master class

Make an elliptical tabletop

BY CHRIS GOCHNOUR

Between the practicality of a rectangular top and the elegance of a circular one lies the elliptical tabletop. Stretching out a circle into an ellipse increases the usable space around a table while maintaining the beauty of a fair curve. It's why I used one on the Shaker-inspired gate-leg table project (pp. 30–37).

An elliptical top can be more difficult to make than a rectangular or circular one, but this jig takes all the pain out of it. It's similar to a circle-routing jig, but instead of swinging around a single point to create a circle, it uses two points to create an ellipse. Two guides, attached to a trammel arm, ride in grooves cut into the jig's base. As you walk the router around the base, the guides slide in the grooves, and move the

trammel arm in an elliptical path. Once the jig is made, there's no layout or complicated setup to make an elliptical tabletop.

Because I don't want to screw the jig to my top, I use the jig to rout a template, and then I use the template to make the top.

Router jig is easy to make

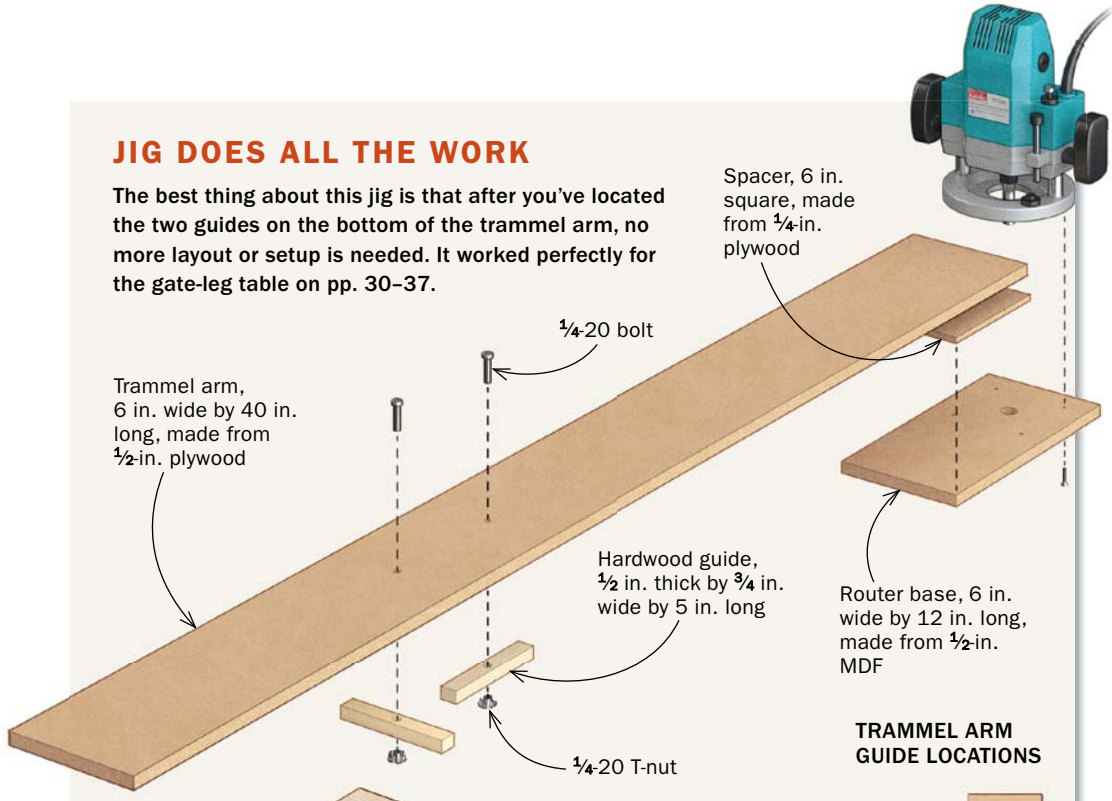
The most important step in making the jig is locating the guides accurately on the trammel arm, because this determines the ellipse's length and width.

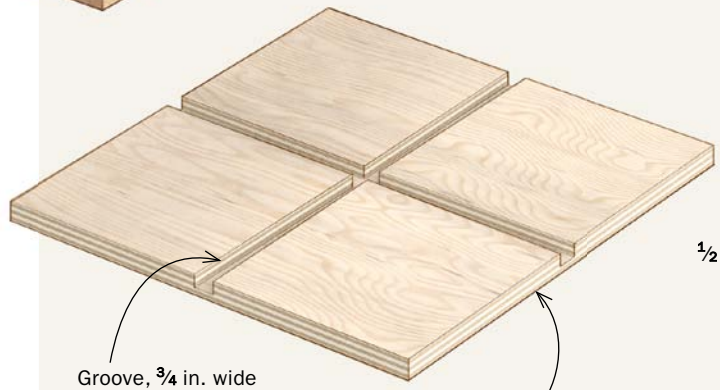
Make the trammel arm first. It holds the router base and two guides. After cutting all the parts to their final dimensions, drill the router base to hold your router. Then drill a hole for the bit. Glue a ¼-in.-thick spacer to the bottom of the trammel arm, and then glue the router base to the spacer.

Chuck a ⅜-in. straight or spiral bit into the router, then attach the router to the trammel arm. Now attach the two guides. Measure from the cutting edge of the bit down the jig's centerline. The distance from the bit to the center of the first guide is half the width of the ellipse. The distance for

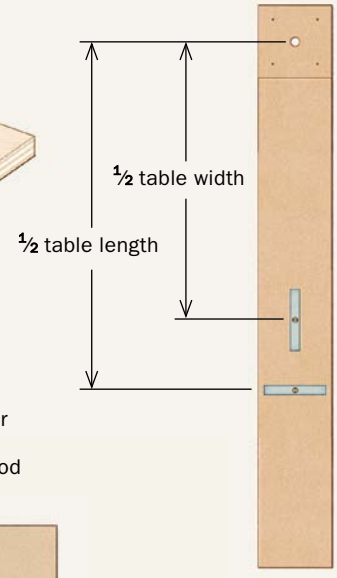
JIG DOES ALL THE WORK

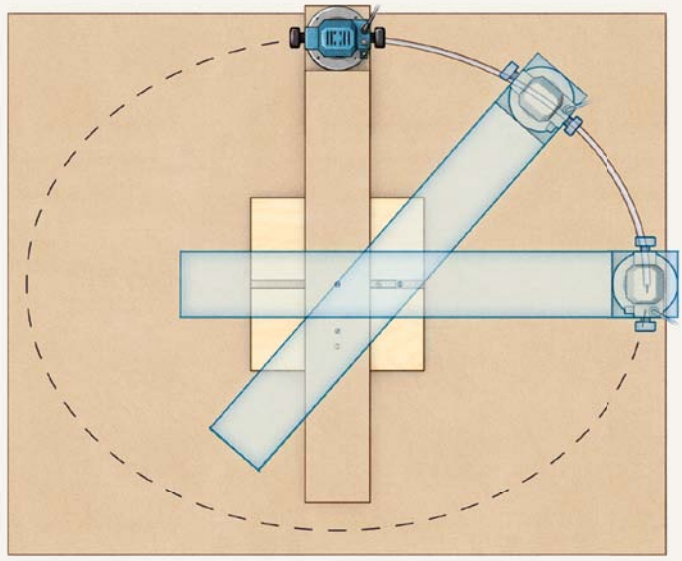
The best thing about this jig is that after you've located the two guides on the bottom of the trammel arm, no more layout or setup is needed. It worked perfectly for the gate-leg table on pp. 30–37.





TRAMMEL ARM GUIDE LOCATIONS





FREE-SPINNING GUIDES ARE THE SECRET

Unlike a circle-routing jig, which has a single, fixed centerpoint, this jig for ellipses has two anchor points (because ellipses have two foci). Guides attached at these points travel in the base's two grooves, resulting in an elliptical cutting path.

Photos: Matt Kenney; drawings: John Hartman

MAKE THE TRAMMEL ARM

Glue the router base to the arm. *Because it's made from ½-in. MDF, Gochnour uses a ¼-in. plywood spacer between the base and arm (top). The ¾-in. height equals the thickness of the base that guides the arm's elliptical travel. You'll need longer screws to get through the MDF and still have good purchase in the router's base (above).*

Guides control the trammel's travel. *They fit into grooves in the base that you'll make next and keep the arm on an elliptical path. Measuring from the bit's cutting edge, locate the first guide half the table's width away, and the second guide half the table's length away (left). Tap T-nuts into the guides, and then bolt the guides to the arm (right).*

MAKE THE BASE

Cut tracks at the tablesaw. *Start with a square base and then cut two grooves for the guides. The grooves must be perpendicular to one another. Use a dado set, and cut to final depth in a single pass guided by the rip fence (top). Screw down the jig base (above). Centerlines drawn on the base align with centerlines on the MDF blank for the template.*

the second guide is half the length of the ellipse. Drill a clearance hole at these two locations for the bolts used to attach the guides. Bolt the guides to the arm.

Next, make the jig's base. Its size is determined by the top's dimensions. Cut two grooves in its top face, centered on the sides and intersecting at 90°. Now you're ready to use the jig.

Make a template for the top

To ensure a smooth ellipse, the jig's base must be screwed down. I don't want four screw holes on the underside of the tabletop, and I bet you don't either. So I use the jig to make a template for the top, then I clamp the template in place and rout the top flush to it.

Screw the base to a piece of MDF. Put the trammel arm on the base, and rout the template. Cut through the MDF in a single pass with a slow, steady feed rate. It's best not to stop during the cut, because this can introduce small bumps into

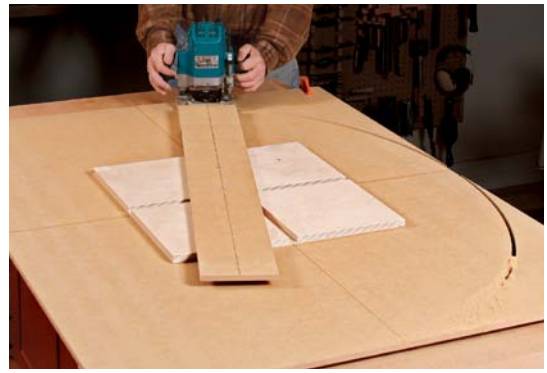
the template. There really isn't more to it than that, because the jig keeps the router on an elliptical path.

After routing the template, trace it onto the top. Cut away the waste with a jigsaw. The entire line is on waste material, so you can cut next to it and still have material left to rout.

Clamp the template to the top in the same orientation as when you traced it. To minimize tearout, rout one quarter of the ellipse at a time, working from the top's widest point down to the center of its length. You can rout two quarters with the template on top. For the other two quarters, the template needs to be on the bottom. After the routing is done, you have a beautiful elliptical tabletop. □

Contributing editor Chris Gochnour is a professional furniture maker near Salt Lake City.

START BY MAKING A TEMPLATE



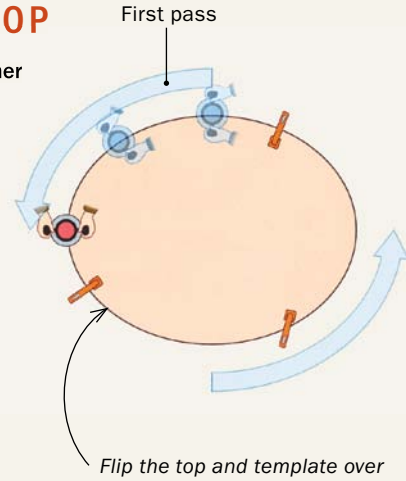
Put the trammel arm on the base. *The guide farthest from the bit fits into the track that's perpendicular to the template's length. The other guide fits into the other track (left). With the bit set to cut all the way through the MDF in a single pass—raise the MDF off the bench to allow for clearance—simply walk around the top. The jig ensures that the router travels an elliptical path (right).*

Trace the template on the real top. *Hand pressure is enough to hold it still at this stage. However, place an X on the template and a matching one on the top so that the template goes back on in the same orientation when it's time to rout. Cut away the waste. Don't leave too much waste—just the pencil line is enough.*

USE THE TEMPLATE TO MAKE THE TOP

At this point, making the elliptical top is no different from any other pattern-routing job, but you'll need top- and bottom-bearing trim bits, or a single bit with a bearing above and below the cutters.

Always rout downhill. *Start at the widest point and work toward the end. You can rout two sections with the template above the top (left). Flip the top and template over to rout the other two (below).*



One bit makes all the cuts. *It can be used with the template above or below the top.*