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Classic Project

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- Step-by-step construction instruction.
- A complete bill of materials.
- Construction drawings and related photos.
- Tips to help you complete the project and become a better woodworker.

Super Box Joint Jig

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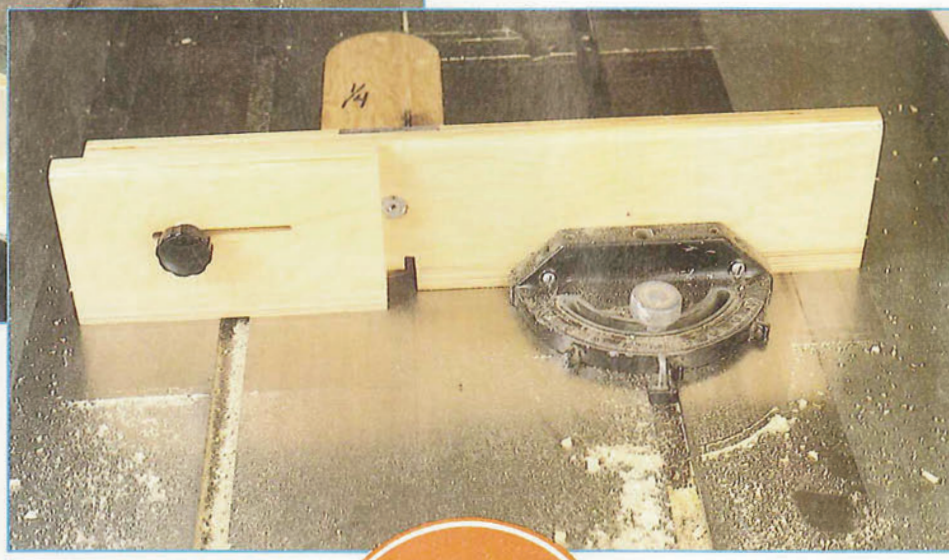
Super Box Joint Jig

Accuracy and versatility in one compact package



FOR YOUR SHOP

Box joints—also called finger-joints—are a wonderfully strong and versatile joint. Often called the machine equivalent of the dovetail joint, the box joint is used for everything from pencil boxes to drawers and case construction. Once your table saw is set up properly, the actual work of cutting the joint goes very quickly.

Our Super Box Joint Jig combines versatility with accuracy and ease of use. Using a system of either single or multiple brass keys, the jig will cut box joints in 1/16 in. increments from 1/8 in. all the way up to 1 5/16 in.—a range that encompasses nearly every possible use.

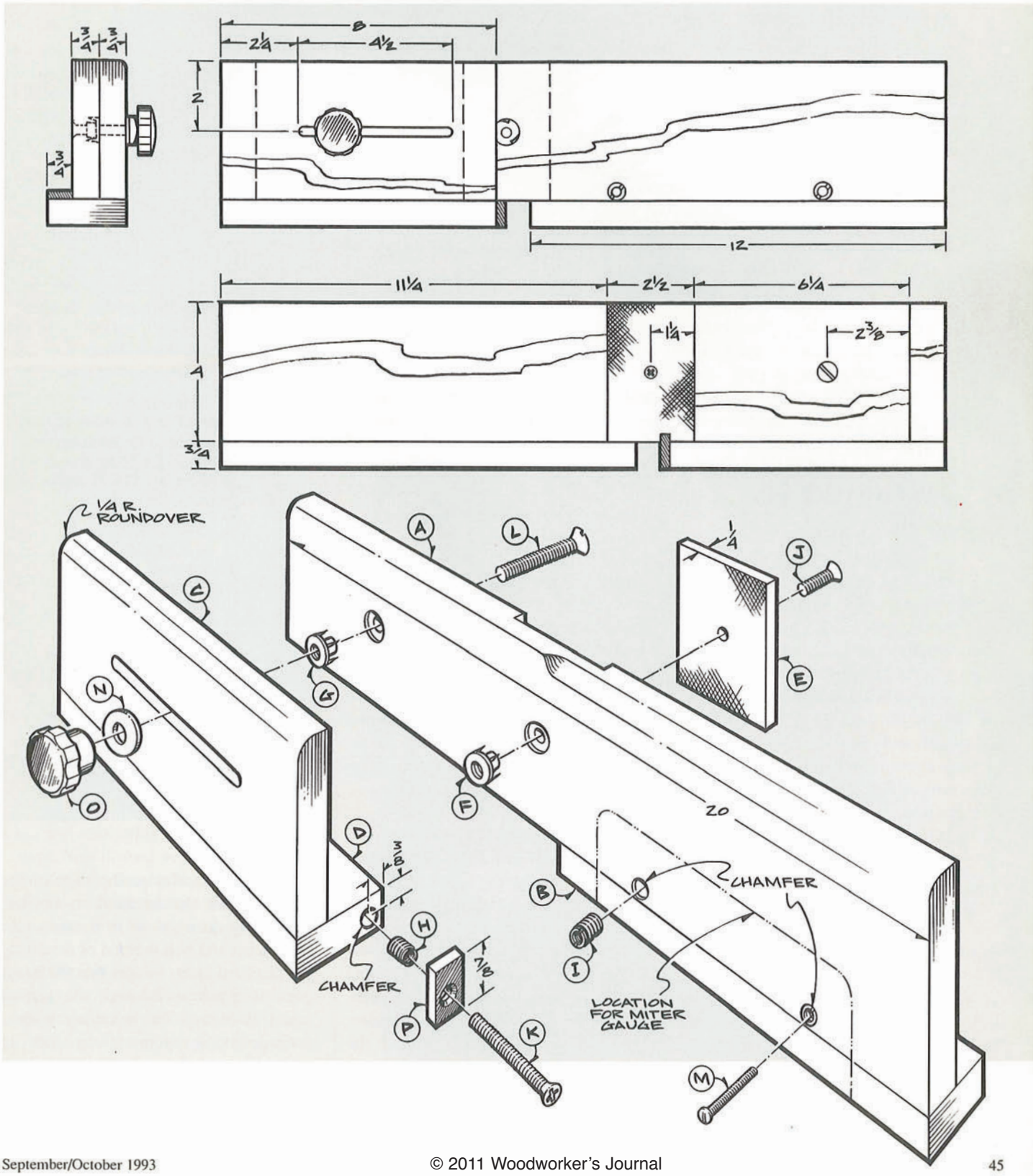
Our super jig is a quantum leap away from the typical shop-made single-purpose box joint jig, where you made a wooden key for a specific size finger, glued it into a board, and then screwed the board to the miter gauge. With this old-fashioned jig, it was critical to locate the board so the key was exactly one key width away from the blade. There was no built-in adjustability in the jig, and if the initial set-up wasn't perfect, your only option was removing the screws and relocating the jig. Given the problems this can entail, plus the difficulties that arise when the wooden key begins to fray or wear, it's not hard to understand why so many hobby woodworkers seem to shy away from the box joint.

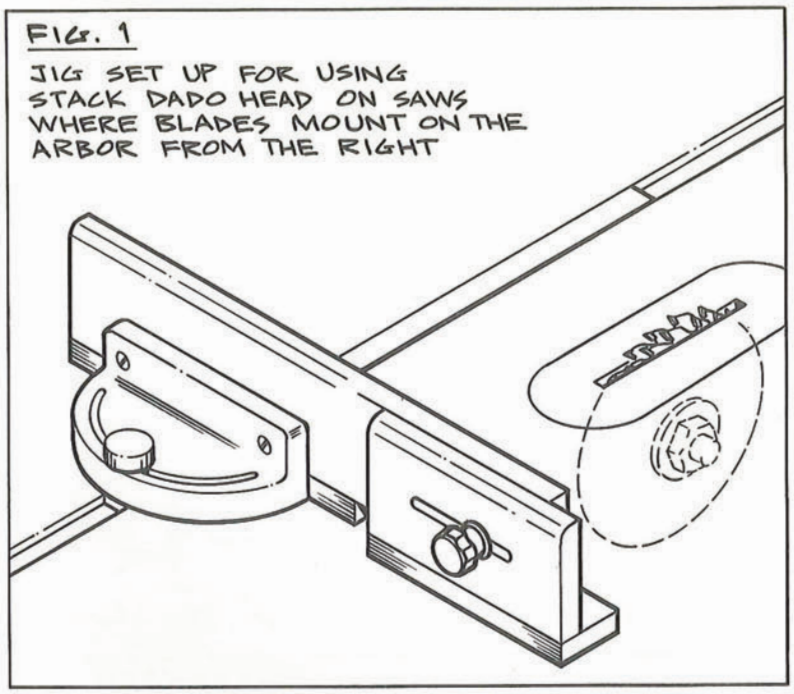
The Super Box Joint Jig takes much of the fuss out of the set up process. But even more important, by including a

bottom surface on which to rest the stock, it eliminates the common problem of uneven cuts that can result if your saw's throat plate isn't perfectly flat and level with the saw table. Whether you're familiar with box joints, and have always wished for a do-it-all jig, or if you've never cut a box joint before, but would like to, this jig is for you.

Before You Start

Before you start building your jig, however, you'll need to take a close look at your table saw. The jig shown in the exploded view and in the elevations is for use on a table saw where the stack dado blades mount on the arbor from the left, such as on the Delta Unisaw. For saws that mount blades from the right, such as many Sears saws, you'll probably want to build the jig as a mirror reverse, as shown in the Fig. 1 illustration. This way, when using a stack dado, the blades will stack in the right direction relative





Bill of Materials
(all dimensions actual)

Part	Description	Size	No. Req'd.
	Plywood/Masonite		
A	Back	3/4 x 4 x 20	1
B	Bottom	3/4 x 1 1/2 x 12	1
C	Adj. Back	3/4 x 4 x 8	1
D	Adj. Bottom	3/4 x 2 1/4 x 8	1
E	Backing Plate	1/4 x 2 1/2 x 4	as req'd
	Hardware		
F	T-Nut	8-32	1
G	T-Nut	1/4-20	1
H	Threaded Insert	8-32	1
I	Threaded Insert	10-32	2
J	F.H. Machine Screw	8-32 x 5/8 (Phillips)	1
K	F.H. Machine Screw	8-32 x 1 1/2 (Phillips)	1
L	F.H. Machine Screw	1/4-20 x 1 3/4	1
M	R.H. Machine Screw	10-32 x 1 1/2	2
N	Washer	3/4 dia.	1
O	Plastic Knob	1 3/8 dia.	1
P	Brass Key Set	1/16 x 3/4 x 7/8 1/8 x 3/4 x 7/8 1/4 x 3/4 x 7/8 3/8 x 3/4 x 7/8 1/2 x 3/4 x 7/8	1 of each

Brass Key Set replaced by Rockler part #51936

to the jig. This distinction isn't critical if you use a wobble dado. Moreover, whether you use a stack or wobble dado, and no matter which version you build or how the blades mount on your saw arbor, the jig will still work fine. You may also want to build the mirror-reverse version if you prefer working with the miter gauge to the left, instead of to the right of the blade.

Cut The Plywood Parts

Use only a top quality plywood for this jig. Avoid using construction-grade plywoods, which often contain voids and may not be dimensionally consistent. Rip about 30 in. of 3/4 in. thick plywood to a 4 in. width, then crosscut to yield the back (A) and adjustable back (C). Cut the bottom (B) and adjustable bottom (D) to size, and make as many Masonite backing plates (E) as you'll likely need.

Using multiple passes with the dado head, establish the 2 1/2 in. wide recess in the back for the replaceable backing plates. Be sure to set your dado head to a cut depth that's equal to the thickness of the Masonite (although the Bill of Materials shows the Masonite as 1/4 in. thick, actual thickness is a little under 1/4 in.). Test-fit the backing plates to make certain they are flush with the face of the back. If your recess is cut a little too deep, add a paper or thin cardboard shim under the backing plate to bring it up flush.

Locate the 4 1/2 in. long slot in the adjustable back, drill a pair of 5/16 in. diameter holes to establish the slot ends, then use multiple passes on the router table with a 5/16 in. diameter straight cutter to establish this slot. Set up stops on the router table and make the slot by raising the router bit about 1/8 in. for each subsequent pass.

Next, glue the bottom to the back, and the adjustable bottom to the adjustable back. No mechanical fasteners are needed, but you may want to add several countersunk screws up through the respective bottoms and into the backs, to prevent slippage as the glue dries. Once the glue has dried, use the router table and a 1/4 in. radius round-over bit to apply the radius to the top edges of the back and the adjustable back. Note that the radius on the back is about 12 in. long. These roundovers just make the jig a little easier to handle.

Drill for Hardware

Using either the drill press, or a hand-held drill, equipped with a 1/4 in. diameter bit, drill a 1 1/2 in. deep hole for the 8-32 threaded insert (H) that accepts the flat head (Phillips) machine screw (K) that mounts the brass keys (P). Note that this hole is located on-center 3/8 in. from the edge of the adjustable bottom. Use a countersink bit to chamfer the edge of the hole, then mount the insert using a ratchet and an 8-32 bolt. The extra depth of the hole is needed to allow for the length of the key mounting screw. The chamfer on the edge of the hole prevents the threaded insert from splintering the plywood as it enters, and the ratchet and bolt method of mounting the threaded insert insures that the insert goes in square. Although the typical insert is slotted for mounting with a screwdriver, the screwdriver tends to slip easily out of the slot, and it doesn't help hold the insert square.

Next, locate and drill for the T-nuts (F, G). Both T-nuts should be located

on-center on the 4 in. wide back, but check the location of the 1/4-20 T-nut for the flathead machine screw (L) that mounts the knob (O) by holding the adjustable back/bottom assembly in position on the back. Note that you'll need to counterbore for the T-nuts so they don't protrude from the back. Mount the T-nuts, drill and countersink the backing plates for the 8-32 by 5/8 in. flathead (Phillips) machine screw (J) that holds them in place, and add the washer (N) and knob to mount the adjustable back/bottom assembly.

No finish is needed for the jig, although you could apply a penetrating oil if desired.

Mount the Jig to the Miter Gauge

To locate the jig on the miter gauge, mount a blade on the saw arbor, position the jig so the end of the bottom is flush against the blade, and mark through the holes in the miter gauge to locate the threaded inserts (I) that accept the round-head machine screws (M). Use a 3/8 in. diameter bit to drill the holes for these threaded inserts, chamfer the hole perimeters with a countersink, then use the bolt and ratchet method described earlier to thread the inserts in place. We don't show a precise location on the illustration for these inserts, since this will vary depending on your saw. If you are using a wobble dado, set the dado to maximum width, then locate the jig so the end of the bottom just touches the blade, before mounting the jig to the miter gauge. By locating the jig with respect to the minimum dado head setting, all lesser settings on the wobble dado are easily accomplished.

Make the Keys

Your hardware kit will include five brass keys, ranging in thickness from 1/16 in. to 1/2 in., and measuring 3/4 in. wide by 7/8 in. long. You'll need to drill and countersink the keys for the 8-32 in. flathead (Phillips) machine screw. No countersink is applied to the 1/16 in. thick key.

Using the Jig

To set up the jig for a specific cut, first mount the appropriate key or keys (the jig is not mounted to the miter gauge at this time). You may use only one of the keys (such as for a 1/4 in., 3/8 in. or 1/2 in. box joint) or you may stack the keys to achieve fingers greater than 1/2 in. or in increments of 1/16 in. For example, for a 5/16 in. finger you'll combine the 1/4 in. key with the 1/16 in. key, or for a 3/4 in. finger you'll use the 1/4 in. and 1/2 in. keys together. For each different size joint, you'll want a fresh backing plate, to provide support and prevent tear-out as the blade exits.

Once your key(s) and backing plate are mounted, set the dado head to a width that equals the key total, and make a test cut through a piece of scrap to check that the setting is right. Check your test cut on the key(s) and adjust the dado head if necessary. The fit of the test slot over the key should be snug (no gaps) but not tight. Once your dado head setting is correct, mount the jig to the miter gauge using the two round head machine screws (you may need to shorten these screws if they're too long).

Next up is adjusting the sliding back/bottom so the blade is exactly one key thickness from the key(s). You can measure the distance, but a better way is to use a piece of scrap that's been cut to equal the key(s) thickness. Tighten the plastic knob to lock the setting, raise the dado head to a height that's equal to 3/4 in. (the thickness of the jig bottom) plus the stock thickness, then take it just a hair higher. Remember, the idea is to make a slot that's just a little deeper than the stock is thick, which enables you to then sand the joint flush after assembly.

Now make a test joint on two sections of scrap stock that are at least 6 in. wide. and the same thickness as your project stock. The joint should fit easily—not tight, but without any slop either. If the fit is too tight, loosen the knob and adjust the sliding back/bottom assembly so the key(s) are a little closer to the dado head. If the fit is sloppy, increase the distance between the key(s) and the dado head.

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