

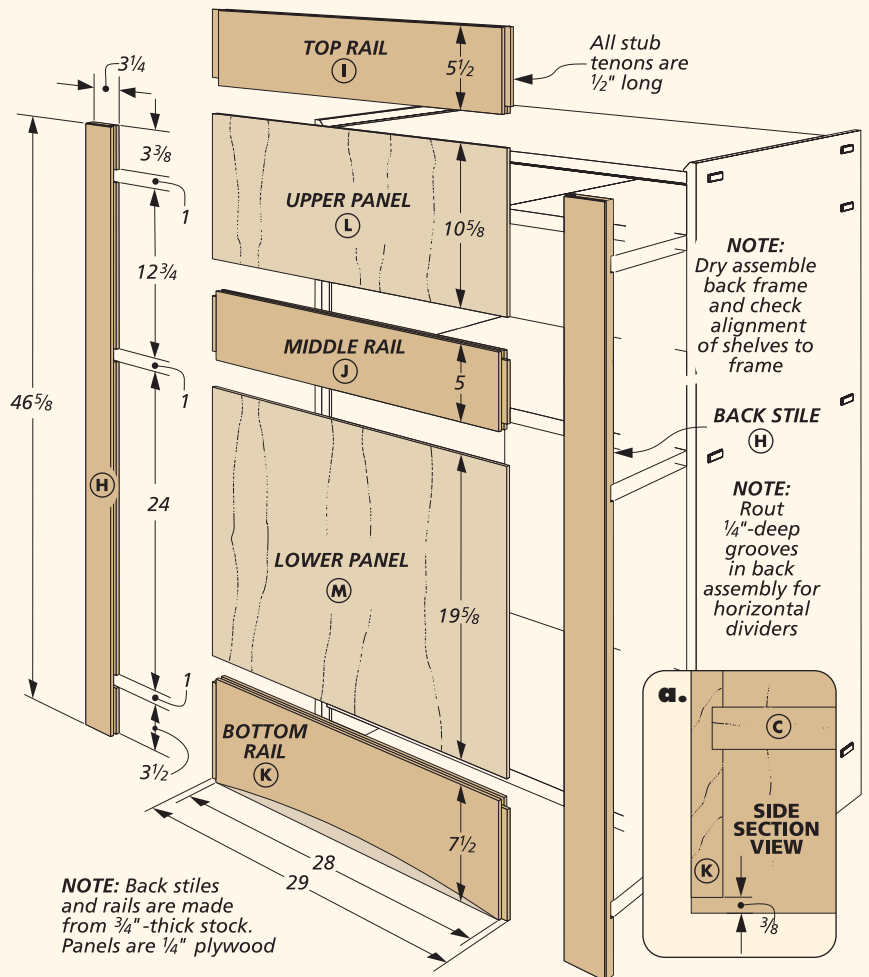
frame & panel CASE BACK & DOORS

All that remains to complete the case of the tool cabinet is the back. The back assembly is made with simple stub tenon and groove joints. For step-by-step instructions on how to make this strong joint, take a look at the "How-To" below.

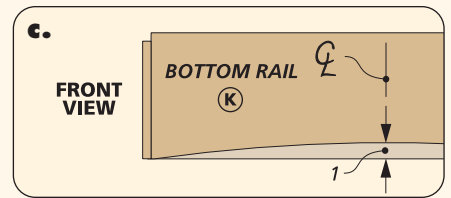
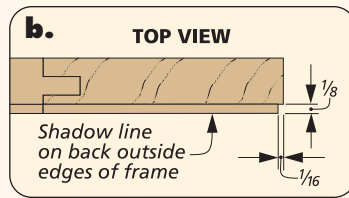
STRENGTHENING THE CASE. Besides closing in the case, the back also adds strength. You can see what I mean in the exploded view at right. First, it fits into the rabbets cut in the sides of the case. This prevents the case from racking. After the back is glued up, a series of dados and grooves are cut to fit over the horizontal dividers to keep the large case rigid and square.

BUILDING THE BACK. I began by cutting grooves on the inside edges of the stiles and rails. Then stub tenons can be cut on each end of the rails. Note: The joinery for the door frames is identical to the back. To save time, you could cut the door rails and stiles here as well.

Once the joinery is complete, I cut a small arch in the bottom rail to match the front skirt, as shown



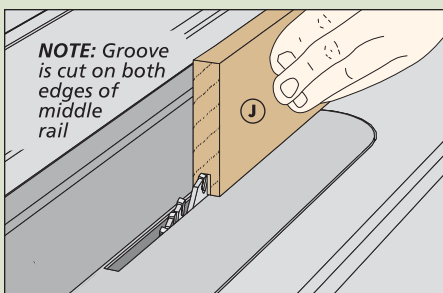
NOTE: Back stiles and rails are made from $\frac{3}{4}$ "-thick stock. Panels are $\frac{1}{4}$ " plywood



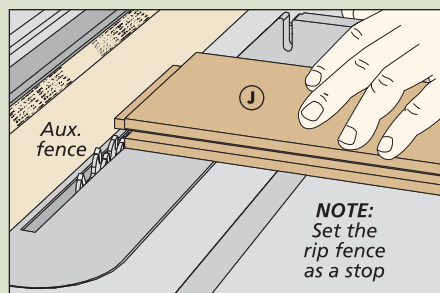
in detail 'c.' Finally, $\frac{1}{4}$ " plywood panels are cut to fit the grooves. Now the back assembly can be glued together (including the panels). Note: Bottom rail (K) sits $\frac{3}{8}$ " up

from the end of the rails, as in detail 'a.' Finally, I routed grooves to fit over the dividers and a small shadow line around the outside edges, as in detail 'b.'

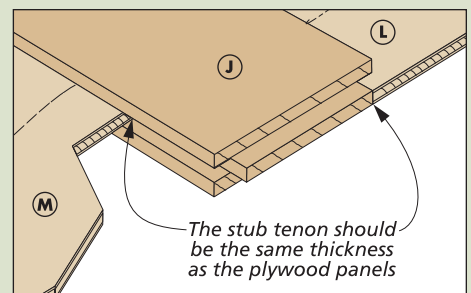
How-To: Stub Tenon & Groove Panels



NOTE: Groove is cut on both edges of middle rail



NOTE: Set the rip fence as a stop



The stub tenon should be the same thickness as the plywood panels

Grooves. The first step is to cut a $\frac{1}{2}$ "-deep, centered groove on the inside edge of the rails and stiles. The groove is sized to match the thickness of $\frac{1}{4}$ " plywood.

Tenons. The next step is to cut the stub tenons on the ends of the rails. Position the rip fence as a stop and cut the stub tenons with a dado blade.

Panels. The center panels are sized to fit between the stiles and rails. Plywood panels can be glued in place. Solid-wood door panels are allowed to "float" in the grooves.

Solid-Wood Doors

With the case complete, I moved on to building the doors. Like I mentioned earlier, the joinery here is the same as the case back. There's one difference between the doors and the back. The panels in the doors are solid wood, instead of plywood. They're solid wood for appearance. I wanted them to look as good when they were open as closed. And to make them stand out from the frame, I selected straight-grained (riftsawn) stock for the frame parts and used highly figured quartersawn wood for the door panels.

DEALING WITH WOOD MOVEMENT. With the parts cut to size, you can then cut the joinery on the stiles (N, O) and rails (P). Because the panels (Q) are solid-wood pieces, they are cut slightly narrower than the grooves so they can expand and contract.

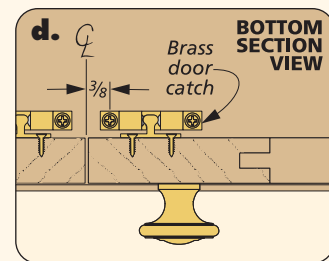
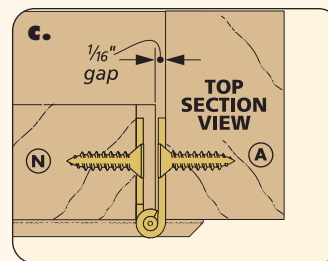
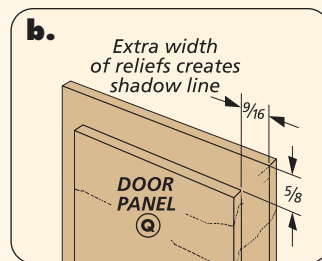
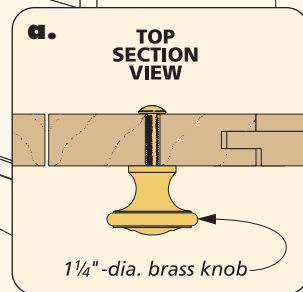
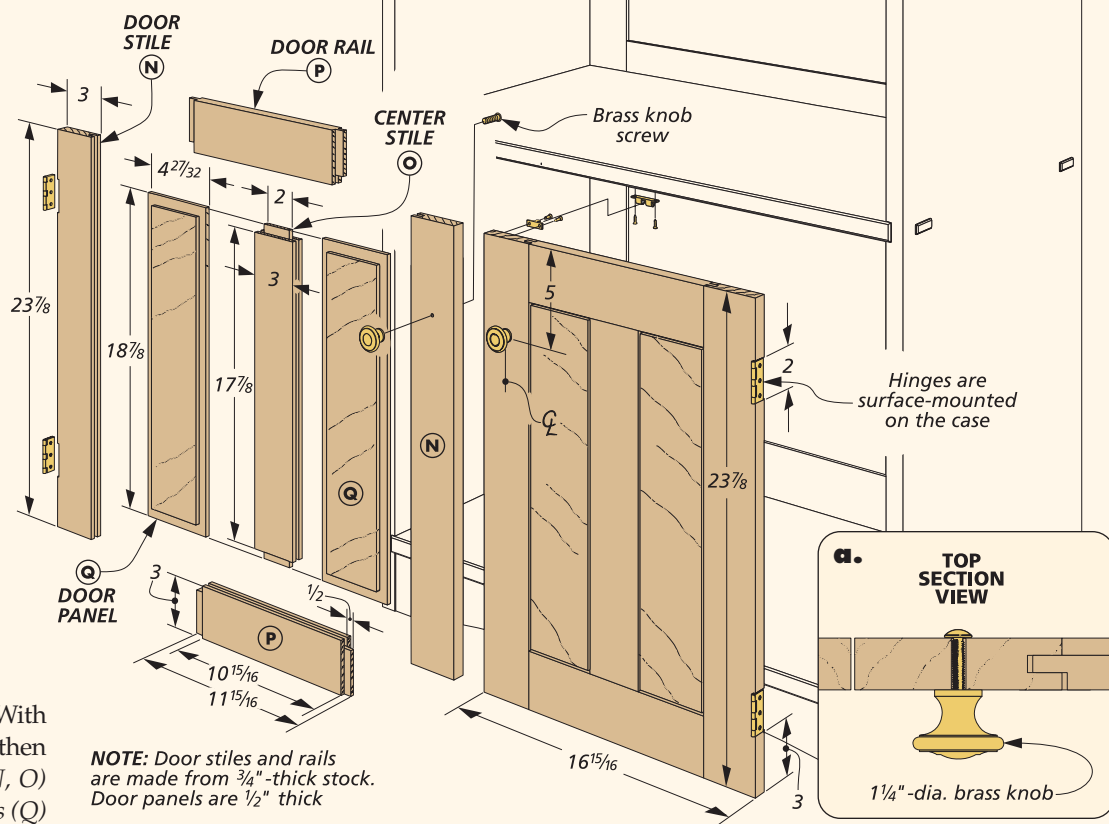
Next, I cut a rabbet on all four sides of the panels to form a tongue, as in detail 'b.' The rabbets are cut a little wider than the grooves to create a shadow line so that they stand out even more.

At this point, you can assemble the doors. I applied glue only to the stiles and rails. The panels need to "float" in the grooves to expand and contract. But to keep the panels centered in the frame, I applied a dot of glue at the top and the bottom of the panels and used some

spacers while clamping. It's also a good idea to stain them as well, as you can see in the shop tips below.

HANGING THE DOORS. The doors can now be hung in the case. To do this, I cut shallow notches in the sides of the doors, as in detail 'c,' to hold

the hinges. The notches are $\frac{1}{8}$ " less than the thickness of the hinge knuckle. The hinges will be surface mounted on the inside of the case. Then the doors can be trimmed to fit. All that's left is to attach the knobs and catches, as in detail 'd.'



Shop Tips: Great Panels



▲ To keep the panels centered in the doors, I placed a dot of glue in the center of the tongue and used thin spacers while gluing up the door.



▲ Staining the panels before assembling the doors prevents unfinished areas from appearing as the panels expand and contract seasonally.