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Subject: design plan for a tractrix horn using electrovoice EVM12L driver

Posted by [Adrian Mack](#) on Tue, 18 Mar 2003 08:12:58 GMT

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Hey everyone.I found this website

[http://www.volvotreter.de/pics\\_plans.htm](http://www.volvotreter.de/pics_plans.htm) which has plans available for download for a 150Hz tractrix horn using a 12" electrovoice EVM12L driver. Has anyone used this driver before? If so, how high do you think this design can reach? (the actual plans can be downloaded from here [http://www.volvotreter.de/files/150Hz\\_Midbass\\_Tractrix\\_Horn\\_v1.3a.pdf](http://www.volvotreter.de/files/150Hz_Midbass_Tractrix_Horn_v1.3a.pdf)). Is this even a good design? Has anybody got any other designs for 8 to 12" cone drivers for midrange horns with a cutoff around 200Hz? If anyone has the time to download the plans above, can you please explain what the angles in the bottom left picture means. The diagram looks very similar to the one in the middle right, it is confusing me !!!!!!! please help if you have the time, or if you can!Thanks in advance!Adrian

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Subject: Re: design plan for a tractrix horn using electrovoice EVM12L driver

Posted by [Wayne Parham](#) on Tue, 18 Mar 2003 21:32:05 GMT

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That's an attractive horn. It looks like a good design and could certainly model it with Hornresp to check it out.

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Subject: Re: design plan for a tractrix horn using electrovoice EVM12L driver

Posted by [Adrian Mack](#) on Wed, 19 Mar 2003 09:48:50 GMT

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Hey Wayne,I reckon it looks good too. Without running the design through HornResp (which I find hard to use, even though I have not really read any instructions!) do you think it would perform well up to 1.6KHz?I can get the Electrovoice EVM12L used in that horn for AU\$350 each (converts to US\$208). Do you think this is a good price? I was thinking maybe an Eminence type driver could be used in its place, or would this screw up the design?Thanks!Adrian

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Subject: Re: design plan for a tractrix horn using electrovoice EVM12L driver

Posted by [Wayne Parham](#) on Wed, 19 Mar 2003 17:32:04 GMT

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Hard to say what kind of top end response you can expect from that horn. Lots of variables, from collapsing DI to cone flex. In that area, it is probably best to build and test.

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Subject: Re: design plan for a tractrix horn using electrovoice EVM12L driver  
Posted by [Adrian Mack](#) on Wed, 19 Mar 2003 20:51:04 GMT

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Hey Wayne, <http://www.usspeaker.com/evm12L-1.htm> has some specs on it. Freq response is 80Hz-5KHz. Also here's some really kewl pics of it [http://www.proaudio.com.au/shspec/ev1\\_lg.jpg](http://www.proaudio.com.au/shspec/ev1_lg.jpg) From the above, what would you say about this woofer? Thanks again! Adrian

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Subject: Re: design plan for a tractrix horn using various drivers  
Posted by [Wayne Parham](#) on Wed, 19 Mar 2003 21:47:39 GMT

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Have you considered using a JBL 2020? It's a 12" driver that works very well in large format midrange horns, and would give you the performance you are hoping for. You could also use the 2012 or 2123 10" drivers for midrange applications; They're perfect in horns like you're planning to use. You might also check out the Eminence Delta 10 and Delta 12, which are other drivers that would probably work for you. I've been toying with midhorns using those drivers and I must say they're looking pretty good.

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Subject: Re: design plan for a tractrix horn using various drivers  
Posted by [Adrian Mack](#) on Thu, 20 Mar 2003 08:12:52 GMT

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Hey Wayne, Thanks for the suggestions. Do you think I will be able to use for example the JBL 2020 or the Eminence Delta 12 as a direct substitute for the electrovoice EVM12L if I wanted to? Or would I have to redesign the horn on the page in my other post for the new drivers? Do these sorts of midrange horns need any compensation, or any other filter corrections for the response? (you have told me guitar speakers have a rising response, does the horn correct this?) Thanks again! Adrian

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Subject: Re: design plan for a tractrix horn using various drivers

Posted by [Wayne Parham](#) on Thu, 20 Mar 2003 09:30:06 GMT

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There are a lot of different ways to use these. The direction I'm going is to use a straight-walled conical horn with approximately 90x40 wall angle. The throat entrance is square and the side walls expand from that. This makes a horn that is fairly simple to build and has a pattern that matches my tweeters. A phase plug would extend the upper response limits but I only need output to 2kHz. It is fine for the path length differences to start rolling off output above that because the cone starts entering breakup around that point anyway. What I'm finding is response to 1kHz is pretty easy but it's harder to hit 2kHz, especially with larger drivers. But I don't need output much above 1kHz anyway, just enough to sum with the tweeter as it comes online.

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Subject: Thanks! (NT)

Posted by [Adrian Mack](#) on Sun, 23 Mar 2003 12:43:51 GMT

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Subject: Re: design plan for a tractrix horn using various drivers

Posted by [Eric Mainardi](#) on Fri, 04 Apr 2003 07:32:02 GMT

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Hello, If I can add some useful information, I would recommend choosing a suitable speaker for horn use, you must have its  $F_s$  and  $Q_{es}$  and then calculate  $f_{hm} = 2 \cdot F_s / Q_{es}$ . It gives you the useable upper frequency limit of your speaker+horn assembly and this must coincide with the lower working frequency limit of your medium driver. Regarding the EVM12L, it's not only an excellent guitar speaker but gives very high efficiency and low distortion in the low mid-band region, where it is the most important for your project. E-V people were the first to give the distortion figure of their speakers in data sheet, proof that they were in advance over their competitors. Unfortunately EVM12L is now phased out. Hoping this will help. Thanks to you all. EM

Subject: Re: design plan for a tractrix horn using various drivers  
Posted by [Wayne Parham](#) on Fri, 04 Apr 2003 13:12:23 GMT  
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Hornresp calculates mass rolloff as you've described. I think it will do a pretty good job for Adrian too. Either way, mass rolloff is a description of what can be expected from the horn when the diaphragm moves as a rigid piston. When the cone begins to flex - undulating across its surface - it will modify upper frequency response from that predicted by mass rolloff.

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