





Wall Cabinet with Curves

A combination of old techniques and new machinery makes working with curves less painful

BY CLARK KELLOGG

This cabinet was my first big project as a student in the Fine Woodworking program at the College of the Redwoods. My inspiration was a cabinet-on-stand made by James Krenov, which I was fortunate to see in person. Although the cabinet is modest in size, I was struck by its subtle details, flawless proportions, and balanced exploration of form: a restrained exterior matched with a playfully arranged interior. So, when I was told to build something “small, simple, solid, and sweet,” I built this little wall-hung cabinet, which I hope captures what I admired in Krenov’s cabinet but expresses it in a slightly different manner.

There are a few elements of this cabinet that seem tricky—curved doors, tapered dividers, and an intricate frame-and-panel back—but building it is fairly straightforward. The carcass is joined with slip tenons, and the back is made with bridle joints and slip tenons. The doors, which are made from slabs of solid wood, have a subtle curve created with handplanes. A matching curve is cut into the cabinet’s top and bottom.

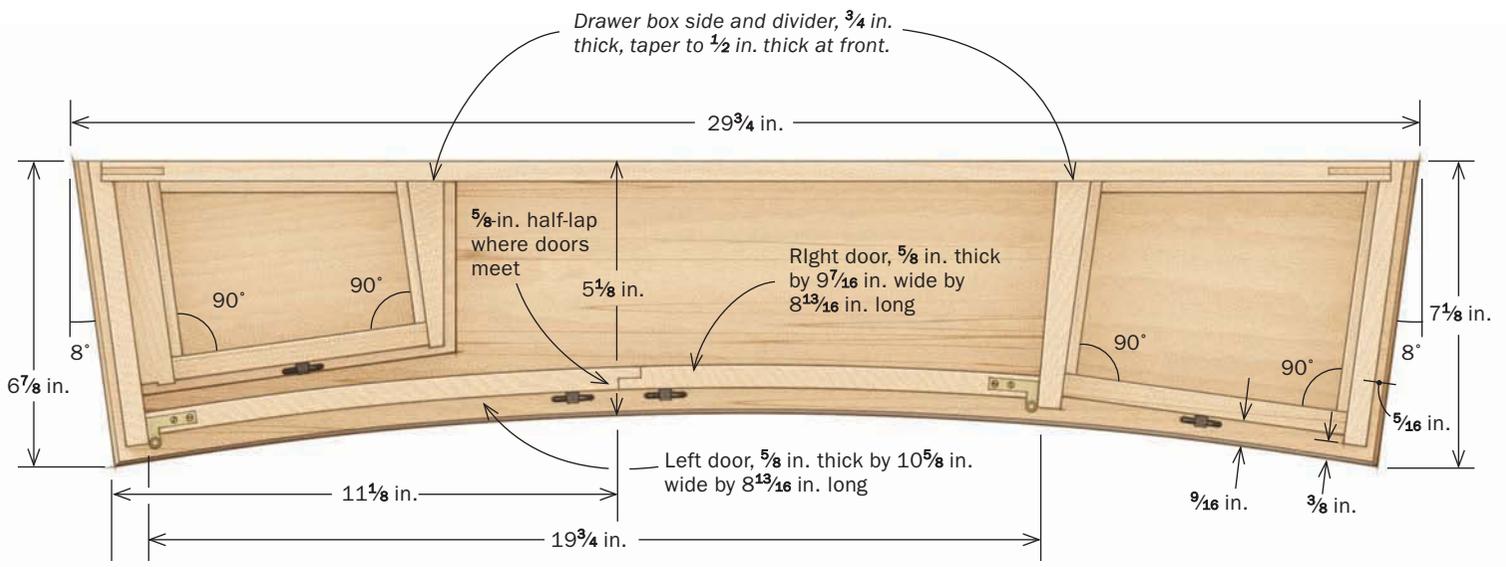
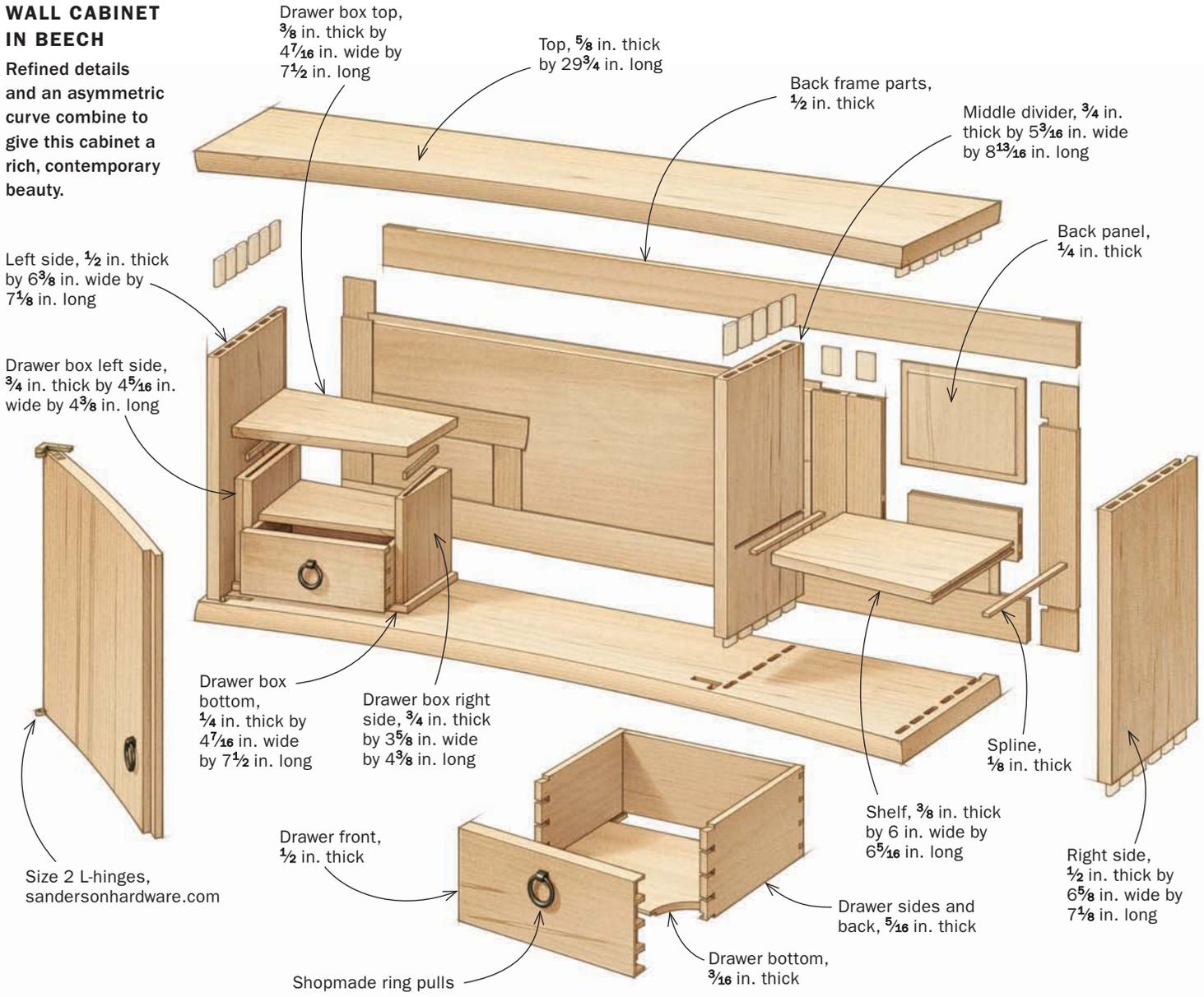
Use planes to curve the doors

I began with the doors rather than the cabinet, and there’s a good reason for it. It’s much easier to adjust the curve on the front edge of the cabinet’s top and bottom to match the doors than it would be to adjust the doors to match the cabinet.

The doors are made from solid wood, and because they are wider than they are tall, you might think that they could warp into pretzels or expand to the point of locking themselves shut. But don’t worry. They’re made from quartersawn boards (riftsawn works, too), so there’s very little seasonal movement. Also, the doors are fully inset into the cabinet, which means that they don’t need to lie flat against a frame. And the little warping that will occur won’t be noticeable because both the front and back faces of the doors are curved.

WALL CABINET IN BEECH

Refined details and an asymmetric curve combine to give this cabinet a rich, contemporary beauty.



MAKE THE DOORS FIRST

It's far less work to adjust the curve on the cabinet's top and bottom to match the doors than it would be to adjust the doors to match the cabinet.



Use a template for the curve. Trace it onto both ends of the door blank. Because it changes radius over its length, Kellogg uses a complete template of the curve. The other half is for the second door.

To begin making the doors, create a full-size pattern. Next, mill two door blanks, leaving them about $\frac{1}{4}$ in. longer than their final dimension, and a bit wider, too.

Plane the front of the first door to create its concave curve. I use a shopmade coopering plane for this (see *Handwork*, p. 24). Work your way across the door's face, checking your progress against the curve drawn on the end grain. Keep an eye on the door's thickness at the top and bottom to keep it consistent. When you plane the second door, check it against the first door to ensure that the transition from one to the other is smooth. Don't worry too much if the curve is not perfect. As long as it's a gentle, fair curve, they'll look great.

After the fronts of the doors are complete, flip them over and shape the backs. Because the curve is convex, the shaping can be done with any normal bench plane. As the blanks start to get thinner, you may need to make some curved supports to keep the doors from flexing as you plane them.

Next, cut the rabbets on the doors. You will need to prop up the doors as you run them across the router table to accommodate their respective curves. Sneak up on the fit, sliding the doors together after each pass. The rabbets should overlap so that there is no break in the curve as it travels from one door to the other.

Build the cabinet around the doors

The cabinet's top and bottom are curved along their front edges. The drawer box side and middle divider are tapered in thickness, being thicker at the back of the cabinet than at the front. This allows them to be parallel to the ends of the top and bottom on the outside face, but square to the back on the inside face. The joinery that holds the case and drawer box together is cut before these parts are shaped, which makes the construction far simpler than if the joints were cut afterward.

Mill the parts to their final dimension, leaving the top and bottom long, and the sides about $\frac{1}{8}$ in. wider than their final width. Next, lay out the mortise locations on the sides and divider. Because I



Hollow the front. With the help of a coopering plane, dish out the door's outside face, working with the grain.



Curve the back. Working with a coopering plane, cut across the grain first to remove material quickly (shown), then use a flat-sole plane along the grain to refine the door's shape.



Doors meet with a rabbet. One door gets a rabbet on its front, the other on its back. Use a block to raise the door so that the rabbet is square to the door's edge.

SLIP TENONS JOIN THE CASE

Plenty strong enough for this wall cabinet, slip tenons also make it easy to join sides to an overhanging top and bottom.



Mortise the sides. Kellogg uses a Festool Domino joiner, which speeds up and simplifies the joinery. A doweling jig and dowels can be used instead of Dominoes.



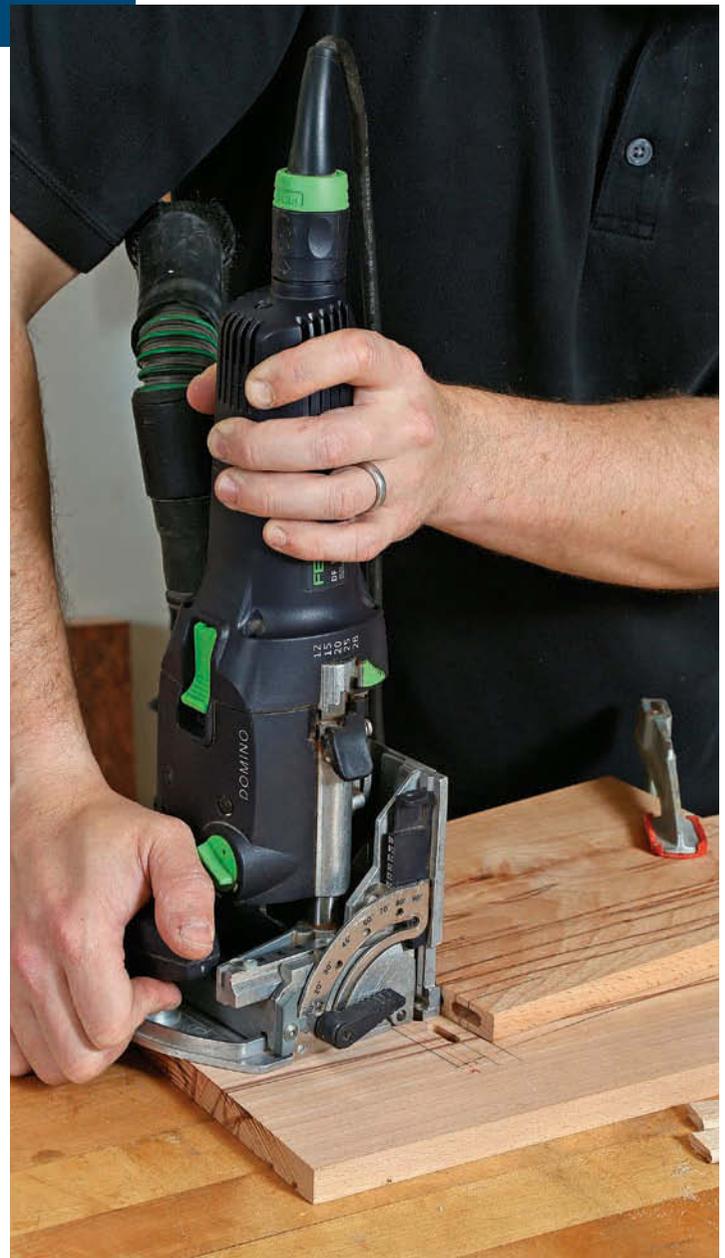
Use the side as a guide. Place the side down parallel, but inset from, its location in the assembled cabinet (above). After clamping it down, use it as a fence for the Domino joiner, aligning the tool with the layout lines on the cabinet side to create mating mortises (right).

used a Domino joiner to cut the mortises for this project, I marked only the centerline for each mortise. I marked the centerlines on the end grain and then transferred them to the panel's face. After cutting the mortises, assemble the case dry, using a few slip tenons per joint.

Fit the doors

The doors swing on offset knife hinges (L-hinges, size 2, sandersonhardware.com), and the space between the hinges and the cabinet sides is extremely narrow, the thickness of a piece of blue tape. So, put a piece of tape on the cabinet side. The center of the hinge pin should line up with the front edge of the cabinet side.

When you have the hinge leaf in place, scribe around it with a knife. Repeat for the other three hinges. Disassemble the cabinet and rout away the waste freehand, using a trim router and $\frac{1}{8}$ -in.



straight bit. Set the depth of cut so the hinges sit about $\frac{1}{32}$ in. below the surface to allow for planing or sanding the surface. Carefully pare to the scribe lines with a sharp chisel.

Next, reassemble the case (still without glue). Plane the doors to fit. Remove material from the top, bottom, and outside edges, but not from the inside edge. Across their width, they should just fit inside the case. Mortise the hinges into the top and bottom of each door. After transferring the mortise location from the cabinet to the door, rout and pare the mortises in the same manner as before.

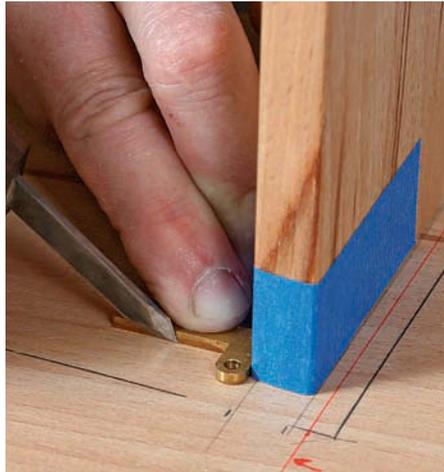
After the doors are swinging and the rabbets are overlapping correctly, clamp a pair of sticks inside the cabinet to act as stops. Then, with the doors closed, trace a line $\frac{1}{2}$ in. offset and parallel to the doors' curve onto the carcass top and bottom. Because the curve of the two doors may differ from your original drawing, it is better to adapt the shape of the cabinet to the doors you have

THE DOORS SWING ON KNIFE HINGES

Barely visible when installed, knife hinges are perfect for a cabinet with modern lines. Use offset, or L-shape, hinges so that the inset door swings open as far as possible.



Locate the hinge. Blue tape on the cabinet creates a perfect gap, while a combination square ensures that all the hinges are in the same plane.



Knife the layout. Holding the leaf in place with a finger, cut around the perimeter to define the mortise.



Pare to fit. After routing out the waste, use a chisel to clean up to the layout lines.



Mortise the door. Locate the door in the cabinet. Clamp scraps in the cabinet to keep it in place (left). Slide the door over and transfer the mortise (center). Hold the hinge in place and cut around it (right).

made, rather than trying to go back and re-shape the doors. Band-saw and spokeshave the case pieces to shape. I use a spokeshave to give the edges a slightly elliptical profile.

Now it's time to taper the right-hand face of the middle divider. I scribe a line on the front edge of the divider marking its final thickness, and then use a handplane to remove the waste. Work back and forth across the grain, taking more shavings where it's thinner, until the divider is tapered to its final dimensions.

Make a drawer pocket, then assemble the case

The shelf that serves as the top of the right-hand drawer pocket is held in place with splines, which means that the middle divider, the case side, and the shelf need dados. I start with the stopped dados in the case parts, using a straightedge clamped to the workpiece to guide a small router that's spinning a $\frac{1}{8}$ -in.-dia. spiral bit.

COMPLETE THE CASE

The curve along the front edge of the cabinet should match the arc of the doors, so take care when cleaning up after cutting the curve at the bandsaw.

Cut out the top and bottom. Do the curve along the front edge first, staying close to the layout line (left), then cut both ends (right). There is no need to do this at the table saw because the cut will be cleaned up in the next step.



Next up are the grooves in the shelf. It's important that the shelf fits without gaps between the case side and middle divider, so cut it a bit long and then sneak up on the fit, using a shooting board and block plane to carefully trim the length until it just slides into place. After the shelf has been fitted, rout grooves in the ends using the same $\frac{1}{8}$ -in.-dia. bit used to rout the dados.

I do this at the router table, standing the shelf on end and pressed against the fence. Next, mill up some $\frac{1}{8}$ -in.-thick spline stock using the same material you used for the cabinet. Note that the grain of the splines runs parallel to the grain of the shelf. This may seem counter intuitive, as you will end up with splines that are $\frac{1}{4}$ in. long by 6 in. wide; however, if you were to run the grain lengthwise you would run into serious wood movement issues.

Now cut the rabbets that will accept the back panel. I use a rabbeting bit in the router table, then cut the top and bottom to length, and do any shaping and smoothing necessary. I also pre-finish all the parts—once the case goes together, getting a nice finish in the corners is tricky.

When gluing up the cabinet, use clamping cauls to distribute pressure evenly across its depth. After the glue is dry, use a chisel to square up the stopped ends of the rabbets in the cabinet.

Elegant back encloses the cabinet

The frame-and-panel back has an outer frame held together with bridle joints and inner frame members joined to it with slip tenons. I cut the bridle joints on the band-



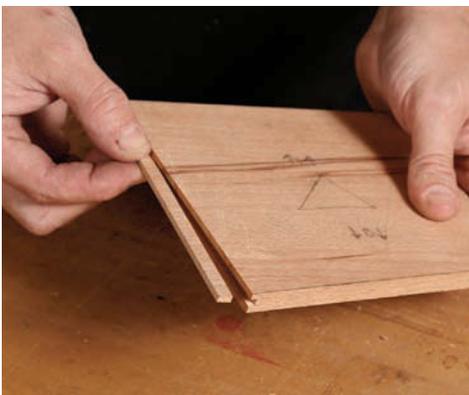
Take a spokeshave to the edge. It's a quick way to remove the machine marks, refine the curve, and create the edge profile. Do the same for the end grain.

saw and with a crosscut sled on the table saw. Make the frame about $\frac{1}{16}$ in. oversize in total height and width. The internal frame members are joined with Dominoes.

Next, shape the end of the short horizontal frame piece to match the profile on the outside of the cabinet. I used a block plane, but a disk sander would also work. Disassemble the frame and cut the grooves for the panels into the frame pieces with a $\frac{1}{8}$ -in. three-wing slot-cutter (Whiteside Machine Co., No. 1906) on the router table.

Reassemble the frame and trace the inside of each section (there should be four) on a piece of $\frac{1}{4}$ -in.-thick solid stock. Remove the frame and draw a new set of lines outside the traced lines, offset exactly $\frac{3}{16}$ in. Cut out the panels. Next, use a straight bit to rabbet the panels. Again, sneak up on the fit—you don't want the panel to crack the frame, but you don't want it to rattle around, either.

Cutting the rabbet on the notched section of the larger panel can get a little tricky, because you need to replace your



Spline joins the shelf and cabinet. The side needs a dado. Cut it with a router guided by a straightedge (top). Use the same bit at the router table to rout a groove in the shelf's end grain (center). The grain of the spline should run in the same direction as the grain of the shelf to prevent problems from wood movement (bottom).

normal fence with one that comes to a point so that you can get into the tight corners. However, because the bit won't get all the way into the corner, you will need to use chisels to square up the round left by the router bit. Do your best to maintain the rabbet's radiused corner. Reassemble the frame and install the panels to check how everything fits, then smooth and pre-finish the panels before gluing up the assembly.

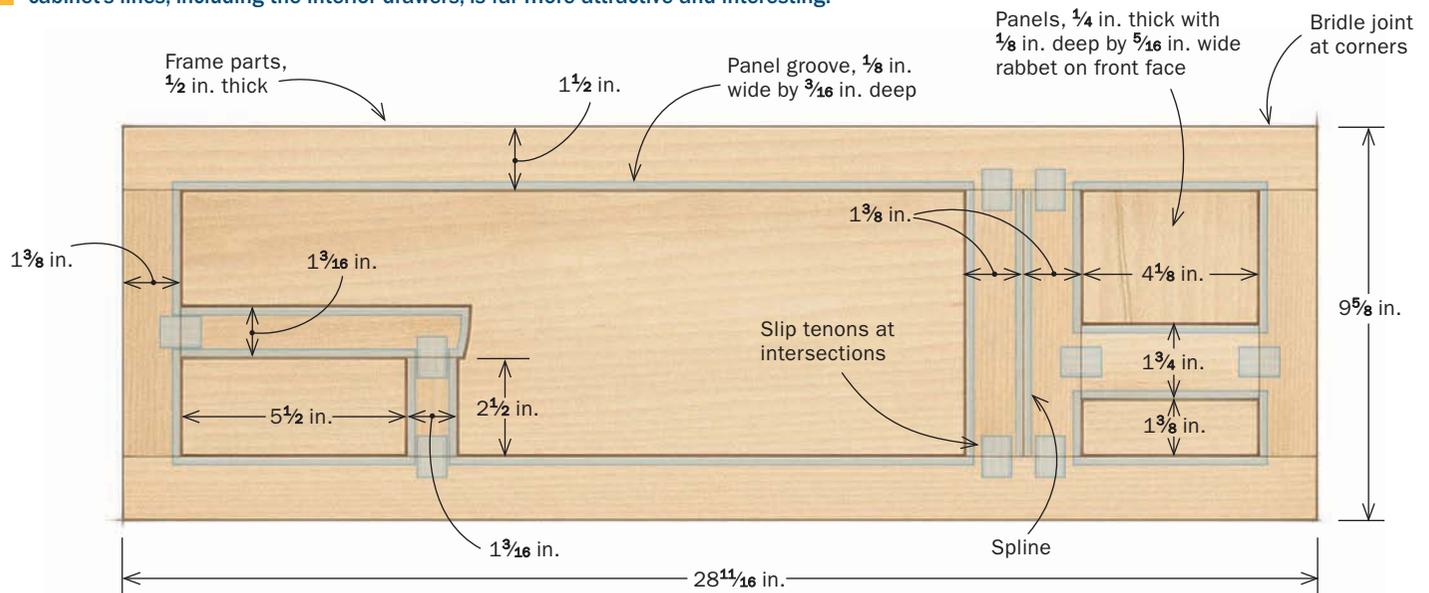
Once the glue has dried, plane or sand the joints of the frame flush, and use a



Glue up the case. Glue the sides and middle divider into the bottom, then add the top. After gluing the splines into the shelf, spread glue in the dados and push in the shelf from behind.

FRAMED WITH A FLOURISH

Sure, you could use a simple frame-and-panel back, but making one that follows the cabinet's lines, including the interior drawers, is far more attractive and interesting.



Trace the frame. Assemble the frame dry and lay it down (front face up) on an oversize blank. Transfer all of the inside edges to the blank. Then lay out offset lines to account for the tongues that fit into the frame groove.



Cut out the panels and rabbet the edges. Cut out the individual panels at the bandsaw. Kellogg uses a straight bit to create a rabbet with a soft corner. A pointy fence gets into the tight corner. The fence's point is offset from the bit's outside edge.





Three parts at once. Join the two small frame parts, and then hold them in place beneath the panel. Slide the panel into the groove, guiding the slip tenon on the small rail into its mating mortise (top). The last panel fits in from the side (above). Finally, glue the last frame part in place (right).



block plane to begin fitting the frame to the back rabbet.

If the cabinet or frame is out of square, plane the frame to fit by starting in one corner of the frame, then working out along the two adjacent edges until the corner of the back panel fits into its respective corner of the rabbet. Next, plane the remaining two edges to fit. The fit of the back panel should be snug, but not overly tight. You really don't want to break your cabinet apart at this point (or at any other point, for that matter.)

Next, sand and finish the frame, then glue the back panel assembly into the case. You don't need much glue, or much pressure on the panel, and you don't want to damage the profiled front edges of the cabinet. Wooden cam clamps, with their moderate grip and forgiving jaws, work great for this job. □

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