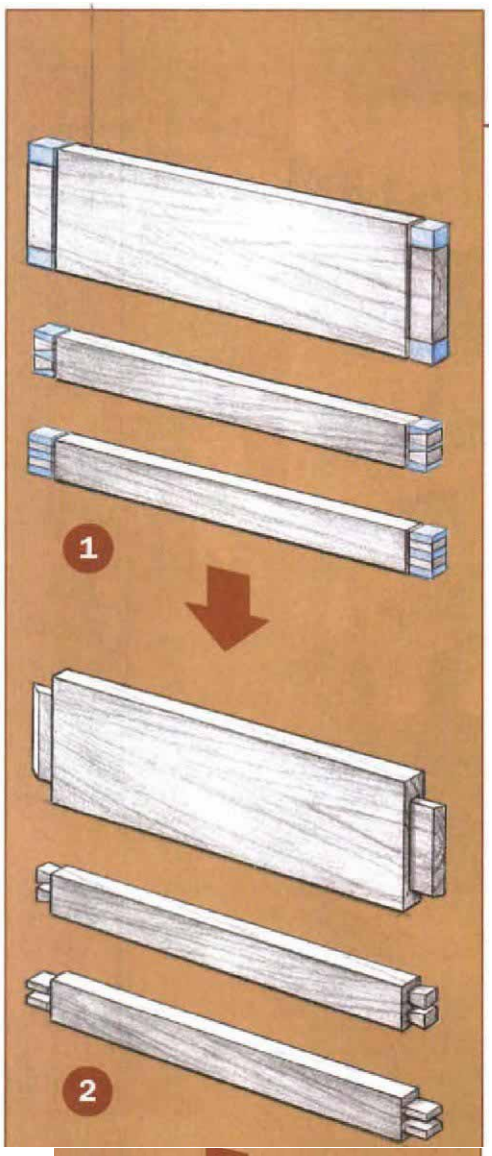
Fast and Accurate

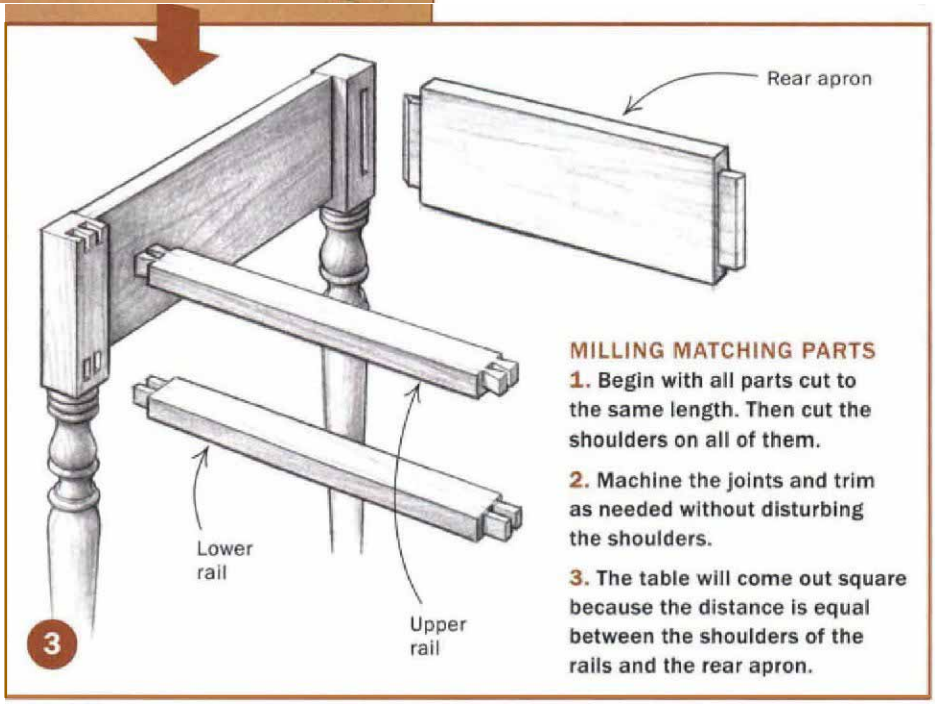
A Sheraton-style table comes together easily, thanks to an efficient approach

BY STEVE LATTA



When the hand, eye and brain fall in sync, something wonderful happens. I call it "hitting rhythm." The ability to find that rhythm, however, is consciously developed over time. It begins with a combination of both instincts and careful planning that takes into consideration joinery, measurements, milling procedures and fine-tuning. If done correctly, no time is wasted remaking parts and refitting them. A piece of furniture properly planned from the start ends up precise and looks crisp.

I learned all of that the hard way. As an apprentice, I worked in a small, overcrowded shop that made a lot of dining tables. Anxious to see big slabs of outrageously figured wood, I milled the tabletops first. But days later, as the base was nearing completion, I would find the tops full of dings and scratches from being around the shop far too long. A lot of time and profit disappeared fixing those little nightmares.



Design logically, but don't sacrifice aesthetics

There is a logical approach to building a piece. I call it "sequencing." Well thought-out strategies allow you to machine all of your joints (tenons, double-tusk tenons, even dovetails) at the same time, using the same initial setup, which helps ensure accuracy. In the case of this Sheraton-style table, a project built by our freshmen each year, most of the joints are executed on the tablesaw. The underlying strategies can be applied to any project, regardless of the joinery or the style.

The table consists of only a few elements: a top, four legs, three aprons, rails, a drawer and its supports. But the choices made when sizing parts can help or hinder construction. The Sheraton table is a delicate piece, so I constructed it using primarily ⅝-in.-thick stock, which makes up the top, aprons, upper and lower rails, drawer runners and kickers. The drawers are mostly ⅜-in.-thick stock, except for the 11/16-in.-thick front.

On a table like this, I design the upper and lower rails to be the same width as the leg so that they end up flush when joined. During the joinery phase it will become apparent why I like doing it this way. One big rule exists, however: Never let engineering conveniences take precedence over aesthetic concerns.

Always mill extra stock

Life happens, and accepting the inevitability of occasional mistakes makes one a more efficient woodworker. That's why, if my stock allows, I make extra pieces to use

Drawings: Bob LaPointe

Table Joinery

for machine setups or for mistakes if they occur. A lot of time gets wasted remilling pieces to fix screw-ups. On the flip side, however, running an extra apron or rail along from the start burns little time at all.

Mill the stock for the rails, aprons, top, kickers and runners down to ⅝ in. Because edge-glued boards often don't line up perfectly, leave the boards used for the top a hair thicker than ⅝ in.; after they've been glued up, they'll need to be handplaned flat. Next, mill up the drawer parts and choose a nicely figured piece for the front.

Regardless of the type of table being built, machine leg stock oversized by about ⅛ in. to ¼ in. and let the blanks sit overnight in case they want to move a little. For final dimensioning, surface adjacent faces on a jointer, then run the opposing faces through the planer to bring the faces parallel and to final thickness. On that final pass, I also run the upper and lower rails through the planer, on edge, so they come out exactly the same thickness as the leg. If this sequence is followed, the stock ends up identically dimensioned, square and without tablesaw marks that can be a nuisance to remove later.

Rip and crosscut all of the parts to length, leaving the internal drawer runners and guides a little long; they will be fitted to the base after it has been assembled. To avoid having to clean up tearout, place a fresh auxiliary fence on the miter gauge. Additionally, crosscut stock so that tearout shows up on unexposed faces. Paying strict attention to tearout adds to the overall cleanliness of the piece and eliminates time spent removing it later.

Strategy for accurate joinery

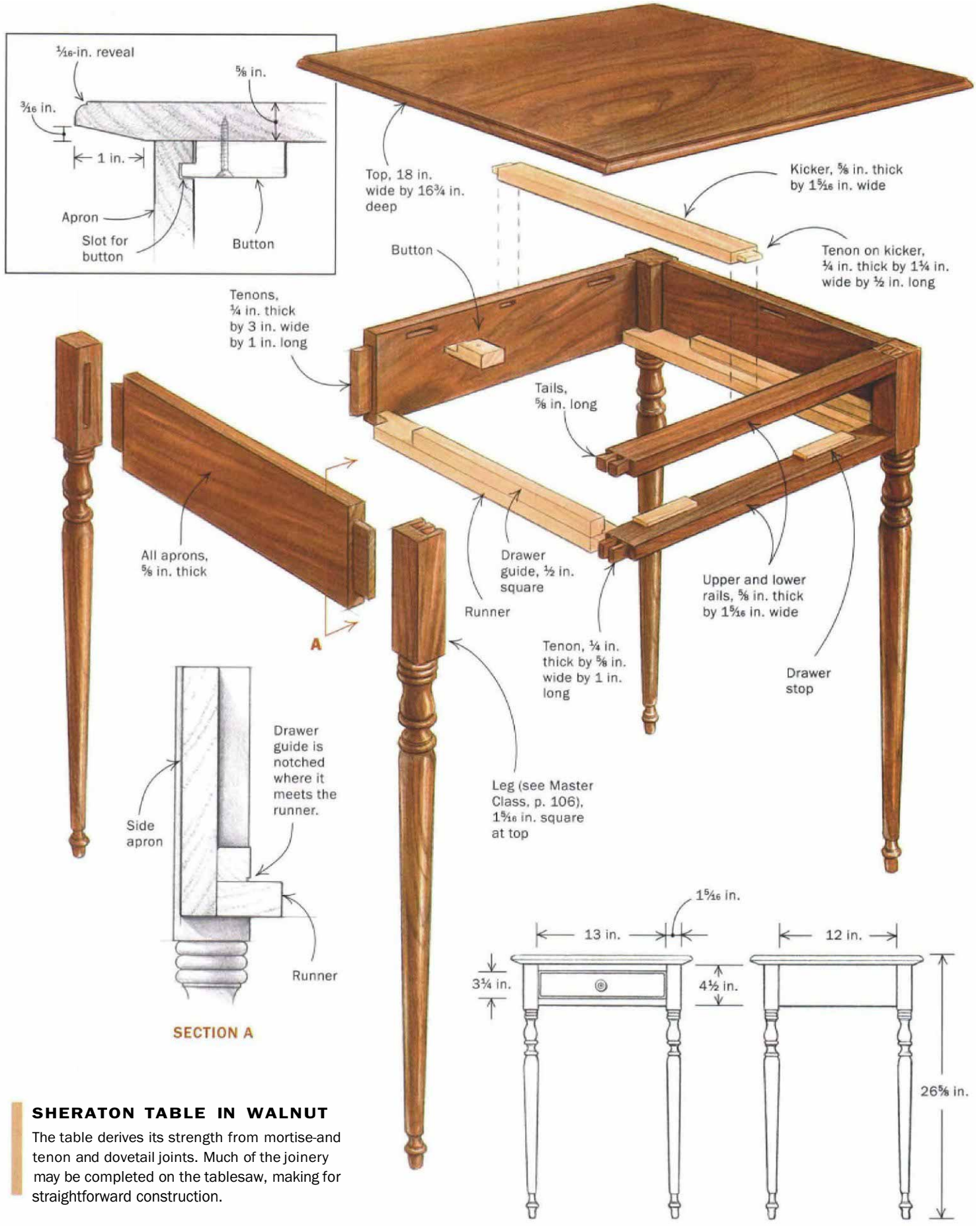
Well-made joints determine the overall structural and cosmetic integrity of a piece of furniture. On any square or rectangular table, the critical factor is the shoulder-to-shoulder distances of parts on opposite sides of each other. In other words, the shoulder-to-shoulder distances of the rear apron and upper and lower rails must be identical. The same goes for the side aprons. If these dimensions differ by even a tiny amount, the table will be out of square, and the drawer won't fit properly, To guarantee these parts come out right, cut all of the shoulders on the tablesaw using the same fence setting.

Mortise the legs first because tenons are easier to fit to mortises than vice versa. So begin with the legs (for more on how to turn a Sheraton leg, see Master Class on p. 106). If you don't wish to turn the legs, simply taper them down to ¾ in,, beginning 5 in. below the top. Next, paying close attention to the grain, choose the best way to orient the legs, then mark the faces as front and side. It's a good idea to look at legs in pairs to get a pleasing match. Then lay out and cut the mortises. (Because the upper sections of the legs remain square, joints may be cut after turning.) Don't wor-

ORGANIZE YOUR MILLING TASKS

Mill legs and rails at the same time. *The table's legs (left) and rails (on edge, right) are both planed to the same thickness.*

Photos: Anatole Burkin



SHERATON TABLE IN WALNUT

The table derives its strength from mortise-and tenon and dovetail joints. Much of the joinery may be completed on the tablesaw, making for straightforward construction.

ry about the dovetail sockets on the front legs for now.

Crosscut parts to length—Cut all of the aprons, rails and extra stock to length on the tablesaw. As the drawing on the facing page shows, the rear apron and lower rail are the same length. Even though the upper dovetailed rail is shorter, cut it to the same length as the upper rail and rear apron. Keeping that lower rail long at this stage will help keep the distance between shoulders identical to the top rail.

Make shoulder cuts on all parts—Cut the shoulders in a logical sequence. Use scrap stock to check your setups. Set the fence 1 in. to the outside of the blade. Then raise the blade so that it barely grazes the stock. With this setting, score the top and bottom faces of the lower rail. Raise the blade to ⅛ in. and cut the bottom face and the front and back edges of the upper rail.

Next, raise the blade and make all of the shoulder cuts on the faces of the aprons. This cut should leave the beginnings of ¼-in.-thick tenons.

Raise the blade again and cut the front and rear edges of the lower rail. Those cuts define the tenon shoulders. Then nibble away at the waste to make a tenon.

Last, cut the edges of the aprons to define the width of the tenons. This step requires raising the blade even more, and due to runout or other saw anomalies, the already cut shoulders on the faces of the aprons may be nicked. To prevent that, move the fence a hair toward the blade before making the cut. Afterward, chisel away the excess material to end up with clean shoulders. Note that up to this point the fence location has not been changed once while making all of the shoulder cuts. Using one setting ensures identical shoulder-to-shoulder distances between components.

Cut the cheeks using a tenoning jig

A simple shopmade tenoning jig in which your hand acts as the hold-down clamp is faster than using a commercial jig that requires stock to be clamped for each cut. But you should use what you feel comfortable with. The concepts are the same.

Set the jig to cut away one cheek from the upper rail, leaving it with a ½-in.-thick tenon. This tenon will be cut into a pair of tails. When done, put it aside for now.

Reset the tenoning jig to cut tenons for

EFFICIENT SHOULDER CUTS

Set the saw fence at 1 in., measured to the outside tooth, then make all of the shoulder cuts on the rails and aprons.

For the first cut, raise the blade just a hair. *Make the first cut on the top and bottom faces of the lower rail, just scoring the stock.*

Crank up the blade to ⅛ in. *Score the bottom face and front and back edges of the upper rail.*

Raise the blade to ⅜ in. *Cut the shoulders on the faces of all the aprons. The stock left between the kerfs should be ¼ in. thick.*

Raise the blade to almost ¼ in. *Cut the front and back edges of the lower rail, then nibble away at the edges.*

Check the fit by holding the rail against a leg. *The edge of the rail should meet the edge of the mortise.*

SEE ERRATA AT END OF ARTICLE

EFFICIENT CHEEK CUTS

This simple shopmade tenoning jig (left) is made of medium-density fiberboard (MDF). It rides on an auxiliary fence screwed to the saw's stock fence.

Machine the shoulder of the upper rail. *Cut the cheek on the bottom face of the rail, leaving it ½ in. thick. Dovetails are cut later.*

Cut the cheeks on the apron. *The author cuts the tenons slightly fat; later he will trim them with a shoulder plane to fit.*

Cut the double tenons of the lower rail. *Cut the outer cheeks first, then nibble away at the waste in the center until the joint fits snugly.*

the aprons. Again, use a piece of scrap to dial in the jig, and check it against the actual leg mortises. Mill these tenons a tad thick and let them shrink overnight. Then, using a shoulder plane, trim them to fit.

Leave the blade height alone, reset the tenoning jig and cut the outside cheeks for the double tenons on the lower drawer rail. Once the outside sections have been removed, reset the jig and remove the waste in the center. Flip the stock and make two passes each time the jig is adjusted; that way the tenons come out identical. By now you'll realize why it was a good idea to mill the legs and rails to a similar dimension. Once fitted, the lower rail is flush to the front and rear faces of the legs.

It's time to finish the upper rail. Trim the tenons to ⅝ in. long, then mark and cut a pair of dovetails. Use the tails of the rail to mark the matching sockets atop the front legs. Cut out most of the waste on the leg using a router with a straight bit, then finish the joint with chisels. When you fit upper and lower rails to the leg, the opening should be perfectly square, as long as the joint closes fully.

The tenoned aprons are mitered where they meet in the rear leg mortises. Cut these at 45° on a chopsaw.

An easy way to fit a kicker

Two small slots, one in the inside edge of the upper rail and one in the back apron, must be cut for the kicker. Cut the slots on a router table using a ¼-in.-dia. straight bit. Position the fence so that the slot comes out centered on the edge of the rail and apron. It may take a few tries to get the fence just right; I use scrap stock. Then cut the slots in the rail, followed by the rear apron. There's no need to move the fence; just reference the top edge of the apron against the fence.

While the router table is still set up, reposition the fence and cut the slots for the buttons. With a chisel, square up the rounded ends of all the slots.

Dry-fit the base first, then glue it up

A lot can go wrong—and often does—during this process. Clamp pads are forgotten, and stock gets marred. Forces from clamp pressures are ignored, and things end up out of square. Too much glue is applied and left to harden before removal. Back in *FWW* #31, Ian Kirby did a wonderful job covering all of the bases in his article on gluing up. For the short course, remember three rules.

First, always do a total dry-fit, complete with clamps, pads, clean-up tools and anything else you'll need for the real thing. Second, after your piece has been dry-clamped, study it, check it for square, and make sure everything looks good before moving on. Third, if you really have to crank on something to pull it together, don't. Disassemble the parts and trim the parts that bind.

Begin the glue-up by attaching the rear legs to the rear apron. Then attach the drawer rails and front legs as a subassembly, Pay close attention to the squareness of the drawer opening; too much clamping pressure, or misaligned clamps, may distort the opening.

When the first set of parts has dried, glue up the rest of the base. In the excitement of the moment, a few of my students have for-

gotten to insert the kicker while gluing up the base. You'll be sorry if you do.

Get to know the ins and outs of drawers

The drawer on this table is inset flush with the front rails and legs. The drawer front, a choice piece of walnut, is first cut to size, then beaded using a scratch stock. To help prevent tearout, use a file to round over end grain, then scratch-bead.

After that, it's time to dovetail the box. A fine piece of furniture deserves dovetails. Because they leave fat pins, router-cut dovetails are unacceptable to me.

When cutting the drawer parts to final dimensions, make the sides slightly narrower, by about ⅛ in., than the face. The sides, made of secondary woods, such as poplar, usually expand and contract at a different rate than the drawer front, and I don't want them proud. The drawer bottom is a piece of solid wood beveled along the underside and fits into a slot cut into the front and sides of the drawer.

The base requires two more parts—a pair of runners and guides—before you can fit the drawer. Begin by cutting the notches on the runners where they meet the rear legs. Then handplane the wear surfaces for a smooth finish. Glue the runners into place flush with the lower rail.

A few tricks of the trade come in handy when making the drawer guides. First, choose straight-grained stock, then orient the grain so that they may be planed easily in place (the side that rubs against the drawer) without causing tearout. There are two other tricks to remember: one, cut a notch on the lower corner of the guide, where it meets the runner; and two, trim the guide about 2½ in. short of the rear leg.

Use nicely figured wood for the top and appropriate finish and hardware

Ideally, a one-board top is the best. I shake my head thinking back to my shop classes where the instructor told us never to use boards wider than 7 in. because they would cup. Many a beautiful board was butchered those early days for the sake of a woodworking theory.

A couple of guidelines, however, deserve consideration. First and foremost, never compromise appearance for some theoretical guideline. The top often dominates the piece visually, and it should be drop-dead gorgeous. If both faces of the top look attractive, orient the growth rings so that the edges cup to the aprons. Boards typically cup against the annual rings, and that fact should not be ignored.

Machine stock for a tabletop close to final thickness before glue-up, as opposed to assembling the slab heavy and planing the whole thing down. In figured woods, grain patterns can change significantly in a single pass through the planer. By following this sequence, you'll have greater control over the final look of the top.

The top of the Sheraton table has a router-cut thumbnail profile and a chamfer along the bottom edge, cut on the tablesaw, and then it's handplaned smooth. When detailing the edges, always profile the end grain before the long grain to prevent blowout in the corners.

The best finish for a period piece is shellac. It's easy to apply and, if damaged, repairs well (for more on shellac, see *FWW* #134, p. 129). Two or three coats, whether padded, brushed or sprayed on, should do fine. Then rub it out for the sheen you desire. For hardware, order something appropriate and of high quality. At my school we use a Sheraton knob (H-30) made by Horton Brasses (800-754-9127).

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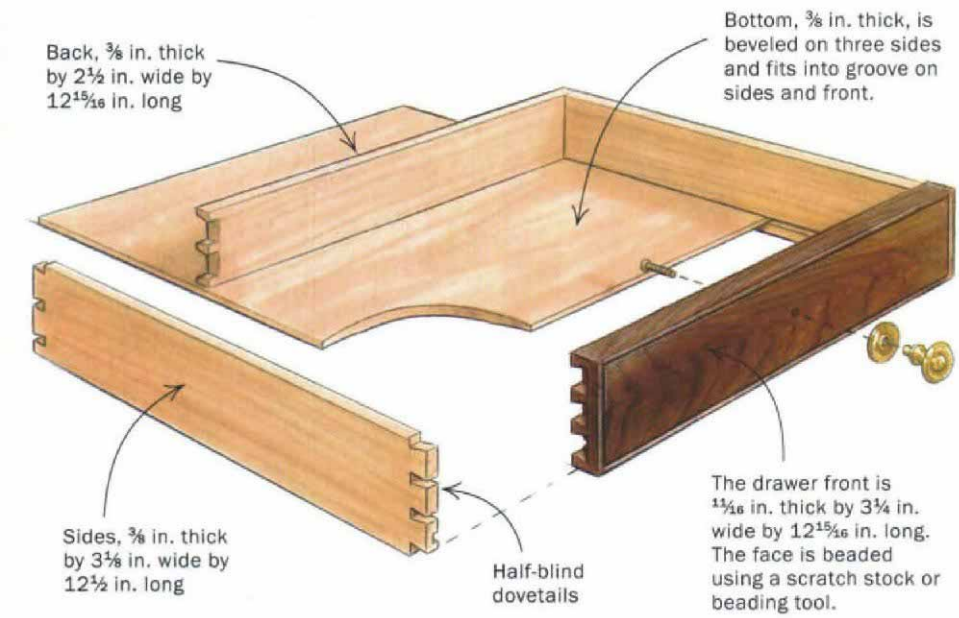
A TRADITIONAL DOVETAILED DRAWER

The drawer face is made of figured walnut, and the interior components are poplar.



The drawer guide is notched and shorter than the runner. *When it comes time to fit a drawer, plane only the guides, not the sides of the drawer.*

Drawer stops are glued to the lower rail. *To position the stops, remove the drawer bottom, replace the drawer and position the stops against the inside edge of the drawer front.*

ERRATA

Upper and lower rails were switched—Your editorial staff made a mistake in the article by Steve Latta, "Fast and Accurate Table Joinery" *(FWW* #148, pp. 50-55). Unless I miss my guess, the last two sentences in paragraph two on p. 53 should read: "Even though the upper dovetailed rail is shorter, cut it to the same length as the lower rail and rear apron. Keeping that upper rail long at this stage will help keep the distance between shoulders identical to that of the lower rail." *—Abram Loft, Rochester, N.Y.*

EDITOR REPLIES: Mr. Loft is absolutely correct. We transposed the upper and lower rails in the wording.