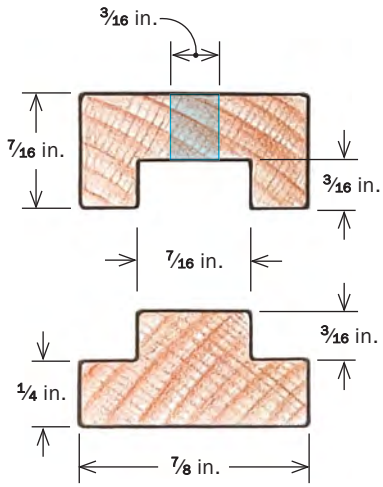
Making and Using Squaring Sticks

Traditional tool lets you check for square without math or measuring

BY CHARLIE DURFEE

Tapered tips tuck into tight territory. *Because the points fit into inside corners, you can accurately compare diagonals when checking for square. Durfee has two pairs of sticks, one long and one short, to accommodate the vast majority of his work. The sets can be made at the same time with the same setups.*



Photos: Barry NM Dima; drawings: John Tetreault

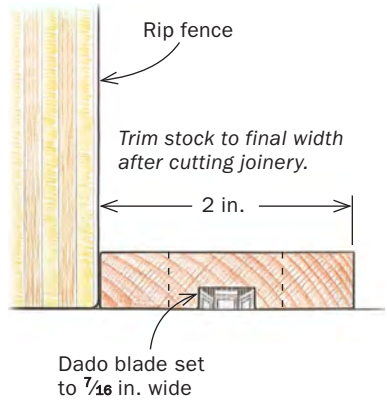
My woodworking career began with building boats, where nothing is square. But as I moved more into making cabinets and furniture, square and flat became the norm—the foundation that the structures depend on.

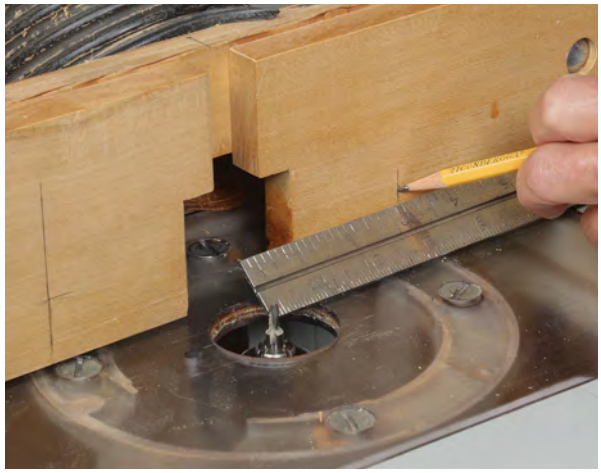
With this new work, I needed to have a reliable method to check for 90°. For small pieces, a square works, but if there's any curve, bow, or reveal, a square quickly becomes useless. Therein lies the beauty of checking inside diagonals, since equal corner-to-corner dimensions mean a piece is 90° all around.

A measuring tape works to check diagonals, but its shortcomings quickly become apparent when you stab the end into one corner, try to hold up the tape so it doesn't sag too much, and take your best guess at the measurement from the scale bent to reach into a corner at the other end.

Start with the grooved blank

Center a groove in wide stock. *Durfee uses overwide stock for now to resist dangerous flex when he routs the slot. He'll use a push stick to finish the cut.*





Mark the fence 3 in. left and right from the center of the bit. *These are your start and stop points for the plunge cut for the slot. This isn't exacting joinery, so pencil marks are fine.*

After fighting the tape, there's the "aha!" moment when you realize something rigid and expandable could do a better job, extending right into the opposite corners without sagging and without numbers.

Two sticks clamped together can work, but my version, with its mating tongue-and-groove and locking wing nut, are outsize upgrades considering how little time they take to make. I made two sets over 30 years ago, a long one and a short one (34 in. and 22 in.), and they've proved reliable partners in making square furniture large and small. I've used them so much I can't tell what finish I put on them—or if the finish is just patina.

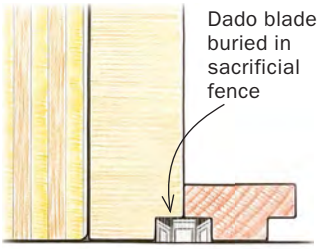
The tongue-and-groove allows the two halves to slide back and forth easily and stay in line with each other. The locking

Pivot the workpiece onto the bit to cut the slot. *Line up the far end with the far pencil mark and plunge onto the spinning bit slowly (above). To control the workpiece, hold its edge tight against the fence and its near end tight to the table. Use a push stick to keep your hands well away from the bit. When the end of the workpiece meets the near line, pull the piece back slightly. Turn off the router and wait for it to stop before removing the piece.*

Cut a tongue to match the groove

Rip parts to final width. *Trim the grooved blank in two passes to keep the groove centered (right). Then rip the tongue blank with the same setting to ensure parts of equal widths (far right).*

Dado stack creates a quick tongue in two passes. *Bury the dado stack in a sacrificial fence to expose only as much as you need for a snug fit between the tongue and the groove. A featherboard assists making an even tongue and resists the workpiece tipping, particularly on the second cut.*



Aim for a snug fit off the saw. *Slightly too tight now will be perfect after you plane or sand off the sharp corners and wax the moving parts.*

mechanism, simply a machine screw with a wing nut and two washers that travels in a slot in the grooved stick, removes any question about whether the sticks slipped while moving from one diagonal to the other. You can also lock in the proper diagonal during a dry run to check for square at the glue-up.

Don't pick any old scrap for these sticks. Choose a hardwood with straight grain, and rough-mill the pieces oversize before setting them aside at least overnight to release any internal stresses. If there's any warp, ditch them and mill new stock. Once you find workpieces that behave, joint and mill them to final thickness and length, but two to three times extra wide.

The temporary added width is for safety, at least for the workpiece that gets slotted. Wider stock is easier to control and keeps your fingers away from the cutters. It will also resist flexing when making the slot. If you tried cutting that slot with the piece at final width, it would almost certainly pinch closed around the cutter, a recipe for danger. Keep the to-be-tongued workpiece wide now, too, for efficiency's sake. Since the two will end up the same width, simply rip them to final dimension at the same time after you cut the slot.

Center the groove and slot as best you can. I use calipers. Doing so isn't crucial and you'll likely uncenter them when you rip off the workpiece's edges. But since the tongue will be centered, having even a centered groove and slot will minimize fitting.

Cut the slot with a router bit the same diameter as the machine screw, 3⁄16 in. It's a tight fit off the bit, but a little sanding afterward gives the slot all the clearance the screw needs.

Point the ends and drill for a screw

Point the ends. *With the two halves assembled, bandsaw the ends into rounded points. Then take your time refining and centering the tip. Durfee uses a belt sander clamped to his bench. A centerline drawn on the stock guides the progress.*

Punch the tongue near the end of the slot and drill for the machine screw. *Place the hole about 1 in. from the end of the slot, giving the sticks plenty of capacity. Use a 3⁄16-in. machine screw and wing nut to secure the halves. The screw travels in the slot.*

The tongue wants to be just a hair narrower than the groove. It also shouldn't bottom out, so set the dado stack lower than the depth of the groove.

To lay out the points, mark a centerline and then draw a long, slight curve on either side starting 2¾ in. from the ends. The shape is less important than the centerline. You just want to remove material so the tips can fit into inside corners. Centering them ensures the sticks' accuracy. After roughly cutting the shape on the bandsaw, carefully refine it on a belt sander clamped to the bench, working each edge until the point is in the middle. Keep the two halves together during these shaping steps.

Drill through the tongue piece for the screw, placing the hole 3½ in. from the end of the piece.

Do the final sanding, ease the sharp edges, and apply finish—or don't. Like me, you'll wonder what's on them after 30 years of square assemblies. □

Charles Durfee is a has been a full-time furniture maker in Woolwich, Maine, for over 40 years.

Sand and wax. *Easing the tongue-and-groove's sharp corners means the joint won't bind as much. A finish is optional, but lubricating the surfaces with wax lets the sticks glide smoothly along their whole length.*