tonight while reading some information on t-lines. Transmission lines are 1/4 or 1/2 based enclosures (like horns) and use polyfill to slow the speed of sound, and thus shorten the transmission length. A 30 Hz, 1/4 wave transmission line has a length of about 9.4 feet. If stuffing is used in the line, it reduces the length required to around 3-4 feet. This his a huge advantage.What I'm wondering is, could this principle be applied to horns as well? Obviously not possible on mid or high horns, but on bass horns, could you extensively stuff the horn itself with polyfill, reducing the necessary length of the horn? My theory is similar advantages could be realized, with the necessary horn length being cut in half or even more. However, I'm not sure if this would affect the mouth size, and if the resulting change in expansion rate would mess up response. Even if this didn't work, could stuffing a 1/4 wavelength horn with polyfill help increase the perceived length closer to 1/2, and thus smooth out frequency response and improve sound quality?Adam

Subject: Re: stuffing a horn?
Posted by Wayne Parham on Tue, 06 Jul 2004 03:50:37 GMT
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I think what you're saying sounds reasonable. But I think the attenuation might work against you. It's certainly easy enought to try, so if you do so, please let us know what you find.Another experimental thing that Charlie Deluca and I have been kicking around is using amorphous metals for diaphragms. I'd sure like to have access to a shop that had the ability to try it out.

Subject: Re: stuffing a horn?
Posted by Adrian Mack on Tue, 06 Jul 2004 09:49:08 GMT
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I think so too. In theory the bass waves should pass through the stuffing fine, I have a gut feeling that efficiency might be a lot lower with stuffing than without it though, making one of the greatest benefits lost. I'd like to see what happens too if he tries it, hope his not using itchy fibreglass ~ lots of contact with the hands stuffing a big folded horn!

Subject: Re: stuffing a horn?
Posted by Martin on Tue, 06 Jul 2004 11:52:45 GMT

Adam,You wrote :"Transmission lines are 1/4 or 1/2 based enclosures (like horns) and use polyfill to slow the speed of sound, and thus shorten the transmission length. A 30 Hz, 1/4 wave transmission line has a length of about 9.4 feet. If stuffing is used in the line, it reduces the length required to around 3-4 feet. This his a huge advantage."First, a transmission line is a 1/4 wave device just like a horn. There are no 1/2 wave action in either, that would violate the laws of physics for an open ended geometry. Second, the fiber does not slow the speed of sound very much. Fiber only attenuates the higher frequencies and will not result in a drmatically shorter line length. The speed of sound is slowed less than 10% with very heavy stuffing.Hope that helps,Martin

Subject: Re: stuffing a horn?
Posted by Wayne Parham on Tue, 06 Jul 2004 19:04:50 GMT

Have you seen Daniel Russell's article? It shows the behavior of transmission lines, and describes open ended and closed ended pipes. It's a pretty good easy read.

Subject: Re: stuffing a horn?
Posted by Martin on Wed, 07 Jul 2004 00:21:49 GMT

Hi Wayne,Yes I have seem that article before and you are right it is a very good introduction. I use essnetially the same formulas and predict similar results. Physics is physics.Martin