

Shopmade Slot Mortiser



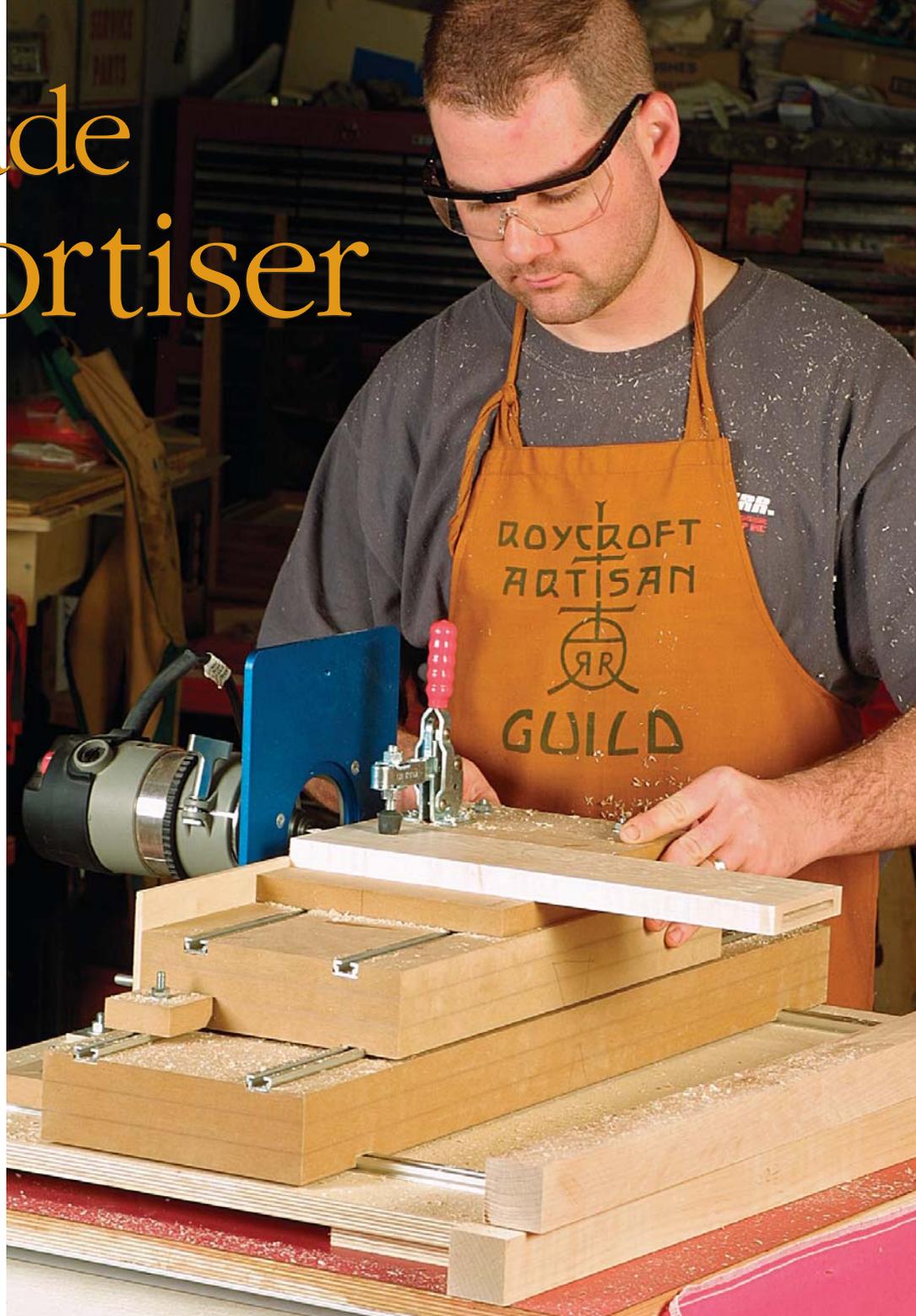
Use your router to cut mortises with speed and accuracy

BY GREGORY PAOLINI

As a member of a professional guild, I make a lot of Arts and Crafts style furniture, and I cut countless mortise-and-tenon joints. I used to cut the joints with a combination of hand and power tools, but I quickly realized that I had to find a more efficient way if I was going to keep the price of my furniture out of the stratosphere. I tried many different methods, but when I saw furniture maker and teacher Gary Rogowski using a slot mortiser, I was sold on the idea.

A slot mortiser basically is a table with a horizontally mounted router equipped with a spiral bit. The mortise is cut by plunging the workpiece into the bit while moving the workpiece from side to side to bore its width. Slot mortisers are the choice of production shops because they are very fast, accurate, and work well with integral or loose tenons.

I went shopping for a slot mortiser and found some machines that could do every-



thing I needed—except fit into my budget. Prices for joint-making machines and commercial slot mortisers ranged from about \$450 to \$2,600, and in some cases I still had to supply my own router. Talk about sticker shock. I figured, for that much money, why not try to make my own.

Like the commercial machines, mine had to be reliable and accurate. It needed to incorporate a horizontally mounted router, a table that could move on both X and Y

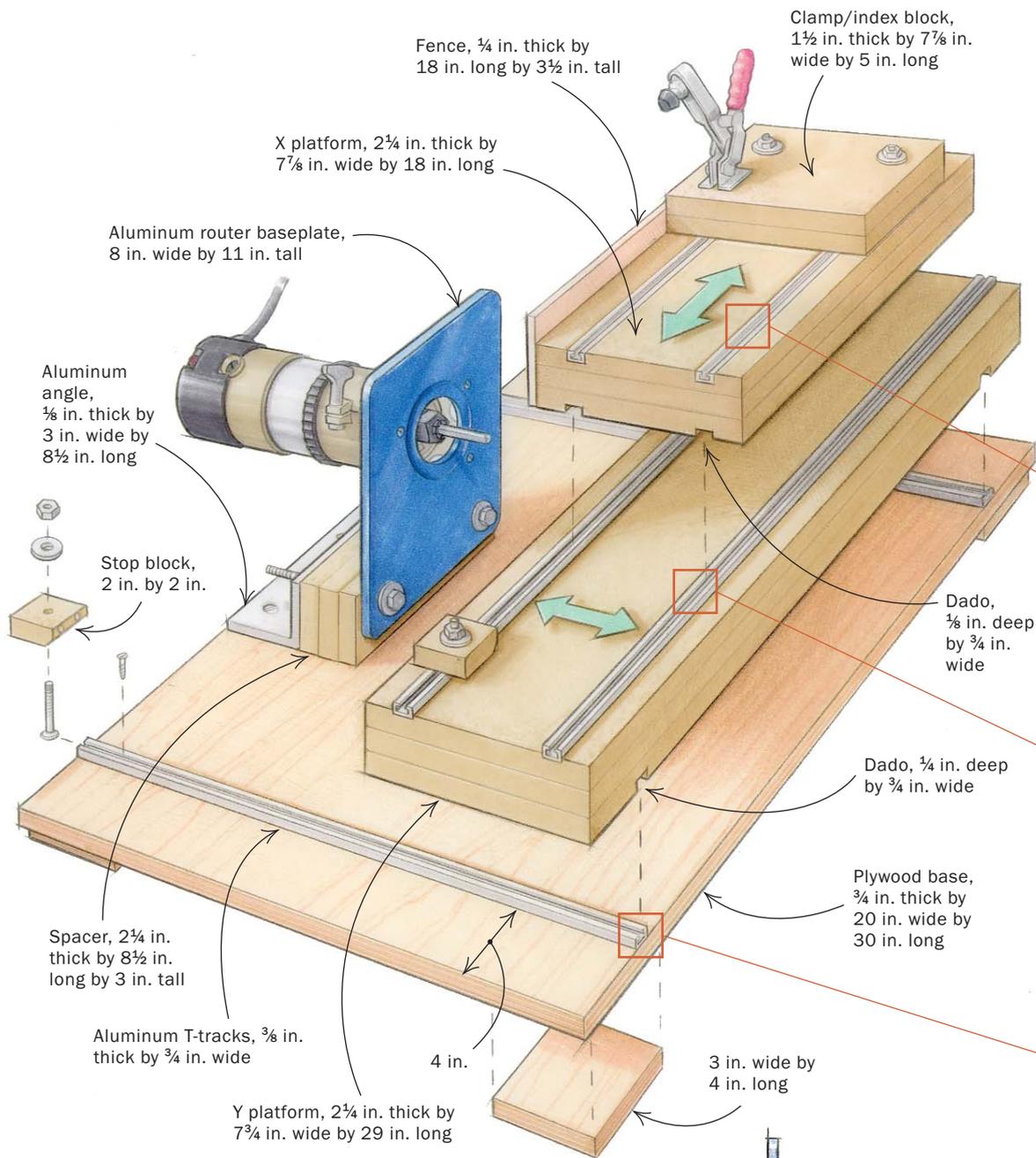
axes, stops to control mortise width and depth, and a system to index and secure my work.

Build heavy sliding tables from MDF

Building the movable table was the tricky part. I needed a system that would provide movement independently along two axes. I achieved the X-Y movement I was after by making two platforms, each of which moves along a different axis, with alu-

Simple-to-make mortiser

Don't let the simple design fool you. This shopmade device, constructed primarily of MDF, makes it easy to cut countless mortises quickly and accurately.

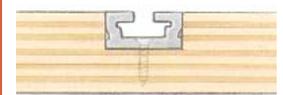


T-TRACKS ARE THE KEY TO SMOOTH OPERATION

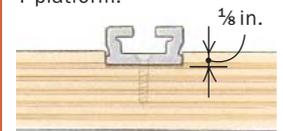


The movable platforms don't make contact with one another; instead, they slide solely on the aluminum T-tracks. The tracks also secure the clamping blocks. Wax the tracks regularly to ensure smooth movement.

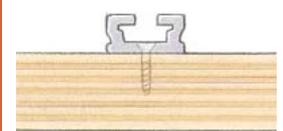
T-tracks that secure the clamping blocks are fully recessed into the X platform.



T-tracks that support the X platform are partially recessed into the Y platform.

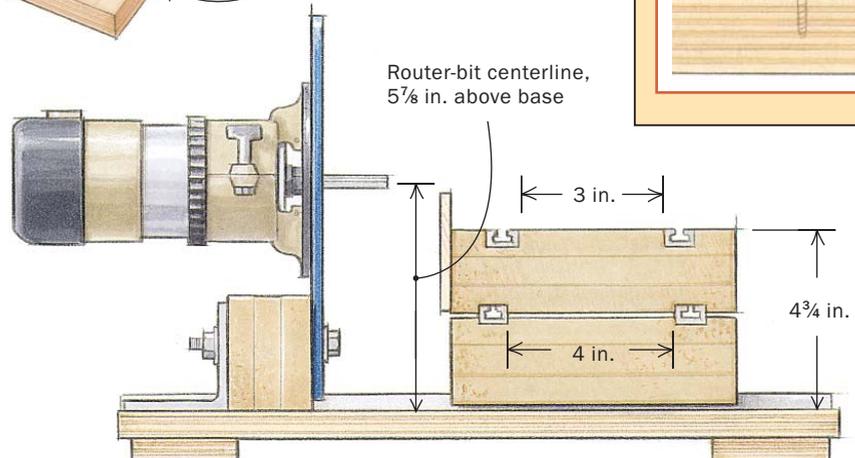


T-tracks that support the Y platform are surface-mounted to the plywood base.



minum T-tracks riding in dadoes. The table also had to be stable and strong, as well as a little weighty, to resist jumping or jerking when cutting. Three stacked layers of $\frac{3}{4}$ -in.-thick medium-density fiberboard (MDF) provided both the weight and the stability I needed.

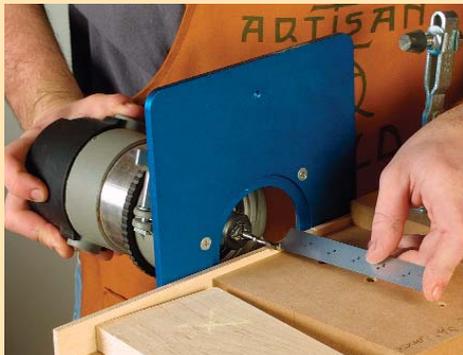
T-tracks make great runners for jigs. They fit into a dado that is $\frac{3}{4}$ in. wide. They don't swell and shrink like hardwood runners. And you can bolt things onto them—in this



Cutting mortises for a leg-to-apron joint

The slot mortiser works well for cutting mortises into two mating pieces to be joined with a loose tenon. And the mortiser can be adjusted quickly to cut a multitude of mortises.

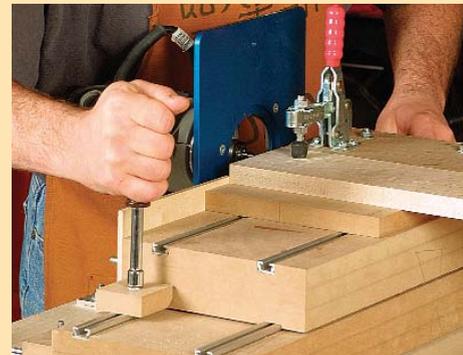
SET UP THE APRON MORTISE FIRST



Adjust mortise depth on the router. The distance from the fence to the end of the router bit determines the depth of the mortise.



Clamp the apron to the sliding platforms. Set the mortise height with a spacer. Then butt the workpiece against the fence and index block, and clamp it in place.

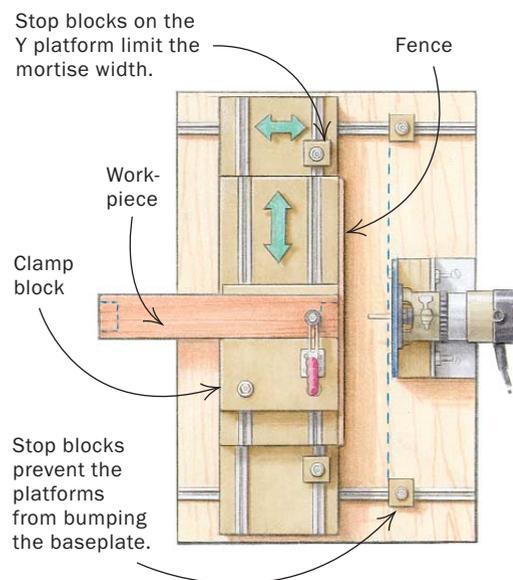


Adjust the stop blocks to the correct mortise width. Align the router bit with one end of the mortise, butt the stop block against the sliding platform, and secure it in place.



MORTISE THE APRONS

Apply light pressure against the bit and move the workpiece side to side, cutting deeper with each pass.



case, I bolted a couple of MDF blocks that act as stops to limit platform travel in each direction. Additionally, the T-track I used can accept standard 1/4-in. by 20-tpi bolts, which keeps hardware and fastener costs to a minimum. Some brands of T-tracks require you to buy specialty hardware.

Keep T-tracks aligned

It is important that the upper (X) and lower (Y) sliding platforms move perpendicular

and parallel, respectively, to the cutting bit. To ensure this, I cut all of the matching T-track dadoes at the same time with the tablesaw. For instance, two 1/8-in.-deep dadoes in the underside of the X platform along its length were cut at the same time as the matching dadoes in the top side of the Y platform below. As a result, T-tracks mounted in the dadoes on the Y platform are aligned perfectly with the dadoes above.

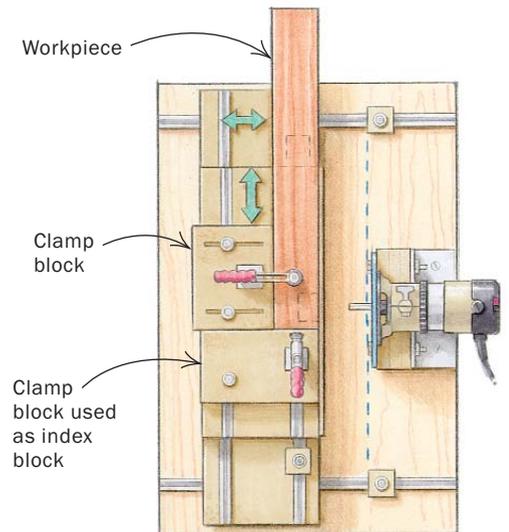
The T-tracks on the base of the slot mortiser are screwed to the surface, so no dadoes are required. However, those T-tracks fit into dadoes cut in the underside of the Y platform along its width. Once the T-tracks are installed, applying a little furniture wax cuts down on wear to the MDF platforms and helps the mortiser work smoothly.

To finish the X platform, I cut a series of dadoes in the top surface for two more T-tracks, on which I can mount index



MORTISE THE LEGS

The clamp block is used as an index block to register the end of the leg. A second clamp block is added to secure the leg.



for the height of a mortise. Instead, I raise or lower the workpiece with spacers of various thicknesses. For example, to cut a $\frac{1}{4}$ -in. mortise in the center of a $\frac{3}{4}$ -in.-thick workpiece, I use a $\frac{3}{4}$ -in. spacer.

It takes some fooling around to determine spacer thickness, but once you have made a few spacers for various projects, label and save them for future use. I also have angled spacers that allow me to cut angled mortises, expanding the versatility of the tool. You can fine-tune the height with plastic laminate or cardstock shims.

Using the slot mortiser

Lay out the first mortise in a series with a marking gauge, and then set up the slot mortiser. Verify that the mortise height is correct and that the stop blocks are set accurately (see the photos on the facing page).

Once you've cut the first mortise, you can use most of the settings to cut the mating mortise. The only adjustment you might have to make is to the height, which involves swapping or removing the spacer. Finally, the two pieces can be joined with a loose tenon, cut from the same material and planed to fit the mortises. □

Gregory Paolini makes Arts and Crafts style furniture at his home in Depew, N.Y.

blocks that act as a fence to butt a workpiece against.

Mount the router on a baseplate

Keeping the router from deflecting while in use is critical, and I didn't think that a plastic router base was up to the task. Instead, I attached the router to a standard aluminum router baseplate and made a spacer from MDF and a piece of $\frac{1}{8}$ -in.-thick by 3-in. by 3-in. aluminum angle to secure the baseplate to the table base. When securing the router plate to the aluminum angle, make sure the router-bit centerline is $5\frac{7}{8}$ in. above the base. This is an ideal height for cutting mortises into most furniture parts.

Also, it's important to reference the

router baseplate against the X and Y plat-forms with a square while securing it to the base. This will ensure that the mortises are cut at a perfect 90° .

Use spacers to adjust the height of a mortise—Unlike commercial machines, the bit on this slot mortiser can't be adjusted

SOURCES OF SUPPLY

T-TRACKS

Brunner Enterprises
877-299-2622; www.brunnerent.com

ROUTER BASEPLATE

Rockler
800-279-4441; www.rockler.com