

Create desks, bookcases, pantries, and more with a slick hybrid design and problem-solving pocket-screw joinery

BY MIKE MAINES

When designed and constructed properly, built-in cabinets can bring both style and storage to many parts of a home. Over the years, I've refined my approach to constructing cabinets to decrease the time and tools it takes to build them while ensuring their strength and good looks. I used my technique to build the Douglas-fir kitchen island featured here for my home, but I've followed the same process to make stain- and paint-grade kitchen cabinets, bookcases, linen cabinets, pantries, desks, bathroom vanities, and storage cubbies.

Your shop is where you make it

The beauty of this system is that the setup is simple and doesn't rely on the space or tools found in big cabinet shops. Being able to set up shop in a driveway, a garage, or a small room has always been helpful in keeping my work on schedule.

The tools you need to construct these cabinets are likely sitting in the back of your truck. For cutting components to size, you need a miter saw, a portable

A Faster, Easier Approach to Custom Cabinets

Good proportions are no accident

Although my built-in cabinets are assembled easily, there's no guarantee they'll look good in a home. A cabinet constructed with wacky proportions won't look or function as well as it should. To start, make a scale drawing on paper of each piece you intend to build. Having this reference on hand will give you a clear idea of what you're building and help you to create a detailed cutlist. I follow a few basic rules when it comes to designing cabinets.



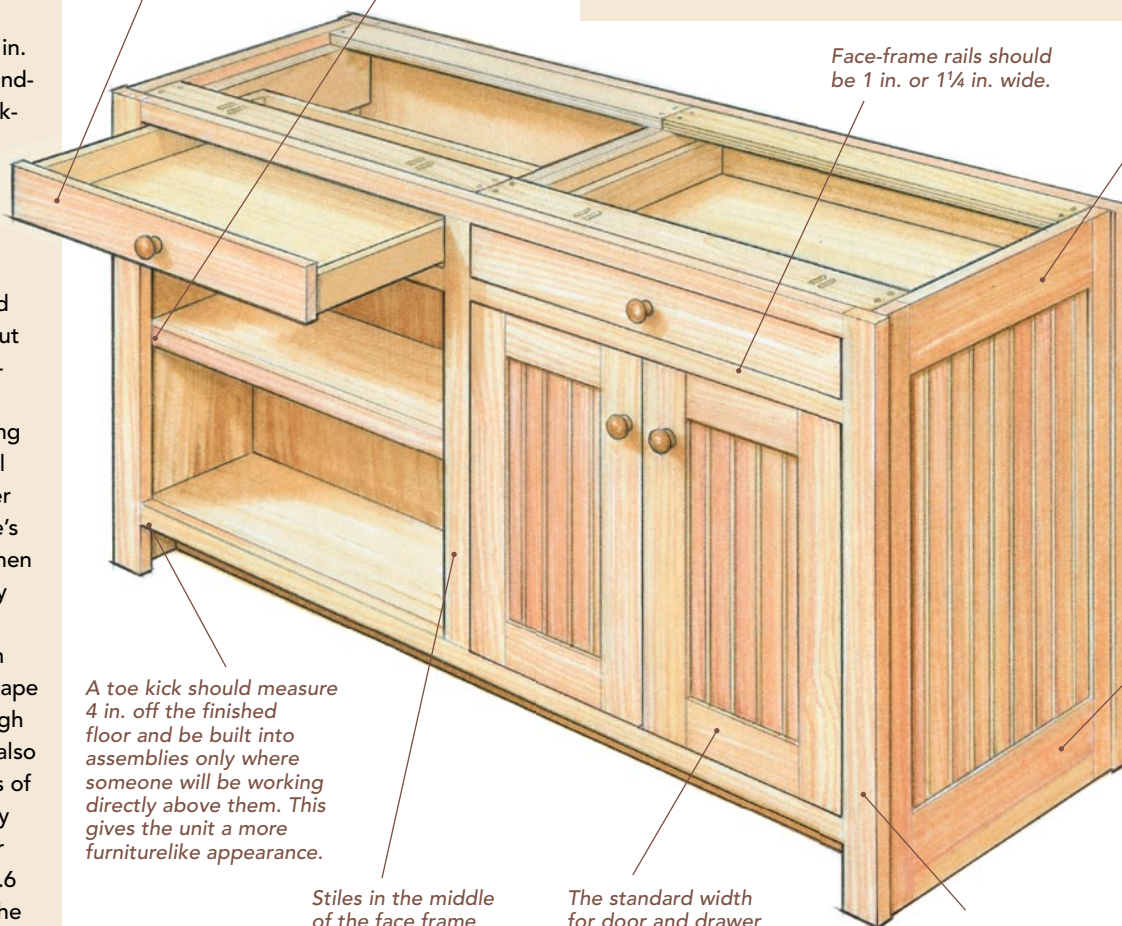
• Built-in cabinets that will be used as workstations

generally have countertops 36 in. above the floor, so boxes should be built to a height of 34½ in. to 35 in., depending on the thickness of the countertop. Cabinets that aren't task-oriented can be any size and are built without toe kicks. I distinguish these units by building the bottom rail taller or shorter than the house's baseboard. When in doubt of any proportions, I use the golden rectangle, a shape 1.6 times as high as it is wide. I also find the widths of components by dividing similar members by 1.6 as done with the end-panel rails.

Drawers can be made as wide as 36 in. when used with quality undermount drawer slides.

End stiles on open shelving should lap the front edge of the shelf by ¼ in.

• **When multiple cabinet boxes are lined up** in a row, they appear more fitted when tied together with a single face frame. I connect the boxes by hiding a screw behind each door hinge. You can make all the face-frame components the same size, but that can make the rails look fat and the end stiles look skinny. Instead, I like to adjust their widths (drawing below) so that the built-in looks more balanced.



Face-frame rails should be 1 in. or 1¼ in. wide.

Divide the width of the bottom rail by 1.6 to determine the width of the panel's top rail. In this case, its width should be either 3⅜ in. or 3⅞ in.

A toe kick should measure 4 in. off the finished floor and be built into assemblies only where someone will be working directly above them. This gives the unit a more furniturelike appearance.

Stiles in the middle of the face frame should measure 1½ in. across their width.

The standard width for door and drawer rails and stiles is 2¼ in. But widths as large as 3¼ in. still look good.

A 5-in.- or 5¼-in.-wide bottom rail on the end panel matches the dimension of the toe-kick space, plus the width of the face frame's bottom rail.

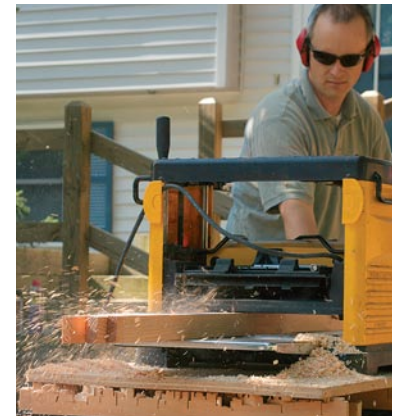
The stiles on the end of a face frame should be 1¾ in. wide to add mass to the assembly and to cover the edge of the end-panel face frame.

• **Doors should always be taller than they are wide** and should never exceed 20 in. in width; otherwise they project too far into a space when opened. Even an 18-in.-wide door can be too large on certain units. Drawers should be left with a flat face when they're shorter than 4½ in., which is typical, and can be detailed to match frame-and-panel doors when they're taller.

CUT ALL THE FACE-FRAME COMPONENTS AT ONCE

When milling 1x6 face-frame material to size, I like to fine-tune its final width with a planer, not a tablesaw. I rip the face-frame stock $\frac{1}{8}$ in. wider than I need on a tablesaw. Then I remove the last $\frac{1}{8}$ in. with a planer. The planer produces more precise dimensions and smoother cuts.

Rip stock to width. Use a tablesaw to square all boards with rounded edges. Then cut all face-frame components $\frac{1}{8}$ in. wider than their final dimension.



Plane similar parts together. Instead of planing each board individually, plane all the end stiles, then inner stiles, then rails to their exact width.



Chop to length. Armed with a fence and a stop made of scrap material, and a cutlist, chop all the face-frame material to its precise length. Stack all the material to make a complete face frame.

tablesaw, a circular saw, an edge guide to cut sheet goods safely, and a portable thickness planer. To fasten the carcass and face frames together, you need a 16-ga. or 18-ga. finish nailer, a screw gun, a pocket-screw jig (www.kregtool.com; www.pennstateind.com), a bunch of screws, and some glue.

A hybrid design makes face-frame cabinets better

Cabinets are typically designed in one of two ways: frameless or with face frames. Each has its merits. Face-frame cabinets are traditional and strong, and they can be scribed to fit seamlessly against a wall. Frameless cabinets are quicker to put together and can be used in conjunction with adjustable, hidden, and now soft-close hinges.

I've done a lot of historically informed work, and frameless boxes just don't provide the appeal of face-frame cabinets with inset doors. Although frameless cabinets allow a bit more space inside, their end pan-

els tend to look tacked-on, crown molding is hard to detail properly, and filler strips are heavily relied on during installation. I use the benefits of both styles by building a hybrid cabinet. Flushing the inside of the carcass to the inside of the face frame allows me to use hardware designed for frameless cabinets while still providing the traditional look, ease of installation, and strength of face-frame construction.

Screws, glue, and quality hardware hold it together

Traditionally, face-frame cabinets are constructed with dados, grooves, dowels, or mortise-and-tenon joinery to lock together each component. These techniques create strong assemblies too, but require much more time.

I assemble face frames with fine-thread, $1\frac{1}{4}$ -in. square-drive washer-head pocket screws and yellow glue. I tack the carcasses together with finish nails and then drive

$1\frac{1}{8}$ -in. drywall screws for strength. I've used drywall screws for years and have never had a cabinet fail, but it's important to use stronger screws when attaching a cabinet to the wall.

Beyond box strength, cabinets are often measured by the quality of their hardware. The best hinge for this hybrid system is a 32-mm cup hinge made by Blum (www.blum.com) or Mepla (www.mepla-alfit.com). Adjustable, self-closing, and quick to install, they are usually my first choice. In more historically accurate work where a visible hinge is preferred or when I don't want a hinge to intrude on storage space, I like to use Cliffside's 2-in. butt hinges (www.cliffsideind.com). I use a trim router to mortise the door for a single leaf and don't mortise the face frame at all, which helps to provide just the right reveal between the door and the face frame.

I've used all three types of drawer slides (see "What's the Difference," *FHB* #184, p. 108) in my cabinets, but when I have a choice, I

ASSEMBLE THE FACE FRAMES FIRST

I build all the face frames before I build their corresponding boxes. This not only saves room on the job site, but it also allows me to use the face frames for reference when a dimension comes into question during carcass construction.

Lay out the parts, and mark pocket-hole locations. Dry-fit the face-frame components so that their grain and color look best. Mark the boards to show their orientation in the assembly and where they'll be pocket-screwed.



A pocket-hole jig makes assembly easy. Drill two pocket holes in the end of each rail and each inner stile.



Squeeze the grain to eliminate splitting. Put a bit of wood glue on the board end before securing a locking C-clamp so that it exerts equal pressure on the grain of each component. The clamp should be placed in line with the pocket hole being screwed.



Quality control. Check to be sure that every component is aligned and secured properly before building subsequent frames. Accuracy here is crucial because the dimensions of the face frame might be used as a reference when building the boxes.

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Visit the Magazine Extras section of our home page to see a video on how to use a pocket-hole jig.

BUILD THE BOXES

Box assembly is a relatively straightforward process. Before the sides of the boxes are fastened together, though, I drill pocket holes and the holes for shelving pins.

Cut sheet goods safely. Full sheets of plywood should never be cut on a tablesaw. Instead, use a straightedge clamped to the sheet's surface and a circular saw with a fine-toothed alternate top bevel (ATB) sawblade.



Jig tip

I make a simple jig out of thin MDF to orient shelf pin-holes 1½ in. from the front and back of the box. I usually place the first hole 12 in. off the bottom of the box and drill holes in 1½-in. increments above and below.



Drill pocket holes in groups of two. When preparing the sides of the carcass that will be joined with the face frame, drill two holes instead of one for each connection point. This extra step will come in handy when attaching the face frames.



Tack and screw together the box parts. Nailing the box with 16-ga. finish nails makes it easier to keep pieces in place while they're locked together with 1½-in. drywall screws.



Support the box and the drawer slides. On top of each box and below each drawer, ¾-in. plywood crosspieces add strength, a place to connect the face frame's top rail, and a surface to attach countertops and undermount drawer slides.

opt for the Blum Tandem, an undermount full-extension unit that is forgiving to install and smooth to operate.

For adjustable shelves, I like to drill groups of three to five holes where I think the shelf should be. This allows some adjustability while avoiding the factory-made look of a continuous row of holes. Often, I use paddle-type supports installed in a 5-mm hole. For heavy-duty applications, such as a bookshelf, I like an L-shaped pin in a ¼-in. hole.

Get doors and drawer fronts that fit the second time

I order or build doors and drawer fronts before the built-ins are complete so that I can finish the job quickly. To be sure they fit the way I want them to, with the perfect reveal, I have them built to the exact size of the face-frame opening written on my plans. Once on site, I fit them tight into their openings. I reduce their size on all sides a heavy ⅛ in. by taking measurements from the face frame, not the door or drawer front itself, and rip them on the tablesaw. □

Mike Maines developed this system as a trim carpenter in Nantucket, Mass., and in Boston. He's now a designer in Yarmouth, Maine. Photos by Rob Yagid.

Dress up an exposed end panel

Built-in cabinets usually have their sides buried in a wall. Sometimes, however, the sides and even the back are exposed to public view. I detail these areas to hide pocket holes in a couple of ways.

On my kitchen island, I'm using a stock of reclaimed Douglas-fir edge and center bead that has been collecting dust in my garage for years. I simply fill the face-frame opening with the boards, attaching them with an 18-ga. pin nailer. Held tight against the carcass, the 3/4-in.-thick face frame would leave a 1/4-in. reveal where it meets the end stiles of the front face frame. So I fur out the end panel with 3/16-in. plywood strips to reduce the size of the reveal.

If I'm not going to use beadboard on a built-in, I fill the face frame with 1/2-in. plywood to create a flat recessed panel. Alternatively, I cover the entire side of the carcass with a sheet of 1/4-in. plywood that can be stained or painted to match the wood I've used, then glue and nail the face frame to it.



Pick a hole, but not just any hole. Although I drilled groups of two pocket holes in the box, only one hole in each set needs to be screwed. The face frame should flush with the inside of the box perfectly, but if it doesn't, having multiple holes gives you the flexibility to push and pull the face frame into alignment.

ATTACH THE FACE FRAMES TO THE BOXES

A face frame can be nailed to a box with 16-ga. finish nails. However, the holes still need to be filled, and the gun can scuff the face-frame surface. Another way to attach face frames is with biscuit joinery, a solid solution, but one that demands a lot of time and a massive arsenal of clamps. By attaching the face frame with pocket screws, I get an immediate, permanent connection while leaving the face of the cabinet clear.



Cover your tracks. To hide pocket holes and screws used to assemble the cabinet, wrap exposed faces with a decorative material, such as stain- or paint-grade plywood, beadboard, or edge and center bead.