

Jigs 101

BUILD JIGS QUICKLY AND ACCURATELY
USING THE RIGHT MATERIALS,
FASTENERS, AND ACCESSORIES

BY GARY ROGOWSKI

A good workshop jig will hold your work accurately and safely so you can make consistent, repeatable cuts quickly. Take the template-routing jig I use at the router table (see photo, right). It protects my fingers and allows me to reproduce a shape over and over. It also speeds up the shaping process. So in one jig I get safety, accuracy, and speed.

The purpose of any jig is to make life in the shop easier. Whether building a simple one-use jig for the job at hand or a more complex jig to last a lifetime, choose materials wisely and take your time.

I design jigs to be easy to use, with stable materials that are flat and straight; I won't grab just any piece of scrap and waste



time trying to make it flat and square. I stick to plywood or medium-density fiberboard (MDF), with an occasional piece of hardwood where I need a high degree of accuracy or durability. I use glue or simple fasteners so that the jigs are quick to build yet hold up in use. And I ease edges to make them friendly to the touch.



The right materials

The purpose of the jig will determine what materials you should use. Mostly I use 3/4-in.-thick MDF or veneer-core plywood.

When I need an absolutely square fence on a jig, I'll use a piece of straight-grained hardwood milled flat and square. When I need to glue up layer after layer, such as when I make a thick bending jig, I'll use particleboard. It's inexpensive and works just fine. If you need material with no voids or gaps in its edges, then use a material like Baltic-birch plywood. (In the western United States, a product known as Apple-Ply is also widely used for jig making.) I've used Masonite for router templates, but I generally prefer MDF because it's easier to see pencil lines on the lighter surface. For jigs that get screwed or nailed together on edge, I use solid wood or plywood and drill pilot holes to avoid splitting the material.

Material that's 3/4 in. thick allows enough room for countersinking large screw heads or bolt heads. It also reduces the chance of splitting if I have to screw into the edge of a piece. There are times when using thinner stock helps me hold a jig easier or maneuver it faster. When I cut butterfly keys on the bandsaw, for example, I hold the small workpieces steady in a simple jig made from two layers of 1/4-in. MDF. It's nice to have a thinner profile on the jig to hold a thin wedge piece.

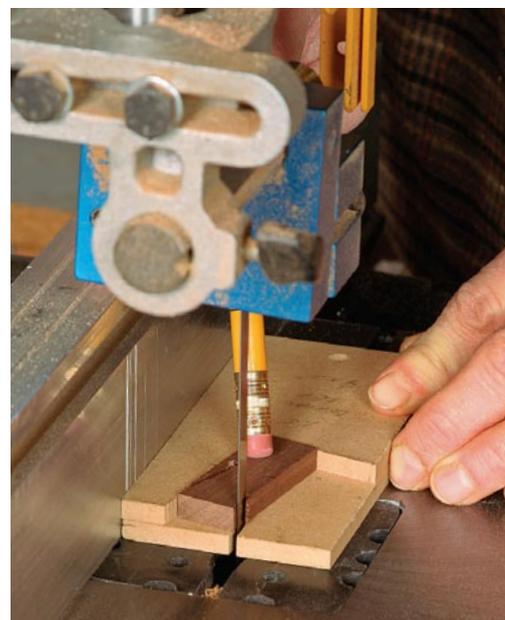
Hardwood for durability. Hardwood components, like these runners on a crosscut sled, can withstand repeated movement and rubbing. Note that the fence is also hardwood, milled perfectly straight and square.



Flat and stable. Sheet goods like Baltic-birch plywood, particleboard, and MDF are the basic materials for jigs. Hardwood is best for runners and fences.



Sacrificial plywood. This jig for cutting key slots in miter joints is made from scraps of 3/4-in. plywood.



Thin MDF. Two layers of 1/4-in. MDF create a handy jig for cutting butterfly keys. A pencil eraser holds down the work.



Low-cost option. Particleboard is an inexpensive material for building up thick bending jigs.

The right fasteners

Some jigs need to be assembled with glue to remain accurate through years of regular use. Just be sure that the surfaces you're gluing are clean and clamp them together for about half an hour. The trouble with glue is that it acts as a wonderful lubricant for 10 seconds or so, then locks your pieces into the wrong position. Or so I've heard.

To combat that creep, use brads or pin nails to lock pieces in place. Spread the glue, align the pieces, shoot several nails in place, then put on the clamps. If you don't have a nailer, clamp the pieces of the jig at the edges so they won't slip when you clamp the faces together. Or, dry-clamp the pieces, predrill screw holes, then glue and screw the jig together.

For jigs that don't require the permanence of glue, use drywall screws or round-head wood screws. Obviously, you shouldn't put any screw where it will get in the way of a blade or bit. For example, my tenoning jig fits over the tablesaw fence, but I made very sure that the screws holding it together are above any blade-height setting. And, obviously, don't use a round-head screw where it might prevent part of the jig from sitting flat, pivoting, or sliding smoothly.

Some jigs slip out of adjustment over time, and you can't always tighten screws enough to bring the jig back into line. On my crosscut jig, for instance, I bolted the fence to the sled. That leaves a little wiggle room for adjustment, and makes it easy to crank down hard on the bolts, both when building the sled and when it needs to be realigned.



Glue for keeps. For jigs that will see repeated use, glue the components together.



Pinned down. A few strategically placed brads keep the parts from shifting during glue-up.



Wiggle room. Use bolts and slightly oversize holes when you need room for adjustment, such as on this crosscut-sled fence.



Clamp in place. Clamp components together to ensure that they are properly aligned (above). Keep components clamped as you drill holes and drive screws (left) to be sure the pieces don't shift.



Quick and strong. Drywall screws and yellow glue are fine for most jigs. Use bolts for extra strength and adjustability. A brad nailer can help keep parts aligned during glue-up.

The right hold-downs

Many jigs are designed to work with some type of clamp to hold the jig down on the bench or on a workpiece, to hold a stop block on the jig itself, or to hold a workpiece in place. There are several types of clamp you can use. But always make sure there's no way in the world that the clamp can be nicked by a blade or cutter. And if the clamps will double as handles, be sure you position them where they keep your hands out of harm's way.

Standard C-clamps or F-style bar clamps work great, especially for holding a jig in place. They're easy to adjust and provide plenty of clamping pressure. When I need only a little holding power—to secure a stop block, for example—I'll use spring clamps. For the ultimate in low-tech clamping solutions, use opposing wedges to clamp your work in place.

For holding workpieces in place, as on a tenoning jig or template-routing jig, DeStaCo-style toggle clamps are the ticket. Screw these in place or mount them in T-tracks screwed into slots routed into the jig base for clamping pressure exactly where you need it. There are several types of toggle clamps available, so pick the one that best suits your needs.



Extra hands. Hold-downs go where your two hands can't, or shouldn't. These four will handle most of your needs.

Spring action. A spring clamp often provides enough holding power to keep something from shifting.



Double duty. Toggle clamps hold the workpiece in a jig and provide convenient hand-holds.



Low-tech hold-down. Opposing wedges can be an effective way to hold a workpiece in place in a jig like this router mortising box.