Getting started in segmented wood turning is exciting. Some basic tools, already in most workshops, are necessary to achieve the accuracy of joinery necessary for segmented work.

First, a table saw. Rigidity and alignment are key here if you want to get predictable results. The blade must be parallel to the table top miter slots and rip fence and be capable of fine adjustments to its alignment. The blade should not come out of alignment with use. The rip fence, too, must be capable of being aligned parallel to the blade for burn free, accurate ripping. The fence should clamp solidly to the saw and not loosen under the pressure of ripping. It should be rigid enough not to drift out of parallel. Cast iron or steel table tops offer superior rigidity, especially compared to stamped or cast aluminum. Granite is now an option, but I have no personal experience with it. Direct drive motors, where the blade is attached directly to the
shaft of the motor, are a definite second choice. They usually have more vibration and more noise, and the play in the motor bearings gets worse with time. Adequate horsepower (1/2 hp for a 10” saw) is a must. Beware of peak horsepower ratings and overrated import motors. Under-powered saws will cause more pushing, burning, and stalling. Safety guards and splitters should align accurately to prevent binding. I polished my splitter and put a coat of wax on it when I wax the table top. Guards should be removable easily if you plan on using a sled to cut your segments, but you can build guards into an aftermarket sled whenever possible.

Next, a jointer. Before you start cutting segments, the edges of your stock must be smooth and parallel. If not, the stock will not sit squarely against a fence and you won’t be able to flip a piece over for economy cutting. The basics here are the same as for the table saw—rigidity, alignment, and power. Most edging work can be accomplished with a 4” or 6” jointer. A major advantage to bigger machines is the longer table and greater power that come with them. Table length goes a long way toward accuracy, especially when handling longer pieces of lumber. If you plan on buying rough lumber or drying your own, the larger the better. The first job in milling rough lumber is flattening the face of the board. Unless you are going to rip the rough lumber into 4” to 6” pieces (a tough and somewhat hazardous job), the bigger the better. Make sure the infeed and outfeed tables are parallel and are capable of adjustment. A center-mounted fence will not flex like a fence attached only on the infeed end. A positive stop at 90° is a time saver but only if it’s accurate. The fence should be easy and quick to adjust, preferably without the need for additional tools. Blade guards come in two varieties. The American style rotates out of the way as the lumber is pushed over the cutterhead. The more European style extends out over the cutters from the side and adjusts to accommodate the thickness of the lumber. The European style does not leave the cutter exposed at the end of the cut, but hold-down devices should always be used instead of bare hands, especially at the end of the board.

John Jaworowicz, an anesthesiologist in Rockford IL, has been escaping to woodworking for 30 years and turning for 20. He became interested in segmenting in 2007, looking for a challenge and a place to find his own voice.
there’s a crack in my bottom

Now that’s one piece of bad news you never want to hear, especially if it comes from a customer who recently paid you a ton of money for a segmented piece. Here’s one possible solution to keep this from happening to you again!

You all know that the strongest possible segmented structure utilizes staggered vertical joints as you go from layer to layer. Assembling your rings like this provides every vertical joint with a supporting horizontal (side-grain to side-grain) joint that ties the segments together so they are restricted from movement because of moisture or temperature changes (Figs. 1 & 2).

But, for most of us, staggering stops when we reach the bottom layer of the project. When you do that, guess what - no more horizontal joint support for the bottom of the bottom layer!

Here’s my fix. Split that layer into two layers and stagger the vertical joints. Voilà! By splitting the bottom ring, the length of unsupported vertical is reduced and increased stability is created (Figs. 3 & 4).

And there’s more! If you choose to use a segmented ring at the base, then it’s just about mandatory to put a plug in the bottom of the project because of movement at the segment tips from the moisture in your glue. Well, now that you’ve improved the bottom with staggered joints, you’ve uncovered yet another weakness - the plug itself (Fig. 5)!

The joint between the plug and the segments is now another unsupported joint. To increase the joint strength, I just divide the plug into two pieces of differing diameters, one in the upper-half layer and the other in the lower-half layer. Now that vertical joint is supported by an adjacent horizontal joint (Fig. 6).

This is my solution to the vessel base movement problem. At least it’s worked for me. Since adopting this technique, I’ve yet to see another crack develop in any of my vessel bottoms.

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Bill Kandler
Board Member-at-Large
Arroyo Grande CA

Bill Kandler used to tell computers what to do. Now he cuts up perfectly good planks of wood into little pieces, glues them back together into rings, stacks them, and turns them. Seem to be the only person afflicted with this “segmented” thing.
a different way of sanding

I think most segmented woodturners know that, to get perfect joints between segments, we need to sand the joining faces of all segments. And I suspect most of us use a disc sander to sand those faces.

In this article, I explain how I came up with a different way - and I think better way - of sanding those segments. Figure 1 shows the way I used to sand the faces of my segments. Here you see my sled with a jig precisely cut and sanded to 60 degrees (or whatever angle you need). The jig rides tight along the fence of the sled while the segment being sanded is between the jig and sanding disc.

With this method, you need to hold the segment tight to the sled, the jig, and the fence while making sure the jig stays tight to the sled’s fence (Fig. 2). While you’re doing all this, you also have to move the sled back and forth across the sanding disc. Although it sounds daunting, it’s not that difficult after a little practice. I found, however, that occasionally, without my knowing it, a segment would shift or rotate very slightly and the resulting segment face would have a very slight rounding. When you put it against another segment and hold it to the light, you can see light between the segment pieces, resulting in not a very good joint. This was especially true with segments having wider faces.

Also, when sanding segments in this manner, after sanding the first face you are required to flip the segment over to sand the other face. If the top and bottom of the segment are not perfectly parallel, the two faces will not be parallel. They may be sanded to the correct angle (for the number of segments in your ring), but their vertical angle will not be the same. Yes, I know - you can fix this problem by either running the stock through a planer or thickness sander before cutting, or you can flip every other segment before gluing - but I thought there had to be a better way.

So after a little thinking I developed a couple of jigs to help me overcome these two issues. I was looking for a jig or two that would not force me to have to hold the segment in three or four different directions at the same time during the sanding process and would not require that the segment be flipped to sand the second face.

Fig. 3 shows the first jig I developed. It’s used to sand the left face of a segment or Face 1 in Fig. 4. This jig happens to have an angle of 15 degrees (for a ring with 12 segments). To sand a segment using this jig, place the back of the segment tight against the angled face of the jig and slightly overhanging the jig’s front edge. Push the jig and segment against the sanding disc while moving the sled back and forth across the sanding disc. Because there
is support behind the back of the segment, there is very little chance of any rounding of the segment face being sanded.

Then, to sand the other segment face (Face 2), I created a second jig (Fig. 5). Figure 6 shows the same jig with the hold-down clamp removed. This jig works very much like the first one. Place Face 1 of the segment (the one already sanded) against the angled face of the jig, again slightly overhanging the jig’s front edge. Use the hold-down clamp to tightly clamp the segment to the jig, preventing it from shifting while the second face is sanded. Slide the sled back and forth across the sanding disc. Again, because there is good support for the segment, there is little chance of any rounding of the face being sanded. And by clamping a stop block to the back of this jig (Fig. 7), you can sand every segment to the exact same dimensions.

These two jigs reduce the chance for rounding of the faces and eliminate the need to flip the segment during the sanding process. So if the top and bottom are not perfectly parallel, it won’t matter. Of course this assumes your disc sander table and the fence of your sled are perfect right angles to the sanding disc.

The one drawback for these two jigs is that they are not trivial to make. I’ve made only one set for an angle of 15 degrees because, whenever possible, I make my rings with 12 segments.

Bill McQuitty, always interested in working with wood, has been segmenting for about 8 years. As a member of the Quad Cities Woodturners (Silvis IL is due west of Chicago, on the Mississippi River), Bill has made about 60 pieces so far. Visit his website at woodturningdesigns.com.
For the last several years, I have made birdhouse Christmas ornaments for my family as a special treat. Since taking up segmented turning, I decided that this year’s ornament should reflect that. I make about 30 ornaments every year because they have gained in popularity. I’m sharing my construction techniques and pictures as a way to get new segmenters started with a simple, enjoyable project.

I’m going to make a birdhouse with a stave construction body. First, start by cutting and squaring up your lumber. I chose cherry because it is a pleasant wood to look at and easy to work with. I cut the rough lumber to ¾” thick using the bandsaw (Fig. 1).

Next, use a joiner and planer to flatten one face and square up an edge. Than, plane the lumber down to 5/8” thick. Stock preparation is critical to segmented turning. Without flat, square material to start with, it is impossible to create accurate joinery, whether for stave construction or glued-up rings (Fig. 2).

Set up the table saw for ripping. I decided on an 8-sided birdhouse, making the angle 22.5° (360 ÷ number of sides = 45° ÷2 = 22.5° = the angle of the table saw tilt to cut the staves). I use the Wixey (wixey.com) magnetic digital protractor to set the tilt of the saw blade to 0.1° accuracy needed for this work. If you do not have a digital gauge, trial and test fit to ensure accuracy.

Be sure to use a push stick and all appropriate guards. I use an 80 TPI carbide ripping blade, ensuring it is sharp and clean! Dirty, gummed up blades will cut poorly and will leave a poor edge. I can produce a fine enough edge, so I do not sand the pieces before construction. Cut about 10% extra to allow for cracks, splits, and gluing errors.

Make the first cut with the squared-up edge against the rip fence. I discard that piece and flip the stock over, making the next cut. The segment length is ¾”, i.e., the wide part of the segment is ¾”. Repeatedly flip the stock over and make as many pieces as possible until the stock is too small to handle safely. I may make a specialized jig in the future to hold the stock more securely. SAFETY FIRST!! (Fig. 3)

After ripping the stock, I take it to the bandsaw and cut the pieces to 3.5” long. This gives me enough length to grab the body in a chuck for turning later. This could be
done on the table saw or chopsaw, as long as it is done safely (Fig. 4).

Now for the messy part! I cut strips of walnut veneer 3.5” long and .75” wide. Glue a strip of veneer to one side of a stave. After applying an additional amount of glue to the veneer side, line all of the staves up on end and apply 2 hose clamps. I use a battery powered impact wrench with a 5/16” hex driver to tighten the hose clamps. I have found that the impact driver works better than a drill. I let them dry overnight.

To create the base and the finial, take a 2.5”x2.5”x3” piece of walnut and mount it between centers. Turn a tenon 1.5” diameter about 3/16” long on the drive end of the block. This will be glued later into the base of the birdhouse body. The imprint in the tailstock end can be used for alignment and tailstock pressure during glue up (Fig. 5).

Square off one end of the body using a bandsaw. Drill a 3/8” diameter hole about 2” down from the squared-off end. Try to center this in one of the staves. This will be the birdhouse “door.”

Hold the squared-off end of the birdhouse body in a suitable chuck, seating the end solidly on the chuck. Drill a 1.5” hole through the body, almost touching the chuck body. Sand the inside starting with 150 grit sandpaper and progressing to 400 grit. Glue the walnut base/finial piece into the base of the birdhouse body and clamp firmly. Be careful to not split the staves with too much pressure (Fig. 6).

After adequate drying time, turn the body, base, and finial to a pleasing form. I turn the outside diameter of the body and base to 1.75”. Sand the turning to 400 grit or better. Apply a coat of wipe-on finish of your choice (I use shellac or Minwax wipe-on polyurethane). Part off the body (Fig. 7).

Create the roof from a single piece or glued up from different colored woods. Drill a 1.75” diameter hole about 3/8” deep in the end that will be attached to the top of the house body. Grasp the roof in a chuck by expansion into the hole previously. Turn the roof to a pleasing form, leaving enough material at the tip to hold a small eye hook. Sand to 400 grit or better. Apply the finish of your choice. While still on the lathe, drill a 1/32” diameter hole in the tip of the roof for a tiny eye hook (Fig. 8).

Gently screw in the eye hook. Remove the roof from the chuck. Glue the roof onto the body (Fig. 9). Prepare to see smiles and get hugs next Christmas.

The possibilities for variations on the roof, base, and finial are endless. Have fun. •
I’m sure many of you have been busy creating “segmented” gifts - I know that I have.

I’d like to thank John Jaworowicz, Bill Kandler, and Bill McQuitty for the articles in this issue of our newsletter – nice job! I’d like to encourage more members to submit something to Sharon Bieman (our editor). Your submission does not have to be a long detailed “how to” article—it can be a simple tip that you think would be interesting to your fellow segmenters.

If you look closely at the photo on page 9, you’ll notice my new shirt that shows off our logo. Sharon has established an account with Lands’ End, and this is a sample of what’s available. If you haven’t already max’d your credit cards, you might consider visiting our Lands’ End e-Store. Information and some shopping tips are available on page 9. Thanks, Sharon.

Our next segmenting symposium will be November 11-14, 2010 at Arrowmont in Gatlinburg TN. We are still working out the details (demonstrators, costs, etc.), but we hope to make a complete announcement in just a few weeks.

Here’s wishing that Santa delivered all the tools you asked for.
appeal for newsletter content

Please forward tips and articles for the newsletter ...

Sharon Bieman
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Birdhouse Ornaments
by Don Leman, Columbus OH
donleman.com
See related story by John Jaworowicz on page 6.

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