Contemporary End Table

The overall form of this table is based primarily on a vintage Danish Modern piece that a student of mine found in an online auction. But there was a second important influence on the design: On a trip to Switzerland a while back, I became intrigued with the construction of a traditional chair with battens dovetailed into the underside of its solid-wood seat and splayed legs that pierce both the batten and the seat. After seeing those chairs, I built a bench using the idea, and when I designed this table, I decided to employ some of that Alpine chair engineering again. I brought the leg tenons right through the tabletop and used sliding dovetailed battens to hold the top flat; the battens also help stabilize the legs and provide the runners for the side-hung drawer.

Because I wanted to make the whole table in solid wood, I gave it a split top whose two halves meet in an unglued tongue-and-groove joint. By allowing the halves of the top to expand and contract independently, I avoided a cross-grain problem with the battens. The split top also solved another problem. I wasn't keen on how visually prominent the dovetailed battens were on the Swiss chairs; making a split top meant I could use sliding dovetails that were stopped at both ends. At assembly, the two halves of the top slide onto the battens until they meet at the middle.

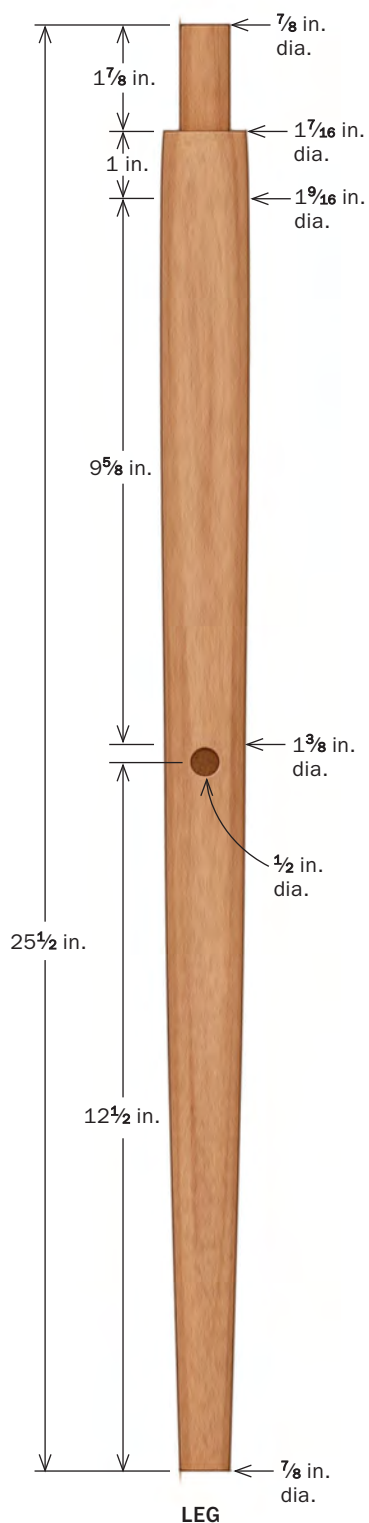## Splayed legs and a split top bring style and stability
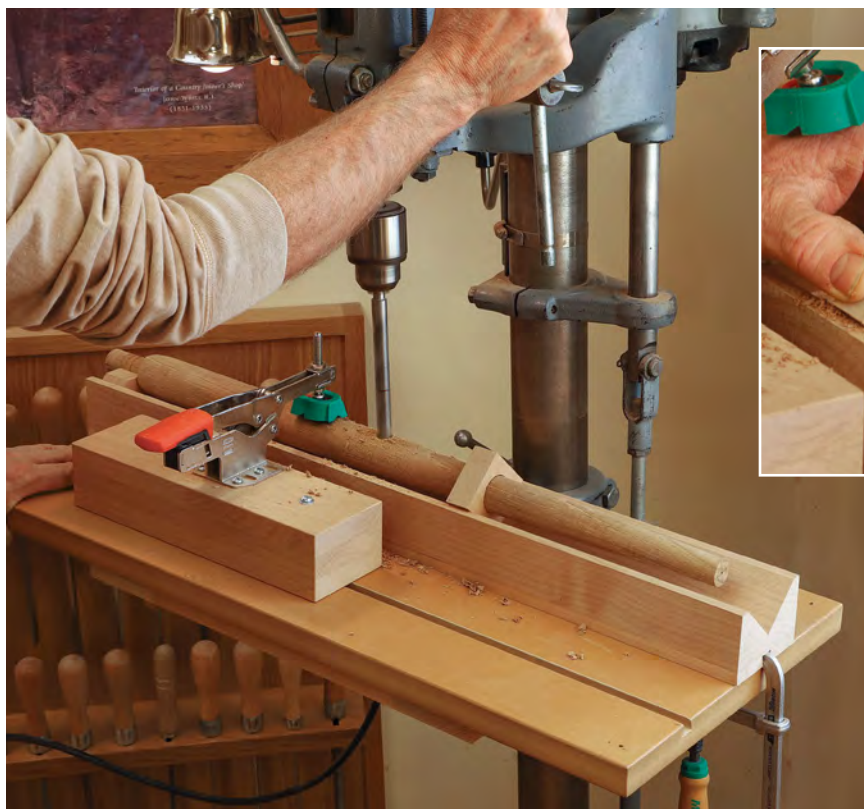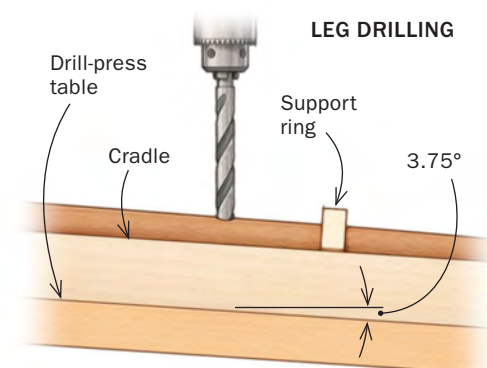
BY CHRIS GOCHNOUR

Make the legs

First turn the tenon. *After making depth cuts with a parting tool at key points along the leg, Gochnour turns the tenon with a bedan, using a wrench for sizing.*

Smooth the taper. *Gochnour turns the leg to a taper with a heavy spindle gouge, then follows up with light sanding.*
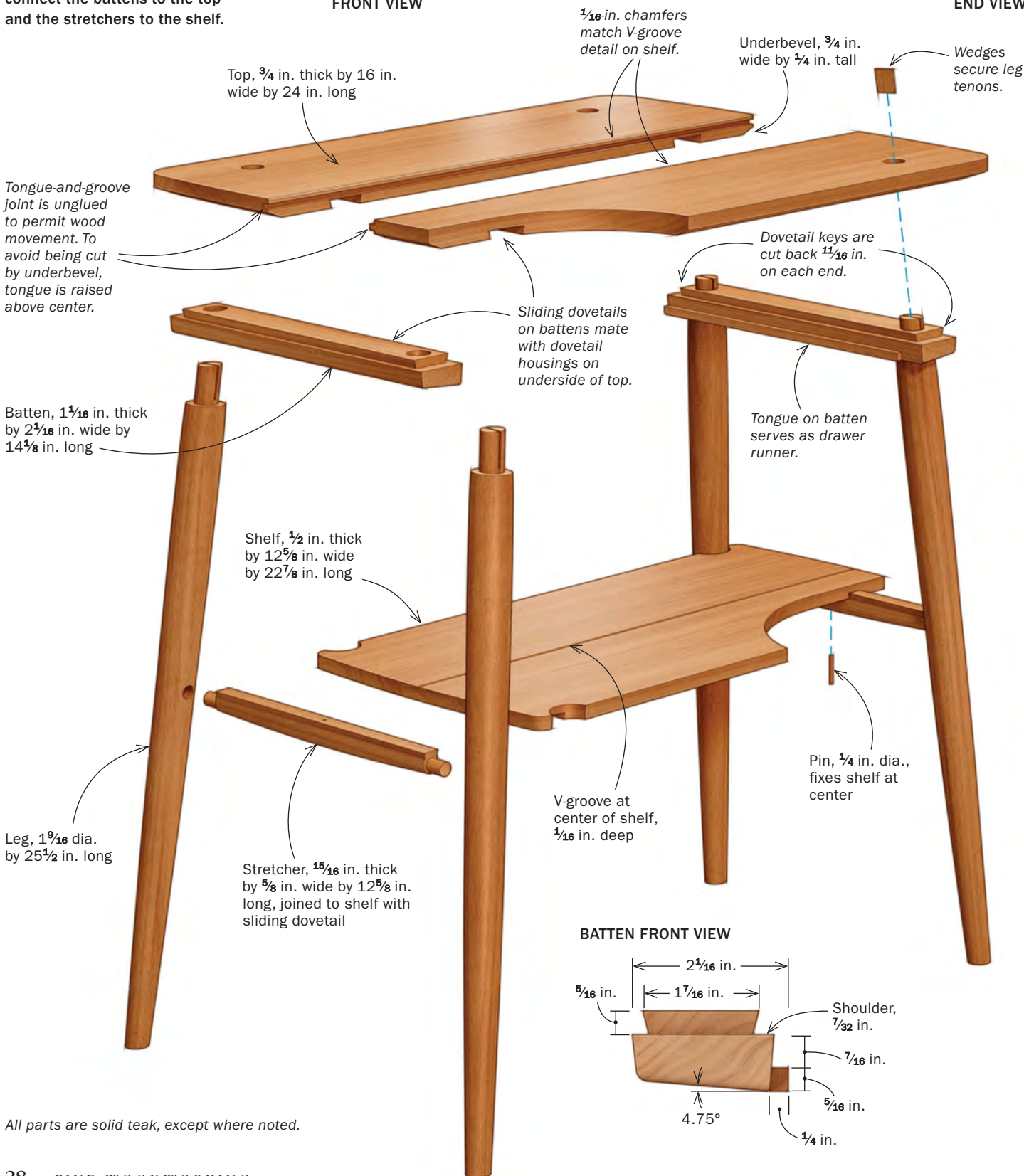

Set the table. *To cut mortises in the legs for the stretchers, Gochnour angles the drill-press table to 3.75°.*

LEG DRILLING

Drill-press table

Support ring

Cradle

3.75°

LEG (diagram, left)

$\frac{7}{8}$ in. dia.

$1\frac{7}{8}$ in.

$1\frac{7}{16}$ in. dia.

1 in.

$1\frac{9}{16}$ in. dia.

$9\frac{5}{8}$ in.

$1\frac{3}{8}$ in. dia.

$\frac{1}{2}$ in. dia.

$25\frac{1}{2}$ in.

$12\frac{1}{2}$ in.

$\frac{7}{8}$ in. dia.

Drilling cradle. *Gochnour uses a V-shaped fixture to cradle the leg for drilling. The square support ring that he threads onto the leg is also useful for setting the drill bit to the centerpoint of the jig.*
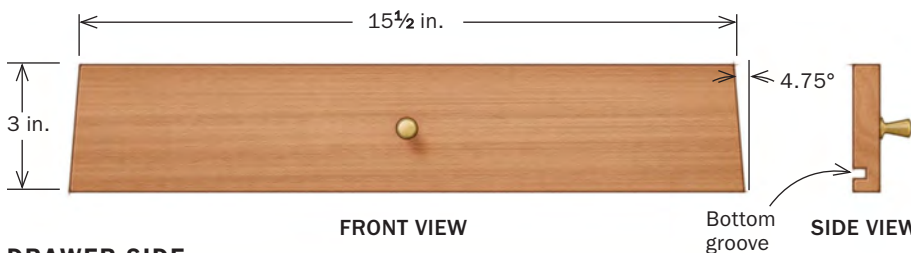
End table

The table's two-part top, with its unglued center joint, can move with the seasons despite being pierced by the leg tenons. Sliding dovetails connect the battens to the top and the stretchers to the shelf.
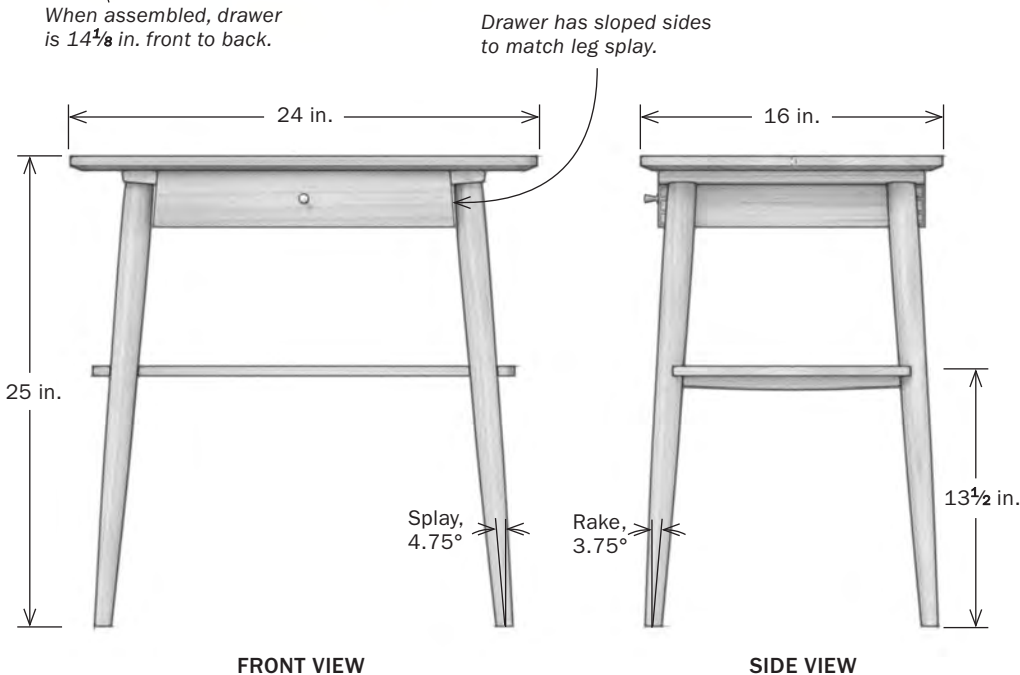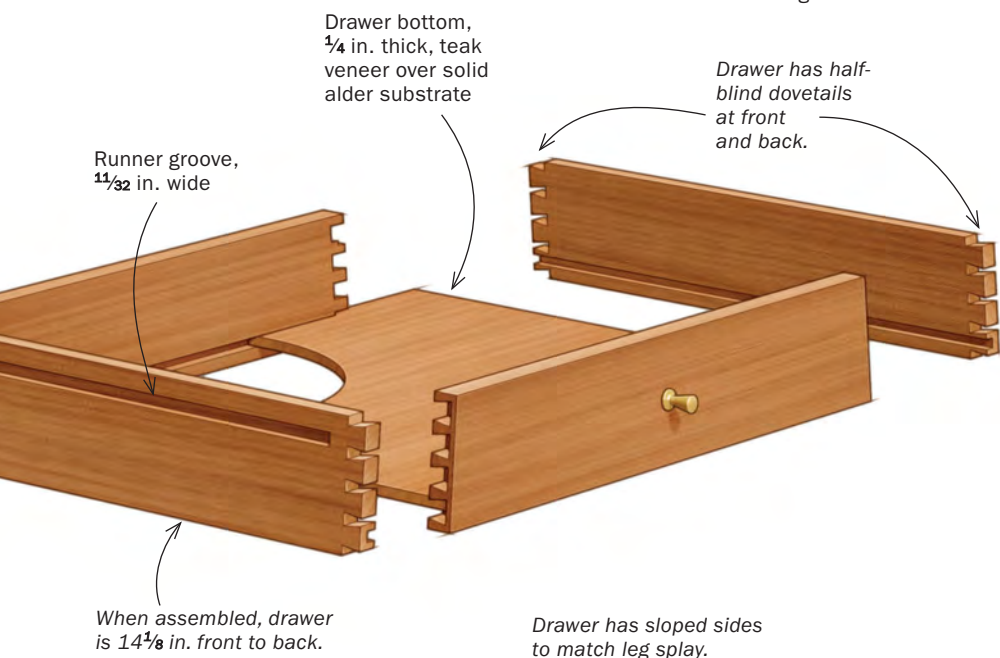
STRETCHER

15/16 in.

25/32 in.

7/32 in.

5/8 in.

3/4 in.

1/2 in.

FRONT VIEW

END VIEW

1/16-in. chamfers match V-groove detail on shelf.

Underbevel, 3/4 in. wide by 1/4 in. tall

Wedges secure leg tenons.

Top, 3/4 in. thick by 16 in. wide by 24 in. long

Tongue-and-groove joint is unglued to permit wood movement. To avoid being cut by underbevel, tongue is raised above center.

Dovetail keys are cut back 11/16 in. on each end.

Sliding dovetails on battens mate with dovetail housings on underside of top.

Batten, 1 1/16 in. thick by 2 1/16 in. wide by 14 1/8 in. long

Tongue on batten serves as drawer runner.

Shelf, 1/2 in. thick by 12 5/8 in. wide by 22 7/8 in. long

Pin, 1/4 in. dia., fixes shelf at center

V-groove at center of shelf, 1/16 in. deep

Leg, 1 9/16 in. dia. by 25 1/2 in. long

Stretcher, 15/16 in. thick by 5/8 in. wide by 12 5/8 in. long, joined to shelf with sliding dovetail

BATTEN FRONT VIEW

2 1/16 in.

1 7/16 in.

5/16 in.

Shoulder, 7/32 in.

7/16 in.

5/16 in.

4.75°

1/4 in.

All parts are solid teak, except where noted.

DRAWER FRONT

15½ in.

3 in.

4.75°

FRONT VIEW

Bottom groove

SIDE VIEW

DRAWER SIDE

1⅛ in.

Runner groove

3 in.

SIDE VIEW

Bottom groove

END VIEW

Drawer bottom, ¼ in. thick, teak veneer over solid alder substrate

Drawer has half-blind dovetails at front and back.

Runner groove, 11⁄32 in. wide

When assembled, drawer is 14⅛ in. front to back.

Drawer has sloped sides to match leg splay.

24 in.

16 in.

25 in.

13½ in.

Splay, 4.75°

Rake, 3.75°

FRONT VIEW

SIDE VIEW

It's a simple-looking table, but with sliding dovetails joining the shelf as well as the top, a drawer with its sides angled to echo the splay of the legs, and other unusual details, it packs some entertaining challenges.

Which wood?

I've built this table in various woods and found that walnut suits it very well. For this one, though, I chose teak, a handsome wood that is appropriate to the Danish Modern period. I hesitated before deciding to use it, because teak can be a bit tricky. The issue is not workability. Apart from its tendency to dull tools rapidly, it's very workable wood. The difficulty is with the color, which is beautiful … eventually. When you buy your boards, they'll have a wonderful reddish-brown glow about them. But the minute you cut into them you get a very odd mix of colors: some oranges, some greens, some blacks. It can be disheartening when you realize that the beautiful color is just on the surface.

Rest assured that ultimately your piece in teak will have that uniformly beautiful color, but you may have to live with a little bit of patchy, irregular color for a few weeks. I've learned that putting the completed piece in the sun will expedite the color shift.

Legs on the lathe, then the drill press

The legs are tapered cylinders with a tenon at the top. From the tenon's shoulder down to the shelf, the taper is very slight—just ³⁄16 in. or so. But below the shelf the taper is more pronounced and more visible. After cutting the tenons with a bedan, I turn the tapers with a heavy spindle gouge.

Once off the lathe, the legs are drilled to receive the stretcher tenons. The legs will have a rake of 3.75°, so I set the drill-press table at that same angle. A V-jig holds the leg during the drilling. To orient the leg in the jig, I put a U-shaped collar at one end to cradle the tenon; and I made a square block with a hole in it that I slide up onto the leg. Together, they keep the leg still and centered and parallel to the table.

The split top

I start the top by milling up the two halves, then cutting a tongue on one and a groove on the other. I fit the halves together, turn them bottom side up, and screw an MDF router template to them. I'll use the template to cut the sliding dovetail housings,

A split tabletop

Tongue-and-groove links the top. *The halves of the split top meet in a tongue-and-groove joint that is left unglued, permitting them to move independently. Gochnour cuts both the tongue and the groove on the router table.*

Tied with a template. *To rout sliding dovetail housings in the underside of the top, Gochnour assembles the two halves and screws an MDF template to them. After routing the housings, he leaves the template in place and uses it with a flush-trimming bit to shape the top's perimeter.*

and also to flush-trim the perimeter shape of the top.

It's vital that the housings are perfectly parallel. If they're not, at assembly the battens will be askew, and it could be impossible to get the halves together. To guarantee parallel housings, I make my template by cutting up a piece of ½-in. MDF to create two parallel "windows" that will guide the router. When I glue the MDF back together, I leave the windows in place, unglued, as spacers; after assembly, I knock them out.

After routing the housings, I use a bandsaw to cut the perimeter of the top to within ¹⁄₁₆ in. or so of the template. Then, at the router table, I trim the top flush to the template with a spiral bit. To avoid chipout, I use a bit with both top and bottom bearings. For half of the routing I use the bottom bearing and make the cut with the template facing down; for the other half I engage the top bearing and make the cut with the template facing up.

The top is complete now, except for the undercut bevel, which I'll shape on the router table using a panel-raising bit with a guide bearing. It's best to do the routing with the halves of the top held together, so I mill two pieces of scrapwood just smaller than the dovetail housings in length, width, and thickness, and screw them in place to keep the halves from shifting as I rout.
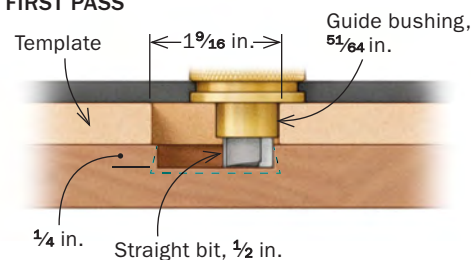
Two bits for the dovetail. *After routing out most of the waste using a guide bushing and a straight bit, Gochnour switches to a dovetail bit to finish the housing.*
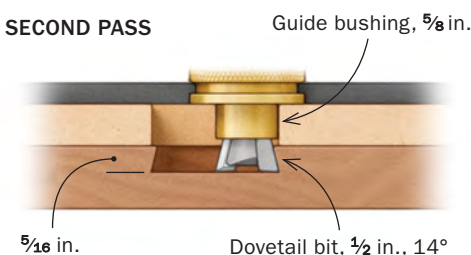

↖ Online Extra

FIRST PASS

Template — Guide bushing, ⁵¹⁄₆₄ in.

1⁹⁄₁₆ in.

¼ in. — Straight bit, ½ in.

SECOND PASS

Guide bushing, ⅝ in.

⁵⁄₁₆ in. — Dovetail bit, ½ in., 14°

Shaping the batten. *The batten keeps the top flat and the legs stable, but it also provides the runner for the side-hung drawer. Here Gochnour makes a second cut to define the runner.*

Batten gets a dovetail key. *Gochnour first cuts the inside shoulder of the dovetail $7/32$ in. wide, then, as shown here, he cuts the outside shoulder to fit the housing in the tabletop.*


Half at a time. *Applying glue only to the last several inches of the dovetail housing, Gochnour slides the batten in place. He'll check its distance from the outside edge of the top with a combination square. Then he'll place a clamp over the glued area until the glue cures.*
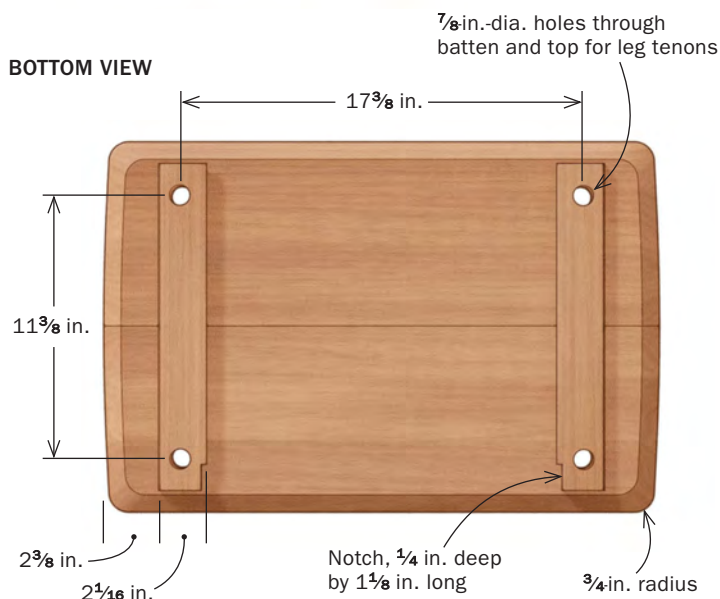

Second assembly. *When the first glue-up is dry, glue the second half and slide it onto the battens. Be sure the tongue and groove engage cleanly, and use spacers to set the gap between the halves.*

DRILLING AT A DOUBLE ANGLE

FRONT VIEW

SIDE VIEW

Splay, 4.75°

Rake, 3.75°
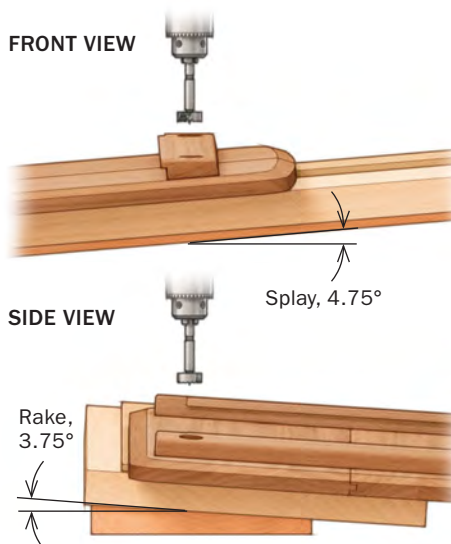
When drilling leg holes through the top and batten, Gochnour must account for the rake and splay of the legs. He sets the drill-press table to 4.75° (the splay angle) and supports his drilling jig on a subbase tapered at 3.75° (the rake angle). He backs up the cut and uses Wave Cutter Forstner bits from Freud for clean through-drilling.

$7/8$ in.-dia. holes through batten and top for leg tenons

BOTTOM VIEW

17$3/8$ in.

11$3/8$ in.

2$3/8$ in.

2$1/16$ in.

Notch, $1/4$ in. deep by 1$1/8$ in. long

$3/4$ in. radius

Stretchers and shelf

STRETCHERS

Tenons on the drill press. *After cutting their shoulders with a miter gauge on the tablesaw, Gochnour finishes the round tenons on the drill press with a tenon cutter.*

Sliders on the stretchers, too. *The stretchers are joined to the shelf with sliding dovetails, and Gochnour cuts the tails on his router table.*

Dynamic battens

From an engineering point of view, the battens are the heart of the table. In addition to the sliding dovetail key cut into their top face, they have a bottom face that's angled at 4.75° to match the splay of the legs. They also get a tongue cut along their lower inside edge that serves as the drawer runner.

I start making them at the tablesaw. First I cut the angled bottom face. Then, with two ripcuts, I create the tongue. I go to the router table at that point and make the dovetail key, cutting along both sides of the batten's top face with a 14° dovetail bit. I aim for a slightly tight fit in the housing. To achieve a perfect final fit, I use a sanding block where needed. The sanding block, made from ½-in. MDF, has self-adhesive 150-grit paper on one face, and its bottom edge is cut to a
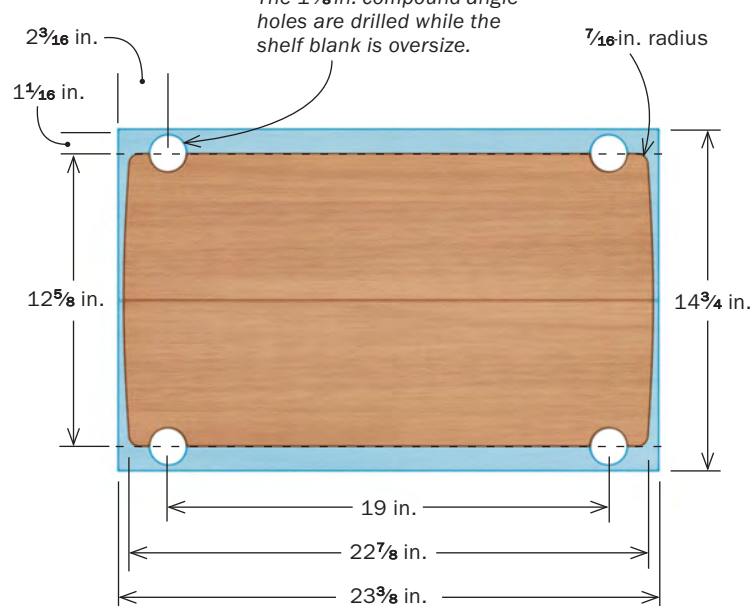
SHELF

Piercing the shelf. *Like the top, the shelf gets drilled with compound-angled through-holes for the legs. Gochnour tilts the drill-press table 4.75° and again rests his drilling jig on a 3.75° wedge-shaped sub base. But he drills the shelf with its top face up.*

Rip through the leg holes. *The shelf is left oversize in width until the leg holes have been bored. Then it gets its edges ripped off, leaving half-circles to cup the legs.*

SHELF TOP VIEW

The 1⅝-in. compound-angle holes are drilled while the shelf blank is oversize.

2³⁄₁₆ in.

1¹⁄₁₆ in.

⁷⁄₁₆-in. radius

12⅝ in.

14¾ in.

19 in.

22⅞ in.

23⅜ in.

Dummy stretchers. **To facilitate layout, Gochnour makes an extra pair of stretchers from scrapwood. They're identical to the real stretchers, but with no dovetail. He inserts them in the legs, clamps the shelf in place, and marks their location with a knife.**

Sliding socket. **With a router template aligned to the knife marks on the shelf, Gochnour cuts the through sliding dovetail housing for the stretcher. The template slot is ⅝ in. wide, and the bushing is ⅝ in. dia. The dovetail bit, ½ in dia. and 14°, is set to cut ¼ in. deep.**

Shaped up and ready to slide. **Once its dovetail has been cut and fitted, the stretcher is sawn to a crown along its underside and then shaped to a round profile with a spokeshave.**

14° angle. This way, it gently abrades the angled wall of the housing. With all that done, I return to the tablesaw and use a miter gauge and dado blade to cut back the tongue, which will also serve as the drawer stop, and the ends of the dovetail.

Now I'm ready to glue the battens to the top and then drill for the leg tenons. To do the drilling, which is at a compound angle that accounts for both the splay and rake of the legs, I set the drill-press table at the splay angle (4.75°) and clamp the workpiece to an auxiliary table that has a tapered sub-base whose angle (3.75°) is the same as the table's rake. To get a perfectly clean exit hole while drilling with the top face down, I lay a piece of ¼-in. MDF beneath the workpiece and use Wave Cutter Forstner bits from Freud.

Shelf and stretchers

I use the same compound-angle drilling setup to cut four holes in the shelf, drilling from the top face this time. At this point the shelf is still oversize in width, and once the holes are cut, I rip it to final width, bisecting the holes to create the half-moon cutouts that wrap the legs.

Just pin it. **The stretcher's sliding dovetail gets no glue. It is just fixed at the center with a pin that's glued and tapped into place.**

Table assembly

Kerfing the shoulders. *At dry assembly, Gochnour uses a flush-cut saw and a loose collar to cut the angled shoulders of the leg tenons. The ¼-in.-thick MDF collar has a through-hole for the tenon and a ⅛-in.-deep counterbore for the full leg.*

Finish the trim job. *Chisel work around the tenon completes the task, ensuring the shoulder will meet the batten squarely and without gaps.*

Cantilevered glue-up. *Gochnour finds it most convenient to start the assembly with the shelf clamped to a low bench or to a board cantilevered from his workbench. He glues the legs to the stretchers, then adds the top.*

The stretcher is secured to the shelf with a sliding dovetail. It doesn't need glue and is just pinned at the center. That way the shelf can move freely, yet it stays centered. To help locate the dovetail housings precisely on the shelf, I mill and tenon two extra stretchers in scrapwood while making the real pair. Once the dummy stretchers are tenoned, I rip ¼ in. from their top edge (removing material that would become the dovetail key on the real stretchers). Then I dry-fit the tabletop, legs, and the dummy stretchers and place the shelf on the stretchers. Using spacers, I center the legs in their cutouts, and then clamp the shelf in place. Then I invert the table

Clampless assembly. *After pressing the top onto the leg tenons (with the help of a rubber mallet if need be), Gochnour moves the table to the floor and drives wedges into kerfs in the leg tenons. After the glue cures, he'll trim the tenons flush with a handsaw and chisel or scraper.*

Drawer with canted sides

The drawer has sloped sides to match the splay of the legs. It's built like an ordinary dovetailed drawer, with a few wrinkles. The ends and edges of some parts are angled, as are some grooves. Because the drawer back is visible, Gochnour cut half-blind dovetails there as well as in front.

Bevel the edges. *The top and bottom edges of the drawer sides are ripped at 4.75° off 90°.*

Angle the ends. *On the drawer front and back, the ends are crosscut at 4.75° with a miter gauge at the tablesaw.*

Sides get two grooves. *After cutting angled through-grooves for the bottom at the tablesaw, Gochnour routs a stopped groove for the drawer runner. The workpiece rides on a tapered auxiliary table to give the groove a 4.75° angle.*

Handwork completes the runner groove. *After assembling the drawer, Gochnour gingerly cuts a series of sawkerfs to open the back end of the runner groove. Then he'll square up the stopped end of the groove with a chisel.*

and make knife marks on both sides of each dummy stretcher. After disassembling the table, I use those knife marks to register my router template. Once clamped in place, the template guides the router as I cut the through-dovetail housings, and the locations are perfect.

Three-stage assembly

Assembly happens pretty quickly, and usually no clamps are required. First I pin the stretchers to the shelf. Then I glue the legs to the stretchers and finally the legs to the top. Putting the top into place can usually be done by hand or with a few taps of a rubber mallet. And if need be, I use a clamp from the stretcher to the top.

At this point I take the table off the bench and put it on its feet so I can add the wedges. As I drive the wedges, I double check that the shoulders of the leg tenons are tight to the underside of the batten. After an hour or so I cut the tenons flush with the top and follow up with a chisel or scraper if needed. □

Contributing editor Chris Gochnour builds furniture in Salt Lake City.