

Step-Back Cupboard



Build this elegant 18th-century cupboard, and hone your hand-tool skills at the same time

BY MIKE DUNBAR

My wife had a narrow space in the kitchen where she wanted more storage. She had pestered me to make a piece of furniture to solve her problem, but I always had other things to do. One day I came home to discover she had bought a factory-made cupboard at a furniture store to fill the spot. One of the major reasons why I am a woodworker is that I want to be surrounded by furniture that is better than the mass-produced stuff. Factory furniture offends all of my sensibilities: It often lacks individuality, character, and craftsmanship; its designs are limited by the capabilities of machinery; and every surface is sanded to death.

I promised my wife that if she returned the piece, I would make something that we both liked better. She selected an antique cupboard on which this one is based. Besides the additional storage, she was happy to gain display space for some of her favorite items. The cupboard's small size also makes the piece versatile, and it can be used in any room if she redecorates or if we move.

The original piece that inspired this project was made in the late 18th century. The wood used in the original—eastern white pine—suggests that the piece was made in New England. While very handsome, the cupboard is not particularly complicated, especially if it is made using machines. However, the project presents a good opportunity to hone hand skills. So, even if you do use machines for most of the steps, I urge you to try at least some of the steps by hand.

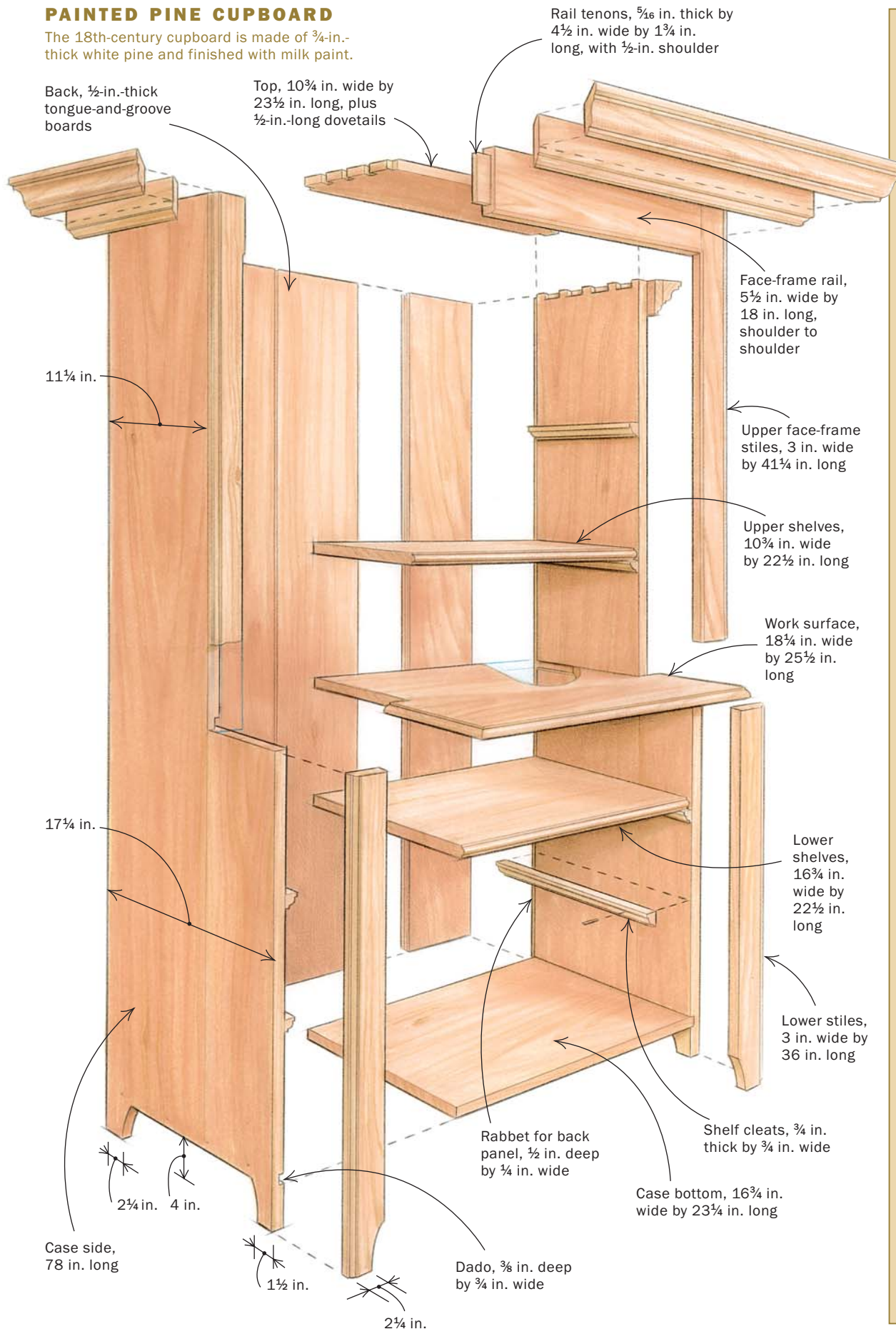
Cut stock to rough dimensions

I purchased 4/4 stock that I dimensioned with a jointer and a thickness planer. This is an important step because the stock must be perfectly flat. If I buy wood that already has been planed to thickness, I have to work with whatever warp or wind it has experienced while it was in the dealer's rack.

Begin by laying out the various parts on the lumber. Select the straightest and best lengths for the sides and the frame-and-panel

PAINTED PINE CUPBOARD

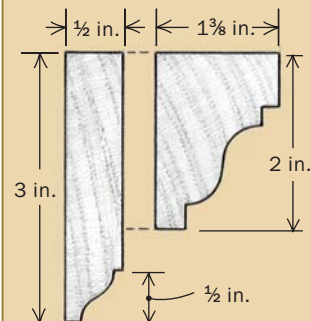
The 18th-century cupboard is made of $\frac{3}{4}$ -in.-thick white pine and finished with milk paint.



EDGE PROFILES ADD DETAIL

Although Dunbar used molding planes to make the edge treatments, router bits may be used to create similar shapes.

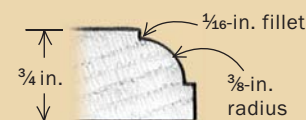
CORNICE MOLDING



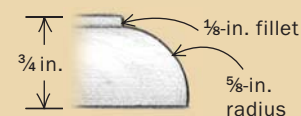
INSIDE EDGE OF UPPER FRAME



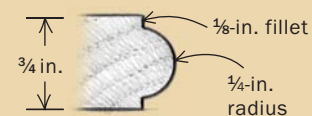
OUTSIDE EDGE OF UPPER AND LOWER FRAMES



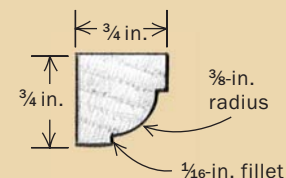
WORK-SURFACE EDGE



SHELF EDGE



SHELF CLEAT



CONSTRUCT THE CARCASE



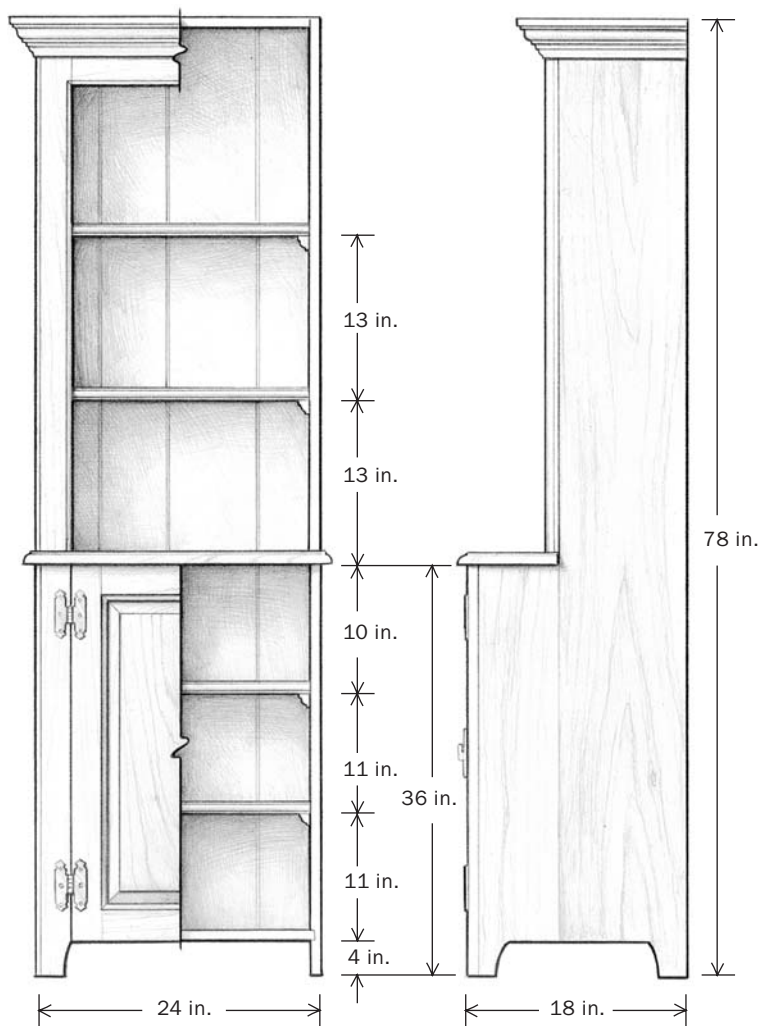
Form the step-back profile. The base is built up by adding a short board to each case side.



Joint the edges. By clamping the face of the short board to the face of the case where they meet, both boards may be planed simultaneously, ensuring that they will meet up perfectly.



Glue and clamp the two boards. The show side can be handplaned to clean up any tool marks or excess glue.



door. You don't want any warp or twist in these most visible sections of the cabinet.

Cut out the various parts to oversize dimensions. You will cut them to their final dimensions later. Finally, joint one surface of each board and plane them all to thickness. Use a handplane on each part to remove the planer marks as well as any dings or scratches that have occurred along the way.

Cut and assemble the carcass pieces

Cut the pieces for the carcass to their final dimensions. Each side of the cupboard has a long piece running the full height of the cupboard and a shorter piece that completes the bottom portion. When glued together they create the step-back profile. These short joints are a nice place to practice jointing with a plane. Clamp the two boards face to face and plane them at the same time. This ensures they mate well. Unless you have stock wide enough to be used for the door panel as well as the work surface, you also will need to joint and glue up these pieces.

Dadoes in the sides hold the bottom board and the work surface. The dadoes can be completed fairly easily with machine tools, but I chose to use a dado plane. For a couple of dadoes, this tool is just as fast and a lot more fun than a tablesaw or router. Dado planes are not hard to find and can be purchased from used hand-tool dealers. They feature two nickers (cutters) that scribe the wood and help the tool cut across the grain. To ensure that the dadoes line up perfectly, butt together the two side boards and pass the dado plane across both boards. It will take several passes to cut the upper and lower dadoes to their depth.

Cut rabbets along the back edge of the carcass to accept the back boards. This step would be faster if done with machine tools, but I did the job with a rabbet plane, which is adjustable for width and depth.

Next, lay out and cut the dovetails that join the top board to the side panels. I chose to use half-blind dovetails. They require a bit



Assemble the carcass. The first step is to glue and clamp the case bottom to the cupboard sides.



Join the dovetails with gentle force. With the bottom securely in place, apply glue to the dovetails and tap the top board into place.



Clamping the top to the sides. Clamp blocks, positioned with wooden hand screws, provide gripping surfaces for the clamps to pull the dovetail joint tight.

more work, but they make the project more interesting. Finally, trace the foot pattern on the bottom of both side boards using a template and cut out the feet with a coping saw. You might find it easiest to cut the curved portion with your coping saw and then use a panel saw to finish off the straight cut. The rough spots can be cleaned up with a spokeshave or rasp.

The carcass is assembled by first gluing and nailing the case bottom into the cupboard sides. Next, assemble the top to the cupboard sides. Clamp the dovetails while the glue sets.

When nails are exposed, as is the case with this project, I prefer to use cut nails. Their long, narrow heads are less obvious than the round heads of drawn finish nails. The right nails for this work are 6d fine finish cut nails.

After the carcass has been glued up, tack a cross brace across the back to keep it square while you work on it for the remaining steps.

Mold and attach the face frames

The upper face frame is made up of three pieces. I laid out the mortise-and-tenon joints with a marking gauge and cut the tenons with a backsaw, and the mortises with a mortise chisel. When done, test-fit the face frame to the carcass. If necessary, plane the outside edges flush.

Edge the upper face frame—The inside edges of the frame are chamfered, which can be done with a chamfering plane if you have one. The chamfers on this frame are so narrow that you can lay them out with a marking gauge and cut them with a block plane. The chamfers on the stiles are stopped, and the plane will not reach into the corners, so complete the chamfers at the



Slide the work surface into the dados. The cupboard work surface should fit tightly in the dados cut into the cupboard sides. It is secured in place with glue and nails. The dados are hidden by the front of the work surface.

ADD THE FACE FRAMES AND CORNICE



The upper face frame gets a chamfer on its inside edge. Scribe the width with a marking gauge and use a block plane to bevel the inside edge of the top rail.



The upper face-frame stiles require a stopped chamfer. Dry-fit the frame and mark the end of the chamfer (left), then plane the chamfer to within an inch or two of the stop mark. A drawknife will give you a smooth edge (center) as you cut away the remainder of the chamfer. Dry-fit again and finish the corner with a chisel (right).

corners with a drawknife. A drawknife typically is used for coarse work, but with a steady hand, the tool can take fine shavings. Use a sharp chisel to complete the mitered corners where the chamfers meet.

Cut the ovolo profile on the outside of the stiles. This is an important detail. Although small, this profile softens the cupboard's vertical corners while giving them definition. Used above and below, the ovolo also ties together the open top and closed bottom.

Because I had to nail through the molding profile to attach the stiles to the carcass, I used 4d headless cut brads (1½ in.), which are less visible than the larger 6d cut nails.

Thumbnail edge completes the work surface

The work surface separates the open top section of the cupboard from the lower, enclosed portion. Before cutting and fitting the work surface into the cupboard, add a thumbnail profile to its exposed edges. The thumbnail profile was common on 18th-century furniture. I made mine with a molding plane. Cut the molding on the end grain first. A waste strip on the far corner keeps the wood from chipping out on the exposed front corners. Now cut the thumbnail on the front, in the direction of the grain.

Attach the lower face-frame stiles—The lower face frame has only two stiles and no rails. Like the stiles on the upper face frame, the outside edges of the lower stiles are molded with an ovolo profile. Before securing the stiles to the carcass, cut out the feet to the same pattern as the sides. To protect the molding, I again used headless brads, but I used 6d nails to secure the stiles to the



Attach the face frame. Once the upper face frame has been assembled, glue and nail it onto the cupboard.

bottom board. A nail through the work surface also strengthens the stile-to-case connection. I don't use any glue.

Locate and cut the shelf cleats

The placement of the shelves is determined by what you plan to put in each section of the cupboard. The shelves are held in place within the cupboard by cleats.

Because some of the cleats in the open portion of the cupboard are visible, they are decorated with the same ovolo profile as the face-frame stiles. The easiest way to make these cleats is to cut the molding on the edge of a board. Rip off a strip to the width given in the drawing, and then cut the cleats to length. If you do not have stock long enough for all 10 cleats, run multiple strips.

Cut the cleats to length and nail them into the cupboard's upper and lower sections. Because the carcass sides are only $\frac{3}{4}$ in. thick and don't provide a lot of material for nailing, I also added a spot of glue in the middle of each cleat. The cleats run across the sides, but the nails are forgiving enough to accommodate seasonal movement. Also, gluing only in the center allows movement. The shelves are not secured to the cleats; gravity holds them in place.

Make an edge on the shelves—The molding profile on the front edges of the shelves is called an astragal and was a common 18th-century treatment for shelves. Its similarity to the ovolos on the carcass and the thumbnail on the work surface help tie together the piece's design.

You also can cut a groove in each shelf with a shoulder plane to prop up plates for display.



Secure the lower stiles to the case. Use 4d headless cut brads through the molding into the sides and 6d cut nails into the bottom.

Add a cornice to the top. The cornice, shaped with a molding plane, is built up from two layers to achieve its pronounced profile.

Clamp a straightedge to the shelf and use this as a fence to guide the shoulder plane. Holding the plane at an angle will cut the V-shaped groove.

Complete the carcass with a cornice

Because this cupboard is so narrow and tall, it needs to be balanced with a large cornice. As long as you design the cornice to the prescribed dimensions, it does not matter what profile you use. I own a nice profile called a stepped reverse ogee (cyma recta), but by itself it is not quite large enough for the piece. Therefore, I made a larger cornice by stacking two layers. The first layer has a small ogee (cyma reversa) that projects below the larger, resulting in a cornice with the necessary scale.

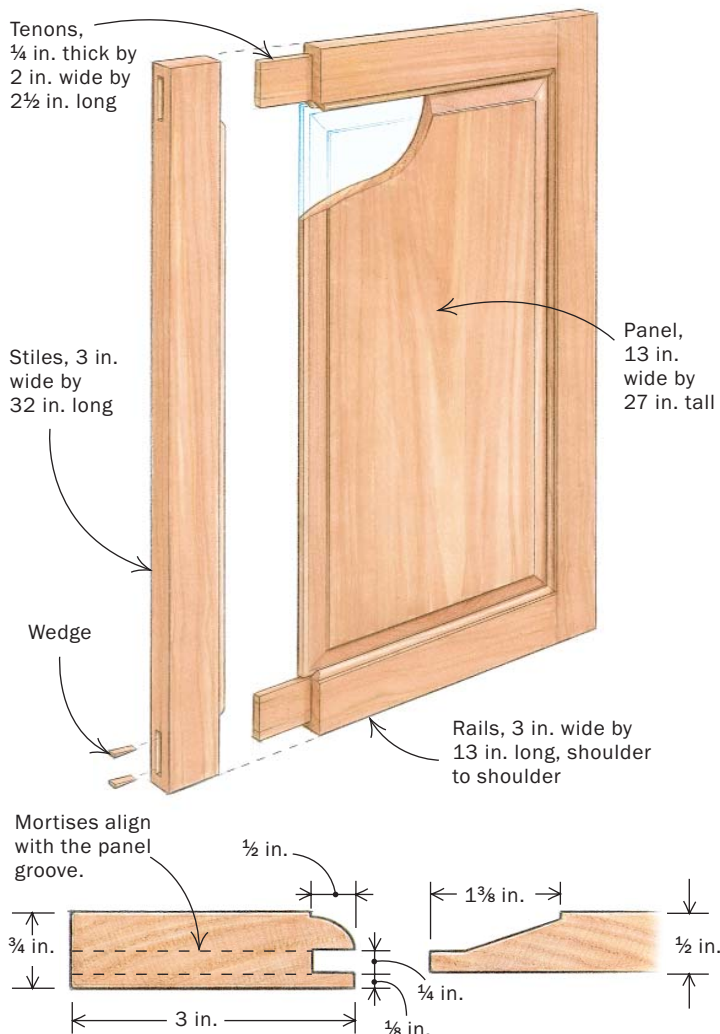
Nail on the tongue-and-groove back boards

In 18th-century furniture, it was common to see back boards of random widths. Cabinetmakers typically used the widest boards



HAND-CUT FRAME-AND-PANEL DOOR

Raise the door panel with a molding plane. Wedges, not glue, secure the tenons in the mortises.



on hand and the fewest needed to fill the space. To achieve this feel I used two wider boards on the sides and a narrow one in the middle. For these I used 1/2-in.-thick pine.

To avoid gaps in the back boards caused by seasonal movement, I cut tongues and grooves into their edges. I have a pair of planes that make this joint, called match planes. Like most hand tools, they are quick and easy for a small job like this.

The back boards are nailed into the rabbets in the cupboard sides. They also are nailed into the top and bottom boards and the work surface. Once again, pay attention to seasonal movement. In the winter, fit the back boards loosely. In the summer, you should snug them up, as they will shrink in the winter.

Make the door parts by hand

The door is the most complicated piece of joinery in the cupboard. Using a plow plane, the first task is to cut a groove in the inside edge of each door stile. Next, cut a molding on the outer edge with the same plane used to make the thumbnail on the work surface. It is easiest to cut these profiles on long stock and then crosscut the stiles and rails from these strips.

Make the stiles slightly longer than the finished door. That way, you have extra length to help prevent the stiles from splitting when you're chopping the mortises. This extra length, known as a horn, can be trimmed after the door has been assembled.

Before cutting the mortise-and-tenons, identify all of the surfaces on the stiles and rails that will be facing out. The mortises are slightly offset and do not pass through the center of the stile's thickness. This will require laying out the mortises with the identical placement on both edges. And be sure to place the fence of the mortise gauge on the same surface of the stiles and rails. By always marking pieces with identifiers you will be able to cut consistently. The mortises are cut through, which means you can see the ends of the tenons in the edges of the stiles.

To avoid blowing out the back side of the stile when making the mortises, cut from both sides and then meet in the middle.

MITER THE THUMBNAIL MOLDING



Miter the inside corners of the door frame. Saw and chisel away the waste. Cut the stiles slightly longer than the finished door to add strength to the board when chopping the mortises. The extra length, known as a horn, can be trimmed away once the door is assembled.



A jig for perfect miters. When cutting the miters on the door stiles and rails, use a jig with a 45° slope to guide your chisel.

You will have to trim away the thumbnail to join the mortise and tenons.

Raise the door panel—I have a very nice panel-raising plane that I enjoy using, so I made the panel by hand. When making only one panel, the plane is about as fast as the tablesaw or router, which also will make this cut. Measure the panel's length and width from the bottom of the grooves in the stiles and rails. If you live in an area of the country with cold winters and humid summers, you will want to accommodate the panel's seasonal shrinkage and expansion across its grain by adjusting the width accordingly. If you are making the cupboard in the summer, you should create a snug fit. If you're making it in winter, fit the panel loosely, as it will swell in the humid summer.

After testing the panel's fit, complete the door assembly. In the 18th century, doors usually were not glued, and over the centuries

SOURCES OF SUPPLY

MOLDING PLANES

Tod Herrli, 765-664-3325

HARDWARE

Horton Brasses, 800-754-9127

Ball and Ball, 800-257-3711

CUT NAILS

Tremont Nail, 800-842-0560

these doors have not sagged, so I followed suit and did not use any glue. Two wedges are driven into the ends of each tenon to tighten it in its mortise. You can strengthen the joint further by pinning the tenons.

After trimming the horns, plane the door's stiles to fit the opening. Your door's fit also will depend on the season. If you make a snug door in the winter, it will bind in the summer.

Finish with fine hardware and milk paint

The original cupboard's door was mounted with wrought-iron hinges and held shut with a wooden turn button. I spruced up mine with cast brass ornamental H-hinges and a matching catch. These items cost about \$80, but after all the work I put into the piece and the cost of the lumber, it seems only fitting.

Once the piece was complete, I finished it with milk paint (for more on milk-paint application, see *FWW* #136, pp. 64-67). To match the color scheme of our home, I finished the outside surfaces of the cupboard with barn red. For the exposed inside walls and back boards, I used mustard. □

*Mike Dunbar is a contributing editor. This article is the fourth in a series of hand-tool-oriented projects (see *FWW* #134, #142, and #151).*



Assemble the door and wedge the tenons. Drive wedges into the tenons to secure them tightly in the offset mortises. Typical 18th-century tenoned doors were left unglued. Pinning the tenons will add even more strength.