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CHOOSING THE BEST JOINERY

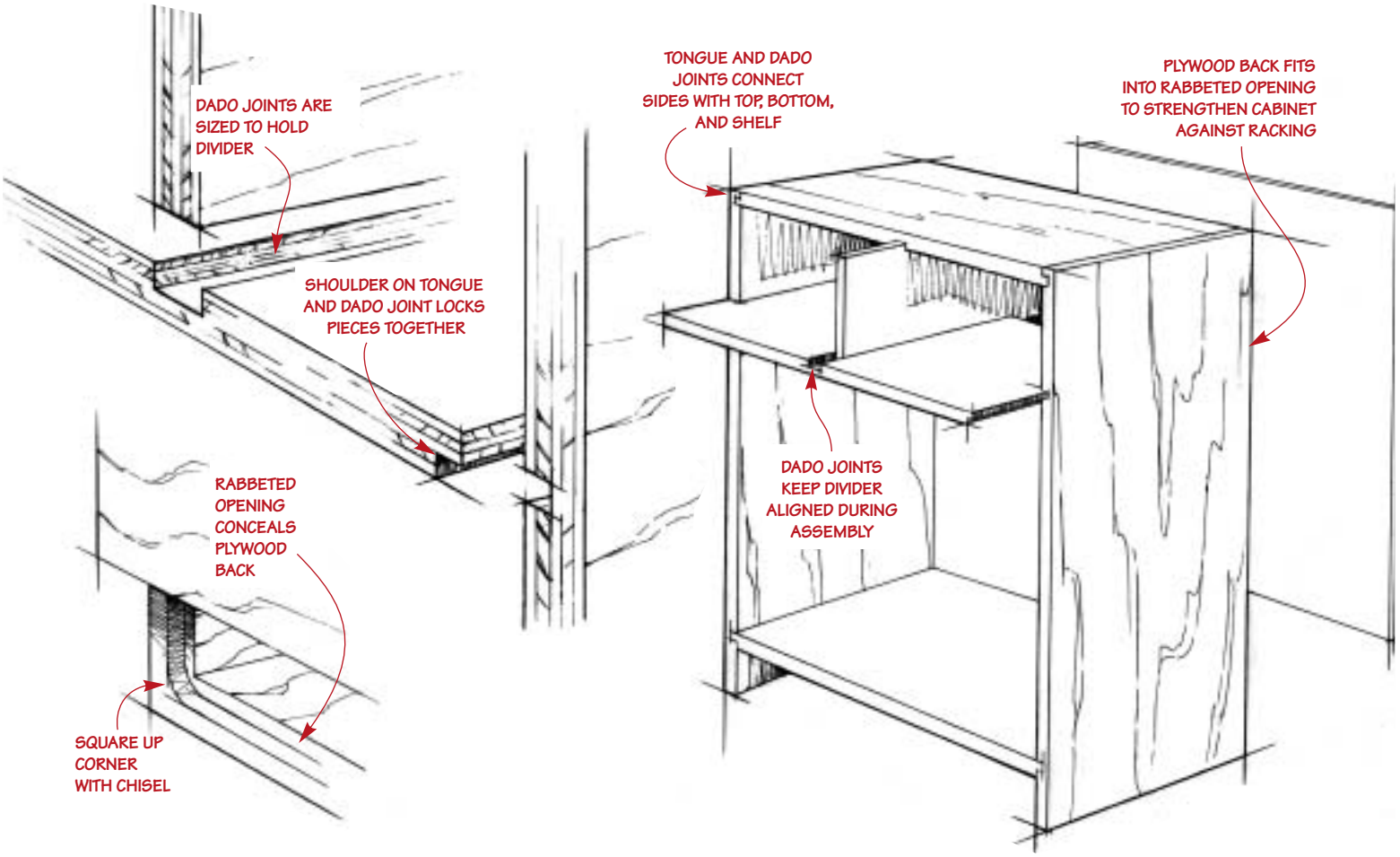
When it comes to choosing joinery for a project, the possibilities often seem endless. Mortise and tenons, half laps, dovetails, dadoes, rabbets, grooves — the choices can be a little puzzling. Fortunately, choosing the right joinery doesn't have to be a mystery. All it takes is a little understanding of the principles behind the joints and how they work.

When we select the joinery for the projects in *Woodsmith*, there are several factors that come into play — strength, appearance, and ease of construction, to name a few. This all sounds good on paper. But maybe the best way to illustrate how the process works is to take a look at a typical project and examine the types of joints we use. And even more importantly, talk about *why* we use them.

Case Construction

Whether you are building a bookcase, a dresser, or a cabinet, most furniture projects are really nothing more than a basic box (or maybe a group of boxes). But in order for the piece of furniture to stand up to the test of time, the box has to be built to last. And the secret to this is in the joinery used in the construction.

CARCASE JOINERY. If you take a look at the project shown below, you'll see what I mean. This is a case for a small cabinet. To construct the case, I used several different types of joints, each for a specific reason. To join the top and bottom of the case to the sides, I used a tongue and dado joint. Although you could use a simple rabbet joint here, a tongue and dado joint is stronger because it interlocks the two pieces. The



shoulder on the tongue helps to keep the two pieces square, which makes assembly a little easier. And finally, you get better gluing surface with a tongue and dado joint than you would with a rabbet joint.

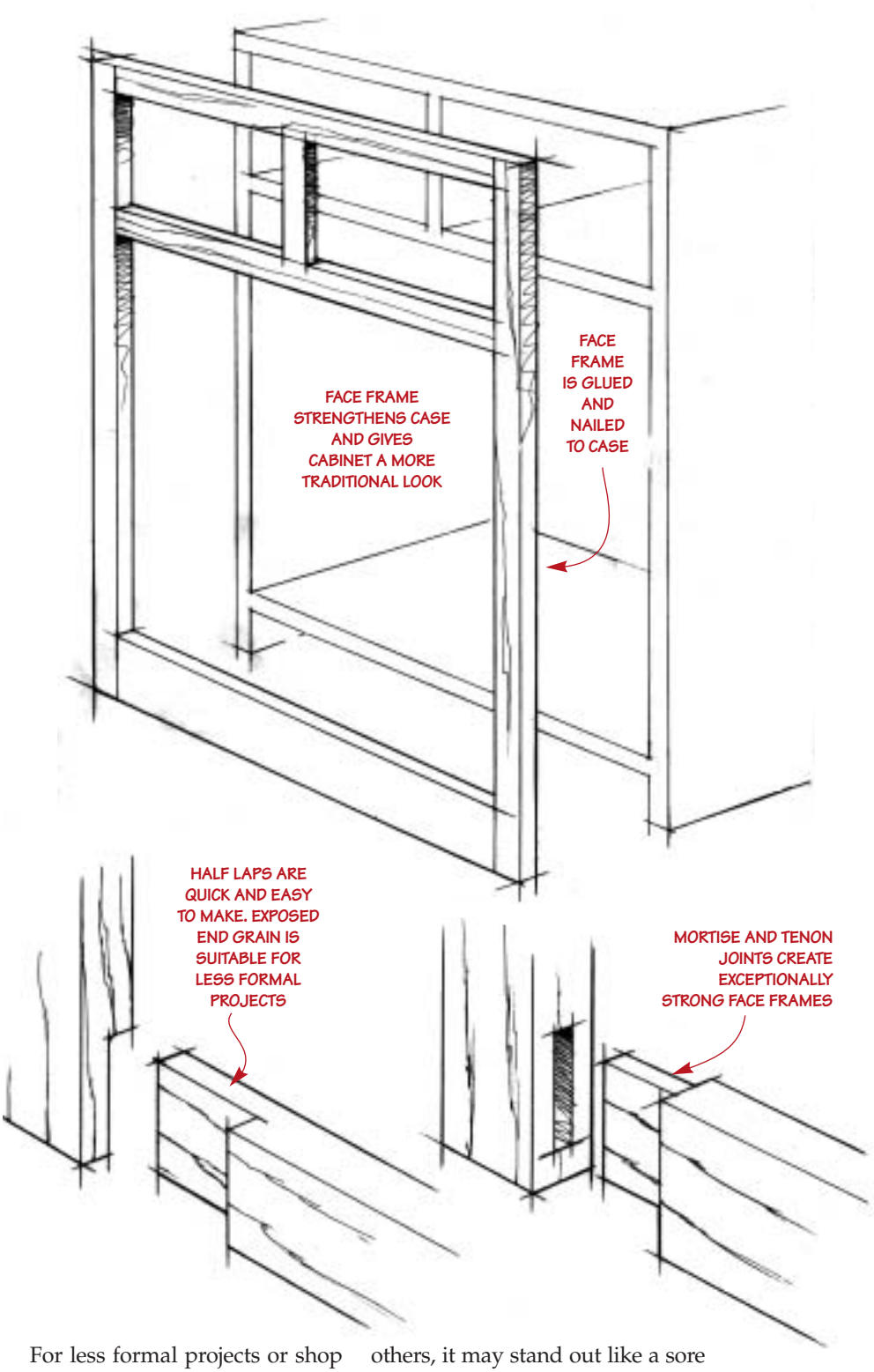
DIVIDERS. In choosing a joint for the vertical drawer divider of the cabinet, I went with a simpler dado joint instead of a tongue and dado. The reason is a dado joint is a little easier to make since it only involves one setup. It's just a matter of cutting a dado to fit the mating piece. And since the drawer divider is not a structural element of the cabinet, I wasn't as concerned with strength.

BACK. To complete the basic box, all we need to do is add a plywood back. Now you could just glue or nail the back directly to the case. But a better method is to create a recessed opening to hold the back by routing a rabbet all around the back edge of the case. This does two things. First, it conceals the edges of the panel. And second, it helps prevent the case from racking. Once the back panel is glued into the rabbeted opening, it acts as a shear panel to stiffen the case.

Face Frame

With the basic box completed, the next step is to add a face frame. Face frames are often used to conceal the joinery or plywood edges at the front of a cabinet — or simply to give a piece of furniture a more traditional look. And because of this, I think there's a tendency to view face frames as purely decorative. But the truth is that face frames serve an important structural purpose as well. Just like the back of the case, a face frame keeps the case square and prevents it from racking.

Face frames are constructed out of stiles and rails that are joined at right angles. But in order for the face frame to be effective at preventing racking, the joints need to be strong. For this reason, mortise and tenon joints are usually my first choice when building face frames. They are mechanically strong and also offer plenty of glue surface for a joint that really holds.



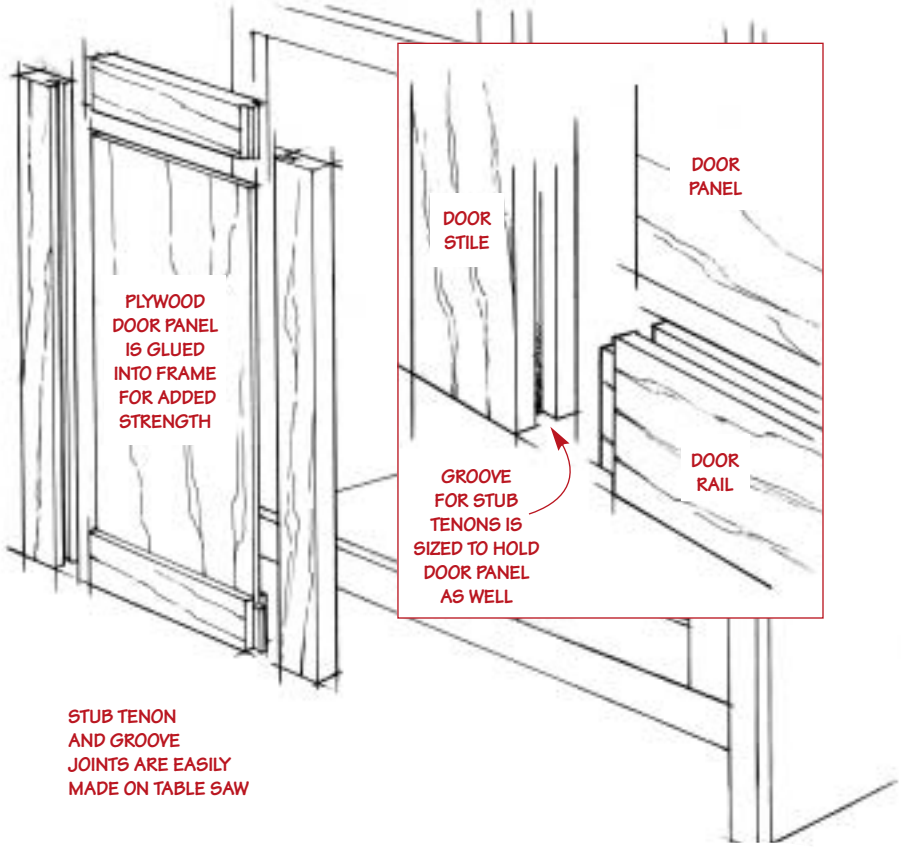
For less formal projects or shop furniture, I often use lap joints for making face frames. From the standpoint of strength, a lap-jointed face frame will be nearly as strong as one made with mortise and tenon joints. But the lap joints are a lot quicker to make. (All you need is a table saw.) The only downside to using lap joints is that the end grain of the pieces is exposed. On some projects, this doesn't really matter, but on others, it may stand out like a sore thumb.

Although they aren't a "traditional" face frame joint, biscuits are another option for building face frames. They're fast and easy to use, and really help to speed up production. They're a good choice for projects that won't be subjected to a lot of racking stress — like kitchen cabinets that are going to be attached directly to a wall.

Once the basic case is complete, the next step is to add the doors and drawers. Unlike the case, doors and drawers are subjected to the additional stress of being opened and closed. Because of this, there are some different types of joints that come into play.

Doors

When it comes to doors, the type of door you use will depend largely on the style of the project. For this cabinet, I chose a frame and panel door with a plywood panel (see drawing). The advantage of this type of door is that since the panel is plywood and won't expand and contract (as a solid panel would) it can be glued into the frame. And gluing the panel into the frame makes for a stronger, more rigid door. Because of this, I was able to use stub tenon and groove joinery to build the door frame.



Stub tenons and grooves aren't quite as strong as traditional mortise and tenon joints, but they are a lot less work to make. You just cut a groove on the inside edge of the door rails and stiles to hold the panel. Then cut stub tenons on the ends of the rails to fit in the grooves. The whole thing can be done on a table saw or a router table. Once the stub tenons and the panel are glued into the grooves, the door becomes a solid unit.

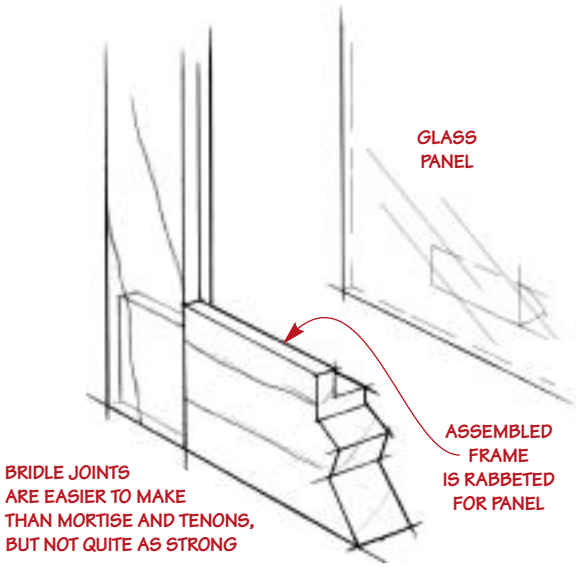
Stub tenons and grooves work great when the door panel can be glued into the frame. But for doors with glass panels or floating, solid wood panels, you'll want to use a joint that is stronger, since the panel won't be adding any strength to the door.

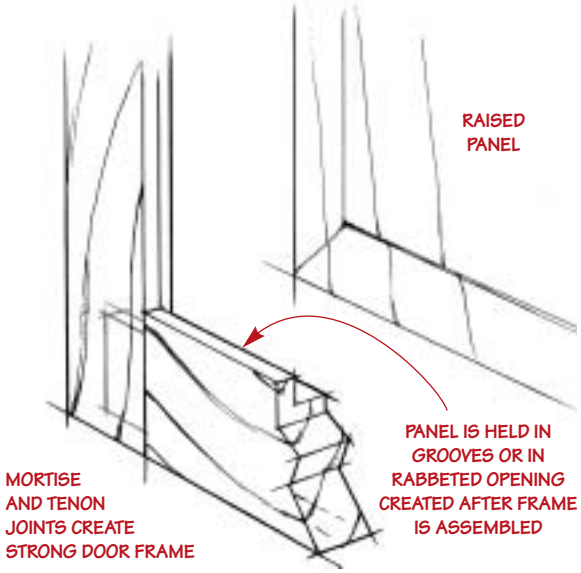
In cases like these, I usually opt to make the door frame with bridle joints or a mortise and tenon joints (see drawings below). Both of these joints have more gluing area than the stub tenon and groove, so they're stronger. And they also allow you to rabbet out an opening in the back of the frame to hold the panel, whether it's a pane of glass or a solid wood panel.

Drawers

Drawers are always a challenge to build. In a sense, they are a "project within a project." Not only do they have to be carefully made so they fit accurately, but they have to be strong enough to withstand the stress of repeated opening and closing. This is especially true for the joints at the front of the drawer.

Since this cabinet is a fairly traditional style, I went with a traditional

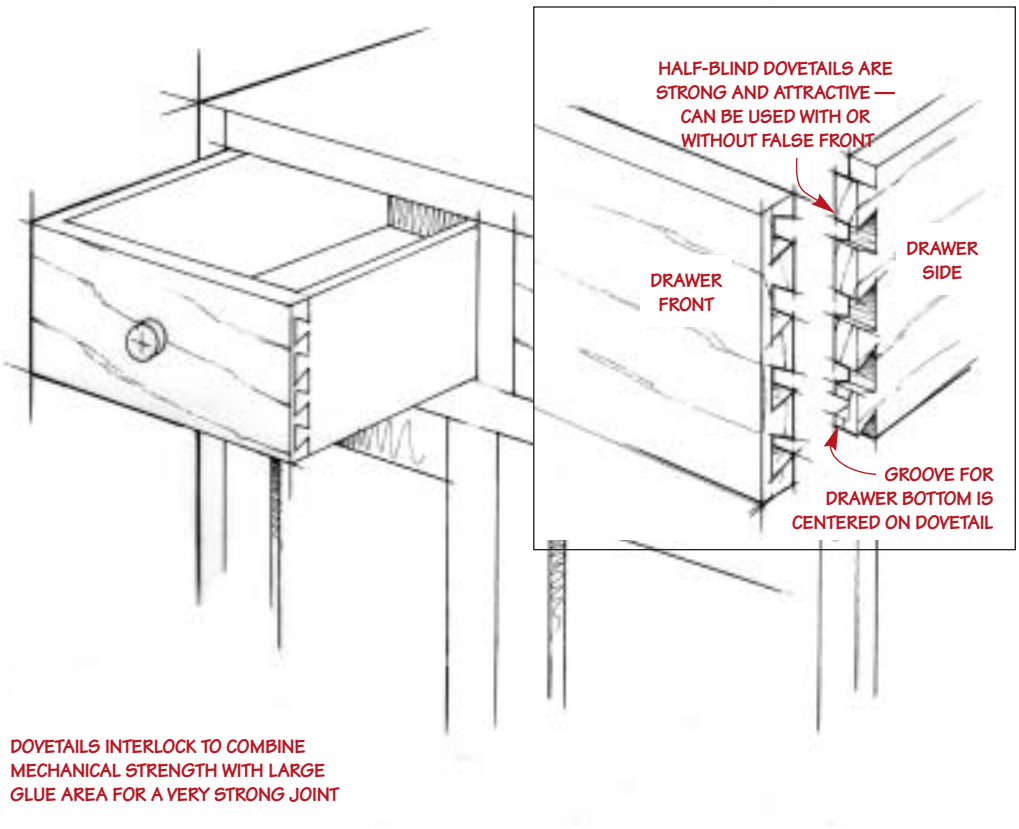




drawer joint — half-blind dovetails (see drawing at right).

Dovetails have almost everything you could want in a drawer joint. For starters, they are exceptionally strong. The interlocking tails and pins create a strong mechanical connection as well as a great amount of glue surface. In addition to strength, dovetails are visually appealing, so you don't have to worry about covering them up. Add to this the fact that you can use dovetails either with or without a false front, and it becomes obvious that this is the most versatile drawer joint around.

If dovetails have a downside, it's that they can be difficult and time-consuming to make. Even with a router and a dovetail jig, they require a fair amount of set-up time to get good results. That's why I usually save dovetails for heirloom furniture projects where the extra time is well spent. For less formal projects, there are a couple of other drawer joints I like to use.



DOVETAILS INTERLOCK TO COMBINE MECHANICAL STRENGTH WITH LARGE GLUE AREA FOR A VERY STRONG JOINT

OPTIONAL DRAWER JOINTS. For drawers that don't require a false front, I often use a locking rabbet (see left drawing below). This joint is easily made on the table saw, and once assembled it is hidden when the drawer is viewed from the front. It's also fairly strong. So it's a good choice for projects with small to medium-size drawers.

Drawers that use metal drawer slides commonly call for an applied false front. In this case, I usually turn to a tongue and dado joint (see right drawing below). This is essentially the same joint that we used to build the case of the cabinet. Although it doesn't have the same amount of glue surface as the locking rabbet, it is still a reasonably strong drawer joint.

One last thing. In woodworking, rarely will you find that there's only one "right" way to do something. The same thing holds true when selecting joinery. No matter what you are building, your primary consideration will be the stresses and demands that are going to be placed upon the project. But beyond that, the joinery you eventually choose will be based on other factors such as appearance, the equipment you are working with, and your own abilities. In most situations, you'll find that there at least a couple of different joints that will work. W