



Woodsmith **PLANS**

POCKET-HOLE JOINERY



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Drill it, clamp it, and drive it — you'll be impressed at how quickly a pocket-hole joint can pull everything together.

When it comes to woodworking techniques, it doesn't get much simpler than pocket-hole joinery. It basically just involves screwing butt joints together. But the screws aren't sunk "straight" through the workpieces like they normally would be. Instead, they're set at a slight angle (15°). This means the screw enters the face of one piece and "bites" into the edge of the mating piece (photo below).

BENEFITS. It doesn't take long to see the benefits of this. Since you're working with butt joints, cutting pieces to length requires almost no math. You don't have to add or subtract the lengths of any tenons or allow for the depths of dadoes, grooves, or rabbets. Just measure, mark, and cut.

Creating the joint is fast, too. There are just two steps — drilling the holes and screwing the pieces together. The only clamping that's required is to keep the pieces from shifting while you're driving the screws. And if you reinforce the joint with glue, there's no waiting for it to set. As soon as the screws are in place, you can move on to the next joint.

POCKET-HOLE JIG. Sound simple enough? It is. But like any method of joinery, you need to have the right tools on hand in order to work quickly and efficiently. This means you have to have a pocket-hole jig.

As you can see in the box on page 2, there are a number of pocket-hole



jigs available. But they all do exactly the same thing. They guide the drill bit so it will drill an accurate hole exactly 15° into the face of a workpiece, as shown in Figure 1. That's all there is to it. Note: The jig shown is made by *Kreg Tool Company*.

DRILL BIT. But there's more to pocket-hole joinery than just a jig. You'll also want to have the right drill bit. It makes the job much quicker and the pocket holes more consistent.

What's unique about this special bit is that it drills two holes at once. The part you see, the oval-shaped counterbore, holds the head of the screw. It's just deep enough to put the head below the face of the workpiece. The second hole is for the shank of the screw to pass through.

Okay, you know what the bit does, but how does it drill both holes at the same time? The answer is simple. The drill bit is "stepped," which means about 1/2" of the tip is a smaller diameter than the rest of the bit. You can see what I mean in the margin photo on the following page. I like the bits with square "steps" or shoulders (not the tapered ones). This way, the head of the screw has something solid to stop against, and there's less chance it will try to drive in farther.

CONSISTENT DEPTH. Of course, the holes have to be drilled at a consistent depth in the first place. So you need to have a stop collar for the drill bit. (Not all bits come with them.) And to set this collar, you need to know where the hole should stop.

I like the bit to stop so the shank hole ends up just short of the edge of the workpiece, as shown in Figure 1a. If you drill completely through the piece, the wood usually splinters, which may prevent the two pieces from fitting together tight.

▼ A simple jig, a special drill bit, and a self-tapping screw work together to create a fast, strong joint.

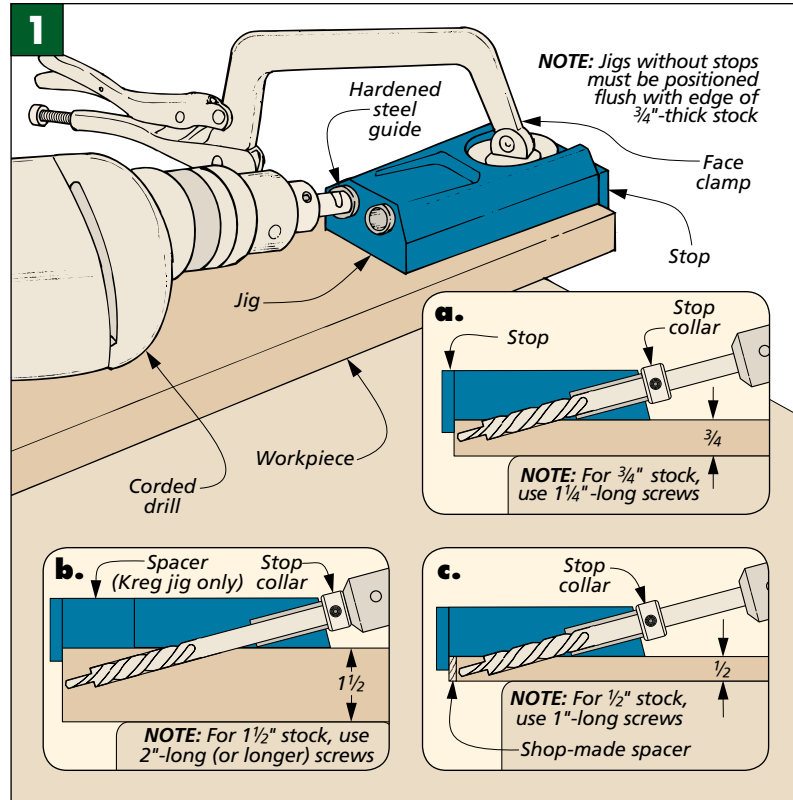


CORDED DRILL. When drilling pocket holes, I like to use a corded drill. It has more power and speed than a cordless drill, which is helpful when drilling into hardwoods. Plus, you won't have to worry about running down the battery with repeated use.

WHICH WORKPIECE? As far as the drilling goes, that's about it. But there are a few more things to mention. First, you need to decide which workpiece to drill the pocket hole in. I like to think of the screws as if they were tenons (or tongues, if I'm working with plywood panels). The piece I normally cut the tenon on is the one that gets the pocket holes. Often, this means the screw threads cut into edge or cross grain (which is much stronger than if the screws were being driven into end grain).

However, this isn't an unbreakable rule. On the entertainment center (provided as a separate article), I often drove the screws into the edge of a plywood panel rather than into the edge grain of the frame around it. That allowed me to hide the screws.

STOCK THICKNESS. The other thing to mention is that pocket-hole jigs are designed to work primarily with $\frac{3}{4}$ "-thick stock, as shown in Figure 1a. In other words, when the jig is aligned



with the edge of the workpiece, the screw will come out roughly centered on the thickness of the stock.

The jig can also be used to join $1\frac{1}{2}$ "-thick ("two-by") stock and $\frac{1}{2}$ "-thick stock (Figures 1b and 1c). But you'll have to adjust the position of

the jig on the piece and reset the depth collar. There can be a bit of trial and error here. To check the setup, just run a screw through a test piece to see where it exits (and how far). Note: The Kreg jig shown here has an extra spacer for $1\frac{1}{2}$ "-thick stock.

▲ Like two drill bits in one, the bit used for pocket holes drills the counterbore and shank hole in one quick step. The stop collar ensures consistent depth.



PICKING A POCKET-HOLE JIG

When you're ready to try pocket-hole joinery, you won't have any trouble finding a jig. As you can see in the photo, there are at least a half dozen available, and you'll find them at just about any wood-working store or home center. But when comparing the costs, make sure you know what you're getting — and what you're not.

JIG. When choosing a jig, there is really just one essential: hardened guides. (Most jigs do have them, but not all.) And I found the positioning stop on the end of the Kreg jig and some of the other jigs to be helpful. As far as being able to adjust the width between guides, it's often just as easy to reposition the jig.

DRILL BIT. Finding the right drill bit is as important as the right jig. I like bits with square shoulders (instead of tapered). Plus you'll need a stop collar for the bit.

OTHER ITEMS. Besides these two items, you'll also need a long power driver and special screws (pages 3 and 4). Plus, Kreg sells a face clamp that's pretty handy.



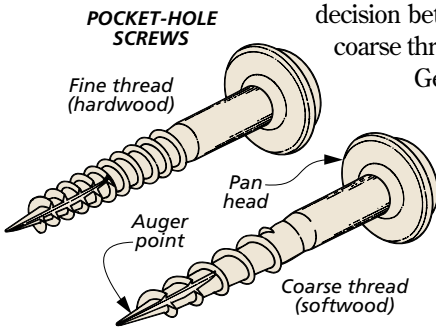
Assembly

Once the holes have been drilled, you're halfway to a strong pocket-hole joint. The second step is to screw the workpieces together. This is almost as easy as it sounds, but again, there are some important differences from the way you're used to working with woodscrews.

SELF-TAPPING SCREWS. The first big difference is the type of screws that you need to use. Instead of regular woodscrews, pocket-hole joinery uses self-tapping screws, as you can see in the margin drawing below. These have an auger point, which allows them to drive into the mating workpiece without splitting the wood.

Because these screws are self-tapping, you'll want to match the threads on the screws with the type of material you're using. This is a simple decision between fine threads or coarse threads.

Generally, screws with fine threads are for hardwoods, such as oak, maple, and cherry. The threads have a shallow pitch, so the screw drives in a bit slower than the coarse-threaded screws tend to. This way, the screw will be less likely to break when being driven into a hard piece of maple. (The shank of the screw is also thicker for this reason.)



▲ Pocket-hole screws aren't your typical woodworking screws. They're panhead-type screws that have self-tapping threads and an auger point.



Since breaking screws is less of a concern for softwoods and plywood, you can use a coarse-threaded screw, which is more aggressive and drives in faster. However, with softer woods, you need to watch that you don't drive the screws in too far. This is a real possibility — even with the square shoulder of the counterbore and the panhead on the screw.

DRILL WITH CLUTCH. The way to prevent driving the screws in too far is to use a drill with a clutch. (This time, I used a cordless drill.) You can play with the setting, but with softwoods, it's going to be fairly light.

If you don't have a drill with a clutch, you might want to drive the screws in most of the way, and then finish them with a screwdriver.

LONG DRIVER. Besides a drill with a clutch, you will also need a long driver. (The pocket-hole screws I used were square drive.) You can get by with a 3"-long driver, but you'll find

that a 6"-long driver is much easier to work with. It lets you drive the pocket screws in at the shallow 15° angle and still have enough clearance for the chuck of the drill.

ASSEMBLY. When you're ready to screw the two pieces together, the important thing is to make sure they're not going to shift during assembly. Remember, the shank hole is a smaller diameter than the threads of the screw, and it's not drilled completely through the first piece. So the two pieces will be forced apart slightly as the threads of the screw start to engage the mating piece — especially with the more aggressive, coarse-threaded screws. The screws will pull the joint back tight, but sometimes, the pieces will have shifted slightly so that there's a small offset between them.

There are a few ways to prevent the workpieces from shifting. *Kreg* offers a face clamp that has a large,

ASSEMBLY PLATFORM FOR POCKET-HOLE JOINERY

With pocket-hole joinery, the key to a good assembly is to keep the pieces from shifting while the screws are driven. For face frames and other flat assemblies, I came up with the plywood platform you see at right.

The simple design includes two short fences that position the workpieces 90° to each other. To help keep the pieces from shifting while the screws are being driven, I placed strips of adhesive-backed sandpaper across the base.



flat disc welded to one of the pads (main photo on page 1). This disc is positioned across the outside faces of the workpieces to hold them flush. It doesn't actually keep them from separating. Instead, it prevents the faces from shifting out of alignment. In my experience, the screws pull the two pieces back tight and flush.

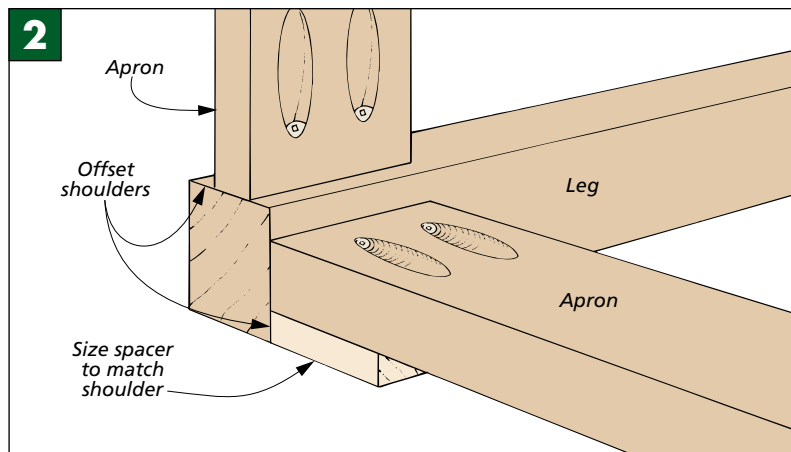
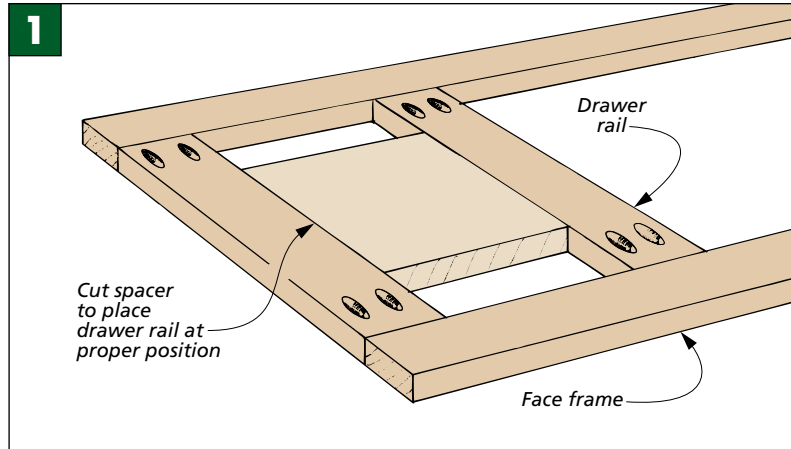
The other way to hold the workpieces is simply to clamp them like you typically would if they were being assembled by some other method — only you won't need to leave the clamps on. Or for flat assemblies, like face frames, you can use the shop-made assembly platform shown in the box on the previous page.

GLUE. By the way, whether or not you add glue to the joint is up to you. Even though the pocket screws are plenty strong, I generally think it's a good idea. Just go light on the glue so there's not a lot of clean up.

ASSEMBLY TIPS

That's essentially all there is to assembling a pocket-hole joint. But not all assemblies are quite so straightforward. I've come across a number of situations where I could have used a few more hands to help position the workpieces. However, it's really just a matter of getting used to a new method of assembly with a different set of challenges than traditional gluing and clamping. And the solution is usually as easy as adding a scrap spacer or cleat.

DRAWER RAILS. Take a face frame with a drawer opening, for instance. Once the outside frame is assembled, I like to cut a scrap piece to match the height of the drawer opening, as you see in Figure 1. This spacer makes



positioning the drawer rail quick and accurate — especially if you're building more than one face frame.

OFFSET SHOULDERS. Spacers also come in handy when you don't want the faces to end up flush. When building a table base, for example, I usually like to set the aprons back from the outside faces of the legs, as shown in Figure 2. To create this shoulder with pocket-hole joinery, all you need to do is slip a small spacer under the piece you want offset.

CASE CONSTRUCTION. Other times, you'll need to make cleats and corner

braces, as I did on the entertainment center. (Refer to Figures 3 and 4 on page 4 of that article, provided separately.) However, since there are no rabbets or dados to position the workpieces, you have to be doubly sure they're square and aligned properly before you add the screws.

All in all, I'd have to say that pocket-hole joinery is pretty impressive. It's fast and strong, and there are lots of times when that's exactly what I need. It won't replace traditional joinery in my shop, but a pocket-hole jig is a good tool to have on hand.

PLUGGING A POCKET HOLE

Most of the time, a pocket hole is hidden inside a cabinet. Other times, you might hesitate to use this joinery because the oval-shaped holes would be visible. But there's a way to either make these holes nearly disappear or "dress them up" by simply adding

a plug. As you can see in the photo, *Kreg* currently offers a variety of hardwood and plastic plugs made just for this purpose. Simply glue the plug into the hole. ("Instant" glue works well here.) And the wood plugs can be trimmed with a chisel or sanded flush.

