

# Build Your Own Kitchen Cabinets



*If you've dreamed of building a kitchen full of cabinets, stop dreaming and start building. Here's what you need to know to get custom results for half what stock cabinets cost.*

For many home woodworkers, outfitting a kitchen with hand-crafted cabinets is the dream project. Who hasn't looked at stock cabinets built with particleboard, hotmelt glue and staples and thought, "I could build something a whole lot better than this for half the money."

And they're right. By

building your own cabinets, you can upgrade materials and construction methods. You're also not locked into "stock" sizes. The style, look, finish, and features are completely up to you.

If you think about it, cabinets are just a bunch of boxes. The only real challenge is the size of such a project. And that's manage-

able as long as you know where to get started and how to proceed.

In the following pages, we'll walk you through how we built these cabinets and how they compare with stock cabinets purchased from a home center. And hopefully inspire you to consider building your own.

**RAISED PANELS**



**BEVELED GLASS**



**LIGHTED VALANCE**



**3/8" INSET DRAWERS**



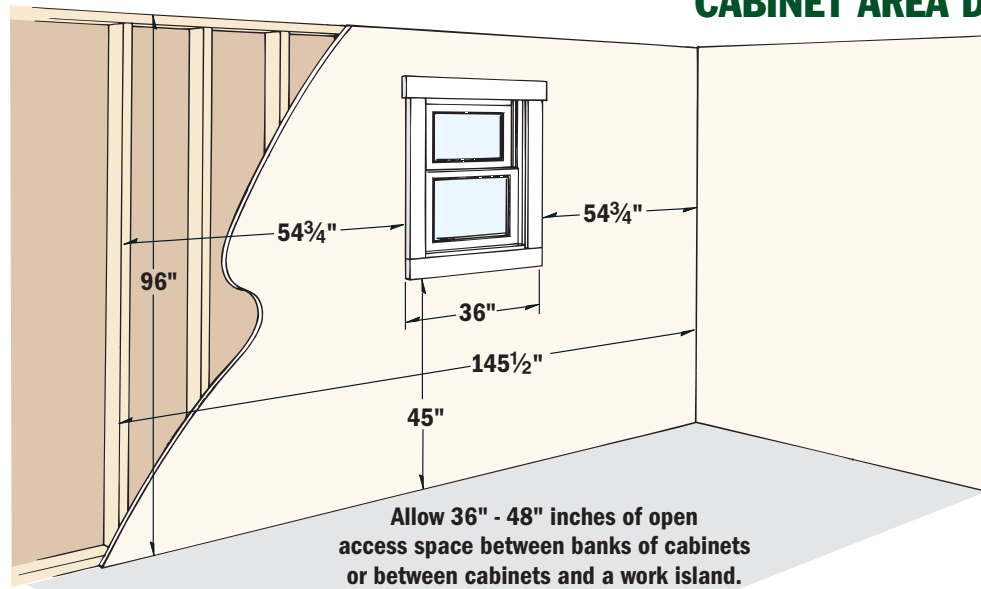
**CUTTING BOARD**



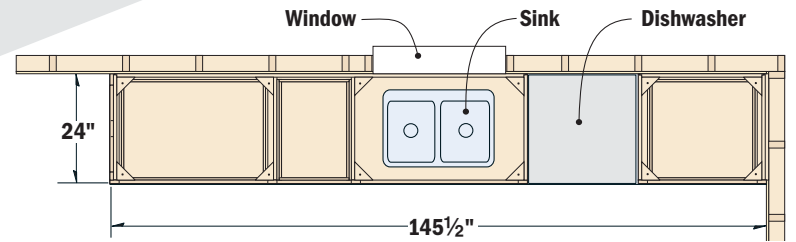
**CUSTOM HARDWARE**



## CABINET AREA DIMENSIONS



## FLOOR PLAN



### BUY OR BUILD?

Unless you're independently wealthy, there's a limit on how much you can spend for store-bought (stock) cabinets. The typical approach is to pick out what you like, then whittle away at the extras to stay within budget.

But suppose you could spend that same amount on materials. By discounting the labor (after all, this is time spent in the shop), you can keep some of those extras and upgrade the materials and improve the quality. I found this out first-hand with this kitchen project.

Because kitchen configurations can vary so greatly, I built one basic wall of cabinets shown above. The wall measures just over 12 feet long and has a double-hung window

centered within the space. I wanted the sink to be located directly underneath the window. Since there isn't a soffit in this room, I could use extra-tall (42") wall-hung cabinets.

To help justify building the cabinets, I decided to do a little comparison shopping. So I took the layout to a local home center and asked them to fill the space with stock cabinets. The stock cabinets I selected were a raised-panel style in red oak that fell slightly above mid-range in price.

(See the description and photo of these cabinets at the bottom of the [next page](#)).

To outfit the kitchen with these basic, no-frill oak cabinets (see the [next page](#)), the estimated cost was \$2,553. When I asked them to price the same set-up in cherry, it jumped to \$3,403. Shipping to our door was another \$110.

By contrast, materials for the cherry cabinets I built cost less than \$1,400. And my design included a

## PLANNING AND IDEAS

Obviously, you can't just start building cabinets without extensive planning. While we don't have room to address those issues here, we can steer you in the right direction.

Some of the best information on kitchen layout and design that I found was published by kitchen cabinet manufacturers. The free brochures at home centers contain checklists of what to consider: appliance sizes, utility locations, and the types of activ-

ities and features that are important to you. They provide grids for laying out the kitchen and are excellent sources for ideas on cabinet styles and layouts.

For additional reading, check out *Kitchens That Work: A Practical Guide to Creating a Great Kitchen* by Martin and Richard Edic (Taunton, 1999), and *Building Traditional Kitchen Cabinets* by Jim Tolpin (Taunton, 1994). Check your library or contact Taunton Press at (800) 477-8727.



20"-deep above-counter pantry unit with a built-in cutting board and a knife rack (see [page 12](#)). Such a unit wasn't available in stock cabinetry except as a 24"-deep, full-height pantry unit that overwhelmed the small space.

In fact, the cost was so far below stock cabinets I was able to add in a few more extras. One particularly nice touch was the display cabinet with beveled glass in both the door and the exposed side. The cabinets also feature custom frame-and-panel cabinet ends and a cove molding along the ceiling.

### MATERIAL CONSIDERATIONS

If you stop by any home center you can find stock cabinets in oak, maple, cherry, hickory, pine, and birch. In most cases, at least the face frames, doors, and drawer fronts will be solid wood.

If you build your own cabinets, you're not limited to these materials (see some other options top right).

Another advantage is being able to select and match grain pattern and color. Manufacturers can't afford to spend time doing this. Instead, grain patterns are random and they use a toner to give the wood a uniform color and appearance.

The materials used commercially for cabinet carcasses, drawer boxes, shelves, and interior divider panels can vary widely. Usually, at least some of these parts are made from vinyl-covered particleboard or melamine.

Because my cabinet project required relatively small quantities of material for these parts, the total

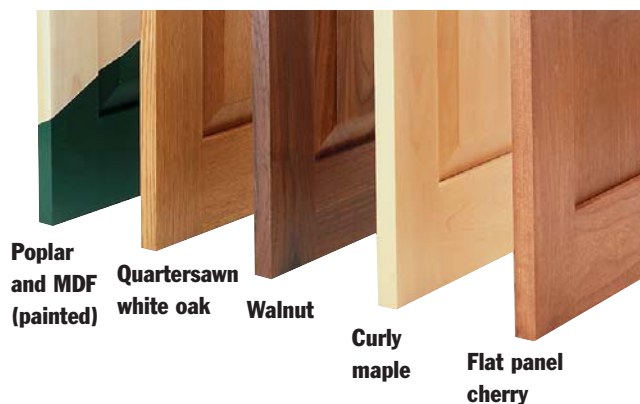
cost difference to upgrade from ½"-thick melamine to ¾" veneer plywood was fairly insignificant.

### RAISED PANEL SUBSTITUTES

I decided to build these cabinets using raised panels. And I'll admit it added both time and cost to glue up solid wood panels, but I thought it was worth it.

A quicker, less expensive option is to build flat panel doors using ¼" veneer plywood (see the top photo at right).

If painted cabinets will work in your kitchen, you might want to consider milling the raised panels in medium density fiberboard (MDF) and building the rails and stiles in poplar. Inexpensive MDF offers the added advantage of being stable, compared to the expansion and contraction of solid wood panels.



My shop-built cabinets feature ¾" inset, solid cherry raised panel doors with wide rails. These features weren't available in stock cabinetry.

### STOCK CABINET COSTS: (Raised-panel red oak)

(2) Wall Cabinets (12"D x 27"W x 42"H)	\$475.54
(2) Wall Cabinets (12"D x 30"W x 42"H)	492.90
(1) Three-dwr. Unit (12"D x 30"W x 18"H)	301.94
(1) Base w/Pots/Pans Drwr. (24"D x 30" W)	377.27
(1) Base w/Trays (24"D x 36"W)	380.99
(1) Base w/4 Drwr. (24"D x 18"W)	194.37
(1) Sink Base (24"D x 42"W)	221.34
(1) Scalloped Valance	49.60
(1) 3"-Wide Base Filler	17.67
(1) 3"-Wide Wall Filler	26.66
(2) Matching Toe kick Panels	14.88
<b>TOTAL</b>	<b>\$2,553.16</b>

**NOTE:** The costs shown do not include countertop.

The stock cabinets as priced do not come with knobs and drawer pulls. Stock cabinet installation is available from most dealers at \$30-\$50 per linear foot.

### SHOP-MADE MATERIAL COSTS:

4/4 Cherry - 100 bd. ft @ \$4.95/bd. ft.	\$495.00
(Face frames, doors, drawer fronts, toekicks)	
4/4 Birch - 30 bd. ft @ \$2.69/bd. ft.	80.70
(Drawer sides, nailers, blocking)	
¾" Birch plywood - 5 sheets @ \$52.50/sheet	262.50
(Carcass sides, bottoms, dividers, shelves)	
¼" Birch plywood - 5 sheets @ \$18.69/sheet	93.45
(Carcass backs, drawer bottoms)	
22" Accuride full extension drawer slides	148.50
(11 pr. @ \$13.50/pr)	
18" Accuride full extension drawer slides	12.50
(1 pr @ \$12.50/pr)	
Beveled glass (2 pieces)	100.00
Bin pulls (antique brass) - 16 @ \$1.40 ea.	22.40
Knobs (antique brass) - 11 @ \$1.10 ea.	12.10
Hinges (antique brass) - 12 pr @ \$1.99/pr.	23.88
Miscellaneous hardware	30.00
Stain and Finish	60.00
<b>TOTAL</b>	<b>\$1,341.03</b>

## STOCK CABINETS: OVERVIEW

So you could see the actual differences between stock cabinets and our shop-built units, we bought two base cabinets and two wall-hung units built by a nationally-known manufacturer.

We had to order them through a local home center — few distributors actually carry an inventory of cabinets. Even with the current building and remodeling boom, it took just four weeks for delivery.

These cabinets, pictured at right, were a basic straight frame-and-raised panel design that represented the upper middle price range. For additional cost, we could have upgraded some components (more decorative arched panels, plywood side panels, and heavier drawer slides).

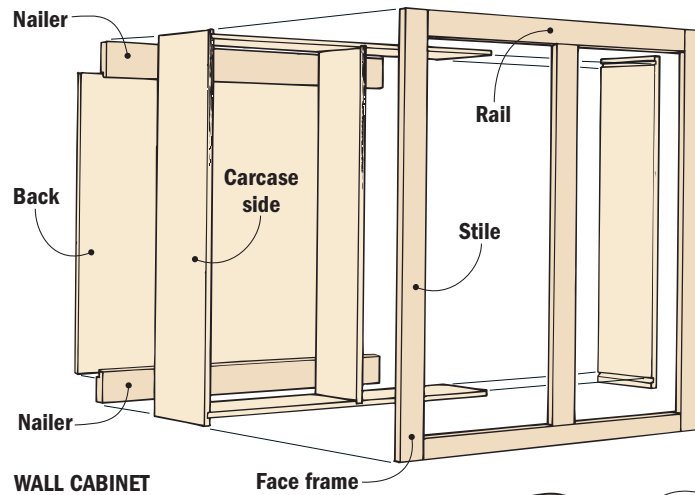
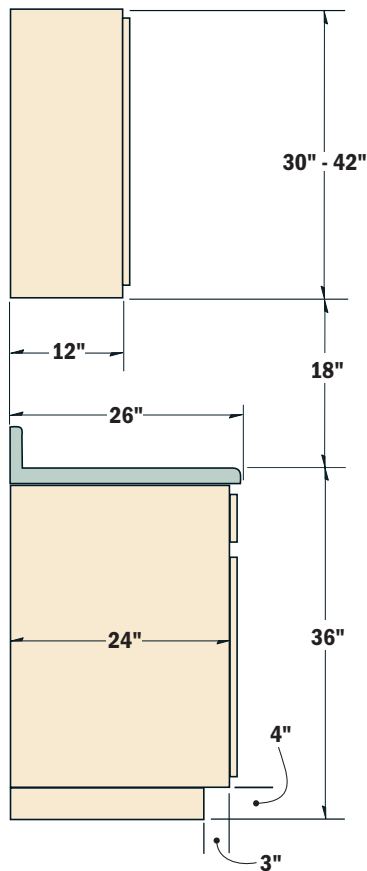
At the bottom of the following pages we'll show construction details of these cabinets.



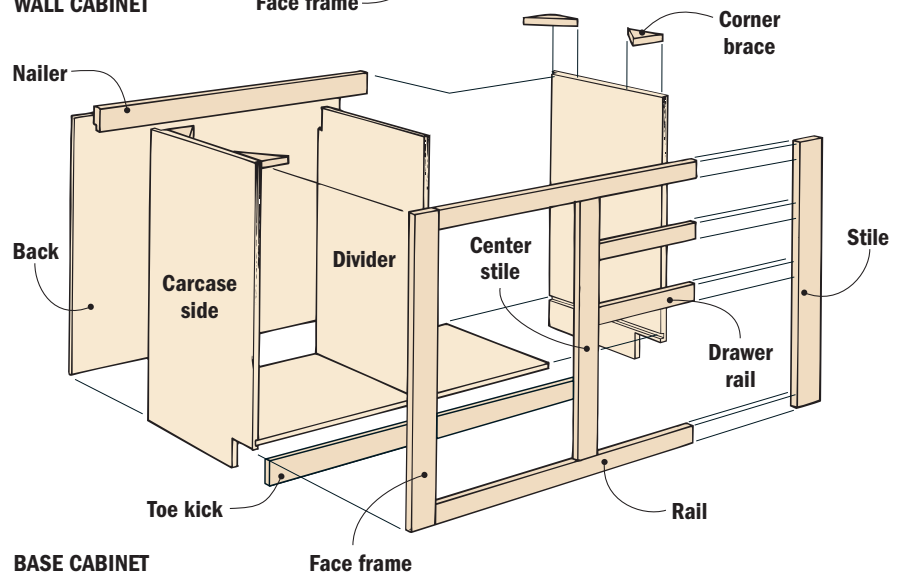
# ANATOMY OF A CABINET

## STANDARD CABINET DIMENSIONS

(END VIEW)



WALL CABINET



BASE CABINET

## CABINET STANDARDS EXPLAINED

If you think about it, cabinets are really furniture for the kitchen. And like most furniture, stock cabinets are built to standard dimensions that make them comfortable to work at.

The primary dimensions for cabinets are shown in the *End View* above. The surface of a countertop is typically 36" high, ideal for most kitchen tasks.

Standard depth for base cabinets (not including the countertop) is 24". If they're deeper, it puts you farther away from the wall cabinets and limits how far up and out you can reach.

Base units also have a toe kick space that's 3" deep and 4" high. The toe kick lets you stand up close to the cabinets without bumping your toes.

Standard wall cabinet depth is usually 12" — just deep enough to hold most dinner plates. The height can range from 30" to 42", depending on whether the room has a soffit.

There's usually 18" of separation between the countertop surface and the bottom of the wall cabinets. This puts the middle shelf in the upper cabinets at roughly 72" — a height most people can still reach without getting a step stool.

Width for most stock cabinets varies from 12" to 48", in 3" increments. The drawback here is that not every wall space neatly fits this 3" scheme. My 12' 1½"-long wall, for example, would have required me to buy a filler strip and trim it to 1½"-wide to "extend" the stock cabinets.

## SIZED TO FIT

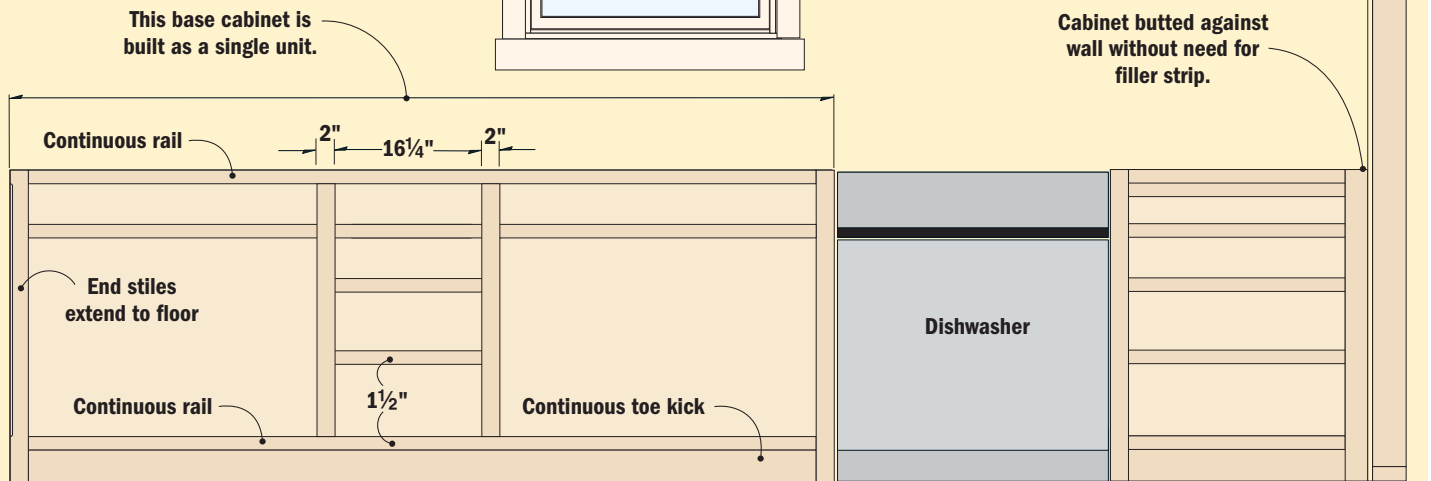
The beauty of building your own cabinets is that you're not locked into these dimensions. They can still serve as a guide, but you can vary them to fit your particular needs.

For example, you can vary heights and widths to easily work around strange door and window configurations. A shorter base cabinet puts the counter at a height that makes kneading and rolling out dough easier for bakers.

While some manufacturers now offer "universal design" cabinets that accommodate persons with physical disabilities (including those in wheelchairs), you can really tailor your shop-built cabinets to meet individual needs. It's all of those custom



## CUSTOM CABINET LAYOUT



touches that provide one of the greatest incentives for building instead of buying.

### MAXIMIZE THE SPACE

The concept behind stock cabinets is that manufacturers build a variety of small, easy-to-handle units that can be combined to fit most any situation. They're easy to mass produce and sized so the cabinet companies can get maximum usage from standard sized sheet goods. And compact sizes (42" widths or less) are easier to ship and store.

While this approach works well for the manufacturers, distributors, and installers, it winds up wasting space. Especially in a small kitchen where space is extremely valuable, you don't want to waste even a few extra inches.

At first glance, the main section of cabinets in the two drawings on this page look similar. Look closer and you'll see that large base cabinet at the left (*above*) is a single unit compared to the three separate stock cabinets (*below*).

By building one large unit, it eliminated the double stiles and gaps between the separate cabinets (see the photo at right). I was able to use this extra space to make drawers that are 14 1/4" wide inside, compared to only 13" in the stock unit.

There's another advantage as well. It took less material — two end panels, two dividers, and four stiles vs. six end panels and six stiles on the stock set. I also think the continuous rails and toekick, and the single stiles give my cabinets a much cleaner look.

Cabinets this large can be hard to move once they're assembled (that's another reason you can't buy a stock cabinet this size). But as you'll see on the [next page](#), the parts can be machined ahead of time and easily assembled in the kitchen just prior to installation.

When you lay out your cabinets, look for the natural breaks between cabinet sections, such as gaps for appliances. For example, I designed my base cabinets in two sections, fitting them on either side of the dishwasher. The larger unit incorporates the sink base, a drawer unit and a drawer-and-doors base.

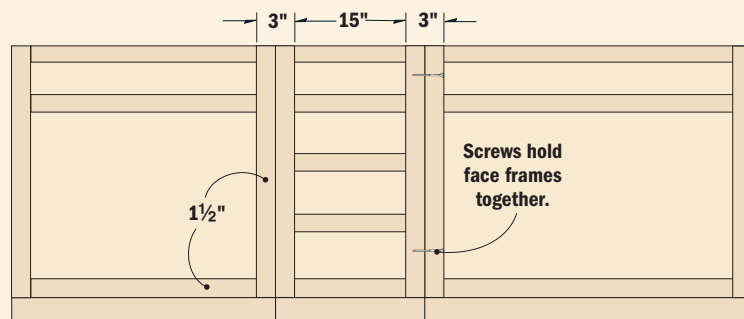


**A single stile and a 3/4"-thick plywood divider panel separate compartments in the large base unit.**

## STOCK CABINETS: MULTIPLE BOXES TAKE EXTRA SETUP

When you install stock base cabinets, you have to shim the cabinets plumb and level to the room and each other — a time consuming process. Once they're lined up, the face frames are clamped together and long screws driven to fasten the face frames together.

You also wind up with a double-wide stile (with a joint line) where two cabinets meet. It just doesn't look as clean and consistent as single width stiles.



## BUILDING THE BASES

At this point, you've seen some of the basic considerations that went into my kitchen design. Now it's time to roll up the sleeves and get into the actual construction.

The first step is to build the base units. As you can see in the drawings at right and on the [next page](#), the base units are simply big plywood boxes with dividers and a face frame on the front.

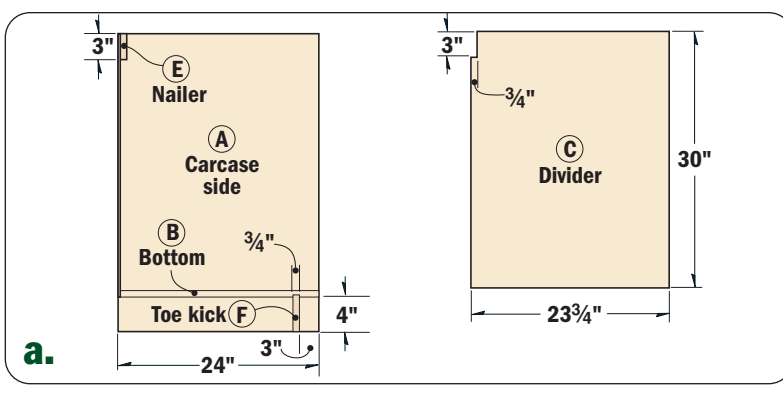
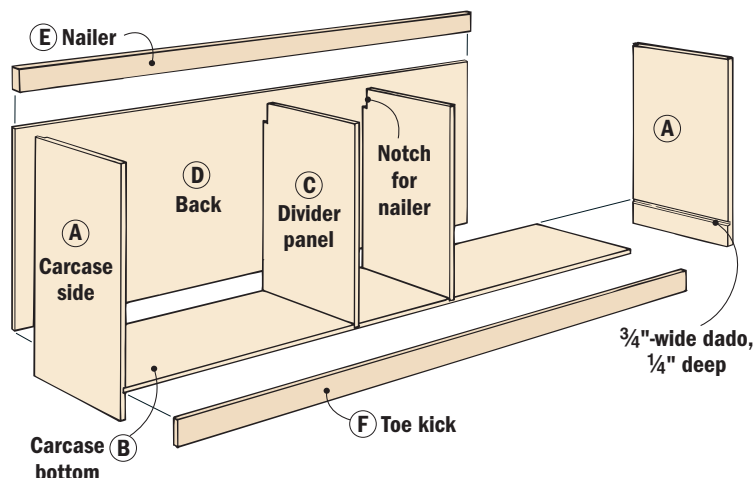
I built the boxes (carcases) out of birch veneer plywood. I decided against melamine or MDF core plywood because those materials lose much of their strength once you cut through the outer skin/veneer. (They also produce some nasty dust.)

I used  $\frac{3}{4}$ " plywood for the carcase sides (A), the carcase bottom (B), and the divider panels (C). The back (D) is  $\frac{1}{4}$ " plywood.

The nailer (E), used for mounting the cabinet to the wall, is solid birch. Since the toe kick (F) is the only exposed portion of the carcase, I made it from solid cherry.

One trick I learned early on was to perform all similar machining operations together. That way, I didn't waste time switching tool setups back and forth. For example, I cut all the cabinet parts to size first, then installed my dado blade and made all the joinery cuts.

## CABINET BASE CARCASE ASSEMBLY



The bottom fits into a dado cut in the carcase side. The toe kick supports the bottom.



The nailer fits between the carcase sides and against the back. A brace adds support.

## USE SIMPLE JOINERY

Joinery in the carcases is simple but strong. Dadoes are cut in the sides (A) to accept the bottom (B), and rabbets are cut along the back edge of the sides for the back (D) as shown in the photos at left and the drawing above.

The bottom is dadoed for the divider panels (C) and grooved on the lower face for the toe kick (F). Besides strength, these dadoes and grooves help keep things lined up squarely during assembly.

To fit the nailer (E) in place, I notched the top corner of the divider panels using a jigsaw. Screws hold the nailer to the divider panels and the carcase sides.

The plywood back completes the carcase and helps square up the entire assembly. I glued and clamped the back to the nailer and nailed it to the sides, divider panels, and bottom using  $\frac{3}{4}$ "-long ringshank nails. The rings grab the wood so the nails won't loosen up over time.

## STOCK CABINETS: CARCASE CONSTRUCTION

So you could see the actual differences between stock cabinets and our shop-built units, we ordered two base cabinets and two wall-hung units.

When they arrived, the overall fit and finish was rough — doors and drawers weren't aligned, some drawer slide attachment screws were missing.

However, the carcase construction was a real disappointment. Before the cabinets were even removed from the

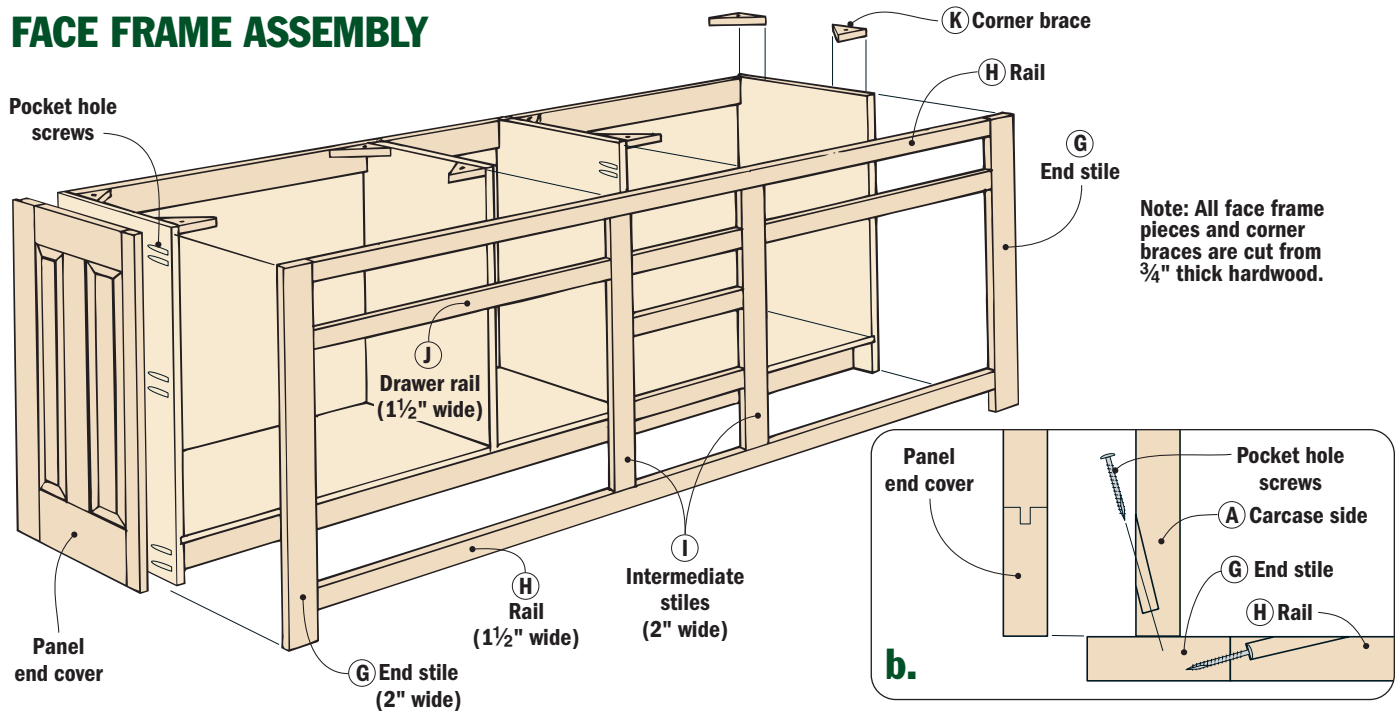
box, the lightweight pine nailer on one of the base cabinets pulled off (see the photo at right). The only things holding the nailer in place were a couple of small dabs of hot-melt glue and two staples driven from the back side into a pair of MDF braces. It would take little force for the cabinet to pull away from the wall with this design.

The carcase sides, bottom, back, and shelves were all vinyl-covered particle



board. The sides and bottom were both  $\frac{1}{2}$ "-thick and the back was  $\frac{3}{8}$ "-thick. The bottom was set into dadoes cut in the sides and hot-melt glued in place.

## FACE FRAME ASSEMBLY



### ADD THE FACE FRAMES

Face frames dress up the front of the cabinet and add structural strength as well. When building face frames in the past, I've used dowels, biscuits, and even mortises and tenons to join the horizontal rails and vertical stiles.

The size of this project, however, was the perfect excuse to try out a new technique. I'd heard that pocket hole joinery was a quick and accurate way to assemble face frames and this project proved it.

Looking at the completed cabinets, the stiles and rails all appear to be the same width. The rails (H) are 1½" wide, but the doors overlap the intermediate stiles (I) on two sides, so I made them 2" wide so the amount left exposed was the same as the rails.

The end stiles (G) are left wider to cover the framed end panels that get added later or to give you some extra for scribing to the wall.

One other added feature of my face frame design is that the end stiles extend down to the floor. This gives the base units a furniture look while covering the carcase ends.

With the face frame parts cut to width and length, the pocket hole jig (shown at right) is used to drill a couple of angled holes on the back side of the rails (H). Then the end stiles (G) and rails, are lined up and clamped together.

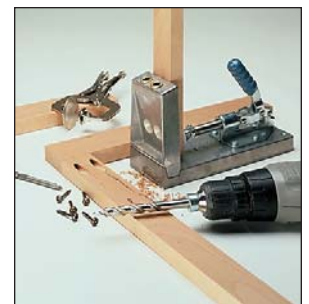
Once everything's positioned, two screws are driven across the joint (you don't even need glue). The intermediate stiles (I) are then attached to the

rails the same way, followed by the drawer rails (J).

Before installing the face frame on the carcase, I applied finish to the inside surfaces of the carcase and stain and one coat of finish to the face frame. It lets you get to both sides of the face frame and eliminates the need for masking off the carcase.

The pocket hole screws came in handy again when it was time to attach the face frame to the carcase (*Detail b*).

Corner braces (K) complete the base cabinet. These help stiffen the carcase and provide a way to fasten the countertop to the base.



## STOCK FACE FRAMES

Like my cabinets, the face frames on these cabinets were ¾"-thick solid wood. And the stiles and rails were held together with pocket hole screws.

Instead of mounting flush with the carcase sides, the stock cabinets' stiles had a shallow groove cut in the back side to accept the carcase sides (photo at near right). To hold the face frames to the carcase, the manufacturer used hot-melt glue and triangular shaped

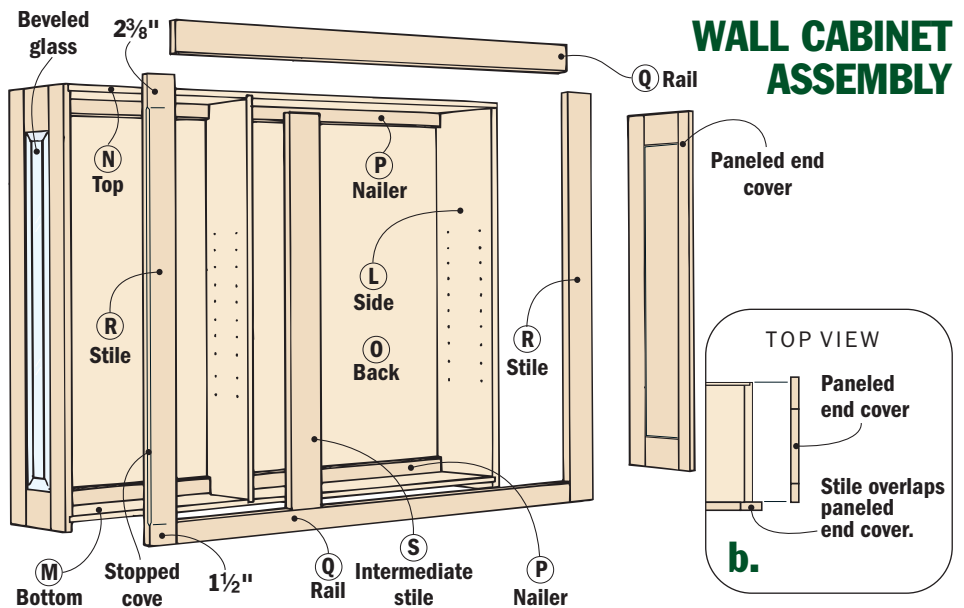
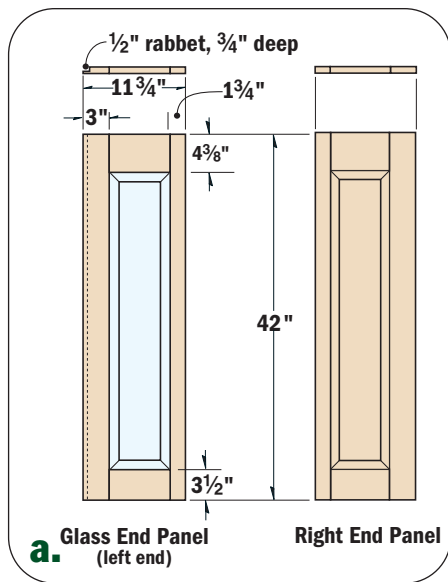


pneumatic fasteners.

As you can see in the photo at the far right, the grain patterns and even wood color used in the rails and stiles vary



greatly. While the faces were sanded smooth, some of the rail and stile edges still showed saw marks from when the parts were ripped to width.



**Adjustable, edgebanded plywood shelves will support heavy loads without sagging.**

## WALL CABINET CONSTRUCTION

The basic construction of the wall cabinets is similar to the base units. The  $\frac{3}{4}$ "-thick plywood carcass sides (L) are dadoed for the bottom (M), and rabbeted for the top (N) and back (O).

The main difference (besides the shallower depth) is the addition of a second nailer (P). While the floor supports the load for base cabinets, wall cabinets must support their own weight plus the weight of what you put in them. With mounting screws driven through the nailers and into the wall framing, these cabinets are rock solid.

As mentioned earlier, this kitchen didn't have a soffit. So I opted for 42"-tall cabinets that extend to the ceiling. Seldom used items go on the harder-to-reach top shelves. But at least when this stuff is stored inside the cabinets — instead of on top of 30" or 36" cabinets — it doesn't collect dust.

In a larger kitchen, I might have considered using a mix of short and tall cabinets to provide display areas for plants or collectibles and create a visual break.

The shelves in the upper cabinets are  $\frac{3}{4}$ "-thick plywood with birch edgebanding (see photo at left). To keep things simple, I drilled a series of evenly spaced (2" apart),  $\frac{1}{4}$ "-dia. holes in the carcass sides for adjustable shelf support pins. To position these holes consistently, I used a 2"  $\times$  30" strip of pegboard as a drilling guide.

The face frames go together just like those for the base cabinets — with pocket-hole joinery. The rails (Q) are drilled, then screwed to the end stiles (R). The intermediate stile (S) is screwed to the rails.

To keep the compartments wide open, I let the doors butt together, eliminating the need for a divider stile. This was also possible because the plywood shelves are strong enough to resist sagging. Many stock cabinets have extra shelf pins in the divider stile to hold up the center of the shelves.

The exposed ends of the cabinets receive frame-and-panel covers, so I made the corresponding stiles wide enough to overlap both the carcass end and cover (*Detail b*). For added interest, I routed a  $\frac{1}{4}$ " stopped cove along the length of the exposed stiles as shown above.

## STOCK CABINETS: WALL UNIT CONSTRUCTION

Construction and materials used on the stock wall units were similar to the stock base units. The  $\frac{1}{2}$ "-thick particleboard top and bottom fit into dadoes cut in the  $\frac{1}{2}$ "-thick particleboard sides.

The backs were mere  $\frac{1}{8}$ "-thick pressboard and add little to the structural integrity of the cabinets. The cabinets had nailers ( $\frac{7}{16}$ "-thick pine) at the top and bottom as well as a  $\frac{1}{2}$ "-thick

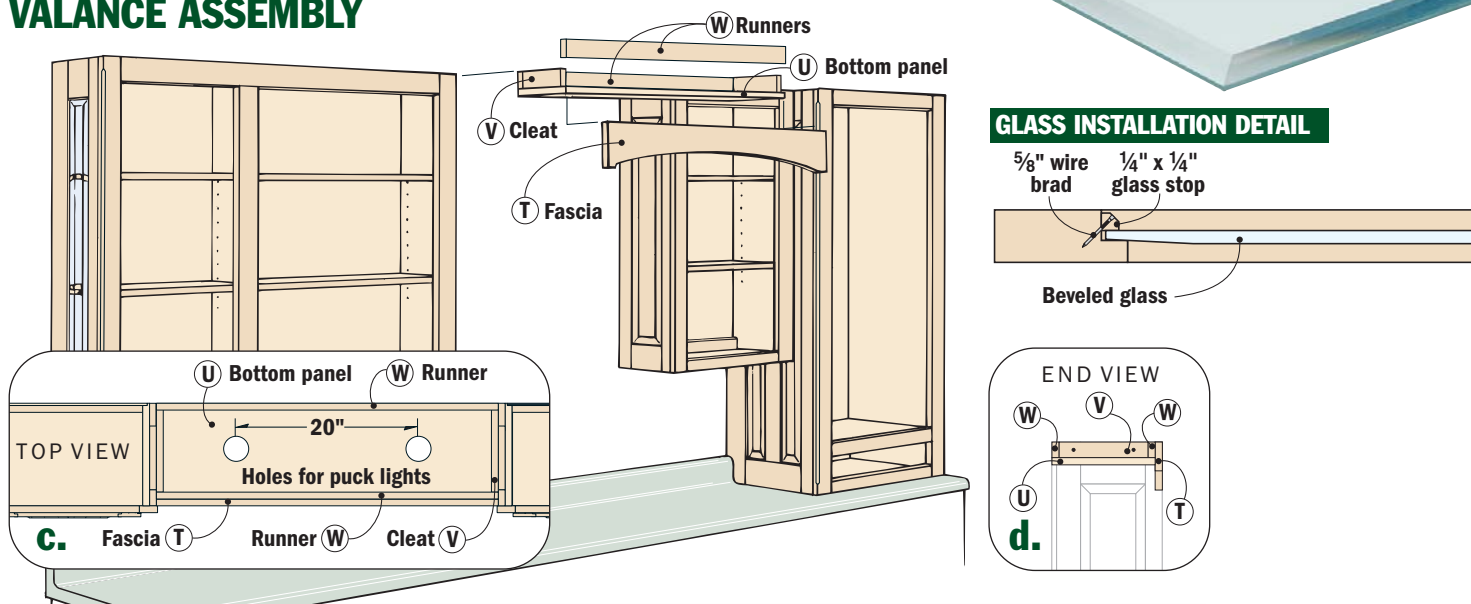
plywood brace across the center of the back. But that's not much to support the cabinets when they're fully loaded with china.

The face frames were joined with pocket hole screws, but held to the carcass with those triangular-shaped pneumatic fasteners. While the shelves were a full  $\frac{3}{4}$ "-thick, they were just vinyl-covered particleboard and were held in place with plastic shelf pins.





## VALANCE ASSEMBLY



### CREATING CUSTOM DETAILS

Most of the custom features I added to the wall cabinets came about because I couldn't find anything similar in stock cabinets. For example, I could buy a cabinet with a glass door, but couldn't find one with a glass end panel.

So, I created a display cabinet by building a paneled end cover frame and installed glass instead of the wood panel — *Glass Installation Detail*. Unlike the other cabinets, this frame is part of the carcass. So once I assembled the frame, I cut a dado and rabbets in the inside face to accept the carcass top, bottom and back.

You'll notice in *Detail a* that the rear stile is wider than the front one and that the rabbet is cut deeper than the 1/4"-thick back. That extra strip allows you to easily scribe the cabinet to the wall.

I considered building some shallow cabinets to go above the window, but decided lights shining on the sink below were more important than the small amount of storage space to be gained. The simple valance shown above bridges the window and connects the two banks of cabinets.

The arched fascia (T) attaches to the 3/4" plywood bottom panel (U) and runner (W). Two cleats (V) attach to the cabinets to provide a mounting surface for the bottom (*Detail c*).

The bottom panel holds two xenon "puck" lights (see [page 13](#)) and hides the wiring and ceiling. Once the wall cabinets were installed, I added matching surface-mounted pucks on the cabinets' underside to brighten up the countertop work areas.

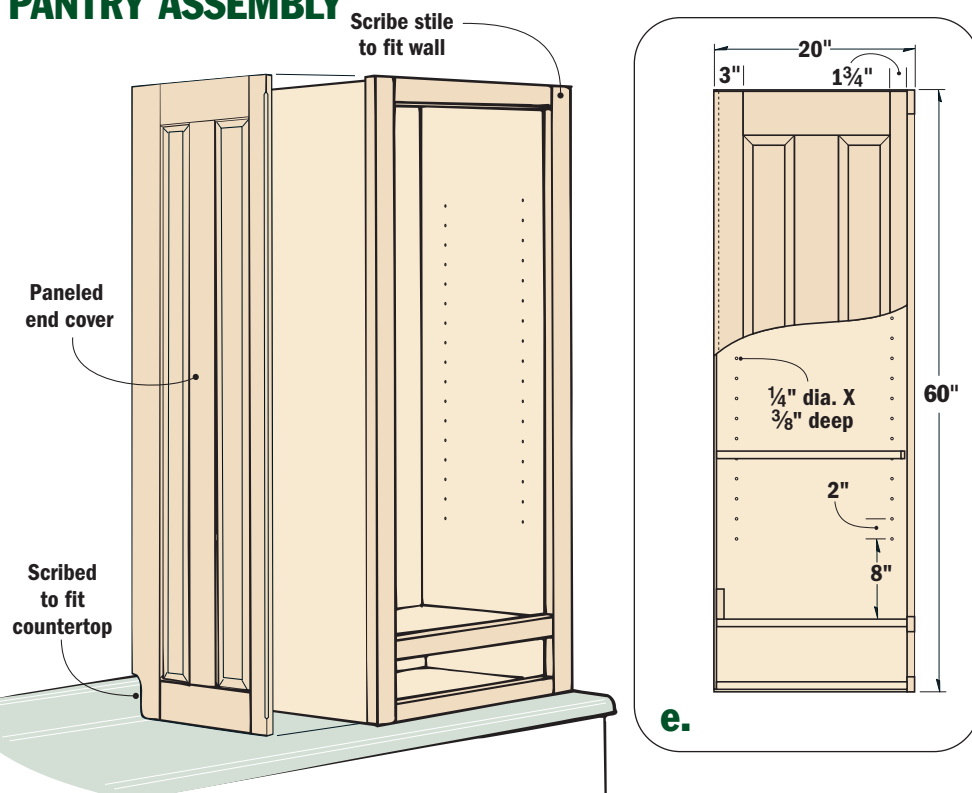
The tall pantry cabinet, to the far right above and detailed in the drawings below, was another extra I added. For starters, it's 20" deep and

that extra depth easily holds cereal boxes and food containers too large to fit in regular 12"-deep cabinets.

It also runs from the counter to ceiling (60"). The only way to get that height in stock cabinets was to stack a 42"-cabinet on top of an 18"-high drawer unit.

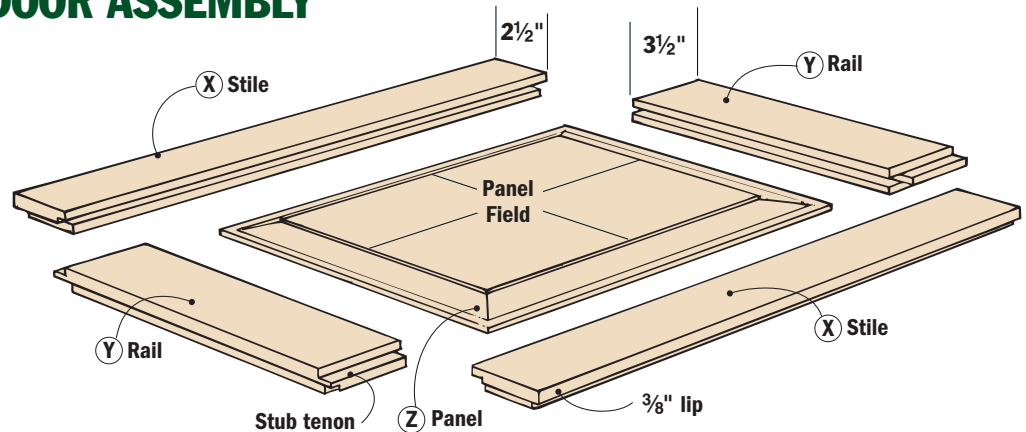
As you'll see on [page 13](#), this cabinet also contains a built-in cutting board and knife rack in the pullout drawer.

## PANTRY ASSEMBLY

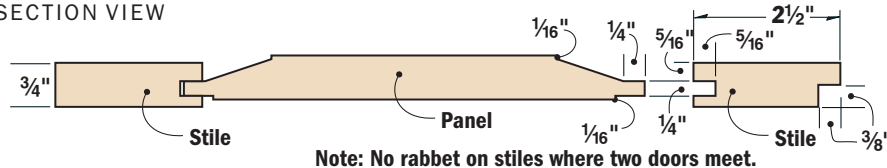




## DOOR ASSEMBLY



### SECTION VIEW



### SIZING THE DOORS AND PANELS

Before you start cutting, it pays to work out all the door and panel sizes on paper. Start by measuring the openings in the face frame. As a general rule, doors should be at least twice as tall as they are wide. This makes it easy to know if an opening needs one or two doors.

To account for the lips and hinges and have some room for adjustment, I added  $\frac{1}{2}$ " to both the width and height of the opening.

For example, the opening on the pantry cabinet measured 24" wide  $\times$  50 $\frac{1}{8}$ " high. The total width for the two doors was 24 $\frac{1}{2}$ ", so I made each door 12 $\frac{1}{4}$ " wide  $\times$  50 $\frac{5}{8}$ " high.

With the door sizes set, the rail length and panel width can be calculated. The stiles are 2 $\frac{1}{2}$ " wide, so the door width minus 5" gives you the size of the opening inside the frame.

But you have to add  $\frac{5}{8}$ " to that distance to account for the two  $\frac{5}{16}$ " grooves for the tenons and panel. So for the 12 $\frac{1}{4}$ "-wide pantry doors, the

### STREAMLINE THE DOORS

All the stock cabinets I looked at had overlay doors. The doors aren't set into the face frame, but lay completely on top of it. That  $\frac{3}{4}$ " thickness sticking out always looks a little clunky to me.

That's why I decided to use  $\frac{3}{8}$ " inset (sometimes called partial overlay) doors and drawer fronts on my cabinets (see drawings above). They have a  $\frac{3}{8}$ "-thick lip that overlaps the face frame while the rest of the door's thickness is inset into the opening.

I also wanted raised panel doors. In the past, I've cut raised panels on my table saw, but even a sharp blade can leave saw marks and burns, especially in cherry. So I invested in a raised panel router bit.

The bit cut smoothly, eliminating most of the sanding. The bit profile I chose cut a flat bevel (Detail a).

### MAKING THE FRAMES

To keep the doors simple, I used stub tenon and groove joinery on the stiles (X) and rails (Y) as shown in the *Door Assembly View*. To fit the panel (Z) to the frame and get it positioned properly, I made a number of test pieces.

With the panel field cut  $\frac{1}{16}$ " high, I had to cut a shallow rabbet on the back edge of the panel so it would fit in the  $\frac{1}{4}$ "-wide grooves (Detail a). You'll also notice that the grooves (and tenons) are shifted slightly off center so the front face of the panel won't protrude too far beyond the surface of the frame.

## STOCK CABINETS: COPE AND STICK DOORS



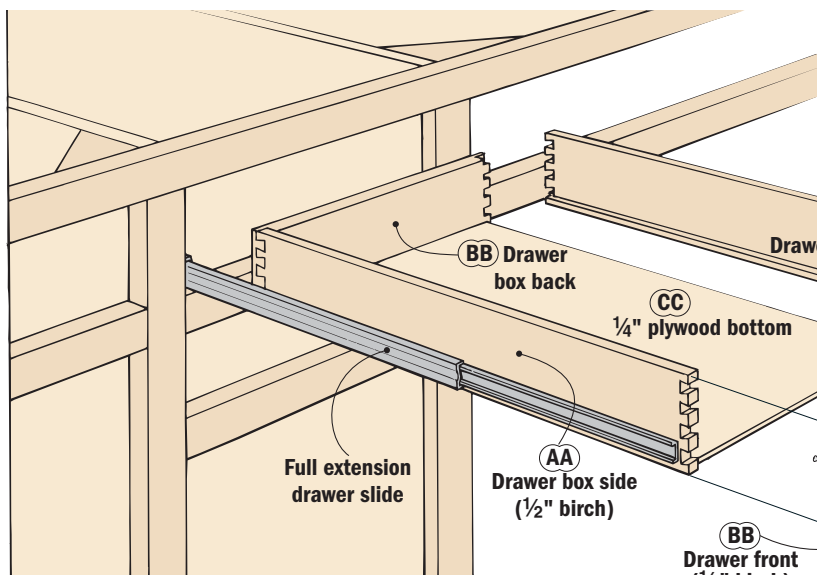
Many stock cabinets come with cope and stick construction on the doors (see the photo at left). Instead of a plain stub tenon, the ends of the rails are coped to match the profile on the inside edge of the stiles. This joint usually requires a pair of matched router bits or shaper cutters and creates a strong joint.

To visually reduce how the full overlay doors stick out from the face frame, a profile is cut around the outer face of

the door frame. A vinyl bumper insert on the back of the frame cushions the door when it closes — a nice touch.

The panels on the stock cabinets we bought were solid wood, but like the face and door frames, the grain patterns varied widely.

On the cabinets with doors that butt together, the gap between the doors wasn't uniform, but could be adjusted easily by fine-tuning the hinges.

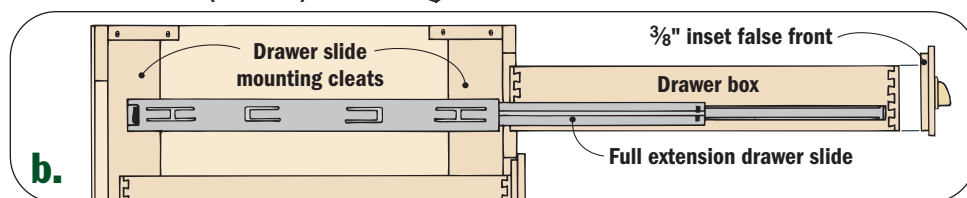


## DRAWER ASSEMBLY

Attach false drawer front with #6 x 1" wood screws.



The drawer boxes feature 1/2" birch sides joined at the front and back with half-blind dovetails



rails would be  $7\frac{7}{8}$ " long ( $12\frac{1}{4}$ " - ( $2\frac{1}{2}$ " +  $2\frac{1}{2}$ " + ( $\frac{5}{16}$ " +  $\frac{5}{16}$ ")).

To allow for some cross-grain expansion, I made the panels  $\frac{1}{8}$ " narrower than the length of the rails.

To determine panel height, subtract the total width of the two rails (7") from the door height. (The rails are wider —  $3\frac{1}{2}$ " — than the stiles.) Then add back in the  $\frac{5}{8}$ " for the two grooves to get total height. Since panels will expand a little lengthwise, subtract  $\frac{1}{16}$ " from this total.

Once all the dimensions were nailed down, I cut to size and labeled the panels, rails, and stiles for each door. Using the test pieces I made earlier as a setup guide, I machined the grooves in all the rails and stiles.

With the grooves cut, I cut the "deeper" face of all the stub tenons, then lowered the blade and cut the other, shallower face. Then I routed the profile in all of the panels.

Next, I dry-fit the frames around the panels. Only the rails and stiles get glued together — the panels

should "float" in the frames. But before gluing the doors up, I applied stain to the panels. This ensures uniform color across the entire panel, even if it shifts slightly in the frame.

With the doors assembled, you can cut the rabbets that create the lip (*Detail a*). But don't rabbet the door stiles where two doors will meet.

### DOVETAIL DRAWERS

One stock cabinet feature I copied was half-blind dovetail joinery for the drawers (see the *Drawer Assembly View*). A dovetail joint's interlocking pins can stand up to the strong forces exerted when a drawer is yanked open or slammed shut.

You might think it took a long time to cut dovetails for 12 drawers.

But once I got my dovetail jig adjusted, the actual cutting went quickly.

All the drawers in each bank are identical in size except for height. Even the 1/4" plywood bottom panels (CC) are the same.

### ADD FALSE FRONTS

False drawer fronts (DD) simplify the drawer installation. They let you install the drawer slides and box first, then position each front so it lines up properly on the face frame opening.

Like the doors, the drawer fronts are lipped for a  $\frac{3}{8}$ " inset, as shown in *Detail b*. And you size the false fronts the same way as the doors, adding  $\frac{1}{2}$ " to the opening's size.

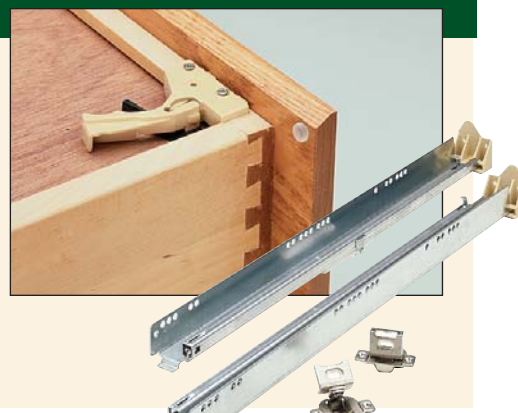
## STOCK CABINETS: DRAWERS, HARDWARE

The drawers in the stock cabinets we bought had dovetail joints and were equipped with full extension undermount-style slides. The drawer portion mounted to the underside of the drawer so the slide was hidden (although you lose a little bit of drawer height).

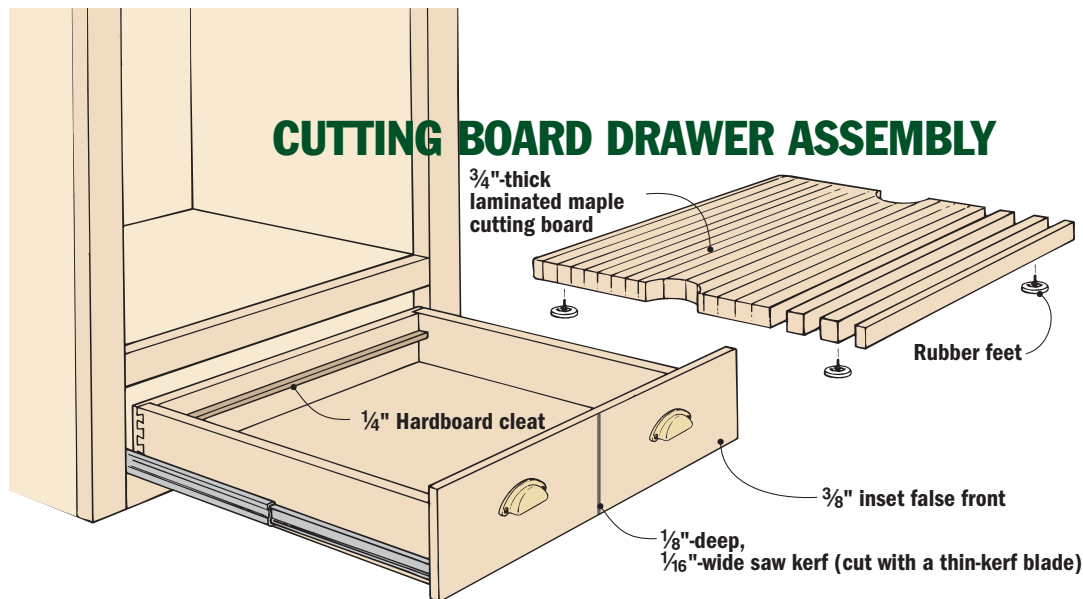
Plastic catches (top right photo) on the underside of the drawer, clipped onto the slides and allow slight adjustments in the position of the drawer.

The slides operated fairly smoothly and had a positive, self-closing feature.

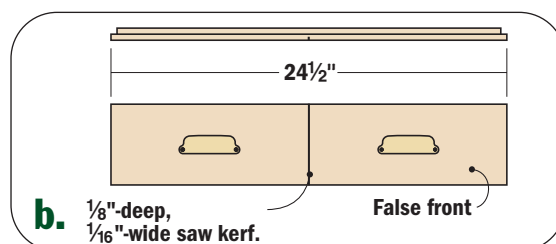
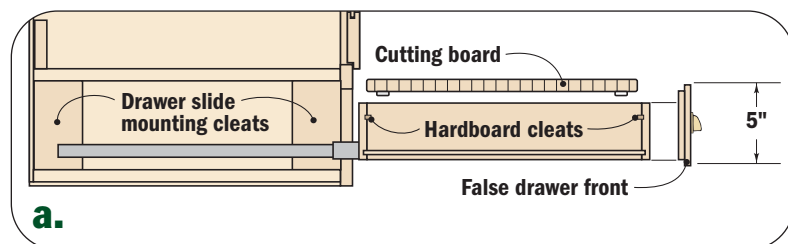
The hinges (pictured lower right) were a Euro-style cup hinge designed for face-frame cabinets. One nice feature is that they allow minor adjustments to the door position — both up and down and side to side. Because of the overlay style of door, these hinges were hidden from view when the doors were closed.



## CUTTING BOARD DRAWER ASSEMBLY



The cutting board is inset into the drawer and serves as a cover for the knife rack.



### MOUNTING THE SLIDES

The side-mounted drawer slides used throughout the cabinets need to be mounted flush with opening in the face frame. To do this I first screwed mounting cleats at the front and back of the cabinet on both sides of the drawer openings (Detail a). These cleats, made from 2x4 stock, were planed down until they fit flush with the face frame. The cabinet part of the slide fastened to these cleats.

### LOOK FOR THE EXTRAS

Now that you've seen how the basic boxes go together and also some of the more dramatic features, it's time to take a look at some extra features that aren't as obvious.

One feature I'm proud of is the drawer built into the pantry cabinet. Designed to look like a pair of drawers to echo the twin doors above it, the one large drawer holds a cutting board and knife rack (*Cutting Board Drawer Assembly* and *Detail b*).

The laminated maple cutting board rests on 1/4"-thick hardwood cleats fit into the front and back panels (Detail a). The cutting board has rubber feet and is designed with built-in handholds to lift out for use. But if counter space is limited, you could use the cutting board while it's in the drawer.

The great thing about this drawer is that it got an old free-standing knife-block off the countertop, yet

the knives are still handy. At 18" deep and 23" wide, the drawer easily holds a flat knife rack with space left for storing small cutting boards or other knife accessories. (The knife rack was featured in the January/February 2000 issue of *Workbench*.)

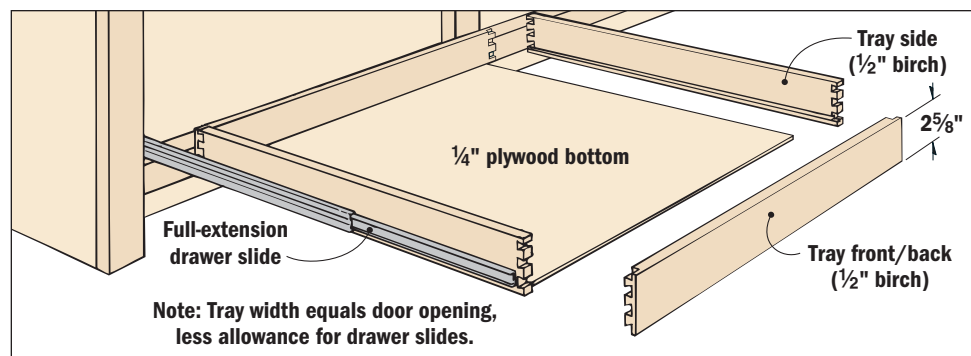
### TRAYS REPLACE SHELVES

Another hidden feature is tucked away behind the doors in the base cabinets. Instead of fixed shelves or ones that rest on adjustable shelf pins, the base cabinets feature pull-out trays, as shown at left below.

Like the drawers, these shallow trays ride on full extension slides. They make it easy to organize and access pots, pans, and storage containers that normally get stacked haphazardly in fixed-shelf cabinets.

Such trays are available as an option in stock cabinetry. (It cost an extra \$54 to add four small pullout trays to the standard 36" wide base unit pictured back on [page 3](#).)

To get wide-open access to the space, I designed my base cabinets with two wide trays that spanned the full door opening. The plywood carcass is rigid enough that a center stile between the doors wasn't necessary.





## CHOOSE CUSTOM HARDWARE

One way to put your own touch on the cabinets is with hardware. Since the drawer slides and hinges are tied to the cabinets' design, it's best to get them early in the planning process. But the knobs and pulls can wait until you've got the cabinets built.

The stock cabinets I priced did not come with door knobs or drawer pulls — these were available as an option in a limited number of styles.

On  $\frac{3}{8}$ " inset doors and drawer fronts, pulls and knobs are a necessity. But you can choose from hundreds of stock or special order styles available at home centers or from mail order catalogs.

Hardware customization doesn't have to stop with knobs and pulls. Many of the special bins, racks, and turntables offered as options by cabinet manufacturers are available from mail order catalogs such as Woodworker's Supply (800-645-9292) and Rockler Woodworking and Hardware (800-279-4441).


## FINAL TOUCHES

As mentioned earlier, I also added low-voltage puck lighting to the valance, shown in the photo right, and under the cabinets to light the countertop work areas. I chose xenon lights because they burn brighter than halogen bulbs and produce less heat. The three-light kit, order no. 73549 - \$99.99, is from Rockler.

The finishing touch was the addition of a 2" cove molding along the top of the wall cabinets. It dresses up the cabinets, but more importantly it helps hide any gaps between the cabinets and ceiling. Since I couldn't find a cove molding this size in cherry, I stained a birch molding to match the cabinets.

Finish on the cabinets is a stain covered with three coats of polyurethane. To get the look of aged cherry, I used a mixture of three parts Zar cherry stain with one part Wood-Kote Cherry Jel'd Stain. The latter gel stain minimizes blotching that sometimes occurs with cherry.

Building your own kitchen cabinets is a big job — probably the

largest woodworking project you'll ever take on. But the quality that you can build into them and the daily use they'll get makes it one of the most worthwhile projects I can think of to improve your home. 



**Puck-style xenon lights and cove molding add finishing touches.**

