
Subject: Another pi midhorn question.

Posted by [Kim Schultz](#) on Sat, 07 May 2005 07:56:59 GMT

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Hi Wayne.

I wanted to make a cad drawing of the midhorn, to get the angles on the sides.

Just bought a new tablesaw, and want to try to minimize the sanding a bit, by cutting the angles on the saw.

But when I make the sides 14.5" long, the top and bottom becomes 11.37" long. And when I make the top and bottom 11" long, the sides become 14.21" long.

Which one is correct, can you tell me the exact depth of the horn, that way I can draw it up using depth instead.

I have included a picture of the two drawings.

Regards

Kim

File Attachments

1) [7pi_horn.jpg](#), downloaded 6015 times

Subject: Re: Another pi midhorn question.

Posted by [Wayne Parham](#) on Sat, 07 May 2005 08:41:28 GMT

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It also shifts a bit depending on the thickness of the wood. Make the throat cutout exactly 4.5" square. Make the sides 45° and the top and bottom 20°, and make the mouth 24" x 12".

Subject: Re: Another pi midhorn question.

Posted by [Kim Schultz](#) on Sat, 07 May 2005 09:46:24 GMT

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Thx Wayne, I'll go with the short version on the drawing and make the top and bottom 11" and the sides a bit shorter than 14.5". That fits 20° and 45° best. But don't you have the depth of the horn, the only thing I can see could change is the mounting plate thickness, and not the horn itself.

Subject: Re: Another pi midhorn question.
Posted by [Wayne Parham](#) on Sat, 07 May 2005 17:52:14 GMT
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Overall, it's about eleven inches, depending on the thickness of the wood of the throat mount plate. Using a little trigonometry, you can find the length you're looking for using the formula $\text{length} = \cos 45^\circ (14.5)$, about 0.707 times the length of the side 14.5", or approximately 10.25". If you use these figures, the mouth will actually be a little larger than 12" x 24", which is just fine.

Subject: Think I got it now :)
Posted by [Kim Schultz](#) on Sat, 07 May 2005 20:42:12 GMT
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If you take $\cos 45^\circ (14.5)$ you get 10.25". And if you take $(10.25/11) \text{inv cos}$ you get 21.28° That gives a mouth of 12.5" x 25". Using 11" as the top and bottom with 3/4" wood and 12" x 24" mouth, the depth is 11.09", that's close enough, so this is how I'll build them. I'll begin cutting wood on Monday. Regards Kim

Subject: Re: Think I got it now :)
Posted by [Wayne Parham](#) on Sat, 07 May 2005 21:00:52 GMT
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You're exactly right.

Subject: Re: Another pi midhorn question.
Posted by [GarMan](#) on Mon, 09 May 2005 13:29:26 GMT
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Kim, When Wayne announced his midrange horns last year, I spent a good afternoon going through my old math books, trying to figure out the angles. You know what I ended up doing? Built a mock up with 1/4" MDF to measure the angles directly off of it. Only took an hour to do the mock up. With a mock up, you don't even have to "measure". Just copy the angle to a sliding bevel and transfer to the saw. Gar.

Subject: Re: Another pi midhorn question.
Posted by [Wayne Parham](#) on Mon, 09 May 2005 20:54:43 GMT
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When I was developing these horns, I made several versions with different throats and different mouth sizes. The last few models were only slightly different, and we really only different because we were deciding how to manufacture them and what cut angles to make. The biggest issue we had is with wood thickness. You need different cuts and jigs for each wood thickness. The basic dimensions shown in the plans are simplified, and you'll need to setup cut dimensions and angles for your wood. We have three different jigs for different various wood sizes. The first horn is the hardest, and after that, they go pretty easy. That's why we make flat pack kits available, because we have the production issues nailed down. This makes it easier for DIY builders that aren't setup to do precise angles and what not.

Subject: Re: Another pi midhorn question.
Posted by [Kim Schultz](#) on Fri, 13 May 2005 08:22:35 GMT
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I build a midhorn with 19mm MDF last monday, using 20° on the ends of the sides and 45° on the ends of the top and bottom. I had converted it all to metric and made a drawing in cad, that ended up making to mouth 63,5cm x 30,5cm, and the depth without mouting plate 26cm. Now I have a pretty good idea how to make it the next time. Which will not be in a while, I have to install floor heating and a new kitchen in the house, before I can do some more wood cutting for speakers.

Subject: Re: Another pi midhorn question.
Posted by [Nelson Bass](#) on Sat, 21 Jun 2014 18:45:18 GMT
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I made a 3D model of the midrange horn in SolidWorks:

I settled the angles at 90x40deg and the horn mouth width to 24".
That makes the mouth around 11.65" high not 12" and the inside depth is 9.75".

Good enough?

File Attachments

1) [7Pi_Midrange_Horn.png](#), downloaded 5620 times

Subject: Re: Another pi midhorn question.
Posted by [Wayne Parham](#) on Tue, 24 Jun 2014 16:04:22 GMT
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Looks good!
