COMBINATION ROUTER TABLE
Installing a router upside down in a router table is a surefire way to upgrade any workshop. The versatility of a router table opens up new options for improving the fit and finish of your projects.

However that isn’t the only way to get more from a router. A router mounted horizontally offers some big benefits for certain tasks, like creating raised panels and cutting mortises and tenons.

Taking advantage of each configuration doesn’t mean you need two separate tools. The top of this router table flips up to convert from a standard router table to a horizontal table in just a few seconds.

VERSATILE ACCESSORIES. To support the workpiece in the horizontal mode, you replace the fence with the adjustable table shown in the photo above. That’s all you need for most shaping tasks.

An add-on mortising jig makes setting up and cutting mortises a breeze, as shown in the middle photo on the next page. Both of these accessories stow away neatly in the storage space below the top.

Despite its size, building this router table is straightforward and breaks down into easy-to-manage components. You’ll end up with a combination machine that expands the capabilities of your router.

A flip-up top adds a new angle to table routing. The result is a unique, two-in-one workstation for the ultimate in shaping and joinery.
Combination track includes miter track and T-track for added versatility.

NOTE: For hardware sources, turn to page 12.

Three-layer top stays flat for heavy-duty use.

Plywood quadrants allow top to pivot between horizontal and vertical configurations.

T-nuts are used to attach router table fence and horizontal table.

NOTE: Plans for router table fence are included on page 10.

Inner knobs are used to lock down the horizontal table once you have dialed in the settings.

Outer knobs attach the horizontal table to the tabletop.

Large hand wheel lets you fine-tune the position of the table in relation to the router bit.

NOTE: Router table base is made from MDF and provides a generous amount of enclosed storage.

NOTE: For hardware sources, turn to page 12.

A large, thick table and a simple, adjustable fence tackle most router table tasks with ease.

The add-on mortising jig and stops make cutting smooth, accurate mortises a walk in the park.

The storage area below holds the router table accessories or other gear you need to organize.

OVERALL DIMENSIONS: 34"W x 47 1/4"H x 30 1/4"D (Horizontal setup)
34"W x 40 1/2"H x 24"D (Standard setup)
A router table that can be configured for horizontal or vertical use requires a sure-footed stance both when routing and while making the transition from one mode to the other. That job falls mainly to the case and pedestal of the router table.

The case uses two approaches for creating stability. First, the overall structure of the case creates a wide footprint that provides a good balance no matter how the router table is set up. This large case also lets you sneak in some storage space for the accessories that are added later.

The choice of materials also plays a role in how well the case works. I used MDF here. And if you’ve ever lifted a sheet of MDF, you know why it can make a case feel more solid. The mass of MDF offers a nice side benefit, as well. It helps dampen vibration from the router.

**SIMPLE CONSTRUCTION.** The drawing above shows how the case is assembled. Rabbets and dadoes join the parts together. Aux. rip fence

**How-To: CUT RABBETS & DADOES**

1. **Rabbets.** An auxiliary fence allows you to position the fence alongside the dado blade without damaging the rip fence.

2. **Dadoes.** Take your time to size the dado blade to match the thickness of the MDF for snug-fitting joints.

**NOTE:** Pedestal is glued up from two layers of MDF

**NOTE:** All parts are 1/4" MDF

**A FEW DETAILS.** Before getting out the glue bottle and clamps, I drilled a couple of
holes in the sides that serve as the hinge and locking points for the tabletop. I also relieved the upper corner of the sides with a radius, as shown in detail ‘c’ on the previous page. This allows the top to pivot freely.

**ADD A PEDESTAL.** After assembling the case, you can move on to making the pedestal. It’s made up of two layers of MDF and extends out in front of the case to improve balance, primarily when the table is set up for horizontal operations.

**CASE WRAP UP**

The open, upper portion of the case is where you’ll turn your attention to next. Here, you need to add two small assemblies next to the case sides, as shown in the drawing at right. These offer additional storage. The space between them will house the router.

**FAMILIAR JOINERY.** Here again, all the parts are joined with dadoes and rabbets. Keep in mind that you’re making two mirror-image assemblies.

The dividers fit into the dadoes in the case top. This creates a narrow pocket between the outer divider and the case side, as shown in detail ‘b.’ This will house a large, arc-shaped plywood panel added later that allows the tabletop to pivot and be locked in place. An overlapping back panel encloses the space.

**DRILL SOME HOLES.** The outer dividers have a pair of holes that line up with the holes in the case sides. I used the holes in the sides and a drill bit as guides for marking the locations in the dividers. Then I drilled the holes at the drill press. Take note in detail ‘a’ that the rear hole is larger to allow for better access to install the table locking hardware later on.

**ADD DOORS.** The storage areas are enclosed with simple slab doors. The hinge side of each door has a shallow rabbet to hold a continuous hinge. The box at right shows how to create low-profile pulls. Soften the outer edges using a roundover (details ‘d’ and ‘e’). The doors are held closed with magnetic catches.

That wraps up the work on the case. Before moving on to the top, I painted the case after sealing the edges of the MDF and applying a coat of primer. You can find the color I used on page 12.
A high-quality router table top should have a smooth, hard-wearing surface that’s large and flat. And it never hurts to include a miter track. The top shown in the drawing above has all those features checked off the list.

However, the dual-purpose nature of this table requires a few other items. In the horizontal routing setup, the top becomes a vertical mounting surface for the router and an auxiliary table. So it needs to stand up to the changing loads. This top also needs a secure connection to the tilting mechanism for long-term reliability.

HEAVY-DUTY CONSTRUCTION. The starting point for meeting all those requirements is laminating the top from three layers of Baltic birch plywood. To make the top, I cut one piece of plywood to final size and shape. Then, one at a time, I glued on two slightly oversize pieces of plywood and trimmed them with a handheld router and a flush-trim bit.

All it takes to make the top smooth and durable is to add a piece of plastic laminate. It’s applied with contact cement and trimmed like the plywood, as shown in Figure 1 on the next page.

ALL IN THE DETAILS. With the top in hand, it’s time to start adding details. The first is drilling several sets of counterbored holes from the bottom (back) face, as shown in details ‘b’ and ‘c.’ The holes hold T-nuts that are used to attach the router table fence and the horizontal table.

I want to point out that there are two different sizes of T-nuts used. So the holes and counterbores are different, as well. Drill the counterbore for the T-nut first using a Forstner bit. Then use the center point to drill the through hole. It’s a good idea to have solid backing below the table to prevent chipping the plastic laminate as the drill bit exits the hole.

VERSATILE MITER TRACK. Next up on the list of details is cutting a groove to hold a commercial miter track. The one I selected is a combination track that includes a miter
track and a T-track. The thing to keep in mind is that the track is wider than a dado blade. So you need to make the cut in multiple passes, as in Figure 2.

A LONG MORTISE. The top is connected to the table with a pair of curved plywood quadrants. For a solid connection, the quadrants fit into long mortises cut in the underside of the top. To determine the location of the mortises, center the top on the case and mark the top where it lines up with the pockets in the case.

Figure 3 shows a good method for making the mortises. A straightedge guides a hand-held plunge router. I used a plywood bit to ensure a good fit between the plywood and the mortise. The mortise is ⅜" deep, so you need to rout it in several shallow passes.

A ROUTER INSERT PLATE. Back on the top face of the router table, you need to create an opening for the router insert plate. This is a little different than a typical opening. Since the table is designed to tilt upright, the insert needs to be anchored to the top so it doesn’t fall out.

The insert plate I used has countersunk holes in the corners. Machine screws and threaded inserts lock the insert plate in place, as shown in detail ‘d’ on the previous page. To create the opening, I used a pair of templates (Figure 4). The full process is detailed in Shop Notes on page 11.

MAKING QUADRANTS. The work on the tabletop is complete at this point. So you can turn your attention to making the quadrants. These have a curved edge and a slot that’s used to lock the tabletop in either working position. One edge of the quadrant is glued into the mortise in the underside of the tabletop.

Lay out the overall shape of the quadrant on a square plywood blank. Be sure to include the pivot hole, the curved slot, and the “ear” along one edge, as in the plan view on the previous page.

A jig saw makes quick work of cutting the quadrant to rough shape. Then I used a router with a simple hardboard trammel to clean up the edge, as shown in Figure 5. The trammel has a second pivot hole that’s used to rout the slot.

After rounding over the outside edges (Figure 6), you can glue the quadrant in place. I used pocket screws to reinforce the joint, as in Figure 7. The tabletop is ready to be installed on the case using the hardware shown in detail ‘a’ on the previous page.
Adjustable horizontal TABLE

Completing the case and tabletop gives you a fairly standard router table. To take advantage of the flip-up top, there needs to be some kind of support for the workpiece. That’s where you’ll be focusing your attention next.

The horizontal table consists of two primary assemblies: a fixed back and an adjustable table. The back is used to mount the table to the vertical tabletop in one of two positions. This is done with the T-nuts that were installed earlier. A hand wheel lets you fine-tune the height of the table in relation to the router bit.

**A SOLID BACK.** The table back is made up of two layers of plywood. I softened the corners with a radius. Cut a pair of dadoes in the face to hold the hand wheel assembly, as shown in Figure 1 below. The dadoes are sized to match the thickness of the Baltic birch plywood used throughout this part of the project. The back has two sets of holes drilled in it, as shown in detail ‘a.’ One is used with studded knobs to lock into the tabletop. The other set incorporates T-nuts, as you can see in the upper right drawing. These secure the table height once you have it dialed in.

**HAND WHEEL ASSEMBLY.** Attached to the table back is the hand wheel assembly. This includes two brackets and a lift block. The brackets are cut from square blanks that have the lower corners beveled, as shown in detail ‘b.’ Besides lightening the look of the brackets, this detail provides greater access to operate the hand wheel. The brackets are glued into the dadoes in the table back and flush with the top edge. Screws driven in from behind further strengthen the joint (main drawing above).

Sandwiched between the brackets is the lift block (detail ‘c.’) It’s glued up from four layers of plywood. Size the block so that it’s a snug fit between the brackets.

At the drill press, drill a counterbore for a T-nut and then the through hole to accommodate the threaded rod for the hand wheel. This is shown in detail ‘c.’ I drove long screws through the brackets and into the block for a solid connection. The hand wheel is attached to a length of threaded rod using a set screw. Thread the rod into the T-nut in the lift block.

**ADJUSTABLE TABLE**

The second part of the horizontal table is the adjustable portion, as shown on the next page. Here you have a double thickness table and two sets of braces with plates that join the table to the
back assembly. The construction is straightforward, but there's a definite order to the process to get the best results.

**MAKE THE BRACE & PLATE.** I began by making the two brace and plate sub-assemblies. The braces are similar to the brackets you just made (main drawing and detail ‘e’). The difference is a tongue and dado joint that runs along the back edge, as illustrated in the drawing below. Locate the dado so that the back face of the mating plate is flush with the end of the brace, as you can see in detail ‘b’ above. Cut a rabbet along each side of the plate to form a tongue that fits into the dados in the braces. The other detail that you need to add is a centered slot, as shown in detail ‘a.’ This accepts a studded knob and washer. The knob threads into the T-nut in the table back.

**NOW THE TABLE.** A common theme with this project is creating strength by doubling up the thickness of critical components. And the top of the horizontal table is no exception. But I did things a little differently here. The table is screwed to the braces, but I didn’t want the screws to show through the top face.

To do this, I cut the lower layer of the table to final size and shape, including the router bit notch, as shown in detail ‘d.’ Attach this layer to the braces with screws, as shown in the details ‘a’ and ‘e.’

You know the routine by now: Once the first layer is in place, the second layer can go on. Like before, start with a slightly oversized piece. Cut a notch for the bit and use that to align the second layer over the first while you glue the upper layer of plywood in place.

Trim the second layer of plywood flush, then add the plastic laminate just as you did on the tabletop. (You’ll have to remove the table from the tabletop to trim the edges flush.) Be sure to trim around the inside of the router bit notch, as well.

Complete the work on the top of the horizontal table by taking a trip over to the table saw. Here, you cut a groove to accept the same combination track that’s installed in the main tabletop. You can find the location for the groove in detail ‘e.’

There’s one final bit of hardware to add to the table before reattaching it to the router table. And that’s to attach a mending plate to the bottom face. This serves as the bearing surface for the hand wheel screw (main drawing and detail ‘c’).
A versatile MORTISING JIG

Routing mortises is an ideal operation for a horizontal router. In this configuration, you have much better visibility of the bit. What you need, though, is a way to secure and guide the workpiece while making the cut. The solution is the jig shown here.

The workpiece is clamped to the jig with stout toggle clamps. Runners in the base and top of the jig constrain the motion in and out and side to side. Stops installed in the table help make it easy to rout consistent mortises. And two large handles give you better control and keep your hands well clear of the bit.

THE BASE FIRST. The base is a piece of plywood. On the bottom face, a length of mini T-track serves as a runner, as shown in detail 'b.' What's important here is that it gets installed parallel to the edge of the base. This is what guides the jig side to side down the length of a mortise.

On the top face of the base are a pair of runners that I cut from a commercial miter bar, as you can see in detail 'c.' These mate with dadoes cut in the bottom face of the mortising jig top. The bars control the in and out motion of the jig when cutting a mortise to its final depth.

ADD THE TOP. In addition to the dadoes I just mentioned, the jig top has four sets of T-nuts installed in the bottom face. The T-nuts are anchor points for the toggle clamp assembly.

In detail 'b,' you can see the dimensions for the handles that are screwed to the jig top. You create the hand holds by drilling out the ends with a Forstner bit (box at left). After cutting away most of the waste with a jig saw, smooth and straighten the edges with files and a little hand sanding.

The toggle clamps are fixed to an adjustable plate. Depending on the size of your workpiece, you can locate the plate in one of four locations on the top using studded knobs and washers (detail 'c').

The last thing to do is make a pair of square stop blocks. These lock into the
T-track in the horizontal table with hex bolts, washers, and knobs, as shown in detail ‘a’ on the previous page.

**ROUTER TABLE FENCE**

The focus so far has been on making the horizontal routing configuration. But in order to use the standard setup, you’ll need a solid, sturdy fence.

The base is a length of hardwood with a centered notch to allow a router bit to be recessed inside. Near each end of the base is a slot that’s used to adjust the position of the fence in use. The fence is attached to the table with washers and studded knobs that thread into the T-nuts along the back of the tabletop, as shown in details ‘a’ and ‘c.’

The hardwood face has a groove cut in it to accept T-track. The final parts to make are the supports, as in detail ‘b.’ Once they’re cut to shape, the fence can be assembled with glue and screws. The key is keeping the fence face square to the base as the parts come together.

That wraps up the project, and the router table is ready for use. Be sure to locate the router table in a prominent place in your workshop. With all the practical features it has, it’s bound to see a lot of use for years to come.

---

**Materials & Supplies**

| A | Case Sides (2) | 3/4 MDF - 15 x 33 |
| B | Case Top/Bottom (2) | 3/4 MDF - 15 x 31 |
| C | Case Shelf (1) | 3/4 MDF - 14 1/2 x 31 |
| D | Case Back (1) | 3/4 MDF - 19 1/4 x 31 |
| E | Pedestal (1) | 1 1/2 MDF - 22 x 33 |
| F | Outer Dividers (2) | 3/4 MDF - 13 x 14 1/2 |
| G | Inner Dividers (2) | 3/4 MDF - 13 x 15 |
| H | Small Shelves (2) | 3/4 MDF - 6 1/4 x 14 1/2 |
| I | Upper Backs (2) | 3/4 MDF - 8 x 12 1/4 |
| J | Lower Doors (2) | 3/4 MDF - 15 1/8 x 19 1/2 |
| K | Upper Doors (2) | 3/4 MDF - 9 x 9 1/2 |
| L | Tabletop (1) | 2 1/4 ply - 24 x 34 |
| M | Quadrants (2) | 3/4 ply - 14 x 13 1/2 |
| N | Table Back (1) | 1 1/2 ply - 6 x 30 |
| O | Brackets (2) | 3/4 ply - 6 x 5 1/2 |
| P | Lift Block (1) | 3 ply - 2 1/4 x 6 |
| Q | Braces (4) | 3/4 ply - 6 x 7 1/2 |
| R | Plates (1) | 3/4 ply - 6 x 6 1/2 |
| S | Horizontal Tables (2) | 3/4 ply - 12 x 30 |
| T | Mortise Jig Base (1) | 3/4 ply - 11 1/2 x 30 |
| U | Mortise Jig Top (1) | 3/4 ply - 10 x 20 |

---

**ALSO NEEDED:**

- Two 24" x 97" sheets of 3/4" MDF
- Two 60" x 60" sheets of 3/4" Baltic birch plywood
- 2.5 bd. ft. of 3/4"-thick hard maple (Parts Y, Z, and AA)
Insert Plate Opening

Creating an opening for a router insert plate is usually a pretty straightforward task. However, the opening for this insert plate requires threaded inserts to secure the insert while the table is flipped upright for horizontal routing. The solution for making it comes in the form of using two templates and three router bits.

The opening in one of the templates is sized to match the insert plate. The other template is sized for the smaller opening. The dimensions for the openings are found on page 5. I used the template with the smaller through opening to trace the opening on the tabletop and cut out most of the waste with a jigsaw.

**Small Opening.** Turning the rough cutout into a smooth, even opening starts with using a pattern bit to trim the edge of the opening flush with the template (Fig. 1). My pattern bit wasn’t long enough to trim all three layers of the tabletop. To complete the job, I flipped the tabletop upside-down and used a flush-trim bit. The bearing on this bit follows along the smooth edge that was just created, as in Figure 2.

**Insert Plate Opening.** Now you’re ready to make the larger recess to house the insert plate. Remove the first template and install the second template centered over the opening. Since this recess is shallow, you need to use a dado cleanout bit, which has a short cutting length so the bearing can follow the template.

The router bit depth should match the thickness of the router insert plate, as shown in Figure 3. In the corners, you need to make a few back-and-forth passes to clear out the remaining waste.

---

*Shop Notes*

**Insert Plate Opening.**}

---

**INSERT PLATE OPENING.** Now you’re ready to make the larger recess to house the insert plate. Remove the first template and install the second template centered over the opening. Since this recess is shallow, you need to use a dado cleanout bit, which has a short cutting length so the bearing can follow the template.

The router bit depth should match the thickness of the router insert plate, as shown in Figure 3. In the corners, you need to make a few back-and-forth passes to clear out the remaining waste.
The case of the router table was painted with Benjamin Moore's Calm Cream (Eggshell Finish).

Manufacturers and retailers will periodically redesign or discontinue some of their items. So you’ll want to gather all the hardware, supplies, and tools you need before you get started. It’s easy to adjust dimensions or drill different-sized holes to suit your hardware.