

Make an End-Boring Jig

Adjustable drill-press setup simplifies difficult drilling jobs

by Jeff Greef

I've built a fair number of custom doors and windows in which I've joined the stiles to rails with dowels. Until recently, I relied on doweling fixtures to position holes. Although fixtures are quick to use, I found them lacking accuracy, particularly for large dowels. The problem is not in locating the fixture's bit guide precisely, but rather it is guaranteeing that the bit drills straight and true.

A horizontal boring machine could solve the problem. But while one of these machines is neither hard to use nor difficult to build, it would eat up precious space in my already cramped shop. Besides, it seemed redundant to buy a motor, bearings and a thrust mechanism when I already had all those things standing in the corner in my drill press.

Boring holes with a drill press is very accurate, but how do you bore holes in the ends of long workpieces? If you turn the press table vertically, clamp a fence to it and secure the work, the setup is still quite limited in terms of making fine adjustments. So with adjusting (and readjusting) in mind, I made an end-boring jig that mounts to my drill press, as shown in the photo on this page.

Drill-press mounting logistics

Before you build the jig, you need to figure out how you will mount it. Although each type of drill press may require a slightly different setup, you should be able to adapt the principles I used to mount a jig to your press. First, my jig is designed for floor-model presses. If you have a bench press, you'll have to bolt its base to a workbench with the spindle overhanging the edge. You can extend the jig to the floor as I did (see the drawing). Second, the jig is made for presses with at least 14 in. of swing to get the depth to the column needed for mounting. Third, the jig is built for presses with tables that both tilt and swivel. By swiveling the table's arm 90° and tilting the table vertically, you can bolt or clamp the jig to it. If your table doesn't tilt and swivel, remove it. Then make a wooden outrigger with a yoke to clasp the press's column. Mount the jig to the outrigger in line with the spindle.



Boring the ends of long workpieces used to present problems for the author, Jeff Greef, until he devised this end-boring jig for his drill press. A pair of platens mounted to the press's table allows adjustments in and out and left and right.

Designing and building the jig

The boring jig has two main parts: a fixed platen and a movable platen. The fixed platen bolts onto the drill-press table. The movable platen attaches to the fixed one with hinges on one side and adjustment bolts on the other. The hinges allow the movable platen to be positioned in and out from the press's column. The adjustment bolts fine-tune the alignment to the bit. The bolts work in a push-me-pull-you fashion (see the drawing detail on the facing page): One bolt pushes the movable platen away, the other bolt pulls it toward the fixed platen and a spring takes up slack. The movable platen also slides to move work left or right, and an adjustable stop plate sets the height of the work. A toggle clamp secures the workpiece alongside a fixed, vertical fence.

Fixed platen—Because of the jig's 4½-in. depth, I turned the press's table a full 90° and pivoted it to vertical before I bolted on the fixed platen, which is just a piece of ¾-in. plywood.

I made the platen 22 in. wide to span the distance to the spindle. On the front of the platen, I fastened two vertical boards: one 7 in. to the left of the press' spindle, one 7 in. to the right. I mounted a pair of hinges to the right board, and I recessed T-nuts in the left one to receive the adjustment bolts. Two boards on the back of the movable platen mate with the hinges and bolts.

Movable platen—The movable platen consists of three layers. The outer two layers of the movable platen are long enough to double as a support because the jig and workpiece are suspended from the drill-press table. The inner layer is hinged and bolted to the fixed platen. The middle layer has a strip of wood screwed along the top of it, so it hangs off the inner layer. I made the middle layer so that it can slide left and right; that way, it's easy to precisely bore side-by-side holes in the same plane of a piece. The outer layer is the work surface and also acts as a spacer to keep work clear of the middle layer's bolt heads. I used fender washers under the bolt heads to avoid splintering the plywood.

End-boring jig assembly

Jig consists of a fixed platen that bolts to the drill-press table and a movable platen, which is made up of three layers.

Outer layer of movable platen serves as a work surface and as a spacer for clearing middle layer's bolt heads.

Inner layer of movable platen is hinged to fixed platen, so work is adjustable in and out from drill-press column.

Fasten toggle clamp to block fixed to rear of inner platen.

Screw two vertical boards to front of fixed platen and inner layer of movable platen.

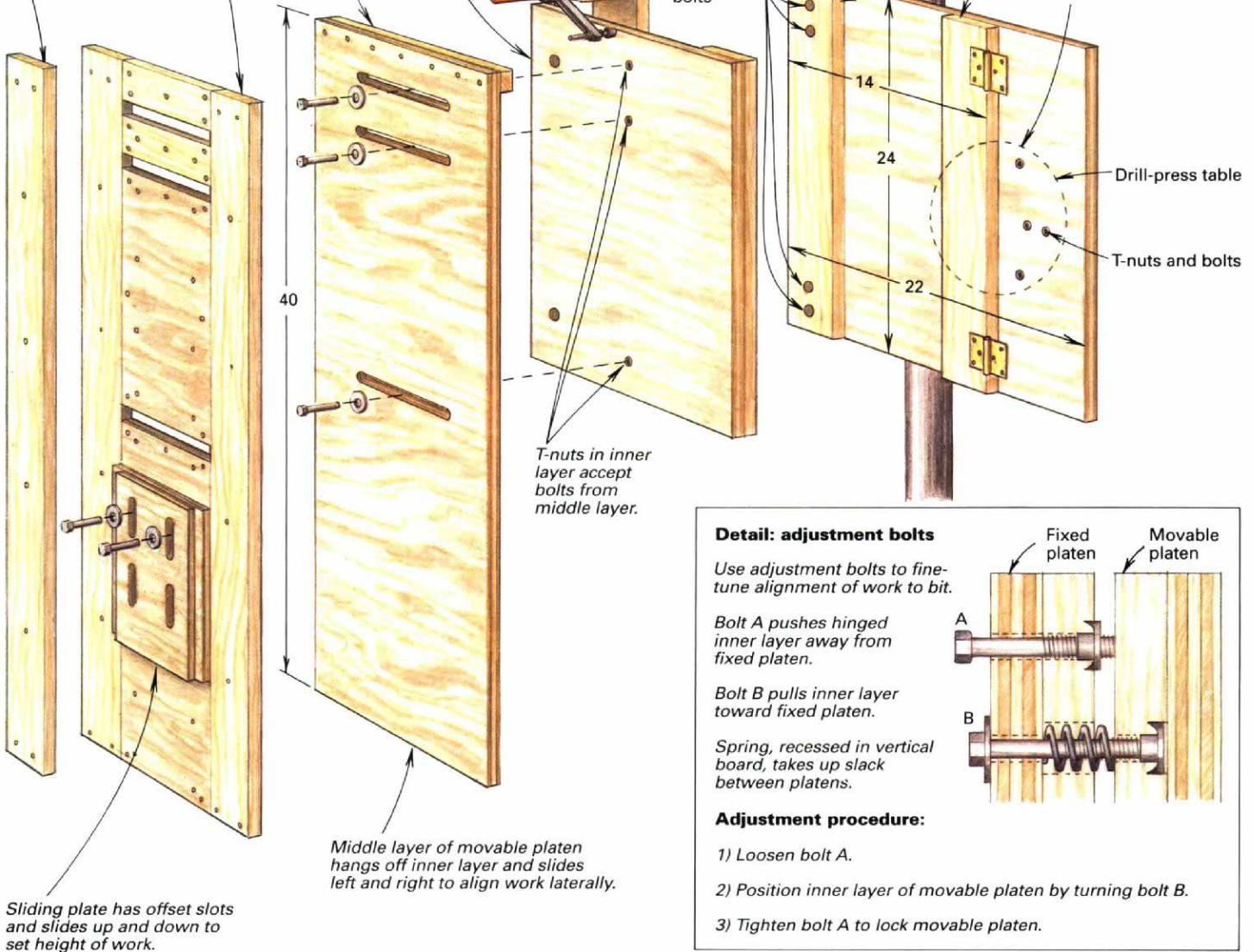
Screw vertical fence to edge of work surface.

Screw horizontal strip to top of middle layer.

Fixed platen

Holes for adjustment bolts

Before securing jig to drill press, swivel arm 90°, and tilt table vertically.



Sliding plate has offset slots and slides up and down to set height of work.

Middle layer of movable platen hangs off inner layer and slides left and right to align work laterally.

T-nuts in inner layer accept bolts from middle layer.

Drill-press table

T-nuts and bolts

Detail: adjustment bolts

Use adjustment bolts to fine-tune alignment of work to bit.

Bolt A pushes hinged inner layer away from fixed platen.

Bolt B pulls inner layer toward fixed platen.

Spring, recessed in vertical board, takes up slack between platens.

Adjustment procedure:

- 1) Loosen bolt A.
- 2) Position inner layer of movable platen by turning bolt B.
- 3) Tighten bolt A to lock movable platen.

Vertical fence, work clamp and adjustable stop plate—A vertical fence on the left side of the work surface and a toggle clamp fastened to the rear of the inner layer secure the work. The middle layer can still slide without affecting the clamp. During end-boring, the work rests on a stop plate. The plate is slotted to handle pieces up to 40 in. long, and the slots are offset, so the plate can be flipped for other heights. To set the height of a piece, I just slide the stop plate up or down on two bolts.

Using the jig

Once I've set up the jig and positioned the work, I wedge in a pair of shims between the bottom of the movable platen and the top of

the press's base to stabilize the jig (see the photo). Even with the platen wedged in place, I can make up to 1/32-in. corrections using the adjustment bolts.

To break in the jig, I bored holes in the ends of rails on 12 interior doors. The end-boring jig proved a real improvement over my conventional doweling fixtures. Once the work was roughly aligned, it was easy to make fine adjustments on test scraps before boring the actual run of holes. I still keep the old doweling fixtures on hand—but only for those rare situations that the end-boring jig won't handle. □

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