A Back for Every Cabinet

The right choices balance strength, appearance, and efficiency

BY STEVE LATTA

Like many avid readers and collectors, I have a lot of bookcases. Over the years, I've jammed some of them so full that paperbacks are wedged into any usable opening. The shelves are so crowded, in fact, that it's almost impossible to see the back of the case. For strictly functional cabinets like these, a sturdy back can be as simple as a plain sheet of plywood.

But there are other types of cases that need a good-looking back, and some instances in which an attractive back also must be rock solid.

I have display cases, for example, that house ceramics, antique tools, and other prized possessions. For cases like these, the back needs to look good. The case that holds my collection of first-edition books needs a different kind of back. It has a pair of inset glass doors, so the back must look good and also be quite rigid. That helps hold the case square and keep the doors from racking and binding, regardless of the substantial weight of the books.

Fortunately, there are several ways to make an attractive back; some combine

Photos: Steve Scott

A bookcase stuffed to the gills with paperbacks doesn't need a fancy-looking back. On the other hand, a case for displaying collectibles probably needs something dressier than a plain sheet of plywood. Slat backs (far left) made of solid wood are attractive enough to set off fine collectibles or rare books, and provide sufficient strength for an open-front cabinet. Frame-and-panel backs (left) are even more handsome. With glued-in plywood panels, this back is also exceptionally rigid, making it the best choice for a cabinet with inset doors.

great looks with construction rigid enough for the most demanding applications.

Apart from that bare sheet of plywood, most cabinet backs fall into two basic designs: slats or frame-and-panel. Slats offer a wide variety of looks—from rustic to refined—and their joinery allows for wood movement. They work well with open-front cases but aren't rigid enough for cabinets with inset doors. A frame-and-panel back, whether it's made with floating panels or glued-in plywood, is sturdier.

Slat-back options

The basic aesthetic goal for any slatted back is a pleasing, consistent pattern that doesn't involve very narrow or wide slats on the edges. I stagger the width of the slats, using pieces around 4 in. and 5 in. wide. Wider boards look better on larger backs.

For slatted backs, three basic forms of joinery come into play. In order of simplicity, these are shiplapping, splining, and tongue-and-groove.
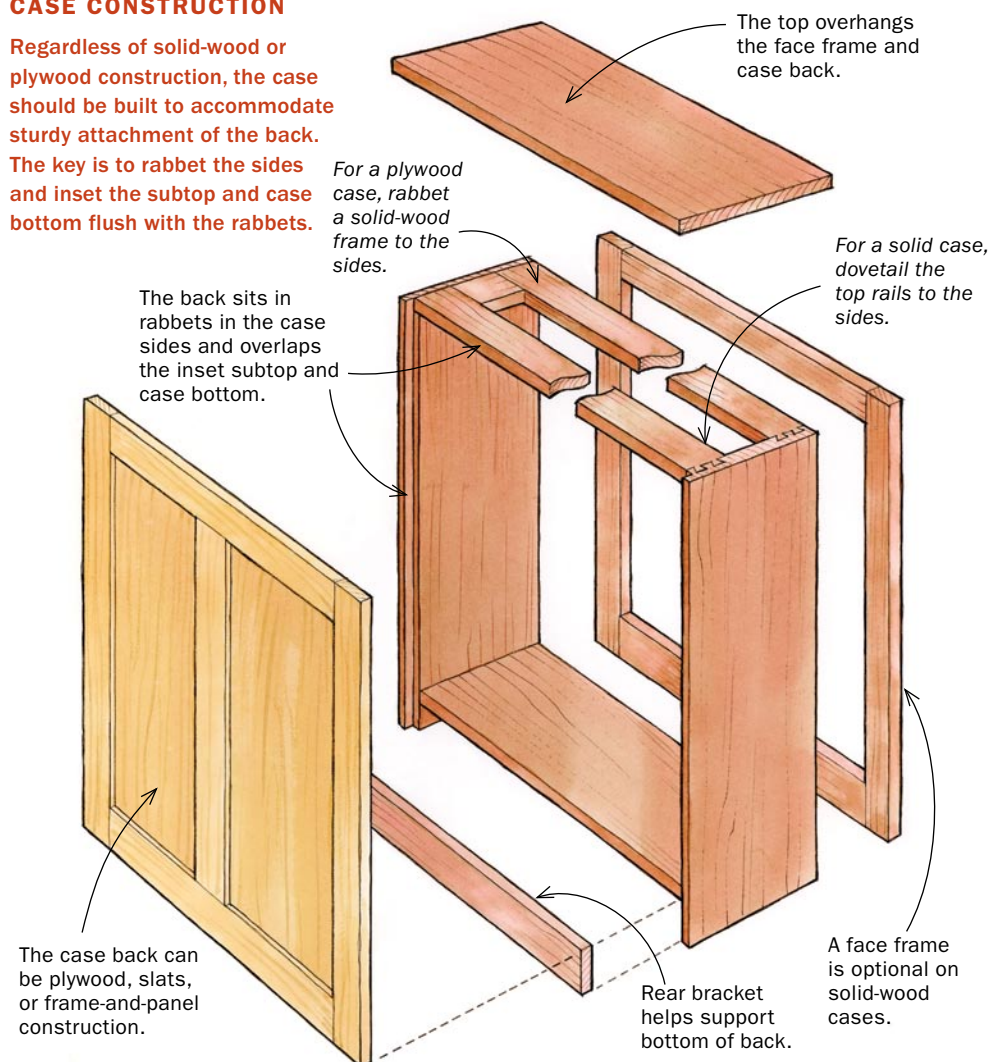
Shiplapping—Shiplapping involves rabbeting opposite sides of the same board so that the edges of adjoining slats overlap. Use a router table, a tablesaw with dado head, or a shaper; make the rabbets about ¼ in. wide and half as thick as the stock.

For small cases like the one shown here, (the back is 28½ in. wide and 42¾ in. tall), slats as thin as 5⁄16 in. would work. But

CASE CONSTRUCTION

Regardless of solid-wood or plywood construction, the case should be built to accommodate sturdy attachment of the back. The key is to rabbet the sides and inset the subtop and case bottom flush with the rabbets.

The top overhangs the face frame and case back.

For a plywood case, rabbet a solid-wood frame to the sides.

For a solid case, dovetail the top rails to the sides.

The back sits in rabbets in the case sides and overlaps the inset subtop and case bottom.

The case back can be plywood, slats, or frame-and-panel construction.

Rear bracket helps support bottom of back.

A face frame is optional on solid-wood cases.

Options for slat backs

A slat back is relatively simple solid-wood construction. Each of these joinery choices is designed to allow for its own wood movement, so don't glue the slats to each other. Each slat should expand and contract as an individual unit.
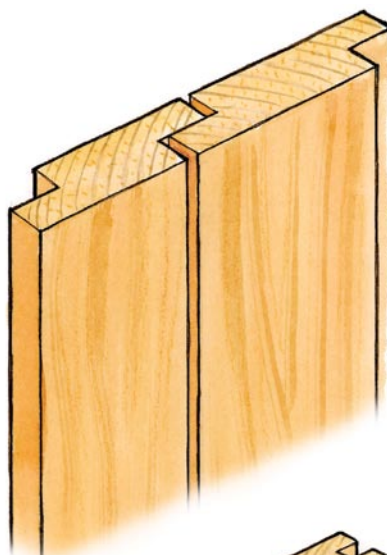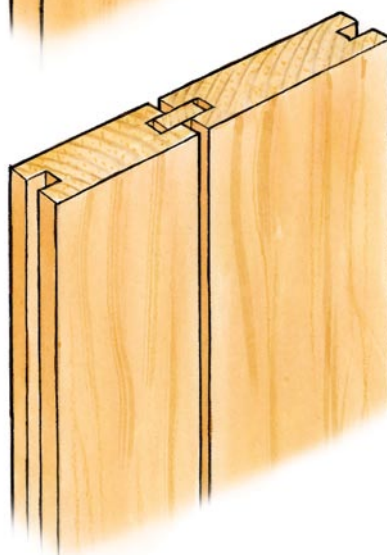
SHIPLAP

This is a practical choice for thinner slat stock because rabbetting divides the narrow edge of each slat into just two elements. In contrast, a groove plowed in the edge of a too-narrow slat will have skinny, fragile walls that could snap off.

Matched rabbets form a joint. *With the bit height set at half the thickness of the stock, all of the cuts can be made with one router-table setup.*
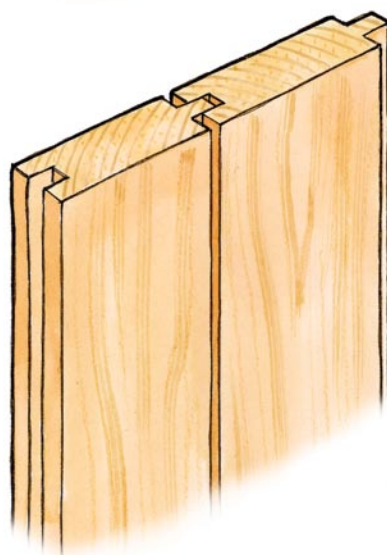
SPLINES

Cutting a simple groove along the edges of each slat allows the boards to be held together with splines. Stronger than shiplap, but not as strong as tongue and groove, a splined back is much quicker to make than the latter.

Cut a groove. *A tablesaw kerf is wide enough to house a spline. The spline should be slightly narrower than the combined depth of the grooves to allow for movement.*

TONGUE AND GROOVE

Tongue-and-groove joinery makes a sturdier back. The joints interlock more securely than splined slats, reducing the likelihood of a piece cupping or twisting.

A slot cutter plows a groove. *Tongue-and-groove joinery requires a wider groove. Make one pass in each direction to ensure that the groove is perfectly centered.*

A straight bit cuts the tongue. *Set the bit height to match the bottom of the groove.*

because shiplapped joints are not truly interlocking, large cases require thicker slats to avoid having edges twist out and pull away from the case. Another strategy for this is to use a splined or tongue-and-groove back, both of which join the slats more securely.

Splining—For boards of this size and length, cut a groove ⅛ in. to ³⁄₁₆ in. wide. Keep the groove no deeper than ³⁄₁₆ in. to ¼ in. or you risk breaking off one of the sides. It's simplest to center the groove on the slat's edge unless you plan to add a bead or chamfer on the front of the board. In that case, cut the groove closer to the back of the board, but not so close that it compromises the strength of the groove's back lip.

On the tablesaw, use a featherboard and a tall auxiliary fence for safety and consistency of cut. A zero-clearance insert adds safety and prevents tearout.

You also can cut the grooves with a slot cutter mounted on a shaper or router table. Most slot-cutter sets are designed to cut a

Drawings: Stephen Hutchings

Edge details
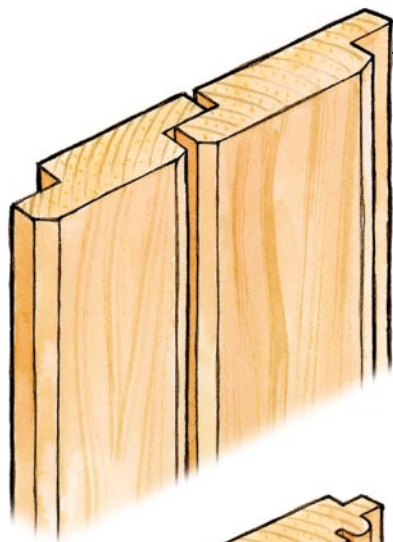
CHAMFERS

Chamfers work well on all three styles of slat backs, and they're easily cut using a block plane or a chamfering or V-groove bit chucked into a router table.

A shiplap fence simplifies the work. Allowing the stock to overlap the fence means both edges can be chamfered with one router-table setup.

Cut a chamfer on each edge. Make sure that the profile doesn't compromise the integrity of the rabbet at either edge.
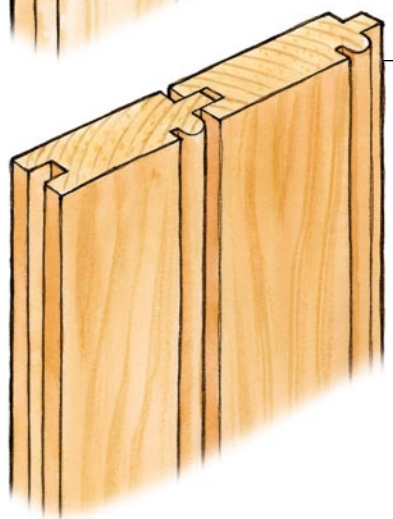
BEADS

Beading works best on a shiplapped or tongue-and-groove back. On a splined slat, however, the bead can weaken one of the groove walls.

Cut the decorative element after cutting the joinery. Cutting the tongue first yields a cleaner cut because the beading bit isn't forced to hog away large amounts of waste material.

groove about ½ in. deep, so I bury the cutter in the fence to get a shallower cut and to reduce tearout. A fence-mounted featherboard adds both safety and accuracy.

After cutting the grooves, I create splines by thickness-planing a board of slat stock to a little less than the combined depth of the two grooves and using the tablesaw to rip off strips that fit snugly in the grooves. When mounting the slats in the case, leave a slight gap, no more than ¹⁄₁₆ in., between the pieces to allow for movement.

Tongue and groove—Positioning and cutting the grooves for tongue-and-groove slats is the same as for splining. Because these boards aren't very wide, there will be minimal movement, so the groove does not need to be very deep.

Amana sells a two-wing, slot-cutting assembly marketed under the name of Quadraset that can be adjusted to cut both halves of the joint with a slot width as

INSTALLING SLATS

Start in the middle. Space the slats about ¹⁄₁₆ in. apart. Rip the outer boards to fit. Nail or screw the outer slats along the edge. Use two nails in each middle slat, about ¾ in. from each edge.

Frame-and-panel backs

Frame-and-panel backs are much more rigid than slat backs and as a result they're much more effective at keeping a case from racking. They are also quite attractive, and the use of contrasting panels adds a contemporary feel.
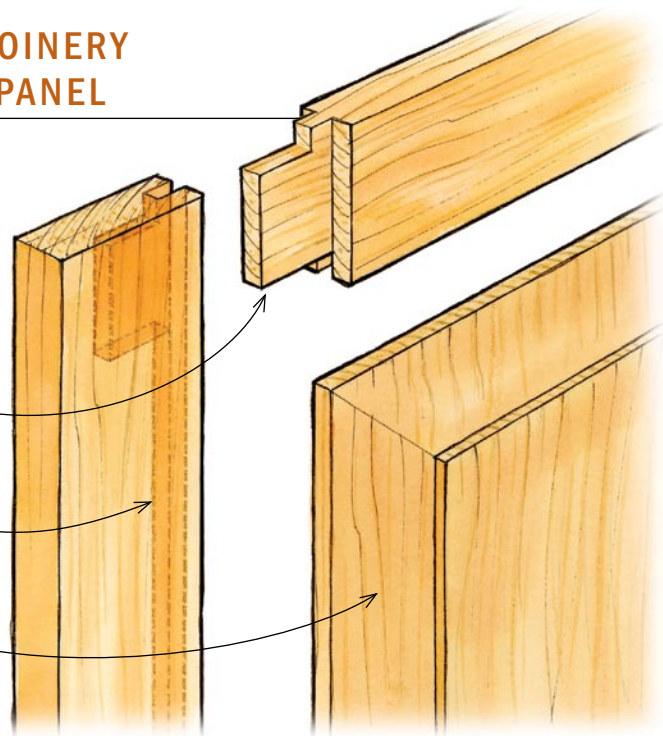
TRADITIONAL JOINERY WITH A SOLID PANEL

A traditional frame-and-panel back uses a solid-wood panel floating in a mortise-and-tenon frame.

Tenon is housed in a deep mortise.

Shallow groove for panel

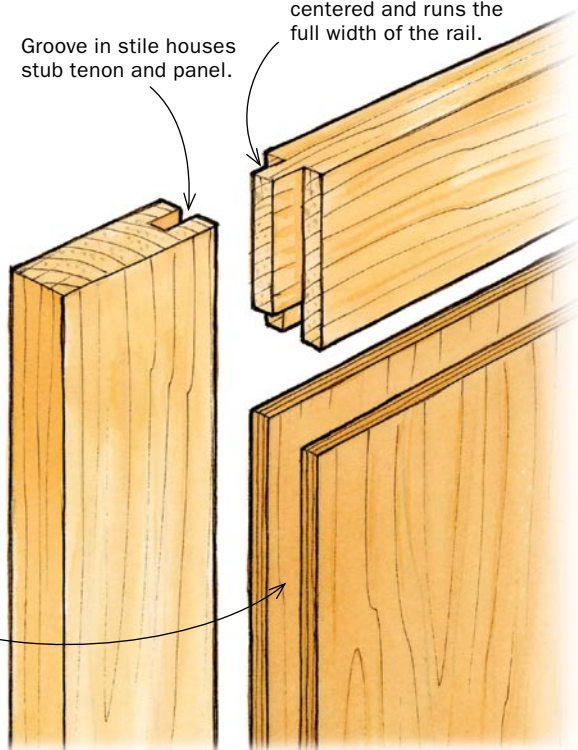Raised solid-wood panel floats in grooves.

STUB TENONS WITH A PLYWOOD PANEL

With plywood panels chosen for good-looking face veneer and glued in place, this approach is just as attractive as a traditional frame-and-panel back, but is both more rigid and easier to make.

Groove in stile houses stub tenon and panel.

Stub tenon is centered and runs the full width of the rail.

Plywood panel is rabbeted to fit into groove. Rabbet is not visible from front of case.

narrow as 1/8 in. and expandable in 1/32-in. increments. There is a distinct advantage in cutting both the top and bottom rabbets at the same time, because the tongue is guaranteed to be consistent and fit the groove. In my experience, cutting one side at a time, regardless of setup efforts, leads to variations in the tongue thickness that may require touch-up with a rabbet plane.

Embellishments—Chamfers and beads are the two most common forms of edge detail on slat backs. For chamfers on splined or shiplapped slats, bury the bit into an auxiliary fence to ensure that the chamfer doesn't take up the entire edge. For tongue-and-groove slats, I make a special fence that allows me to chamfer both the tongued and the grooved slats with one router-table setup. I cut one of the lips off an extra piece of grooved stock, then bury the V-groove bit into the lower lip. (Don't use a chamfering bit here. The tongue on your slats will ride the bit's bearing and push the work away from the cutter.) The small flat that was left below the chamfer rides the edge of the rabbet.

I typically bead only tongue-and-groove slats, using a high fence and a beading bit in a table-mounted router. I cut the

Cut a continuous groove in the frame members. On the stiles, the groove that houses the panel also serves as a mortise for the stub tenons on the rails. Because the cutter is buried into the fence, tearout is radically reduced. Make one pass in each direction to center the groove.

bead on the tongued section. When using thin stock, I don't bead the grooved edge because it will weaken the lip. This isn't an issue for larger cases with thicker back boards. If possible, set the top of the bead a little below the surface of the board so that it is not flattened during subsequent planing, scraping, and sanding stages.

Easy frame and panel

Frame-and-panel backs are much more rigid than slat backs and, as a result, are more effective at keeping a case from racking. Frame-and-panel backs are also quite attractive, and the use of contrasting panels adds a contemporary feel.

A very traditional back can be made with full tenons and a solid, raised panel, but I prefer another method, using plywood panels. This is just as attractive yet easier and more rigid. Plywood frame-and-panel backs can be made with a simple, quick method. For a case of this size, use ⅝-in. to ¾-in. frame stock with panels made from ⅜-in. or ½-in. plywood. Plywood is available rotary cut in common species such as walnut, mahogany, cherry, and red or white oak. Since the panels aren't large, it is not difficult to cut a sheet for optimum appearance. Plain-sliced plywood has a more uniform look, but may not be as readily available in most species.

Size the back about ⅛ in. taller and wider than the rabbeted case opening. Design the back so that interior stiles and rails are proportional to each other. In my bookcase (see photo, below), the back is divided into two panels for a balanced look. The center stile is about ½ in. narrower to compensate for the edges of the side, which rest in a rabbet in the case.

Making the frame—I use stub-tenon joinery, which is a wonderful way to make frames quickly for a variety of applications such as cabinet backs and dust panels. By itself, this frame isn't as strong as one made with traditional mortise-and-tenon joinery. But with plywood panels glued in place, you wind up with a lightweight back that is more rigid than its traditional cousin.

The joinery is easy to cut. Start by plowing a full-length groove, ½ in. deep and ¼ in. wide, along the inner edges of the frame members. You can do this with a slot cutter or dado head. Lay out the tenons so they are centered on the stock. You can cut them quickly using any tenoning jig.

With all the joints cut, fit the frame together and size the panels. Measure the panel openings and add ⅞ in. to the length and width to account for the panel's rabbeted edges. Cut the rabbets about ½ in. to 9/16 in. wide. There is no need to make the reveal precisely even, as the rabbets are not visible from the front of the case.

Glue up in stages—It's best to approach the glue-up very systematically, starting with the top and bottom rails and the center stile. Next, apply a bead of glue along the back edges of the grooves only. In this way, any squeeze-out will be on the back of the plywood panel. Slide the panels in, mount the side stiles dry, and clamp the whole assembly, making sure everything is flat and square. After about half an hour, unclamp the assembly, glue on the side stiles, and reclamp.

Fit the panel to the case—Taking special care to keep the panel square, size it for a snug fit in the case back. Racking is devastating if you plan to use inset doors. Rather than nails, use screws to hold paneled backs in place. This facilitates easy removal for finishing or any other reason that might arise. □

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Cut the stub tenons. *Raise the tablesaw blade enough to barely nick the bottom corner of the groove (top). This ensures a clean, snug-fitting corner at the base of the tenon. Raise the blade to trim the tenon cheeks (bottom).*

Assemble the back. *The ½-in.- thick plywood is rabbeted on the back side, ensuring a good fit in the grooves. Check carefully once the clamps are on to make sure the assembly is flat, tapping the components into place with a deadblow hammer, if needed, as you tighten the clamps.*