

Making a mast (or spars) from square stock

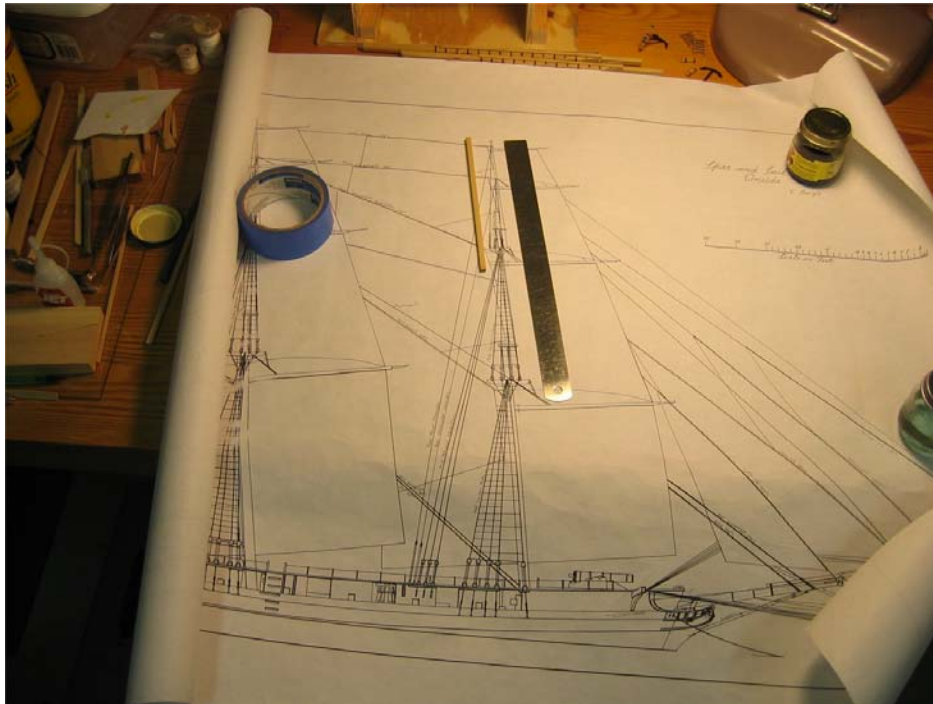
From Elia Gianopulos : Original thread at [Model Ship World](#)

Shipwrights,

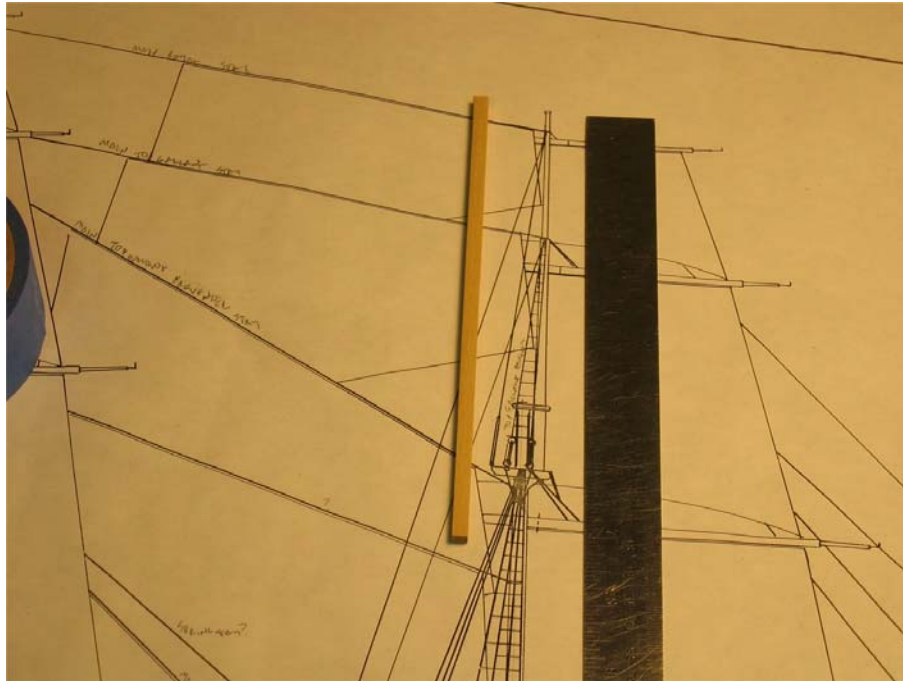
For quite some time now I've benefited from the knowledge of more experienced ship model builders at MSW and DDM, and I've wanted to contribute, or give a little something I've learned or done, back to the community. So here goes...

My brig Oneida model hull has been completed and I've ventured into making the masts and spars. OK, so far really it's just masts. On my last build I used dowels for the masts, and they worked out OK. For the brig masts there are many 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. Well, the result has been acceptable to me. I've made the lower fore and main masts, the fore and main top masts, the bowsprit, jibboom, and flying jibboom. As I now have my technique "down" I thought I might 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 was recommended to me by Dave Stevens at the Lumberyard (he also designed and sells the Oneida kit, and from whom I bought the wood). It's a gorgeous wood, light yellow in color, with subtle grain. I couldn't be happier. It complements the woods of the kit very nicely.

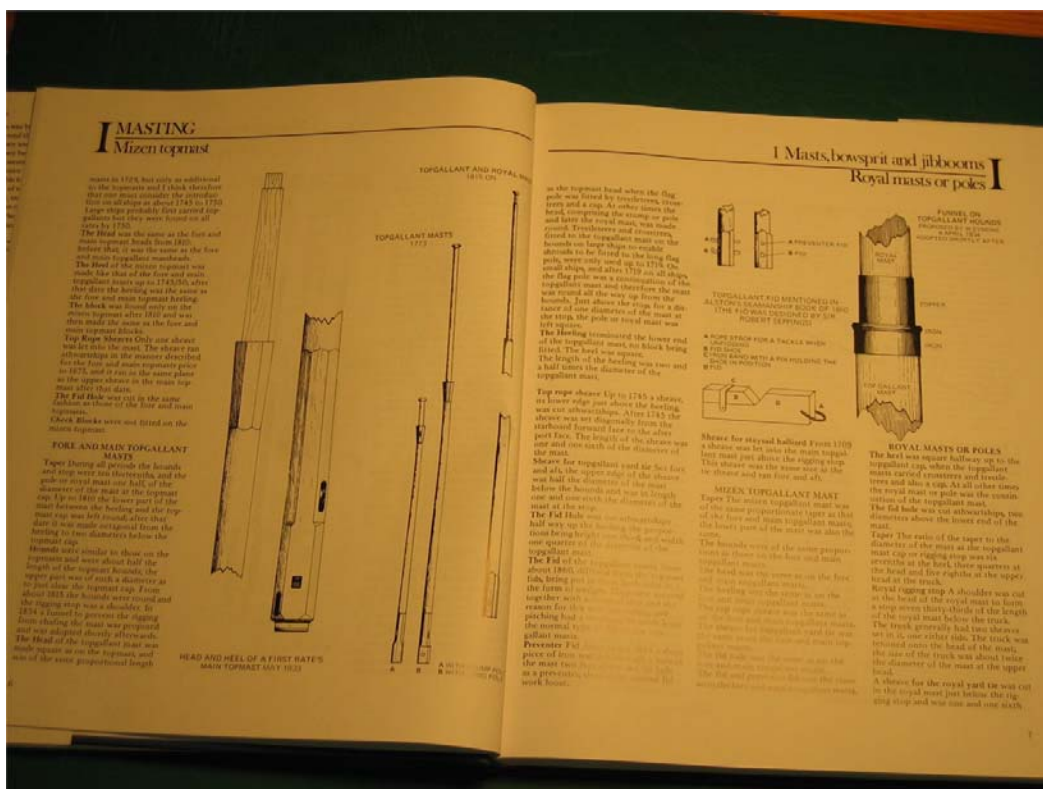
One of my limitations (as some might see it) in modeling is the lack of a wide variety of power tools. I don't have a lathe, or a large drill press, so you'll see a technique that uses a bunch of hand tools, a Dremel on the Dremel drill stand (used as a sander), and a cordless hand drill. Pretty unsophisticated,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



For my 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 don't have the finer details of the masting and rigging, just 'the big picture' view, so I've chosen to use James Lee's *Masting and Rigging of English Ships of War* 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 Lee 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 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 seem to draw my lines and curves a little to the outside of the final dimensions, knowing that I can sand further in the final steps to get close to the proper dimension. I hope no one ever takes a micrometer to my models because I'm not obsessive about getting the gnat's last dimension off...my masting might be a tad heavy. :) 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 (madness? Ha ha).



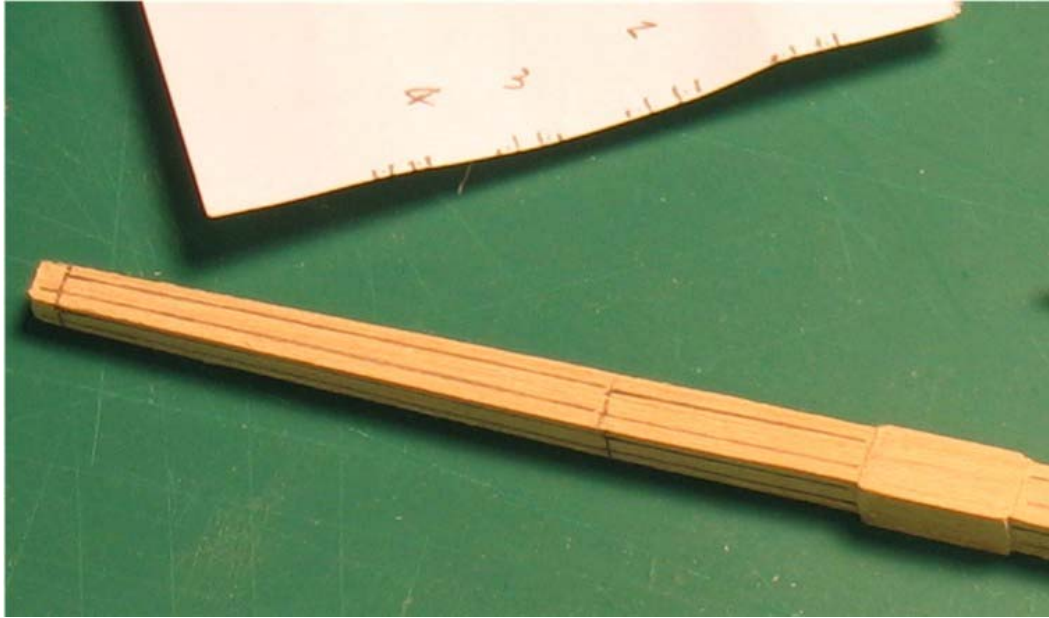
Back at the workbench you can see the two sanded sides. I've used a fine, flat file to clean up the edges at the hounds and the heel. I've now transferred the taper curves of the mast to the side adjacent to the first marked side.



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 I have, again, 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. 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, large file/rasp I remove the corner of the mast wood up to the curves I just drew. 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 just begin filing 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 now use a strip of 220 grit sand paper, my trusty hand drill, and begin to get a fine, smooth finish on the mast. If one happens to break the mast at this point it conveniently falls directly into the trash can, below.



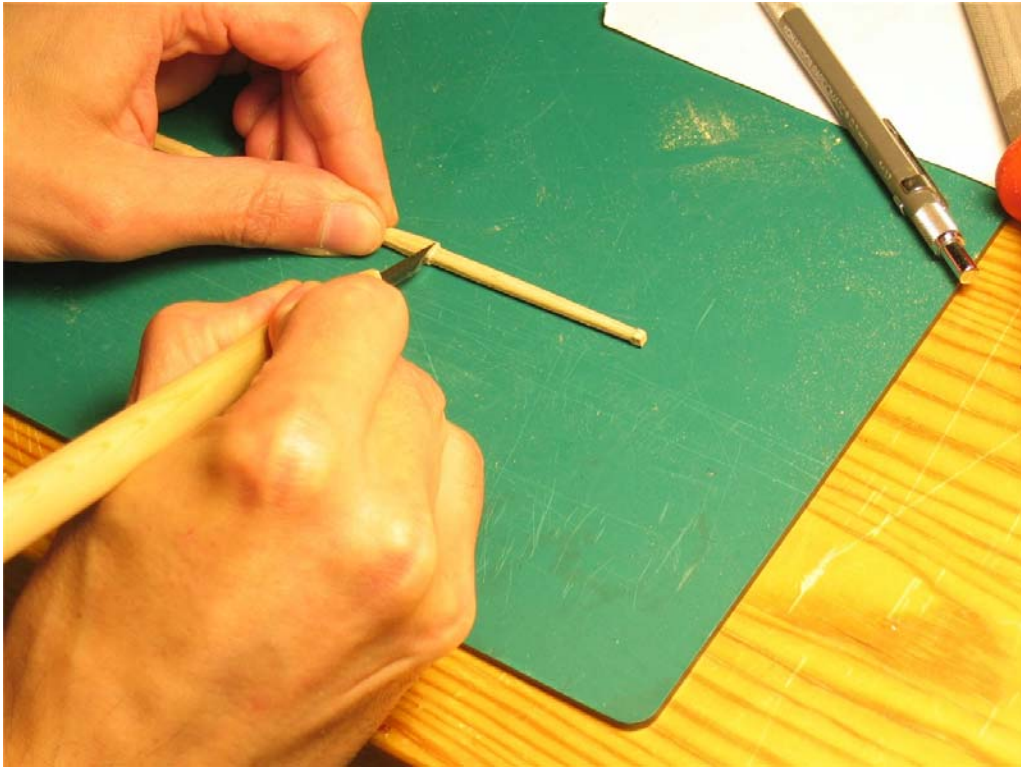
I've now used the tick strip to draw the 2/3/2 spaced lines for the true octagonal mast sections.



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'm now cleaning 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. I'll probably give it 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 hard, and can yield some pretty nice looking masts and spars.