AN ELLIPTICAL TABLE

Building a small table with Greene and Greene design details

BY DARRELL W. PEART

It has been said of art (and furniture design) that only its arrangement is new. In other words, everything has been done before, and it's only which elements we bring together and how we compose them that make a design unique. This is true of Greene and Greene furniture—Charles Greene developed a cohesive style by borrowing design elements from a variety of often unrelated sources. His work was always fluid, never static. Each house (and for that matter, each room) was an opportunity for a new arrangement of existing design elements and the introduction of new ones. The Greenes never repeated a single design for more than one setting. Every project was a new challenge to further explore and expand their repertoire.

This was in mind when I designed this small Greene and Greene-inspired table.

One of two most prominent features of this design is its elliptical top. Elliptical tops are not new to the Greene and Greene vocabulary; an obvious example is the Thorsen living room table. What is different about this top, though, is its lack of applied edging, which was common to most Greene and Greene round or elliptical tops.

There are methods that approximate the elliptical shape, but the curve of this table top is a true ellipse. There is a magic in the true ellipse that simply does not exist in other shapes. Something intrinsic to its continuously changing radius is deeply satisfying.

The other major feature is the six-legged faceted base. This too is not new to Greene and Greene, but its application is. The Ford and Thorsen dining tables had faceted bases, but the angles producing the facets were hidden in the tenons, leaving the face of the legs flat. In this design the legs are angled instead of the tenons. This produces a distinct line that accents the angle, much like you might find in a Gothic corner cabinet.

GETTING STARTED

To produce the angles on the legs, they are made in two pieces, ripped at an angle and then joined together. So that the two leg halves blend together and give the illusion of one solid piece, I chose the relatively straight, consistent grain pattern of ribbon African mahogany.

To start with, blank out the material for the legs and mill to size, taking care to keep the pieces very flat and square. Next, pair the pieces up, matching for grain pattern. With this many pieces it is essential to have a marking system that will instantly tell you the position and orientation of each part. I have my own marking system which you may wish to follow. Start by numbering each pair, then putting an arrow on each piece indicating "up." I next mark an "X" on the sides that will later be ripped to an angle, and I put an "O" on the sides that will be mortised.

EBONY PLUG HOLES

The 1/4" x 1/4" square holes for the ebony plugs can now be machined. The method I will describe here should ensure consistent crisp holes.

First, mark the position of the holes with center lines. Draw the 1/4" squares with a plastic drafting template, using the center lines for reference (**1**). With a 7/32" brad point bit chucked in a drillpress, drill out the center of each square to a depth of 5/16". Square the holes up by hand, using either a 1/4" chisel or a 1/4" square chisel from a hollow chisel mortising set (**2**). The hollow chisels are readily available from various suppliers and are very handy for this work. However, it is absolutely essential that they be as sharp as possible. Fine-grit diamond honing cones are available from Rockler that will produce great results. Don't forget to hone the outside surface as well. Use a small hand chisel to remove any material not removed with the hollow chisel.

LEG MORTISES

The legs can be mortised next. I am a big fan of floating tenons. They are relatively easy to do, exceptionally forgiving and very strong. I normally use a Multi-router for my mortises, but since Multi-routers are not a common tool, for this article I will use a plunge router and routing jig. If you have any one of the many router/mortising systems, by all means use it.

The routing jig is basically a platform consisting of two pieces of 3/4" MDF joined by 5/8" strips between them (**3**). The spaces between the 5/8" strips form the two slots for the router template guide to ride in. Make the 5/8" strip a few thousands more than the width of the template guide—just enough so the template guide moves freely but without slop.

Attach a piece of 1" x 3" x 19" to the underside of the jig to register the position of the leg and for clamping the leg to the jig (**4**). The registration/clamping block will need to be screwed to one side of the routing slots for half the parts, then removed and screwed to the other side of the routing slots to register the other half of the leg parts.

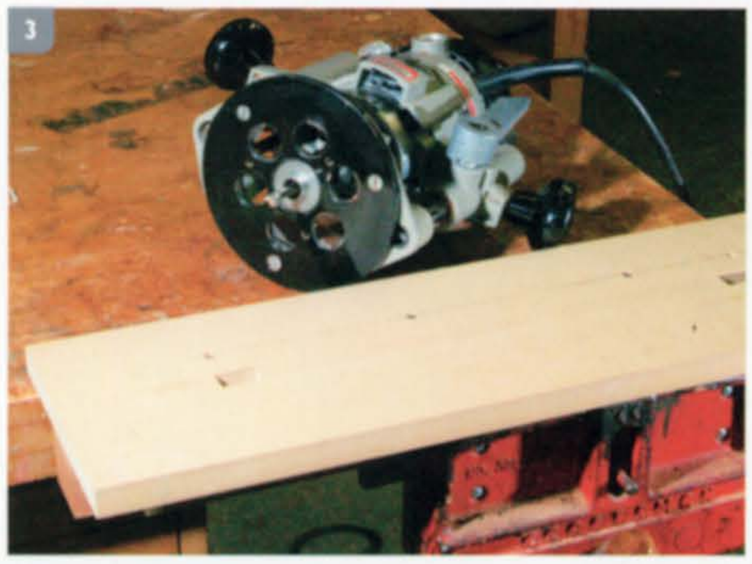
With the jig construction complete, clamp the leg part and the jig in a bench vise and rout to a depth of 9/16", using a plunge router with an 3/8" up-cut spiral bit and a 5/8" template guide (**5**). Make the mortises in several passes.

LEG ANGLES

In order for the base to mimic the elliptical shape of the top, two of the six legs will have a different angle than the other four.

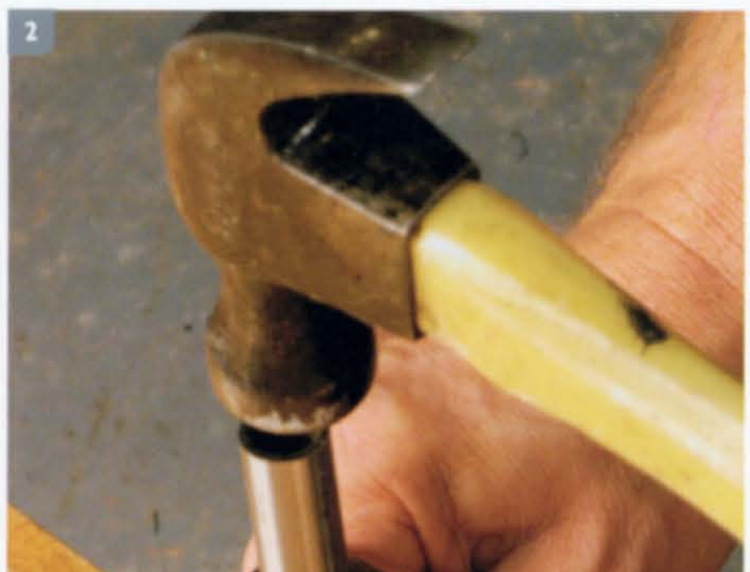
It is important to be as accurate as possible when laying out and machining the angles. With six legs (and twelve pieces) a

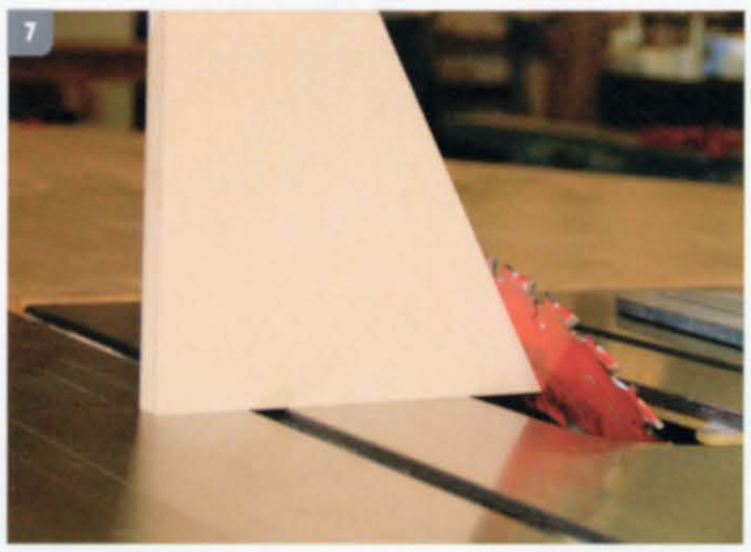
PHOTOS BY DARRELL PEART



small inaccuracy can accumulate to an unacceptable gap in the end product.

Both of the angles needed are odd fractions of a degree, but there is a straightforward way to create them precisely without the use of a protractor, though I find an





Incra 12" Precision T-Rule extremely helpful for accurately marking the lines needed to create these angles. First, cut out two pieces of 3/4" MDF to about 9" x 12". The first angle we need to create is 55.261°. With a sharp pencil (5mm lead) mark a line across one of the MDF pieces 10-1/2" from the edge. From the adjacent edge mark another line 7-9/32" from that edge. Draw a line from the common corner of the two edges to the point where the two lines intersect (**see drawing**). This line will produce the 55.261° angle needed. Bandsaw close to the line, then attach a straightedge to the MDF exactly on the line. Using a router with a flush trim bit, rout to the line (**6**). Now, use this triangular piece of MDF to set the angle on your tablesaw (**7**).

Rip four sets of paired legs (8 leg pieces) to this angle. The leg blanks are close to the same size in thickness and width (1-1/2" x 1-9/16"), so refer to your markings to orient the piece as it is ripped. Also note that the finished face of one leg half (prior to joining together) is 1-7/16". The blank is 1-1/2", which leaves 1 /16" to be trimmed off the face in the angle-ripping process. A note on safety here: ripping long narrow stock can be dangerous, so use a push stick and featherboard for better control.

The angle for the other two legs can be done in a similar fashion. Repeat the layout process to create a second triangle, but to get the required angle of 69.477°, draw the first line at 10-1/2" and the second line at 3-15/16" (**see drawing**).

GLUING THE TWO LEG HALVES

Gluing the leg halves together is a relatively simple procedure. Lay the paired parts face up. It may be helpful to support the two pieces with shims that keep them together. Run a line of clear packaging tape down the seam, trying to keep the two pieces tightly together. Next run several pieces of tape at right angles to the first piece (**8**).The idea is to stretch these right-angled pieces of tape so there is a fair amount of tension holding the two halves together. Turn the assembly over so it is face down on the bench. Spread a light amount of glue on the surfaces to be joined. Don't worry about squeeze-out—it will be easy to clean up later. Pull the pieces together. You should feel the tension from the tape on the face side. Stretch tape across the back side to pull the leg parts tightly together (**9**), and let dry for at least an hour. Repeat this process with all six leg pairs. Be very cautious when removing the tape as it is easy to peel up long slivers of wood with the tape. The sooner the tape is removed after the glue has cured the less chance of pulling up slivers.

To finish the legs, place them face up on the jointer. Make repeated shallow passes until the "points" are removed and the back side is flat (**10, 11**).

Put a 1/8" radius on all the corners of the leg. The seam joint corner can be lightly rounded over using 120-grit sandpaper and a cork-lined sanding block. Finish sand the legs to 220-grit and set them aside.

THE APRONS AND LOWER STRETCHERS

Mill the aprons and lower stretchers to the specified size. Referring to the photos and drawing, make a routing template for the mortises along the same lines as for the legs (**12**). The mortising procedure is also the same as with the legs, using a 3/8" up-cut spiral cutter and a 5/8" template guide. The difference this time is the mortises will be routed into end grain. When routing the narrow stretchers, it helps to capture them with wider scrap material of the same thickness (**13**). It can be a bit tricky correctly aligning and clamping the narrow stretchers in the routing template, so work carefully.

Next, make the MDF routing templates for the cloud-lifts (**see drawing**). A spindle sander helps greatly in maintaining the true shape of the template's radii. Once the templates are machined to shape, attach stops and De-Sta-Co clamps for hold-downs (**14**).

Bandsaw most of the waste, then secure the stock in the template with the clamps. Working on the router table, rout to the template using a flush trim bit with a top-mounted bearing (**15**).

Clean up any burn marks left by the flush trimming operation. Again, a spindle sander works best for cleaning up the radii of the cloud-lifts. Put a 1/8" roundover on the bottom edges of the aprons and on all four exposed corners of the lower stretchers.

Finally, use a biscuit jointer to place a slot 3/8" deep and 1/2" down from the top back side of all the aprons; this will be for the table top fasteners. If a biscuit joiner is not available, simply rip a groove on the tablesaw.

Sand all the aprons and stretchers to 220-grit.

MILL THE TENON STOCK

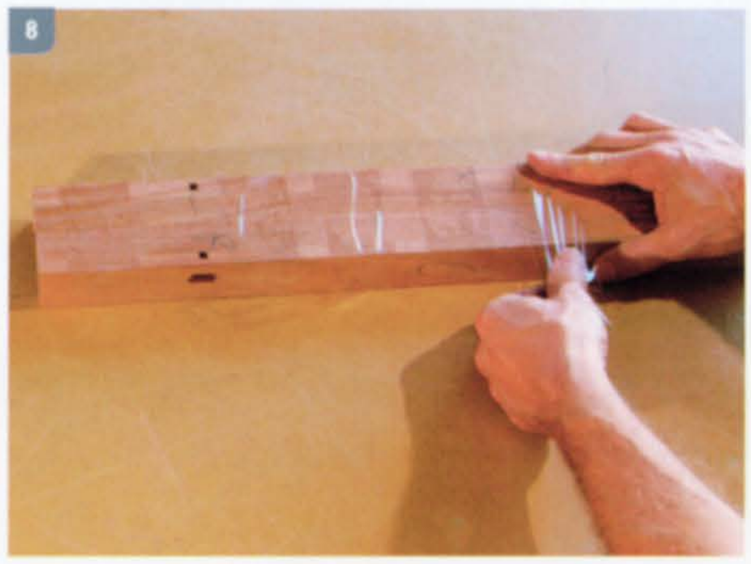
Use the already routed mortises to size the floating tenon stock. Make the width of the tenon stock about 1/16" less than the length of the mortises, and make the thickness a snug press fit in the mortises. Using a router table and fence, put a 3/16" radius on all four long edges of the tenon stock. Cut twelve 1" pieces for both the aprons and the stretchers. Glue the loose tenons into the mortises of the aprons and stretchers (**16**).

GLUING UP THE LEG APRON /STRETCHER ASSEMBLY

The leg apron/stretcher assembly should be glued in two stages. At this point you should have six sets of legs: four of one angle and shape and two of another. For the first stage, gather up the four like legs, along with two aprons and two stretchers.

Pair up two legs with one apron and one stretcher. In order to maintain the correct angle for the second stage glue-up, it is important to keep the face of the legs flat during glue-up. Make a set of four glue blocks that mimic the shape of the legs and provide a parallel clamping surface. It helps prevent damage if the inside face of the blocks are lined with a softer material such as leather. Fit the pieces together in a dry fit prior to applying any glue.

Upon glue-up use a straightedge to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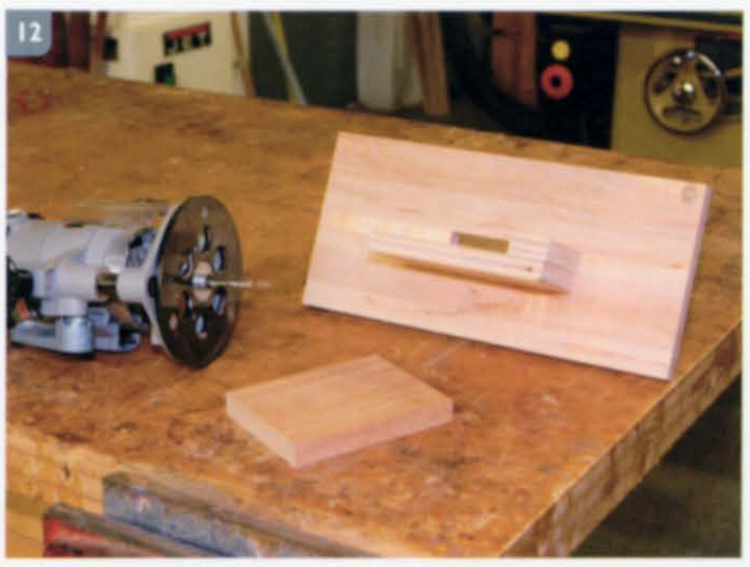
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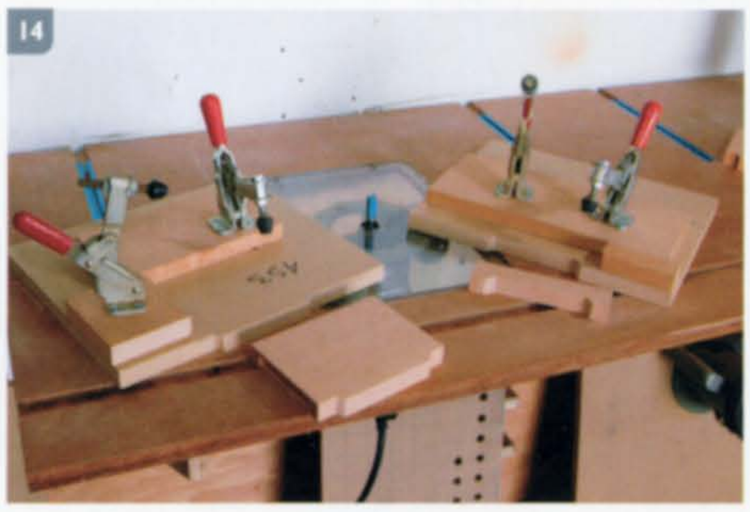
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