

Routers: The Best Tool You're Not Using

A well-equipped router is an indispensable tool for trim work; but which type and which accessories are right for you?

BY JOHN MICHAEL DAVIS

It may not have the sex appeal of an oversize sliding compound-miter saw, but in my opinion, the router is the power tool that separates the craftsman from the wood butcher. Outfitted with the right collection of bits and accessories, a router is like a woodworking shop in a box. If you ever have to replicate an odd profile, plow a dado, or simply round over a square edge, your router might become the best friend you've ever had.

The problem with routers is that they're complicated. Choosing the right model from among a dizzying array of sizes and styles is tough enough; deciding which bits and

accessories you need (rather than covet) is even harder. And if you've never used a router before, you'll find the learning curve is a bit steeper than it is for most other power tools. But once you're set up and running, you'll wonder how you ever got along without one—or more.

Size matters

Although individual models vary greatly, today's routers are generally available in three sizes: compact laminate trimmers, medium-duty all-purpose units, and heavy-duty production models. If you favor either of the two larger sizes, you've also got to choose between the traditional fixed-base routers and the relatively new plunge routers.



D-handle with trigger switch

One-wrench convenience

Many modern routers include a push-button spindle lock, which makes it possible to change bits with one wrench rather than two.

Two knobs are the norm

Most routers have a toggle switch and a pair of handles mounted on opposite sides of the base. But a D-handle is better if you ever need to operate the router with one hand.

Fixed base

Over the years, I've accumulated an arsenal of routers of various types and sizes; but if I had to get by with just one, I'd pick a medium-duty (1½ hp to 2 hp), fixed-base model.

Fixed-base routers are less complicated than the plunge variety, and they're generally easier to set up and operate in a router table (sidebar p. 74). Most routers of this type have

two handles, or knobs, on each side of the base for the operator to grasp. Some of them have on/off switches that are located on one of the handles; but most are controlled by means of a motor-mounted toggle switch. The location of handles and switches is mostly a matter of personal preference, but if you're planning to use a router-table setup,

MIDSIZE IS VERSATILE AND AFFORDABLE

Routers vary in size from tiny laminate trimmers to enormous production machines (sidebar below right), but most models fall in the midsize (1½ hp to 2 hp) range. These all-purpose units have enough power for all but the most extreme tasks, yet are more controllable (and more affordable) than their musclebound cousins.

Safety first

A trigger-style switch is safer than one on the motor because you don't have to hunt for it. And a plunge router is safer than a fixed-base unit because the spinning bit can be retracted once the job is done.



Toggle switch

Sliding depth rod



A knuckle buster if you're not careful

Some routers still require two wrenches to change bits: one to secure the shaft, and one to tighten or loosen the collet.

Revolving turret



Plunge routers

especially if it's a homemade table, you should check out how easy or difficult it would be for the router you're considering to operate in an upside-down configuration.

Some fixed-base routers are available with a D-handle that includes a convenient trigger switch. Many of us who are more accustomed to circular saws than woodworking tools find

this setup more to our liking; I prefer it because the solid handle enables me to work one-handed if necessary, though the tool is not nearly as steady as a laminate trimmer (sidebar right).

Regardless of handle type, all fixed-base routers must be treated with respect because the cutters are exposed and unguarded. The

How many routers do you need?

A router is one of those tools that you just can't have enough of. Although I'd choose a midsize unit for my first router, my second purchase would be a laminate trimmer.

Most routers require two hands to operate safely and effectively, but a laminate trimmer is a one-hand wonder. For small edge-shaping jobs, such as rounding the sharp edges of exterior-trim elements before painting (photo top right), I cherish the ability to secure the work with one hand while guiding the router with the other.

My third purchase would be a heavy-duty production router. The oversize motor that powers my production router makes for a tool that's top heavy and cumbersome, as well as expensive; but when I need to spin a large-diameter bit (more than 1½-in. dia.), or plow through miles of tropical hardwood, I'm glad I've got the power. If I were shopping for a new production router, I'd look for one that has variable speed and a soft-start feature.



Laminate trimmer



Production router

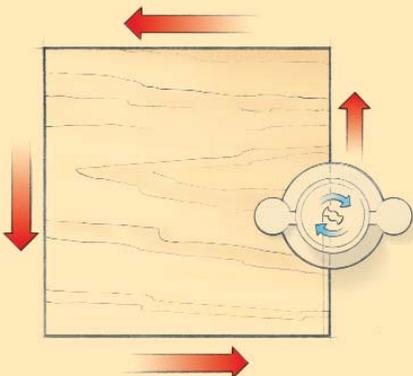
Respect and proper feed direction are keys to safe routing

Routers are not as scary-looking as circular saws, but their cutting edges are not as well-guarded, so they demand respect.

- Always make sure that you have a firm grip on the handle, and verify that the bit is not in contact with the work before you flip the switch.
- Edge-route in a counterclockwise direction to ensure that the bit's rotation pulls itself into the work rather than away from the edge (drawing below).
- Don't cut too deeply. Taking a series of shallow passes is safer and easier on the equipment than trying to gouge out a large chunk at one time.
- After completing a cut, wait for the blade to stop spinning before you set down the tool.
- Always unplug the tool when making adjustments or changing bits.
- Never walk away from a router without securely tightening a newly inserted bit.

Router feed direction

Running the router along the right edge of the workpiece (as you push it forward) ensures that the router bit pulls itself into the wood and resists pulling away. Cuts made around the edges of a board should follow a counterclockwise rotation.



FIVE REASONS TO



If you think of a router as purely a shop tool, you're making a mistake. Unless I'm pouring concrete, I've always got at least one router on the job, and few days go by that I do not find a use for it. These are just a few of my favorite uses. Once you start bringing a router to the job, you'll find uses for it that you never imagined.

Grooves for shelf standards

Controlled by an edge guide, a $\frac{3}{8}$ -in. straight bit carves $\frac{1}{4}$ -in.-deep grooves to recess a pair of shelf standards.

first time you accidentally set down the tool right side up while the bit is still spinning will be an experience you'll never forget.

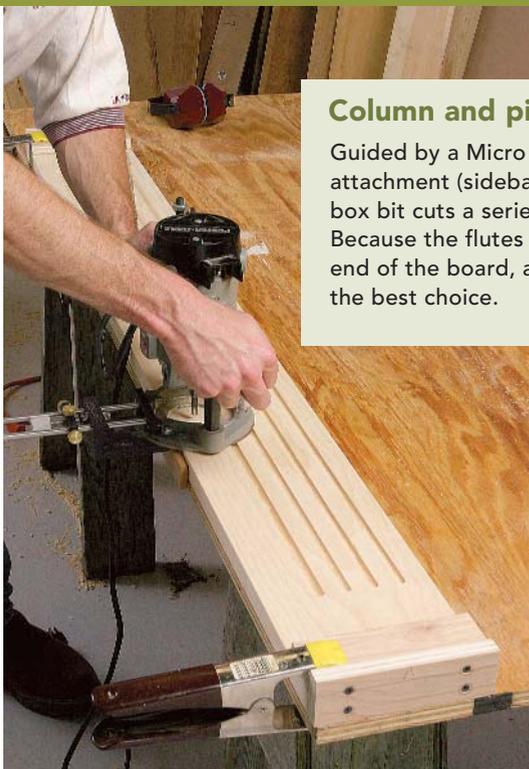
Plunge routers are safe and versatile, but cumbersome

From a safety standpoint, a plunge router is a great improvement over a fixed-base unit because the bit can be retracted beneath the level of the baseplate after the work is done. It's still a good idea to maintain the practice

of laying the router on its side after use, just in case you find yourself using a fixed-base unit from time to time.

Like a drill press, a plunge router allows you to start in the middle of the work and to lower the cutterhead accurately into the surface. The ability to raise and lower the cutter while the router is running is vital if you're carving shapes that have definite starting and stopping points, such as column flutes (photo top left, facing page) or housed dados.

GET OUT THE ROUTER



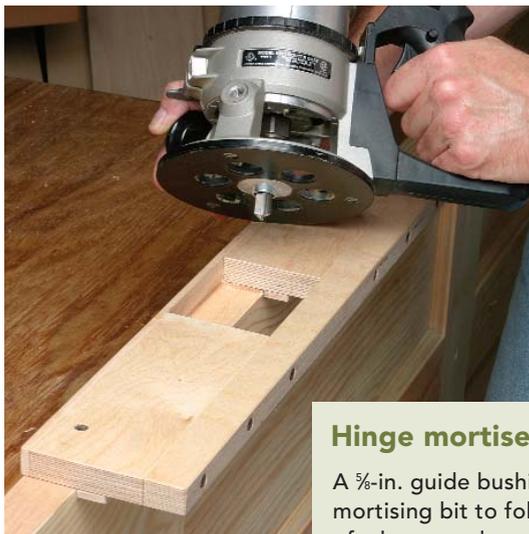
Column and pilaster flutes

Guided by a Micro Fence attachment (sidebar p. 75), a $\frac{3}{8}$ -in. box bit cuts a series of flutes. Because the flutes stop before the end of the board, a plunge router is the best choice.



Shelf dadoes

A homemade jig with a square stop on one end and a fence on each side of the router makes for fast and accurate dadoes, especially if you cut both uprights at the same time.



Hinge mortises

A $\frac{3}{8}$ -in. guide bushing enables a $\frac{1}{2}$ -in. mortising bit to follow the contours of a homemade mortising jig.



Custom molding

The right router bit, or combination of bits, can replicate the profile of many types of hard-to-find period moldings.

For my work, the most useful feature of a plunge router is the multilevel depth stop, which is essentially a revolving turret with five or six ascending steps that contact a sliding depth rod. This feature allows me to make up to six different depth cuts by just rotating the turret, truly a godsend when I'm plowing out a deep cut that requires multiple shallow passes.

Despite its versatility, the typical plunge router is top heavy compared to a similar

fixed-base model, and the process for dialing in the depth of cut is more of a hassle. A plunge router is probably essential for cabinetmakers and furniture builders, but I haven't found many situations in general carpentry that require the need to make plunge cuts.

Bits, features, and accessories

Most routers include some type of scale to set cutting depth. I use these scales only as a rough guide, if at all. It's good practice to ver-

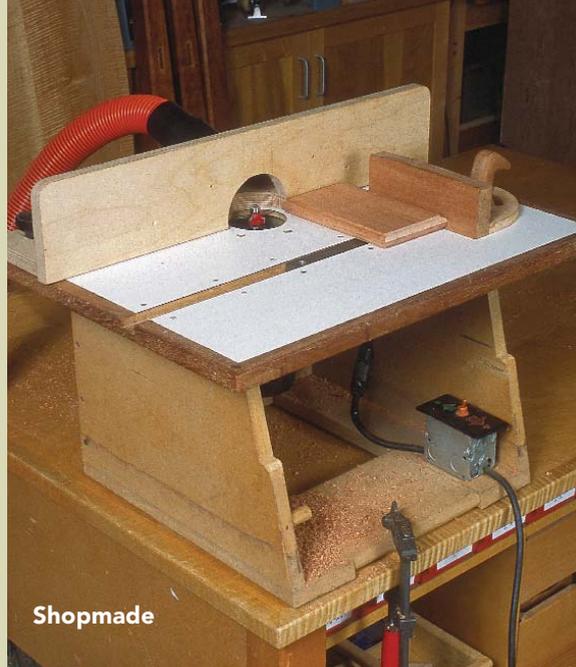
ify cutting depth with a ruler or, better yet, a depth gauge (photo bottom left, p. 75), then make a test cut on scrap lumber before plowing into the workpiece.

Almost all full-size routers are available with interchangeable $\frac{1}{4}$ -in. and $\frac{1}{2}$ -in. collets (the sleeve that holds the shank of the router bit). Smaller router bits are mounted on $\frac{1}{4}$ -in. shanks. Many larger bits are manufactured with either $\frac{1}{4}$ -in. or $\frac{1}{2}$ -in. shanks. The $\frac{1}{4}$ -in. variety might save you a buck or two, but if you

For most of my needs, a handheld router fits the bill. But when I have to replicate narrow moldings or short lengths of trim, and whenever I have to shape the face rather than the edge of a board (bottom photo), I prefer to set up a router table. Many companies make highly evolved commercial router tables. The photo below shows an older bench-top model made by CMT (888-268-2487; www.cmtusa.com). But you may not need all the bells and whistles.

A router table can be as simple as a strong, flat board with a hole in the middle and some type of clamp-on fence. In a pinch, I've gotten by using the sink cutout from a plastic-laminate countertop and fitting it with a pivoting fence that was made from a scrap of backslash; plastic laminate makes for a durable, nonbinding top surface.

If I were building a serious router table, I'd want a sturdy, nonslip tabletop that would not deflect under the weight of a heavy-duty production router, and a tall, perfectly straight fence amenable to a vacuum hose for dust removal (top photo). I'd also prefer to have a conveniently located on/off switch.



A router table turns a small power tool into a portable shaper



buy the 1/2-in. bit, you'll get a cleaner cut with less chatter and fewer ripple marks.

Few router operations are done freehand. Some cuts require an external guide such as a straightedge, a guide collar, or an edge guide.

For most edge-shaping work, it's faster to use a piloted bit than a guide. Bits with a pilot on the bottom follow the unshaped edge of the work as if it were a straightedge. Bits with pilots on the top follow a template that's fastened over the workpiece. Inexpensive bits

use a solid-steel pilot; they should be avoided because they spin so fast that they can leave indentations or burn marks. Professional-quality bits use ball-bearing pilots that spin freely.

Another advantage of using ball-bearing pilots is that the profile of the cut can be altered by switching pilots (top photos, facing page). Use care when removing pilots because the small mounting screws can snap easily if you apply too much pressure. Even ball-bearing pilots can seize and mar the

workpiece if they're not kept clean and lubricated. I don't clean router bits as often as I should, but I always give the bearings a test spin before I use a piloted bit and add a drop of lubricant (Empire Manufacturing; 866-700-5823; www.empiremfg.com) if the router bit doesn't turn smoothly.

A single high-quality carbide-tipped router bit can set you back \$50 or more, so you don't want to leave these valuable tools clanging around in the bottom of a toolbox. There are plenty of aftermarket trays available for protecting and organizing router bits; but a simple block of wood with a collection of 1/4-in. and 1/2-in. holes works as well as anything (photo top right, facing page).

Edge-shaping: Go with the flow

The most important thing to remember about a router's operation is that the bit rotates in a clockwise direction (when viewed from above). When edge-shaping, a sound rule of thumb is to keep the router to the right of the workpiece as you move forward (drawing p. 72). This operation is easy to control because the bit's rotation pulls the router into the work. By contrast, if you ran the router along the left side of the work, you'd find the spinning bit behaves like the wheel of a car, tending to accelerate the router down the length of the board and away from the edge.

During edge-shaping operations, it's also important to consider the orientation of the wood grain. Whenever possible, you want the grain pointing in the direction the router is traveling so that the bit is spinning with the grain, not into it. Otherwise, you risk a lot of tearout that will be difficult to sand smooth.

The greatest chance for error happens at the beginning of the cut. I prefer to leave the workpiece a few inches long and shape the edge before I cut the piece to length. If a workpiece has to be shaped to the very ends, I start the cut an inch or two from the end and allow the bit's natural momentum to draw the router backward and off the end of the board. Then I return to the starting point and finish the cut.

Use clamps sparingly

Speaking strictly of safety, every workpiece should be securely fastened while routing, but I live in the real world. When I'm making a modest cut such as a 3/8-in. roundover, it's much faster to clamp the board to the sawhorses using my free hand than to tighten and loosen a mechanical device each time.

A WOODWORKING SHOP IN A BOX

A midsize router, a few accessories, and a modest assortment of bits can tackle a remarkable variety of carpentry tasks. A toolbox made of scrap lumber keeps the whole lot organized and ensures that the bits stay sharp.



Bearing assortment kit



Bearing-guided pilot

Solid pilot

Bearing guides are better. Many edge-trimming jobs are guided by a pilot that follows the unshaped part of the edge. Cheaper bits use a solid pilot that can mar the edge of the work; a bearing-guided pilot is less risky because it rotates independently.



Roundover

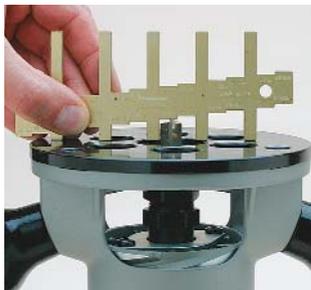
Beading bit

Change the bearing, change the profile.

Put a larger pilot on a beading bit (right), and it becomes a roundover bit (left). A router-bit survival kit (Jesada Tools; 813-891-6160; www.jesada.com) includes a variety of extra bearings as well as spare washers, mounting screws, and wrenches (photo top left).



TWO NIFTY ACCESSORIES



A \$5 router gauge (General Tool Co.; 212-431-6100; www.generaltools.com) makes dialing in cutting depth a snap. At \$160 and up, the Micro Fence (800-480-6427; www.microfence.com) is no bargain, but it's the most accurate and reliable edge guide on the market.



For added stability, I place small items atop a nonslip router pad. If I'm shaping a long board, I draw the router off the edge just before I get to the end of my reach; then I reposition my clamping hand and ease the router back into the work before proceeding.

When conditions require two hands on the router, I generally rely on a pair of 12-in. Bessey clamps (James Morton Inc.; 800-828-1004; www.jamesmorton.com) to secure the work to sawhorses. Of course, if the workpiece

is narrow or if both top edges have to be shaped, the clamps will get in the way. In these situations, I fasten the work to the horses with two small finish nails. After the piece is popped loose from the horses, I pull the nails through on the back side with bullnose end nippers so that I don't mar the front side. □

John Michael Davis is a restoration carpenter in New Orleans. Photos by Dan Thornton.

The perfect starting point

I wouldn't want a plunge router for my one and only router, but if I were just getting started, I'd choose a combo kit such as Porter-Cable's #693LRPK (Porter-Cable Corp.; 800-321-9443; www.portercable.com), which includes a motor and two interchangeable bases, one plunge and one fixed.

A D-handle base is also available for this model, which would give you the best of all possible worlds.

