ESSENTIAL GUIDE TO THE ROUTER TABLE

Open up a new world of woodworking possibilities by learning how to set up and use a table-mounted router.

The router undeniably ranks as one of the most versatile woodworking tools. But a router becomes even more capable when it’s turned upside down and mounted in a router table.

Table-mounting gives you a level of control over the router you just can’t get when using it handheld. Think of it like ripping a board with a handheld circular saw versus ripping it on a table saw. Rather than having to secure the workpiece somehow and then move the cutter over it, you secure the tool and then move the workpiece over the cutter. This lets you guide the workpiece with confidence and means you don’t have to fight the weight, torque, and vibration of the tool.

A router table also offers large surfaces, namely the table and fence, that support and guide your workpiece. Plus, the table and fence accept accessories like a miter gauge, guards, featherboards, and others that make routing safer and easier.

TABLE ANATOMY

To use a router table successfully, you need to get familiar with its components and their functions. The Illustration below provides an overview.

Table — The table is, of course, the key component in a router table. It provides a flat, smooth surface for your workpiece to ride on. Obviously, the large surface simplifies routing large pieces, but it offers better control when working with small stock, too.
Tables are made from many materials, but one of the most common is melamine-coated MDF. It’s dense, stable, and stays flat.

**Insert Plate** — On most router tables, the router mounts to a removable plate that fits into an opening in the table. This setup lets you easily remove the router for changing bits, servicing the router, or even using it handheld.

**Miter-Gauge Slot** — Most tables also have a slot that accepts a miter gauge. That means you can support workpieces when routing across the grain. On some tables, the miter slot is paired with a T-slot for mounting accessories.

**Fence** — The next critical component is the fence. Its mission is simple: to hold your workpiece in a constant position relative to the bit as you rout. That makes the router-table fence a lot like a table saw rip fence, but the router-table fence is more complex.

When routing along the edge of a workpiece, you only expose a portion of the bit. The rest tucks into an opening in the fence face. On most fences, the faces slide, so you can make the opening around the bit as small as possible to help prevent tearout.

To adjust the position of a router-table fence, you slide it backward or forward and then lock it down. And because the router bit is essentially a single point, it doesn’t matter during most routing operations whether the fence is parallel to the edge of the table or whether it sits at an angle (Illustration, below).

**ALL THE ANGLES.** The fence can sit at any angle on the table without affecting how far the bit protrudes from the face.

**FEED STOCK FROM RIGHT TO LEFT.** Looking down on the router bit, it spins counterclockwise, so pushing the workpiece from right to left moves it against the rotation of the bit and forces the workpiece against the fence.

1] **Always feed from right to left.** A workpiece should always be moved against the rotation of the bit. When routing handheld, that means you move the router from left to right. Flip the router upside down in a router table, though, and you need to reverse the feed direction: Feed from right to left (Illustration, above). This prevents the bit from grabbing and throwing the workpiece.

2] **Use a guide.** When routing, you always have to use something to guide the workpiece. On a router table, use the fence or a pilot bearing on the bit to guide the workpiece.

3] **Don’t stress the router or bit.** On a router table, it’s easy to force the router to bite off more than it can chew by feeding too fast, taking an oversize cut, or pushing too hard. This puts a tremendous side load on the bit that can tear up a workpiece, stress the router bearings, or even break a bit. So make sure to take light cuts.

4] **Get a grip on small pieces.** When working with pieces that are narrow or less than about 6” long, the torque of the spinning bit can yank the workpiece out of your hands and throw it, or draw your hands into the bit. So always use a small-piece handler, a clamp, a push block, or a miter gauge to hold the piece (Photo, above).

5] **Use featherboards when routing with the fence.** Featherboards apply steady pressure to keep a workpiece tight against the table or fence. This helps ensure accuracy by maintaining a consistent depth and width of cut, and it prevents you from having to get your hands close to the spinning bit.

**SECURE SMALL PIECES.** When routing a small piece, use a strong clamp to hold the workpiece securely.
You can perform a lot of different operations on a router table, but they all boil down to the same simple goal: Making a cut of a specified depth and width in a workpiece. To do that, you need to guide the workpiece against the router table’s control surfaces. The first of those is the table itself. This is “ground zero,” so the height of the bit above the table determines the depth of cut.

The second control surface determines the width of cut. In most cases, this is the fence. Use it anytime a workpiece has a straight edge that can ride along the fence face. Sometimes, however, like when you’re routing irregular-shaped pieces, a guide bearing on the bit plays a role in width of cut (see the Box, below). This is true whether you are routing the edge, end, or face of a workpiece.

**ROUTING EDGES**

One of the most common uses of a router table is shaping the edge of a workpiece. This may be to add a decorative profile, such as an ogee or chamfer, or it may be for creating rabbets, tongues, or other kinds of joinery.

To machine an edge, you position the fence so that only a portion of the bit is exposed in front of the fence face (Photo, above). As you rout, your hand pressure keeps the workpiece against the fence, while the bit’s rotation pulls the workpiece tightly against the fence. To get the most consistent cutting results possible, position featherboards on the infeed (right) side of the bit. These help maintain steady pressure on the workpiece.

When routing edges, you should only rout the edge that rides against the fence. In other words, don’t move the fence back and trap the workpiece between the fence and bit. Routing that way is almost guaranteed to result in a “kickback,” where the bit grabs and throws the workpiece.

The fence, by the way, can still be useful when using bearing-guided bits, particularly when routing long pieces (Photo, below). In these cases, you position the fence so the guide bearing is flush with the fence face or sits just slightly proud of the face (Illustration, below). The bearing controls the width of cut, while the fence provides support as you feed the workpiece.

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**FENCE-GUIDED ROUTING**

**ON THE EDGE.** By changing the position of the router-table fence, you control how much of the bit is exposed and, in turn, how wide of a cut the bit makes.

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**TWO TYPES OF BITS**

Some bits have an auto-pilot. Some router bits have “pilot” bearings (left) that limit their width of cut. Bits without bearings (right) require a control surface (usually the fence) to limit cutting width.

PILOTED BIT
- Bearing limits width of cut

NON-PILOTED BIT
- Requires fence to limit width of cut

Piloted Bits. The fence can enhance control with piloted bits. Set the fence so the bearing just clears the face (below).
ROUTING ENDS
Using the fence also allows you to rout the ends of a workpiece. This is especially useful for joinery, such as cutting tenons on the ends of door rails.

Routing the end of a wide workpiece is no different than routing the edge: pass it over the bit with the end riding against the fence. But if a piece is narrower than about 3", it doesn’t have a large enough bearing surface against the fence to resist the force of the spinning bit. So narrow pieces have to be handled differently to prevent the bit from grabbing the workpiece and pulling it out of your hand.

The solution for successfully routing the end of a narrow piece is to place support behind the long edge. That’s done with a miter gauge or push block.

Miter Gauge — Many tables come equipped with slots that will accept a miter gauge. With this setup, you can support the edge of the workpiece as you rout it with the end butted against the fence (Photo, above).

One thing to be aware of when routing with a miter gauge, though, is that the end of the workpiece will always move in a straight line parallel to the miter-gauge slot as you push it. So if the fence isn’t perfectly parallel to the miter-gauge slot, you’ll get an inconsistent width of cut.

On the positive side, a miter gauge can be rotated, which allows you to rout the ends of mitered workpieces.

Push Block — If you want to avoid the hassle of setting the fence parallel with the miter-gauge slot, you can use a push block when routing narrow pieces (Inset Photo, above) instead of a miter gauge. It’s just a square block that serves the same role as the miter gauge: supporting the edge of the workpiece while you rout the end. The difference is that the block rides against the fence, instead of following the miter-gauge slot. That means you’ll always get a consistent width of cut without having to set the fence parallel to anything. The push block offers one more advantage, too. It backs up the workpiece to prevent tearout as you rout.

ROUTING THE FACE
When routing the face of a workpiece, the role of the router-table fence changes slightly. That’s because when routing on a face, the diameter of the bit itself establishes width of cut. The fence simply determines the location of the cut (Photo, below).

Another important thing to know is that you’ll have to feed the piece over the bit more slowly than you would when routing an edge. This is necessary because the bit is taking a larger bite, and there’s very little room for chips to escape as you cut.

If you want to widen a cut you’ve routed in the face of a workpiece, it might seem logical to move the fence closer to the bit for the next pass. But that traps the workpiece between the bit and fence. The proper method is to move the fence farther away from the bit (Illustration, below).
Though the router-table fence is incredibly useful, there are times when it can get in the way. For instance, if the edge of a piece is curved or has an irregular shape, it can’t ride against the flat face of the fence. That means you can’t use the fence to limit the width of cut.

You can rout these pieces on a table, though, using bearing-guided bits. As discussed on page 76, the bearing on this type of bit acts like a “fence” to limit how wide of a cut the bit can make. So all you have to do is run the workpiece along the guide bearing.

The bearing can either ride on the edge of the workpiece, or on a pattern attached to the workpiece. We’ll talk more about that in a moment, but a safety note is important first.

Get Off to a Good Start — When routing with the fence, you have a solid surface to hold the workpiece against as you start the cut. Without a fence, though, all you have is the bearing on the bit. And if you just push the workpiece against the bearing, the spinning bit can grab it with enough force to cause the workpiece to kick back.

To make routing without the fence safe, most tables have a starting pin that you can insert into the router plate (Photo and Illustrations, above). To use the pin, just set the edge of the workpiece against the pin, and then pivot the leading end into the spinning bit. Then rout as normal, guiding the workpiece against the bearing on the bit.

**TEMPLATE ROUTING**

One very useful variation on bearing-guided routing is shaping a piece to match the contour of a template (Photo, below left). With this technique, you can rout almost any shape easily.

The process is simple. First, you cut a template from ¼” hardboard to match the final shape you want for the workpiece. Then, trace the outline of the template onto a workpiece. Next, cut the piece to roughly shape with a jig saw or band saw, staying about ⅛” outside the layout line.

Now adhere the template to the rough-cut piece with double-sided tape. That done, mount a flush-trim bit in your router table, and adjust the bit height so the bearing rides on the template. Now all you have to do is rout the waste to trim the piece to final shape (Photo, below).

—Written by David Stone, illustrated by John Hartman

**GOING FENCE-FREE.** With bearing-guided bits, the bearing controls width of cut, not the fence. That lets you rout curved and odd-shaped pieces that can’t ride against the flat face of a fence. A starting pin in the table helps you start cuts safely.

**BEARING-GUIDED ROUTING**

**USING A TEMPLATE.** The bearing on a flush-trim bit rides against a template to rout a workpiece to the exact same shape.

**TOP VIEW.** The workpiece is cut to rough shape before routing, so the bit only has to trim off a small amount of waste.
At its most basic, a router table is just a panel with a router attached to the underside of it. Cut a hole in the panel to let the router bit fit through, and the workpiece can be machined right on the tabletop.

Somewhere along the line, however, woodworkers realized that the router table was more than just a nifty trick for this essential tool. It was a concept revolutionary enough to change the way we use our routers. Router tables turn the average router into a precision woodworking machine, accurate enough to rout dead-on dadoes, and powerful enough to make raised panels and elaborate profiles on molding.

The result was the creation of a new tool for our shops — the manufactured router table. And to get an idea of how much the design has evolved from that panel with a router under it, just take a look at the Photo below. Aluminum insert plates, microadjustable fences, router lifts, auxiliary power switches, and T-track-mounted stops, hold-downs, and push blocks are just a few of the numerous enhancements you can add to a router table.

The next seven pages present some of our favorite accessories to maximize your router table for both basic and advanced routing techniques. And be sure to see the Buyer’s Guide on page 78 for a rundown of router table add-ons and where to get them.
**INSERT PLATES**

One of the simplest, yet most important, router table accessories is the insert plate. The idea behind an insert plate is easy to grasp. It lets you pull the router out and change bits above the table. This way, you don’t have to reach under the table every time you have to change a router bit.

**Plate Extras** — Today, insert plates come pre-drilled for your specific router. Some come equipped with other bells and whistles such as “corner snuggers” that lock the plate tightly in place and concentric rings for centering your router in the plate opening (like the Rousseau, right).

**Reducer Rings** — Another nice feature of insert plates is reducer rings, which lock or screw into a rabbeted opening in the plate. Reducer rings do just what their name suggests — they reduce the size of the plate opening to create the right amount of clearance around bits of different diameters. Most plates come with a blank ring that you can customize to create the proper-sized opening.

**Plate Materials** — Plates are available in a variety of different materials. Phenolic, plastic, and acrylic plates are less expensive ($25 - $50), while higher-end aluminum and nickel-plated ones are a little pricier ($55 - $100). We noted little difference between them, but a metal plate is a good choice for heavy routers.

**Plate Sizes** — Manufacturers size their plates to match their tables, so a Bench Dog plate won’t fit in a Rockler table, and vice versa. Of course, you can always use your router to enlarge the opening if necessary.

**PLATE LEVELERS**

On most router tables, the insert plate fits into a rabbeted opening in the table. The idea is for the plate to rest perfectly flush with the surface of the table. Oftentimes, though, this rabbet is a hair too deep, and the insert plate won’t align flush with the table. The results are misaligned cuts and workpieces that catch on the lip of the plate.

**Fixing the Plate** — People try all kinds of things to correct this problem. I’ve seen everything from woodscrews driven into the rabbeted opening to plastic shims placed in the rabbet. But none of these fixes is what you would call an exact science.

**Easy Plate Leveling** — Luckily, Woodhaven has developed a foolproof plate-leveling system that is an exact science. These Stay–Tru Plate Levelers ($19) consist of mounting blocks that screw to the underside of the tabletop and plate supports that attach to the mounting blocks with thumbscrews. Adjusting the thumbscrews moves the insert plate up and down in the opening. By turning the individual thumbscrews, a plate can be leveled perfectly with the table in a matter of seconds (Photos, right).

**Using the Levelers** — These plate levelers are most useful when you cut the opening in a router tabletop yourself. But they can be used on all router tables by removing the rabbeted portion of the opening. This is easy to accomplish by using a flush-trim bit in a hand-held router.
GLIDE BLOCK
A push block’s greatest assets are its ability to apply firm, even pressure to a workpiece and prevent injury by keeping your hands away from the bit. One of the most common push blocks is the rubber-bottom push block with a handle (shown in the top right Photo on page 75), which is available from a number of manufacturers.

Glide Block — Woodhaven’s newest offering, however, is a slightly different take on this critical accessory. This new glide block ($45) slides in a T-track on the top of the router table fence to guide the workpiece precisely.

The glide block is attached to an extruded aluminum block that allows you to add several accessories. One example is a plastic adjustment mechanism that holds a wood push stick. Couple this push stick with a featherboard for side support, and you can machine narrow or thin workpieces easily (Photo, top right).

Right-Angle Block — Replace this adjustment mechanism with the included right-angle block (Inset, right), and it becomes easy to rout the ends of pieces. A backer block prevents chipout during such operations.

T-Track Accessories — One quick note on these T-track mounted accessories (the glide block, fence stop, and featherboard). These accessories often mount to the fence in different ways. If they don’t fit your specific fence, you may have to make some small modifications.

FENCE STOPS
When you need to start or stop routing a workpiece at a precise point along its length, then a stop attached to the router table fence is the right accessory for the job. A stop can be as simple as a wood block clamped to the face of the fence.

But many manufacturers have made stops even more convenient by making them a separate accessory that attaches to a T-track on the fence. A manufactured stop is a lot easier to adjust and clamp in place than a wood block.

Flip Stop — Of all the stop blocks I looked at, though, this Econostop ($35) was my favorite (left). It’s a flip stop, which means it flips down in front of the fence when you need it. And when you don’t, it flips up out of the way. This eliminates the hassle of constantly removing and replacing stops between cuts.


HANDY HOLDER
This small-parts holder from MLCS proved itself quite valuable for freehand routing small workpieces. The yellow jaws of the tool adjust easily to apply firm clamping pressure to pieces up to 10” wide.

The two handles make it a snap to move and control the workpiece during a cut. And as you can see, they keep your hands well clear of the spinning router bit.

Another nice thing about this accessory is the price. At press time, it was available through the MLCS catalog for just $20 (see the Buyer’s Guide on page 78).
FEATHERBOARDS

Running a piece of wood past a hunk of metal spinning at 20,000 RPM isn’t the most predictable operation, which is why there’s always a possibility the workpiece will kick out, lift up, or even kick back.

Thus the beauty of the featherboard. Whether mounted on a table or fence, it applies pressure against the workpiece, preventing it from lifting up or kicking out. Its flexible fingers allow workpieces to slide smoothly underneath them, but they prevent a piece from kicking back at you.

Feather-Loc — For router tables, most manufacturers offer hold-downs with the tried-and-true featherboard design. Of all the featherboards I looked at, Bench Dog’s Feather-Loc ($25) is the most versatile. Not only can it act as a featherboard in both fence and table positions, but turning the Feather-Loc upside down makes it a handy stop (top right).

Tandem Feather-Loc — When routing a tall workpiece on edge, Bench Dog offers a Tandem Feather-Loc (far right) for around $35.

Hold-Down — The Woodhaven hold-down ($16) is a slight variation on the typical featherboard design. Rather than having individual “fingers,” this design is more like little feet, resulting in a hold-down that works extremely well.

SWITCHES & GUARDS

Another accessory that puts safety first is this auxiliary power switch from Rousseau (right). Of all the power switches I looked at for this article, this one scored the highest marks because of its “crash bar” for quick shut-offs. The Bench Dog Power-Loc (Top Photo, right) is also a solid choice at $50.

Freehand Guards — For freehand routing a workpiece, these two guards from Bench Dog and Rousseau (far right) offer extra safety and convenience. The Bench Dog ($30) is a bit larger and features a dust port. The Rousseau ($11) easily pivots out of the way when not in use. Both freehand routing guards have built-in starting pins for easing the workpiece into a spinning bit.

If you should need to turn off your router in a hurry, this auxiliary power switch from Rousseau ($35) features a handy crash bar.
advanced router ENHANCEMENTS

ROUTER LIFTS
The two most common gripes about router tables are that it’s a pain to change bits and to set the depth of cut. A good router lift solves both problems. It lets you adjust the height of the router bit on the tabletop. Setting the depth of cut suddenly becomes simple and precise, and bit changes are accomplished above the table.

Fixed-Base Routers — For fixed-base routers, the basic lift design is a ring-shaped housing that is tightened around the router motor, holding it firmly in place. This housing is mounted to the insert plate, and height adjustments are made on the table using some form of ratchet or speed wrench. Three good examples of fixed-base lifts are shown on this page.

► BENCH DOG PROLIFT
With a speed wrench for quick height adjustments and an aluminum housing, the ProLift is a rock-solid lift. Models are available for large routers (like the P-C 7518, shown) for $360 and smaller routers (like the P-C 690) for $225.

► WOODHAVEN EZ LIFT
At just $160, the EZ Lift may be the most economical of the fixed-base router lifts. Its housing is phenolic, and you use your own ratchet to raise it (Inset). Models are available for large and small routers.

► JESSEM ROUT-R-LIFT FX
Jessem had the first fixed-base router lift, and their new Rout-R-Lift FX ($180) for smaller routers lives up to the company’s strong tradition (above). Jessem also offers a pro-grade Mast-R-Lift ($290) for larger 3¼-hp routers.
ROUTER RAIZER

If you own a plunge router, there are a few great ways to convert it into a handy router table tool.

Height Adjusters — Some manufacturers are beginning to make height adjusters as accessories for their specific plunge routers. The adjuster for the Porter-Cable 8529 shown on page 72 is one example of this.

Router Raizer — The Router Raizer (right) can turn just about any plunge router into a router table tool. This “lift kit” works by replacing the plunging mechanism on the router itself with its own hardware (Photo). This enables the router body to move up and down and lock in place under the table (Illustration, right). An included speed wrench makes these adjustments fast and easy. And for about $80, it’s hard to beat the price.

ULTRA ADJUSTER

A router lift will take care of precise height adjustments for cutting on the router table. And when you need to position the fence precisely, this Ultra Adjuster from Woodhaven ($100) fills the bill.

Adjuster Setup — The phenolic housing of the Ultra Adjuster is bolted or clamped to the back edge of a router table. An extruded aluminum rail passes through this housing and attaches to the router table fence. (It attaches directly to Woodhaven’s fence, and an adapter is available for attaching it to other fences.)

Precise Cuts — What makes precise adjustments possible is a self-adhesive scale that’s applied to the aluminum rail. The key is to place the scale so that it registers at “zero” when the fence is aligned with the center of a router bit. Once this is accomplished, you’ll be able to see the precise distance from the fence to the center of the bit every time you move the fence. This is great for cutting dadoes and grooves when they must be at an exact location on the workpiece. A locking knob holds the fence in place at the correct setting.

Index Stick — Another nice feature of the Ultra Adjuster is an index stick and pin. This makes operations like routing flutes that need to be evenly spaced a lot easier to set up and cut. For each cut after the first, you simply release the index pin from the stick, move the fence, and then lock the pin in the stick in its new position.

This Ultra Adjuster makes precise fence settings for operations such as cutting dadoes and grooves automatic. And the index stick and pin make it possible to align and cut multiple flutes and grooves without complex layout (Inset).
There are a lot more router table add-ons than six pages can hold. Jointech’s Premium Workstation (left) is just one great example. See the guide below for a rundown of all the accessories.

### Router Table Fences

- Dust Ports
- Insert Plates
- Plate Levelers
- Router Lifts
- Featherboards
- Other Hold-Downs
- Freehand Guards
- Aux. Power Switches
- Stop Blocks
- Fence Adjustment Scales
- Push Blocks
- Small-Piece Holders
- Miter Slots

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