The box (or finger) joint is a remarkably strong, interlocking corner joint that can be quickly made on the table saw. The only catch is that you need a jig to help you hold and position your workpieces as you make the cuts. At its simplest, a box joint jig is an auxiliary fence with an indexing key that you attach to your miter gauge. My version adds the stability of a sled and a sliding fence to make adjusting the fit easier. For additional corner-making options, you can remove the key to create offset box joints, as I did for the treasure box on page 26. The replaceable fence enables you to use this jig to match any cutter width, from ¼” (the kerf thickness of a standard blade) up to 13/16” (the widest dado setup). But I pair the jig with a specialty box joint cutter set that cuts ¼” and ⅜” fingers, which I find suits most situations. And it eliminates the guesswork.
Adjustable joints on a sled

Box joint jigs can be simpler, but this one is easy to build and will last for years. This simple sled slides safely over the blade, carrying your work through the cut. And an adjustable fence allows you to fine-tune the finger widths.

The base is made from flat sheet material, and the runners of durable hardwood, such as cherry.

The rear fence is slotted to accept carriage bolts, and attaches at 90° to the base with a couple of hardwood cleats. The adjustable front fence holds the bolts and the hardwood indexing key. Tighten the front fence in place when you have the finger width homed in. Make the blade guard from any solid wood.

Better Blade for Box Joints

Newbies to finger-joining should realize that, for a successful joint, the width of the cutter (and its slot) should result in a very snug fit of the slot over the pin. If there’s any slop, the joint won’t work, no matter what lateral fence adjustments you make after the fact. So, to prevent problems with the initial construction of the jig, and with subsequent uses, make sure your cutter is set up to a precise, repeatable width.

But if you make a lot of box joints as I do, you’ll want to pony up for a dedicated cutter set like the one from Freud (right). The set cuts dead flat slots, and perfectly square fingers at ¼" and ⅜" wide. CMT and Forrest also make quality box joint cutters. Sets like these eliminate the need for shimming or making awkward adjustments.
Build the jig

Make the parts as shown in the drawing. Mill the runners for a snug, but sliding, fit in your saw’s table slots, and drill and countersink them for screws. Tape the base to the runners as shown, and then install just the outermost screws. After test-fitting, install the rest of the screws, and scrape the edges of the runners if necessary to ensure a freely sliding, but snug fit. Take time to get this right, as ill-fitting runners lead to inconsistent joinery results. See page 24 of Tips & Tricks.

Slot the rear fences at the router table as shown. At the table saw, set up your cutter to your desired finger width, and saw about halfway across the sled.

With the cleats at the drill press, bore countersunk 3/16”-dia. clearance holes where shown in the drawing. The one exception is the right-most top hole: Drill a 5/16”-dia. clearance hole there without a countersink. This will allow fence adjustment. Screw the cleats to the rear fence, and attach the left end of the rear fence to the sled.

Square the fence to the sled slot, and then, fasten it with a #8 round-head screw through the larger hole in the right-hand cleat. Make a test cut and check for square. Adjust the fence if necessary, and screw it in place with the remaining two holes. Then, using the slots in the rear fence as a guide, drill two 3/8”-dia. counterbored holes in the front fence, and attach the front fence to the rear fence.

Raise the dado to slightly shorter than the thickness of desired stock above the surface of the sled, and cut a notch in the front fence. Trim the key to fit this notch perfectly. Lightly chamfer the top edges of the key, and insert it in the notch. Cut the blade guard to size and screw it to the base from underneath. Finally, position the key for your first cut, as shown.

Attach the runners. Place the runners in your table saw’s miter gauge slots and add a strip of double-sided tape on top of each one. Press the base down on top of the runners using the rip fence as a guide. Afterward, remove the sled and attach the runners with screws from underneath.

Rout the slots. Cut two slots in the jig fence with a 5/16” straight bit in your router table. Mark the diameter of the bit on the router table fence, and lower the leading end of the jig fence blank onto the spinning bit to begin the cuts. To avoid stressing the bit, take a series of shallow, successively deeper passes, cutting in from both faces of the piece for efficiency.

Square the fence. Having attached the fence to the sled with a single screw through the left-most cleat hole, square the fence to the sled kerf using a drafting triangle. Then install one right-hand cleat screw, and take a test cut to check for square.

Set up for your first cut. After cutting the slot in the jig, insert the key in the fence. Then adjust the fence laterally to make the distance between the key and cutter exactly match the width of the cutter. Lock the fence in place.
Cut a test joint

It’s time to make a test joint, one piece of which will begin with a finger, and its mate with a notch. Mark the top edges of 2 test pieces with an “X.” Set the blade height a scant ⅛” less than the thickness of your stock (see “Innies and Outies” on the facing page). Cut the parts, then check the fit.

Correct an ill-fitting joint by adjusting the position of the key. For tighter joints, loosen the wing nuts slightly, and tap the front fence to your right, moving the key away from the blade. For looser joints, do the opposite. Go easy; tiny adjustments result in big changes, and any error in the position of the key will compound as you work your way across a board. The wider your workpiece, the more important it is to get the setup just right. Be sure to make a new test joint after each jig adjustment.

First cut. Load the first test piece into the jig with its marked edge against the key. Then make the cut.

Leapfrog across the width. After cutting each notch, use it to straddle the key for making the next notch. Be sure to hold the workpiece firmly against the fence and sled platform.

Cut the mating piece. To set up to cut the mating piece, use the first finger of the first piece as a spacer, which requires flipping the piece edge-for-edge. After sawing the first notch, remove the first piece, and cut all the notches in the mating piece as before.

Check the fit. A properly fit box joint should go together with just firm hand pressure, and hold together with just friction.
In an ideal world, fingers would all align perfectly flush with each other in an assembled box joint. But this can be difficult to achieve. Instead, most woodworkers aim for either protruding ends (Photo right) or recessed ends (Photo left). Protruding ends require only minor flush-trimming. But the protrusions are end grain, which can be difficult to neatly trim. Also, they hinder the use of clamping cauls during glue-up.

In the case of recessed finger ends, you have to flatten the whole surface to make the joint flush. This is my preference as face grain is much easier to plane than end grain. And, gluing up using cauls is easy.

If the fingers you’re currently cutting are shorter than the notch previously cut into the jig fence, you’ll likely experience exit tear-out. To combat this, back up your cuts with a piece of sacrificial plywood.

One shallow notch begets the next, and the problem can compound, as shown in exaggerated fashion here. To prevent the error, make sure your key isn’t too tall, and that you’re holding the workpiece firmly against the sled base with every cut.