Tablesawn Dovetails



Accuracy and hand-cut look in half the time

BY STEVE LATTA

Dovetailing—time-tested, reliable and strong—is also ornamental and should reflect the personality of the builder. For this to happen, the cabinetmaker must control the number of pins and tails and their size and spacing. Unfortunately, most router dovetailing jigs don't allow for that type of expression. The appearance of the final joint, with thick pins and uniform spacing, is void of personality.

Hand-cutting represents the other end of the spectrum. The size and spacing of the pins are determined by the cabinetmaker. Combine that with the natural irregularities of handwork, and this technique yields a look that is truly wonderful, tying the builder to traditions that are hundreds of years old. However, it requires a great deal of time and skill.

I teach students a tablesaw method that bridges the gap between router-cut and totally hand-cut dovetails. The technique guarantees accuracy while allowing you to control spacing and size. The tails can be as close together as the width of your sawblade. And it's easy to make the spacing irregular, another sign of handwork.

The main problem my students have with hand-cutting dovetails is crooked sawcuts, which come back to haunt them when they use the tails to lay out the pins. Any irregularities create gaps and splits when the boards are joined. Cutting the tails on a tablesaw, using a miter-gauge setup or a guide block riding the rip fence, ensures square cuts. This leads to an accurate transfer and, inevitably, a better joint. The guide-block setup also lets you run a stack of parts in one pass.

Another big advantage is that you spend less time on layout. For multiple dovetails that are identical, the tails need to be marked on only a single piece of stock. The tablesaw setup guarantees repeatability. This also means that pieces are interchangeable, so when running components such as drawer sides, I send a few extra parts along for the ride. If one gets damaged later, a replacement is at hand.

The pins are pretty easy, as long as the layout is transferred accurately with a marking knife. I use machines to remove the waste between the pins and then pare them by hand, working to the incised line.

Have a blade specially sharpened

Years back I read an article where a cabinetmaker ground all of the teeth of a table-

CUSTOM-GROUND BLADE IS THE KEY



Angled teeth make for perfect tail cuts. With the sawteeth ground to the dovetail angle, the blade can be tilted to the same angle, making the top of the cut flush with the scribe line. Only a small triangle of waste stock is left.



Tablesaw setup involves a tall support board attached between two miter gauges. A simple stop and clamp allow for accurate repeat cuts.

saw blade 11¹/₂° in one direction and used the blade strictly for dovetailing. Fascinated by this idea, I spent \$12 to have an old narrow-kerf blade ground this way to work with my Unisaw. I had another blade sharpened in the reverse direction to fit my left-tilting Powermatic 66.

When tilted to the proper angle, the top edges of the teeth should be parallel to the surface of the table. Although this tablesaw technique will work with a standard blade, the cut will not reach all the way into the corner. The specially ground blade cuts a perfect corner, leaving only the small triangle of waste between the cuts.

You can have your blade ground to your favorite dovetail angle. I chose a 5:1 angle,

which works out to $11\frac{1}{2}^{\circ}$, but you might prefer 6:1 (9^{1/2}°) or an 8:1 ratio (7°). The cost of having a blade custom ground is usually under \$20 (a couple of grinding sources are listed below). The blade will handle its light task for many years without resharpening. I'm still on my first one.

SOURCES FOR GRINDING

Forrest Manufacturing (800-733-7111) will grind an angle on any square-tipped blade for \$11.

Freud Manufacturing (800-472-7307) has a list of regrinding services around the country. I recommend using a carbide-tipped blade that has a flat-top grind. Squaretipped teeth like this are common on older blades and blades designed for ripping. The problem with alternate-top-bevel (ATB) teeth is that too much of the carbide may have to be removed to get each tooth down to a common angle, and then the blade may not cut properly. Try telling your local sharpening service what you want; they may be able to work with almost any blade.

Cut the tails first

When teaching students to cut dovetails, I lay down a simple rule: pencil marks for the tails, knife marks for the pins. Because

MARK AND CUT TAILS



Make a test cut to set your sliding bevel tool. Use that setting to lay out your dovetails.

The rip-fence-and-support-block method works well for smaller parts. In this case the rip fence acts as the stop, making it possible to run up to six parts at a time and keep them aligned.



FOUR CUTS ARE POSSIBLE WITH EACH SETUP

If the dovetail layout is symmetrical, these setups allow you to make up to four cuts without moving the stop or rip fence. And the dovetails have to be laid out on only one end of one board.



the tails are cut first, it's no big deal if your cut misses the pencil mark by a little. If it's a scribe line, however, you'll have to cut or pare all the way to that line to remove it and get rid of the small blowouts from severed fibers. Of course, I use a marking gauge to scribe the depths on both the pins and tails boards.

Size matters—Basically, I cut the tails by setting the board on end and pushing it through the angled blade. However, depending on the size of the workpiece, I do this in two different ways. For large case pieces, I use drywall screws to attach a support board of medium density fiberboard (MDF) to a pair of miter gauges, which makes a very stable jig. Then I clamp a stop onto this board to allow repeat cuts. With a very high support board and a waxed table, I've made dovetail cuts on boards standing over 6 ft. tall.

Rather than using a miter-gauge setup for narrow pieces such as drawer sides or drawer stretchers, pieces can be guided by a heavier chunk of stock riding against the rip fence (I save the cutoffs from bedposts for this purpose). This method has a couple of advantages: It's quicker to set up, and the stop, which is the rip fence in this case, is easier to adjust.

Typically, I'll run each set of drawer sides as a pair, cutting through both simultaneously. For larger-scale jobs, with several drawers equal in height, I often run a stack of six parts in one shot. The rip fence keeps them aligned. Once again, this support block also works to prevent chipout, so make sure each cut goes into fresh stock.

Setting the blade height—For throughdovetails, when using the marking gauge to scribe the baseline, go a hair deeper than the thickness of the mating piece. This will cause you to leave the tails slightly proud when the joint comes together; then they can be planed flush to create a perfect appearance. The same should be done for the pins. Half-blind dovetails, however, should be laid out for a flush fit.

Scribe a piece of scrap stock and use it to fine-tune the blade height. Tilt the blade to the appropriate angle and raise it slowly, making several test cuts until the blade is cutting right at the line. If you accidentally go too high, reposition the support board or flip the support block. That board or block backs up the cut to prevent chipout.

RABBET, THEN REMOVE WASTE





When the blade is hitting the scribe line exactly, you can use the sawkerf in the scrap piece to set the angle of your adjustable bevel. Lay out the dovetails on your first workpiece. Move the stop block so that the blade lines up with the pencil line, then guide the piece through the cut.

Rabbet the tails before cleaning out the waste

Before I clean out the waste between the tail cuts, I rabbet the inside edge of the **Rabbet** *the tails*. A small rabbet behind the tails creates a clean inside edge on the finished joint and makes it easier to locate the tails over the pins board when transferring the layout. It also protects the corners of the tails when the boards are stacked.

Latta prefers the scroll saw for removing waste stock between tail cuts. He cuts directly across the scribe line, leaving no waste, and the job is done in one step. This waste also can be removed quickly with a chisel.

joint. The rabbet is flush with the bottom of the tail sockets and serves a number of purposes. Most importantly, it makes it much easier to locate the tails board on the pins board, resulting in a precise layout transfer. Rabbeting the tails also leaves a clean corner on the inside of the finished joint, with the shoulder covering blowout, milling errors and glue squeeze-out.

Cut this rabbet *after* making the tail cuts. If the rabbet is there first, you will get blowout when cutting the tails. When you

THROUGH-DOVETAIL PINS



Transfer the layout. The rabbet makes it much easier to keep the boards correctly aligned. Use a knife to mark pins; the scored line will guide your chisel later.

Area cut away



Use a dado blade to remove as much stock as possible. Again, the rip-fence and support-block setup allows multiple workpieces to be run at once.







Paring to the line. The dado blade (or a router) will leave a square, clean bottom between the pins but small triangles of wood to be pared away. The combination of a chisel and knife works well for paring right to the scribe line and then severing the fibers at the inside corner of the pin.

put the rabbeted side against the miter fence, there will be no support there for the cut. However, rabbet the tails before cleaning out the waste between the angled tablesaw cuts. There will be less waste to clean out and the rabbet will help guide your chisel if you're chopping by hand

For small to medium workpieces, make a shoulder that's less than ¹/₈ in. deep. You can make this cut in a single pass over the tablesaw blade. For carcase pieces or drawer stretchers ⁵/₈ in. or thicker, when the rabbet is thicker than a sawblade, make a shoulder cut followed by a cheek cut on the tablesaw.

It is critical that this rabbet hit the scribe line exactly. Otherwise, the joint won't fit or there will be an unsightly gap on the inside corner. After rabbeting the inside of the tails, don't forget to reset your marking gauge for the pins, which now have less stock to pass through.

Clean out the tails—I prefer to use a scroll saw to cut away the waste. The thin blade can slide sideways down to the base of the tablesaw cut and then cut straight across the bottom in one shot. Cut to the scribe line. It's a waste of time to stay shy of the line and leave the rest for hand-paring.

If you don't have a scroll saw, waste some of the stock out with a bandsaw and finish with a sharp chisel. Of course, chop only halfway into the workpiece before flipping it over and working in from the other side. Regardless of the method, this step goes quickly—especially if the spacing between the tails (the size of the pins) is kept to a minimum.

Now cut the pins

Use a marking knife or X-Acto when transferring the location of the tails to the pins board; a pencil line is just not accurate enough. Also, during the final paring, the tip of your chisel will fall right into the knife mark, leading to a perfect fit.

How you waste out the stock between pins depends on the type of dovetail being cut, the size of the workpieces and which machines you own.

Three options for through-dovetails—

For smaller workpieces, I use a scroll saw to clean out the waste between the pins. Cut in along the widest part of the pin and across the depth line. With a little practice you will be able to cut right to the scribe

HALF-BLIND DOVETAILS



line. Having removed the bulk of the waste, use a chisel and marking knife to pare away the remaining triangles of stock.

For larger case pieces with throughdovetails, or when you have a lot of parts to do, use either a router setup or a dado head on the tablesaw. By working with the board set on end, you can use the height adjustment on these machines to establish a clean and square surface at the bottom of these wide spaces.

A router with a straight bit leaves the cleanest cut at the bottom of the pin spaces, and it lets you work closer to the angled cheeks of the pins, but it involves one quick extra step. First clean out most of the material with a scroll saw or bandsaw. The router will work more smoothly with less material to hog through. Because the router will be riding on the end of the board, clamp on a wide support block. This piece will also back up the cut. Remove as much stock as possible, then pare to your scribed layout lines with a sharp chisel or knife.

On the tablesaw, use the double-mitergauge setup. I usually stack the dado head to a ¹/₂-in. thickness, which doesn't hog away too much material in one pass but still makes the job go quickly. Just as before, if you go too high with your test cuts on scrap, reset the support board so that the cut plows through fresh stock. Place the workpiece so that the widest part of the pin is facing the dado head; that way any blowout will be mostly in a waste area. Again, finish the joint by hand.

Router setup for half-blinds—The router-and-support-block setup works well for just about all half-blind dovetails, whether fitting dovetailed stretchers into the tops of table legs, drawer sides into drawer fronts or case tops and bottoms into sides. Once again, set the router's cutting depth exactly to the scribe line. Finish the pins with a chisel and knife.

Method is a good compromise

I'd love to teach my students to cut all of their dovetails by hand, cherishing both the process and final product. But their skill levels and the reality of the marketplace they're entering simply won't allow for that. The structural integrity and final appearance of the joint is what matters most. With this tablesaw technique, you get most of the character of a hand-cut joint in much less time. All in all, it's a compromise I can live with.

Steve Latta is a furniture-making instructor at the Thaddeus Stevens College of Technology in Lancaster, Pa. **Rough them out freehand with a router.** The end-grain orientation makes it easy to control the cut as you work close to the lines. Clamp the workpiece to an extra block to support the base of the router.





Finish with a sharp chisel. For accurate results when making the final paring cuts, start the chisel in the scored layout marks.



Expect a flawless fit. A few light taps should be enough to close the joint.