



# A New Approach to Classic Cabinets

BY MIKE MAINES



Combine modern tools with creative techniques to build bookcases on site

## FACE FRAMES COME FIRST

The room in the southwest corner of our 1830s Greek revival is by far the fanciest in the house, with its tall baseboards and door casing with flat planes meeting at an angle instead of the more common rounded field. Even the windows are fancy—at least by the standards of rural Maine—with the casings running to the floor and a flat panel under each that is finished to match the walls. The existing fireplace surround, however, was not very attractive.

My wife and I appreciate the history of our house, but we have no desire to live in a museum. So we decided it was time to design and build a fireplace surround, complete with a pair of bookcase cabinets, that would be honest to the spirit of the house but updated with a slightly modern feel.

Over the years, I've refined my approach to building cabinets without the luxury of a fully stocked cabinetry shop, so I knew this was a project I could tackle on site.

### Modernizing the style

The design process involved a lot of sketches and scribbles, but it breaks down simply: The fireplace surround is proportioned to be stocky and proud, just like the house. The flanking bookcases have clean lines and flush surfaces. Meant to evoke classical columns, they look traditional without being fussy. The two pilasters (the legs of the mantel) sit on plinth blocks. The frieze (or lintel) projects beyond the pilasters by  $\frac{1}{4}$  in., just like the plinth blocks. The mantel shelf is  $1\frac{1}{4}$  in. thick, just like most of the other horizontal components, with a flat, angled molding supporting the shelf. After considering many options for the supporting molding, we settled on a simple, angled crown. I realized later that this matches the crown molding on the house's exterior, which gave me confidence that I was on the right track.

### Start with the right materials

Most of this project makes use of two materials: solid  $\frac{3}{4}$ -in. (nominal 4/4) D4S (dressed on four sides) poplar lumber and  $\frac{3}{4}$ -in. veneer-core birch plywood. Poplar is my go-to material for paint-grade trim and cabinetry. It is hard, stable, affordable, relatively knot-free, and usually straight-grained. It is also easy to work with both hand tools and

Everybody wants to build the boxes first and then add the face frames. Even if you have the room to work around a bunch of boxes while you try to mill, assemble, and install the face frames, why bother? Maybe you like to build each cabinet separately from start to finish. Good luck making a living with that approach. To make money, you need to be fast. Build the face frames first, then set them aside.



**Hidden screws.** After marking the rail positions on the stiles, fasten each rail with at least two pocket screws. For wider rails, use more screws, and make sure to favor the outer edges of the boards to help prevent cupping. Once fastened, the frame can be sanded smooth on both sides and set aside.



**Shelf-pin holes on the cheap.** Instead of buying a jig, mark and drill the desired pin layout into  $\frac{1}{4}$ -in. plywood. Clamp the template along the edge of the side piece, and use a self-centering shelf-pin drill bit to bore the holes.



**Pairs of pockets.** The face frame is screwed to the case sides through pocket holes drilled in pairs. Use only one hole out of each pair; if the first screw pushes parts out of alignment, you have a second option right there.

# ASSEMBLY SHOULD LEAVE ROOM FOR ADJUSTMENT

If you've cut all the parts correctly, the face frame and the plywood should line up perfectly. Here's how to assemble the carcasses when they don't.

**Start with nails.** Tack the plywood box together with 15-ga. or 16-ga. finish nails. It will be a little floppy, but that's a good thing at this point.



**Hidden attachment.** After nailing the box together, align the long sides of the face frame to the cabinet, and fasten them with pocket-hole screws. The screws will be covered by end panels after installation.



**Tap it into alignment.** Use a hammer and block to tap the tops, bottoms, and any fixed shelves into alignment, then fasten them with pocket screws.



**Secure it with screws.** After everything is aligned, fasten through the sides of the cabinet with 1 $\frac{5}{8}$ -in. screws. Shorter screws won't hold well, and longer screws may lead to splits.



**Solid backs mean extra steps.** After slotting the edge of each back board to receive a  $\frac{1}{4}$ -in.-thick plywood spline, fasten the boards with screws in a combination of countersunk and slotted holes to allow for seasonal movement.

## SCRIBE FOR A TIGHT FIT

power tools, and it's readily available here in the Northeast.

For carcasses, I like to use a good grade of veneer-core plywood. When choosing between plywood panels, my first decision involves the quality of the face veneer, which in order from best to worst is graded AA, A, B, C, D, and E. Here, I used plywood with a grade-B face, which is better than shop-grade plywood but not the fully grain-matched product that is typical for stain-grade work. The back side of the plywood can be graded as 1, 2, 3, or 4. I chose a grade-1 back, which is nearly as nice as the grade-B face except that it can have more filled knots. I like birch for the face veneer because it has a discreet but still slightly apparent grain pattern, yet it costs a little less than other veneers. I prefer veneer-core plywood over MDF-core plywood because it's lighter and the dust is not as nasty. Finally, I use  $\frac{3}{4}$ -in. plywood for carcasses because it's thick enough to accept screws and pocket-hole joinery.

The cabinet backs for this project were made from red birch coated with a clear oil finish. Not just any red birch (which in the Northeast, at least, usually refers to the heartwood of a yellow birch or sometimes a paper birch), the boards in this project were cut from logs recovered from the bottom of Maine's Moosehead Lake. The boards I chose have tight grain, rich color, lots of character, and a great story to go with them.

To be true to the house, we decided to use traditional butt hinges for the doors, albeit installed in my slightly nontraditional manner, which allows for some adjustment if the doors warp a bit.

### Traditional work can still use modern joinery

Although I considered using my Festool Domino joiner to build the face frames, I ultimately opted for the speed and simplicity of pocket-screw joinery on these parts. I like to add a dab of glue to the joints; end-grain gluing only has one-tenth the strength of edge-grain gluing, but I think it contributes to the joint staying tight and not telegraphing through the paint.

For joining the plywood carcasses, I used my no-fuss, adjustable method in which each box is constructed loosely and then tweaked as needed to fit the more-rigid face

I usually leave a stile that will butt against a wall or other finished surface  $\frac{1}{4}$  in. to  $\frac{3}{4}$  in. wider than necessary so that it can be scribed for a perfect fit. After marking the scribe in place, I lay the cabinet flat on its back so that I can cut to the line and then finish the edge with a block plane.



**Trim the fat.** Use a track saw to remove as much wood as possible without reaching the scribe line. Back-cutting at a  $30^\circ$  bevel makes the hand-planing easier.



**Finish with care.** For a simple scribe, use a block plane to shave up to the line. Complicated scribes may need a jigsaw or an angle grinder with a sanding disk.

## DOORS THAT BREAK ALL THE RULES

A typical cabinet door consists of a framework of rails and stiles—usually assembled with cope-and-stick, mortise-and-tenon, or other joinery—with grooved edges that capture a panel. The frame holds the panel but allows it to expand and contract seasonally. For this project, I tried a new technique.

I used the Festool Domino tool to cut slots on all edges of the  $\frac{3}{4}$ -in. plywood panels, rails, and stiles, and on the ends of the rails. After cutting a rabbet around the panel to create a reveal, I glued the panels right in their frames.



**Mark to avoid mix-ups.** Arrange the door parts with their finished sides facing up. Draw a triangle in the center of the panel, then mark each stile and rail with the corresponding portion of the triangle that matches its position relative to the panel. Mark the same number in each triangle so that you know the grouping and orientation of each part.



**Slots, not biscuits.** In terms of layout and use, operating the Domino is very similar to operating a biscuit joiner. Mark both pieces where they will join, dial in the height and depth, and plunge the tool into each piece to create a matching slot.



**A rabbeted shadowline.** To disguise the joint between panel and door frame, and to create a nice reveal, rabbet the edges of each panel on the finished side. Hit the rabbets with spackle, primer, and a light sanding before assembly.



**Glue and clamp.** After inserting glue and tenons into the edges of the plywood panel, dab glue into the tenon holes of the stiles, rails, and along their edges. Position the rails first, repeat the process for the stiles, and then clamp everything together. Using a straightedge as a guide, adjust the position of the clamps to ensure that the doors are flat.

# THE TRICKS TO QUICK BUTT HINGES

frame. I have tried every possible way to join face frames to carcasses; my go-to method for paint-grade work is to glue the face frames on, tacking them in place with 18-ga. brad nails. The downside to that method is that the filled nail holes sometimes telegraph through the paint. Because our new house has an intermittently wet basement, I expect significant fluctuations in humidity, so I chose my “high-end” system of attaching the face frames with pocket screws.

The backs presented an unusual challenge. I typically use plywood because it’s self-squaring and easy to attach with screws or narrow-crown staples. But solid wood needs room for seasonal movement. I bought the red birch planks rough-sawn, then milled them to  $\frac{3}{4}$  in. thick, straightened them with a track saw, and grooved their edges with a router. The groove was sized to accept plywood splines that hold everything in plane but still allow the solid boards to expand and contract. I drilled pilot holes in the perimeter and the center of each board, but to allow for expansion, I used the Domino to create elongated slots at each edge of the wider boards. All the boards are attached to the carcass with bugle-headed cabinet screws.

To attach the cabinets to the wall, I used #10 wood screws with finishing washers, placed to lower their visibility once the shelves were installed and loaded with books. I shimmed the cabinets adequately at the floor, so the screws in the wall aren’t bearing any weight.

The cabinets and the trim are both finished with Sherwin-Williams’ All Purpose Latex Primer and topcoated with two coats of Benjamin Moore’s Advance waterborne alkyd paint in a semigloss finish. I had planned to use my Graco airless spray gun for the primer coat only, because I think a brushed finish is more appropriate for an old house like ours, but once I went through the effort to mask everything off, I decided to spray the two topcoats as well. The finish came out great, and I highly recommend the paint, which flows out better and dries harder than regular latex paints. My wife and I love the way the new fireplace surround ties the room together. □

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I chose the BH2A series of butt hinges from Cliffside Industries because I like the adjustment offered by their slotted holes. When working with these butt hinges, I like to follow two tricks I learned from a local cabinetmaker. First, mortise the door only; the other leaf of the hinge will create a nice reveal. Second, don’t bother with stopped mortises; cut them right from the front of the door through to the back.



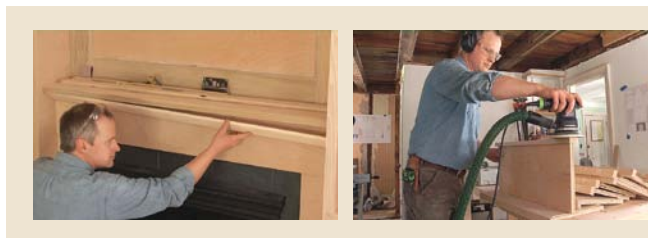
**Site-made mortise jig.** Plywood scraps are all that’s needed to make a custom hinge jig. A router with a flush-bearing bit rides the jig to cut the through mortise.



**Plan for adjustability.** Place the hinges with the horizontal holes on the door and the vertical holes on the cabinet, and you’ll have some room for adjusting.



**Hang and adjust in place.** With the hinges in place on the cabinet doors, hold the doors in position while you transfer the hinge locations to the face frame. Attach the door, and tweak as needed for a perfect close.



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