



A Woodworker's Kitchen

Save money and show off your craftsmanship
by building custom cabinets

BY SCOTT GIBSON

Making your own kitchen cabinets offers one of those rare chances to get more by spending less. It's far less expensive than ordering cabinets from a showroom, yet the result should be better than virtually anything you can buy. Think of a set of cabinets as a room-size piece of furniture. You choose the materials you like and steer the project wherever you want creatively. In the end, you get a kitchen that's been tailored to suit your tastes and meet your needs exactly.

Building cabinets isn't complicated, although it can seem repetitive at times. It requires only the tools that most home woodworking shops already have.

I have three or four books that explain how to make cabinets, all of them a little differently. My approach is a mixed bag that includes some fussing over details but also relies on assembling cabinet boxes and drawers quickly with biscuits, glue, a few screws, and pneumatic nails. I use inset drawers and inset doors with butt hinges for a fine furniture feel.

I'd never argue that my approach is the only way, but it will give you strong, durable, and attractive cabinets that are easy to adapt to kitchens of different architectural styles.

Planning early prevents headaches

Taking enough time to plan the project is the key to creating a great-looking, truly functional kitchen. Before you touch a piece of stock, develop a floor plan showing cabinet locations and dimensions and a detailed map of where you want everything to go. That includes canned vegetables, cutlery, the coffee pot, your beloved Kitchen Aid mixer, recycled newspapers—everything. If you're planning a kitchen with your mate, this is the time to decide

together how the space should be used. Don't miss a chance to make the kitchen completely your own.

Kitchen design is a complex trade, and there are a variety of sources available for industry standards on cabinet sizes and heights, and recommended distances and clearances between cabinets and appliances. For more information, visit the

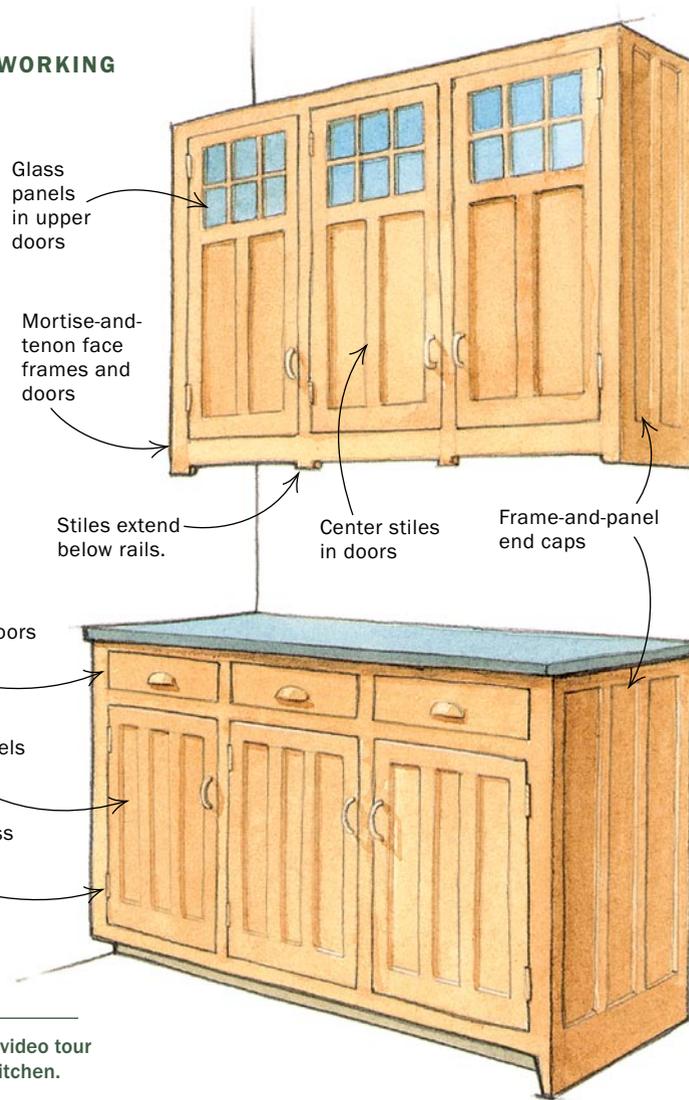
National Kitchen and Bath Association at www.nkba.com.

One of the first steps is deciding how to break up runs of cabinets into smaller, more manageable units. I'd rather not move anything longer than about 60 in. because it is heavy and awkward.

In this kitchen, the peninsula that includes the dishwasher, sink, and butcher-block

SAVE THE FINE WOODWORKING FOR THE OUTSIDE

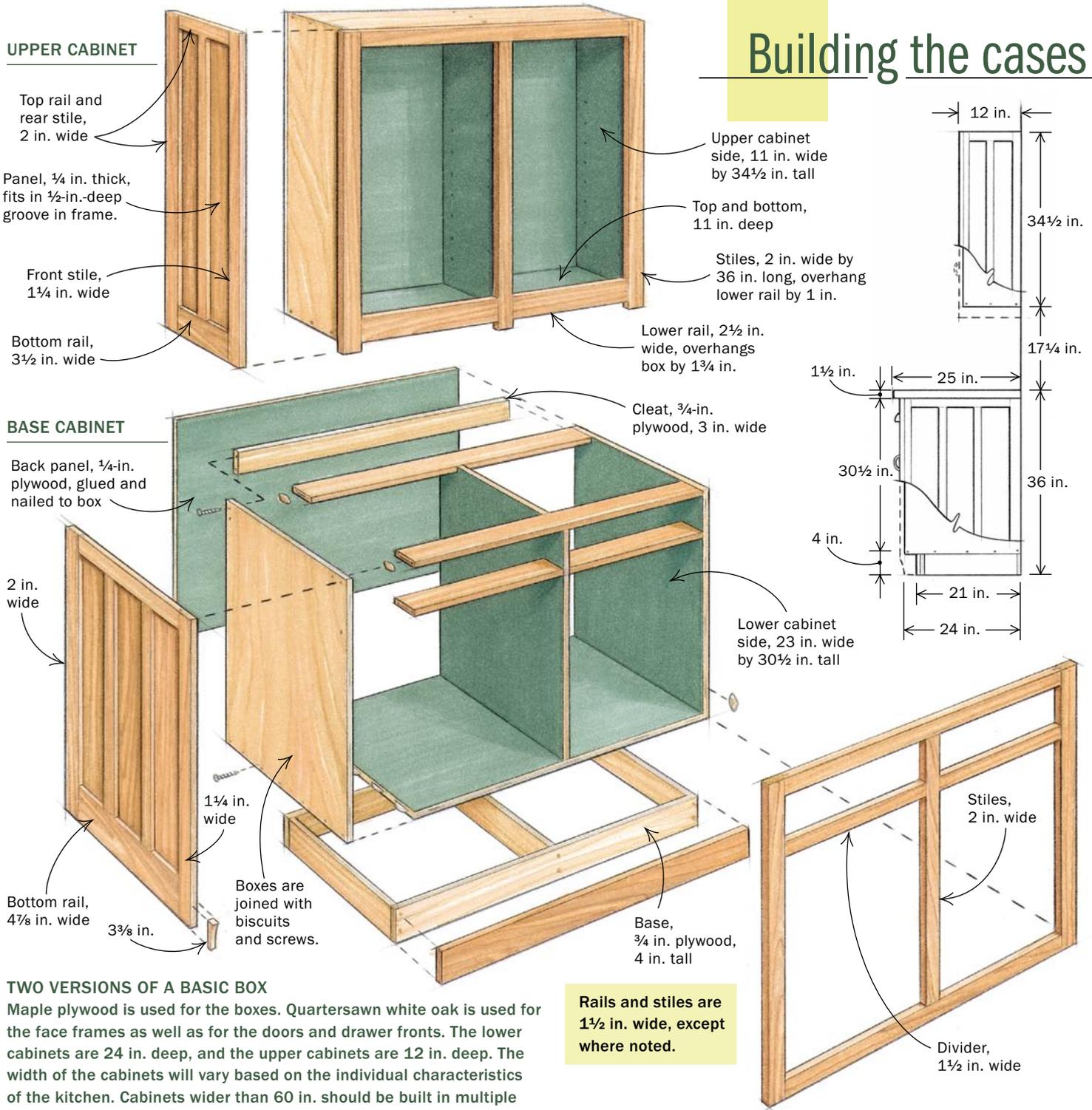
Gibson focuses his efforts on the elements that people will see—face frames, doors, drawer fronts, and end caps. His cabinets combine Shaker simplicity with a hint of Craftsman style that is appropriate to his new Maine home. He relies on a basic set of dimensions that is flexible enough to be adapted to almost any kitchen.



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Visit our Web site to take a video tour of Scott Gibson's finished kitchen.

Building the cases



food prep area calls for about 80 in. of cabinets. I split that into two pieces, one cabinet for the sink and an adjacent cabinet for storage. The longest piece is just over 60 in. Even with drawers and doors removed, that cabinet with its finished end panel was a chore to move, but there was no logical way to divide it into smaller sections. On the other end of the spectrum, cabinets narrower than about 12 in. aren't

of much use for general storage but may be ideal for cookie sheets, spice jars, and odds and ends. In a kitchen, every inch counts.

A blend of plywood and hardwood

These cabinets are made mostly from 3/4-in. maple plywood plus solid hardwood for face frames, doors, and drawer fronts. The hardwood in this kitchen is quartersawn white oak. At the time, it was between \$1

and \$2 cheaper per board foot than either walnut or cherry.

I gladly spent extra money on Baltic-birch plywood for the drawer sides and bottoms. Although not as easy to find, it has more plies, fewer voids, and greater strength than standard veneer-core plywood. For cabinet backs, the \$12-a-sheet 1/4-in. lauan plywood works just fine, but it's just too flimsy to use on drawer bottoms.



Biscuit joinery is quick and strong. Biscuits align and anchor the interior dividers to the cabinet shelves. Note that the mating surfaces were not stained.



The cleat bears most of the cabinet's weight. It is attached to the back of the cabinet box and used to anchor it to the wall. The cleat provides enough strength to hold a fully loaded cabinet.

Brads secure the back. Gibson uses brads to attach the 1/4-in. plywood back of the cabinet. This gives the inside a finished look and adds stability to the box.



Baltic-birch plywood comes in 5x5 and 4x8 panels. The larger size typically gives you more flexibility in cutting out cabinet parts with less waste. For instance, the drawers in my kitchen are all 22 in. long. I can get four drawer sides from a rip on an 8-ft. panel with only 8 in. of waste. The advantage of the 5x5 sheets is that they're lighter and easier to maneuver single-handedly over the tablesaw.

Lower cabinets: Divide and conquer

While each upper cabinet is a single box, lower cabinets consist of two parts: a cabinet box and a separate base that creates the toe-kick, that space at the bottom of a cabinet that allows you to stand and work comfortably at the counter. Having the base as a separate unit makes both construction and installation easier; the base is leveled before the cabinets go on.

When completed with a face frame, these cabinet boxes are 24 in. deep by 30½ in. tall. The bases are 4 in. tall. Taller people may prefer their completed cabinets an inch or two taller, including the counter, than

the 36-in. standard that I used. The upper cabinets are 12 in. deep by 34½ in. tall.

After cutting out the pieces for the upper and lower cabinets, I cut a ¾-in. by 3-in. notch in the top rear corner of any internal partitions. This is for the cleat, a 3-in.-wide piece of plywood used to anchor the cabinet to the wall. On the upper cabinets, this cleat supports the cabinet's entire weight.

Once pieces are cut, they can be laid out for biscuit joints. I use #20 biscuits and 1¾-in.-long screws. The screws add some strength, but their main purpose is to clamp the pieces together while the glue dries. These joints are very strong.

Before assembling the boxes, sand and finish the inside surfaces of all cabinet parts and then cut all the shelf-pin holes in the parts for the upper cabinets. I taped off the areas where parts would join, and then I stained the inside of the boxes with a latex stain that covers nicely in two coats and dries quickly.

Traditional joinery makes strong frames

A cabinetmaker friend asked how I made face frames. Mortise and tenon, I told him. Oh, he said, you'll have to get over that.

No doubt cutting mortises and tenons is time-consuming, but I think it makes the frames easy to assemble and glue up. I

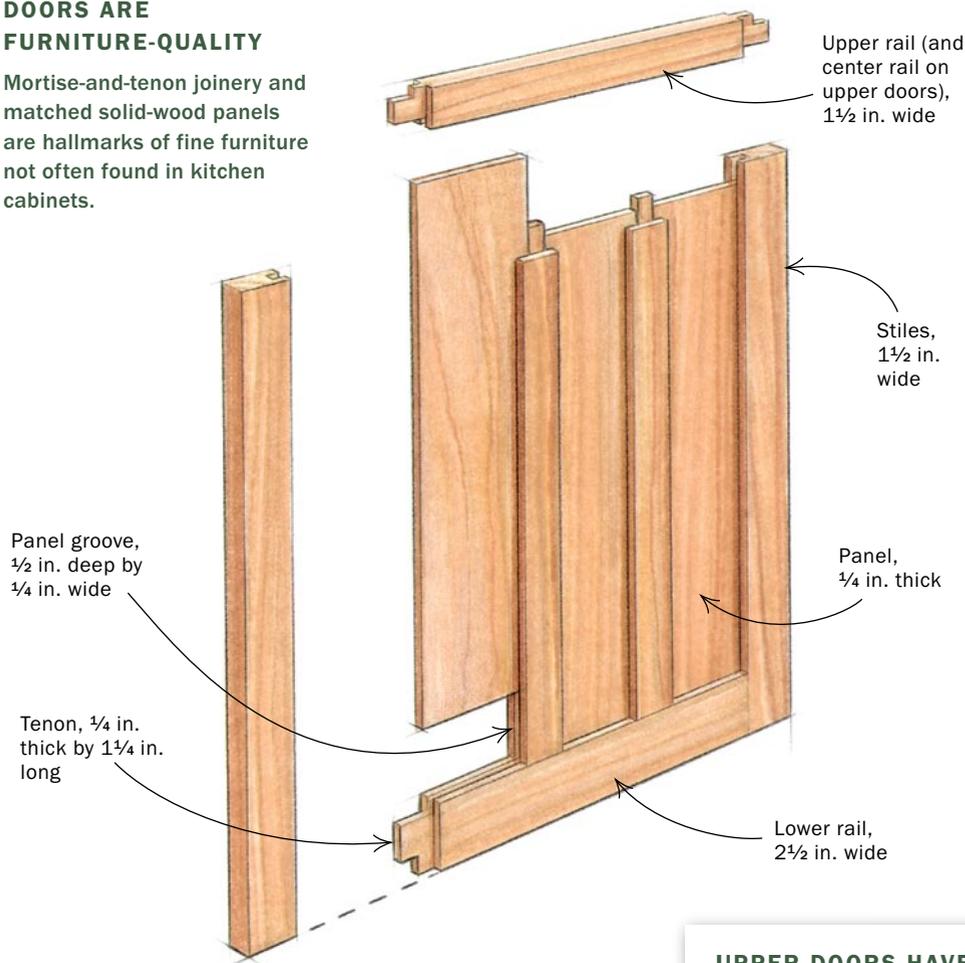


Biscuits align face frames with cabinets. Accurate measuring is critical when installing biscuits.

Doors vs. drawers

DOORS ARE FURNITURE-QUALITY

Mortise-and-tenon joinery and matched solid-wood panels are hallmarks of fine furniture not often found in kitchen cabinets.



cut mortises with a benchtop hollow-chisel mortiser and tenons on a tablesaw. Once you get into a rhythm, it goes quickly. You also could use biscuits or pocket screws.

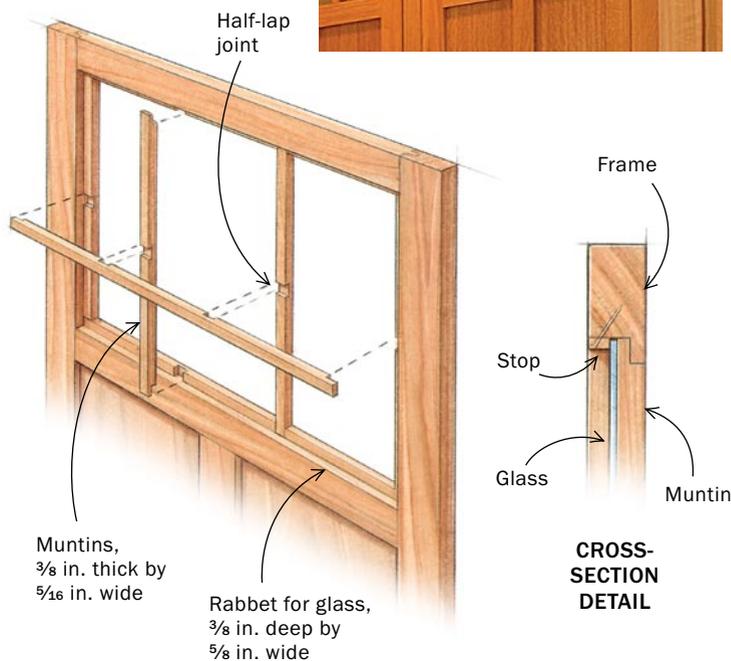
Determining the widths of individual face-frame members is a matter of personal choice. It's all about what your eye likes. Lay out the face frame so that it's at least ¼ in. wider on each side than the plywood box. That allows the cabinet to be scribed to an adjacent cabinet or a wall (in old houses with really crooked walls, make the allowance greater than that). Take care to make and clamp the frame so it's square. This is more important than getting a perfectly square plywood box.

One preliminary step that saves time later is to cut any mortises for butt hinges in the stiles before you glue the frame together. It will never be easier than right now.

When the frame has been glued up and allowed to cure overnight, I lay the cabinet on its back, put the frame on the face, and mark both the frame and the cabinet



UPPER DOORS HAVE GLASS PANELS



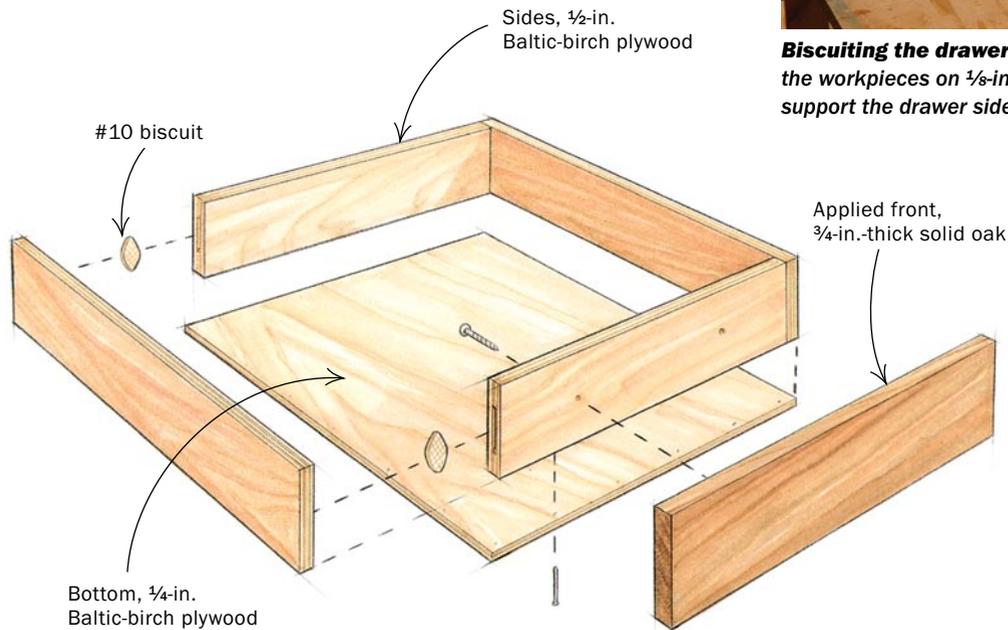
INSTALLATION TIP

Attach hinges to the face frame first. Use shims to set the lower and upper gaps. Then mark the door with the location for the hinge mortises.



DRAWERS ARE SIMPLE AND STRONG

Gibson used Baltic-birch plywood for the drawer boxes, which are biscuited at the corners. The bottom is glued and nailed on. The drawer boxes are 22 in. deep and 1 in. narrower than the opening to accommodate slides.



box for biscuits. Yellow glue is probably all that's required to keep the face frame in place, but a few biscuits will help align the frame and keep it from drifting out of place when it's clamped. You usually can clamp the perimeter of the frame, but for the middle of the box you can use pieces of wood flexed between the cabinet and the ceiling to create downward pressure.

Drawers: Simple boxes with solid fronts

When it comes to drawers, I look for sturdy boxes that can be made quickly and accurately. I used to make dovetailed drawer boxes from yellow poplar, but I gave that up in favor of 1/2-in. Baltic-birch plywood with a single #10 biscuit at each corner. It's very fast and the drawer boxes are strong and, at least to me, attractive.

Drawer bottoms traditionally fit in a groove cut into the sides of the drawer box. Instead, I attach the bottom with glue and brads. The drawer slides I use—full-extension ball-bearing models—disguise the edge of the plywood on the bottom. Just remember to sand the insides of all the pieces before assembly, and keep the small

bead of glue for the bottom to the outside so that you don't get too much squeeze-out in exposed parts of the drawer box.

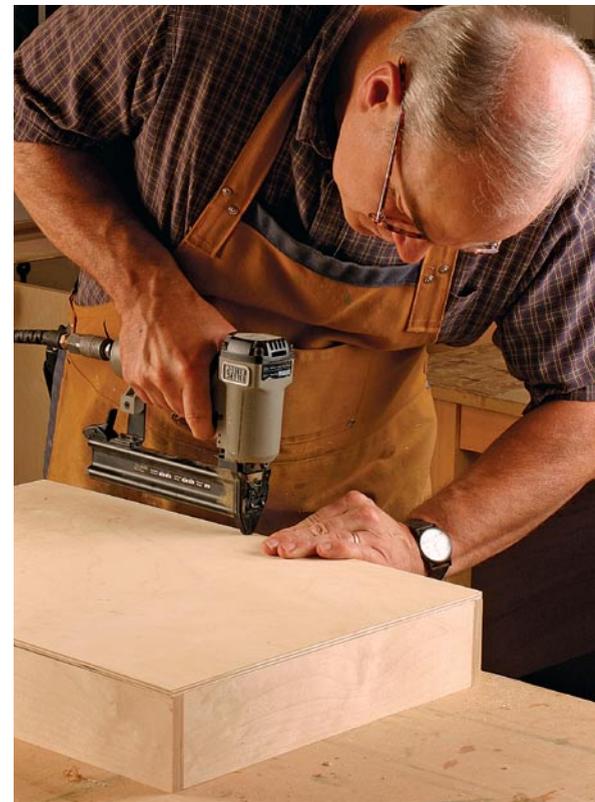
Drawer faces are applied to the box and screwed on from the inside. The drawer boxes don't have to be the same height as the drawer opening. Keeping them a little undersize makes installation easier. But the drawer fronts should fit the openings exactly, with a narrow, even margin all the way around. Leave more room in the winter than you do in summer to account for seasonal expansion and contraction.

Doors are mortise-and-tenon with solid panels

After saving all that time on the drawers, I feel like I've earned the time to fuss over the doors. As the most dominant visual element in the kitchen, they're worth the effort. I like inset doors with butt hinges because to me they look like something you'd put in a piece of furniture. European-style cup hinges are a lot more versatile and easier to adjust, and overlay doors are not nearly as much trouble to install, but I've never warmed up to that style. My



Biscuiting the drawers. To center the slots in 1/2-in. plywood sides, place the workpieces on 1/8-in. shims (left). Gibson uses a right-angle jig to support the drawer sides (right). A 1/8-in. shim is needed under the end.



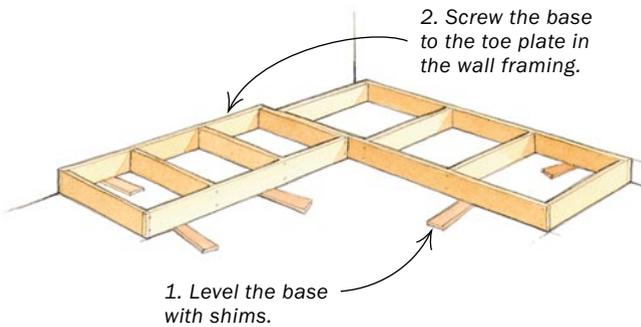
Glue and brads attach drawer bottoms. This simple approach provides strength and durability.



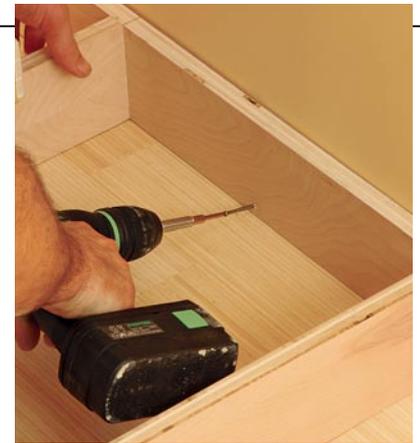
Install the drawer and then the front. Shims ensure that the space between the frame and the drawer front is uniform on all four sides.

Installation

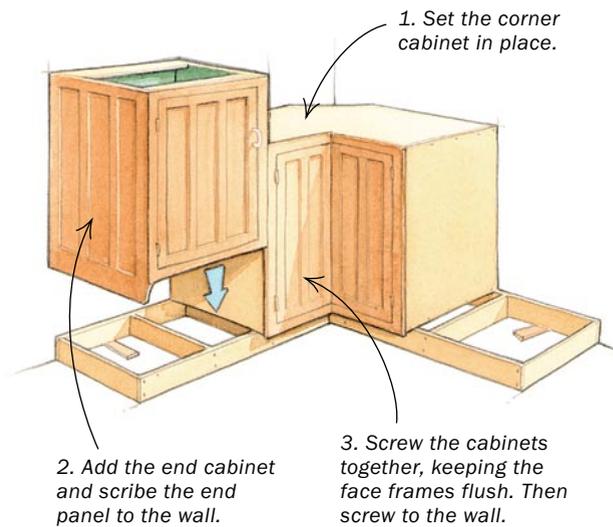
1. LEVEL AND ANCHOR THE BASES



Level with shims. Check side to side and front to back, shimming as necessary (above). When the base is level, attach it to the wall using 3½-in. screws (right). The screws are secured to the toe plate behind the wall.



2. INSTALL THE LOWER CABINETS



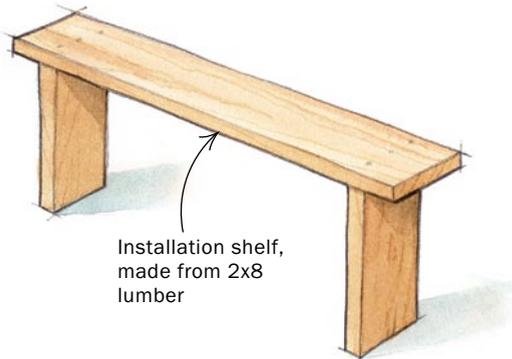
When installing cabinets, start from the corners. Lock those into place and work outward from there.



Scribe the back edge of the cabinet to the wall. Scribe the end cap to the uneven wall and trim it as needed to eliminate any gap (above). Align the face frames and screw the cabinets together to create a solid unit (right).



3. INSTALL THE UPPER CABINETS



Temporary shelf eases installation. It supports the heavy cabinet and guarantees uniform spacing between the upper and lower cabinets. Place a scrap of plywood on the lower cabinets to create a stable base.

approach is to avoid a manufactured look and to create a more personalized feel.

Sizing door parts, like face frames, is really about personal preference. I think the proportions of rail and stile width on these doors are about right. Try to make the doors so that they just squeeze into the openings. If something is out of square, you will have enough excess material to trim the door to a good fit without making the margins too wide.

When doors call for 1/4-in.-thick flat panels, as these do, I like to resaw them from a single plank. This method takes a little time



Attach the cabinets to the wall. Drive 3 1/2-in. screws through the cleat and into wall studs to lock the cabinet to the wall.



but rewards you handsomely in the end. I chose this option because I had some special 4/4 lumber that I wanted to use for the doors. A simpler alternative would be to use quartersawn white-oak plywood.

Be careful to keep the doors flat when you're gluing them up. Use the hinge mortises on the stiles to locate the mating mortises on the doors.

I don't know of any shortcuts to hanging inset doors. You have to install them, see how they fit, remove them, and trim them until the margins are equal. (We're woodworkers. We're supposed to like this stuff.) For door catches I use 1/4-in.-dia. rare-earth magnets from Lee Valley (www.leevalley.com). They're very forgiving to install.

Cabinet installation requires a sound, level foundation

If you've made the bases separately from the cabinets, it's fairly simple to level them. After you've set a base in place, find the high spot and shim everything to that level. Take your time; bases should be level front to back and side to side. Adjacent cabinets must align evenly with each other so that countertops can span them smoothly.

I make the bases from strips of 3/4-in. plywood, the same material I used on the cabinet boxes. Mine are 4 in. tall, but that dimension can change depending on the

height of your box, the counter height, and whether you set the cabinets before or after the finished floor is installed. Plan to add a second face board to the base when you're through. It will hide any gaps.

To secure the cabinets, run screws through the cleat at the back of the base cabinet and about 1 in. into the wall studs.

With an integral cleat that's glued and screwed in place and reinforced with a plywood back, the upper cabinets don't really need a ledger on the wall for support. But installing a level ledger first will make it easier to hang the cabinets correctly. These cabinets will carry a lot of weight, so do not substitute brittle drywall screws for good-quality steel screws. I use #12 screws that penetrate 1 1/2 in. into the studs.

Some of the finishing details, such as a crown molding (if desired) on top of upper cabinets, may have to wait until last if the cabinets were scribed to fit walls. And it's possible that a few of the doors and drawers may need to be adjusted again to correct their fit after the cabinets are installed. Why a door fits beautifully in your shop but not after the cabinet has been installed is just one of those life mysteries we're destined not to solve. □

Scott Gibson is a woodworker and writer in East Waterboro, Maine.