

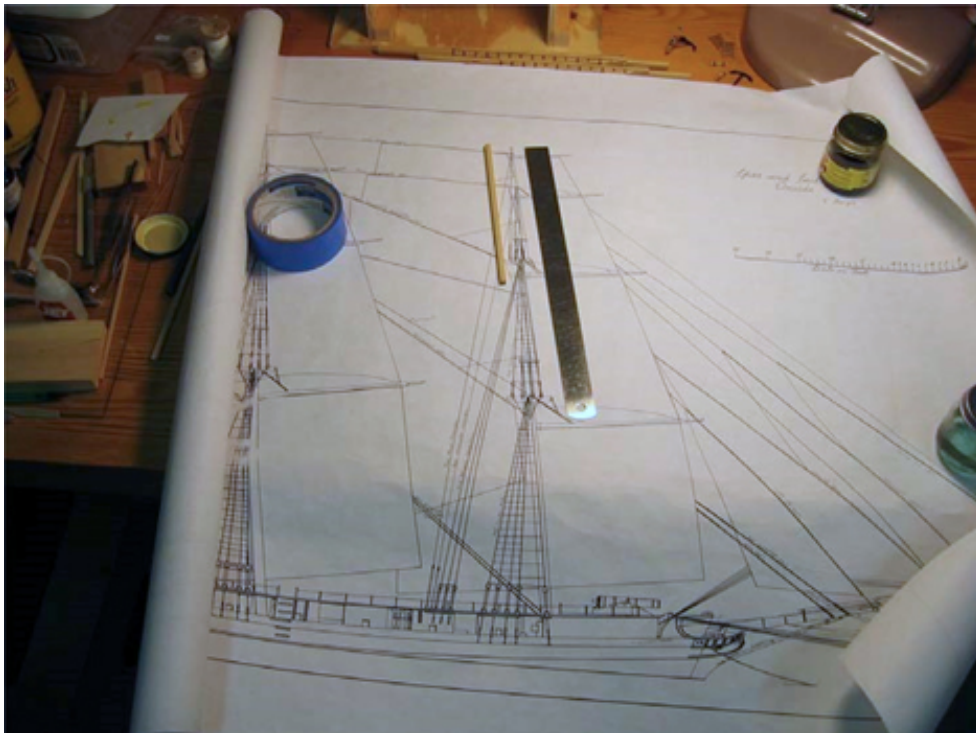
Making a mast (or spars) from square stock

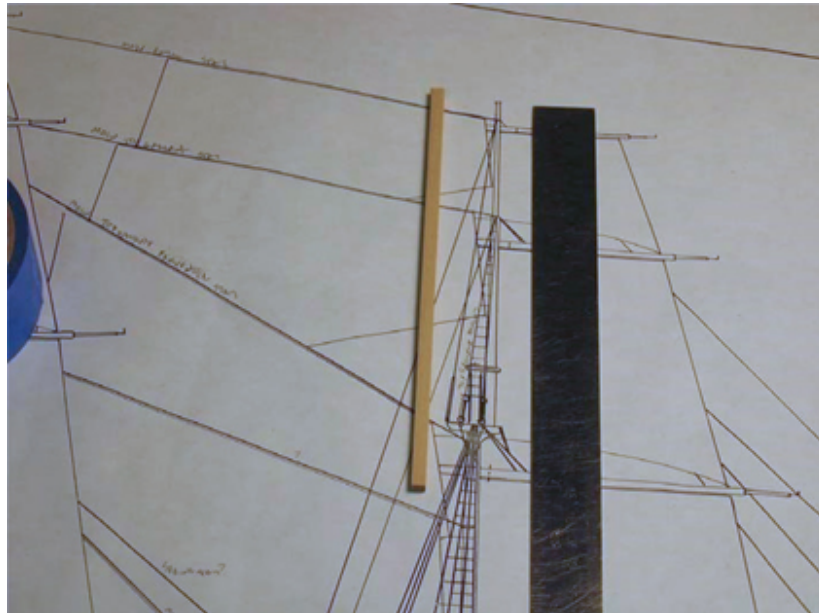
By Elia Gianopulos and ed. by NRG Staff

My brig Oneida model hull had been completed and it was time to make the masts and spars. OK, so far it is just masts. On my last build I used dowels for the masts, and they worked out OK. For the brig masts there are sections of the masts which are octagonal and my attempts at shaping dowels into masts with octagonal features failed miserably. I had read a few times of making masts from square stock and decided to give a try. After making several spars, I now have my technique “down”. I decided to share it, in the hope that it can show others that making masts from square stock isn’t all that hard. It also allows one to use wood other than the usual dowel materials. I’m going to make one of the topgallant and royal pole masts for Oneida. The wood I’m using for the mast is Southern Magnolia. It’s a gorgeous wood, light yellow in color, with subtle grain. It complements the woods of the kit very nicely.

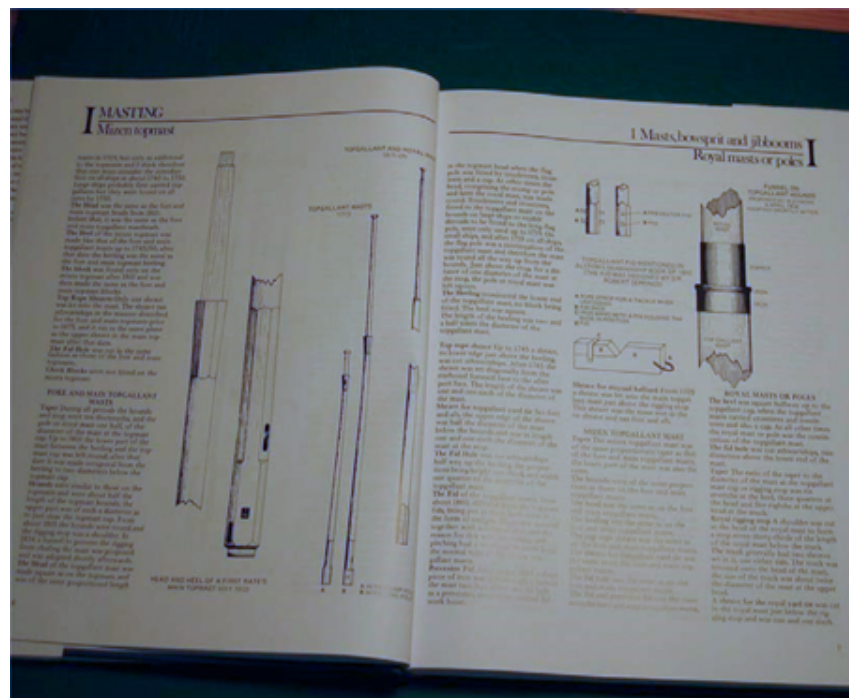
One of my limitations (as some might see it) in modeling is the lack of a wide variety of power tools. I don’t have a lathe, or a large drill press, so you’ll see a technique that uses hand tools, a Dremel on the Dremel drill stand (used as a sander) and a cordless hand drill. Pretty unsophisticated, all in all.

For the masting and rigging of Oneida, I purchased the plans drawn by Howard Chapelle and sold by the Smithsonian. The plans are 1/48 scale, the same as the model, so no scaling or conversion was necessary. Following are two pictures of the plans.





The plans do not include the finer details of the masting and rigging, just 'the big picture' view, so I've chosen to use *Masting and Rigging of English Ships of War 1625-1860* by James Lees for all of the fine details. It is an outstanding book; I highly recommend it. There may be better reference books for early 1800's American ships masting and rigging, but I don't know of them, so *Oneida* will have a slightly English Naval flair to her.

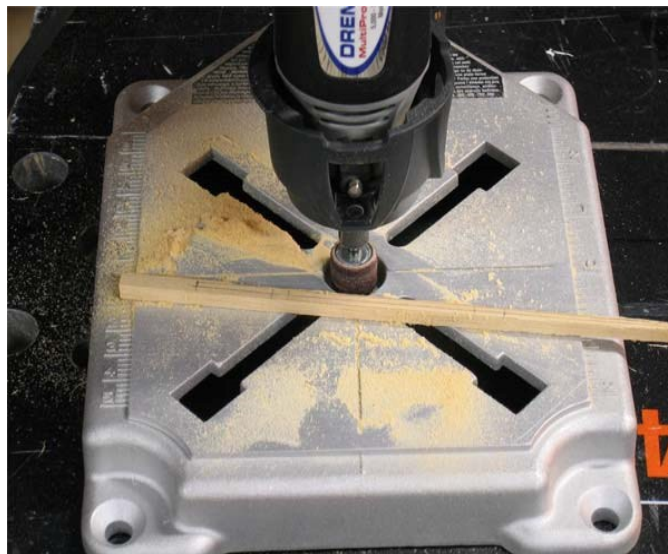


I've taken the gross dimensions of the mast, and its features from the plans: the overall length, the length of the heel to the masthead, and the length up the mast of the hounds. I used Lees for the diameter and taper, the length of the square portion of the heel, the length of the hounds, and so forth.

With these dimensions in hand, I mark in pencil all of the dimensions on the square stock, including the taper of the mast. I used a ships curve and fit it to three diameters along the length of the mast: at the mast cap, at the hounds and at the very top of the mast. I draw my lines and curves a little to the outside of the final dimensions, knowing that I can finish sand to get the proper dimension. The wood stock I cut is usually about 1 inch longer than necessary, so that I have some material to place in the chuck of my hand drill later in the process.



At my Dremel/sanding station I sand off the excess on each of the two sides of the stock in the areas of the circular section of the mast, leaving those areas where there are octagonal sections for last. The reason I do this is that it is easier for me to get a nice clean edge between the flat sided octagonal sections and the tapering cylinder of the mast. Follow along and hopefully you'll understand my method.

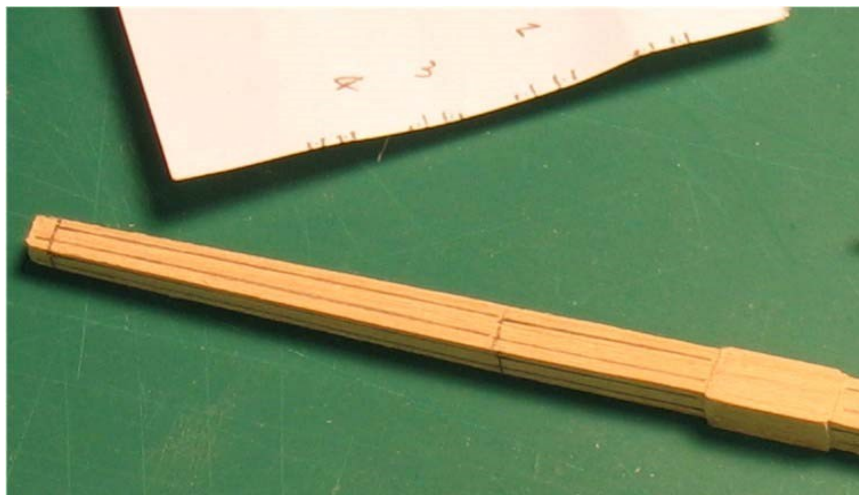


Back at the workbench you can see the two sanded sides. I've used a fine flat file to clean up the edges at the hounds and the heel. I've now transferred the taper curves of the mast to the side adjacent to the first marked side.



Back to the Dremel to sand the taper into the second sides of the mast, perpendicular to the first marked and sanded sides.

At my workbench cleaned up the edges of the hounds and the heel with a fine flat file. I made a tick strip from scrap paper and used the 2/3/2 7th's rule. (This is the geometric projection for a hexagon. That is, the ratios of the width are 2 to 3 to 2.) I used the tick strip to mark a few locations on the mast sides. I will use these curves to create an eight-sided mast, still leaving the hounds and the heel for later, even though they are eight sided.



With what some might think a medieval-looking file, I remove the corner of the mast wood up to the curves I just drew. You might prefer to use a less aggressive file, knife or scraper. I always work from the skinny end of the mast to the wide end, and I only allow just enough mast to cantilever out from my vise to allow filing. I also hold the free end with my hand as a support while sanding/removing wood. It is very easy to break off a skinny section. Don't ask me how I know this!



Ta-da! An eight-sided mast.



I now move on to using a fine, flat file. The next step is to turn that eight-sided mast into a 16-sided mast. Since marking the lines would cause more errors for me than it's worth, I simply filed the edges of the eight sides. With little effort the mast becomes very close to a tapered circular section. This amazes me each time I do it. It is surprisingly easy.



I chuck the mast into my trusty hand drill and, using a strip of 220 grit sandpaper, get a fine, smooth finish on the mast. If I happen to break the mast at this point, it conveniently falls directly into the trash can.



I have used the tick strip to draw the 2/3/2 spaced lines for the octagonal mast sections.



In this photo I've already filed the octagonal section near the heel and am working on the hounds. I first file the hounds to octagonal, but without the taper, and then come back and gently file the taper, working from the lower end up. This is the one portion of my process that takes some finesse.



I clean up the upper edge of the hounds with a chisel; the fine flat file works well for this, too.



And, at last, the mast is complete. It still needs a little light sanding with 220 grit paper, taking care not to sand off the nice, subtle, octagonal sections.



I hope this has been of some help to you and has convinced some that this technique is not at all difficult and can yield some very nice-looking masts and spars.