Woodsmith PLANS

STACKING SAWHORSES

FEATURE PROJECT

STACKING SAWHORSES

A simple system of interlocking tabs and notches makes this set of stacking sawhorses as sturdy as they are versatile.

Aren't they a little short? That was the question I heard most often as I was building this set of sawhorses. Actually, there are two answers to that question — yes and no. Let me explain.

First of all, the sawhorses are short. Each one stands in at only 17" tall. (Which is why one of the guys suggested we call them saw ponies instead.)

But it only takes a second to make the sawhorses "taller." You simply stack one sawhorse on top of another. This raises the top sawhorse to a height of 30."

That provides a comfortable working height for most jobs, as you can see in the photo above. But if you need a worksurface that's not as tall (when assembling a large project, for instance), it's just a matter of unstacking the sawhorses, refer to the photo on page 5.

STORAGE. Once the job is completed, storage isn't a problem either. You can tuck a whole stack of sawhorses in a corner (lower photo on page 2).

TAB & NOTCH. But as much as I appreciate the convenience of these sawhorses, the thing that impresses me even more is how sturdy they are — even when they're stacked together. The secret is a system of interlocking tabs and notches that prevents them from moving from side to side or from end to end (inset photo).

PLYWOOD. One more great thing about these sawhorses is that you can make a set of four from a single sheet of plywood. (I used fir plywood with an 'AC' grade, see page 3.)

Template

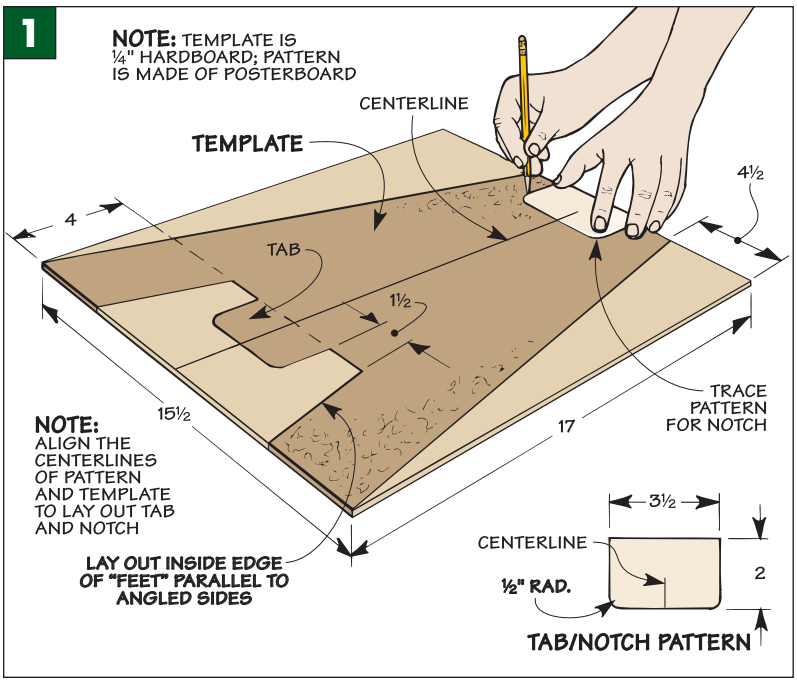
The key to these stacking sawhorses is the 'M-shaped' pieces on the ends. Altogether, there are eight of these pieces. And the tab on one piece needs to fit the notch in another like the pieces of a jigsaw puzzle.

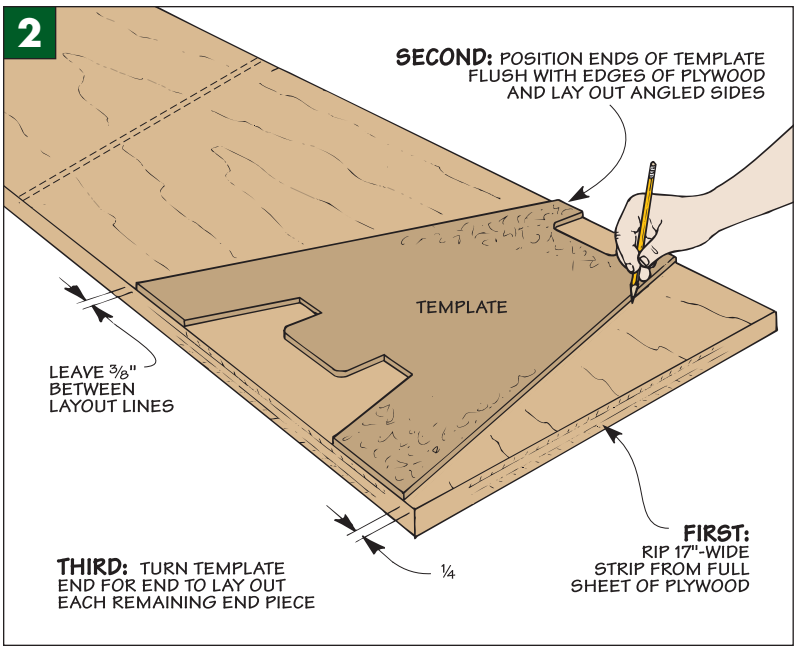
To produce a good fit, I began by making a template (photo at right). This ensures that all eight pieces are identical. And it speeds up the process of making the end pieces.

LAY OUT THE TEMPLATE. The template starts out as a piece of ¼" hardboard that's cut to the same width (15½") and height (17") as the end pieces, as you can see in Figure 1.

To provide a firm footing, the end pieces taper gradually from a wide base to a narrow top. So in order to duplicate this taper, you'll need to lay out an angled line on each side of the template.

The next step is to mark the location of the tab and notch. The important thing is that each one is the exact same size and shape.





A hardboard template provides a quick way to make identical end pieces.

PATTERN. An easy way to accomplish this is to make a pattern from a piece of posterboard and use it to lay out both the tab and the notch (Figure 1). To accurately position the pattern on the template, draw a centerline on each one and align the marks.

FEET. Now all that's left is to lay out the two "feet" at the bottom of the template. The lines that form the inside edge of these feet are parallel to the angled sides. But before drawing these lines, you'll need to establish the outside corner of the "ear" on each side of the tab.

CUT TO SHAPE. At this point, it's just a matter of cutting the template to shape. The goal is to make the edges of the template as smooth as possible. That's because they'll be used to guide a flush-trim bit when the end pieces are routed to shape.

To cut the straight, angled sides of the template, I used a simple jig on the table saw, refer to page 5. It allowed me to cut right up to the layout line. But you'll need to cut the tab and notch with a band saw (or jig saw). Just be sure to stay about ⅛" to the waste side of the line and then sand up to the mark.

LAY OUT END PIECES. Once the template is complete, you can use it to lay out the end pieces. It's possible to get all eight pieces from a 17"-wide strip cut from a full sheet of plywood. But there's not a lot of "extra" material.

So I started by positioning the template ¼" in from the end to lay out the first piece (Figure 2). To lay out each remaining piece, simply turn the template end for end. Note: It's a good idea to leave a ⅜" space between layout lines. This way, you can use a jig saw to separate them without cutting into either piece.

When it's time to "stable" your sawhorses, they don't take up much floor space. Just stack all four together for storage.

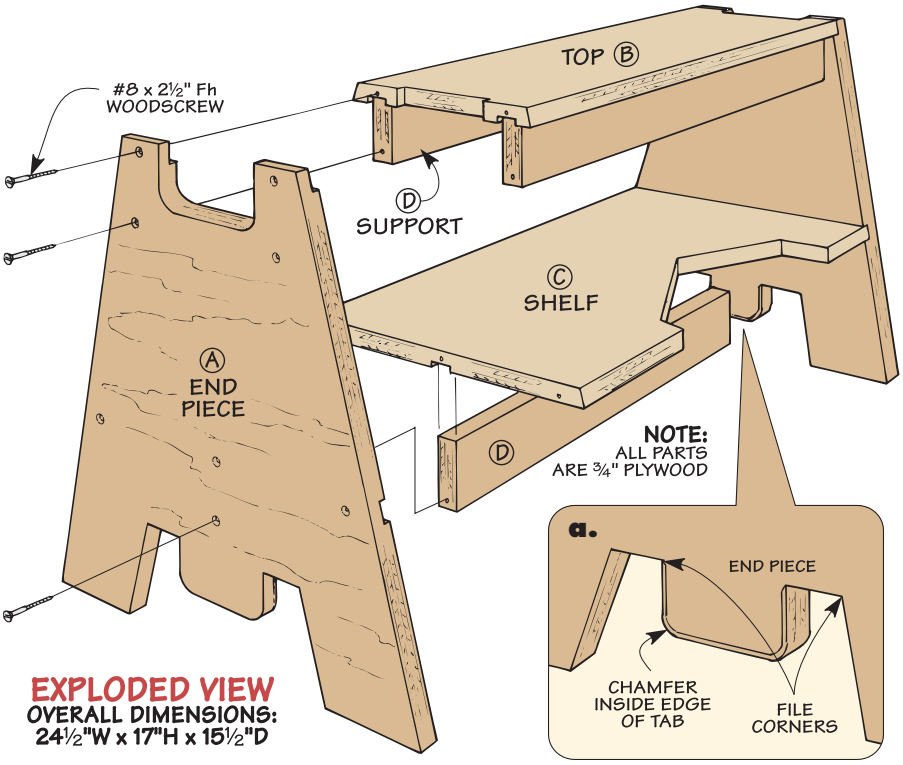
Construction

At this point, the basic groundwork for the set of sawhorses is complete. Now it's just a matter of cutting the end pieces to final shape and connecting them with the top, shelf, and supports (Exploded View).

REMOVE WASTE. First, remove the bulk of the waste from the area inside the notch and around the tab. There's no need to lay out these areas. Just use double-sided tape to attach the template to each end piece, and use a band saw (or jig saw) to rough out the basic shape, as in Figure 3.

As you do this, make sure you don't accidentally cut into the edge of the template. I make it a point to keep the saw at least ⅛" away from the edge. This leaves a small amount of material that can be removed quickly and easily.

ROUT TO SHAPE. Now you can rout the end piece to final shape with a flush-trim bit mounted in the router table (Figure 4). The idea here is to adjust the height of the bit so the bearing rides against the edge of the template. This way, the cutting edge of the bit trims the end piece perfectly flush with the template.



The router bit will leave the inside corners of the end piece slightly rounded. That's okay for the notch. But the "ears" around the tab will need some additional work.

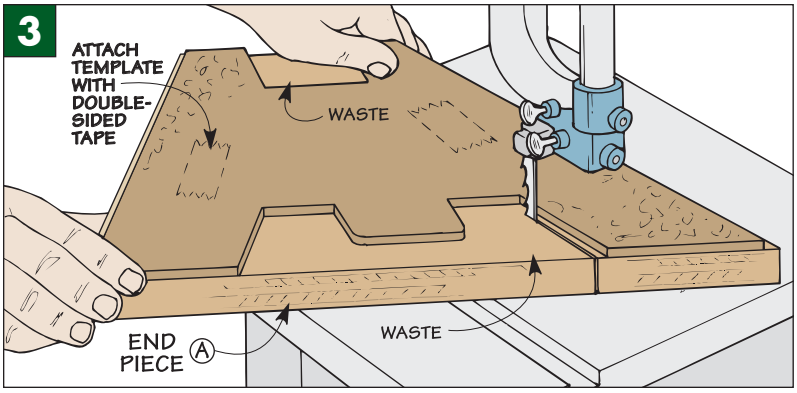
FILE CORNERS. For the tab on the top sawhorse to fit all the way into the notch of the one below, you'll need to clean up these corners. A few strokes with a file is all it takes to get them nice and straight (detail 'a').

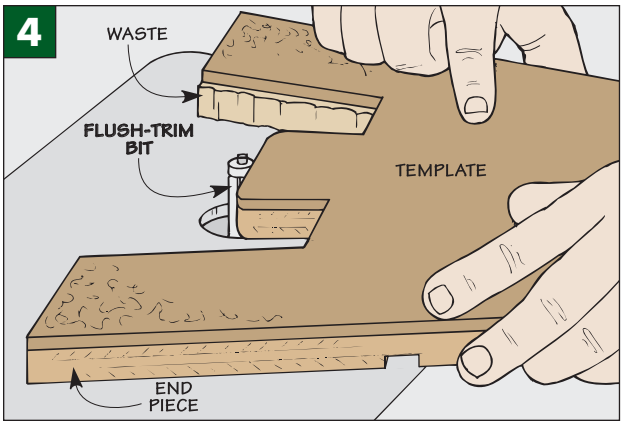
CHAMFER TAB. While you're at it, it's a good idea to file a chamfer on the inside edge of the tab. This will make it easier for the tab to slip into a notch when stacking sawhorses.

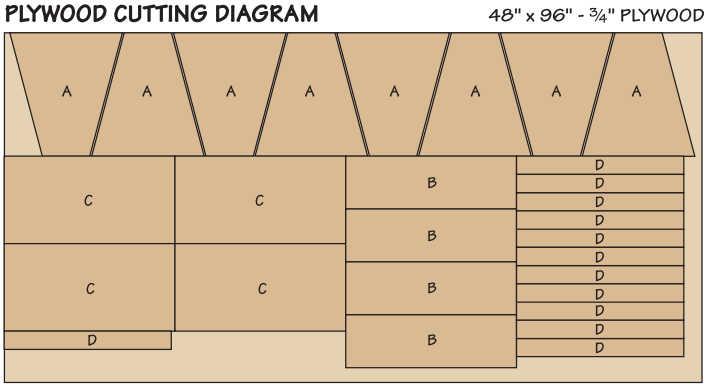
JOINERY. After repeating this process for all of the remaining end pieces, you can concentrate on the joinery that's used for assembly.

To provide sturdy support for the top of the sawhorse, it sits in a rabbet in the top edge of each end piece. And to strengthen the shelf, it fits into a dado.

AUXILIARY FENCE. But before cutting either the rabbet or dado, I attached







a long auxiliary fence to the rip fence on the table saw (Figure 5). It's a scrap piece of wood that extends about 6" past the end of the rip fence. This lets you "bury" the blade when cutting the rabbet (Figure 5a). And it provides continuous support for the bottom edge of the end piece as you cut the dado (Figure 5b).

TOP & SHELF. With the ends complete, the next step is to add a plywood top and shelf (Figure 6). The long edges of these pieces are beveled to match the angle of the end pieces.

Ripping the bevels is easy. The trick is to get the beveled edges to fit flush with the end pieces once the sawhorse is assembled.

The best way I found to do this is to first rip the pieces to rough width. Then sneak up on the final width by making a series of bevel cuts and removing a small amount of material with each pass.

CUT GROOVES. In addition to the bevels, you'll also need to cut two grooves in the top and one in the shelf. These grooves will accept the supports that are added later.

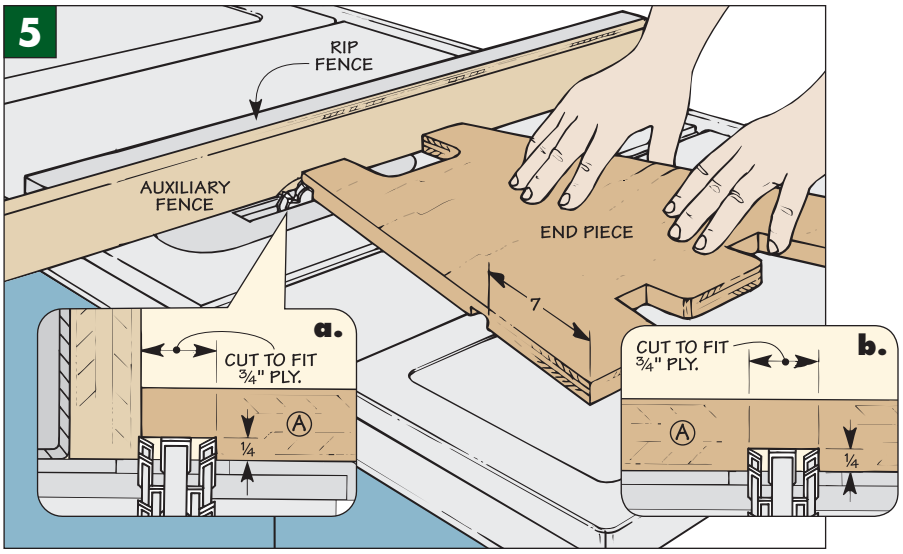
RECESS. Before assembling the sawhorse, you'll need to cut a shallow recess in each end of the top. Once the sawhorse is assembled, the recess will provide clearance so the tab can fit down in the notch.

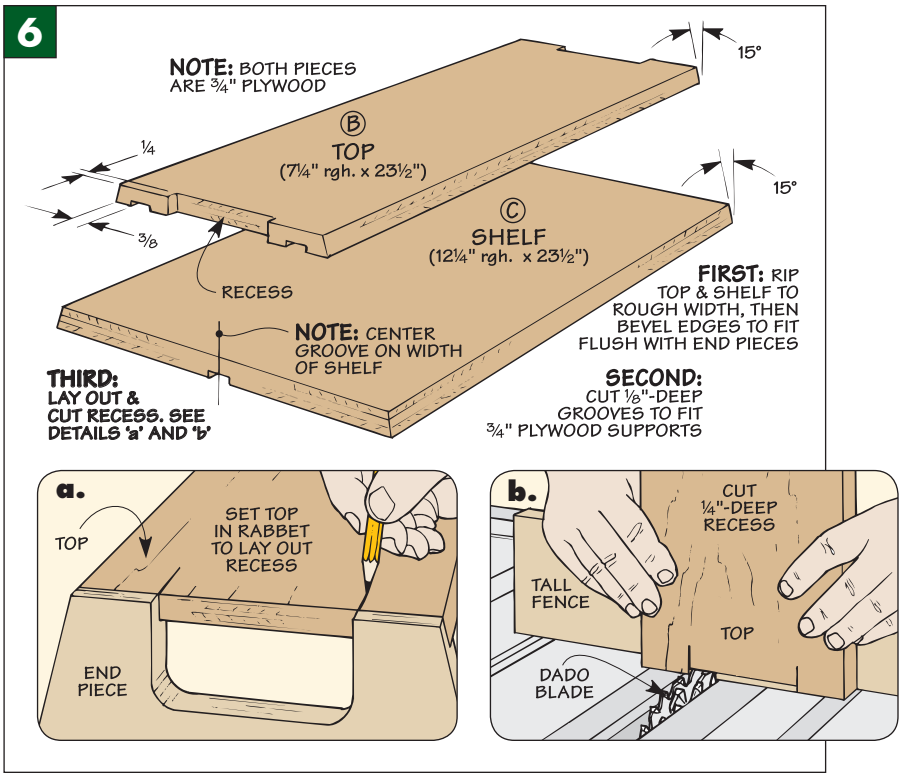
To lay out this recess accurately, it's easiest to set the top in place, as in Figure 6a. Then, after attaching a tall fence to the miter gauge, make several passes over a dado blade to cut the recess (Figure 6b).

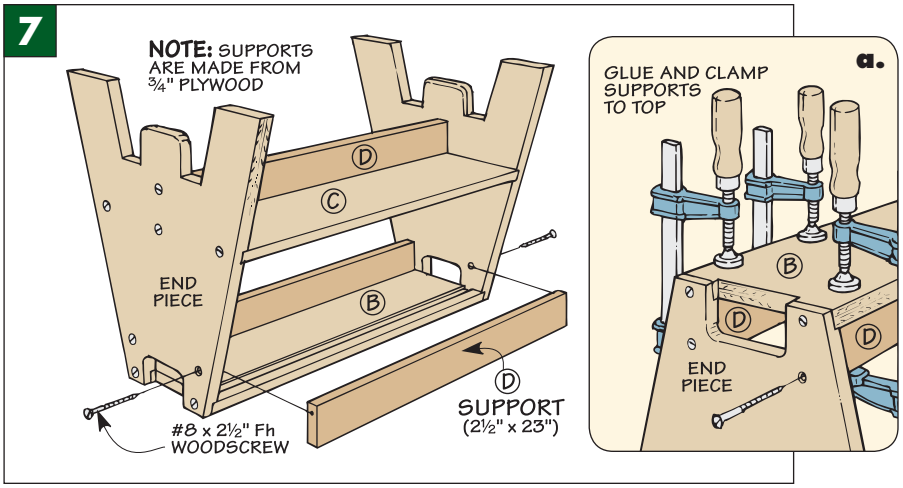
SUPPORTS. To help strengthen the sawhorse, I added three plywood supports, as shown in Figure 7. Two of these supports fit in the grooves in the top. And there's a single support below the shelf.

These supports are ripped to final width. But it's best to dry assemble the sawhorse before cutting them to final length.

ASSEMBLY. Now you're ready to assemble the sawhorses. The top and shelf of each one are glued and screwed to the end pieces (Figure 7). And the supports are glued into the grooves and secured with screws driven into the ends (Figure 7a).







► *With a set of four sawhorses, you'll be able to work on any project — big or small — at a comfortable level. Stack the sawhorses, as shown on page 1, or set up a lower table like this.*

TAPER SLED

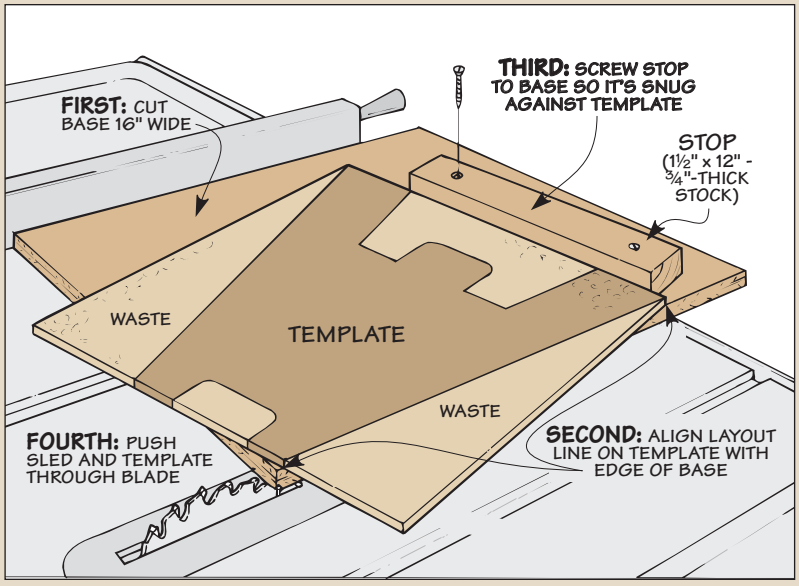
Using a template to make the end pieces for the sawhorses ensures each one is identical. But there's a catch. To get the sawhorses to fit together tight, each side of the template (discussed on page 2) needs to be cut at the exact same angle.

To accomplish this, I made a sled for the table saw. It consists of two parts: a plywood base and a wood stop, as you see in the drawing.

REFERENCE EDGE. The idea here is to create a reference edge on the base that indicates the path of the saw blade. This edge is then used to position the template.

To establish the reference edge, rip the base to a width of 16". Then, without moving the rip fence, align one of the layout lines on the template with this edge.

ATTACH STOP. Before making a cut, you'll need a way to keep the template from sliding. So butt the stop against the bottom edge of the template and screw it to the base.



Then turn on the saw and push the sled through the blade.

FLIP TEMPLATE. This takes care of the cut on one side of the template. But flipping the template over to cut the opposite side hides the layout lines. That's the nice thing about the stop. It makes it easy to duplicate the angle that's already cut.

To do this, just place the bottom edge of the template against the stop. Then, after aligning the corner with the reference edge, cut the angle on the second side.