

WOODWORKER'S JOURNAL

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Classic Project

In this plan you'll find:

- Step-by-step construction instruction.
- A complete bill of materials.
- Construction drawings and related photos.
- Tips to help you complete the project and become a better woodworker.

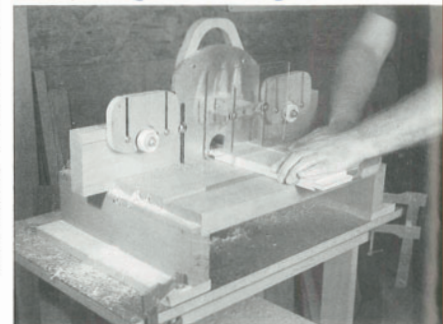
Shop-Built Mortising/Tenoning Table

The special jig adapts a portable router, preferably a plunge router, for use as a stationary tool. It does not negate the use of the machine in conventional fashion but there are times when accuracy is easier to achieve and it is more convenient to apply the work to the tool instead of the tool to the work. It's also true that even under normal conditions, router applications require extra attention for support and guidance. This "master" jig, in a sense, supplies a host of work setups in one compact package. The cuts shown in Fig. 1 are typical of work that can be done with the jig.

The jig includes a clear acrylic guard that is adjustable vertically to accommodate various stock thicknesses, and adjustable hold-downs that help keep workpieces, especially long ones, secure during the pass. A plunge router is highly recommended because of the convenience of being able to preset the depth of the cut.

Shop-Built Mortising/Tenoning Table

by R.J. DeCristoforo



With a plunge router, this workhorse router table will handle just about all your joinery needs

Making the Jig

Start with the 1 1/2 in. thick table (A). You'll need to edge glue two or three narrow boards to get the 15 1/4 in. width.

Next, use the table saw and dado head to cut a groove to accept your miter gauge. A 1/2 in. by 1/2 in. groove will fit most miter gauge bars, but check before cutting. After the miter gauge groove is completed, cut the 1/2 in. by 1 1/2 in. groove for the left and right fences (D).

Now, referring to Fig. 2, lay out and mark the location of the router cutout and also the location of the two notches. The router cutout creates clearance for the router and also establishes the spacing between the left and right fences. (The 6 in. spacing shown should be satisfactory for most routers, but it's best to check your model to make sure.) The notches allow clearance for the router mount (E) and facing (F). A notch that measures 1 1/2 in. long and 7/8 in. wide should be just about right.

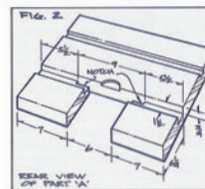
Once the router cutout and notch locations are marked, use the band saw to cut them out. You'll need to use a

chisel to clean up the ends of the notches. The 2 in. diameter by 1/2 in. deep half-round cutout provides clearance for chips and sandcut.

After cutting the two ends (B) to size, cut the 1/2 in. by 1/2 in. rabbet along the top edge of each one as shown. Use glue and box nails (or screws) to secure the ends to the table. The two bases (C) can then be cut to size and joined to the ends in the same manner.

The router mount (E) should be made from a cabinet-grade hardwood plywood (birch plywood is a good one). Cut it slightly longer and wider than needed, then apply the mount facing (F). You can use either 1/2 in. thick Reynolds' brand "Do-It-Yourself" aluminum (as I did) or plastic laminate (Formica) for the mount facing. Apply the facing with contact cement, then cut the mount to fit just inside the notches in the table. After using the band saw to cut the 6 in. radius on the top, the mount can be crosscut to its final length of 13 1/2 in.

Cut the left and right fences (D) to size. They should fit snugly in the table groove that was cut earlier. Note that



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The Woodworker's Journal

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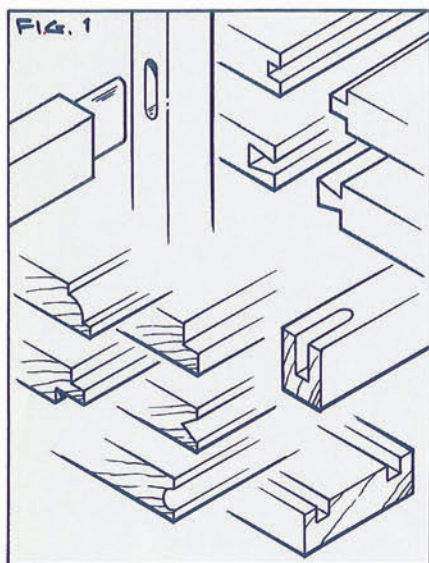
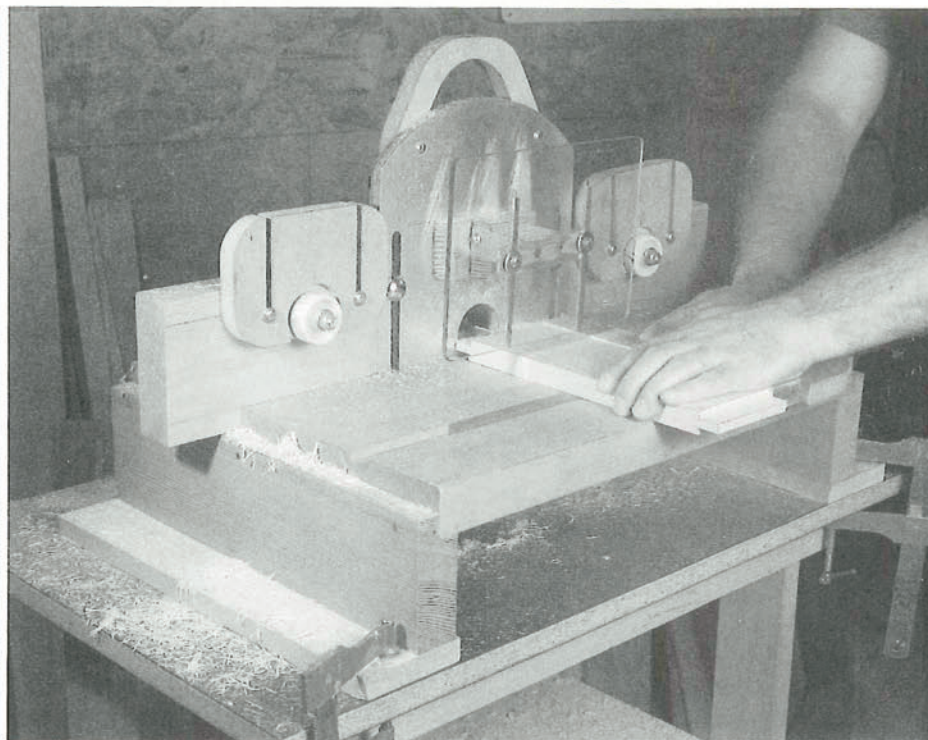
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Shop-Built Mortising/Tenoning Table

by R.J. DeCristoforo



With a plunge router, this workhorse router table will handle just about all your joinery needs

Making the Jig

Start with the 1½ in. thick table (A). You'll need to edge glue two or three narrow boards to get the 15¼ in. width.

Next, use the table saw and dado head to cut a groove to accept your miter gauge. A ¾ in. by ¾ in. groove will fit most miter gauge bars, but check before cutting. After the miter gauge groove is completed, cut the ¾ in. by 1½ in. groove for the left and right fences (D).

Now, referring to Fig. 2, lay out and mark the location of the router cutout and also the location of the two notches. The router cutout creates clearance for the router and also establishes the spacing between the left and right fence. (The 6 in. spacing shown should be satisfactory for most routers, but it's best to check your model to make sure.) The notches allow clearance for the router mount (E) and facing (F). A notch that measures 1½ in. long and 9/16 in. wide should be just about right.

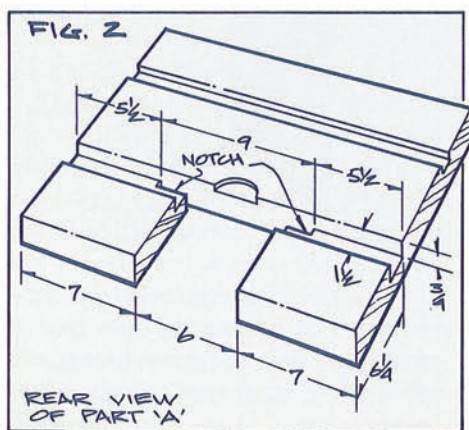
Once the router cutout and notch locations are marked, use the band saw to cut them out. You'll need to use a

chisel to clean up the ends of the notches. The 2 in. diameter by ¾ in. deep half-round cutout provides clearance for chips and sawdust.

After cutting the two ends (B) to size, cut the ¾ in. by ¾ in. rabbet along the top edge of each one as shown. Use glue and box nails (or screws) to secure the ends to the table. The two bases (C) can then be cut to size and joined to the ends in the same manner.

The router mount (E) should be made from a cabinet-grade hardwood plywood (birch plywood is a good one). Cut it slightly longer and wider than needed, then apply the mount facing (F). You can use either 1/32 in. thick Reynold's brand "Do-It-Yourself" aluminum (as I did) or plastic laminate (Formica) for the mount facing. Apply the facing with contact cement, then cut the mount to fit just inside the notches in the table. After using the band saw to cut the 6 in. radius on the top, the mount can be crosscut to its final length of 13½ in.

Cut the left and right fences (D) to size. They should fit snugly in the table groove that was cut earlier. Note that



there is a 1½ in. wide rabbet on the end of each fence. The depth of this rabbet should be equal to the thickness of the router mount plus the facing.

Next, dry assemble the table, the two fences, and the mount. Locate the fences so that they fit snugly against the side edges of the mount. When satisfied with the fit, mark the location and attach the fences in the table groove with several wood screws. This is a critical installation. The mount should be able to move vertically but without play. It will help to periodically coat the edges of the mount and fences with paste wax.

The handle (G) can be cut on the band saw and attached as shown.

Use a router to form the two slots in the mount, then with the mount in place, drill through the slots for the ¾ in. by 2 in. long carriage bolts.

The best way to position the router on the mount is to first make a paper template of the router base. This will enable you to pick up the mounting holes and then use the template to mark the hole locations on the mount. You will increase the depth of cut if you mount the router without its base plate. The 2 in. diameter center hole can be made with a jigsaw. Use flathead machine screws to attach the router; it's not likely that the original ones will be long enough.

The hold-downs (H) are next. I used plastic wheels (I) that I removed from a caster assembly, but wooden (or rubber) ones can be substituted.

The guard assembly (parts J, K, L and M) is made as shown. The guard is made

from ⅜ in. thick acrylic sheet (Plexiglas) which can be found at most hardware stores. For safety's sake, let's not assume the guard is a "maybe" item. Make it and use it.

When the guard is lowered within an inch or so of the table, you may find that your table saw miter gauge is too high to clear the guard. You can solve that problem by making your own miter gauge for the jig. Cut the fence (N) as shown, then attach the bar (O) with glue and slightly countersunk flathead wood screws. The bar should be centered on the fence. And also, of course, the fence must be square to the bar.

The auxiliary fence (parts P, Q and R) will help to hold stock against the jig fence when making certain cuts. The adjusting bar permits the fence to accept stock up to about 3 in. wide. A pair of screws on each end (driven into the miter gauge slot) serve to firmly secure the fence, yet allow it to be easily removed when not in use.

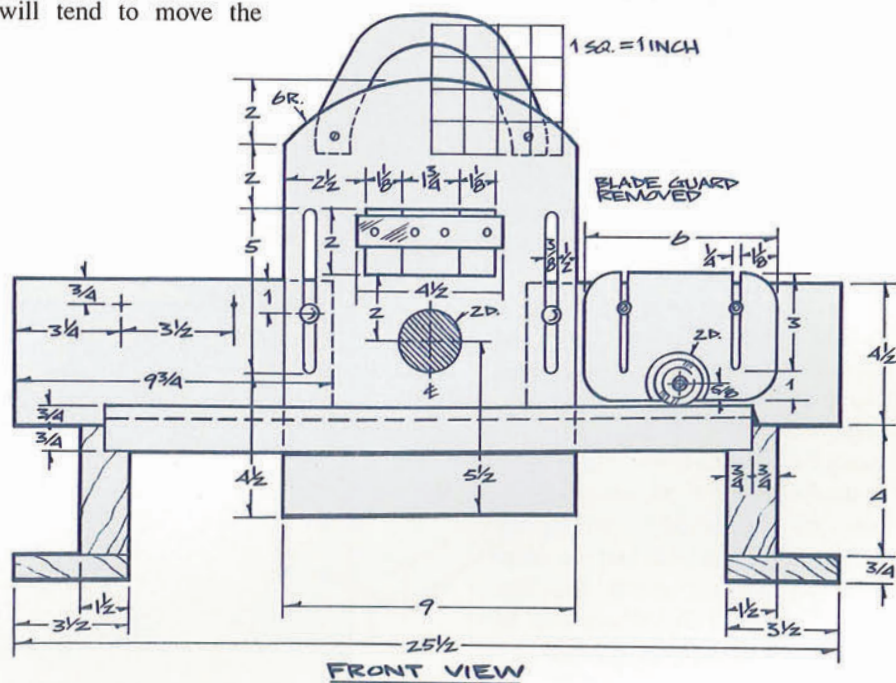
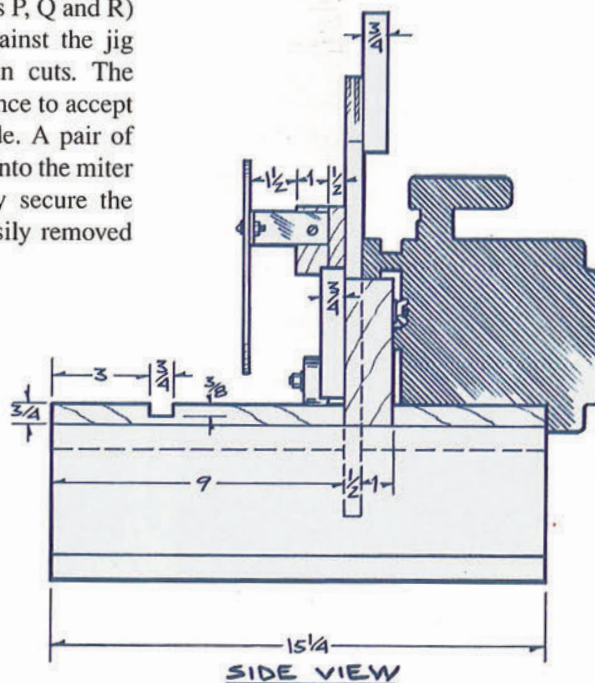
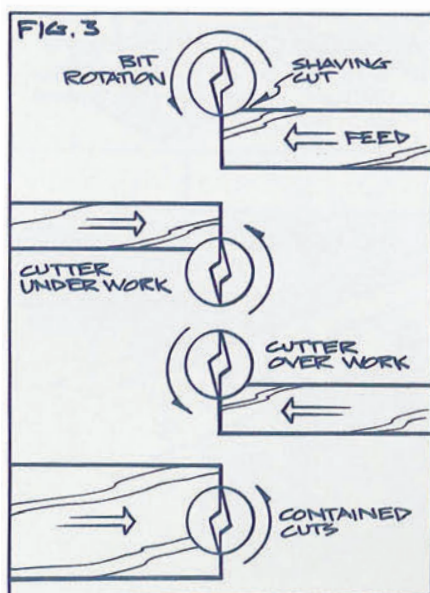
Using the Jig

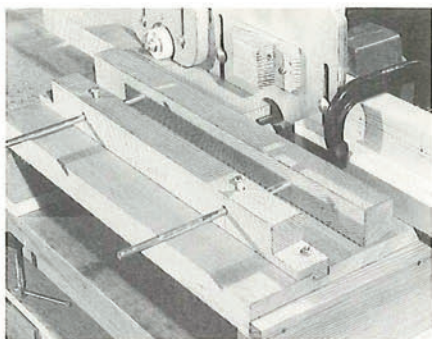
Editor's Note: For the sake of clarity, the guard has been removed in photos A through G. In actual operation, however, the guard should always be used.

Always feed the work against the bit's direction of rotation. If you work otherwise, the bit will tend to move the

work for you, which can be dangerous. Since the router is mounted horizontally, you will see the rotation as counter-clockwise when the jig is viewed from the front. Direction of feed will depend on whether the bit is situated over or under the work (Fig. 3). In some situations, the bit will be cutting, in essence, on the "up" stroke. This can result in rough cuts. The solution is to first make a very thin (no more than 1/16 in.) "shaving cut" to establish a clean shoulder. Follow the general power tool rule—accomplish deep cuts by making repeat passes.

The setup for an open mortise is





shown in Photo A. Note how the auxiliary fence and the hold-down are used to guide the work. Feed the work only as fast as the cutter can perform. A stopblock, clamped to, in this case, the outfeed fence, is used to gauge the length of the mortise.

A true mortise is done as shown in Photo B (the cut can't be seen). The work is placed and secured before the bit

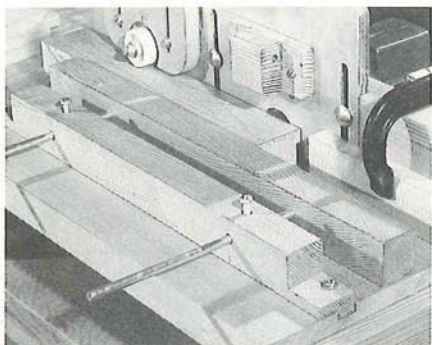


PHOTO B

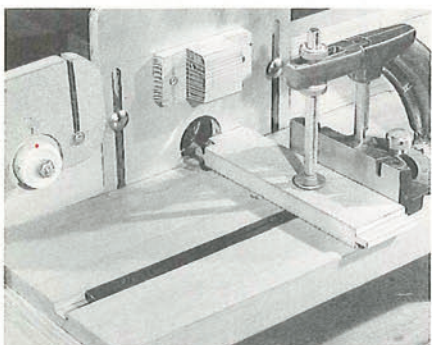


PHOTO C

The Right Cutter for Mortising

When it comes to router mortising, one type of bit, the spiral end mill cutter, stands head and shoulders above the others. Unlike straight cutters, spiral end mill bits both pull into the workpiece and efficiently eject chips. This is a marked difference from standard straight cutters, where constant pressure must be applied and the cutter seems to end up turning previously cut chips into ever finer dust. The spiral bits—sometimes called two flute spiral cutters—produce an exceptionally smooth bottom cut, with equally clean vertical walls, and no chipping or tear-out at the shoulder. Spiral end mill cutters are sold by most woodworking supply outfits.

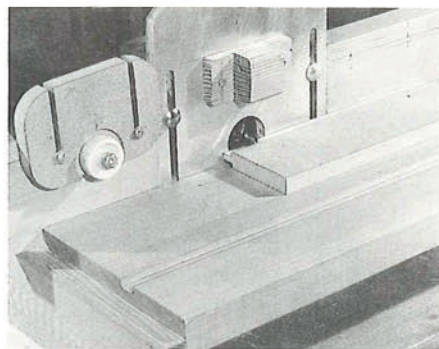


PHOTO D

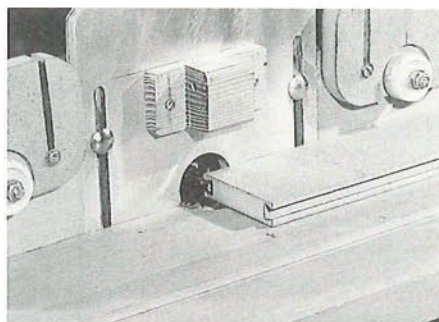


PHOTO E

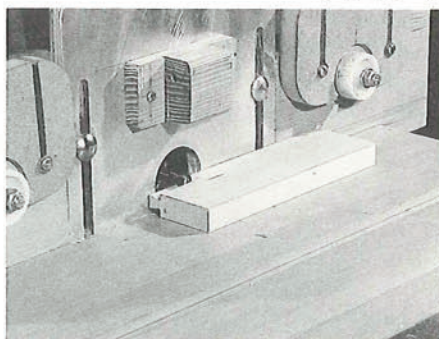


PHOTO F

is brought forward. This is one situation where the value of a plunge router is evident.

End-cuts, especially on narrow stock, are made by advancing the work with a miter gauge (Photo C). Don't freehand this kind of cut unless the workpiece has enough area for safe handling.

Cuts along edges are made by moving the stock along the fences. For a tongue, flip the stock for a second pass after the first one is accomplished (Photo D). When repeat passes or a shaving cut is required, make the first cut on all the pieces involved before resetting the bit for other cuts.

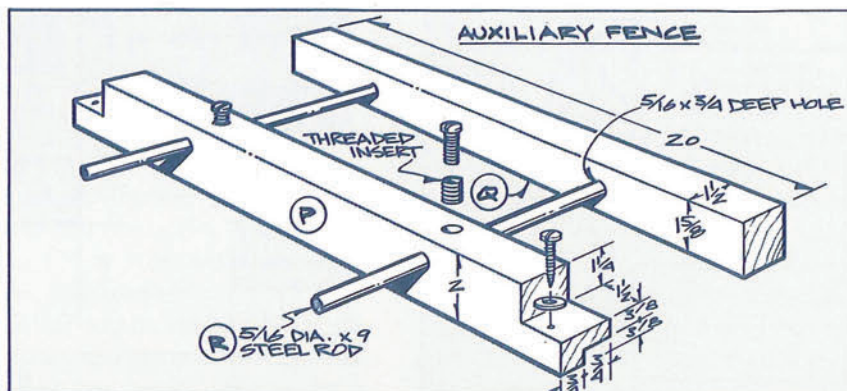
Photos E and F show the jig being used to form an edge-dovetail joint. You can't, of course, form the socket by

Bill of Materials

(all dimensions actual)

Part	Description	Size	No. Req'd.
Jig			
A	Table	1 1/2 x 15 1/4 x 20	1
B	End	1 1/2 x 4 x 15 1/4	2
C	Base	3/4 x 3 1/2 x 15 1/4	2
D	Left/Right Fence	1 1/2 x 4 1/2 x 9 3/4	2
E	Router Mount	1/2 x 9 x 13 1/2	1
F	Mount Facing	1/32 x 9 x 13 1/2	1
G	Handle	3/4 x 4 3/8 x 7 *	1
H	Hold Down	3/4 x 4 x 6 *	2
I	Roller	1 1/2 in. dia.	2
J	Guard Support	1 1/2 x 2 x 4	1
K	Guard Bracket	1/8 x 1 x 6 3/4	1
L	Guard Holder	1/8 x 1 x 4 1/2	1
M	Guard	3/16 x 6 1/2 x 9	1
Miter Gauge			
N	Fence	3/4 x 4 x 8 3/4 *	1
O	Bar	3/8 x 3/4 x 14	1
Auxiliary Fence			
P	Support	1 1/2 x 2 x 20	1
Q	Holder	1 1/2 x 1 5/8 x 20	1
R	Adjusting Rod	5/16 dia. by 9 long	2

* As shown, these parts are Medium Density Fiberboard, however hardwood plywood can be used as well.



making repeat passes, but if a single pass presents problems, you can use a pretty standard procedure to get by. First, form a groove with a straight bit, then replace the straight bit with the dovetail bit. The first cut will have removed the bulk of the waste so the dovetail bit will have little work to do.

The dovetail pin is formed following

the procedure used to shape a simple tongue. In the case, repeat passes can be used if necessary.

Photo G makes the point that the jig can be used to shape straight edges as well as for joint configurations. Be sure, when using piloted bits, that the pilot does not ride on the surface of the stock. Bits that have ball bearing pilots can be used pretty freely if the ball bearing is removed

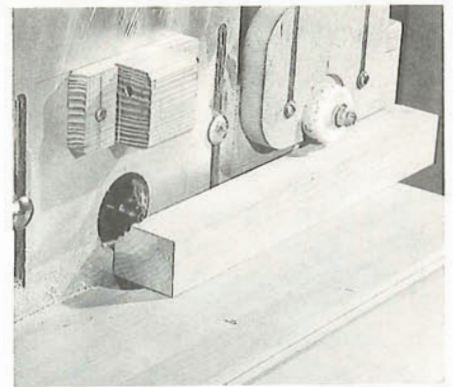
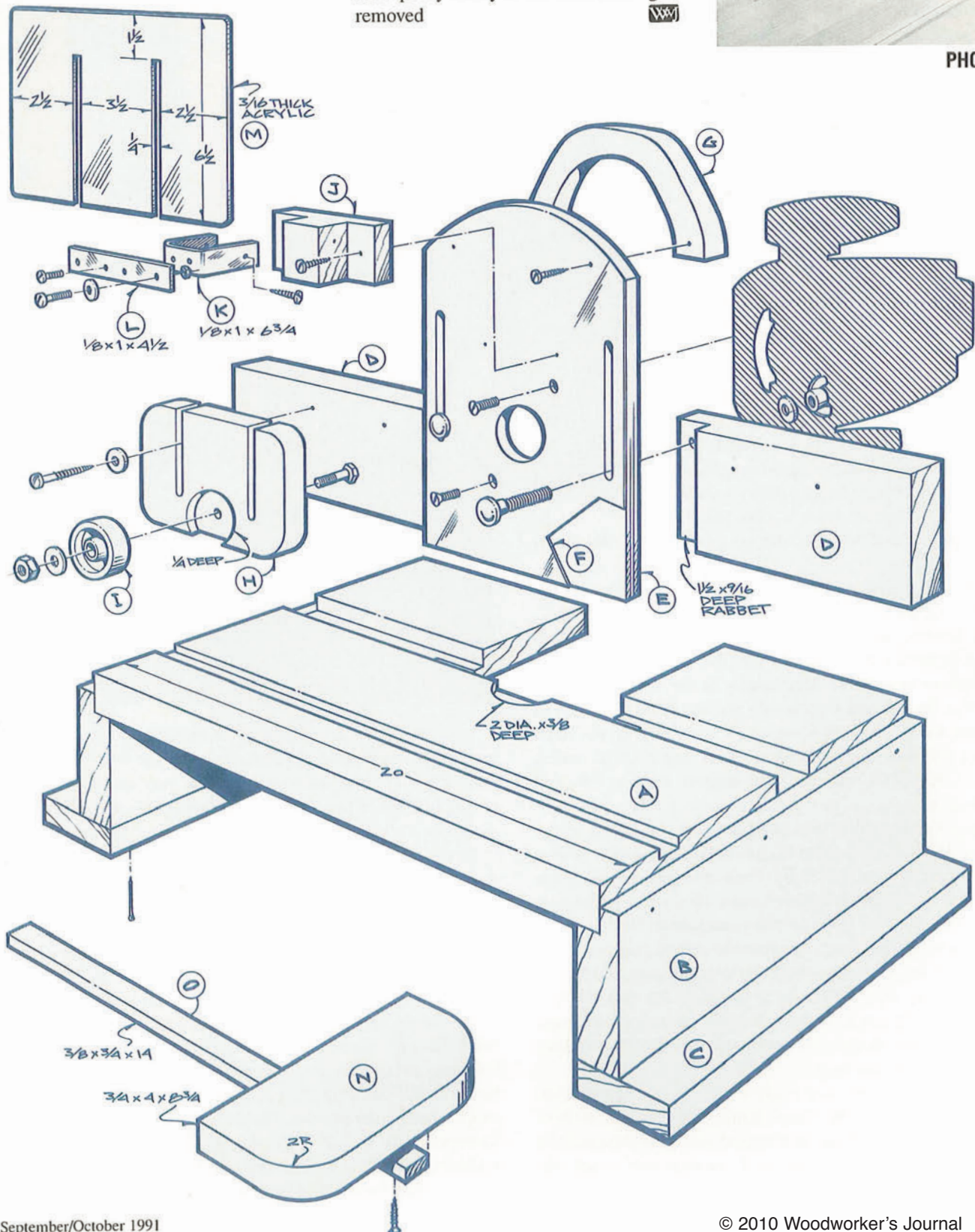


PHOTO G



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Internet Production Coordinator