

# Building Kitchen Cabinets on Site

**B**ack when I had a small cabinet shop in Connecticut, I built kitchens the old-fashioned way, the *right way*. Although beautiful when finished, the cabinets took forever to build. Over time, I slowly modernized my methods. But I was really making only minor refinements of an essentially antique process. Then I had the good luck of moving to Austin, Texas.

I worked briefly for a man named Paris Carroll, a craftsman with no fear of technology. He came to each kitchen-cabinet job with a stack of plywood, prepped face-frame stock, a few basic tools and plenty of pneumatic nailers. Everything was glued and nailed. If I was a bit skeptical at first, it didn't take long to see that his cabinets were solid and fit beautifully. What amazed me most was how fast they went together.

After I finished school in Austin and moved back to stodgy New England, I built a few kitchens with overlay doors and cup hinges using many of Paris's techniques. I couldn't imagine going back to my old methods. When a project came along that called for the traditional look of face-frame cabinets with flush-fit doors, I started looking for a faster way to build them. Borrowing heavily from what I had learned in Austin, I figured out how to make site-built cabinets that look every bit as traditional as cabinets painstakingly built in a custom shop.

## The key is making the face frames after the doors have been hung

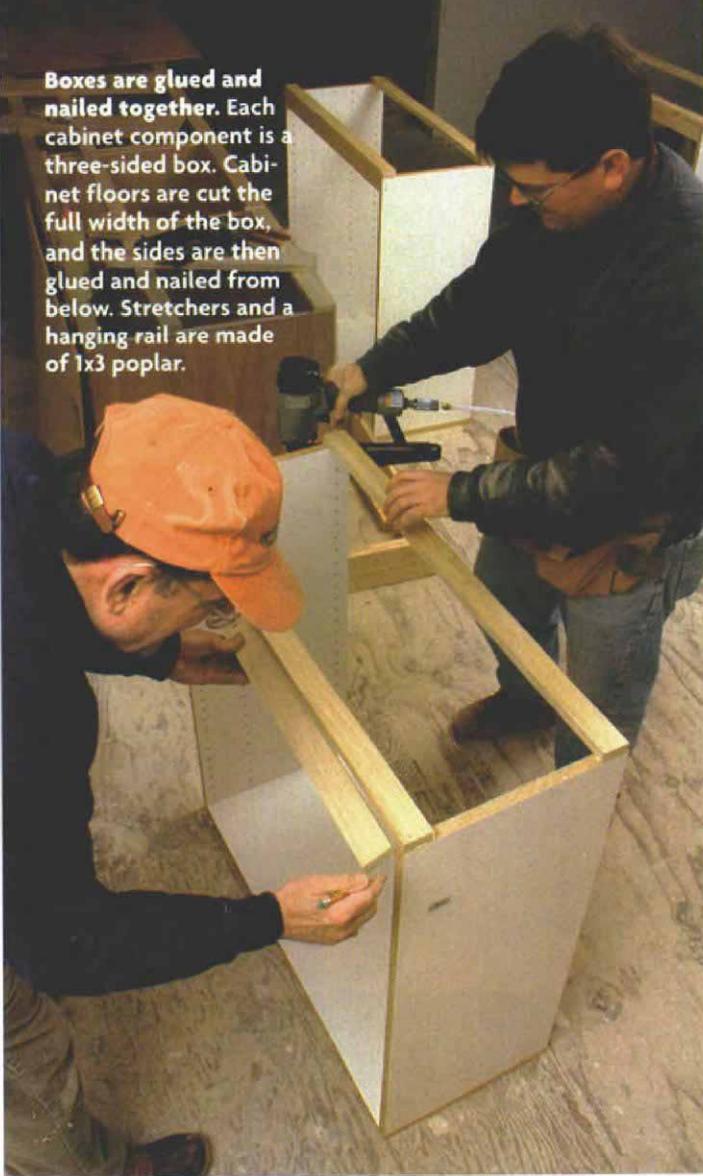
My cabinets consist of plywood or melamine boxes tied together with two layers of face frame: a structural subframe made from poplar and a finished face frame in the same wood species as doors, drawer fronts and trim. Face frames are assembled with butt joints, glue and air-driven nails, but because joints overlap each other, the finished cabinets are amazingly strong and rigid.

The proper door hinge is important. Face-frame cup hinges result in a door overlay of at least  $\frac{1}{2}$  in., and the doors never sit quite flush. I knew they wouldn't work. Half-overlay cup hinges made for frameless cabinets, on the other hand, are adjustable from front to back as well as up and down and from side to side. They mount on the cabinet side, not on the face frame, and result in a door overlay of about  $\frac{3}{8}$  in.

It may seem backward at first, but I hang the doors after the subframe has been installed. Then the finish face frame is added, piece by piece, around the doors. It's much faster than the traditional method of hanging inset doors in a finished cabinet. When you do it the old-fashioned way, you have to hang a door on butt hinges, check the fit, take the door out to plane it and then hang it again. And again. It's a tedious process at best. Now I can make adjustments on small pieces that are easy to run through a table saw or small jointer *before* they are attached. Cab-

Make face frames after the doors are hung for a perfect fit and quick, no-hassle installation

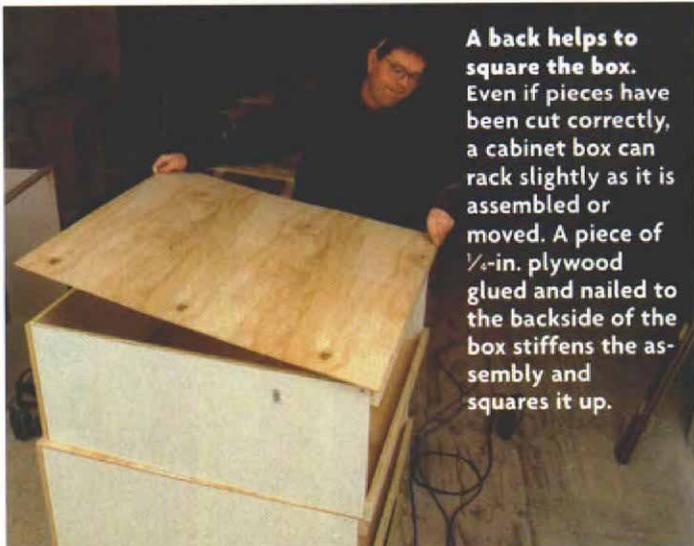
BY JOSEPH B. LANZA

A photograph showing two men in a workshop. One man, wearing an orange cap, is leaning over a large, partially assembled cabinet box made of light-colored panels and wooden frames. The other man is standing behind it, using a power tool. The floor is made of wood.

Boxes are glued and nailed together. Each cabinet component is a three-sided box. Cabinet floors are cut the full width of the box, and the sides are then glued and nailed from below. Stretchers and a hanging rail are made of 1x3 poplar.

## USE MELAMINE OR PLYWOOD TO BUILD CABINET BOXES

Base cabinets for site-built kitchen cabinets start with simple carcasses made from  $\frac{3}{4}$ -in. particleboard-core melamine or a shop-grade hardwood plywood. Although plywood is lighter and somewhat stronger, melamine is less expensive, and it needs no additional finish. For cabinets with adjustable shelves, the author often uses melamine predrilled for shelf pins. These base units, without face frames, are  $22\frac{1}{2}$  in. deep and  $29\frac{3}{4}$  in. tall. With a toe kick and a  $1\frac{1}{2}$ -in. allowance for the countertop, the cabinets will be a standard 36 in. tall and 24 in. deep. Wall units are also built from  $\frac{3}{4}$ -in. material.

A photograph of a man in a dark shirt working on a cabinet box. He is holding a large, light-colored plywood panel that will serve as the back of the cabinet. The box is already partially assembled with side panels and a bottom panel.

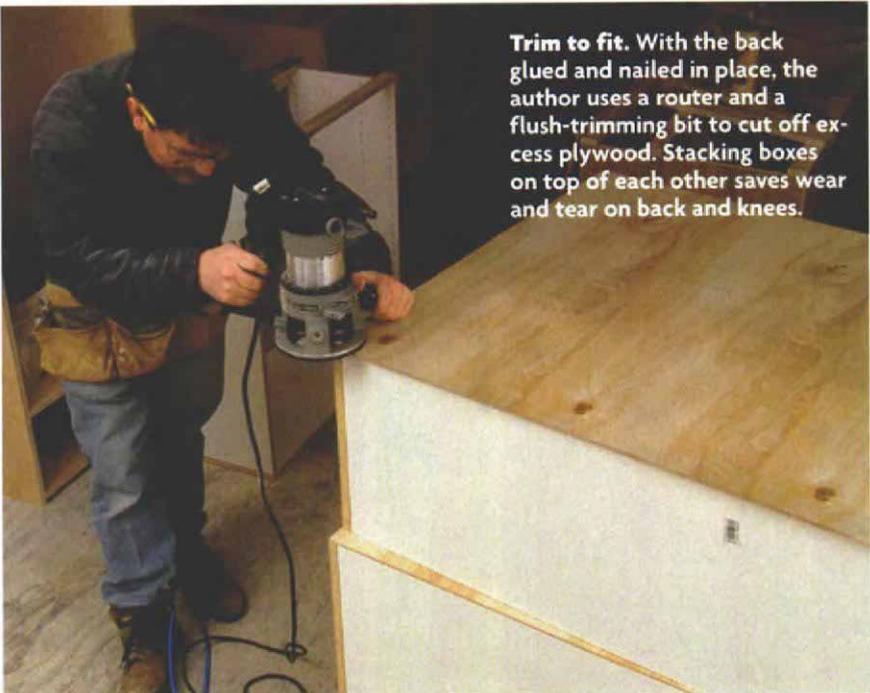
A back helps to square the box. Even if pieces have been cut correctly, a cabinet box can rack slightly as it is assembled or moved. A piece of  $\frac{1}{4}$ -in. plywood glued and nailed to the backside of the box stiffens the assembly and squares it up.

inets are finished in place when they're all done, either with a spray gun or by hand.

A fair question is how these site-built cabinets compare with what you can buy. I've found that even with a staggering array of manufactured kitchen cabinets to choose from, it can be difficult to find the right product. Sizes of manufactured kitchens are usually limited, and the fit and finish may not be what the customer wants. Several manufacturers and many local shops will build cabinets to any dimension, but this flexibility has high costs. Shop-built cabinets also may require extended lead times and precise planning. Dimensions that vary even a little from drawings cause big headaches. (Ever try to plane  $\frac{3}{16}$  in. off a  $\frac{3}{4}$ -in. plywood cabinet side?)

By building cabinets on site, I get finished cabinets with a finely crafted, "meant-to-be-there" look, and the process is speedy. □

Joseph B. Lanza is a designer and builder in Cambridge and Chatham, Massachusetts. Photos by Scott Gibson.

A photograph of a man in a dark jacket and blue jeans using a hand-held router on the top edge of a cabinet box. The router is being used to trim the excess plywood from the top surface. The cabinet box is stacked on top of another one.

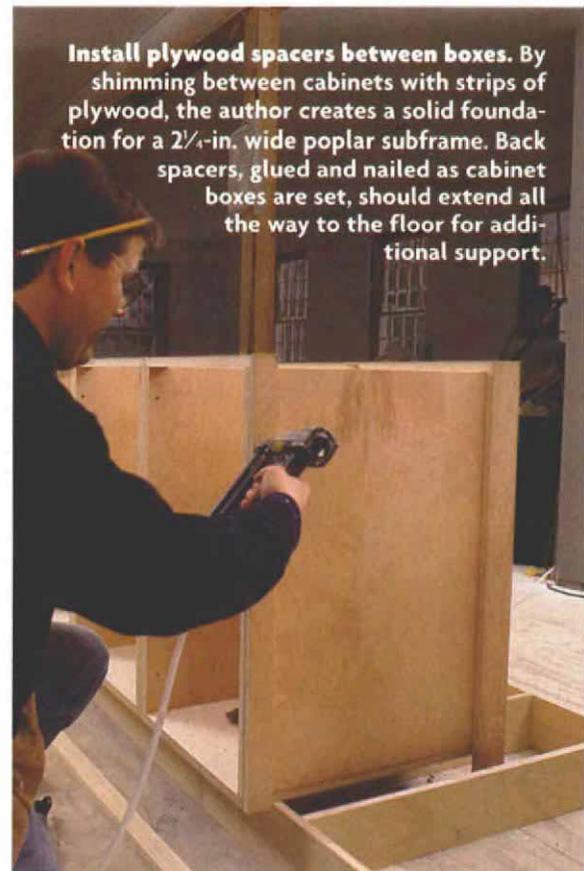
Trim to fit. With the back glued and nailed in place, the author uses a router and a flush-trimming bit to cut off excess plywood. Stacking boxes on top of each other saves wear and tear on back and knees.

## SET BOXES ON A LEVEL BASE

These cabinet boxes have no integral toe kick. Instead, they are set on a narrower base that creates one. The author makes bases from  $\frac{3}{4}$ -in. plywood glued and nailed together. He dimensions them so that they provide a 4-in. high by 3-in. deep toe kick once the finish floor has been installed. After checking the floor for level, he makes the bases to the smallest dimension—it's much easier to shim up the base than it is to scribe and cut it down. Bases are attached to the floor with 2x4 blocking screwed to the subfloor. Spraying the faces of the base with flat black enamel before cabinet boxes are installed makes the base virtually invisible later.



**No heavy lifting.** Even a large kitchen island, such as this 12-ft. long unit, can be handled by a single person because it is made of a number of smaller components.



**Install plywood spacers between boxes.** By shimming between cabinets with strips of plywood, the author creates a solid foundation for a  $\frac{2}{4}$ -in. wide poplar subframe. Back spacers, glued and nailed as cabinet boxes are set, should extend all the way to the floor for additional support.



**Screws complete box assembly.** Screws unify the boxes. Countersunk screw heads are hard to see when the cabinets are completed. Three 2-in. screws along the inside of each box, front and back, are plenty.

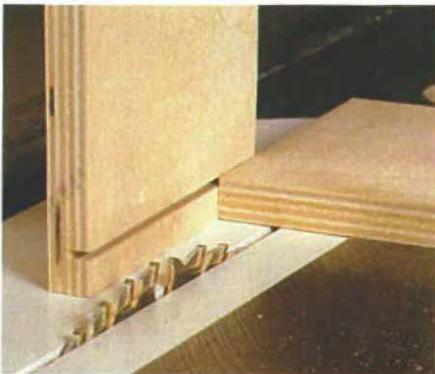
## A SUBFRAME HOLDS THE WHOLE THING TOGETHER

A finished run of cabinets is amazingly strong, in part because cabinet boxes are tied together with a subframe made of  $\frac{3}{4}$ -in. poplar glued and nailed in place. The three horizontal pieces (top, bottom and drawer rails) span the full length of the run. Vertical pieces fill the spaces between them. Most of the poplar subframe will be covered later with a finish face frame. But a reveal about  $\frac{3}{8}$  in. wide will form door and drawer stops, so the author keeps nails inside this imaginary line as he attaches the pieces with a 16-ga. finish nailer.

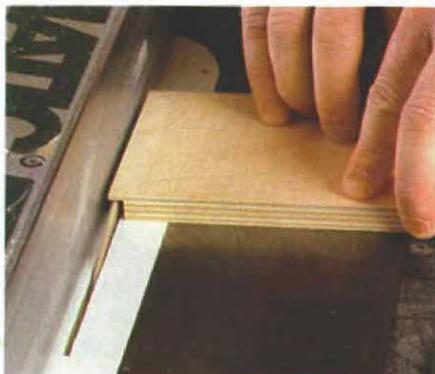


## Strong plywood drawers with simple joinery

Working with  $\frac{1}{2}$ -in. Baltic-birch plywood, the author builds drawers on site. Using void-free plywood with thin hardwood plies makes it possible to leave edges unbanded. The author uses a roundover bit on a router table to relieve both inside and outside edges on the top of the drawer sides. Drawer bottoms are  $\frac{1}{4}$ -in. hardwood plywood. Corner joints can be cut on a table saw with only a few setups and little fiddling. Completed drawer boxes are glued and brad-nailed at the corners. To make assembly easier, the author rips the drawer back so that the drawer bottom can slide beneath it.



**Kerf the inside face of drawer sides.** The first step is to cut a saw kerf at the front and back of each drawer side. The slot offset should equal the thickness of the plywood that will be used for drawer fronts and backs.



**Tenons on drawer fronts and backs.** Tenons on the mating drawer pieces are exactly the thickness of the saw kerf and as long as the slot in the drawer sides. Tenons are cut in several passes on a table saw. Aim for a snug fit.



**A good fit.** With yellow glue and a couple of brads, this simple joint should last a long time. With joinery completed, the author cuts the groove for the plywood bottom in a couple of passes on a table saw.

## INSTALLING DRAWER SLIDES AND HANGING THE DOORS

Ordinarily, a cabinet gets its face frame before doors are cut and trimmed to fit. Not here. With only a poplar subframe in place, the author next turns to doors and drawers. Finish drawer fronts, which are made on site, are added later, after the face frame has been installed. A number of companies make cabinet doors. These doors came from the Cabinet Factory (2600 Hemstock St., La Crosse, WI 54603; 608-781-6355) and cost about \$11 per sq. ft of door. The author uses top-quality full-extension drawer slides.



**A jig for installing hinge plates.** Cup hinges attach to plates that are screwed to the insides of the cabinets. A jig for predrilling holes in the cabinet speeds the installation process considerably. This jig works for both top and bottom hinge plates.



**Snap-on hinges are a joy to install.** If the jig has been made correctly, hinge parts will align, and doors should snap right into place. These Blum hinges allow the door to be adjusted in three directions for a perfect fit.



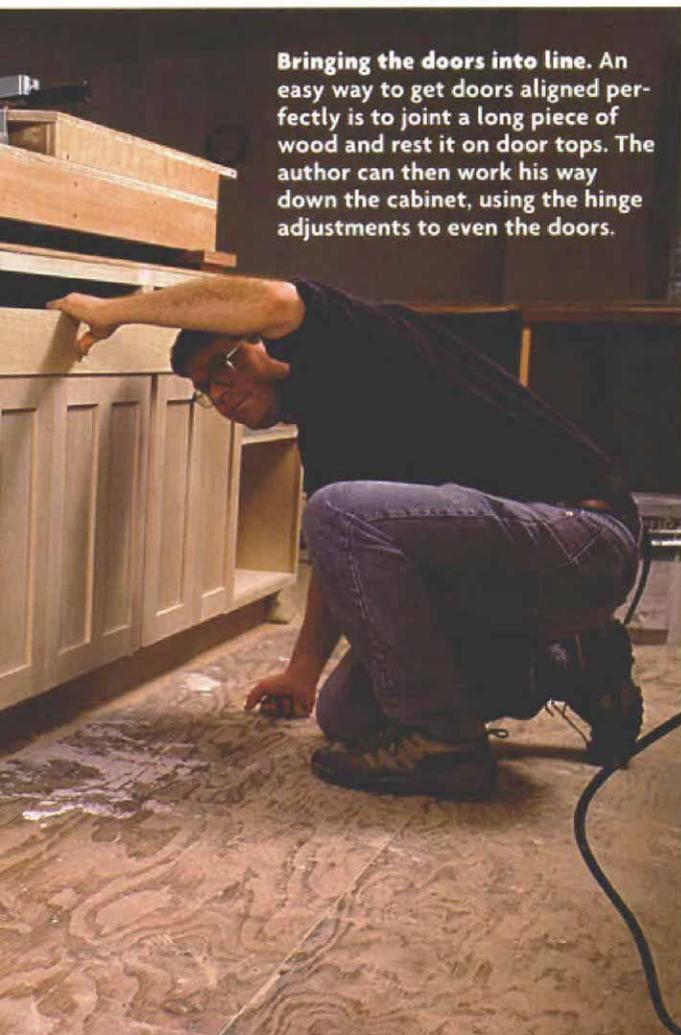
**Scrap wood becomes a jig.** A length of 12-in. wide flooring that has been cut to the right length and then stood inside the cabinet makes an effective support for a long drawer slide as it is screwed to the cabinet side.





## THE FACE FRAME COMPLETES THE CABINET

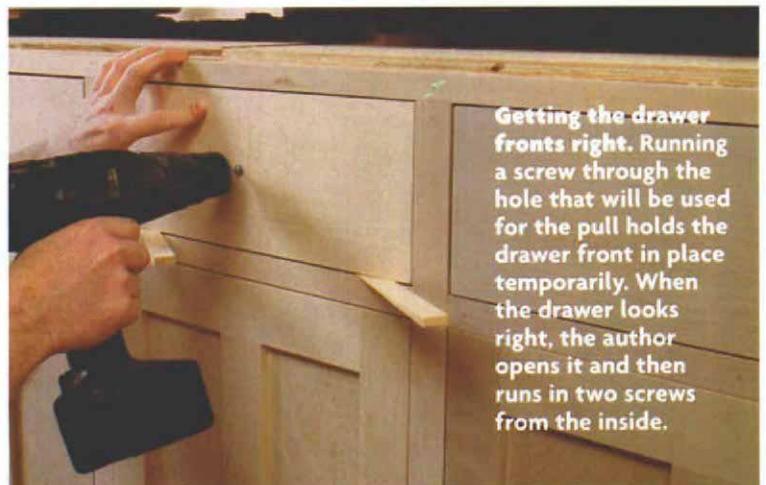
With doors hung and aligned, the author adds the finish face frame. Keeping reveals between face-frame pieces and doors consistent, ordinarily a fussy process with inset doors, is easy because the face frame is added one piece at a time. If gaps between doors are not perfectly consistent, face-frame pieces can be tapered slightly with a hand plane or on a jointer. The author starts with full-length stiles at both ends of the cabinet, adds a one-piece top rail and then fills in with the drawer rails and the shorter stiles between doors. He uses a brad nailer and yellow glue to attach pieces.



**Bringing the doors into line.** An easy way to get doors aligned perfectly is to joint a long piece of wood and rest it on door tops. The author can then work his way down the cabinet, using the hinge adjustments to even the doors.



**It looks traditional, but it isn't.** Overlay doors look like traditional inset doors when the author adds the finish face frame. When filling in short pieces, cutting one end at a slight bevel helps to ensure a tight fit.



**Getting the drawer fronts right.** Running a screw through the hole that will be used for the pull holds the drawer front in place temporarily. When the drawer looks right, the author opens it and then runs in two screws from the inside.