

How to Veneer a Sunburst

Dazzling tabletop,
step by step

BY MARK ARNOLD

Veneer can replicate solid lumber, but if you use it only for that purpose, you are missing out on some dazzling design opportunities. One of the most spectacular of these is to arrange consecutive sheets around a center point. Known as a sunburst, this pattern is ideal for circular tabletops. It creates interesting concentric patterns, and the tapered shape of each segment draws the eye from the perimeter toward the center.

If you try this with solid stock it will fail, either from radial splitting caused by shrinkage or from cupping caused by expansion. I'll show you how to work with veneer to create a beautiful sunburst tabletop, from laying out the pattern to cutting and installing the segments. I'll also show how to install a simple border that frames the sunburst. But I don't stop there. For an ornate scalloped edging that will take a sunburst to another level, turn to Master Class (pp. 88-92).

Crotch veneers create stunning effects and are the traditional choice for sunbursts, but plain sliced veneers also yield interesting results. Cross-grain figure works, such as curly and fiddleback, but bird's-eye and burl tend to understate the sunburst effect. For this tabletop, I chose a blistered cherry veneer with an African satinwood border.

Choose an even number of segments

An accurate layout is critical to success. The first step is to decide upon the number of segments in the sunburst pattern. This may be dictated by the size of the veneer sheets you have. The key to good results is to assemble the pattern in small sections first and then join those sections. In this 12-piece sunburst, the

LAY OUT THE SUNBURST

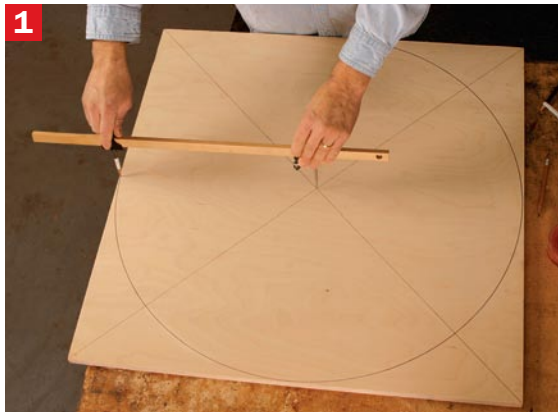
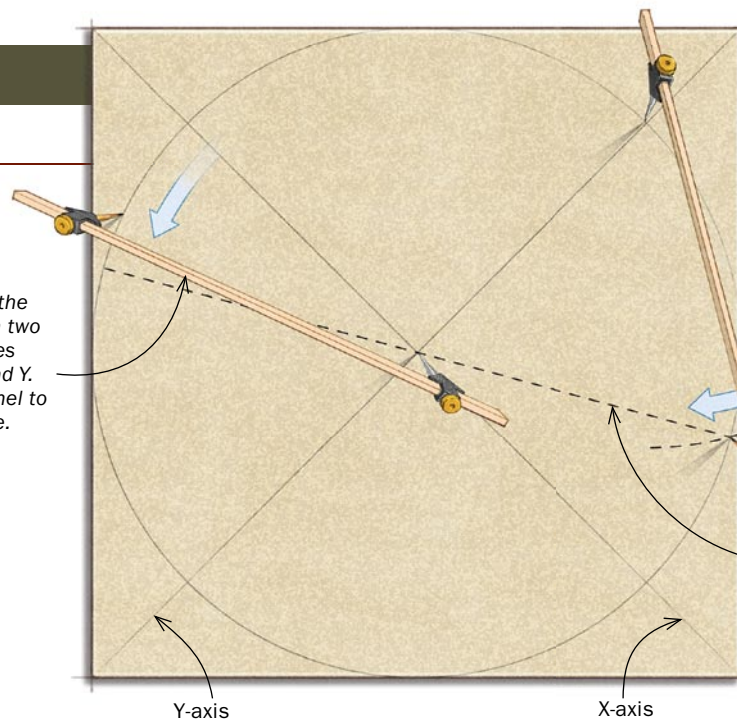
HOW TO DRAW A 12-PIECE PATTERN

Begin with a perfectly square piece of plywood or MDF. Draw lines from opposite corners, then use a trammel to draw a circle slightly larger than the desired circumference (1). Without adjusting the trammel, place the point where one of the diagonals, or axes, meets the circumference, sweep the pencil in an arc, and mark where it crosses the circumference on either side (2). Repeat this on the three other axis points, and then connect each pencil mark with the one diagonally opposite to divide the circle into 12 equal segments (3).

1 Connect the corners with two diagonal lines labeled X and Y. Use a trammel to draw a circle.

2 With the same setting, place the trammel where a diagonal crosses the circle. Mark where the pencil end crosses the circle.

3 Draw in the segment lines from the arc points through the center point.



PREPARE THE VENEER

Make sure that the veneer is flat and dry. Treat it with a veneer-flattening solution such as Rockler's Veneer Glycerin and keep it clamped flat until you are ready to use it. To determine where to cut the veneer, use two mirrors taped along one edge and opened, with the aid of a slice of wood, to 30° (360° divided by 12 segments). Placed over a sheet of veneer, the mirrors give you a preview of the finished sunburst. Find a pleasing pattern, and then faintly trace the outline onto the first sheet. Number the sheets in their correct order in a location that will not be trimmed off later.

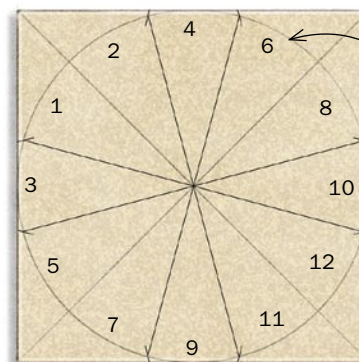


Look in the mirror. Two mirrors angled at 30° preview what the finished sunburst will look like.



Keep the sheets sequence. Number the sheets of veneer in the order they were cut from the log.

HOW TO MINIMIZE THE DIFFERENCE IN GRAIN



Grain and figure change progressively from sheet to sheet. For the best match throughout the sunburst, arrange each numbered segment as shown. In this way, adjacent slices of veneer are never more than two away from each other in the sequence.

ASSEMBLE THE SUNBURST

TAPE THE VENEER SEGMENTS INTO QUARTERS, THEN HALVES

When cutting the sunburst segments to size, the four pieces that adjoin one of the axes are deliberately left oversize. Beginning with these pieces, tape together the three segments in each quarter, flipping and book-matching each alternate piece.

1 Alternate the orientation of adjacent veneers.

U = Upward facing
D = Downward facing

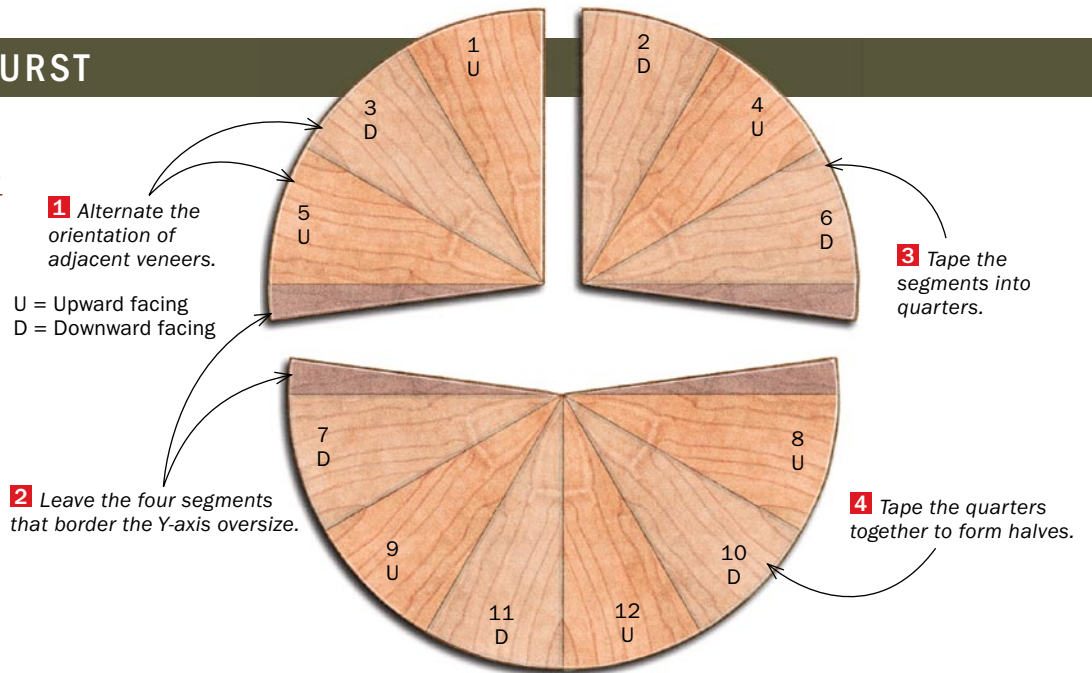
2 Leave the four segments that border the Y-axis oversize.

3 Tape the segments into quarters.

4 Tape the quarters together to form halves.

Online Extra

To see the author tune up a veneer saw and show how to use it, go to FineWoodworking.com/extras.



1 **First cut.** Use a veneer saw guided by a straight-edged fence to make the left-hand cut on all 12 sheets of veneer.



2 **Second cut.** Remove the four sheets that border the Y-axis, leaving them oversize for now. Flip the remaining sheets and align them with the left-hand side of the template. Then make the left-hand cut on the segments.



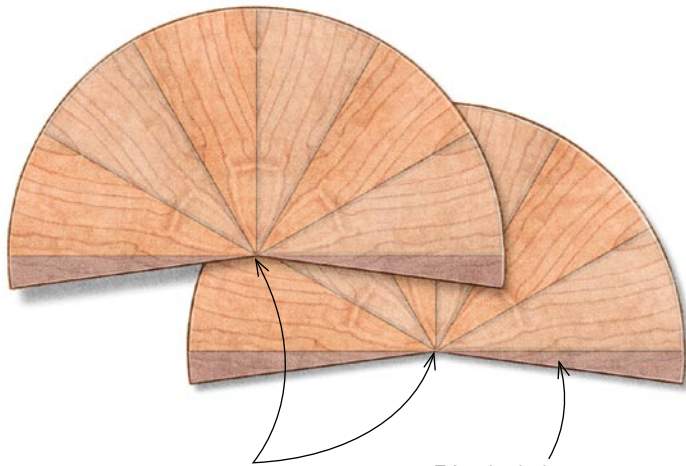
3 **Quarter by quarter.** Beginning with an oversize segment, use masking tape to assemble each quarter, flipping and book-matching alternate segments.



4 **Two halves completed.** Join adjacent quarters to form two halves that extend about 190°.

THEN TAPE THE TWO HALVES TOGETHER

Finally, align the points of the two halves and their center seams, cut away the surplus from the four oversize segments (shaded), and tape the sunburst together.



The two halves are aligned using the center points and seams of the segments.

Trim the halves using a straightedge as a guide.

total number of segments is divisible by four, so I'll assemble the pattern in quarters first. An eight- or 16-piece design can be created using the same basic layout.

Sunbursts with an even number of segments not divisible by four must be assembled in halves, each with an odd number of segments. Whatever method you choose, for best grain and color match, you'll need a stack of veneer sheets that were sequentially sliced.

Make sure the veneer is wide enough—Before you lay out the pattern on the substrate, make sure the veneer will fit the pattern. Divide the circumference of the sunburst you want to create by the desired number of segments to find out how wide each sheet must be. In this case, the top has a diameter (D) of 30 in. The formula for the circumference (C) of a circle is $C=\pi D$, so the circumference of the table is slightly more than 94 in. ($30 \times 3.14 = 94.2$). Each segment of a 12-piece sunburst will therefore need to be 7.864 in. wide, or about $7\frac{7}{8}$ in.

Lay out the pattern and cut the veneer

Sketch the sunburst pattern on the substrate to use as a template. I use $\frac{3}{4}$ -in.-thick Baltic-birch plywood, but MDF or stable, quartersawn solid wood is also acceptable. Cut the substrate to an exact square, slightly larger than the intended final diameter of the tabletop. Draw out the sunburst pattern as shown in the drawings on p. 73.

Use sequentially cut veneer—Number the veneer sheets in the order they were sliced from the log. Then number the segments on the template as shown on p. 73. In this way, no adjacent pieces of veneer will be more than two sheets from one another as sliced from the flitch. No stack of veneers is identical from the first piece to the last, so if you simply lay them out clockwise, the first and last sheets would likely be noticeably mismatched along their seam. To help make accurate cuts, use a $\frac{3}{4}$ -in. MDF template



Cut the halves. Place the halves together with the taped sides facing each other. Align the tips and the central seam of each half. Place a fence across the top aligned with the tips and saw through both halves.



Complete the sunburst. Use masking tape to join the halves into the finished sunburst.



Apply veneer tape. Flip over the sunburst and apply strips of veneer tape to the seams on the show face. Draw the tape over a damp sponge to avoid over-wetting it. When the veneer tape is dry, remove the masking tape from the glue face of the sunburst.

GLUE AND TRIM



Veneer both sides. To avoid the risk of the substrate warping, glue a backing veneer to the underside and press both sides at once.



Bandsaw the top. After the glue dries, use a trammel to redraw the circumference of the table and then bandsaw just outside the line.

cut to the shape of a segment, but a little longer. Double up the MDF to create a fence on one edge (see photos 1 and 2, p. 74). Align the veneer sheets in the same direction. Locate the four pieces that border the Y-axis (Nos. 5, 6, 7, and 8) at the bottom of the stack.

The best way to cut a stack of veneers is with a veneer saw. Because the saw cuts on the pull stroke, start with the stack upside down and cut the left-hand side first to reduce the likelihood of losing a segment tip on the second cut. After the first cut, remove sheets No. 5, 6, 7, and 8, leaving them oversize for now. Align the cut edge of the remaining eight sheets with the far edge of the angled template, and make the second cut to create the 30° segments.

Assemble the sunburst one quarter at a time

Lay the cut segments on the back of the substrate and, using the numbered pie chart as a guide, assemble them into quarters as

ADD THE BORDER

HOW TO ROUT A SHALLOW RECESS



Attach the pivot point. A pivot point is attached with double-faced tape directly over the center of the sunburst. Shine a flashlight through the hole to align it over the center point.



Rabbet for the border. Make a simple trammel to hold the router, attach it to the pivot point, and use a mortising bit to cut a shallow 2-in.-wide rabbet for the border.

shown on p. 74. Begin with a larger piece that overlaps the Y-axis, such as segment 5. Flip over segment 3 so that it forms a mirror image, or book-match, with segment 5. Pull the two segments together with masking tape, making sure the tips align perfectly. This is more critical than a having adjacent halves be perfectly symmetrical. Now connect segment 1, faceup, to segment 3. Repeat the process starting with segment 7 facedown; book-match it to segment 9 faceup, and then add segment 11 facedown. Repeat for the two other quarters.

Once all four quarters are taped up, join the two pairs across the X-axis (segments 1 to 2 and 11 to 12) to create two halves. Next, fold one half over onto the other and align the seams of the two X-axes. Verify that all the segment tips meet at one point, then lay a straightedge across the diameter, perpendicular to the X-axis and aligned to the point where all segment tips meet.

Trim the waste from all four segments at once, open up the two

CUT AND GLUE THE BORDER VENEER



Prepare the sections. Use a trammel to scribe the sunburst curve onto a stack of border veneer.

halves, and attach them with masking tape. Then flip over the sunburst and apply veneer tape to all the seams on the show face. For adhesion, you need to moisten the veneer tape, but don't use too much water or you'll distort the cut seam. Instead, pull the tape across a damp sponge, then apply it. Allow the veneer tape to dry, then remove all the masking tape from the opposite face. The sunburst is now ready to be glued to the substrate.

I use Better Bond (www.veneersupplies.com), a polyvinyl acetate (PVA) adhesive formulated to reduce the risk of glue bleeding through the veneer, and apply it with a paint roller. Veneering only one side of the substrate could cause warping, so stabilize it with a backing veneer. Apply adhesive to the underside of the substrate and position the backing veneer perpendicular to the face grain of the plywood. Then flip the panel onto a 3/4-in.-thick MDF caul covered with a sheet of plastic, apply adhesive to the top of the substrate, and center the sunburst face on it, taped side up. Cover the veneer with a sheet of plastic and another MDF caul, and press the stack in a vacuum bag or veneer press for six hours.

A border made from contrasting veneer

A border is a classic way to frame the sunburst veneer. It can either be a simple circle of consistent width, as shown here, or a more ambitious pattern (see Master Class, pp. 88-92).

When the glue has cured, remove the panel from the clamps or vacuum bag, dampen the tape, and peel it away. Much of the remaining work is done referencing off the center of the sunburst. First, use a trammel (with the metal point in a plastic tip to protect the veneer) to draw the circumference of the table on the veneer, and cut just outside the line using a bandsaw. Next, make a pivot block with a hole in it that matches the diameter of the



A clean cut. A plane iron creates a tight seam when joining the sections.



Three at a time. Tape three pieces of veneer together, lay them on the substrate, and place masking tape at both ends to help remove glue squeeze-out.

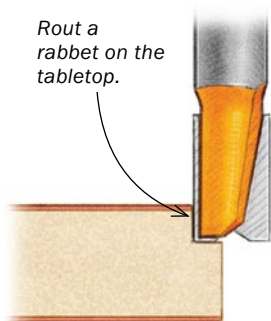


Clamp with a curved caul. After applying glue to the substrate, tape the border to the sunburst to prevent it from moving when clamping pressure is applied.

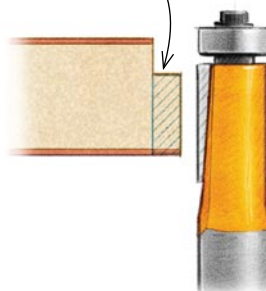
TRIM THE EDGE AND BAND IT

CUT THE CIRCUMFERENCE IN TWO STEPS

Use a straight bit and a trammel-mounted router to make an initial 1/4-in.-deep cut.



A flush-trimming bit completes the table edge.



metal rod or drill bit you intend to use. Align the hole with the center point of the tabletop and attach the block to the top with double-sided tape. Set up a router on a trammel whose pivot point is connected by a metal rod or drill bit to the pivot block. Use a 3/4-in.-dia. mortising bit and set the depth of cut to the thickness of the border veneer. Subtract 2 in. from the intended radius of the finished top, and cut a shallow rabbet from that point to the edge of the top. Go clockwise on all passes to minimize tearout, and keep a firm grasp on the router for this climb cut.

Cut the border veneer into pieces 3 in. wide by a little over 2 in. long, with the grain running perpendicular to the width. Cut enough pieces to go around the tabletop. Mount the trammel point in the center of the pivot block and use the pencil to mark the arc of the sunburst on the stack of border veneer. Use the bandsaw to cut the stack along that mark. Place a piece of scrapwood under the stack to create a zero-clearance surface.

A sharp plane iron is the easiest way to cut the joint between the radial seams of the border, but you can also use a veneer saw. After joining three or four sections together with veneer tape, lay them adjacent to the sunburst (stringing will fill any slight gap) and place masking tape on the substrate at both ends of the border. This will make it much easier to remove glue squeeze-out before adding adjacent sections. Use masking tape to attach the border to the sunburst veneer to prevent it from moving. Apply glue and then clamp the border using a suitably shaped caul.

Work around the top in this fashion.

Once all the border has been applied, use the trammel-mounted router to cut the top to final size. This can be done with a straight-cutting bit in 1/4-in. incre-



Add the edging. Use narrow strips of edge-banding veneer to cover the edge of the tabletop.



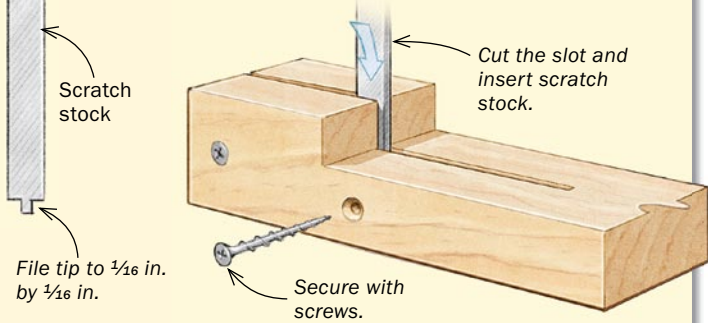
Circle clamp. Apply the edging in short sections and use a band or strap clamp. The large triangular section keeps the clamp jaws off the wood. Note that the section being clamped is along the far edge of the table.

For an alternative border design and technique, see Master Class on pp. 88-92.

ADD STRINGING AND A SOLID CORNER

SCRATCH STOCK CREATES A GROOVE FOR STRINGING

A scratch stock is just a piece of old hacksaw or bandsaw blade with the teeth ground away and a profile filed onto the end. It is held in a simple hardwood block and makes a surprisingly clean cut.



Another trammel. Attach the scratch stock to the pivot point and cut a groove between the sunburst and the border to receive the stringing.

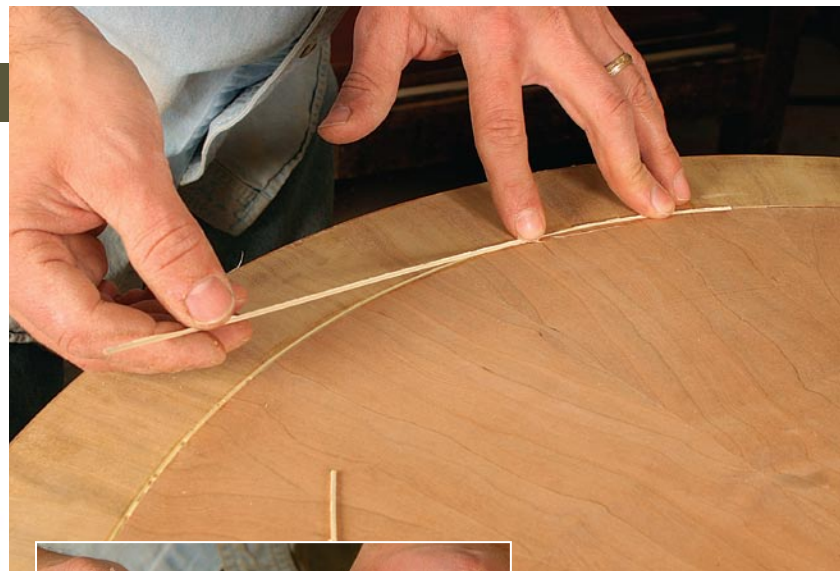
ments, or after the first pass you can go to the router table and trim away the waste using a bearing-guided, flush-trimming bit.

Now wrap the table edge with vertical pieces of the edgebanding veneer. Again, do short sections at a time, place a piece of masking tape at the end to facilitate removing squeeze-out, and use thin strips of wood or bending plywood as cauls. An edgebanding clamp with its steel strapping works best, but you could also employ a nylon strap clamp.

You could use a router to cut the groove for the stringing between the sunburst veneer and the border, but I use a scratch stock indexed to the center point. You could also run it against the table edge. Glue in the stringing and scrape it flush.

To give the vulnerable veneered edge of the tabletop some added protection, I add a thin strip of solid stock. I cut a 1/8-in.-square rabbet in the top corner using the router and trammel and glue in a piece of hard maple. Scrape the edging flush, sand the whole surface, and apply a clear gloss finish to bring out the wood's figure. □

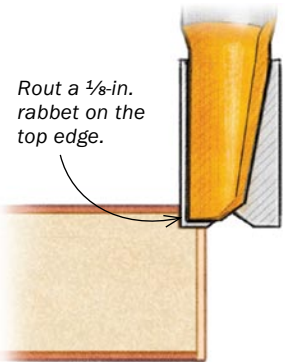
Mark Arnold is the owner of Boston Woodworking in Sunbury, Ohio.



Insert the stringing. Use a syringe to insert glue into the groove, and then add the holly stringing. When the glue has dried, bring the stringing flush with a scraper.



The final cut. Use the trammel-mounted router one last time to cut a 1/8-in.-square rabbet on the top corner of the tabletop.



Rout a 1/8-in. rabbet on the top edge.



Added protection. A strip of hard maple protects the vulnerable veneered edge.

Glue a strip of hardwood into the rabbet.

