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- Sturdy & Simple
- Crafts & Hobbies
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workbenches & workstations



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This classic heirloom workbench is sure to serve you well for years to come.

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workbenches & Workstations

A good workbench serves as the cornerstone for any shop. Whether you want a quick and easy bench, a space for crafts and hobbies, an extra workstation, or an heirloom, one of these projects will fill the bill.

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cabinetmaker's Workbench

This great-looking heirloom workbench provides a place to hone your woodworking skills for years to come.

Patterned after a workbench found in wood shops at the turn of the 20th century, this traditional-style bench has it all. And it starts with the worksurface. The large top provides plenty of room to work on any project. The solid-wood top also features a large face vise and shop-built tail vise. And there's plenty of storage underneath — with or without the optional drawers.

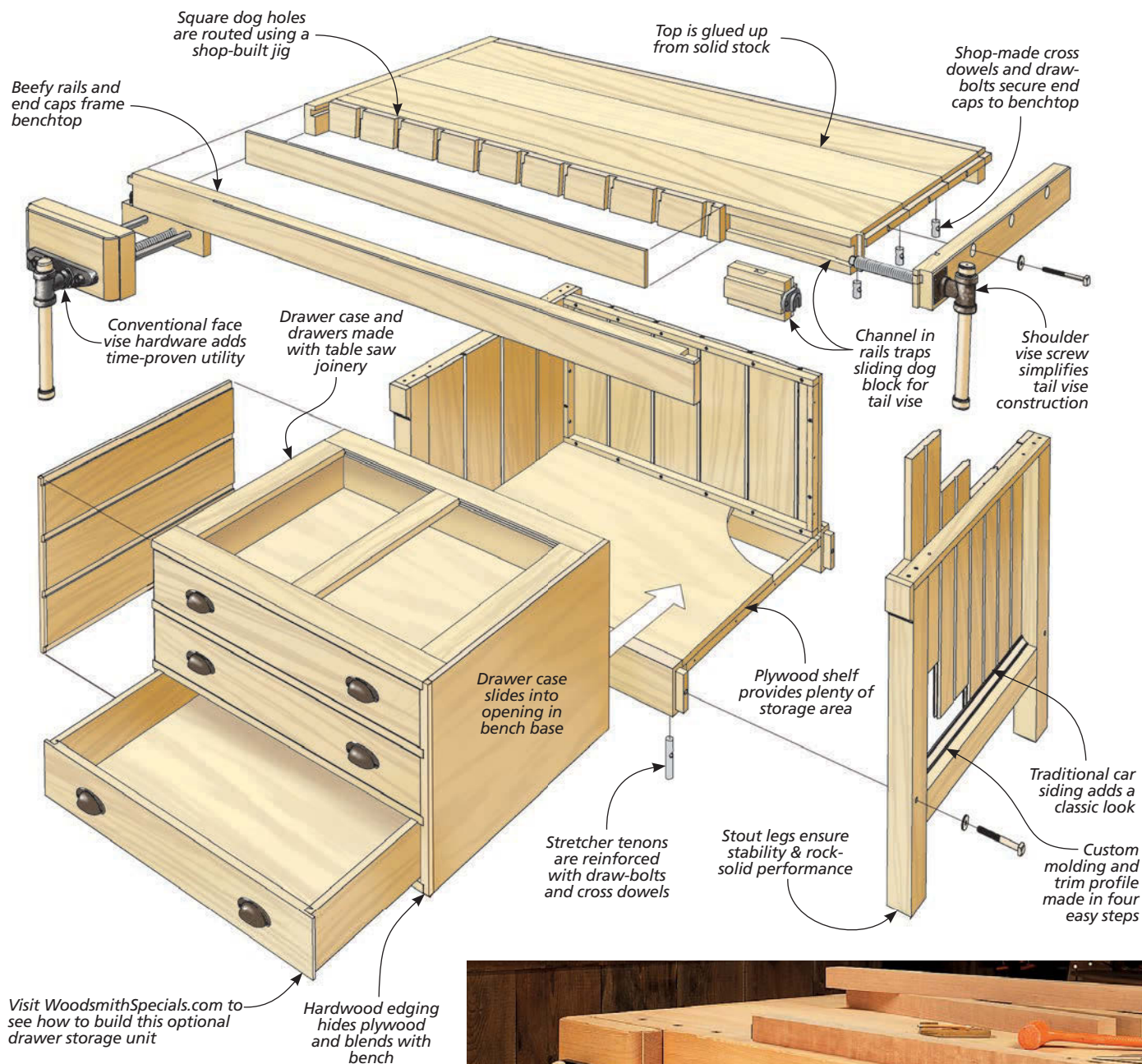
Classic details, like the shop-made car siding and trim molding, add to the appeal.

The bench is designed to withstand the rigors of everyday woodworking, whether you're working with hand tools or power tools. All in all, it's a great-looking bench that will provide rock-solid performance in your shop for a long, long time.

CONSTRUCTION DETAILS

OVERALL DIMENSIONS:

71½"W x 35½"H x 36⅛"D (without vise hardware)



Visit WoodsmithSpecials.com to see how to build this optional drawer storage unit

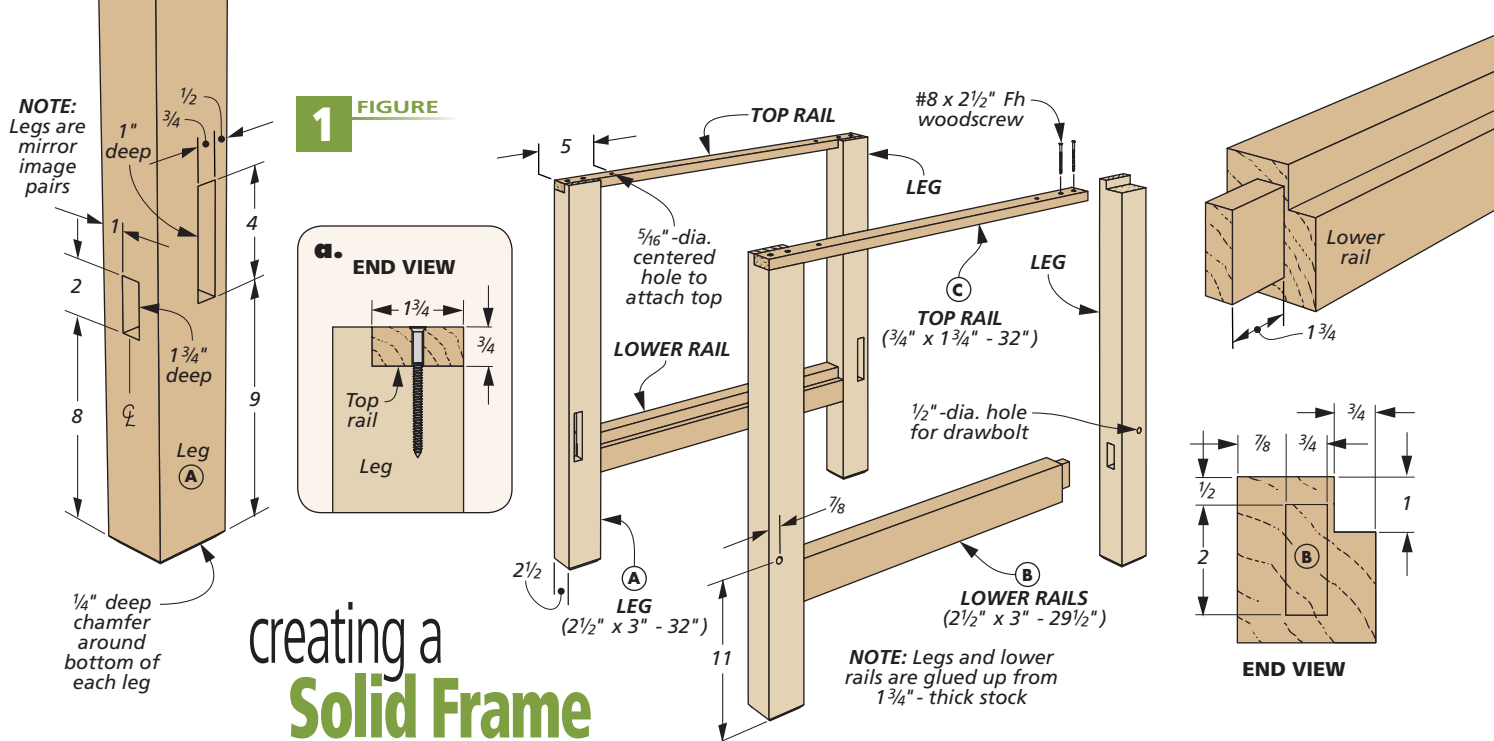
NOTE: Refer to sources on page 98 for hardware used on the bench



Download instructions for building the drawers and other helpful techniques at:
WoodsmithSpecials.com

WoodsmithSpecials.com





A rock-solid workbench requires a stout frame. And this design fills the bill. Four robust legs are tied together with beefy rails to form two end frames. Then heavy-duty stretchers connect the frames to create the base.

LEGS. The drawings on this page provide all the details you need to get started. The first thing to do is glue up the legs from 1 3/4"-thick stock

and cut them to final size. Some careful layout work will help you create the mortises for the rails and stretchers. (The right and left pair are mirror images of each other.) A Forstner bit is great for hogging out the waste. Then a little hand work with a chisel will finish them up.

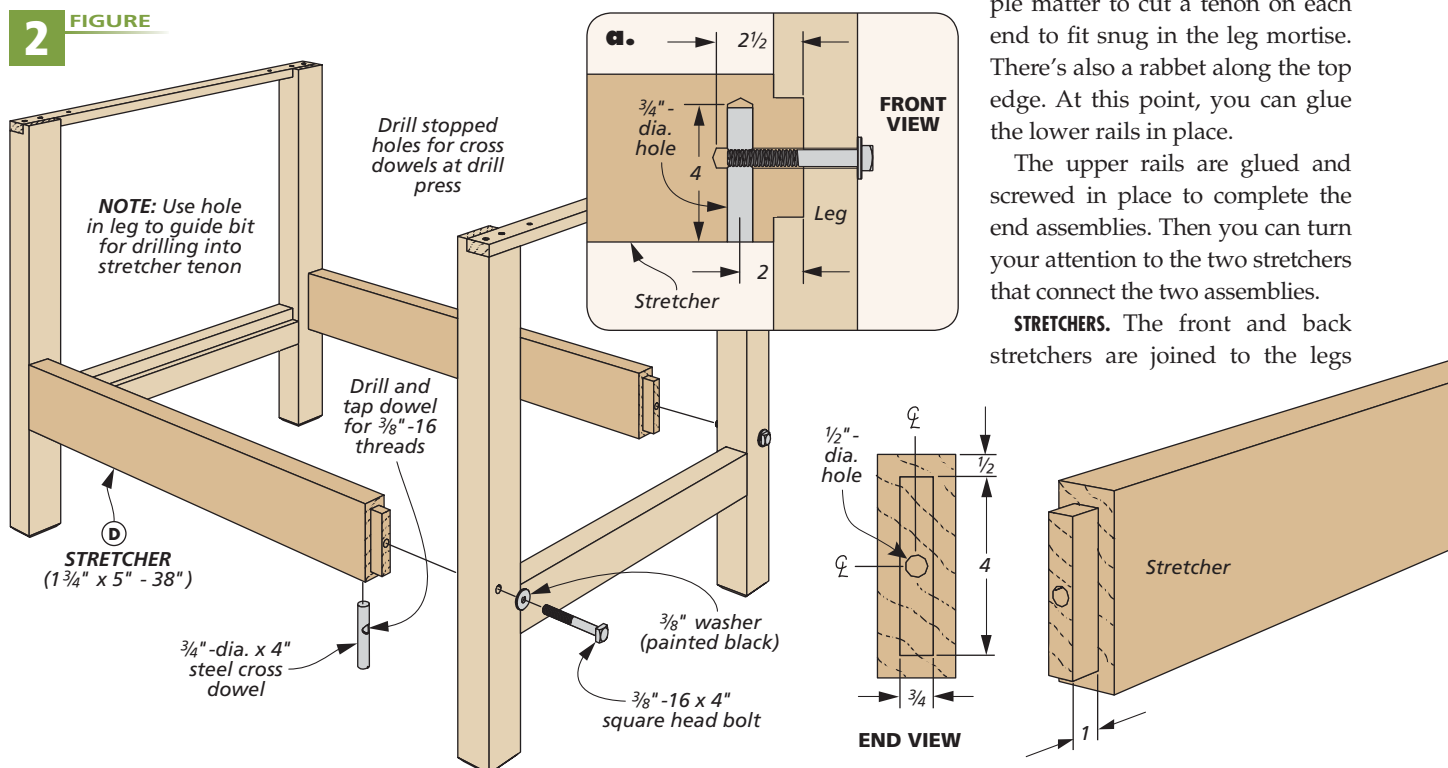
DETAILS. There are a few other details to take care of before you complete the legs. First, I cut a

notch at the top of each leg for the top rail. Next, I drilled the holes for the draw-bolts used to secure the stretchers to the frames. Finally, you can rout a chamfer around the bottom of each leg.

ADDING THE RAILS. The lower rails tie the legs together and provide a ledge for the car siding you'll add later. You can glue them up just like the legs. Then, it's a simple matter to cut a tenon on each end to fit snug in the leg mortise. There's also a rabbet along the top edge. At this point, you can glue the lower rails in place.

The upper rails are glued and screwed in place to complete the end assemblies. Then you can turn your attention to the two stretchers that connect the two assemblies.

STRETCHERS. The front and back stretchers are joined to the legs



with mortise and tenon joints. Draw-bolts and cross dowels pull the joint tight (Figure 2a).

After cutting the stretchers to final size, the next step is to cut the tenons on the ends. Then dry-assemble them to the end frames and drill the holes for the draw-bolts into the ends of the stretcher tenons. (I used a portable drill.) Remove the stretchers and step over to the drill press to drill the holes in the bottom edge for the shop-made cross dowels, as shown in the box at right.

ASSEMBLY. Now you're ready to connect the end frames with the stretchers. I clamped the stretchers in place while I worked on fitting the cross dowels and draw-bolts. Once the bolts are tightened, you're ready to add the car siding to enclose the base.

Cross Dowels

A length of mild steel rod and a tap are the key supplies that you'll need in order to make your own cross dowels.

First, lay out each cross dowel along the rod (I cut them to length later). Securely clamp the rod for marking and drilling holes for the $\frac{3}{8}$ "-16 threads (I used a $\frac{5}{16}$ "-dia. bit.) Next, clamp the rod in a machinist's vise for tapping the threads. Light oil helps with this.

Finally, use a hacksaw to cut the dowels to length and create a shallow slot for a screwdriver on one end. This slot helps align the threaded hole with the draw-bolt during assembly.

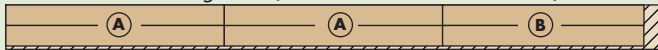


Drill, Tap, & Cut. Securely clamp the rod while drilling and tapping. After you finish cutting the cross dowels to length, file all edges smooth.

MATERIALS, SUPPLIES & CUTTING DIAGRAM

A Legs (4)	2 1/2 x 3 - 32	O Right End Cap (1)	1 3/4 x 3 1/2 - 32 7/8	• (14) #8 x 1 1/4" Fh Woodscrews
B Lower Rails (2)	2 1/2 x 3 - 29 1/2	P Filler (1)	3/4 x 3/4 - 4	• (32) 1 1/4" Finish Nails
C Top Rails (2)	3/4 x 1 3/4 - 32	Q Mounting Cleats (2)	1 3/4 x 1 3/4 - 26 3/8	• (16) #8 x 1 1/2" Fh Woodscrews
D Stretchers (2)	1 3/4 x 5 - 38	R Dog Run (1)	1 1/16 x 3 1/2 - 72 rgh.	• (4) 5/16" x 1 1/2" Lag Screws
E Car Siding (14)	3/4 x 7 1/8 - 24 rgh.	S Dog Cap (1)	7/16 x 3 1/2 - 72 rgh.	• (3) 5/16" x 4" Lag Screws
F Cove Molding (1)	3/4 x 3/4 - 96 rgh.	T Front Rail (1)	1 3/4 x 3 1/2 - 71	• (3) 5/16" Washers
G Trim Caps (2)	3/4 x 2 1/2 - 3 3/4	U Guides (2)	3/4 x 1 3/4 - 6	• (1) Shoulder Vise Screw
H Shelf Cleat (1)	3/4 x 1 - 132 rgh.	V Rear Half Jaw (1)	7/8 x 2 1/16 - 12 3/4	• (1) Large Front Vise
I Shelf (1)	28 1/2 x 36 - 3/4 Ply.	W Inner Jaw Face (1)	1 3/4 x 6 1/8 - 14 1/8	• (2) Vise Handles
J Back Cleat (1)	3/4 x 1 1/4 - 110 rgh.	X Outer Jaw Face (1)	1 x 6 1/8 - 13 5/8	• (4) #14 x 1 1/2" Fh Woodscrews
K Top (1)	1 3/4 x 26 5/8 - 70	• (14) #8 x 2 1/2" Fh Woodscrews		• (4) 1/4" -20 Threaded Inserts
L Rear Rail (1)	1 3/4 x 3 1/2 - 70	• (10) 3/8" x 4" Square Head Bolts		• (4) 1/4" -20 x 1 1/2" Hex Bolts
M Inner Rail (1)	1 3/4 x 3 1/2 - 69 3/4	• (10) 3/8" Washers		• (4) 1/4" Washers
N Left End Cap (1)	1 3/4 x 3 1/2 - 33 3/8	• (1) 3/4" x 36" Steel Rod		• (2) Square Bench Dogs

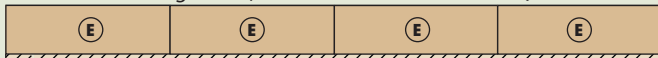
1 3/4" x 6 1/2" - 96" Douglas Fir (Two boards @ 8.7 bd. ft. each)



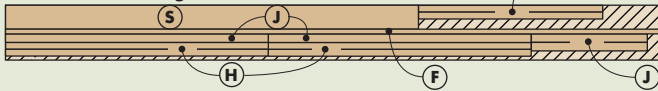
1 3/4" x 6 1/2" - 96" Douglas Fir (8.7 bd. ft.)



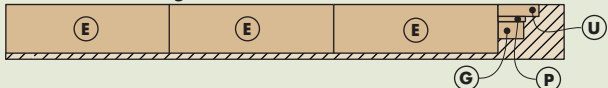
3/4" x 8" - 96" Douglas Fir (Two boards @ 5.3 bd. ft. each)



3/4" x 8" - 96" Douglas Fir (5.3 bd. ft.)



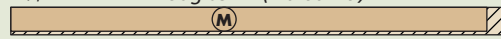
3/4" x 8" - 84" Douglas Fir (Two boards @ 5.3 bd. ft. each)



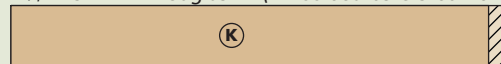
1 3/4" x 8" - 96" Douglas Fir (10.7 bd. ft.)



1 3/4" x 4" - 72" Douglas Fir (4.0 bd. ft.)



1 3/4" x 9" - 72" Douglas Fir (Three boards @ 9 bd. ft. each)



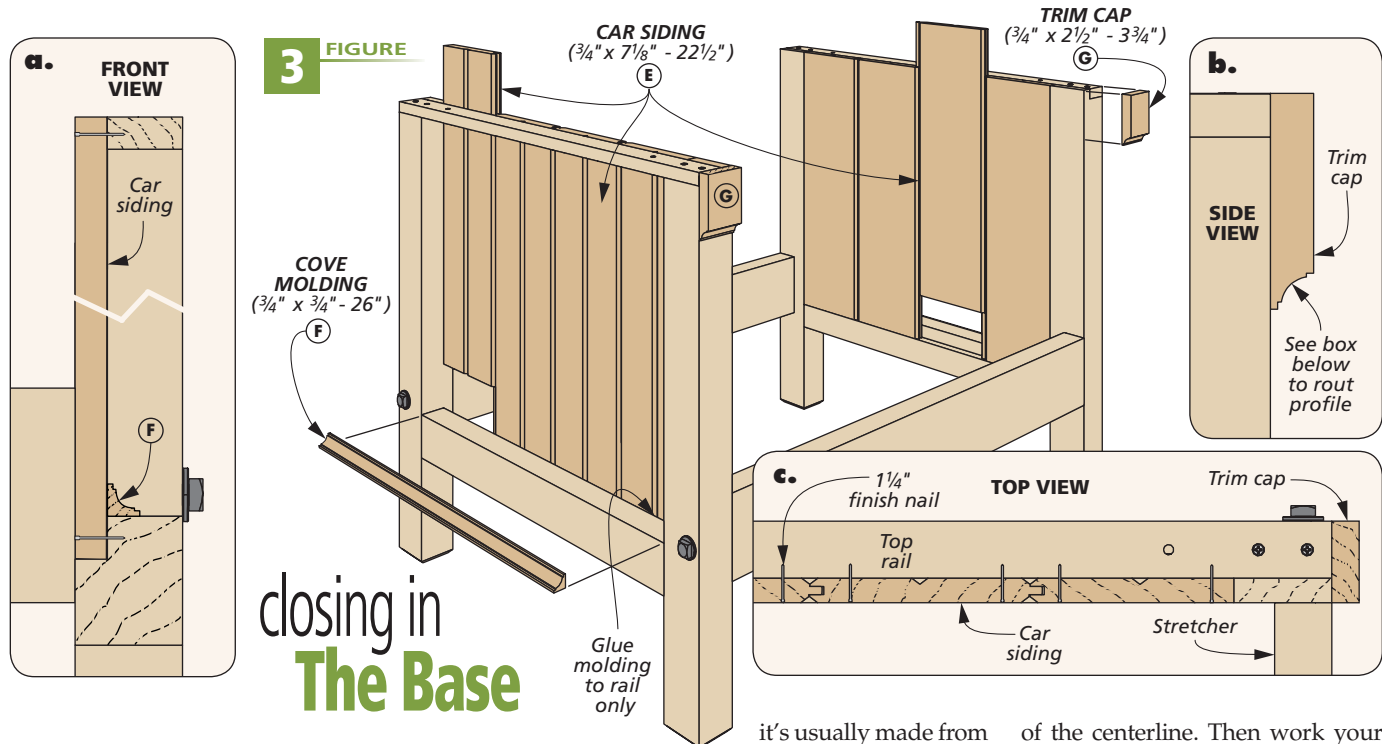
1 3/4" x 4" - 96" Douglas Fir (5.3 bd. ft.)



1 3/4" x 4" - 96" Douglas Fir (5.3 bd. ft.)



ALSO NEEDED: Half sheet of 3/4" plywood for shelf



closing in The Base

Now that you've completed the "skeleton" of the bench, it's time to add the "skin." I used traditional car siding to close off the ends and back. A few pieces of molding and trim complete the look.

CAR SIDING. The bulk of the work will be in making the car siding. You can purchase car siding, but

it's usually made from pine. I made my own to match the rest of the project. You can find out all the details on making car siding in an article available at WoodsmithSpecials.com.

CLOSING THE ENDS. Figure 3 shows how the ends of the base are closed in with the car siding. Start in the center, with a piece on either side

of the centerline. Then work your way toward the front and back. Chances are you'll have to trim the edge at each end to fit snug to the leg. And you'll have to slip the piece in from the top to avoid breaking the tongue.

There's one more thing I need to mention. You don't want to glue the car siding in place. Each piece should be able to expand and contract on its own with changes in humidity. I used a couple of finish nails at each end to hold it in place. They'll flex with any movement.

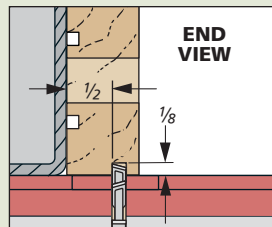
MOLDING. To provide a finished look, a strip of molding runs along the bottom edge of the car siding where it meets the lower rail (Figure 3a). A table saw and a core box bit in your router table are all you need to make the molding. The box on the left shows you how. With the molding in hand, you simply cut it to length to fit between the legs of the bench. I always start with an extra-long piece and shave a little off at a time until I get a seamless fit.

You can glue the molding in place. Just be sure to glue it to the rail — not the car siding. This way, the car siding can still move freely.

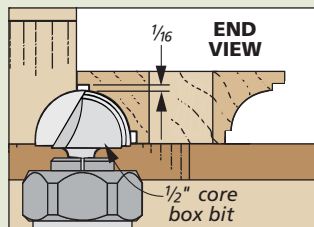
TRIM CAPS. Next, I added a couple of trim pieces to hide the joinery at the top of the front legs. You can see

Custom Molding

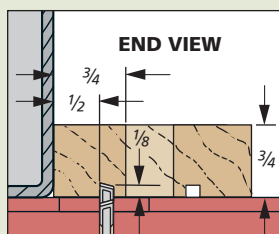
All you need to make the molding and trim pieces for the workbench is your table saw and a core box bit in your router table. You'll start with a wide workpiece, create the profile on the edge, and rip it to size. The drawings (starting at right) step you through the process. You'll cut two kerfs to form the fillets of the profile. It's best to use a rip blade for smooth, square edges. Then it's off to the router table to rout the cove. Finally, head back to the table saw to rip the molding free.



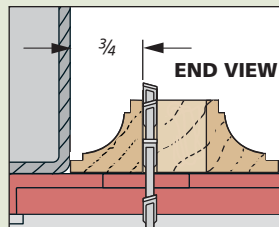
2 The next fillet cuts are made by standing the workpiece on edge.



3 Rout the cove profile by making a series of shallow passes at the router table.



1 Cut a shallow kerf to define one fillet of the molding profile.



4 Finally, rip the molding free at the table saw and sand it smooth.

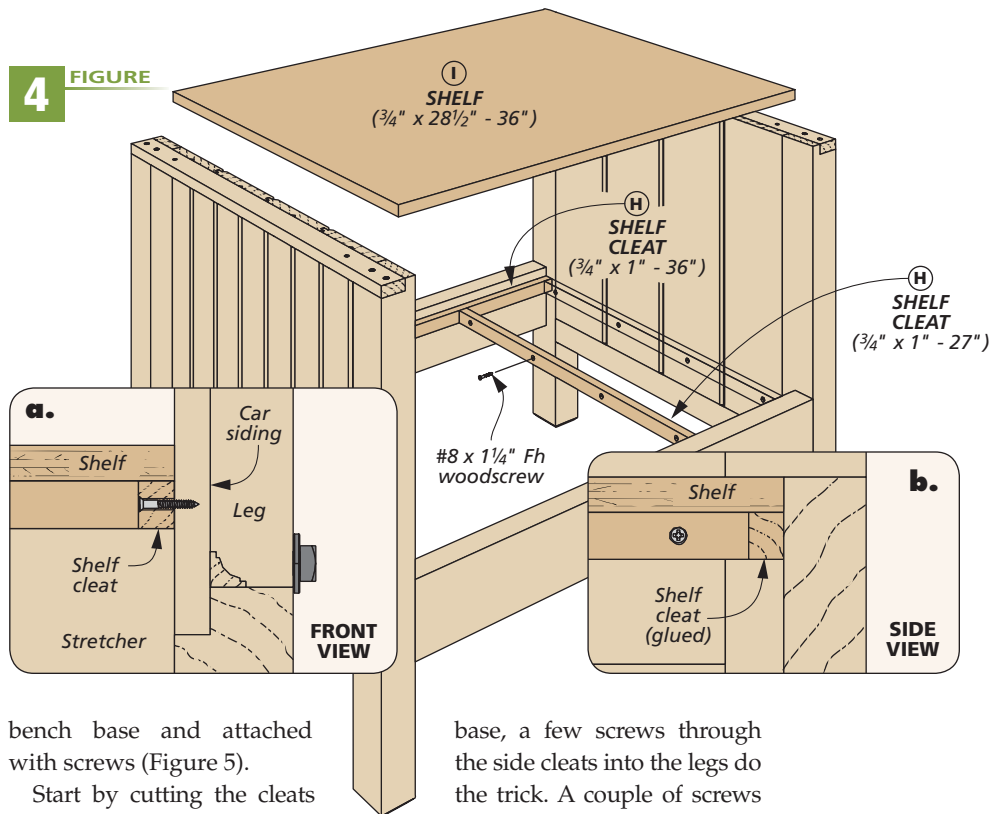
in Figure 3b that I used the same profile as the molding. The procedure is identical, except that I made the profile along the end of a wide blank. This way, all you need to do is rip the two pieces to width and attach them with glue.

SHELF. To provide easy-access storage underneath, I added a large, plywood shelf. Cleats screwed to the stretchers and sides support the shelf from below, as shown in Figure 4. You'll want to position the cleats so that the top of the plywood is flush with the top of the stretchers. Then it's a simple matter to cut the plywood to size and fasten it in place.

Note: You can add drawers under the bench, as shown in the main photo on page 24. Just go to WoodsmithSpecials.com to download an article for building the three-drawer case.

BACK PANEL. I added a back to close in the bench. Here again, car siding does the job and matches the look of the sides.

Like the shelf you just completed, you'll need cleats to attach the car siding. But unlike the shelf, I built the frame and attached the car siding with screws through the back edge of the cleats. Then the whole panel assembly is set into the



bench base and attached with screws (Figure 5).

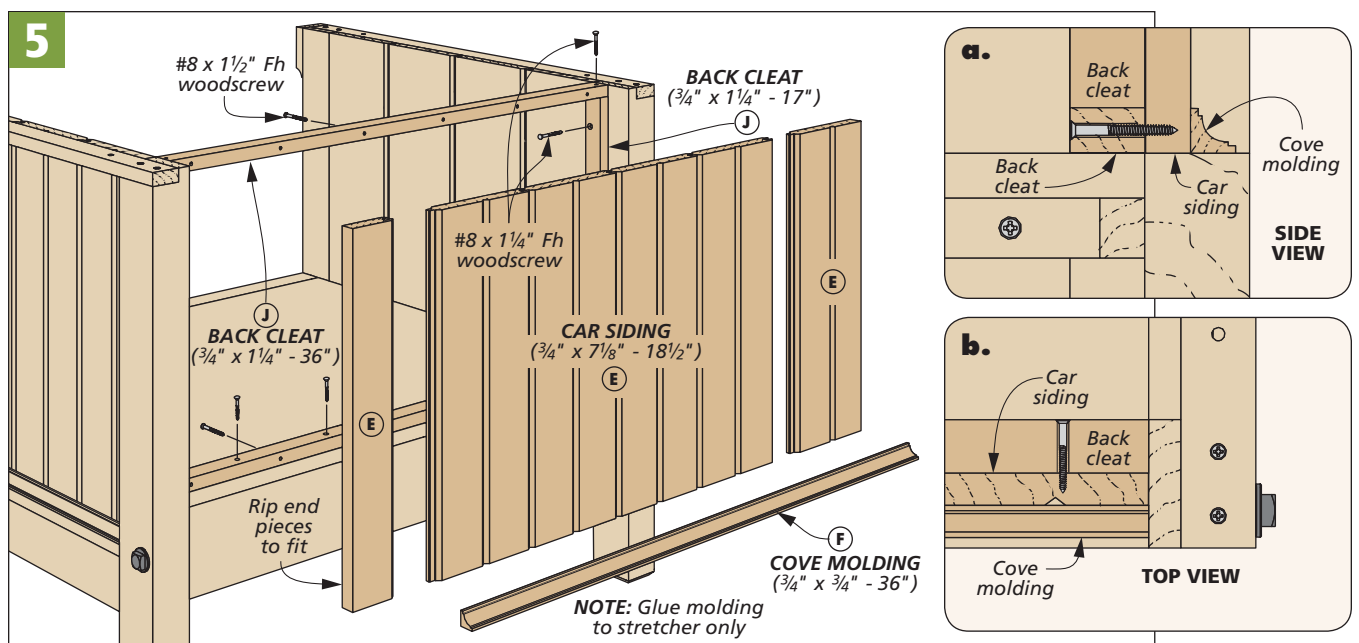
Start by cutting the cleats to fit inside the base. At the drill press, drill countersunk holes in the top and bottom cleats. These are for the screws that will fasten the car siding (Figures 5a and b).

After building the frame, you can install the car siding like you did before — by starting in the middle. As you work toward the ends, rip the end pieces to fit flush with the outside of the frame. To fasten the panel into the bench

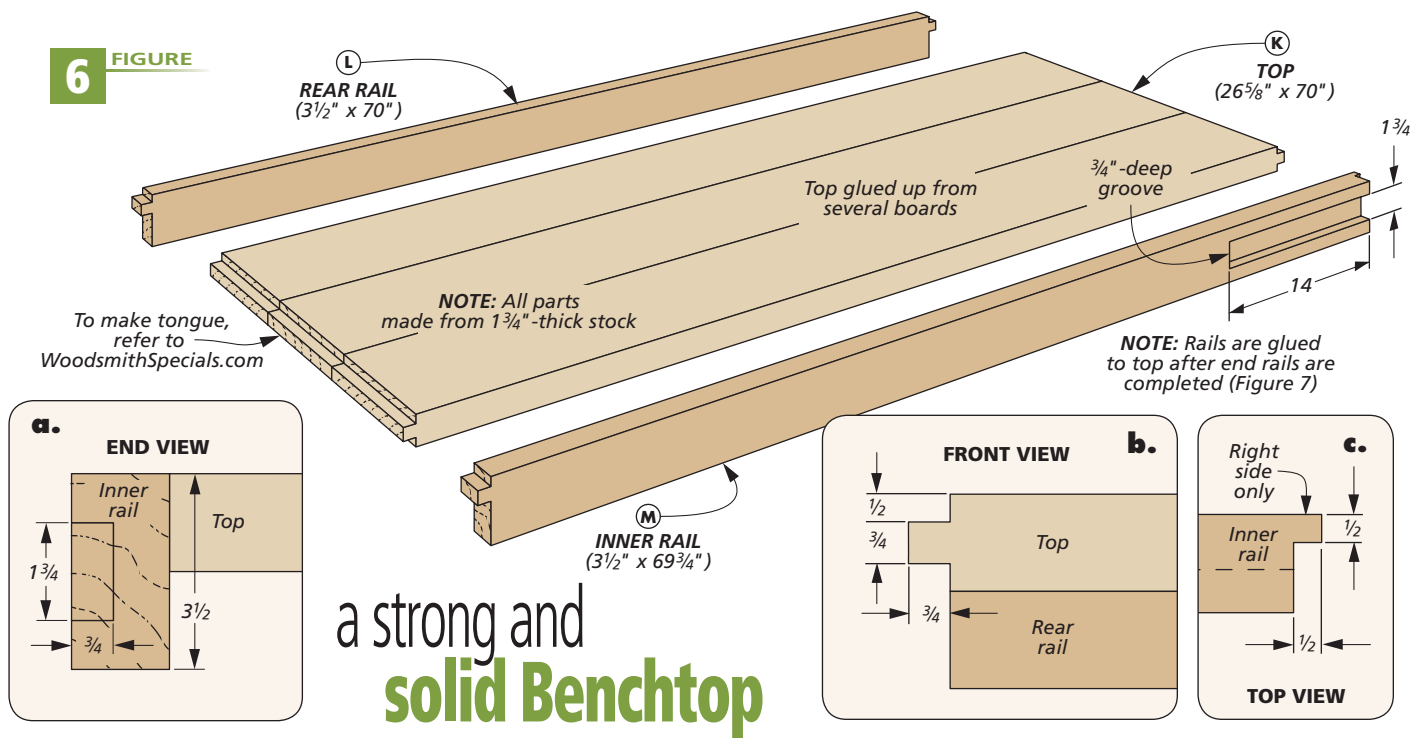
base, a few screws through the side cleats into the legs do the trick. A couple of screws through the bottom cleat help keep everything secure.

FINAL TRIM. The last piece needed to finish the base is the molding along the bottom edge of the back panel. It's the same molding you used on the sides and is glued to the stretcher only.

With the base complete, you can turn to the next page to get started on putting together the top and adding the vises.



6 FIGURE



a strong and solid Benchtop

With a solid base complete, you're ready to build the top. It starts with a thick, glued-up blank. Then a few stout rails and a pair of end caps frame the top. The top also features a face vise, a row of dog holes, and a tail vise made from a shoulder screw.

WORKSURFACE. The heart of this benchtop starts with gluing up 1 3/4"-thick stock to create a panel (Figure 6). After squaring up the ends and ripping it to width, you'll need to create a thick tongue on each end. There's an article at

online to step you through this process. This tongue fits into grooves in the end caps later on.

RAILS. With the top ready to go, you can make the rear rail. Figure 6 shows how a short tongue on each end matches the one on the glued-up panel. The top edge of the rail is flush with the top of the panel. Once that work is done, set the rail aside for the time being and work on the inner rail at the front.

INNER RAIL. There's quite a bit going on with this front, inner rail. The left end is shaped just like the rear rail (to match the tongue on the panel). The other end mates with the right end cap and houses the sliding block for the tail vise.

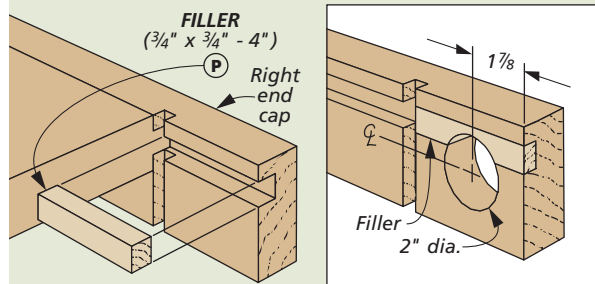
At the router table, I routed a shallow, stopped channel for the sliding block to ride in. To do this, I set up a stop block on the router table fence to limit the length of cut. Start cutting the channel edge closest to the fence then move the fence away from the bit with each pass to widen the channel. Follow up with a sharp chisel to clean and square up the corners.

Finally, you can cut a vertical tongue on the end of the rail. This fits into a dado in the right end cap (Figure 6c). Dry clamp the rear and

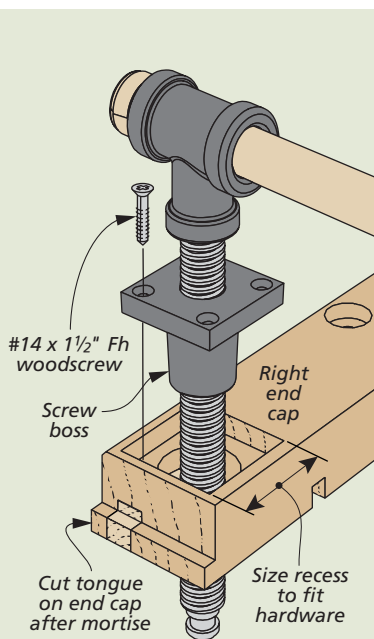
Fitting Tail Vise Hardware

You'll need to do a little work on the right end cap to fit the tail vise hardware (drawings below). The first thing to do is fill in the groove beyond the dado. This provides material for the screws in the vise to grab.

Next, drill a large hole to accommodate the vise screw boss. Now you can insert the vise hardware and scribe around the square plate. This gives you guidelines for removing the waste with a chisel.

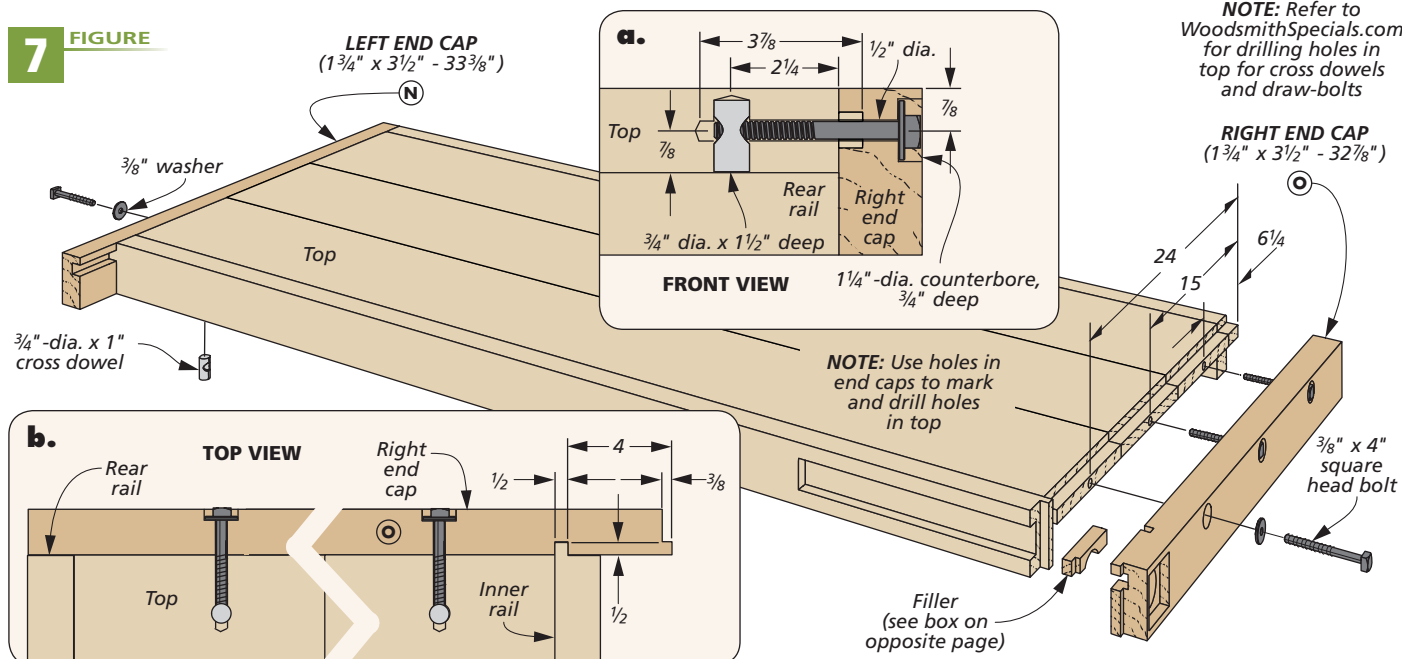


- 1 Cut a small piece to fill in the groove. Glue it in place and sand it flush.
- 2 Next, drill a large hole for clearance at the drill press for the vise hardware.



- 3 Scribe around the hardware for the vise and chisel out the waste for a flush fit. Then cut the tongue on the end.

7 FIGURE



front inner rail in place while you work on the end caps.

END CAPS. The left end cap is pretty straightforward, so I started with that one. A groove cut along its length fits over the tongue on the top. You can see all the details about the joinery in Figure 7.

At this point, you can cut the right end cap to size and make the groove on the inside face. Then use the tongue on the inner rail to locate the dado (Figure 7b).

FITTING THE VISE SCREW. Now you can work on fitting the vise screw and cutting the tongue on the end. The box on the opposite page will guide you through this. After that's all done, you need to move over to the drill press.

HOLES FOR BOLTS. Figure 7 shows you where to drill the through holes and counterbores in the end caps for the bolts and washers. Use these holes to mark the bolt holes on the ends of the tongues on the top blank. Then refer to *WoodsmithSpecials.com* to find out how to finish drilling for the cross dowels and bolts.

Go ahead and fasten the end caps in place with the draw-bolts and cross dowels. You might want

to pick up a "12-point" socket (right margin) to avoid damaging the counterbore as you tighten the bolts. (You could also temporarily substitute hex head bolts.) You'll be removing and reinstalling the end caps a number of times in the process of fitting all the pieces.

GLUE THE RAILS. At this point, you can glue the rear and inner rail to the top. You may have to loosen the end caps to get the rails seated properly then tighten them back up to hold the rails in position.

Don't glue the end caps just yet. You may need to remove them when fitting parts for the tail vise.

CLEATS. The next step is to mount the top to the base. To do this, you'll add cleats to the underside of the top (refer to Figure 8). To allow for

the expansion and contraction of the top, the cleats are a hair shorter than the width of the top. In addition, the bolt holes in the base top rail are slightly oversize (detail 'a', below). Drill from underneath the top rail and into the cleat to mark for the threaded inserts.

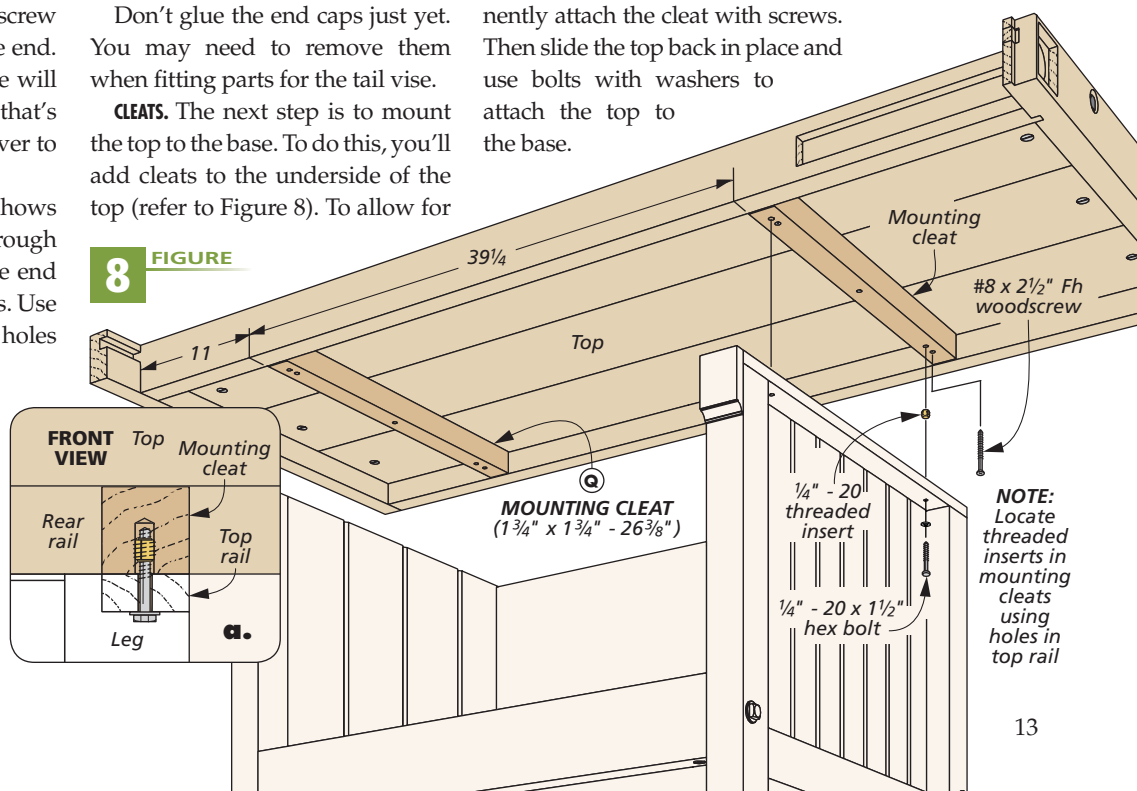
After removing the cleat and installing the inserts, I reinstalled the cleats with a few dabs of glue on top to hold them in position. When the glue dries, you can slide the top to the side a few inches to permanently attach the cleat with screws. Then slide the top back in place and use bolts with washers to attach the top to the base.



12-Point Socket.

This special socket makes it easy to tighten square-head bolts.

8 FIGURE



making room for Bench Dogs

No woodworking bench is complete without a reliable means of clamping a workpiece securely in place. And the traditional method of doing so is with a vise and bench dogs. We chose to use square bench dogs in keeping with the classic look of the bench (left photo).

The row of dog holes works in tandem with the tail vise (right photo). The tail vise incorporates a sliding block that holds a single bench dog. The block rides in shallow channels routed in the two front rails.

DOG RUN. To get started, you'll work on the dog run with its nine dog holes. But how do you make square dog holes? The box at the bottom of the next page and Figure 9 show you how this is done.

I started with an extra-long workpiece (at least 62") planed to thickness and ripped to width. The extra length will be cut off to make the sliding dog block that attaches to the tail vise screw.

Lay out the first nine dog holes starting at the left end of the workpiece. After laying out the location for the ninth dog hole, skip some space and lay out a tenth dog hole. This last dog hole should be centered on a 6" length you'll cut off and use for the sliding dog block.

After the dog holes are routed, you can cut the strip to final length and glue it to the inner rail (Figure 9). Then you complete the dog holes by capping them with a thin cap. Take some time to clean out any glue squeezeout in the dog holes that might prevent the dogs from fitting into the holes.

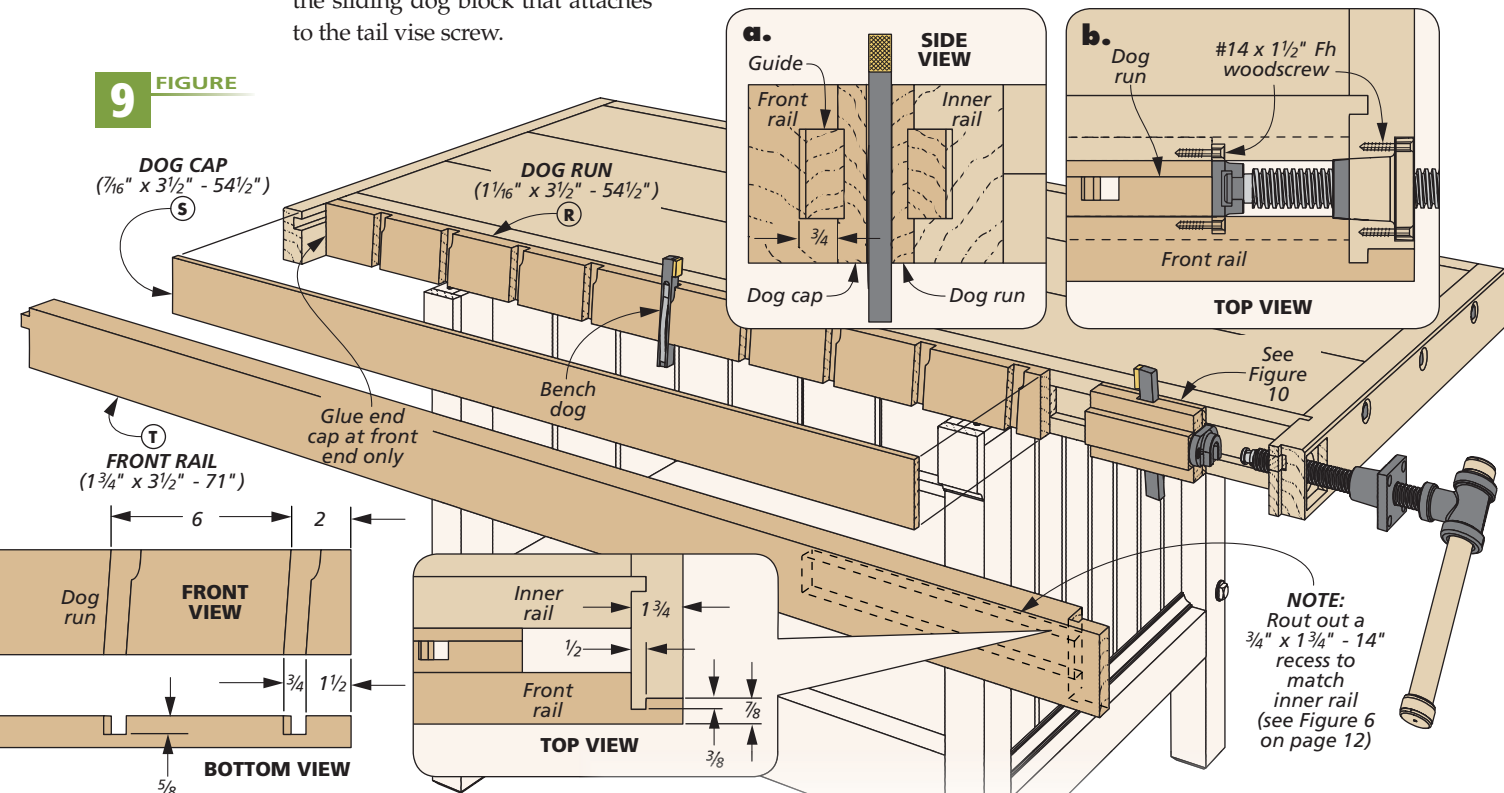
OUTER RAIL. With the nine main dog holes done, you can turn your attention to the front rail. Completing the outer front rail first will help you fine-tune the fit of the sliding dog block. Figure 9 shows you the joinery you'll need to cut on each end of the rail. A channel on the right end mirrors the one you routed on the inner rail earlier. When complete, clamp the rail in place (without gluing it just yet) so you can work on making and fitting the parts of the tail vise.



Tail Vise. Simple hardware is all it takes to build and install a versatile, heavy-duty tail vise.

SLIDING DOG. Using the leftover pieces cut off of the main dog strip and cap, you'll make the sliding dog block. This dog hole is rotated 180° so that the dog will oppose the main dogs for effective clamping. After gluing these two pieces and

9 FIGURE

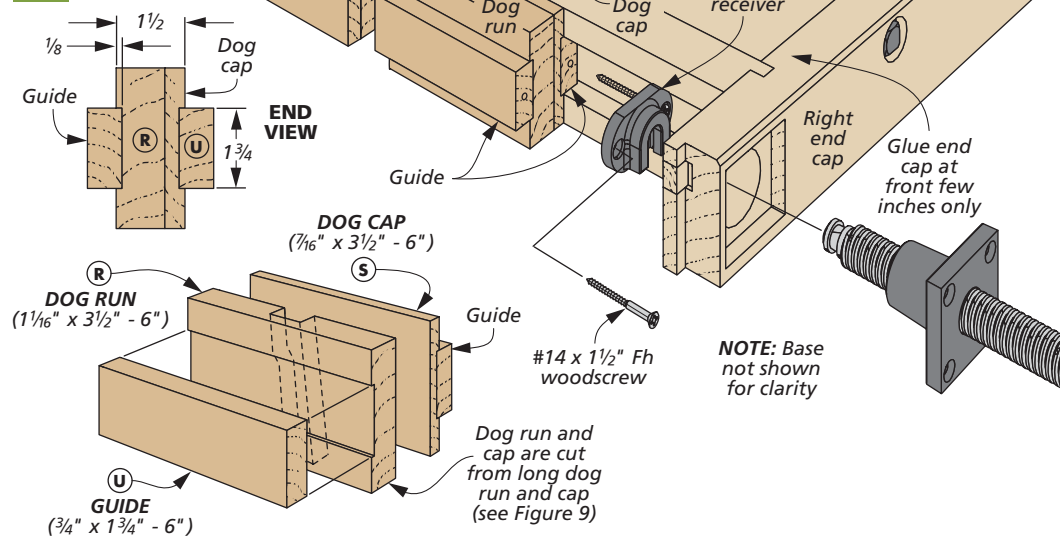


trimming them to length, the guide strips come next. Wide, shallow grooves in the sliding dog assembly accommodate the guides, as you can see in Figures 9a and 9b. Here is where you'll be removing and replacing the front rail to check the fit of the sliding block. Aim for a smooth fit that's not too loose yet doesn't bind. Getting a good fit here is important. Once the front rail is glued in place, it will be difficult to make any adjustments.

WISE HARDWARE. With the sliding dog block complete and fitting nicely, it's time to concentrate on the vise hardware. Add the hardware before you glue the front rail in place. Doing this now will make it easier to mark the location and attach the U-shaped receiver for the vise screw (Figure 10).

WISE SCREW. To properly locate this small plate, I mounted the vise screw in the end rail. The only thing to note here is that I replaced the screws that came with the vise hardware with longer screws, as shown in Figure 10. And to match

10 **FIGURE**



the classic styling, I painted all the hardware black.

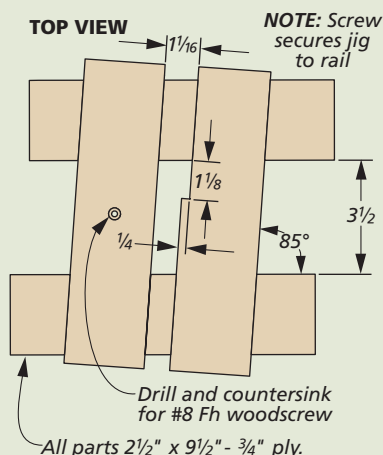
With the receiver on the vise screw, you can transfer the screw locations onto the sliding block and fasten the receiver in place. This task is easier if you remove the block assembly from the rails. Then assemble the sliding block onto the vise screw and dry-clamp the

front rail in place. You may have to loosen the four screws in the mounting plate to get the large vise screw to seat properly.

With the vise working smoothly, you can glue the rail and end caps in place. (Only apply glue at the front few inches of the end caps.) Again, you'll want to be sure to clean up any glue squeezeout.

Routing Dog Holes

Armed with your router, a mortising bit (with bearing), and this jig, you can rout consistent dog holes. The jig rides along the workpiece and is fastened in place with a screw. I built the jig from $\frac{3}{4}$ " Baltic birch



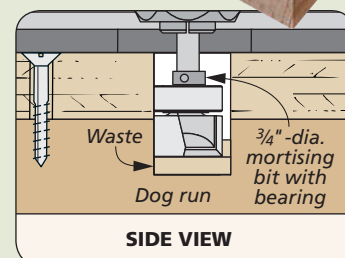
plywood using the dimensions shown below. To use the jig, first lay out the locations for the dog holes. Position the jig on the layout line and fasten it with a screw.

I used a bearing-guided mortising bit as shown in the side view drawing. (Refer to Sources on page 98.) You'll get better results if you start with a shallow cut and rout in a couple of passes, moving the router clockwise.

After routing, you can remove the template and check the fit of the bench dog (lower right photo). The top of the dog should sit just below the top edge of the workpiece. And the recess should be a little deeper than the dog's thickness. This way, the bench dog will slide easily without binding.



Router Jig.
A shop-built jig will help you rout perfect dog holes every time.





Face Vise. No woodworking bench is complete without a sturdy face vise for securely holding a workpiece.

installing a Face Vise

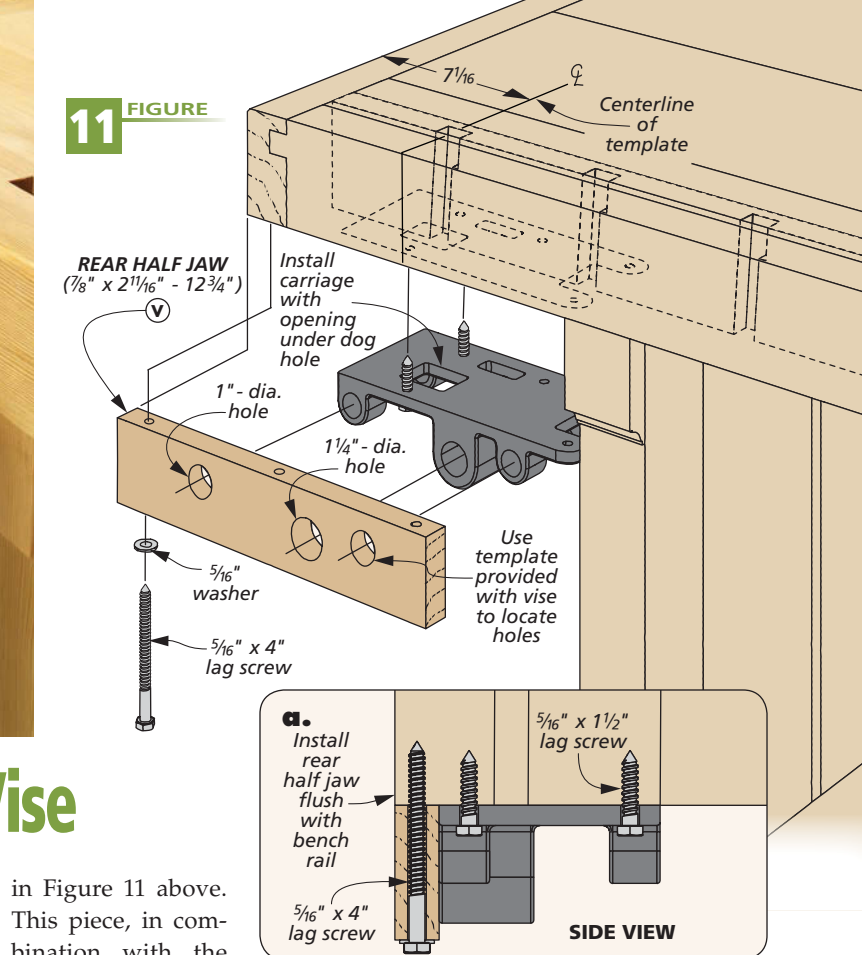
Installing a face vise rounds out the bench's capabilities as a complete woodworking center. And to do that, I used traditional face vise hardware. Like the tail vise, I painted the metal parts of the vise hardware black before mounting them to the benchtop.

GETTING STARTED. If you've never installed a face vise before, it might look a little overwhelming. I've learned that if you just take your time, the end result is a vise that works smoothly and clamps the workpiece evenly.

The face vise hardware includes a cast iron "carriage." It's carefully machined to allow the guide rods to slide smoothly and the threaded screw to operate without binding. You'll mount the carriage on the underside of your benchtop, as shown in Figure 11.

Note: One thing to watch out for is to not block the first dog hole with the carriage. The rectangular opening in the carriage should align with the dog hole. (bottom view in Figure 13a.) Keep this in mind as you install the vise.

HALF JAW. The first thing to do is make a rear "half jaw," as shown

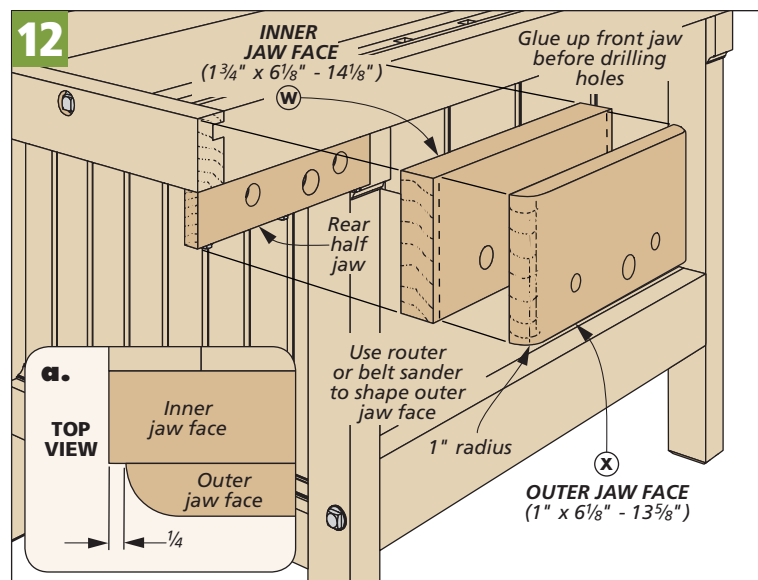


in Figure 11 above. This piece, in combination with the bench's front rail, forms the rear jaw of the face vise and sits in front of the carriage. Its main function in this case is to hide the carriage.

The three holes in the half jaw accommodate the guide rods and vise screw. I started by cutting this piece to size and fastening it with lag screws. You'll be marking

the locations for the holes then removing it to drill them.

USE THE TEMPLATE. Most face vise hardware includes a paper template and detailed instructions for using it. The template helps you properly locate and size the holes for the guide rods and vise screw, usually based on a centerline.



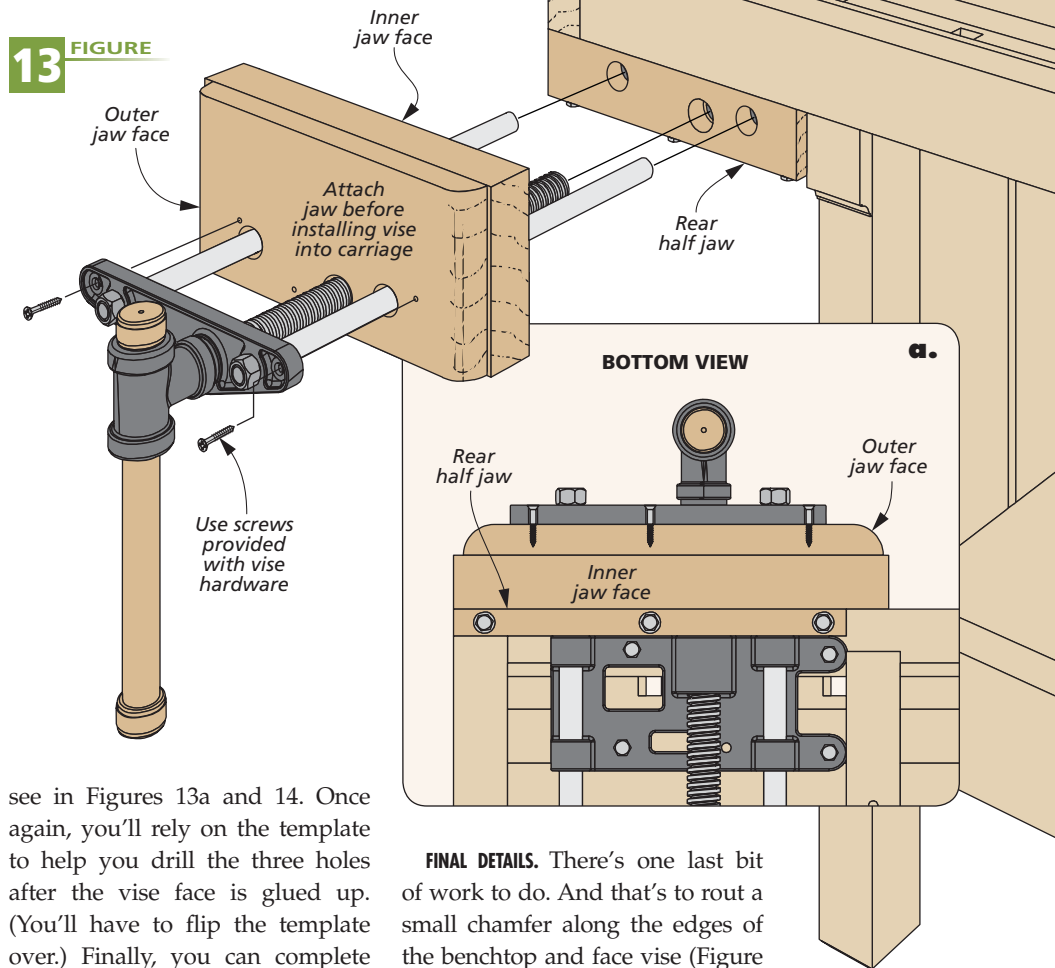
You'll use the template for locating the holes in the half jaw and the front vise jaw later on.

Tape the template in place where indicated in the instructions. I used a sharp awl to mark the centers of the three holes on the half jaw. Then just remove the half jaw, drill the holes, and reattach it. I didn't use the metal support collars that came with the vise. The carriage supplies plenty of support since it sits right behind the half-jaw. So the collars aren't really needed and this also simplifies the installation.

MOUNTING A CARRIAGE. The next step in the process is to attach the carriage behind the half jaw. Here is where marking a centerline (based on the template) can really help you out. The end result is that the holes in the half jaw will align with those in the carriage.

FRONT JAW. With the carriage in place, you can work on the two-piece front jaw (Figures 12 and 13). To create the traditional shape, I glued up two pieces. The inner jaw will sit flush with the top and end of the benchtop. The ends of the outer jaw are shaped with a large roundover and create a small shoulder on the inner jaw, like you

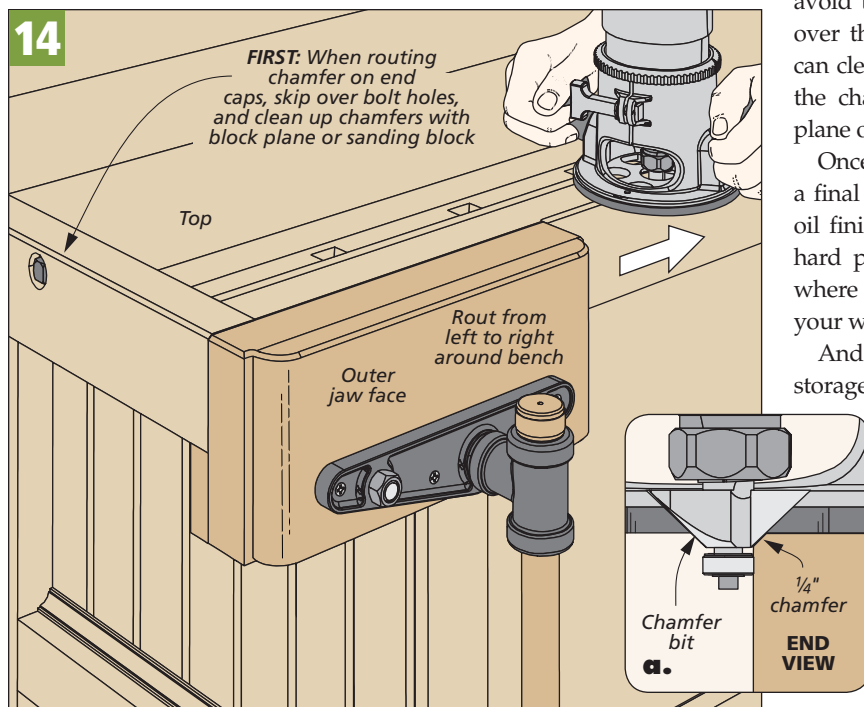
see in Figures 13a and 14. Once again, you'll rely on the template to help you drill the three holes after the vise face is glued up. (You'll have to flip the template over.) Finally, you can complete the vise by attaching the jaw to the rod assembly. Then guide the rods into the carriage while turning the screw until it engages.



FINAL DETAILS. There's one last bit of work to do. And that's to rout a small chamfer along the edges of the benchtop and face vise (Figure 14). There's one thing you'll want to watch, though. Be careful as you rout the end rails — the bearing could slip into the bolt holes. To avoid this problem, I just skipped over those areas. Afterwards, you can clean up what's left and blend the chamfers with a sharp block plane or sanding block.

Once that's done, all you need is a final sanding and a few coats of oil finish. Finally, there comes the hard part — you need to decide where the bench will be located in your workshop.

And if you'd like to add more storage, check out the detailed plans for the drawer assembly shown in the main photo on page 6. You'll find the complete plans for the drawers at WoodsmithSpecials.com. With or without the drawers, this bench is sure to provide a lifetime of dedicated service.



cabinetmaker's workbench

Drawers



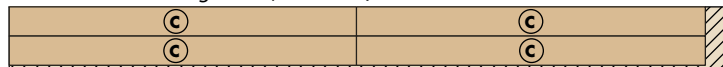
MATERIALS & HARDWARE

A	Case Sides (2)	18 ³ / ₈ x 25 - 3/4 Ply.	I	Drawer Fronts (3)	3/4 x 5 - 34 ³ / ₈
B	Edging (2)	3/4 x 3/4 - 18 ³ / ₈	J	Drawer Sides (6)	3/4 x 5 - 25
C	Front/Rear Rails (8)	3/4 x 3 - 35	K	Drawer Backs (3)	3/4 x 5 - 32 ³ / ₄
D	Stiles (12)	3/4 x 3 - 20 ¹ / ₂	L	Drawer Bottoms (3)	23 ⁷ / ₈ x 32 ¹ / ₂ - 1/4 Ply.
E	Center Guides (3)	3/4 x 1 - 25	M	Stiffeners (3)	1/4 x 3 - 23 ³ / ₈
F	Guide Blocks (6)	1/2 x 3/4 - 3 ¹ / ₂			
G	Case Back (1)	18 ³ / ₈ x 36 - 3/4 Ply.			
H	Drawer Stops (3)	3/4 x 3/4 - 3			

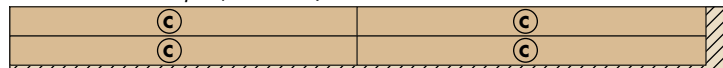
• (6) Drawer Pulls (Lee Valley 02W18.09)

CUTTING DIAGRAM

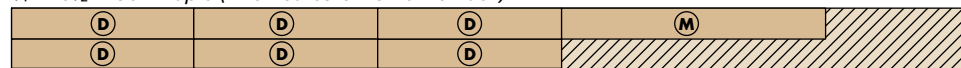
3/4" x 6 1/2" - 72" Douglas Fir (3.3 Bd. Ft.)



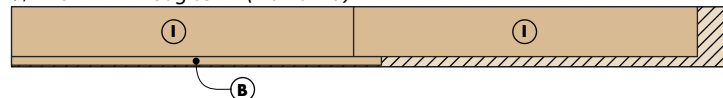
3/4" x 6 1/2" - 72" Maple (3.3 Bd. Ft.)



3/4" x 6 1/2" - 96" Maple (Two Boards @ 4.3 Bd. Ft. Each)



3/4" x 6" - 72" Douglas Fir (4.0 Bd. Ft.)



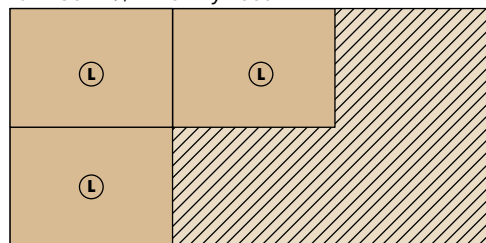
3/4" x 6" - 72" Douglas Fir (4.0 Bd. Ft.)



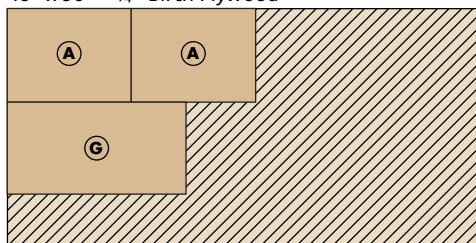
3/4" x 6 1/2" - 96" Douglas Fir (Three Boards @ 4.3 Bd. Ft. Each)



48" x 96" - 1/4" Birch Plywood



48" x 96" - 3/4" Birch Plywood





car Siding

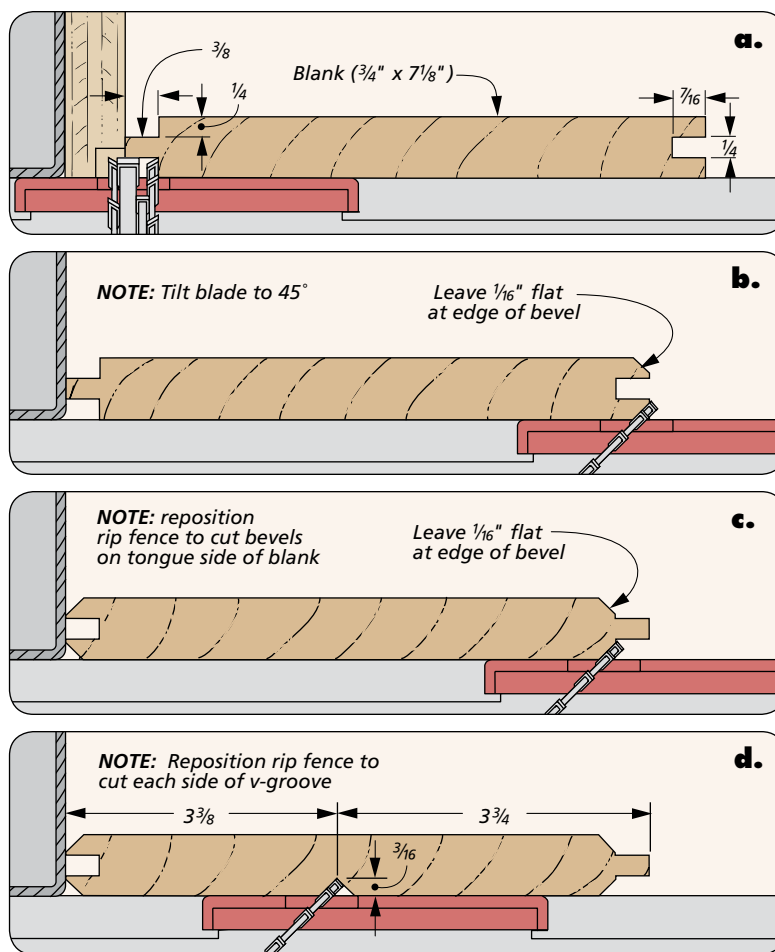
Car siding gets its name from its traditional use for lining the walls inside rail cars. You can find car siding at well-stocked lumber yards, but you can easily make your own, as I did for the cabinet-maker's workbench shown above.

ROUGH BLANKS. The first thing you'll need to do is prepare enough stock for the job. You'll be making a series of cuts in an assembly line process, so be sure to have plenty of stock on hand plus some extra to use for set up.

TONGUE & GROOVE. The drawings at right will step you through the process. After ripping the stock to width, use a rip blade to cut a groove centered along one edge. Then switch to a dado blade to cut the mating tongue along the other edge, as you can see in detail 'a.'

BEVEL CUTS. The next thing to do is make the bevel cuts along the edges. Details 'b' and 'c' show how this is done. You'll notice that the rip fence is set so that a flat fillet remains at the edge of the bevel. This flat avoids creating a sharp, fragile point on the grooved edge.

After making the first pass along the edge, flip the workpiece end-for-end. Then make another pass on the back side of the workpiece. Do this with all your workpieces before resetting the rip fence to cut the bevels on the opposite edge.



CENTER GROOVE. The final step, as shown in detail 'd,' is to cut the center V-groove. The goal is to center the V-groove between the two beveled edges of the workpiece. This will require two passes with the rip fence set differently for each pass. And to create a sharp

inside corner and smooth bevels on the V-groove, I like to use a flat-tooth rip blade.

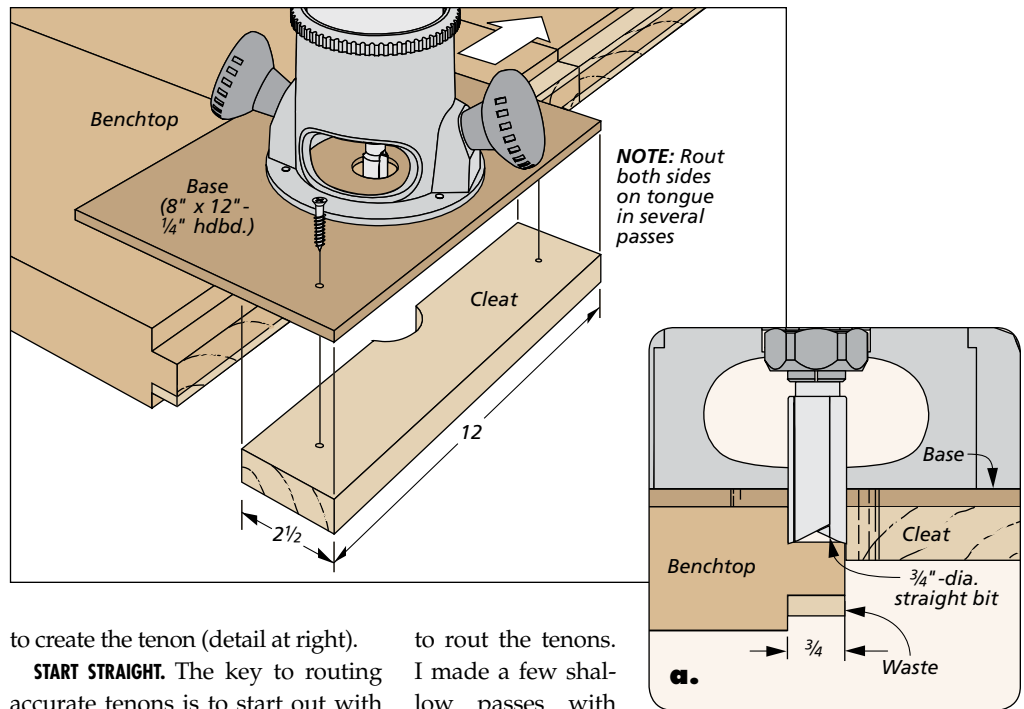
You only need to cut this V-groove on one side of the workpiece. Since the other side of the car siding won't show on the final project, it can remain flat.

edge Guide

Creating the tenon on each end of the workbench top proved somewhat of a challenge. The top was too large to cut safely and accurately on my table saw. Instead, I devised the handy router jig you see in the drawing at right.

THE JIG. The jig couldn't be much simpler. It's nothing more than a $\frac{3}{4}$ "-thick hardwood cleat attached to a $\frac{1}{4}$ " hardboard base.

The base attaches to the router with screws in place of the standard base. The trick is to position the cleat so that the router bit creates the $\frac{3}{4}$ "-long tenon required on the benchtop. To do this, I made the baseplate first and mounted it to my router. After installing a straight bit I made the cleat. Using the cutting edge of the bit as a reference, it was easy to position the cleat on the base



to create the tenon (detail at right).

START STRAIGHT. The key to routing accurate tenons is to start out with straight and square ends on your workpiece. To square up the ends of the benchtop, you can use a straight-edge to guide a router or a circular saw as you trim them to size. Once that task is complete, you're ready

to rout the tenons.

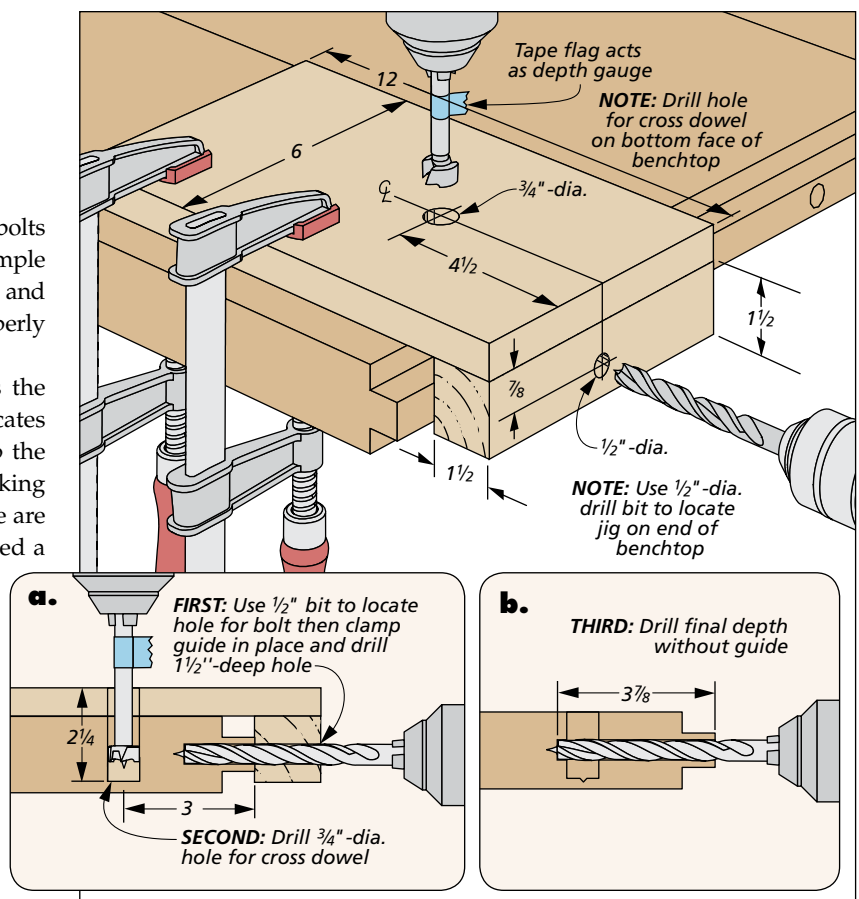
I made a few shallow passes with the router. To do this, press the cleat tight against the workpiece and rout from left to right. Rout both faces of the benchtop to center the tenon and sneak up on the proper thickness.

cross dowel Drilling Guide

Drilling the holes for the cross dowels and draw-bolts in the workbench top can be a tricky task. This simple shop-made guide makes the process of locating and drilling them easy and accurate so they're properly aligned with each other.

DRILLING GUIDE. As you can see, a cleat registers the drilling guide on the end of the benchtop and locates both holes. A $\frac{3}{4}$ " MDF base allows you to clamp the guide securely as you drill the holes. When making the guide, it's important that the edges of the base are square and the cleat is sized accurately. And I used a drill press to drill the guide holes in the base and the cleat perfectly square.

To use the guide, place the base on the bottom face of the benchtop. Insert a drill bit through the cleat to locate and drill the hole for the draw-bolt (detail 'a'). Then use a Forstner bit to drill the stopped hole for the cross-dowel. I used a piece of tape to mark the depth to make sure I didn't drill through the top. Finally, remove the guide and drill the hole for the draw-bolt to final depth, as shown in detail 'b.'



hardworking Hobby Bench

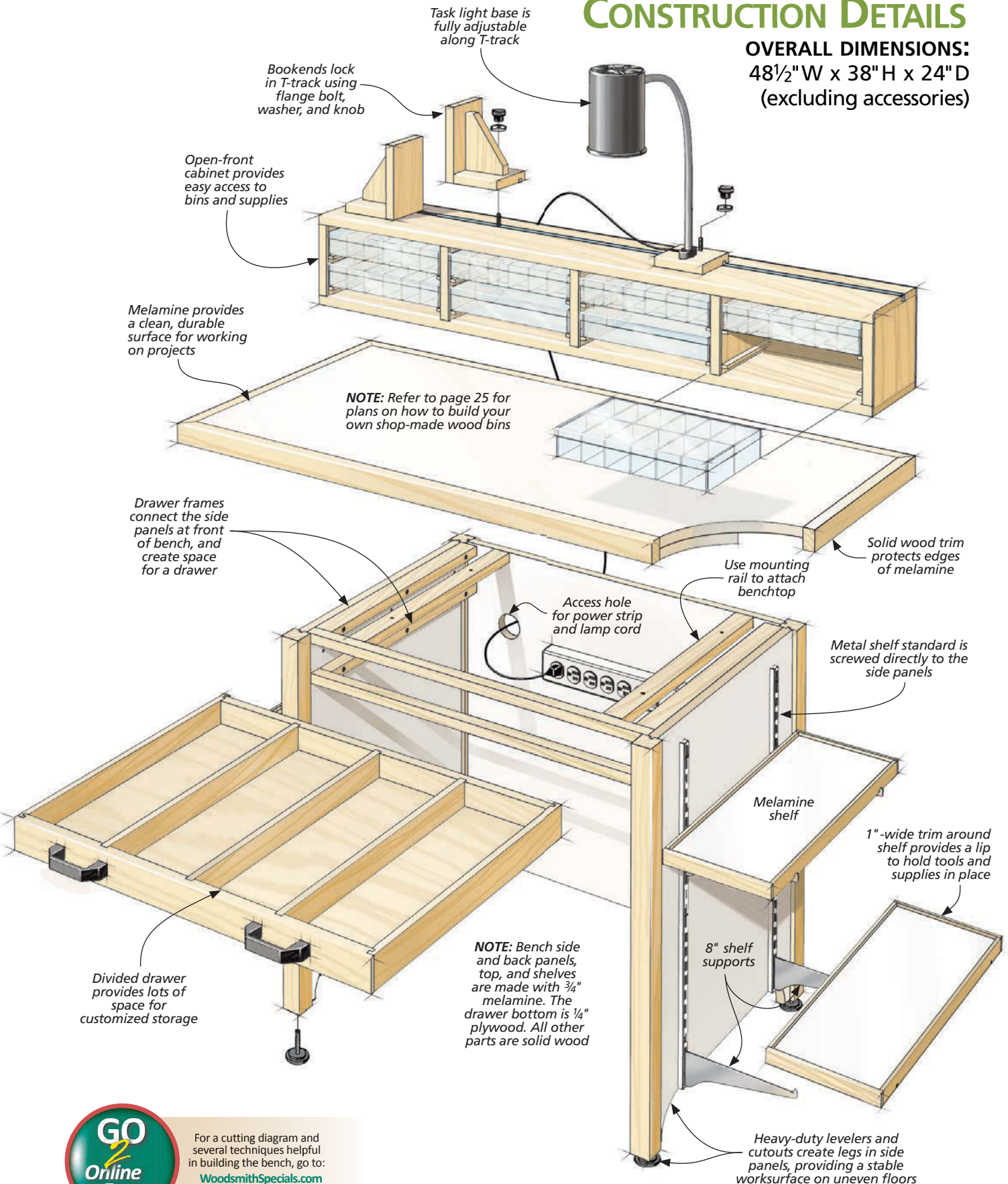
No matter what your interest is, this compact bench has storage galore. Plus it offers plenty of room to spread out and get to work.

Most workbenches are great for building furniture. But, they're often too large for smaller hobby activities. Plus, they often lack storage for both large and small items. That's why I really like this hobby bench. Its small size allows you to put it anywhere, but it

features a lot of storage options, like the open-front cabinet shown above. The cabinet holds eight storage bins that are ideal for organizing small parts. It also has a few other handy features like a built-in lamp and adjustable bookends.

CONSTRUCTION DETAILS

OVERALL DIMENSIONS:
48½" W x 38" H x 24" D
(excluding accessories)



For a cutting diagram and several techniques helpful in building the bench, go to:
WoodsmithSpecials.com

construct the Base

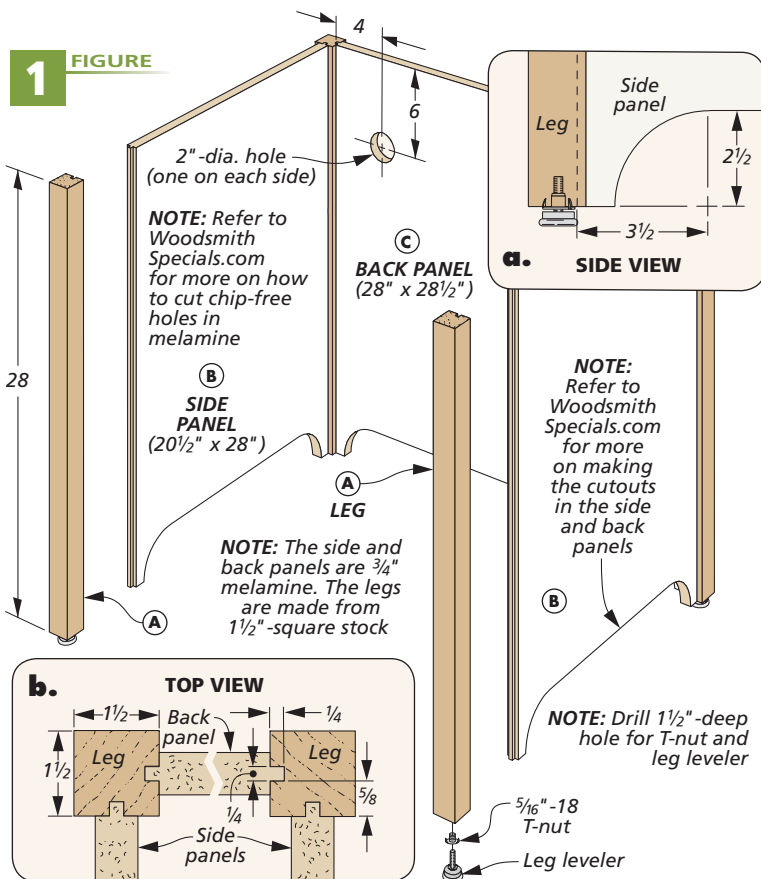
One of the first things you'll notice about this bench are the clean, white panels in the base and top. You could use plywood or MDF for this project, but I chose to use melamine. It's made of particleboard that's coated with a plastic resin on both faces, so it's super durable. Best of all, it's inexpensive and available at most home centers.

Melamine does have one drawback, though. Avoiding chipout when you cut it can be a challenge. But don't worry, I've spelled out a few guidelines for success in making clean, chip-free cuts in the box on the next page.

BASE. Unlike a traditional bench with four large legs, this base has end assemblies made up of two hardwood legs connected by a panel. Then a third panel connects the end assemblies to form a back.

The construction of the base is pretty straightforward. The panels are connected to the legs with tongue and groove joinery. You can get started by making the legs.

LEGS. The legs are made from 1½"-square stock (Figure 1). Each leg has a groove for a side panel, plus the back legs have a second groove for the back panel. And, as



you can see in Figure 1b, the grooves are centered on the legs.

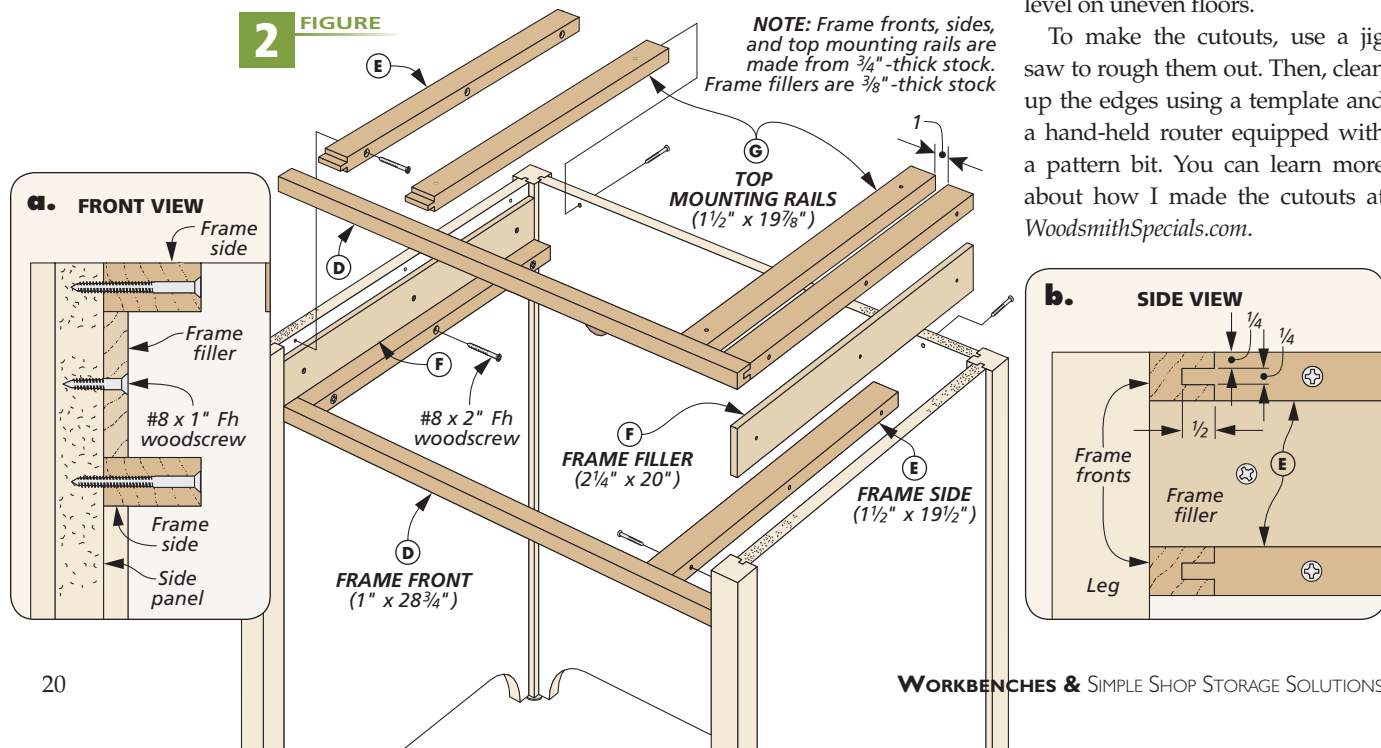
The next step is to drill holes in the bottom of the legs for T-nuts and add the leg levelers (Figure 1a).

MELAMINE PANELS. Now it's time to make the side and back panels. Cut the panels to rough size. Then make a cleanup pass, trimming the parts

to finished size. To learn about the blade I used to make clean cuts in melamine, see the the next page.

CUTOUTS. In order to create a good, solid foundation for the base, I added cutouts to the bottom edge of each panel (Figures 1 and 1a). Along with the legs and levelers, the cutouts help keep the bench level on uneven floors.

To make the cutouts, use a jig saw to rough them out. Then, clean up the edges using a template and a hand-held router equipped with a pattern bit. You can learn more about how I made the cutouts at WoodsmithSpecials.com.



Next, you'll need to cut tongues on the panels to fit the grooves in the legs. To do this, use a dado blade to cut them and set the height of the blade to establish the thickness of the tongue. I like to get it close, then sneak up on the thickness until I have a snug fit.

Before assembling the base, there's one more thing to do. And that's to cut a couple of holes in the back panel for cord access (Figure 1). To get a clean cut, I used a hole saw, drilling from both sides. Refer to WoodsmithSpecials.com for more.

ASSEMBLY. Now you can attach the panels to the legs with glue, then apply some clamps.

DRAWER FRAMES. To provide space for a drawer, I added a pair of drawer frames. As you'll notice in Figure 2, the frame fronts are trapped between the side panels.

The frame fronts have a centered groove to accept stub tenons that are cut on one end of the frame sides. You can use a table saw and dado blade to cut the grooves first (Figure 2b). Then, cut the stub tenons to match the grooves.

Between the two frames, you need to add some frame fillers. If you take a look at Figure 2, you'll see how everything goes together. The frame fillers keep the drawer aligned between the legs and are screwed directly to the side panels, as shown in Figure 2a.

Finally, to provide an easy way to attach a top later, I made two mounting rails with countersunk screw holes (Figure 2).

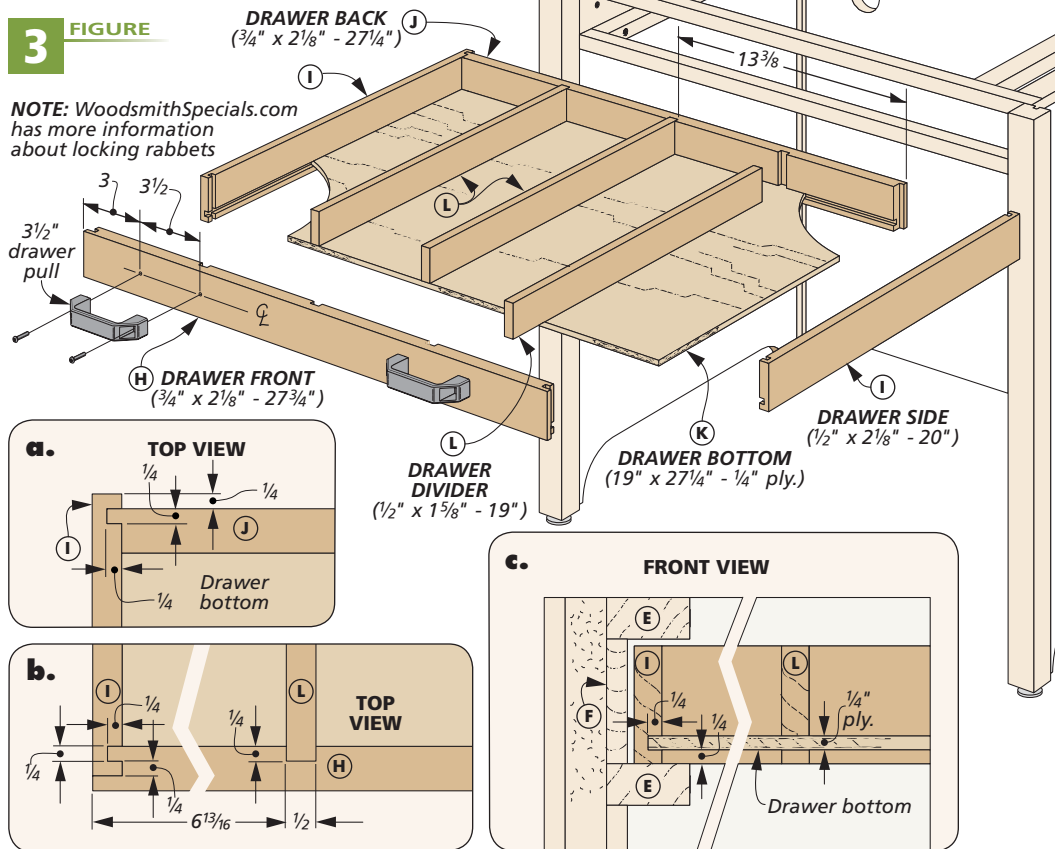
Once the frames and fillers are in place, install the mounting rails by cutting stub tenons like the ones on the frame sides and add screws through the back panel.

ADDING STORAGE

With the base of the bench completed, you can now focus on the drawer. The drawer front is connected to the sides with a locking rabbet joint (Figure 3b). Refer to WoodsmithSpecials.com for tips on making locking rabbets. And, the

3 FIGURE

NOTE: WoodsmithSpecials.com has more information about locking rabbets



drawer back uses a simple tongue and dado joint (Figure 3a). Plus, grooves on the inside faces of all these pieces hold the bottom.

With the joinery cut, you need to cut some dadoes for the dividers, as shown in Figure 3b. The dividers

give you an opportunity to customize the drawer for your own needs.

Once the dividers are cut to size, go ahead and assemble the drawer, as shown in Figure 3. Now you can get started on the bench-top and shelf system.

Cutting Melamine

When cutting melamine on a table saw, chipout can be a real problem. So to get the cleanest cuts possible, I like to do a couple things. First, I always use a zero clearance insert to support the workpiece along the cut line. Plus, I like to use an 80-tooth HiATB (High Alternate Tooth Bevel) blade, like the one shown below. (The cleanest face will be the one that is facing up during the cut.)

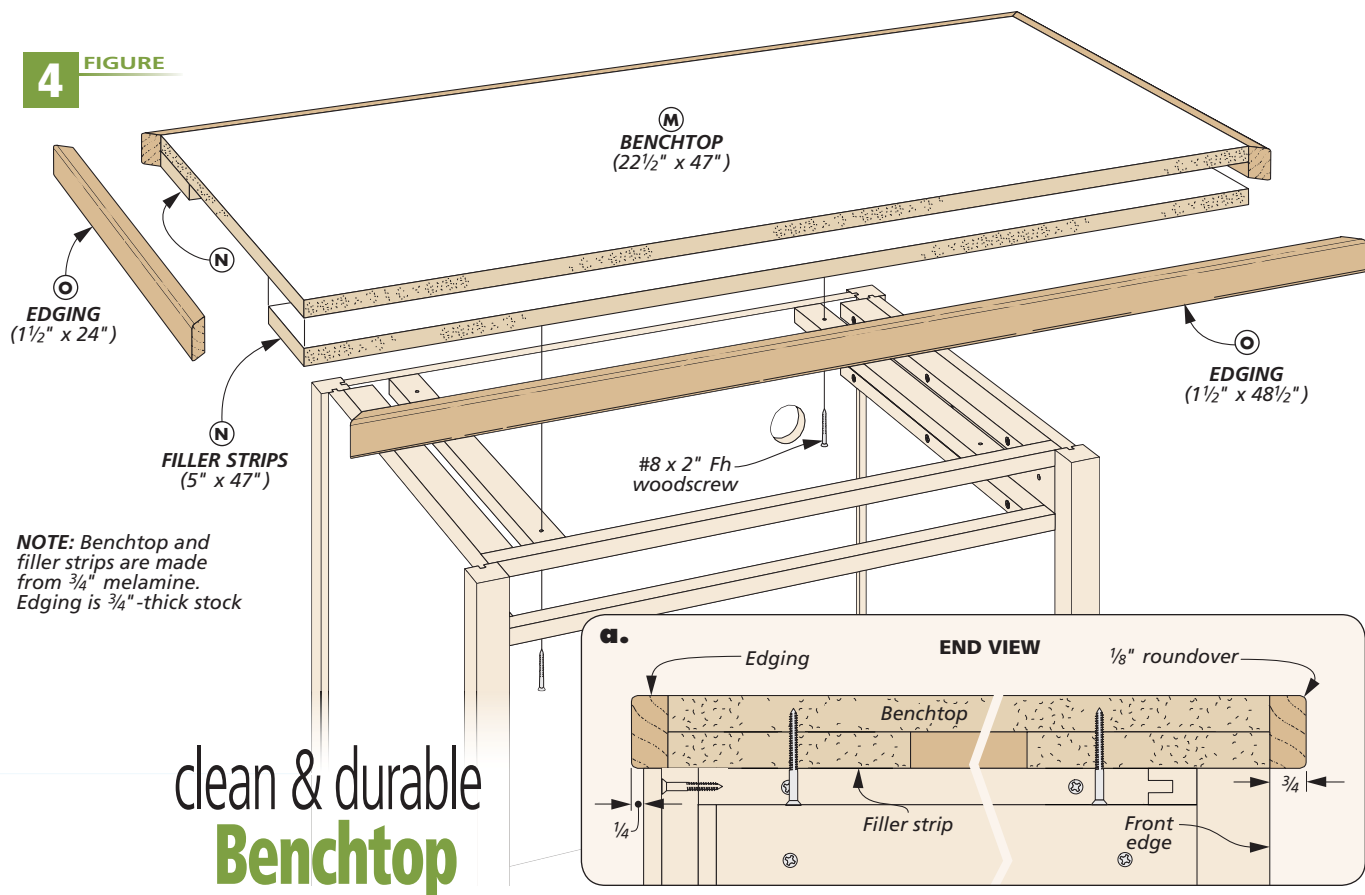
This blade is specially designed to make smooth cuts in plywood and melamine by scoring the workpiece with a knife-like

action at the edge of the blade. Its teeth have alternating bevels that are ground at a steep angle with a negative hook. You'll get the smoothest cuts by using a slow, steady feed rate.

JOINERY. For cutting dadoes and rabbets in melamine, I use a dado blade. The teeth on the outside cutters provide the same scoring action as the specialty melamine blade.

80-Tooth Saw Blade. The high angle of the teeth allow you to make clean, chip-free cuts in plywood and melamine.

4 FIGURE



clean & durable Benchtop

Now that the base is complete, you can turn your attention to the benchtop. It's hard to imagine a better material for the top of the hobby bench than melamine. It's a durable surface that doesn't need a finish, so it's easy to keep clean.

ALTERNATE TOP. But, if you're seeking a more traditional look for your hobby bench, a good option is the solid-wood, laminated benchtop shown below. It's the same size as the melamine top, but it's 1½" thick

to match the overall thickness of the built-up melamine benchtop.

BUILD THE BENCHTOP. As you can see in Figure 4, the benchtop starts as a solid layer of melamine. Then, a couple of filler strips add strength and thickness to the top.

This is the most visible part of the project, so take some care to avoid chipout. Once the pieces are cut to size, attach the filler strips to the top with contact cement. The difficult part is getting the strips

to align with the top. I solved this problem by gluing on oversized filler strips, then trimmed them up with a router and flush trim bit.

MITERED EDGING. The top and bottom faces of the melamine are pretty durable, but the core is not. So to avoid damaging it, I wrapped the benchtop with ¾"-thick edging that's mitered on all four corners.

Now, cutting and fitting mitered edging is one of those tasks that can be a real challenge. But don't worry, you'll find some great tips and techniques for getting perfect mitered edging every time in the article that's available online at WoodsmithSpecials.com.

Once the edging is attached, you can soften the edges on the top and bottom by adding a small, ⅛" roundover (Figure 4a).

ATTACH THE TOP. The top is attached to the base with screws. If you take a look at Figures 4 and 4a, you can see how it's done. I used the holes drilled in the mounting rails and positioned the top according to the dimensions in Figure 4a.

Top Option.
Instead of using melamine for the benchtop, you can make a solid-wood top for a more traditional look.



SHELF STORAGE

The bench is great as is, but to make it even more useful, you may want add some extra storage to the side panels. As you can see in the drawing at right, there's a pair of shelves on each end panel.

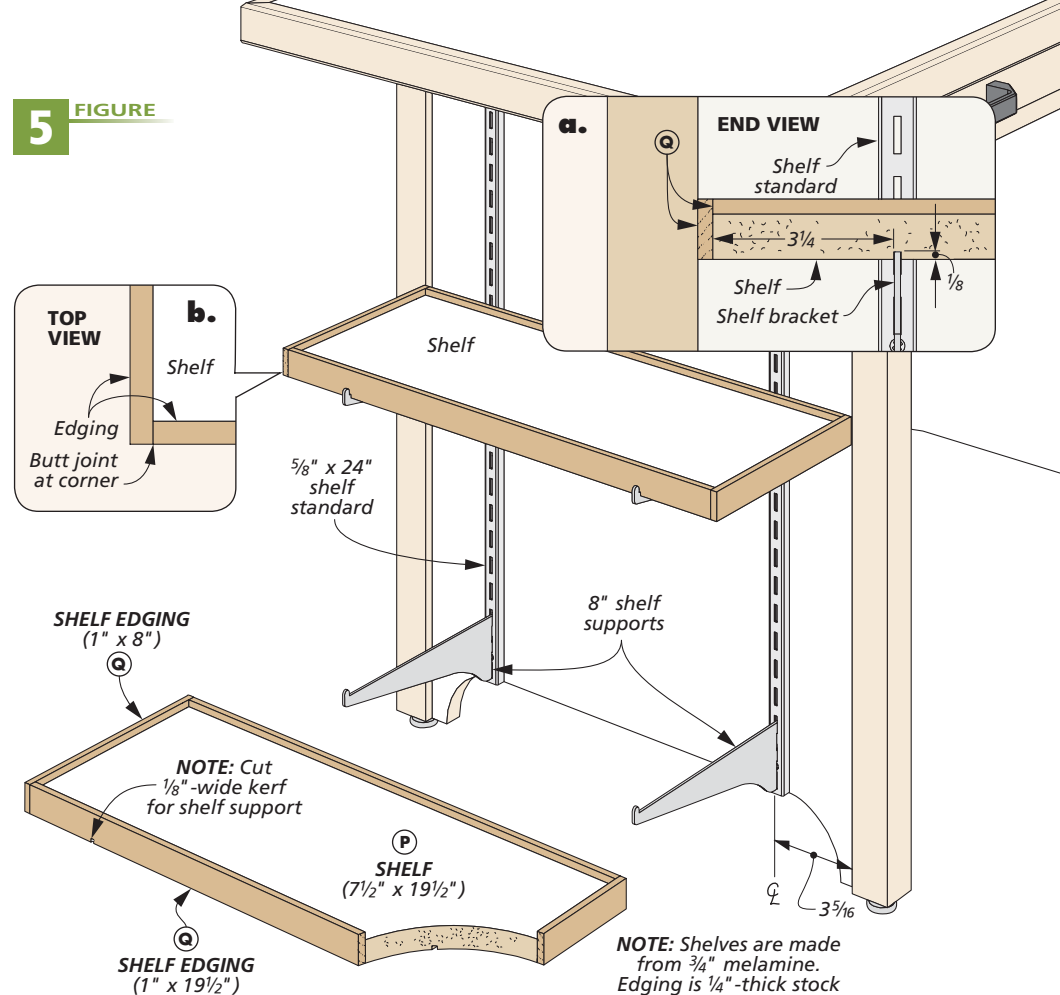
The shelves are pretty basic. As shown in Figure 5, you can tell that I've used metal shelf standards and metal supports to hold them in place. The important thing to remember here is that the shelves are sized to fit snug on the supports from front to back. And the shelf length should match the space between the legs (Figure 5a)

SIMPLE EDGING. Once the shelves are cut to size, you can wrap them with solid-wood trim. The extra-wide trim provides a lip around the top of the shelf to keep things in place. Butt joints make sizing the parts a snap, as shown in Figure 5b. And gluing them in place is quick and easy.

METAL SHELF STANDARDS. Once the shelves are complete, they're ready to be installed onto the sides of the hobby bench. As I mentioned earlier, I used sturdy metal shelf standards and supports to hold the shelves. They're available at most hardware stores and home centers (refer to Figure 5).

The thing is, you don't want the shelves sliding around on the brackets. To avoid this, I used a

5 **FIGURE**



standard kerf saw blade to cut 1/8"-deep grooves from front to back in the bottom of each shelf. These grooves are for the shelf supports to fit in (Figures 5 and 5a).

Now, when the shelves are installed, they'll slip over the supports and lock into place.

At this point, you could get to work at the bench. But you still need a place to store tools and supplies so they're always close by. The solution is an open-front cabinet that holds eight storage bins for small parts. You'll find plans for the cabinet on the next page.

MATERIALS & SUPPLIES

BASE

A	Legs (4)	1 1/2 x 1 1/2 - 28
B	Side Panels (2)	20 1/2 x 28 - 3/4 Melamine
C	Back Panel (1)	28 x 28 1/2 - 3/4 Melamine
D	Frame Fronts (2)	3/4 x 1 - 28 3/4
E	Frame Sides (4)	3/4 x 1 1/2 - 19 1/2
F	Frame Fillers (2)	3/8 x 2 1/4 - 20
G	Top Mounting Rail (2)	3/4 x 1 1/2 - 19 7/8
DRAWER		
H	Front (1)	3/4 x 2 1/8 - 27 3/4
I	Sides (2)	1/2 x 2 1/8 - 20
J	Back (1)	3/4 x 2 1/8 - 27 1/4
K	Bottom (1)	19 x 27 1/4 - 1/4 Ply.
L	Dividers (3)	1/2 x 1 5/8 - 19
TOP		
M	Benchtop (1)	22 1/2 x 47 - 3/4 Melamine

N Filler Strips (2)

O Edging

SHELVES

P	Shelves (4)	7 1/2 x 19 1/2 - 3/4 Melamine
Q	Shelf Edging	1/4 x 1 - 240 Rgh.

STORAGE CABINET

R	Cabinet Top/Bottom (2)	3/4 x 7 - 48
S	Cabinet Ends (2)	3/4 x 7 - 6 1/4
T	Cabinet Dividers (3)	3/4 x 6 3/4 - 6 1/4
U	Cabinet Back (1)	6 1/4 x 47 - 1/4 Ply.
V	Bin Supports (16)	1/4 x 3/4 - 6 3/4
W	Cabinet Edging	1/4 x 3/4 - 240 Rgh.

ACCESSORIES

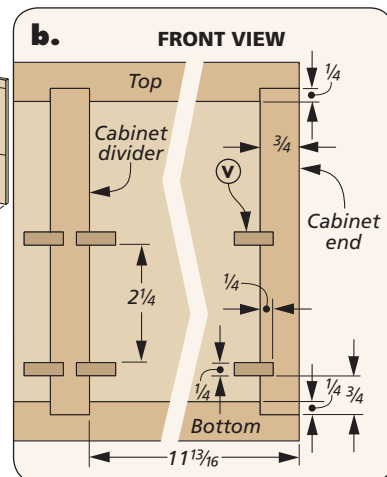
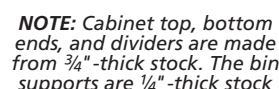
X	Bases (3)	3/4 x 4 - 4
Y	Keys (3)	5/16 x 3/8 - 4
Z	Bookend Plates (2)	3/4 x 4 - 6

AA Braces (2)

3/4 x 3 1/2 - 4 1/2

- (10) #8 x 1 1/2" Fh Woodscrews
- (14) #8 x 2" Fh Woodscrews
- (4) 5/16"-18 T-Nuts
- (4) Plastic Leg Levelers
- (2 pr.) 24" Shelf Standards
- (4 pr.) Shelf Supports, 8" Long
- (2) 3 1/2" Drawer Pulls w/Screws
- (1) 3/8" x 3/4" - 48" T-Track w/Screws
- (8) Plastic Storage Bins
- (1) Task Light w/Screws
- (3) 1/4"-20 x 1 1/2" Flange Bolts
- (3) 1/4"-20 Knurled Knobs

6



Just about every hobbyist ends up with drawers full of small supplies that get used on a daily basis. So it's a real benefit to have an easily accessible place for everything. The bin cabinet that sits on top of the bench provides the solution.

The cabinet has four side-by-side bays. Each bay has space for two plastic storage bins, as shown in the photo at lower right. The bins slide on solid-wood supports, and the front is open for easy access.

Note: If you'd rather build your own wood storage bins, the plans

for how to build them are in the box on the next page.

Another unique feature of this cabinet is the two accessories that are mounted on top — a task light and bookends. I'll talk about each of them a little later.

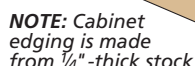
BUILD THE CABINET. The storage cabinet is basically just a box divided into four compartments. It's made from solid wood with solid wood edging. You can start by cutting the top, bottom, sides, and dividers to size.

TOP AND BOTTOM. There are three evenly spaced dadoes in the top and bottom pieces sized to hold the dividers, as you can see in Figure 6. A table saw equipped with a dado blade makes quick work of cutting them. I started by making the center dadoes, then adjusted the rip fence to complete the two other sets of dadoes.

The next thing to do is cut a rabbet along the back edge of the top, bottom, and sides to hold the cabinet back (Figure 6a).

DIVIDERS & SIDES. As I mentioned earlier, each bin rests on a pair of bin supports. The supports are actually thin strips that fit in dadoes cut in the sides and dividers. To make the supports, I first cut the dadoes. Then, I ripped the strips from the edge of $\frac{3}{4}$ "-thick stock to match the width of the dadoes (Figure 6b).

T-TRACK. There's one last step to take before you can assemble the cabinet. And that's to cut the groove for the T-track that will hold the accessories. The location of the groove is shown in Figure 6a, and I used the table saw and a dado blade to cut it. With the groove cut, you can get started putting the cabinet together.



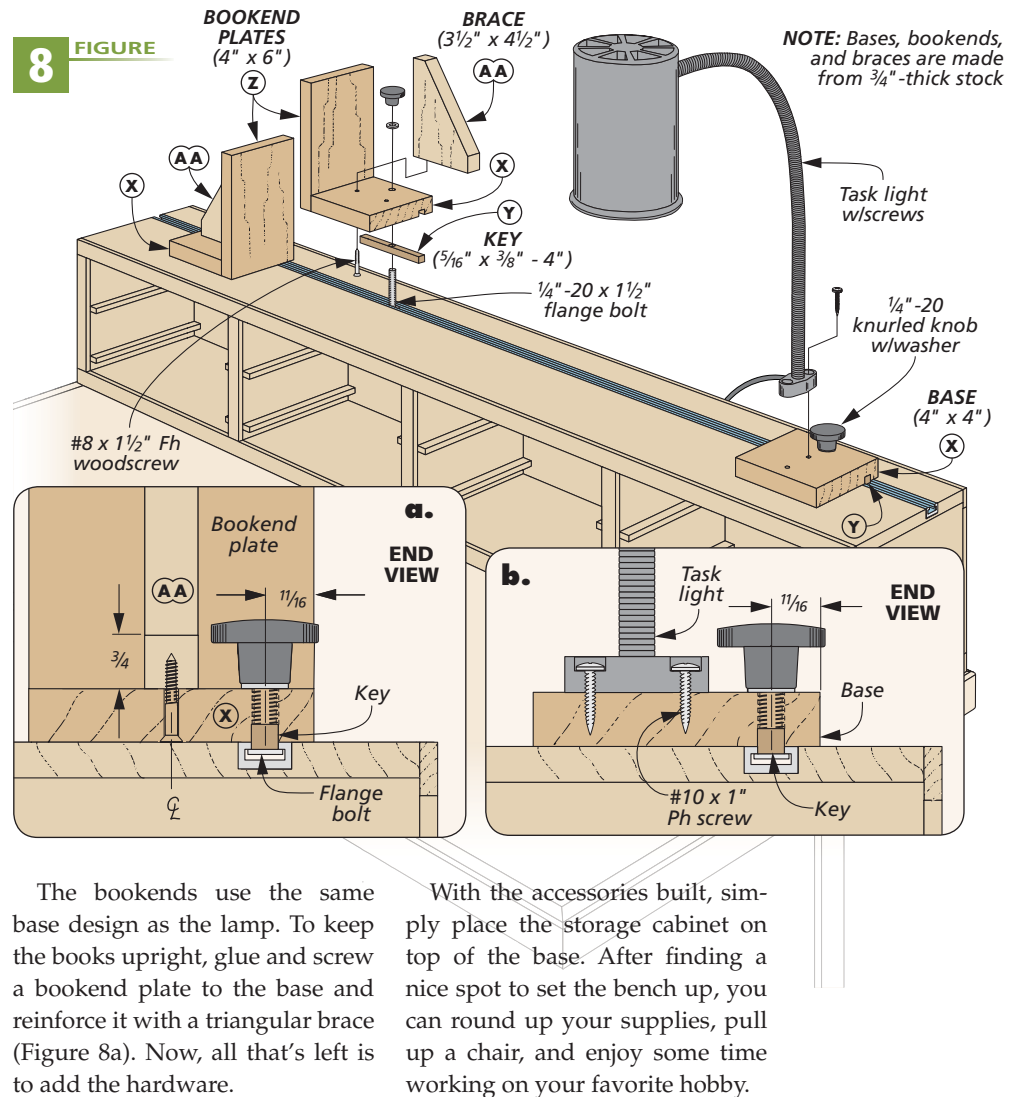
CABINET ASSEMBLY. Like the bench base, the cabinet goes together pretty easily. Start by gluing up the top, bottom, sides, and dividers. Then glue the supports in place before adding the back.

Once the cabinet is complete, you can hide the joinery on its front and back faces by adding some trim, as shown in Figure 7. I glued the trim in place and used masking tape to hold it until the glue dried.

ACCESSORIES

Now you can get started building the two accessories: a task light and a pair of bookends. They're very similar in construction and they're held to the top of the cabinet with a flange bolt, washer, and knob that rides in some T-track. The track rests in the groove you cut earlier.

CABINET ADD-ONS. The light is mounted to a solid-wood base. (Refer to Sources on page 98 for information on where to find the task light.) The base has a key that keeps it aligned in the T-track (Figures 8 and 8b). A hole, drilled through the base and centered on the key accepts a flange bolt. To lock everything in place, I added a knob and washer.



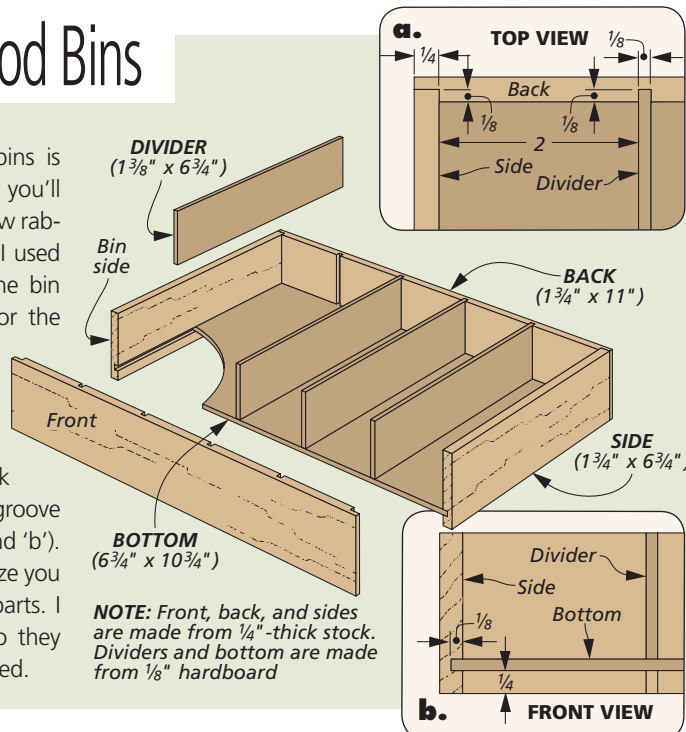
The bookends use the same base design as the lamp. To keep the books upright, glue and screw a bookend plate to the base and reinforce it with a triangular brace (Figure 8a). Now, all that's left is to add the hardware.

With the accessories built, simply place the storage cabinet on top of the base. After finding a nice spot to set the bench up, you can round up your supplies, pull up a chair, and enjoy some time working on your favorite hobby.

Optional Wood Bins

Building your own wood bins is simple. Like the drawer, you'll need to cut a series of shallow rabbets, dadoes, and grooves. I used 1/4"-thick solid wood for the bin parts and 1/8" hardboard for the bottoms and dividers.

The rabbets are cut in the bin front and back (detail 'a'). Then cut dadoes in the front and back to hold the dividers and a groove for the bottom (details 'a' and 'b'). Once the pieces are cut to size you can glue up the main bin parts. I left the dividers unglued so they can be repositioned as needed.



hardworking Hobby Bench

MATERIALS & HARDWARE

BASE

A	Legs (4)	1½ x 1½ - 28
B	Side Panels (2)	20½ x 28 - ¾ Melamine
C	Back Panel (1)	28 x 28½ - ¾ Melamine
D	Frame Fronts (2)	¾ x 1 - 28¾
E	Frame Sides (4)	¾ x 1½ - 19½
F	Frame Fillers (2)	¾ x 2¼ - 20
G	Top Mounting Rails (2)	¾ x 1½ - 19⅞

DRAWER

H	Front (1)	¾ x 2⅛ - 27¾
I	Sides (2)	½ x 2⅛ - 20
J	Back (1)	¾ x 2⅛ - 27¼
K	Bottom (1)	19 x 27¼ - ¼ Ply.
L	Dividers (3)	½ x 1⅝ - 19

TOP

M	Benchtop (1)	22½ x 47 - ¾ Melamine
N	Filler Strips (2)	5 x 47 - ¾ Melamine
O	Edging	¾ x 1½ - 156 Rgh.

SHELVES

P	Shelves (4)	7½ x 19½ - ¾ Melamine
Q	Shelf Edging	¼ x 1 - 240 Rgh.

STORAGE CABINET

R	Cabinet Top/Bottom (2)	¾ x 7 - 48
S	Cabinet Ends (2)	¾ x 7 - 6¼
T	Cabinet Dividers (3)	¾ x 6¾ - 6¼
U	Cabinet Back (1)	6¼ x 47 - ¼ Ply.
V	Bin Supports (16)	¼ x ¾ - 6¾
W	Cabinet Edging	¼ x ¾ - 240 Rgh.

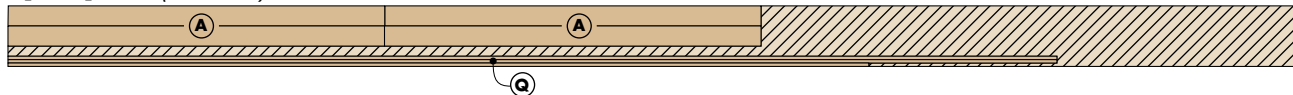
ACCESSORIES

X	Bases (3)	¾ x 4 - 4
Y	Keys (3)	⅝ x ¾ - 4
Z	Bookend Plates (2)	¾ x 4 - 6
AA	Braces (2)	¾ x 3½ - 4½

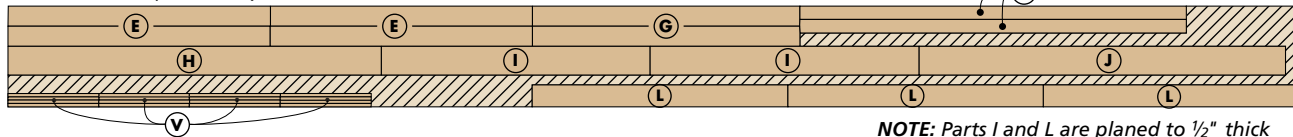
- (10) #8 x 1½" Fh Woodscrews
- (14) #8 x 2" Fh Woodscrews
- (4) ⅝"-18 T-Nuts
- (4) Plastic Leg Levelers
- (2 pr.) 24" Shelf Standards
- (4 pr.) Shelf Supports, 8" Long
- (2) 3½" Drawer Pulls w/Screws
- (1) ¾" x ¾" - 48" T-Track w/Screws
- (8) Plastic Storage Bins
- (1) Task Light w/Screws
- (3) ¼"-20 x 1½" Flange Bolts
- (3) ¼"-20 Knurled Knobs

CUTTING DIAGRAM

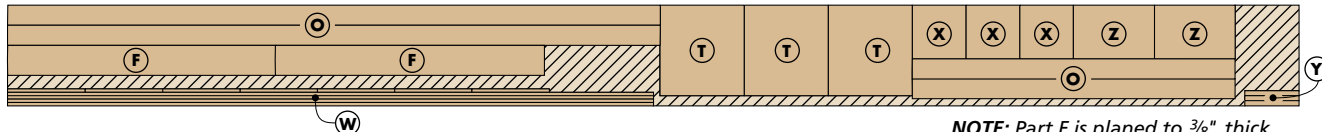
1½" x 4½" - 96" (6.0 Bd. Ft.)



¾" x 7½" - 96" (5.0 Bd. Ft.)



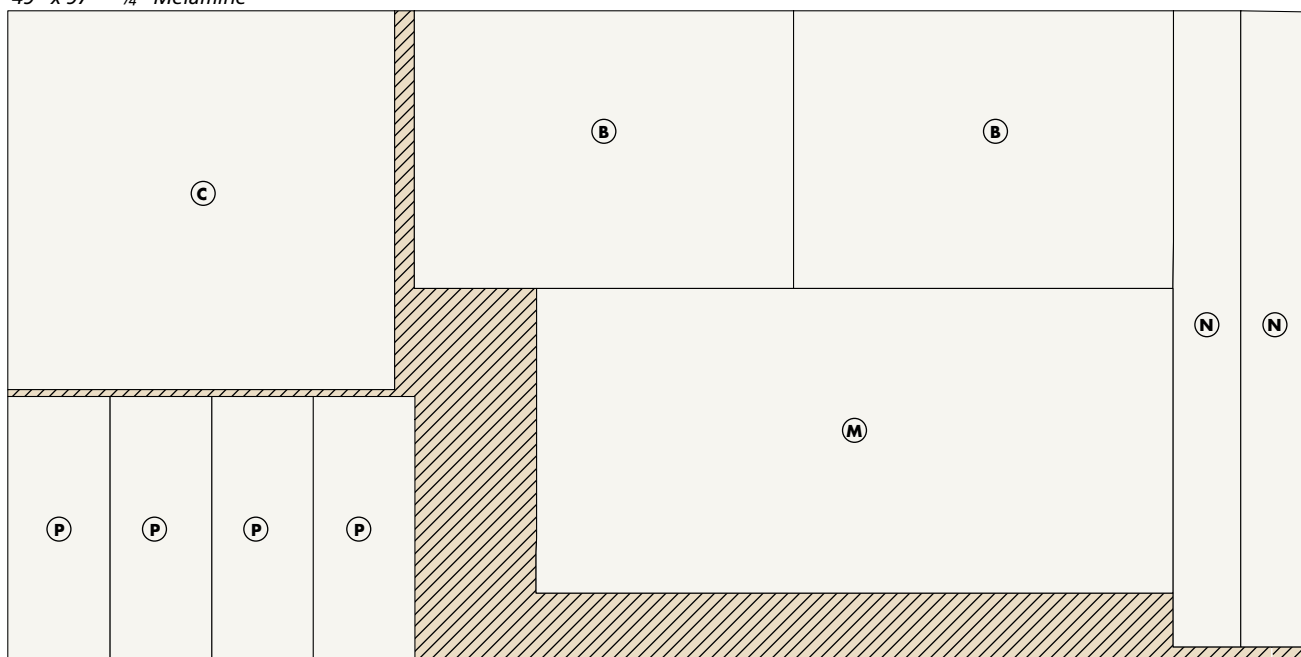
¾" x 7½" - 96" (5.0 Bd. Ft.)



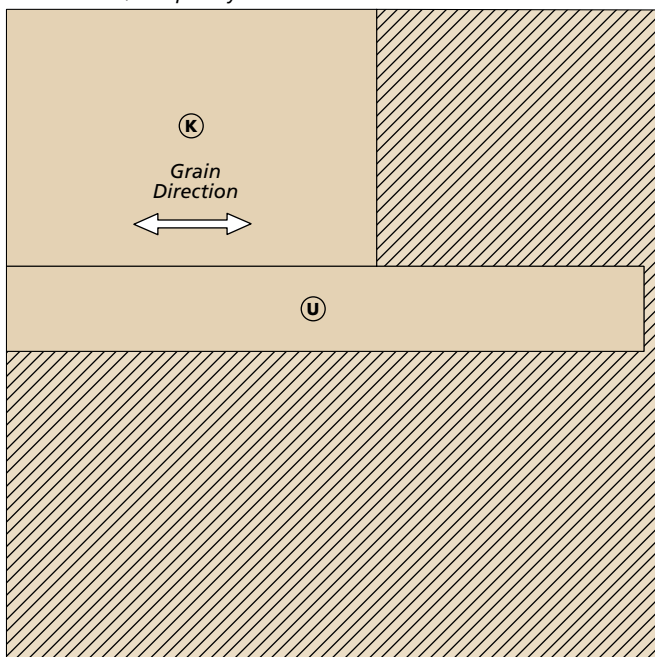
¾" x 7½" - 60" (Two Boards @ 3.1 bd. Ft. Each)

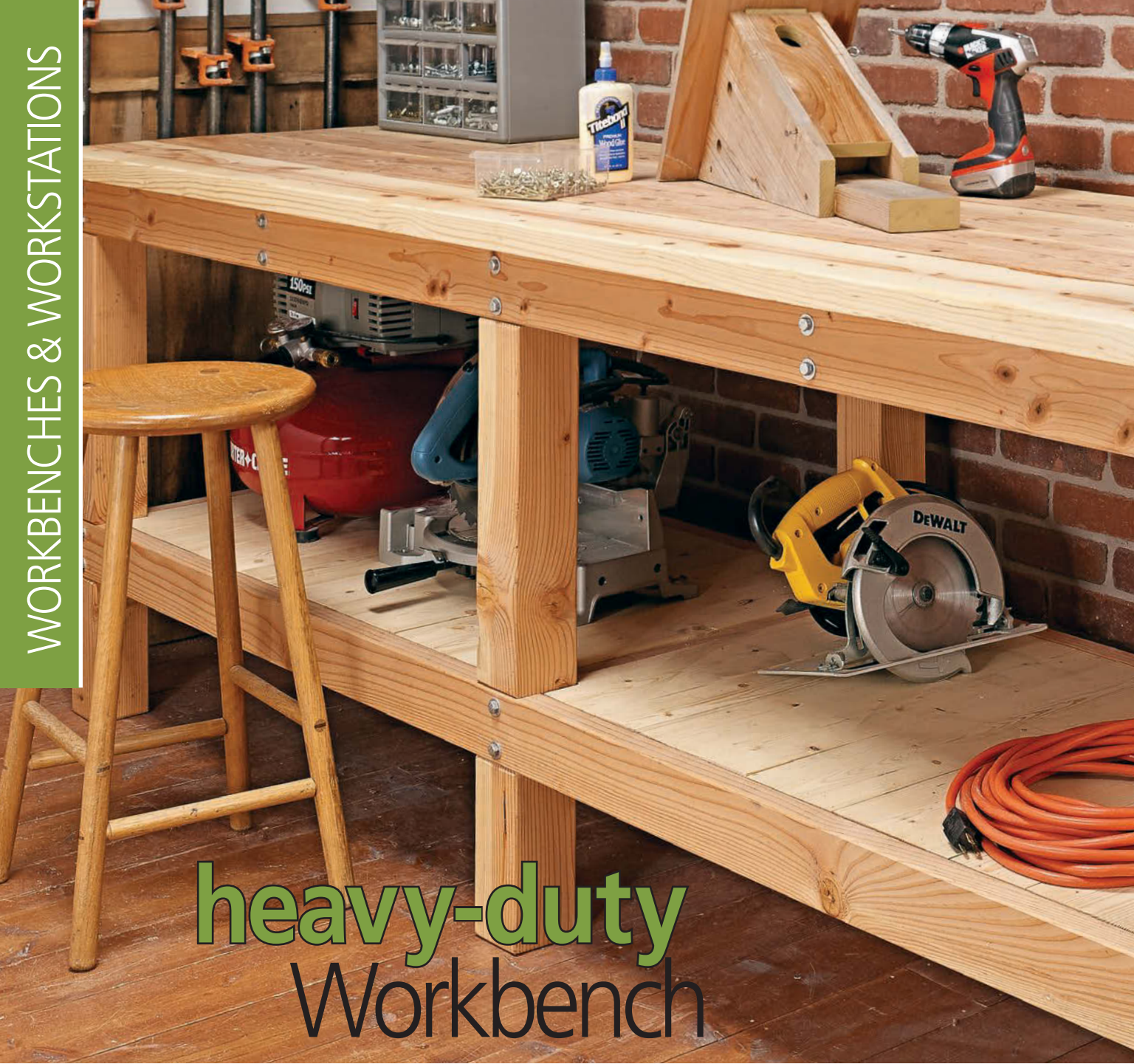


49" x 97" - 3/4" Melamine



48" x 48" - 1/4" Maple Plywood





heavy-duty Workbench

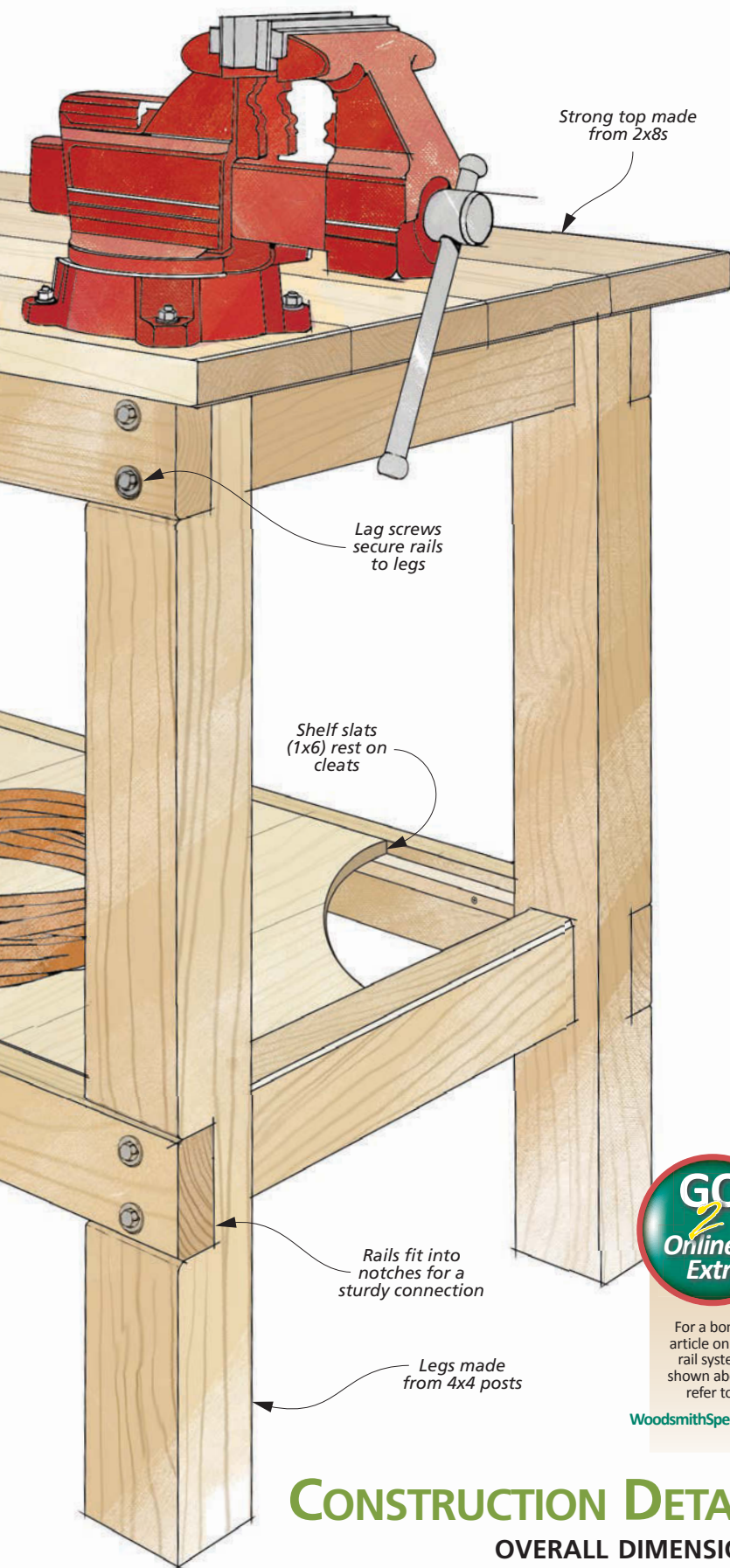
A basic, stable workbench is a must-have fixture for every shop. Built from low-cost materials, this bench won't break the bank, either.

I remember walking into my grandfather's garage as a child. There, along one wall, was a large, heavy-duty workbench with 4x4 legs and a top made from "two-by" lumber. On any given day, you could see everything from lawn mower repair to woodworking being done on top of that workbench.

The bench you see here is just like my grandfather's. It's strong enough for any task you can throw at it and will last for generations. And just like the old bench

from my childhood, it can really take a beating. But the best part is, you can build it in a weekend using readily available construction-grade lumber from any home center. And the woodworking couldn't be simpler. The base assembly involves a few lag screws. The top planks are held with washerhead screws.

The techniques involved in making your own rock-solid workbench are easy to master. In the end, you'll have a bench that will last for decades.



Rail System. Upgrade this basic bench with a rail system that incorporates bench dogs and clamping accessories. You'll find the bonus plan at WoodsmithSpecials.com.



For a bonus article on the rail system shown above, refer to:

WoodsmithSpecials.com

MATERIALS & SUPPLIES

A	Legs (6)	3½ x 3½ - 32½
B	Front/Back Rails (4)	1½ x 3½ - 93
C	Short Cross Rails (6)	1½ x 3½ - 19
D	Long Cross Rails (2)	1½ x 3½ - 23
E	Cleats (4)	¾ x 1 - 41
F	Shelf Slats (16)	¾ x 5½ - 23
G	Top Planks (4)	1½ x 7¼ - 96

- (24) 5/16" x 5" Lag Screws
- (8) 5/16" x 3" Lag Screws
- (32) 5/16" Washers
- (40) #10 x 2¾" Washer-Head Woodscrews
- (20) #8 x 1¾" Fh Woodscrews

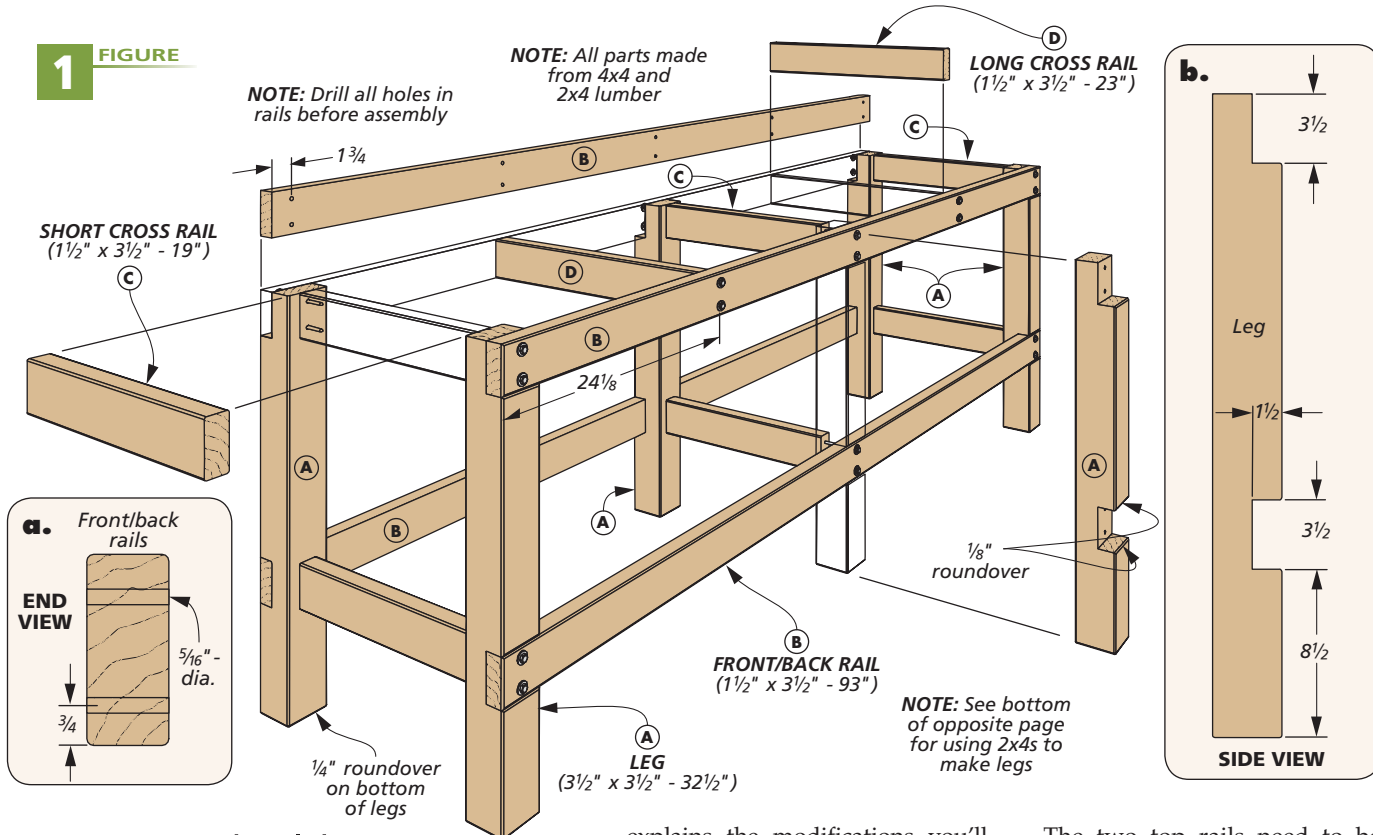
CONSTRUCTION DETAILS

OVERALL DIMENSIONS:
96"W x 34"H x 29"D

1 FIGURE

NOTE: All parts made from 4x4 and 2x4 lumber

NOTE: Drill all holes in rails before assembly



building a Strong Base

The beauty of this workbench is its simplicity of construction. Notched legs form the joinery for the long front and back rails. Cross rails are joined with lag screws that are driven into the long rails.

STURDY LEGS. I used 4x4 legs for the workbench. If you are having trouble finding construction-grade 4x4s in your area, you can use 2x4s glued together. The box at the bottom of the next page

explains the modifications you'll need to make to some dimensions.

Start by cutting the 4x4 legs to their final length, as illustrated in Figure 1. After laying out the location for the notches for the rails, I set up the table saw with a wide dado blade and attached an auxiliary fence to the miter gauge. Adjust the height of the dado blade to match the thickness of the 2x4 stock you'll be using for the rails.

Once the notches are cut, I used a hand-held router to round over the edges of the notches to match the radius on the edges of the rails. You can also do this with a little sanding. This extra step creates a more finished look after the rails are attached.

FRONT & BACK ASSEMBLIES. Long 2x4 rails join the legs to create a front and back frame assembly. The only things you need to do are make sure they're all identical length. You'll also need to drill holes for the lag screws used to attach the shorter cross rails later. Crosscutting long 2x4s at the table saw can be a chore. I find that a miter saw is a better choice when cutting long parts like this to length.

The two top rails need to be drilled with five pairs of holes. These are used for securing cross rails that support the benchtop. The bottom rails are only drilled where they fasten at the legs, as shown in Figure 1.

After the holes are drilled, you can glue the long rails into the notches in the legs. Just make sure to keep the assemblies square. The notches help by aligning the rails as you fasten them.

CROSS RAILS. While the glue dries, you can cut the six short cross rails that fit between the legs (Figure 1). These short cross rails join the front and back assemblies. I set up a stop block on an auxiliary fence of the miter saw to ensure each of the cross rails were the same length.

TIME FOR ASSEMBLY. The short cross rails are joined to the front and back assemblies with 5"-long lag screws. I used the holes in the front and back rails as a guide to drill through the legs.

At this point, you may need some help in clamping and attaching the short cross rails. I started by temporarily clamping the short cross rails between the front and back



Construction Lumber. You'll find the lumber you need to build the bench at any home center.

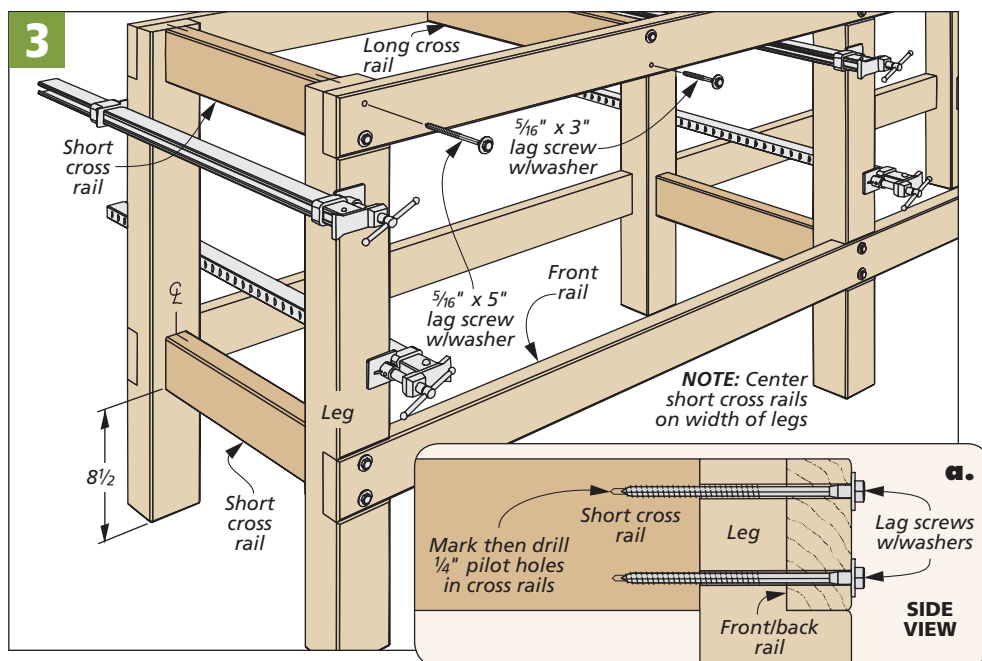
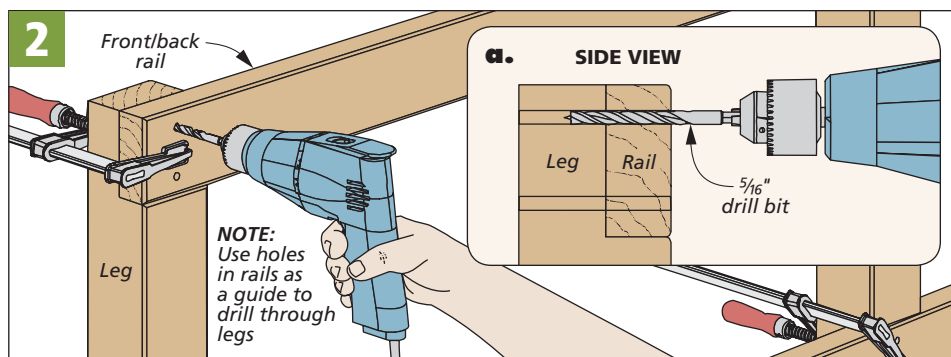
assemblies, centered on the legs. The top of the cross rails should be even with the top of the long rails.

Use a drill bit to mark the ends of the cross rails through the holes in the legs. Then remove the clamps to drill $\frac{1}{4}$ " pilot holes about 2" deep into the ends of the cross rails at the marked locations (Figure 3a).

DRIVING LAG SCREWS. To install all of the lag screws, you can use a ratcheting socket wrench. But I find that a socket adapter for an impact driver or drill makes the job go quicker. Just be careful not to overdrive the screws, stripping them from the cross rails.

ADDITIONAL SUPPORT. With the shorter cross rails tying the front and back assemblies together, you can measure and cut a pair of longer cross rails. These help support the benchtop. They fit between the front and back rails.

As before, you'll slip the cross rails into place, centering them over the predrilled holes in the front and back rails. Mark the pilot hole locations in the end of the cross rails. Remove them to drill the pilot holes and then fasten them in place.

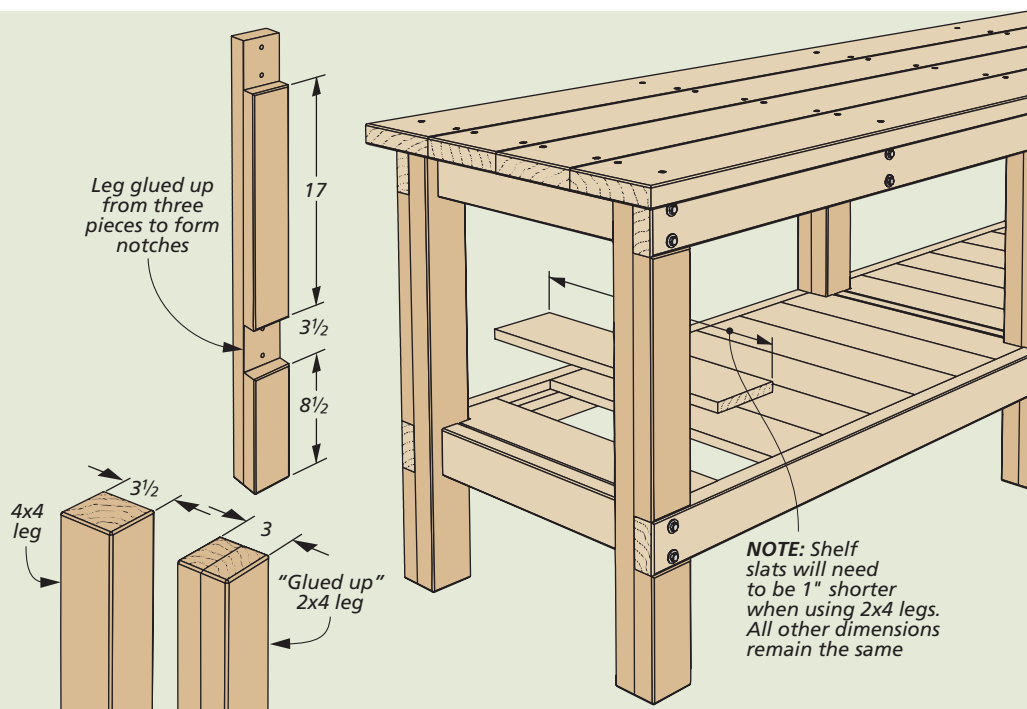


Option: 2x4 Legs

If you can't find construction-grade 4x4s in your area to make the legs for the workbench, there's a good alternative. You can form them from three pieces of "two-by" stock, as shown in the drawings at right.

The overall dimensions for the legs will be a $\frac{1}{2}$ " thinner than the 4x4s, which in turn affects the overall depth of the base. For the cleanest look, the glue joints are oriented toward the ends of the bench.

With this change, the shelf slats need to be 1" shorter. You won't need to make any changes to the top dimensions, but the overhang of the top will increase by $\frac{1}{2}$ " at the front and back.



finishing with a Shelf & Top

The overall skeleton of the workbench is complete. You'll build a shelf below to add much-needed storage space. Finally, the heavy-duty top caps off the workbench.

FLOATING SHELF. The shelf is made up of 1x6 boards. The slats simply "float" on cleats without using fasteners. So the first order of business is installing cleats on the inside of the lower front and back rails. Figure 4a shows how they're offset from the top of the rail. This allows the shelf to be flush with the top of the rails after all of the slats are installed.

The cleats are 1" wide and cut from $\frac{3}{4}$ " stock. The 1" face supports the shelf. After cutting the cleats to length to fit between the



Installing Screws.

Washer-head screws secure the planks for the benchtop. They're installed in counterbored holes.

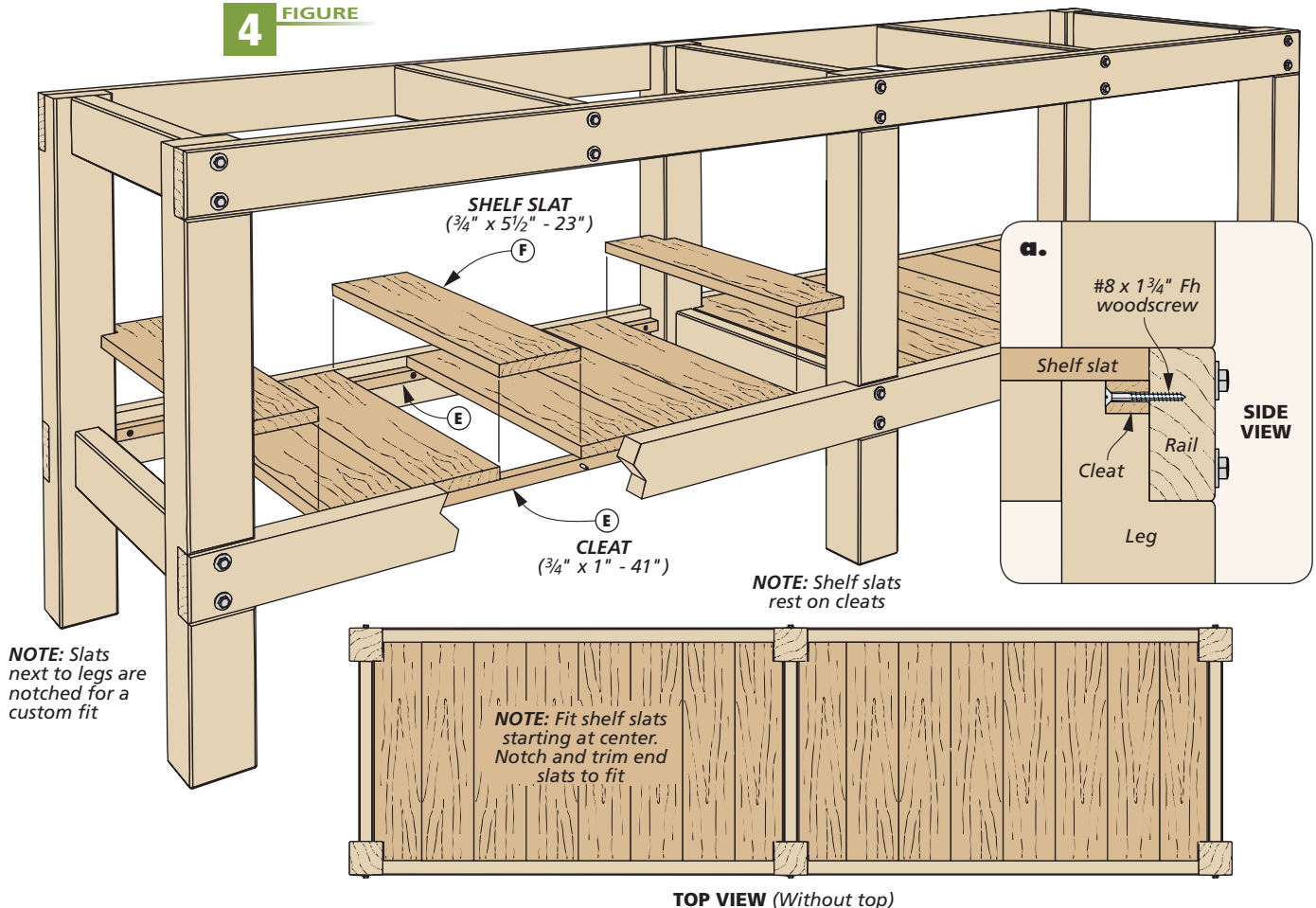
legs, I used a countersink bit to drill the shank holes and countersinks for #8 woodscrews. A combination square set to $\frac{3}{4}$ " helps to locate the cleats from the top edge of the rails as you're driving the screws to fasten the cleats.

SHELF SLATS. You'll notice in Figure 4 that there are 16 shelf slats. Here again, a stop block attached to the fence of your miter saw makes

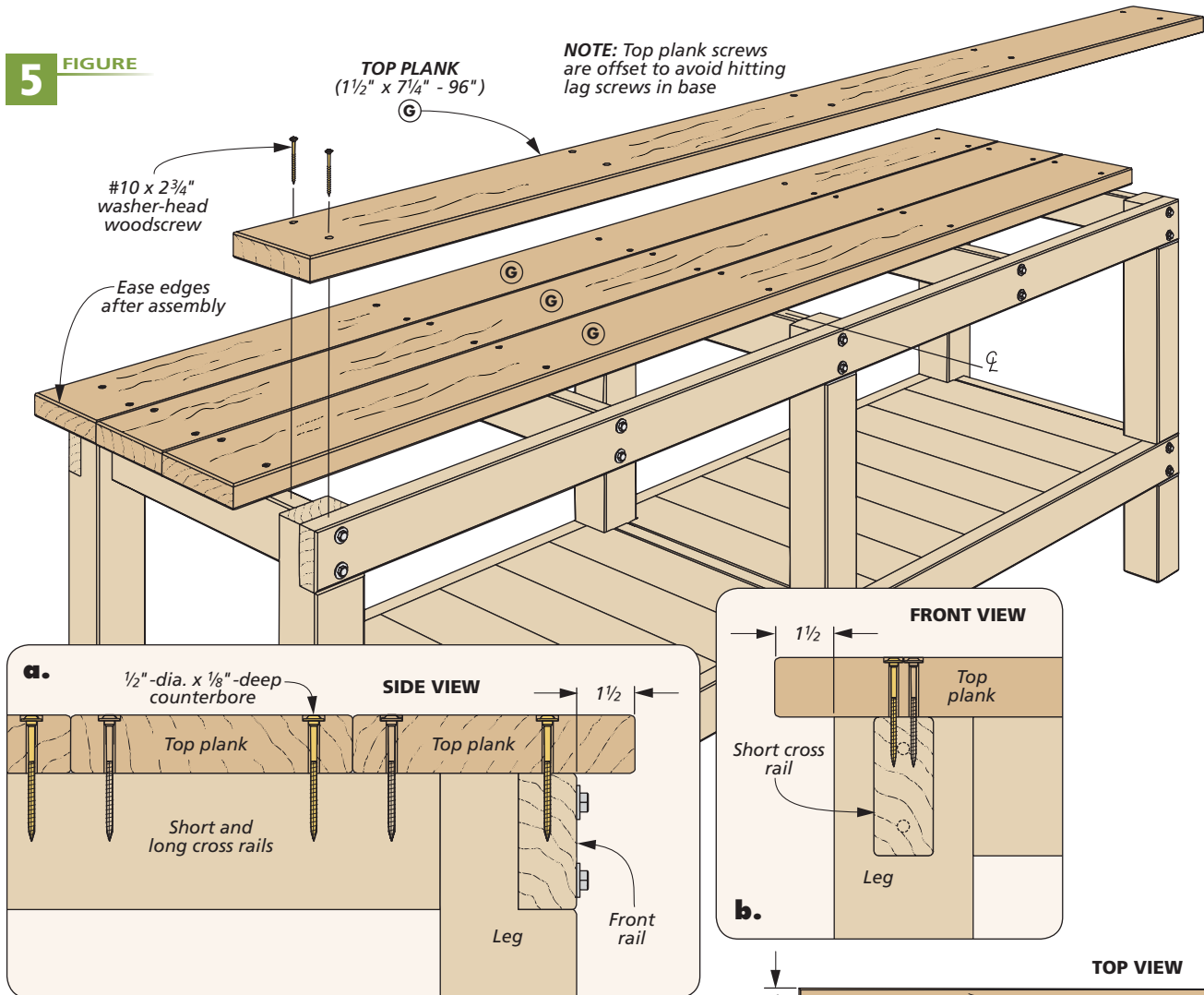
cutting them to the same length a snap. But before you can place the slats on the cleats, there are a couple of things I need to point out.

The slats that fit next to the legs need to be notched to fit around the legs. I started by cutting and fitting the two slats at the center of the bench and worked outward toward each end. This means that the last two slats you add at each

4 **FIGURE**



5 FIGURE



end will likely need to be ripped to width to fit the remaining space. As I mentioned before, they're also notched to fit around the legs.

When laying the slats in place, I made sure to leave a little room (about $\frac{1}{16}$ ") between them to allow for seasonal expansion and contraction. If you find over time that the slats are fitting too tight, all you need to do is trim the end slats for a looser fit.

ADDING THE TOP. All that's left to do now is add the benchtop. It's made up of four 2x8s. If you take a look at the top view at right, you'll see how to lay out the screw locations. I staggered the screws to help prevent splitting the rails and to avoid the lag screws that secure each cross rail.

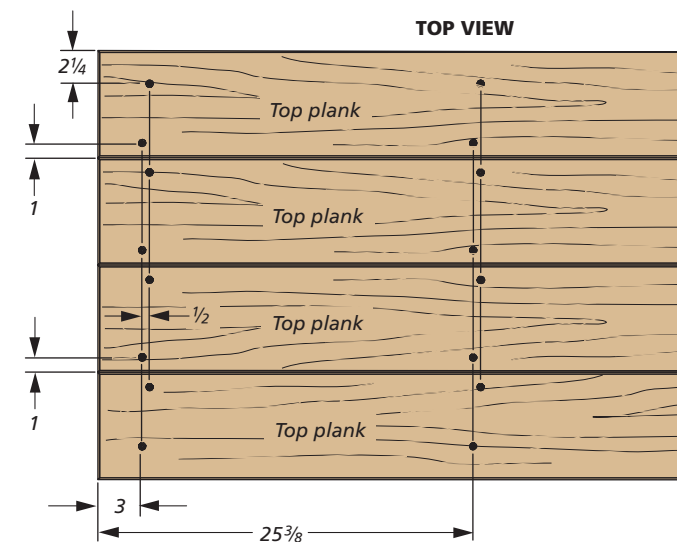
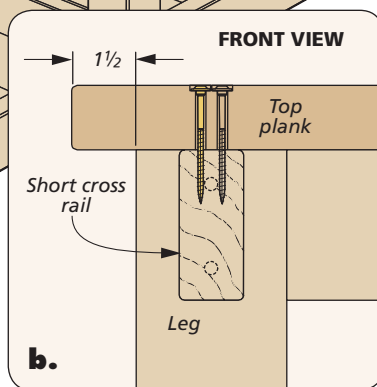
You can see the type of screw I used in the photo at the top of the

previous page. The large washer head provides additional bearing surface to help prevent the planks from warping.

To accommodate the washer head and allow the fastener to sit below the surface of the benchtop, I counterbored all of the screws, as illustrated in Figure 5a. The screw hole is oversized to allow for movement.

FINAL DETAILS. After all of the top planks are in place, ease the edges at the cut ends. I did this with a sanding block to form a slight radius on the ends of the boards. Using a random-orbit sander, go over the whole bench with 150-grit sandpaper before applying a finish.

SIMPLE FINISH. To finish the bench, I wiped on a couple coats of an oil/polyurethane blend. This durable



finish helps protect the bench from dirt and grime. Plus it's an easy finish to refresh periodically as the benchtop wears over time.

With the finishing done, it's time to position the workbench in your shop and put it to good use on your next project.



Tool Platforms. Plywood platforms for your tools are easy to make. They fasten securely to the rail system.

add-on Bench Rail System

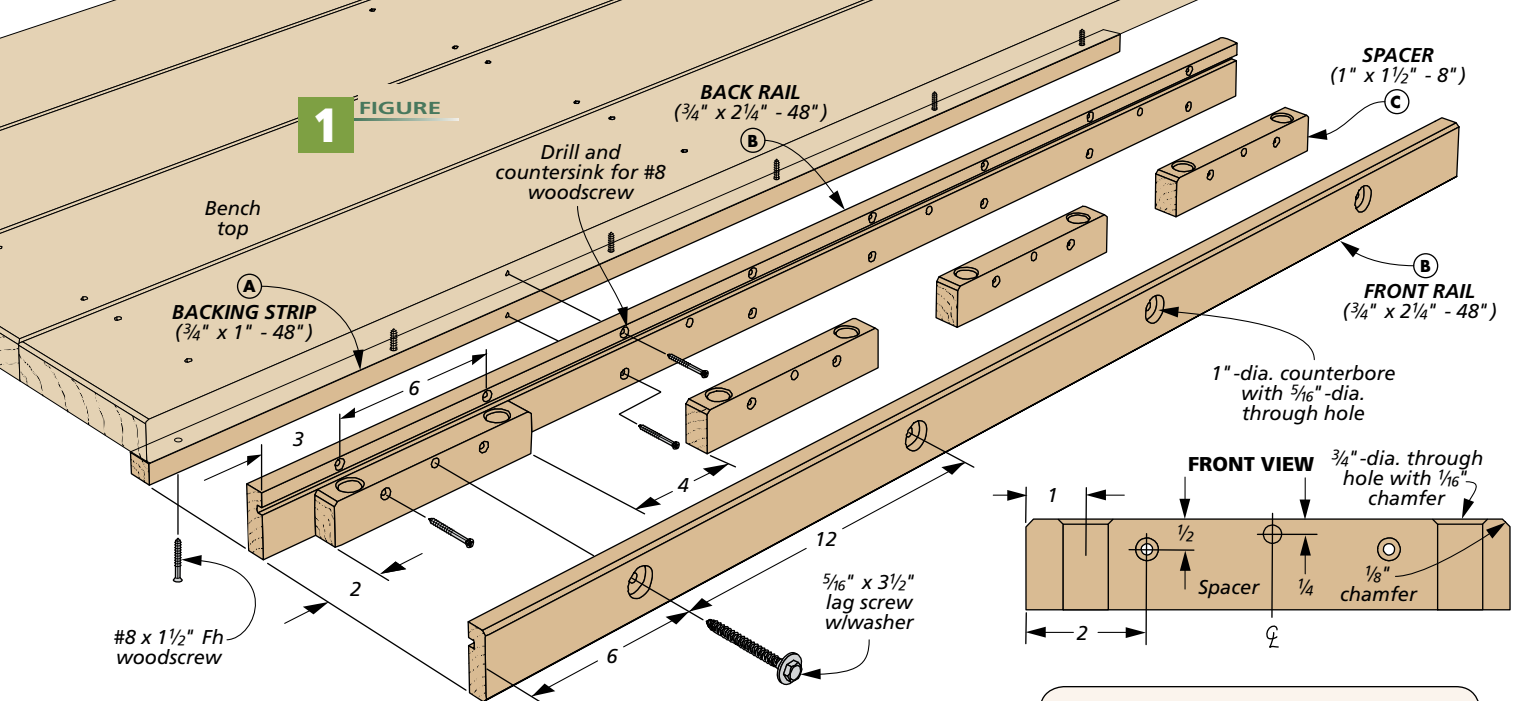
Transform any workbench into a multipurpose workstation by adding this versatile shop-made rail system.

A workbench is often just a large, flat surface for setting your work on to assemble a project. But as your woodworking skills grow, you might need more functionality from your workbench.

That's where the dual-rail system you see here comes into play. It adds a lot of features to an otherwise ordinary bench. First, the grooves in the pair of rails accommodate sliding accessories. These include dog blocks to clamp a workpiece, and tool anchors used to attach auxiliary platforms for tools like a bench vise or miter saw.

And speaking of a miter saw, the rail system also features a pair of support blocks for holding long workpieces when using the saw. Each of the support blocks can be positioned anywhere along the rails. Each one incorporates a stop that can be raised to make repetitive cuts quick and easy.

The bottom line is, you can turn an ordinary bench into a multipurpose workspace without a lot of time or material. Gaining additional functionality out of your shop space is always a good thing. And this project is just the ticket.



creating a Rail System

The foundation for the bench rail system starts with a pair of long rails separated by spacers. There's a groove in each of the rails on the inside face that forms a "track" for the accessories. A backing strip supports the back rail on thinner benchtops. And that's what you'll install first.

BACKING STRIP. There's one thing I need to point out before you start. The dimensions shown for the rails and backing strip are for a 48"-long section. My bench is 8' long, so I made two rail sections. You'll need

to adjust the dimensions to suit your workbench.

Each of the rails is 2 1/4" wide. Since the top of my bench is only 1 1/2" thick, I made a 3/4"-thick backing strip to beef up the thickness of the top and support the back rail. The final thickness of the backing strip, and whether you need one, depends on the thickness of your benchtop.

After cutting the backing strip to size and proper thickness, fasten it to the underside of the benchtop, flush with the front edge. Then you can turn your attention to the rail assembly.

GROOVED RAILS. The front and back rails are simple to make, as you can

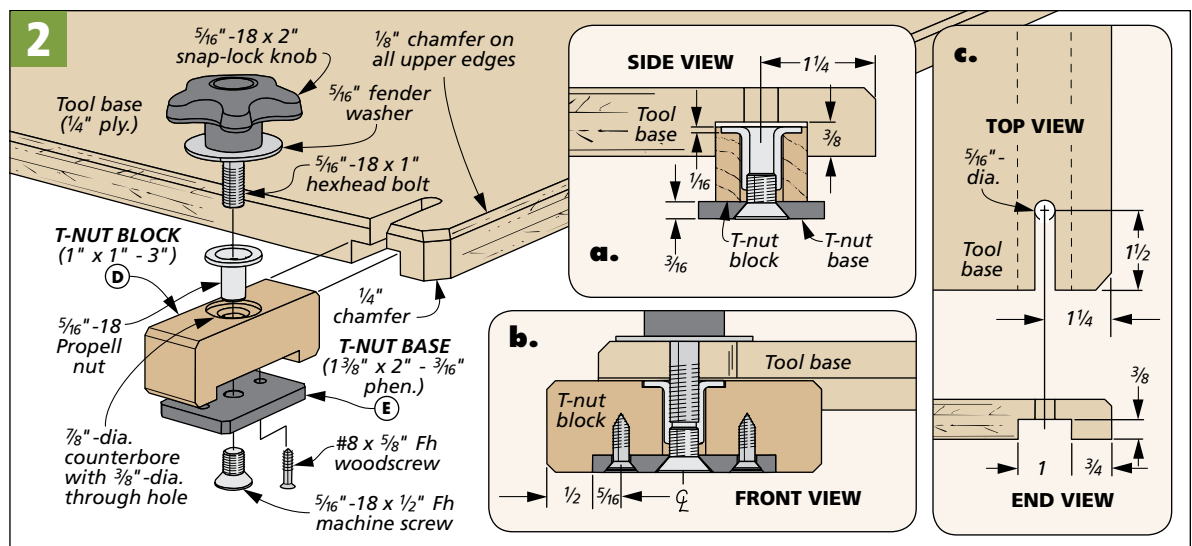
see in Figure 1. They're cut to the same size. I cut a 1/4" groove on the inside faces with a dado blade. A chamfer on the front rail eases the outside edges.

Some careful layout is in order for drilling all of the holes in the two rails. Countersunk screw holes



Phenolic.

A strong, stable material, a phenolic insert is an ideal base for the sliding accessories.



in the back rail are used to fasten it to the bench.

To drill the holes for the lag screws that secure the rail assembly, start by drilling the counterbores in the front rail. Then clamp the two rails together to drill the through holes.

SPACERS. Several spacers separate the rails (Figure 1). The openings between them allow sawdust to fall through the rails.

ASSEMBLING THE RAILS. The rails and spacers can now be mounted to the bench, starting with the back rail. It should be flush with the top of the workbench.

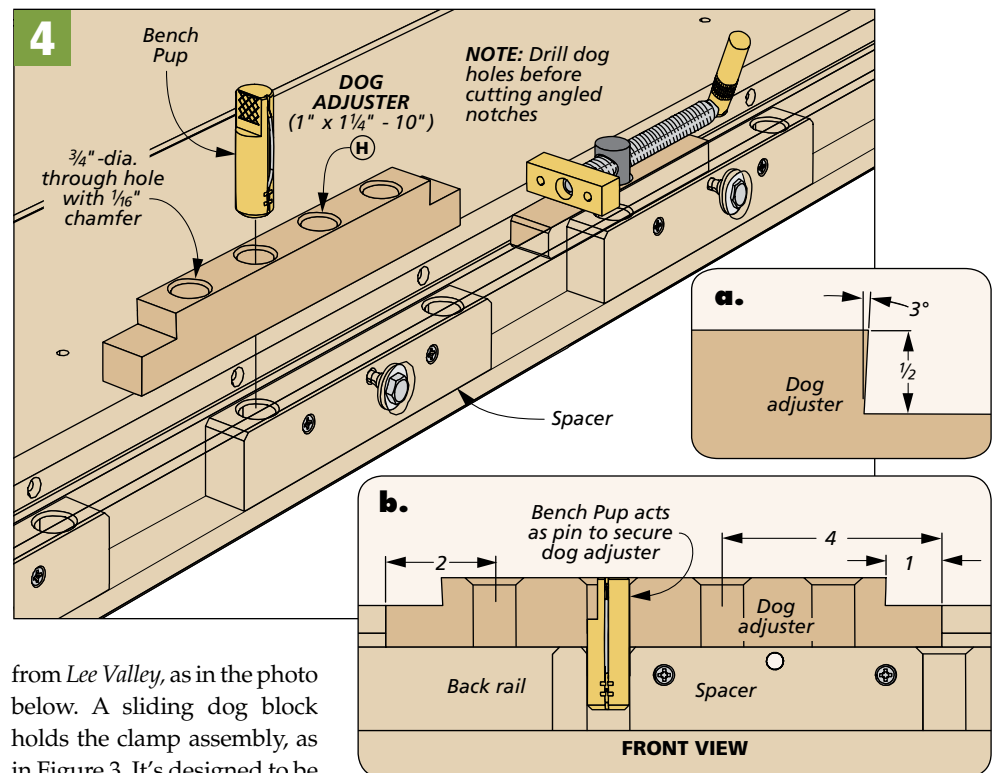
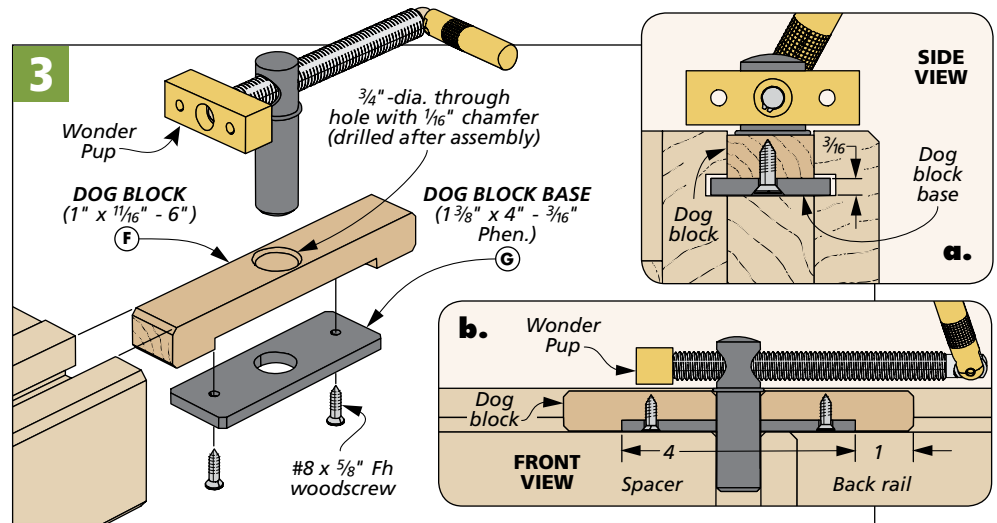
The spacers are next. Just make sure they're level and flush with the bottom of the groove in the rail (Figure 1a). Finally, add the front rail, keeping the top of the rail even with the back rail.

T-NUT BLOCKS. Now you can start adding accessories to the rail system. The T-nut block shown in Figure 2 is used to attach tools to the benchtop. I made six of them.

The blocks are made of hardwood with a phenolic base that slides along the grooves in the rails. I added a *Propell* nut to accept a studded knob that's used to secure the tool bases.

TOOL BASES. Figure 2 also shows how a plywood base fits over the T-nut blocks. The block slides into a groove. A slot at each end of the base allows it to slip around the studded knob. You'll size each base for the tool you intend to use on the benchtop. I made bases for my miter saw and machinist's vise.

DOG ASSEMBLY. No woodworking bench is complete without a series of bench dogs. I used a *Bench Pup* set



from *Lee Valley*, as in the photo below. A sliding dog block holds the clamp assembly, as in Figure 3. It's designed to be secured over a dog hole in one of the spacers between the rails.

I also made a dog adjuster that fits over one of the spacers, as in Figure 4. It can be positioned to allow easy clamping.

A bench dog locks the adjuster over a spacer, as shown in Figure 4b. Angled notches on the ends of the adjuster secure the workpiece tightly when clamped.



Bench Dogs. Clamping a workpiece with this adjustable bench dog system is a snap.

making the Support Stands

Since I planned to use my miter saw on my workbench, I thought it would be helpful to make a pair of supports for long workpieces. You can see what they look like in the photo at right. The height of each support matches the height of the table on the miter saw when it's mounted on the plywood base. So you may need to modify the height of the support stands to fit your miter saw.

The supports also incorporate an adjustable stop. It's made from phenolic and locks in place with a T-knob on the back side.

TOP & BASE. The top and the base of the supports are the same size. But their construction is a little different than what you might expect. Each of



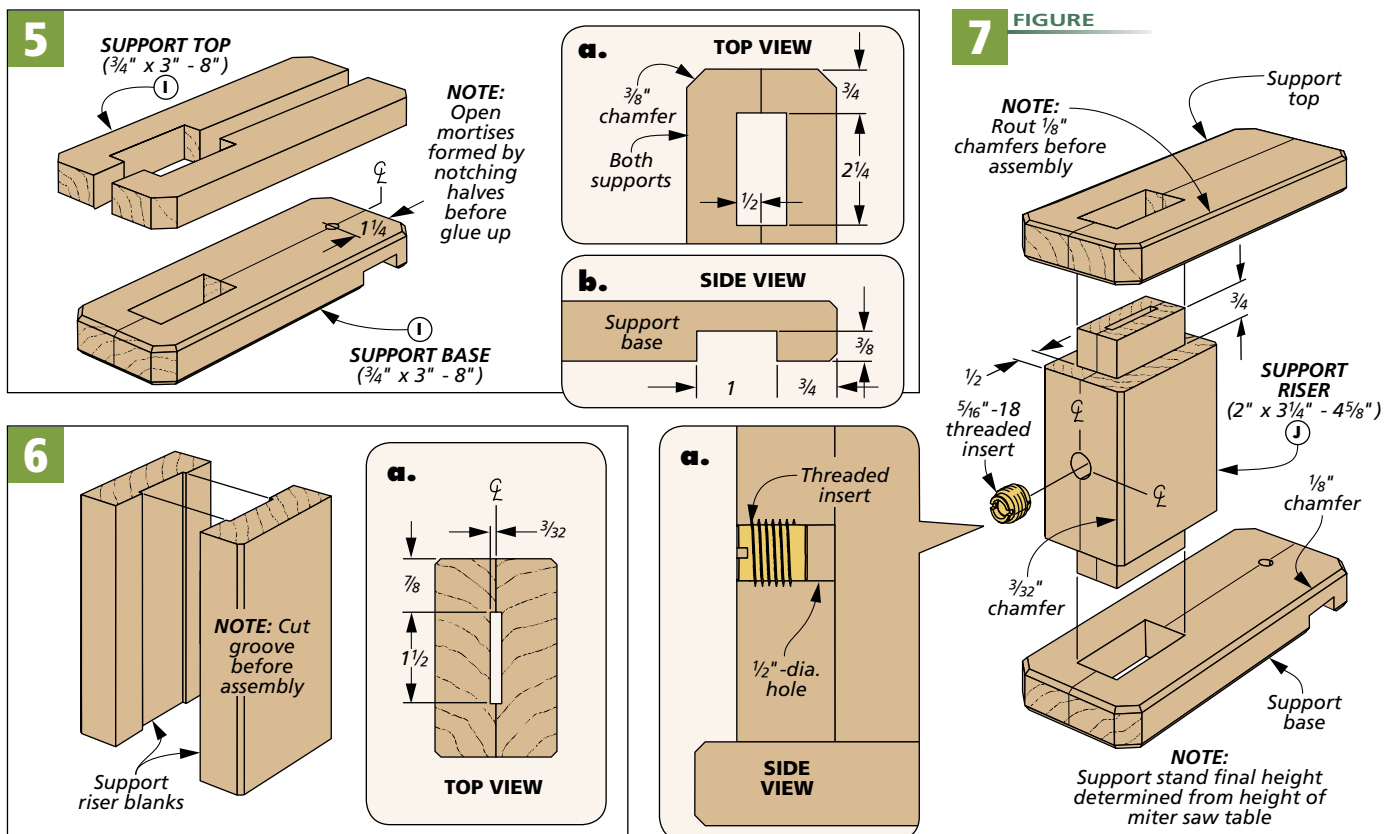
Support for Long Stock. A pair of supports slide along the bench rails and lock in place with cam clamps. An integrated, phenolic stop allows you to make accurate, repetitive cuts.

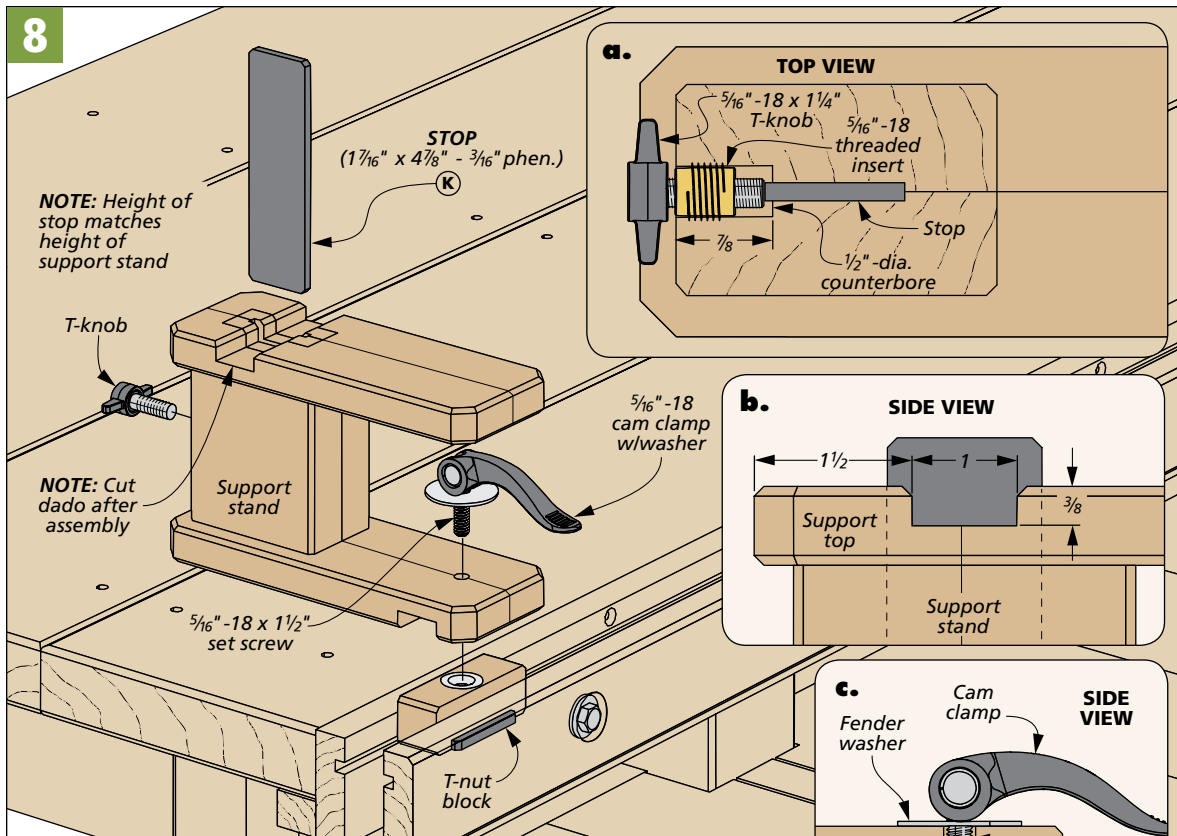
the pieces has a through mortise for the support riser. To cut these mortises, it's easier and more accurate to rip a blank in two, cut notches in each piece, then glue them together, as you can see in Figure 5.

Like the tool bases, the bottom of the support base has a dado to fit over the T-nut block. After nipping off the corners, chamfer both pieces

along the edges. Finally, drill a hole in the base for attaching the completed support to a T-nut block.

TWO-PART RISERS. An adjustable stop is one of the features of the supports. To form the mortise in the support riser to accommodate the piece of phenolic that serves as the stop, I used a similar two-part assembly process (Figure 6). Start with two blanks,





each long enough for the two halves of a riser. After cutting the blank to final width, cut a wide, shallow groove down the center. Size the groove for a smooth, sliding fit of the phenolic when the halves are assembled.

Glue the parts together, keeping the edges flush. I applied glue only along the outer edges to keep it out of the grooves.

There are a couple more woodworking tasks to complete. The first thing is to drill a hole for a threaded insert and install it (Figure 7). Next, you'll need to cut a tenon on each end to fit into the mortises in the top and base.

SUPPORT ASSEMBLY. You're ready to assemble the three parts of the support. Simply glue the top and base to the riser keeping them parallel to each other and square to the riser.

You can see in Figure 8 how a dado is cut on the top of each support after assembly. This provides room to adjust the stop. After cutting the dado, use a sanding block to chamfer the edges of the dado.

There are a few final details to complete the supports. It starts with cutting a piece of phenolic to create the stop. I sized the length to match the overall height of the support. This way, it sits flush when stored inside the support.

Now there are a couple pieces of hardware to add. The first is a small T-knob. It holds the stop in position. The second is a cam clamp. This makes it easy to lock the support securely on the rails.

All that's left to do now is put the rail system to use for your projects. It won't take long for you to wonder how you ever got along without it.

MATERIALS & SUPPLIES (FOR ONE 48" SECTION)

A	Backing Strip (1)	3/4 x 1 - 48	• (2) 5/16"-18 x 1" Capscrews
B	Rails (2)	3/4 x 2 1/4 - 48	• (2) 5/16"-18 Threaded Inserts
C	Spacers (4)	1 x 1 1/2 - 8	• (1) Bench Pups Set
D	T-Nut Blocks (6)	1 x 1 - 3	• (2) 5/16"-18 Cam Clamps
E	T-Nut Bases (6)	1 3/8 x 2 - 3/16 Phenolic	• (12) #8 x 5/8" Fh Woodscrews
F	Dog Block (1)	1 x 1 1/16 - 6	• (32) #8 x 1 1/2" Fh Woodscrews
G	Dog Block Base (1)	1 3/8 x 4 - 3/16 Phenolic	• (4) 5/16" x 3 1/2" Lag Screws
H	Dog Adjuster (1)	1 x 1 1/4 - 10	• (2) 5/16"-18 Snap-Lock Knobs
I	Support Base/Top (4)	3/4 x 3 - 8	• (2) 5/16"-18 x 1" Hex Bolts
J	Support Risers (2)	2 x 3 1/4 - 4 7/8	• (2) 5/16"-18 x 1 1/2" Set Screws
K	Stops (2)	1 7/16 x 4 7/8 - 3/16 Phenolic	• (8) 5/16" Washers
			• (6) 5/16" Fender Washers
			• (4) #8 x 1/2" Fh Woodscrews
			• (16) 5/16"-18 x 1/2" Fh Machine Screws

A wooden multipurpose shop cart is shown in a workshop setting. The cart has a thick, solid-wood top with a blue vise and a pencil resting on it. A person wearing a brown leather apron and blue jeans is standing behind the cart, working on a piece of wood. The cart features a storage cabinet with two drawers and a door, all with black handles. A blue cordless drill and a grey box are on top of the cabinet. The side of the cart has a pegboard with various tools hanging on it, including a hammer, pliers, and a saw. The cart is mounted on four heavy-duty casters. The background shows a wooden wall and floor.

multipurpose Shop Cart

A rock-solid design, ample workspace, and loads of storage all add up to a versatile project that's a great addition to any shop.

It's a good idea to have an extra workspace in the shop for assembly, finishing, or just to have a place to stack parts and supplies. The trouble is you don't always need it in the same place every time. That's where this cart comes in. The solid-wood top provides a generous amount of space to work. It rests on a stout

base that's built to stay strong and stable for years. The heavy-duty casters allow you to smoothly roll the cart wherever you need it. And finally, it has a storage cabinet and a pair of pegboard racks to keep tools and supplies close at hand. In fact, this sturdy cart would be a great rolling workbench for a small shop.

CONSTRUCTION DETAILS

OVERALL DIMENSIONS:

40³/₄" W x 36³/₄" H x 31¹/₂" D

Laminated, edge-grain top increases stability and wear-resistance

Ends of cart are assembled with bridle joints

Storage cabinet slides into base after assembly

Top of cabinet acts as a shelf for additional storage

NOTE: Cart base and top are made from inexpensive "two-by" construction lumber

Full-extension metal drawer slides allow easy access to the entire drawer

Three rows of bench dog holes give you versatile clamping options

NOTE: Wide overhang on top allows you to use clamps to secure a workpiece

NOTE: Back of cabinet is open to provide knee room when sitting (photo below)

Cart is built with heavy-duty, knock-down joinery (detail 'a')

Foot rail

Large, locking casters roll over cracks and debris, yet lock to create a stable workstation

Pegboard rack provides easy-access tool storage

a. Bed bolts thread into cross dowels in stretchers

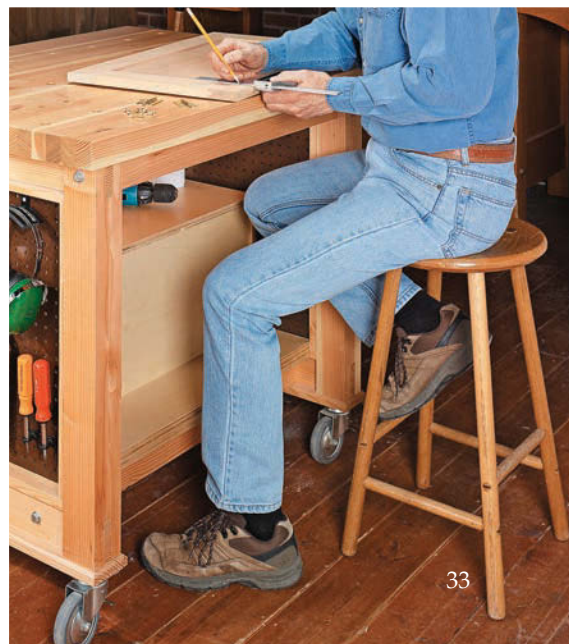
Cross dowel

NOTE: For hardware sources, refer to page 98

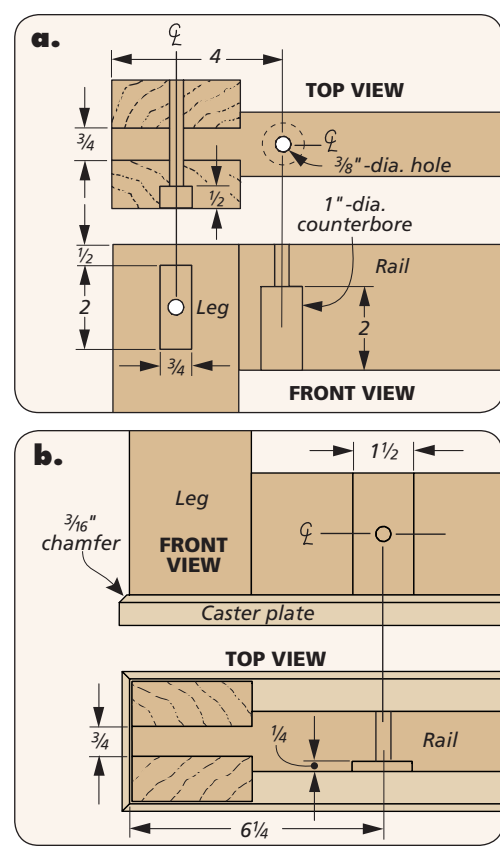
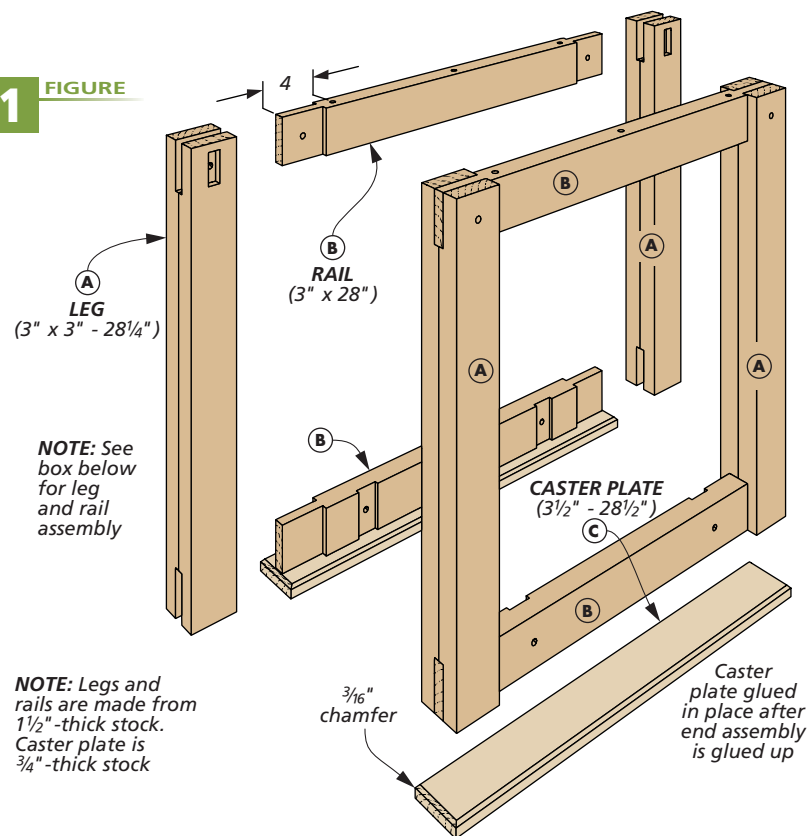
Open Back. Inset stretchers and a shallow storage cabinet give you leg room at the back of the cart.



For a cutting diagram and bonus technique articles, go to:
WoodsmithSpecials.com



1 **FIGURE**



heavy-duty Base

The core of the cart is the base. I had a few goals in mind when making it. The most important one is that it should be strong and rigid — and stay that way for years to come. As I said earlier, this cart can be a rolling workbench, so it should be just as tough as a regular workbench, too. To do this, I made

the base from thick solid-wood parts and traditional joinery — mortise and tenon, and bridle joinery. Rolling around uneven floors puts a lot of stress on the frame of a cart. So my second goal was to make the base easy to tighten up if things start to get wobbly. To do this, I used a set of bed bolts to secure some of the joints instead of glue. With just a few twists of a wrench, you can

snug up the joinery if necessary. A side benefit of this system is that it makes assembling the base a breeze.

The final goal is that I didn't want to spend a lot of money on materials. So I used ordinary construction lumber (Douglas fir).

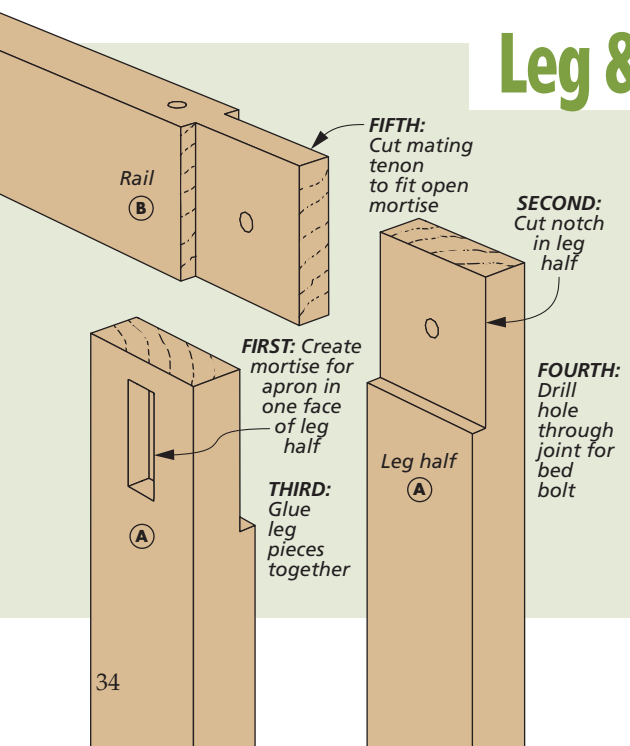
END FRAMES. In Figure 1, you can start to see how all this comes together. The base is made up of a pair of end frames that get connected by a set of stretchers and aprons. Each frame consists of a pair of legs and a pair of rails assembled with bridle joinery.

THICK LEGS. The thick legs that support the cart are 3"-square posts. They have an open mortise cut on each end to accept the rails. To create the legs, I glued them up from two pieces. This also makes it easier to make the open mortises. For more on the joinery, take a look at the box at left.

END RAILS. Once the legs are complete, the next task is the connecting rails. Each end rail has a tenon on the ends that fits the open mortise in the legs.

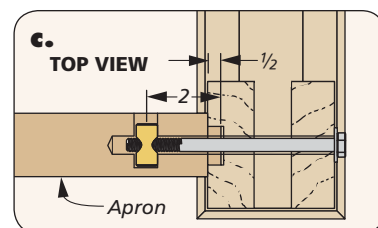
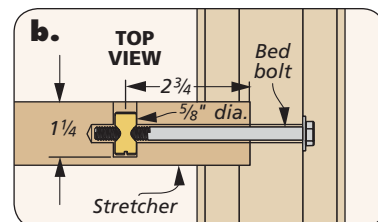
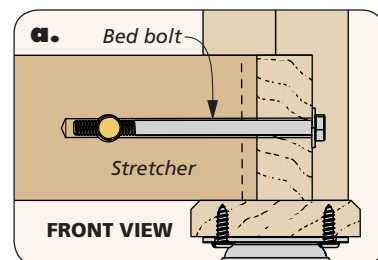
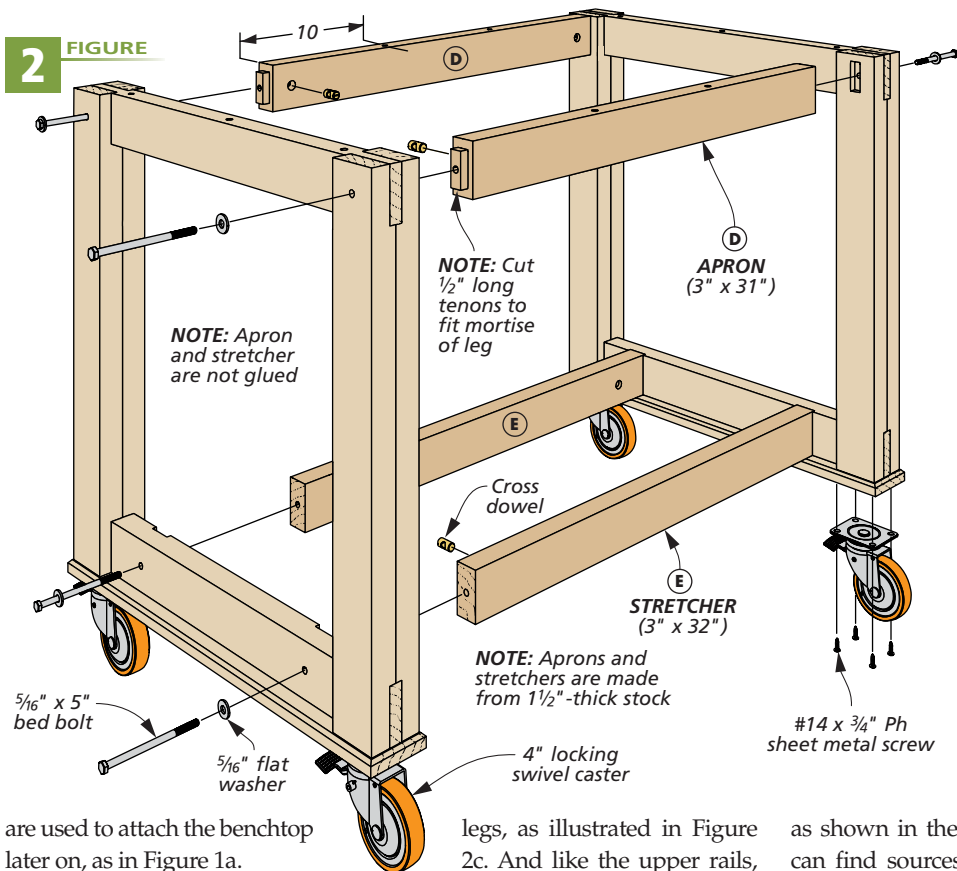
In addition, the upper rails have some deep, counterbored holes that

Leg & Rail Joinery Details



The key to creating the leg to rail joinery is doing things in the right order. It will make the joints tighter and more accurate to align.

Start by cutting a mortise in one leg half. Then cut a shallow notch on each half. When you glue the halves together, it will create the open mortise for the bridle joint. Next, you can drill the bed bolt hole through the mortise at the drill press. After cutting the mating tenon on the rails, you can complete the hole with a hand drill.



are used to attach the benchtop later on, as in Figure 1a.

At the bottom, the lower rails have a pair of dados cut on the inside faces. These dados accept stretchers that stiffen the lower part of the cart. There's also a hole through each dado to hold a bed bolt, as you can see in Figure 1b. I drilled these holes at the drill press so they were straight.

When you're ready to assemble the end frames, there are a few things to keep in mind. First, make sure the rails seat snugly in the mortises and at the shoulders. Then check that the assembled frame is flat and square.

CASTER PLATE. The last item to complete on each end frame is to make and attach a plate. This provides a solid mounting surface for the casters, as in Figure 2. The only detail to note is a small chamfer on the top edges (Figure 1b).

STRETCHERS & APRONS. Connecting the end frames are a set of aprons and stretchers. They're held in place with bed bolts (Figure 2). This technique doesn't require glue or clamps. The aprons have a tenon on each end to fit the mortise on the

legs, as illustrated in Figure 2c. And like the upper rails, the aprons are drilled and counterbored to attach the benchtop. The stretchers at the bottom of the cart are simply sized to fit in the dados in the lower rails.

The next step is to drill the aprons and stretchers to accept the special bed bolt and cross dowel hardware,

as shown in the right margin. You can find sources for the hardware on page 98. What's important here is that the holes intersect in the right spot. The box at the bottom of the page shows you how it's done.

With the joinery work complete, you can assemble the base. The last thing to do is install the casters.

Solid Assembly.

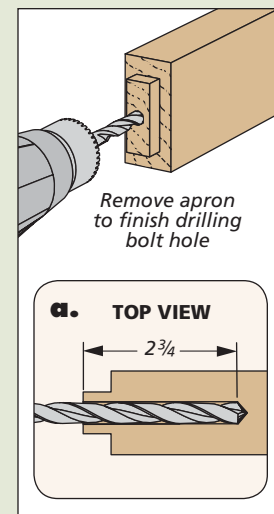
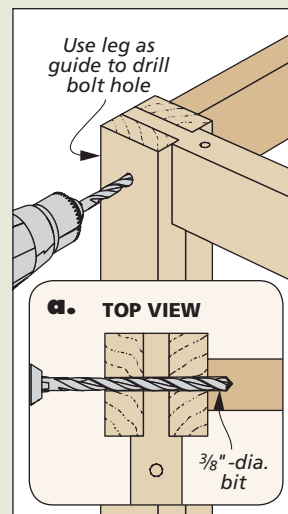
The base is held together with a set of bed bolts.



Drilling for Bed Bolts

Installing bed bolts to assemble the base of the cart involves nothing more than drilling a few holes. You just need to make sure they're aligned. To do this, you can use the holes you drilled in the legs and lower rails as a guide (detail 'a' in the left drawing at right).

The drill bit isn't long enough to complete the hole. So you need to remove the apron and continue drilling to final depth (far right drawing). Finally, at the drill press, drill the intersecting hole for the cross dowel.



laminated Benchtop

3 **FIGURE**

NOTE: Benchtop is made from 1 3/8"-thick stock laminated on edge

BENCHTOP
(31 1/2" x 40 3/4")

NOTE: For an article on making the benchtop, refer to WoodsmithSpecials.com

Capping the base of the shop cart is a large, solid-wood benchtop. I chose a wood top for a couple reasons. The primary one is functional. A thick, wood top provides a durable, sag-resistant worksurface. So it can stand up to the heavy, long-term use that you'd expect from a traditional workbench.

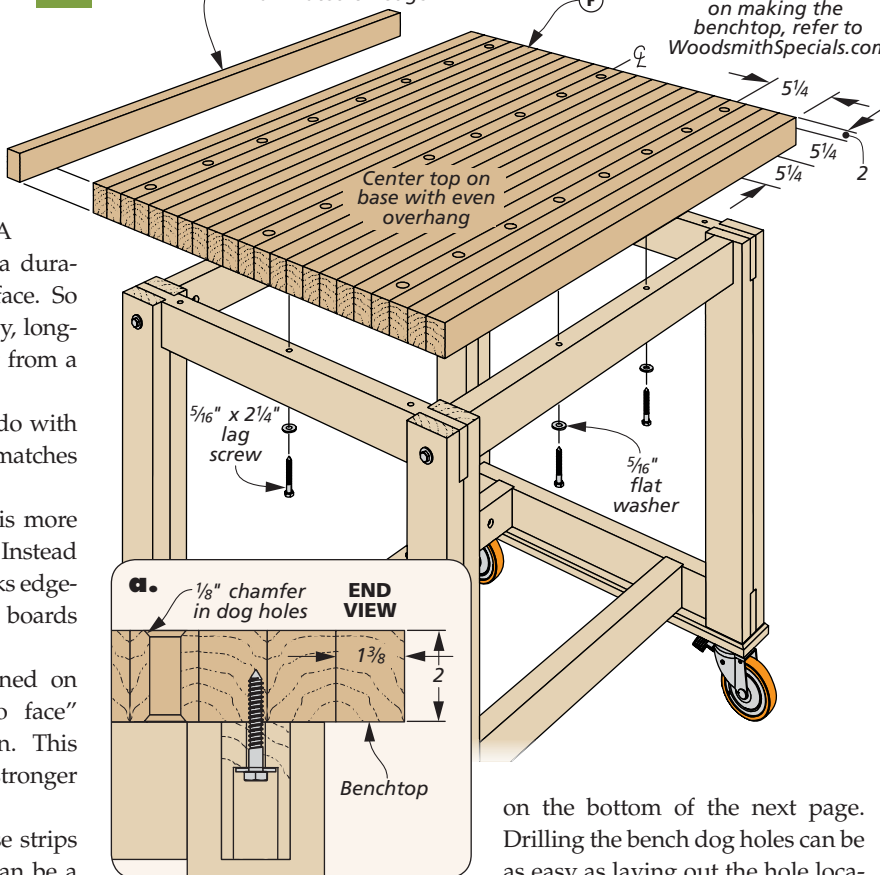
The other reason has to do with appearance. The wood top matches the look of the base.

EDGE GRAIN. The benchtop is more than just a glued-up panel. Instead of simply gluing wide planks edge-to-edge, I ripped the wide boards into narrow strips.

Then the strips are turned on edge and glued "face to face" to expose the edge grain. This butcher block-like top is stronger and more wear resistant.

However, gluing all those strips into a flat, consistent top can be a real challenge. You'll find an article detailing the process I used to do this at WoodsmithSpecials.com.

There's one last thing I want to point out about the top. It's sized to overhang the base on all four sides. This provides a way to clamp a workpiece to the top without interference from the legs, aprons, or rails.



BENCH DOG HOLES. You can leave the benchtop as is, but I went ahead and drilled three rows of bench dog holes, as you can see in Figure 3. This way, I can use a variety of dogs, hold-downs, and other aids to secure a workpiece to the benchtop without worrying about it shifting. You can see some of these

on the bottom of the next page. Drilling the bench dog holes can be as easy as laying out the hole locations (as shown in Figure 3) and drilling them with a hand drill and a 3/4"-dia. spade bit.

Just take care to drill them as straight and square as possible. To simplify the layout and drilling process, you can turn to page 24 to see a time-saving drilling guide.

CHAMFER THE HOLES. Finally, ease the edges of the holes. You can

MATERIALS & SUPPLIES

BASE & TOP

A	Legs (4)	3 x 3 - 28 1/4
B	Rails (4)	1 1/2 x 3 - 28
C	Caster Plates (2)	3/4 x 3 1/2 - 28 1/2
D	Aprons (2)	1 1/2 x 3 - 31
E	Stretchers (2)	1 1/2 x 3 - 32
F	Benchtop (1)	2 x 31 1/2 - 40 3/4

TOOL RACK

G	Tops/Bottoms (4)	3/4 x 2 1/2 - 22
H	Sides (4)	3/4 x 2 1/2 - 20 3/4
I	Tool Panels (2)	21 x 21 1/4 - 1/4 Pgbd.

STORAGE CABINET

J	Case Top (1)	15 1/2 x 30 - 3/4 Ply.
K	Case Bottom (1)	19 3/4 x 30 - 3/4 Ply.

L	Case Sides (2)	15 1/2 x 13 - 3/4 Ply.
M	Case Back (1)	13 x 29 - 1/4 Ply.
N	Case Divider (1)	15 x 13 - 3/4 Ply.
O	Foot Rail (1)	6 x 31 1/2 - 3/4 Ply.
P	Lip (1)	1 1/2 x 30 - 3/4 Ply.
Q	Upr. Drwr. Frt/Bk (2)	4 1/4 x 15 3/4 - 3/4 Ply.
R	Upr. Drwr. Sides (2)	4 1/4 x 14 - 3/4 Ply.
S	Drawer Bottoms (2)	13 x 15 3/4 - 1/4 Ply.
T	Lwr. Drwr. Frt/Bk (2)	6 9/16 x 15 3/4 - 3/4 Ply.
U	Lwr. Drwr. Sides (2)	6 9/16 x 14 - 3/4 Ply.
V	Upr. False Front (1)	5 x 17 5/8 - 3/4 Ply.
W	Lwr. False Front (1)	7 5/16 x 17 5/8 - 3/4 Ply.
X	Door (1)	9 7/8 x 12 3/8 - 3/4 Ply.
Y	Door Stop (1)	1/4 x 1 - 1

- (4) 4" Locking Swivel Casters
- (16) #14 x 3/4" Ph Sheet Metal Screws
- (2 sets) Bed Bolt Sets
- (44) #8 x 1 1/2" Fh Woodscrews
- (10) 5/16" x 2 1/4" Lag Screws
- (10) 5/16" Flat Washers
- (8) #8 x 1 1/4" Fh Woodscrews
- (2 pr.) 14" Full-Ext. Drwr Slides w/Screws
- (3) 5 3/4" Plastic Handles
- (6) #8 x 1 1/4" Ph Sheet Metal Screws
- (1 pr.) Spring Hinges w/Screws

do this with a hand-held router and a chamfer bit. This prevents the edges from splintering as you insert and remove bench dogs and other hold-downs.

ATTACHING THE TOP. Using solid wood for the top does have another challenge — accommodating seasonal wood movement. An edge-grain panel won't move as much as a plank-type top, but you still need to allow for it.

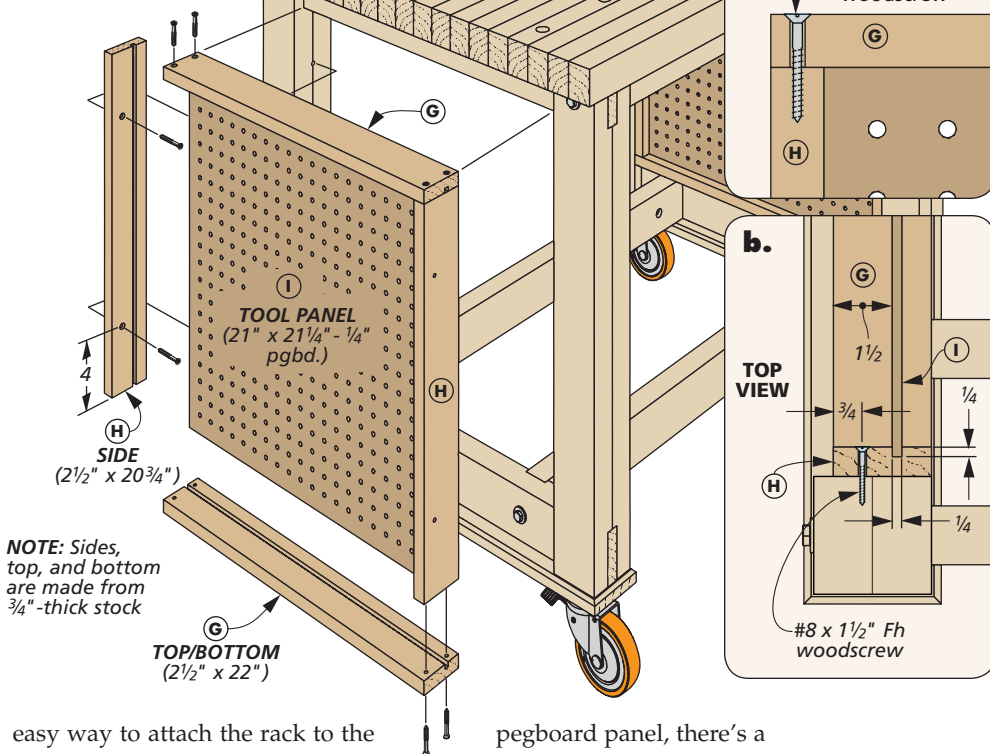
The top is secured to the cart base with long lag screws and washers. The screws are seated in the holes you drilled earlier in the rails and aprons. These holes are slightly oversized (Figure 3a). This allows the screws to move with the top as it expands and contracts.

That wraps up the major construction of the shop cart. And you can use it just as it is. But I wanted to take advantage of the space in the base to add some storage.

TOOL STORAGE RACKS

One way to build in some storage space is to add some pegboard tool racks to each end assembly. The racks are simply wood frames that wrap around a pegboard panel. The frame not only stiffens the panel but also provides an

4 **FIGURE**



easy way to attach the rack to the base, as illustrated in Figure 4.

MAKING THE FRAME. To make the racks, size the frame pieces to create a snug fit in the opening in each end assembly. Then cut the top and bottom pieces to fit between the legs in the base. Finally, cut the sides to fit between the top and bottom. To accept the

pegboard panel, there's a groove cut in each of the frame pieces, as in Figure 4b. The rack is assembled with glue and screws (Figures 4 and 4a).

After assembly, the racks can be screwed to the base, as you can see in Figure 4b. In the lower photos below, you can see some options for storing tools and supplies.



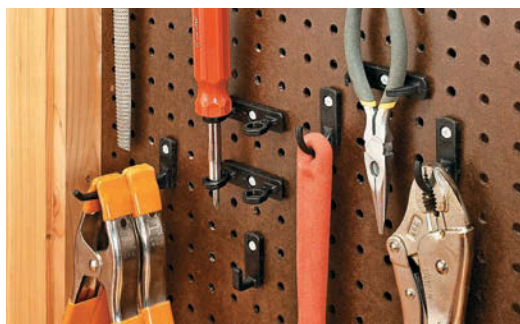
Clamping. A round brass *Bench Pup* and a threaded *Wonder Pup* create a handy "bench vise."



Hold-Downs. These cam-activated hold-downs secure a workpiece and allow you to reposition it quickly.



Racks. You can make plywood shelves and racks to store all kinds of tools on the pegboard racks.



Hooks. The plastic hooks lock into the pegboard so you never have to worry about them falling out.

storage Cabinet

5 FIGURE

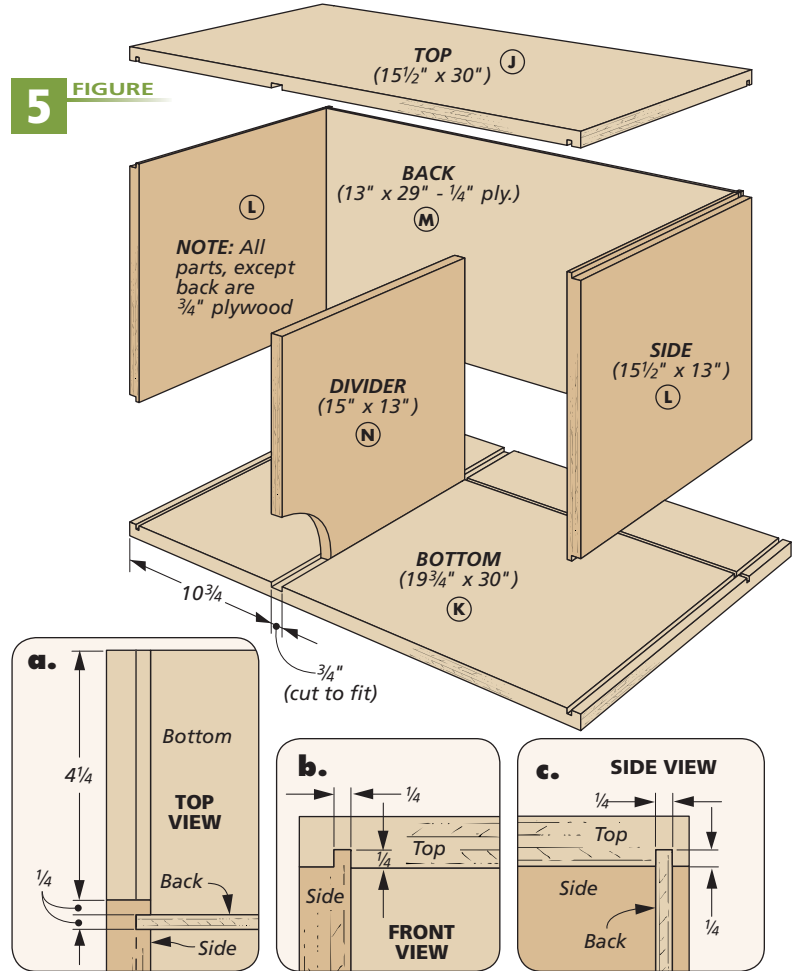
The open space created by the base of the cart is the perfect place for adding even more storage. The small cabinet you see in Figure 5 has a few interesting features. To provide several storage options, the cabinet contains two drawers and a door. And you can even use the top of the cabinet as a shelf to keep items within easy reach.

CASE

There's a lot of open space in the base, so it's tempting to fill it completely with a storage cabinet. But I built the case of the cabinet relatively shallow. There are a couple reasons for this. First, it's too easy for things to get lost in the back of the door side of the cabinet. And, it provides leg room on the back side to allow me to sit at the bench on a stool while I'm working.

TOP & BOTTOM. I started with the top and bottom. Each piece has dados and grooves to hold the sides, divider, and back (Figure 5).

To keep the setup straightforward, I sized the dados for the sides and groove for the back to match the thickness of the 1/4" plywood that makes up the back. The dado for the divider, on the other hand, is sized to match the thickness of the 3/4" plywood I used for the other parts of the cabinet.

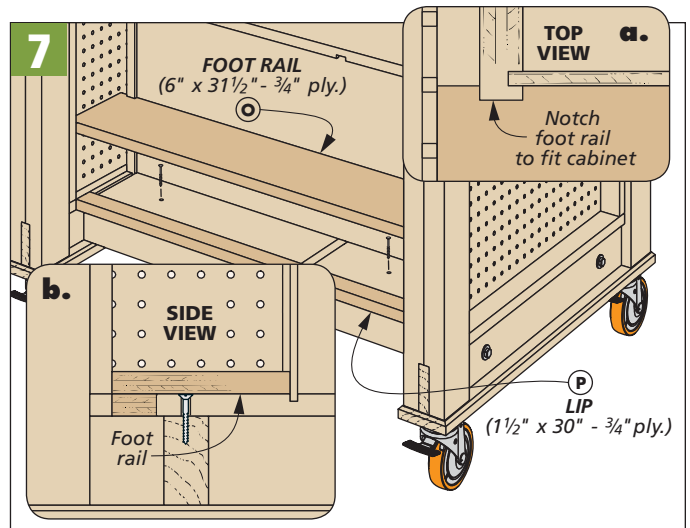
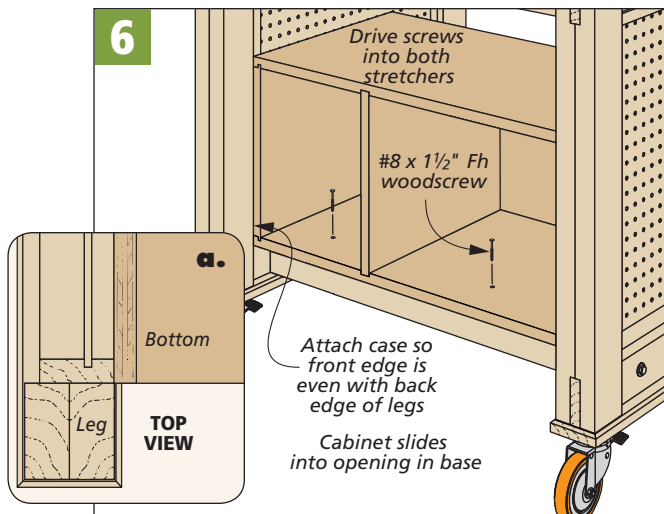


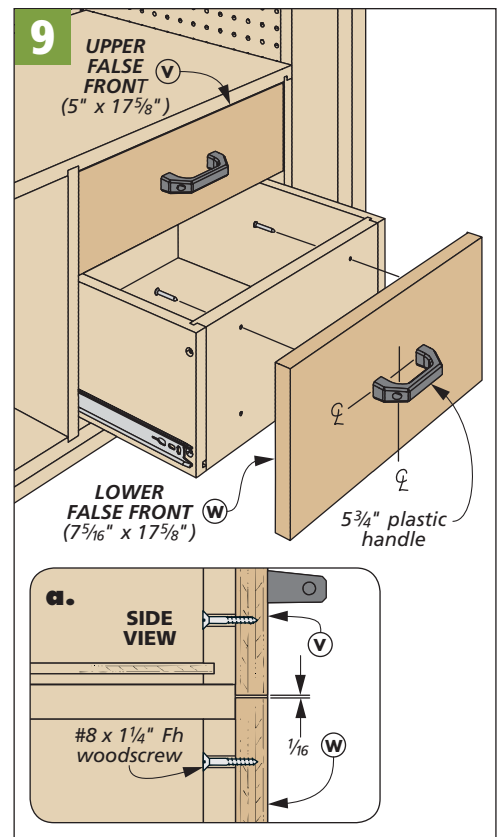
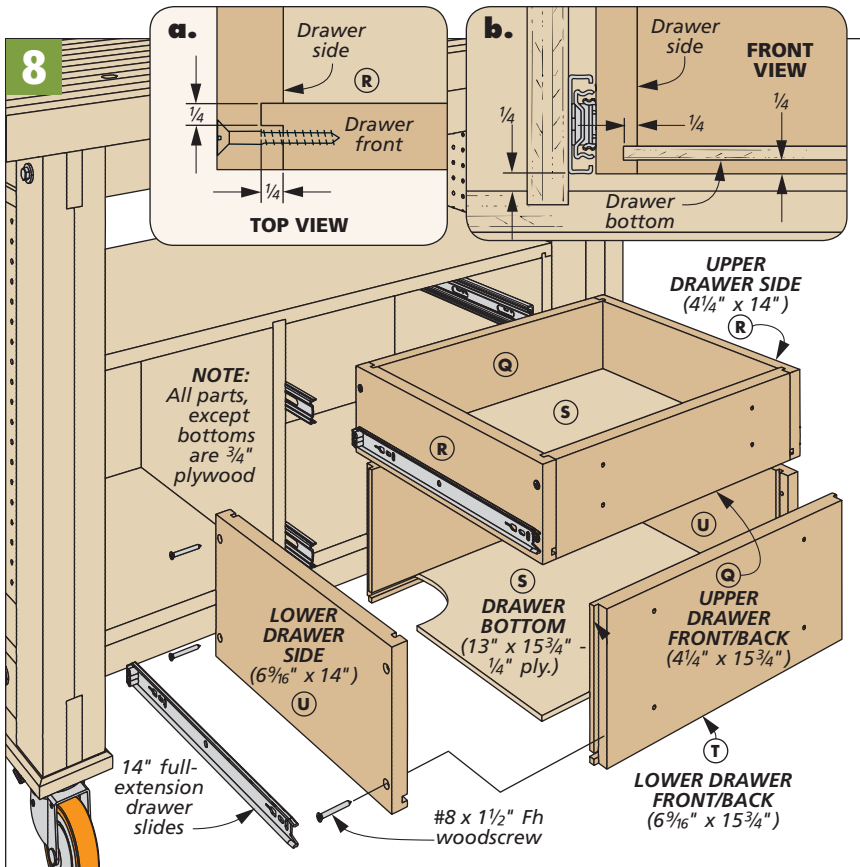
You'll notice that the bottom is wider than the top (Figure 5). This extra width allows the cabinet to rest on both stretchers in the base of the cart. And it provides a place to add a foot rail later on.

SIDES & DIVIDER. The next step is to make the sides and divider. The sides have a tongue cut on each end to fit the dados in the top and

bottom, as shown in Figure 5b. (The divider simply slides into its matching dado.) I also cut and fit the case back.

SOME ASSEMBLY. At this point, the case is ready to be assembled. Start by gluing the sides in place, add the divider, then the back. Finally, add the top and a few clamps to draw the joints tight.





In Figures 6 and 6a, you can see how the cabinet is attached to the base. I positioned the front edge of the case so that it's flush with the back edge of the legs.

FOOT RAIL. I mentioned earlier that the back of the case extends across both stretchers for stability. I wanted to cover the exposed dadoes on the back of the case bottom. So I added a foot rail and lip to cover the top face and back edge, as you can see in Figure 7. It also provides a footrest when working on this side of the cart.

DRAWERS & DOOR

That takes care of the case of the cabinet. Now you can turn your attention to the two drawers and door that divide the cabinet.

DRAWERS. The drawers on the right side of the cabinet are the perfect place to store frequently used tools and supplies. They're slightly different sizes, but the construction process is the same, as shown in Figure 8.

Once the main drawer parts are cut to size, you can work on the joinery. The drawers are assembled with tongue and dado joinery, as shown in Figure 8a. The sides have a dado cut near each end. And a mating tongue is cut on each end of the front and back.

Next, a groove is cut in all the parts to hold the drawer bottom, as shown in Figure 8b. Once again, the groove is sized to match the thickness of 1/4" plywood.

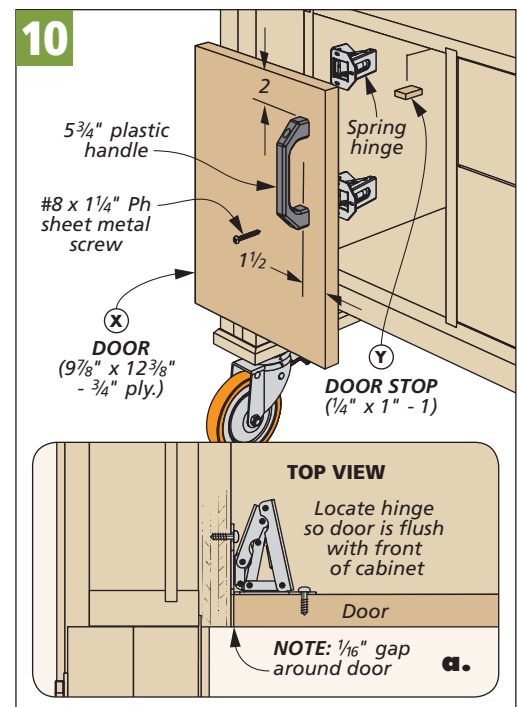
After gluing the drawer box together, I added screws to reinforce the joinery (Figure 8).

The final step on the drawers is to add a false front. This covers the end grain of the drawer sides and the exposed groove for the drawer bottom. And it gives the drawer a clean look, as illustrated in Figure 9. The false front is screwed in place and has a plastic pull attached.

DOOR. The last part of the storage cabinet is the door, as shown in Figure 10. It's simply a plywood

panel that's sized to fit the opening with a 1/16" gap on all sides.

The cart can now be loaded up with supplies. And it will be a versatile addition to your shop.



multipurpose Shop Cart

MATERIALS & HARDWARE

BASE & TOP

A	Legs (4)	3 x 3 - 28 $\frac{1}{4}$
B	Rails (4)	1 $\frac{1}{2}$ x 3 - 28
C	Caster Plates (2)	$\frac{3}{4}$ x 3 $\frac{1}{2}$ - 28 $\frac{1}{2}$
D	Aprons (2)	1 $\frac{1}{2}$ x 3 - 31
E	Stretchers (2)	1 $\frac{1}{2}$ x 3 - 32
F	Benchtop (1)	2 x 31 $\frac{1}{2}$ - 40 $\frac{3}{4}$

TOOL RACK

G	Tops/Bottoms (4)	$\frac{3}{4}$ x 2 $\frac{1}{2}$ - 22
H	Sides (4)	$\frac{3}{4}$ x 2 $\frac{1}{2}$ - 20 $\frac{3}{4}$
I	Tool Panels (2)	21 x 21 $\frac{1}{4}$ - $\frac{1}{4}$ Pgbd.

STORAGE CABINET

J	Case Top (1)	15 $\frac{1}{2}$ x 30 - $\frac{3}{4}$ Ply.
K	Case Bottom (1)	19 $\frac{3}{4}$ x 30 - $\frac{3}{4}$ Ply.

L	Case Sides (2)	13 x 15 $\frac{1}{2}$ - $\frac{3}{4}$ Ply.
M	Case Back (1)	13 x 29 - 1/4 Ply.
N	Case Divider (1)	13 x 15 - $\frac{3}{4}$ Ply.
O	Foot Rail (1)	6 x 31 $\frac{1}{2}$ - $\frac{3}{4}$ Ply.
P	Lip (1)	1 $\frac{1}{2}$ x 30 - $\frac{3}{4}$ Ply.
Q	Upr. Drwr. Frt/Bk. (2)	4 $\frac{1}{4}$ x 15 $\frac{3}{4}$ - $\frac{3}{4}$ Ply.
R	Upr. Drwr. Sides (2)	4 $\frac{1}{4}$ x 14 - $\frac{3}{4}$ Ply.
S	Drwr. Bottoms (2)	13 x 15 $\frac{3}{4}$ - $\frac{1}{4}$ Ply.
T	Lwr. Drwr. Frt/Bk. (2)	6 $\frac{9}{16}$ x 15 $\frac{3}{4}$ - $\frac{3}{4}$ Ply.
U	Lwr. Drwr. Sides (2)	6 $\frac{9}{16}$ x 14 - $\frac{3}{4}$ Ply.
V	Upr. False Front (1)	5 x 17 $\frac{5}{8}$ - $\frac{3}{4}$ Ply.
W	Lwr. False Front (1)	7 $\frac{5}{16}$ x 17 $\frac{5}{8}$ - $\frac{3}{4}$ Ply.
X	Door (1)	9 $\frac{7}{8}$ x 12 $\frac{3}{8}$ - $\frac{3}{4}$ Ply.
Y	Door Stop (1)	$\frac{1}{4}$ x 1 - 1

- (4) 4" Locking Swivel Casters
- (16) #14 x $\frac{3}{4}$ " Ph Sheet Metal Screws
- (2 sets) Bed Bolt Sets
- (44) #8 x 1 $\frac{1}{2}$ " Fh Woodscrews
- (10) $\frac{5}{16}$ " x 2 $\frac{1}{4}$ " Lag Screws
- (10) $\frac{5}{16}$ " Flat Washers
- (8) #8 x 1 $\frac{1}{4}$ " Fh Woodscrews
- (2 pr.) 14" Full-Ext. Drawer Slides w/Screws
- (3) 5 $\frac{3}{4}$ " Plastic Handles
- (6) #8 x 1 $\frac{1}{4}$ " Ph Sheet Metal Screws
- (1 pr.) Spring Hinges w/Screws

CUTTING DIAGRAM

$\frac{3}{4}$ " x 5 $\frac{1}{2}$ " - 96" Douglas Fir



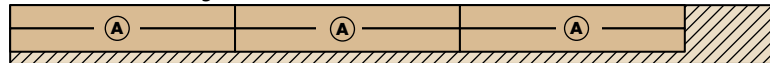
$\frac{3}{4}$ " x 5 $\frac{1}{2}$ " - 96" Douglas Fir



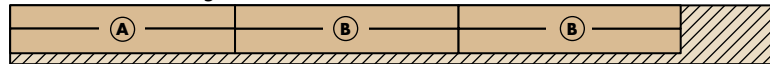
1 $\frac{1}{2}$ " x 7 $\frac{1}{4}$ " - 96" Douglas Fir (Four Boards)



1 $\frac{1}{2}$ " x 7 $\frac{1}{4}$ " - 96" Douglas Fir



1 $\frac{1}{2}$ " x 7 $\frac{1}{4}$ " - 96" Douglas Fir



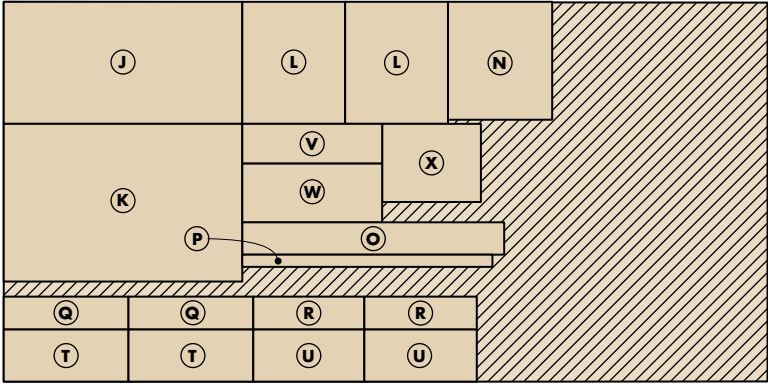
1 $\frac{1}{2}$ " x 7 $\frac{1}{4}$ " - 96" Douglas Fir



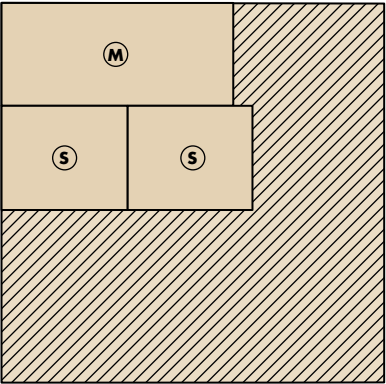
NOTE: Door stop (Y) is resawn and planed to $\frac{1}{4}$ " thick



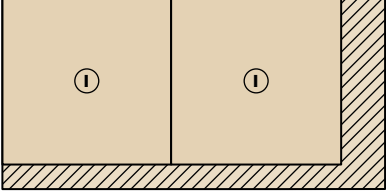
48" x 96" - 3/4" Birch Plywood



48" x 48" - 1/4" Birch Plywood



24" x 48" - 1/4" Pegboard



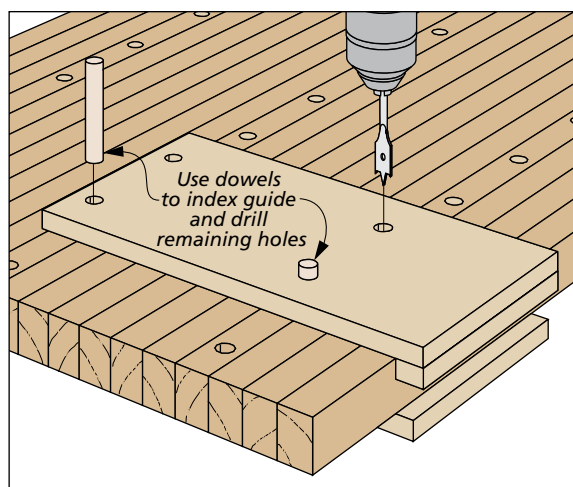
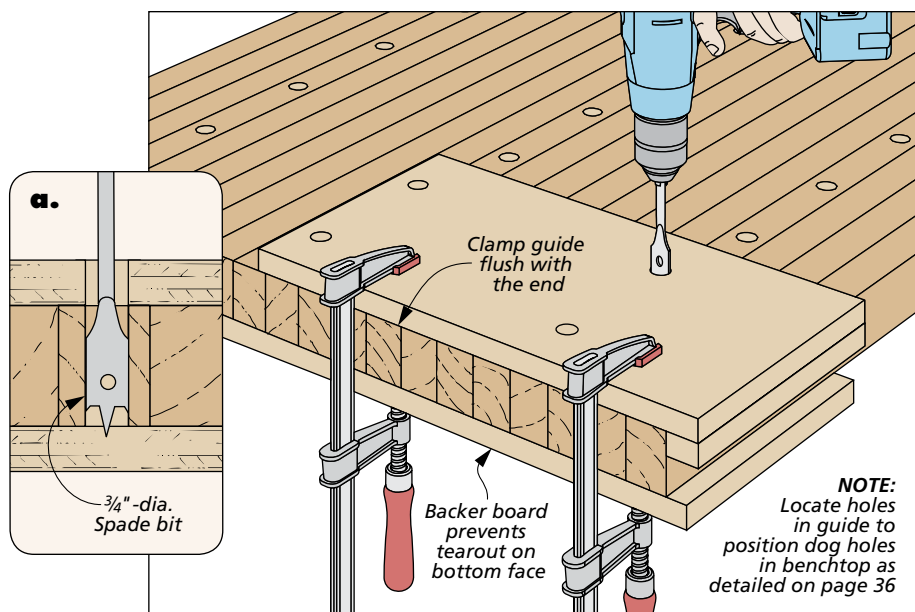
drilling Bench Dog Holes

There are a few things to keep in mind when you drill holes in the benchtop on the multipurpose shop cart. First, you want each of the three rows to be straight. Then the rows need to be parallel and each set of holes need to be aligned. Finally, the holes should be drilled square to the benchtop. That's a lot to keep track of.

To take some of the hassle out of drilling the holes, I made the drilling guide you see in the drawings above and at right. The guide helps keep the spade bit square to the surface and sets the spacing of both the holes and rows on the benchtop.

The guide is just a piece of plywood with two sets of guide holes. I drilled these at the drill press to make sure they'd be square. A cleat on one edge of the guide registers it against the side of the benchtop.

I used a couple of clamps to prevent the guide from shifting during use. And I placed another piece of



plywood on the bottom face of the benchtop to prevent tearout as the bit exits. To accurately position the guide after drilling the first set of holes, slip a couple of dowels through the guide (drawing above).



gluing up a Solid-Wood Top

A step-by-step approach is the secret to turning a number of ordinary wood strips into a flat, stable worksurface.

Building a laminated top, like the one on the multi-purpose cart, might seem intimidating at first. There are a lot of strips to glue together. So getting a flat, smooth surface with tight-fitting joints can be a challenge.

The key to success is breaking up the process into smaller, more manageable steps. You'll be surprised at how easy it is.

CREATING THE STRIPS

The first step in building a laminated top is selecting the right material for the strips. Since the top will see a lot of use, a durable material is a must. You could use hardwood, but cost is always a consideration. To solve both problems, I chose "two-by" Douglas fir (top board in margin) to make the top of the cart. Besides being hard and durable, it's relatively inexpensive and you can find it at most home centers and lumberyards.

As you select your material, be sure to spend some time finding straight boards with as few knots and defects as possible. It pays to be a little choosy here. Once you get the lumber home, it's a good

idea to let it sit for a few days to acclimate to your shop.

ROUGH LENGTH & EXTRA WIDE. The next step is to cut the lumber to rough length. I like to start with pieces that are a few inches longer than I need. And then I rip the boards into strips, like the center boards shown in the margin.

The main goal is to start with extra-wide strips. Then you can flatten one face and straighten one edge with your jointer. After running each strip through the planer and ripping the other edge straight, you'll end up with consistent strips ready for gluing (lower boards

in margin). Since I wanted my top about 2" thick, I ripped the strips down to 2 $\frac{1}{8}$ " wide. This provides a little extra thickness for jointing and planing later.

Once you have all the strips cut, you'll be turning them on edge when you glue them up. This exposed edge grain provides a couple of side benefits — a tougher surface and a more stable top.

START SMALL

At this point, you're ready to start gluing up strips. But the key to a flat top is to start small. Instead of trying to glue all the strips at



Step-by-Step.

Starting with basic "two-by" stock (upper photo) and cutting it to rough size (center), you can create straight consistent stock ready for glueup (lower photo).



Flatten. Once you have glued up a narrow section of strips, use a jointer to flatten one face.



Thickness. With one face flat, a planer makes quick work of bringing each section to final thickness.

once, it's better to deal with just a few at a time. It's less hectic and you'll end up with better results.

REFERENCE SURFACE. If you have a nice flat worksurface to use for the glue-up, that's great. But the sawhorses I used worked just as well. The first thing I did was sight across their tops and adjust them to make sure they were in the same plane. This minimizes any chance of introducing twist into the glueups.

GLUE UP A SECTION. With the reference surface ready, apply glue and clamp a set of the strips together to form a small slab that's narrow enough to run across your jointer, like you see in the main photo on the opposite page. I also like to use a clamp across each joint line. Doing this keeps the surfaces as even as possible.

After scraping off the squeezeout, flatten one face (left photo at bottom of opposite page). Finally, run the section through your planer to flatten the opposite face and bring the assembly to final thickness, like you see in the lower right photo on the opposite page. It's also a good idea to joint each edge to ensure it's flat, straight, and square to the surface.

Then you can simply repeat this process to create as many sections as you'll need for the top. (I ended



up with five, four-strip sections and a single, three-strip section.)

FINAL ASSEMBLY

At this point, you're ready to glue the sections together into a full-width top. Here again, I keep things simple. Instead of gluing up all the sections at once, I only glue two together at a time (inset above).

Now comes the easy part, gluing the larger sections together to create the top. Again, clamping across the joint lines minimizes any flattening work once the glue dries.

Since the top is too wide to run across a jointer (or through a planer, for that matter), any flattening will have to be done with a belt sander or hand plane. But with the steps detailed here, don't be surprised if all you really need to do is scrape away a little excess glue. That's all I did for the top you see here.

TRIM TO FINAL SIZE. All that's left to do at this point is cut the top to final length. And that means trimming both of the ends straight and square.

Because of the size of the top, you won't be able to do this on your table saw. A simple solution is to use a circular saw and a straightedge clamped securely across the end, as in the photo at left.

As you can see, the task of creating a solid-wood top that's smooth and flat isn't all that difficult. The key to the process is taking it one step at a time. This way you're sure to end up with a great-looking top — just like the one you see below.

Final Assembly.

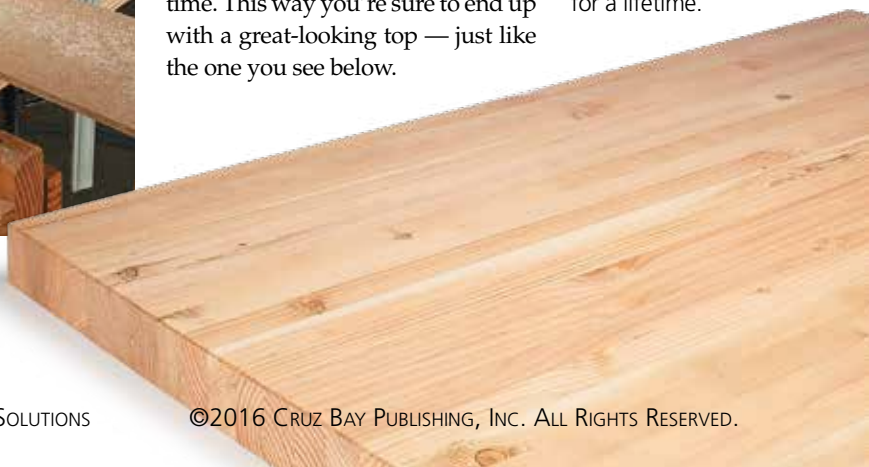
After gluing up pairs of narrow sections (inset photo at left), it won't take much effort to complete the final glueup of the top.

Flat & Smooth.

Keeping each step of the process simple and concise is key to creating a solid-wood top that will serve your shop for a lifetime.



Trimming the Top to Size. A circular saw and a simple straightedge clamped square to the edge make quick work of trimming the top to its final length.







mobile storage Options

Often when working in the shop, you'll need your tools to move along with you. From high-capacity storage cabinets that roll to smaller toolboxes that you can carry, these projects provide the solutions.

ROLL-AROUND TOOL CABINET42

HEIRLOOM TOOL CHEST50

SWING-DRAWER SHOP CART56

ANTIQUE TOOLBOX62



roll-around Tool Cabinet

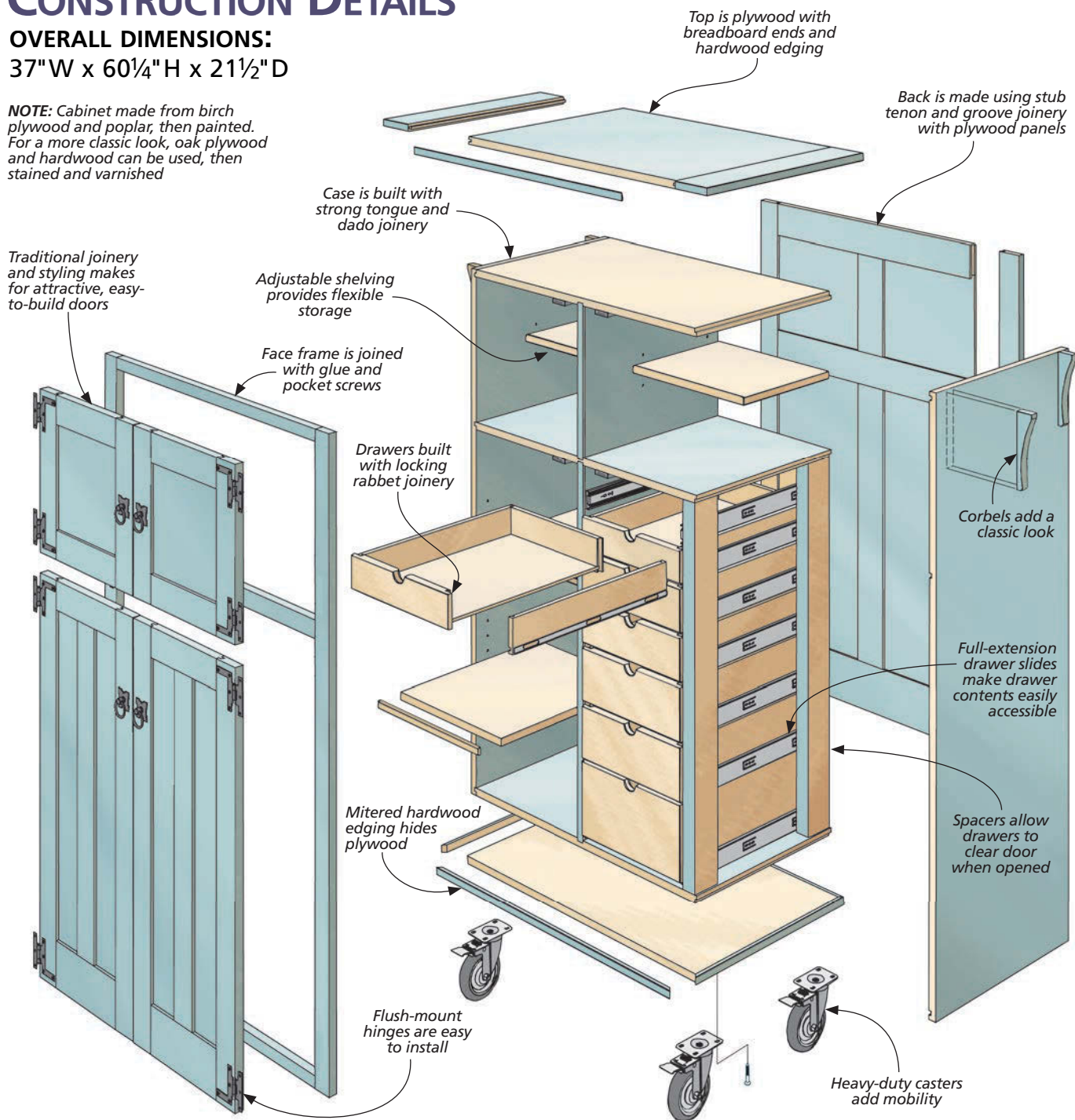
Organize and store all your power tools, hand tools, and other shop supplies in high style with this classic mobile cabinet design.

CONSTRUCTION DETAILS

OVERALL DIMENSIONS:

37"W x 60¼"H x 21½"D

NOTE: Cabinet made from birch plywood and poplar, then painted. For a more classic look, oak plywood and hardwood can be used, then stained and varnished



When I first saw the concept drawings for this tool chest, I thought it hit all the right buttons for a shop project. It's packed full of storage options, including a bank of drawers and adjustable shelves. All of this is hidden inside a classic, "country Craftsman" cabinet that looks more like an armoire worthy of storing your most-prized tools. The heavy-duty locking casters make it easy to keep your tools at hand wherever you need them. The project got another

nod of approval from the shop craftsman who built it. He's already laid claim to it and put it to use near his workbench in the *Woodsmith* shop.

The best part is, the woodworking is all pretty straightforward. You start by building the basic case, add the top and bottom, and then concentrate on the shelves and drawers with full-extension slides. Finally, you close everything up with the two pairs of frame and panel doors.



For a cutting diagram and bonus technique articles, go to:

WoodsmithSpecials.com

start with the Case

Building the plywood shell for the cabinet involves simple but strong joinery. The case is put together with tongue and dado joints. I made a hardwood face frame assembled with pocket screws. After assembling the case, you'll attach the face frame with glue.

CASE CONSTRUCTION

You'll find most of what you need to know about building the case in Figure 1 below. The first order of business is to rip plywood panels to the same width for the sides, top, shelf, and bottom.

DADOES. I started by cutting the panels to their final length. Then I got busy on making the joinery. For that, a $\frac{3}{8}$ "-wide dado blade in the table saw is the tool of choice. You'll use it to first cut dados in the sides that hold the top, shelf, and bottom panels.

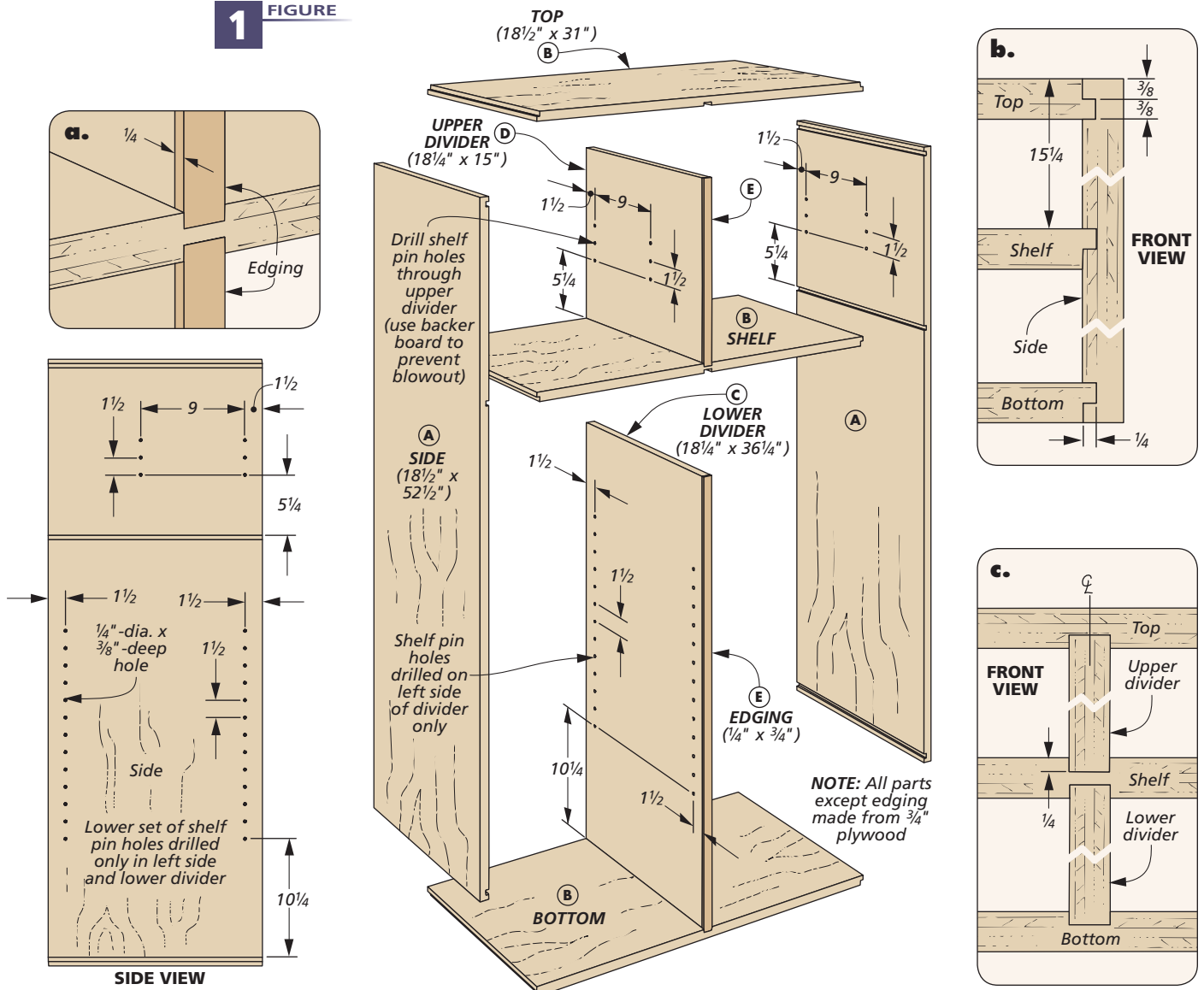
When cutting the dados, the rip fence acts as a stop to locate them. To help guide the long workpieces through the cut, I fastened a long auxiliary fence to the miter gauge. It's a matter of adjusting the blade height to cut the $\frac{1}{4}$ "-deep dados. Then you can work on the mating pieces.

CENTERED DADOES. In Figure 1 you can see how the top, bottom, and

shelf have a dado centered on their length. These dados accommodate the upper and lower dividers you'll add later. I kept the dado blade at $\frac{3}{8}$ ", made one pass, then flipped the workpiece for another pass. This centers the dado and allows you to sneak up on the proper width.

TONGUES. To cut the mating tongues on the top, shelf, and bottom, I widened the dado stack and installed an auxiliary rip fence. By partially burying the dado blade in the fence, you can cut the rabbets on the ends of the workpieces. These rabbets form the tongues to fit in the dados in the two case sides.

1 **FIGURE**



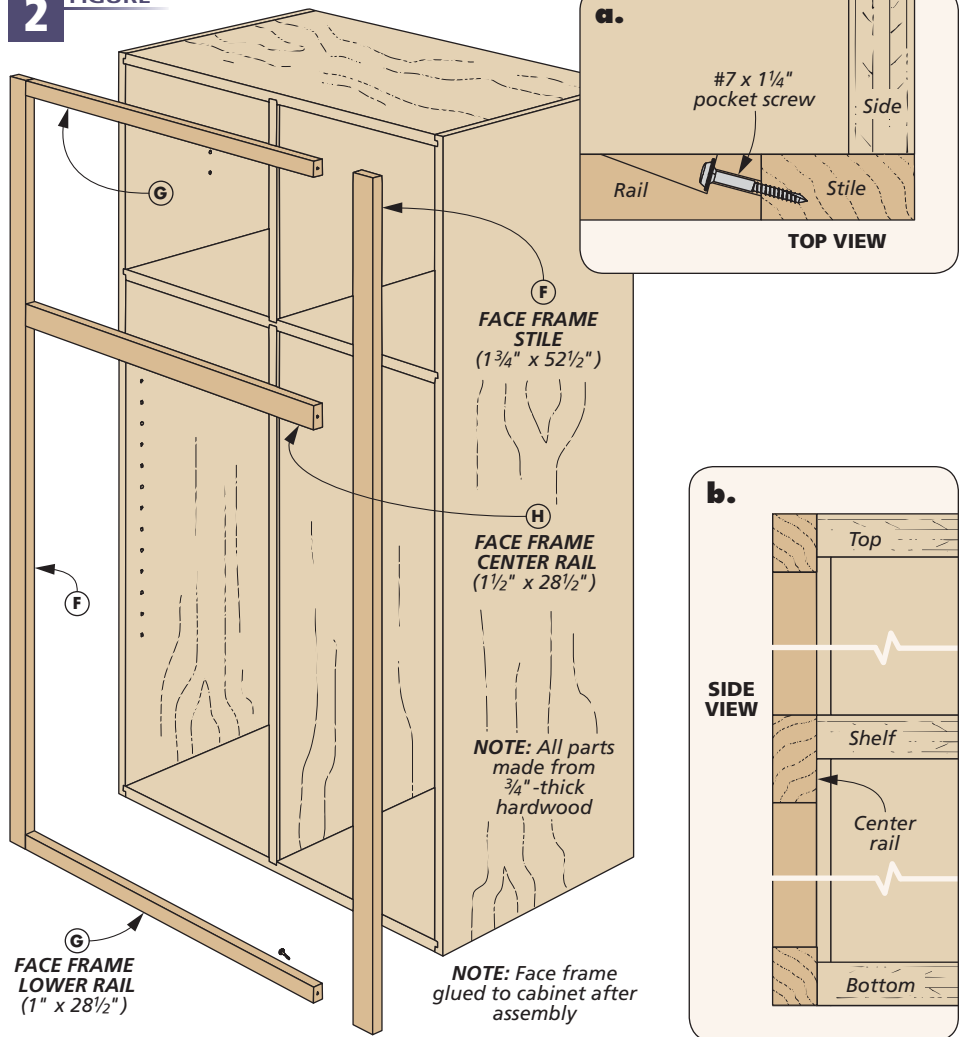
DRY ASSEMBLY. Now would be a good time to assemble the parts. This gives you an opportunity to check the fit of the joinery. It also allows you to measure between the dados to determine the exact length of the dividers. Then you can cut them to their final size. I ripped the dividers $\frac{1}{4}$ " narrower than the other parts. Doing this allows for the hardwood edging you'll add to hide the plywood edges (Figure 1a).

Once you're satisfied with the fit, you can add glue and clamps. Then you can use a hardboard template to help locate and drill the holes for the shelf pins.

FACE FRAME. Next, you can work on building the face frame, as in Figure 2. It's assembled with pocket screws and glue. When sizing the rail lengths, your goal is to have the outer edges of the stiles flush with the exterior of the case (refer to Figure 2a).

To locate the rails, see Figure 2b for guidance. The center rail sits flush with the top face of the fixed shelf. The top and bottom rails are flush with the case exterior. After assembling the frame, I glued and clamped it to the case.

2 **FIGURE**



MATERIALS & SUPPLIES

CASE

A	Sides (2)	$18\frac{1}{2} \times 52\frac{1}{2}$ - $\frac{3}{4}$ Ply.
B	Top/Shelf/Bottom (3)	$18\frac{1}{2} \times 31$ - $\frac{3}{4}$ Ply.
C	Lower Divider (1)	$18\frac{1}{4} \times 36\frac{1}{4}$ - $\frac{3}{4}$ Ply.
D	Upper Divider (1)	$18\frac{1}{4} \times 15$ - $\frac{3}{4}$ Ply.
E	Edging (1)	$\frac{1}{4} \times \frac{3}{4}$ - 190 rgh.
F	Face Frame Stiles (2)	$\frac{3}{4} \times 1\frac{3}{4}$ - $52\frac{1}{2}$
G	FF Upper/Lower Rails (2)	$\frac{3}{4} \times 1$ - $28\frac{1}{2}$
H	FF Center Rail (1)	$\frac{3}{4} \times 1\frac{1}{2}$ - $28\frac{1}{2}$

BACK, TOP, & BASE

I	Spacers (2)	$1\frac{1}{2} \times 3$ - $35\frac{3}{4}$
J	Back Stiles (2)	$\frac{3}{4} \times 2\frac{1}{2}$ - $52\frac{1}{2}$
K	Back Upper Rails (2)	$\frac{3}{4} \times 3\frac{1}{2}$ - $27\frac{3}{4}$
L	Back Lower Rail (1)	$\frac{3}{4} \times 5$ - $27\frac{3}{4}$
M	Back Lower Stile (1)	$\frac{3}{4} \times 3\frac{1}{2}$ - $30\frac{3}{4}$
N	Back Upper Stile (1)	$\frac{3}{4} \times 3\frac{1}{2}$ - $11\frac{1}{4}$
O	Back Upper Panels (2)	$12\frac{1}{2} \times 11\frac{1}{4}$ - $\frac{1}{4}$ Ply.
P	Back Lower Panels (2)	$12\frac{1}{2} \times 30\frac{3}{4}$ - $\frac{1}{4}$ Ply.
Q	Top Panel (1)	$21\frac{1}{4} \times 29$ - $\frac{3}{4}$ Ply.
R	Breadboard Ends (2)	$\frac{3}{4} \times 4\frac{3}{8}$ - $21\frac{1}{2}$

S

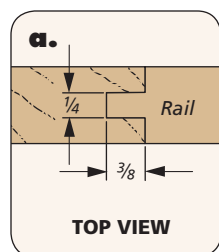
Top Edging (1)	$\frac{1}{8} \times \frac{3}{4}$ - 60 rgh.
T Corbels (4)	$\frac{3}{4} \times 1\frac{1}{2}$ - $6\frac{1}{2}$
U Base Panel (1)	$19\frac{3}{4} \times 31\frac{3}{4}$ - $\frac{3}{4}$ Ply.
V Base Edging (1)	$\frac{3}{8} \times \frac{3}{4}$ - 108 rgh.

SHELVES, DRAWERS, & DOORS

W Lower Adj. Shelves (2)	$17\frac{3}{4} \times 14\frac{3}{4}$ - $\frac{3}{4}$ Ply.
X Upper Adj. Shelves (2)	$11\frac{3}{4} \times 14\frac{3}{4}$ - $\frac{3}{4}$ Ply.
Y Small Drawer Fronts (2)	$\frac{3}{4} \times 3$ - $13\frac{1}{8}$
Z Small Drawer Backs (2)	$\frac{1}{2} \times 3$ - $12\frac{3}{8}$
AA Small Drawer Sides (4)	$\frac{1}{2} \times 3$ - $17\frac{3}{4}$
BB Drawer Bottoms (7)	$17\frac{1}{2} \times 11\frac{7}{8}$ - $\frac{1}{4}$ Ply.
CC Medium Drawer Fronts (2)	$\frac{3}{4} \times 4$ - $13\frac{1}{8}$
DD Medium Drawer Backs (2)	$\frac{1}{2} \times 4$ - $12\frac{3}{8}$
EE Medium Drawer Sides (4)	$\frac{1}{2} \times 4$ - $17\frac{3}{4}$
FF Large Drawer Fronts (2)	$\frac{3}{4} \times 5$ - $13\frac{1}{8}$
GG Large Drawer Backs (2)	$\frac{1}{2} \times 5$ - $12\frac{3}{8}$
HH Large Drawer Sides (4)	$\frac{1}{2} \times 5$ - $17\frac{3}{4}$
II Bottom Drawer Front (1)	$\frac{3}{4} \times 7\frac{1}{8}$ - $13\frac{1}{8}$
JJ Bottom Drawer Back (1)	$\frac{1}{2} \times 7\frac{1}{8}$ - $12\frac{3}{8}$
KK Bottom Drawer Sides (2)	$\frac{1}{2} \times 7\frac{1}{8}$ - $17\frac{3}{4}$

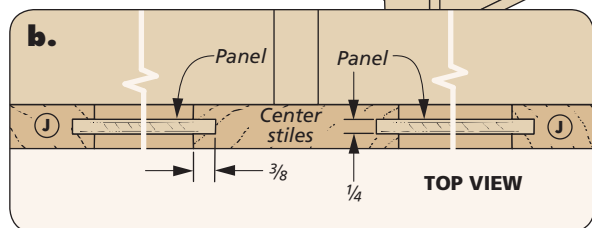
LL Lower Door Stiles (4)	$\frac{3}{4} \times 2\frac{1}{2}$ - $34\frac{1}{2}$
MM Lower Door Upper Rail (2)	$\frac{3}{4} \times 2\frac{1}{2}$ - $9\frac{13}{16}$
NN Lower Door Bottom Rail (2)	$\frac{3}{4} \times 4$ - $9\frac{13}{16}$
OO Lower Door Center Stile (2)	$\frac{3}{4} \times 2\frac{1}{2}$ - $28\frac{3}{4}$
PP Lower Door Panels (4)	$4 \times 28\frac{3}{4}$ - $\frac{1}{4}$ Ply.
QQ Upper Door Stiles (4)	$\frac{3}{4} \times 2\frac{1}{2}$ - 14
RR Upper Door Rails (4)	$\frac{3}{4} \times 2\frac{1}{2}$ - $9\frac{13}{16}$
SS Upper Door Panels (2)	$9\frac{13}{16} \times 9\frac{3}{4}$ - $\frac{1}{4}$ Ply.
TT Upper Catch Spacers (2)	$\frac{1}{4} \times 1$ - $2\frac{1}{2}$
UU Lower Catch Spacers (2)	$\frac{5}{8} \times 1$ - $2\frac{1}{2}$

- (4 pr.) H-L Hinges w/Screws
- (4) Door Pulls
- (4) Magnetic Catches
- (6) #7 x $1\frac{1}{4}$ " Pocket Screws
- (7 pr.) 18" Full-Ext. Drawer Slides w/Screws
- (4) 4" Heavy-Duty Locking Swivel Casters
- (16) #14 x 1" Panhead Woodscrews
- (16) $\frac{1}{4}$ " Washers
- (16) Shelf Support Pins



1
SPACER
(1 1/2" x 3" - 35 3/4")

NOTE: Back panel assembly glued to back of cabinet



finishing the basic Cabinet

The next chunk of your shop time will be spent on the cabinet exterior. You'll add a frame and panel back, a breadboard top with corbels, and a base with casters.

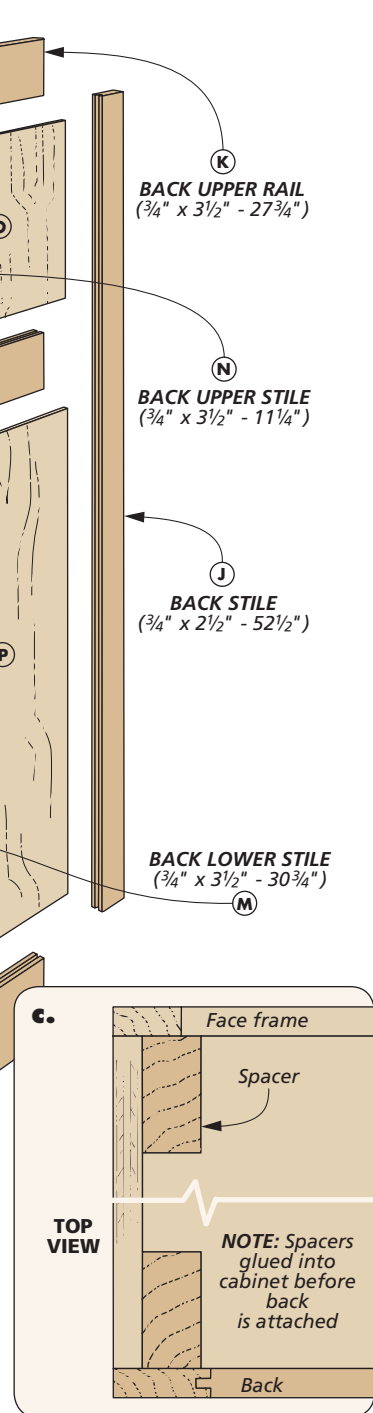
SPACERS. Before starting on the back, there's one thing to do while the case is still open. I added a pair of spacers to the interior of the cabinet. The drawer slides are fastened to these to provide clearance for the drawers. They're simply cut to size and glued in place, as you can see in Figures 3 and 3c.

BACK ASSEMBLY. If you take a look at Figure 3, you can see that the back

assembly is made with stub tenon and groove joinery. This joinery method will also be used for the two pairs of doors you'll add later.

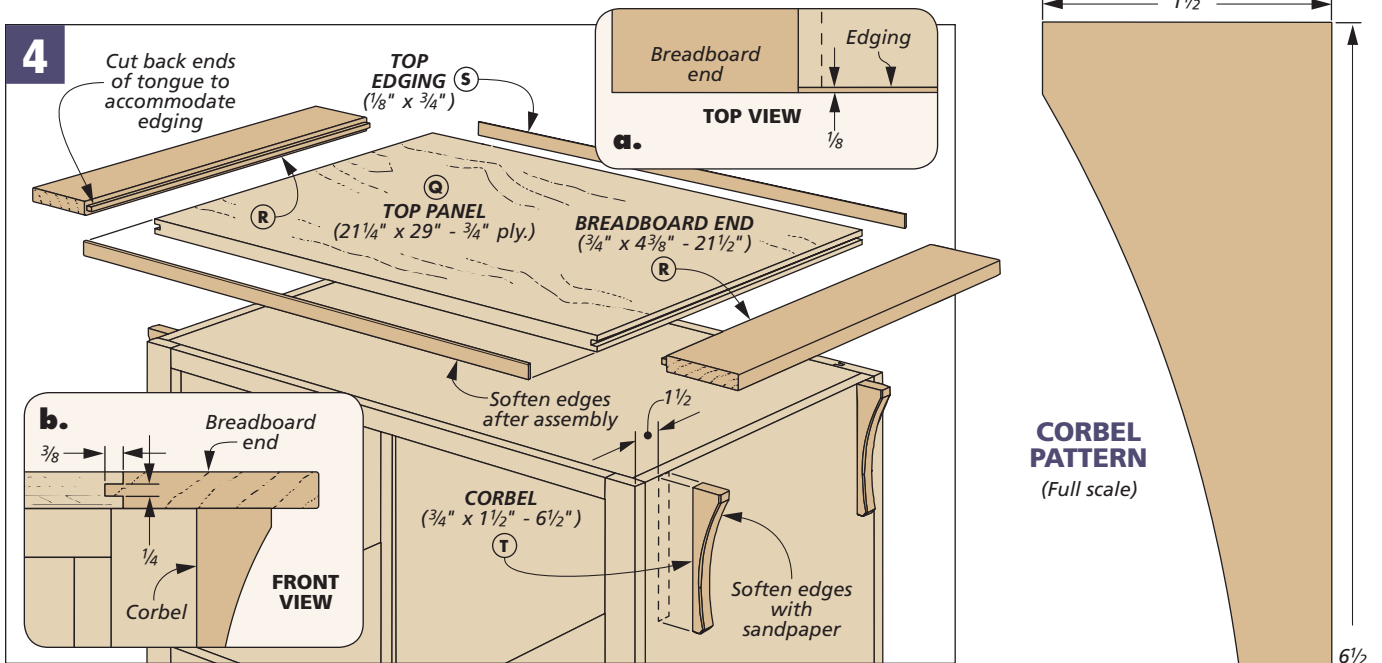
The setup is pretty simple. After cutting all of the frame pieces to their final size, cut a centered groove along the edges to hold the plywood panels, as shown in Figures 3 and 3a.

Your attention should focus next on the stub tenons at the ends of each rail and two center stiles. For this operation, I used the table saw with a dado blade buried in an auxiliary rip fence. Using the miter gauge, make a few test cuts to sneak up on the thickness of the tenon.



Before adding any glue, I like to clamp the assembly together and check all of the joinery. It's also a good time to check the fit of the back against the overall assembly. Like the face frame, you'll want all of the exterior edges to be flush.

When gluing up the back assembly, take your time. I find it easier to work from the center out, adding one piece at a time. Glue and clamp the completed



assembly to the back of the case. Then you can start on the top.

BREADBOARD TOP. Figure 4 shows how I made the top with breadboard ends. The ends are joined to the top with a tongue and groove joint. I cut the grooves in the panel using a dado blade with a tall auxiliary rip fence for extra support. The tongues on the ends are cut to fit the grooves.

To hide the front and back edges of the plywood panel, I added hardwood edging. But I also wanted to hide the tongue and groove joinery. To do this, I cut the tongue back to accommodate the thickness of the edging. You can see what I mean

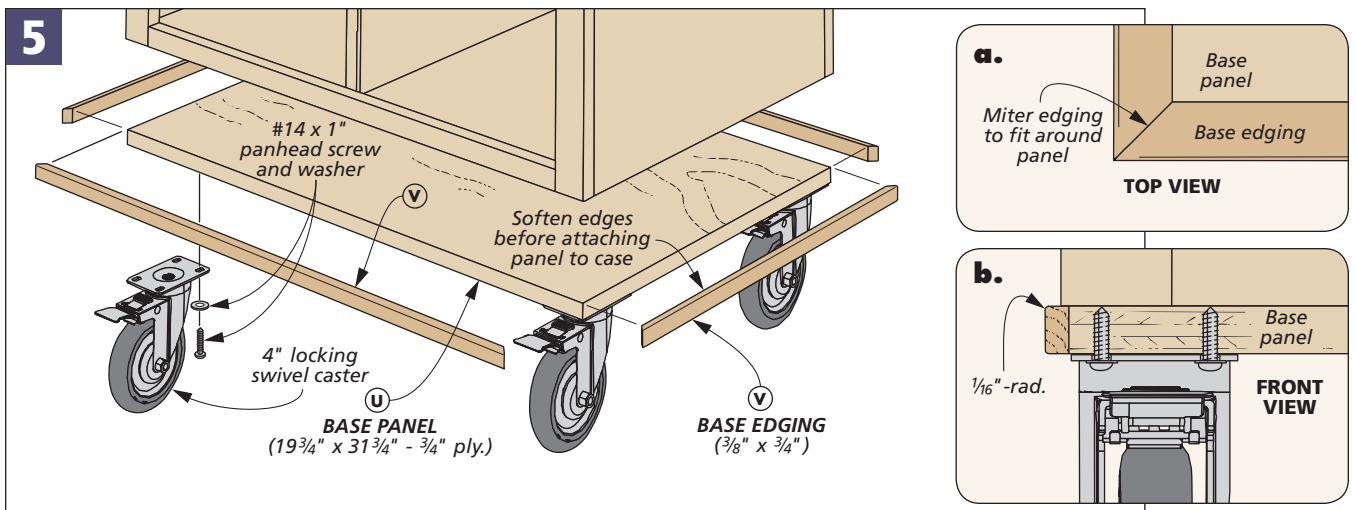
in Figures 4 & 4a. After assembling the top, you can simply center it on the case and glue it in place.

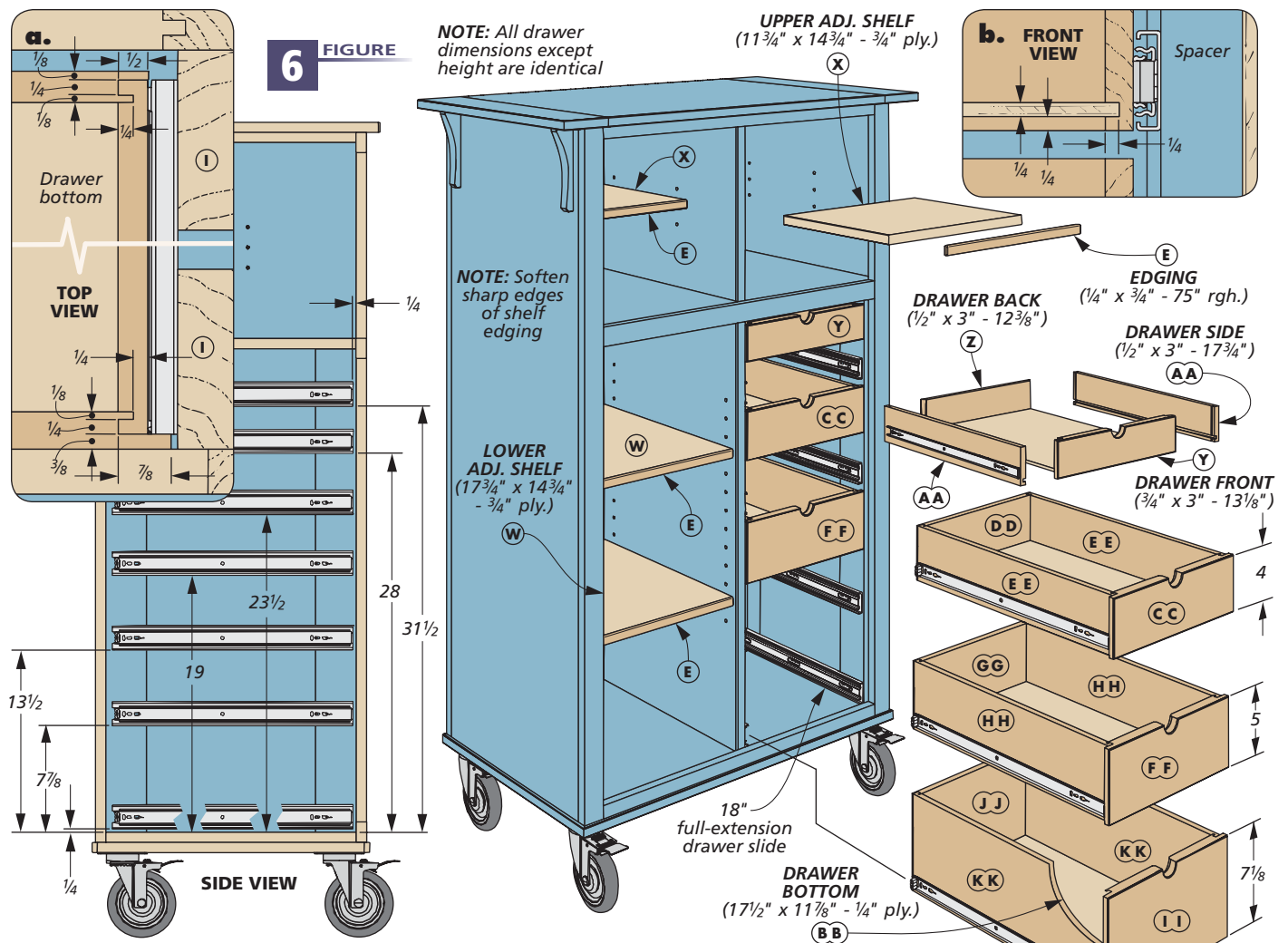
CORBELS. The graceful curve of the corbels adds a trademark Craftsman-style touch to the cabinet. You can use the full-size pattern at right to cut and sand them to shape. To fasten them in place, I used a rub joint. First, apply a thin layer of glue (I use original Titebond because it "grabs" quicker). Press the corbel in place, then move it up and down slightly until the glue grabs. After a minute or so, you can let go, and it will stay put.

CASTER BASE. To complete the basic case assembly, I added a plywood

base that's wrapped with mitered edging, as shown in Figure 5. I like to miter the edging to fit one side of the panel and then work my way around. After easing the sharp corners with sandpaper, you can glue the base to the bottom of the cabinet.

CASTERS. The locking, heavy-duty casters added to the underside of the base make the cabinet easy to roll across the shop floor. They're attached with #14 pan-head screws and washers. Once that's done, you can set the case upright and get ready to apply a finish before adding shelves and a bank of drawers.





final Details

Applying a finish to the interior and exterior of the cabinet is easier now, before you add the drawers. I applied a coat of acrylic latex primer and sanded it smooth before spraying on the color coat. I used *Benjamin Moore's* Aura satin acrylic paint, "Fair Isle Blue" (CSP-715) followed by *General Finishes' High Performance* flat, water-based varnish (refer to Sources on page 98).

ADJUSTABLE SHELVES. While you're waiting for the finish to dry, you can make the two sets of adjustable shelves. The shelves are all made of plywood with hardwood edging on the front. Figures 6 and 6d provide the details. Note that the pair of lower shelves are deeper than the pair of shelves in the top.

BANK OF DRAWERS. The next order of business is setting up to make the set of seven drawers (Figure 6). They feature locking rabbet joinery for strength, as you can see in Figure 6a. You'll want to have some extra stock on hand to fine-tune the setup for the drawer joinery.

All the drawers are the same width and depth but four different heights. This makes it easy to rip the stock for the sides, fronts, and backs to the appropriate width and then cut them to length. I used a stop block on an auxiliary miter fence to guarantee consistent lengths.

FINGER PULL. Figure 6c shows a simple finger pull I made in each drawer front. The best way to do this is to use a Forstner bit to drill the semicircular notch. (Refer to *WoodsmithSpecials.com* for more.) Then round over the inside edge of the notch at the router table.

LOCKING RABBET JOINERY. The most difficult part of making locking rabbet joints is tweaking the setup for a perfect fit. This is where the extra drawer stock comes in handy.

I like to start by cutting the $\frac{1}{8}"$ -wide dadoes in the drawer sides.

Then cut tongues on the drawer backs to fit the dados.

For the drawer fronts, you'll start by cutting a deep groove in each end. The goal is to leave a tongue to fit the dado in the drawer side. Then you just cut that tongue back so the drawer front "wraps" around the end of the drawer side (Figure 6a).

The final step in drawer construction is cutting the groove for the plywood drawer bottoms. After cutting the drawer bottoms, you can start the process of assembling all of the drawers.

DRAWER SLIDES. Mounting the full-extension drawer slides to the spacers and divider is an easy task. Just follow the simple technique at WoodsmithSpecials.com.

The drawer portion of the slide is mounted $\frac{1}{4}$ " up from the bottom edge of the drawer.

FRAME & PANEL DOORS. You can close in the cabinet by adding the two pairs of doors, as in Figure 7. You'll follow the same joinery techniques you used to build the back assembly. When cutting the parts to size, the end goal is a $\frac{1}{8}$ " gap all around.

I installed the hinges on the door first, as shown in Figure 7b. The photo at right shows how I then used shims to hold the door in position while fastening the hinges to the face frame.

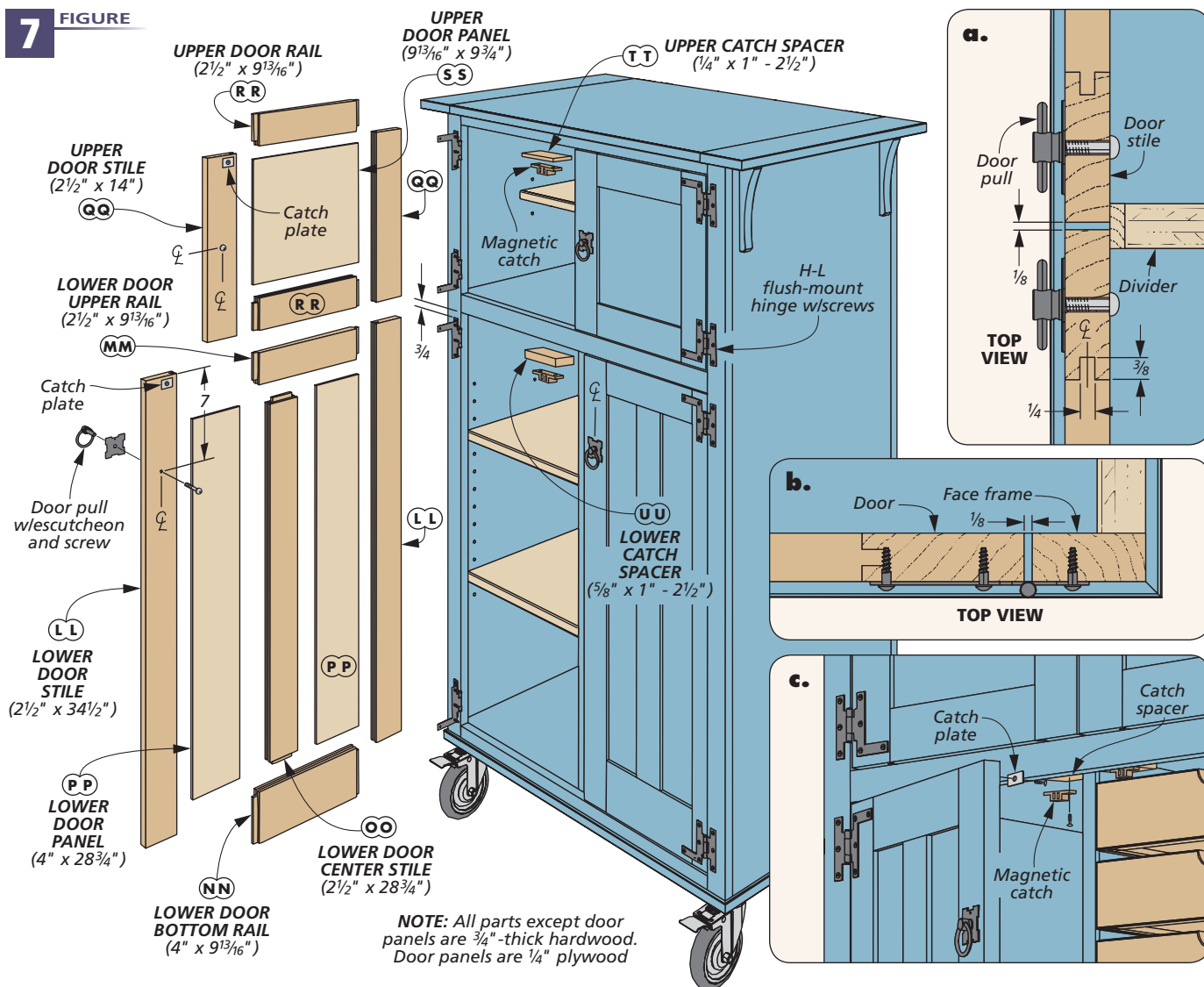
The final detail on the doors is adding the pulls. The drawing in Figure 7 shows where to locate them on the door stiles.



Hinges. Align the door within the opening using shims then fasten the hinge in place.

CATCHES. Magnetic catches hold the doors closed. To align the catch with the plate, I added a spacer (Figure 7). Now that the tool cabinet is complete, your woodworking skills can be shown off in style. Filling up the cabinet with your tools and supplies should be the next task on your to-do list.

7 **FIGURE**



roll-around Tool Cabinet



MATERIALS & HARDWARE

CASE

A	Sides (2)	18½ x 52½ - ¾ Ply.
B	Top/Shelf/Bottom (3)	18½ x 31 - ¾ Ply.
C	Lower Divider (1)	18¼ x 36¼ - ¾ Ply.
D	Upper Divider (1)	18¼ x 15 - ¾ Ply.
E	Edging (1)	¼ x ¾ - 190 rgh.
F	Face Frame Stiles (2)	¾ x 1¾ - 52½
G	FF Upper/Lower Rails (2)	¾ x 1 - 28½
H	FF Center Rail (1)	¾ x 1½ - 28½

BACK, TOP, & BASE

I	Spacers (2)	1½ x 3 - 35¾
J	Back Stiles (2)	¾ x 2½ - 52½
K	Back Upper Rails (2)	¾ x 3½ - 27¾
L	Back Lower Rail (1)	¾ x 5 - 27¾
M	Back Lower Stile (1)	¾ x 3½ - 30¾
N	Back Upper Stile (1)	¾ x 3½ - 11¼
O	Back Upper Pnls. (2)	12½ x 11¼ - ¼ Ply.
P	Back Lower Pnls. (2)	12½ x 30¾ - ¼ Ply.
Q	Top Panel (1)	21¼ x 29 - ¾ Ply.
R	Breadboard Ends (2)	¾ x 4¾ - 21½

S	Top Edging (1)	⅛ x ¾ - 60 rgh.
T	Corbels (4)	¾ x 1½ - 6½
U	Base Panel (1)	19¾ x 31¾ - ¾ Ply.
V	Base Edging (1)	⅜ x ¾ - 108 rgh.

SHELVES, DRAWERS, & DOORS

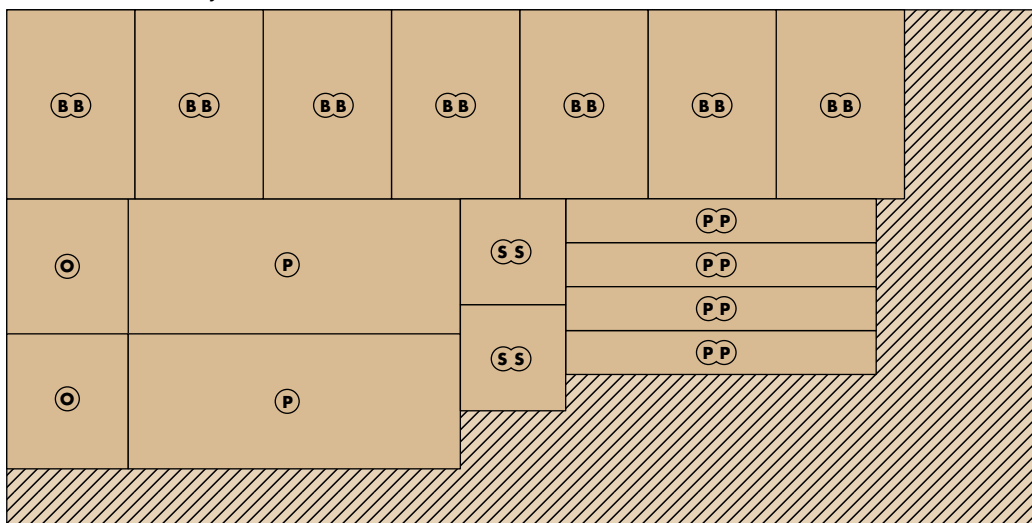
W	Lower Adj. Shelves (2)	17¾ x 14¾ - ¾ Ply.
X	Upper Adj. Shelves (2)	11¾ x 14¾ - ¾ Ply.
Y	Small Drawer Fronts (2)	¾ x 3 - 13½
Z	Small Drawer Backs (2)	½ x 3 - 12¾
AA	Small Drawer Sides (4)	½ x 3 - 17¾
BB	Drawer Bottoms (7)	17½ x 11⅞ - ¼ Ply.
CC	Medium Drawer Fronts (2)	¾ x 4 - 13½
DD	Medium Drawer Backs (2)	½ x 4 - 12¾
EE	Medium Drawer Sides (4)	½ x 4 - 17¾
FF	Large Drawer Fronts (2)	¾ x 5 - 13½
GG	Large Drawer Backs (2)	½ x 5 - 12¾
HH	Large Drawer Sides (4)	½ x 5 - 17¾
II	Bottom Drawer Front (1)	¾ x 7⅞ - 13½
JJ	Bottom Drawer Back (1)	½ x 7⅞ - 12¾
KK	Bottom Drawer Sides (2)	½ x 7⅞ - 17¾

LL	Lwr Door Stiles (4)	¾ x 2½ - 34½
MM	Lwr Door Upper Rails (2)	¾ x 2½ - 9½
NN	Lwr Door Bottom Rails (2)	¾ x 4 - 9½
OO	Lwr Door Ctr. Stiles (2)	¾ x 2½ - 28¾
PP	Lwr Door Panels (4)	4 x 28¾ - ¼ Ply.
QQ	Upper Door Stiles (4)	¾ x 2½ - 14
RR	Upper Door Rails (4)	¾ x 2½ - 9½
SS	Upper Door Pnls. (2)	9½ x 9¾ - ¼ Ply.
TT	Upper Catch Spacers (2)	¼ x 1 - 2½
UU	Lwr Catch Spacers (2)	⅝ x 1 - 2½

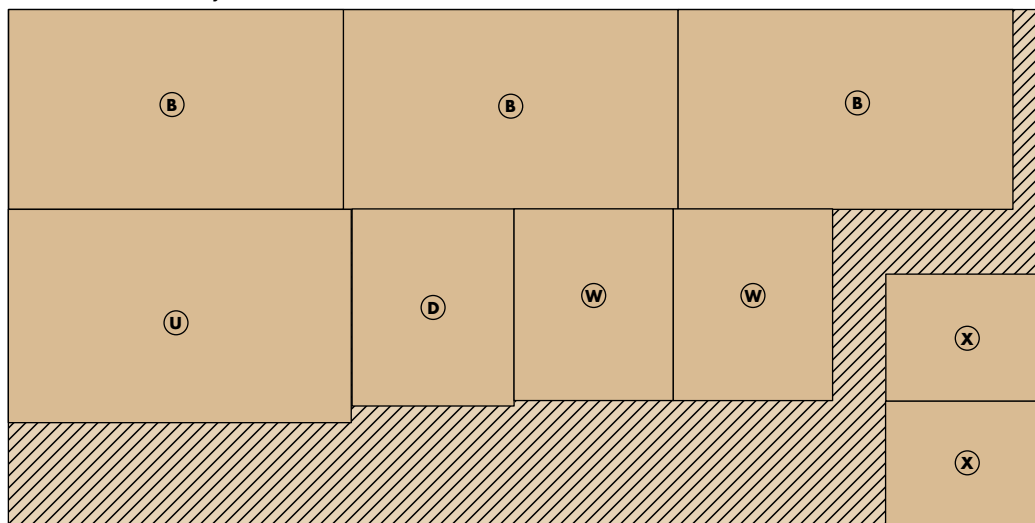
- (4 pr.) H-L Hinges w/Screws
- (4) Door Pulls
- (4) Magnetic Catches
- (6) #7 x 1¼" Pocket Screws
- (7 pr.) 18" Full-Ext. Drawer Slides w/Screws
- (4) 4" Heavy-Duty Locking Swivel Casters
- (16) #14 x 1" Panhead Woodscrews
- (16) ¼" Washers
- (16) Shelf Support Pins

CUTTING DIAGRAM

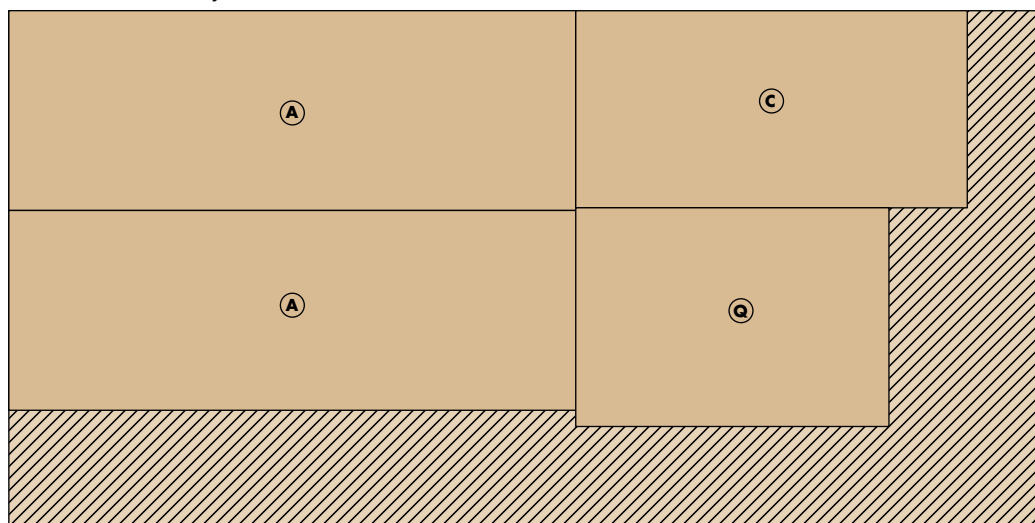
¼" x 48" - 96" Birch Plywood



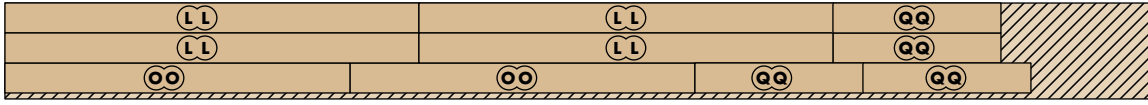
3/4" x 48" - 96" Birch Plywood



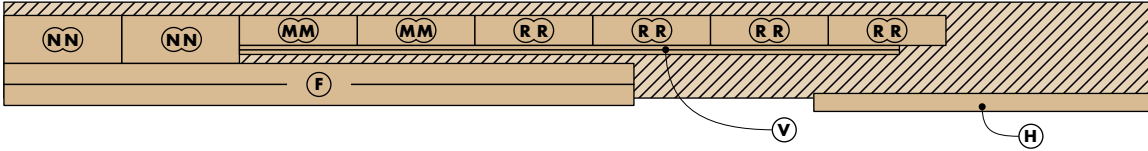
3/4" x 48" - 96" Birch Plywood



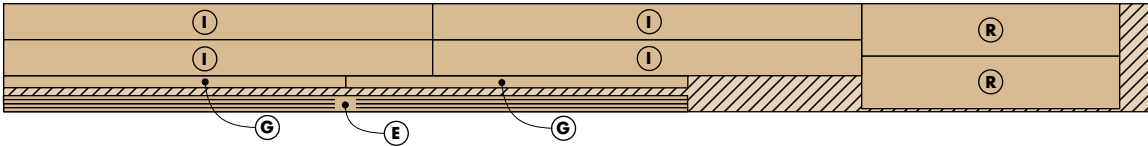
3/4" x 8" - 96" Poplar (5.3 Bd. Ft.)



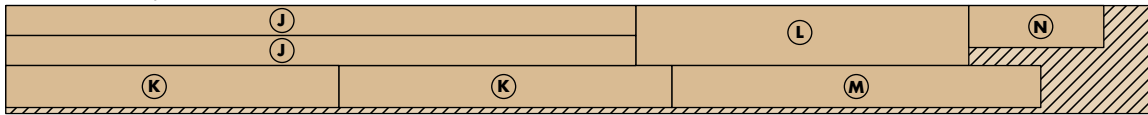
3/4" x 8" - 96" Poplar (5.3 Bd. Ft.)



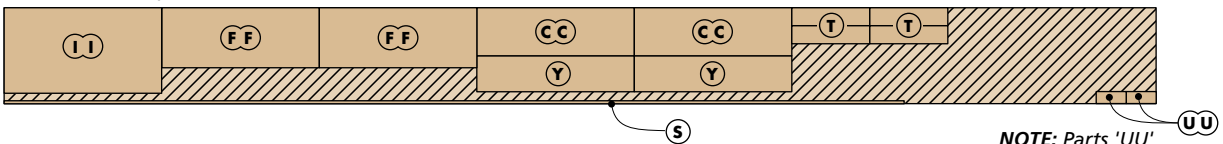
3/4" x 9" - 96" Poplar (6.0 Bd. Ft.)



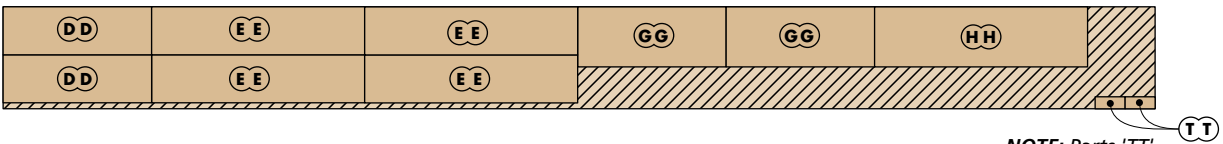
3/4" x 9" - 96" Poplar (6.0 bd. Ft.)



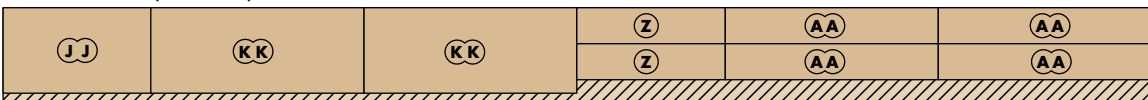
3/4" x 8" - 96" Maple (5.3 Bd. Ft.)



1/2" x 8 1/2" - 96" Maple (5.7 Sq. Ft.)



1/2" x 8" - 96" Maple (5.3 Sq. Ft.)



1/2" x 6" - 60" Maple (2.5 Sq. Ft.)



slide Spacer

Whenever I need to install drawer slides in a cabinet, I use a quick and surefire method to position them properly. It's important that they're level and that each pair is aligned.

To accomplish this goal, I use a spacer, as shown at right. This could be a scrap of plywood or MDF. The drawer slide rests on the top edge of the spacer as you fasten it to the cabinet.

Start with the topmost pair of drawer slides in the cabinet. Cut the spacer so that the slides are located at the proper position, as shown in the near photo at right. Use the spacer to hold them in place as you drive the screws.

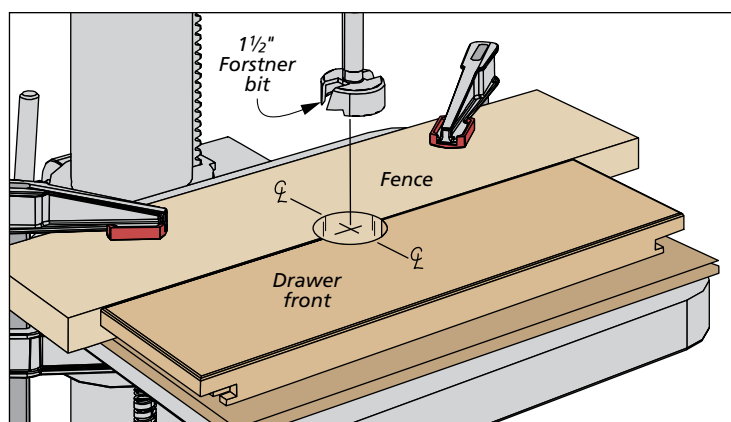
Now you can simply cut the spacer down to locate the next pair of slides, as you can see in the far right photo. Simply repeat the process until all of the slides are installed. This method helps ensure that all of the drawers are even and operate smoothly.



Start at the Top. Size the spacer to position the uppermost drawer slides. Rest the slide on the spacer to drive the screws.



Work Down. Cut the spacer to locate the next pair of slides below the previous pair. Repeat until all the slides are installed.



finger Notches

The drawer fronts on the tool cabinet use a semicircular cutout as a finger pull. Making this notch is easy to do with the right setup.

Start by chucking a Forstner bit in the drill press. Then clamp a fence that's the same thickness as the drawer front to the drill press table. Align the fence so that its front edge is under the centerpoint of the bit, as shown in the drawing below.

Now butt the drawer front against the fence, center it with the bit, and drill the notch.



heirloom Tool Chest

This compact and handsome storage project creates the perfect place to store all of your small hand tools.

Building a tool chest that looks like the one above may seem over the top to some. But I think it's a good way to hone skills that you can use in furniture projects.

In the process of building this relatively small project, you'll learn about working with veneer, cutting

small parts accurately, and building smooth-sliding drawers, among other foundational skills.

The payoff is a project that serves as a fitting home for the hand tools you rely on most. More than that, it's an inspiration every time you step into your shop.

OVERALL DIMENSIONS:
25"W x 16"H x 13¼"D

OVERALL DIMENSIONS:
25"W x 16"H x 13¼"D

Frame and panel top assembly adds a fine cabinetry detail

*Bead molding
at top and bottom
frames drawer opening*

NOTE: Four graduated drawers make organizing your tools a snap

*Side and back panels
are covered with
purchased veneer*



For bonus techniques helpful in building the chest, go to:

WoodsmithSpecials.com

Tongue and dado joints — are used at the back of the drawer

*Locking rabbits
secure drawer fronts*

*Drawers lined
with cork sheets*

*Custom molding
draws attention
to veneered panels*

Drawers ride on side-mounted runners

Thick, shop-made veneer — adds interest to corner posts

Contrasting veneer
on drawer fronts matches
the look of the tool chest case

NOTE: For hardware and veneer sources, turn to page 98

A	Posts (4)	1¼ x 1 ¼ - 14¾	M	Front Moldings (2)	7⁄₁₆ x 1⅛ - 21½	Y	Bottom Drawer Front (1)	½ x 4 - 21¾
B	Post Veneers (4)	⅛ x 1⅝ - 14¾	N	Drawer Runners (8)	5⁄₁₆ x 1⅞ - 10¾	Z	Bottom Drawer Sides (2)	½ x 4 - 10¾
C	Sides (2)	9¾ x 14⅞ - ¾ Ply.	O	Small Drawer Front (1)	½ x 2½ - 21¾	AA	Bottom Drawer Back (1)	½ x 4 - 20⅝
D	Side Veneers (2)	½ x 14⅞ - 9¾	P	Small Drawer Sides (2)	½ x 2½ - 10¾	BB	Small Drawer Veneer (1)	⅛ x 2½ - 21¾
E	Back (1)	14¾ x 21¾ - ¾ Ply.	Q	Small Drawer Back (1)	½ x 2½ - 20⅝	CC	Medium Drawer Veneer (1)	⅛ x 3 - 21¾
F	Back Veneer (1)	½ x 14¾ - 21¾	R	Drawer Bottoms (4)	10 x 20⅞ - ¼ Ply.	DD	Large Drawer Veneer (1)	⅛ x 3½ - 21¾
G	Frame Sides (4)	¾ x 2 - 22⅝	S	Medium Drawer Front (1)	½ x 3 - 21¾	EE	Bottom Drawer Veneer (1)	⅛ x 4 - 21¾
H	Frame Ends (4)	¾ x 2 - 10⅝	T	Medium Drawer Sides (2)	½ x 3 - 10¾	FF	Drawer Trim (1)	⅛ x ¾ - 210 rgh.
I	Corner Wedges (8)	¾ x 1⅞ - 11⅝	U	Medium Drawer Back (1)	½ x 3 - 20⅝	• (9) #8 x 1½" Fh Woodscrews		
J	Top (1)	¾ x 9⅞ - 21⅞	V	Large Drawer Front (1)	½ x 3½ - 21¾	• (16) #6 x 1" Fh Woodscrews		
K	Bottom (1)	9½ x 21½ - ¼ Ply.	W	Large Drawer Sides (2)	½ x 3½ - 10¾	• (8) 16mm Brass Knobs w/Screws		
L	Panel Molding (1)	½ x 7⁄8 - 180 rgh.	X	Large Drawer Back (1)	½ x 3½ - 20⅝	• (4) 9⅛" x 20¾" - ⅛" Cork Liner		

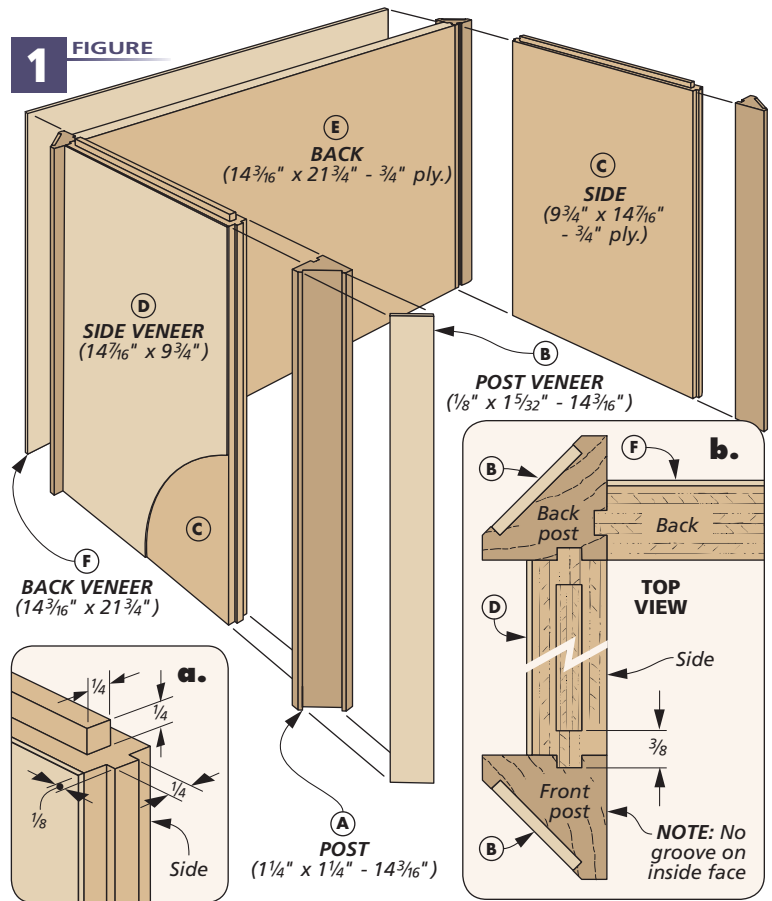
start with the Posts & Panels

In order to create the look I was aiming for in this tool chest required a combination of materials: bird's eye maple veneer and solid mahogany. The darker colored mahogany highlights and frames the maple veneer. As you go along, you'll see several examples of how this works.

The case of the tool chest consists of three assemblies. The first is a three-sided box made up of panels joined with sturdy corner posts. The other components are frame and panel assemblies used for the case top and bottom.

CORNER POSTS. The three-sided case comes first. You can see the components in Figure 1. I started by making thick posts with a beveled corner. A recess in the wide, beveled face holds a strip of veneer. The box below gives you a run down on making the posts.

For the inlaid veneer strips, I cut my own $\frac{1}{8}$ "-thick veneer from solid stock. *WoodsmithSpecials.com* provides the technique involved in sawing your own veneer pieces at the table saw.



VENEERED PANELS. Speaking of veneer, you can set the corner posts aside for now to work on the panels. For a seamless look, I bought sheets of veneer wide enough to cover each plywood panel with a single piece. Here again, the technique I use to

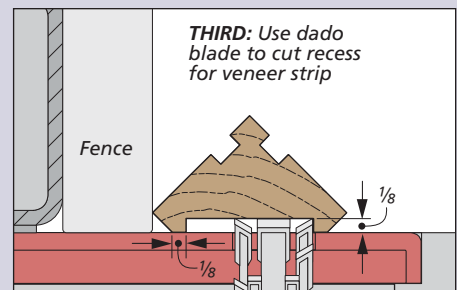
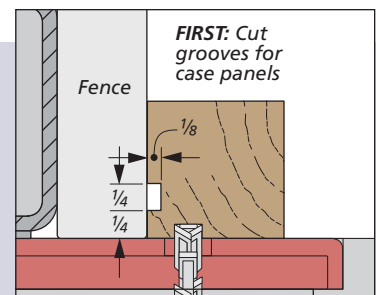
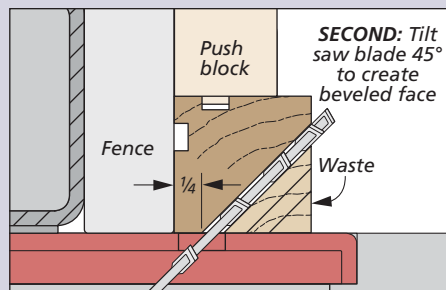
glue up a flat and smooth panel is available at *WoodsmithSpecials.com*.

SIMPLE JOINERY. The panels are connected to the posts by a centered tongue cut along each side, as illustrated in Figure 1a. The tongues mate with the grooves in the posts.

Beveled Corner Posts

Creating the angled corner posts requires three types of table saw cuts. A dado blade is used to make the first cuts. These create grooves to accept the case panels (right drawing). Note in Figure 1b that the front posts

have one groove. The second step is to bevel the front face. It's best to do this in several passes to sneak up on a final size (left drawing below). Finally, use a dado blade for to create a channel for veneer (lower right drawing).



The detail also shows that the side panels have an additional tongue cut on the top edge. This creates a way to register and attach the upper frame assembly.

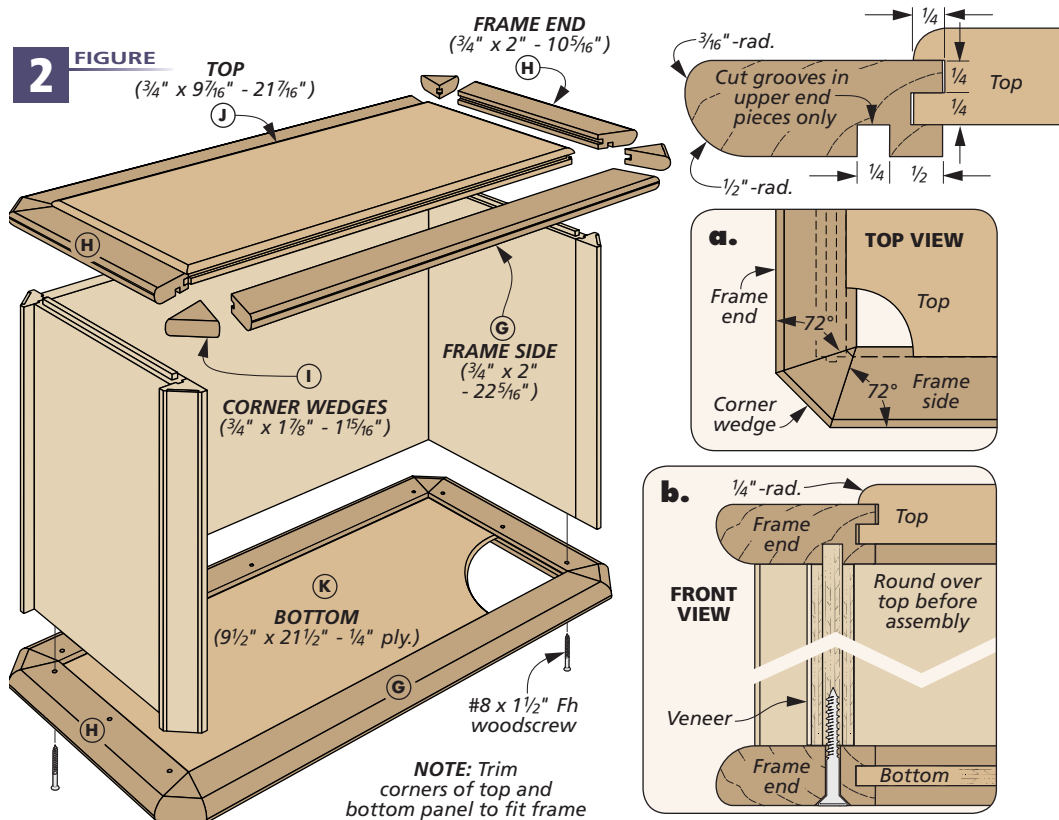
INITIAL ASSEMBLY. At this point, you can do a little assembly. Glue the panels into the posts. To keep the front of the case aligned and square, I cut a couple of spacers to fit the opening and clamped across them.

FRAMES. Enclosing the top and bottom of the case is the next thing to do. The corners of the identical frames are angled to match the beveled faces on the posts. While this seems tricky, I found the secret to success lies in a methodical process.

Start by ripping two sets of strips for the frame stock. One set is 2" wide and becomes the long side pieces and the shorter ends.

The other set of strips is for making the wedge-shaped corner pieces. These strips are cut slightly narrower at 1 7/8" wide. Each strip needs a centered groove cut on the inside edge to capture a panel. The next step is to miter the sides, and ends to length, as shown in Figure 2.

Before moving on, I cut a groove in the bottom face of the end pieces that will be used in the upper frame. These grooves will



mate with the tongues on the top of the side panels (Figure 2b).

Cutting the corner wedges to size takes a little more finesse. The starting point is cutting a complementary miter on each end of several blanks. You can see the setup I use in the box below. It's a good idea to make a few test cuts to

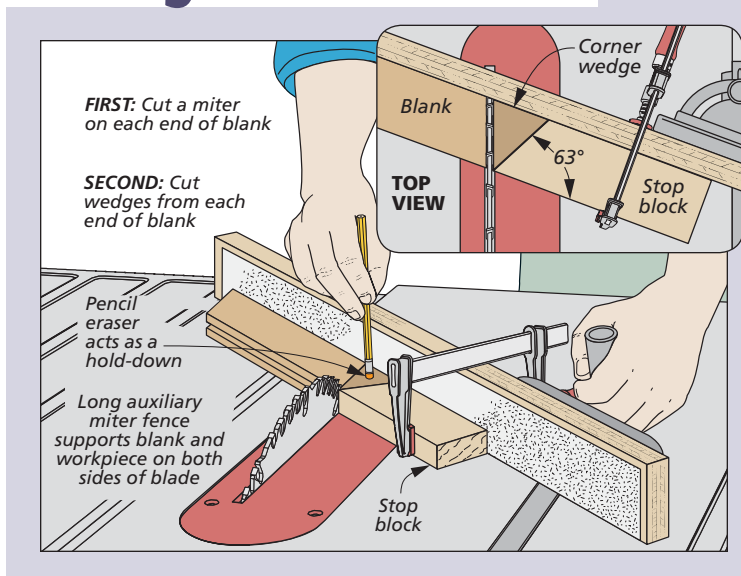
sneak up on the right setting for the stop block. Your aim is to make the parts come to a point without changing the overall width (1 7/8").

PANELS. The frame pieces wrap around a panel on both the top and bottom. But the panels aren't the same. The top has a solid wood panel with a gentle round-over on the top edge. To mate with the groove in the frame, I formed a tongue by cutting a centered groove in the panel. The lower panel is a piece of plywood.

ASSEMBLY. At this point, you can glue up the frames around the panels. Focus your attention on keeping the frame pieces flush. You can glue the plywood panel in place, but not the upper panel.

After the glue dries, rout round-overs around the edges of the frames. The details are shown in the upper right corner of Figure 2. When you're finished, the frames can be attached to the case. The upper frame is glued in place with the tongues on the sides mating with the grooves in the upper frame. The lower frame is glued and screwed in place from below.

Cutting the Corner Blocks



now for the Trim & Drawers

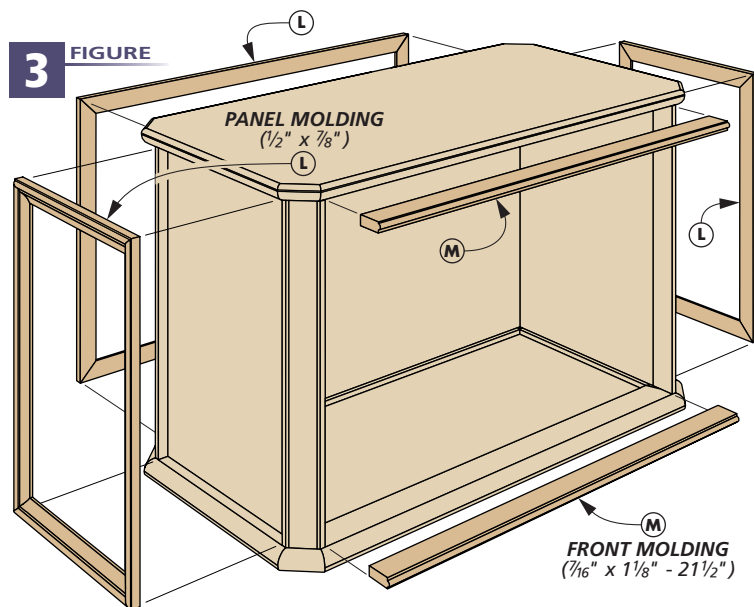
By this point, you've wrapped up the construction of the case that houses the drawers. But before building the drawers, there are a few details left to cross off the list. These include two types of decorative molding and the side-mounted runners that support the drawers in use.

CUSTOM MOLDINGS. I like to think of the moldings added to the tool chest as frames to highlight what's inside. It's a similar idea to the top of the chest where the profiled frame pieces show off the top panel.

You can see a sample of the molding profiles I used in the left margin. The upper profile wraps the side and back panels. The molding frames the veneer and provides a good transition between the posts and panels.

PANEL MOLDING. The molding is made with two router bits. I combined a half-round bit and a cove bit to create a unique look. The process for routing this profile is available at

Profiles. For tips on routing the molding profiles, go online to *WoodsmithSpecials.com*.



WoodsmithSpecials.com. It's a good idea to make a few extra molding blanks while you're at it. This will save the headache of recreating the molding if you miscut a piece.

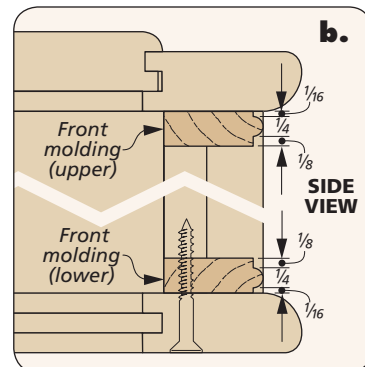
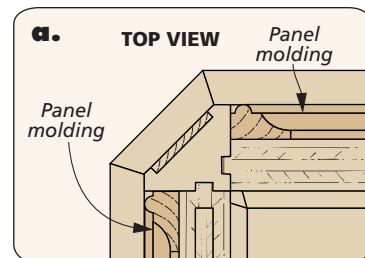
Take your time as you miter the blanks to length. Your goal is to get a tight-fitting miter in each corner with the profile wrapping seamlessly. I cut the long pieces first and glued them in place. Then I cut the shorter pieces to fit, as in Figures 3 and 3a.

FRONT MOLDING. The other molding profile I made is shown in the lower margin photo. It "frames" the top and bottom of the drawer compartment, as you can see in Figure 3.

This profile uses the same half-round bit used on the panel molding. It's used to form a bead on the edge of a relatively wide molding blank. As you can see in Figure 3b, the bead isn't centered on the thickness of the workpiece. It's offset to create shadow lines between the molding and top and bottom assemblies.

Here again, it's a good idea to rout the profile on long blanks. Then you can cut the pieces to fit snugly between the posts and glue them in place. The leading edge of the bead is aligned flush with the front edge of the corner posts. This is shown in Figure 3b.

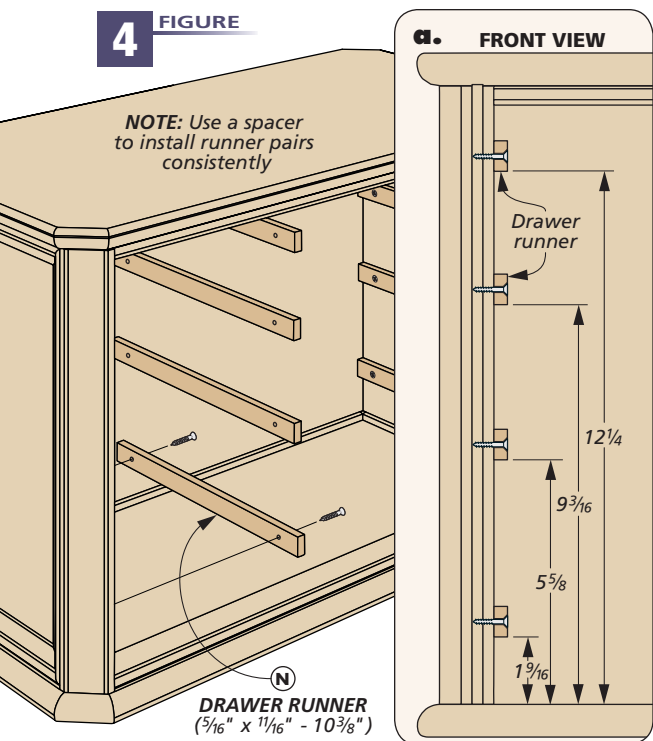
DRAWER RUNNERS. The molding completes the work on the outside



of the heirloom tool chest. Now you can turn your attention to the inside of the case.

The first thing to do is make and attach runners for the drawers, as in Figure 4. These are just thin hardwood strips that are ripped to size and screwed to the side panels of the tool chest.

Consistency is the name of the game when attaching the runners to the case. For the drawers to sit level and operate smoothly, each pair of runners needs to be installed perfectly parallel and level. To do this, I made a spacer from a piece of MDF. The height



of the spacer matches the location for the upper set of drawer runners, as shown in Figure 4a.

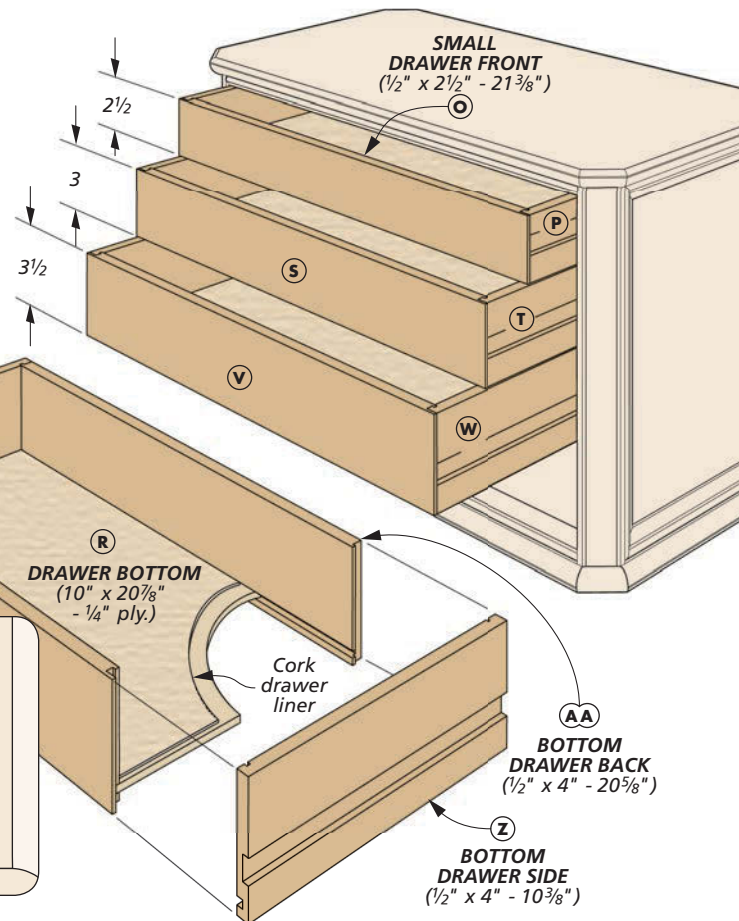
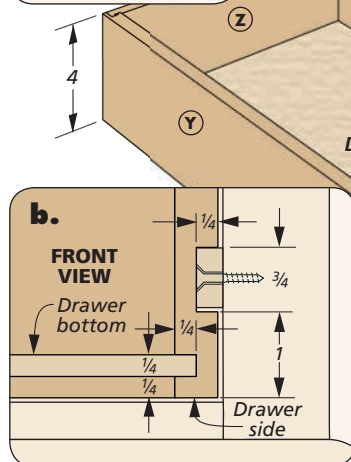
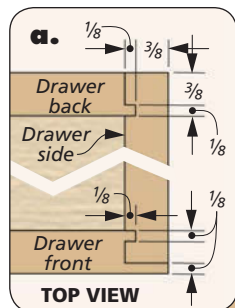
Using the spacer is straightforward. Clamp it to one side of the case. Then you can set the runner in place and screw it to the case. (The runners are set flush with the back of the case.) Simply cut the spacer down to match the next pairs of runners.

ADDING THE DRAWERS. Building the four drawers completes the tool chest. The front of each drawer is veneered and then wrapped with trim to match the look of the rest of the case.

The drawers are all different sizes for maximum flexibility. However, the construction details are the same. The front corners are joined with locking rabbets. A tongue and dado joins the back, as in Figure 5a.

The drawer sides have a groove cut on the outside face that slips over the runners in the case. I sized the groove to be just a hair wider than the runners for smooth operation. The groove is located in the same position on all four drawers. So once you have the dado blade sized and rip fence positioned, you can cut grooves for all the drawers

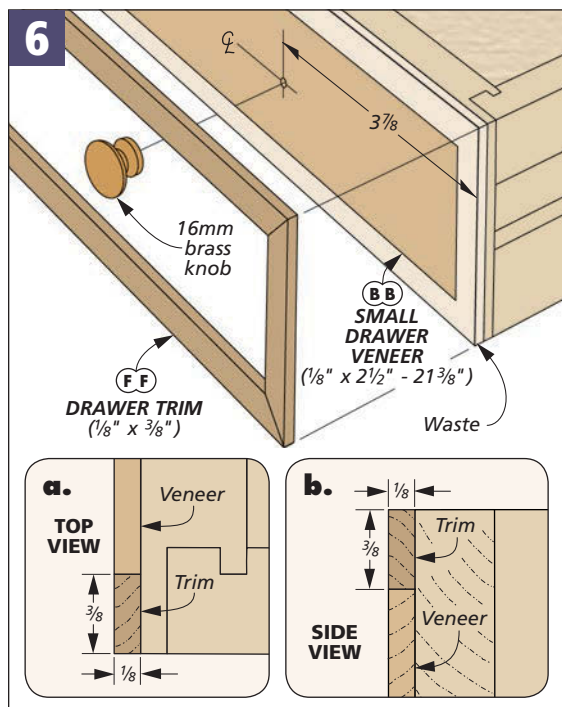
5 FIGURE



at the same time. The drawers can then be glued together. The next step is to add the veneer work to the front of each drawer (box below).

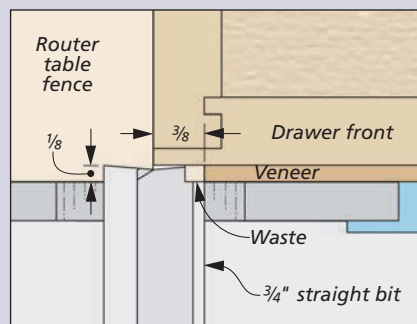
For the finish, I wiped on a coat of natural oil to bring out warm tones

found in the mahogany and the maple. Then I applied a few coats of lacquer for added protection and to impart a bit of sheen. The last addition is to line the drawers with cork before loading up the chest.



Veneer the Drawer Fronts

The veneer for the drawer fronts is resawn from a thicker board and then glued to the completed drawer. At the router table, you can use a straight bit to cut a shallow rabbet around all four edges that matches the thickness of the veneer (drawing below). The trim can then be ripped to fit the rabbet and mitered to wrap around the front.



Veneer.

Bird's eye maple veneer is wrapped with mahogany trim to create a framed look to match the tool chest.

versatile Storage Cart

Unique pivoting drawers, a set of shelves, and simple bins pack a lot of storage potential into this easy-to-build shop cart.

As far as shop carts go, this one is relatively compact. But despite this, perhaps the most surprising thing about the project is how many supplies you can store in it. The pivoting drawers stand as a clever storage feature. But when you add the fixed shelves, an array of parts bins, and an open top complete with trays, you end up with a top-notch supply station.

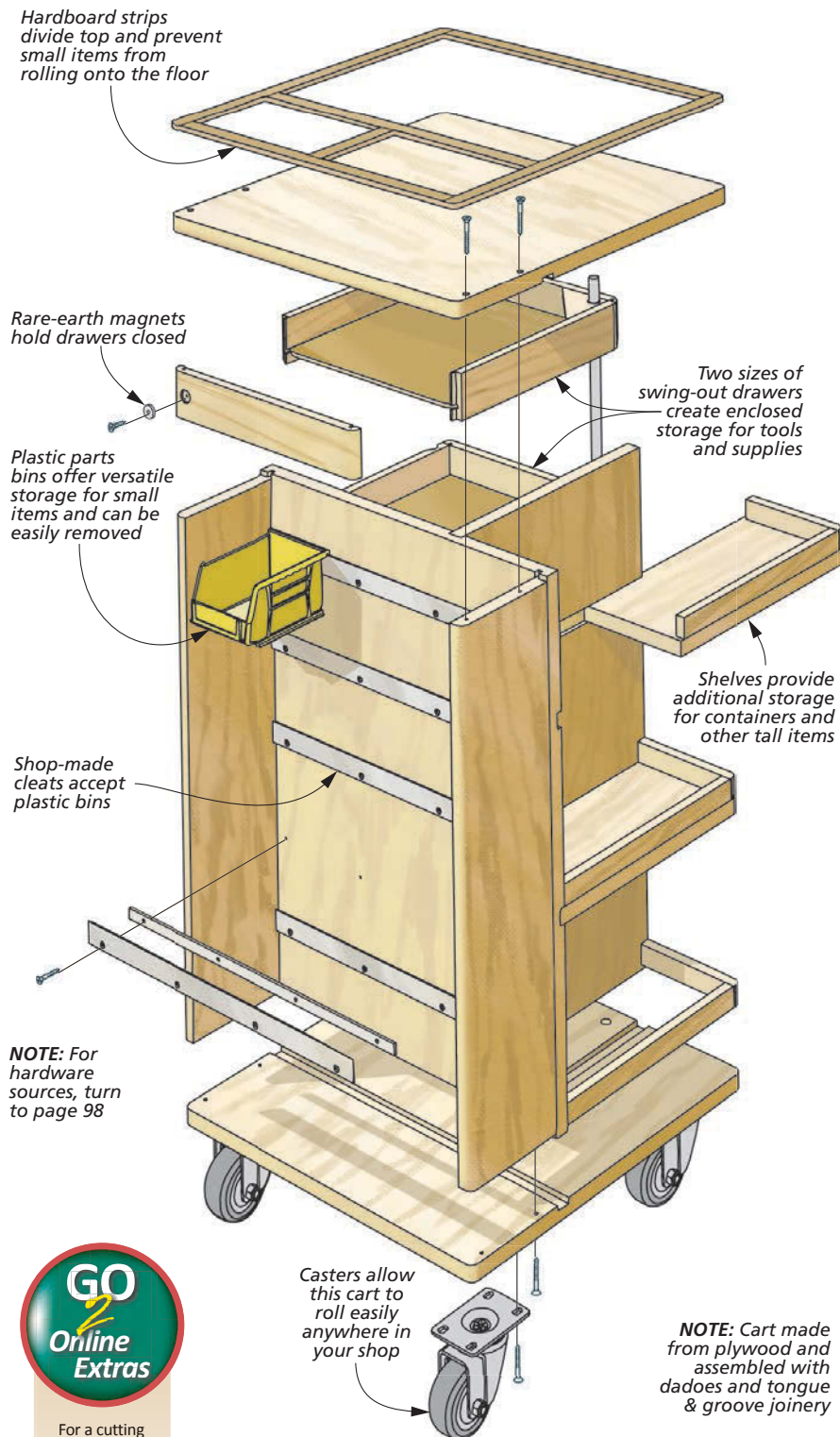
As you can see, the cart is small enough to tuck under a tool or the end of your workbench. Finally, plywood and simple joinery means you can build one for your shop in a short time.



CONSTRUCTION DETAILS

OVERALL DIMENSIONS:

18½"W x 30⅞"H x 18½"D



Compact Storage. You can hold a surprising amount of hardware, tools, and supplies in a relatively small footprint with this cart.

MATERIALS & SUPPLIES

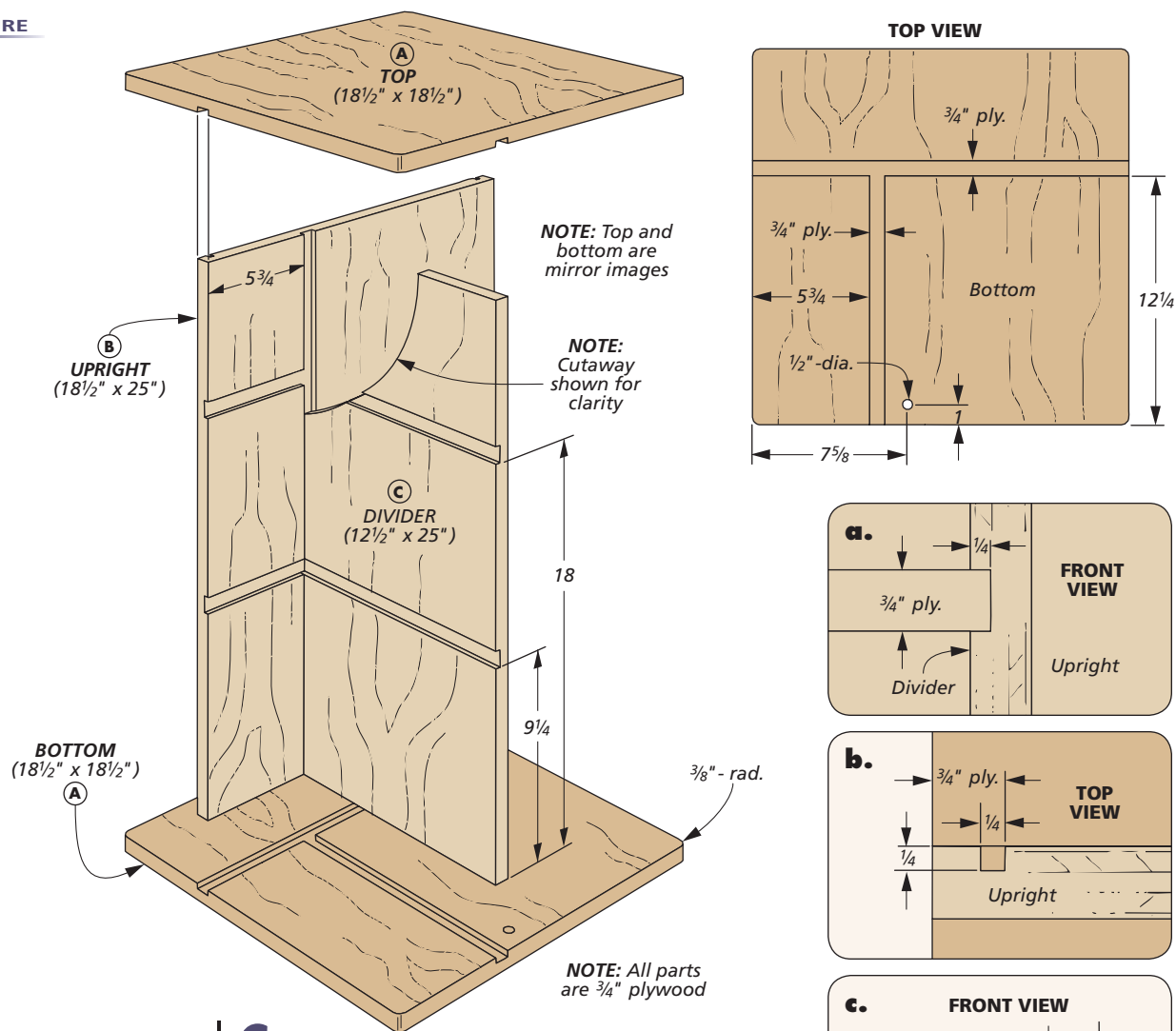
A	Top/Bottom (2)	18½ x 18½ - ¾ Ply.
B	Upright (1)	18½ x 25 - ¾ Ply.
C	Divider (1)	12½ x 25 - ¾ Ply.
D	Sides (2)	5¾ x 24½ - ¾ Ply.
E	Lip (1)	¾ x 94 rgh. - ¼ Hdbd.
F	Shelves (2)	6 x 12½ - ¾ Ply.
G	Shelf Ends (3)	½ x 1 - 5¾
H	Shelf Sides (3)	½ x 1 - 11¾
I	Small Drwr. Ends (8)	½ x 2⅜ - 11⅞
J	Small Drwr. Sides (8)	½ x 2⅜ - 11⅞
K	Drwr. Btms. (7)	11⅞ x 11⅞ - ¼ Hdbd.
L	Corner Blocks (14)	½ x 3 - 3
M	Large Drwr. Ends (6)	½ x 4⅝ - 11⅞
N	Large Drwr. Sides (6)	½ x 4⅝ - 11⅞
O	Magnet Strip (1)	¾ x 2 - 24½
P	Plate (1)	¾ x 1 - 2

- (8) #8 x 1½" Fh Woodscrews
- (4) 3" Locking Swivel Casters
- (16) #12 x ¾" Sheet Metal Screws
- (16) #12 Flat Washers
- (5) ½" x 17" - ⅛" Aluminum Bars
- (5) 1" x 17" - ⅛" Aluminum Bars
- (22) #6 x ⅝" Fh Woodscrews
- (20) 4" Plastic Parts Bins
- (1) ½"-Dia. x 25¾" Steel Shaft
- (14) ½" I.D. x ½" Sleeve Bearings
- (7) ½" Thrust Bearings w/Washers
- (7) ⅝" Rare-Earth Magnets, Cups & Washers



For a cutting diagram and bonus technique article, go to:

WoodsmithSpecials.com



an unusual Case

While the storage features of this cart steal the show, it's the case that makes it all possible. A quick glance at Figures 1 and 2 lets you know that this isn't your ordinary, box-shaped assembly. Instead, the case consists of an interior framework that in turn creates three compartments for each type of storage.

All this makes building the case for this cart unique. But there isn't anything here that's more complicated than you'll find in a traditional case.

TOP & BOTTOM. I began with the plywood top and bottom panels and worked my way in. These square pieces capture the other parts of the casework. To do this, you need to cut a dado and a stopped groove

on the inside face of each. This is shown in the Top View detail.

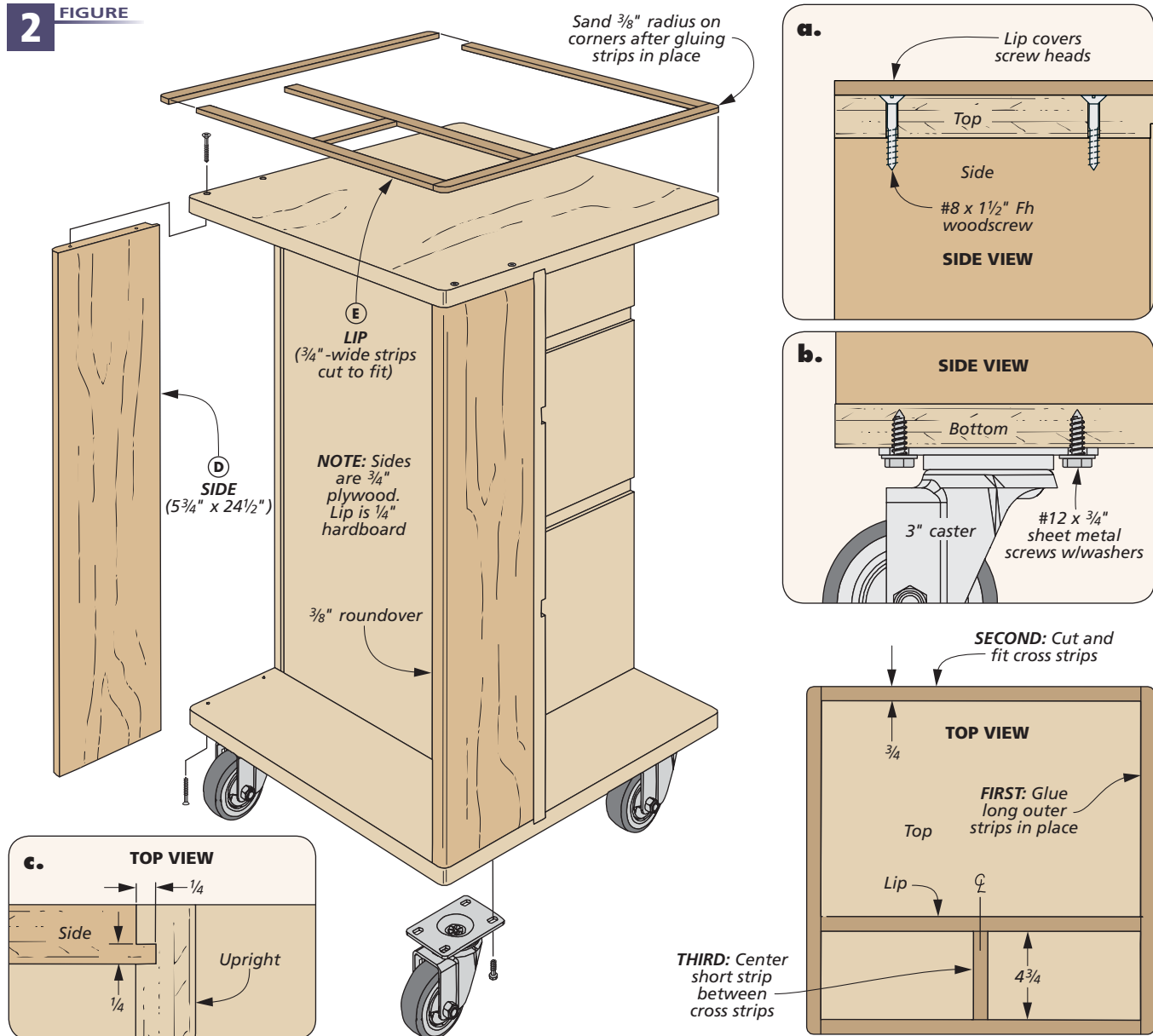
I used a hand-held router, a straight bit, and a straightedge guide to cut the case joinery. (The process is outlined in an article at WoodsmithSpecials.com.) The key part of this is making sure the bit matches the thickness of the plywood for a solid assembly.

The top and bottom panels also serve as the supports for the swing-out drawers. The drawers pivot on a steel shaft that's installed in the top and bottom. So you can drill these holes at this point. A good way to make sure the holes are perfectly aligned in each piece is to tape them together and drill the holes in both pieces at the

same time. Figure 1c shows an important detail. The hole in the bottom panel is a through hole, while the hole in the top is stopped.

The final detail to add on the top and bottom is to ease the corners with a gentle radius.

THE INSIDE. The task of connecting the top and bottom, as well as creating the storage compartments, falls



to the upright and divider panels, as you can see in Figure 1.

The upright is the bigger of the two pieces and the more involved. A groove on one face holds the smaller divider panel. It aligns with the stopped dadoes in the top and bottom (Top View). In addition, narrower grooves on the opposite face accept a pair of sides added later, as in Figure 1b.

The other bit of joinery to take care of is cutting a pair of stopped dadoes. These hold one end of a couple of fixed shelves. Figure 1 shows the locations for these. The divider is the same length as the

upright, and its width is sized so that it's flush with the edge of the top and bottom. Two dadoes align with those in the upright to hold the back edge of the shelves (refer to Figure 1a).

ASSEMBLY. I assembled these four case pieces at this point. The grooves and dadoes register the parts and make the gluing and clamping process less hectic.

SIDES. The assembled case provides a good reference point for sizing the length of two sides, as shown in Figure 2. A tongue along one edge interlocks with the groove in the upright, as shown in

Figure 1b. The other edge of the side has a roundover to match the radius of the top and bottom.

The tongue and groove joinery is glued and the sides are screwed and glued to the top and bottom (refer to Figure 2a).

DIVIDED TOP. The top of the cart makes a handy workspace or staging area. To keep small parts organized and prevent them from falling to the floor, I added a grid-work of hardboard strips to the top, as detailed in the Top View, above.

Adding a set of 3" casters to the bottom completes the case of the cart, as in Figure 2b.

add Storage

Completing the case sets the stage for adding storage to the cart. Versatility is the name of the game here.

BIN RACK. Over the years, I've come to appreciate how handy plastic parts bins can be. The compartment formed by the upright and sides provides space for up to twenty 4" bins. The bins hang on the simple cleat system that's shown in Figures 3 and 3a. The cleats are made from two strips of aluminum bar stock. A lip on the back of the bins fits over the cleat. I glued the two strips together with some super glue. This holds the pieces together

while drilling the mounting screw holes. The Side View below shows the spacing for the cleats.

FIXED SHELVES. Moving to the next side of the cart, you can add two shelves. They fit into the dadoes routed in the upright and divider. The shelves are sized to be flush with the ends of the upright and divider when glued into the dadoes. The outside corner of each shelf is eased just like the radius on the top and bottom, as you can see in Figure 3b.

To keep items stored on the shelves from falling off while moving the cart, I added hardwood strips to form an end and side for each shelf. The end is profiled to

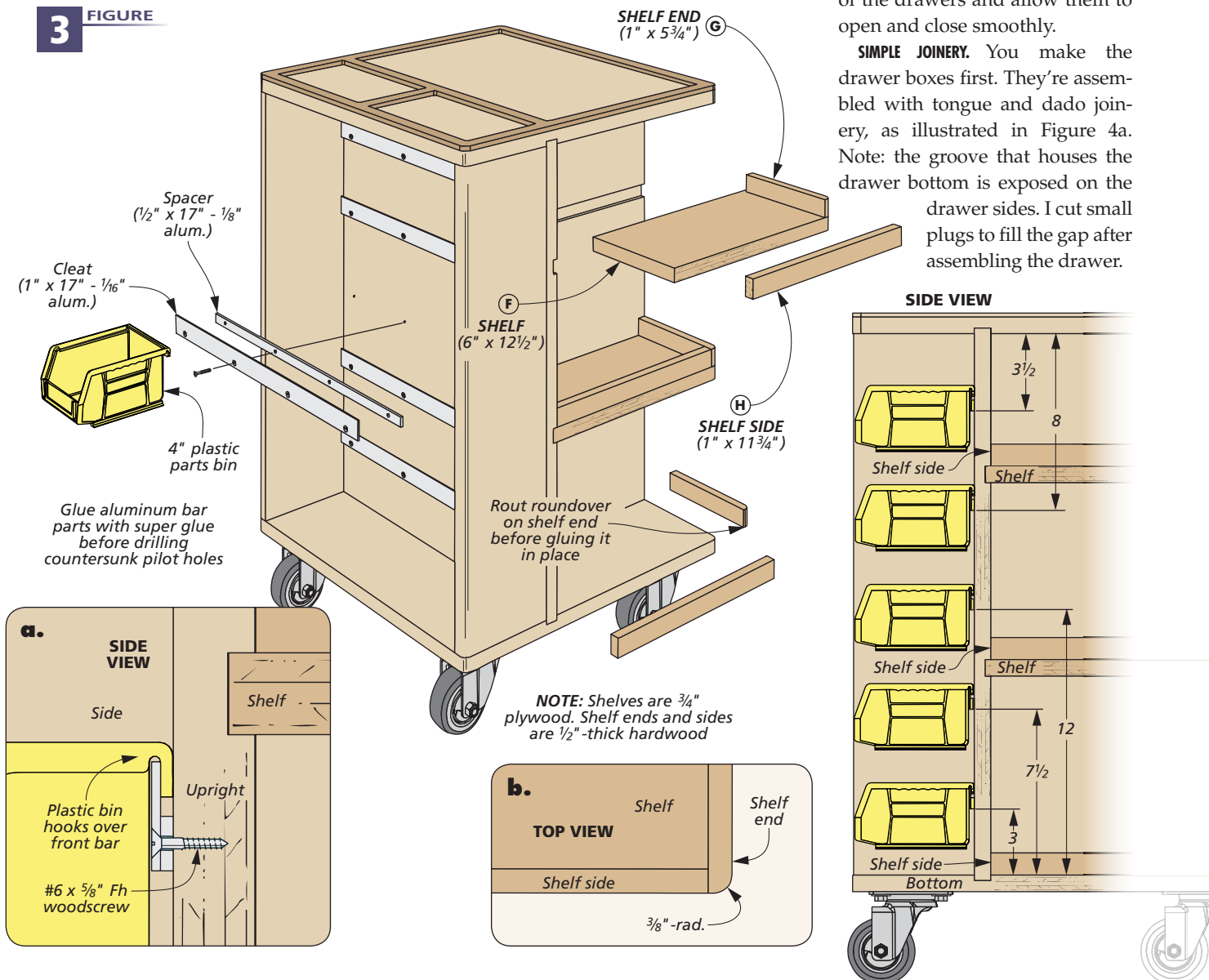
match the shelf radius. The pieces are simply glued to the top face of the shelf, flush with the edges.

I also added an end and side to the case bottom. This creates a third shelf, as shown in Figure 3.

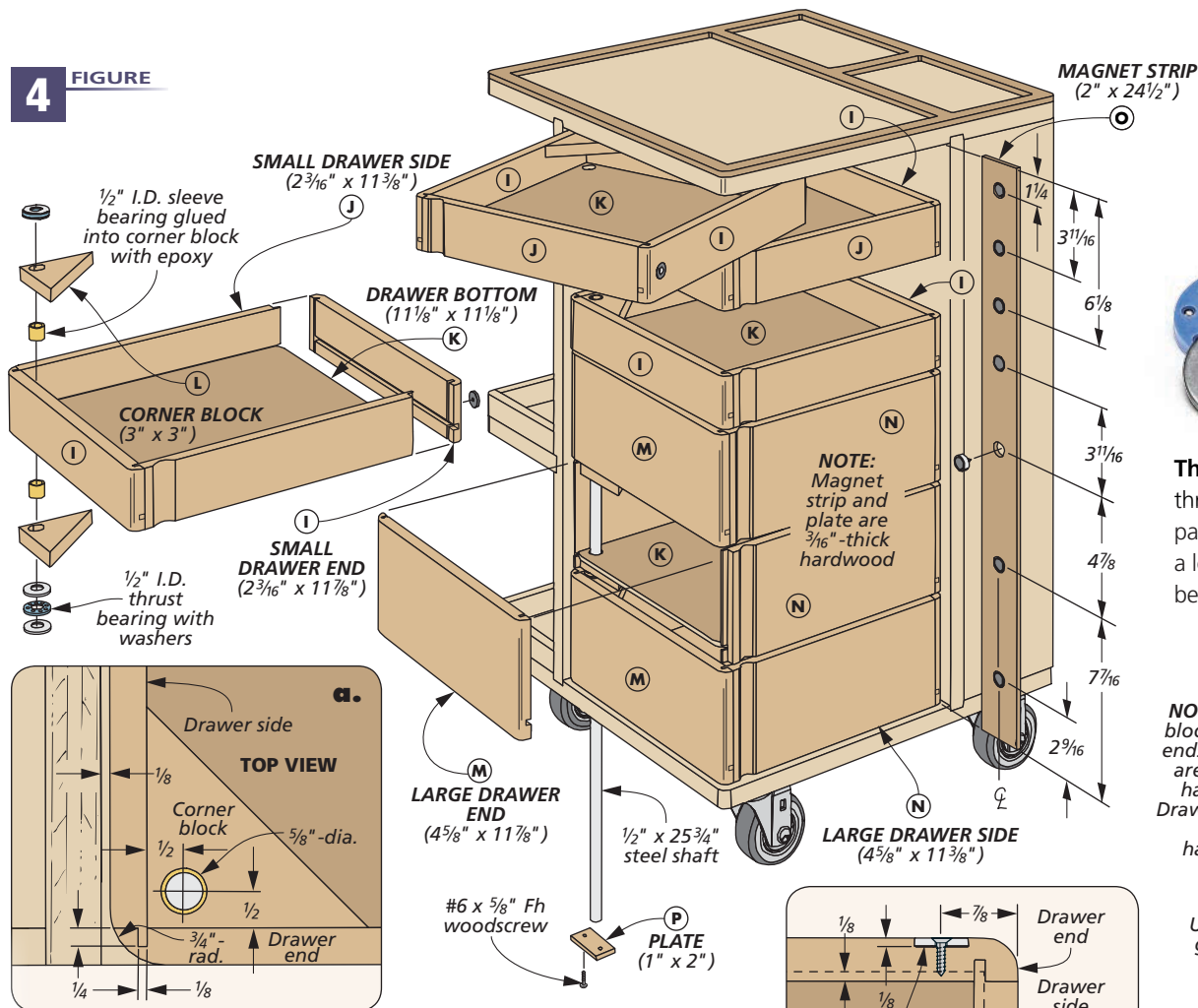
PIVOTING DRAWERS. The drawers give this cart its unique twist. The idea was inspired by the small supply carts used by artists. Pivoting on a steel shaft allows for total access to the drawer without the need for metal slides.

To keep the drawers from sagging, there's a pair of sleeve bearings in one corner of the drawer. Between the drawers, I used thrust bearings (right margin photo). These support the weight of the drawers and allow them to open and close smoothly.

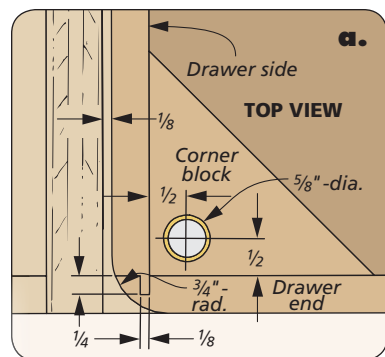
SIMPLE JOINERY. You make the drawer boxes first. They're assembled with tongue and dado joinery, as illustrated in Figure 4a. Note: the groove that houses the drawer bottom is exposed on the drawer sides. I cut small plugs to fill the gap after assembling the drawer.



4 FIGURE



Thrust Bearings. A thrust bearing and pair of washers create a low-friction surface between the drawers.

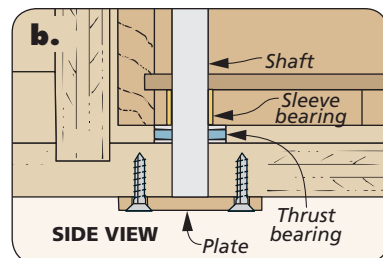


Three of the corners have a roundover that matches other details on the cart, as in Figure 4c. The pivoting corner has a larger radius so the drawer won't catch as it opens or closes (Figure 4a).

I used a core box bit in the router table to form a finger pull on one side, as in Figure 4c. A magnet strike installed on one side completes the drawer.

CORNER BLOCKS. The next step is to add corner blocks so the drawers can fit onto the steel shaft. Drill the hole for the sleeve bearing at the drill press so the blocks are consistent (Figure 4a).

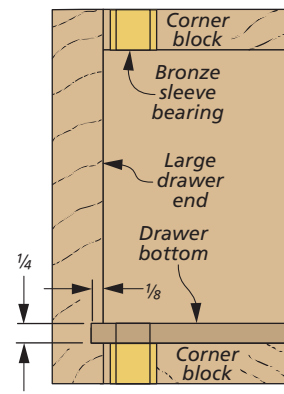
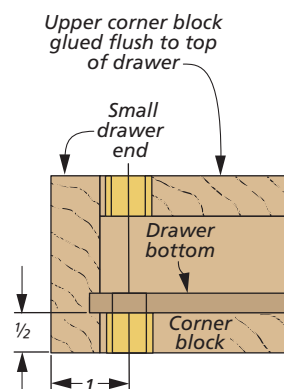
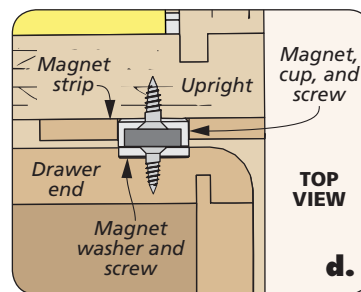
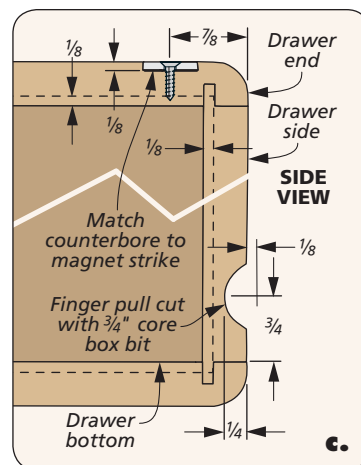
After gluing the sleeve bearings into the corner blocks, glue the lower block to the underside of the drawer. Before you add the upper corner block, you need to drill through the drawer bottom at the drill press. It's a good idea to make a backing block to fit inside



the drawer. This prevents tearout as the bit exits the workpiece. Then you can glue the upper corner block flush with the top of the drawer (Side View at right).

Installing the drawers is a matter of sliding the shaft in from the bottom, adding one drawer at a time. Just be sure to install a thrust bearing and washers between each drawer. A hardwood plate keeps the shaft in place (Figure 4b).

The final piece of the puzzle is a thin magnet strip. It houses rare-earth magnets that hold the drawers closed and is glued in place.



SIDE VIEWS

A few coats of wiping varnish adds a little color and protection. Considering how much stuff this cart can hold, you're sure to end up with a neater shop.

multipurpose Shop Cart

MATERIALS & HARDWARE

BASE & TOP

A	Legs (4)	3 x 3 - 28 $\frac{1}{4}$
B	Rails (4)	1 $\frac{1}{2}$ x 3 - 28
C	Caster Plates (2)	$\frac{3}{4}$ x 3 $\frac{1}{2}$ - 28 $\frac{1}{2}$
D	Aprons (2)	1 $\frac{1}{2}$ x 3 - 31
E	Stretchers (2)	1 $\frac{1}{2}$ x 3 - 32
F	Benchtop (1)	2 x 31 $\frac{1}{2}$ - 40 $\frac{3}{4}$

TOOL RACK

G	Tops/Bottoms (4)	$\frac{3}{4}$ x 2 $\frac{1}{2}$ - 22
H	Sides (4)	$\frac{3}{4}$ x 2 $\frac{1}{2}$ - 20 $\frac{3}{4}$
I	Tool Panels (2)	21 x 21 $\frac{1}{4}$ - $\frac{1}{4}$ Pgbd.

STORAGE CABINET

J	Case Top (1)	15 $\frac{1}{2}$ x 30 - $\frac{3}{4}$ Ply.
K	Case Bottom (1)	19 $\frac{3}{4}$ x 30 - $\frac{3}{4}$ Ply.

L	Case Sides (2)	13 x 15 $\frac{1}{2}$ - $\frac{3}{4}$ Ply.
M	Case Back (1)	13 x 29 - 1/4 Ply.
N	Case Divider (1)	13 x 15 - $\frac{3}{4}$ Ply.
O	Foot Rail (1)	6 x 31 $\frac{1}{2}$ - $\frac{3}{4}$ Ply.
P	Lip (1)	1 $\frac{1}{2}$ x 30 - $\frac{3}{4}$ Ply.
Q	Upr. Drwr. Frt/Bk. (2)	4 $\frac{1}{4}$ x 15 $\frac{3}{4}$ - $\frac{3}{4}$ Ply.
R	Upr. Drwr. Sides (2)	4 $\frac{1}{4}$ x 14 - $\frac{3}{4}$ Ply.
S	Drwr. Bottoms (2)	13 x 15 $\frac{3}{4}$ - $\frac{1}{4}$ Ply.
T	Lwr. Drwr. Frt/Bk. (2)	6 $\frac{9}{16}$ x 15 $\frac{3}{4}$ - $\frac{3}{4}$ Ply.
U	Lwr. Drwr. Sides (2)	6 $\frac{9}{16}$ x 14 - $\frac{3}{4}$ Ply.
V	Upr. False Front (1)	5 x 17 $\frac{5}{8}$ - $\frac{3}{4}$ Ply.
W	Lwr. False Front (1)	7 $\frac{5}{16}$ x 17 $\frac{5}{8}$ - $\frac{3}{4}$ Ply.
X	Door (1)	9 $\frac{7}{8}$ x 12 $\frac{3}{8}$ - $\frac{3}{4}$ Ply.
Y	Door Stop (1)	$\frac{1}{4}$ x 1 - 1

- (4) 4" Locking Swivel Casters
- (16) #14 x $\frac{3}{4}$ " Ph Sheet Metal Screws
- (2 sets) Bed Bolt Sets
- (44) #8 x 1 $\frac{1}{2}$ " Fh Woodscrews
- (10) $\frac{5}{16}$ " x 2 $\frac{1}{4}$ " Lag Screws
- (10) $\frac{5}{16}$ " Flat Washers
- (8) #8 x 1 $\frac{1}{4}$ " Fh Woodscrews
- (2 pr.) 14" Full-Ext. Drawer Slides w/Screws
- (3) 5 $\frac{3}{4}$ " Plastic Handles
- (6) #8 x 1 $\frac{1}{4}$ " Ph Sheet Metal Screws
- (1 pr.) Spring Hinges w/Screws

CUTTING DIAGRAM

$\frac{3}{4}$ " x 5 $\frac{1}{2}$ " - 96" Douglas Fir



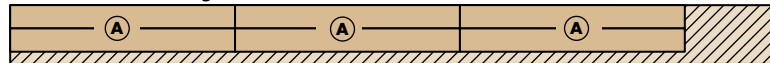
$\frac{3}{4}$ " x 5 $\frac{1}{2}$ " - 96" Douglas Fir



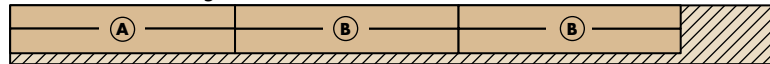
1 $\frac{1}{2}$ " x 7 $\frac{1}{4}$ " - 96" Douglas Fir (Four Boards)



1 $\frac{1}{2}$ " x 7 $\frac{1}{4}$ " - 96" Douglas Fir



1 $\frac{1}{2}$ " x 7 $\frac{1}{4}$ " - 96" Douglas Fir



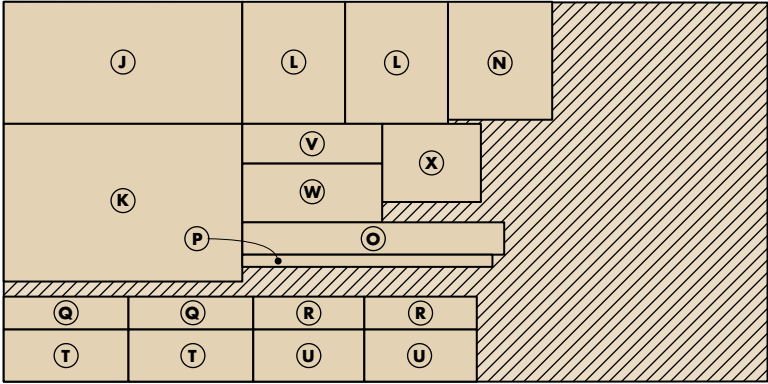
1 $\frac{1}{2}$ " x 7 $\frac{1}{4}$ " - 96" Douglas Fir



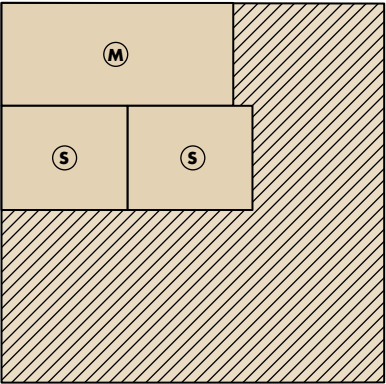
NOTE: Door stop (Y) is resawn and planed to $\frac{1}{4}$ " thick



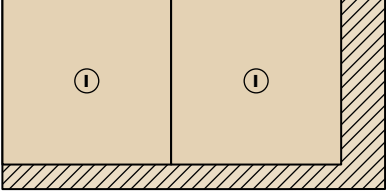
48" x 96" - 3/4" Birch Plywood



48" x 48" - 1/4" Birch Plywood



24" x 48" - 1/4" Pegboard





on-the-go Antique Toolbox

With some basic materials and simple techniques, you can build this handy portable toolbox with a time-tested design.

Even though I do most of my woodworking in my shop, there are still times when I need to take a few tools on the road, so to speak, to help out a friend or tackle a project on site. That's where the compact toolbox you see here really shines.

The inspiration for this toolbox is based on an old *Stanley* toolbox. While the design is more than 100

years old, its sturdy construction and practical storage make it ideal for a modern shop.

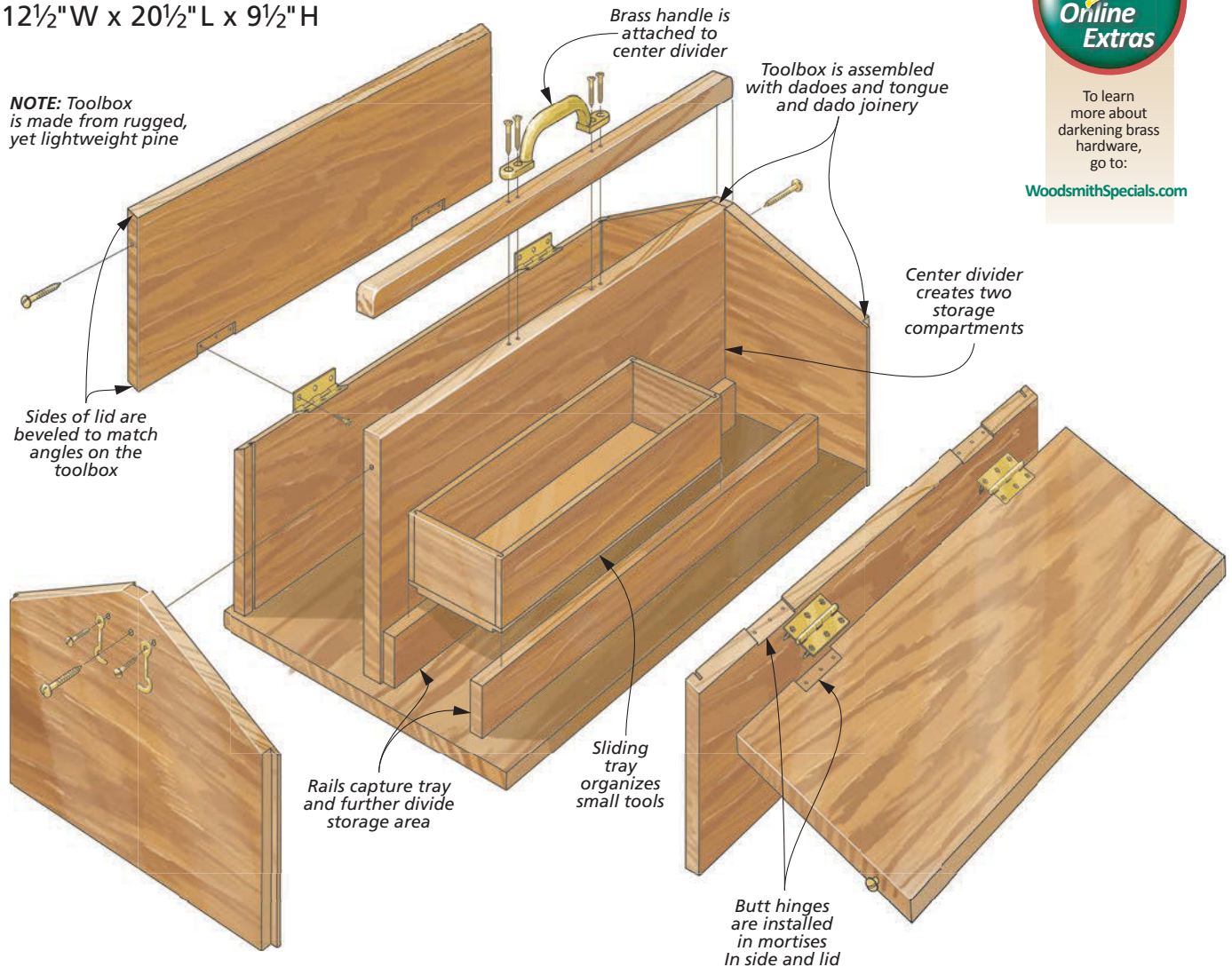
The box has two generous, lidded compartments that can accommodate a wide variety of tools. A sliding tray on one side allows you to store and organize smaller items that would otherwise get lost or damaged in the bottom.

CONSTRUCTION DETAILS

OVERALL DIMENSIONS:

12½"W x 20½"L x 9½"H

NOTE: Toolbox is made from rugged, yet lightweight pine



NOTE: For hardware sources, turn to page 98

Closed In. Flip-open lids keep dust and debris out of the toolbox. Simple hooks hold them closed.

MATERIALS & SUPPLIES

A	Sides (2)	½ x 5⅛ - 20	• (2) #8 x 1¼" Rh Brass Woodscrews
B	Ends (2)	½ x 7¼ - 11½	• (4) #8 x ¾" Rh Brass Woodscrews
C	Divider (1)	¾ x 7¼ - 19¼	• (2 pr.) 1⅞" x 2" Brass Butt Hinges
D	Cap (1)	¾ x ¾ - 20	• (24) #4 x ⅜" Fh Brass Woodscrews
E	Bottom (1)	½ x 12½ - 20½	• (4) Brass Latch Hooks w/Screws
F	Rails (2)	½ x 1½ - 19	• (1) Heavy-Duty Brass Handle w/Screws
G	Tray Sides (2)	¼ x 2 - 12	• (6) #8 x 1½" Fh Woodscrews
H	Tray Ends (2)	¼ x 2 - 3¾	
I	Tray Bottom (1)	¼ x 4 - 12	
J	Lids (2)	½ x 6⅝ - 20	



To learn more about darkening brass hardware, go to:

WoodsmithSpecials.com



building the Toolbox

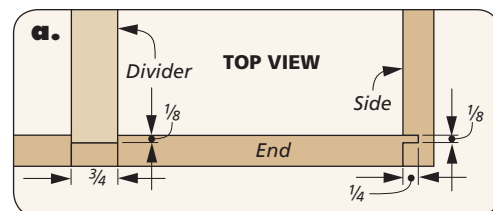
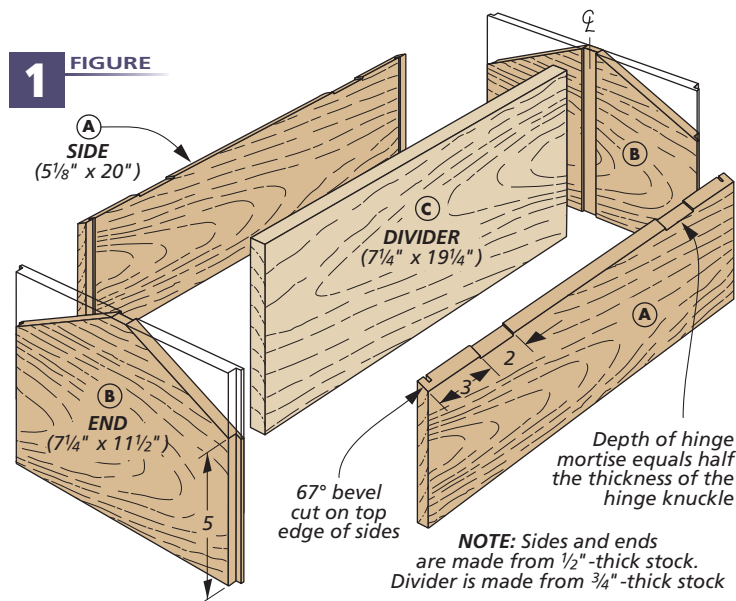
The main purpose of a toolbox is portability. It needs to be tough enough to stand up to on-the-go use. But it also needs to be light. This way, the box won't be too heavy to carry once it's loaded up with tools and gear.

I used construction-grade pine I bought at the home center to make this toolbox. That, on its own, is a good way to keep the weight down. Then, to lighten it up even more, I planed most of the stock to $\frac{1}{2}$ " thick.

Another part of making a durable box is the joinery. Here I balanced simplicity with stoutness. Dadoes and tongues register parts and increase the glue surface. Then in a few key areas, I added some screws to increase the mechanical strength.

SIDES. One place to see how this works out is in the sides. The $\frac{1}{2}$ "-thick sides have a dado cut at each end that captures a mating tongue cut on the ends of the toolbox, as you can see in Figure 1a. The upper edge of each side is beveled to establish the overall sloped profile. In addition, each side has a pair of

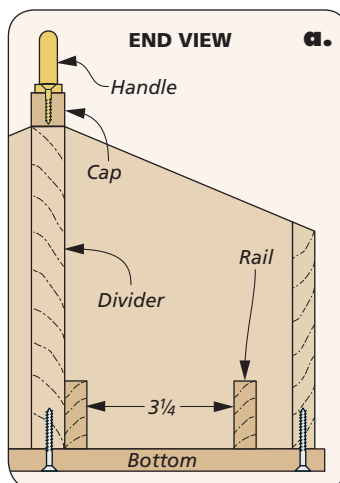
1 FIGURE



mortises to hold butt hinges for the lid (Figure 1). It's a good idea to have your hinges on hand before cutting the mortises so that you can get the size just right.

ENDS. A pair of ends tie the sides together and create the overall framework of the box body. Figure 1 shows how the top of the ends are angled to match the sides, but that's really the final step. Before we get to that, you need to cut some joinery.

The first step is cutting a rabbet on each end of the ends. This forms a tongue that locks into the dado cut in the sides. Here again, Figure 1a has the dimensions you need. Take some time to get a good, snug fit.



The second joinery element to cut is a centered dado that holds the divider. Since the handle for the box is attached to the divider, I used $\frac{3}{4}$ "-thick material for a stouter assembly.

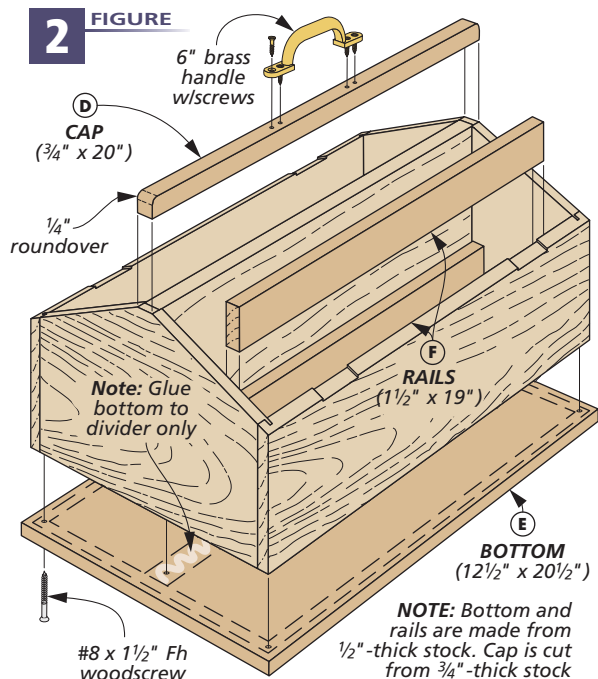
At this point, you're ready to make the beveled cuts on the ends. The bevel begins at the edge of the center dado and runs to the sides of the tool box for a smooth slope. Assemble the ends and sides without glue and mark where the sides meet the ends. Cut just to the waste side of the line at the band saw. You can use a block plane (or sanding block) to smooth out the cut edge.

DIVIDER. The divider is pretty simple. It's nothing more than a board cut to fit into the dadoes in the ends. It's sized to match the width (height) of the ends.

I glued up the sides, ends, and divider at this point. Take care to keep the assembly square as you apply the clamps.

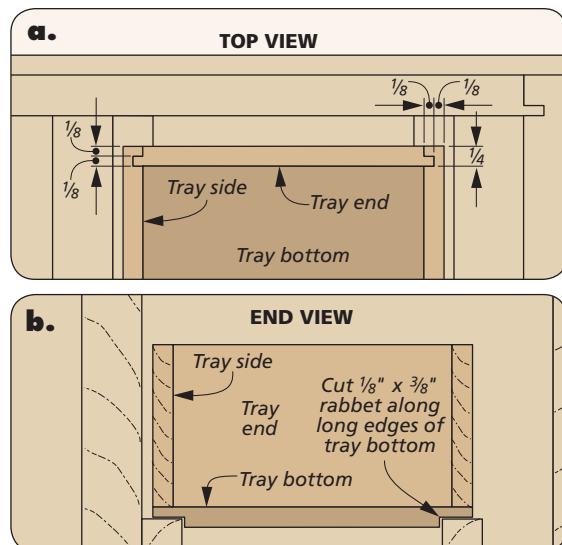
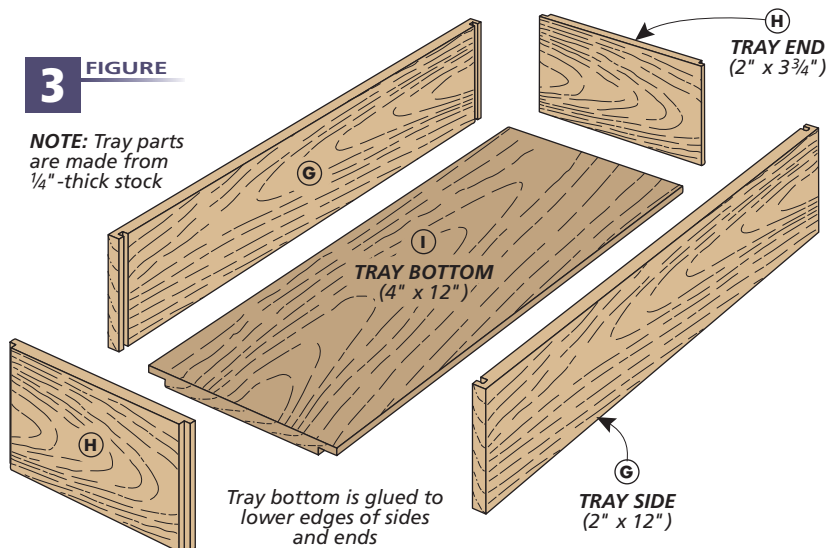
CAP. The top of the divider has a cap that extends across the length of the divider and covers the ends, as illustrated in Figure 2. A radius on each end softens the corners. I attached a brass handle to the top.

2 FIGURE



3 FIGURE

NOTE: Tray parts are made from $\frac{1}{4}$ "-thick stock



WoodsmithSpecials.com has an article that shows how to tone down the shine of the brass hardware and give it an antique look.

BOTTOM. The bottom of the box is a panel with eased edges that's slightly larger than the body. It's centered on the box body and held with glue and screws.

SLIDING TRAY

Inside the box, I added a tray to hold smaller items. The tray rides on a pair of rails. One rail is glued flush to the divider. The other is set out from the side, as in Figure 2a. This rail also divides the

compartment for smaller items. I used spacers to keep the rails parallel while the glue set up.

The tray itself is made just like the box body, as you can see in Figure 3 above. The sides and ends are joined with tongue and dado joints (refer to Figure 3a). And the bottom is glued in place. The difference is the bottom is flush with the sides and ends of the tray body.

Once complete, I cut a rabbet along each edge of the tray bottom so that it would nestle down over the rails and help it stay in place. This is shown in Figure 3b.

LIDS. The final components to add are the lids. These are beveled along each edge to match the slope of the ends and sides, as shown in Figure 4b. The bevels are parallel to each other so take care when orienting your cuts.

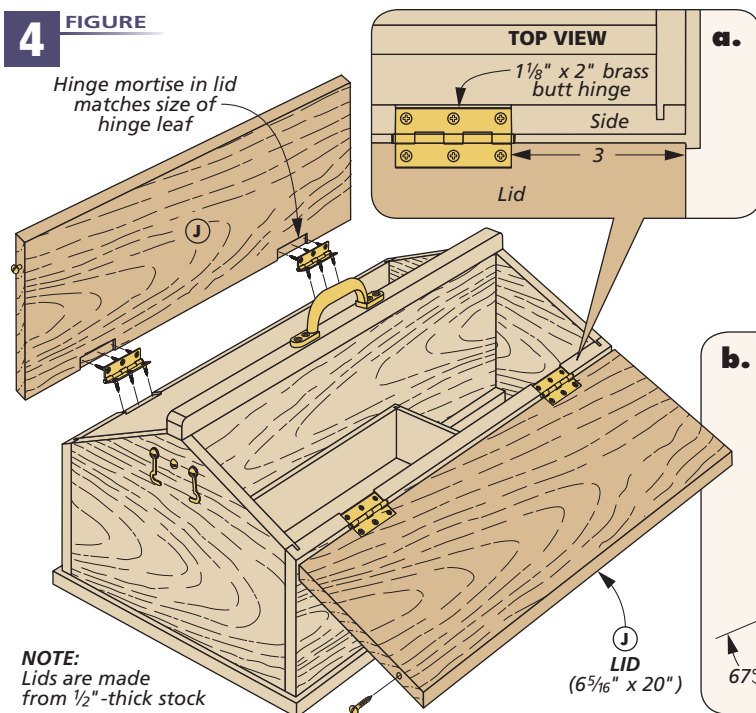
HARDWARE. The lids open on brass butt hinges. As I mentioned earlier, the hinges are recessed in the box sides. In addition, you need to cut matching mortises in the underside of the lid (Figures 4a and 4b).

I found some simple hook catches at the hardware store to keep the lid closed. They fit over roundhead screws installed in each end of the lids (Figure 4b). An additional roundhead screw between the catches adds some strength and matches a detail from the original tool box.

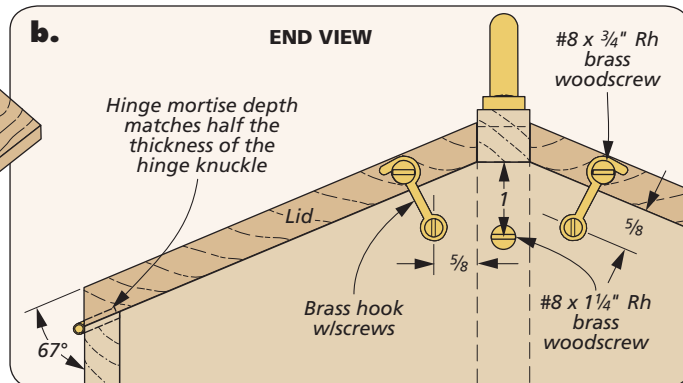
All that's left is to load up the toolbox. Now you're ready to take your tools on the road.

4 FIGURE

Hinge mortise in lid matches size of hinge leaf



NOTE: Lids are made from $\frac{1}{2}$ "-thick stock







storage Systems

Along with a workbench, every shop needs some permanent stations for both tool and lumber storage, as well as specialized work. These five systems are specifically designed for common shop needs.

RUSTIC TOOL CABINET68

ULTIMATE LUMBER CENTER74

HIGH-CAPACITY CLAMP RACK.....80

BENCH STORAGE SYSTEM86

SHARPENING STATION92



rustic Hand Tool Cabinet

Store and display all of your favorite hand tools in this wall-mounted cabinet that breaks the mold of traditional shop storage.

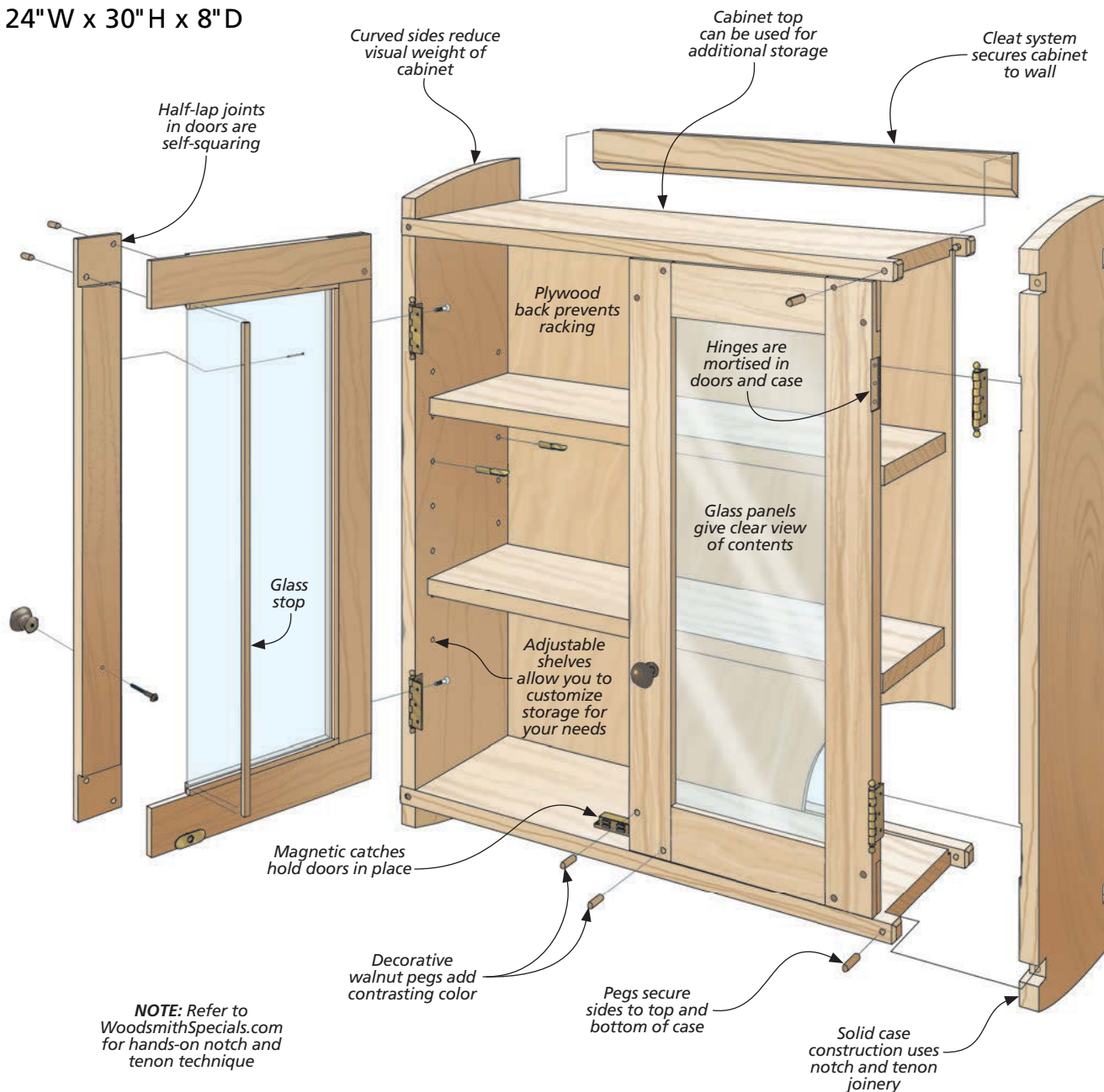
Some of my tools have been handed down through generations. So when I design a cabinet to store and display them, I want it to share the same level of detail and craftsmanship as the tools themselves. I think you'll agree that this design fits the bill.

The cabinet features ample space for some of your favorite tools and the glass doors make it easy to see the contents. Decorative details such as highly figured wood and gentle curves really make it stand out. Finally, unique joinery brings it all together.

CONSTRUCTION DETAILS

OVERALL DIMENSIONS:

24"W x 30"H x 8"D



MATERIALS & SUPPLIES

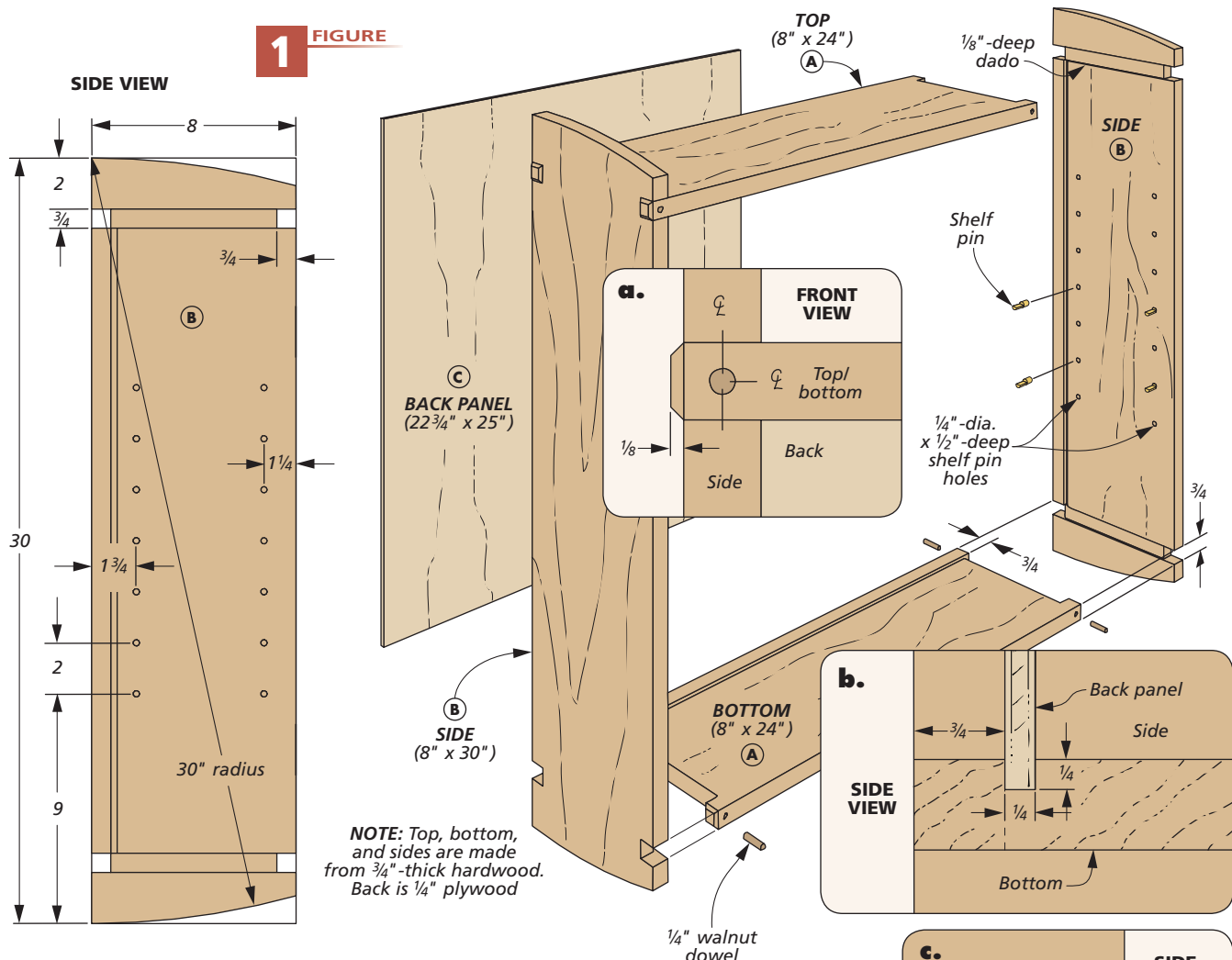
A	Top/Bottom (2)	$\frac{3}{4}$ x 8 - 24	• (1) $\frac{1}{4}$ " -dia. x 36" Walnut Dowel
B	Sides (2)	$\frac{3}{4}$ x 8 - 30	• (4) $1\frac{1}{2}$ " x 2" Hinges
C	Back Panel (1)	22 $\frac{3}{4}$ x 25 - $\frac{1}{4}$ Ply.	• (2) 1" -dia. Knobs
D	Rails (4)	$\frac{3}{4}$ x 2 $\frac{1}{4}$ - 11	• (2) $\frac{1}{8}$ " Glass Panel ($7\frac{7}{16}$ x $20\frac{5}{16}$ ")
E	Stiles (4)	$\frac{3}{4}$ x 2 - 24 $\frac{3}{8}$	• (2) Magnetic Catches w/Screws
F	Glass Stop (1)	$\frac{1}{4}$ x $\frac{1}{4}$ - 140 rgh.	• (8) $\frac{1}{4}$ " -dia. Shelf Pins
G	Shelves (2)	$\frac{3}{4}$ x 6 - 22 $\frac{1}{8}$	• (32) Brads
H	Hanging Cleats (2)	$\frac{3}{4}$ x 2 - 22 $\frac{1}{4}$	



For a cutting diagram and bonus technique articles, go to:

WoodsmithSpecials.com

1 **FIGURE**



making the Case

What I like most about this tool cabinet are the details. They're subtle, but they really make it a showpiece for some of your favorite tools. The first thing you may have noticed is the wood selection. I chose ambrosia maple because of its distinctive color and figure characteristics.

Another detail worth noting is the joinery used to assemble the case. It begins with tenons cut on the ends of the top and bottom. As you can see in Figure 1, these fit into notches cut in the sides. This joinery not only makes for a strong case, but adds visual interest that you don't see in a lot of basic tool cabinets.

CHAMFERS. I started building the case by cutting the sides, top, and bottom to final size at the table saw.

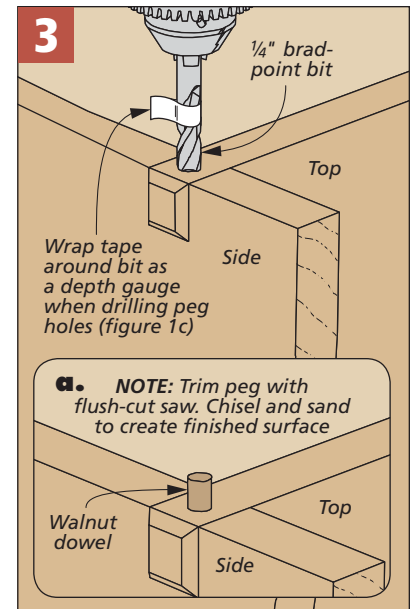
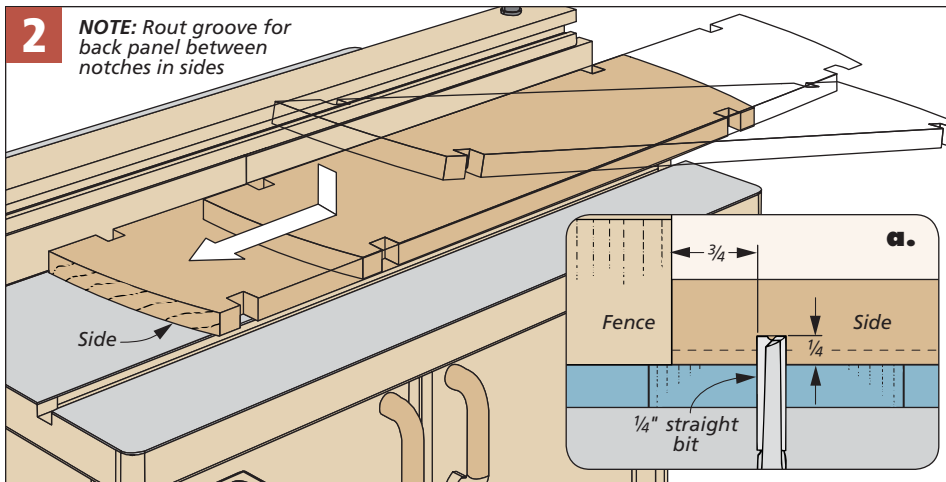
Before making the cuts for the joinery, notice in Figure 1a that the end of each tenon extends 1/8" proud of the case sides. To create a more finished look, I softened these ends by adding a chamfer around all four edges. It's easier to start this three-step process before making the cuts for the tenons.

Take a look at the box at the bottom of the next page. You'll see that I started by routing a chamfer on the ends of the pieces that make up both the top and bottom of the case. This takes care of the chamfers on three sides of each tenon. You'll add the fourth chamfer to the inside edges after the tenons have been cut.

JOINTS. Now it's time to get started on the joinery. With a dado blade in

your table saw, you begin by cutting the dados and notches in the sides first. With these cut, you can make the tenons for the top and bottom. Once you've made all the cuts, use a sanding block to create the chamfer on the inside edge of the tenons. Making cuts while standing a board on end can be challenging, but I came up with a technique that will give you perfect results. For more details, refer to the article at WoodsmithSpecials.com.

CURVES. You can see in Figure 1 that the case sides extend above the top. I designed the cabinet this way because I wanted to use



the top of the cabinet as an additional shelf for open storage. And I didn't want to risk having a tool fall off the sides. To balance the look of the cabinet, I extended the sides below the bottom as well. This added a lot of visual weight to the cabinet though. To reduce this weight and streamline the look, I added a slight curve to the top and bottom of each side.

Notice that the curve starts from the back of the cabinet and curves down towards the front. The radius of the arc is 30", which just happens to be the full length of the sides. This makes it easy to lay out the line using a beam compass. Just adjust your compass to extend the full length of the side. To get the desired arc, place the fixed end on the back corner, then draw an arc from the opposite back corner to

the front edge. Repeat this process for the remaining three curves.

A band saw makes it easy to cut the curves. When making the cuts, be sure to stay just to the waste side of your layout line. When you're done, a little work with a sanding block and you'll have a nice smooth finish.

GROOVES. All that's left to complete the case is to cut grooves in each piece for the back panel (Figure 1b). Figure 2 above shows you how to rout the groove between the dados in the sides. Drill holes for the shelf pins and you're ready for assembly. There are details for a jig at WoodsmithSpecials.com to help you with that.

ASSEMBLY. After you cut the back panel to final size and assemble the case, you can drill a hole through each tenon for the pegs. I used a

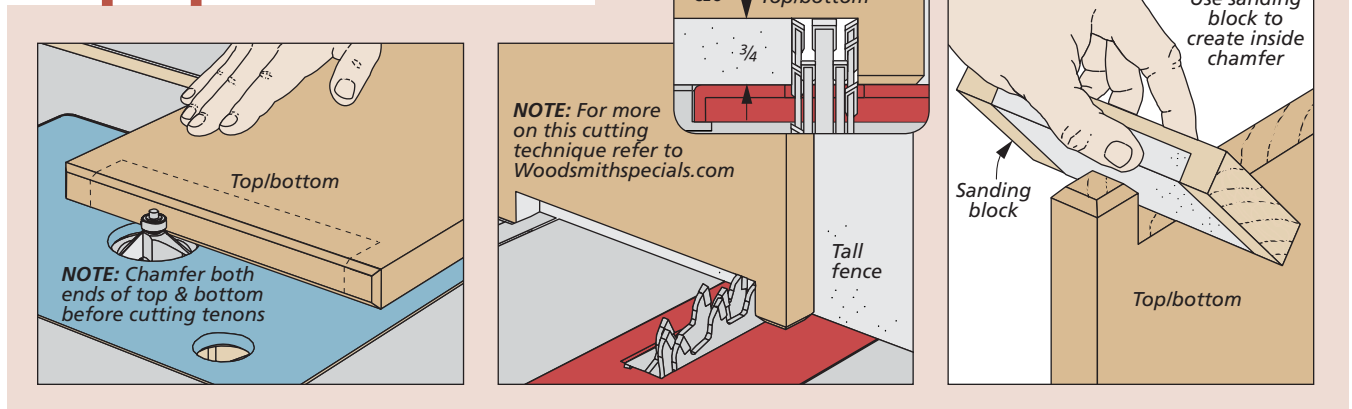
hand-held drill and attached tape to my bit as a depth guide, as illustrated in Figure 3.

The pegs in the tenons add a decorative detail, but they also help secure the top and bottom to the sides of the case (Figure 1c). I used walnut dowels to create contrast with the light color of the maple used in the case.

With a mallet, drive the dowels into the holes until they seat fully. A flush-cut saw allows you to trim most of the excess waste. Some work with a chisel and sanding block will bring the dowels flush and leave a nice smooth surface.

While the glue dries on the case, you can turn the page and begin your work on constructing the shelves and doors.

Shop Tip: Chamfer Tenons



adding shelves & Doors

Being able to display your favorite tools is what this cabinet is all about. That's why the panels in the doors are glass instead of solid wood. And to keep the construction simple, the door frame is constructed using half-lap joinery. To tie the design of the doors to the rest of the case, I used the same walnut dowels as decorative pegs in the door frames.

RAILS & STILES. Construction of the doors starts by ripping the rails and stiles to width and cutting them to length. One thing to make note of is that the rails are $\frac{1}{4}$ " wider than the stiles.

Next, you can install a dado blade. Adjust the height of your dado blade using test pieces the

same thickness as the door frame. The goal here is to sneak up on the final height of the blade by slowly raising it until both sides of the joint fit flush. Once you have the blade height dialed in, you can set the rip fence to 2" and use it as a stop while making the joinery cuts. For more details on cutting perfect half-lap joinery, refer to the article at WoodsmithSpecials.com.

Finish the doors by cutting rabbets to secure the glass panels. An auxiliary fence clamped to your rip fence allows you to bury the dado blade in the fence. This lets you control the width of cut.

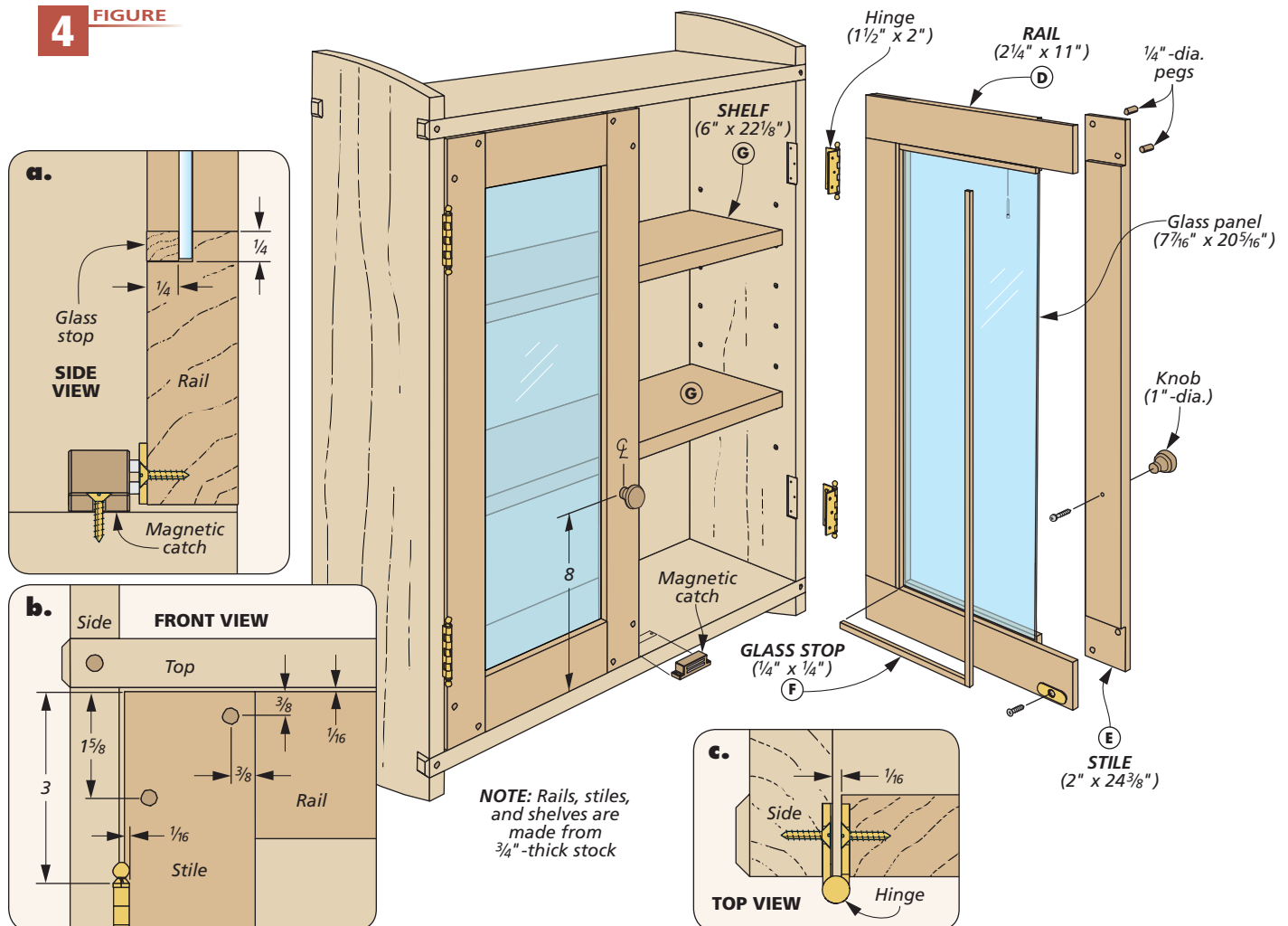
ASSEMBLY. Assembling the frame is straightforward because the half laps help square up the frame automatically (Figure 5). You'll want to use large clamps to pull the joints together across the



Decorative Pegs. Dowels installed in the case and doors enhance the overall design of the cabinet.

ends and smaller clamps directly across the half laps.

After the glue dries, you can add the pegs to the door frame. Unlike on the case, these pegs are purely decorative. In other words, they don't go through both the stile and rail (Figure 5b).



The process is basically the same though. The only difference is the depth of the holes ($\frac{3}{8}$ ").

HINGES. To attach the doors, you need to cut mortises for the hinges. I find that it's easiest to start with the case first. I use the hinges to mark the locations on the case and a small palm router to remove most of the waste. Clean up the corners with a chisel and you're ready to attach the hinges.

Now you can transfer the hinge location to the doors and cut the mortises for the other side of the hinges. Then attach the doors and make adjustments as necessary to get a good fit. What you're looking for is a consistent gap of $\frac{1}{16}$ " around each door. Once the doors are fit, you can drill holes for the knobs to attach later.

GLASS STOPS. You'll install the glass after applying finish, but go ahead and cut the stops used to secure

5 FIGURE

NOTE: Rails are $2\frac{1}{4}$ " wide; stiles are only 2" wide

NOTE: Inside view shown

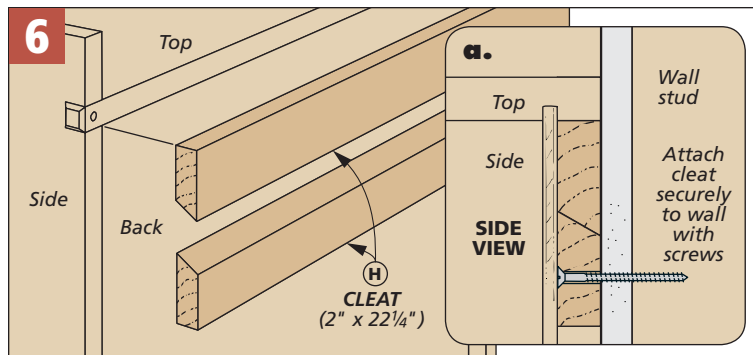
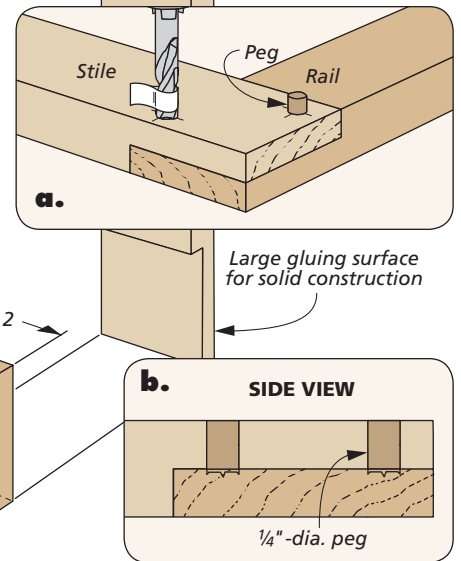
the glass to the doors. They're just small strips cut on the table saw. The box at the bottom of the page shows how it's done. Now is also a good time to cut the shelves to fit.

CLEAT. Fully loaded, the cabinet is going to be fairly heavy. That's why I secured the case to the wall with a two-part cleat. Figure 6 shows that it's made from two identical beveled strips. The degree of the angle

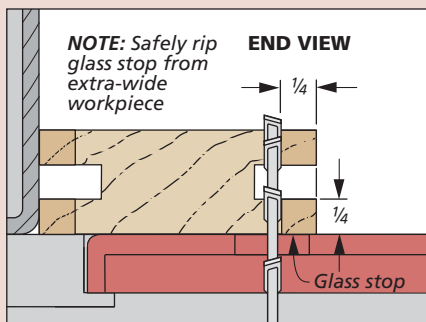
isn't critical (I used 30°), just be sure to attach each piece correctly. The cabinet hangs on the cleat and the sides of the case keep it from sliding sideways on the wall.

Complete the case by installing the glass panels and adding the knobs. You'll notice that the knobs are attached low on the door. So the magnetic catches are screwed to the bottom of the case instead of at the top. I did this to reduce any racking that may occur when opening the door.

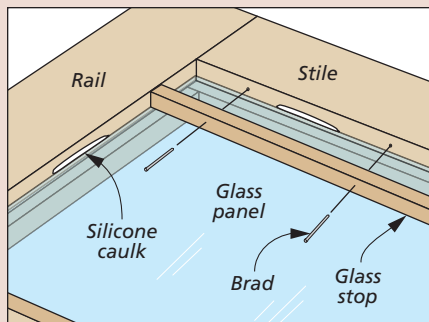
I finished the cabinet with two coats of spray lacquer. That's all it needs to bring out the beauty of the wood and complete a cabinet you can be proud of.



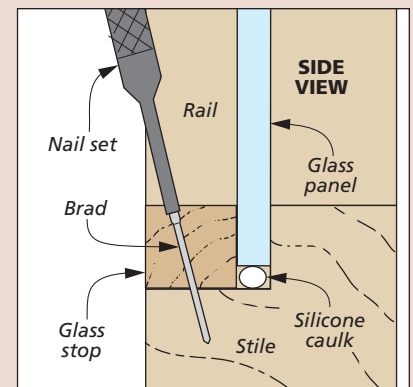
Installing the Glass



Making the Stops. After cutting grooves in the edges of a wide workpiece, cut the glass stop free.



Add Silicone. Silicone caulk holds the glass panel secure while allowing for easy replacement if necessary.



Secure Stops. Use a nail set to install the brads that secure the stops to the rails and stiles.

rustic Hand Tool Cabinet



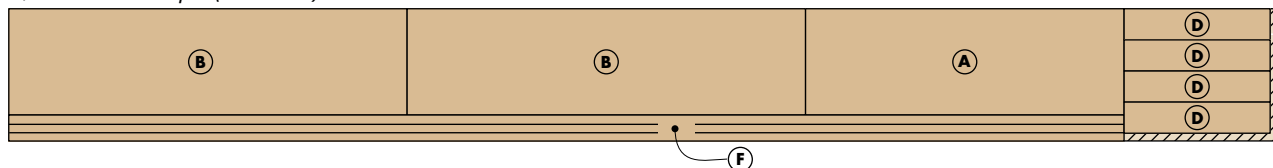
MATERIALS & HARDWARE

CASE

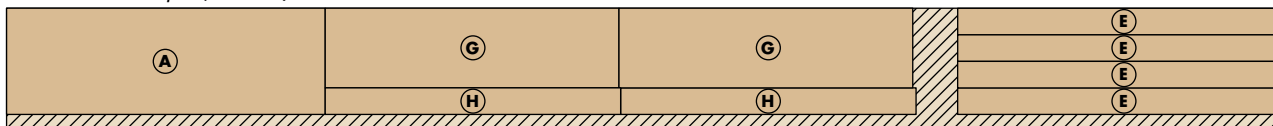
A	Top/Bottom (2)	$\frac{3}{4}$ x 8 - 24	• (1) $\frac{1}{4}$ "-dia. x 36" Walnut Dowel
B	Sides (2)	$\frac{3}{4}$ x 8 - 30	• (4) $1\frac{1}{2}$ " x 2" Hinges
C	Back Panel (1)	$22\frac{3}{4}$ x 25 - $\frac{1}{4}$ Ply.	• (2) 1"-dia. Knobs
D	Rails (4)	$\frac{3}{4}$ x $2\frac{1}{4}$ - 11	• (2) $\frac{1}{8}$ " Glass Panel ($7\frac{7}{16}$ " x $20\frac{5}{16}$ ")
E	Stiles (4)	$\frac{3}{4}$ x 2 - $24\frac{3}{8}$	• (2) Magnetic Catches w/Screws
F	Glass Stop (1)	$\frac{1}{4}$ x $\frac{1}{4}$ - 132	• (8) $\frac{1}{4}$ "-dia. Shelf Pins
G	Shelves (2)	$\frac{3}{4}$ x 6 - $22\frac{1}{8}$	
H	Hanging Cleats (2)	$\frac{3}{4}$ x 2 - $22\frac{1}{4}$	

CUTTING DIAGRAM

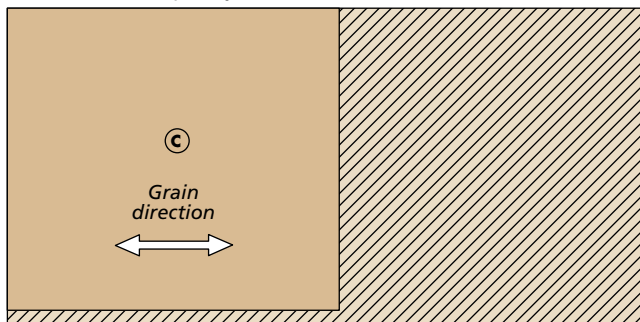
$\frac{3}{4}$ " x 10" - 96" Maple (6.7 Bd. Ft.)



$\frac{3}{4}$ " x 9" - 96" Maple (6 Bd. Ft.)



24" x 48" - $\frac{1}{4}$ " Maple Plywood



ultimate Lumber Center

This lumber rack has room for much more than boards.

As I searched for a board in my lumber rack awhile ago, I happened to notice how much empty space there was between the stacks. I decided that space could be put to much better use, so I came up with this multi-functional lumber storage center.

As you can see from the photo, this lumber center not only provides plenty of storage for boards of various lengths and widths, but it also keeps cutoffs and shorter stock well organized. There are deep, removable drawers for tools and supplies, as well.

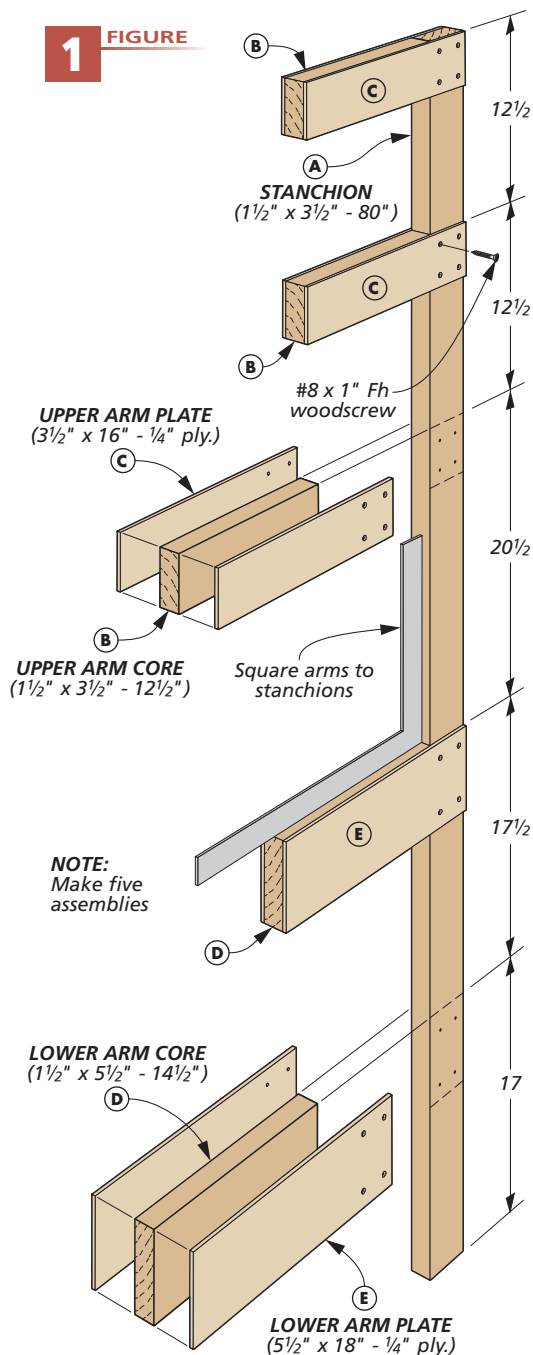
Another nice feature is the addition of a worksurface with a built-in miter saw. I used to have to tote unwieldy boards across the shop to rough cut them, but now I can make those cuts on the spot.

The rack is made of dimensional lumber and plywood available at any home center. The supports will safely hold a good-sized supply of lumber. Most of the weight rests on the floor, and it's kept upright by screwing it to the wall studs.





1 FIGURE



cutting all the Parts

The design of the lumber center is simple. It's essentially made up of a series of posts or stanchions. Attached to these are several horizontal arms that support the lumber and provide a place for mounting some storage drawers.

STANCHIONS & ARMS. Each upright is made up of a solid wood stanchion and arms. The arms consist of a lumber core sandwiched and glued between two plywood arm plates.

I started by planing all the stanchion and arm cores to uniform thickness, and cutting them to length and width. Then I cut the arm plates to size and glued them to the cores.

Next, I laid all the stanchions on the floor so the ends were flush and clamped them together. Measure for the locations of all the arms and mark across the edges using a square. It helped me to draw an "X" where I wanted them

positioned (Figure 1b). Now attach the arms with screws through the plates (Figure 1a). Check each one to make sure it's square with the stanchion, as shown in Figure 1.

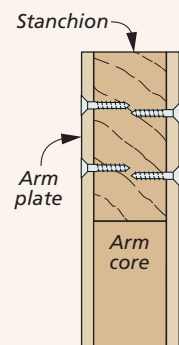
BUILD THE SHELVES

In addition to minimizing the weight, partially assembling the unit on the floor makes it easier to attach the skins to the shelves. You'll be able to get your driver into tight spots and not have to fight gravity so much. You may also want to consider how you'll lift the unit into place against the wall. I built mine so the top shelf was closest to the wall to minimize maneuvering a heavy assembly into place.

I began by cutting the skins to size (Figure 2 at right). Then I clamped all of them together in order to lay out the location of the notches (Figure 2a). Note that the top shelf skin doesn't have notches.

In order to cut the wide, deep notches, I separated the large stack

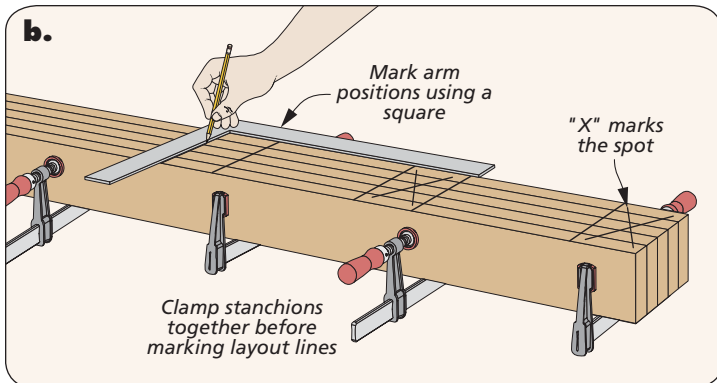
a. TOP VIEW



MATERIALS & SUPPLIES

A	Stanchions (5)	1 1/2 x 3 1/2 - 80
B	Upper Arm Cores (15)	1 1/2 x 3 1/2 - 12 1/2
C	Upper Arm Plates (30)	3 1/2 x 16 - 1/4 Ply.
D	Lower Arm Cores (10)	1 1/2 x 5 1/2 - 14 1/2
E	Lower Arm Plates (20)	5 1/2 x 18 - 1/4 Ply.
F	Top Shelf Skin (1)	16 x 96 - 1/2-Ply.
G	Upper Shelf Skins (5)	16 x 96 - 1/2 Ply.
H	Lower Shelf Skins (4)	18 x 96 - 1/2 Ply.
I	Upper Shelf Short Cleats (3)	3/4 x 3 1/2 - 20
J	Upper Shelf Long Cleat (1)	3/4 x 3 1/2 - 26
K	Lower Shelf Short Cleats (6)	3/4 x 5 1/2 x 20
L	Lower Shelf Long Cleats (2)	3/4 x 5 1/2 x 26
M	Narrow Drawer Fronts/Backs (12)	3/4 x 5 7/16 - 19 7/8
N	Wide Drawer Front/Back (2)	3/4 x 5 7/16 - 25 7/8
O	Drawer Sides (14)	3/4 x 5 7/16 - 16 3/4
P	Narrow Drawer Bottoms (6)	16 x 18 7/8 - 1/4 Ply.
Q	Wide Drawer Bottom (1)	16 x 24 7/8 - 1/4 Ply.
R	Saw Platform Front/Back (2)	1 1/2 x 3 1/2 - 26
S	Saw Platform Sides (2)	1 1/2 x 3 1/2 - 16 1/2
T	Saw Platform Top (1)	19 1/2 x 26 - 1/2 Ply.

- (12) 3" Power Pro Lag Screws
- (200) #8 x 1" Fh Woodscrews
- (256) #8 x 1 1/2" Fh Woodscrews
- (84) #8 x 1 1/4" Fh Woodscrews
- (8) #10 x 2 1/2" Fh Woodscrews



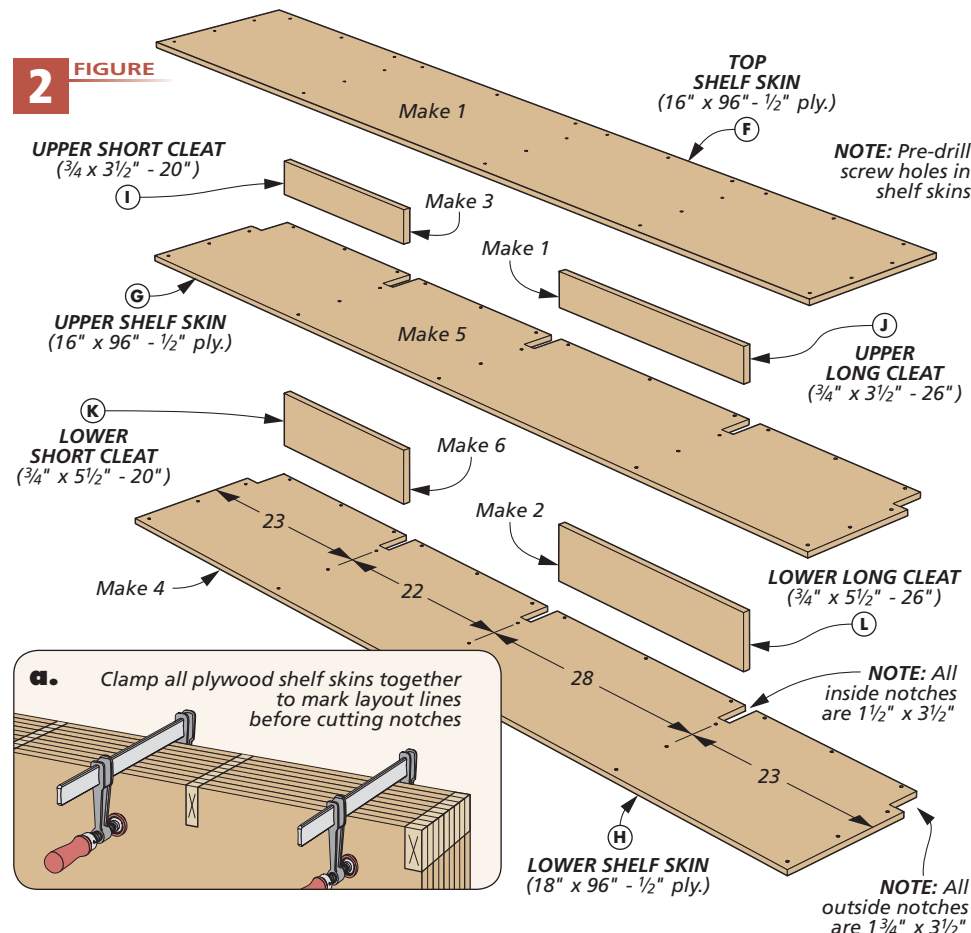
shown in Figure 2a into stacks of two shelf skins each. Then I used a jig saw with a fresh blade to cut out the notches in each stack of two.

Next, I pre-drilled the holes in the skins and partially threaded in the screws to fasten them to the arms. This helps to locate the screws and hold them in place to get them started.

Fasten the lower shelf skins to the arms first, taking care to square each arm to the skins' front edge before driving the screws (Figure 3). Now you can cut the cleats to size and attach them through the bottom shelf skins. (Note that there are no cleats in the second and third highest shelves). The assembly is now rigid enough to lift in place.

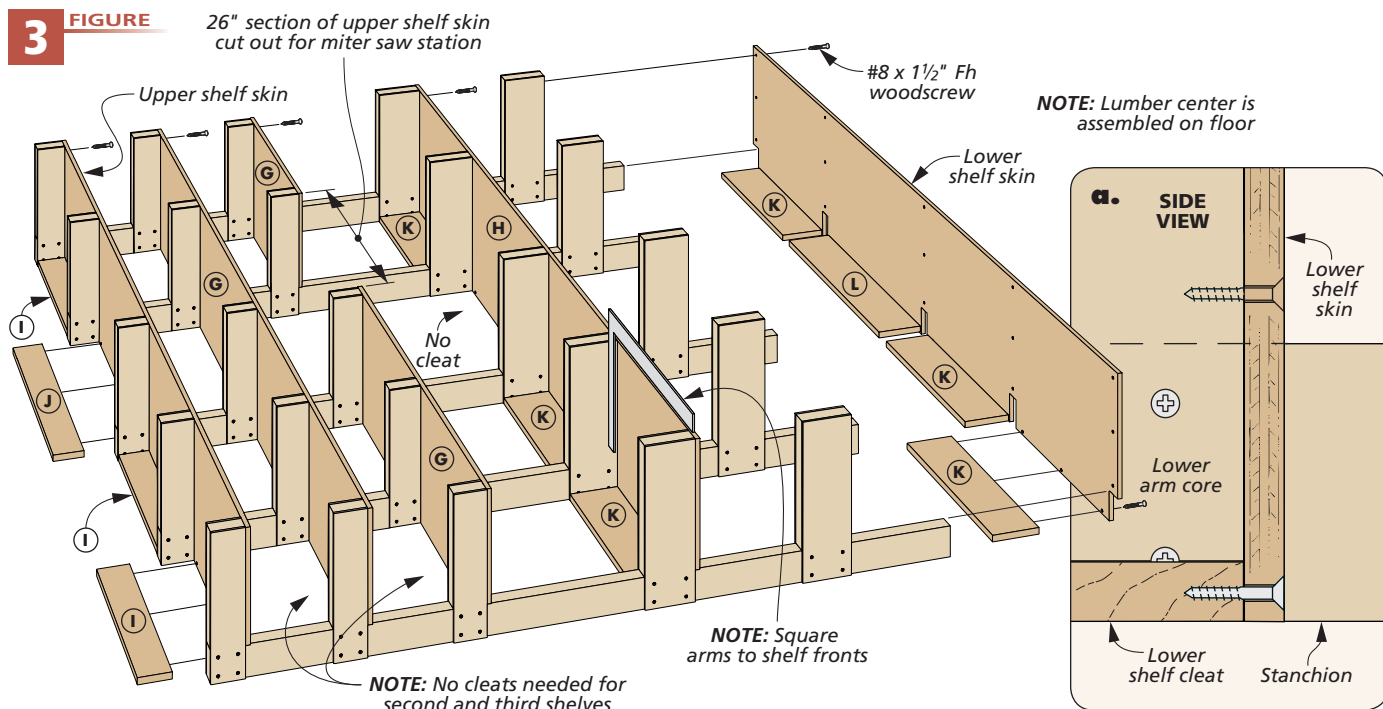
CLEARANCE, LEVEL & PLUMB. But before you do, you'll want to locate the studs in the wall. (Note: If you're installing the rack against masonry, you will have to install cleats on the wall first, using special masonry anchors). Next, you'll want to locate the high and low spots on the floor and wall. Locating these now will help you level the entire unit once it's upright.

I started at the floor by laying a straight, 8'-long board on the



floor along the wall and placed a carpenter's level on its edge. Raise one end of the board until it's level, then mark the highest part of the floor, as well as any dips or high spots.

Finally, check the wall for plumb by holding a level vertically at the stud locations and mark any dips or high spots. As I'll explain later, you may need to use shims once the rack is up.



mount & add Storage



To download a free cutting diagram for the lumber center, go to:

WoodsmithSpecials.com



Lag Screws.

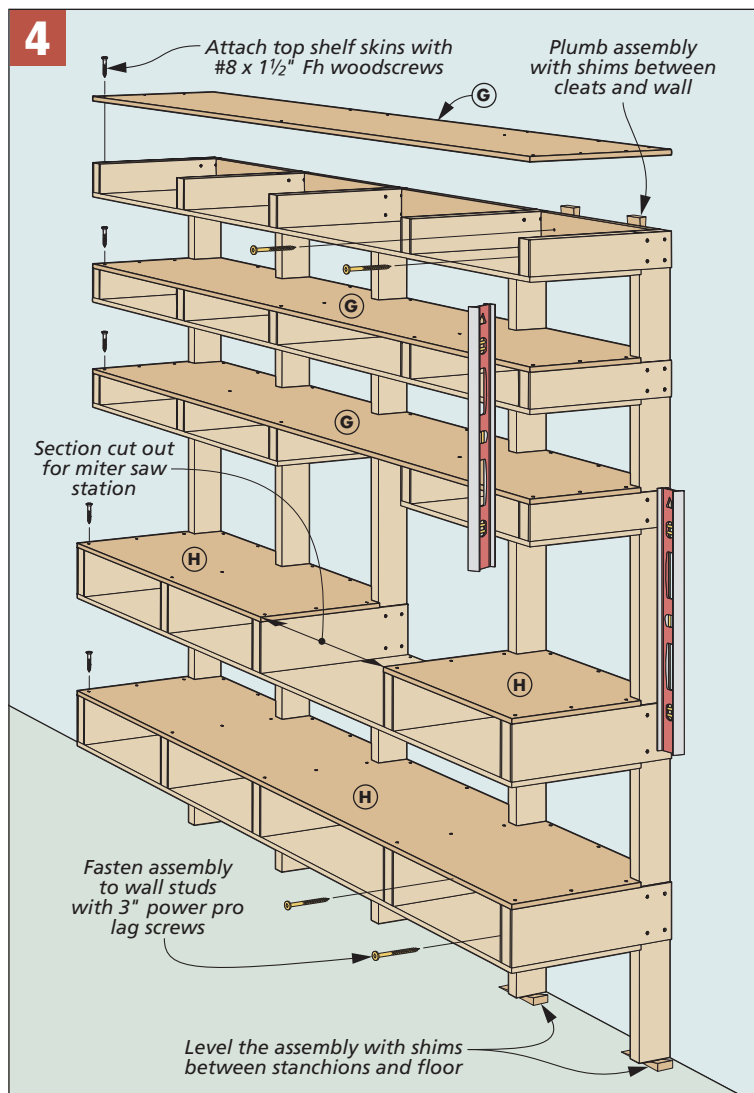
Heavy-duty construction lag screws are used to anchor the lumber center to the wall studs.

Setting the partially completed unit in place is definitely a two person job. And once in place, you'll need help to keep it there while you level, plumb, and fasten it to the wall.

I found it was easiest to plumb the rack side-to-side first. Then locate the highest spot on the floor and drive one screw through the cleat into the wall at this point, as shown in Figure 5. (You'll want to have a supply of shims ready to put in place as you finish the installation). I used 3" construction lag screws because they have extra large heads and are less likely to pull through the wood (refer to Sources on page 98). Pre-drill the holes in the cleats, so the screws are sure to hit a stud.

Next, I leveled the unit with shims under the stanchions as required (Figure 4). You may also have to place shims behind the cleats and drive screws through them to plumb the rack back-to-front, as shown in Figure 4. You should use a shim anywhere there is a gap behind a screw. Drive screws through all the top shelf cleats and all the lower shelf cleats into the studs in the wall.

FASTEN THE TOP SKINS. Finish up by installing all the top shelf skins.

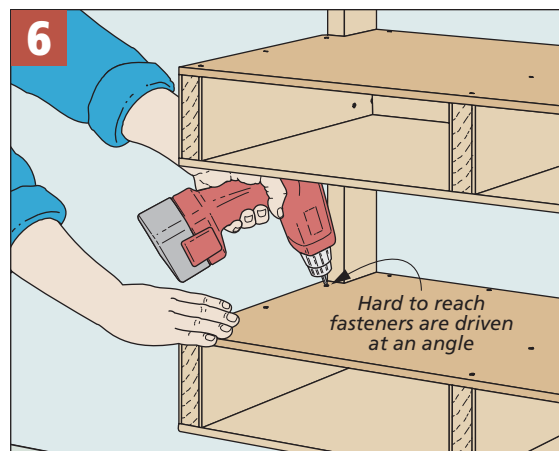
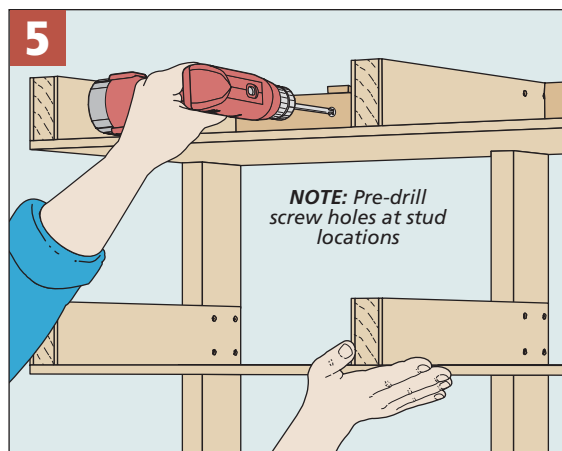


You can lay each one across the arms and drive the screws through the pre-drilled holes. I had to drive some of the fasteners at an angle because there was not enough room for my driver, a

bit, and a fastener to drive them straight in (Figure 6).

MAKE THE DRAWERS

Making the drawers is pretty straightforward. They're simple



ultimate Lumber Center



MATERIALS & HARDWARE

A	Stanchions (5)	1½ x 3½ - 80	N	Wide Drawer Front/Back (2)	¾ x 57/16 - 257/8
B	Upper Arm Cores (15)	1½ x 31/2 - 12½	O	Drawer Sides (14)	¾ x 57/16 - 16¾
C	Upper Arm Plates (30)	3½ x 16 - ¼ Ply.	P	Narrow Drawer Bottoms (6)	16 x 187/8 - ¼ Ply.
D	Lower Arm Cores (10)	1½ x 5½ - 14½	Q	Wide Drawer Bottom (1)	16 x 247/8 - ¼ Ply.
E	Lower Arm Plates (20)	5½ x 18 - ¼ Ply.	R	Saw Platform Front/Back (2)	1½ x 3½ - 26
F	Top Shelf Skin (1)	16 x 96 - ½-Ply.	S	Saw Platform Sides (2)	1½ x 3½ - 16½
G	Upper Shelf Skins (5)	16 x 96 - ½ Ply.	T	Saw Platform Top (1)	19½ x 26 - ½ Ply.
H	Lower Shelf Skins (4)	18 x 96 - ½ Ply.			
I	Upper Shelf Short Cleats (3)	¾ x 3½ - 20			
J	Upper Shelf Long Cleat (1)	¾ x 3½ - 26			
K	Lower Shelf Short Cleats (6)	¾ x 5½ x 20			
L	Lower Shelf Long Cleats (2)	¾ x 5½ x 26			
M	Narrow Drawer Fronts/Backs (12)	¾ x 57/16 - 197/8			

- (12) 3" Power Pro Lag Screws
- (200) #8 x 1" Fh Woodscrews
- (256) #8 x 1½" Fh Woodscrews
- (84) #8 x 1¼" Fh Woodscrews
- (8) #10 x 2½" Fh Woodscrews

CUTTING DIAGRAM

2" x 4" - 8' Douglas Fir (Five Boards)



2" x 4" - 8' Douglas Fir (Two Boards)



2" x 4" - 8' Douglas Fir



2" x 6" - 8' Douglas Fir (Two Boards)



1" x 4" - 8' Douglas Fir



1" x 6" - 8' Douglas Fir



1" x 6" - 8' Douglas Fir



1" x 6" - 8' Douglas Fir (Three Boards)



1" x 6" - 8' Douglas Fir



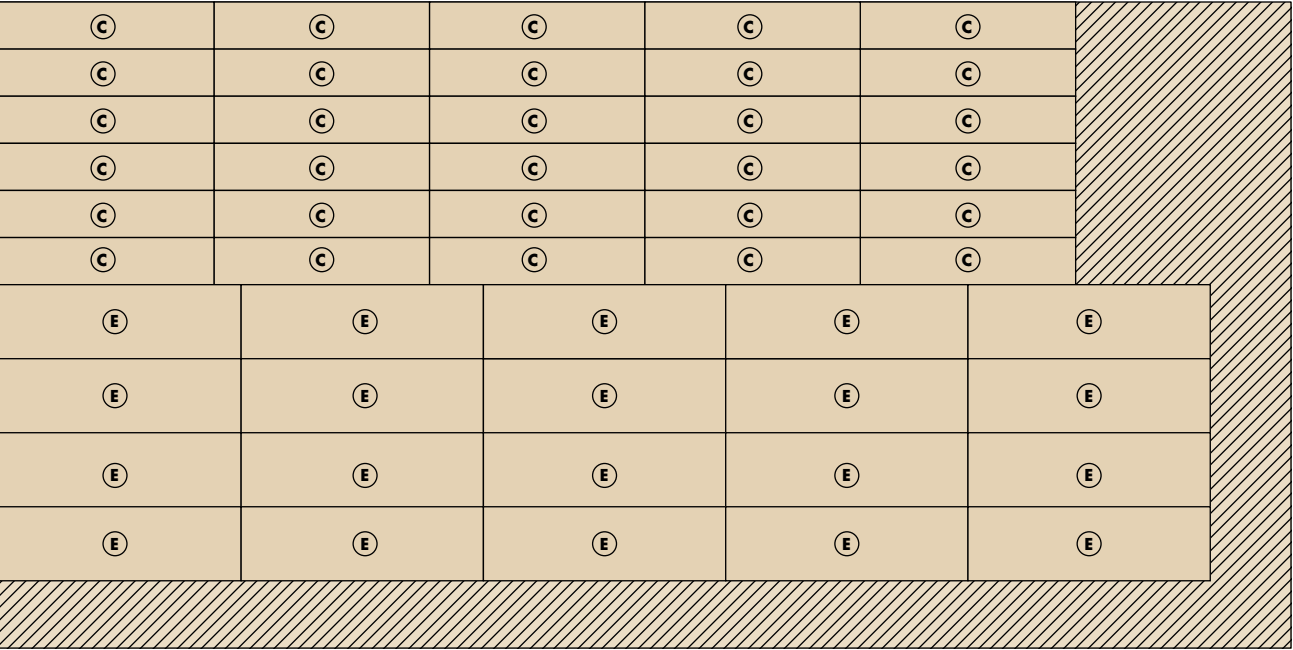
1" x 6" - 8' Douglas Fir (Two Boards)



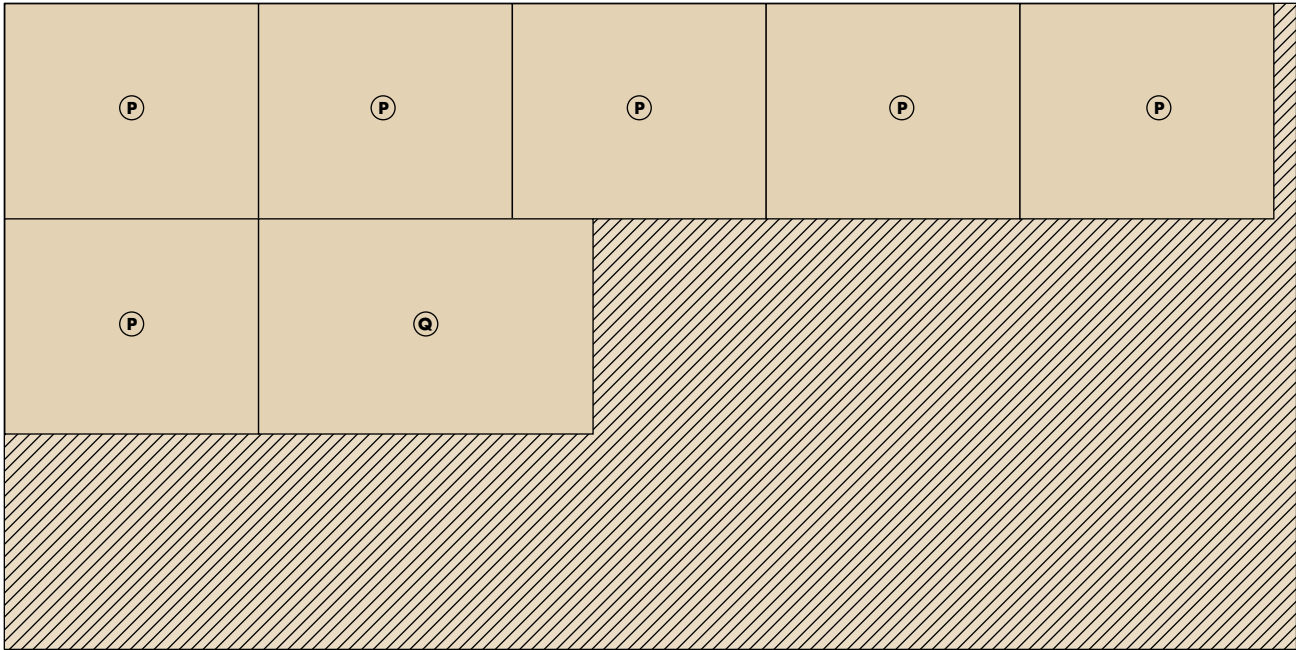
1" x 6" - 8' Douglas Fir



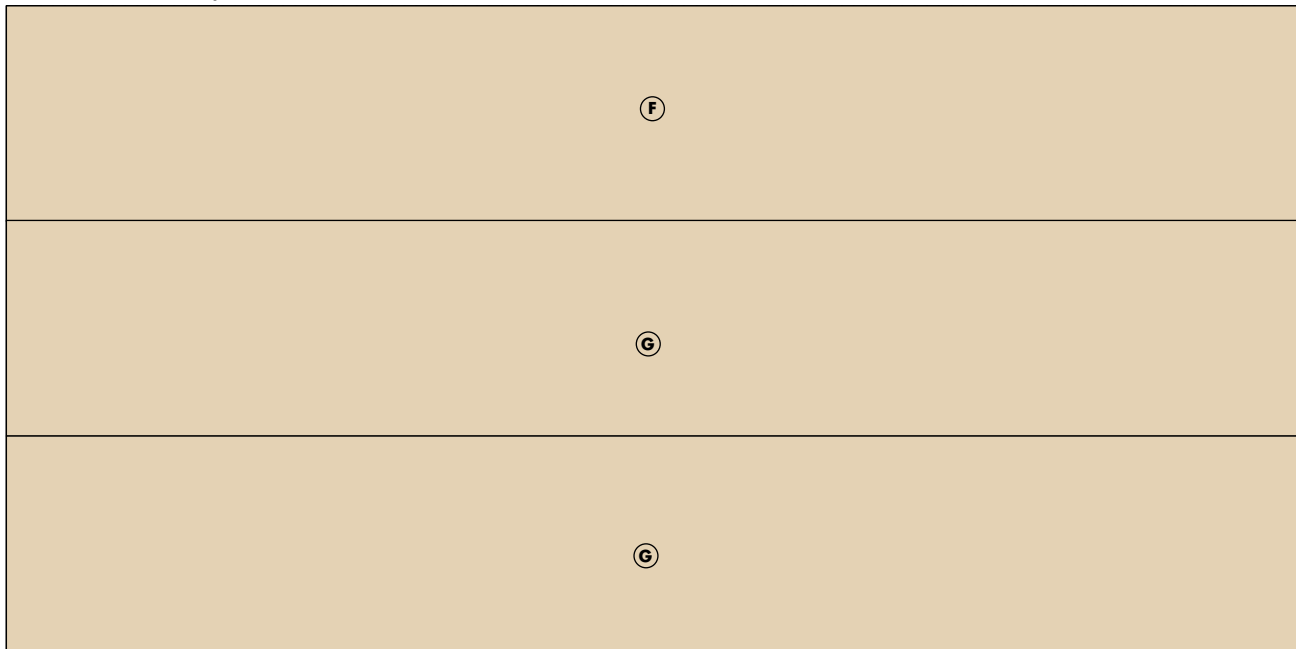
48" x 96" - 1/4" Birch Plywood



48" x 96" - 1/4" Birch Plywood



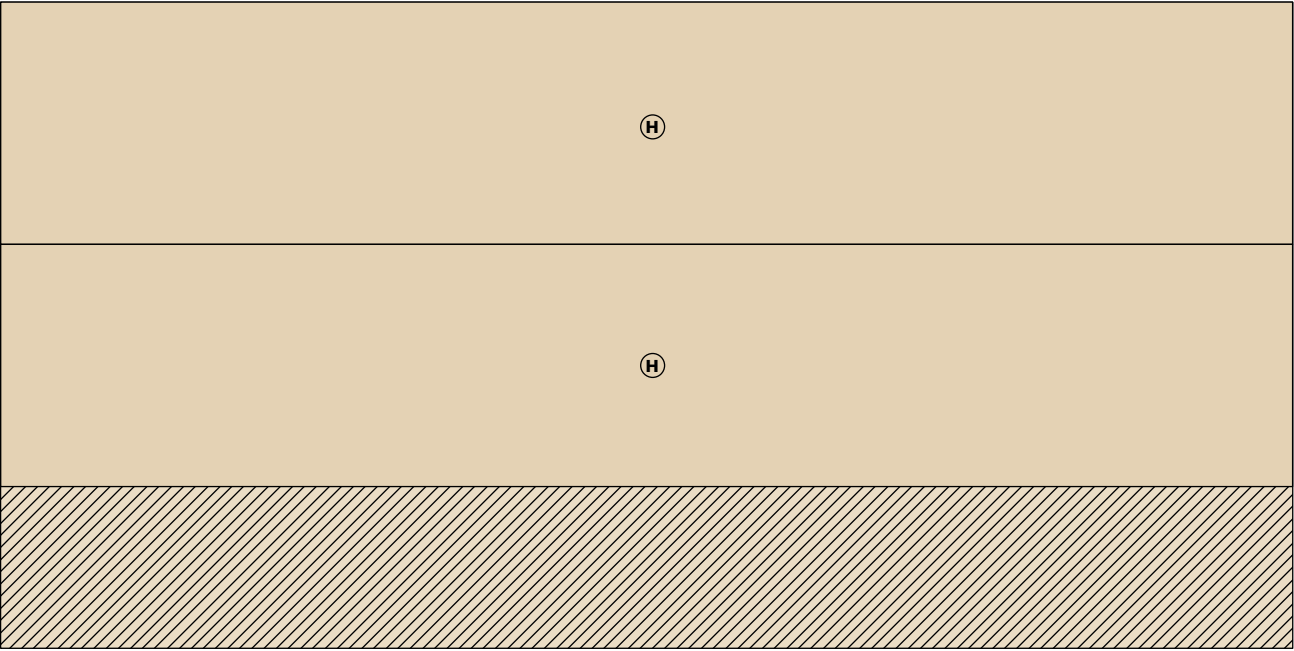
48" x 96" - 1/2" Birch Plywood



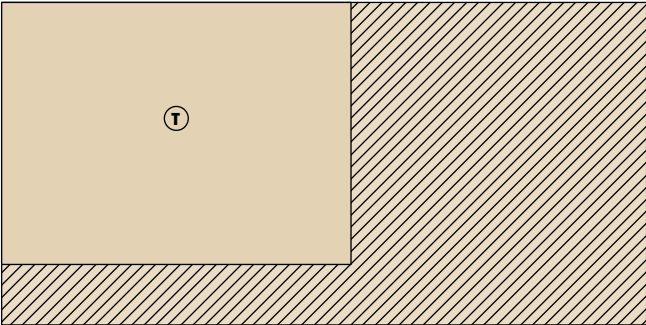
48" x 96" - 1/2" Birch Plywood



48" x 96" - 1/2" Birch Plywood (Two Sheets)



24" x 48" - 1/2" Birch Plywood



This rack provides ample storage in a compact space.

Clamp storage is a problem that almost every woodworker faces. But this compact, wall-mounted system provides the perfect answer.

Hinged and fixed racks are anchored to a tall cabinet. The racks can be customized to hold F-style bar clamps, parallel-jaw clamps, pipe clamps, and aluminum bar clamps. Add-on racks hold spring clamps, handscrews, and C-clamps — all without taking up much wall space.

It's a project you can expand to suit your clamp collection. And best of all, it's easy to build.



Double the Storage. A hinged rack opens up to reveal even more clamp storage in a second layer.

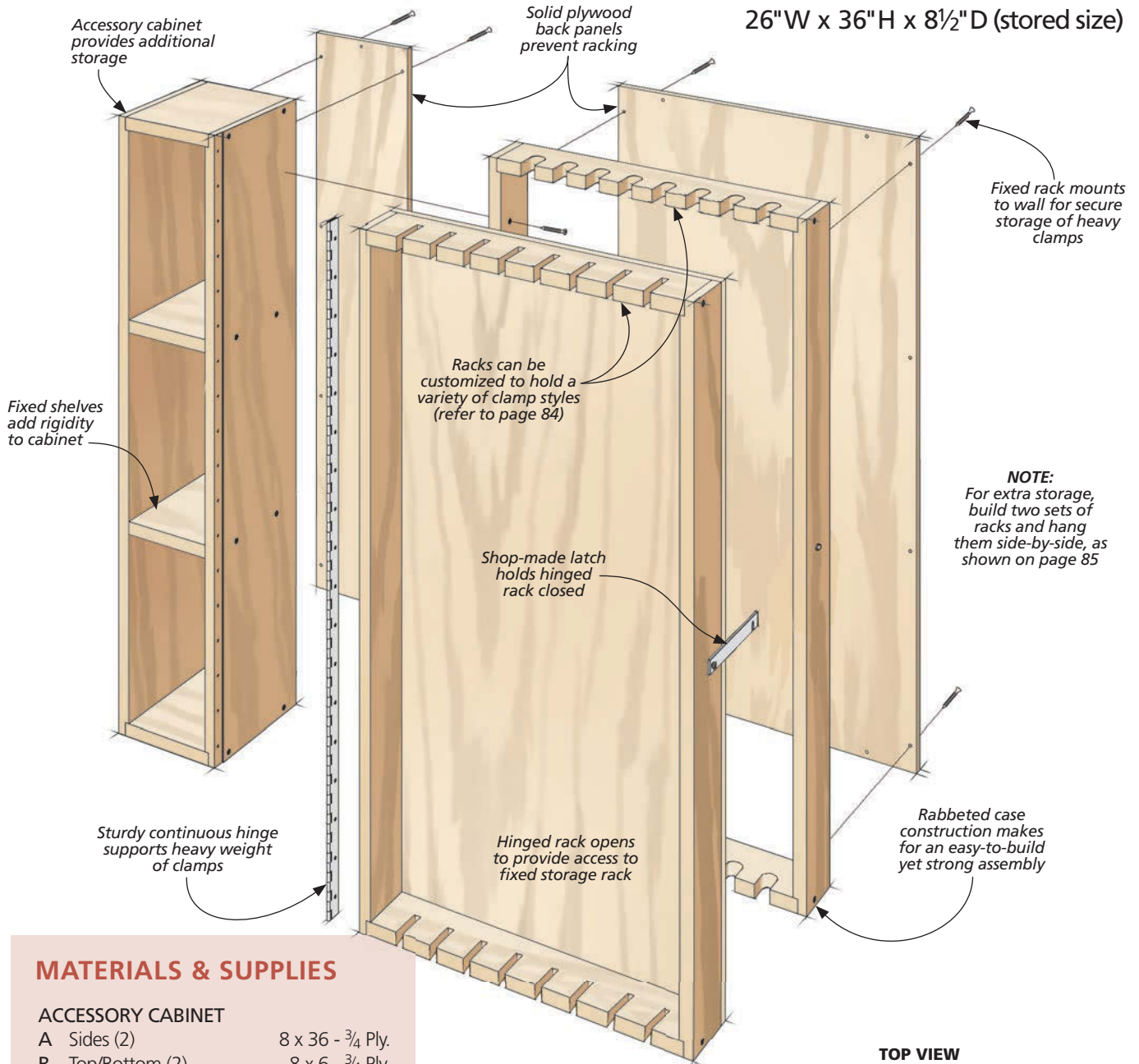


high-capacity Clamp Rack

CONSTRUCTION DETAILS

OVERALL DIMENSIONS:

26"W x 36"H x 8½"D (stored size)



MATERIALS & SUPPLIES

ACCESSORY CABINET

A	Sides (2)	8 x 36 - ¾ Ply.
B	Top/Bottom (2)	8 x 6 - ¾ Ply.
C	Back (1)	7 x 36 - ½ Ply.
D	Shelves (2)	8 x 5½ - ¾ Ply.

CLAMP RACKS

E	Sides (4)	3 x 36 - ¾ Ply.
F	Clamp Holders (4)	3 x 18 - ¾ Ply.
G	Backs (2)	19 x 36 - ½ Ply.
H	Latch (1)	¾ x 6 - ⅛ Aluminum

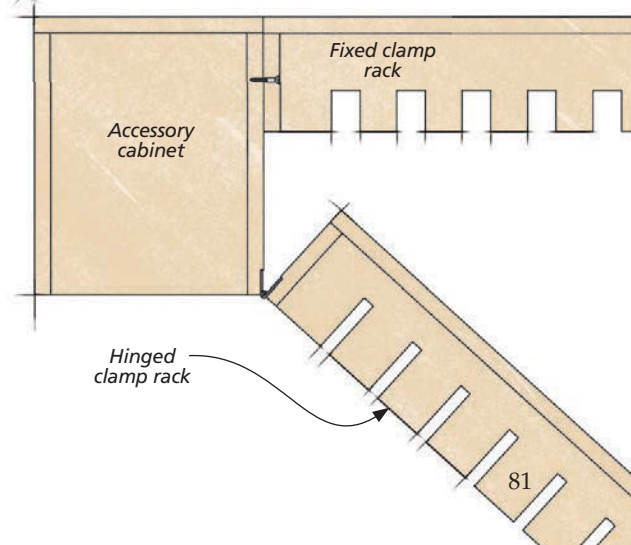
- (1) 1½" x 36" Continuous Hinge w/Screws
- (3) #8 x 1¼" Fh Woodscrews
- (56) #8 x 1½" Fh Woodscrews
- (2) #8 x ¾" Ph Sheet Metal Screws



To download a free cutting diagram for the high-capacity clamp rack, go to:

WoodsmithSpecials.com

TOP VIEW



building simple Cases

A tall accessory cabinet serves as the foundation for the two clamp racks. The fixed clamp rack is attached securely to the accessory cabinet, both of which will be mounted to the wall. The hinged clamp rack is attached to the front edge of the accessory cabinet.

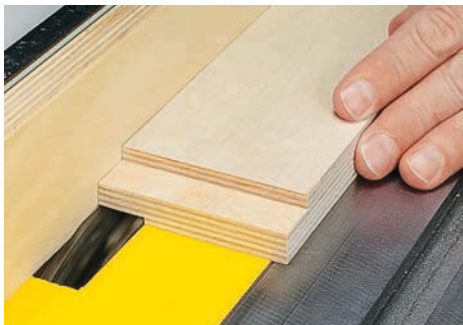
Building the three components of the clamp rack is an easy process. The joinery is pretty simple. Rabbets on the ends of the sides hold the top and bottom. And a plywood back keeps everything square and rigid.

Since you'll be using the table saw to cut the joinery, you might want to read ahead before you start. This way, you can minimize switching back and forth between a standard blade to cut the parts and a dado blade to cut the joinery. It's easier to cut all the parts to size first, then switch to a dado blade to cut all the rabbets.

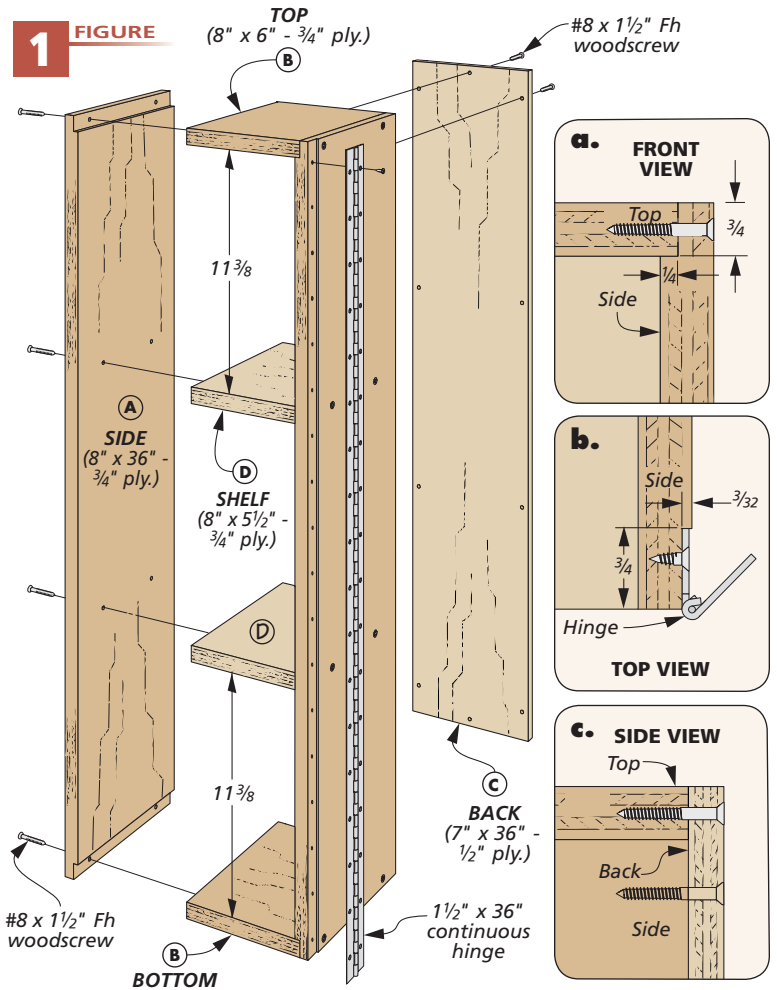
ACCESSORY CABINET

If you study Figure 1 for a moment, you'll notice that the sides, top, bottom, and shelves of the accessory cabinet are all the same width. So it makes sense to rip the plywood for all these pieces to width first. Then you can cut them to final length before cutting the rabbets for the joinery.

The joinery is easy to cut with a dado blade in the table saw.



Cutting Rabbets. A dado blade buried in an auxiliary wood rip fence makes quick work cutting the rabbet for the continuous hinge.



I buried the blade in an auxiliary rip fence to make it easy to cut all the rabbets in one pass.

HINGE RABBIT. To hold the leaf of the continuous hinge, there's a shallow rabbet that runs along the outside front edge of one cabinet side (Figure 1b). The depth of the rabbet is one half the thickness of the closed hinge (refer to the photos below).



Self-Centered. Use a self-centering drill bit to accurately locate pilot holes for the screws.

Later, you'll cut a matching rabbet on the front, hinged cabinet.

CABINET ASSEMBLY. Assembling the accessory cabinet involves some glue and a few screws. Then you can measure for the plywood back and cut it to size, taking care to make your cuts square. The back can then be fastened to the case with glue and screws.

The shelves can be added at this point. They're simply fastened in place with screws, keeping them square and level (Figure 1).

HINGE. With the shelves installed, the cabinet is complete. Now you can install the hinge. I used a self-centering bit to locate the screw holes, as shown in the near left photo. You can turn your attention to the clamp racks next.

CLAMP RACKS

The assembly process for the two clamp racks (fixed and hinged) are

the same, with one minor exception. As I said earlier, the side of the front, hinged rack is rabbeted to accommodate the continuous hinge. Figures 2 and 3 show you how everything goes together.

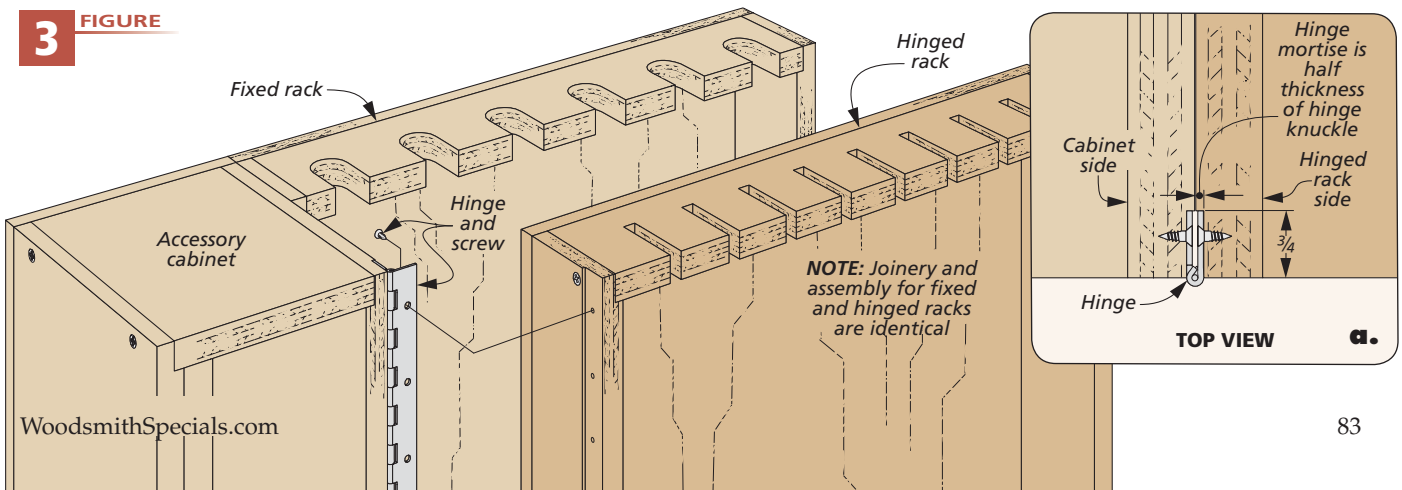
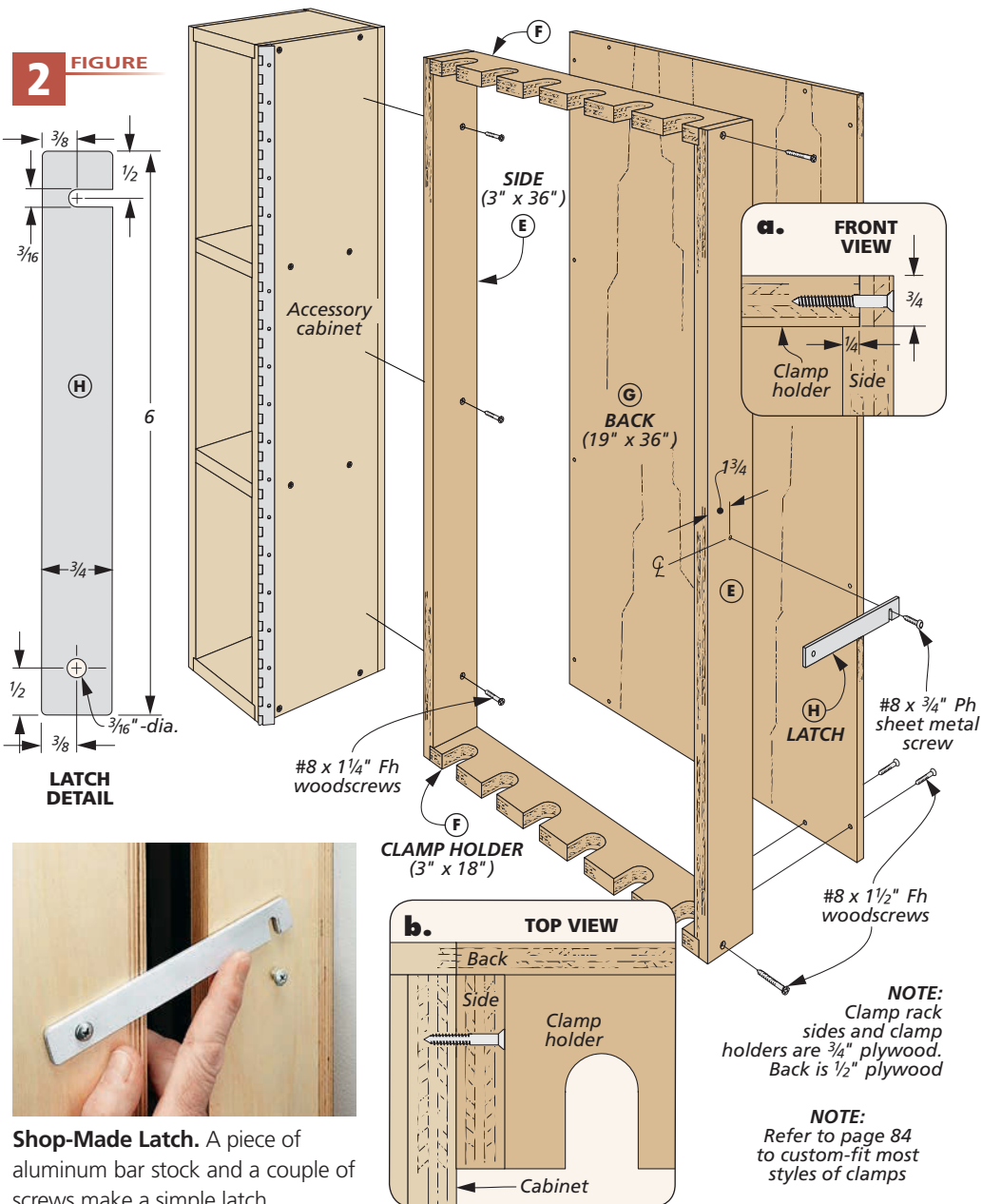
CUSTOM CLAMP HOLDERS. There is something else I need to point out before you start building the clamp cabinets. The tops and bottoms of the two clamp racks are designed to hold a particular style of clamp, as you can see in Figures 2 and 3. Turn to page 84 to see some other options along with the detailed drawings you need to help you build them.

This is where it might help to stop and take inventory of your clamps. You can determine how best to organize your clamps and what style of clamp holder to build. The nice thing is, the top and bottom of the racks are all the same size. So it's easy to come up with an arrangement that fits your assortment of clamps.

RACK CONSTRUCTION. After deciding on the style of holders you need, building the cabinets follows along the same lines as the tall accessory cabinet. And don't forget to cut the rabbet for the hinge on the front cabinet before starting on the assembly.

FINAL ASSEMBLY. With the two clamp racks complete, you can attach the fixed rack to the accessory cabinet with screws. The backs of both cabinets should be flush. Then, just fasten the hinged rack to the front of the cabinet.

CUSTOM LATCH. To finish up, a simple, shop-made latch secures the



custom clamp Holders

It's not unusual for woodworkers to end up with a wide range of clamp styles in their shops. The great thing about this clamp rack is that you can customize it to exactly suit the collection of clamps you have in your shop.

The photos at right show some ideas for making clamp holders for the most common styles of clamps. You'll find the dimensions for these in the figures below.

CUSTOM HOLDERS. The process for making the holders is pretty simple. In Figure 4, you can see the rounded notches I made for pipe clamps. After laying out their locations, I drilled the holes, then cut out the waste at the table saw.

For the other styles of clamps shown in the photos, you can refer to Figures 5 through 7. The notches for these clamps are cut at the table saw using a dado blade.

To make cutting the clamp holders easier, lay out all the notches on the blanks, then use those marks to line up the cuts at the table saw. An auxiliary fence on your miter gauge will help



Pipe
Clamps
(Figure 4)



Aluminum
Bar Clamps
(Figure 5)



Parallel-Jaw Clamps
(Figure 6)



F-Style Bar Clamps
(Figure 7)

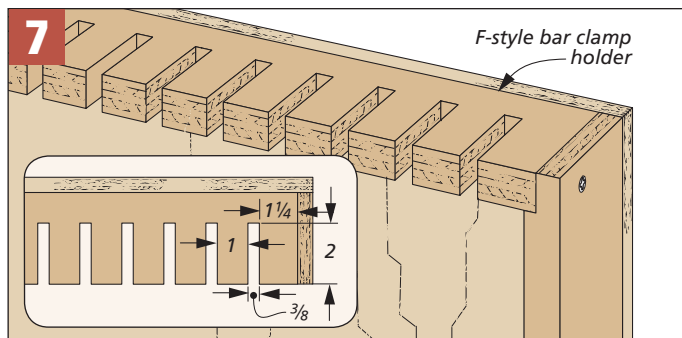
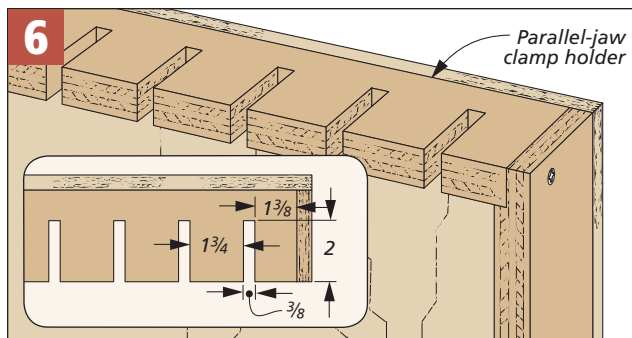
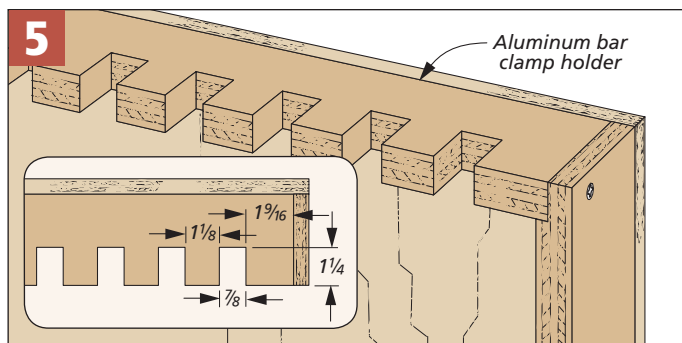
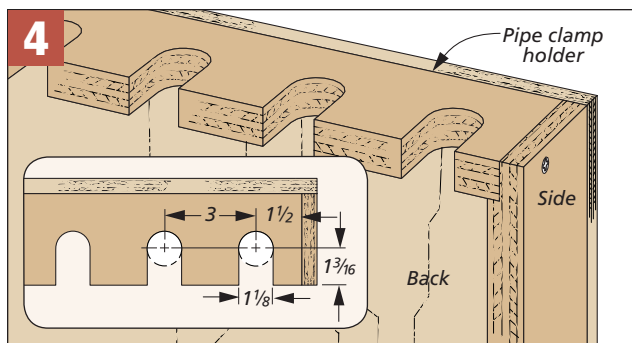
Versatile Clamp Storage. By customizing the top and bottom clamp holders, you can create compact storage for a variety of clamp styles. The holders are easy to make for any style of clamp.

support the workpiece and prevent tearout. For other styles of clamps, you'll need to do a little planning. Lay out your clamps side-by-side and determine the spacing and dimensions of the notches needed to hold them.

ACCESSORY RACKS. When it comes to other hard-to-store clamps like handscrews, small F-style bar

clamps, C-clamps, and spring clamps, take a look at the next page. You'll find easy ways to pack a lot of clamps into your new clamp rack using scraps of plywood and a few dowels.

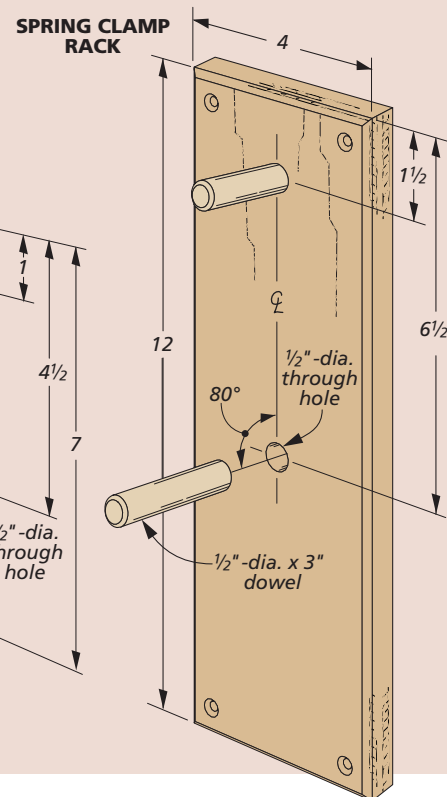
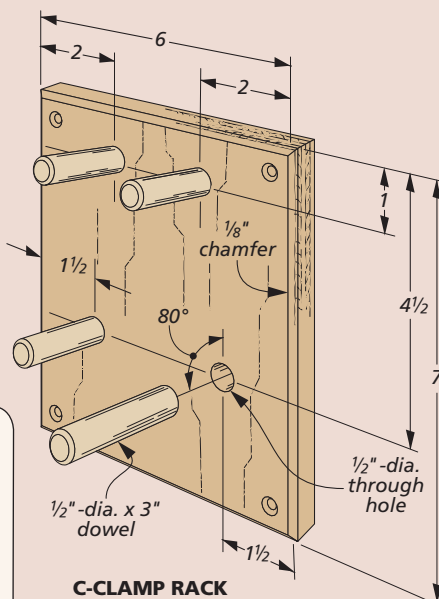
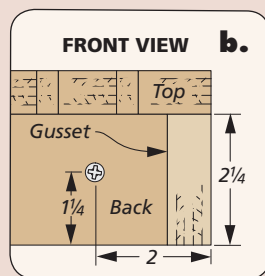
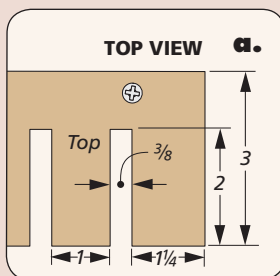
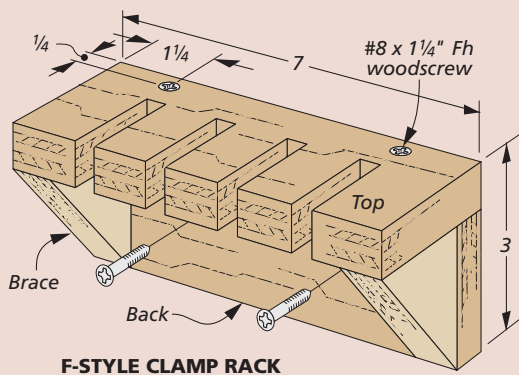
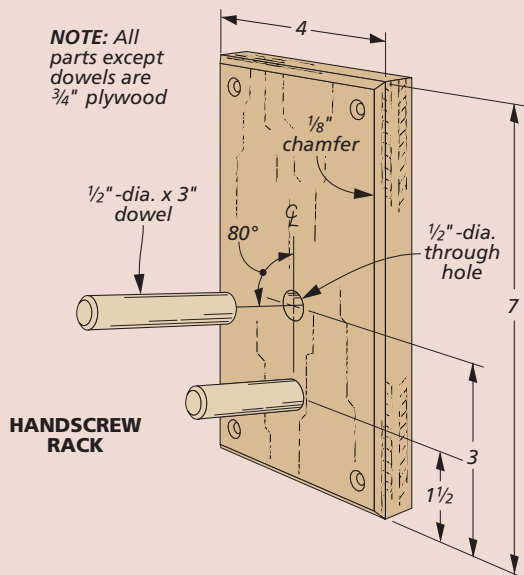
Then the next time you go to assemble a project, you'll be glad to have all your clamps organized and within easy reach.



Add-On Clamp Racks

It's one thing to build a nice clamp rack for all your big clamps. It's another challenge entirely to find a way to store all the other small, miscellaneous clamps you have lying around the shop.

In the photo at right, you can see the four specialized racks I added to hold various styles of clamps. Most are nothing more than a plywood back with a couple of dowels inserted at a slight upward angle. There's even a small rack for short, F-style bar clamps. You can see all the details for each of the racks in the drawings below. After they're assembled, a few screws are all you need to fasten them to the cabinet (in any available space) to keep all your clamps at hand.



Compact Storage. Build a second rack to double your storage capacity. Add-on racks fill in the spaces to store smaller clamps.

high capacity Clamp Rack

MATERIALS & HARDWARE

ACCESSORY CABINET

A	Sides (2)	8 x 36 - $\frac{3}{4}$ Ply.
B	Top/Bottom (2)	8 x 6 - $\frac{3}{4}$ Ply.
C	Back (1)	7 x 36 - $\frac{1}{2}$ Ply.
D	Shelves (2)	8 x 5 $\frac{1}{2}$ - $\frac{3}{4}$ Ply.

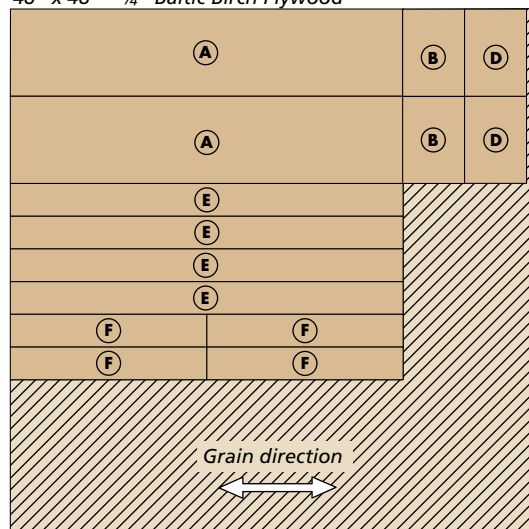
- (1) 1 $\frac{1}{2}$ " x 36" Continuous Hinge w/Screws
- (3) #8 x 1 $\frac{1}{4}$ " Fh Woodscrews
- (56) #8 x 1 $\frac{1}{2}$ " Fh Woodscrews
- (2) #8 x $\frac{3}{4}$ " Ph Sheet Metal Screws

CLAMP RACKS

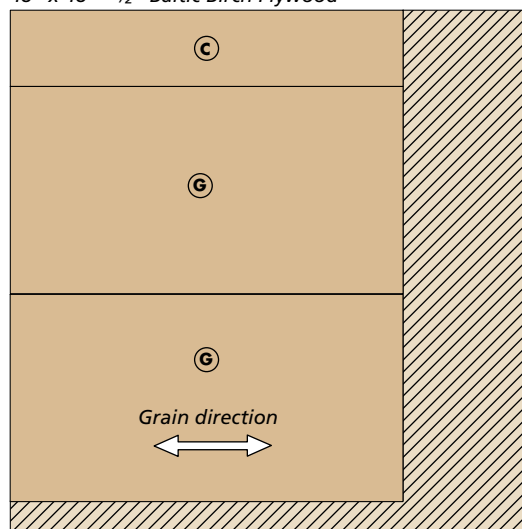
E	Sides (4)	3 x 36 - $\frac{3}{4}$ Ply.
F	Clamp Holders (4)	3 x 18 - $\frac{3}{4}$ Ply.
G	Backs (2)	19 x 36 - $\frac{1}{2}$ Ply.
H	Latch (1)	$\frac{3}{4}$ x 6 - $\frac{1}{8}$ Aluminum

CUTTING DIAGRAM

48" x 48" - $\frac{3}{4}$ " Baltic Birch Plywood



48" x 48" - $\frac{1}{2}$ " Baltic Birch Plywood





workbench Storage System

This easy-to-build modular system helps you turn unused space into valuable storage.

During the course of building a project, the top of my workbench can get pretty cluttered. It's a real challenge keeping the tools I need close at hand and preserving a clear work area at the same time.

The solution turned out to be under my nose. Taking advantage of the large, open space in the base of my workbench, I created

a modular system of drawers and shelves that you see here.

The key is that each component is easy to make and simple to add to the bench a piece at a time — like building blocks. The reward for spending a little time assembling this system is more than matched by the organization it adds to your shop.



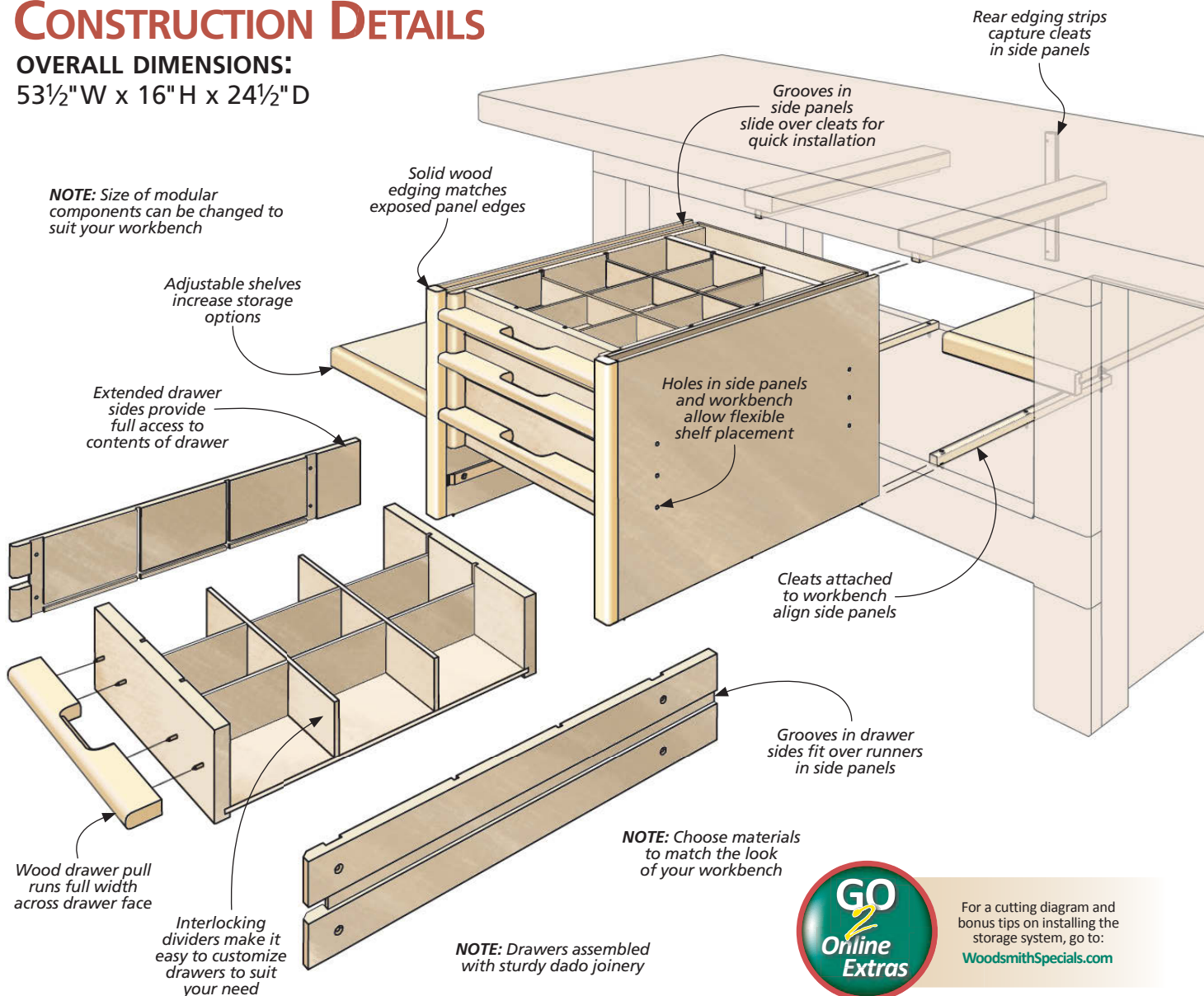
Versatile Drawers. The centerpiece of this workbench storage system is the bank of four drawers.

CONSTRUCTION DETAILS

OVERALL DIMENSIONS:

53½"W x 16"H x 24½"D

NOTE: Size of modular components can be changed to suit your workbench

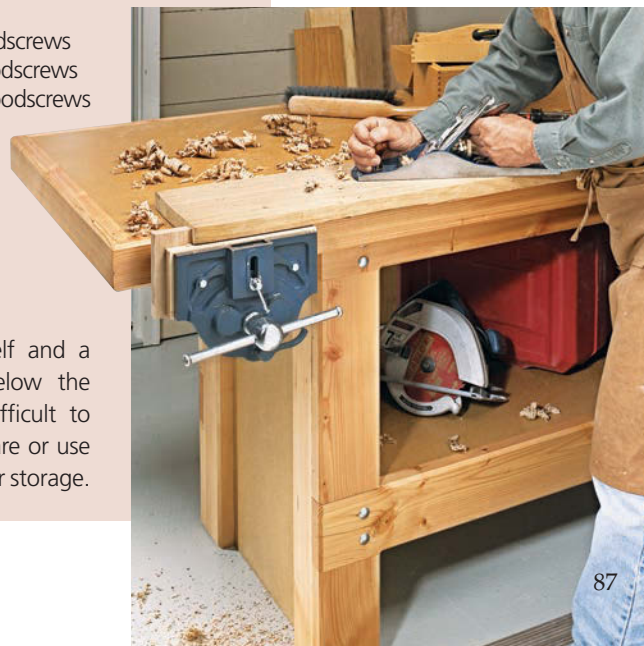


For a cutting diagram and bonus tips on installing the storage system, go to:
WoodsmithSpecials.com

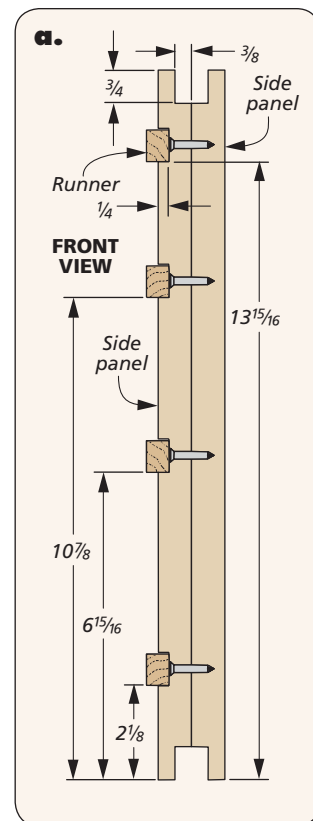
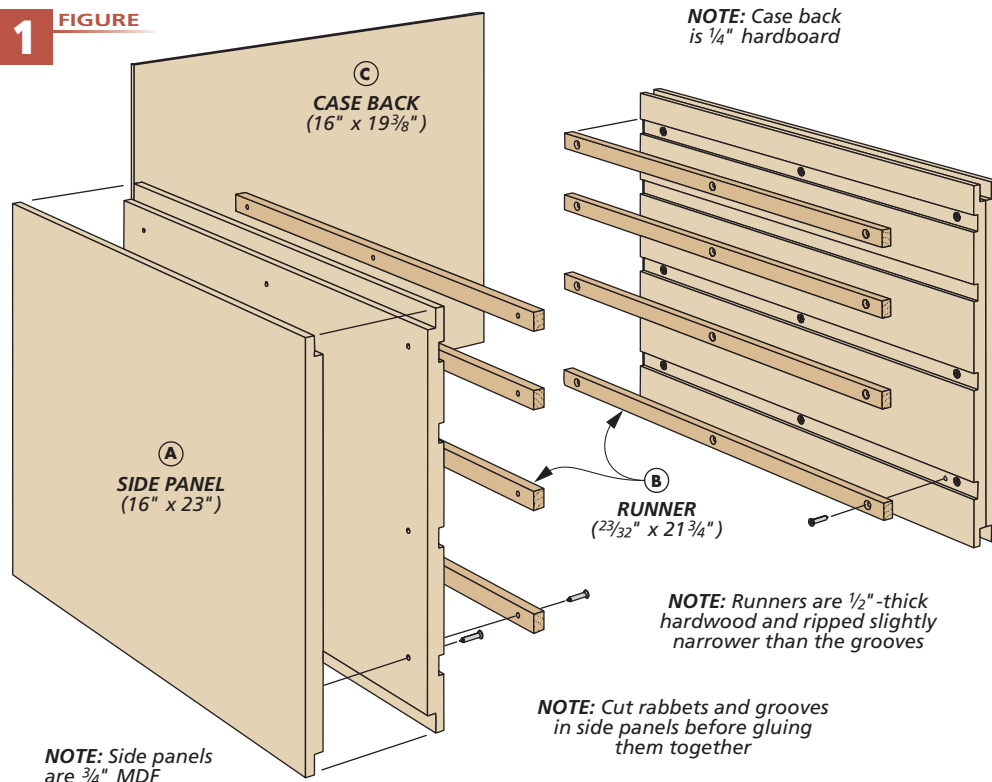
MATERIALS & SUPPLIES

A	Panel Sides (4)	16 x 23 - ¾ MDF	• (42) #8 x 1" Fh Woodscrews
B	Runners (8)	½ x 23½ - 21¾	• (6) #8 x 2½" Fh Woodscrews
C	Case Back (1)	16 x 19¾ - ¼ Hdbd.	• (66) #8 x 1½" Fh Woodscrews
D	Panel Edging (1)	¾ x 1½ - 130 rgh.	• (8) Shelf Supports
E	Cross Rails (2)	1½ x 3½ - 23	
F	Cleats (4)	¾ x 1½ - 23	
G	Small Drwr. Sides (4)	3 x 22¾ - ¾ MDF	
H	Small Drwr. Ft/Bk. (4)	3 x 17½ - ¾ MDF	
I	Drwr Bottoms (4)	17½ x 17½ - ¼ Hdbd.	
J	Drwr Pulls (4)	¾ x 1½ - 18½	
K	Lrg. Drwr. Sides (4)	4¾ x 22¾ - ¾ MDF	
L	Lrg. Drwr. Ft/Bk. (4)	4¾ x 17½ - ¾ MDF	
M	Lrg. Shelf (1)	18¾ x 18¾ - ¾ MDF	
N	Sm. Shelf (1)	12½ x 18¾ - ¾ MDF	
O	Sm. Drwr. Dividers (8)	2 x 17½ - ¼ Hdbd.	
P	Lrg. Drwr. Dividers (8)	3 x 17½ - ¼ Hdbd.	

Before. A single shelf and a wide open space below the benchtop made it difficult to find tools and hardware or use the space efficiently for storage.



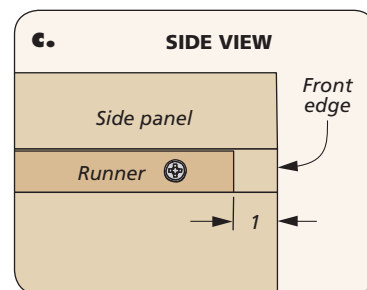
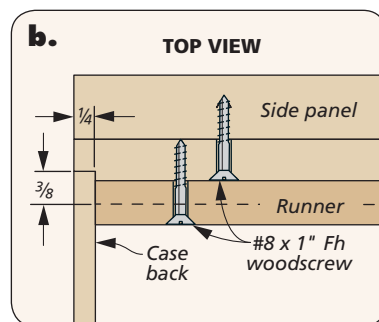
1 FIGURE



begin with the Case

The first task on the list is to create a foundation to support the drawers and shelves. For that, I made a three-sided case. The two side panels and back divide the space below the benchtop into three compartments.

The trick is installing these pieces in a completed bench. The solution I came up with is flexible enough to work with just about any bench design. In the drawings on these pages, you'll see the



Shims. Use wood shims to position the drawer runners along the lower edge of the groove.

dimensions that suit my workbench. You may need to tweak things to fit your bench.

MATERIAL CHOICES. Altering the sizes of parts isn't the only way to make this project work for you. I used Douglas fir construction lumber and MDF to build these components because it matched the bench. But you're free to use materials that suit your needs.

THE CASE. The project begins with making two vertical panels, as shown in Figure 1. The panels slide into place over cleats installed in the bench. The panels "borrow" the underside of the benchtop and shelf below to create a case. Each panel consists of two layers of MDF glued together.

JOINERY DETAILS. There are a few details to take care of before gluing up the side panels. A rabbet cut on each end of the pieces creates a groove for the cleats I mentioned earlier.

The inner layer of each panel has a series of grooves cut in it. These hold hardwood runners that the drawers slide on.

It can be tricky gluing up panels like this. So I use screws to pull the parts together while the glue dries. I installed the screws in the bottoms of the runner grooves so they wouldn't be visible, as in Figures 1 and 1b. After the sides were glued up, I cut a shallow rabbet on the back inside edge. This will hold the case back, as shown in Figure 1b.

RUNNERS. The runners that fit the grooves in the side panel are up next. I want to point out a couple things. First, they're cut slightly narrower than the grooves. This way they won't bind on the drawers.

Second, the runners are installed flush to the edge of the rabbet at the back, leaving a gap at the front (Figures 1b and 1c). In the photo on the previous page, you can see how shims keep the runners level.

EDGING. The surface of the MDF is durable, but the edges are fragile. To cover these up, I made thick strips of edging (Figure 2). They're chamfered on the leading edges to match the details on the workbench, as in Figure 2d. For now, glue the edging pieces on the front of the case and set aside the rear edging strips.

INSTALLATION. The panels are now ready to be installed in the workbench base. Before that can happen, though the bench needs some prep work.

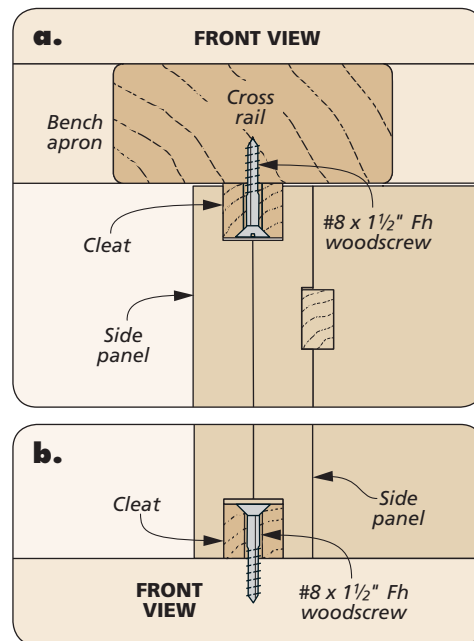
This involves adding a set of four cleats, as shown in Figure 2. The cleats need to be proud of any aprons or stretchers in order to engage the side panels. For example, on my bench, I needed to add a pair of cross rails to the underside of the benchtop, Figure 2a. The lower edges of the rails are flush with the top apron.

I cut the cleats so the panel slides smoothly into place. What's important is that the cleats are square to the front and bottom of the bench and parallel with each other. Otherwise, you're going to have trouble fitting the drawers.

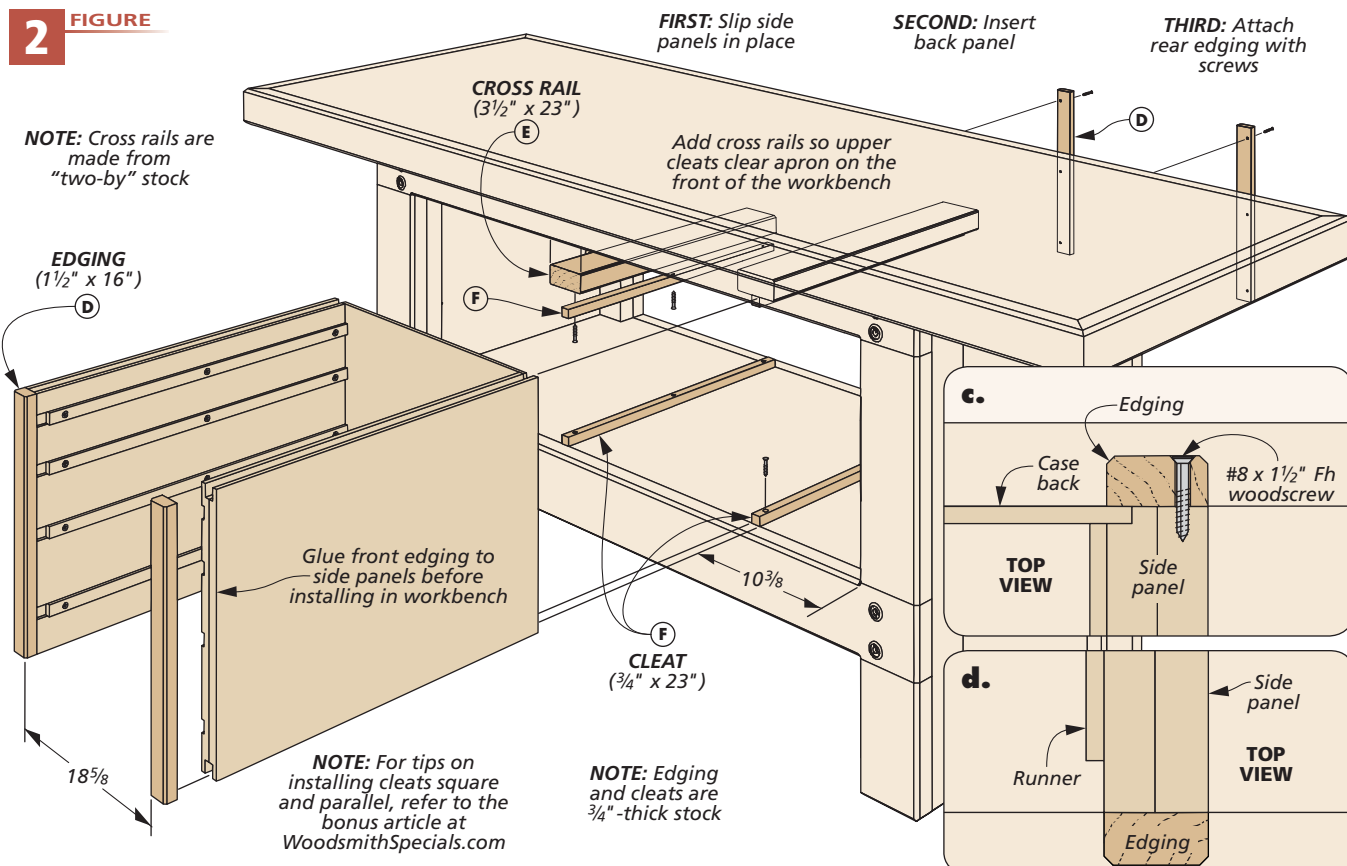
In a bonus article you'll find at WoodsmithSpecials.com, you can see how to use a spacer and a framing square to get the job done. (I positioned the cleats slightly off center. This results in two different size storage areas.) A little wax applied to the cleats eases the fit.

WRAP IT UP. The front edging acts as a stop for the side panels, as in Figure 2d. But it won't prevent the

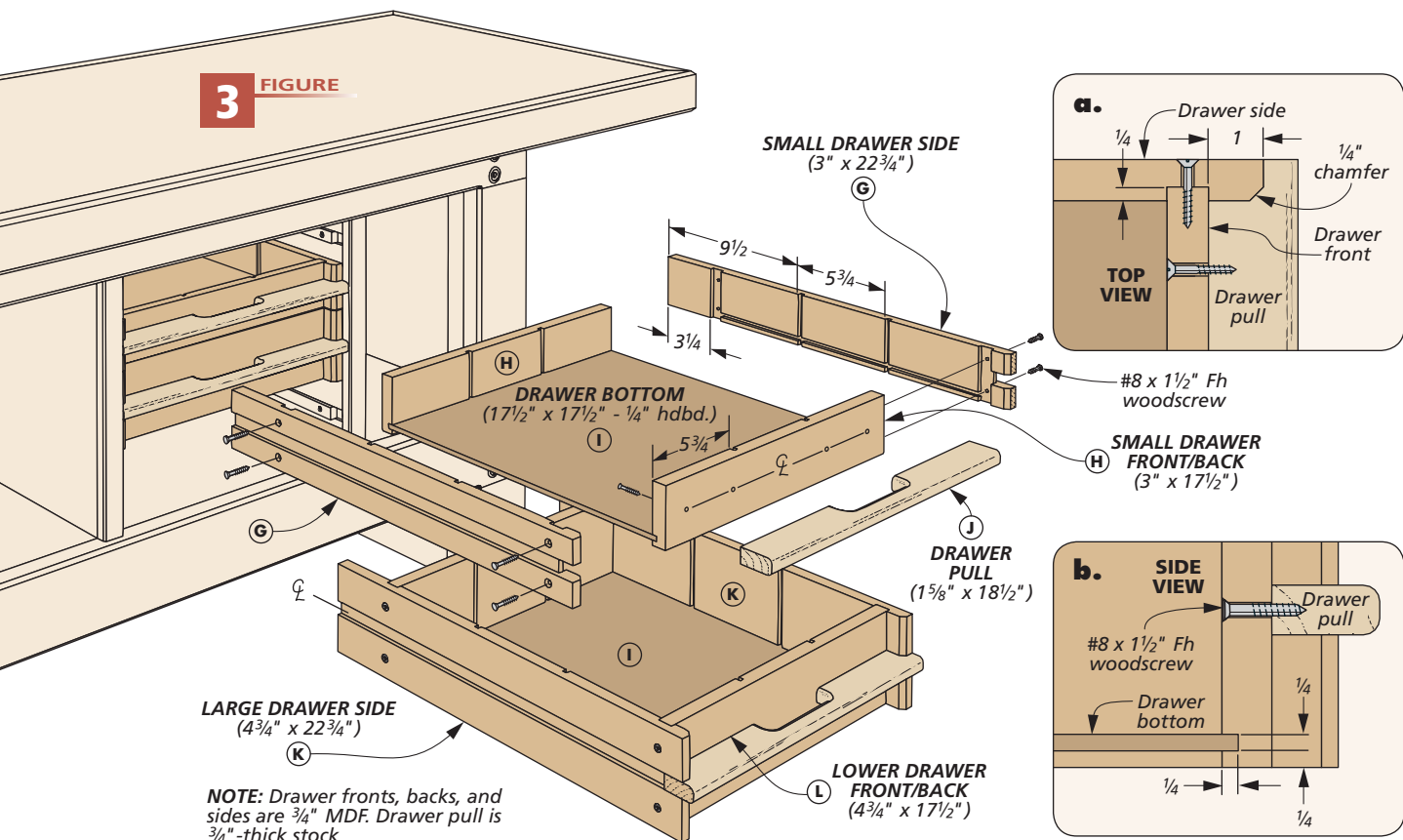
panels from being pulled out. That job falls to the rear edging. These two strips are attached with screws only. In addition to capturing the panels, the edging holds the back panel in place, as in Figure 2c.



2 FIGURE



3 FIGURE



NOTE: Drawer fronts, backs, and sides are $\frac{3}{4}$ " MDF. Drawer pull is $\frac{3}{4}$ "-thick stock

adding the Drawers

The side panels provide the structure for the project. The next order of business is to build the drawers and shelves that add storage to make the most of the space. Neither of these components is difficult to build, but there are some features of each that may not be obvious, so I'll point those out as they come up.

SIMPLE, RUGGED DRAWERS. I made four drawers to fill the inside of the case. And as you can see in Figure 3, there are two sizes. However, the construction is the same. Building the drawers begins with making the sides.

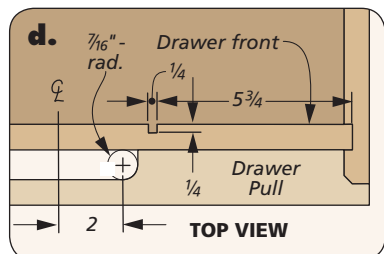
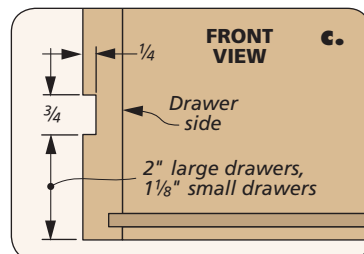
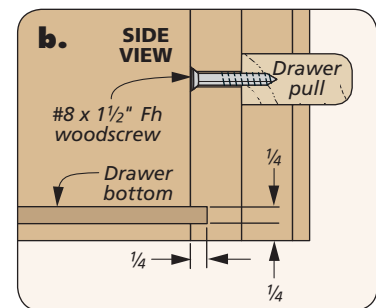
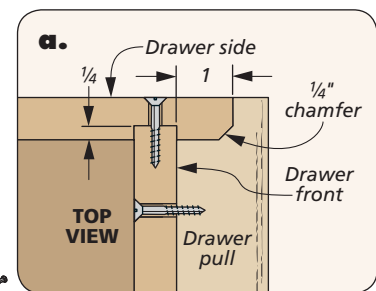
The drawer sides (front and back, as well) are made from $\frac{3}{4}$ " MDF. Begin by cutting a wide groove on the outside face to fit over the runners in the vertical dividers, as in Figure 3c. A dado blade in the table saw makes quick work of this.

The groove is carried around the front edge of the sides to create a notch. This notch accepts the drawer handle.

While at the table saw, cut a pair of wide dados on the inside face (Figures 3 and 3a). These hold the drawer front and back.

The dado for the drawer back deserves some mention. You'll notice it's positioned well forward of the rear end of the side, as in Figure 3. While it does reduce the capacity of the drawer, the upside is that it creates the effect of a "full-extension" drawer. And you can access the entire contents of the drawer without worrying about it falling out of the case.

ONE MORE THING. I located the dado for the back so the inside drawer opening is square in shape. This simple trick means the drawer divider pieces that are added later can all be identical.

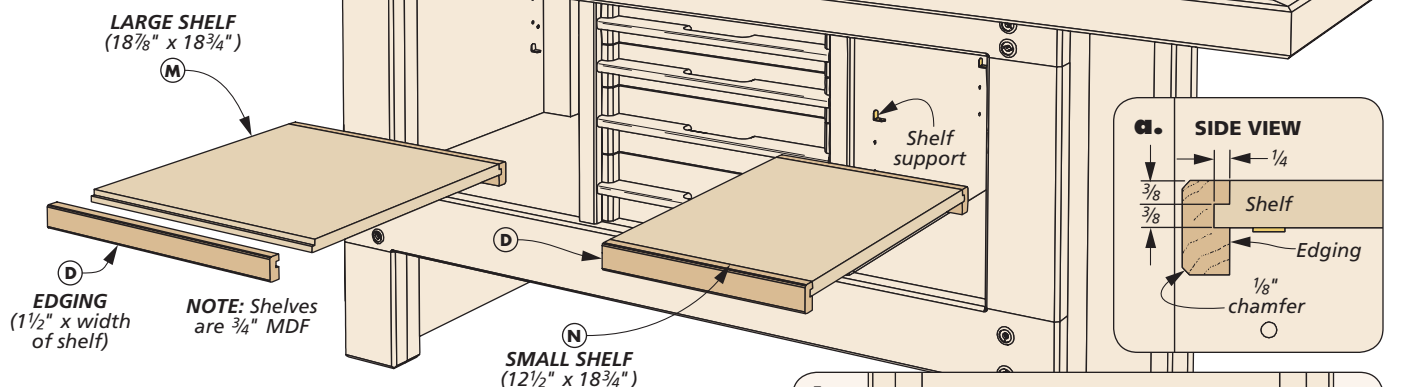


ROUTER WORK. The rest of the joinery work takes place at the router table. First up is cutting a groove for the drawer bottom with a straight bit (Figure 3b). This isn't a big deal on the front and back pieces. But on the sides, I didn't want the groove visible. So this groove is a stopped cut, as shown in Figure 3.

The other joinery detail to address is the dados that hold the drawer dividers. Even if you don't plan to make the dividers right away, it's a good idea to cut the dados anyway. Then you can always add dividers later. You can find the dimensions in Figures 3 and 3d.

CHAMFER. Swap the straight bit for a chamfer bit to add a little detail on the front end of each drawer side. Again, it matches the profile on the

4 FIGURE



rest of my bench. So you could use another profile, like a roundover, to suit your bench. The drawer can then be glued and screwed together.

WOOD PULL. To complete the drawer, I cut a pull from Douglas fir and glued and screwed it to the front edge of the drawer. A cutout on the inside edge creates a handhold. And the long front edges of the piece are rounded at the router table.

QUICK SHELVES. The remaining components of this system are a pair of shelves. Since I positioned the drawer case off center, this allowed me to have compartments on either side of the drawer

case that were of different sizes, as shown in Figure 4.

The shelves rest on shelf supports that fit into small holes drilled into the outside face of the case side and into the sides of the workbench (Figure 4b).

Here again, the design of your bench comes into play. You may need to make a filler panel in order to have a place to drill the holes for the shelf supports.

The shelves are made from MDF. A tongue on the front and back edge interlocks with wood edging, as illustrated in Figure 4a. The edging strips do more

than just cover the MDF edges. They keep the shelf from sagging. Additionally, the edging locks over the shelf supports so that the shelf can't get pulled off.

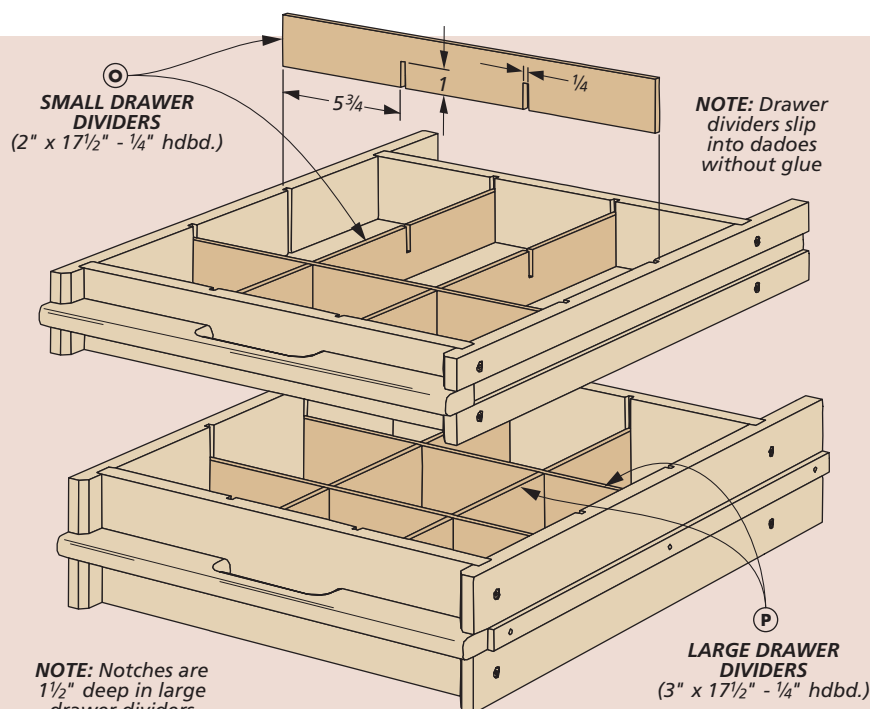
At last, you can load up the shelves and drawers. The added storage makes it much easier to keep your benchtop clear.

Drawer Dividers

The drawers add a lot of handy storage space. But they don't necessarily keep things inside organized. To do that, I added simple dividers, as you can see in the drawing at right. These allow you to arrange the contents to suit your storage needs.

The dividers are made from 1/4" hardboard and are cut to fit the dados in the drawer front, back, and sides. Since the drawer opening is square, the strips will fit in either direction. (Take note that the strips are narrower than the height of the drawer.)

At the table saw, I cut notches along one edge. These allow the strips to overlap each other and create an interlocking grid.



workbench Storage System

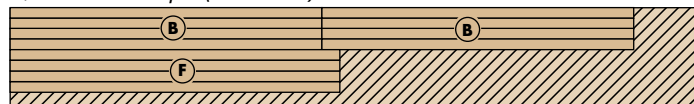


MATERIALS & HARDWARE

A	Panel Sides (4)	16 x 23 - $\frac{3}{4}$ MDF	K	Large Dwr Sides (4)	$4\frac{3}{4}$ x $22\frac{3}{4}$ - $\frac{3}{4}$ MDF
B	Runners (8)	$\frac{1}{2}$ x $23\frac{3}{32}$ - $21\frac{3}{4}$	L	Large Dwr Ft./Bk. (4)	$4\frac{3}{4}$ x $17\frac{1}{2}$ - $\frac{3}{4}$ MDF
C	Case Back (1)	16 x $19\frac{3}{8}$ - $\frac{1}{4}$ Hdbd.	M	Large Shelf (1)	$18\frac{7}{8}$ x $18\frac{3}{4}$ - $\frac{3}{4}$ MDF
D	Panel Edging (1)	$\frac{3}{4}$ x $1\frac{1}{2}$ - 130 rgh.	N	Small Shelf (1)	$12\frac{1}{2}$ x $18\frac{3}{4}$ - $\frac{3}{4}$ MDF
E	Cross Rails (2)	$1\frac{1}{2}$ x $3\frac{1}{2}$ - 23	O	Small Dwr. Dividers (8)	2 x $17\frac{1}{2}$ - $\frac{1}{4}$ Hdbd.
F	Cleats (4)	$\frac{3}{4}$ x $1\frac{1}{16}$ - 23	P	Large Dwr. Dividers (8)	3 x $17\frac{1}{2}$ - $\frac{1}{4}$ Hdbd.
G	Small Drawer Sides (4)	3 x $22\frac{3}{4}$ - $\frac{3}{4}$ MDF			• (42) #8 x 1" Fh Woodscrews
H	Small Drawer Ft/Bk. (4)	3 x $17\frac{1}{2}$ - $\frac{3}{4}$ MDF			• (6) #8 x $2\frac{1}{2}$ " Fh Woodscrews
I	Drawer Bottoms (4)	$17\frac{1}{2}$ x $17\frac{1}{2}$ - $\frac{1}{4}$ Hdbd.			• (66) #8 x $1\frac{1}{2}$ " Fh Woodscrews
J	Drawer Pulls (4)	$\frac{3}{4}$ x $1\frac{5}{8}$ - $18\frac{1}{2}$			• (8) Shelf Supports

CUTTING DIAGRAM

$\frac{3}{4}$ " x 7" - 48" Maple (2.3 Bd. Ft.)

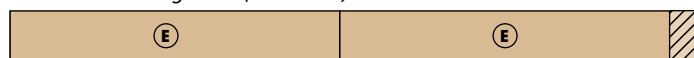


NOTE Plane parts 'B' to $\frac{1}{2}$ " thick

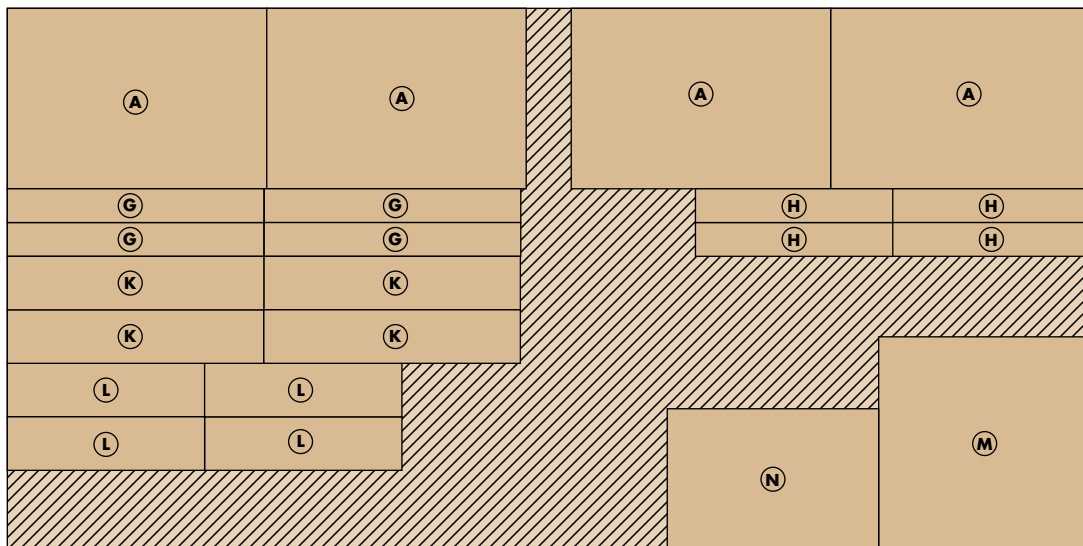
1" x 6" - 96" Douglas Fir (4 Bd. Ft.)



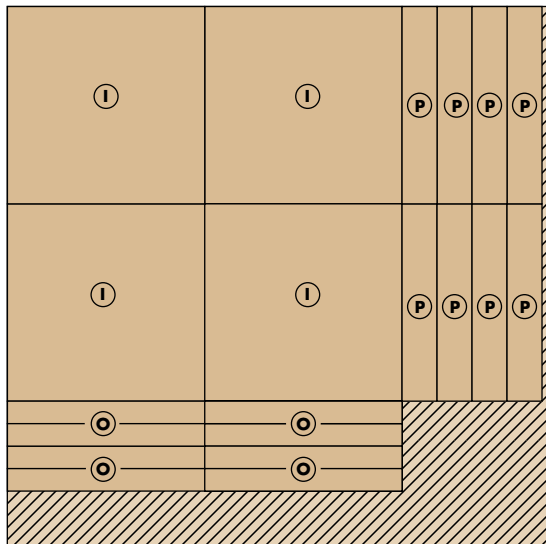
2" x 4" - 48" Douglas Fir (2.7 Bd. Ft.)



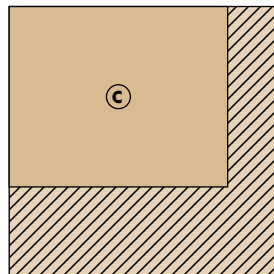
3/4" MDF - 48" x 96"



1/4" Hardboard - 48" x 48"



1/4" Hardboard - 24" x 24"



wall-mounted Sharpening Station

Keep sharpening supplies close at hand with this easy-to-build cabinet.

When it comes to sharpening my chisels and plane irons, having a convenient worksurface and handy storage for all my supplies is always a challenge. This sharpening center you see here easily solves these space and storage problems.

Since the cabinet is mounted to your shop wall, it doesn't take up valuable floor space. The drop-front door will provide the strong and stable worksurface that you'll need for all of your day-to-day sharpening tasks. The strong plywood construction and simple joinery makes it easy to build. And the best part is, when it's finally mounted on your shop wall, this is one project that will show off its practicality right away.



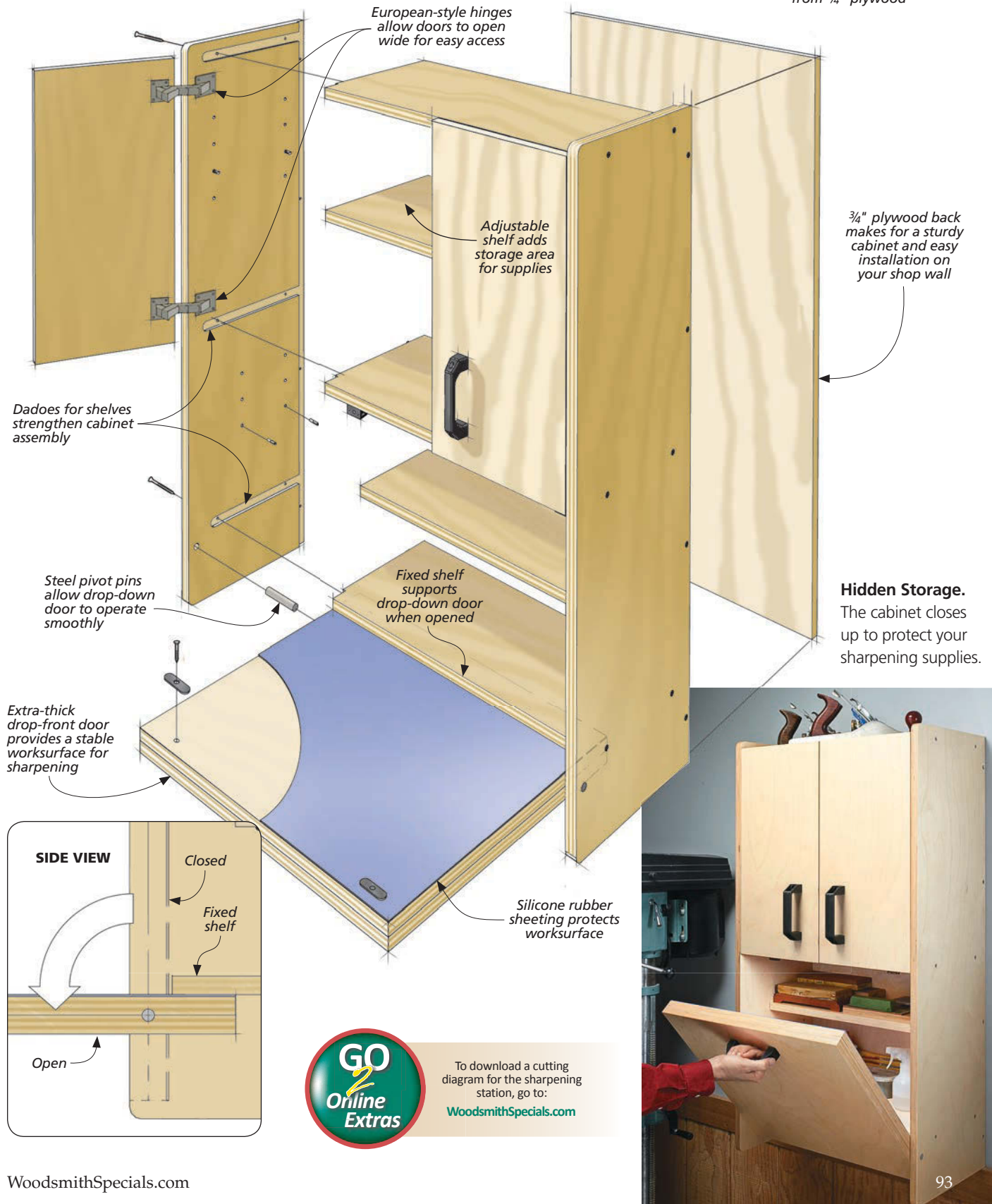
CONSTRUCTION DETAILS

OVERALL DIMENSIONS:

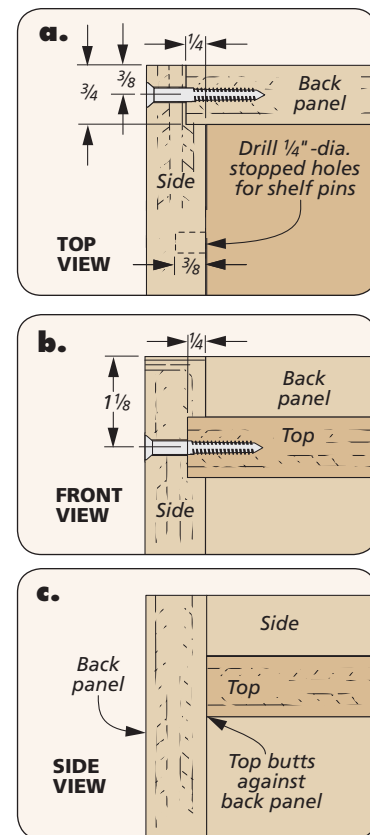
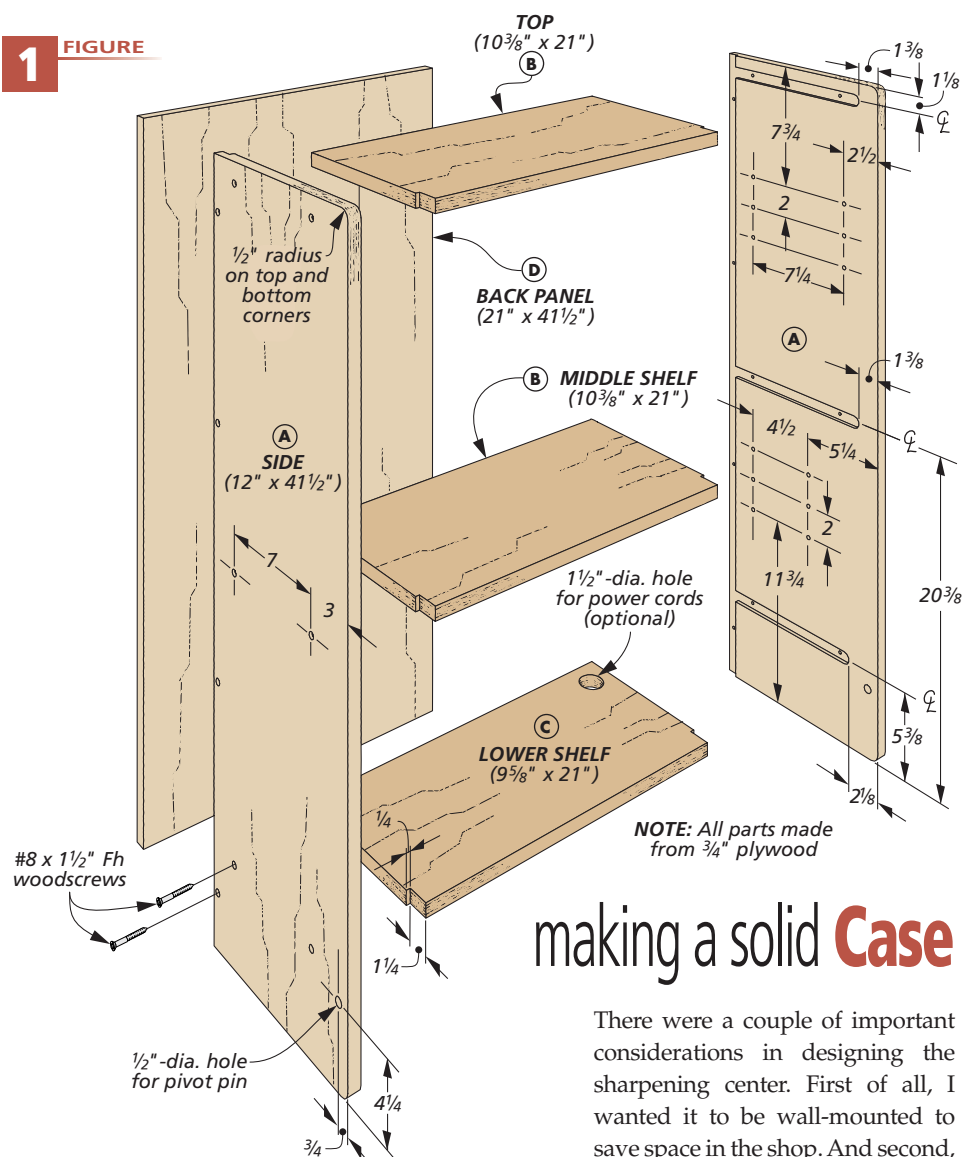
22"W x 41½"H x 12"D (Closed)

22"W x 41½"H x 26⅞"D (Drop-Front Door Opened)

NOTE: All parts made from ¾" plywood



1 **FIGURE**



making a solid Case

There were a couple of important considerations in designing the sharpening center. First of all, I wanted it to be wall-mounted to save space in the shop. And second, the drop-front door had to provide a strong and stable work surface for sharpening tasks.

To accomplish these goals, I did two things. I used $\frac{3}{4}$ " Baltic birch plywood for all the parts, including the back (Figure 1). And then I joined the top, middle shelf, and lower shelf to the sides with stopped dados. This joinery is plenty strong enough to support the extra-thick, drop-front door. But to make the cabinet even stronger, I used both glue and screws to assemble everything.

CASE CONSTRUCTION

Most of the joinery you'll need to cut will be on the side pieces, so that's where to start. The two sides start as one extra-wide blank.

This way, you can lay out and cut all the stopped dados at once. And that guarantees they'll be perfectly aligned when it's time to assemble the cabinet later on.

STOPPED DADOES. You'll use your router to cut the three sets of stopped dados. A shop-built jig (like you see in the box at the bottom of the opposite page) will help make sure they're aligned and sized correctly.

CUT TO SIZE & SHAPE. After cutting the sides to size, I used a jig saw to create the radius on the front corners, as you see in Figure 1. Back at the table saw, you can use a dado blade to cut a rabbet along the back edge. This will accommodate the plywood back.

DRILLING OPERATIONS. With the two side pieces in hand, you'll be spending a little time at the drill press. There are two sets of holes on the inside for the shelf pins. And you can flip the pieces over to drill the countersunk screw holes that will be used for assembly later on. Finally, I stacked the

MATERIALS & SUPPLIES

CASE

A	Sides (2)	12 x 41 1/2 - 3/4 Ply.
B	Top/Middle Shelves (2)	10 3/8 x 21 - 3/4 Ply.
C	Lower Shelf (1)	9 5/8 x 21 - 3/4 Ply.
D	Back Panel (1)	21 x 41 1/2 - 3/4 Ply.
E	Upper Adj. Shelf (1)	10 3/8 x 20 3/8 - 3/4 Ply.
F	Lower Adj. Shelf (1)	7 x 20 3/8 - 3/4 Ply.
G	Upper Doors (2)	10 1/8 x 20 3/4 - 3/4 Ply.
H	Drop-Front Door (1)	19 1/8 x 20 3/8 - 1 1/2 Ply.
I	Pivot Pins (2)	1/2 x 2 3/4 Steel Rod

- (3) 5 3/4" Door Pulls
- (6) #12 x 1" Rh Woodscrews
- (2 pr.) 175° Fully Concealed Hinges w/Screws
- (20) #8 x 1 1/2" Fh Woodscrews
- (8) 1/4"-dia. Shelf Pins
- (2) Magnetic Catches
- (1) 1/32" x 24" - 24" Silicone Sheet

pieces together to drill the $\frac{1}{2}$ "-dia. holes for the pivot pins that hold the drop-front door. To ensure the holes were straight, I used the drill press. This way, the drop-front door will function properly.

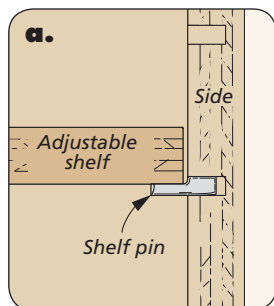
FIXED SHELVES. The most time-consuming part of the project is done. Now you can move on to making the top and two fixed shelves. The top and middle shelf are the same width. The lower shelf is narrower to provide clearance for the drop front. All you need to do after cutting the pieces to size is cut a notch on each end (Figure 1). These notches "wrap around" the stopped dados in the sides to hide the end of the dado.

ASSEMBLY

The nice thing about this project is that everything is held together with glue and screws. This means that you only need to clamp the parts while driving the screws, then you can remove the clamps.

ONE SIDE AT A TIME. On glue-ups like this, I find it easier and less stressful to start with one side. What I mean is, it's easier to assemble the top, middle shelf, and lower

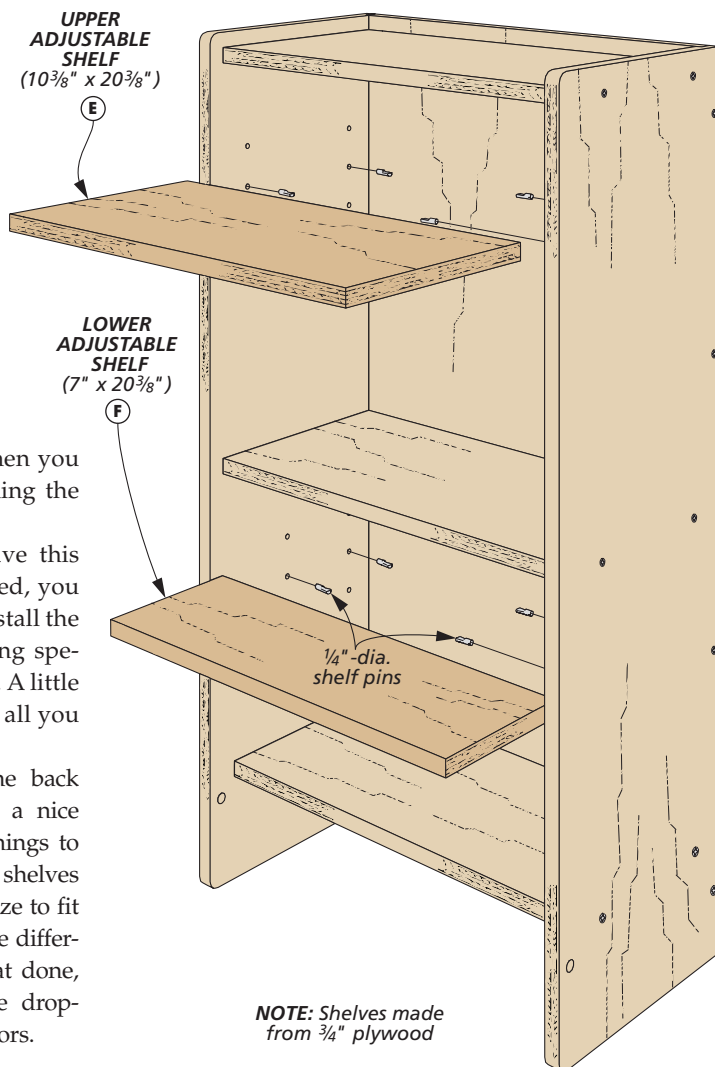
2 FIGURE



shelf to one side piece. Then you can concentrate on attaching the other side piece.

BACK PANEL. Once you have this much of the case assembled, you can set it on its face and install the back panel. There's nothing special here. Just cut it to size. A little glue and a few screws are all you need for assembly.

ADJUSTABLE SHELVES. With the back panel in place, you have a nice strong cabinet. The next things to add are the two adjustable shelves (Figure 2). They're cut to size to fit over the shelf pins (note the different shelf widths). With that done, you're ready to make the drop-front and the two upper doors.

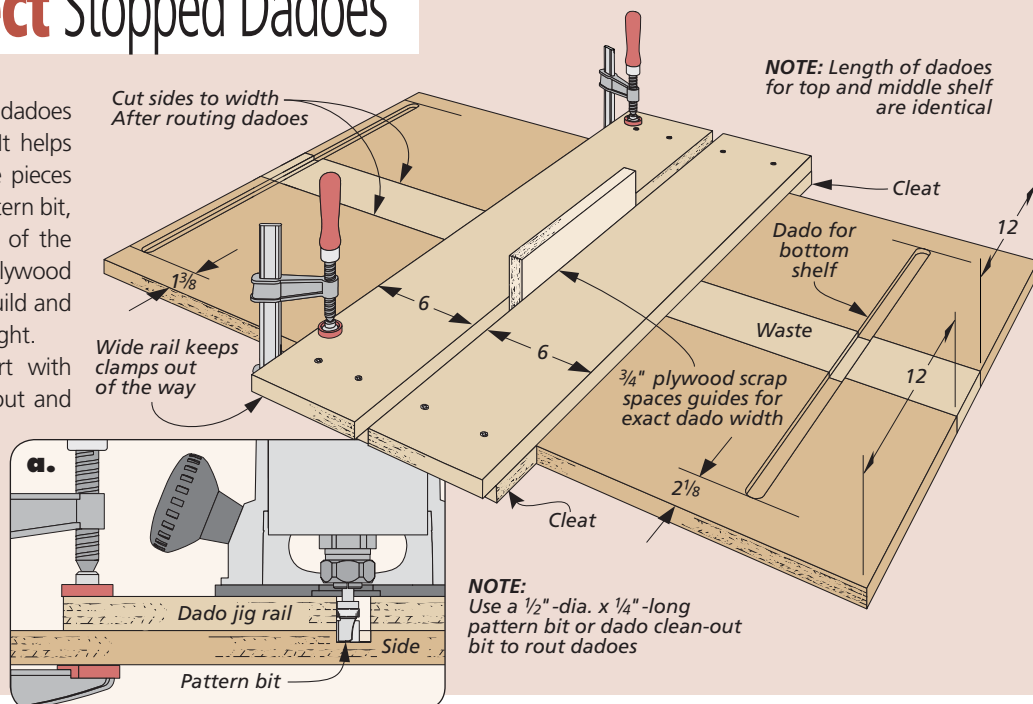


NOTE: Shelves made from $\frac{3}{4}$ " plywood

Routing Perfect Stopped Dados

The key to routing the stopped dados is in the jig you see at right. It helps ensure the dados on the side pieces are aligned. And by using a pattern bit, you can make sure the width of the dados is an exact fit for the plywood shelves. You can see how to build and use the jig in the drawings at right.

The process is simple. Start with an extra-wide blank then lay out and mark the ends of the dados. Use a scrap piece of plywood the same thickness as the shelves as a spacer when fastening the guides to the two cleats. Align the jig to the layout lines, then rout to the end marks you made earlier.



NOTE: Length of dados for top and middle shelf are identical

NOTE: Use a $\frac{1}{2}$ "-dia. x $\frac{1}{4}$ "-long pattern bit or dado clean-out bit to rout dados

finishing up with Doors

Now that the basic cabinet is complete, you're ready to add the three doors. The two upper doors are simply cut to size and installed with hinges. The drop-front door is a double-thickness of plywood and pivots on two steel pins (photo at right).

UPPER DOORS

Figure 3 shows you everything you need to know to make and install the two upper doors. Still, as simple as they are, there are a few things to watch out for as you cut them to size and install them.

The first thing is to size the doors so the top edges are flush with the top of cabinet. The bottom edges should be flush with the bottom of the middle shelf.

When it comes to installing the doors, the goal is to make the door faces flush with the front edge of the cabinet sides. The hinges I used allow for some adjustment to make this an easy task.

The other thing I like to do is aim for a $\frac{1}{16}$ " gap at the sides of

doors and an $\frac{1}{8}$ " gap between them. You might need to shave a little off of the edges or make some adjustments to the hinges to accomplish this.

DROP-FRONT DOOR

The heart of the workcenter is the drop-front door shown in the photo above. Like the two upper doors, this door is made from $\frac{3}{4}$ " plywood. The difference is I used two layers of plywood to make a solid worksurface. And it pivots on a couple of sturdy, steel pins.

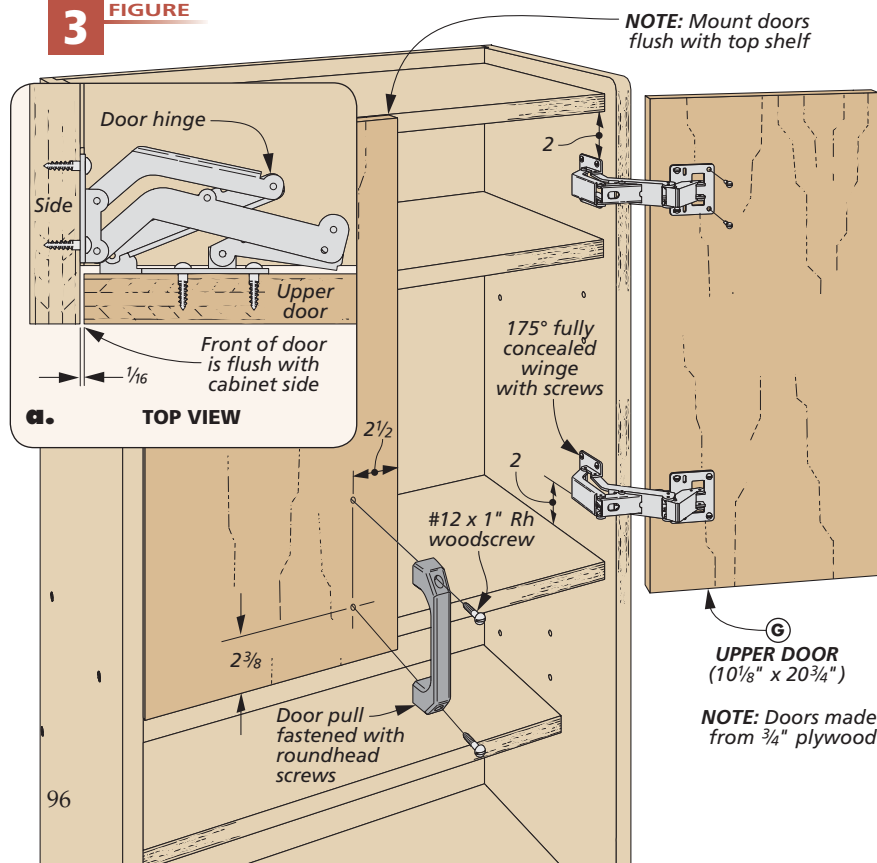
Locating and drilling the holes for the pivot pins will come a little later.

MAKING THE DOOR. To get started, glue up two oversize pieces of plywood. A few cuts at the table saw are all it takes to square up the door and cut it to final size. Again, shoot for an even gap at the sides that matches the gaps of the two upper doors.

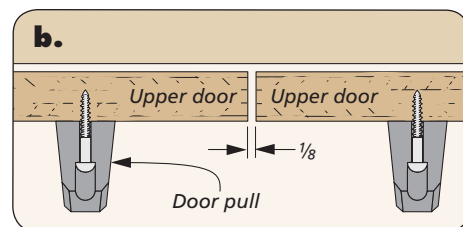
To protect the worksurface from the grit and grime when honing tools, I added a rubber liner, like you see in the photo on the opposite page. Spray adhesive is perfect for fastening it down.



3 FIGURE



Fully Concealed Hinge. These hinges hold the doors open and out of the way while you tend to your sharpening tasks.



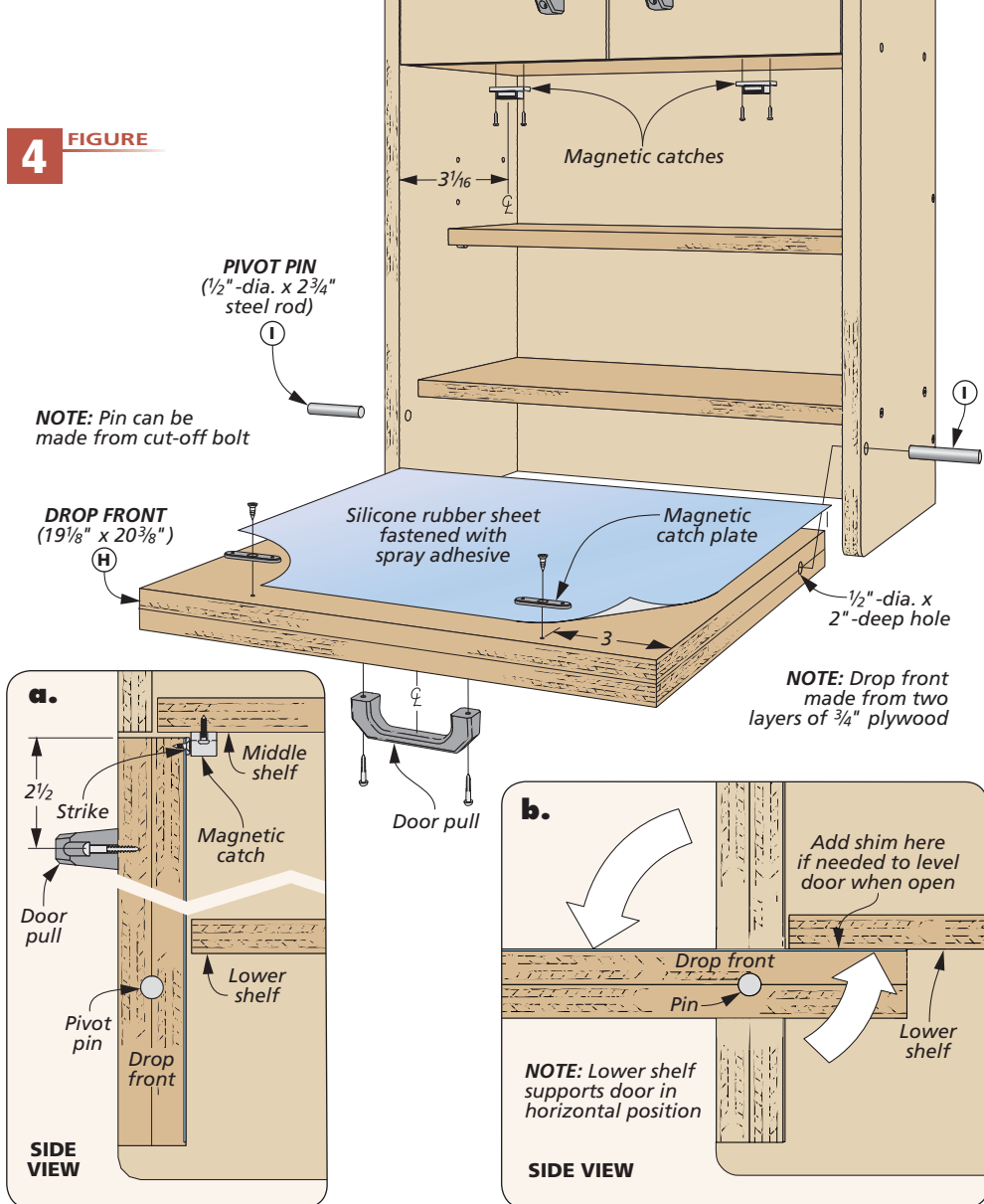
PIVOT PINS. The last step to installing the drop-front door is locating and drilling holes for the pivot pins. The box below walks you through the process. The goal is to locate the pins so that the drop-front is level when it's open and is flush with the sides when it's closed. (I only partially inserted the pins so I could remove the door for tweaking the fit.)

Note: If the door doesn't rest at 90°, all you need to do is add a shim on the bottom of the lower shelf. This will bring the door level when opened and the shim will be hidden from view. Then you can fully seat the pins flush with the cabinet sides. Since the pins are friction fit, I didn't need to use epoxy to glue them.

FINAL DETAILS. All of the hard work is done. Now you just need to add the door pulls and magnetic catches. Then a couple coats of spray lacquer will finish it off.

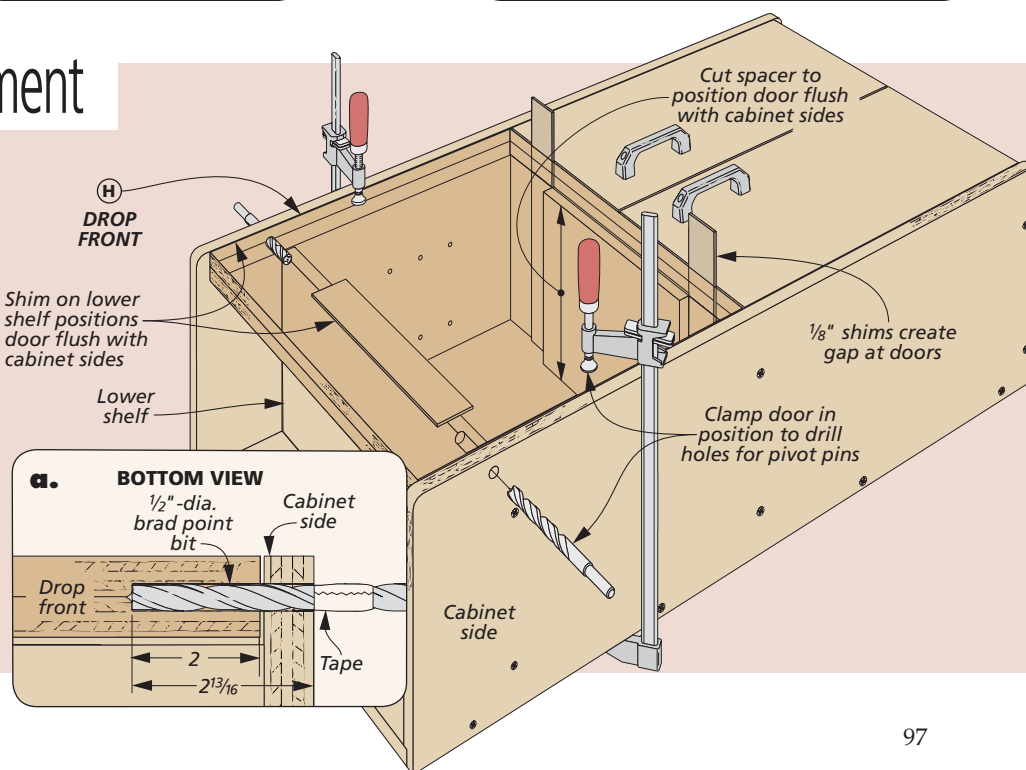
Finally, the cabinet is ready for you to install it on the wall of your shop. I located mine over a couple of studs and anchored it to them with several long screws. With that done, you'll soon find out how convenient it is to have all your sharpening supplies at hand.

4 FIGURE



Drop-Front Alignment

The process for locating the pivot pins starts with positioning the door flush with the front edge of the cabinet sides. To do this, I used a couple of spacers. First, a thin spacer is located on the front edge of the cabinet bottom, as shown at right. A second, wide spacer is fastened to the underside of the fixed shelf with double-sided tape. Take a little time here to center the door side-to-side and check for an even gap at the top. Finally, you can carefully drill the holes in the edges of the door, keeping the bit straight as you go.



wall-mounted Sharpening Center

MATERIALS & HARDWARE

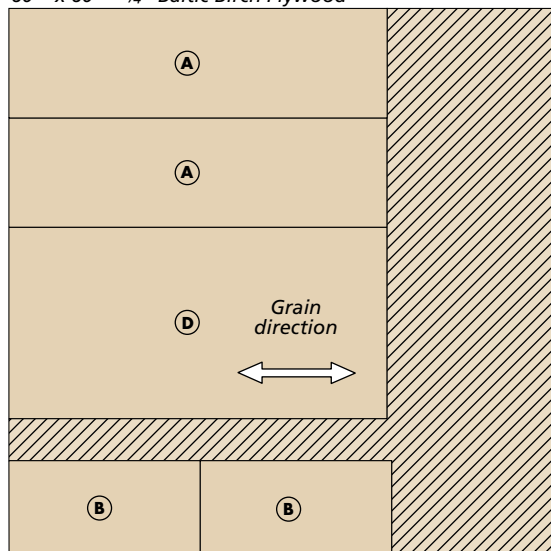
CASE

A	Sides (2)	12 x 41½" - ¾ Ply.
B	Top/Middle Shelves (2)	10⅜ x 21" - ¾ Ply.
C	Lower Shelf (1)	9⅝ x 21" - ¾ Ply.
D	Back Panel (1)	21 x 41½" - ¾ Ply.
E	Upper Adj. Shelf (1)	10⅜ x 20⅜" - ¾ Ply.
F	Lower Adj. Shelf (1)	7 x 20⅜" - ¾ Ply.
G	Upper Doors (2)	10⅜ x 20⅜" - ¾ Ply.
H	Drop-Front Door (1)	19⅛ x 20⅜" - 1½ Ply.
I	Pivot Pins (2)	½-Dia. x 2⅜" Steel Rod

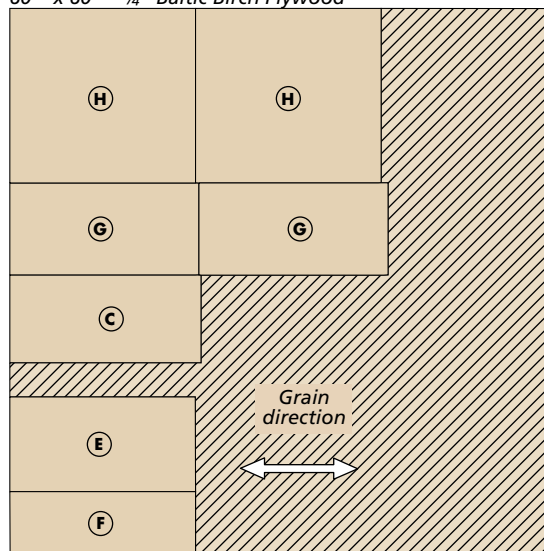
- (3) 5¾" Door Pulls
- (6) #12 x 1" Rh Woodscrews
- (2 pr.) 175° Fully Concealed Hinges w/Screws
- (20) #8 x 1½" Fh Woodscrews
- (8) ¼"-Dia. Shelf Pins
- (2) Magnetic Catches
- (1) ⅓" x 24" - 24" Silicone Sheet

CUTTING DIAGRAM

60" x 60" - ¾" Baltic Birch Plywood



60" x 60" - ¾" Baltic Birch Plywood



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Varathane
varathane.com

Woodcraft
800-225-1153
woodcraft.com

Woodworker's Supply
800-645-9292
woodworker.com

Most of the supplies you'll need for projects in this book are available at hardware stores or home centers. For specific products or hard-to-find items, take a look at the sources listed here.

Retailers will periodically discontinue some items, so gather all the hardware that you need before you get started on your project. You can always adjust dimensions or drill different-sized holes to suit your hardware.

CABINETMAKER'S BENCH (P. 6)

• Lee Valley

Large Front Vise70G08.02
Shoulder Vise Screw70G01.51
Vise Handles05G12.03
Square Bench Dogs05G02.01

• Essentra Components

Square-Head T-BoltsTB-115

• Speedy Metals

3/4"-dia. Steel Rod18r.75-36

• Carbide.com

Mortising BitAMA-45561

HOBBY BENCH (P. 18)

• Essentra Components

3 1/2" Drawer PullsKHO-5
1/4"-20 Star Knob.RST-94

• L.K. Goodwin Co.

Plastic Compartment Boxes.....varies

• Amazon.com

24" Task Lamp.....95050

• Woodworker's Supply

Shelf Standard906-048

8" Shelf Bracket.....906-244

• Rockler

3/8" x 48" T-Track20054

5/16"-18 T-Nut.....26062

Plastic Leveler Glides24257

MULTIPURPOSE SHOP CART (P. 32)

• Lee Valley

4" Locking Casters00K20.01

Bed Bolts05G17.01

Veritas Pup Set05G10.03

• Rockler

14" Drawer Slides32474

Spring Hinge28845

Talon Pegboard Hooks81351

• Essentra Components

Plastic HandleDUH-55

• Woodworker's Supply

Leigh Bench Clamp155-147

ROLL-AROUND CABINET (P. 32)

• Horton Brasses

Door Pulls (Antique).....MS-13

• Lee Valley

4" Locking Casters00K20.10

18" Drawer Slides02K42.18

H-L Hinges01X35.30

• Rockler

Magnetic Catches26559

Shelf Pins (Black)22781

The cabinet is painted with Benjamin Moore's Aura satin acrylic paint, Fair Isle Blue (CSP-715), followed by High Performance flat water-based varnish from General Finishes.

HEIRLOOM TOOL CHEST (P. 50)

• Certainly Wood

Bird's Eye Veneervaries

• Woodcraft

Freud Beading Bit830674

• Lee Valley

Brass Knobs01A02.16

SWING-DRAWER CART (P. 56)

• McMaster-Carr

3" Swivel Casters2426T55

Steel Shaft.....1346K19

Thrust Bearings.6655K17

Sleeve Bearings2868T9

Rare-Earth Magnets3506K25

ANTIQUE TOOLBOX (P. 62)

• Lee Valley

Brass Handle00W58.90

Brass Hinges00D02.01

Brass Hinge Screws91Z04.02

Brass Screws91X06.09

• Rockler

Darkening Solution.....34477

The toolbox is stained with Varathane's Gunstock stain then sprayed with a couple of coats of lacquer for protection.

RUSTIC TOOL CABINET (P. 68)

• Horton Brasses

1 1/2" x 2" HingesPB407B

1"-dia. KnobsK-12

LUMBER CENTER (P. 74)

• Lowe's

Power Pro Lag Screws155907

SHARPENING STATION (P. 92)

• Rockler

175° Concealed Hinges66613

• Essentra Components

Door PullsDUH-55

• McMaster-Carr

Silicone Sheet5812T22

• Carbide.com

Dado Cleanout BitAMA-45460-S

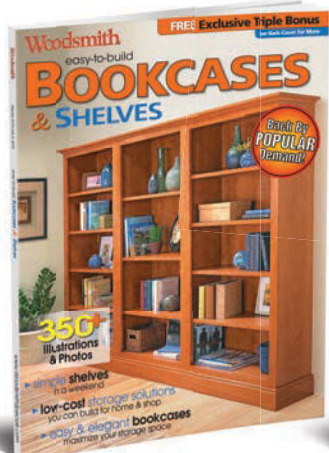
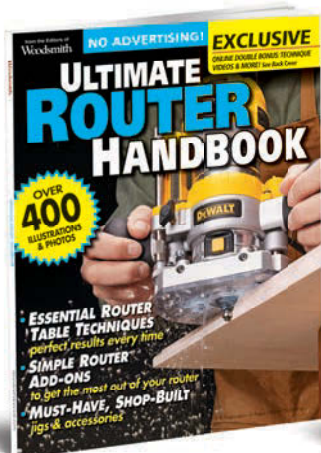
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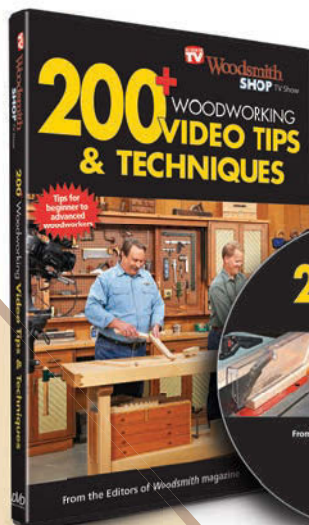
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