Low-Cost, High-Impact

Kitchen Facelift

▲ Although this kitchen was quite usable, the knotty pine cabinets, worn countertop, and old appliances all needed updating.

Sometimes less is more. This kitchen remodel was considerably *less* expensive, *less* time consuming, and required *less* demolition than many similar projects I've seen. However, if you compare the "before" photo with the "after" photo, I think you'll agree that this relatively small-scale project made a big improvement in the appearance of this kitchen.

One of the biggest improvements was to the kitchen cabinets. Rather than tear out the old cabinets, we gave them a "facelift" instead.

SHOP-MADE CLADDING. For starters, we refaced the existing cabinets by applying shop-made cladding. The ends of the cabinets are covered with $^1/_4$"-thick cherry plywood. And we glued $^1/_4$"-thick strips of solid cherry to the rails and stiles on the face frames.

SOLID-WOOD DOORS. As for the cabinet doors, they needed attention, too. So we built new frame-and-panel, solid-wood doors. Making solid-wood panels for the doors takes more time than using plywood panels. But once the finish is applied, it results in a much more uniform color than using plywood. Solid wood also mean that the panels look good both inside *and* out.

DISPLAY DOORS. Speaking of looks, the homeowners had a special collection of colorful dishes they wanted to display. The solution was to convert two of the cabinets into display units by adding glass doors. Low-voltage lighting installed in the display cabinets highlights the dishes.

The construction of the display doors is similar to the solid-wood doors. Here though, we fit a shop-made divider and a glass panel into the door frame.

DRAWERS. Another part of this cabinet facelift focused on the drawers. As it turned out, the existing drawers were sturdy and well-made, so it didn't make sense to build new ones. Instead, we cut each of the old drawer fronts free on the table saw. Then, after adding a new front for the drawer box itself, we installed a false front made of solid cherry (page 9.)

FINISH. But there's more to this kitchen remodel than the cabinet facelift. The water, steam, and spills that are part of a kitchen's everyday life demand a tough finish. To accomplish that, I used a finishing process that included a stain covered with three coats of polyurethane.

The rich, warm color you see is produced by a mixture of three parts Zar Cherry Stain and one part Wood-Kote Cherry Jel'd Stain. The gel stain minimizes blotching that can sometimes occur with cherry.

MORE IMPROVEMENTS. In addition to the cabinets, we also made several other improvements to make this kitchen as functional as it is attractive *(see Photos above)*. For information about these products, refer to the Buyer's Guide below.

buyer's guide

Appliances
KitchenAid
- Dishwasher (KUDS01FKPA)
- Cooktop (KECC508GBT)
- Vent (KWVU205YBA)
- Oven (KEBC107KSS)
- Refrigerator (KTRC22EKSS)

www.KitchenAid.com

Handles & Pulls
Amerock
Inspiration Series
- Drawer pulls (1592-WID)
- Door pulls (1583-WID)

www.Amerock.com

Hinges
Blum
Compact Series 33
- 110^0 - $^1/_2$" Overlay Self-Closing Hinges

www.Blum.com

▲ The face frames of the cabinets are clad with strips of solid wood that are glued and clamped in place. I used tape to "clamp" hard-to-reach areas.

cladding the cabinets

One of the appealing things about a kitchen facelift is there's no need to tear out the existing cabinets. By covering the old cabinets with *cladding*, you can make them look brand new.

MATERIALS. I used two types of material for the cladding. The exposed end panels of the cabinets are covered with 1/4" cherry plywood *(Construction View below)*. And I applied 1/4"-thick solid cherry to the face frames and toekick.

So why not cover the face frames with veneer instead of solid stock? Two reasons. First, solid wood lays flat, so it's easier to glue and clamp. Second, the joints can be sanded flush without worrying about sanding through the thin veneer.

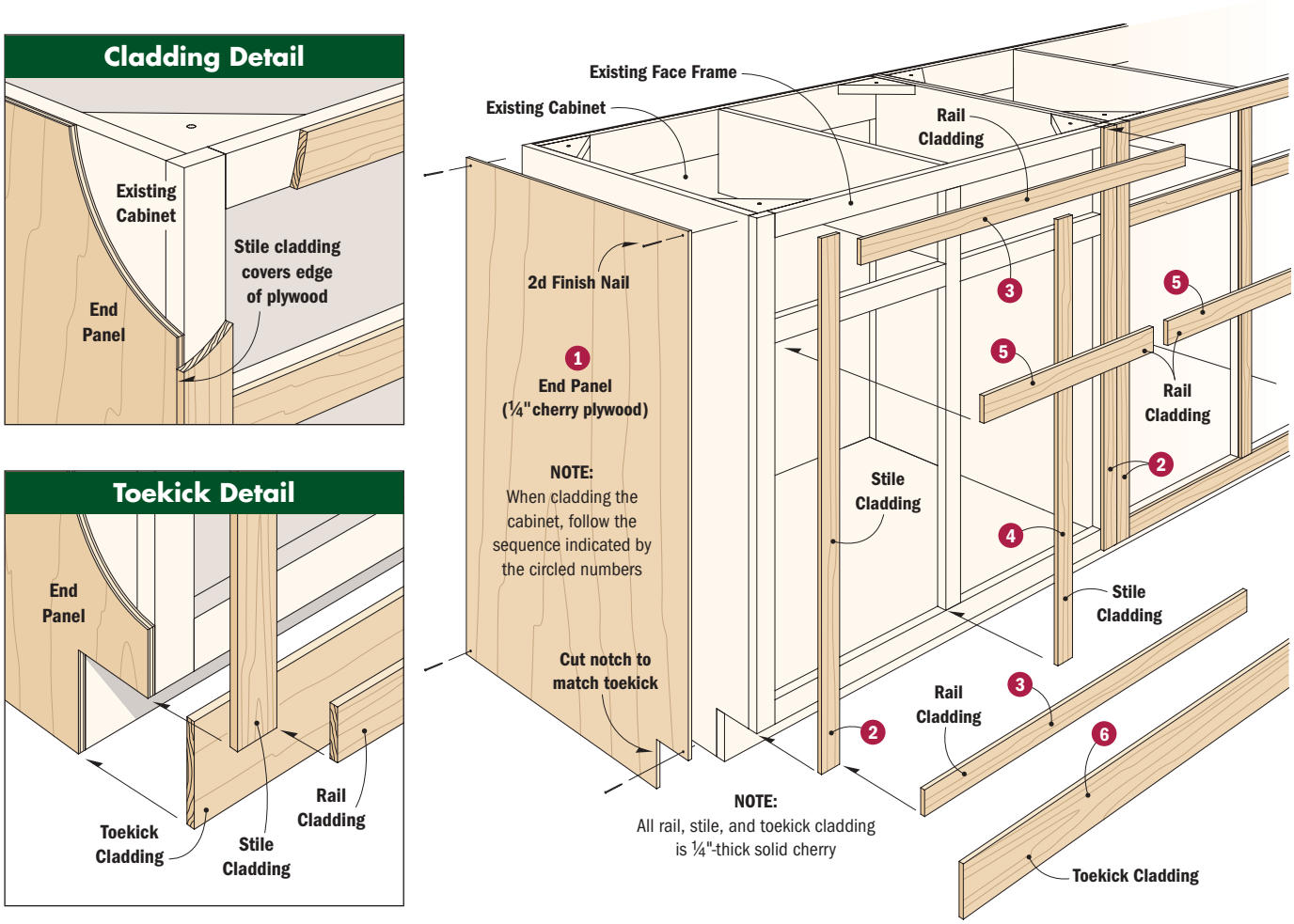
Getting Started

As with any project, there are a few preliminary things to take care of before you get started. First of all, you'll need to remove all the cabinet doors, drawers, and trim.

Once that's accomplished, check the outer stile (vertical frame piece) on the face frame of your cabinets. Sometimes in order to create a more finished appearance, the stile extends past the end of the cabinet, forming a small lip *(Figs. 1 and 1a)*. If so, you'll have to remove it. Otherwise, the plywood and the solid-wood cladding won't fit tightly together.

ROUT THE LIP. An easy way to remove this lip is to use a router and a flush trim bit *(Fig. 1)*. As you rout,

CONSTRUCTION VIEW



the bearing on the bit should ride against the end of the cabinet *(Fig. 1a)*. This way the cutting edges of the bit will trim the overhanging lip flush with the end panel.

Just a note about routing the lip on the upper cabinets. The base of the router won't allow you to rout the lip near the ceiling. To get around that, just pare off the lip near the ceiling with a chisel.

CLEAN & SAND. After the lip is removed, clean all the surfaces that will be clad with a household degreaser. Then, to ensure a good glue bond, sand each surface with a random-orbit sander, using either 80- or 100-grit sandpaper.

Time for the Cladding

Now that the cabinets are prepared, you can concentrate on the cladding.

END PANELS. As I mentioned, the ends of the cabinets are covered with $^1/_4$" plywood panels. Each panel is cut to size to fit flush with the front of the existing face frame. You'll also need to cut a notch for the toe-kick, as shown in the *Construction View*. By the way, don't worry about the exposed front edge of the plywood. It will be concealed by the cladding on the face frame *(Cladding Detail)*.

The end panel is glued on with panel adhesive. Apply the adhesive to the cabinet and press the panel into place *(Fig. 2)*. Tack brads at the corners of the panel to keep it from shifting as the adhesive cures.

FACE FRAMES. The next step is to add the thin, solid-wood cladding to the face frames. So where do you get *thin* wood? A quick and easy way is to make your own by resawing a thick board into two (or more) thin pieces *(see Sidebar at right)*.

When resawing, you'll want to work with extra-long pieces that are ripped to final width. I ripped all the pieces to match the width of the rails and stiles on the face frames — with one exception. To cover the edge of the $^1/_4$" plywood end panels, I made the side stile near the exposed end of each cabinet $^1/_4$" wider.

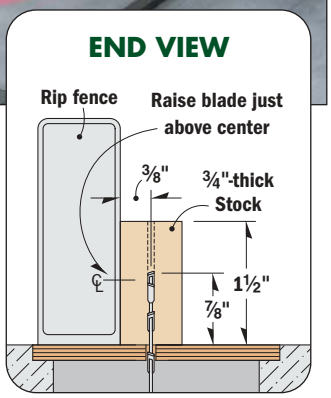
Keeping those things in mind, go ahead and prepare the pieces for resawing. Plan on making a few extras to allow for mistakes. Then resaw the stock and plane the cladding to its final thickness ($^1/_4$").

At this point, it's time to attach the cladding to the face frame. I used simple butt joints where the end of one strip meets the adjoining piece. So to produce tight-fitting joints, it's important that each piece of cladding is accurately cut to length.

To accomplish that, follow the sequence in the *Construction View*, cutting each piece of cladding to fit. As you glue on each piece (I used yellow glue), make sure the clamping pressure is evenly distributed across the cladding *(Fig. 3)*. To get more "reach," remove the clamp pad from the inner jaw *(Fig. 3a)*.

SAND FLUSH. After gluing on the cladding, sand the faces flush with each other. A random-orbit sander makes quick work of this.

RESAWING ON THE TABLE SAW

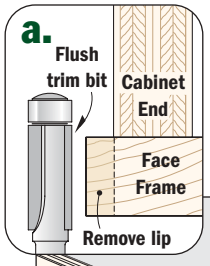


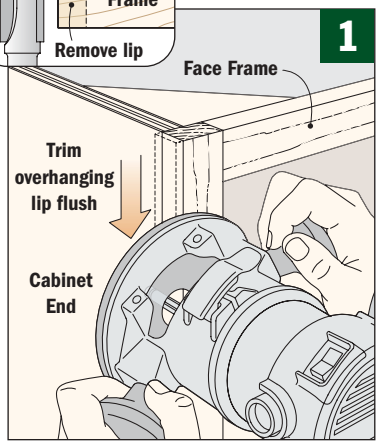
Resawing is cutting thin pieces of wood from a thick piece of stock. (In effect, ripping on edge.) A quick way to do this is on the table saw.

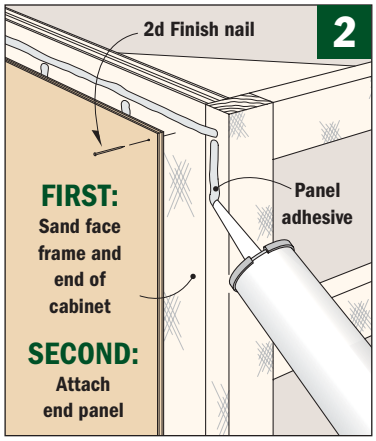
Before you get started though, there are two safety precautions that are a "must." First, to reduce the chance of kickback, use a "zero-clearance" insert with a splitter *(see Photo above)*. Second, be sure to use a push block when making a cut.

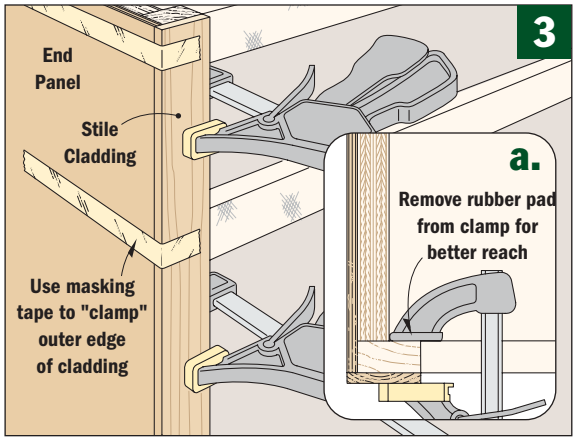
When resawing, set the rip fence so you end up with slightly thicker workpieces than needed. That way you can sand or plane pieces to final thickness.

To avoid bogging down the saw, I use a two-pass method. Start with the blade raised just over half the width of the piece *(End View)*. Then make two passes at this setting, flipping the piece over between passes. Note: Always keep the same face against the fence.









building solid-wood doors

▲ To glue up a perfectly flat door, clamp a *straight* scrap of wood across each end. Use wax paper to avoid gluing the scrap to the door.

The cabinet doors for this kitchen facelift feature frame-and-panel, solid-wood construction. For ease of installation, I decided to make overlay doors, which means they lay on top of the face frames. The amount of overlay is 1/2" on all sides, so the doors are 1" wider and taller than the openings in the face frame.

Build the Frames

The first step in building the doors is to make the frames that surround the solid-wood panels.

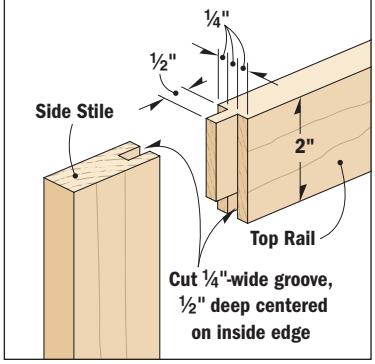
As you can see in the *Door Assembly* illustration below, each frame consists of three vertical stiles (two sides and a center stile) and two horizontal rails. Note: For narrow doors (less than 12" wide), I left out the center stile.

JOINERY. To simplify construction, the frames are assembled with stub tenon and groove joints. Both ends of each rail have a short tenon that fits into a groove in the stile *(Rail & Stile Detail)*. And a tenon on each end of the center stile fits into grooves in the rails *(Center Stile Detail)*.

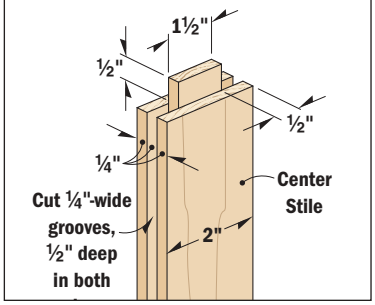
CONSTRUCTION. After taking the joinery into account, cut the rails and stiles to size from 3/4"-thick hardwood. Be sure to label each piece to avoid getting them mixed up. Also, mark the *outside* face to use as a reference when machining the parts.

CUT GROOVES. Now you're ready to cut grooves in the rails and stiles. I mounted a 1/4" dado blade in the table saw to do this *(Fig. 4)*. For consistent results, run the *outside* face of each piece against the fence.

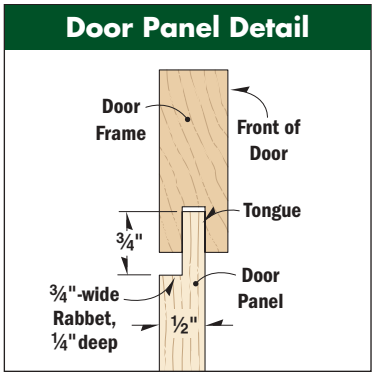
Rail & Stile Detail



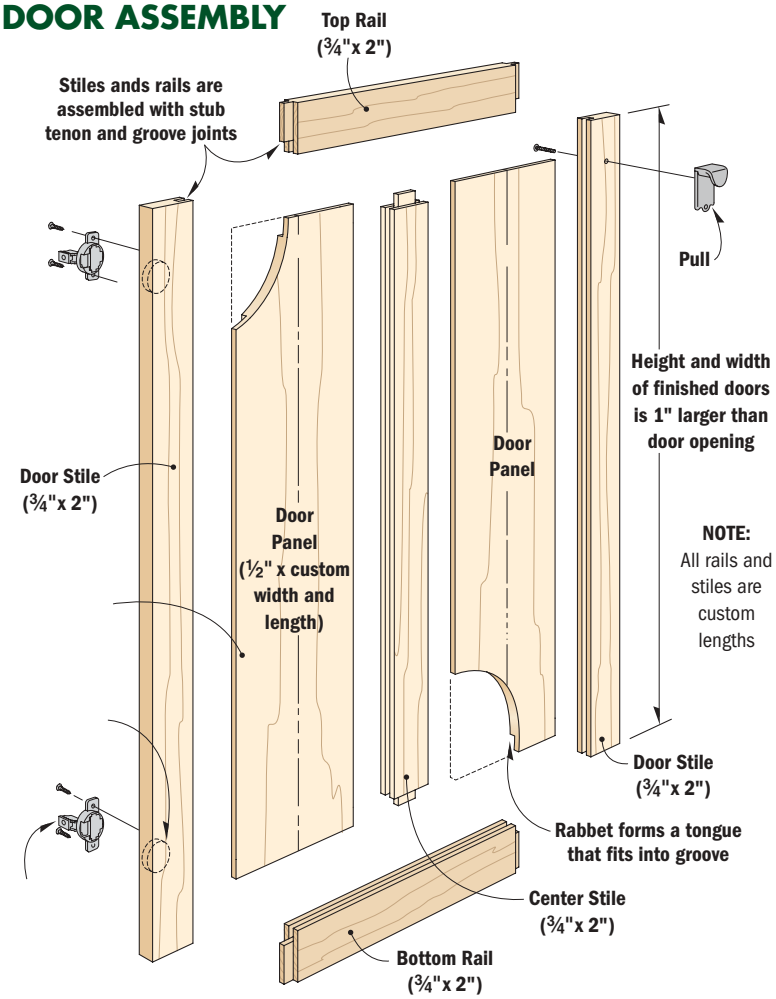
Center Stile Detail



Door Panel Detail



DOOR ASSEMBLY



TIME FOR TENONS. The next step is to cut stub (short) tenons to fit the grooves. The tenons are 1/2" long. So here again, I used a dado blade, setting it up to cut roughly 5/8" wide. To ensure consistent-length tenons, use an auxiliary fence as a stop and "bury" part of the blade in the fence *(Figs. 5 and 5a)*.

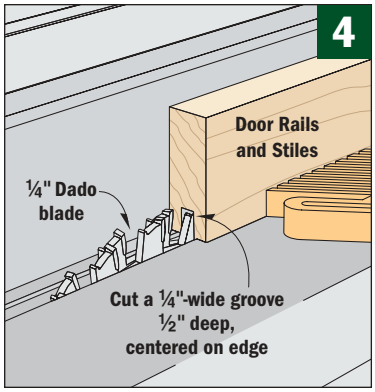
A handy way to establish the *thickness* of the tenons is to use one of the grooved pieces as a gauge for setting the blade height *(Fig. 5b)*. Check the setup by making test cuts. Then cut tenons in the actual workpieces, using the miter gauge to guide each piece through the blade. Making two passes, one on each side, should result in a tenon that fits snug.

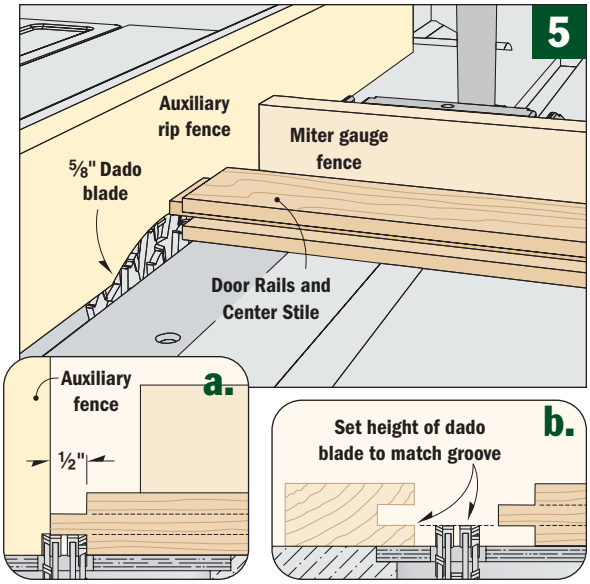
Solid-Wood Panels

With the door frames complete, it's time to start on the solid-wood panels. Instead of going with a traditional raised-panel look, I wanted the door panels to be *flat* on the outside for a clean, simple look *(Door Panel Detail)*.

GLUE UP PANELS. The door panels are made by edge-gluing 1/2"-thick cherry. It's best to start with panels that are about 2" larger than you need in length and width, then trim them to size after the glue-up.

To determine the final size of the panels, dry assemble the frames, measure the openings, and then add 7/8". That's 1/8" *less* than the combined depth of the grooves. When the door is assembled, this will allow the panel to expand and contract with changes in humidity.





TONGUES. If you look at the *Door Assembly* illustration again, you can see there's a tongue on all four edges of the door panel that fits into the grooves in the frame pieces. The tongue is formed by cutting a rabbet in the back of the door panel.

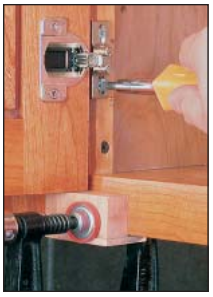
To cut the rabbet, I used a two-step process on the table saw. First, with the panel lying flat, cut four shallow, crisscross kerfs *(Figs. 6 and 6a)*. Second, stand the panel on edge and run it against a tall auxiliary fence to remove the remaining waste material, leaving a 1/4"-thick tongue *(Fig. 7)*.

After sanding the tongues smooth, dry-clamp the doors to check for final fit before glue-up. If you plan to stain the doors, now is a good time to do it. This way, if the panel shrinks a bit, it won't expose unstained wood.

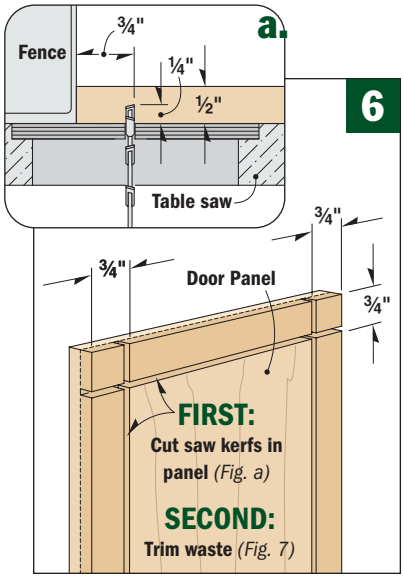
FINAL ASSEMBLY. When assembling the doors, keep in mind that only the rails and stiles are glued together — the panels should "float" in the frames to allow for wood movement. Also, be sure the door is square and flat while the glue dries *(see photo on page 5)*.

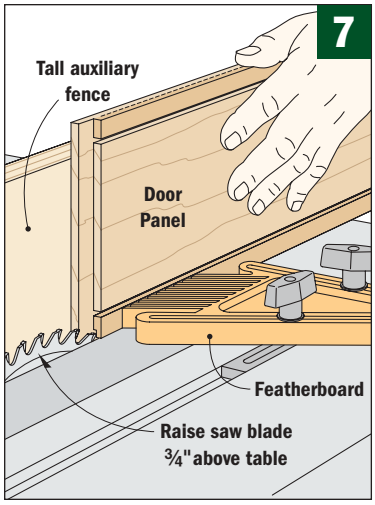
MOUNT DOORS. After removing the clamps and sanding the doors smooth, the next step is to drill two large holes in the back of each door to hold the hinges *(Fig. 8)*. This requires a 35mm drill bit that's designed for just this purpose.

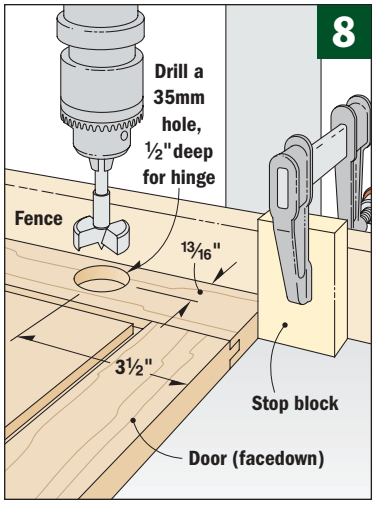
Finally, after staining and finishing the doors, I installed the hinges and mounted the doors to the cabinets, using the alignment tip shown in the margin.



▲ To ensure that all the doors align, set each one on an L-shaped block that's clamped to the face frame. Then screw the hinges to the cabinet.







display doors & dividers

▲ This easy-to-build, elegant display door is made using simple techniques that can be applied to any kitchen remodeling project.

As an option, you may want to make glass display doors for your kitchen cabinets. By installing a wood divider and a piece of glass in the door frame, it's easy to convert a kitchen cabinet into an elegant display case *(Photo at left)*.

Frame First

The frame for the display doors is similar to the other doors. It's an overlay door that's 1" larger than the cabinet opening. Here again, it's assembled with stub tenon and groove joints *(Display Door Assembly)*.

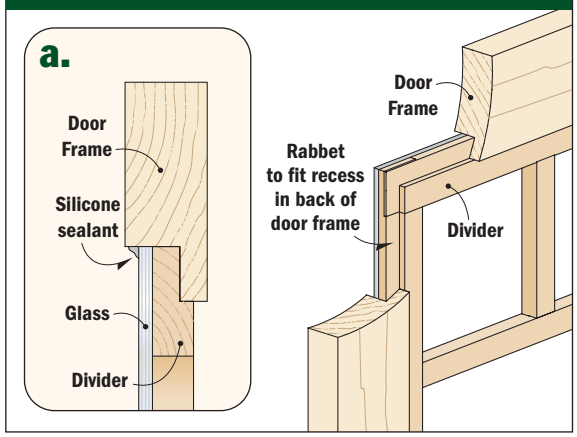
Of course, the thing that's different about this frame is it's assembled without a solid-wood panel. What's not so obvious is how the wood divider *and* the glass fit into the grooves in the frame. The answer is, they don't. Let me explain.

In order to insert the divider and the glass in the frame, the back lip of the groove must be removed. This forms a large rabbet in the back of the door frame that holds the divider and glass *(Door Frame Detail)*.

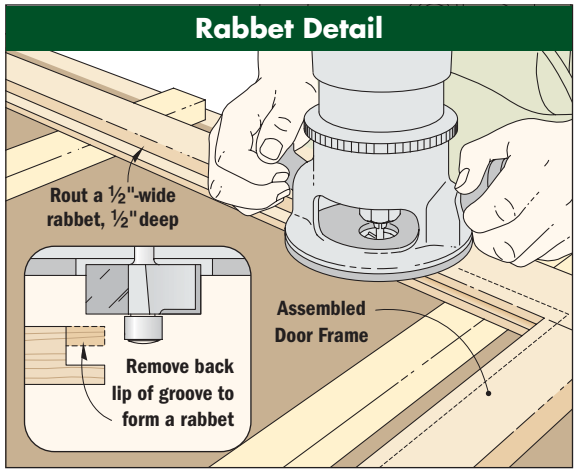
RABBET THE BACK. An easy way to trim off the back lip is to lay the frame face down on a bench and use a hand-held router with a rabbet bit *(Rabbet Detail)*. Just a word of caution here. The lip is fairly thin, which could cause it to split as you're routing. To avoid that, make a couple of *light* passes, routing from left to right. Then, with the bearing riding against the lower lip, make a full-depth cut.

The bit will leave rounded corners, which are easily squared up with a chisel. This is also a good time to drill holes for the hinge cups, using the same method shown on page 6.

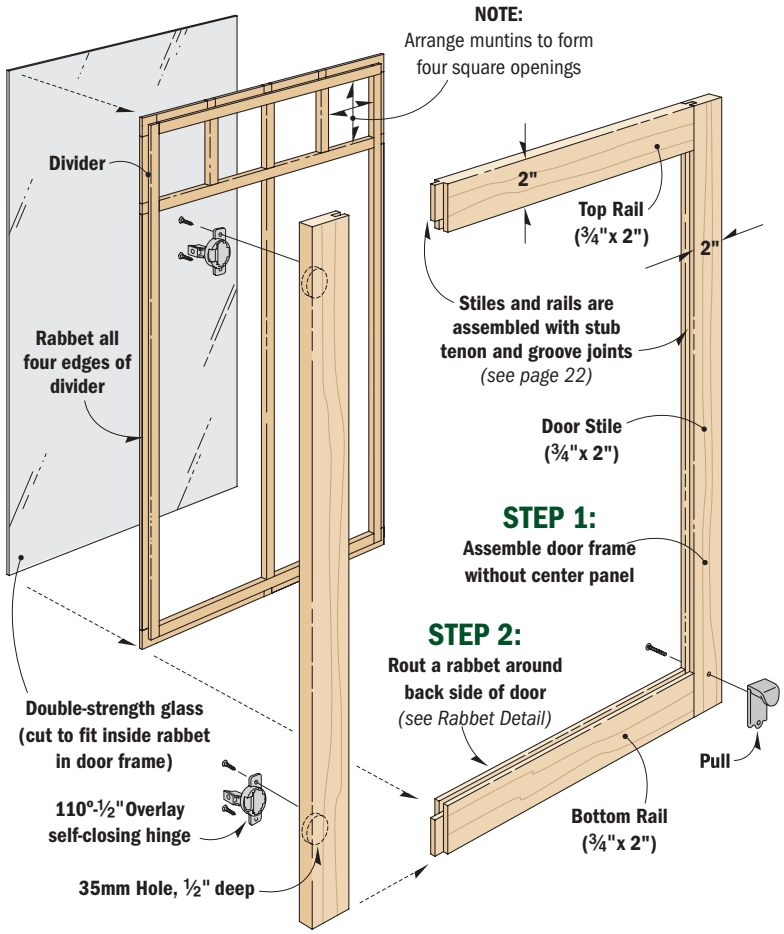
Door Frame Detail



Rabbet Detail



DISPLAY DOOR ASSEMBLY



Simple Division

Once the frame is complete, the next step is to build the wood divider that creates what appears to be the individual panes of glass. The divider is made up of narrow strips of hardwood that are assembled with half-lap joints *(Divider Assembly)*.

SUB-FRAME & MUNTINS. As you can see, the divider consists of a rectangular sub-frame and several individual muntins (a fancy word for window dividers). All of the pieces for the sub-frame and muntins are made from $^3/_8$"-thick hardwood.

Although their thickness is identical, the *width* of these pieces is different. The rails and stiles of the sub-frame are 1" wide while the muntins are only $^1/_2$" wide.

To understand the reason for the different widths, take a look at the *Door Frame Detail* on page 7. Notice that the divider is rabbeted to fit into the rabbet in the back of the door frame. This accomplishes two things. First, it positions the divider closer to the front face of the door frame. Second, since the wider pieces of the sub-frame are partially concealed behind the door frame, they will ultimately *appear* to be the same width as the muntins ($^1/_2$").

CONSTRUCTION. Once you understand how the divider goes together, construction should go fairly quickly. Start by planing the stock for the rails, stiles, and muntins to thickness. Then simply rip the pieces to width on the table saw.

To determine the length of these pieces, measure the shoulder-to-shoulder distance of the rabbets in the back of the door frame. Then cut the rails and stiles of the sub-frame and the *long* vertical and horizontal muntins to match. As for the short muntins, I wanted them to form four *square* openings at the top of the divider, so I cut them to length accordingly *(Display Door Assembly)*.

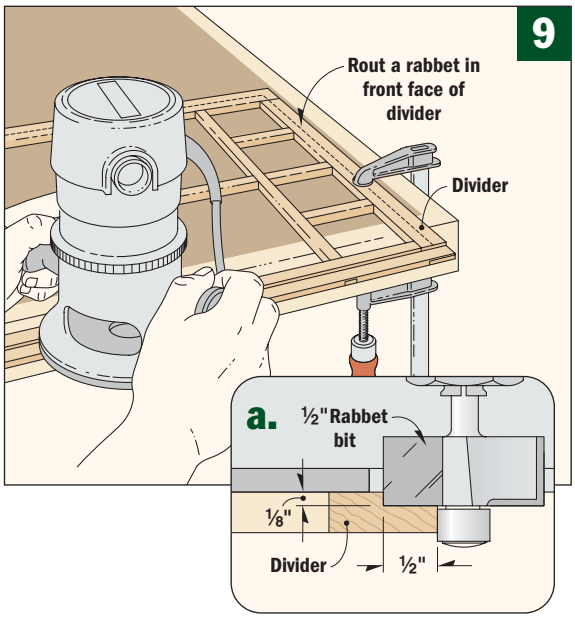
HALF-LAPS. Once the pieces are cut to length, you can lay out and cut the half-laps. To get consistent results, I used a simple jig that attaches to the miter gauge on the table saw. (For more on this, see page 11.)

ASSEMBLY. Now it's just a matter of gluing and clamping the divider together, as shown in *Steps 1 and 2* in the *Divider Assembly* below.

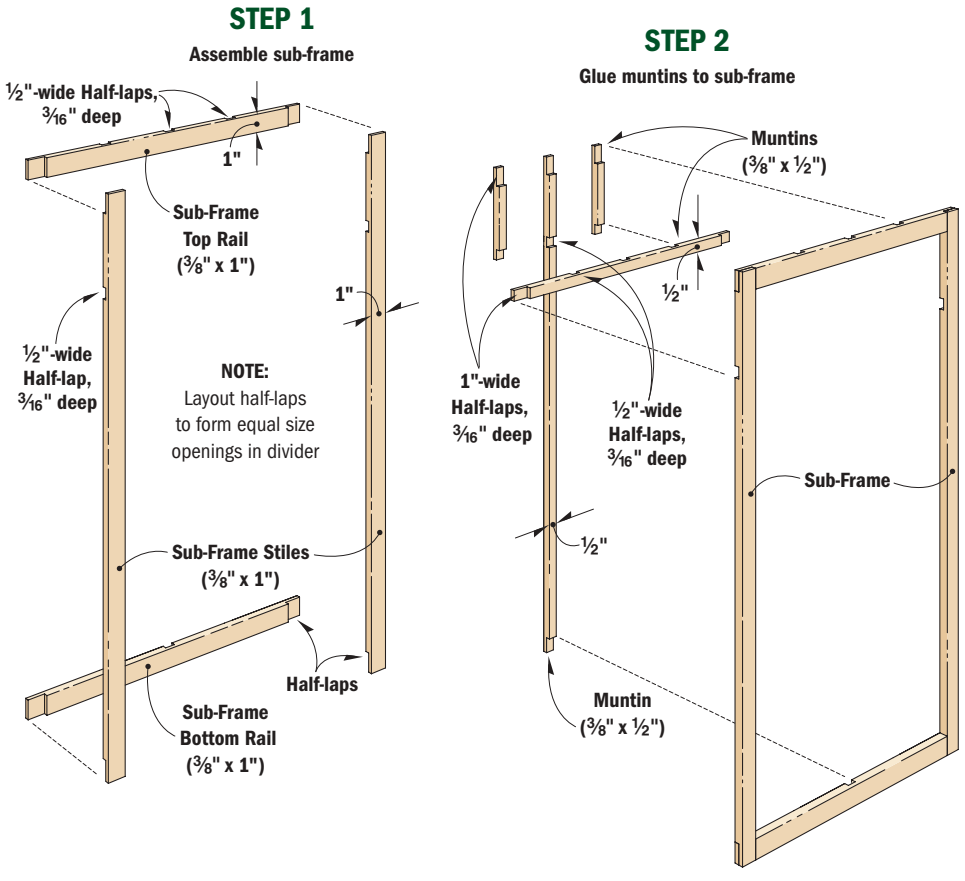
CUT RABBET. After sanding the divider smooth, it's time to cut the rabbet in the front face of the divider that I mentioned earlier. Here again, a handheld router with a rabbet bit makes quick work of this task *(Figs. 9 and 9a)*.

FINAL DETAILS. At this point, you're almost ready to install the divider in the door frame. But first, you'll need to have a piece of glass cut to fit into the rabbeted opening in the back of the frame. (I bought double-strength glass.) To allow for wood movement, it should be $^1/_8$" smaller in length and width than the opening in the door frame.

To install the glass, lay the door frame face down on a padded surface. Then fit the divider and glass into the rabbet. To hold them in place, apply a small bead of clear silicone sealant around all four edges *(Door Frame Detail)*. Be sure that the sealant is forced down into the small gap between the edge of the glass and the door frame. Let the door and glass sit until the sealant cures fully, usually at least 24 hours.



DIVIDER ASSEMBLY



▲ To align the false fronts, temporarily screw them to the drawers. Then simply open the drawer and install permanent screws.

adding new drawer fronts

Building all new drawers for an entire kitchen can be expensive and time consuming. Fortunately, I didn't have to build new drawers — I just reused the old drawers and installed new false fronts, as shown at left.

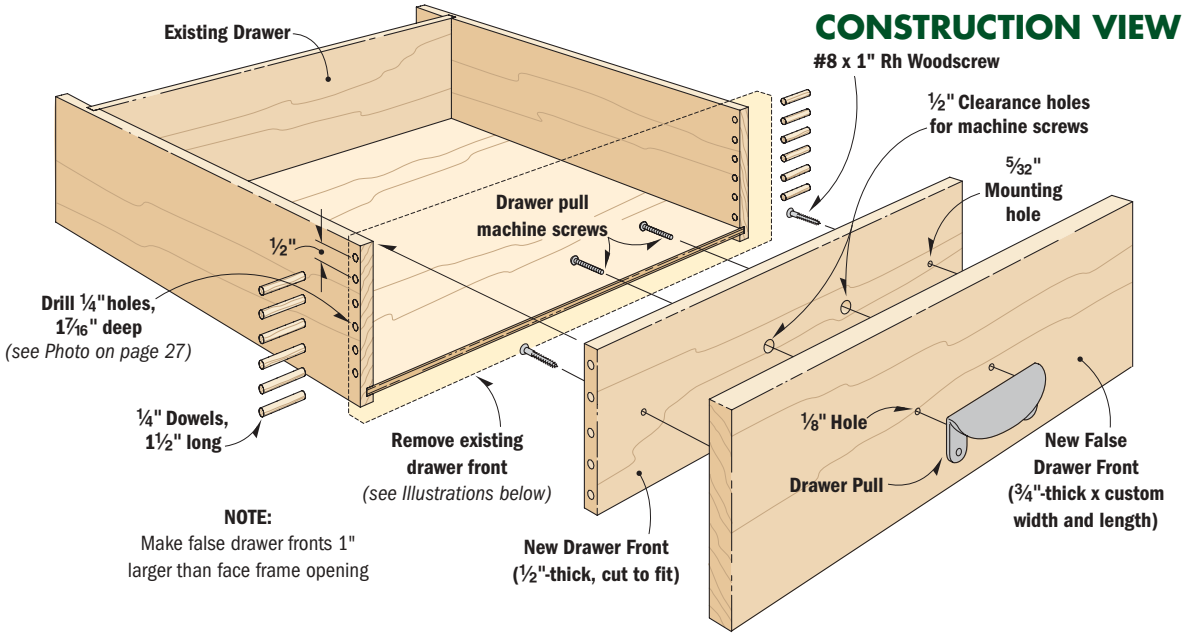
The type of drawers you have determines how to replace the drawer fronts. Some drawers already have a separate false front mounted to the drawer box. In that case, just replace the old false fronts with new ones.

But if the drawer front is an integral part of the box like mine, it's a bit more involved. The old drawer front has to be trimmed off and then replaced with a new one *(Construction View below)*. Then a new false front is added to the drawer box.

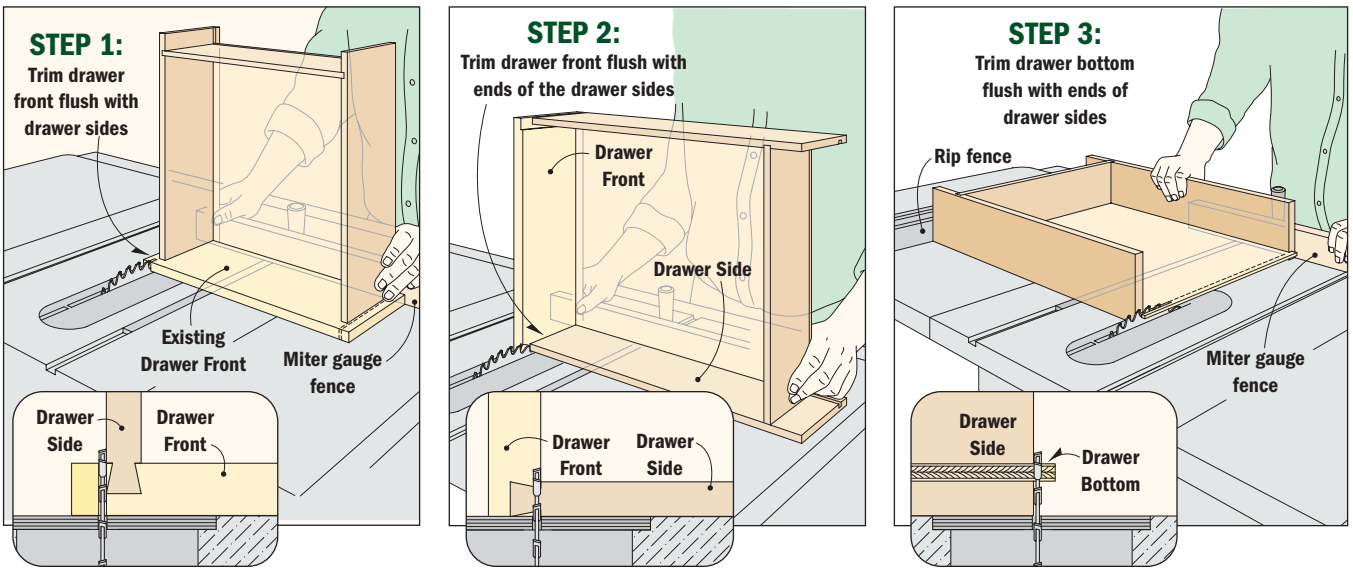
REMOVE FRONTS. To remove the old drawer fronts, start by taking off the slides and pulls. Then use the table saw to trim off the front, following the three-step process shown in the illustrations below.

ADD NEW FRONT. The next step is to add the new drawer front. This is a piece of 1/2"-thick hard-

CONSTRUCTION VIEW



TRIMMING OFF DRAWER FRONTS



wood cut to fit between the drawer sides. To make it easy to attach the false front later, drill a couple of mounting holes now. Then glue and clamp the front flush with the ends of the drawer sides.

DOWELS. To strengthen the connection, I used 1/4" dowels to "pin" the joints. This requires drilling holes through the drawer sides into the front. To drill these holes quickly and accurately, I used the drill-press setup shown in the *Photo* at right.

Notice that a fence and stop block are used to position the drawer. I also used four spacer blocks to index the location of the dowel holes. To accomplish this, set the drawer against the spacer blocks and drill the first hole. Then remove a spacer and drill the second hole. Continue like this until the box is against the fence and then drill the last hole.

After drilling the holes, glue in the dowels. They'll stand a bit "proud" at this point, so after the glue dries, just sand the ends smooth.

FINISH & INSTALLATION. You'll want to apply a finish on the ends of the dowels, as well as the drawer front. Then reattach the drawer slides and install the drawers.

Adding the False Fronts

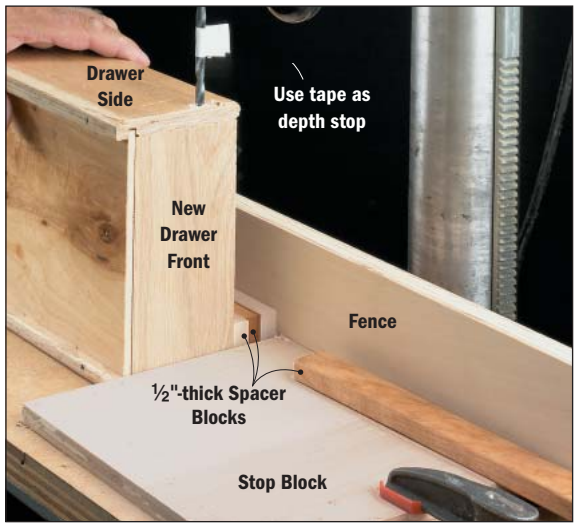
All that's left to complete this kitchen facelift is to add the false fronts.

Like the doors, the false fronts are made from 3/4"-thick hardwood. Here again, they're 1" larger than the opening in the face frame.

Design Note: If a drawer is directly above a door, it's more important to match their widths since even a small difference is quite noticeable.

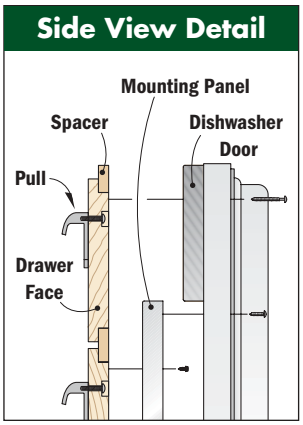
ATTACH FALSE FRONTS. After cutting the false fronts to size, the final step is to attach them to the drawers. To ensure proper alignment, I used an old trick here.

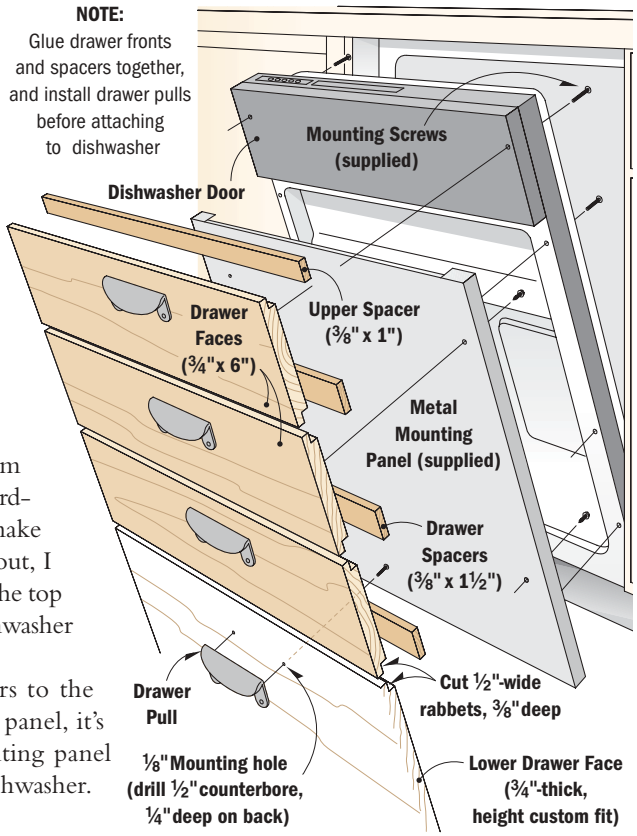
Start by drilling mounting holes for the drawer pulls in the false front. Then hold the false front in position and temporarily install screws through the mounting holes to attach it to the drawer *(Photo on page 9)*. Next, open the drawer and screw it to the false front from the back. Now remove the temporary screws and drill the mounting holes for the pulls all the way through the drawer with an 1/8" bit. Finally, using the points where the tip of the bit breaks through as centerpoints, drill 1/2" clearance holes for the machine screws used to mount the pulls.



▲ A set of 1/2"-thick spacer blocks makes it easy to index the holes for the 1/4" dowels.

custom dishwasher panels





We chose a dishwasher for this project that's designed to accept a shop-made, front panel (a *fully-integrated* dishwasher).

Most dishwashers like this use a large plywood door panel. But to tie the kitchen together, I made a panel that *appears* to be a bank of four drawers.

This panel starts out as four drawer faces made from 3/4"-thick hardwood *(Illustration at right)*. To create a gap between the "drawers," the faces are rabbeted on the top and bottom edges to hold 3/8"-thick hardwood spacers. Note: To make the drawer spacing work out, I also added a spacer strip at the top to reach the top of the dishwasher door *(Side View Detail)*.

After gluing the spacers to the drawer faces to form the panel, it's screwed to a metal mounting panel that's supplied with the dishwasher.

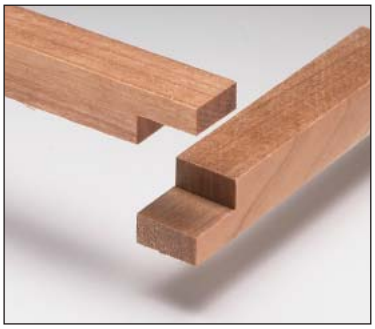
In The Shop

Cutting Half-Lap Joints in Thin Stock

▲ To use the cutting jig, butt the workpiece against a stop block clamped in place and use a scrap piece to hold the stock firmly against the base of the jig. Then use the miter gauge to slowly guide the jig over the dado blade to cut the half laps.

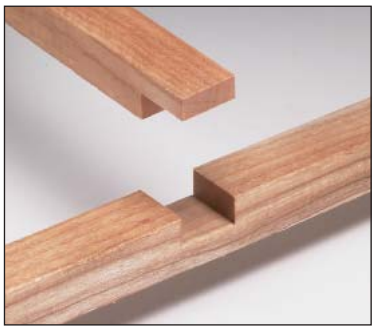
► END LAP

Half laps that join the ends of two boards provide plenty of face-to-face surface for a good glue joint.



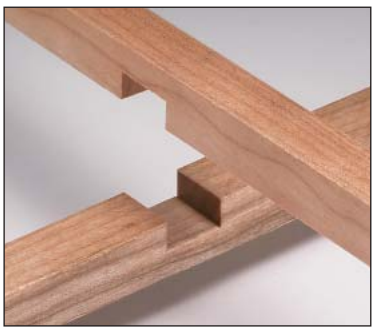
► "T" JOINT

A half lap on the end of one piece fits into a dado in the middle of the mating piece to create a T joint.



► CROSS LAP

Mating half laps cut in the middle of two pieces are often used to create a strong grid.



Cutting half-lap joints in narrow, thin stock on the table saw poses a few more challenges than working with thicker stock. Namely, the blade on the table saw has a tendency to make thin pieces chatter or bounce more than thicker pieces as you make a cut. This can cause an inconsistent depth of cut, creating a joint where the faces don't fit flush.

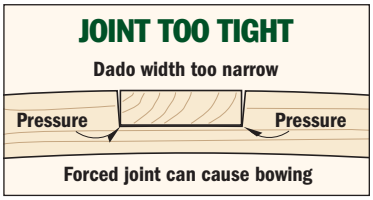
CUTTING JIG. One solution is to use a shop-made jig that attaches to the miter gauge to support the workpieces and raise them off the table during the cuts *(see Photo above)*.

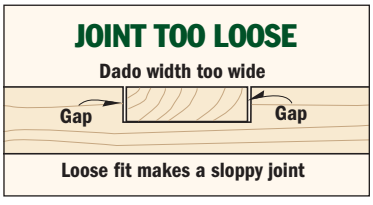
The jig consists of a hardboard base screwed to an auxiliary fence. A stop block clamped to the fence lets you maintain consistent cuts.

Another advantage of using the jig is that it bridges the throat plate on the table saw. This provides a smooth, flat surface for the workpieces to rest on all the way through the cut.

Once the jig is made, you're ready to cut the lap joints. Depending on where the cut is made in the workpiece, this can be an end lap, a T-shaped lap joint, or a cross lap *(see Photos at left)*.

Regardless of the type of lap joint, the goal is the same. The mating pieces should fit snug (not tight), and the faces should be flush. Both of these are accomplished with the proper setup.





PROPER SETUP

Getting a snug-fitting joint is simply a matter of shimming the dado blade to match the width of your stock. You don't want to have to force the joint together. The pressure can cause the thin stock to bow *(Joint Too Tight)*. Likewise, there shouldn't be any visible gaps between the shoulders *(Joint Too Loose)*.

SET DEPTH OF CUT. Next, set the height of the dado blade so it's a little less than half the thickness of the workpiece. Then make some test cuts in a piece of scrap (scrap should be same thickness as the final stock) to sneak up on the final depth of cut *(Fig. 1)*.

To do this, make a cut on one end of the test piece, using the jig and miter gauge to guide the test piece. Now flip the piece over and make a second cut on the same end. At this point, you should have a thin sliver of material remaining.

Next raise the dado blade a hair and repeat the process. This time around, remove a little from each side of the sliver until it completely disappears on the second cut.

CHECK THE FIT. Now before cutting the final half-lap joints in the actual stock, double-check the blade setup by cutting a half lap on the end of a couple of test pieces. Then check the fit to make sure the faces are flush.

If everything looks good and you don't have to force the pieces together, go ahead and cut the final joints.