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Arts & Crafts Wine Cabinet

In this plan you will be getting:

- Step by Step construction instruction.
- A complete bill of materials.
- Exploded view and elevation drawings.
- How-to photos with instructive captions.
- Tips to help you complete the project and become a better woodworker.



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Arts & Crafts Wine Cabinet

Here's an involved but straightforward exercise in casework construction that will also test your furniture-building skills. This is a huge cabinet: the upper unit provides loads of shelf space for storing and displaying glassware, while the bottom stows a substantial collection of wine. If you have other needs for this project, it easily converts to a conventional hutch by simply omitting the lower shelf dividers or flipping the shelves over.

We'll never know if Gustav Stickley would approve of an Arts & Crafts wine cabinet, but the style lends itself well here, both in terms of form and function. The base cabinet discreetly stores more than five dozen bottles of wine, while the divided glass doors above show off a full collection of stemware.

If you've never worked with quartersawn white oak, here's a fitting opportunity to select some top-quality stock from a reputable supplier. For a vibrant and authentic look, choose boards with a wide flake pattern. It's also a good idea to splurge for plywood laid up with quartersawn face veneer so the plywood components blend in well with the solid-wood parts. Quartersawn oak veneered plywood can be difficult to find. If you can't locate it, riftsawn veneered plywood is a good substitute. It looks more appropriate than common rotary-cut veneer for this project.

Building the Upper Carcass

The upper cabinet has a pair of frame-and-panel ends made of solid wood, but the rest of the carcass is mostly plywood. Start building the carcass by choosing the best plywood veneer for the back panel. As you can see in the *Exploded Drawing* on page 126, the cabinet back consists of three plywood panels (pieces 1 and 2) joined



Removable shelves in the base cabinet are outfitted with divider strips to keep the bottles stationary and evenly spaced. The shelves could be flipped over onto their flat faces for storing other items as well.

with biscuits. Here's why: In order to orient the plywood veneer so the grain pattern runs vertically—a visual necessity here—you'll need a panel nearly five feet wide and four feet long. We chose the most dazzling veneer for the center panel, since it shows through in the end.

Cut the three back panels to size and mill #20 biscuit joints along the mating edges, then glue the panels up.

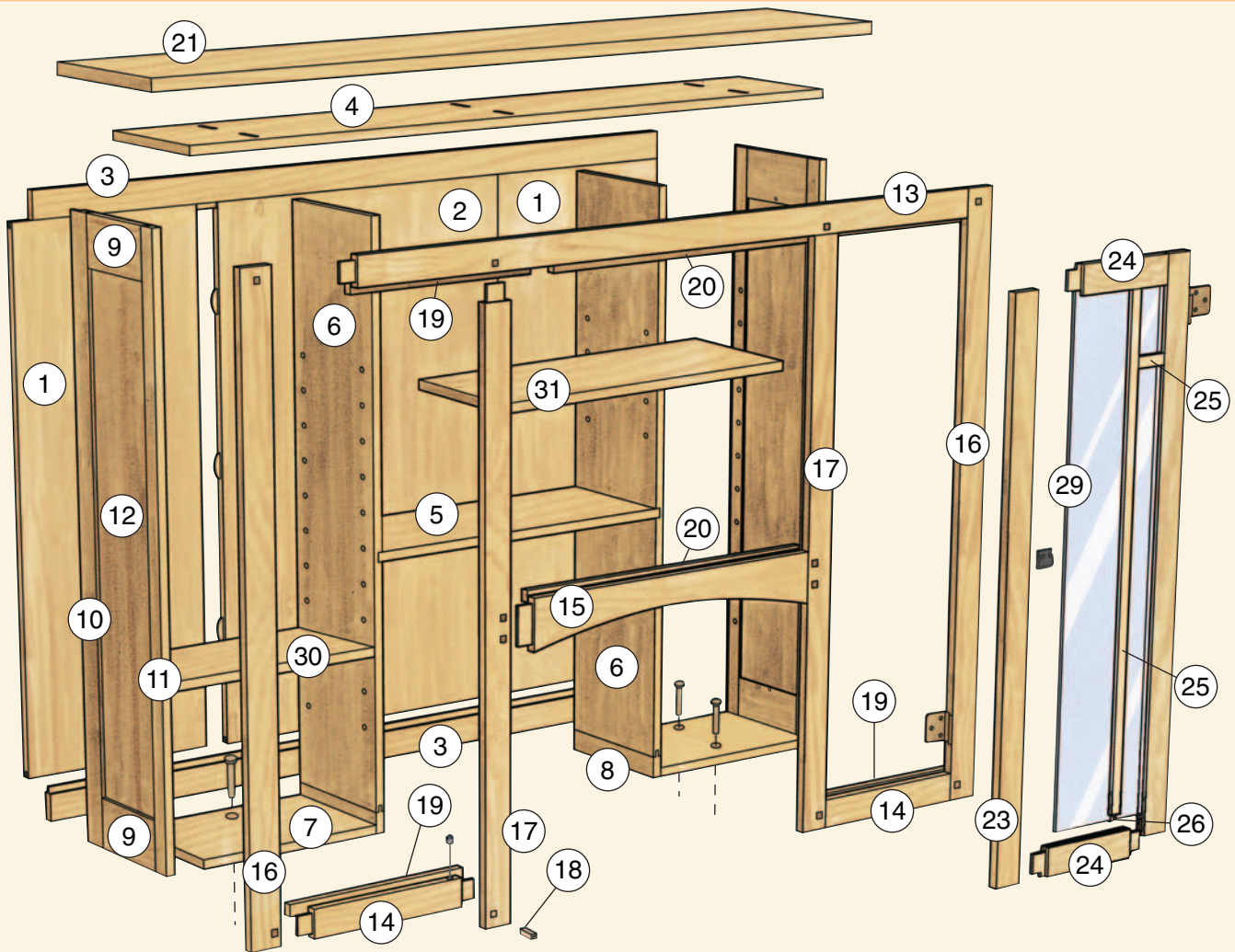
Cut the rails (pieces 3) now, too.

The rails stiffen the fragile biscuit joints, and the bottom rail forms a finished edge where the two cabinets meet. The back panel and rails are joined with 1/4" x 1/2" tongue and groove joints. We used a piloted slot cutter to cut the long panel grooves. Stain and finish the completed panel now, while all its surfaces are fully accessible.

Follow the *Material List* dimensions to cut plywood parts for the subtop, horizontal divider, side panels and bottoms (pieces 4, 5, 6 and 7). Rout slotted holes through the subtop so the solid-wood top can expand and contract with the seasons. Cut the side panel bottom rails (pieces 8), and join these to the sides the same way you did with the back panel rails. Complete the sides at this stage by cutting 3/8" x 3/4" dadoes across their inside faces for the horizontal divider.

Next, make the solid-wood end frames (pieces 9, 10, 11 and 12). The rails and stiles are joined with more tongues and grooves (see *Elevation Drawings*, page 127). Cut a wide rabbet along the back edge of the rear stiles to house the back panel. Carefully choose your stock for the panels that float inside these frames. Quartersawn flakes are hard to match up if you need to prepare the panels from more than

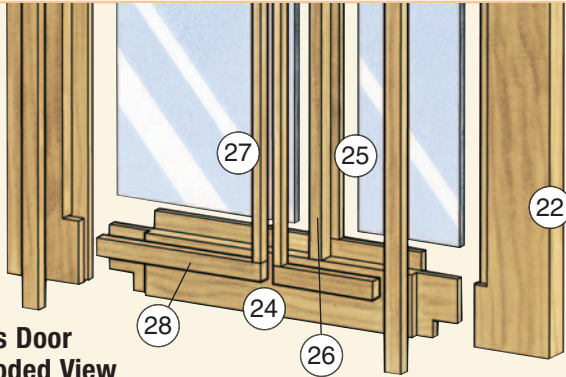
Upper Carcass Exploded View



MATERIAL LIST – Wine Cabinet

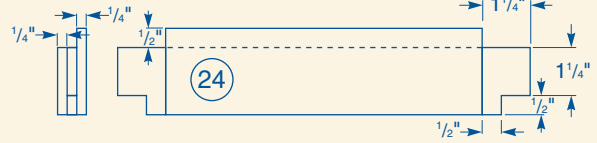
	T x W x L		T x W x L		
1	Back End Panels (2)	3/4" x 16 ³ / ₈ " x 44 ¹ / ₂ "	16	Outer Face Frame Stiles (2)	3/4" x 2 ¹ / ₂ " x 48"
2	Back Center Panel (1)	3/4" x 26 ³ / ₄ " x 44 ¹ / ₂ "	17	Inner Face Frame Stiles (2)	3/4" x 2 ¹ / ₄ " x 47"
3	Back Panel Rails (2)	3/4" x 2 ¹ / ₄ " x 59 ¹ / ₂ "	18	Face Frame Pegs (12)	3/8" x 3/8" x 3/4"
4	Subtop (1)	3/4" x 10 ¹ / ₂ " x 58 ¹ / ₂ "	19	Large Door Stops (4)	1/2" x 1" x 15 ¹ / ₂ "
5	Horizontal Divider (1)	3/4" x 10 ¹ / ₂ " x 26 ³ / ₄ "	20	Small Door Stops (2)	1/2" x 1" x 26"
6	Side Panels (2)	3/4" x 10 ¹ / ₂ " x 45 ¹ / ₂ "	21	Top (1)	1" x 13" x 66"
7	Bottoms (2)	3/4" x 10 ¹ / ₂ " x 15 ¹ / ₂ "	22	Short Door Stiles (4)	3/4" x 2 ¹ / ₄ " x 23 ³ / ₄ "
8	Side Panel Bottom Rails (2)	3/4" x 2 ¹ / ₄ " x 10 ¹ / ₂ "	23	Tall Door Stiles (4)	3/4" x 2 ¹ / ₄ " x 43 ¹ / ₂ "
9	End Frame Rails (4)	3/4" x 4" x 8 ¹ / ₂ "	24	Door Rails (8)	3/4" x 2 ¹ / ₄ " x 10 ³ / ₄ "
10	Rear End Frame Stiles (2)	3/4" x 2 ¹ / ₄ " x 48"	25	Muntins (8)	1/4" x 7/8" x Varies
11	Front End Frame Stiles (2)	3/4" x 1 ¹ / ₂ " x 48"	26	Muntin Backer Strips (8)	3/8" x 1/2" x Varies
12	End Frame Panels (2)	1/2" x 8 ¹ / ₄ " x 41"	27	Small Glass Retainer Strips* (20)	1/4" x 3/8" x Varies
13	Face Frame Top Rail (1)	3/4" x 2 ¹ / ₄ " x 58"	28	Large Glass Retainer Strips* (28)	3/8" x 1/2" x Varies
14	Face Frame Bottom Rails (2)	3/4" x 2 ¹ / ₄ " x 15 ¹ / ₄ "	29	Glass* (12)	1/8" x Varies
15	Face Frame Arched Rail (1)	3/4" x 4" x 28"	30	Side Shelves (6)	3/4" x 10 ³ / ₈ " x 15 ¹ / ₄ "

*Measure and cut after doors are assembled

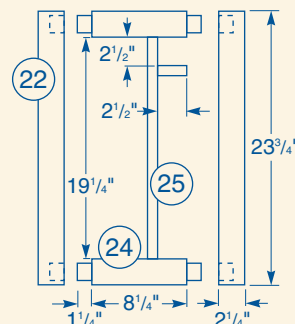


**Glass Door
Exploded View**

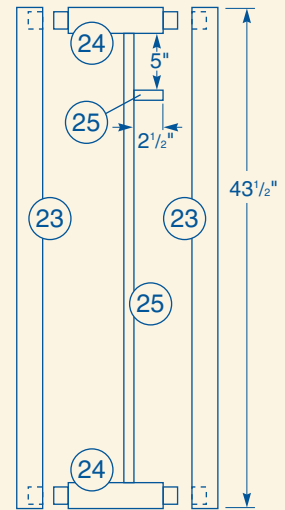
Door Rail (Front and End Views)



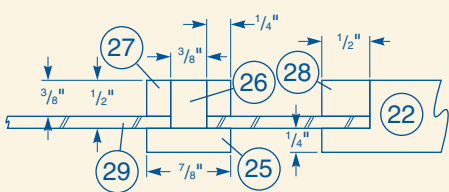
Short Door (Front View)



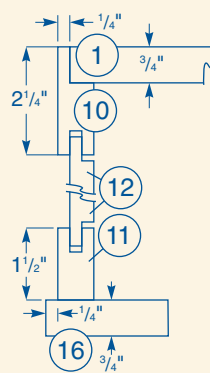
Long Door (Front View)



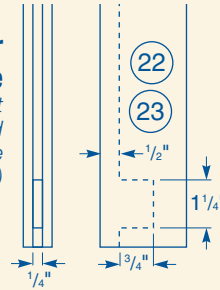
Muntin Assembly Detail (Top View)



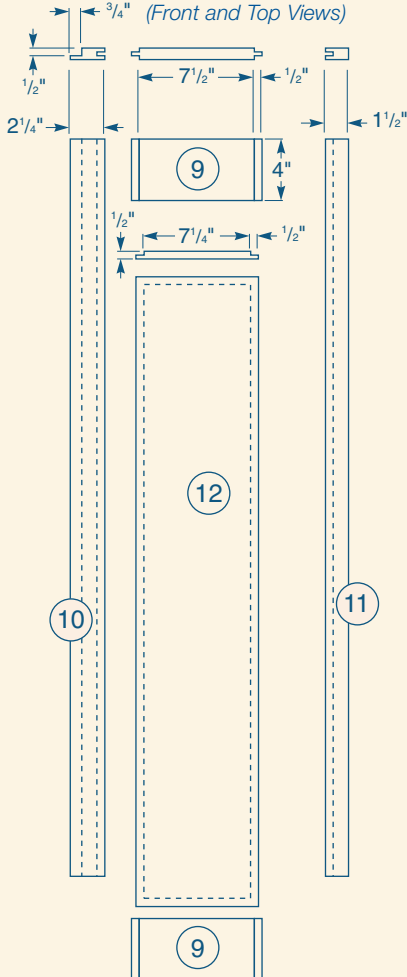
**End Frame
Joinery Detail
(Section View)**



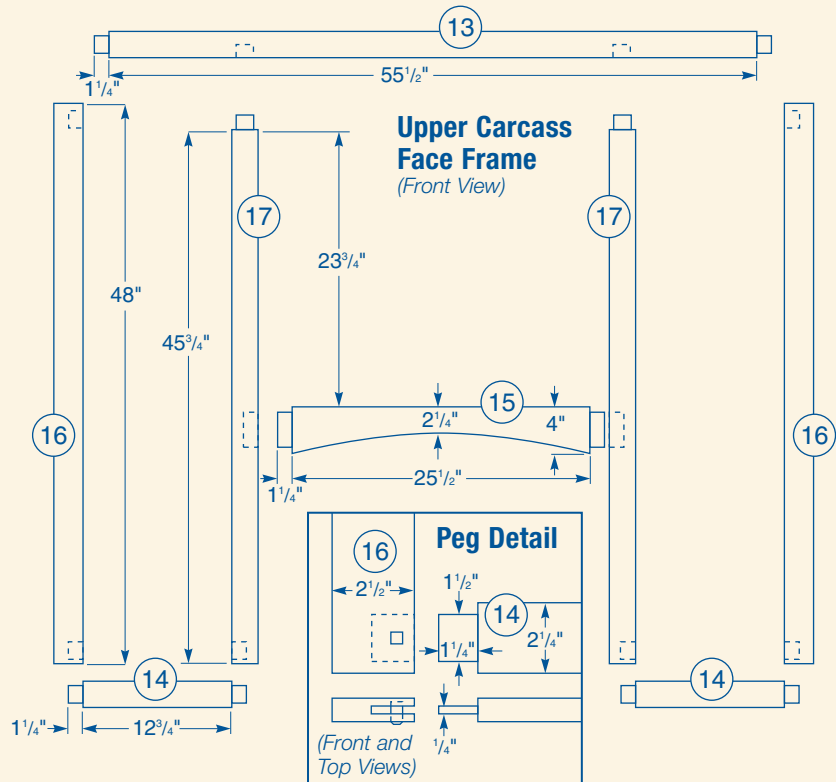
**Door
Stile
(Front
and
Edge
Views)**



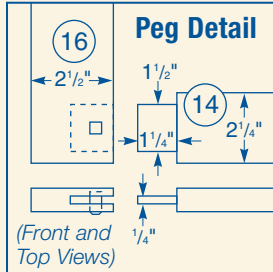
**End Panel
(Front and Top Views)**



**Upper Carcass
Face Frame
(Front View)**



Peg Detail





Tongue-and-groove joints connect the upper cabinet end frame parts. Finish the floating panels before assembling these frames.

one board. Our stock was too thin to resaw for a book-matched look, so we made each panel from two widths of single boards to help blend the random grain pattern.

Once you've got your panel blanks planed and trimmed to size, mill a rabbet around the inside faces (see *Elevation Drawings*). When you fit the frames and panels together, you'll notice that the panels are undersized 1/4" across their width to accommodate wood movement. You should pre-finish the panels now, including the topcoat. This way, bare wood can't show if the panels shrink. Assemble the frames and panels with the panel rabbets facing inward, and lock the panels to the rails with a centered dowel, top and bottom. This keeps the rabbet reveals even if the panels shift inside the frames.

Before you assemble the rest of the carcass, drill rows of shelf pin holes in the side panels and end frame stiles. Remember that the side panels require shelf pin holes on both faces—two columns for shelving in the long cabinets and another set for the center cabinet shelves. Now, assemble the carcass by joining the end frames, side panels, subtop and bottoms with #20 biscuits and glue. Drive countersunk screws down through the subtop and into the side panels instead of

using biscuits here—it's easier. Slip the horizontal divider into its dadoses and pin it in place with 18-gauge finish nails.

Making the Face Frame

Following the *Material List*, cut all the face frame parts (pieces 13 through 17) to size. The rail and stile joints are straightforward mortises and tenons. The tenons are all 1/4" thick, 1 1/2" wide and 1 1/4" long, except for those on the arched rail (piece 15), which are 3" wide. Mill these joints using whatever machining techniques you prefer. Cut the curve in the arched rail, sand it smooth on a drum sander, and glue up the face frame. Connect the parts, starting with the arched rail and working toward the outer stiles. Chamfer the outer edges with a block plane or a chamfer bit in your router for a more finished look.

To break up the flat plane of the face frame and doors, we locked the face frame joints with square oak pegs (pieces 18). If you've got a mortising machine, simply lay out the peg locations and chop square holes using a 3/8" hollow-chisel bit. Otherwise, you

could pull off this technique by drilling slightly undersized round holes and tapping in the square pegs. Once the holes are chopped, plane down some oak scrap into 3/8" x 3/8" strips and cut them into pegs (pieces 18). Chamfer the "show" ends of the pegs (see top *photo* on the next page) before gluing them in.

With the face frame and carcass construction behind you, apply finish to these parts before attaching them. We used the face frame to square up the carcass instead of following the usual convention of installing the back to pull things into square. The face frame is oversized to provide 1/4" of overhang where it meets the end frames, horizontal divider and side panels. By installing the face frame first, you'll be able to square the carcass in relation to the face frame and keep the overhangs even all around. Nail on the face frame and, while the back is still off, cut and attach pairs of door stops (pieces 19 and 20) to the back of the face frame at each door opening with short countersunk wood screws. Then fasten the back into its rabbets with more screws.

Make a blank for the top (piece 21).

Cut 5/8" deep square holes for the face frame pegs using a mortising machine. Support the face frame with blocking and line up the bit carefully. You may need to raise the mortiser's table with additional blocking (as I did) to get full throw of the lever arm on 3/4" thick stock.





Make the face frame pegs from longer strips, chamfering each on a sander before cutting it to length. A simple angle jig helps maintain even chamfers. Press the pegs into their square face frame holes with a C-clamp to avoid marring them.

We glued ours up from several pieces of 5/4 stock planed to 1" thickness. Pre-finish the top on all surfaces and attach it to the subtop with #10 panhead or washerhead wood screws. Drive these up through slotted holes in the subtop so the top can expand and contract widthwise.

Making Door and Muntin Assemblies

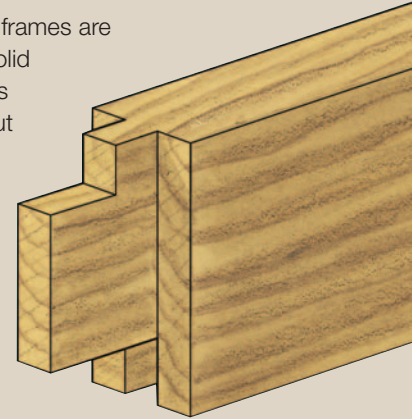
Now, on to the doors. Spend some extra time at the jointer when preparing your door frame stock to ensure the part surfaces are dead flat and square. Build all the door frames at once to economize your machining sequences. Once the rails and stiles (pieces 22, 23 and 24) are cut to size, mill 1/4"-wide, 1/2"-deep centered grooves along one edge of these parts. These grooves will house the glass, muntin assemblies (pieces 25 and 26) and retainer strips (pieces 27 and 28). Follow the sidebar at right to make the corner joints. Glue up the door frames and complete them by trimming off the back lip of the rail and stile grooves to form a 1/2" x 1/2" rabbet. We used a router and piloted rabbeting bit for this task, then squared up the rounded corners where the bit couldn't reach with a chisel.

Rather than employing a single large piece of glass in the doors and dividing it with faux muntins, these doors feature working muntins and individual panes of glass (pieces 29). Essentially, the muntins are "stick built" into the door frames. They're easy as pie, and you don't need cope-and-stick bits. To make the dividers, mill long strips of both backers and muntins. Follow the three photos on the top of page 132 to install the muntin parts. Slip the glass panes into the rabbets formed by the muntins and backers, and then cut and fit four retainer strips around each glass pane. Mount the retainers to the door frames with hot-melt glue or silicone caulk; this way, the strips are easy to remove in the event a glass pane breaks someday.

Now comes a moment of truth: hanging the doors. If you've

HAUNCHED TENONS FOR SOLID CORNER JOINTS

These door frames are joined by rock-solid haunched tenons and mortises. Cut the mortises in the stiles first with a plunge router, drill press or mortising machine. Start the 1/4"-long mortises a 1/2" in from the ends of the stiles, and cut them a bit deeper than necessary to allow extra room for glue to pool. Then set up your table saw and dado blade to cut 1/4"-wide, 1/4"-long tenons on the ends of the door rails.



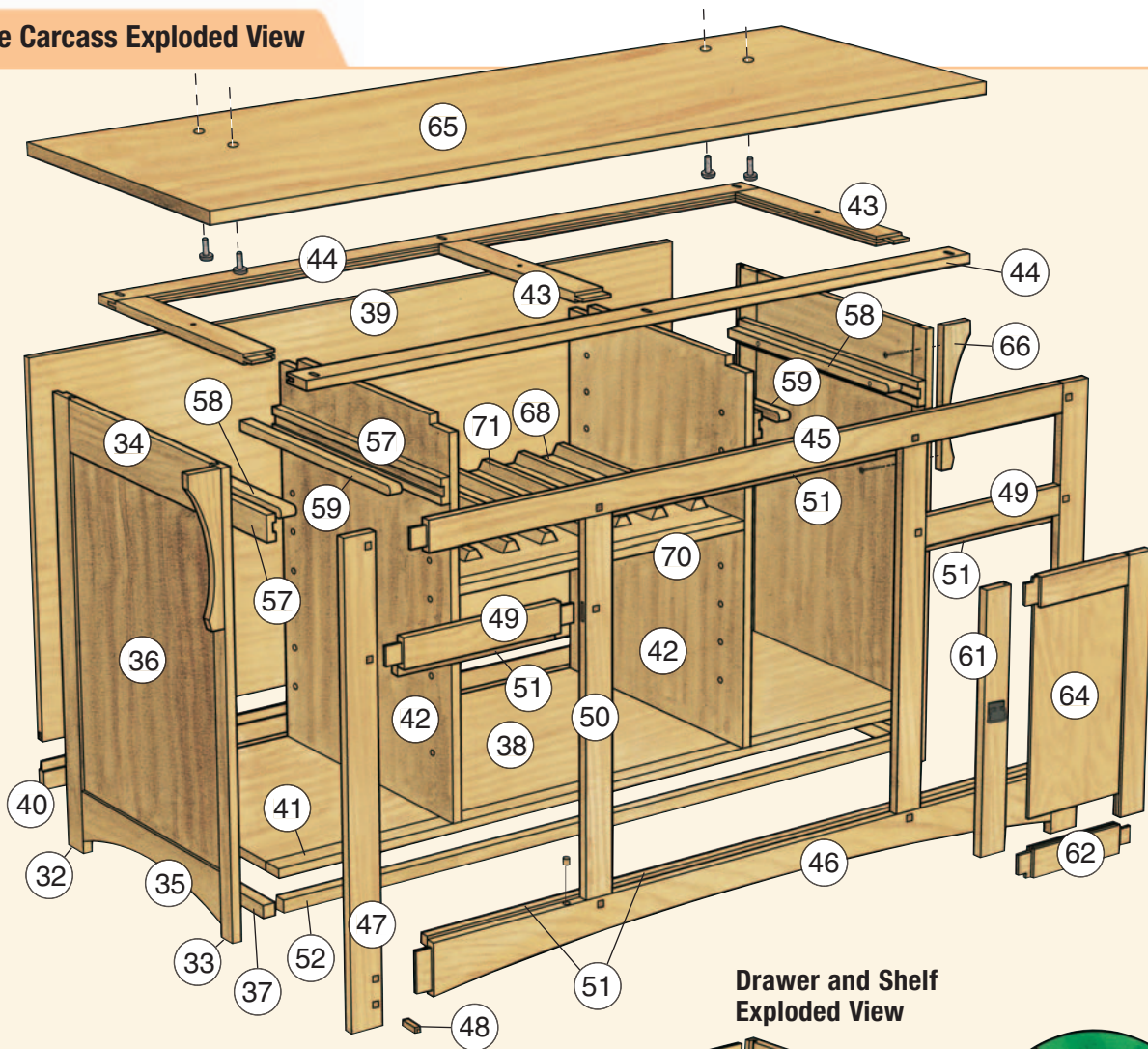
Haunches on these door tenons add more glue surface area, which strengthens the joint. They also fill the ends of the full-length grooves in the stiles.

Trim the haunch from the outside edge of the tenons to complete them. Index the haunches off the ends of the tenons with a 1/2"-thick stop block clamped to your rip fence. Once the joint parts are cut, refine their fit with a hand plane and chisel. Keep trimming and test fitting until there's just a bit of friction between the mortises and tenons. Otherwise, an overly tight joint can introduce a twist into an otherwise flat frame, which is the last thing you'll want when hanging these flush-fitting doors.

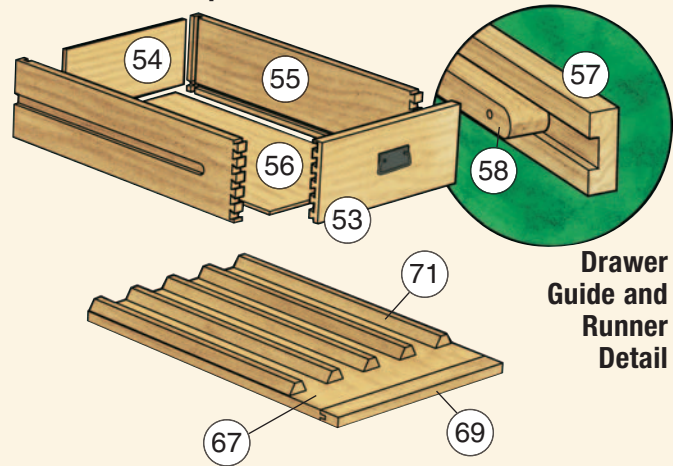


Nibble the haunched portion on the tenons so they'll fit into their mortises on the door stiles. A 1/2"-thick spacer on the rip fence establishes the haunch length.

Base Carcass Exploded View



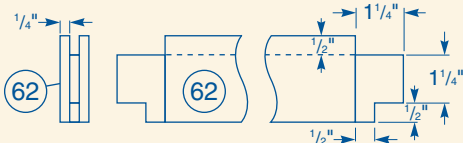
Drawer and Shelf Exploded View



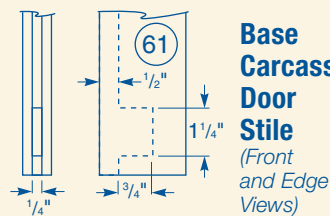
Drawer Guide and Runner Detail

MATERIAL LIST – Wine Cabinet

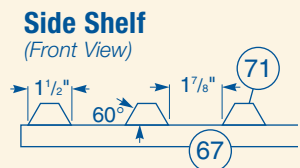
	T x W x L
31 Center Shelf (1)	3/4" x 10 ³ / ₈ " x 25 ³ / ₄ "
32 Rear End Frame Stiles (2)	3/4" x 2 ¹ / ₄ " x 35"
33 Front End Frame Stiles (2)	3/4" x 1 ¹ / ₂ " x 35"
34 Top End Frame Rails (2)	3/4" x 4" x 20 ¹ / ₂ "
35 Bottom End Frame Rails (2)	3/4" x 4" x 20 ¹ / ₂ "
36 End Frame Panels (2)	1/2" x 20 ¹ / ₄ " x 27"
37 Short Cleats (2)	1" x 1" x 22 ¹ / ₂ "
38 Bottom (1)	3/4" x 20 ³ / ₄ " x 58 ¹ / ₂ "
39 Back Panel (1)	3/4" x 30 ¹ / ₄ " x 59 ¹ / ₂ "
40 Back Panel Rail (1)	3/4" x 2 ¹ / ₄ " x 59 ¹ / ₂ "
41 Bottom Rail (1)	3/4" x 2 ¹ / ₄ " x 58 ¹ / ₂ "



Base Carcass Door Rail
(Front and End Views)



Base Carcass Door Stile
(Front and Edge Views)

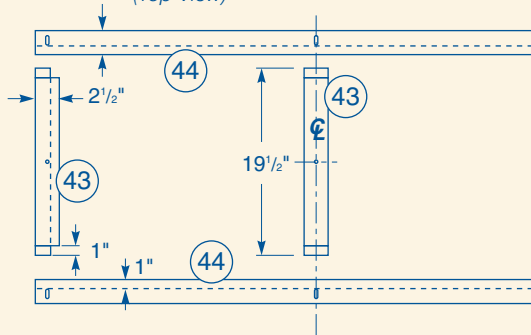


Side Shelf
(Front View)

MATERIAL LIST – Wine Cabinet

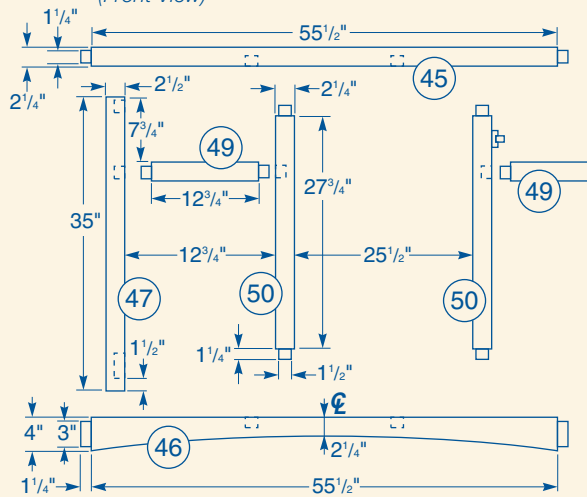
Base Carcass Support Frame

(Top View)



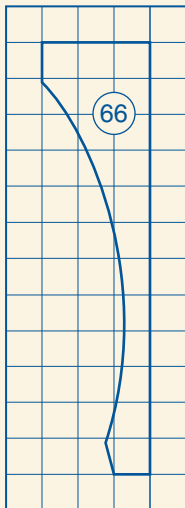
Base Carcass Face Frame

(Front View)



Corbel

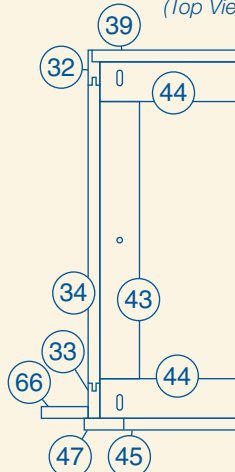
(Front View)



Each square equals 1"

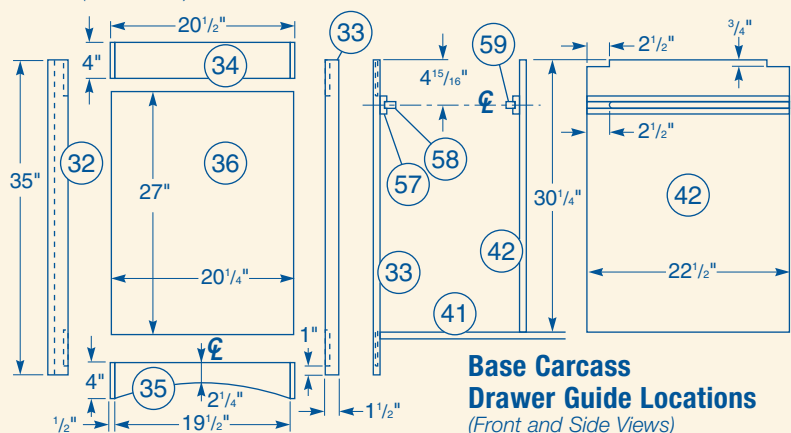
Base Carcass Assembly Detail

(Top View)



Base Carcass End Panel

(Front View)



**Base Carcass
Drawer Guide Locations**
(Front and Side Views)

	T x W x L
42 Dividers (2)	3/4" x 22 1/2" x 30 1/4"
43 Support Frame Stiles (3)	3/4" x 2 1/2" x 19 1/2"
44 Support Frame Rails (2)	3/4" x 2 1/2" x 58 1/2"
45 Face Frame Top Rail (1)	3/4" x 2 1/4" x 58"
46 Face Frame Bottom Rail (1)	3/4" x 4" x 58"
47 Outer Face Frame Stiles (2)	3/4" x 2 1/2" x 35"
48 Face Frame Pegs (14)	3/8" x 3/8" x 3/4"
49 Face Frame Drawer Rails (2)	3/4" x 2 1/4" x 15 1/4"
50 Inner Face Frame Stiles (2)	3/4" x 2 1/4" x 30 1/4"
51 Door Stops** (1)	1/2" x 1" x 120"
52 Long Cleat (1)	1" x 1" x 56 1/2"
53 Drawer Fronts (2)	3/4" x 5 3/8" x 12 5/8"
54 Drawer Backs (2)	3/4" x 4 5/8" x 11 7/8"
55 Drawer Sides (4)	3/4" x 5 3/8" x 20"
56 Drawer Bottoms (2)	1/4" x 11 3/4" x 19 7/8"
57 Drawer Guides (4)	3/4" x 2" x 22 1/2"
58 Wide Drawer Runners (2)	3/4" x 1 1/4" x 20 1/4"
59 Narrow Drawer Runners (2)	3/4" x 1" x 20 1/4"
60 Tall Door Stiles (4)	3/4" x 2 1/4" x 27 3/4"
61 Short Door Stiles (4)	3/4" x 2 1/4" x 20"
62 Door Rails (8)	3/4" x 2 1/4" x 10 3/4"
63 Tall Door Panels (2)	1/2" x 9" x 24"
64 Short Door Panels (2)	1/2" x 9" x 16 1/4"
65 Top (1)	1" x 25" x 68"
66 Corbels (2)	1" x 3" x 12"
67 Side Shelves (8)	3/4" x 15 1/4" x 21 1/4"
68 Center Shelves (5)	3/4" x 21 1/4" x 25 3/4"
69 Shelf Edging (8)	3/4" x 1 1/2" x 15 1/4"
70 Long Shelf Edging (5)	3/4" x 1 1/2" x 25 3/4"
71 Bottle Divider Strips (80)	3/4" x 1 1/2" x 18"

*Cut to fit.



Cut, fit and glue the vertical backer pieces into the door frame rabbets first, locating the backers so they'll be centered behind the long muntins (left photo). Flip the doors, then cut and glue the long, vertical muntin strips to these backers (right photo). Flip again to install the short horizontal backer pieces, followed by the short muntin strips. With enough spring clamps, you'll be able to assemble the muntins for an entire door or two at once without waiting for glue to dry.

Drive 2" screws through the support frame rails to attach this frame to the end frames. Mount the support frame just shy of flush with the upper end frame rails. The offset will enable the support frame to pull the cabinet top down flat and hold it under tension.

sized the doors and face frame openings carefully, a couple passes over the jointer should shave the doors down just enough to fit in their openings. Aim for about 1/16" of clear space all around to allow room for the hinge leaf thickness and swing clearance.

If you end up with a door that twists slightly or discover an out-of-square face frame opening (it happens to the best of us!), take a few shavings off the backs of the door frames or the edges and ends with a sharp low-angle block plane to improve the fit. The hinges you use may allow for some adjustment as well. You'll save yourself door hanging headaches and the effort of cutting all those hinge mortises if you use non-mortising hinges. Wrap up the assembly by making the side and center shelves (pieces 30 and 31).

Turning to the Base Carcass

Except for a few design details (and a couple of drawers), building the base cabinet is similar to constructing the upper cabinet. It's actually it's even easier.

Start by cutting and assembling pieces 32 through 36 to create your end frames. The joinery for the frames and floating panels is the same as for the end frames on the upper cabinet, but this time stop the grooves in the stiles 1½" from the bottom ends. This will position the bottom curved rails 1" up from the floor. Also, don't forget to cut the rabbet along the back edge of the back stiles.

Tackle the glue-ups for the wide, thin floating panels in two stages. First, glue up a couple of narrower blanks from thicker stock and mill them down to 1/2", then join these together to form the wide panels. It makes the thin, wide stock easier to clamp, and you'll have far fewer "wet" joints to manage during final clamping. Apply finish to the wide panels before assembling and pegging the end frames. Attach short cleats (pieces 37) with screws and glue to the bottom arched rails.

Make the bottom assembly, back panel assembly and dividers (pieces 38 through 42) and the support frame (pieces 43 and 44) next. You'll see in

the *Exploded Drawing*, page 130, that the bottom and back panels have solid-wood rails along one edge joined to the plywood with tongues and grooves. Notch the top corners of the dividers so they'll fit around the support frame rails. The support frame rails and stiles are joined by deeper 1/4" x 1" centered tongues and grooves. Cut three groups of round and slotted holes in this frame for attaching the cabinet top later.

Time for some assembly. Drive screws up through the end frame cleats to attach these frames to the cabinet bottom. Fasten the support frame to the end frames with screws (see *photo*, above). Slip the divider panels in place and fasten these with more screws. Drill all the shelf support holes at this point, taking into account where the drawers will hang when you lay out your hole locations—no need for shelf supports there.

Build the base cabinet face frame (pieces 45 through 50) with the same joinery you used for the upper face frame. This time, however, bore holes for the pegs that secure the drawer rails to

the inner face frame stiles before you assemble the full face frame. Otherwise, your mortiser might not reach these locations once the face frame is glued up. Cut the large arch in the bottom face frame rail prior to assembling the face frame but after tenoning the ends. Sand the curve smooth. Screw the door stops (pieces 51) behind the face frame openings, and nail the face frame to the cabinet. As an added measure of support, fasten a long cleat (piece 52) to the face frame and cabinet bottom with glue and countersunk screws.

Making the Drawers, Doors & Top

Refer to the *Drawings* on page 130 to construct the drawers (pieces 53, 54, 55 and 56) and mill the stopped



Slip the loose guide/runner assemblies into the drawer dadoes and slide the drawers and guides into their face frame openings to position them. Support the guides and drawers temporarily from below with clamps and scraps as you tack the guides in place. Test the drawer action, then fix the guides permanently with countersunk screws.

dadoes in the drawer sides. These grooves fit over drawer runner assemblies (pieces 58 and 59) and keep the drawers tracking straight. Make the drawer guides and runners, rounding the front corners of the runners to fit the curved ends of the drawer dadoes. Screw together two pairs of runners and drawer guides with the back ends of the parts held flush. Mount these inside the carcass to the end frames and dividers so they're centered on the drawer openings in the face frame (see *photo* below). The guides holding the wide runners fit against the end frames, and the narrow runners with their guides belong on the dividers (as shown in the *Exploded View*).

You're in the home stretch now, believe it or not! Build the four base cabinet doors (pieces 60 through 64), employing the same haunched tenon joinery as the upper glass doors and swapping wood panels for glass. Leave both lips of the tongue-and-groove joints intact this time. Hang the doors on their hinges. Apply finish to all the interior cabinet surfaces, drawers and doors before installing the back panel.

Glue up 5/4 stock in several sub-assemblies to make the base cabinet top (piece 65), then apply finish to all its surfaces. Mill the corbels to shape (pieces 66) and mount them flush against the face frame overhangs on the end frame stiles with screws. Fasten the top to the support frame with #10 panhead or washerhead screws.

Time for More Shelving

Cut plywood blanks (pieces 67 and 68) according to the *Material List* dimensions, and attach solid-wood edging (pieces 69 and 70) to the front edges with tongue-and-groove joints. Wrap the other exposed edges and end of each shelf with iron-on veneer edge



Dress this cabinet project with hammered copper Arts & Crafts door and drawer pulls. They may cost a little more than the cheap imitations, but you won't regret the investment when you see how good they look.

tape to give the shelving a finished look. Bevel-rip the bottle divider (pieces 71) strips (yes, there are 80 in all!), and cut them to length. Nail five dividers to each side shelf and eight dividers to the center shelves. It helps to make a bevel-edged spacer block for separating the dividers evenly.

Finishing Up

Apply the stain of your choice and follow up with several coats of satin varnish. Gel varnish is a good choice here: you can rub it on with a rag and avoid all the annoying drips and sags that happen when brushing varnish on vertical surfaces. Then rub some paste wax on the drawer runners. Install the door catches as well as the drawer and door pull hardware. To keep the upper cabinet safely upright on the base, run pairs of connector bolts and cap screws through the upper cabinet bottoms and the top of the base cabinet, or attach the cabinets with metal strapping and screws driven into the backs. Install shelf supports and slide in the shelving. Then take a well-deserved rest with a bottle of your best vintage...after all, this unit holds 67 of 'em!