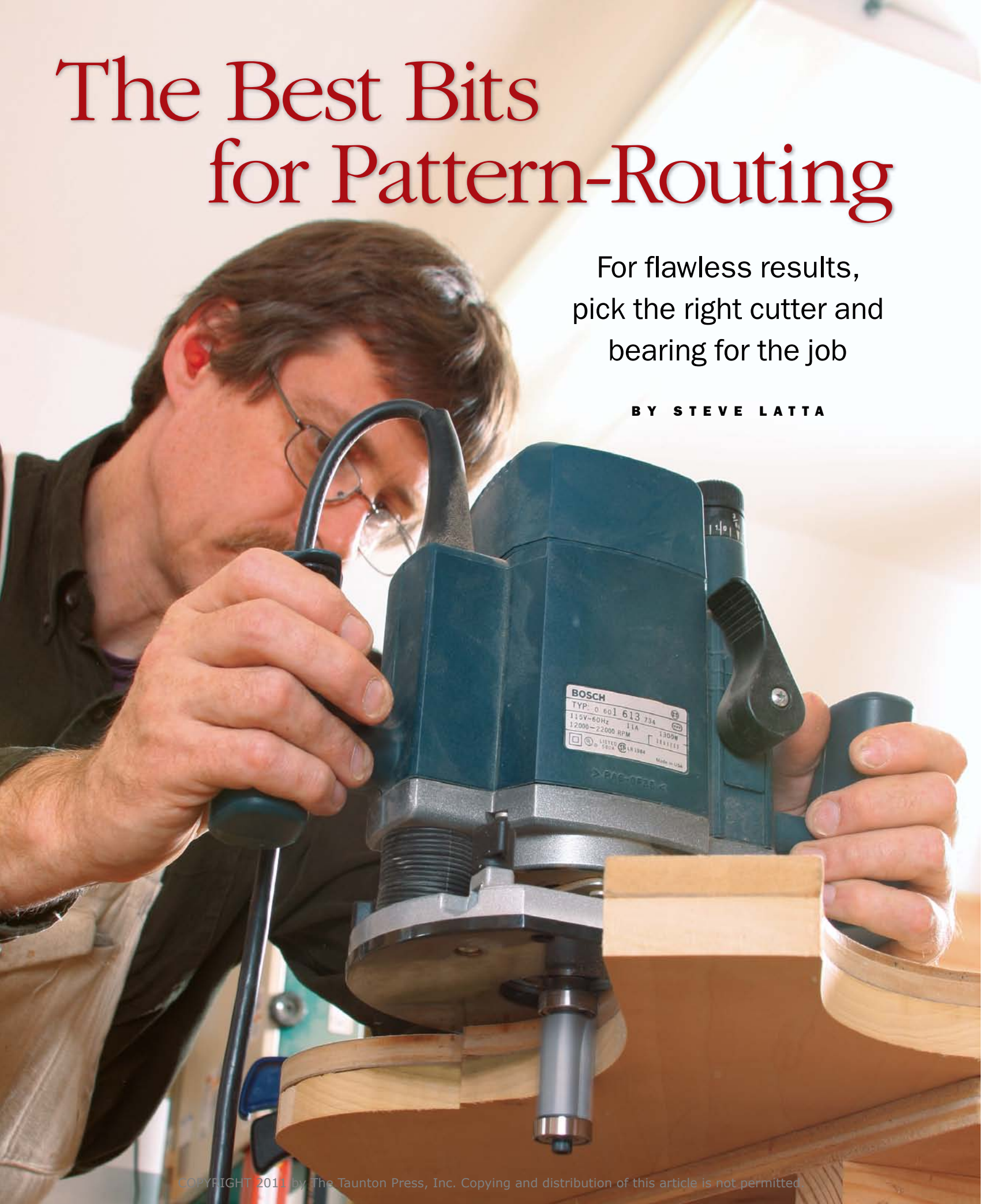
The Best Bits for Pattern-Routing

For flawless results, pick the right cutter and bearing for the job

BY STEVE LATTA



Match the bit to the material

Not every job requires a big investment in a router bit. Use cheaper bits when you can and save the good ones for when you really need them.

Armed with a router and a template, you can tame any curve a furniture project throws at you, as long as you have the right bit for the job. But because of the large range of options, making the right choice can be difficult. Bearing-guided bits are available in straight and spiraled flutes that are designed to tackle a variety of materials, from sheet stock to the most unforgiving hardwoods, and they also come in several bearing configurations, letting you approach templates and grain direction in a few different ways.

With all these choices at your fingertips, it's important to know what the differences are and when to use each one. I'll help you choose the right bit for each project. The good news is that you don't have to buy all of these bits at once. Starting out with a few of them will improve the quality of your woodworking, and using this article and the buyer's guide on p. 43, you can easily add the bits you need as you tackle new projects.

Straight bits work, but spirals are better

For a long time, I got by with straight-fluted bits. They worked OK, but caused problems like chipout and burning on harder woods. I stuck with them simply because I didn't know anything better was out there. Then I tried a spiral bit, and had a "Where have you been all my life?" moment. It didn't take long to discover that spiral bits could easily replace my straight cutters for many tasks.

Spiral bits leave a beautiful finish even on extremely figured woods, and problems like chatter and chipout all but disappear. Because of their helical cutter shape, they maintain greater contact with the stock, vibrate less, and "slice" at a skew angle, leading to a clearly superior quality of cut.

Inexpensive straight bits are still a staple in my shop, but now I reserve them for well-behaved

STRAIGHT BITS FOR MDF AND PLYWOOD

Straight bits have carbide flutes brazed to a steel shank. Some have slightly angled flutes, which slightly improves performance. They work OK on straight-grained lumber, but to get the most value out of these inexpensive bits, save them for tough sheet goods.

***Shop workhorse.** Inexpensive straight bits are great for MDF and plywood, which can wear out a bit quickly.*

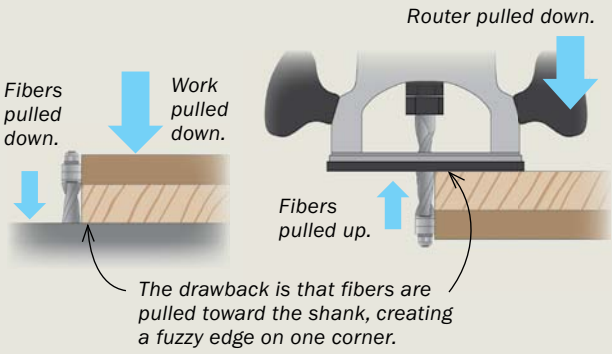
GO SPIRAL FOR SOLID WOOD

Spiral-fluted bits are ground from a solid piece of carbide, making them more costly than straight-fluted bits. However, their shearing action produces a smooth surface with little to no tearout, even on tough woods like curly maple.

***Don't mind the fuzz.** Spiral gets you a clean face with raised fibers on one corner. It's easy to knock off with sandpaper and not a problem on most hardwoods.*

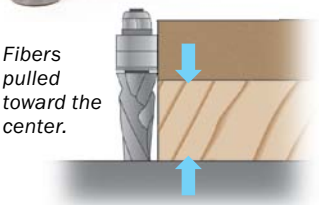
UP-SPIRAL BITS ARE A SAFER CHOICE

The rotation of an up-spiral bit pulls the router toward the work when hand routing, or toward the table when using a table-mounted setup. In both cases, the cutting action helps keep the bearing in contact with the pattern.



COMPRESSION BITS ELIMINATE CHIPOUT

A variation of a spiral bit, a compression bit has a cutting action that forces the wood fibers toward the center of the cut. This leaves the edge clean and both corners chipout-free, even on brittle woods and veneered panels.



***Tame tearout on veneer.** A spiral bit leaves chipout on the lower edge of a veneered panel (top). Cutting the same piece with a compression bit, however, yields a perfect cut with no chipping on either edge (bottom).*

Photos: Michael Pekovich; drawings: Kelly J. Dunton

Match the bearing to the task

Template-routing bits are available with bearings at the tip, shank, or both. Often it takes more than one bit to complete the job.

BEARING AT THE TIP IS A SAFE BET

Flush-trimming bits have a bearing at the tip. They're a great first choice for both router tables and handheld routing, because the tip of the cutter is covered, making them a lot safer. They're available with straight, spiral, or compression flutes, giving you the most options as well.

Good for handheld and router-table tasks. *On a router table, mount the pattern on top of the workpiece (above). For handheld routing, the pattern must be attached to the bottom (right).*

PATTERN BIT OFFERS MOUNTING OPTIONS

A pattern bit with the bearing at the shank can make template routing easier by offering different ways to orient the template to the stock. However, more care must be taken with these bits because of the exposed cutter at the tip. They are available with straight or compression flutes.

Easier pattern mounting. *At a router table, a pattern bit lets you clamp a workpiece to the top of a pattern (above), which makes it faster to shape multiples. For handheld routing, the pattern must be secured to the top of the workpiece (right).*

FLUSH-TRIMMING BITS WON'T BITE WHEN TIPPED

It's easy to accidently tip a handheld router. Using a flush-trimming bit, the cutter moves away from the wood (right). But watch out with a pattern bit, or the cutter will gouge into your workpiece (far right).

woods and sheet stock. I save my pricey spiral bits for the tougher solid-wood jobs.

Spiral-fluted bits are available with flutes that run up, down, or both, but I'd stick with "up-spiral" bits, also called up-cut bits, because they are safer. In a handheld router, the bit pulls the work securely toward the router base, where a down-cutting spiral would push it away and could cause the router or workpiece to jump unexpectedly. An up-cutting spiral bit is easier to control in a router table too, pulling the work down against the table instead of pushing up and away.

Though spiral bits cut a cleaner edge on solid wood than straight bits, their cutting action tends to create a fuzzy corner on the work as it pushes fibers up or down. It's not a big deal, as the fuzz is easily cleaned up with sandpaper. For

TEAM UP BITS FOR BETTER RESULTS

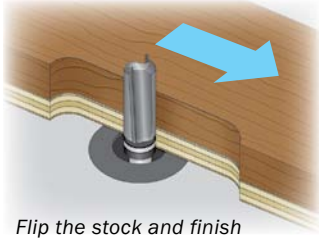
Using a flush-trimming and pattern bit together lets you tackle thick stock and manage grain changes without tearout.

SHAPE THICK STOCK WITH EASE

Tag team for wide parts. *With the template on the bottom, rout the lower portion of the stock with a pattern bit (left). Then flip the workpiece and finish routing with a flush-trimming bit, registering the bearing against the previously routed surface (above).*

NAVIGATE GRAIN CHANGES WITHOUT TEAROUT

Rout halfway with a flush-trimming bit and stop the cut.



Flip the stock and finish with a pattern bit.

Rout halfway and flip. *Start with the template on top and use a flush-trimming bit to rout half of the profile working downhill (1). Then install a pattern bit (2) and flip the workpiece and template to rout the remainder of the profile (3).*

jobs where you need a perfect surface with two clean corners, like when working with veneer, compression spiral bits really deliver. Their cutting action pulls fibers toward the center for a clean edge top to bottom. These bits also excel when cutting extra-brittle solid woods where both corners won't hold together with spiral bits.

Get your bearings on template routing

When it comes to routing to a template, there are three types of bearing arrangements you can use: flush-trimming, with the bearing at the tip; pattern, with the bearing at the shank; and "over-under" or "double bearing," with both. If the names "flush trim" and "pattern bit" don't quite add up, it's because they are named after their purposes in professional cabinetmaking shops, and those aren't necessarily the same for furniture makers. A flush-

Bearings continued

DOUBLE UP FOR CONVENIENCE

With bearings at the top and bottom, the over-under bit is like a flush-trimming and pattern bit rolled into one. It is available with either straight or compression flutes.

trimming bit works great for most types of routing projects, and because it is safer, it's usually my first choice for both the handheld router and the router table. For the projects that a flush-trimming bit can't handle, a pattern bit fits the bill.

Because their bearings are mounted at the shank, pattern bits open up more template-routing possibilities. The router table is the safest place to use one, but it's also OK in a handheld router on projects that are too large for the router table. Both instances require extra caution—the sharp end of this cutter is exposed. So be sure to put proper guards in place.

Used in tandem, flush-trimming and pattern bits make even more tasks possible, like shaping a workpiece that is taller than a single bit (see photos, p. 41). Pairing up the bits also allows you to reverse your cutting direction and always cut with the grain without having to remove the template from the workpiece.

An alternative to this method is to re-mount the template to the opposite side of the workpiece, but this has a major downside. When you re-mount the template, it's almost im-

The steps are the same as before, but you'll finish in less time. *Start with the top bearing aligned to the pattern (1). Instead of changing bits, simply raise the bit to align the bottom bearing with the template (2) and finish routing the profile (3).*

SAVES TIME WHEN HANDHELD ROUTING, TOO

Bring the router to the work. *On projects too big for the router table, start routing with the template on the bottom (1). Then flip over the workpiece (2), extend the bit, and finish the job (3).*

Real-world buying guide

If the variety of bits still seems dizzying, this guide will put you at ease. The actual options boil down to just a handful. I prefer bits with a ½-in. shank, since they're less prone to breaking under a load, and the larger cutters aren't available in a ¼-in. shank anyway. Also, some bearing configurations aren't easy to find in an up-spiral yet, so that limits the choices as well. What's left over is a tidy group of bits that will keep you in pattern-trimming bliss. —S.L.

STRAIGHT FLUSH-TRIMMING BIT

The first bit in most of our tool kits, the straight-fluted flush trim is the easiest to find, and at about $20 it's also the most affordable. I like to use one with a ½-in.-dia. cutter that's 1½ in. long, but there are many other sizes to choose from. If it's kept clean and sharp, this bit will generally get you good results on straight-grained, well-behaved hardwoods, and it's also great to use on plywood and MDF, which dull tools quickly. I use it to cut shaped ribs for bending forms, plywood furniture parts, and also to make duplicate patterns. It's a good idea to keep two of these bits around; use one on sheet goods, and reserve the other for solid woods.

UP-SPIRAL FLUSH-TRIMMING BIT

If you're not getting good enough results using a straight-fluted bit, it's time to try an up-spiral flush-trimming bit. You'll see a major jump in quality over straight bits, and cut your time spent sanding and cleaning up tearout. They are available with 1¼-in., 1½-in., and 2-in. cutter lengths. I recommend getting the 1½-in. cutter, which gives you the flexibility to rout thin and some pretty thick stock. A bit like this runs around $55 to $90, but it's worth it for a long-lasting, high-performance bit. Though not as common as straight bits, they are still pretty easy to find.

STRAIGHT PATTERN BIT

Widely available and ringing in at around $35, this is a very attainable bit, and adds tons of versatility to your kit. Use it when your flush-cutter faces extreme uphill grain, and for sled-style templates where the workpiece is clamped on top. It can also be used in sequence with a flush-trimming bit to accurately shape stock that's normally too thick for a single bit. Because the bearing must fit over the ½-in. shank and be flush with the teeth, you'll find these available in ¾-in. or ⅞-in. diameters, with up to 2 in. of cutting length. But unless you're working with really thick stock, 1 in. should be all you need.

COMPRESSION BITS DO IT ALL

If you're still having trouble with the toughest-grained woods and even the wonderful spiral bit can't tame them, then a compression bit is your best shot. These bits run between $100 and $150, and they perform accordingly. From changing grain directions in tough wood to veneer work, they leave perfectly smooth, straight edges.

1/2-IN. FLUSH-TRIMMING COMPRESSION BIT

This is a great go-to bit, and it will cost you about $100, a little more than the spiral flush-trimmer. It comes in 1¼ in. and 1½-in. cutter lengths. I go for the 1½-in. bit. It handles the toughest grain like a champ, and its ½-in. dia. gets you into tight corners better than larger bits, so you have less cleanup work later on.

DOUBLE-BEARING COMPRESSION BIT

You could almost call this bit the "super bit" because it boasts so many versatile features. At $150 (whitesiderouterbits.com), it combines compression-style flutes with over-under bearings, which lets you use it for many jobs in place of a flush-trimming or pattern bit. It also will save you time on jobs where you need to flip over the workpiece, because you'll be changing bits a lot less—just reset the depth and keep routing.

possible to match the original alignment, so you'll always have to sand out transition lines where the cuts from each side meet. With my method of using a pattern and flush-trimming bit, you'll keep the pattern mounted on one side, you won't have to sand transition bumps, and you may never have to rout uphill grain again.

One more bit makes things even easier: the over-under bit. also called a "double-bearing bit." This bit has bearings at both the shank and tip, eliminating the need to change bits. □

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