

TAPER JIG





multipurpose Taper Jig

In a few hours, you can build an adjustable jig for cutting a wide range of angles and tapers at the table saw.

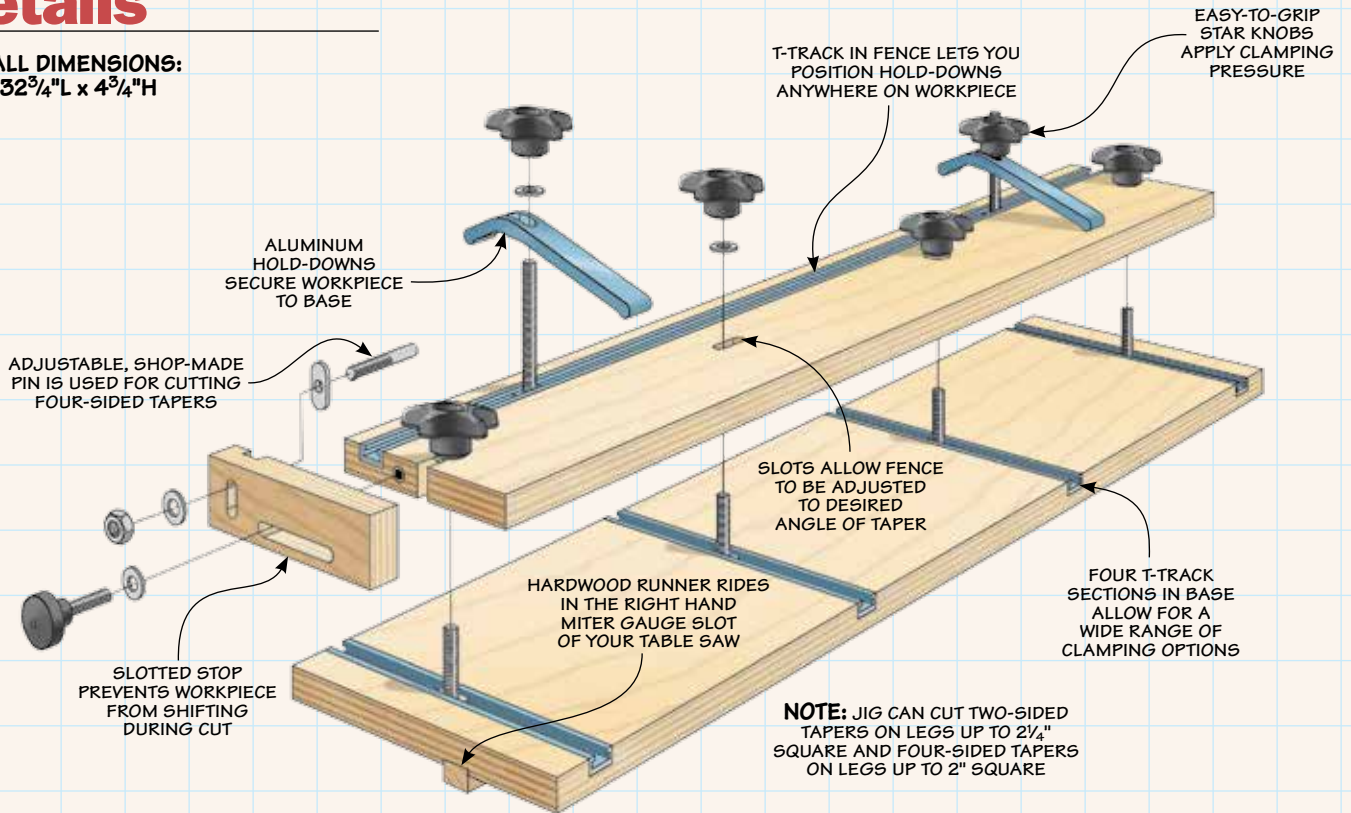
Cutting tapers at the table saw usually involves making a quick jig. When the project is complete, the jig gets tossed. Instead of building a jig for each project, I wanted a permanent and flexible solution. In a nutshell, what sets the taper jig shown above apart from a single-purpose jig is its flexibility. By adding some simple hardware, the jig can be adjusted to cut two- and four-sided tapers in almost any size leg.

A side benefit to the adjustable features of the jig is that it allows you to tackle other tough cuts. The photos on page 2 show how to make any kind of angled cut or create a straight edge on rough lumber.

There's another option, too. You can buy a taper jig. After designing this jig, I came across a jig from *Rockler* that shares some of the same features. Just take a look at page 6 to find out more.

Exploded View Details

OVERALL DIMENSIONS:
8"W x 32³/₄"L x 4³/₄"H



▲ **Accurate Angles.** Remove the fence and use the hold-downs to make steeper angle cuts.



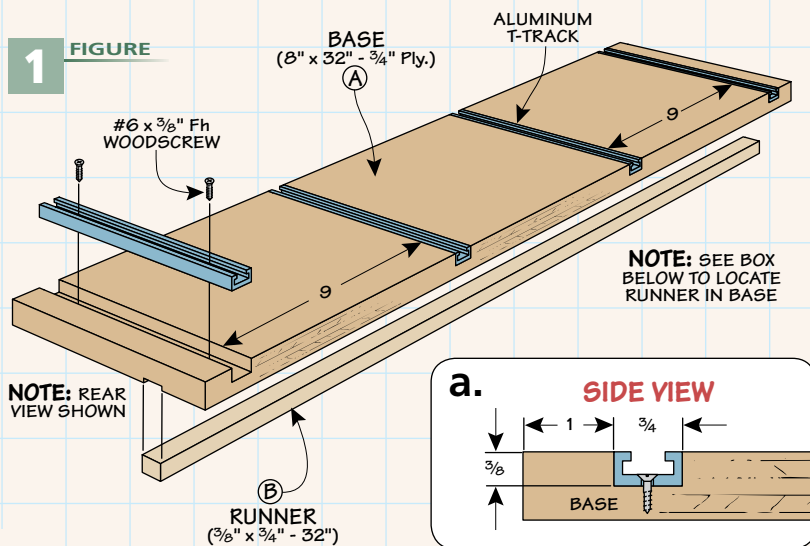
▲ **Get a Straight Edge.** You can secure rough-edged lumber to the base and rip a straight edge safely and easily.

easy-to-build Base & Fence

You'll work from the bottom up to build this jig. The base of the jig begins as a wide piece of Baltic birch plywood. I used $\frac{3}{4}$ " plywood here to resist warping when a workpiece is clamped in place. Plus, it provides enough thickness to secure the aluminum T-track used to adjust the fence and accept the hold-downs.

Cut Dadoes. The T-track fits into a series of dadoes cut across the base, as you can see in Figure 1. This provides a wide range of adjustability for the fence and hold-downs. There are two things to consider when making these cuts at the table saw.

The first is the width of the dado blade. Size the blade so it matches the width of T-track you're using. The other key is cutting the dadoes to the right depth. It should equal the thickness of the T-track (or a little deeper), as shown in Figure 1a.



You don't want the T-track proud of the surface where it could possibly mar the workpiece.

To make these cuts, I guided the base with the miter gauge. And I used the rip fence as an end stop. The dadoes can be cut in pairs. Just flip the base end-for-end and make another cut. Adjust the rip fence for the second set of dadoes and then repeat the process.

Runner Groove. There's one last cut to make on the base. And that's

a groove that runs the length of the base to hold a solid-wood runner. The location of this groove will vary depending on your table saw. You can see how to locate it in the box at the bottom of the page. For the runner, I used a piece of hard maple. It's smooth and durable enough to stand up to a lot of use.

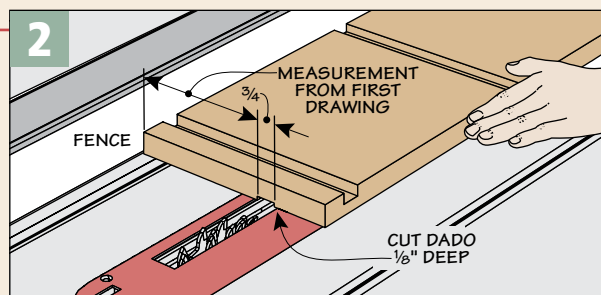
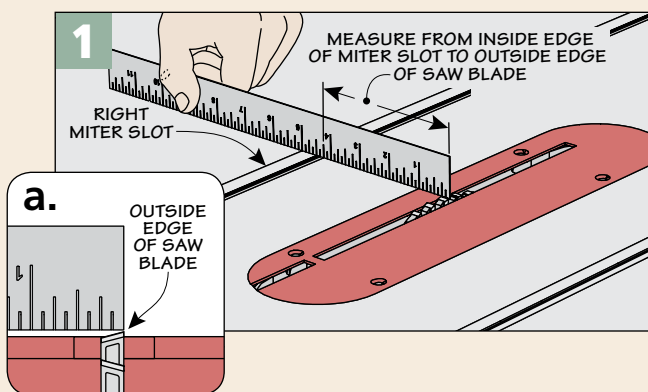
Install the T-Track. At this point, you can fill each dado with a length of T-track. In order to prevent the track from pulling out when

Locating the Runner

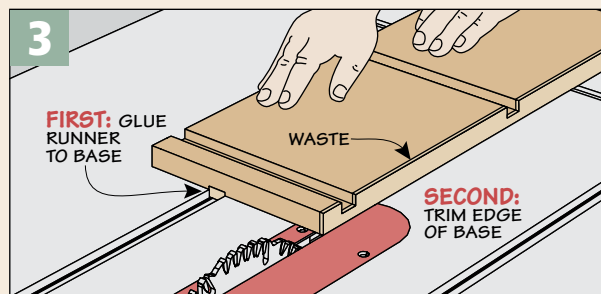
One of the key features of this jig is that the left edge of the base serves as a reference line for positioning a workpiece so you know exactly where the saw will cut. To make this work, the jig needs to be custom-fit to your table saw.

The best way to accomplish this is to locate the runner so that you can trim the base for a perfect match. Start by cutting a runner

that slides smoothly in the miter gauge slot. Figure 1 shows how to determine the location of the groove. The next step is to cut the shallow groove with a dado blade set to match the width of the runner, as in Figure 2. Then you can glue the runner into the groove. The final step is to trim the base with the same blade that you'll use to cut tapers (Figure 3).



▲ **The Groove.** Mark the measurement from Figure 1 on the base and cut a shallow groove. Match the dado blade to the width of the miter slot.



▲ **Runner & Trim.** After gluing the runner in place, trim the edge of the base. This creates the reference edge for aligning a workpiece to cut a taper.

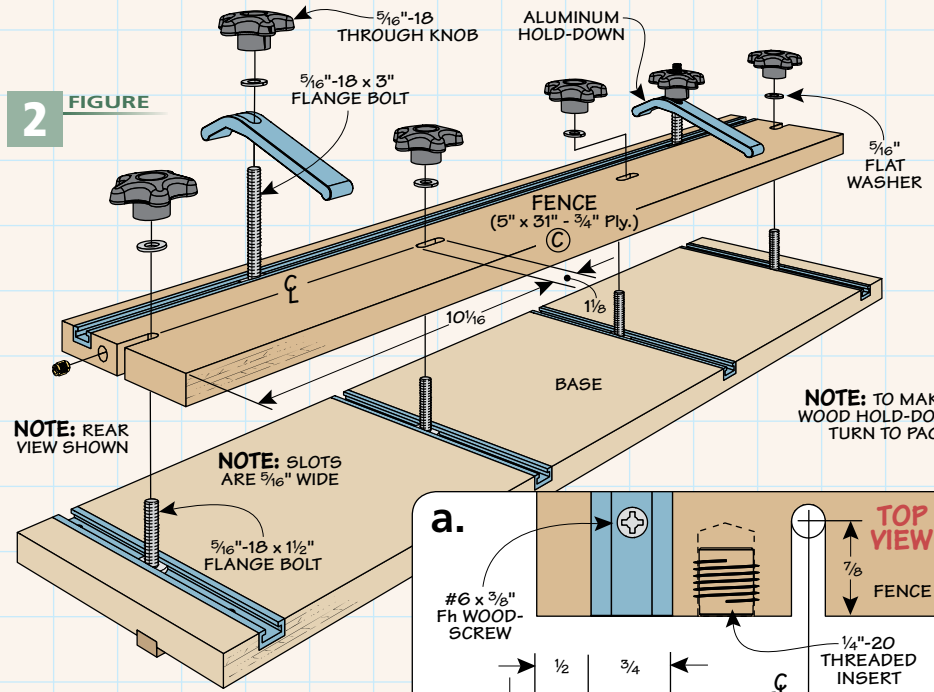
◀ **Measure.** The distance from the miter slot to the outside of the blade determines the location of the runner groove.

the fence (or a hold-down) is locked down, I like to have at least two screws securing each piece. So you may need to drill and countersink an extra hole in each section of track.

Adjustable Fence. Resting on top of the base is a long plywood fence. It serves two purposes. First, it holds the workpiece at the correct angle to cut a taper. The other purpose is to act as an anchoring point for a pair of hold-downs, as you can see in Figure 2.

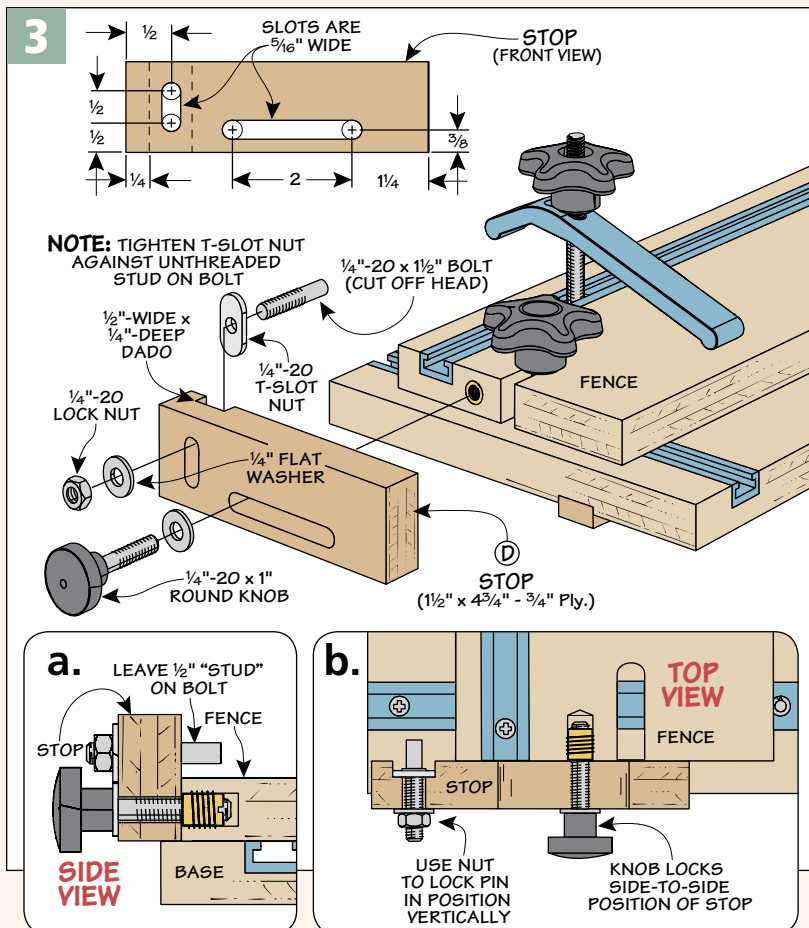
To accommodate the hold-downs, I started by cutting a groove down the top of the fence. Like the dados in the base, this groove accepts a length of T-track (Figure 2a). This way, the hold-downs can be placed anywhere along the fence. You can buy aluminum hold-downs or you can make hardwood versions. For more on how to do this, go to page 7.

Flange bolts, washers, and large knobs secure the fence to the base. And to allow maximum adjustability, you need to cut four slots in the fence to match up with the T-track



in the base, as in Figure 2. One other detail I want to point out is a hole and a threaded insert on the back end of the fence, as in Figures 2 and 2a. The insert is used to attach a stop to the fence.

The stop is a narrow strip of plywood that supports the back end of



the workpiece, as shown in Figure 3. A slot along the lower edge allows you to adjust the stop side-to-side, as in Figures 3 and 3b.

I also cut a dado on the inside face and a vertical slot to accept a shop-made pin. When cutting four-sided tapers, the pin supports the end of the leg (Figure 3a).

The jig is now ready to use. However, to prevent a waste piece from getting trapped in the blade insert, it's a good idea to use a zero-clearance insert when using the jig. (Page 7 shows how to make one.) And finally, page 5 gives you step-by-step instructions on cutting two- and four-sided tapers.

Materials & Hardware

- | | | |
|---|------------|--------------------------|
| A | Base (1) | 8 x 32 - 3/4 Ply. |
| B | Runner (1) | 3/8 x 3/4 - 32 |
| C | Fence (1) | 5 x 31 - 3/4 Ply. |
| D | Stop (1) | 1 1/2 x 4 3/4 - 3/4 Ply. |
- (1) 48" T-Track
 - (1) 24" T-Track
 - (16) #6 x 3/8" Fh Woodscrews
 - (4) 5/16"-18 x 1/2" Flange Bolts
 - (2) 5/16"-18 x 3" Flange Bolts
 - (6) 5/16"-18 Through Knobs
 - (6) 5/16" Flat Washers
 - (2) Aluminum Hold-Downs
 - (1) 1/4"-20 Threaded Insert
 - (1) 1/4"-20 x 1 1/2" Hex Bolt
 - (1) 1/4"-20 Lock Nut
 - (1) 1/4"-20 T-Slot Nut
 - (1) 1/4"-20 x 1" Round Knob
 - (2) 1/4" Flat Washers

Simple Steps for Cutting Two-Sided Tapers

One of the biggest advantages of this taper jig is how easy it is to set up and use. All you need to do is line up the starting and ending points of the taper, secure the workpiece, and make the cut.

Since the jig is custom-fit to your saw, the left edge of the base shows you exactly where the saw will cut. This allows you to use it as a reference line for positioning a workpiece. The photos on this page show how this process works for cutting a two-sided taper.

Layout. The first step is to draw layout lines for the beginning of the taper cut on the corresponding faces of each leg. Then, mark the end of the taper on the bottom, as shown in Photo 1. It's a good idea to double-check your layout to make sure you're cutting the tapers on the correct faces.

Fence & Stop. Photos 1 and 2 show how the sliding fence is used to position the leg so the layout lines align with the edge of the jig's base. (The bottom of the leg is placed at the trailing end of the jig.) Then set the stop, as in Photo 3.

Clamp & Cut. All that's left to do is to lock the workpiece to the base with the hold-downs (Photo 4). And with the jig set up, making the second taper cut is simply a matter of rotating the leg and making a second pass.



Lay Out & Set Fence. Start by drawing layout lines on the two faces and the end of each workpiece. Next, align a layout line on the bottom of the leg with the edge of the taper jig. Then slide the fence in place.



Top of Leg. Positioning the upper part of the leg works about the same. Use your fingers to feel that the leg is flush with the edge of the jig at the layout line.



Set the Stop. The stop on the back of the fence keeps the workpiece from shifting along the fence during a cut. Make sure the leg is tight against the stop.



Hold-downs. Lock a hold-down near each end of the leg to secure it to the base.



Making Cuts. The hold-downs keep your hands safely away from the blade. After completing the first cut, unclamp and turn the workpiece. Then lock it down for the second cut.

Cutting Four-Sided Tapers

There's one main challenge that everyone faces when cutting a taper on all four sides of a leg. And that's keeping the piece in the proper position for the final two cuts. The reason is that the first two passes remove the support surfaces needed for the remaining cuts. But the jig here makes creating a four-sided taper just as straightforward as a two-sided taper.

Once again, it starts with the layout. You can see the layout for the bottom of the leg in Photo 1. The hole drilled in the leg is the key to making these cuts hassle free.

The hole fits over an adjustable pin in the stop (Photo 2). You can then use the pin and fence to position the leg for the cuts, as shown in Photo 3. The pin holds the bottom end of the leg in the right position both side-to-side and vertically for all four passes. All it takes to secure the top end of the leg is a single hold-down.



1

Lay Out & Drill. Mark the beginning of the taper on the faces of the leg. At the bottom, draw the final taper size and drill a 1/4"-dia. centered hole.



2

Slip Leg On Pin. Loosen both the stop and the pin (inset). Adjust the stop and pin so that the leg fits over the pin. With the leg resting on the jig base, lock the pin in position.



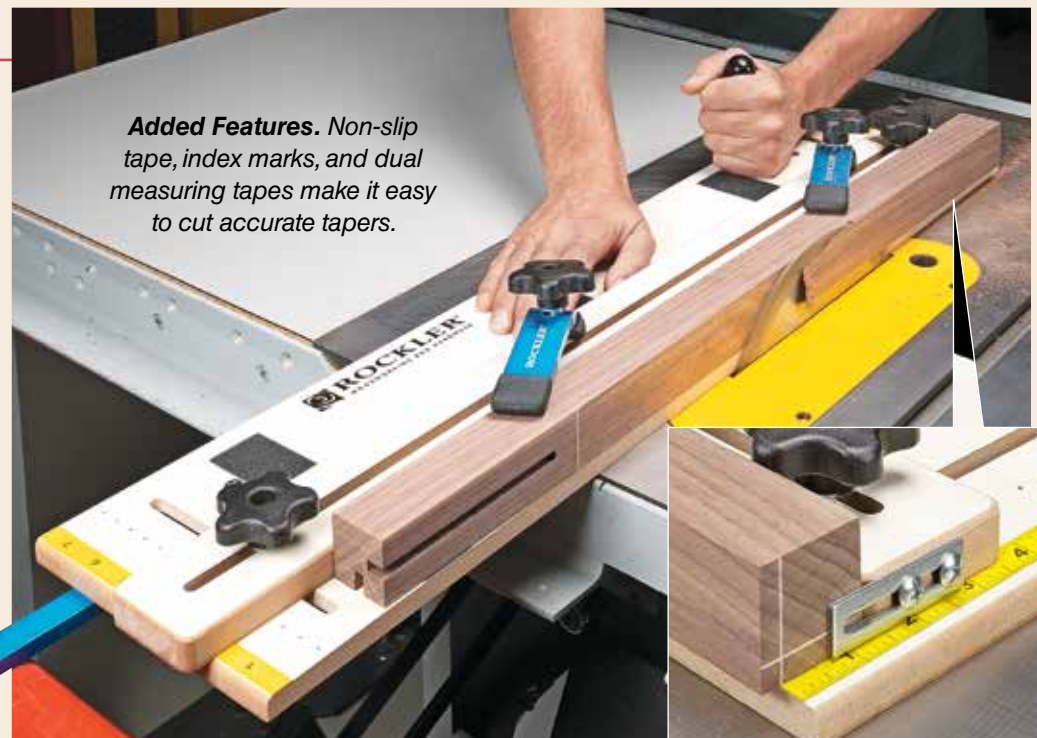
3

Position Workpiece. Slide the leg against the fence and locate the fence so the layout line on the leg is aligned with the edge of the jig. Finally, lock the stop and fence in place.

Rockler Jig

Our versatile, shop-built jig works like a charm but there's a jig made by Rockler that's a good option. The *Taper/Straight Line Jig* handles two-sided tapers, angled cuts, and straightening rough lumber. Refer to sources on page 7 to find out how to purchase this jig.

The jig is made from melamine-covered 1/2" MDF and features an adjustable fence with aluminum hold-downs. The extra-long miter bar can be fine-tuned for a perfect fit in the miter slot of your table saw. A steel stop captures the end of the workpiece (inset photo) and a large handle provides firm control when making cuts.



Added Features. Non-slip tape, index marks, and dual measuring tapes make it easy to cut accurate tapers.

Shop Short Cuts

Shop-Made Hold-Down

The commercial hold-downs used on the taper jig are a great way to keep your work firmly in place. But there is a way to make your own quickly and easily.

Follow the Grain. To make this hold-down, you'll want to use hardwood. Any type will do. What's more important is that you're careful to align the grain with the length of the clamp. This way, you don't have to worry about the clamp cracking when you apply pressure with the knob.

Use the Pattern. To make the hold-down, transfer the pattern

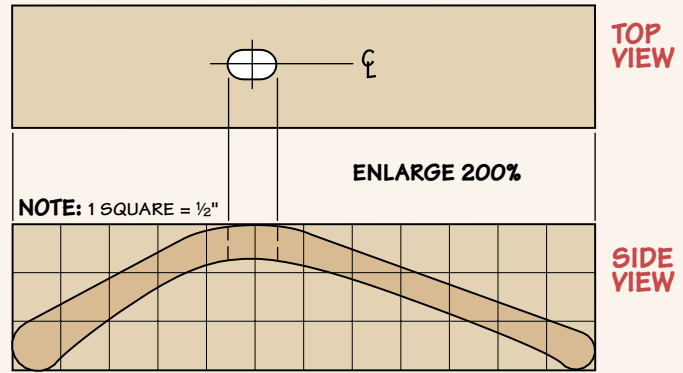
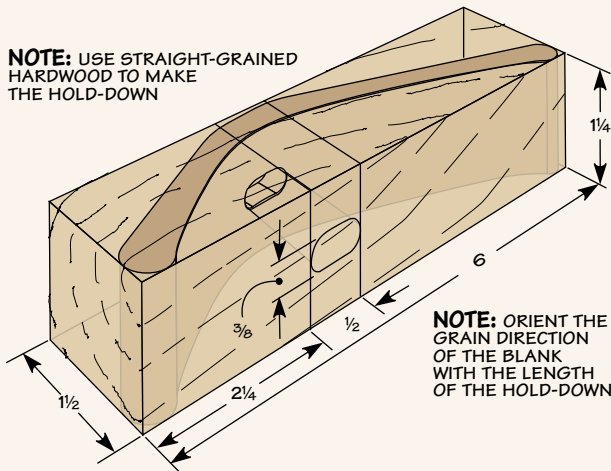
from the drawing below to the face of your blank. You can either enlarge the pattern 200% on a photocopier or lay out the pattern by hand using the grid marks.

Make the Slot. It's a good idea to drill the holes for the slot before shaping the hold-down. The slot provides clearance for a flange bolt. To make the slot, I drilled a pair of holes on the drill press and then cleaned up the edges of the slot with a chisel and small file.

Shaping. All that's left to do is cut out the hold-down on the band saw and sand it smooth.



▲ **A Firm Grip.** In just a few minutes, you can make a hardwood hold-down. It locks a workpiece in place with the simple turn of a knob.



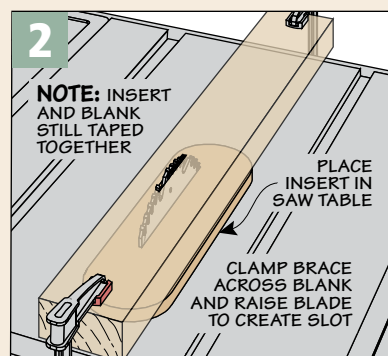
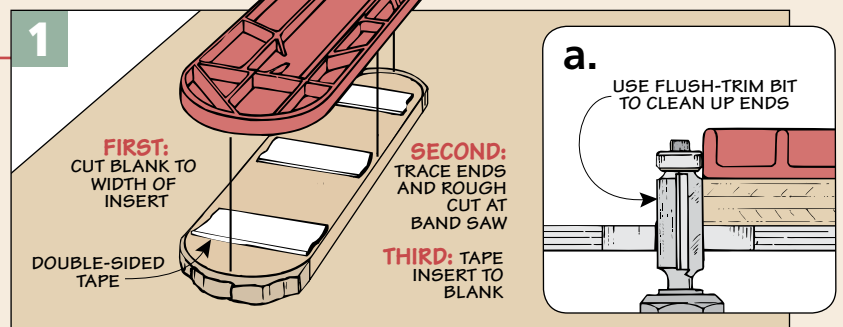
Zero-Clearance Insert

I normally use a zero-clearance insert in my table saw to prevent tearout. But with the taper jig project, there's another reason to use one — safety.

Even though the workpiece isn't in direct contact with the saw table, cutting a taper can create a thin, wedge-shaped waste piece. The zero-clearance insert prevents the waste piece from becoming trapped between the blade and insert.

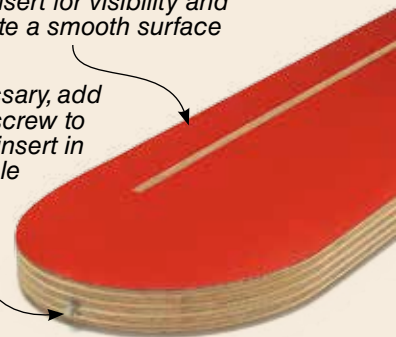
Start with a Blank. The nice thing is you can make an insert in less than an hour. The process starts with a blank that matches the thickness of your stock insert. Plywood and MDF are good choices for a flat, stable insert. Cut the blank to the same width as the factory insert, as shown in Figure 1.

Shaping. The next step is to use the existing insert as a template to rough cut the blank to shape (Figure 1). Then tape the insert to the blank to trim it to size at the router table (Figure 1a). At this point, you're ready to cut the slot in the insert, as in Figure 2. Finally, drill a finger hole in the insert to make it easy to remove.



Paint insert for visibility and to create a smooth surface

If necessary, add cut-off screw to secure insert in saw table



**MAIL
ORDER
SOURCES**

Woodsmith Store
800-444-7527

Rockler
800-279-4441
rockler.com

Lee Valley
800-871-8158
leevalley.com

Project Sources

The multipurpose taper jig doesn't require a lot of complicated hardware. You'll need both 2' T-track (22104) and 4' T-track (20054). You can also purchase a 48" hold-down kit (25736) that contains 4' of T-track and two hold-down clamps. Other hardware for this project includes flange bolts (36677), $\frac{5}{16}$ " insert knobs (23812), and round knobs (34238). All of these items can be purchased from *Rockler*. *Rockler's Taper/Straight Line Jig* (21597) also can be found on their website.

The T-slot nuts (05J21.15) are available from *Lee Valley*.