A Clever Kitchen Built-in

Six small boxes joined behind a face frame exploit a shallow space

BY NANCY R. HILLER

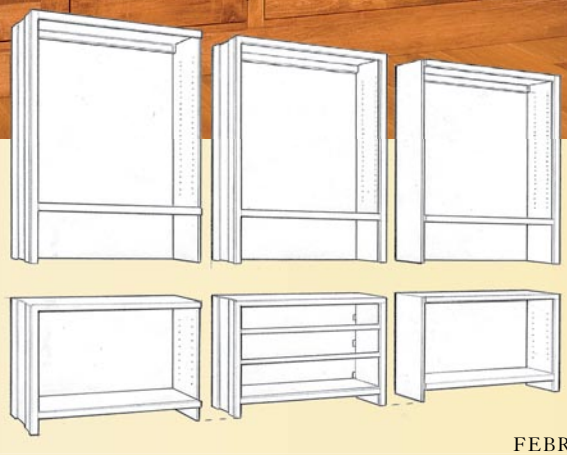
Modern kitchens are made for storage, but it never seems to be sufficient. Recently, my company built a cabinet to provide generous storage on a shallow section of wall in our clients' kitchen. It was space that normally would have gone to waste because it was too shallow for stock cabinets.

The inspiration for this custom-made cabinet came from a traditional piece of British furniture known as a Welsh dresser. In use since the 17th century, the dresser originally provided the main storage in a kitchen; built-in cabinets did not become the norm until the early-20th century. More commonly known in the United States by the less-elegant term *hutch*, the dresser typically has a shallow, open upper section that sits on a partially enclosed base. The dresser described here also exemplifies the sort of planning, production, and installation essential for genuinely custom built-in cabinets.

A strategy for storage that doesn't waste space

The kitchen had a section of unused wall about 11 ft. long, which I thought could be used for storage and display space without impeding traffic flow. Although 1 ft. of depth is shallow for a base cabinet, it is enough to hold a surprising variety of kitchen wares: cookbooks, decorative china, coffee mugs, small mixing bowls, jars of beans or pasta. Knowing that one of my clients had grown up in England and would be familiar with Welsh dressers, I suggested a similar cabinet with more-contemporary lines, customized for her family's budget and for the available space.

The upper sections would have open shelves, but the base cabinets would be enclosed with doors and drawers to keep their contents free of the dust and debris that collect at a kitchen's edges. Enclosing the lower

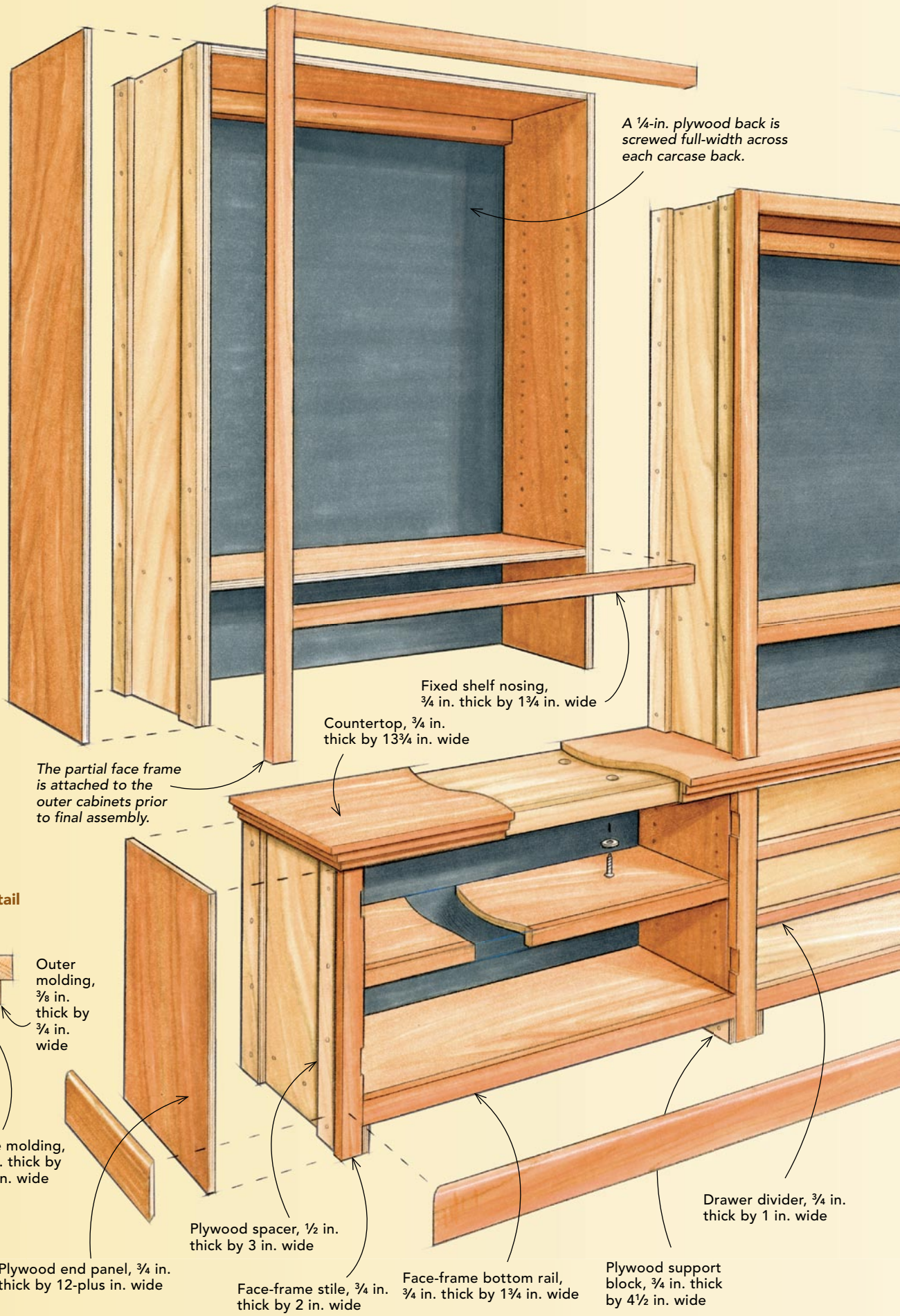


More parts make construction efficient. *This type of modular cabinet construction allows a majority of the assembly work to be done in the shop. Consequently, I get more control over the processes and their costs.*

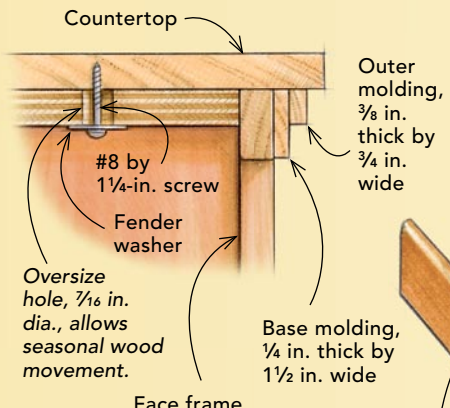
ANATOMY OF A BUILT-IN

Segmented construction let us assemble everything in the shop, break it down, and reassemble it in the kitchen. After the plywood boxes were screwed together in the shop, individual solid-wood face frames were glued to each box. The center cabinets had a complete face frame, while each side cabinet's frame, when joined to the center, would share the center's left or right stile.

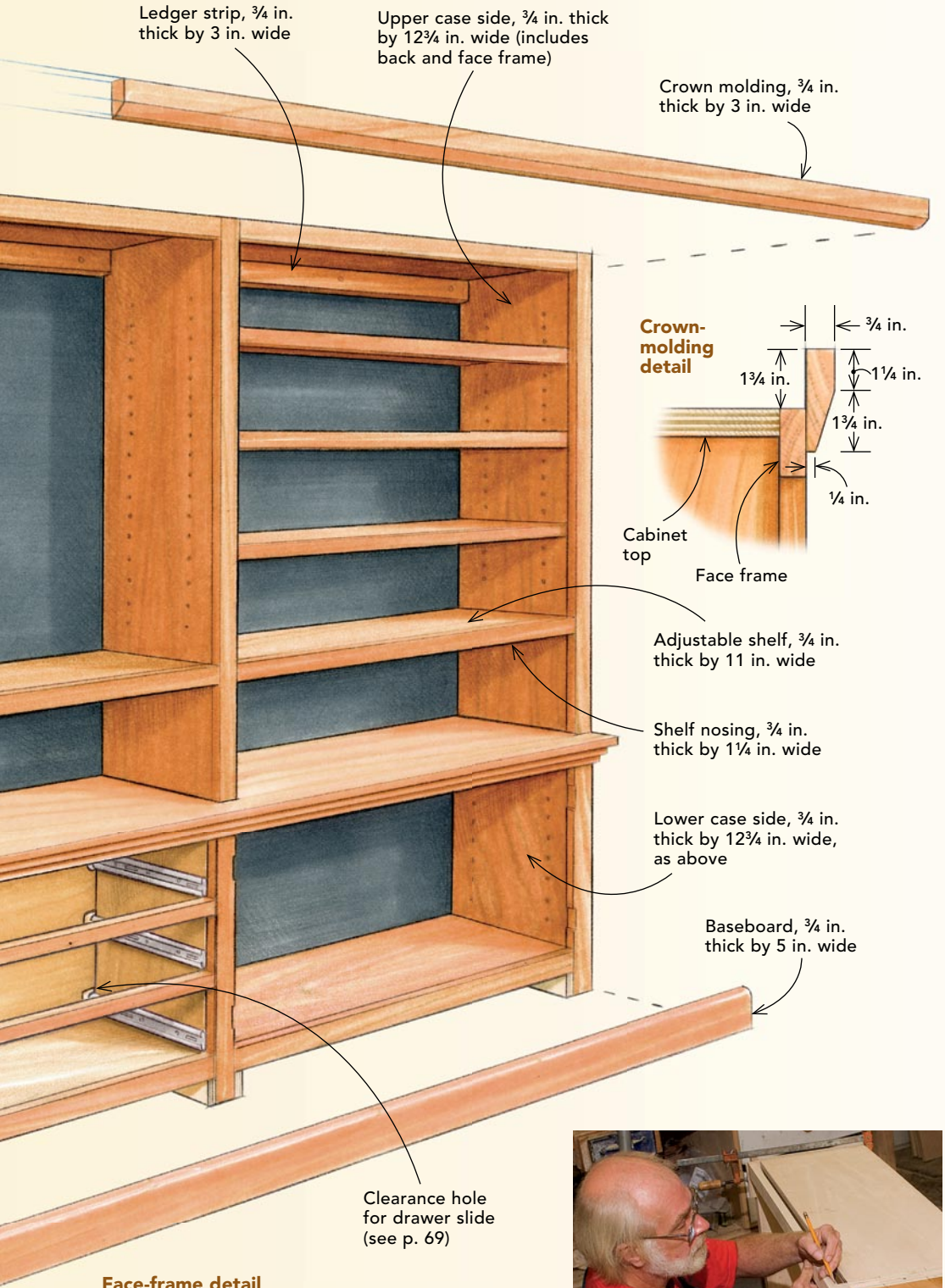
At the client's house, we reassembled the base cabinets, shimmed them level, and screwed them to the framing. After scribing the counter to fit, we screwed it to the base cabinets. We installed the upper cabinets in the same way as the lower.

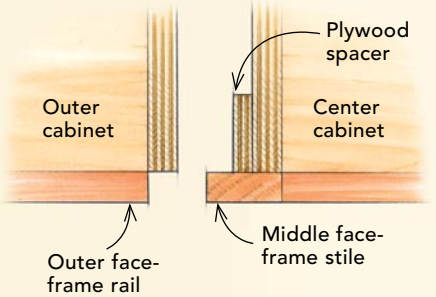


Undercounter molding detail



Drawings: Bob La Pointe





sections also would give a nice visual weight to the wall without making it appear too heavy. The break between base and upper cabinets would be at 32 in., not the typical kitchen-counter height of 36 in., because I wanted this piece to look more like furniture than a regular kitchen cabinet.

Building smaller components makes the project easier

The six-piece unit is divided into three uppers and three bases for ease of production, delivery, and installation (drawing, p. 65). To make the six plywood cases and the solid-maple counter resemble a single piece of cabinetry, I used a complete maple face frame on the center section of the upper and lower casework and a partial face frame on each end. The end cases would butt tightly against the center unit and share its face-frame stiles to make the unit appear as one piece (drawing left).

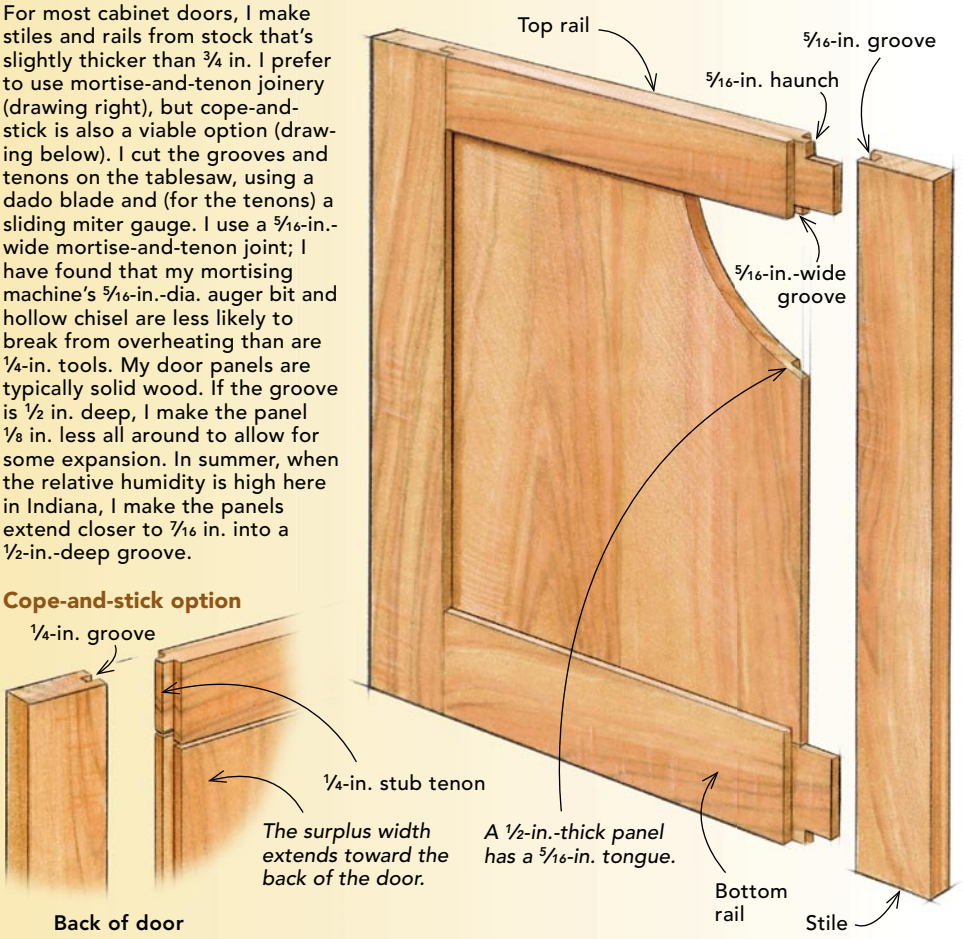
Although 10-in. slides are available for many purposes and would have been ideal for this job, they are rated only for drawers up to approximately 2 ft. wide. For smooth operation, I needed hardware designed for oversize openings. Given the location of the adjacent door casing, which limited the cabinet's depth to a maximum of 12¾ in., and a design that called for inset drawer faces, we needed to create ¼ in. of additional depth to accommodate the 12-in. slides by routing out the plywood cabinet back in those locations.

For ease of production, I typically use a full-width applied back on built-in cabinets rather than rabbeting the cabinet sides to accept the back. Scribed on site, a finished

First assembly is done in the shop for a better final fit. *After Jerry Nees glued the center face frame to the center cabinet, he clamped the base cabinets together in the shop. The left and right portions of the face frame then can be scribed to fit and glued to their respective cabinets. The process is repeated for the upper cabinets.*

SOLID DETAILS FOR LONG-LASTING DOORS

For most cabinet doors, I make stiles and rails from stock that's slightly thicker than ¾ in. I prefer to use mortise-and-tenon joinery (drawing right), but cope-and-stick is also a viable option (drawing below). I cut the grooves and tenons on the tablesaw, using a dado blade and (for the tenons) a sliding miter gauge. I use a 5⁄16-in.-wide mortise-and-tenon joint; I have found that my mortising machine's 5⁄16-in.-dia. auger bit and hollow chisel are less likely to break from overheating than are ¼-in. tools. My door panels are typically solid wood. If the groove is ½ in. deep, I make the panel ⅛ in. less all around to allow for some expansion. In summer, when the relative humidity is high here in Indiana, I make the panels extend closer to 7⁄16 in. into a ½-in.-deep groove.



When I make cabinet doors, I keep the stock as thick as possible, at least ¾ in. and ideally ⅞ in. I flatten door stock on the jointer, then run it through the thickness planer to ensure that it is flat, square-edged, and uniform thickness. Using bar clamps rather than pipe clamps can help to keep doors flat. I lay the door directly on the clamp-bar surface so that I can detect any deflection, and clamp the door to the bar using smaller clamps if necessary. I check for square by comparing diagonal measurements and hold a straightedge across the top and bottom of the frame to ensure that the rail and stile joints are glued up flat, not bowed. I also check for twist, either by sighting across the bare surface of the door or with the aid of winding sticks. Finally, I check the back of the door to make sure the panel is centered in the frame, and I adjust it if necessary by applying pressure with a wide chisel.

When the doors are dry, I rough-fit them to the cabinet openings using a handplane or a tablesaw. Then I rout and chisel mortises for the butt hinges on the cabinets' face frames; the mortises in the doors will come later.

Next, I install the case backs and the solid ledgers. These hanging strips are screwed not just through the ¼-in. plywood cabinet backs, but directly through the top, the sides, or both. If the strips go only through the back and the back should somehow detach from the case, the entire assembly can fall forward, causing damage and possibly injury.

Installation starts at the highest point of the floor

Because this design called for an applied base molding, I could shim the casework up to level and count on the baseboard to hide the shims. I began from the high point on the floor and shimmed the cases up to level as necessary. The sections also were clamped together, so I could treat the three cabinets as a single unit if the wall behind them wasn't flat.

end covers the seam between the cabinet and the ¼-in. back. After cutting biscuit slots to join the case sides to the tops, I used cleats fastened with glue and brads or screws to support the case bottoms. The biscuit- and cleat-supported butt joints were reinforced with 1½-in. screws once the casework was put together.

As we assembled the cases, I checked for square and twist. I also cleaned off squeezed-out glue before it dried.

Solid-wood parts need special consideration

Depending on the finish, I use either mortise-and-tenon joinery or pocket screws to assemble face frames before gluing them to carcases. Although pocket screws are quick and simple, I don't think the joint is as immobile as a glued mortise and tenon. While a hairline gap isn't as noticeable in natural wood, I've learned the hard way not to use pocket screws for painted work that needs to look seamless. For this project, once the face frames were pocket-screwed, we glued and clamped them to the carcases.

The solid-maple counter was made by edge-joining two or three full-length boards. To increase the glue surface and to keep the boards even during clamping, I used biscuit joints about every 18 in. along the length. I determined the approximate location of the finished end so that I could avoid the nightmare of exposing a biscuit when I made the final cut. I sand and finish counters in the shop before I scribe and install them.

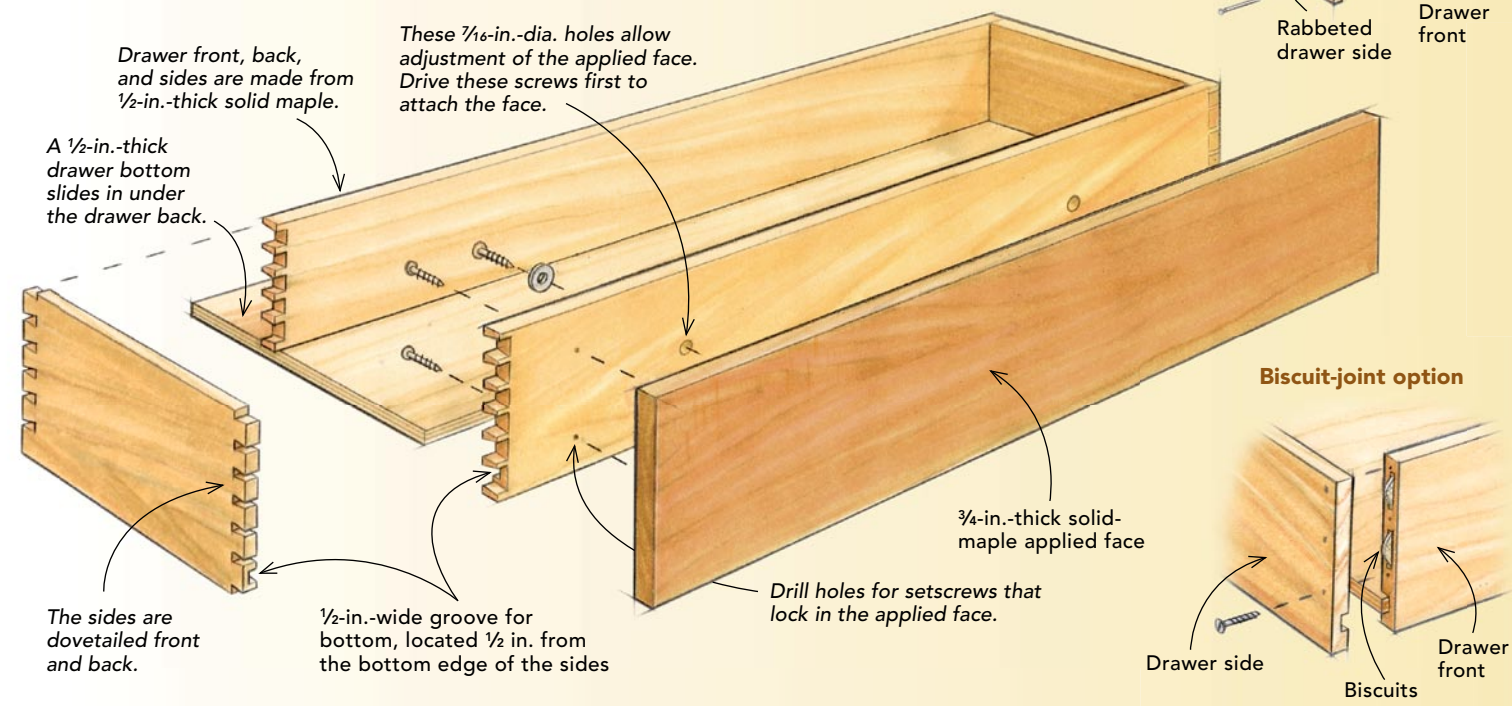
Drawer size and weight determine drawer-

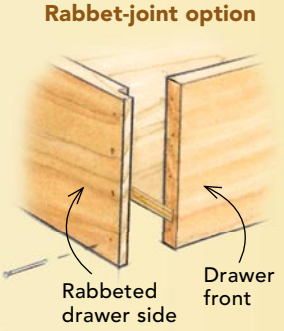
A drawer that's 40 in. wide requires special slides to withstand the stresses placed on it when it's fully extended. However, the full-extension, heavy-duty 12-in. drawer slides from Accuride (model 3640; www.accuride.com) that I chose turned out to be ¼ in. longer than the inside of the base cabinets. Fortunately, cutting a hole in the cabinet's back (photo right, facing page) made just enough space.

To install the drawers, we hang the drawer box first and apply the face later (see facing page).

DRAWER CONSTRUCTION AND INSTALLATION: HANG THE BOX, THEN ATTACH THE FACE

I usually make drawers from ½-in. solid stock and dovetail the corners; it's a joinery option that my customers expect. (For less-expensive projects, I use biscuits or a rabbeted joint, as shown in the detail drawings at right.) I groove the inside faces of the front and sides to accept the drawer bottom (I use ⅜-in.- or ½-in.-thick plywood for the bottoms of extrawide drawers to prevent them from sagging). I also rip the back even with the top face of the drawer bottom so that I can slide in the bottom once the drawer sides are glued. Securing the bottom with small screws (but no glue) provides the option of a removable drawer bottom.





I use solid wood for counters because it generally holds up better than plywood and looks better with wear. When a solid counter is attached to a plywood case, the wood has to be able to move with changes in relative humidity. I set the counter in place and scribe as necessary, then attach it with screws in oversize holes that allow for wood movement.

As with the bases, I scribe the right face-frame stile to conform to irregularities in the wall, then screw together the upper units to form a single assembly before attaching it to the rear wall. No shimming is necessary because these upper cases are placed on a surface that should be level. I scribe the finished ends as needed and glue them in place. I also sand the face-frame edges flush if necessary.

Hang the doors and drawers after the casework is locked in

After applying the baseboard and crown molding, we work on the doors. For inset applications, I like to plane doors and drawer faces to size after installing the casework. Although this technique is unconventional, I find it more efficient. Once in their final position, cabinets don't always sit quite the way they did in the ideal conditions of the shop, so postponing this final fitting until the installation is complete means the work is done only once.

After shimming the doors in place with the proper margins (about 3/32 in. for stain grade, more for painted work), I mark the positions of the hinge mortises on the door stiles. Once marked, the door is clamped in a vise or on sawhorses, where I rout the mortises and mount the hinges. Once the door is rehung, I do a final fitting with a handplane.

Setting the drawers is the final stage. After finalizing the fit, I use a pair of screws and fender washers to hold the drawer face in position. Once I'm satisfied with the fit, I drive in four additional screws to lock the face to the drawer box. □

Nancy R. Hiller runs a custom-cabinet shop in Bloomington, Ind. Photos by Kendall Reeves.

slide hardware

Typically, we hang the box with special low-profile screws that can be purchased with the drawer hardware. The box should be hung initially about ⅛ in. behind its final position. In this instance, we were working with ¾-in.-thick applied drawer faces, so the box was set back ⅞ in.