

TOP SECRET


A lesson in hidden compartments built into a sweet little table

By Larissa Huff


It's not often "U.S. Government" appears on our shop phone caller-ID. And I was certainly surprised when the voice inquired if we could design a custom course in concealment furniture making for a group of Navy Seals. As an instructor at the Lohr School of Woodworking, I know firsthand that we are not a reputed hub of covert operations, but I wasn't about to pass up the opportunity to change that!

This table, born of that request, provided a fun design challenge. It combines traditional furniture making techniques with commonly available hardware to create surreptitious storage in a finely built, but inconspicuous piece of furniture. The four hideaways include a compartment under the hinged top, a cavity behind each of the two side aprons, and a false back in the drawer. The top is secured with an RFID (Radio Frequency Identification) lock that requires passing an electronic key-card over it to release it. The child-proof lock on the left-hand side compartment disengages with the use of a dowel-encased magnet, while the push-latches in the right-hand compartment require only finger pressure. Pushing the drawer stop up from underneath releases the drawer to expose its hidden back space.

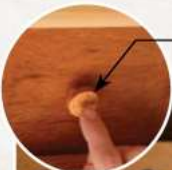
My hope is that building this piece teaches and inspires you to incorporate similar secrets into your own furniture. Just remember—and this is important—never under any circumstances should you [REDACTED]!



RFID key card passed over interior lock area releases top for lifting.



Magnet (embedded in dowel) held over catch area opens left-hand apron compartment.



Raising dumbbell stop from underneath allows full retraction of drawer to expose hidden section at rear.



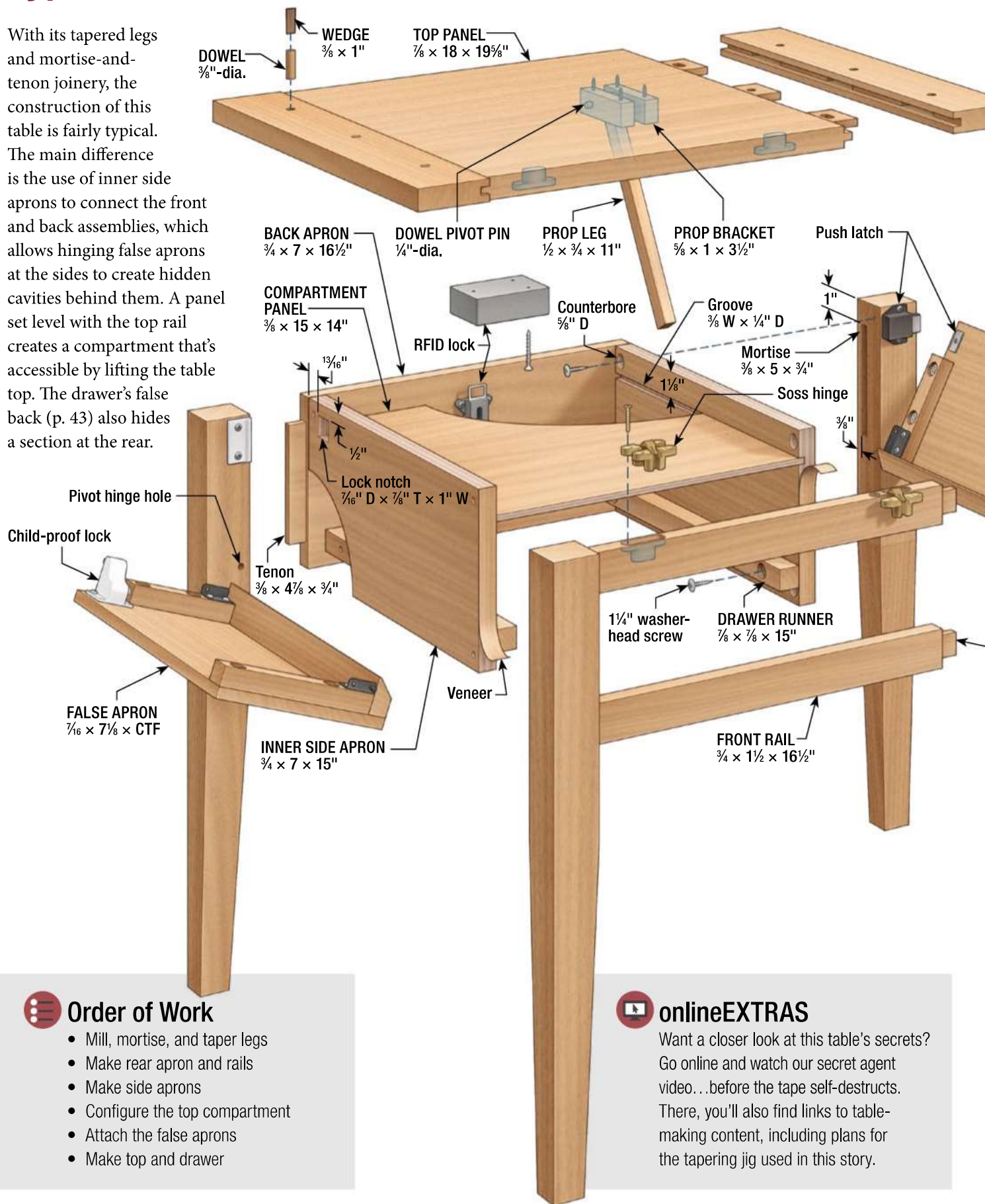
TABLE



To open false apron, press to activate interior push-latch.

Typical table construction with a few twists

With its tapered legs and mortise-and-tenon joinery, the construction of this table is fairly typical. The main difference is the use of inner side aprons to connect the front and back assemblies, which allows hinging false aprons at the sides to create hidden cavities behind them. A panel set level with the top rail creates a compartment that's accessible by lifting the table top. The drawer's false back (p. 43) also hides a section at the rear.



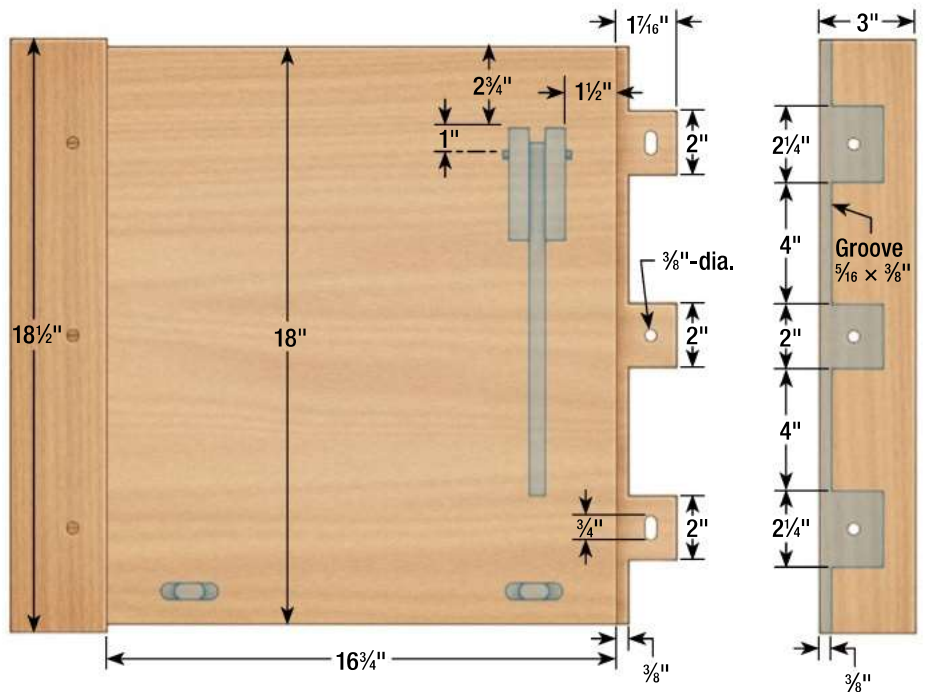
Order of Work

- Mill, mortise, and taper legs
- Make rear apron and rails
- Make side aprons
- Configure the top compartment
- Attach the false aprons
- Make top and drawer

onlineEXTRAS

Want a closer look at this table's secrets? Go online and watch our secret agent video... before the tape self-destructs. There, you'll also find links to table-making content, including plans for the tapering jig used in this story.

Table Top Detail



BREAD BOARD END
 $\frac{7}{8} \times 3 \times 18\frac{1}{2}$ "
 (See Table Top Detail at right)

BATTEN
 $\frac{3}{4} \times \frac{7}{8} \times \text{CTF}$

CLEAT
 $\frac{3}{4} \times 1\frac{1}{8} \times \text{CTF}$

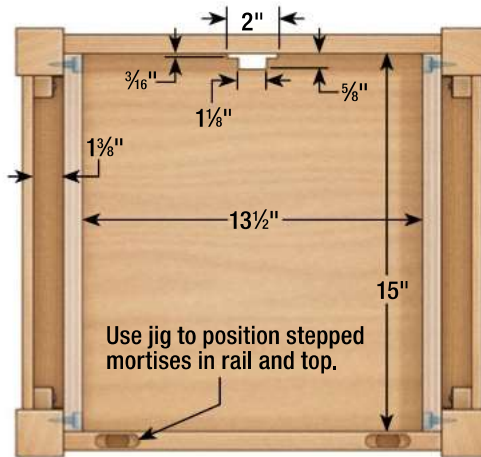
Mortise
 $\frac{3}{8} \times 1 \times \frac{3}{4}$ "

Tenon
 $\frac{3}{8} \times \frac{7}{8} \times \frac{3}{4}$ "

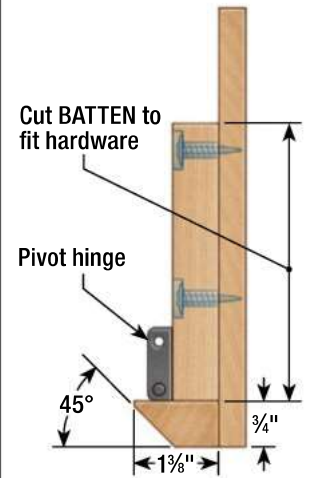
Taper begins 10 1/2"
 from top of LEG

LEG
 $1\frac{1}{8} \times 1\frac{1}{8} \times 23\frac{1}{4}$ "

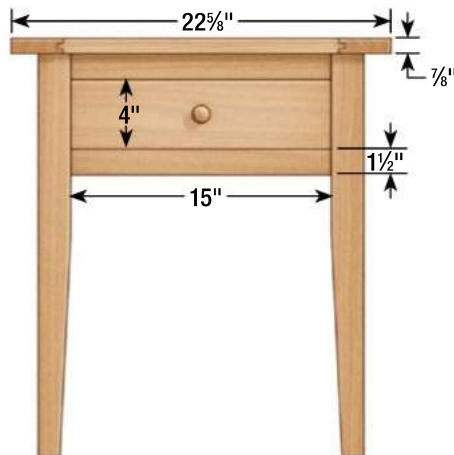
Frame Detail



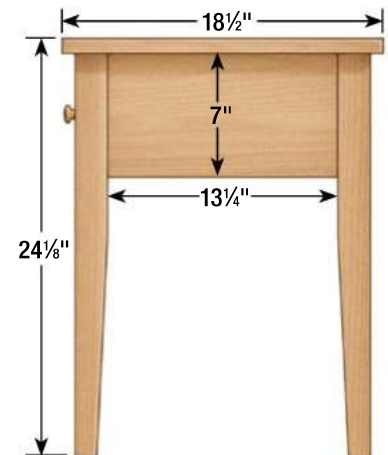
False Apron Detail



Front View



Side View



Notes:

- Rear apron and rails lengths include tenons.
- CTF = Cut to fit.
- See page 69 for hardware sources.

Mill, mortise, and taper the legs

Mill the leg blanks to squared size, cutting them from rift-sawn stock (with diagonally oriented annular rings) to ensure relatively straight-grain on all faces. If you don't have

thick stock, legs can be attractively laminated. (Visit [onlineEXTRAS](#).) Mark them for desired orientation, and then lay out and cut the mortises before sawing the tapers.



Mortise for the rails and rear apron. When using a hollow chisel mortiser, I start with the ends, and then make a series of cuts separated by a distance a bit less than the chisel's width. This approach prevents the workpiece from shifting, keeping the cuts straight and true.

Taper the legs. Sawing the tapers on the table saw is fast and accurate, and requires only a pass on the jointer to clean up the saw marks. See [onlineEXTRAS](#) for plans on making this versatile, competent tapering jig.

Make the rear

Mill the rear apron and front rails to size, then cut their tenons. I do this at the tablesaw as shown. Next, plane each tenon for a perfect fit in its mortise.



Fine fitting. Having cut all the tenons a bit fat, use a rabbit plane to trim the cheeks as necessary to create

apron and rails

The parts should slip together without undue force, and should stay together simply as the result of the friction fit.



Cut the cheeks. Using a dado head and a sacrificial fence, saw the cheeks a bit fat, flipping the stock over to make each cut in turn. Afterward, raise the cutter to saw the narrow shoulders. The resulting tenon width should be about $\frac{1}{8}$ " less than the mortise length.



a snug fit in each mortise. Number each tenon to match its mating leg. Here, a bench hook holds the stock for quick, secure trimming.

Make the side aprons

Make the false aprons to width, but oversized in length for now, glue on the unbeveled (for easier clamping) cleats, and set them aside. Make the inner side aprons, groove them to accept the top compartment panel, and face the front end of each with a strip of veneer. Then notch the inner face of the left-hand apron as shown. Dry-clip the legs to the rear apron and front rails, mark for the screw clearance holes in the side aprons, and then drill the holes and counterbores at the drill press. With the side aprons clamped in place, use an awl to locate the pilot hole locations in the legs. Disassemble the parts, and use a

template to mark for the hinge pin locations. Then drill the hinge pin holes and the pilot holes in the legs to attach the inner aprons.



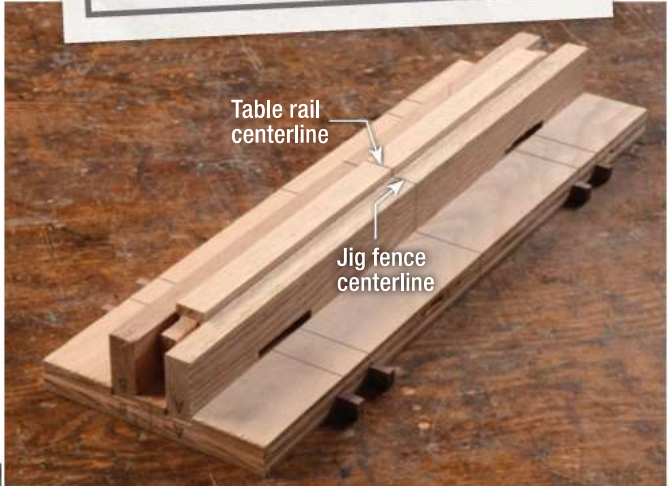
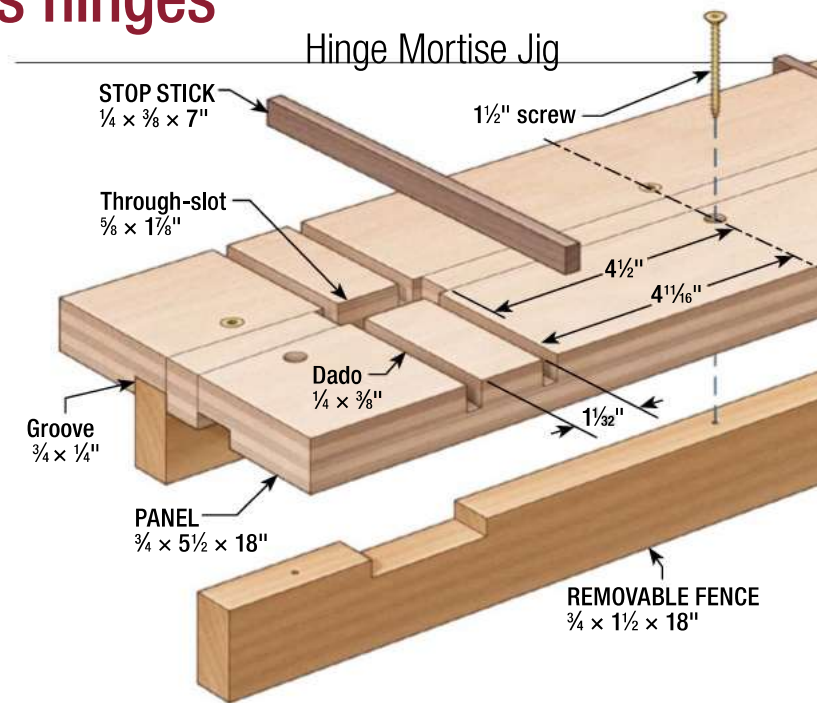
Notch for the left-hand lock. After laying out the $1 \times \frac{7}{8}$ " recess for the child-proof lock on the left-hand inner apron, rout it out to a depth of $\frac{7}{16}$ ". No need to get fussy with this cut; it just needs to provide clearance for the head of the catch without cutting through to the opposing groove.



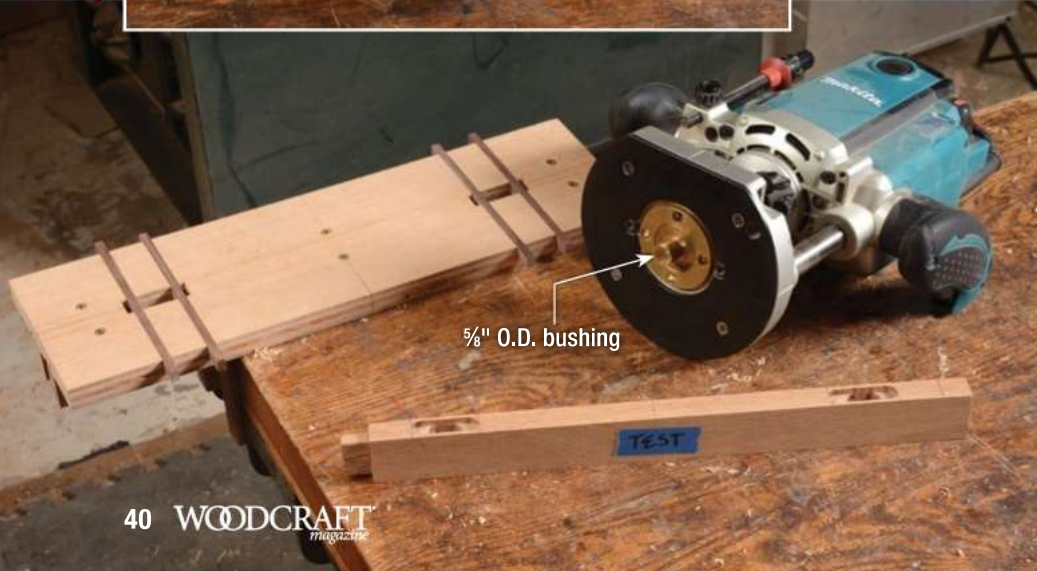
Marking hinge pin locations. For precision, locate the false apron hinge pin holes in the legs using a template. Tapping an awl slipped into the template hole does the job. Then drill the stepped holes for the receiver cups at the drill press. A $\frac{15}{32}$ " countersink drilled with a standard twist drill should fit the flange perfectly, and a $\frac{3}{8}$ "-diameter hole should suit the barrel. But test the fits in scrap first.

Make a jig to set the Soss hinges

Build the hinge-mortise routing jig, and then rout out the hinge mortises as shown. The jig guides a router for cutting T-shaped mortises for a pair of Soss “invisible” hinges. The fences are screwed in place when mortising the table rail, and are removed later when routing the mating mortises on the underside of the table top. After routing the rail mortises, sand the legs, rear apron, false aprons, and rails, and then glue up the front and back assemblies. Screw the inner aprons to the legs using washer-head screws and a hand driver. Then fit the top compartment panel, and notch it for the RFID lock.



Set up for routing Soss hinge mortises. Mount the table's top rail between the jig fences with the centerlines of each aligned. Then clamp the jig in a bench vise.



Route for the Soss hinges. Outfit your router with a 5/8"-O.D bushing and a 1/2"-diameter up-cut spiral bit, then rout the deep section of each mortise with the stop-strips in place. Remove them to rout the longer, shallow section of each mortise.

Attach the false aprons

Now you're ready to fit and attach the false aprons. With the inner aprons attached to the legs, begin by crosscutting your previously glued-up false apron-and-cleat assemblies for a snug fit between the legs. Bevel the cleats as shown in the detail drawing on page 37, and make and attach the battens. Also attach the hinges and catches. Then attach each false apron in turn as shown.

UNDERCOVER GEAR



Shop-made magnet-embedded dowel

CHILD-PROOF LOCK

Attach the false aprons.

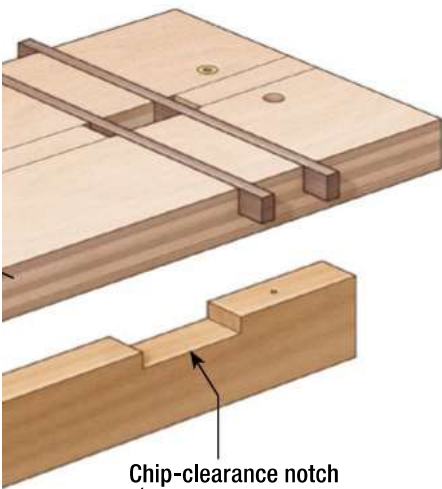
With the front end of an inner apron detached from its leg, slip the rear end of a false apron in place, inserting its hinge pin into its hole. Then pull the front leg away as shown in order to insert the opposite hinge pin. Reattach the inner apron to the leg, and repeat the process for the remaining false apron.

UNDERCOVER GEAR



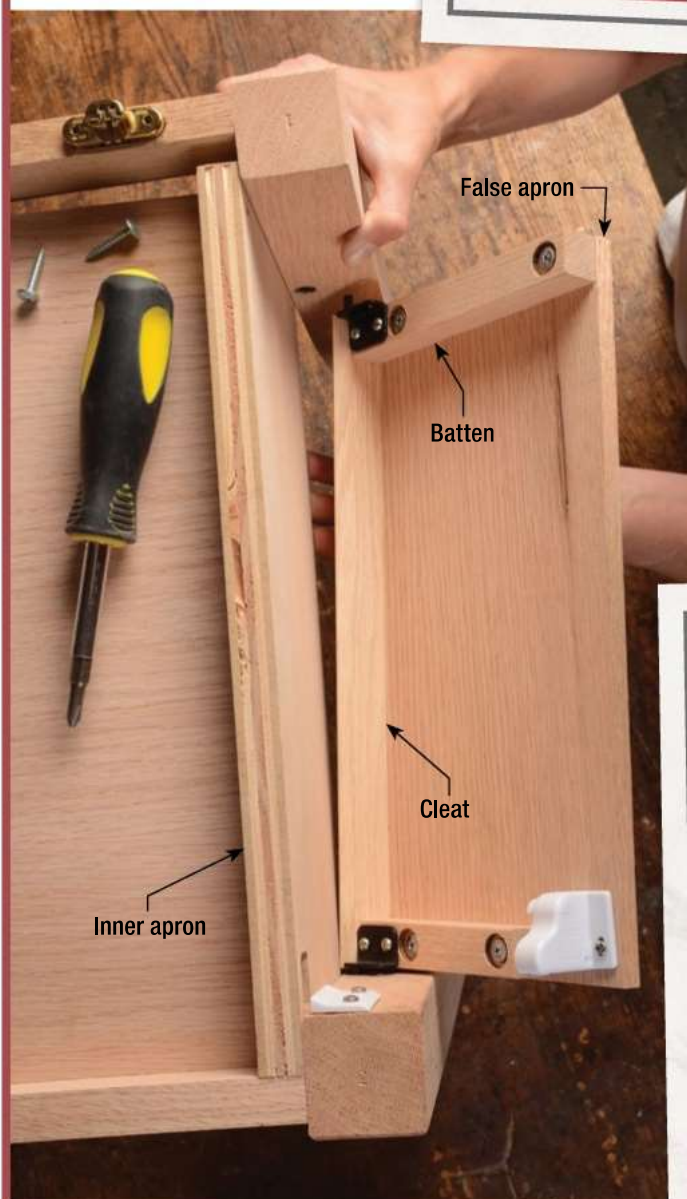
PIVOT HINGE

Chip-clearance notch
1/2 x 2"



Clamping pad

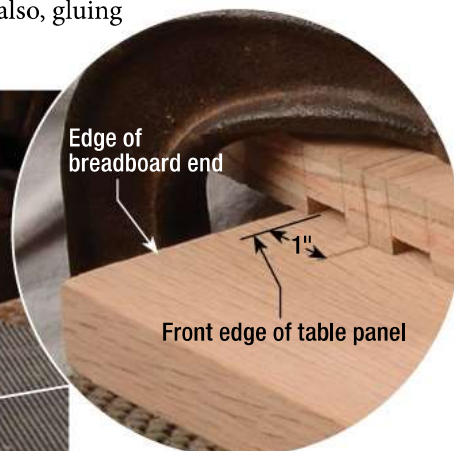
Front assembly glue-up. When gluing up the legs to the front rails, carefully align the top rail with the tops of the legs, and use a pair of 4"-long spacers to ensure that the bottom rail is perfectly parallel to the top rail.



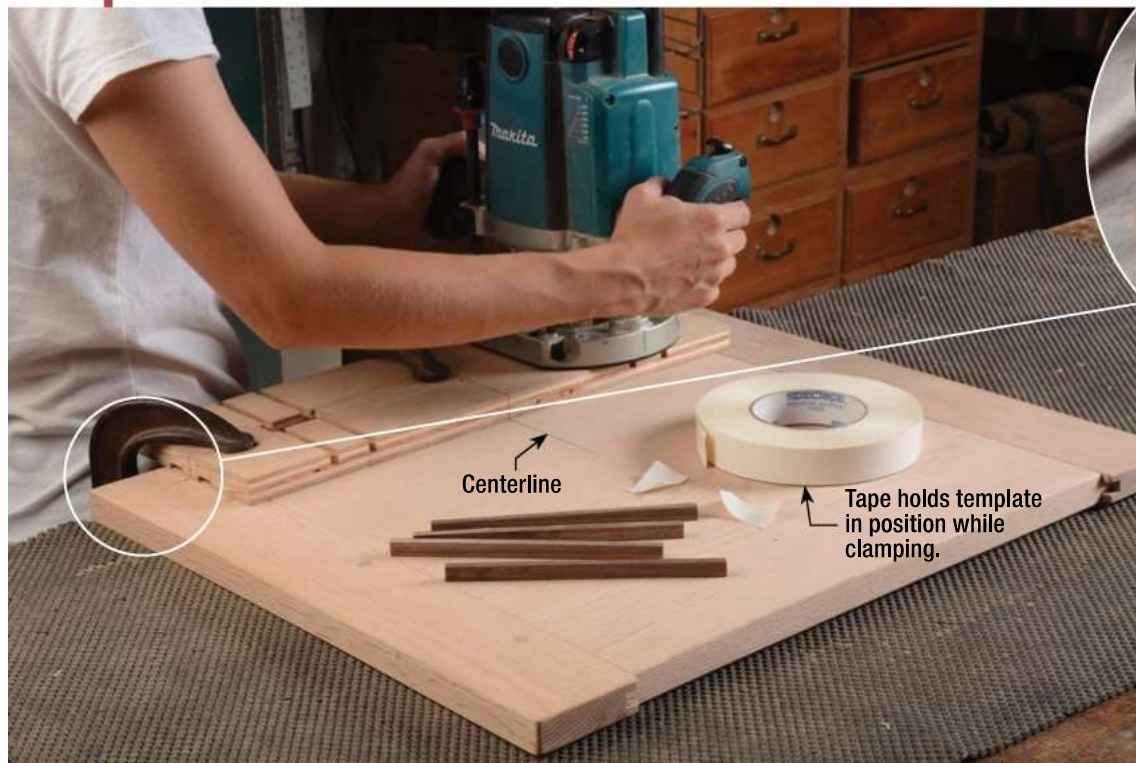
Make the top and drawer

Because this top is not secured to the aprons all around like a typical table top, I made it with breadboard construction to keep it flat. Referring to the dimensions shown in the drawing on page 37, build the top following the instructions beginning on page 46. Then rout the hinge

mortises as shown. Make the drawer using sliding dovetails to attach the front. I rout the socket using a jig, and then saw the dovetail, but you could use a router table instead. Make the drawer stop also, gluing only one end for now.



Rout the hinge mortises in the top. Detach the fences from your hinge mortising jig, and clamp it to the underside of the table top, centering it along the width of the top, and offsetting the center of the jig 1" from the table's front edge (inset). As before, remove the stop strips when cutting the long, shallow section of each mortise.

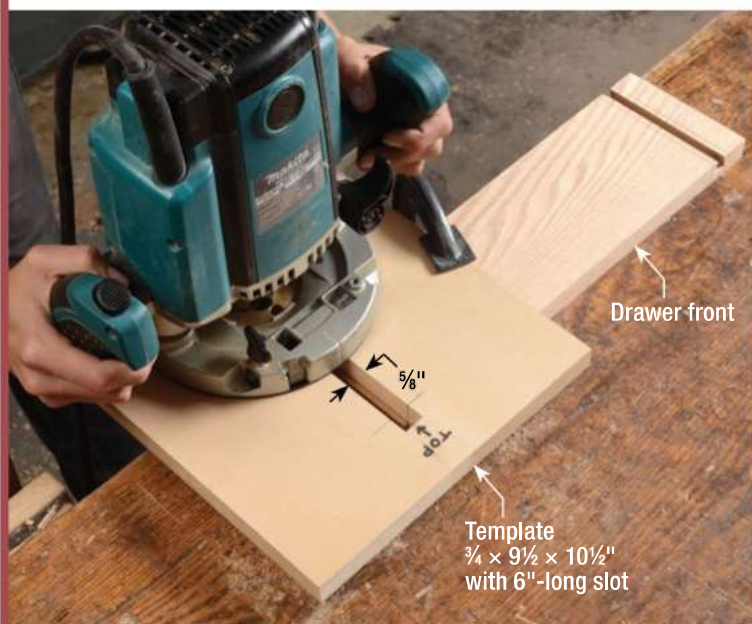


Sawing a Sliding Dovetail

Although many woodworkers cut sliding dovetails on a router table, I find the table saw to be just as effective. All you need is a tenoning jig and a miter gauge to hold the work.



Edge layout. Using your dovetail socket as a reference, lay out the dovetail on the edge of scrap that's the same thickness as your project stock.



Rout the dovetail slot in the drawer front. Rout the dovetail sockets in the drawer front using a simple shop-made bushing-guided jig and a router outfitted with a $\frac{5}{8}$ "-dia. bushing and a $\frac{1}{2}$ ", 14° dovetail bit. Clamp and tape the template to the workpiece.

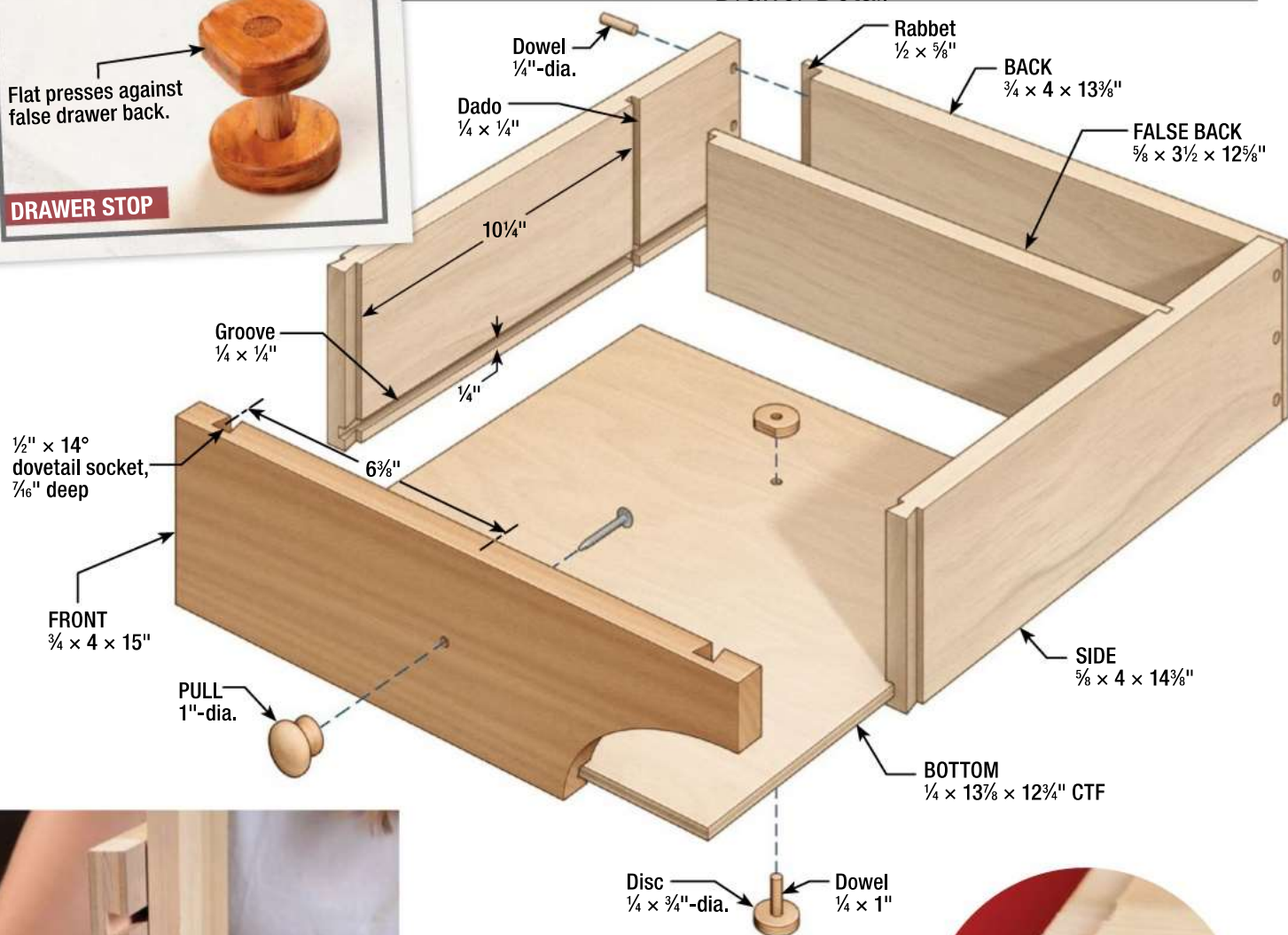
UNDERCOVER GEAR

Flat presses against false drawer back.



DRAWER STOP

Drawer Detail



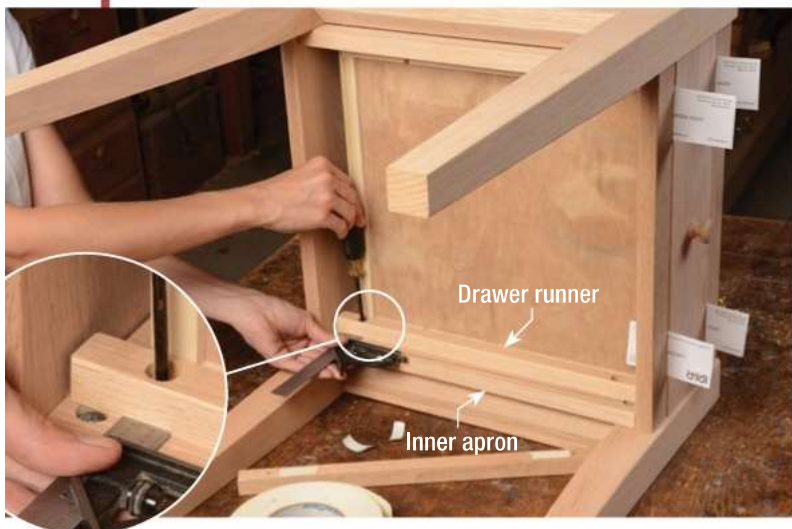
Saw the cheeks. With the blade tilted 14° and the scrap clamped securely to a tenon jig, adjust for a cut just outside your dovetail cheek and shoulder layout lines. Cut one cheek, then flip the work over on the jig, and cut the opposite cheek.

Saw the shoulders. Saw the shoulders, registering the cut against a rip fence stand-off block. Set the blade height just shy of scoring the cheek. After sawing both shoulders, chisel away the waste that remains at the cut intersections. Now check the fit in the dovetail socket. It should be slightly fat. Repeat the cheek cuts, removing tiny amounts at a time until the joint fits snugly. Then cut all your workpiece cheeks with that setting, followed by all the shoulder cuts.

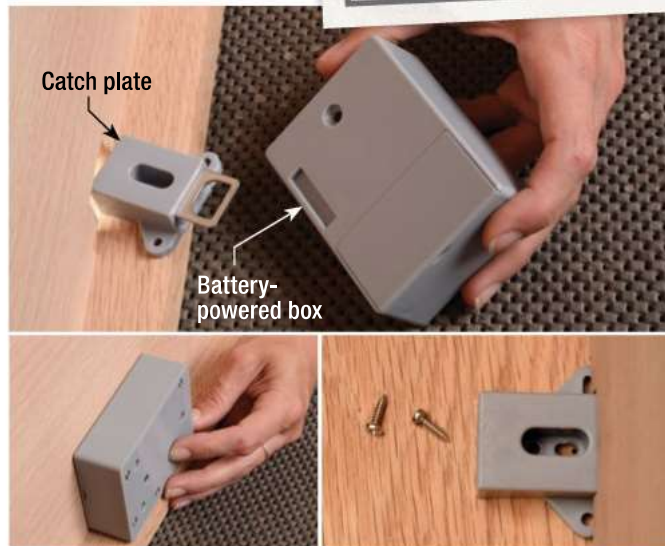
Final assembly and finishing touches

Make the drawer runners, pre-drill them, and attach them to the inner aprons. Use a block plane to cut a 45° chamfer with a 3/16"-wide flat on the foremost top edge of each front leg to allow swing clearance for the top. Make the parts for the table top prop, but don't attach it yet. Remove all the hardware, scuff-sand all surfaces, and apply finish to all the parts. Reattach the false aprons and their hardware, and attach the RFID hook to the rear apron as shown. Then screw on the prop, connect the top with the Soss hinges,

and attach the RFID box to the underside of the top. Finally, attach the drawer stop, inserting it in its hole in the drawer bottom, and then gluing the remaining disc to the dowel. ■



Attach the drawer runners. With the table on its side, and the drawer front shimmed evenly in place, locate each pre-drilled drawer runner against the underside of the drawer. Double-faced tape will keep the runner in place as you use a combination square to adjust the runner parallel to the underside of the inner apron. Then drill pilot holes in the apron, and screw the runners to the inner aprons.



Attach the RFID lock. The RFID lock consists of a battery-operated box that attaches to the underside of the table top, and a catch plate on the rear apron (top). To locate the lock, connect the two parts, and push the box against the compartment panel (left), which properly locates the catch plate underneath the panel (right). Install a screw in the slot, test the lock operation, and make any necessary adjustments before locking the unit in place with a screw in the hole.



Connect the top. After screwing the Soss hinges to the front rail, attach them to the table top. Because the top won't fully open 90°, you'll need to prop the lid on a board, and use a right-angle screwdriver to do the work.

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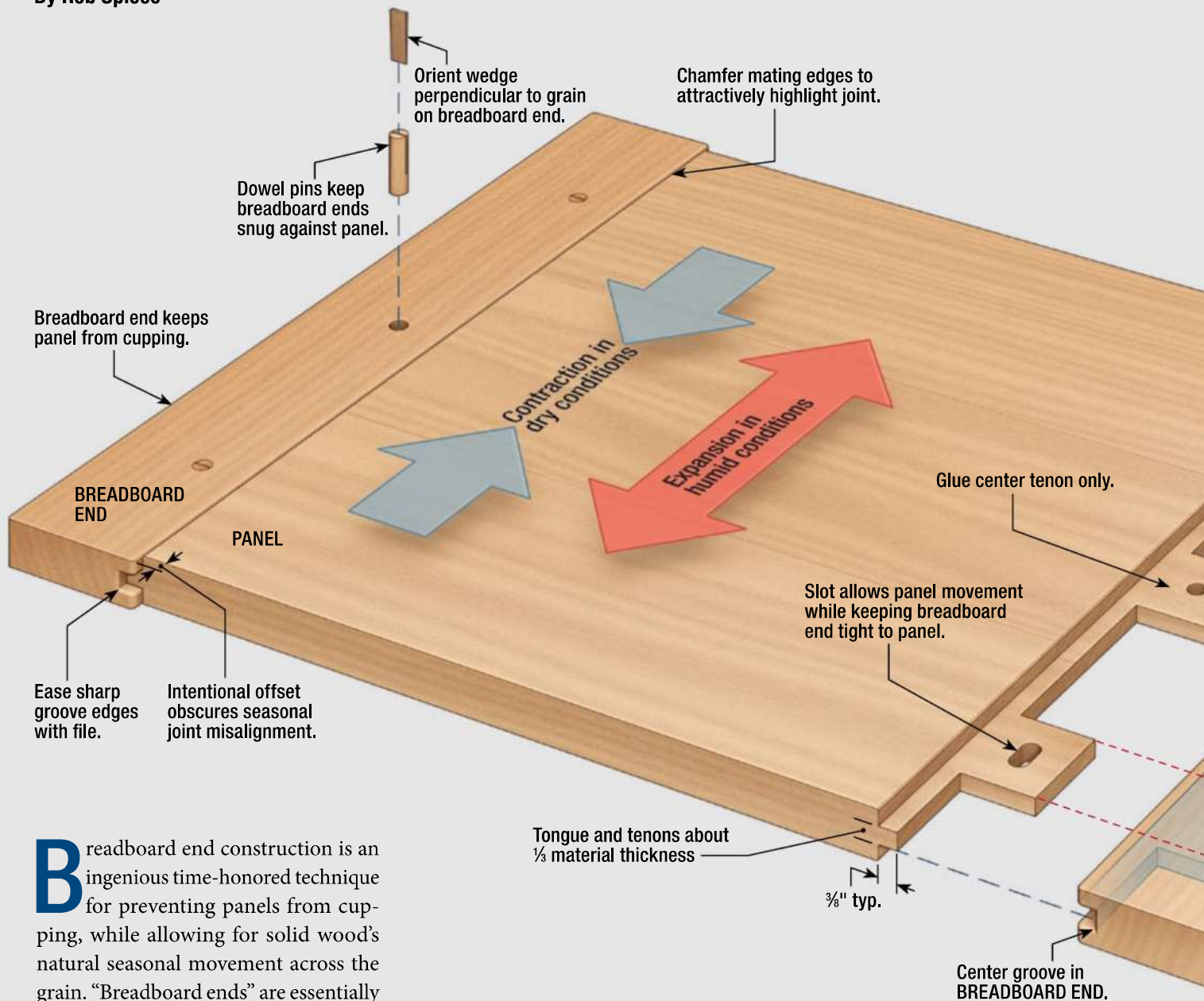
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Visit woodpeck.com for complete details on both Ultra-Shear Turning Tools and Pen Mill-Ci.

The BREADBOARD END Joint

A pretty and practical solution for keeping panels flat

By Rob Spiece



Breadboard end construction is an ingenious time-honored technique for preventing panels from cupping, while allowing for solid wood's natural seasonal movement across the grain. "Breadboard ends" are essentially grooved rails with oversized mortises that accept tenons on the end of a panel.

The joint is often used on furniture with a hinged lid, such as a blanket chest, tool chest, or specialty piece such as the "Top Secret Table" on page 34. It may also be found on the dangling ends of a drop leaf table or the long, cantilevered ends of a trestle table. Because I also like the joint simply for its looks, it is my favorite treatment for most tabletops,

whether they need them or not. It can be made to look elegant and refined, or bold and rugged. It provides interesting detail without excessive ornamentation, and exudes fine craftsmanship if done well.

In addition to the tongue-and-groove and mortise-and-tenon aspects that are essential to the joint, I often like to add a few aesthetic flourishes. For example, I incorporate a tiny V-shaped groove at the intersection of the panel and bread-

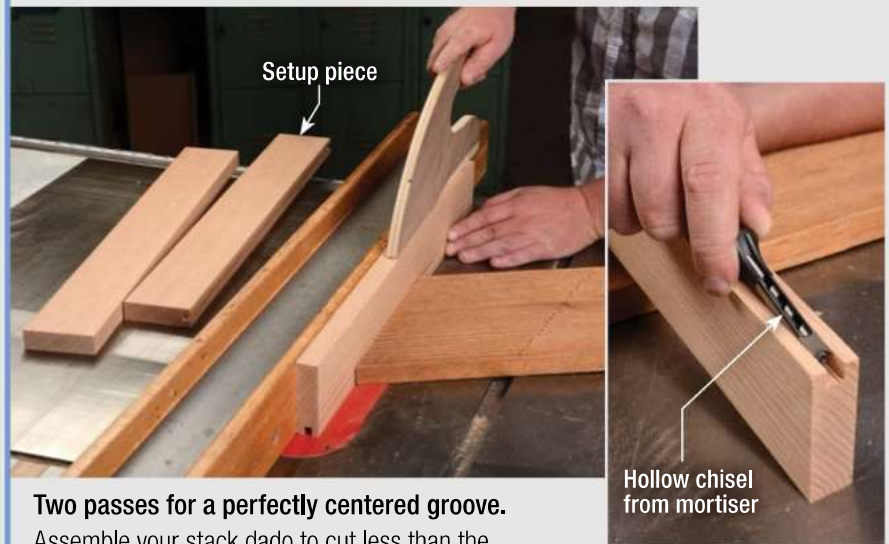
board end to highlight the joint. And, because breadboard ends will not remain flush to the panel edges during seasonal movement, I extend them past the panel about $\frac{1}{4}$ " so that the offset will always look relatively the same. Finally, I like to wedge my dowel pins with a contrasting wood, which just looks cool.

Making the breadboards

Mill the material for the panel and breadboards together, as it's critical that all pieces are identical in thickness. Process extra material for machine setups. Rip the breadboard ends to width, but leave them about 4" over their finished length for now. Saw a centered groove in one edge of each breadboard end, using a setup piece to sneak up on the exact width. Then lay out and cut the mortises; I use a hollow chisel mortiser for the job, as shown.

onlineEXTRA

- Shoulder Plane (issue 44)
- Ten Table Top Tips (issue 84)



Two passes for a perfectly centered groove.

Assemble your stack dado to cut less than the width of the finished groove. Then adjust the cut height to match the groove depth. Set your rip fence so that the blade is roughly centered on the setup workpiece. Plow the groove in two passes, rotating the board end-for-end, and then check the width with a hollow chisel. Adjust the fence until the chisel fits perfectly. Now saw your breadboard ends.



Cut the mortises. After laying out the length of each mortise on the edge of the breadboard end, set the mortiser fence to perfectly center the chisel within the groove. Check by pressing each face of the stock against the fence in turn, making sure that the chisel doesn't cut into the groove wall either way. Set the machine depth stop to cut slightly deeper than your planned tenon length, then make the cuts as shown.

Tenon length about $\frac{2}{3}$ the width of breadboard end

Tenon width about $1\frac{1}{3} \times$ tenon length

Tongue in groove keeps joint aligned.

Oversized outer mortises allow seasonal movement.

Order of Work

- Groove and mortise breadboard ends
- Saw tongue and tenons
- Fit ends and drill for pins
- Make pins and wedges
- Assemble panel and breadboards

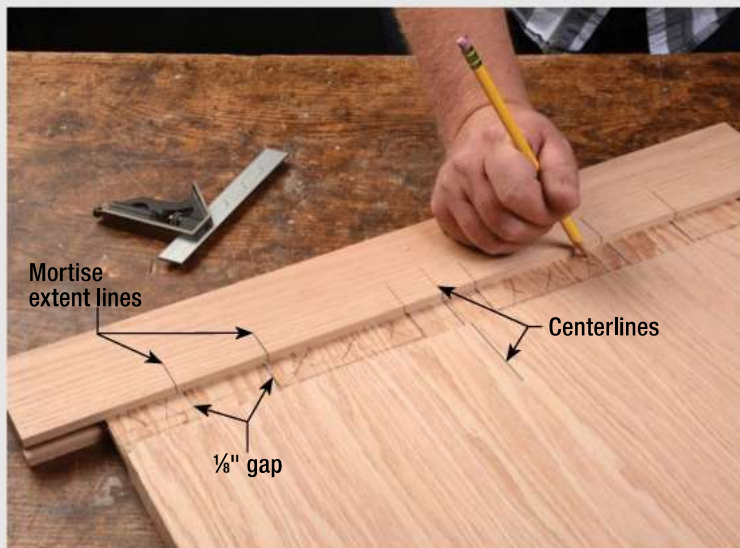
Cut the tenons

To set up to saw your tenon cheeks, rest a breadboard end on your table saw, and raise the blade to a hair below the lower edge of the groove. Then saw the tenon cheeks as shown. Lay out the tongues and individual tenons, and remove the waste at the bandsaw.

Tap the breadboard ends onto the panel to check the fit. If the joint won't seat fully, check the tongue length, shortening it with a file if necessary. Note that the breadboard ends' excessive overhang allows tapping them free harmlessly with a mallet for fitting.



Saw the tenon cheeks. Using a wide dado head configuration and a sacrificial fence, saw the tenon cheeks in multiple passes, initially making them just a bit too thick for their mortises. Set the fence, and take a maximum-width cut from both faces at the far ends of the panel. Then reset the fence to saw the tenons to final length as shown here. Use push blocks to apply consistent downward pressure on the panel.



Tenon layout. After transferring the mortise extents across the edge of each breadboard end, tuck the tenon section into the groove, centering it on the breadboard end. Then lay out the individual tenon widths, as well as the tongue. Incorporate a 1/8" gap on each edge of the outer tenons to allow for wood movement.

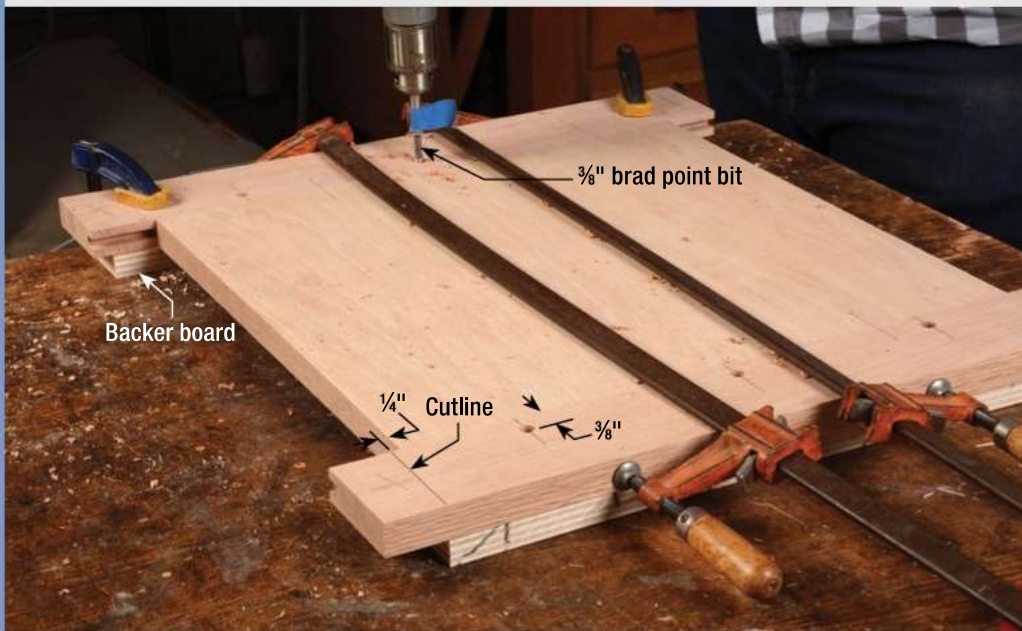


Plane to fit. Use a shoulder plane or a rabbet block plane (shown here) to cut equal amounts off both tenon cheeks as you trim them to fit. The tenons should slide into their mortises snugly without using excessive force.

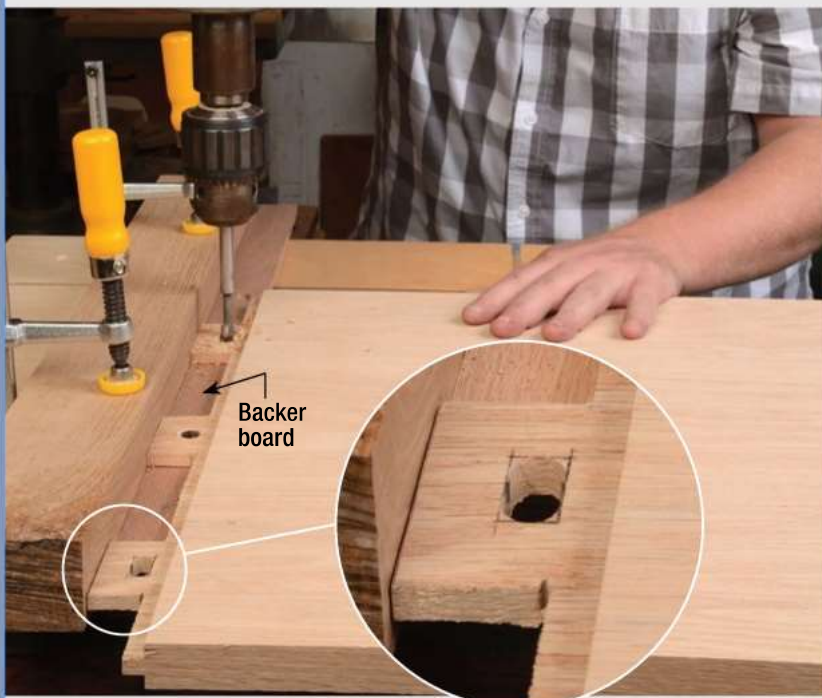
Drill, sand, and shape

Extend each tenon centerline onto its breadboard end, and use an awl to mark a dowel pin hole center on the line $\frac{3}{8}$ " in from the edge of the breadboard end. Dry-clamp the whole assembly together, and drill the dowel pin holes as shown. Remove the breadboard ends and elongate the outermost holes at the drill press to create slots. Dry-assemble the parts again and sand them, starting with 80

grit to flush them up and remove machine marks. Then move through progressively finer grits up through 220 to smooth everything. Cut the breadboards to final length, and finesse their ends as shown. Finally, use 220-grit paper and a hardwood backer to sand mating 45° chamfers on the edges where a breadboard end meets the panel. Aim for creating a V-groove that's about $\frac{1}{16}$ " wide and deep.



Drill for pins. Dry-clamp the assembly and use a $\frac{3}{8}$ " brad point bit to drill through a breadboard end and panel tenon at the same time to create the dowel pin holes. Use a backer board to prevent exit tearout. Also mark a cutline on the end of each breadboard end $\frac{1}{4}$ " past the panel edges.



Elongate the outermost holes. Chuck a $\frac{3}{8}$ " Forstner bit in your drill press, lower it into the previously drilled hole in one outermost tenon, and then clamp your fence against the end of the tenon. Drill an overlapping hole to each side of the original hole to create a $\frac{3}{4}$ "-long slot. Then repeat for the remaining outermost holes.



Finesse the breadboard ends. Use a mill file to soften the sharp edges at both ends of each breadboard end groove

Assemble and glue-up

To prepare for glue-up, start by making the $\frac{3}{8}$ "-diameter dowel pins, cutting them about $\frac{1}{4}$ " longer than your top is thick. Chamfer one end of each pin by chucking it in a drill and spinning it against fine sandpaper at a 45° angle. The chamfer makes for easier insertion, prevents exit blowout, and—when left to project from the table's underside—provides a nice

surprise for exploring fingertips. I also like to wedge the dowels, primarily for added visual interest, so I slot them at this point too.

To make the wedges, mill a piece of contrasting species to $\frac{3}{8}$ " thick, then use the table saw to rip $\frac{1}{16}$ "-thick strips from the outer edge of the board. Afterward, crosscut and pare the individual wedges to shape as shown.

To glue up the assembly, clamp the breadboard ends to the panel after applying glue to only the center mortise-and-tenon joints. Then install the pins and wedges, trimming them flush afterward. ■



Slot the pins for the wedges.

Using a back saw and a simple shop-made guide, saw a kerf perpendicular to the dowel's end grain and a little more than halfway down the length of the pin.



Point the wedges. To shape a wedge, I place it against the fence on my bench hook, and pare forward and downward with a sharp chisel.

Pin and wedge. Install each pin and wedge in turn, beginning with the center pin, which is the only one to receive glue. Tap the pin in first, orienting its slot perpendicular to the grain on the breadboard end. If a pin starts to rotate during tapping, wrap a paper towel around it and grip it with pliers to correct the slot orientation. When the pin projects $\frac{1}{8}$ " from the underside, apply a little glue to the wedge, tap it home, and move on to the next hole.



Saw the pins flush. When the glue dries, use a flush-cut saw to trim the pins flush to the surface. I encircle the pin with a punched scrap of file folder as insurance against saw marks, then pare and sand away what little remains.

