

Dado Jig Is a Cut Above

I got my first job in woodworking when I was 9 years old, cleaning up the shop at my father's shutter business in Lubbock, Texas. When I was 12, Dad let me start using the tools. Early on, I learned a lesson that I carry with me today in my own cabinet-door business—the value of jigs for both speed and safety.

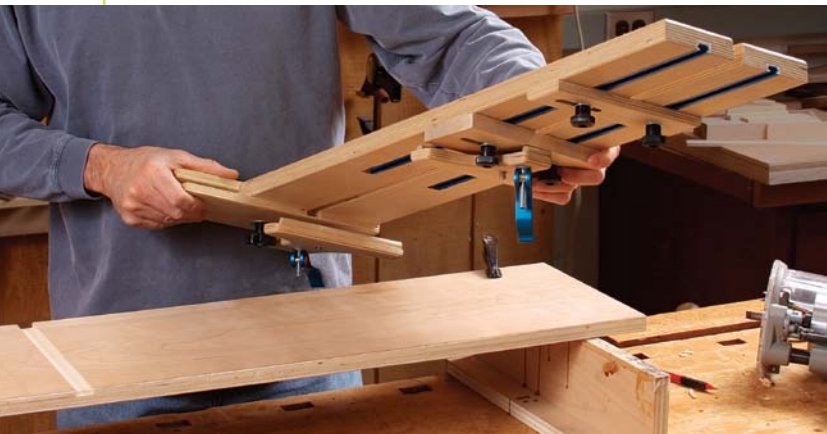
At work and in my home shop, I use dados often in a variety of ways, from housing fixed shelves and vertical case partitions to drawer construction. Traditional router jigs involve wrestling with C-clamps to hold them in place and require calculating offsets to align the jig, and in turn the bit, with the location of the dado.

Neither of those requirements appealed to me,

Clever guide guarantees a perfect fit for shelves of any thickness

BY KENT SHEPHERD

3 STEPS TO A DEAD-ON DADO

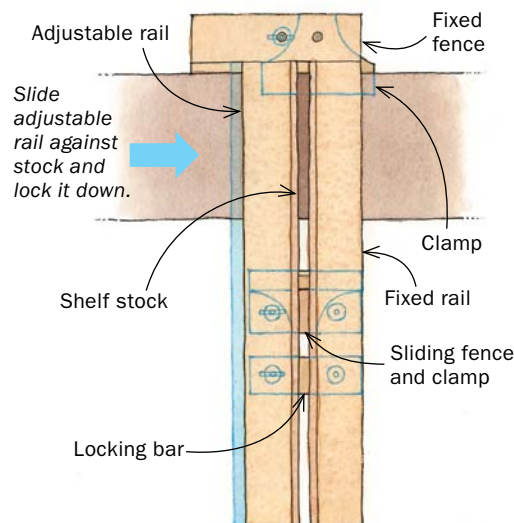


The clamps are underneath, to stay out of the router's way, so you have to elevate the workpiece. But after that the jig is foolproof: You use one of your actual shelves to adjust it for a perfect-fitting dado.

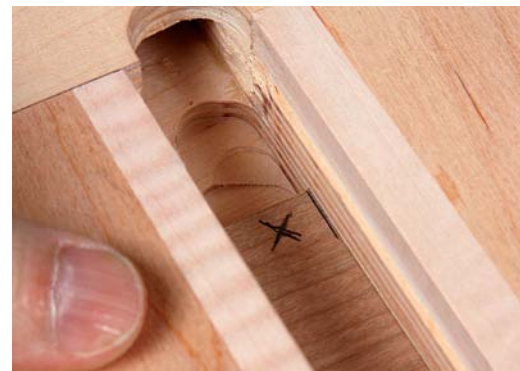


1 USE A SHELF TO SET IT UP

Set the guide rails. The lower parts of the guide rails show exactly where the router will cut. For a perfect fit, snug the rails up to a shelf, then tighten the adjustable rail.



2 ALIGNMENT IS SIMPLE



Just a pencil line. All you need is a mark on one edge of the dado, with an "X" to show the waste side.



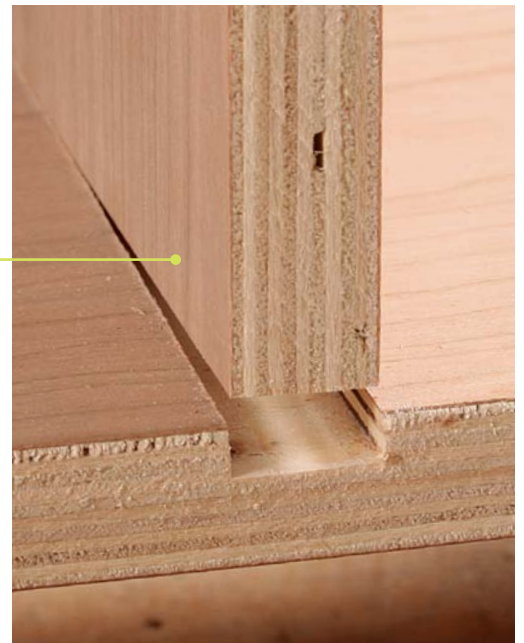
so I created this router jig instead. I started with an adjustable, twin-rail design that calls for using a guide bushing in the router. By custom-fitting the jig with the bit and bushing I planned to use for cutting the dados, it's easy to locate and set up the cuts by eye. The innermost edges of the rails show exactly where the bit will run, so you don't have to factor in the offset between the bit and bushing when setting up a cut. The twin rails—one fixed and one adjustable—make it easy to cut a dado to custom width, exactly matching the thickness of the part it will house.

To do away with C-clamps, I added an integral clamping system that makes it easy to secure the workpiece and lock the jig in place. These built-in clamps can handle stock from $\frac{3}{8}$ in. to 1 in. thick, and they work from underneath, so they don't interfere with the router's travel. With them, I can quickly release and reposition the jig while keeping the setting for my dado's width. This makes speedy work of tasks like cutting multiple shelf dados in a case side.

The adjustable rail lets you set the jig for a dado that will precisely match the thickness of the mating piece it will house. And one final benefit of the jig is that its inner edges act to prevent chipout along the edges of the cut. It's a bit of work to build, but the reward is having the world's most reliable dado jig.

Two rails make for straight cuts

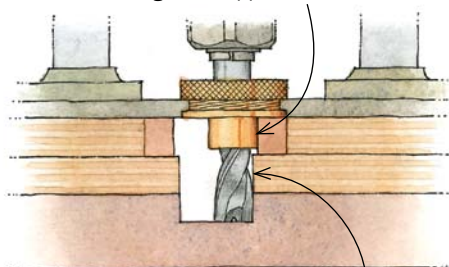
The rails are made from two layers of $\frac{1}{2}$ -in.-thick plywood, face-glued together. The inside



3 LOCK IT DOWN AND ROUT

The genius of the jig is the offset rails, which both guide the bushing and show exactly where the bit will cut.

Guide bushing rides upper rail.



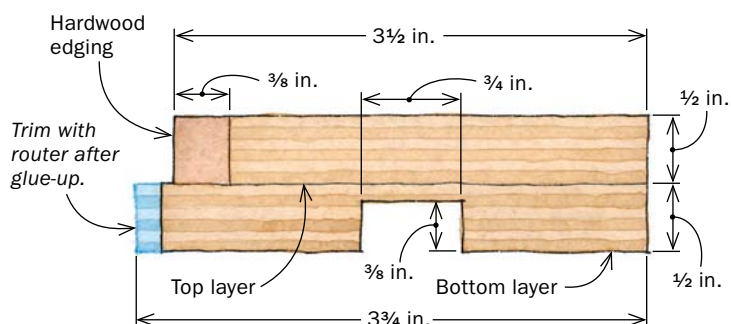
Lower rail is flush with bit.



Clamp and go. The cam clamps lock the jig in place quickly, and it's easy to ride each rail for a perfect-fitting dado every time!

Making the jig: Rails first

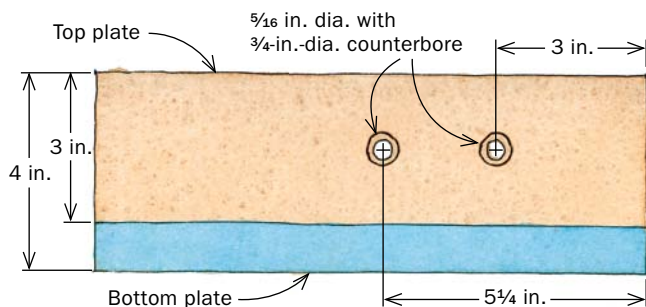
RAIL DETAIL



Built to last. Hardwood edging gives the router's guide bushing a long-wearing surface to ride on. Edge-glue the strip in place and sand it flush.

ULTIMATE DADO JIG

Shepherd's jig is built around a rigid square, with two rails that guide the router bushing, one fixed and one adjustable. Each rail has two layers, which are offset to account for the distance between the bit's cutting edge and the guide bushing. Built-in clamps are underneath, one on the fixed fence, and the other attached to a sliding fence. There is also a locking bar that keeps the far end of the guide rails in alignment.



FIXED FENCE ASSEMBLY

Rail bottom layer, 1/2 in. thick by 3 3/8 in. wide by 33 in. long

Adjustable rail

T-bolts

T-track fits 20-in.-long dado.

Locking bar, 1/2 in. thick by 2 1/2 in. wide by 7 1/2 in. long

Carriage bolts, 5/16 in. by 3 in.

Top fence plate, 1/2 in. thick by 3 in. wide by 11 in. long

Rail top layer, 1/2 in. thick by 3 3/2 in. wide by 30 in. long

Fixed rail

Bottom fence plate, 1/2 in. thick by 4 in. wide by 11 in. long

Sliding fence, 3/4 in. thick by 3 in. wide by 7 1/2 in. long

Front clamp, 1/2 in. thick by 7 1/2 in. wide by 5 1/4 in. long

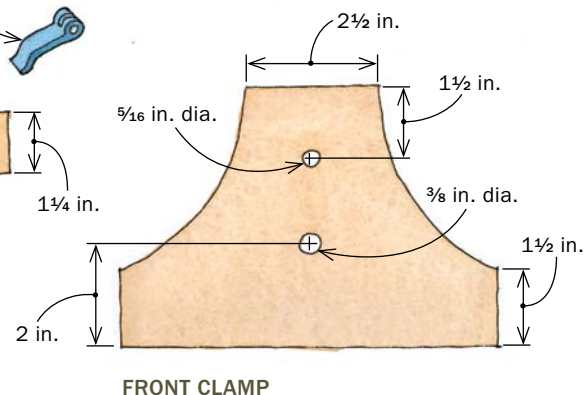
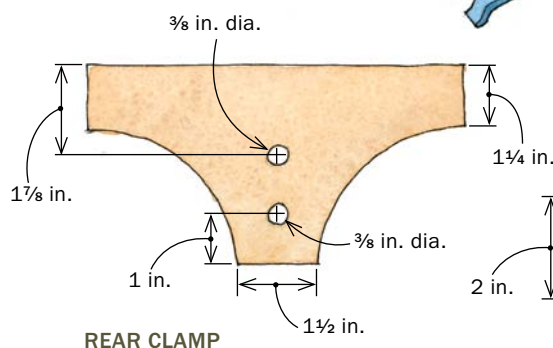
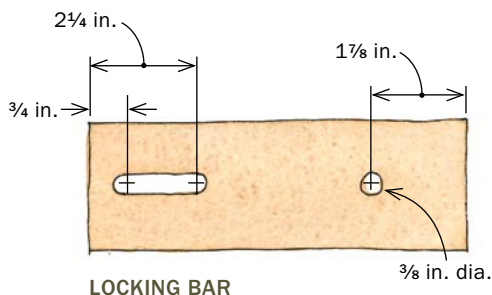
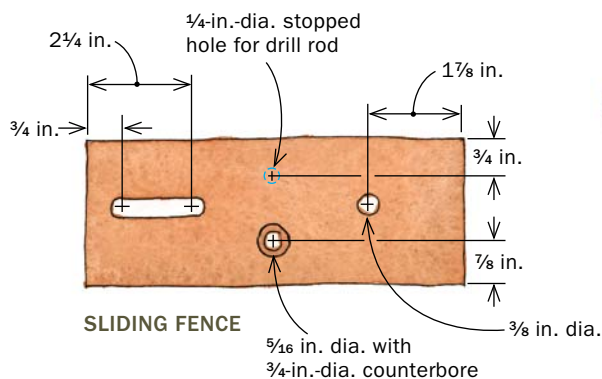
Drill rod, 1/4 in. dia. by 1 1/4 in. long

Cam hold-down

1/4-in. wooden dowels, sanded flat for glue-up

Cam hold-down

Rear clamp, 1/2 in. thick by 7 1/2 in. wide by 4 in. long





Offset layers make up the rails. Leave the bottom layer wide at this point. Alignment is not super-critical, as you will be trimming the bottom rail with the router afterward (see lower right photo).

edge of the top layer has a strip of hardwood for the guide bushing to ride against. The bottom layer of each rail is longer, for attaching to the jig's right-angle fence, and wider to accommodate the offset between the router bit and the guide bushing. When the jig is assembled, one rail is fixed and the other adjusts to set the width of the dado. An elongated mounting hole drilled in the sliding rail lets it travel back and forth while the clamps are loose.

When face-gluing the top and bottom layers of each rail, pay close attention to how the layers are oriented. Viewed side-by-side, the two rails should mirror one another, with the extra length of the bottom layers at the same end and the extra width toward the center. After the glue dries, use a router to trim the inside edge of each lower rail, tailoring it to fit the bit and bushing that you'll use to make dados. I use a $\frac{5}{8}$ -in. bushing with a $\frac{1}{2}$ -in. upcut spiral router bit. Later, if you want to cut dados narrower than $\frac{5}{8}$ in., be sure to use a bit-and-bushing combination with the same offset that you cut into the jig.

With the bit and bushing installed, make a pass against each rail, with the bushing riding tight against the upper rail. The trimmed lower rails will perfectly define the limits

of the bit's travel and, therefore, can be used for perfectly aligning the jig for dado cuts.

Last, use the router table to cut a stopped groove in the bottom of each rail. Once this is done, you can install the lengths of T-track that will hold the sliding fence and locking bar.

A square glue-up is key—The next step is to glue the fixed fence to the fixed rail. The tongue end of the fixed rail fits between the top and bottom plates of the fence. The bottom plate of the fence assembly is the reference surface that ensures your dados will be square to the edge of the workpiece, so it must be perfectly 90° to the fixed rail.

To keep things square during glue-up, attach the top and bottom plates of the fence one at a time, letting the glue dry between



Put tracks under the rails. Rout a $\frac{3}{4}$ -in.-wide stopped groove on the underside of each rail (above), then square up the ends of the groove with a chisel (right). Mount a length of T-track (below) for securing the sliding clamp and locking bar.



SOURCES OF SUPPLY

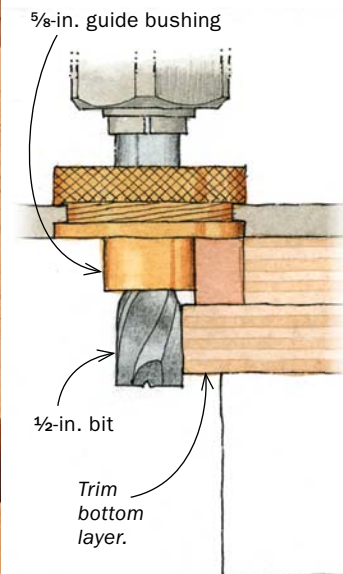
CARRIAGE BOLTS, NUTS, WASHERS, SPRINGS, AND DRILL ROD

Available at local hardware stores

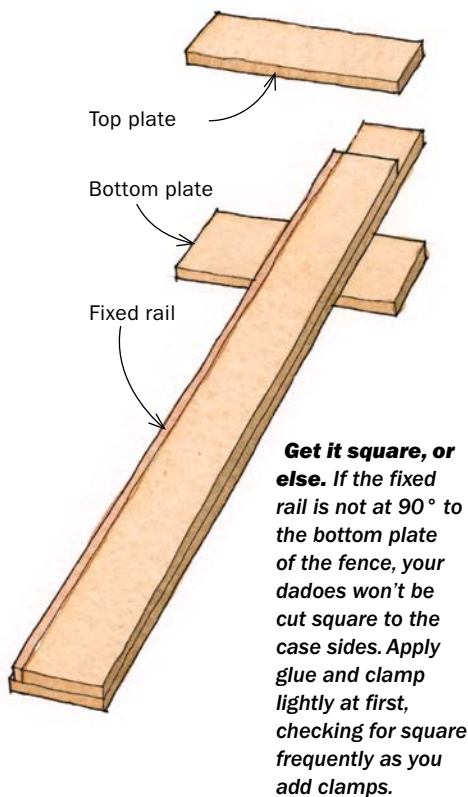
T-TRACKS, T-NUTS, FIXTURE KNOBS, AND CAM HOLD-DOWNS

rockler.com
woodcraft.com

Custom tailoring. Trim the bottom layer of the rails with the same bit and bushing you'll use to cut dados. A smooth, straight cut is critical, so be careful not to tip the router.



Add the fence



Attach the top of the fence. The top plate of the fence is only there to support the router at the beginning of the cut.



The top should be flush. Use the same plywood for the top surfaces of both the fixed fence and fixed rail. This ensures smooth travel for the router and no unwanted variations in the cut.



steps. Apply the glue and lightly clamp each fence plate in place with a single clamp. After checking for square, use more clamps to apply greater pressure.

Install the hardware

Underneath, a pair of clamps secures the work to the underside of the jig and against the fixed fence. One is bolted to the fixed fence and the other is attached to a sliding fence that rides in the twin T-tracks. Each clamp applies pressure via a piece of plywood. A dowel glued along the plywood's back edge lets the clamp pivot freely during adjustment; another attached along the front edge grips the workpiece. A spring keeps the clamp open before tightening, making it much easier to reposition the work between cuts.

Also underneath the jig are several fasteners used to lock down the sliding fence and the

adjustable rail. To install this hardware, first drill two counterbored holes through the fixed fence. These holes will hold a pair of carriage bolts—one to secure the clamp underneath and the other for the adjustable rail. With the holes drilled, insert the slotted end of the adjustable rail between the open holes and epoxy the carriage bolts in place. Use a washer and 5/16-in. nut to temporarily tighten from the bottom to seat the bolts into the jig. After the epoxy sets up, remove the washer and nut.

Another carriage bolt mounts the second clamp to a sliding fence, which rides in the T-tracks on a pair of T-bolts. A second block also sits in the T-tracks and is used to lock down the "out-board" end of the adjustable rail.

The jig is simple to use

To use the jig, you'll need to elevate the workpiece off the bench to accommodate the clamps underneath. A pair of simple T-shaped risers works great. Mark your workpiece exactly where you want the dados, and set the jig on the workpiece. Don't fasten it in place just yet.

Start by setting the dado's width. Place in the jig a scrap of the stock that will need to fit into the dado. Bring the adjustable rail tight against this scrap and use the star knob and T-nuts underneath the fixed fence and the locking bar to secure both ends of the rail. For a dado that will still be snug but a little easier to assemble, use a piece of masking tape as a shim between the scrap and the adjustable rail.

With the width set, go ahead and position the jig. Set the inside edge of the fixed rail on the appropriate layout line and bring both the fixed and sliding fences tight against the edges of the

Install the hardware



Drill and counterbore. Drill the larger holes in the fence first, to accommodate the heads of the carriage bolts, and then bore through-holes.

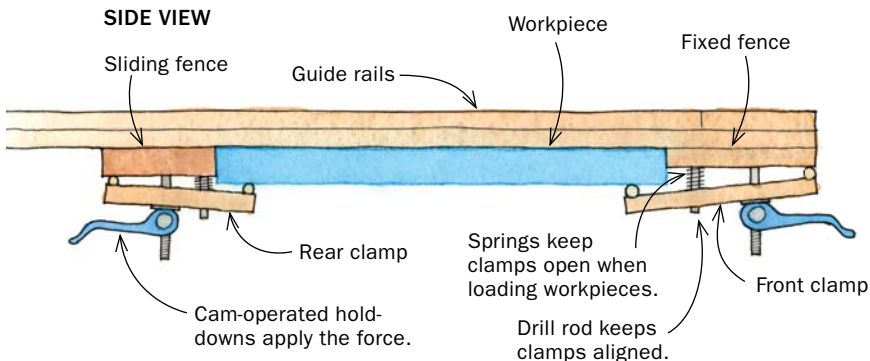


Attach the hardware. The bolts hold the cam hold-down for grasping the workpiece and the star knob that secures the adjustable rail.



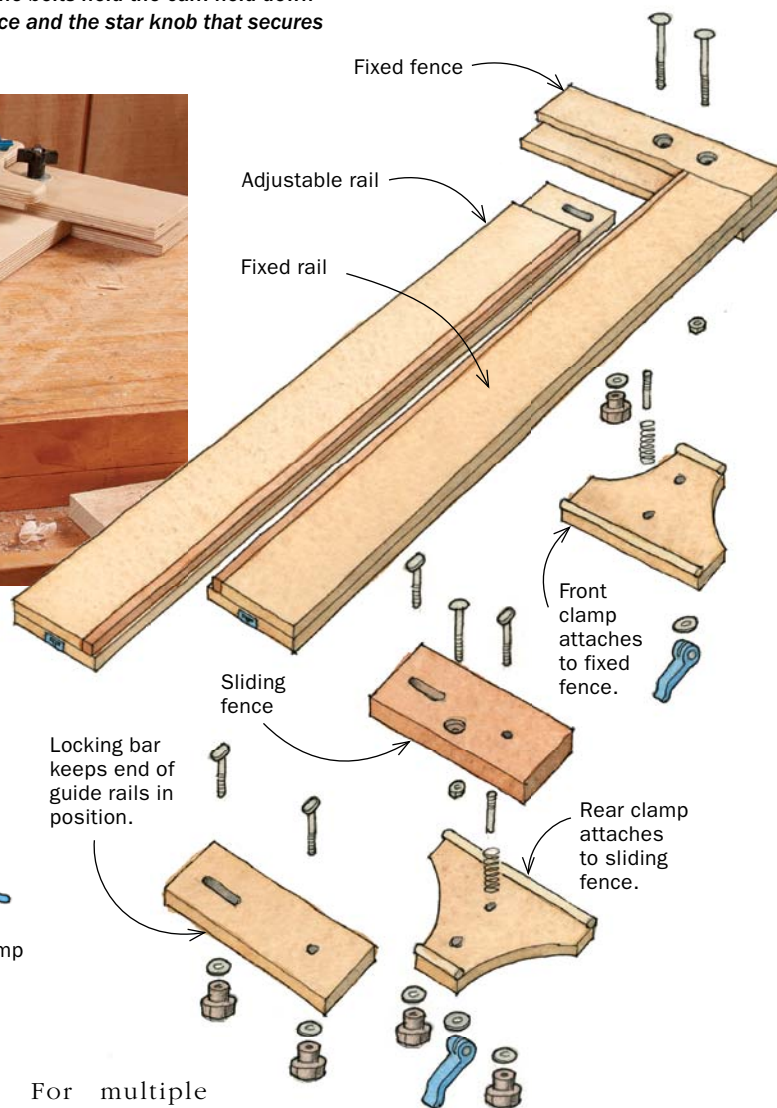
Assemble the clamps. They are a smart assembly of cam clamps, pins, bolts, knobs, and springs.

SIDE VIEW



workpiece. Now use the cam clamps and the other fasteners on the fixed and sliding fences to lock the workpiece in place and hold it snug to the bottoms of the rails.

Now you are ready to cut. Start at the end closest to you, with the router on the jig; rout down the left side, and come back toward you on the right side. To avoid excess strain on the router, take repeated passes at incremental depths until you have the proper depth.



For multiple dadoes, the cam clamps make it easy to release the clamp pressure on the workpiece while keeping your dado-width settings. This means you can quickly reposition the jig and then retighten it for the next cut. □

Kent Shepherd operates Shepherd Woodworks in Lubbock, Texas.