In the history of woodworking joinery, box joints (sometimes called finger joints) are a fairly recent arrival. That’s because before the circular saw blade, cabinetmakers didn’t think that the square-shouldered joint was worth the effort. They viewed box joints as harder to cut than dovetails. Plus, the joints required glue. True to its name, the box joint found its first practical use later in mass-produced boxes and crates for storage and shipping purposes. Today, it’s far outgrown its humble beginnings.

Because the fingers multiply the gluing surface area, box joints are super strong, making them the perfect choice for utility boxes and tool chests. Their decorative appearance is a bonus, lending a unique design element to jewelry boxes and projects like the steak knife box on page 52. The best thing is that with the right jig, you can fashion box joints quickly and easily with either the table saw or router. Since the table saw offers more flexibility and variety, we’ll explore this option first.

By Craig Bentzley

To make box joints at the table saw, you’ll need three items. First is a dado set which will enable you to make almost any size joint, or a dedicated box-joint cutter (see “Dedicated Box-Joint Cutter Sets” on page 12). Second, you’ll need a zero-clearance insert to prevent tear-out. Last but not least, you’ll need a box-joint jig. You can buy a ready-made jig, but you may want to start off with a shop-made version that can be fastened to your miter gauge. Once you have these basic items, you’ll be ready to get started.
BUILD A BAREBONES BOX-JOINT JIG

This simple (but still perfectly functional) jig can be made and attached to your miter gauge in less than an hour. To build it you need a flat piece of stable hardwood for the fence, a short piece of T-track, and a handful of common hardware. As shown in Figure 1, mill a groove for the T-track so it centers over the screw holes in your miter gauge. Screw the T-track in the groove and fasten the fence to your miter gauge with bolts in the T-track and wing nuts. Next, install the blades you will be using and set your blade height to match the thickness of your box stock. Adjust the miter-gauge fence so the right side is about 6" beyond the blade and make your first cut through the fence. This notch will be used for the registration pin.

Next, mill a strip of hardwood about 5" long to the height and width of the slot. Precision is important; if you have one, use a dial caliper to sneak up on the exact dimension, as shown in Photo A. Aim for a friction fit so the pin doesn’t need to be glued in place. That way, you’ll be able to remove the pin, reposition the fence, and install new registration pins for future setups. Once the strip fits, trim off a 1¼" pin, ease the sharp edges on the top edge, and insert the pin into the fence. Mark the leftover piece so it doesn’t get thrown away; you’ll use it later as a spacer for setting up your cuts.

Make a practice box joint using your jig. If your joint doesn’t fit quite like it should, check out “Fine Points for Finer Joints” on page 12.

TIP ALERT
Plan your project so that two opposing sides (usually the longest) start and end with a full finger. This produces the most attractive joint.

USE A CALIPER TO COMPARE THE SIZE OF THE PIN AND SPACER STRIP TO THE FIRST NOTCH CUT. IT MIGHT HELP TO REMOVE THE MITER-GAUGE FENCE TO TEST THE FIT.

SIX STEPS FOR SNUG-FITTING BOX JOINTS

Set the pin spacing for the side by placing the spacer between the registration pin and the blade. Tighten the wing nuts to secure the fence to the miter gauge.

Butt your workpiece against the registration pin and make the first cut. Use clamps to support larger boards.

To make your first cut on the mating end, place your spacer between the registration pin and the workpiece as shown.

Place the notch you just cut over the registration pin and make your second cut. Repeat the process until you reach the opposite edge of the board and final pin.

Butt your workpiece against the registration pin and make your second cut. When you’ve finished the end cuts you’re done. Test-fit your joint.

Remove the spacer without moving the workpiece and make your first cut to notch the corner.

To butt your workpiece against the registration pin and make the first cut, use clamps to support larger boards.
Fine Points for Finer Joints

Box joints rarely come out perfect at first cut. After cutting two practice boards, slide the pieces together and inspect the joint. If it doesn’t look right or fit, use the troubleshooting strategies below to achieve the desired result.

PROTRUDING FINGERS

Ideally, your joints should be perfectly flush, but this is not always practical. A slight amount of finger protrusion is acceptable and easily leveled with a sharp hand plane or a block of wood wrapped with sandpaper. With table saw box joints, if your fingers protrude more than \( \frac{1}{64} \)”, lower your saw blade. Conversely, if your fingers are too short, raise the blade.

ILL-FITTING FINGERS

A loose joint not only looks bad, but also may not hold together no matter what glue you use. On the other hand, if a joint requires force to get it together, the glue will swell the fibers and make the joint impossible to assemble. Move the registration pin to the right for a tighter joint or to the left for a looser joint. Note that wider workpieces require more careful setup because tiny errors multiply by each pin.

DEDICATED BOX-JOINT CUTTER SETS

If you plan on rows of box joints, you may want to consider a dedicated box-joint cutter. This high-quality set costs half as much as comparable dado sets, and setup couldn’t be easier. The teeth are offset so that installing the blades back-to-back creates \( \frac{3}{8} \)” joints; flipping the blades around creates \( \frac{5}{8} \)” joints. Neither setup requires shims. As an added plus, the tooth geometry creates perfectly square and smooth flat-bottomed joints. Freud Box Joint Set, Woodcraft #831914, $94.99.

Prices subject to change without notice.
Box joints with a router

Two common ways let you make box joints with a router. One is on a router table with a straight bit and a miter gauge fixture that resembles the table saw jig; the other (faster and easier) way relies on a router dovetail jig with a box-joint template. Box-joint templates come packaged with some jigs. If not, you can buy them as a reasonably-priced upgrade.

Most jig templates provide two finger widths (¼" and ½") to choose from. The size of the jig will also limit the width of the boards you can use. If you can work within these limitations, you’ll be rewarded with fast setups and the ability to crank out box joints lickety-split. (Note: Unlike table saw and router table jigs, the tightness of a template-routed box cannot usually be adjusted. If you use a good quality jig, bit, and guide bushing, this is usually not an issue.)

Each jig is a little different, but here we worked with one of the most popular models to offer a step-by-step overview. First, install the appropriate guide bushing and bit in your router. Next, set the jig’s left side stop and then horizontally clamp a piece of scrap—the same thickness and at least as wide as your workpiece—in the upper clamp to serve as a backerboard. Now insert your workpiece into the vertical position and align the guideline on the template with the rear edge of your workpiece. Clamp your workpiece and backerboard securely and rout the fingers, moving from left to right as shown in Photo H. Rotate the workpiece and cut the other fingers on the other end. The opposite side is made in the same fashion.

To make the adjacent sides, move over to the right side of the jig and set the right stop. Put a backerboard in the upper clamp. Insert your workpiece in the vertical position against the right stop. Secure the clamps and rout from left to right. When finished, you should have perfect complementary joint parts as shown in Photo I.

Rout into the ends slowly and smoothly to avoid blowout. A D-handled router is easier to control when doing template work.

Some jigs rout mating sides on opposite ends of the template; others use spacers. With either type, you’ll want a cut and stack system to avoid miscut ends.

**Tip Alert**

If you experience blowout when routing, try switching to a spiral bit and using a slower feed rate.
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