Power Tool-Friendly Bench

Store and use key benchtop tools on a single mobile unit

by Richard Tendick

See the mobile base and tool platforms in action at **AmericanWoodworker.com/WebExtras**

INNOVATIVE FEATURES such as a lever-operated mobile base and dual-height pullout tool platforms give this bench a five-star rating, especially if you have to share your shop space with cars and other vehicles in a garage.

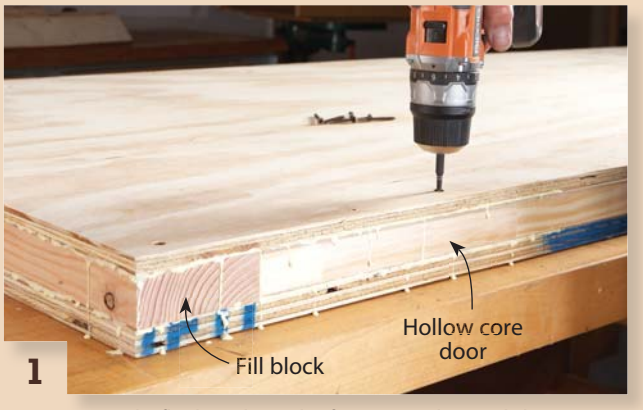
The mobile base works just like a floor jack, so you can easily move the bench from the middle of the shop to store it against the wall. The tool platforms allow you to pull out stored benchtop machines and raise them to operating position—flush with the top of the bench—in seconds.

The benchtop houses a power strip (see Sources, page 63), so you don't have to fish for extension cords to plug in portable power tools. The top is long enough to mount a vise at one end and a router at the other.

Simple construction methods make this bench doable for most woodworkers. You'll need four sheets of plywood, a hollow core door and some hardware. You can get these materials at any home center (see Sources).

The bench's modular design is easy to modify to fit your space or tools. Shorten the top, for example, or install drawers or shelves on one side of the cabinet or forgo the tool platforms entirely and just build the bench. Whether you build the Cadillac version shown here or an economy model, this bench is sure to enhance your woodworking.

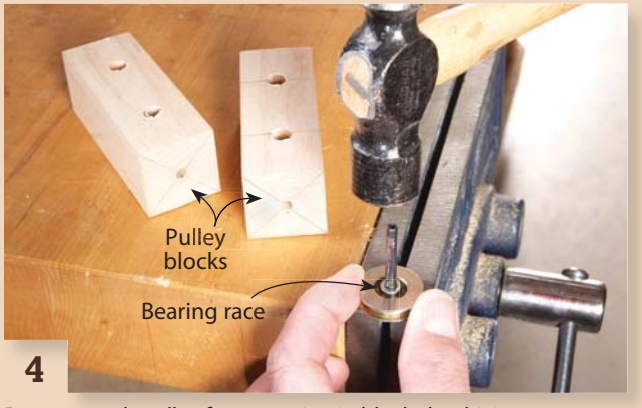
EDITOR: TIM JOHNSON | PHOTOGRAPHY: JASON ZENTNER | ILLUSTRATION: FRANK ROHRBACH



Create a sturdy, flat bench top by fastening plywood sheets on both sides of a hollow core door. Adding a fill block makes this top long enough to house a router.

Assemble the cabinet's frames by stacking and gluing plywood stiles, rails and fill blocks. Use a 90° assembly jig to keep each frame square.

Install the lever in the middle frame after attaching the lever stiles. The lever raises the bench onto its casters by means of a cable and pulleys.



Prepare each pulley for mounting in blocks by driving an axle through its bearing. Make sure the bearing's inner race is supported on both sides by the vise.

Start with the top

The bench top consists of a 30" hollow core door sandwiched between sheets of plywood (A–C, Fig. A, page 58; Cutting List, page 58; **Photo 1**). This construction is both flat and sturdy. A 4" wide core spacer (D) makes the bench top long enough to mount a router at the end. Cut the 3/4" plywood top and 1/2" plywood bottom wider than the door to create a groove at the front for mounting a power strip.

Apply glue to one side of the door. (A paint roller works great for this job.) Lay the glued side of the door on the 1/2" plywood, flush at one end and at the back edge. Tack the door to the plywood by driving four 1-1/2" screws through the solid wood near the door's corners. Use screws designed for woodworking (see Sources). Attach the core spacer similarly.

Apply glue to the door and spacer. Place the 3/4" plywood on top and clamp it so you can flip over the assembly. Then fasten the plywood to both sides of the door by driving 2-1/2" screws all around the perimeter and through the center. These long screws may poke slightly through the 3/4" plywood, so it's a good idea to remove them after the glue dries. Glue on the vise fill strip (E) and install the vise (see Sources).

Build the cabinet

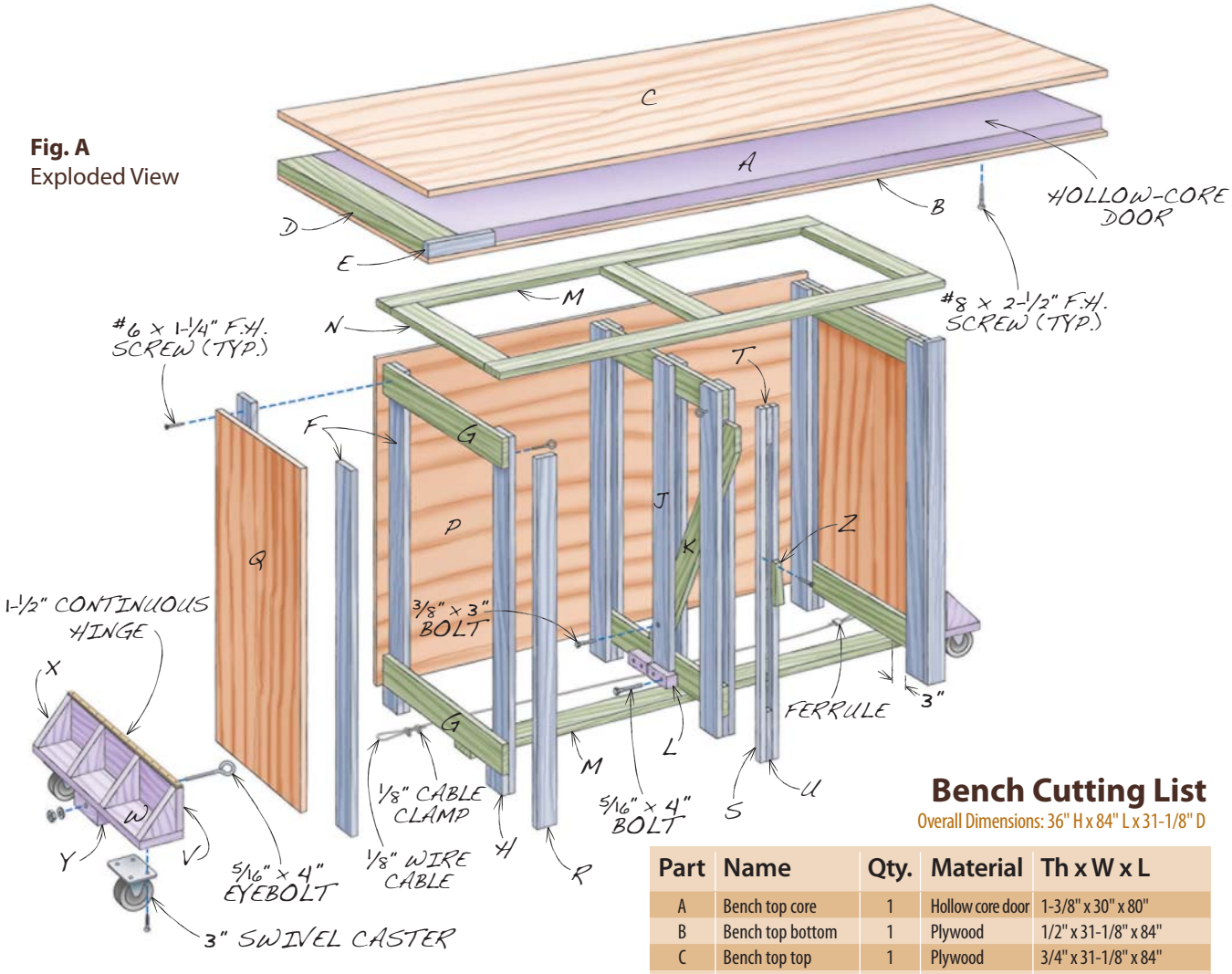
The cabinet consists of three stacked plywood frames that are connected by stretchers and a back to create two 24" wide x 24" deep openings. Cut the stiles, rails and fill blocks (F, G, H; Fig. B) for the frames to final width and length—use a stop block so the lengths of similar pieces are identical. The frames must be square, so construct a squaring jig to assemble them (**Photo 2**). The jig is simply a piece of flat 3/4" sheet stock that has one square corner, with fences attached on both sides.

The middle frame includes two additional stiles (J). They house the lever (K) that operates the bench's mobile base. For accuracy, clamp these stiles together and use a drill press to drill the 3/8" hole that's used to mount the lever. Install a 3/8" x 3" bolt to keep these the holes aligned when you fasten the lever stiles to the middle frame.

Cut the 1/2" plywood lever to final dimensions (Fig. C) and drill the two 3/8" dia. holes. Use one hole to bolt the lever between the middle rails (**Photo 3**). The cable for the mobile base passes through the other hole. Install a 3/8" o.d. x 1/4" i.d. x 3/4" long steel bushing in this hole. This bushing will keep the cable from wearing the wooden lever.

On both sides of the lever, the cable passes through pulleys mounted in maple blocks that are bolted on the center frame's bottom rail (L; Fig D). The pulleys are steel screen door repair wheels with 5/32" x 1-1/2" roll pins driven through them to act as axles (**Photo 4**). The roll pin must be carefully ham-

Fig. A
Exploded View



Bench Cutting List

Overall Dimensions: 36" H x 84" L x 31-1/8" D

Part	Name	Qty.	Material	Th x W x L
A	Bench top core	1	Hollow core door	1-3/8" x 30" x 80"
B	Bench top bottom	1	Plywood	1/2" x 31-1/8" x 84"
C	Bench top top	1	Plywood	3/4" x 31-1/8" x 84"
D	Bench top core spacer	1	Pine	1-3/8" x 4" x 30"
E	Vise fill strip	1	Pine	1-3/8" x 1-1/8" x 8"
F	Stile	12	Plywood	3/4" x 3" x 32-5/8"
G	Rail	6	Plywood	3/4" x 3" x 24"
H	Fill block	6	Plywood	3/4" x 3" x 2"
J	Middle stile	2	Plywood	3/4" x 3" x 29-1/8"
K	Lift lever	1	Plywood	1/2" x 3" x 29-1/2"
L	Pulley block	4	Maple	1-1/4" x 1-1/4" x 3-1/2"
M	Stretcher	3	Plywood	3/4" x 3" x 54-1/2"
N	Cleat	3	Plywood	3/4" x 3" x 18"
P	Back	1	Plywood	1/2" x 30-5/8" x 54-1/2"
Q	End panel	2	Plywood	3/4" x 18" x 30-5/8"
R	Frame face	2	Pine	3/4" x 2-1/4" x 33-3/8"
S	Center face	2	Pine	3/4" x 3/4" x 33-3/8"
T	Center top fill	1	Pine	3/4" x 3/4" x 3-3/4"
U	Center bottom fill	1	Pine	3/4" x 3/4" x 5"
V	Caster bracket back	2	Pine	3/4" x 4" x 24"
W	Caster bracket bottom	2	Plywood	3/4" x 4-3/4" x 24"
X	Caster bracket brace	4	Plywood	3/4" x 4" x 4" (a)
Y	Caster bracket block	2	Plywood	2-1/4" x 3" x 6" (b)
Z	Lever stop	1	Plywood	1/2" x 1-1/2" x 5"

Notes: **a)** Cut diagonally. **b)** Stack three 3/4" pieces.

Fig. B Cabinet Frame Dimensions

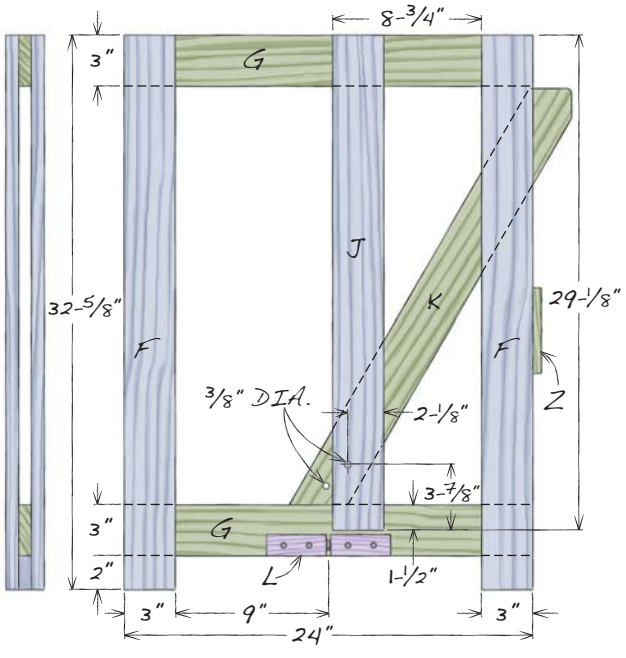
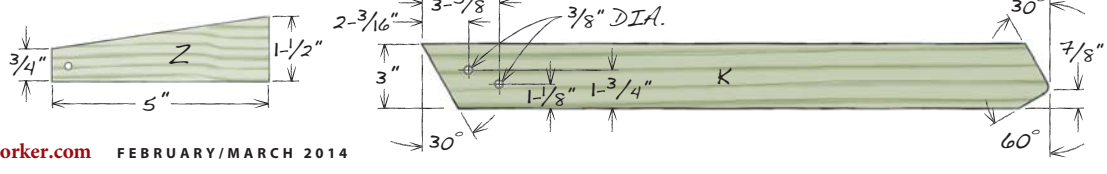
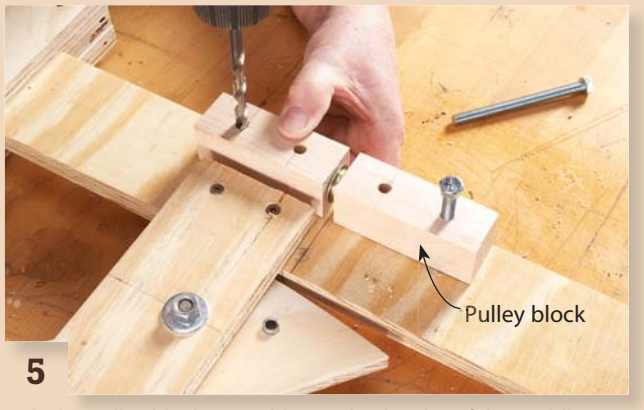


Fig. C
Lever and Stop Dimensions





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Bolt the pulley block assemblies on both sides of the middle frame's bottom rail. To properly align the holes in the rail, insert a bolt after drilling the first hole.

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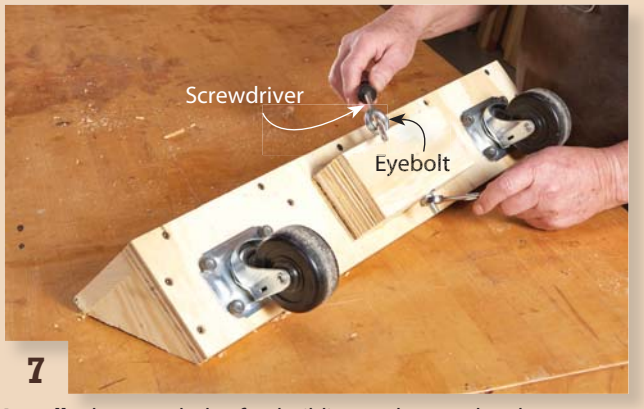
Assemble the bench cabinet by attaching stretchers and cleats after installing spacers to properly position the frames. Attach the back to complete the job.



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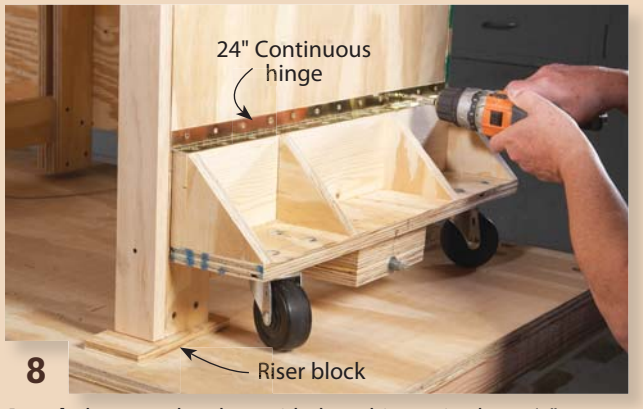
Install a large eyebolt after building each caster bracket.



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Attach the caster brackets with the cabinet raised on 1/2" plywood blocks.

Fig. D Pulley Blocks

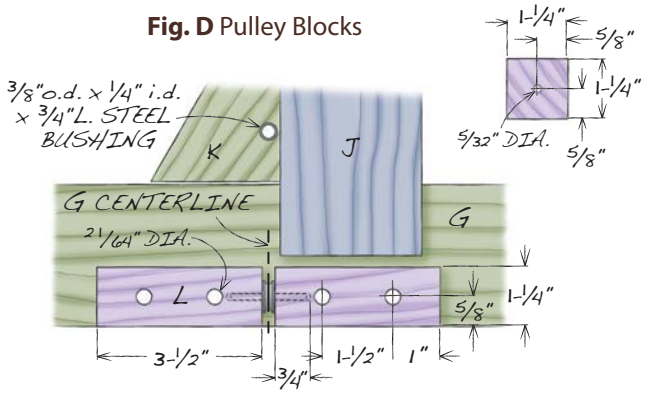
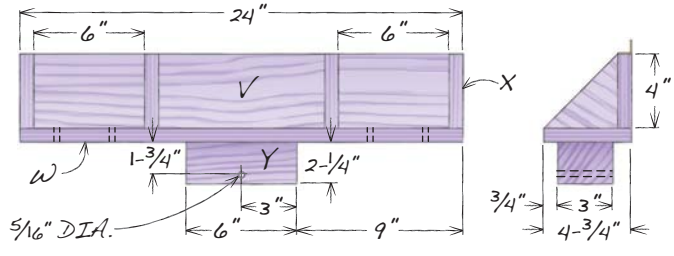


Fig. E Caster Brackets



mered through the pulley to prevent damaging its bearing.

Drill a centered 5/32" hole in one end of each pulley block and 5/16" holes for the mounting bolts. These 5/16" holes must line up, so stack the blocks in pairs (back blocks and front blocks) for drilling. After drilling the first hole in each pair, insert a bolt to keep those holes in alignment while drilling the second hole. Install a pulley between each front and rear block. Position one assembly with the pulley centered on the center frame's bottom rail and drill a hole through the rail (**Photo 5**). Install a bolt before drilling the remaining holes. Then bolt the pulley block assemblies on both sides of the bottom rail.

Assemble the cabinet on a flat surface—you can use the bench top you completed earlier (**Photo 6**). Space the frames 24" apart by using spacers that are rabbeted on both ends. Construct each spacer by fastening a 24" long piece of scrap plywood to a longer piece of plywood.

It's a good idea to recruit a helper to install the spacers. When the frames are properly spaced, screw the stretchers (M) to the top and bottom. Then screw on the cleats (N) and fasten the back (P) to square and stabilize the assembly. Attach the end panels (Q) and the decorative pine facing (R–U).

Install the mobile base

Build the caster brackets (V–Y; Fig. E) and install 5/16" x 4"

Fig. F
Tool Platform

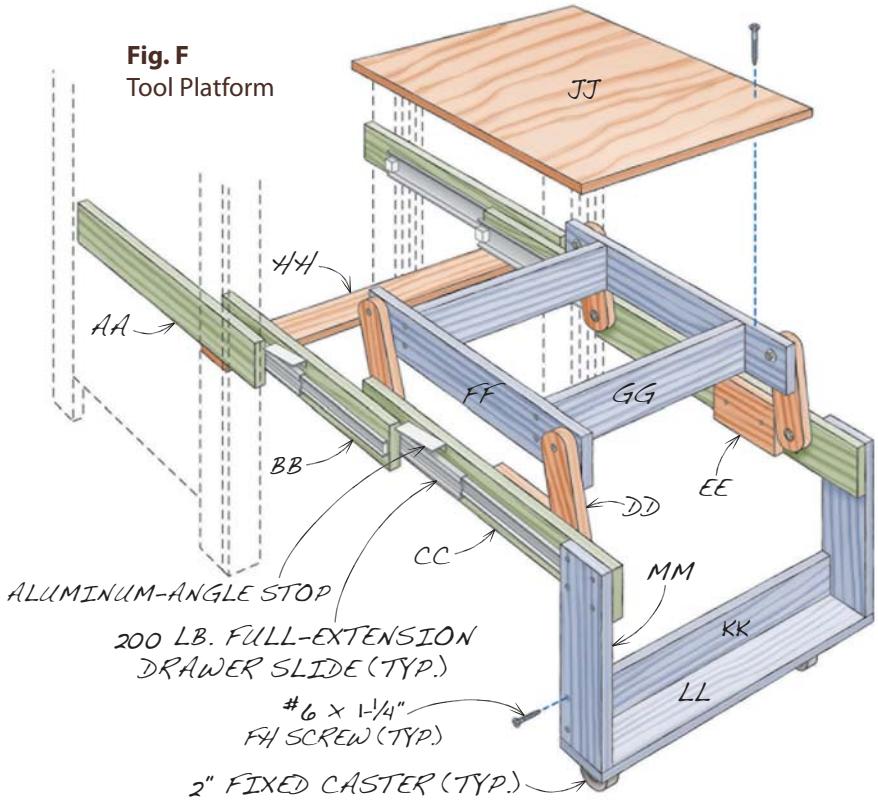


Fig. H Slide Support Dimensions

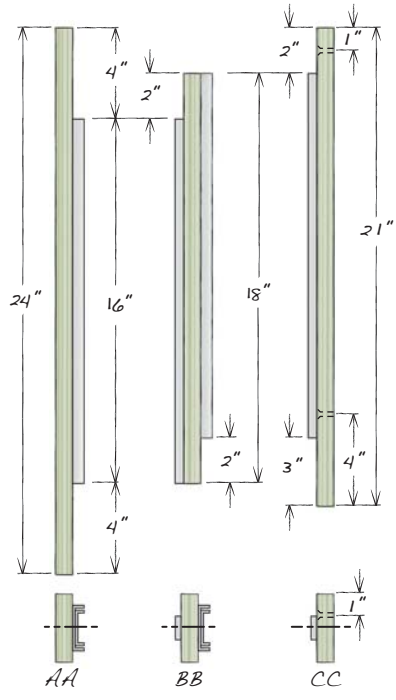
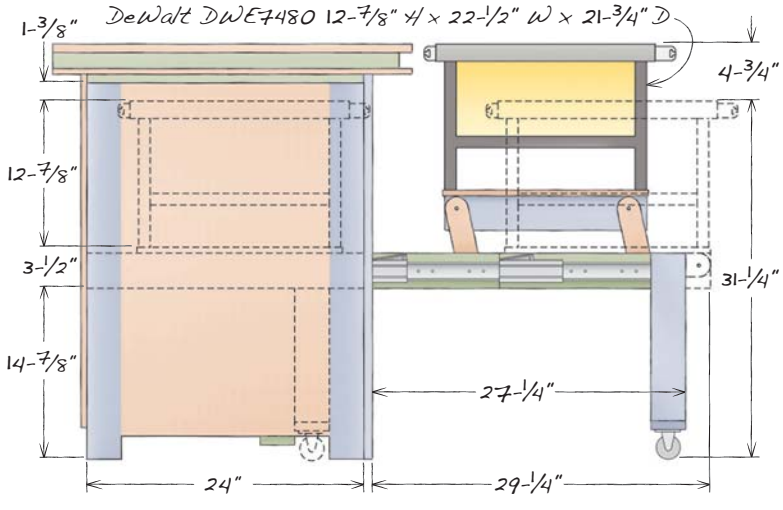
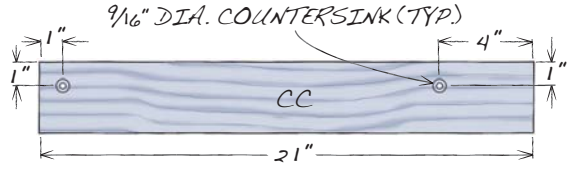


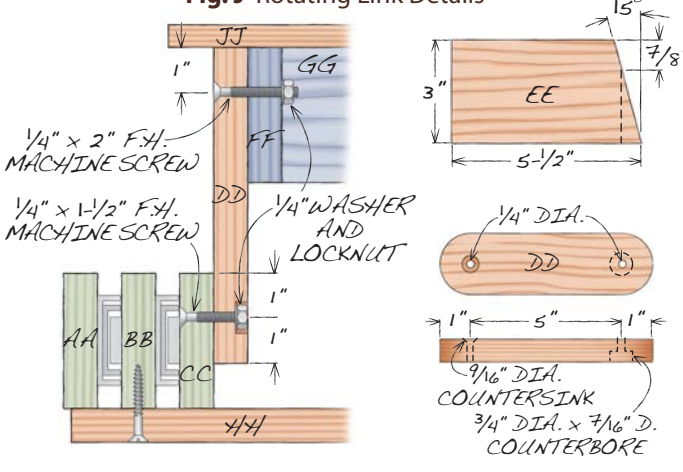
Fig. G Tool Platform Dimensions





Build a fence to use with the bench top's router at **AmericanWoodworker.com/WebExtras**

Fig. J Rotating Link Details

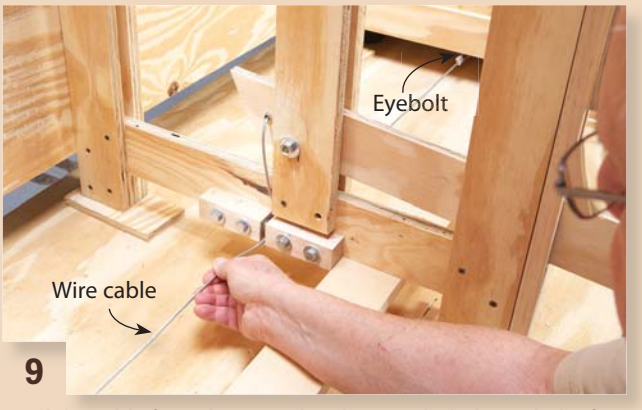


Tool Platform Cutting List

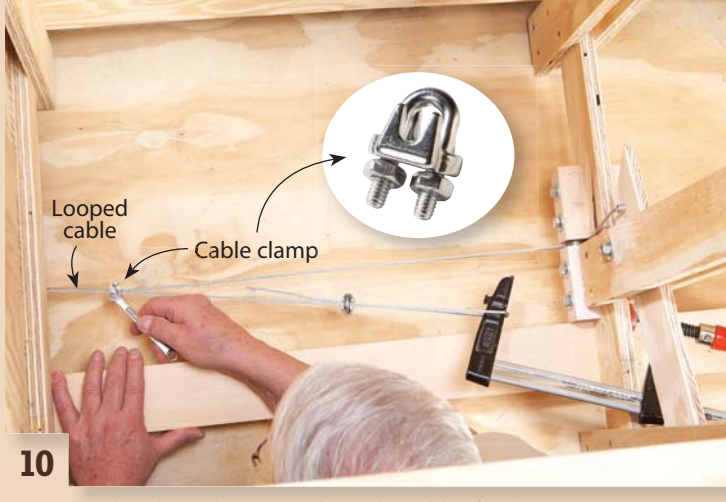
Overall Dimensions: 18-3/8"–23-1/8" H x 24" W x 24" – 54" D

Part	Name	Qty.	Material	Th x W x L
AA	Outside slide support	4	Plywood	3/4" x 3" x 24"
BB	Middle slide support	4	Plywood	3/4" x 3" x 18"
CC	Inside slide support	4	Plywood	3/4" x 3" x 21"
DD	Link	8	Plywood	3/4" x 2" x 7" (aa)
EE	Stop block	4	Plywood	3/4" x 3" x 5-1/2" (bb)
FF	Platform side	4	Plywood	3/4" x 3" x 18"
GG	Platform brace	4	Plywood	3/4" x 3" x 13-3/4"
HH	Cross brace	1	Plywood	1/2" x 3" x 23-3/4"
JJ	Platform	1	Plywood	1/2" x 18" x 19-1/4" (cc)
KK	Support bracket brace	1	Plywood	3/4" x 3" x 18-1/4" (cc)
LL	Support bracket plate	2	Plywood	3/4" x 3" x 19-5/8"
MM	Support bracket leg	2	Plywood	3/4" x 3" x 14-1/2" (cc)

Notes:
aa) Ends rounded at 1" radius.
bb) Cut front end at 15° angle.
cc) Dimensional changes to accommodate Delta 31-483 Oscillating Spindle Sander: Slide support mounting height: 9-5/8"; Platform: 15-1/4" W; Support bracket brace: 1-1/4" W; Support bracket leg: 9-1/4" L.



Feed the cable from the caster bracket's eyebolt through the first pulley, up and through the lever, and back down through the second pulley.



Use a woodworking clamp to tighten the cable after looping it through the second eyebolt. Secure the tensioned cable using two cable clamps.

Lay out the platform assembly's support slides and links. Mark centerlines on all of the pieces and locate the bolt holes on the inside slide supports and on the links.

Screw the drawer slides to the slide supports. Mount slides on both sides of the middle slide supports.

eyebolts (**Photo 7**). Loop one end of an 8' length of 1/8" wire cable through the eyebolt on one of the caster brackets. Secure this loop by hammering on an aluminum ferrule. Raise the base on 1/2" plywood blocks. Then attach the caster brackets (**Photo 8**).

Thread the free end of the cable through the nearest pulley (**Photo 9**). Feed the cable up to the bushed hole in the lever, through the bushing, down through the other pulley and over to the second caster bracket. Then thread the cable through the eyebolt, bring the end back into the bench and install a cable clamp to form a loop.

Use an F-style clamp with its head inside the loop and its screw bearing against the opposite side of the middle frame to tighten the cable (**Photo 10**). Then install two cable clamps to hold the tension. You have to use cable clamps because the cable will stretch like a guitar string and need to be re-tensioned. Install the lift lever stop (Z). Then test the lift mechanism and make any necessary adjustments. Move the cabinet to the floor and attach the bench top by driving screws through the cleats. Then follow the manufacturer's instructions to install the router plate.

Assemble the tool platform

The pullout tool platform extends by means of two 16" 200 lb. capacity drawer slides on each side (see Sources) and rides on a support bracket with fixed casters. Rotating links raise and lower the platform between its storage and operating positions.

The platform shown shown here is designed for use with DeWalt's Compact Job Site Tablesaw (Fig. F; Fig G; Cutting List, page 60; see Sources). Note that the saw's blade must be lowered and its guard, fence and miter gauge must be removed in order to store the tool. We built simple brackets to conveniently store these must-have accessories on the left side of the cabinet.

To work with other similar saws you may have to make some alterations. For a shorter or taller saw, simply raise or lower the outside slide support's mounting position inside the cabinet and adjust the length of the support bracket's legs. For a wider saw, simply widen the cabinet's opening.

Cut the plywood slide supports (AA–CC, Fig. F) and the rotating links (DD) to length. Note that the slide supports are different lengths (Fig. H). Draw centerlines for mounting the slides on each support and mark the 1" radius ends on each link (Fig. J). Then locate the 1/4" dia. holes on the inside slide supports (CC; Fig. H) and on the links (**Photo 11**). Correctly locating these holes is critical for the platform's lift mechanism to work properly. The spacing between these holes must be the same on all similar pieces. Make sure to correctly

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Fasten an angled stop block behind the link near the front end of each inside slide support. The links at the back end don't require stop blocks.

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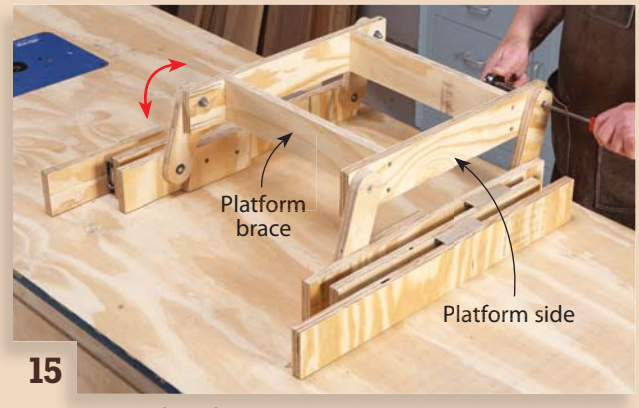
Install shop-made stops to ride on top of the slide supports and automatically fall into place when the slide assembly is fully extended.



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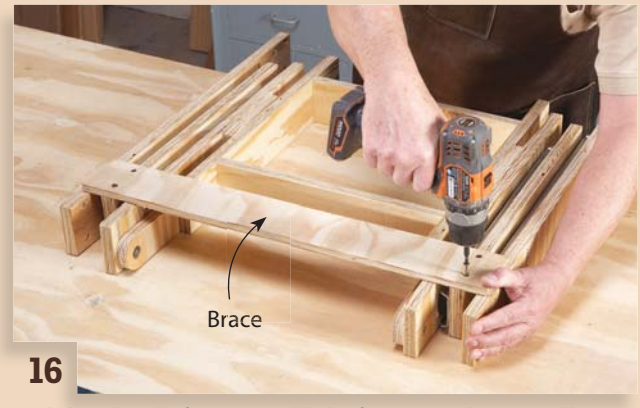
Attach the platform frame to the links. Tighten the bolts so the links rotate freely, without binding or wobbling.



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Stabilize the platform assembly by fastening a horizontal brace to the bottom, flush with the back ends of the middle slide supports.

countersink or counterbore the holes and drill deep enough to recess the screw head or locking nut and washer slightly below the surface. After all the holes are drilled, round the ends of the links to a 1" radius (or slightly less) so they won't rub and cause the mechanism to bind.

Start the assembly by attaching the drawer slides on the supports' centerlines (**Photo 12**). Note that the slides mount in different locations on each support. Fasten the links and their 15° stop blocks (EE) to the inside slide supports (**Photo 13**). Tighten the links so they rotate smoothly, without wobbling. Don't over-tighten. Attach each stop by rotating the front link up and over to match the stop's angle.

Assemble each set of slide supports and fully extend the slides. Then install stops made from 1" x 1" aluminum angle to stabilize the pullout assembly (**Photo 14**). These stops keep the slides from rolling back into the bench when you lift or lower the tool platform. Cut one leg of the angle down to 1/2" on the tablesaw. Set the blade height at 1/8", place the angle against the fence with a sacrificial piece of wood nested inside and run the assembly through the saw as if it were a piece of wood. Each slide assembly requires four 3-1/2" long stops. Drill mounting holes for screws and attach the stops. Make sure the stop is high enough to ride on the adjacent slide support when the assembly is pushed in. Fasten the stops just tight enough to automatically fall into place when the assembly is pulled out.

Assemble the platform's frame (FF, GG) and attach it to the links mounted on the two slide assemblies (**Photo 15**). Flip over this assembly to attach the cross brace (HH, **Photo 16**). Then flip the assembly again to fasten the platform (JJ).

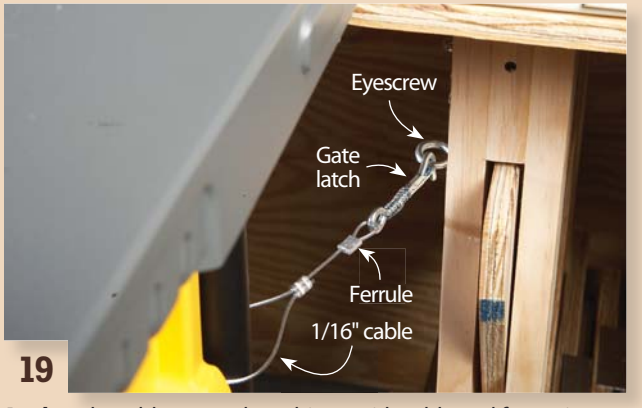
Install the tool platform

Remove the platform's outside slide supports and mount them in the cabinet. Remember, the mounting height shown in Figure G is for the DeWalt saw that's pictured. Make adjustments as necessary to find the correct mounting height for your saw, so the benchtop functions as an outfeed table. Cut a pair of spacers to the proper length and clamp them inside the cabinet. Place each outside slide support on top of these spacers. Then fasten it to the frame, flush at the back (**Photo 17**). After attaching both slide supports, install the rest of the platform assembly as if it were a drawer.

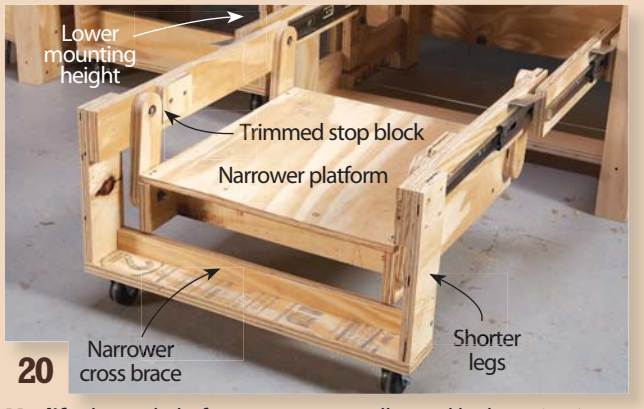
Install a support bracket with fixed casters to complete the tool platform (**Photo 18**). With the platform fully recessed inside the cabinet, measure the length between the outside faces of the inside slide supports. Cut the cross brace (KK) to the same length and the plate (LL) 1-1/2" longer. Cut the legs (MM) extra long. Assemble the bracket and mount the 2" casters. Pull the platform out of the cabinet just far enough

Mount the platform assembly's outside slide supports in the cabinet. Use spacers to level the supports and position them at the correct height.

Install the support bracket to complete the tool platform.



Anchor the tablesaw to the cabinet with cable and fasten it to the tool platform with screws or brackets to secure it in the event of a kickback.



Modify the tool platform to accept a taller tool by lowering its mounting height inside the cabinet and making other minor changes that allow the links to rotate all the way down.

to slide the bracket into position against the inside slide supports. Then mark the legs' exact height. Remove the bracket and cut the legs to length. Then fasten it to the platform.

Position the saw on the tool platform so it slides in and out without touching the cabinet and so the rip fence and miter gauge work properly when the platform is raised. (You may have to cut slots in the benchtop for the miter gauge's bar.) Fasten the saw to the platform (the base of the DeWalt saw has holes for screws). Then install restraints on both sides to anchor the saw to the cabinet during use (**Photo 19**). These restraints will help to keep the saw and platform from dropping to storage height in the case of a kickback.

Accommodate a tall tool

Minor modifications allow the tool platform to house a much taller tool (**Photo 20**). Mount the platform lower. Shorten the support bracket's legs and trim the width of its cross brace. Trim the platform's width so it fits between the links and cut the stop blocks to the dotted line (Fig. J). These alterations lower the platform's storage height by 5" while maintaining the same operating height. To accommodate the Delta 31-483 Heavy Duty Oscillating Spindle Sander shown on page 56 (see Sources), see Note "cc" on the Tool Platform Cutting List (page 60).

Richard Tendick is a retired engineer who loves designing projects and working wood.

SOURCES

- Home Center, B-C Fir Plywood, 4x8, 1/2" and 3/4" thickness (2 sheets each); Hollow Core Door, 1-3/8" x 30" x 80"; Power Strip, 52"; Bolt, Washer and Nut, 3/8" x 3" (1 req.), 5/16" x 4" (4 req.); Screen Door Repair Wheel (2 req.); Roll pin, 5/32" x 1-1/2" (2 req.); Eyebolt, Washer and Nut, 5/16" x 4" (2 req.); Continuous Hinge, 1-1/2" x 24" (2 req.); Heavy-Duty Swivel Caster, 3" (4 req.); Stranded Wire Cable, 1/8" x 8', 1/16" x 2'; Cable Clamp, 1/8" (3 req.); Aluminum Ferrule, 1/8" (1 req.), 1/16" (8 req.); F.H. Machine Screw, 1/4" x 2", 1/4" x 1-1/2" (4 req. for each); Washer and Lock Nut, 1/4" (8 req.); Aluminum L-Angle, |1" x 1" x 36"; Fixed Casters, 2" (4 req.); Gate Hook, 3" (4 req.), Screw Eye, #8 (4 req.).
- Rockler Woodworking and Hardware, rockler.com, 800-279-4441, Woodworker's Bench Vise, #68888, $89.99; Square-X Drive Lube Finished Screws, #6, #28647, #8, #29322, $3.69 to $6.59 per 100 screws; Heavy-duty Full-Extension Drawer Slide, 16", #46899, $34 per pair (4 pair req.).
- DeWalt, dewalt.com, 800-433-9258, 10" Compact Job Site Tablesaw, #DWE7480, $379.00.
- Delta Power Equipment Corporation, deltamachinery.com, 800-223-7278, Heavy Duty Oscillating Bench Spindle Sander, #31-483, $519.99.