

Enter the octagon

OLD-WORLD EXERCISE HONES HAND-TOOL SKILLS

BY MICHAEL CULLEN

Making the octagon was the final exercise of the first segment of the year at Leeds Design Workshops in Massachusetts, where I trained to be a furniture maker. Up to that point, the class had focused solely on tool preparation, sharpening, and hand-tool skills through a series of core exercises. It was the culmination of everything we had learned to that point: a test to see if one could cut straight and plane true without hesitation or flaw.



We had all seen the octagon in the Barnsley book—that black-and-white photo of Edward Barnsley and several students standing by the bench as lead craftsman George Taylor deftly defined the facets of the octagon. Our teacher, David Powell, had worked in Edward Barnsley's

FLATTEN THE FACES



First face. A jointer plane used along the grain, then at 45° to it, flattens the face (above). Cullen frequently uses the plane as a straightedge to check his progress toward flatness (right).



Erase the roughness. Without worrying about squareness, Cullen quickly planes the edges clean to prepare for the pencil lines.



Preliminary pencil work. With the first face flat, Cullen marks the edges with a pencil gauge, placing the line $\frac{3}{8}$ in. over final thickness.



Tune it with a smoother. After flattening the second face and waiting a day to let the blank move, take it to final thickness and flatness with a smoothing plane, working to a cutting-gauge line.



Be a tough critic. Cullen tests final flatness with a straightedge, checking along the grain, across it, and diagonally.

workshop in England in the early 1950s, and we were at Leeds to learn the same set of skills. The successful execution of that simple-looking octagon provided the confidence to begin making entire pieces of furniture by hand.

I use the same octagon exercise as the culmination of hand-tool training for my apprentices and students. Making the octagon tests everything from material selection and careful layout to tool preparation, blade sharpening, and sawing and planing skills.

Start with a square

The first step toward the octagon is to make a perfect square. Begin by choosing a roughsawn blank of 4/4 lumber big enough to yield a 12 $\frac{3}{4}$ -in. square. Select a flat board without a lot of figure. Specify all the dimensions you'll aim for in the octagon before you pick up your tools, and stick to them at

SQUARE THE BLANK

each stage. Start by planing one face flat, using a combination of jointer and smoothing planes. Then plane the second face flat and parallel with the first.

It's best to thickness the blank in two stages: First bring it to within $\frac{1}{8}$ in. of the final thickness, and then sticker it and leave it overnight to reach equilibrium. The following day, reflatten the first face, scribe a line around the perimeter, and plane to the line, bringing the blank to final thickness.

Choose a long-grain edge and use a jointer plane to make it flat along its length and square to the faces. Follow this by laying out a line parallel to this edge on the far side of the blank. Saw close to the line to minimize planing—and to practice sawing straight and square. Clean and square up the sawn surface with a plane, and then lay out, saw, and plane the last two edges. At this point you should have a perfectly square blank. Check it with a square and ruler thoroughly to be sure that you do.

On to the octagon

Now lay out the octagon with a compass, making sure each edge is of equal length and corresponding angles measure the same. Once the layout is done, saw off the four corners to create the outline of the octagon. Using a smoother, plane downhill to finalize the four freshly sawn edges. Check your work with a large square, and measure to see that all eight edges are equal.

To lay out the chamfers, use a marking gauge to scribe a line around the perimeter of the blank, defining the bottom edge of the chamfers. Then scribe a line on the top face of the octagon to define the upper edge of the chamfers.

Create the chamfers entirely with a plane, beginning with a smoother and finishing with a block plane. To reduce the risk



The vital reference. With the faces flat and parallel, square up one long-grain edge. This is the reference edge, used to lay out the other edges.



The second side. Using a combination square or a panel gauge, mark a line parallel to the reference edge.



Find the line. Cullen counsels sawing close to the line to develop confidence and to save time in planing. He uses a crosscut saw for this rip because it cuts so cleanly.



Refine the sawn surfaces. With the edges sawn, plane them smooth and square to the faces (above), and check for flatness with a straightedge (right).



CLIP THE CORNERS



Compass drives the layout. Find the square's centerpoint by drawing diagonals corner to corner. Then set a compass to span the distance from one corner to the centerpoint.



Two ticks. Using that compass setting, make two marks from each corner to define the octagon's facets.



Define the facets. Connect the compass tick marks with a straightedge.



Saw the facets. Saw the four facets, being sure to cut downhill to limit tearout.



Plane them perfect. Fine-tune the corner facets with a smoother (top), checking squareness to the face (above left) and squareness to each other (above right). Also, measure the facets to be sure they are all equal in length.

CREATE THE CHAMFERS



Scribed layout. After scribing a baseline for the chamfer around the perimeter of the octagon, establish the chamfer's upper limit with a marking gauge.



Start skinny. Cut the chamfer with a smoothing plane, broadening out from a narrow band. Propping one edge of the workpiece on a scrap presents a less angled surface for planing.

of tearout, it's best to plane the end-grain chamfers first. If your handplaning skills are particularly good, you might plane the surface flat and to the line entirely with a smoother.

The completed octagon should appear as nearly perfect as possible, without flaws from planing or sawing. There should be no tearout or ridges left from incorrect setting of the iron. All dimensions should be checked for exact measurement, and all the angles should be equal. Most important, every plane on the piece should be dead-flat in all directions.

When you've finished your octagon, you might keep it in the shop as a symbol of hand-skill accomplishment—or do as the Barnsleys did and put it to use as a bread board. □

Michael Cullen studied at Leeds Design Workshops in 1986-88.



No crowning. Check with a straightedge to see that the chamfer is dead-flat in all directions.



Tune the arris. With your last plane passes, be sure to bring the line between neighboring chamfers into alignment with the line between the edge facets below.