Cut and Fit Perfect Pins

Don't Fear the Dovetail, Part 2

Scribe the tails accurately
and the rest
is simple handwork

BY CHRISTIAN BECKSVOORT

In the first half of this two-part article, I described every step of the process I use to lay out, saw, and chop the tails in a through-dovetail joint (*FWW* #238). I always cut the tails first and use them as the template for the pins. In this part, I'll show you my method for transferring the tails to the pins, as well as how I cut the pins and assemble the joint. Even if you use a different method to cut the tails—as long as you cut them first—you can apply all these techniques to your process.

Transfer the tails with precision
When you're making hand-cut dovetails, transferring the first half of the joint to the second half is where the rubber hits the road. Accurate scribing is essential. Luckily, two of the big benefits to cutting tails first and pins second come into play as you make the

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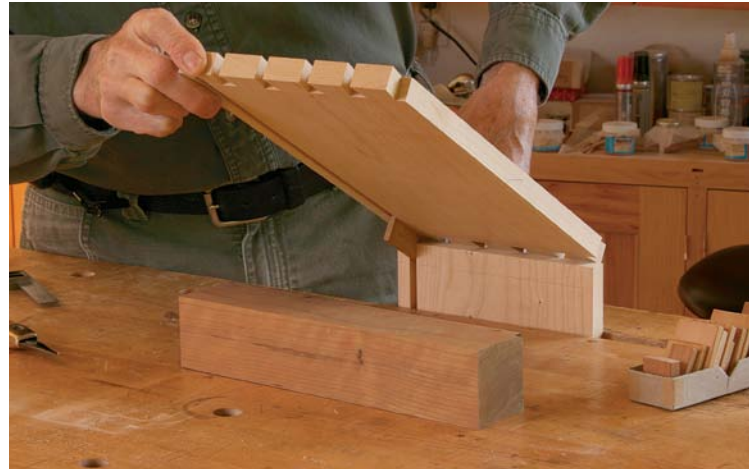
Easy alignment. *Use a scrap block to support the tail board during scribing. First clamp the pin board in the vise so its top edge is flush with the block (left). Then move the block to support the far end of the tail board. If your boards are grooved for a bottom or back, insert a small square of wood into the groove to control side-to-side alignment (above).*

Knife work. *Align the tail board so the gap between its shoulder and the face of the pin board is just barely closed (above). This will leave the ends of the tails proud by about the thickness of a fingernail. Trace the tails onto the end grain of the pin board (right), starting with a light stroke and following with one or two heavier ones.*

transfer. One is that you can lay the tail board flat as you trace the tails. The other is that you can make the marks with a knife into end grain for maximum accuracy. Before you begin tracing the tails, number the mating joints—1,1; 2,2; 3,3; 4,4—so it's clear which sets of pins belong with which sets of tails.

I use a simple trick to keep the tail board flat and steady while I scribe. Place a square block on the benchtop in front of the vise. Then clamp the pin board in the vise so its top end is flush with the top face of the block. Now when you set one end of the tail board on the pin board for scribing, you can use the scrap to support the other end.

Align the tail board so that its sides are flush with the sides of the pin board. Then line up the shoulders of the tails with the inside face of the pin board. The tails, which will be proud in

Finish the layout. *Use a square and a pencil with a fine point to draw the lines between the scribed angles and the scribed baseline.*

Saw and chop the waste

Down to the line. *Your kerf should be right on the knife and pencil lines. Mark the waste with Xs to avoid mistakes.*

the finished joint, will protrude slightly past the outside face of the pin board.

Holding the tail board down firmly with one hand, mark along both cheeks of all the tails. Use a sharp knife with a long bevel, and hold the bevel flat against the wood. For maximum accuracy, make a light cut first, followed by a heavier cut. Then use a square and a fine-point pencil to carry these knifed lines down the faces of the pin board to the baseline.

Remove the waste between pins

When you cut the pins, your sawkerfs should, ideally, be right on the layout lines. You could saw close to the lines and pare to them later, but this is a slow and inefficient process. Better to put the extra time into practicing cutting to a line beforehand.

Once all the pins are sawn, you can move on to chopping out the waste. Clamp the pin boards flat on the bench, stacked like steps, and begin by establishing the shoulder. Use a wide chisel held vertically and with its point right in the scribed baseline. Make one light mallet blow at each setting of the chisel—you'll likely have to set the chisel twice to span the baseline from pin to pin—and chop between all the pins. This light chop establishes the shoulder without driving the chisel beneath the baseline.

Use the same wide chisel held horizontally to tap into the end grain and take out a chip of waste about $\frac{1}{16}$ in. thick. Now you have a shallow, square shoulder. The rest of the joint will be
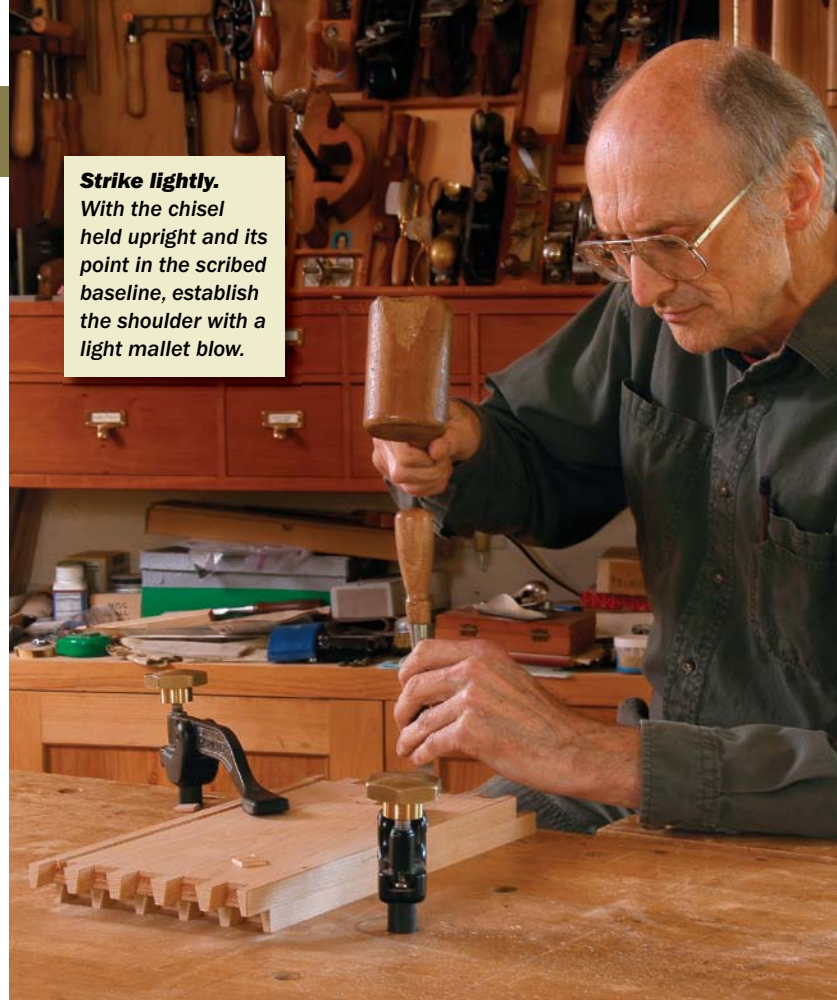

First chip is the slimmest. *Remove a thin chip of waste with a tap on a horizontal chisel, and you'll have a $\frac{1}{16}$-in.-deep square shoulder. To chop out the rest of the waste, hold the chisel just off vertical—tilted toward you—and use harder mallet blows. This undercuts the joint, leaving the shoulder intact.*

Same sequence on side two. *After chopping to the middle of the pin boards, flip them and use the same techniques to establish a square shoulder and chop away the waste on the other side. Lighten up at the end to avoid damaging the shoulder below.*

Pare for a perfect fit

Slice on the scribe lines. *If any of your scribed lines are visible on the end grain, put the tip of a chisel in the line and pare away the waste (right). If the grain is running into the pin, pare from the side instead of the top (far right).*
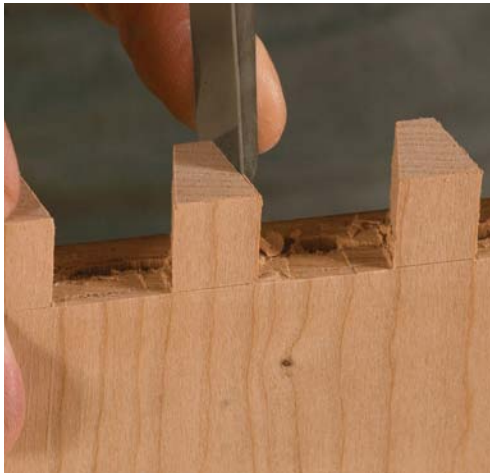
Gauge the fit with graphite. *Blacken the first ⅛ in. or so of the tails' cheeks with a pencil (left). Engage the joint evenly with moderate fist pressure (center). Where the graphite has transferred to the pins, pare it away gingerly, coming from the top if the grain permits (right), or from the side if the grain is tricky.*

undercut slightly, speeding up the process and leaving the shallow shoulder pristine. You can afford to undercut, since this is all end grain and is not a good glue surface anyway.

With the chisel tilted toward you slightly, make each chop with several firm mallet blows. Chop between all the pins and follow up by removing a thick chip of waste. Continue chopping this way between all the pins until you reach the middle of the boards. Then flip them, reclamp, and repeat the two-step chiseling process from the other face. When you are working on the last bit of waste, use a series of light hits to avoid damaging the shoulder and stock below.

With the chopping finished, clamp each pin board in the vise in turn and examine the end grain. If any of the scribe lines are visible, you have paring to do. Select a chisel that's wider than the pin, put its point in the scribe line, and pare straight down. Be careful of the grain here; if it runs in toward the pin and pulls the chisel with it, try paring from the side instead of from the top. After paring, use a knife to clean out all the inside corners. Lastly, check with a square to see that the joints are properly undercut—

Knock it home. *After paring the pencil marks away, test the fit again, disengaging the boards and reapplying graphite as often as necessary until the joint slides snugly home.*

Clever glue trick. To simplify the glue-up, assemble the box so the joints are just barely engaged. Then apply glue to the cheeks of all the pins and tails before pounding the joints home.

Use clamps if you need them. After pounding the joints home, use clamps if necessary to close any gaps and to adjust the box for squareness.

the shallow shoulders you established on each face of the board should be the high points.

Pare the pins to fit the joint

In a perfect world, you would now be able to drive the joints all the way home with moderate fist blows. But in reality, fitting comes next. Always do this paring and fitting on the pins; the tail board is the pattern, and the pins must conform to it.

With a pin board in the vise, align the matching tail board and press down lightly. If the two pieces barely engage, that's good. Remove the tail board and, with a pencil, darken the leading edges of the tails. Re-engage the pieces and pound a bit harder. Where the graphite has transferred onto the pins, pare ever so slightly, keeping the chisel vertical. Don't undercut, since this is your glue surface. If the joint is already engaging, don't pare all the way from the top of the pin, since it already fits there. Be patient; it may take three, four, or even five tries before you get a good fit.

If there are gaps between any of the pins and tails, you'll need remedial action after the glue-up (see opposite page).

Tricks for a confident glue-up

For small glue-ups, you can coat the pins and tails with glue while the parts are separate and assemble as normal. But for medium and large glue-ups, partially engage all four corners—by ⅛ in. or so—before applying any glue. Then use a narrow stick to apply glue to the exposed faces of the tails and pins on all four corners. Pound the joints together with a caul and mallet. If the joints don't come completely home with the mallet, use clamps. I use scraps of pine as clamping pads. Even though the joints are proud, there's no need for custom clamping blocks. The pine conforms easily to the shape of the joint while delivering the clamping pressure. If there's much glue squeeze-out, slip a piece of waxed paper under the pine to keep the blocks from adhering to the workpiece. □

Christian Becksvoort is a contributing editor.

Easy squeeze. Becksvoort doesn't need specially made clamping blocks to contend with the proud tails. He just makes white pine blocks, which are soft enough to conform to the proud parts of the joint.

A fine fix for gaps

As the glue dries, examine the joints. If there are any hairline gaps between the pins and tails, you can fill them with commercial wood filler or with a homemade recipe: ⅔ glue to ⅓ water, to the consistency of heavy cream, then blend in sanding dust (not sawdust) to the consistency of peanut butter. With white or yellow glue, avoid contacting metal while you mix and apply the filler, since the glue will react with the metal and turn black.

Larger gaps—the width of a sawkerf or less—can be fixed after the clamps are off. Widen the gap with a handsaw. Then cut a thin shim from a scrap that matches your project and glue it into the kerf. Depending on which direction you insert it from, the shim's grain will match either the pin or the tail.

Kerf the corner. To repair a gap between a pin and a tail, start by sawing into the gap with the blade on a 45° angle. Cut the kerf from baseline to baseline.

Create a kerf-sized shim. Using the tablesaw and a scrap of stock that matches your project, cut a shim that fits your handsaw's kerf.

Trim the shim. Cut one end of the shim on a 45° angle with the chop of a chisel. After gluing it in place, trim the shim flush (right) with a few strokes of a knife.
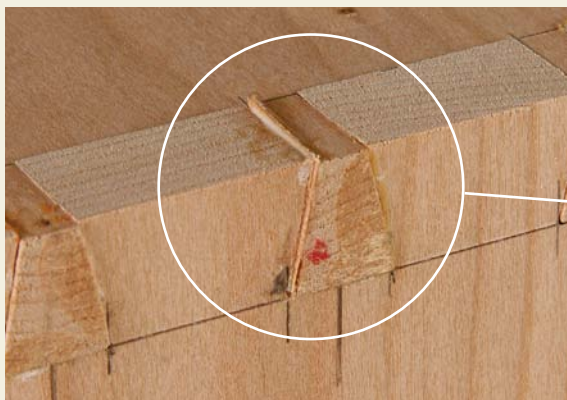
Seamless repair. Glued in with its side grain and end grain matching the neighboring pin (above), this shim is virtually invisible once it's sanded flush (right).