Wall-mounted panel router is ideal for making quick dadoes. *Knowing his panel router had to save space, Skip Lauderbaugh mounted it to a wall at a comfortable height and angle. To build the jig, he used a router he owned and commercial hardware costing less than $100.*

Compact Tool Makes Dadoes a Snap

This panel router folds flat against a wall and is inexpensive to build

by Skip Lauderbaugh

Many of my cabinetmaking projects require panels that have dadoes, rabbets and grooves to allow strong, easy assembly. I've tried lots of ways of cutting these joints and have found that a panel router is the quickest and most accurate tool to use. Unfortunately, the expense of one of the commercial machines (up to $3,500) and the floor space it requires (up to 25 sq. ft.) is more than I can justify. As is often the case, however, once you have tasted using the proper tool for a particular job, using anything else becomes a frustrating compromise.

I had seen other shopmade panel routers (for one example, see Steven Grever's article in *FWW* #88, p. 48), but they lacked features I wanted and seemed complicated. So I set out to design and build my own version of a panel router. By simplifying the guide system and by using common materials and hardware (see the drawing on p. 89), I built a panel router for less than $100 (not including the router, which I already owned). And although this jig easily handles big pieces of plywood and melamine, the jig folds compactly against the wall when it is not in use.

Designing the panel router

Because the guide rails used in industrial panel routers often get in the way, the rails were the first things I eliminated on my design. The next thing was to orient the machine so that gravity would help feed the router into the work. Big panel routers are oriented horizontally, and they have the capacity to handle 36-in.-wide pieces of plywood. But because shelf dadoes in cab-

Photos except where noted: Alec Waters

inets and cases are usually less than 3 ft. wide, I scaled things down a bit, and I situated the whole setup vertically. This orientation also saved considerable shop space. Then I came up with a clamp-on router guidance system, so I don't have to do any measuring or marking on a panel. Finally, I devised a router subbase that eliminates depth-of-cut adjustments when changing material thicknesses. To help you understand the abilities of this tool and how it is constructed, I've divided it into six basic components:

1. The workpiece table
2. The router guide system
3. The fence with adjustable stop
4. The upper and lower guide stops
5. The router subbase
6. The router tray

The workpiece table—A panel router requires a flat, stable work surface with a straight edge for mounting the fence. I chose an ordinary 3-ft.-wide hollow core door for the table because it provides those things, and at $15, it cost less than what I could build it for. I mounted the table to a ledger on the wall. The ledger is 75 in. from the floor to give a comfortable working height. A 5-in. space from the wall gives enough clearance for the guide system. Standard door hinges let the table swing out of the way during storage, and side supports hold the table at a 65° angle when the table is in use.

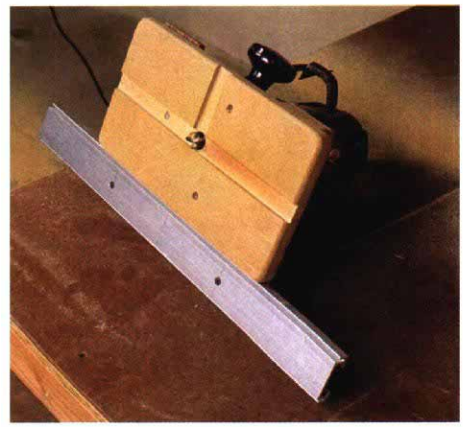
The router guide system—Several years ago, I discovered that the aluminum extrusions used in Tru-Grip's Clamp 'N Tool Guides (manufactured by Griset Industries Inc.; see the sources of supply box on p. 89) interlock when one is inverted (see the photo at right). In this configuration, the two pieces slide smoothly back and forth with little side play, like a track. This system has several benefits: A panel can be set directly on the table without having to go under fixed guide rails. The guide is accurately located, and the panel is clamped tightly to the fence and to the table. The clamps are available in several lengths, but I've found that 36 in. is the most convenient (see the sources box). The manufacturer recommends using silicone spray to minimize wear.

The fence with adjustable stop—The fence holds the bottom edge of a panel straight, adds a runner for an adjustable stop and measuring system, and gives a place to mount the lower guide stop. Fence construction is partially dictated by the stop you use. I chose a Biesemeyer miter stop because it has two adjustable hairline pointers, which let you set and read both sides of a dado (see the top photo).

For the adjustable stop to work, the fence should be 1½ in. thick and the top edge of the fence has to be 1⅝ in. above the top of the table. My fence is two thicknesses of ¾-in. plywood laminated to form a 1½-in.-thick piece that is 3 in. wide and 96 in. long. To allow the router to pass through at the end of a cut, I made a 1-in.-deep notch in the fence. The notch is 13 in. long to fit my router. I located this notch 36 in. from the right, so I can dado in the center of an 8-ft.-long panel. To finish off the fence, I glued plastic laminate to the top, faces and ends. Before mounting, I cut a ¼-in. by ¼-in. groove in the back to provide for dust clearance, which ensures that the bottom of a panel stays flush to the fence. The fence is mounted to the bottom edge of the table with 2½-in.-long screws.

The upper and lower guide stops—The upper and lower guide stops allow the Clamp 'N Tool Guide to be set exactly

The fence's adjustable stop ensures perfect alignment. *A Biesemeyer micro-adjustable stop and measuring system precisely positions the left side of the work for each dado or groove. Lauderbaugh uses a pair of dividers to point out two cursors that indicate left and right limits of a cut.*



Channels align subbase and evacuate dust—*The underside of the router subbase reveals an inverted aluminum guide channel and a medium-density fiberboard bottom with dust-evacuation slots cut across it for the bit.*

The key to the router guide is interlocking aluminum track. *When the author discovered the edges of Clamp 'N Tool Guides nest and slide easily, he made them into a two-piece guide system: An inverted 21-in. piece is fixed to the router subbase, and another piece is clamped to the work.*

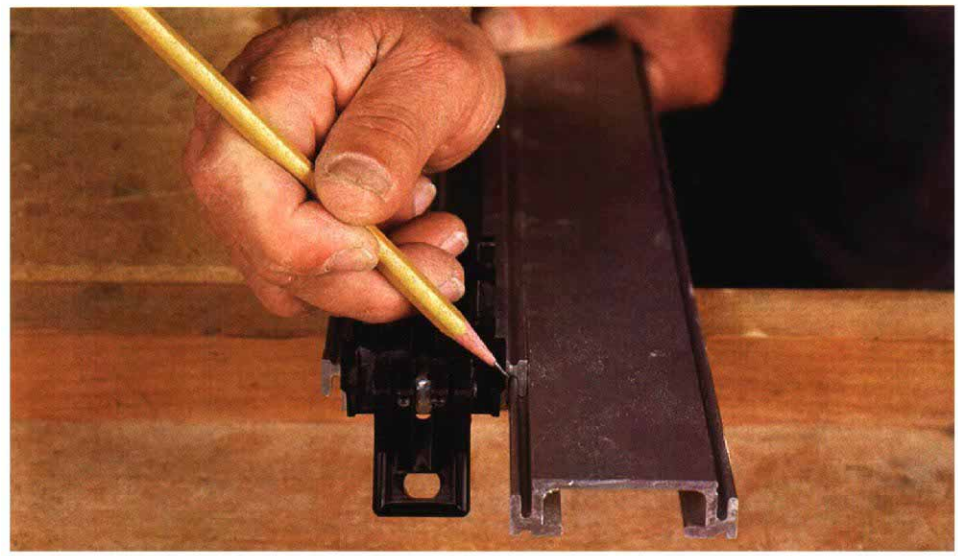


Photo: Kent Bzzell

Setup for dadoes is easy. *Just slide the Clamp 'N Tool Guide to the stops, and clamp the guide to the work by snugging up the black plastic dogs.*

Commercial bits make clean cuts

Commercial panel routers work so well because the router bits are specifically designed to eliminate chipping and tearout, and they can also cut at higher feed rates. But their biggest benefit is that their cutter and arbor are two separate pieces (see the photo at right), which means that the arbor can stay secured in the router collet while you simply unscrew the cutter from the ½-in. arbor to change the bit size. Commercial panel-router bits (see the sources of supply box on the facing page) are available in a full range of sizes, including undersized ones for veneer plywood and oversized ones for two-sided melamine. An arbor and cutter set costs about $35, less than a decent-quality dado blade set.

When you need to change the width of a dado, select the correct cutter size, and screw it on the arbor (no wrenches required). The depth of cut doesn't need to be reset because the height of the cutter stays the same. This process is much quicker than using a dado blade on the tablesaw, where you have to use shims to get the proper width, and then make test cuts to set the depth of cut. —*S.L.*

Panel-routing bits change easily. *The only things the author uses from industrial panel routers are the bits, which have interchangeable cutter tips.*

90° to the bottom edge of a panel. The lower guide stop is integrated in the fence (see the top photo on p. 87), and the upper guide stop is fixed to the top of the table. The lower stop is a ⅜-in. bolt threaded into a T-nut inset into a block and glued to a notch in the fence. The center of the bolt head should be 1⅛ in. above the work surface, or ½ in. above the bottom of the notch. The upper stop consists of two pieces of ¾-in.-thick plywood laminated to form a 1½-in.-thick piece, 12 in. long. The top is notched on both ends to leave a 2-in.- by 2½-in.-wide section in the center. Another bolt and T-nut are screwed to the shoulder. The center of this bolt is 1⅛ in. above the bottom of the notch. To fine-tune the stops for square, turn the bolts, and lock them with a nut. After the stops are set, adhere the measuring tape for the adjustable stops onto the top of the fence.

The router subbase—Parts for the router subbase consist of a medium-density fiberboard (MDF) bottom, an upper base made out of ¾-in. plywood that mounts to the router, and a piece of upside-down extrusion screwed to the side so it can engage the guide track. Drawing detail B shows the dimensions I used to mount my Porter-Cable model 690 router. But you could modify the subbase to suit your router. Regardless of the router, the bottom should be ⅝ in. thick so that the extrusions interlock properly.

After the bottom is cut to size, center the baseplate on the bottom, and align the router handles at a right angle to the extrusion. Drill and countersink the mounting holes and mount the upper base to the bottom. Next, carefully, plunge a ¾-in. bit by slowly lowering the router motor. Then cut two dadoes, each ¼ in. deep by ¾ in. wide across the bottom. The first dado runs the full length and the second goes halfway across, 90° to the first. This T-shaped slot removes dust from the subbase (see the center photo on p. 87).

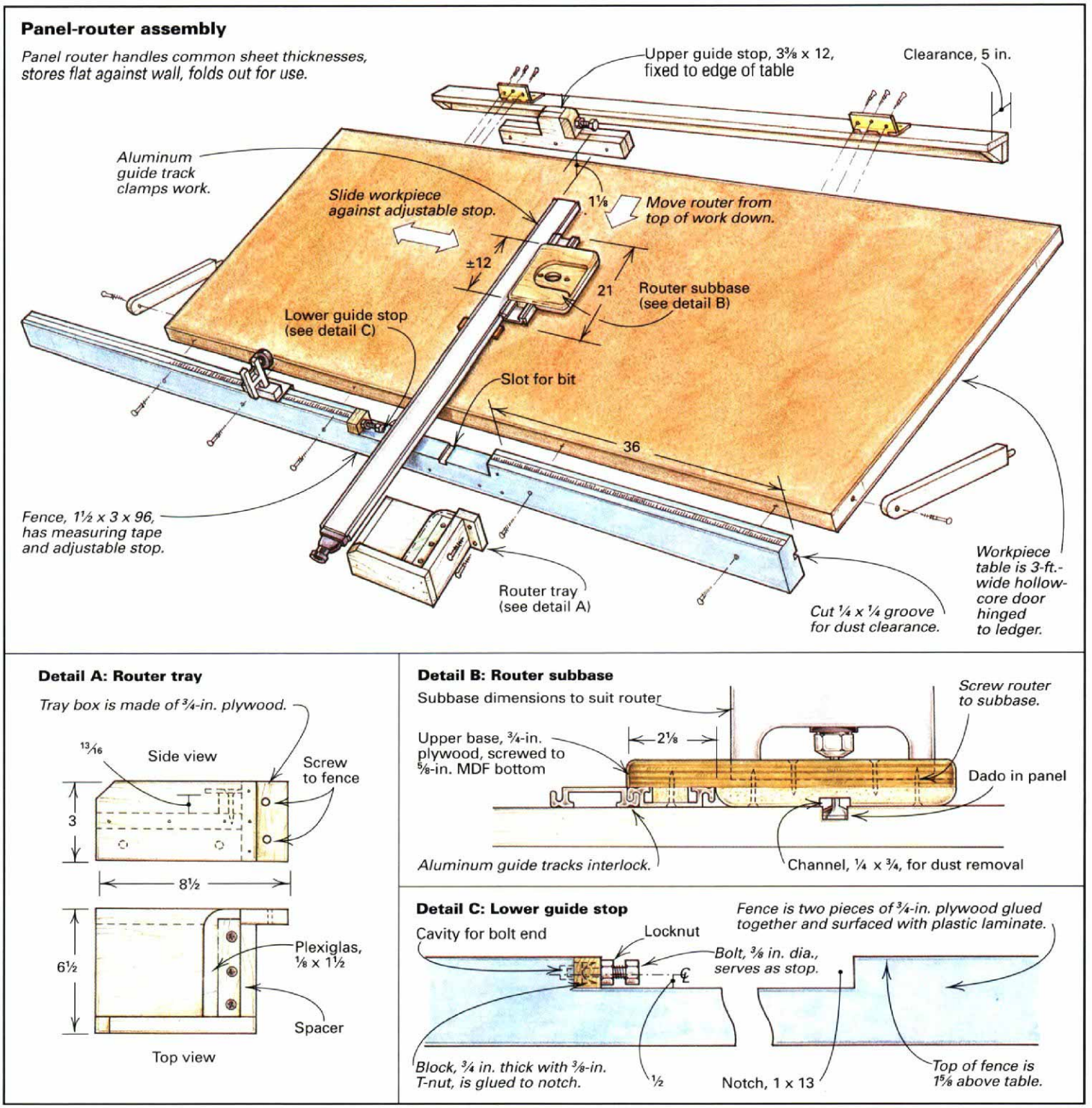
For the piece of inverted extrusion, I obtained stock from the manufacturer. But because they currently don't sell this separately, just buy a 24-in. clamp, and cut off the ends. I used a 21-in.-long piece.

The bottom of the router subbase slides directly on the face of the panel so that the depth of cut is registered from the top of the panel. This is desirable because when you switch material thickness from ⅝ in. to ¾ in., for example, the depth of cut does not have to be adjusted. Also, if the panel is slightly warped or some dust gets between the panel and the table, the cutting depth is not affected. Interchangeable bits also speed up the process (see the box at left).

The router tray—The purpose of the router tray is to give the router a place to rest after it has completed a cut. The tray is mounted to the fence on the back side of the notched-out area. My tray is made out of ¾-in. plywood and is screwed to the fence. On the right edge of the tray, a piece of ⅛-in. Plexiglas protrudes into the tray opening. As the router slides down into the tray, the Plexiglas piece fits into a slot cut into the edge of the subbase and prevents the router from lifting out of the tray.

Using the panel router

The panel-router sequence to make a dado goes like this: First, I set the adjustable



stop to locate the dado where I want it. Second, I set the panel on the table and slide it up against the adjustable stop. Third, I place the Clamp 'N Tool Guide on the panel, slide it against the upper and lower guide stops, and clamp it down (see the top photo on the facing page). In this one step, the guide is squared to the panel and clamped to the table. Fourth, I set the router on the panel with the extrusions interlocked. I hold the router subbase above the top of the panel so the bit clears. Finally, I turn the router on and cut the dado. To make stop dadoes, I insert a spacer block in the bottom of the tray to prevent the router from cutting all the way across a panel. While this setup may not be perfect for a large production shop, it is certainly affordable and conserves space. □

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Sources of supply

Clamp 'N Tool Guide
Griset Industries, Inc., P.O. Box 10114, Santa Ana, CA 92711; (800) 662-2892

Adjustable stop
Biesemeyer, 216 S. Alma School Road, Suite 3, Mesa, AZ 85210; (800) 782-1831

Panel-router bits
Safranek Enterprises, Inc., 4005 El Camino Real, Atascadero, CA 93442; (805) 466-1563

Drawing: David Dann