

TV SHOW HANDBOOK

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Projects
from
Season
19

Step-by-Step Projects

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Handy Tool Box

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Round-Top Bookcase

Hokkaido Hall Table, Picture Frame Moldings

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SHOP SAFETY IS YOUR RESPONSIBILITY

Using hand or power tools improperly can result in serious injury or death. Do not operate any tool until you read the manual and understand how to operate the tool safely. Always use all appropriate safety equipment as well as the guards that come with your tools and equipment and read the manuals that accompany them. In some of the illustrations in this book, the guards and safety equipment have been removed only to provide a better view of the operation. Do not attempt any procedure without using all appropriate safety equipment or without ensuring that all guards are in place. Active Interest Media Holdco, assumes no responsibility for any injury, damage, or loss suffered as a result of your use of the material, plans, or illustrations contained in this book.

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Hokkaido Sideboard

Redefine the space in your home with this sideboard inspired by modern Japanese furniture designs.

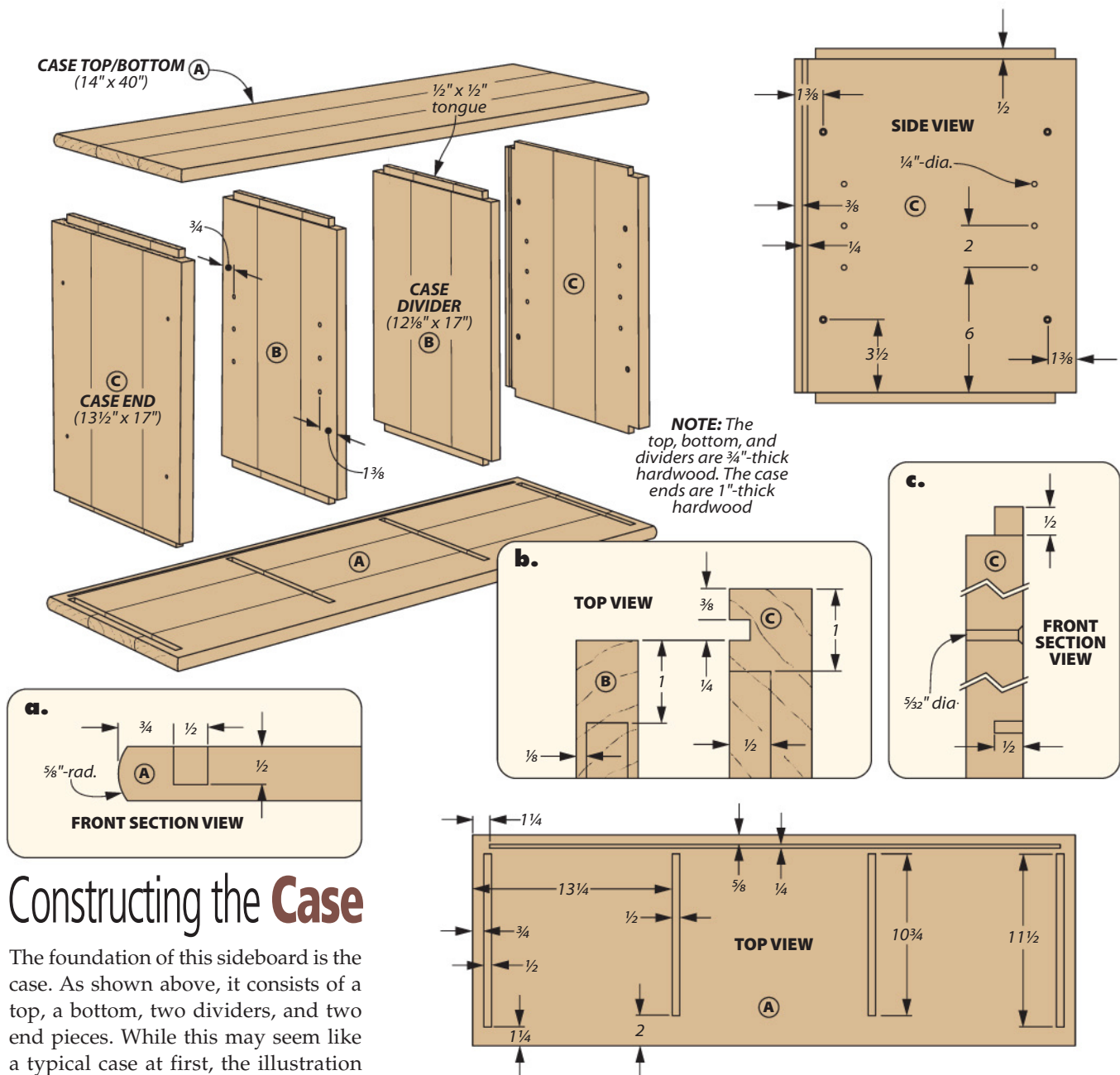
Furniture has a fascinating way of shaping the space around it. In large rooms, the furniture divides and defines. In smaller rooms, that same furniture seems to expand the area and give it life.

The sideboard you see here was inspired by a selection of pieces manufactured in the Hokkaido region of Japan. Interestingly, these designs were based on Dutch furniture, with the intent of recreating the aesthetic of grand European and American homes with a smaller footprint to accommodate typical Japanese housing.

Here you'll find a lifted case and top that provide an airy sense of minimalism. Four sturdy drawers and two compartments with shelves provide plenty of storage despite the small footprint. Additionally, the back panels (shown below) allow this sideboard to function well as either a centerpiece or as a wallflower.



Hardwood Construction. Red alder hardwood makes a back that's as beautiful as the front, along with sturdy joinery throughout. Baltic birch plywood provides strong, stable drawers that run on hardwood guides.



Constructing the Case

The foundation of this sideboard is the case. As shown above, it consists of a top, a bottom, two dividers, and two end pieces. While this may seem like a typical case at first, the illustration at right shows a key difference: the tongues on the dividers and ends are buried in stopped grooves and dados.

TOP & BOTTOM. I prefer to make the “mortise” side of a joint first, so I began with the top and bottom. Because of their width, I glued together several boards to create some appealing panels, then cut them down to size.

Next came those stopped dados. My plunge router, along with a

straight bit, was the best tool for the job here. The grooves for the back panel were easy enough: an edge guide kept the grooves parallel while stop blocks kept a consistent length between them. However, for the dados, I ended up creating two jigs to use with a guide bushing (one for the dividers and one for the ends). For more on making and using these jigs, take a look at Woodsmith.com/magazine/sip.

To finish up the top and bottom, take the pieces over to the router table. I used a bullnose bit to create the rounded edges around each piece (detail ‘a’).

DIVIDERS & ENDS. Next on the docket are the dividers and ends. After gluing them up and cutting them to size, I began creating the tongues by removing the corner waste with vertical cuts on each piece at the table saw, using a tall auxiliary fence on my miter gauge to support the workpieces. Next, I buried the blade in an auxiliary rip fence to rabbet the ends and create the tongues.

While at the table saw, I also cut the grooves for the back panel. Once those were in place, I finished up the case pieces by heading to the drill press and adding the shelf pin holes, as well as the countersunk pilot holes for the legs.



For more on making the stopped dados and grooves go to:
Woodsmith.com/magazine/sip

Although this completes most of the case, there's something else we need to get to before assembly.

CASE BACK ASSEMBLY

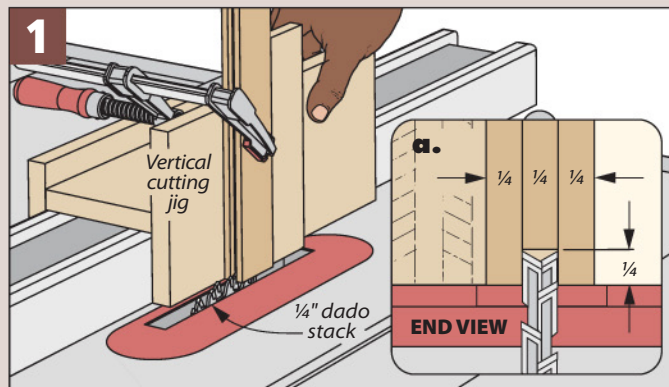
There's a lot going on with the back assembly. Luckily, it can be broken down into simple, frame-and-panel joinery with splines to join it to the case.

RAILS & STILES. After sizing the rails and stiles, it's time to cut some grooves at the table saw. Details 'a,' 'b,' and 'c,' show the dimensions here; keep in mind that the end and central stiles are nearly identical, save that the center stiles have the added groove to accept the case dividers shown in detail 'a.'

To address the ends of these pieces, Figure 1 shows how to create grooves in the ends of the rails. As for the stiles, they'll need tongues to fit into the grooves.

PANELS. Now for the panels. After the glueup and sizing is done, it's time to rabbet their edges. Bury the dado blade in an auxiliary fence, then rabbet

Grooves in the End



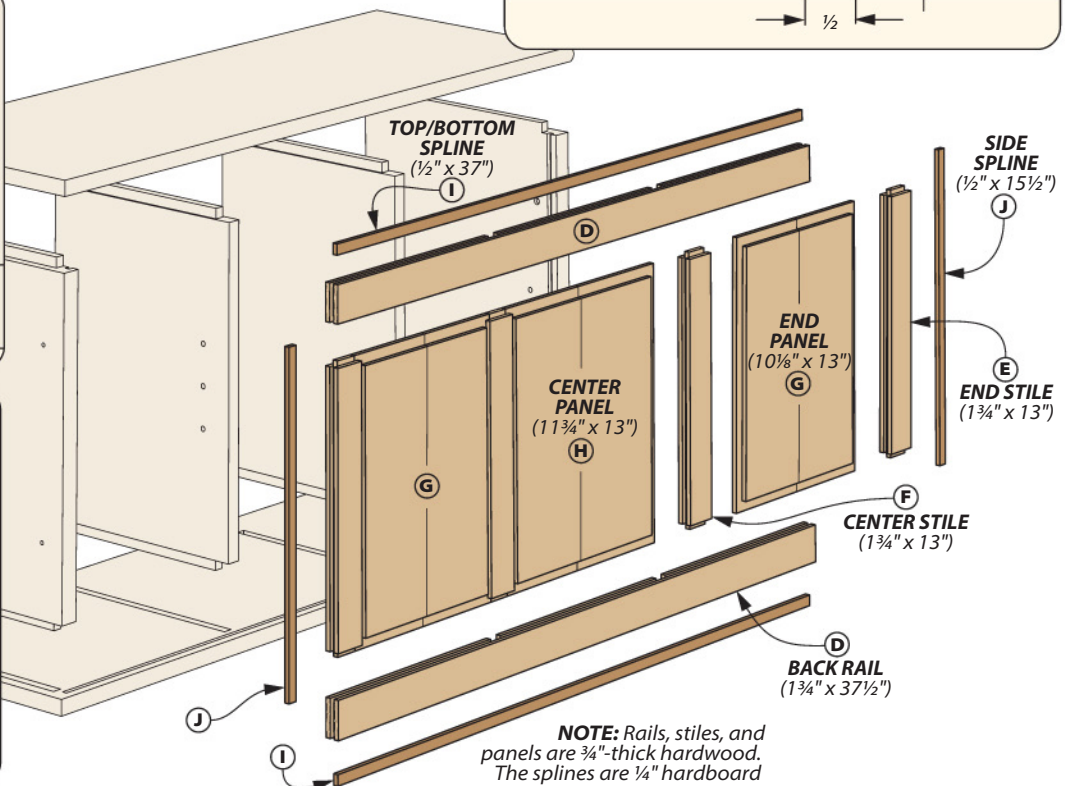
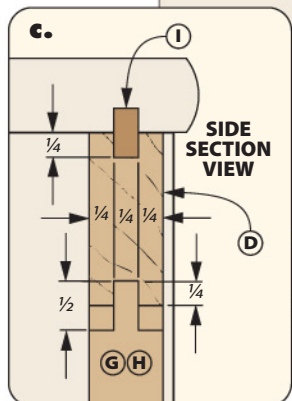
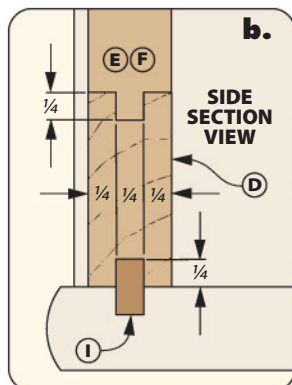
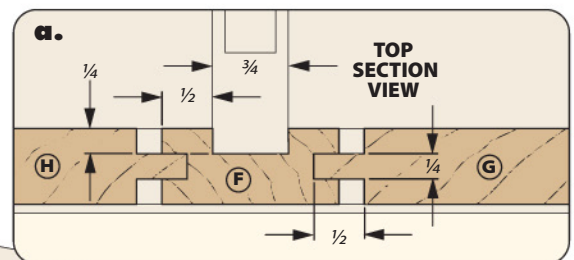
Vertical Cuts. The best way to cut the grooves in the ends of the back rails is at the table saw, using a vertical cutting jig. The jig supports the workpiece on two sides while a clamp keeps it firmly in place during the cut.

around the panels to create tongues to match the grooves in the rails and stiles.

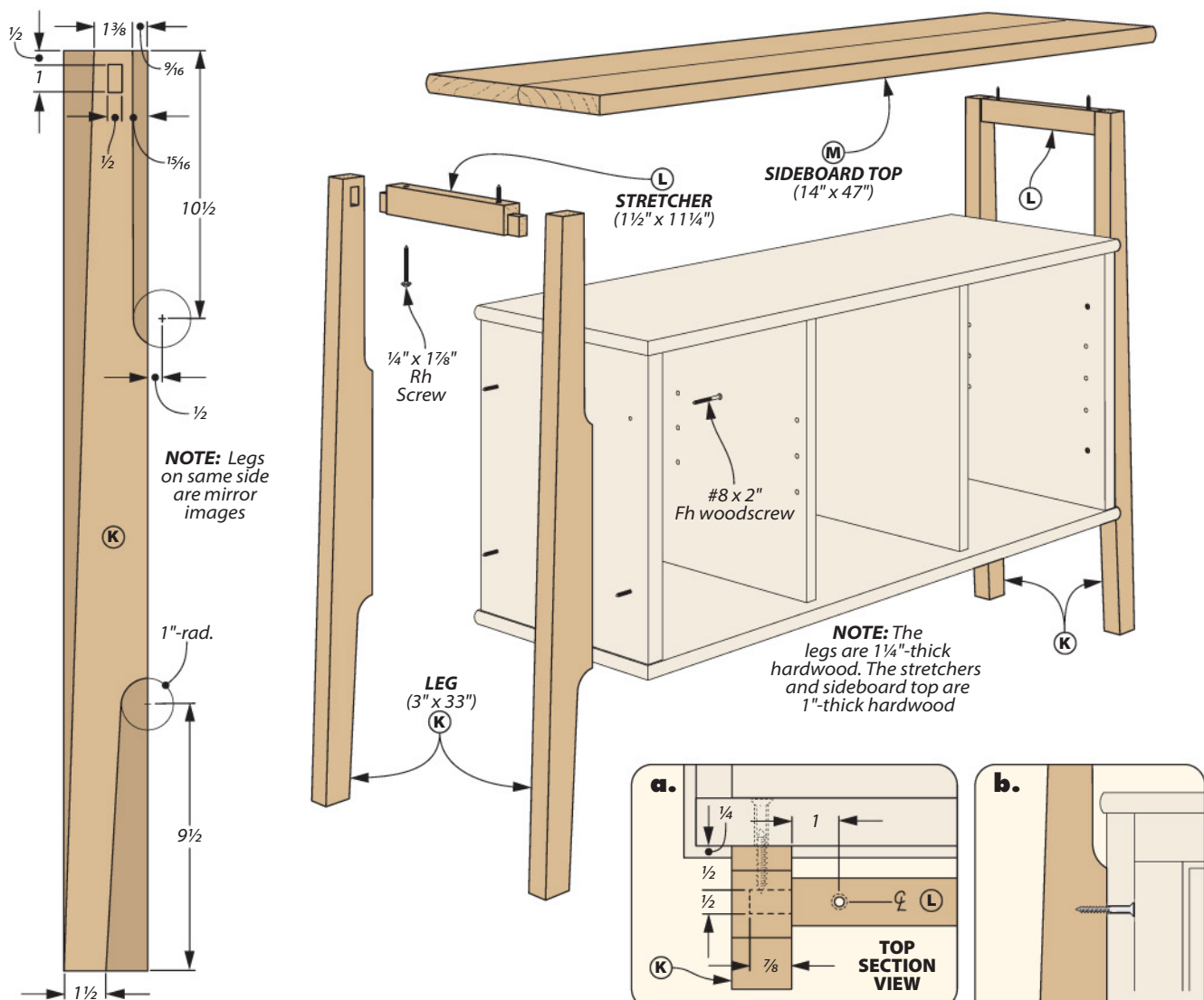
ASSEMBLY. Begin the assembly by gluing up the back panel. Start by joining the rails and stiles around the panels. Then, cut the splines to size.

It's time to glue up the case. I recommend using a slow-setting glue and keeping a few squares nearby. Set the case bottom on your bench, then fit in

the back assembly (splines included). Bring the case ends into place. Slip the tongues of the case dividers into their dados and the grooves in the center stiles, then bring the top in over everything else, clamping it all together.



NOTE: Rails, stiles, and panels are 3/4"-thick hardwood. The splines are 1/4" hardboard



Astride a Set of Legs

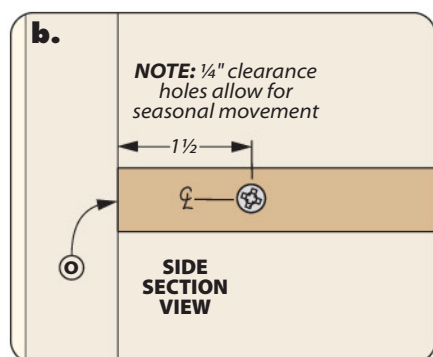
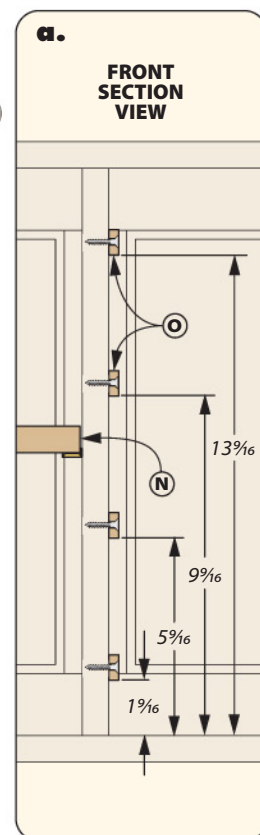
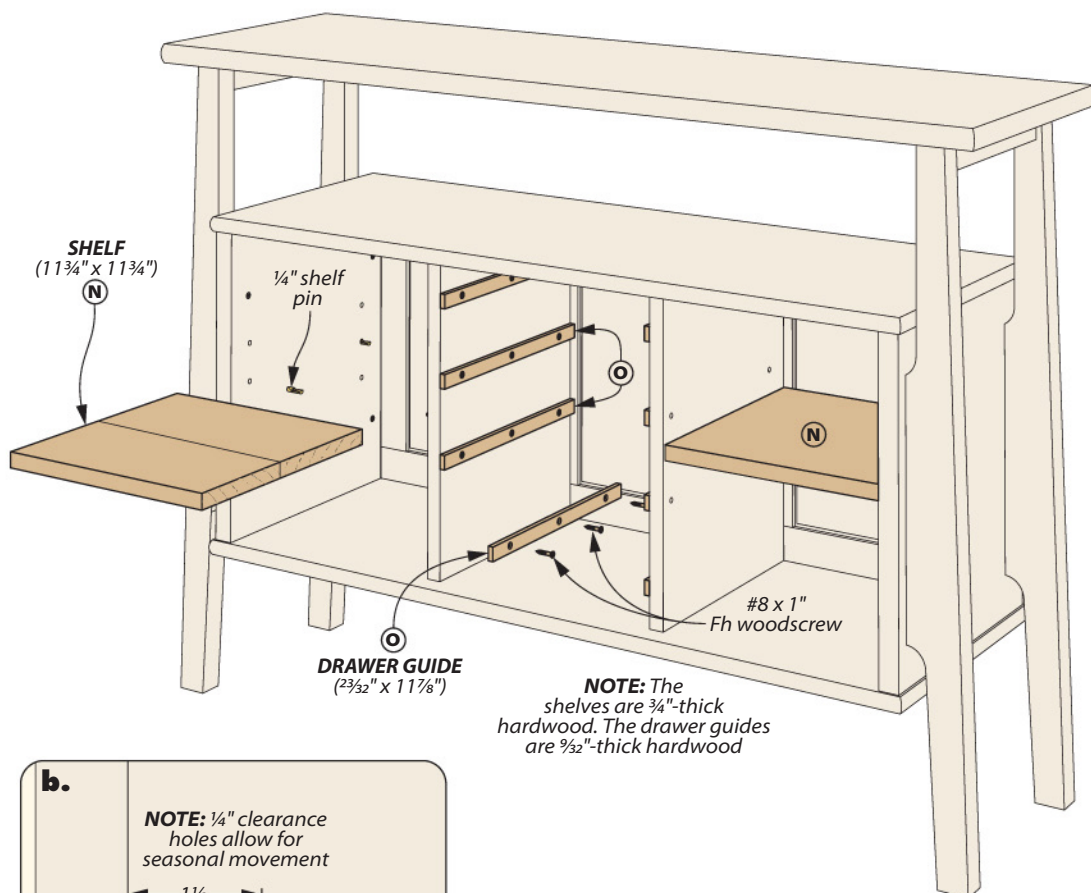
With the case constructed, the next item was to make and mount the legs, and give the sideboard its actual top. Addressing the shape of the legs seemed like a good place to start the work.

LEG TEMPLATE. To ensure each of the legs would be identical, I chose to make a template out of hardboard. The left illustration above shows the dimensions I used.

After laying out the shape of the template, I drilled out the waste for the radii using a large Forstner bit. Additionally, I drilled out the waste

where the mortises would be. Doing this ensures that each mortise will be in the same position relative to the profile for every leg blank. From there, I cut the rest of the waste free at the band saw, then used the spindle sander and edge sander to reach the final shape of the profile (filing the mortise clean as well).

SHAPING THE LEGS. With the template in hand, I could now start shaping the legs. After sticking the template down to one of the blanks with double-sided tape, I began with the mortises. I drilled out the majority of the waste with a Forstner bit, then cleaned up the sides and squared the corners with a chisel.



Next came the profile. Each leg takes just a couple steps. First, I headed to the band saw. I rough-cut the blank to shape, leaving a little waste outside of the template. After that, either a pattern bit in a handheld router or a flush-trim bit at the router table can be used to clean up the edges following along the template to achieve the final shape. Once you're happy with that leg, remove the template, scrape off the remaining tape, and repeat the process for the other legs.

STRETCHERS. With the legs made, we'll now want something to connect them at the top; that'd be the stretchers. After cutting them to size, take these pieces over to the drill press. As you can see in detail 'c' on the previous page, roundhead screws secure the

top in place, so you'll need to drill counterbored clearance holes to accept these.

Next up are the tenons on the ends. I used a miter gauge at the table saw to create the tenons. These match the mortises in the legs. Keep in mind that only three sides of these tenons will have shoulders.

SIDEBOARD TOP. Finally, we can get to the top. After selecting the best boards for your sideboard, glue them up and cut the top to size. To create the bullnose edges shown in detail 'c,' (previous page), I used a bullnose bit at the router table, as I did with the case top and bottom.

ADDING THESE PIECES. To begin assembling all these parts, I started out by gluing up the leg and stretcher assemblies. Once dry, I followed that by gluing and screwing each assembly to the case (detail 'b,' previous page). With those attached, I flipped the project up and clamped the top centered onto the stretchers. To mount the top, I drilled pilot holes

into it and secured it with a series of roundhead screws.

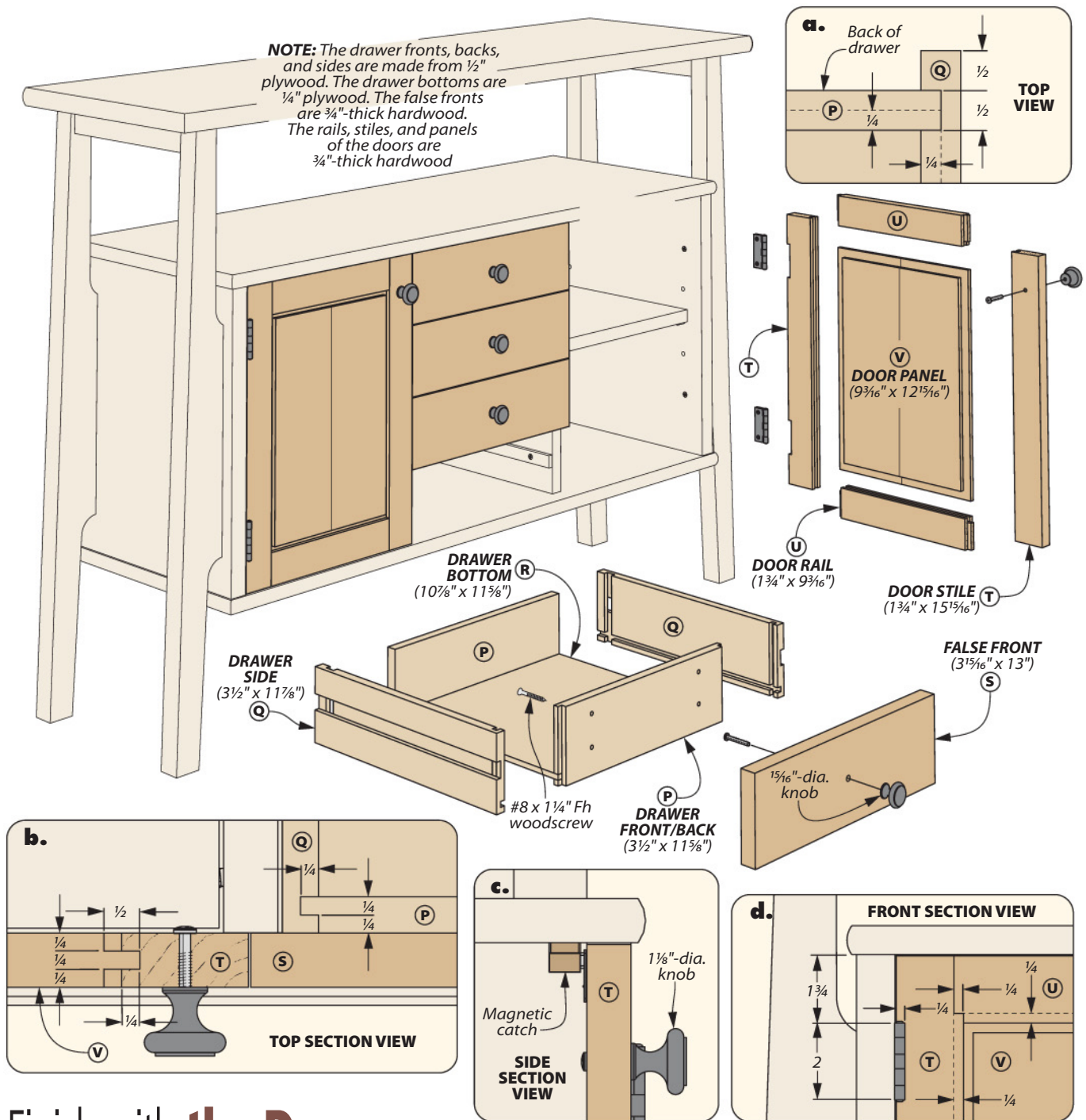
SHELVES & GUIDES

The drawers and doors will really fill out this sideboard, but there are two sets of parts we need to address before we get there.

SHELVES. A pair of shelves fit in the compartments of the sideboard. These are simple, hardwood squares held up by shelf pins. After sizing the shelves, you can insert the pins and set the shelves in place.

DRAWER GUIDES. Last come the hardwood drawer guides. After planing them down and sizing them so they'll sit flush with the fronts of the case dividers, the clearance holes were the main thing to take care of (detail 'b'). I made these at the drill press, using the fence and stops to ensure consistency.

Details 'a' and 'b' above show the locations of the drawer guides. Once you've screwed the guides in, you're ready to move on to the next parts: the drawers and doors.



Finish with the Drawers

A pair of doors and a quartet of drawers finish up this project. Although it doesn't matter which ones you tackle first, I went with the drawers.

DRAWER JOINERY. While the false fronts are alder like the rest of the sideboard, I made the drawer parts themselves from reliable Baltic birch plywood.

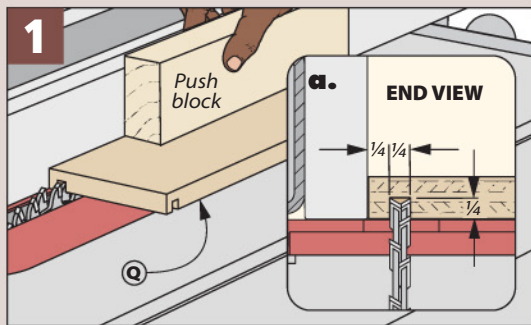
After cutting the fronts, backs, and sides all to size, you can set the

backs aside for the time being. All the drawer joinery takes place at the table saw. I started out with my miter gauge, using a dado blade to cut the dadoes in the side pieces. The front dadoes will accept a tongue (detail 'b'), but the back ones are sized for the back pieces (detail 'a'). Be sure to size your dado stack precisely to the thickness of your plywood pieces.

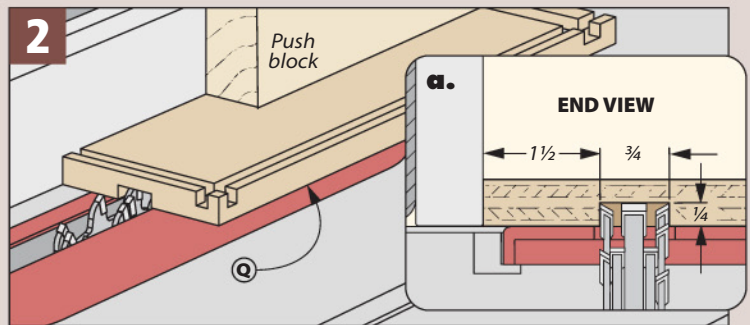
Once those are done, attach an auxiliary rip fence and bury the dado blade. Rabbet both ends of the front pieces to create tongues matching their dadoes.

After the drawer joints fit together nicely, set your table saw up to cut the grooves for the bottom panels (Figure 1, next page). Then, cut the wide grooves in the sides to accept the drawer guides (Figure 2).

Drawer Joints & Guide Slots



Bottom Grooves. Use a dado blade and push block to cut the grooves to accept the bottom panel.



Guide Slots. Slots in the drawer sides allow them to run along the guides. Size these $\frac{1}{32}$ " wider than the drawer guides themselves.

These are slightly wider than the guides for smooth movement.

ASSEMBLY. To bring these drawers together, cut the bottom panels to size and glue up each drawer. Next, cut the false fronts to size. Once the clamps come off the drawers, screw on the false fronts, keeping their bottoms flush with each other. Lastly, attach the knobs. Drill out their clearance holes, then thread them in place.

A PAIR OF DOORS

Finally come a pair of doors to close off the cabinets. There's a bit of simple panel-and-frame joinery here — a great way to finish up this project.

DOOR JOINERY. Rails, stiles, and panels make up the two doors. After cutting the pieces to size, the story is similar to the back panel: cutting the grooves and rabbeting the tongues. Take note that one stile on each door

has mortises for the hinges; this is a good time to cut them.

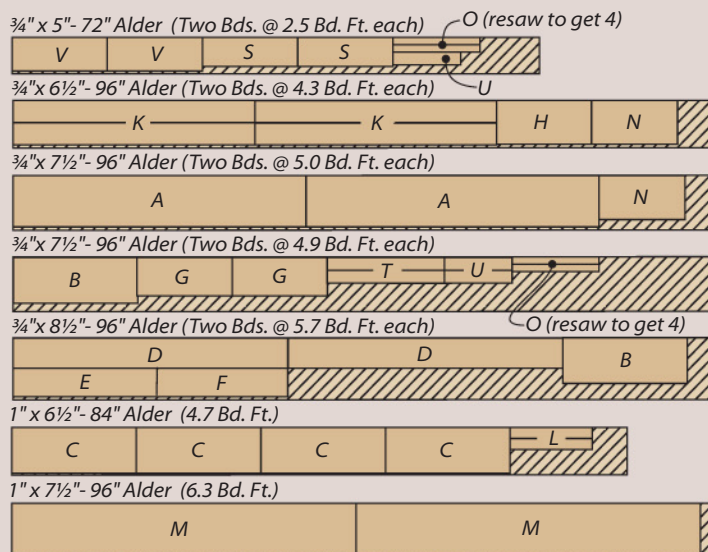
FINAL TOUCHES. Now that the joinery is all made, you can glue up the doors. Once they've dried, hang the doors and do any final sizing needed with a block plane, aiming for a $\frac{1}{16}$ " reveal all around. Add the knobs and catches, then take some time to choose where this sleek, new hall table belongs.

MATERIALS, SUPPLIES & CUTTING DIAGRAM

A Case Top/Bottom (2)	$\frac{3}{4}$ x 14 - 40
B Case Dividers (2)	$\frac{3}{4}$ x $12\frac{1}{8}$ - 17
C Case Ends (2)	1 x $13\frac{1}{2}$ - 17
D Back Rails (2)	$\frac{3}{4}$ x $13\frac{1}{4}$ - $37\frac{1}{2}$
E End Stiles (2)	$\frac{3}{4}$ x $13\frac{3}{4}$ - 13
F Center Stiles (2)	$\frac{3}{4}$ x $13\frac{3}{4}$ - 13
G End Panels (2)	$\frac{3}{4}$ x $10\frac{1}{8}$ - 13
H Central Panel (1)	$\frac{3}{4}$ x $11\frac{3}{4}$ - 13
I Top/Bottom Splines (2) $\frac{1}{4}$ hdbd. - $\frac{1}{2}$ x 37	
J Side Splines (2) $\frac{1}{4}$ hdbd. - $\frac{1}{2}$ x $15\frac{1}{2}$	
K Legs (4)	$1\frac{1}{4}$ x 3 - 33
L Stretchers (2)	1 x $1\frac{1}{2}$ - $11\frac{1}{4}$
M Sideboard Top (1)	1 x 14 - 47
N Shelves (2)	$\frac{3}{4}$ x $11\frac{3}{4}$ - $11\frac{3}{4}$
O Drawer Guides (8)	$\frac{9}{32}$ x $23\frac{3}{32}$ - $11\frac{7}{8}$
P Drwr. Fronts/Backs (8) $\frac{1}{2}$ ply. - $3\frac{1}{2}$ x $11\frac{5}{8}$	
Q Drawer Sides (8)	$\frac{1}{2}$ ply. - $3\frac{1}{2}$ x $11\frac{7}{8}$
R Drawer Bottoms (4) $\frac{1}{4}$ ply. - $10\frac{7}{8}$ x $11\frac{5}{8}$	
S False Fronts (4)	$\frac{3}{4}$ x $31\frac{5}{16}$ - 13
T Door Stiles (4)	$\frac{3}{4}$ x $13\frac{3}{4}$ - $15\frac{15}{16}$
U Door Rails (4)	$\frac{3}{4}$ x $13\frac{3}{4}$ - $9\frac{3}{16}$
V Door Panels (2)	$\frac{3}{4}$ x $9\frac{3}{16}$ - $12\frac{15}{16}$

- (8) #8 x 2" Fh Woodscrews
- (4) $\frac{1}{4}$ "-20 x $2\frac{1}{4}$ " Rh screws
- (24) #8 x 1" Fh Woodscrews
- (8) $\frac{1}{4}$ " Shelf pins

- (4) $\frac{15}{16}$ "-dia. Forged iron knobs
- (2 pr.) 2" Solid brass butt hinges
- (2) $1\frac{1}{8}$ "-dia. Forged iron knobs
- (2) $1\frac{1}{8}$ " Narrow profile magnetic catches



ALSO NEEDED:
One 24" x 36" sheet of $\frac{1}{2}$ " Baltic birch plywood, one 24" x 48" sheet of $\frac{1}{4}$ "-thick hardboard, and one 24" x 24" sheet of $\frac{1}{4}$ " Baltic birch plywood



Hanging Tool Rack

Tool storage takes a myriad of forms, but there's an excellent case for keeping some tools front and center where they're needed the most: right over your workbench. This handy tool rack is big enough to hold your go-to necessities, and is a blank canvas you can modify for your tools and specific needs.

A lot of landscape in these pages has been dedicated to large tool chests and cabinets, and with good reason. But smaller solutions like this around your shop absolutely deserve the same level of attention and customization that these larger storage options get.

We're not going to go into too much detail on the tool holders you see at the bottom of the rack in these photos. They're meant to inspire you to make your own to fit the tools you want closest access to. They're also not core to the structure of the rack itself — they're modular and can be added or removed as your needs change with time.

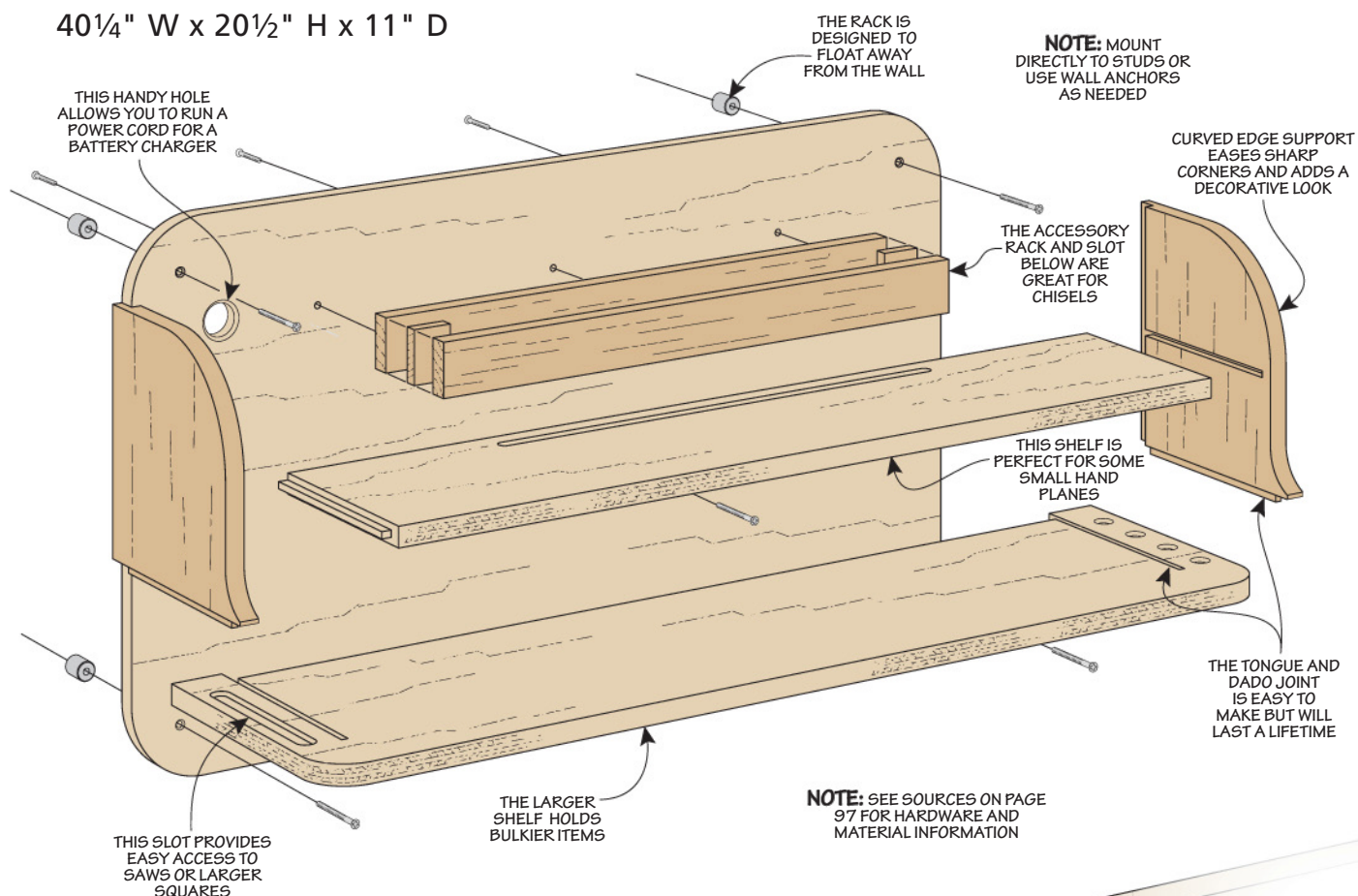


Prime Time Tools. Every tool in the shop needs a home, but some tools get used so often they deserve a spot right above your bench.

CONSTRUCTION DETAILS

OVERALL DIMENSIONS:

40¼" W x 20½" H x 11" D



Spare Parts? Like many *ShopNotes* projects, this tool rack can be made from whatever materials you already have in your shop.

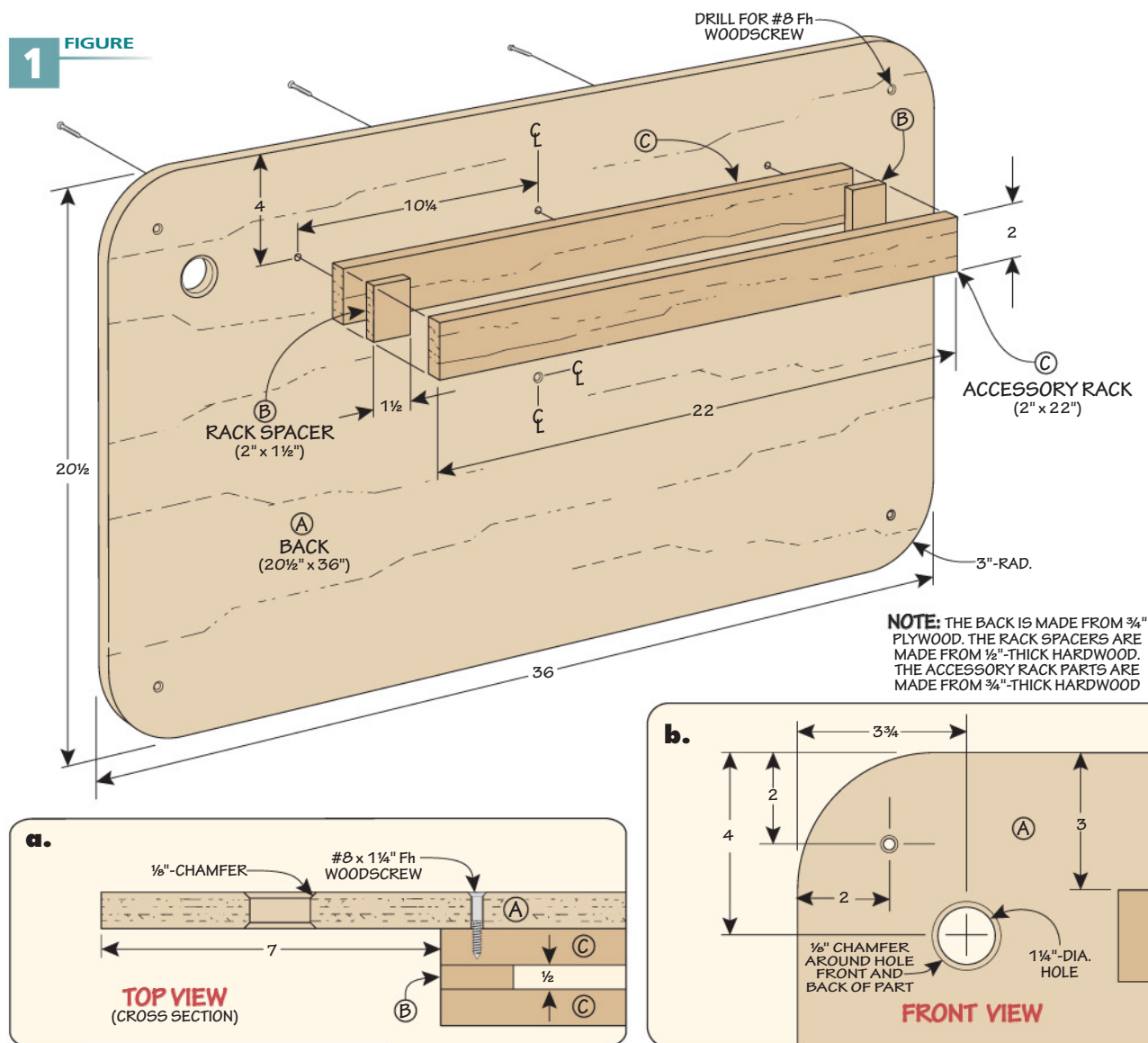


MATERIALS & SUPPLIES

A	Back (1)	20½ x 36 - ¾ Ply
B	Rack Spacers (2)	½ x 2 - 1½
C	Accessory Rack (2)	¾ x 2 - 22
D	End Brackets (2)	¾ x 9⅝ - 10¼
E	Middle Shelf (1)	7¾ x 36 - ¾ Ply
F	Lower Shelf (1)	11 x 40¼ - ¾ Ply

- (5) #8 x 2½" Flathead Woodscrews
- (5) #8 x 1¼" Flathead Woodscrews
- (5) ¾" O.D. x 1" Nylon Spacers

1 FIGURE



Give it a Strong Backboard

Scrap wood is the name of the game when it comes to this project. The plywood components are leftover cherry, and the hardwood is alder that might have otherwise gone to the burn bin.

BLANK CANVAS. The back is the foundation of this tool rack, and it's also the easiest part to knock out.

Start by laying out the locations of all the holes in the back for the cables and mounting hardware. You don't even need a drill press for this, though it makes boring out the largest hole with a Forstner bit easier. The charging hole is then cleaned up on both sides with a 1/4"

chamfer bit, as seen in Figures 1a and 1b.

ROUNDED CORNERS. Most of our projects feature rounded corners. This is because it's more aesthetically pleasing, and we feel that if you're taking the time to do something, put some pride into it.

In general, the easiest way to cut these corners (so to speak) is to use a band saw and then come back with a router and flush-trim bit to clean it up. The smart money move is to make templates out of thin plywood or hardboard and save them for repeat use. A bit of CA glue on the outside edge will help them last a lot longer. The templates also double as layout tools, so you're not measuring a radius with a compass every time before you make your cuts on the band saw.

ACCESSORY RACK. This is the real first opportunity for you to go off script. I

specifically needed something to hold my most-used chisels and a few measuring tools.

The accessory rack itself is dead simple to make. I ripped a single piece of hardwood down to size, and cut the individual pieces on my miter saw. Then I applied glue, stacked them up, and clamped it up tight for a few hours.

THE SHELF

With a sturdy foundation established, it's time to build on it. I decided to go with open shelves for the entire tool rack, but you could also include removable cubbies or dividers to keep things sorted.

SUPPORT THOSE SHELVES. The shelves themselves are held between mirrored ends on the right and left sides.

I kept the stock square to cut dados and rabbets for safety. The curves were cut after everything else was done.

STOPPED DADOES. Since I would be cutting the dados blind, I marked the target depth on each outside face so I knew where to stop and start my cuts. Then I set up my router table using a $\frac{1}{4}$ " straight bit.

For the right-side rack, I simply had to run the workpiece along the fence until I reached my stop mark.

The left side was a bit different — the cut ran in the opposite direction, and routers are a one-way machine. Instead, the piece needed to be carefully lowered over the spinning bit at the marked location. The piece was then fed through the router

until the bit exited out the back end.

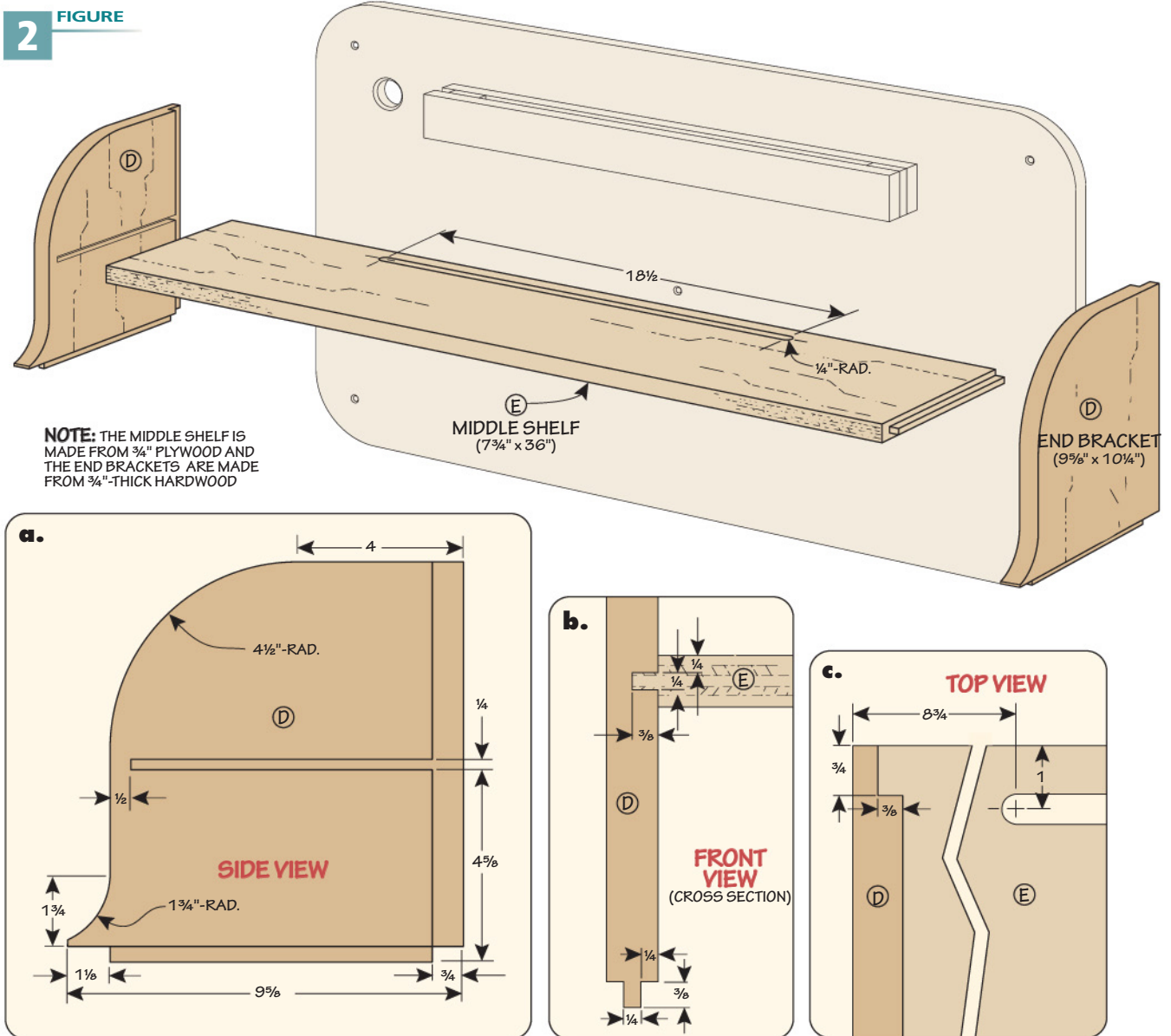
RABBETS & TONGUES. For the rabbet and stub tenon, I moved to the table saw. With a dado blade and sacrificial fence installed, I cut both rabbets (Figure 2c). Keeping the wider dado stack installed still, I lowered the blade slightly and cut the outside shoulders of the tenon using a miter gauge. Finally, I swapped in a smaller dado stack to cut the long tenon cheeks.

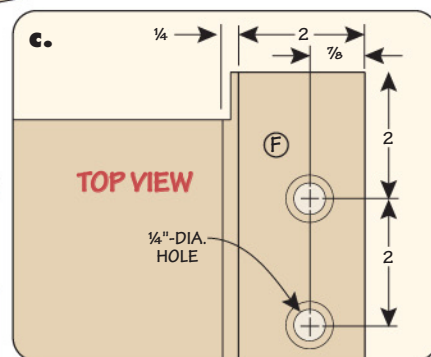
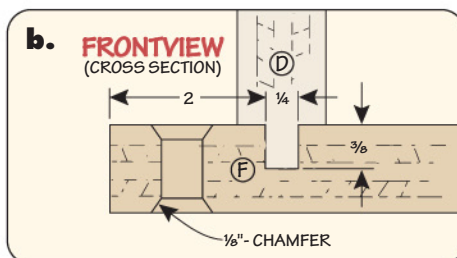
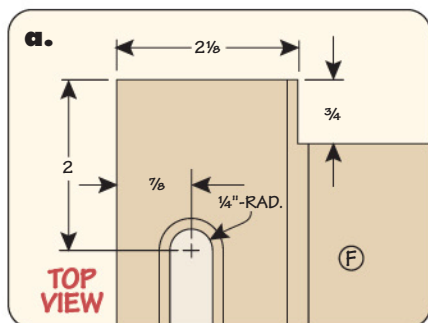
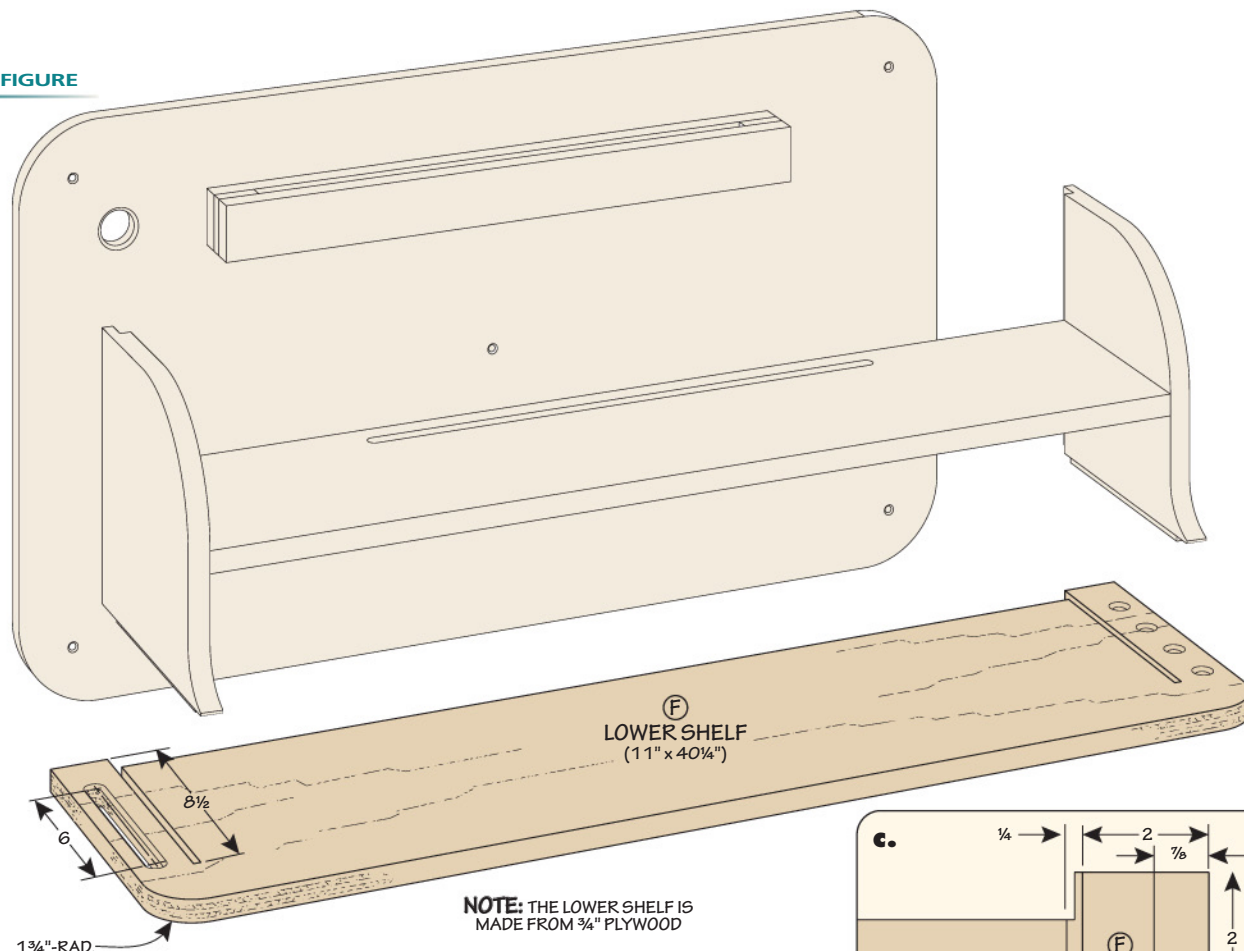
With all of the joinery cuts taken care of, I gang-cut the curves on a band saw, then cleaned each side up at the spindle sander.

SHELF SITUATION. Since I already had the table saw set up for tenon work, I started there. The shelf features a tongue on both ends that fits into the outside

grooves in the end pieces. You're better off cutting the joint oversized at first, then sneaking up on the final size (you can't add material back, after all.) The cuts were done on the table saw using a dado stack and the miter gauge.

For the tool slot you'll go back to the router table with a $\frac{1}{2}$ " straight bit installed. On the top surface of the board, mark the start and end points of the slot. Set the router fence so the bit is $\frac{3}{4}$ " from the inside edge of the workpiece. Like before, you'll lower the workpiece down on the spinning bit at the start point. This time you'll only run through to the stop point though, then turn off the machine and allow it to come to a stop before removing the shelf.





Put it all Together

You'll notice that our diagrams here diverge from the finished photos. I had decided that I wanted a drill in easy reach for assembly, so I made a cutout for one in my shelf. For this text though, I'll just focus on the base model of the rack. If you want any additional cutouts yourself, now is the time to add them, before everything is put together.

PREP FIRST. As before, you're going to want to cut your dadoes and slots before doing anything else. I stayed at the router table to complete both of these tasks.

The slot on the left-hand side was cut with a $\frac{1}{2}$ " straight bit. I marked the stop and start points, then lowered the workpiece onto the bit to cut the slot.

A $\frac{1}{4}$ " bit is used to cut the stopped dadoes. Like with the shelf brackets, you'll want to pay attention to which direction the cut needs to be made. The left dado can be made in the normal fashion; the right one will use the aforementioned method of lowering the shelf onto the spinning router bit.

There are many different ways to cut the recess on the back of the shelf, but I decided to stick with the machines I already had set up. Using a dado stack at the table saw, I defined the outside edges. Then it was on to the router table to clear out the middle area.

A quick stop at the drill press took care of the holes on the right side. Then I went to the band saw to round the corners, finishing them at the edge sander.

ASSEMBLY. With your components ready, it's time to put it together. There's nothing particularly special here, but there are a few things to remember.

The shelves and end brackets are glued together before attaching to the backboard. The project was finished with spray lacquer, which is fairly easy to get in all the nooks and crannies of the finished product.

INSTALLATION. The tool organizer is designed to float slightly off the wall, which allows you to run power cords behind it. We used some small nylon spacers for that, making sure to use long enough screws to get good purchase into the studs behind.

MAKE IT YOURS

We often encourage readers to adjust each project in this magazine to fit their shop, their tools, and their needs. For this one, though, we really wanted to emphasize that point.

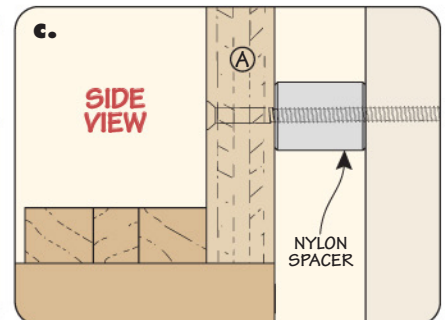
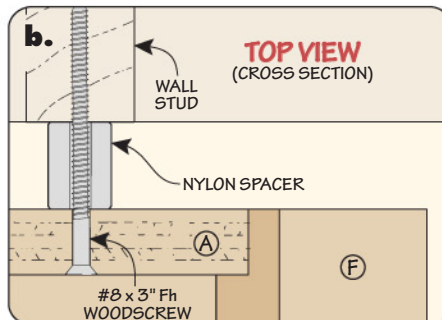
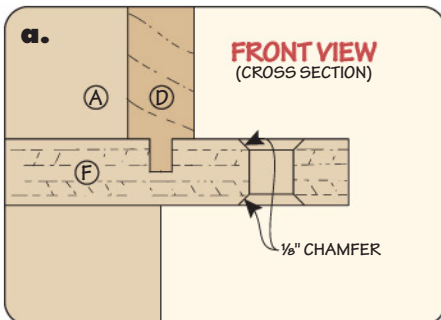
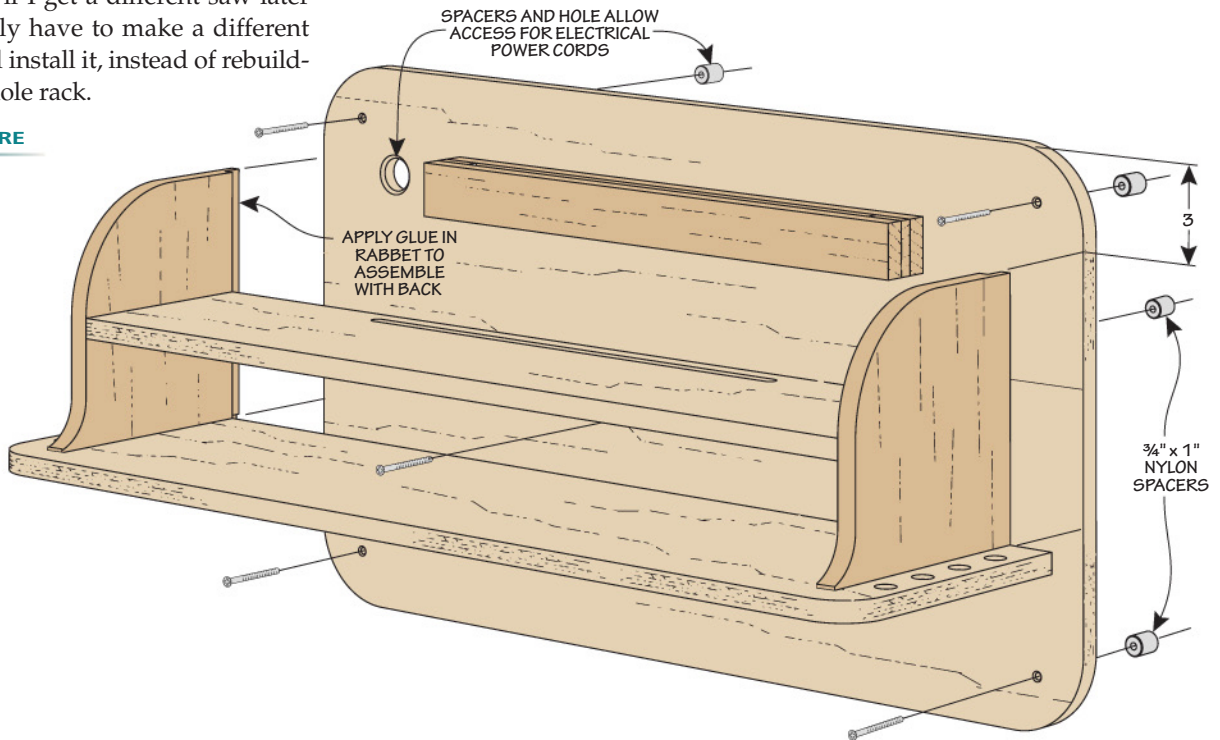
A shelf like this can be the nexus of your go-to tool storage in the most convenient spot: right above your workbench. Take time to think of what you're working on most often. Maybe you need space for more chisels and hand planes, or perhaps a spot for additional power tool chargers. Planning ahead will get you a tool organizer that fits your exact specifications.

The area below the bottom shelf is entirely up to your imagination. For our organizer, we created spots for a saw, a ruler, and a Shaker-style peg for tape. The setup is designed to be modular though — if I get a different saw later on, I simply have to make a different holder and install it, instead of rebuilding the whole rack.



Custom Rack. This rack is set up to store all the tools and layout utensils I use most often at my bench, but don't be afraid to arrange it to suit your needs.

4 FIGURE





Handy Tool Tote

Choosing the right tool storage for your workshop can be a daunting task. There's no shortage of cabinets, chests, and shelving options that can be built or bought, but your most-used tools just tend to disappear into them. So if you're looking for the perfect solution for your everyday tool set, a handy tool tote like this one is the way to go.

The goal was to design a tool tote that was large enough to carry the essentials,

light enough to move around, and laid out so everything you could need would be visible at a glance. A magnetically locking drawer was added to store smaller items that tend to disappear at the bottom of the deeper trays.

The thoughtfulness continues to the construction techniques and materials as well. Box joints add strength and visual interest, while solid walnut makes sure the tote looks just as good as it functions.

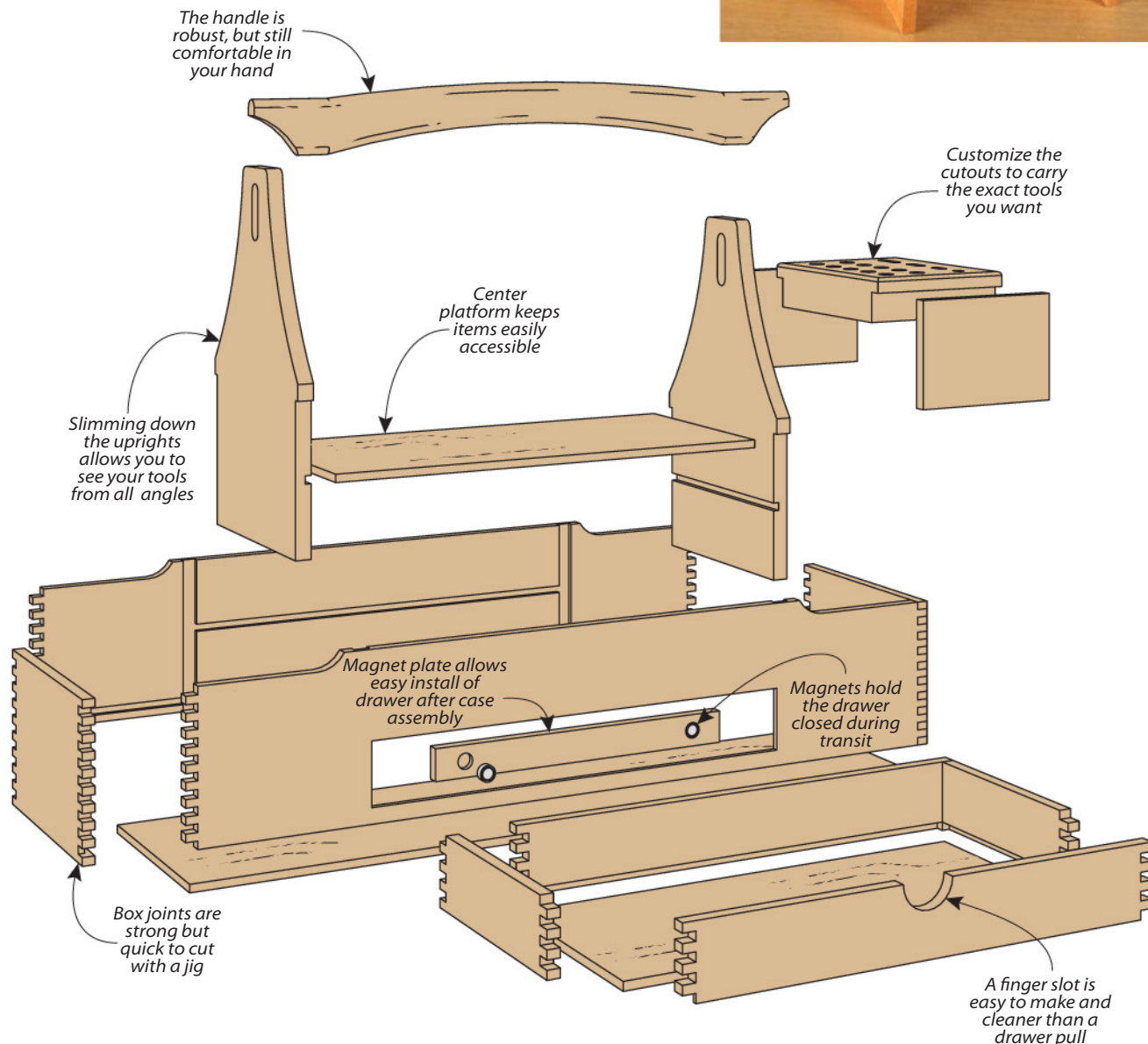
Think of this toolbox design as a starting template for you to create the custom solution for the tools you're actually using. Maybe you need two storage inserts to hold your carving tools. Or maybe you omit them altogether to store bulky items. It is definitely worthwhile to spend some time prior to building to make sure you can fit everything you want to carry. It's easier to add an extra inch at the start instead of the end.

CONSTRUCTION DETAILS

OVERALL DIMENSIONS:

26" W x 12" H x 7" D

Extra Storage. This custom insert keeps the tools you need right at hand without having to dig around.



MATERIALS & SUPPLIES

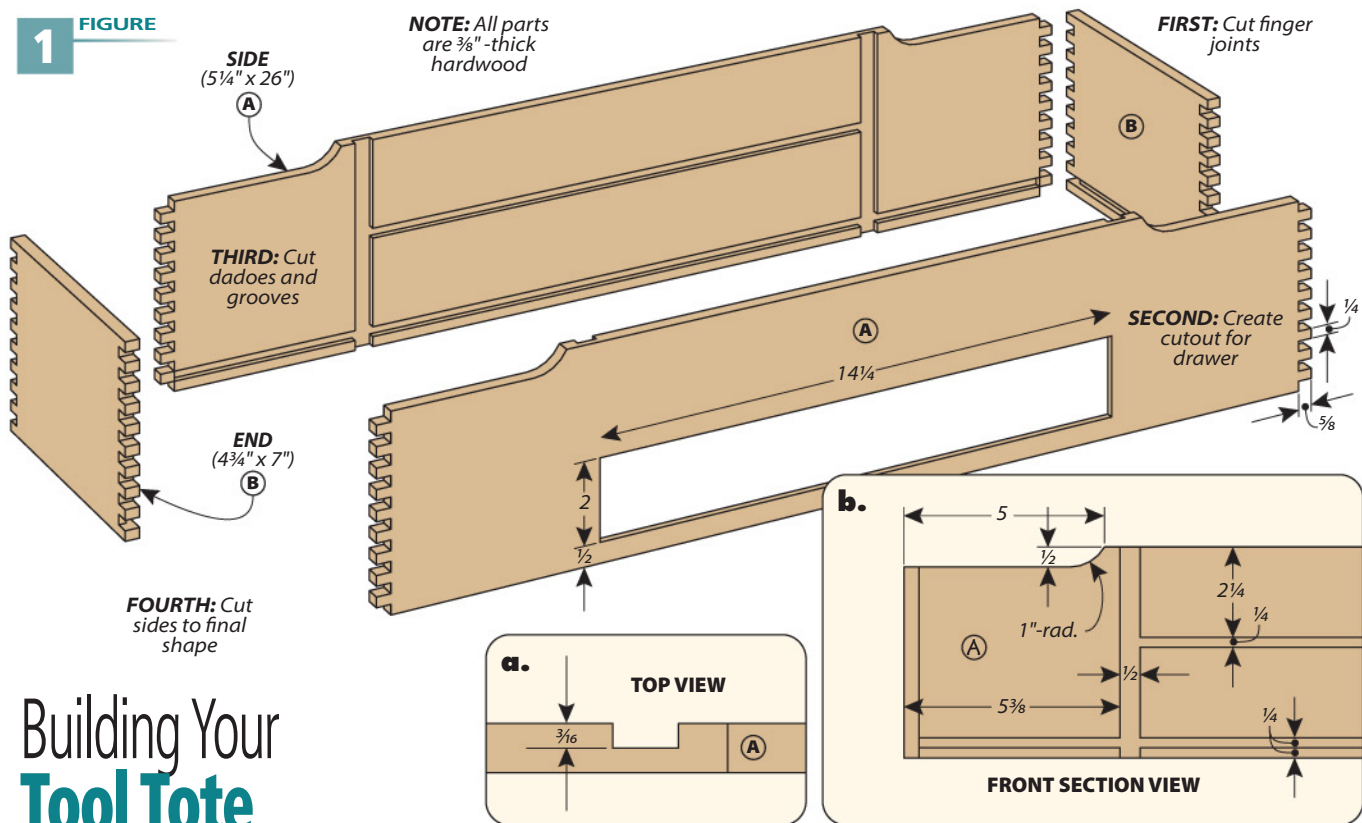
TOTE

A	Sides (2)	$\frac{3}{8}$ x 5 $\frac{1}{4}$ - 26	F	Drawer Front/Back (2)	$\frac{3}{8}$ x 2 - 14 $\frac{1}{4}$
B	Ends (2)	$\frac{3}{8}$ x 4 $\frac{3}{4}$ - 7	G	Drawer Ends (2)	$\frac{3}{8}$ x 2 - 6 $\frac{1}{4}$
C	Uprights (2)	$\frac{1}{2}$ x 7 - 11 $\frac{1}{2}$	H	Drawer Bottom (1)	$\frac{1}{4}$ x 6 - 14
D	Bottom (1)	$\frac{1}{4}$ x 6 $\frac{5}{8}$ - 25 $\frac{5}{8}$	I	Magnet Bar (1)	$\frac{3}{8}$ x 1 - 10
E	Center Platform (1)	$\frac{1}{4}$ x 6 $\frac{5}{8}$ - 14 $\frac{5}{8}$	J	Handle (1)	$\frac{1}{2}$ x 2 $\frac{3}{16}$ - 19 $\frac{1}{4}$

TOOL HOLDER

K	Top (1)	1 $\frac{1}{2}$ x 5 - 6 $\frac{1}{4}$
L	Sides (2)	$\frac{3}{8}$ x 5 - 3 $\frac{1}{2}$
• (2) $\frac{1}{2}$ " x $\frac{1}{8}$ " magnet		
• (2) $\frac{1}{2}$ " x $\frac{1}{4}$ " x $\frac{5}{8}$ " O.D. magnet cup		
• (2) Washer for $\frac{1}{2}$ " magnet		

1 FIGURE



Building Your Tool Tote

Right off the bat, mill all of your stock to the desired thickness. I'm partial to walnut, but any hardwood will do. Rip all of the components to width on the table saw, then cut to length.

BOX JOINTS. There is a direct relationship between the height of the sides and the spacing of the finger joints. For most things, $\frac{1}{4}$ " joints are about perfect.

After cutting pieces to size, it's time to load up a dado blade to cut the finger joints. You'll want to use a jig to cut the fingers — it will ensure consistent results

and reduce chipout. We made a simple one with some scraps. It consists of an auxiliary miter fence and a key that sets the spacing for the cuts. The key needs to be the exact same width as your dado blade, and the space between the key and the blade needs to be the same as well.

Take a few practice cuts on a test piece of identical thickness — make sure that the depth of cut is correct as well as the spacing. It should be tight enough not to fall apart, but you shouldn't have to force the sides together.

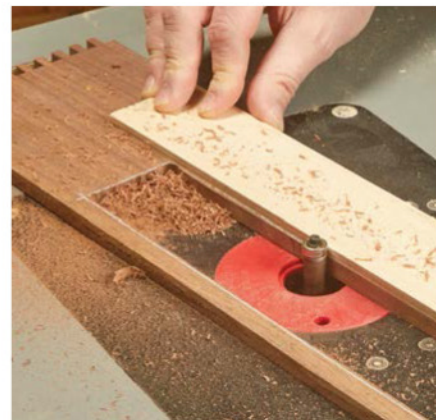
Once your practice cuts are out of the way, it's time for the real thing. Start by cutting the fingers on the two outside end pieces. Hold the workpiece flat against the miter fence and pressed firmly against the key. Take your first pass, making sure that you go far enough to cut cleanly through the workpiece and completely square the cut. Slide the workpiece over so the first slot is resting over the key, and make your next cut. Repeat this process until all of the fingers for the end have been cut.



Finger Joint Jig. Building a simple jig with an auxiliary miter fence will ensure accurate box joints.



Drawer Opening. Drill out the corners, then use a jigsaw to rough out the opening for the drawer.



Flush Trimming. A piece of thin stock can be used with a top-bearing flush-trim bit to clean up the edges.

Without removing the end piece from the jig, position your side piece abutted to the edge of the end piece against the fence. This will set the correct spacing for the first finger cut without having to build an adjustable jig. Make the first cut on the side piece, remove the completed end piece, and finish your remaining cuts as before.

DRAWER OPENING. With the joinery all sorted out, it's time to cut the drawer opening. Measure and mark the location of the drawer on your preferred side. Drill out the four corners, then use a jigsaw to finish cutting the opening. A quick pass on the router table with a flush-trim bit riding against a taped-on straightedge will clean everything up nicely.

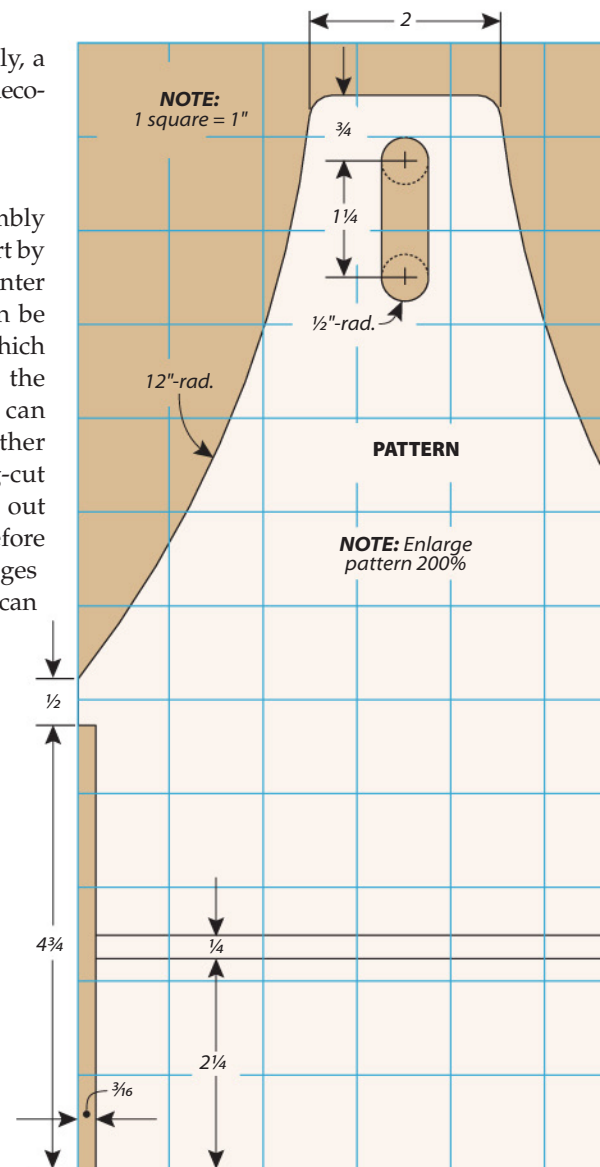
Don't go far from the router table after — the side pieces have a handful of slots to hold interior parts in place. There are two dados that hold the uprights in place which are cut with a straight bit. Next, swap in a $\frac{1}{4}$ " bit and cut a groove just above the lower edge to hold the bottom, and a stopped groove near the center to hold the fixed shelf. These cuts

are mirrored on both pieces. Finally, a jigsaw or band saw can be used for decorative edges at the top.

HANDLE UPRIGHTS

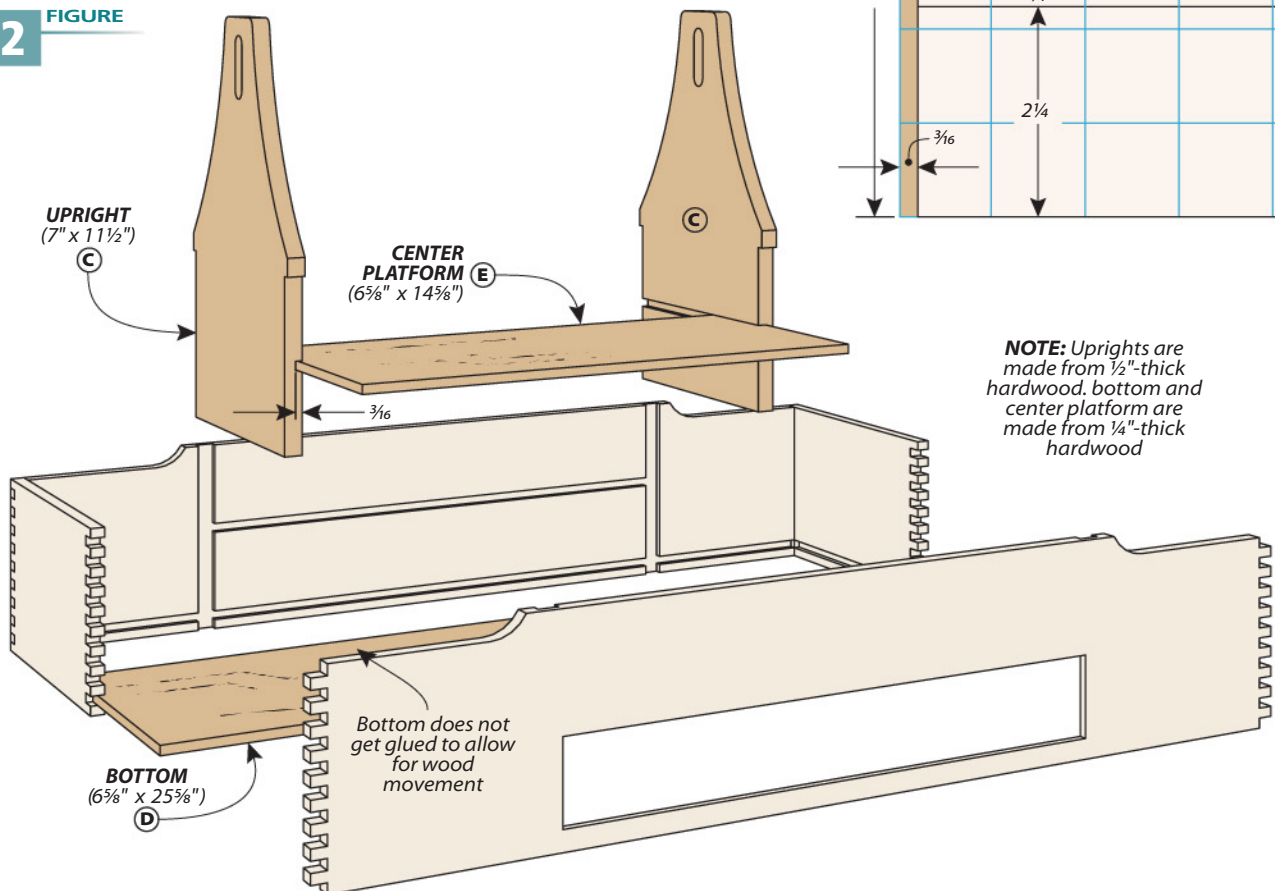
The last parts to build before assembly are the uprights for the handle. Start by cutting the two dados for the center platform. The pattern at right can be used to help lay out the shape, which you'll cut at the band saw. Since the two uprights are identical, you can adhere the two workpieces together with double-sided tape and gang-cut them at the same time. Next, drill out and cut the slots for the handle before separating them. If your curved edges aren't as clean as you'd like, you can use a flush-trim bit in your router and a template to get them nice and smooth.

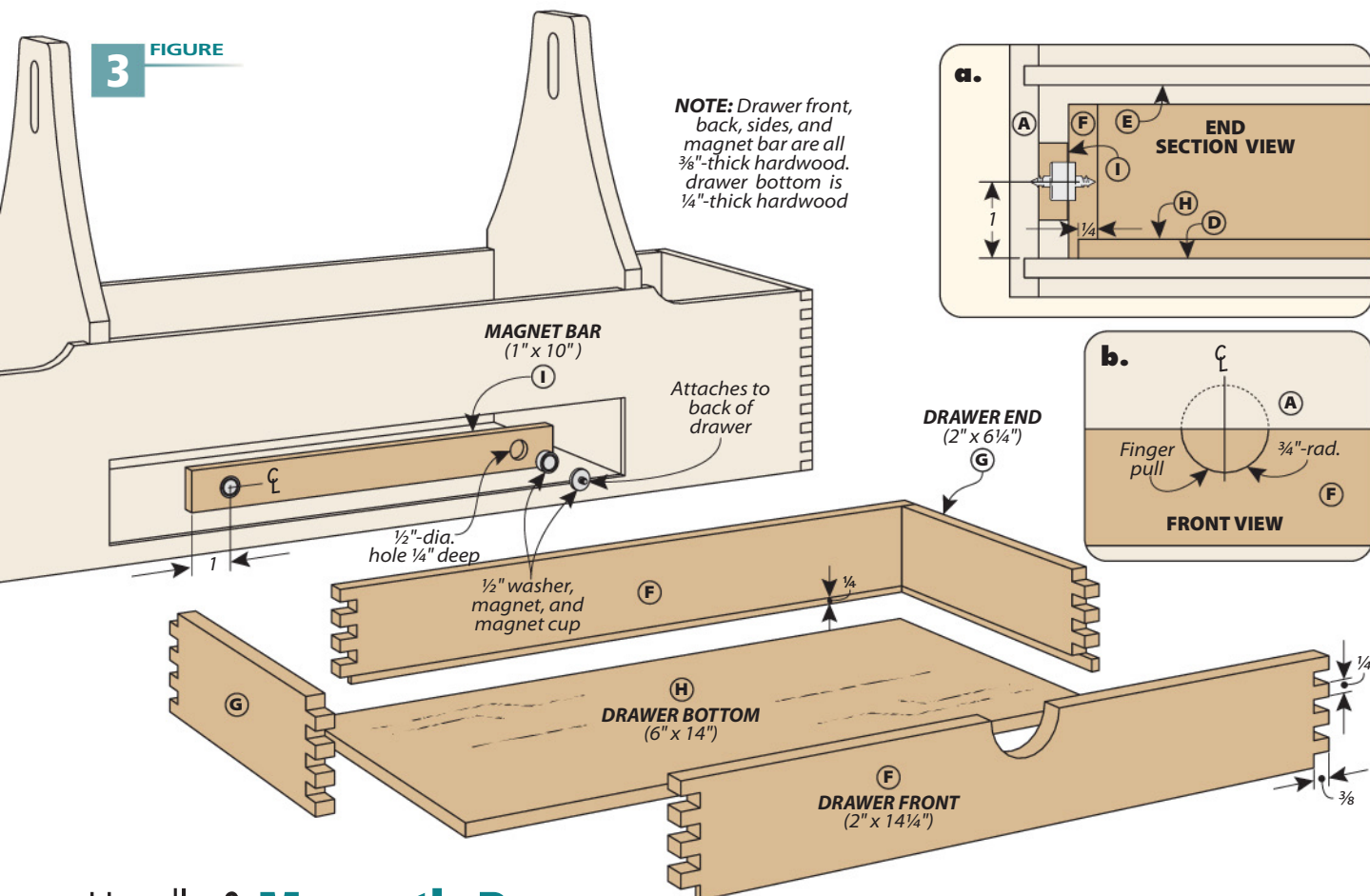
Dry fit everything to make sure it all fits well, then glue it up. You don't need a ton of glue for the finger joints, just something with a long enough open time so it won't be dry before you finish spreading it around.



NOTE: Uprights are made from $\frac{1}{2}$ "-thick hardwood. bottom and center platform are made from $\frac{1}{4}$ "-thick hardwood

2 **FIGURE**





Handle & Magnetic Drawer

The small drawer on the tote is perfect for holding bits and bobbles you don't want rolling around the bottom of the bins. Small magnets keep it from sliding open during transit.

DRAWER CONSTRUCTION. The build order for the drawer is similar to the rest of the tote. Cut your pieces to size and set up your jig on the table saw again. Like before, place the stock flat against the sacrificial fence and cut the fingers one by one. You'll still need to use the end of your first piece to cut the matching joint. Place the open-ended joint against the key and butt the next piece against it to correctly locate your first cut.

While a small knob or handle might look nice on the drawer, it's just likely to get in the way, so I cut a finger notch instead. A short stop at the drill press made quick work of it.

A small rabbet is cut on the router table on each drawer piece for the bottom to fit into. Glue up your drawer and let it dry completely before moving on to the next step.

MAGNETS. It might sound a little counterintuitive, but it is easier to install the magnets after the case and drawer are both assembled. Cut the magnet bar to size, and use your drill press to recess the holes for the cup magnets.

The next part is a bit like making a sandwich. Install the cups into the recesses without screwing them in for now. Once those are in, place the magnets, followed by the washers with screws in place. The correct order is demonstrated in Figure 3a above. Now, you can use this entire assembly to transfer the location of the magnets to your drawer. Line up the magnet plate where you'd like on the drawer, then gently press down to embed the screw tips and mark the location for the washers.

Use these marks on the back of the

drawer to recess the hole for the washer component. Install the washer and screw it firmly into place. Now you can reattach the magnet, cup, and magnet plate to the back of the drawer. Apply a thin layer of glue to the back of the plate, then slide the entire assembly into the drawer slot on the tote. Push the drawer all the way in and apply light pressure until the glue is dry.

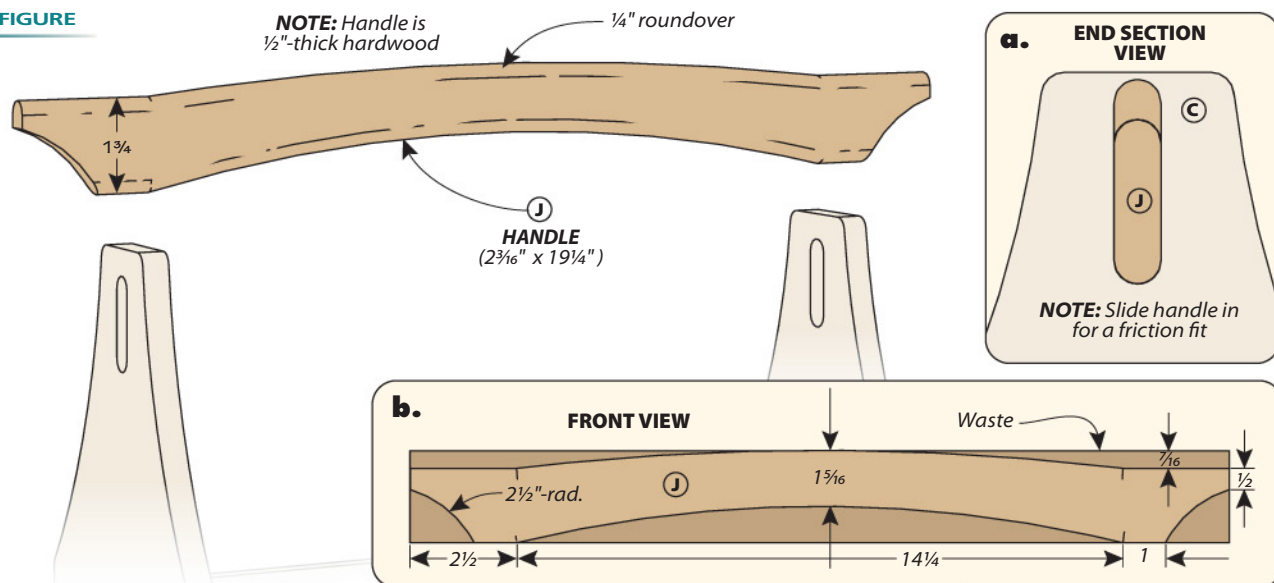
Remove the drawer and the two magnets, then reinsert the magnet cups into their holes on the magnet plate inside the tote. Use a screwdriver to install the screws for the cups, which should be long enough to embed into the tote itself. Reattach the magnets to the washers on the back of the drawer and reinstall it in the tote to complete the drawer assembly.

Cup Magnet. The cup magnet has three main components. From left to right — the washer, magnet, and cup.



4

FIGURE



HANDLE

The final part of the tote is the hardwood handle. Since this is where the rubber meets the road, so to speak, this is a good area to make some personal adjustments so the handle feels comfortable in your hand. There are a few key dimensions you'll want to stick with though — namely the shape and height of the handle where it connects to the uprights. The overall length of the handle and

distance of the connecting areas from the center should also remain the same.

The shape of the handle was cut on the band saw from a $\frac{1}{2}$ "-thick piece of stock. A rasp was used to finalize the shape of the handle and create the necessary roundover on the edges.

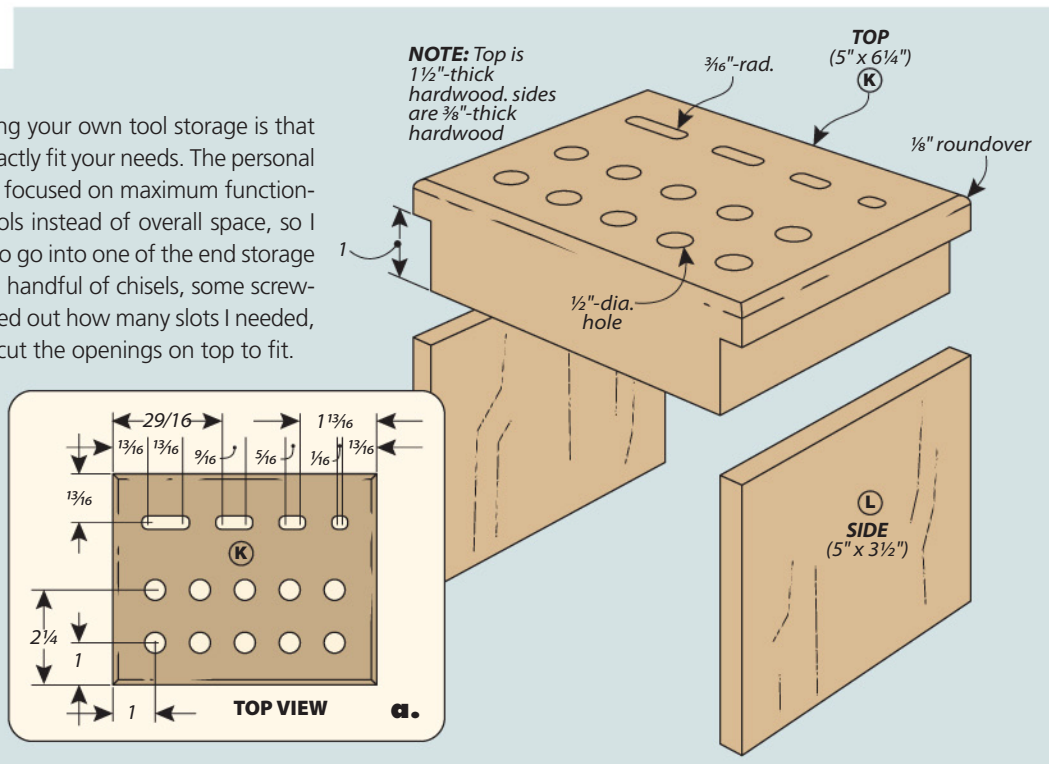
The handle and tote were both finished with a few coats of spray lacquer before final assembly so the handle would be free to move a bit in the slots.

To install the handle, insert one end into the slot at a high angle and slide it far enough in to clear the other upright, then slide it through so the handle is centered. The curvature of the handle should prevent it from moving too much, but you can also pin it in place if you'd like more surety. All that's left to do is fill it up with your everyday tools and you'll be ready to go with this stylish, functional tote.

Tool Holders

The best part about making your own tool storage is that you can customize it to exactly fit your needs. The personal goal for this tool tote was focused on maximum functionality and access of the tools instead of overall space, so I made a small tool holder to go into one of the end storage bays. I needed space for a handful of chisels, some screwdrivers, and an awl. I figured out how many slots I needed, measured my tools, then cut the openings on top to fit.

While the full dimensions are included here for you, feel free to think outside the box and make something that fits your requirements. Since the insert isn't permanent, you can always make another one (or three) down the road as your needs change.





Three Special Joinery Planes

When a woodworker hears the word hand plane, the first image that most of us visualize is that of a bench plane. And, I think that's fair. Most of us were (or will be) introduced to either a bench or block plane as the first real "hand tool" in our shop. However, as a woodworker that tries to blend equal amounts of hand tools and power tools, I think there's another class of hand planes that most people are aware of, but may not know exactly where they would be used in the shop. I refer to these as joinery planes.

When I use the term joinery plane, you would expect that these are planes that cut joinery. And yes, that's certainly true, but more often than not,

I'm actually using these planes to refine joinery that I've cut somewhere else. For example, I might cut a rabbet at the table saw and get it close. At the bench, I can finesse the fit with a rabbet plane. Tasks like that are where these planes really fit into my shop. However, they can do so much more.

THE CONFUSED COMBINATION PLANE. Before we go much further, let's talk about the plane that everyone likes to talk about. I've given talks about joinery planes at about half a dozen guild meetings, and it never fails that someone asks about the combination plane. It slices, it dices, and it juliennes. I wasn't around when Stanley (and others, such as the Record

shown above) were marketing their respective combination planes, but I'm sure that was a tagline used at one point. The combination planes were designed to be the jack of all trades — a variety of add-ons, blades, and set-ups would have this plane doing anything you needed. However, upon practical use, most users of these planes realize that they're pretty tedious. Most get frustrated and throw them back in the box. It's for this reason that I tend to not cover them in joinery planes, as I feel there are better options available for most common shop tasks. With that in mind, let's start at one of the most common — the rabbet plane.



RABBET PLANE

Rabbet planes take many forms. Some are “rabbeting block planes.” Others, like the *Veritas* version shown, are stand-alone planes. The benefit of this plane is that it can cut rabbets along the edges of boards, both with the grain and across it.

THE RIGHT FEATURES. When you look at a

rabbet plane, you’ll notice that it shares one feature with a shoulder plane — the blade extends to the very edge of the body, allowing it to get right up against the shoulder of a workpiece. However, there are a few additional features that make it better suited to cutting rabbets. First, to control the depth of the



Rabbets on End. Cutting cross-grain rabbets is a rough task with a hand tool. A dedicated rabbet plane has many things going for it, including a nicking/scoring blade that leads the cutting edge, as well as a cutter that is at a skew angle, peeling the cross-grain fibers.



Skew Plane. For cutting clean rabbets, a skewed rabbet plane makes quick work of the task.

rabbet you’re cutting, a rabbet plane has a depth stop. You can see this in the photos above and left. You set the stop to your desired depth, and once the skid comes in contact with the surface, it will stop the plane from cutting.

The width of the rabbet is controlled by a fence. The fence is positioned to only expose as much blade as you want. Older, vintage (wood) rabbet planes may have wood arms and wedges or wood nuts. Modern versions have brass knobs and stainless steel fence rods.

Finally, what really makes a rabbet plane a beautiful tool to use is the addition of a nicker. You can see this little round cutter below the depth stop above. This is, in essence, a scoring blade. The nicker is designed to sever the wood fibers as you cut across them, such as you see to the left. These features make this a tool that can quickly clean up machine-cut rabbets, or form its own with a few quick strokes.

Pre-Scored Cuts. The nicking blade is used first by pulling the plane back across the area to be cut, pre-scoring the fibers before the first pass.





Start the Cut. Start the cut at the end of the workpiece. Make several passes, pulling back a bit further each time.



Expand the Groove. As you deepen the groove, continue to pull the plane further and further down your workpiece, creating a longer groove.



Finish the Joint. As the groove becomes established, you're ready to make full-length passes. The quick, short strokes from the end help ensure a straight groove that doesn't wander.

THE PLOW PLANE

Up next is the plow (plough) plane. This is one that hasn't changed a lot over the years. Vintage ones are often found made out of wood with heavy cutters. A plow plane lives its existence with the sole purpose to cut grooves in any wood that gets in its path. The key with a plow plane is that they cut with

the grain. The lack of any nicker or scoring blade means that this plane simply will not cut across the grain very well. And that's okay. The plow plane is the plane that you reach for when you need to quickly zip grooves in drawer parts to fit a bottom. Or, when you need to cut grooves on the inside of a frame assembly for a panel.



IT'S ALL IN THE BONES. The ability to cut grooves comes down to a solid skeleton — the framework of this plane is designed to put all of the force from the narrow cutter into the body of the plane. Unlike a bench plane (or the rabbet plane earlier), the plow planes don't have a traditional bed for the blade to seat on. Instead, the bed is a narrow skate — as you can see in the photos here, the plane frame is only an $\frac{1}{8}$ " wide. This means that, while narrow, the entire plane is built around this backbone. It provides support for even the narrowest cutter to provide chatter-free cuts.

VARIETY OF CUTTERS. As with the rabbet plane, a fence positions the cutter on a plow plane. However, the width of the cut is determined by the blade that is installed. To change the width of the groove you're cutting, you need to swap out the blade. This means that to get the most out of a plow plane, you'll need to have several different cutters on hand in your most commonly used sizes. The ability to change cutters also blurs the line into combination plane lane — check out the box on the next page for other cutter options.

IN OPERATION. Cutting a groove seems simple. Keep the fence up against the workpiece, and cut until the depth stop engages. With a perfect piece of wood? Yes, but there's usually a bit more to it than that. The narrow blade of a plow plane has a tendency to follow the grain on a workpiece. To counteract this, you need to break the cuts up into shorter sections. You can see what I mean by following the three photos to the left.



Versatility. This plane is the closest modern plane to a combination plane, with the exception that it works well in every task.

A MODERN COMBINATION PLANE

Finally, this is an oddball little plane that I love. It's what I call a "modern combination" plane. This is the HP-6FX from *Bridge City Toolworks*. It has the unique feature of changing out the sole to swap in different profiles, in essence making this a modern-day molding plane.

SOLES & CUTTERS. As you can see in the photo above and to the right, the HP-6FX uses various cutters and profiles to achieve different cuts. Some of the soles include a bullnose (top left photo), a rabbeting sole, a grooving sole, and more. These soles offer a lot of versatility in a small package (though, to be clear, you need to buy



Sole Choice. The interchangeable soles mean that the cutter is a perfect match to the profile of the sole.

the additional soles and blades, so the cost can quickly add up).

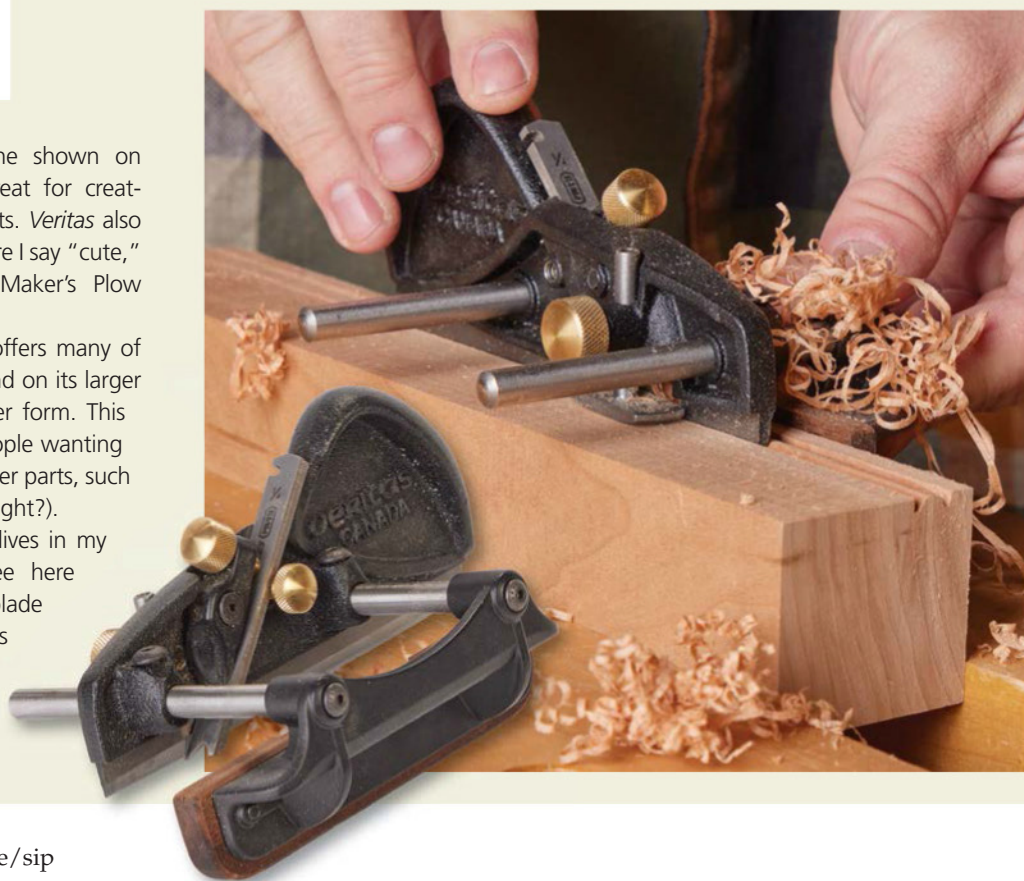
Adding one or several of these joinery planes to your tool cabinet is a great way to enhance your woodworking. There's something about fine-tuning a joint or quickly plowing a groove that puts a smile on your face. And that is what woodworking is all about.

Expanding the Plow

The medium plow plane shown on the previous page is great for creating grooves in larger parts. *Veritas* also offers a much smaller, dare I say "cute," plane called their Box-Maker's Plow Plane, shown here.

This pint-sized plane offers many of the same things you'll find on its larger brethren, but in a smaller form. This plane is designed for people wanting to create grooves in smaller parts, such as boxes (oddly named, right?).

My small plow plane lives in my tool cabinet as you see here — with a beading blade installed. This little plane is unbelievably adept at cutting various sizes of beads on parts of all sizes.





Round-Top Bookcase

Here's a project that goes way beyond a box with shelves. This elegant piece is a perfect showcase for the words, moments, and curios that you treasure.

Building a basic bookcase is one of the quickest projects you can do in your shop. It's a box with a back and shelves. Bam! Out the door the bookcase goes to its new role in the world of decorative storage furniture.

Then there's the cherry bookcase you see here. Structurally it starts out the same way, but then what lifts and tops the bookcase you see in the photos below, are game-changers.

THE BASE. The four legs that raise this project off the floor are scaled properly

to remove any notion of spindly support. They also sing subtle praise for the kindred curves in the arch at the top of the bookcase. There's fun to be had at the band saw making the legs.

THE TOP. The barrel vault that is underneath the top is the pinnacle of classic Roman architecture. Making the barrel involves an alliance of a product called *Bendy* plywood (plywood made from plies whose grains are all

oriented in the same direction) and a thickened epoxy. The shape is achieved by curing the plywood over a shop-made form. Once the vault is glued to the case, it's draped with a unifying cherry veneer and a face frame.

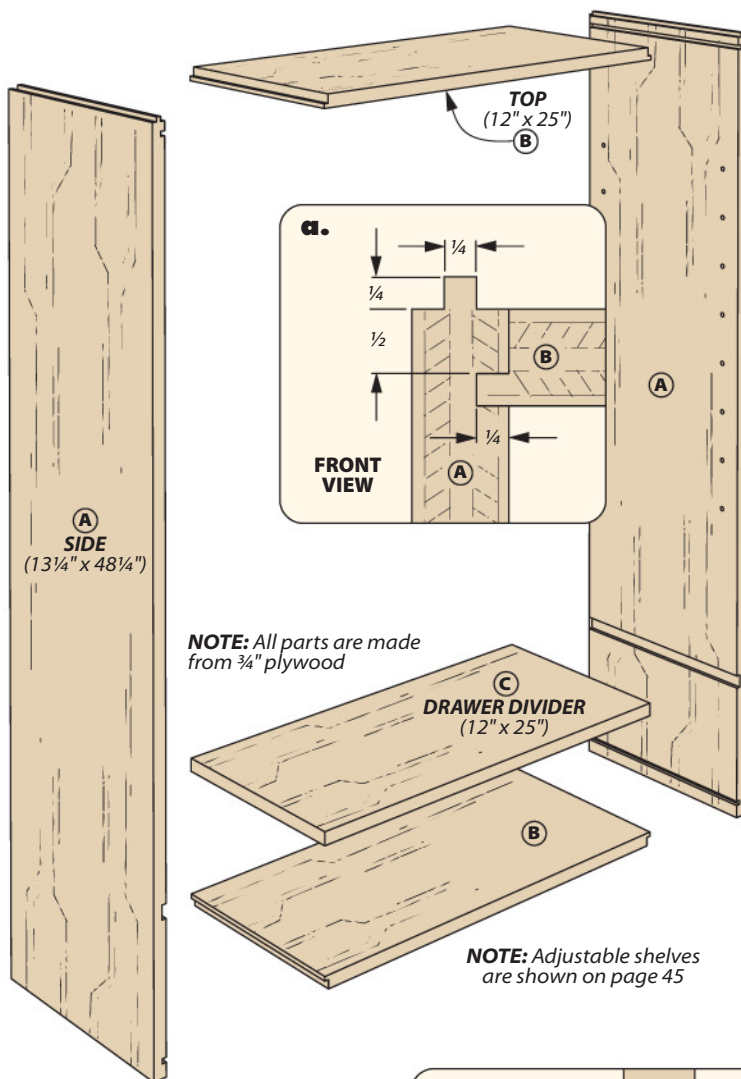
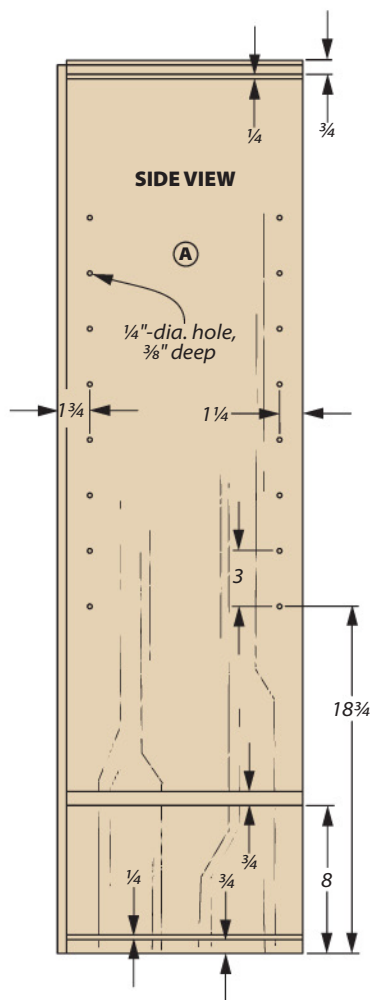
A fair amount of work indeed, but for me the reward is in the effort and results of such a project. Let's head to the shop.



Arched Top. The seamless transition between the case and the crown of the bookcase is brought to you by a unique product called "bendy" plywood that lives underneath the veneer.



Space Below. Handsome feet lift the bookcase off the floor and provide a stately air to the look of the piece. Full-extension drawer slides give you full access to a generously sized drawer.

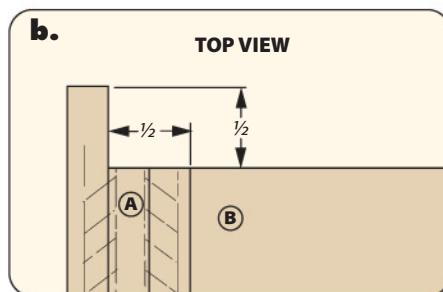


At the Core is a Solid Case

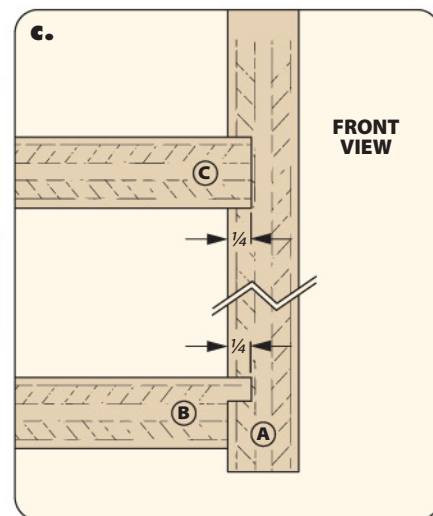
The shell of this bookcase is identical to the example I described in the introduction of this project — it's a box with shelves. But there's a little more to it; let's review the details.

There's joinery on the inside face of the sides to accommodate the top and bottom, along with a divider that defines a space for a drawer, and a rabbet for the plywood back. Also, you've got an array of shelf pin holes for the adjustable shelves you'll add later. Then there's the matter of a tongue on the top edge to mate with a groove in the barrel vault.

SIDES FIRST. To start, cut the case sides to their final size. Then it's time to cut the three dadoes on the inside faces for the horizontal members we just talked about. The side view drawing above shows all three dadoes. After cutting



the narrow dadoes for the top and bottom, change out the dado stack to cut the wider dado for the drawer divider. Detail 'c' shows what this looks like on the lower portion of the case. Follow this up with burying the blade in an auxiliary rip fence to make the rabbet along the back edge of the sides (detail 'b'). As for the shelf pin holes, I made a hardboard story stick that lines up with the top of the dado for the drawer



divider. When drilling the holes along the rear edge, the story stick aligns flush with the rabbet for the back.

MAKE A TONGUE. To cut the tongue along the top edge that will join with the groove in the barrel vault (Figure 2a),

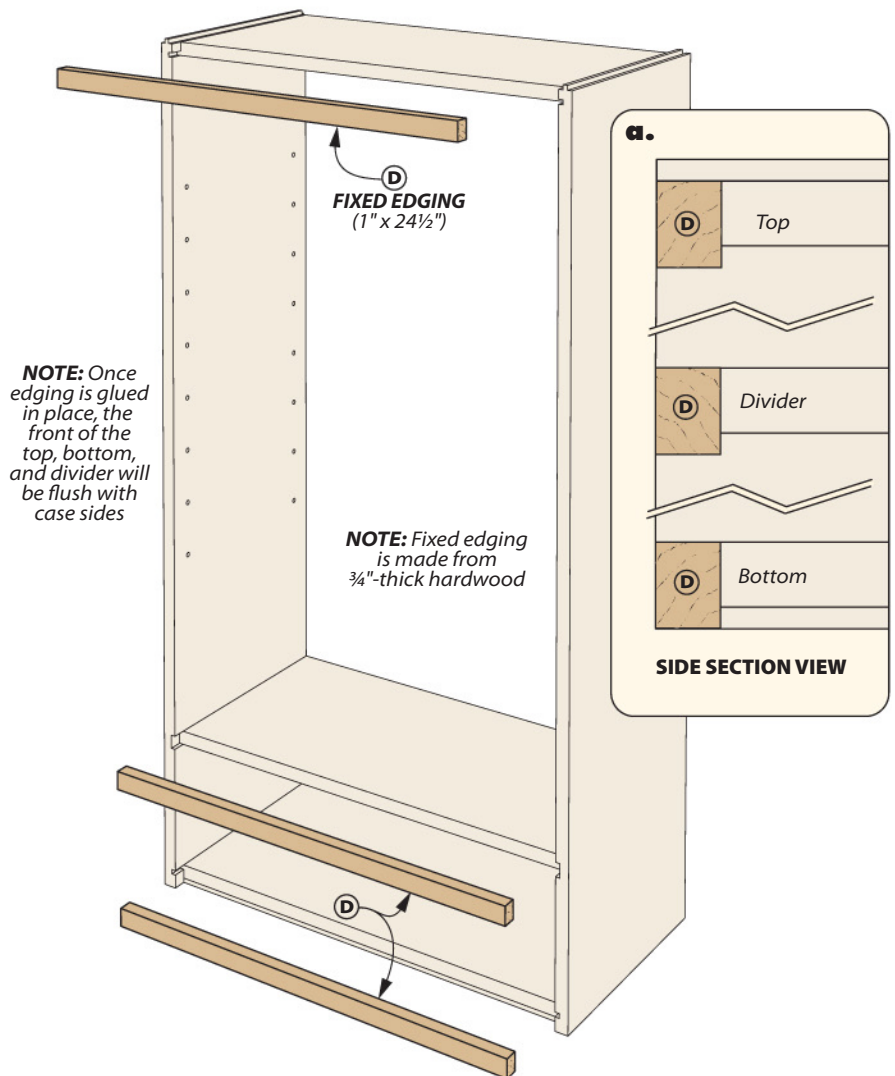
you're going to need some support on the outboard end. Or, you can cut the tongue with a hand-held router and a rabbeting bit. If you choose to do the latter, protect the outfeed end from chipout by clamping a sacrificial scrap to the edge of the side.

TOP, BOTTOM & DIVIDER. The three horizontal members are initially cut to the same size. Doing that task completes the drawer divider, now you need to make the tongues on the top and bottom. As you see in detail 'c' and the main drawing on the previous page, the tongues are the same size, just flipped in orientation. To make the tongue, dress up your table saw the same way you did to make the rabbet in the back.

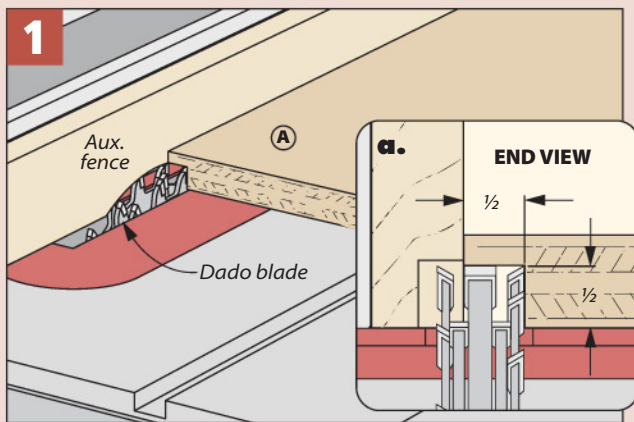
GLUE-UP & EDGING. One thing to remember when gluing up the case — hold the horizontal members flush to the rabbet at the back of the sides. It's a good idea to use clamping squares to ensure the case is square.

EDGING

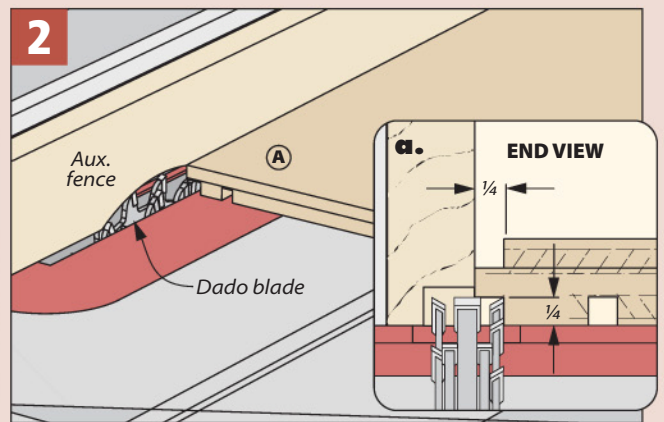
The last item on the case agenda is to fit and glue the edging on the top, bottom, and drawer divider. This is easy to do since the back of the case is open. As you see in detail 'a,' each edging piece is flush to the top of the panel it's glued to. Later, when the face frame is installed on top, it makes for interesting shadow lines across the case.



Case Side Joinery



A Long Rabbet. A dado blade and an auxiliary fence make quick work of the rabbet needed in the sides.



A Tongue on Top. Lower the blade and adjust the fence to cut the tongue along the top edge of the sides.

A Barrel Vault

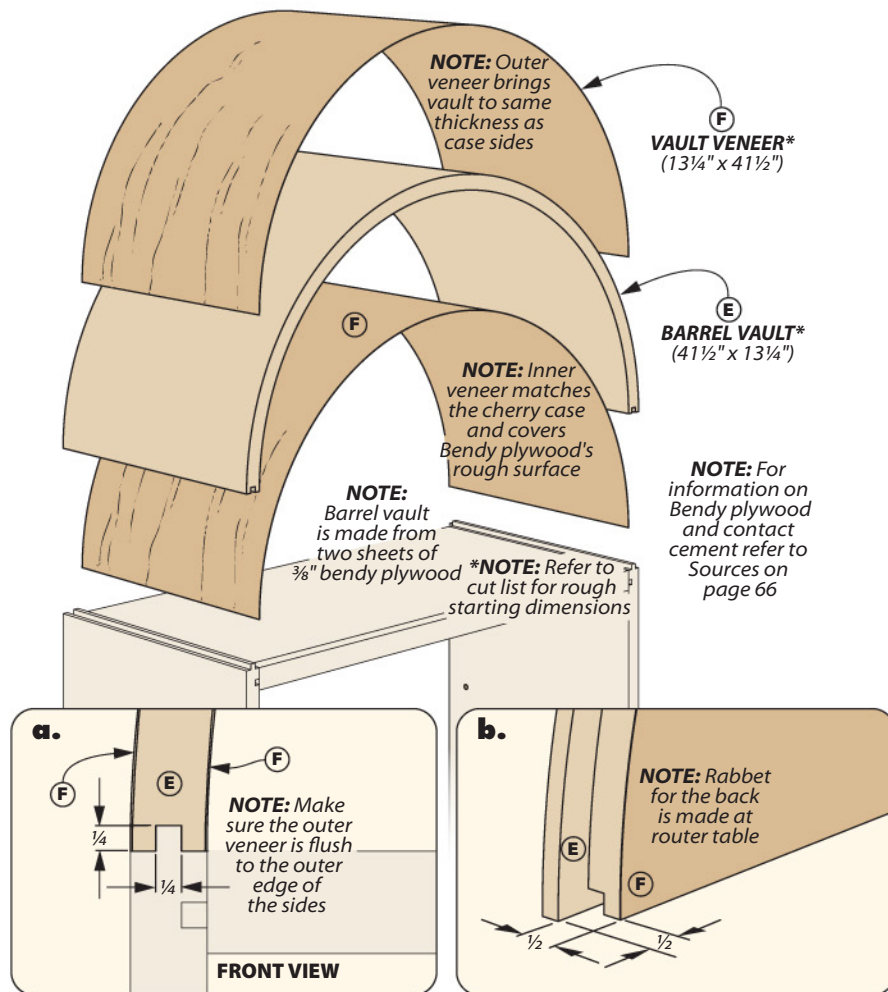
Barrel vaults are designed to distribute weight from above down the sides to the ground. A by-product of that engineering happens to be that the vaults look good while doing their thing. And that's what is mainly at play with this bookcase — making a handsome top.

UNIQUE PLYWOOD. The easiest way to make the curved barrel is to use a material called “bendy” plywood. You'll coat two sheets of $\frac{3}{8}$ " plywood with thickened epoxy and clamp them to the form you see in the box below. There are detailed instructions about making the form, and using it to shape the barrel vault online at Woodsmith.com/magazine/sip.

The critical part I will mention here deals with the trim line you need to mark on the barrel vault while it's clamped to the form. Figure 1 in the box below shows what I'm talking about.

TRIM TO SIZE. When the barrel comes off the forms, it's time to prepare it for joining to the tongues you made in the case sides. This involves trimming the barrel to final size and adding grooves to join with the case. Also, you'll need to rout a rabbet for the back. Start by squaring the edges

SNEAK UP ON SQUARE. To start the process I used a track saw to cut close to the

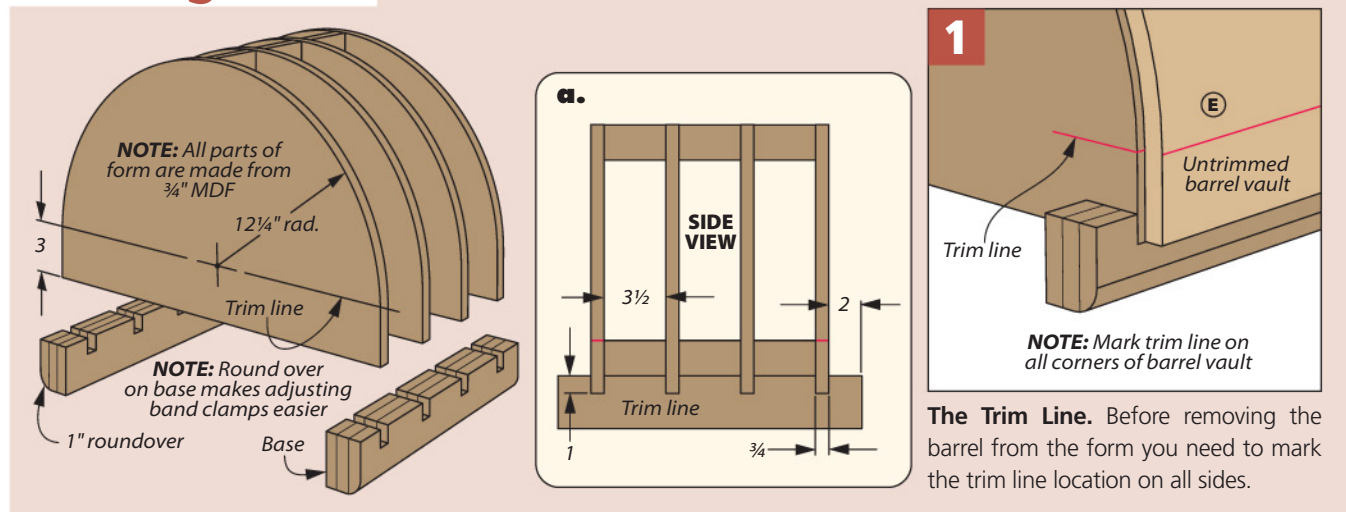


trim line on both edges. Then it was time for a trip to the jointer to true the edges and sneak up on the trim line. Although the barrel is already quite rigid from the epoxy, it's a good idea

to screw a spacer between the ends of the barrel to minimize movement while dialing in the edges.

VENEER. The thickness of the barrel vault needs to be close to that of the

Bending Form



plywood sides it's joining. The easiest way to do this is to line the barrel vault with veneer like you see in the main drawing on the previous page. When the veneer is in place, carefully trim it flush with your router.

JOINERY DETAILS. Next is cutting the grooves in the edges of the barrel (detail 'a,' previous page). I made a sled for the barrel to rest on as it's fed through the table saw blade. Next is routing the rabbet for the back along the rear edge of the barrel (detail 'b,' previous page).

GLUE BARREL TO CASE. It's time to mix another batch of thickened epoxy to bond the barrel to the case. This epoxy will work as a filler in any voids around the seams. No clamps were needed here, just tape (and gravity).

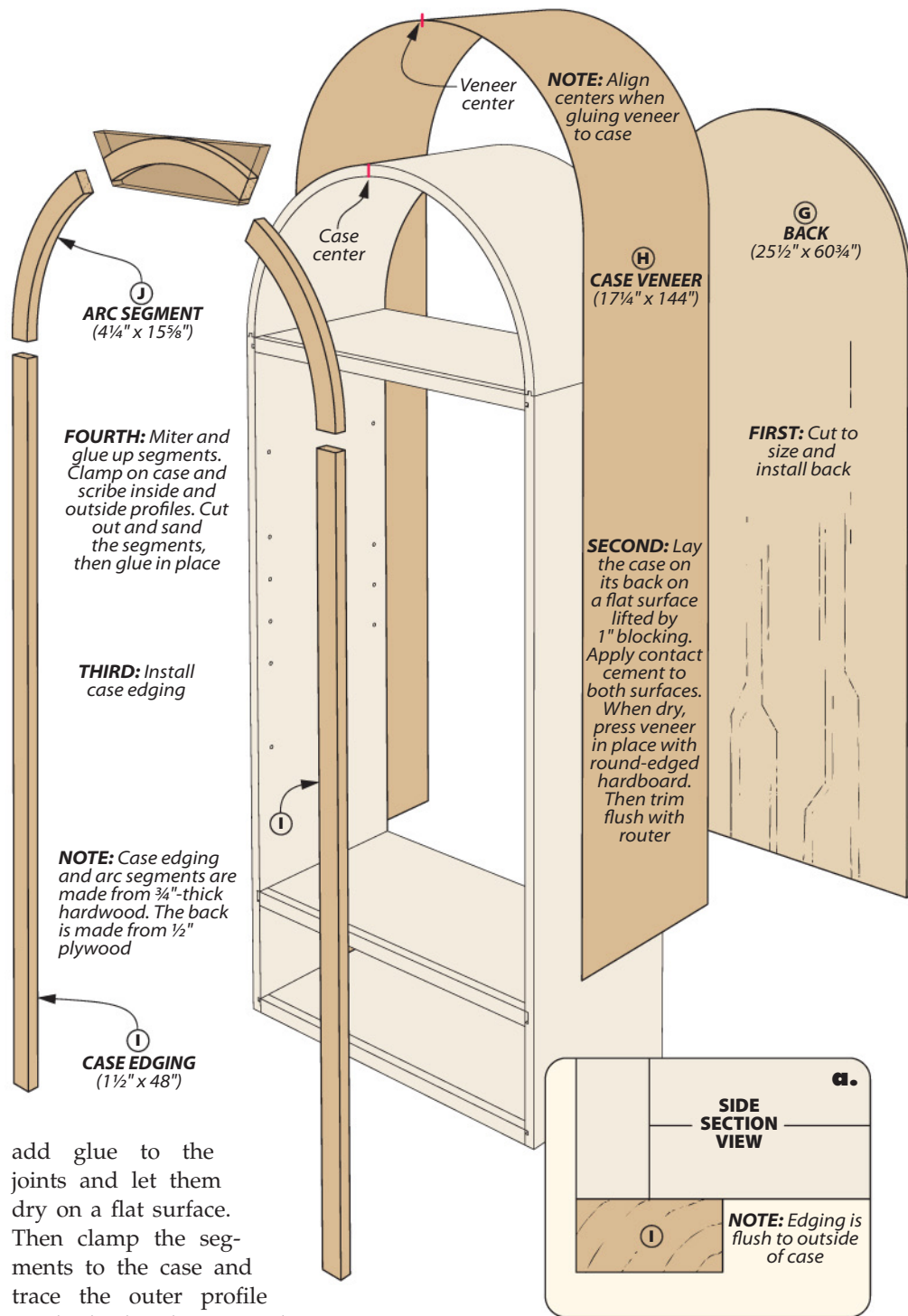
THE BACK. First, rip the back to width at the table saw. Then place it in the opening and trace the contour of the arch and cut it out with a jig saw and pin nail it in place.

MORE VENEER. Now it's time for the big match — veneering the case. The best way to win the battle against this long, floppy, piece of veneer is to not fight it. To do that, you'll lay the case on its back lifted off the floor with blocking. Then you can apply the contact cement to both surfaces. When the surfaces are dry, stand the veneer on edge. With the help of a trusted friend or two, press the veneer in place. After it's trimmed flush, it's time to install the face frame.

THE FACE FRAME

To start the face frame, the two long pieces of edging are cut to size then glued and clamped to the case. There are three segments that make up the arched face frame on the barrel vault. They're mitered to length at the table saw.

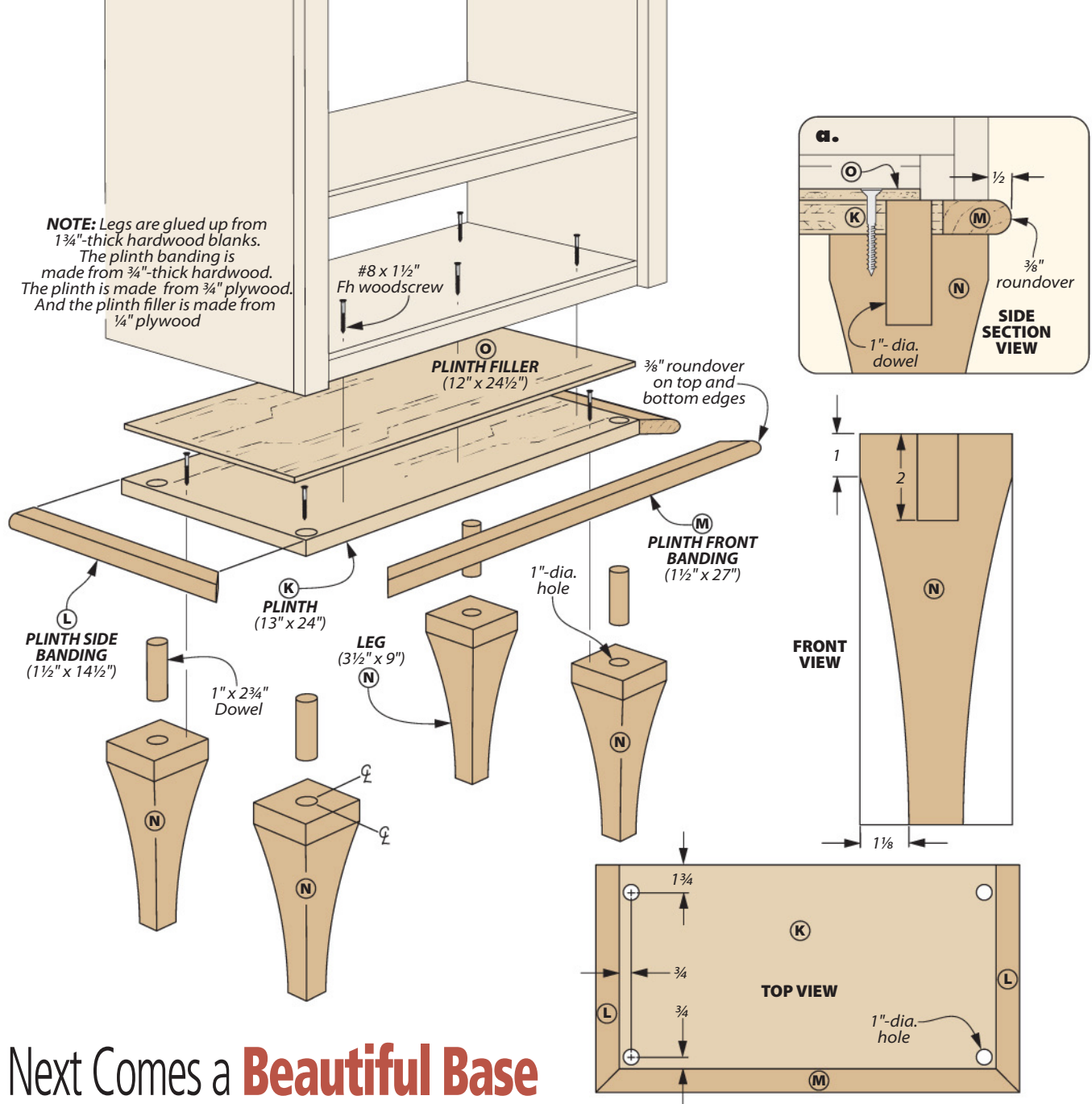
GLUE UP SEGMENTS. Apply tape to the back side of the segments,



add glue to the joints and let them dry on a flat surface. Then clamp the segments to the case and trace the outer profile on the back side. For a clever way to scribe the inside of the segments, go to Woodsmith.com/magazine/sip. Then you can glue the shaped segments to the case.



For more on making barrel vaults, veneering, and curved edging go to:
Woodsmith.com/magazine/sip



Next Comes a Beautiful Base

Now we'll dress up the bottom of the bookcase with the base assembly you see in the drawings above. Since the legs are the center of attention, let's look at them first. The legs have a large surface at the top that makes for a stable connection to the plywood plinth above them via a hardwood dowel. The tapered curves along their sides lighten the visual load as they meet the floor.

There are two plinths you'll need to make. The one I just mentioned is the thicker of the two and is banded with hardwood. The other is a thinner piece that fills the void between the plinth and

the case. All of this information is shown in detail 'a.' To start this phase of the project, we'll make the banded plinth.

PLINTH & BANDING. First, the plywood core of the main plinth needs to be cut to size. Also, you can rip the banding to width — clearly two tasks for your table saw. The next step is to merge the parts you just made into the finished plinth. As you can see in the drawings above, the banding has a generously sized roundover on its edge. I chose to rout the blanks first to avoid the risk of chipping out the miters when fitting them to the plinth.

FIELD FIT. Instead of measuring the sides of the plinth for the miter cuts, it's best to field fit each piece — starting with one of the sides. Hold it flush to the back edge and mark the front corner for the miter cut. After the cut is made, dry clamp it in place and cut the adjacent miter on the front banding. In turn, hold the front banding against the miter and mark the location of the miter on the other end and make that cut. On the last side, cut the miter first and fit it to the clamped front banding's miter while marking the square cut at the back of the plinth.

Glue on the banding one piece at a time, ensuring each piece is flush to the top edge and parallel to the plinth surface. Once those are nicely in place, it's time to drill the holes for the dowels. The Top View on the previous page shows where they're located.

THE LEGS

You can find sources online that provide large blanks that could be used for the legs. We chose to glue up 8/4 blanks instead. As for making the legs, the box to the right covers most of the information needed — here we'll visit about some of the details.

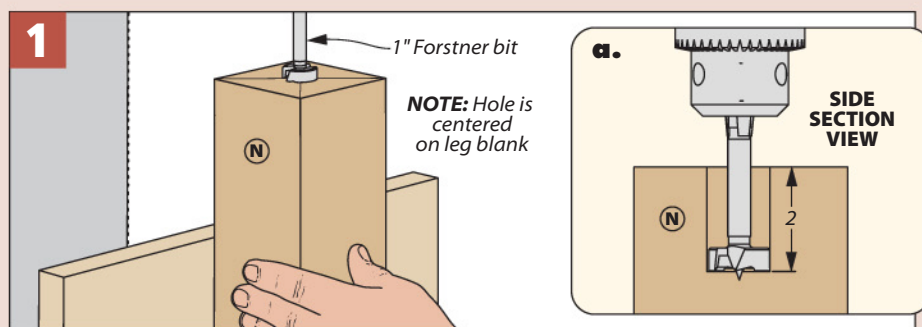
As you see in Figure 1, a Forstner bit is used to make the hole for the dowel. Forstner bits are perfect for making a flat-bottomed hole.

Tracing the profile on the blank is next up (Figure 2). There's a pattern online at Woodsmith.com/magazine/sip that you can use for a template. Keep in mind you'll want to orient the glue lines to the sides of the bookcase. Once you've got the patterns in place, it's time to make the first cuts as you see in Figure 3.

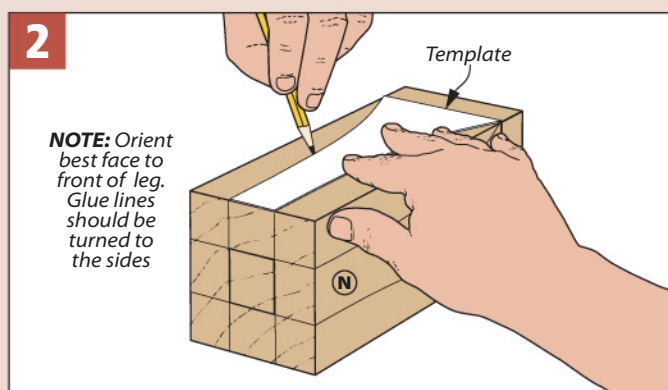
To safely make the cuts on the opposite faces, you'll need to tape the cutoffs back on the legs (Figure 4). Then you can sand all the surfaces smooth. Finally, cut dowels to length and glue them into the holes on the legs. Then glue and screw the legs to the holes in the plinth.

JOIN THE BASE & CASE. To join the base to the case it's just a matter of gluing the plinth filler to the underside of the case. (The case and base are flush at the back, and centered side to side.) Also, they are screwed together from inside the drawer cavity and the underside of the plinth.

Making the Legs

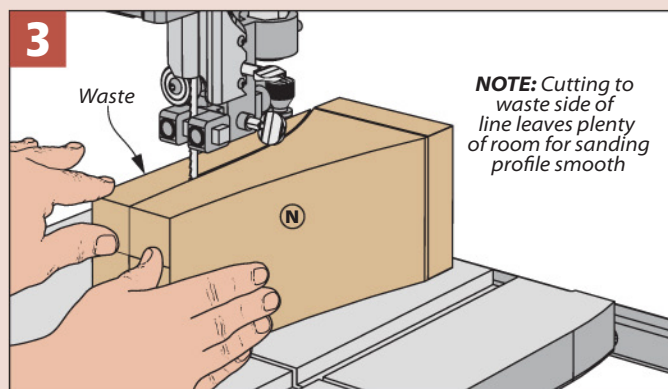


Backed Up Drilling. Use an auxiliary fence to support the legs while drilling the holes. Retract the bit periodically as you go, to clear the chips.

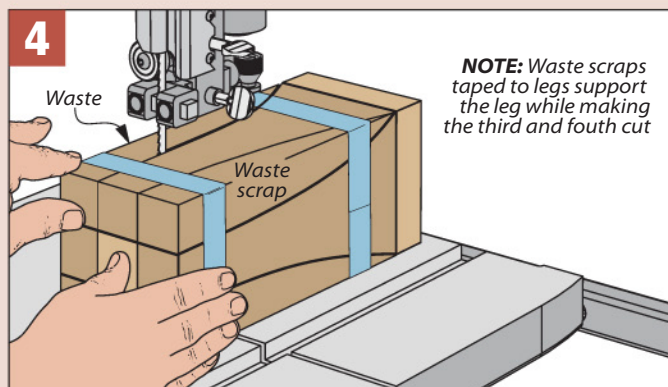


Draw the Profile.

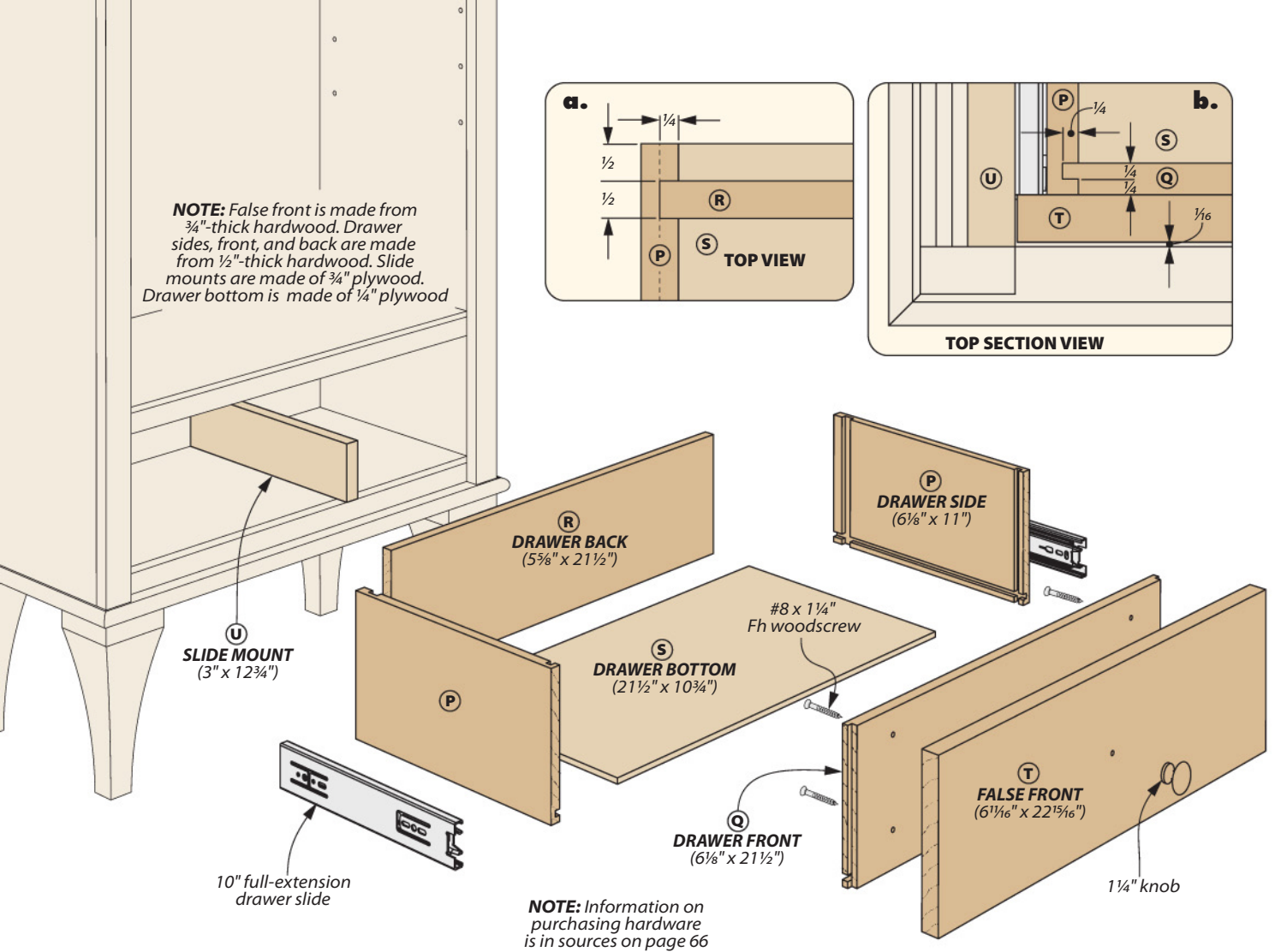
When the leg blank is cleaned up after the glueup it's time to trace the leg profile on all four sides. Use a sharp, soft-leaded pencil to leave a crisp, dark line instead of a marker which will occasionally bleed.



First Pass. The first step is to cut away the waste on opposing sides of the leg blank. Stay to the waste side of the line while making the cuts. Keep the cut-off portions of the legs; you'll need them next.



Second Pass. Taping the waste portions back on the leg blank allows you to see the cut lines and safely make the profile cuts on the other two faces of the leg. When the cuts are done, sand the legs smooth.



Drawer & Shelves

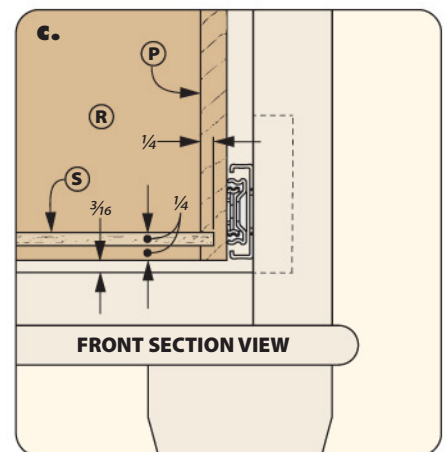
There are just a handful of things left to do to complete the bookcase. You'll start by making the drawer you see in the drawings above, then mounting it to the case. After that, you have a couple of shelves to make — adjustable ones with hardwood edging. Beyond that, it's just a matter of stain and finish. Let's get to work on the drawer first.

THE DRAWER. The drawer you see above is a maple box with a cherry false front. There are two reasons behind choosing maple: first, it's a durable wood that can take a beating; second, since it's left unstained, it brightens the interior of the drawer.

As for the false front, its main purpose is to hide the drawer slides that attach the drawer to the cabinet. There is another type of joinery that would allow you to integrate the cherry drawer front into

the box. It's known as a "lipped locking rabbet." The joint is structurally the same as a locking rabbet, but the front lip extends beyond the drawer box to cover the drawer slide. That would be a more than sufficient option with a unique look to it; however, with a drawer this size, I prefer to use a false front and stick with the tongue and dado joint you see in detail 'b' — it's not as fussy to make on larger drawers.

To get started on the drawer box, I milled the parts to thickness and cut them to finished size. The next step is to cut the dados in the sides. Detail 'a' shows the wider of the two that's toward the rear for the drawer back. The narrow dado is near the front edge of the sides. A dado blade, along with an auxiliary rip fence at the table saw, is used to make this joinery.

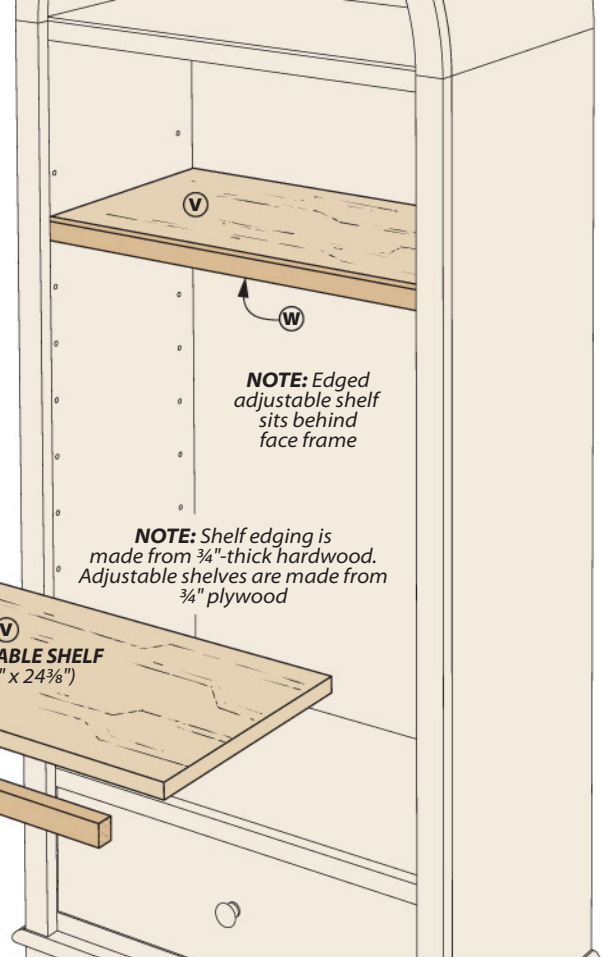
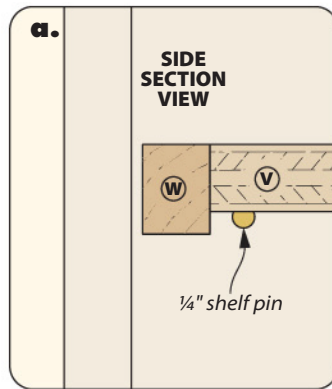


Before you leave the table saw, cut the groove along the lower edge of the sides and front for the plywood bottom. The drawer back has no joinery — it sits on top of the drawer bottom. The drawer bottom is the last piece to cut for the box.

GLUE UP. After gluing up the drawer box, slide the drawer bottom in place (under the back) and pin nail it to the back. Next, screw the slide mounts in the case (detail 'b'), then install the drawer slides to the mounts and the drawer sides (detail 'c').

Put the drawer in the bookcase with double-sided tape on the face, then center the false front in the opening. Press it firmly against the drawer box with an even gap all around. Remove the drawer and screw the false front to the drawer box.

SHELVES & EDGING. Lastly, cut the two adjustable shelves and their edging to size. It's just a matter of gluing the edging to the front of the shelves, as you see in detail 'a' above, and you're done with this project. Of course, you'll likely want a friend to show this dignified bookcase off to — and help move it — to its new home.



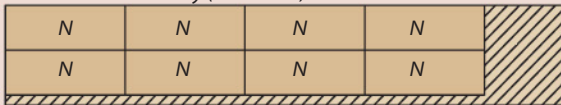
MATERIALS, SUPPLIES & CUTTING DIAGRAM

A Sides (2)	$\frac{3}{4}$ ply. - $13\frac{1}{4} \times 48\frac{1}{4}$
B Top/Bottom (2)	$\frac{3}{4}$ ply. - 12×25
C Drawer Divider (1)	$\frac{3}{4}$ ply. - 12×25
D Fixed Edging (3)	$\frac{3}{4} \times 1 - 24\frac{1}{2}$
E Barrel Vault (2)	$\frac{3}{8}$ ply. - $44\frac{7}{8} \times 14\frac{1}{2}$ *
F Vault Veneers (2)	$14\frac{1}{2} \times 44\frac{7}{8}$ rgh.
G Back (1)	$\frac{1}{2}$ ply. - $25\frac{1}{2} \times 60\frac{3}{4}$
H Case Veneer (1)	$17\frac{1}{4} \times 144$ rgh.
I Case Edging (2)	$\frac{3}{4} \times 1\frac{1}{2} - 48$
J Arc Segments (3)	$\frac{3}{4} \times 4\frac{1}{4} - 15\frac{5}{8}$

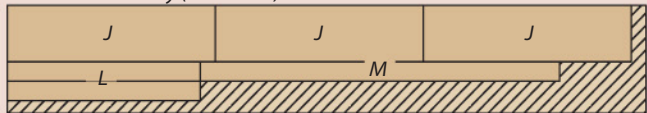
K Plinth (1)	$\frac{3}{4}$ ply. - 13×24
L Plinth Side Banding (2)	$\frac{3}{4} \times 1\frac{1}{2} - 14\frac{1}{2}$
M Plinth Front Banding (1)	$\frac{3}{4} \times 1\frac{1}{2} - 27$
N Legs (4)	$3\frac{1}{2} \times 3\frac{1}{2} - 9$
O Plinth Filler (1)	$\frac{1}{4}$ ply. - $12 \times 24\frac{1}{2}$
P Drawer Sides (2)	$\frac{1}{2} \times 6\frac{1}{8} - 11$
Q Drawer Front (1)	$\frac{1}{2} \times 6\frac{1}{8} - 21\frac{1}{2}$
R Drawer Back (1)	$\frac{1}{2} \times 5\frac{5}{8} - 21\frac{1}{2}$
S Drawer Bottom (1)	$\frac{1}{4}$ ply. - $21\frac{1}{2} \times 10\frac{3}{4}$
T False Front (1)	$\frac{3}{4} \times 6\frac{11}{16} - 22\frac{15}{16}$

U Slide Mounts (2)	$\frac{3}{4}$ ply. - $3 \times 12\frac{3}{4}$
V Adj. Shelves (2)	$\frac{3}{4}$ ply. - $11\frac{7}{8} \times 24\frac{3}{8}$
W Adj. Shelf Edging (2)	$\frac{3}{4} \times 1 - 24\frac{3}{8}$
• (1) 12" x 1" Dowel • (10) #8 x $1\frac{1}{2}$" Fh Woodscrews • (1pr.) 10" Full-Extension Drawer Slides • (1) $1\frac{1}{4}$" Knob • (4) #8 x $1\frac{1}{4}$" Fh Woodscrews • (8) Shelf Pins	

$1\frac{1}{4} \times 7\frac{1}{2}$ - 42" Cherry (4.4 Bd. Ft.)



$\frac{3}{4} \times 8$ - 48" Cherry (2.7 Bd. Ft.)

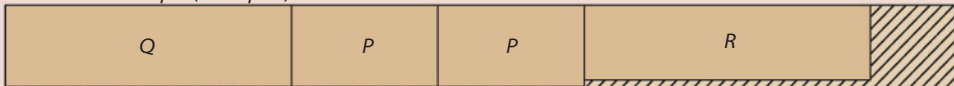


$\frac{3}{4} \times 8$ - 78" Cherry (4.3 Bd. Ft.)



*Denotes part E plywood size before final trim

$\frac{1}{2} \times 6\frac{1}{2}$ - 72" Maple (3.3 Sq. Ft.)



ALSO NEEDED: One 48" x 96" Sheet of $\frac{3}{4}$ " Cherry Plywood, One 48" x 48" Sheet of $\frac{3}{4}$ " Cherry Plywood. One Sheet of 48" x 96" $\frac{1}{2}$ " Cherry Plywood. One Sheet of 48" x 48" $\frac{1}{4}$ " Maple Plywood

This saw till is a great way to keep your saws organized, protected, and close at hand.

Hanging Saw Till

SEASON 19 WOODSMITH SHOP TV SHOW

There is a debate among hand tool woodworkers about saw tills. Officially, there haven't been any historical accounts of a saw till in an old-time shop. Most of the time, saws would have been hung on a peg on a wall, or in a holder in the back (or lid) of a toolbox. However, I think there's something beautiful about a well-made hand saw, and I want them out where they can be seen. That, combined with my growing ... collection ... of hand-saws led me to design and build the saw till that you see here.

The design of this till is fairly common. Two sides are connected by some inner framework. I decided to also include a few drawers for saw files, sets, and other random saw-related items. On the ledger board below the drawers, a few pegs offer places to hang items that don't fit in the till. Coping saws, fret saws, even a bow saw find a home here (and of course, my apron).

Now, I would be remiss if I didn't mention one facet of this project. Prior to designing and building this till, I was talking about it on our *ShopNotes Podcast* (we do it weekly, by the way). A saw maker whom I respect greatly reached out to offer his thoughts on the saw till. In his opinion, the best way to store a saw is hanging by the handle — whether that is from a peg, nail, or some form of holder that is similar to a saw scabbard. The idea being that, in the vertical orientation, the plate is being twisted and torqued.

I agree with Jared's assessment and input on the saw till. With that said, I could not come up with a design that I liked holding the saws by the handle, letting the saw plate hang down. Maybe I like seeing the saws lined up in an orderly fashion. I know; I'm throwing logic and professional advice out the window simply for my aesthetic preference. I never have claimed to be a smart man.

START WITH THE CASE

In essence, this saw till is a hanging wall-shelf. A pair of sides are connected by framework that holds the

saws. For this till, I wanted to paint it (I've been experimenting with linseed paint lately—look for that in an upcoming article). I happened to have some poplar that I knew would paint well, so I grabbed that for the painted portions of the case. I like my shop fixtures to look nice enough to hang in a house, but I would never shame anyone for choosing to make this out of something like pine or plywood. In the

shop, function over aesthetics (regardless of my prior comments).

The sides are made from one wide board, ripped down to final width. Even though the top edges of the sides get shaped a bit (and therefore could be left rough for now), I trimmed down both ends. Starting with workpieces that are square from the get-go just makes everything go a bit more smoothly in my opinion.



Rip to Width. Start this saw till off by milling down the stock for the sides, then cutting it to width. Poplar is available in wide boards, but you could glue up stock if you need to.



Crosscutting. I crosscut the side panels for the till at the table saw. I find my table saw and miter gauge to be far more consistently accurate than my miter saw.



3
Joinery Layout. To ensure the joinery will line up from side-to-side, I clamp the parts together first before marking out the dado locations.



4
Side Dadoes. There are three dadoes in each side panel: one for the top, one for the bottom, and one for the divider.



5
Stick Them Down. A pair of fences would guide the cuts on the dadoes, which I stuck down with double-sided tape.



7
Routing Dadoes. A dado clean-out bit has a bearing to ride along the plywood fences while routing the stopped dadoes.



8
Square Up. Use a chisel to chop the ends of the dado square. Chop across the grain first to prevent splitting the joint.

The sides are mirror images of each other. For accuracy, I clamp sides like this together and lay out my lines all at once. The inner framework (and top) of the till is attached to the sides with stopped dadoes. After laying out the dado locations (there are three in each side—top, bottom, and divider), it's time to decide how to cut the dadoes.

The dadoes go through at the back edge, but not at the front. Cutting these dadoes with a router means you can stop them at the correct location and has the benefit of using the part that goes into the dado to set the width — an easy way to get a good fit. The steps I took to cut these dadoes are outlined below in the photos.



6
Dado Spacing. To ensure an exact fit in the dadoes, sandwich the mating part between two fences when setting up the dado cuts.



9
Check It Out. Fit the mating part into its respective dado to test the joint. Chisel away waste as needed for a good fit.



10
Arcing Layout. Lay out lines to shape the sides. A drawing bow, such as the one here, helps get smooth curves.



11
Rough Cut. Cut outside the layout lines at the band saw to remove most of the waste. This will save a good deal of time later on.



12
Work the Curve. Refine the shape of the curve. Rasps and sandpaper will suffice, but a compass plane is an ideal tool for this task.



13
Back Rabbet. A rabbet along the back of each side will accept the back slats and the ledger board. Rout this using an edge guide.

SHAPE THE SIDES

Now, you can shape the sides of the till. I like the asymmetrical curve that I chose for the sides. It's actually an intentional curve — the shape is reminiscent of a skew-back saw. I like the poetic-ness of it. I used an asymmetrical drawing bow (Step 10) to come up with the curve, and transferred it to the sides. (I stuck them together with double-sided tape). I also drew a small scoop on the bottom edge. That scoop size isn't intentional. It happens to be the same radius as a *Folgers* coffee tin full of rusty nails. (Disclaimer: I don't know if the radius changes if it's not full of Tetanus).

CUT THE CURVE. I don't actually own a bow saw, so cutting this curve is done at the band saw. The shape of the curve

isn't critical, so I trimmed close to the line. Any cleanup that needs to happen on this curve can be done with a rasp and sandpaper, or if you own a compass plane, here's a great place to use that tool before putting it back on the shelf for the next few years.

BACK RABBET. The final thing left to do on the sides is to form a rabbet along the back edge. This rabbet will run from the top dado through the bottom edge. The rabbet will capture two parts — the back slats as well as the ledger board. Routing the rabbet is straightforward. I used the same dado clean-out bit as before, but instead of guiding the bearing, I added an edge guide to the router base. You'll need to make two passes to

form the rabbet. Any final cleanup can be done with a router plane.

THE INNER WORKINGS. With the sides complete, we can turn our focus to the inner-workings of the saw till. The bottom, a horizontal divider, and two vertical dividers form the majority of this assembly. The assembly will hold the handle rest, as well as a saw divider. Before working on the assembly, I decided to get the handle rest glued up and drying. While it dried, I took the time to plane down the bottom and dividers, then cut those pieces to size. Once the handle rest was dry, I did the same with it before moving on.



14 Handle Rest Rabbet. Before rounding out the handle rest, rabbet the stock at the table saw while it's still square.

As you can see in Steps 14-16 on this page (as well as in the drawings on page 46), the handle rest is, at its simplest, a rabbeted dowel glued onto a board. The dowel registers the horns of my saws, while the rabbeted-in-place board below supports the dowel. Rabbeting a round dowel would be a bit of a tricky task, so I started with a square blank that I rabbeted with a dado blade first (Step 14). With that out of the way, I headed to the router table and used a roundover bit to form the blank into a dowel, leaving the ends square for support. This could then be glued up and allowed to cure.

The horizontal divider as well as the bottom are dadoed. I cut these the same way as before. First, a pair of fences sandwich the workpiece to set the width of the dado. Unlike the dadoes in the sides, however, these are through-dadoes, so this time I cut them with the workpieces clamped edge-to-edge. Before grabbing the glue bottle though, one more item needs taken care of: the bottom needs a rabbet along the back edge to accept the ledger board, just like the sides.

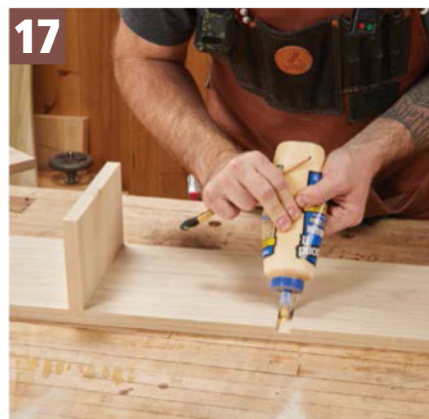
The vertical dividers are cut to size and glued in place with the divider and bottom (Step 18). You'll notice in the photos that the dividers are all the same depth, but the bottom of the till is a little wider. This is because everything is aligned on the front faces. Since the horizontal divider isn't full depth, that gap in the back will allow the back slats to sit behind the divider and be screwed in place.



15 Round the Rest. Form a dowel with a roundover bit. Test out the set up to make sure you get a completely round dowel, and leave the ends square for support.



16 Handle Rest Glueup. Glue the rounded dowel to its supporting board. Quick-grip clamps work well for this small assembly.



17 Dado Glueup. Apply glue to the dadoes in the sides. Spread the glue inside the dadoes using a brush to ensure a firm connection.



18 Divider Assembly. Glue up the divider assembly and allow it to cure. This assembly will inform the size of several other parts down the road.

SAW DIVIDER

With the glue cured, I took a measurement and routed a stopped groove in the top of the assembly. This is for the saw divider — you can see this in place in Step 19 at right. The purpose of the saw divider is to break up the cavity of the till into panel saws and back saws. I did this the same as earlier, using taped-down fences to guide the bearing on my dado-cleanout bit.

The divider has a similar curve to the sides. I also decided on somewhat of a whim to curve the top edge of the divider. Despite myself, though, I ended up liking the look of it enough that I went back and sanded the same curve into the side panels (you can see that curve in Step 20).

Finally, here's where the real-world building comes in. With the saw divider in place, I was able to play with the position of the handle holder. I used a few of my saws to see where the best position for the holder would be, then routed a groove for it. Finally, a measurement can be taken for the length of the handle holder and it can be cut to length (as in Step 20).

THE BIG ASSEMBLY

Here's where building something designed from scratch gets really exciting — the first assembly. This is the moment when you can really see your design come to life. Of course, it's also where you might realize if you made a design or sizing mistake, but we won't worry too much about that.

Nothing crazy is going on with this saw till assembly. The divider assembly you glued up earlier slips in place in the lower stopped dados. The top slips into place as well, joining with the dados in the sides.

Additionally, there are two other pieces to add at this time — the first being a top cleat. This cleat seats in the side rabbets, directly below the top, and it has a rabbet along the bottom edge of its back face. Once this is in place, it can then be screwed into the top from the top face. This cleat will be where we attach the till to the wall.

The second piece to add is a lower ledger board. As you saw in the main



Measure Directly. Dry-fit the saw divider and measure the length of the holder. Test the fit with a few of your favorite saws to make sure it works well for you needs.



Case Glueup. Glue up the till case. The divider assembly fits into the lower dados on the sides while the top piece slots into the upper dados.

photo on page 40, the ledger board has a curve cut in it. You could leave it straight — no problem if that's what you'd rather do. However, I liked the curve to reflect the shapes on the sides.

After I had everything glued in place and clamped, I drove in a bunch of screws. I'm not too proud of a woodworker to not use screws, at least where they're appropriate

(and especially where you can fill the screw holes). I tried a new type of screw here called *Spax* screws. Supposedly the shape of their tips means no pilot holes are required to install them. I was impressed — I didn't pre-drill anything and nothing split. A few screws through each joint is all that's needed to keep everything tight while the glue cures.



21 Secure with Screws. Drive a few screws in each joint. Spax screws don't require pilot holes, so you can drive them right in.



22 Wood Fill. Mix up *Bondo*, using a small amount at a time. Be sure the filler and hardener are thoroughly mixed.



23 Cover the Holes. Cover the screw holes with the mixed *Bondo*. After 15-20 minutes, sand it flush with the surface.



24 Drilling Template. A template helps position the Forstner bit to ensure the holes for the tool rest are aligned on either side.



25 Tool Rest Glueup. Glue the dowel for the tool rest into place. In order to slip it in, you'll need to tip the saw divider as you insert it.

Covering screw holes can be done many ways. Plugs and filler work, but one of my favorite ways to plug screws is with a product called *Bondo*. It's a trick I picked up from the trim carpenters I hired when I built my house. The colored varieties of *Bondo* are easy to see, they cure very quickly (and sand easily), plus they don't shrink as they cure. The blue stuff I used here is sold as an "all-purpose filler". The smell and working properties tell me it's the same as the standard "pink" body *Bondo*, and I simply paid \$5 more for it. (It may actually be different, but I couldn't tell — see

the previous remark about me not being too bright).

BACK SAW HOLDER

There are some things that, despite being right in front of you on many occasions, are still easy to miss. Something that I didn't realize before building this till is just how different backsaw handles are from panel saws. The handles on backsaws actually need to be held several inches higher, due to the length and the hanging angle of the saw. To deal with this, I chose to use a dowel as my handle holder for the

backsaw side of the till. Holding my saws in place, I eyeballed where the dowel should go, then I made a template to help position the Forstner bit I used to drill the hole out. Keep in mind that the template is aligned with the front edge of the horizontal divider, not the front edge of the side. After clamping it in place, I could drill the hole in both the side and the saw divider, confident that they'd be aligned without too much fussing. This hole only goes in a bit — don't poke through the outside! Now, the dowel and saw divider can be glued in place.



Shiplapped Back Slats. To create the back slats for this till, begin by rabbeting the edges of the back slats.



Room for the Cleat. To accommodate the top cleat that this till will attach to the wall with, rabbet the top, front face of each slat.

A FANCY BACK

I'm going to be a little pompous now. I really like the look of a fancy wood (in this case, some curly maple) with a painted case. So, curly maple back slats and drawer fronts it is.

The back is a shiplap back. This allows the back slats to expand and contract as needed. To create the ship-lap, I used a dado blade buried in an auxiliary fence and cut a rabbet on opposite faces on each edge (you can see this in Step 26 above). Using push pads while you cut will help keep a consistent downward pressure on the workpiece to ensure a full-depth rabbet.

The top edge of each back slat has a rabbet along it. This will seat in the rabbet on the top cleat. Cutting this is done with the same setup, but using a miter gauge to guide the workpiece. To make the inside look neat and tidy, I chamfered the edges where the slats meet—simply count the number of swipes along each edge (mine was 6 swipes). Before screwing them in place, I finished them with a thin coat of shellac followed by Danish oil.

Attaching these slats to the back is done with screws. The biggest thing to keep in mind here is that only one edge should be attached. This allows room for seasonal movement. As you see in Step 29, I attached only the right-hand corner of each slat. The next slat holds the previous one down. A few washers, in the rabbet, space out the slats to create breathing room.



A Quick Chamfer. Use a block plane to chamfer the edges of the slats for a clean look and to help distinguish each one.

THE DRAWERS

Good-looking drawers don't need to be complicated. Not every fancy drawer needs to be dovetailed. For these drawers, I went for something simpler.

I used dowels to hold the sides of the drawers together with the front and back. Even small dowels can be plenty sturdy, and they will be sufficiently strong for what these drawers will hold. Now, to be completely honest, I did receive a *Milescraft* Joint Master doweling jig for Christmas, and I was looking for an excuse to try it out. For what it is, it's much more versatile than the self-centering style of doweling jig. It gets an A+ from me.

After gluing up the drawers, I slipped the bottoms in place. You can see in Step



Screw 'Em Down. Screw the slats in place. A pair of screws on the same edge of each slat allows them to expand as needed.

33 on the next page that I chose to leave the back shorter than the other parts. This allows the back to slide into the groove and get installed with just one screw. That makes it easy to replace the bottom at a later point if necessary.

Selecting the pulls for the drawers was a thorn in my side. Everything at the hardware store was much too large for what I wanted. The drawers needed a smaller pull, but I didn't want to have to wait on one to get shipped. That's when I remembered I had a "spare parts tray" that contained a few saw nuts and medallions. The idea seemed fitting, so the pulls for my drawers are saw medallions. Once again — poetic and pompous. You can order your own pulls, or buy saw medallions on *eBay*.



30 Bottom Panel Groove. A groove along the bottom edge of all the drawer parts will accept the bottom panels later on.



31 Dowel Holes. Drill the dowel holes in the edge of the sides, and faces of the fronts. I chose to use a doweling jig for these.



32 Dowel Glueup. To assemble the drawers, squeeze a bit of glue into the dowel holes, then fit the dowels in place.



33 Drawer Bottoms. Slip in the bottom and drive in a screw to hold it. This makes the bottoms easy to replace should you need.



34 Saw Plate Kerfs. A thin-kerf blade makes nearly a perfect slot for even the heaviest-set saw plates.

SAW HOLDER

The final part to put together is a saw holder. This captures the blades and keeps them from tipping. There's really not a whole lot to this piece. To make it, I began with a block of hard maple cut to size. From there, I simply spaced out marks on the block and cut the kerfs at the table saw using a thin-kerf blade (as shown in Step 34). A thin kerf blade is an excellent choice for making these kerfs — not too snug that they're difficult to remove or replace, but not so loose that saws will jiggle or hang funny. A pair of these parts are needed — one for the backsaw side and one for the panel saw side. To install them, I simply screwed them in from the back using a pan-head screw and oversized holes (so the back can continue to move).

Here's where you may want to start customizing some of these saw holders. I have several pull-style saws and gent's saws. To hang these, I cut wider slots in a small shelf and screwed it in place on top of the backsaw blade holder. You can see these in the main photo back on page 40.

The final detail is to decide if you want pegs on the ledger board. I chose to turn three Shaker-style pegs from offcuts of the curly maple I had. This made for the perfect spot to hang some specialty saws, in my opinion. After that, hanging the till can be done with a series of cabinet screws through the top cleat.



Small Shop Router Table

Clever clamp-on design turns any surface into a router table workcenter.

I have too much space — said no one ever. Each tool, storage cabinet, workbench, and machine has to earn its place. One common expectation is that important machines require a permanent position. The second tier of tools can be smaller, benchtop varieties.

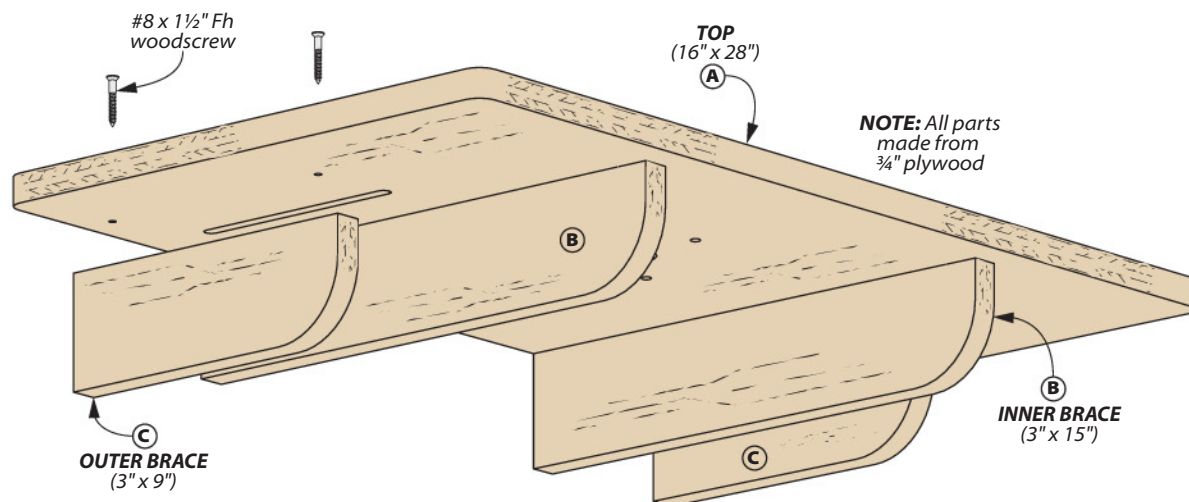
I fell into the permanent tool trap. A router table serves as a joinery station and shaping tool that I use in nearly every project. The catch: a standalone

router table just doesn't fit in the space I have. I've tried several different options. Enter this candidate. Chris Fitch's design works by keeping the top generously sized. Below the surface, the support and clamping system makes setup speedy.

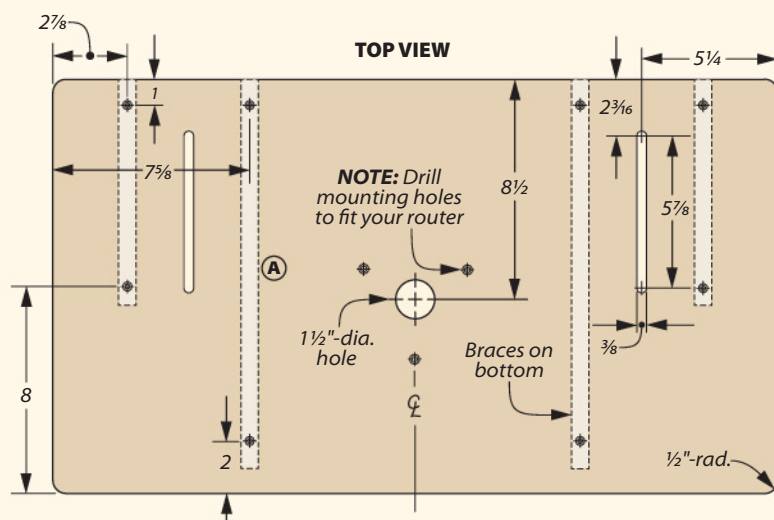
A side benefit: Your router table isn't tied to a fixed location — or even to your workshop. You can take it out for site work.



Working Height. A system of braces and cleats elevates the top and allows it to be secured with clamps.



a.



TOP COMES FIRST

Many portable router tables skimp on the size of the worksurface. This one doesn't. For rigidity, the top is made from 3/4" plywood. Baltic birch was our choice, but what's important is that the piece is flat.

Besides cutting the top to size, it's a good idea to round the corners. These will be less likely to ding your workpieces, as well as being a little gentler should you bump into the table.

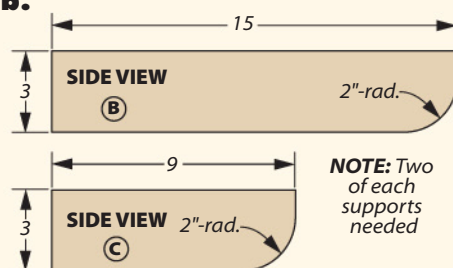
ROUTER OPENING. The agenda moves to fitting your router to the table. The

first step here is to locate and drill a hole for a bit to pass through (detail 'a'). The size shown handles most bits. However, if you use a slot cutter or a large rabbeting bit, you may want to upsize this hole.

Allow me to point out that the hole isn't centered. It's offset towards the front of the table. This provides clearance for the router body from the support structure that is coming shortly.

The second part of this is to drill smaller holes to attach your router base (or a lift). I did this from the

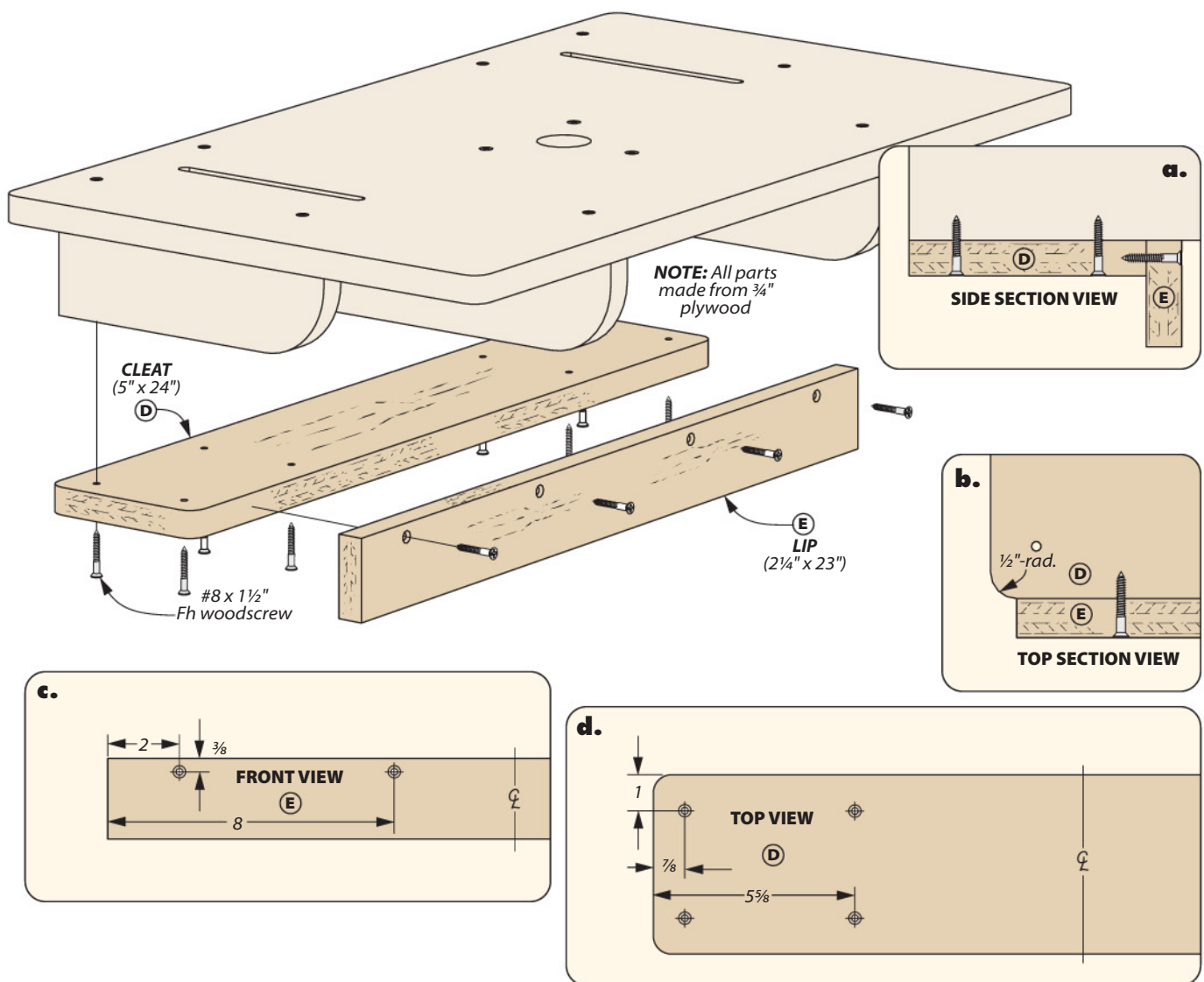
b.



bottom side by centering the base on the hole and marking the locations of the mounting screw holes. Be sure that the motor clamp faces towards the front for easy access to change the bit height.

FENCE SLOTS. A slot near each end of the top accommodates the fence, as in detail 'a.' To create slots like this, you can use a handheld plunge router with an attached edge guide. Work in several passes, lowering the bit between each pass.

BRACES. Two pairs of braces support the top from below. These are shown in the main drawing and detail 'b' above. In addition to increasing rigidity, the braces also raise the top of the router table so it's at a more comfortable working height. The lower front corner of each brace is eased with a large radius.



A Secure Attachment

A flex-free tabletop is critical to a router table. However, there are other components that are just as important. The first one to tackle is the mounting system. Since this portable table doesn't have a base, you need a way to attach it to another surface.

The drawing above shows the parts required to clamp it to a table. A wide cleat is cut to size. Ease the sharp corners with an edge sander or a corner rounding router template, (detail 'b').

Woodscrews join the cleat to the braces. Drill two countersunk clearance holes in the cleat at each brace location. The cleat is centered on the braces side-to-side.

Don't just drive the screws in. The screws could split the braces since they are in the "edge grain" of the plywood. Instead, clamp the cleat to the braces so it's all flush at the back (detail 'a'). Then drill pilot holes in the braces through the clearance holes.

LIP. The cleat allows you to clamp the table in place. To ensure that the table overhangs the surface enough to allow for the router to be mounted, a lip is screwed to the front of the cleat, as shown in detail 'a.' The clearance hole locations are given in detail 'b.' Locating these precisely isn't necessary for this table to function, but careful

placement provides a better look in the finished piece.

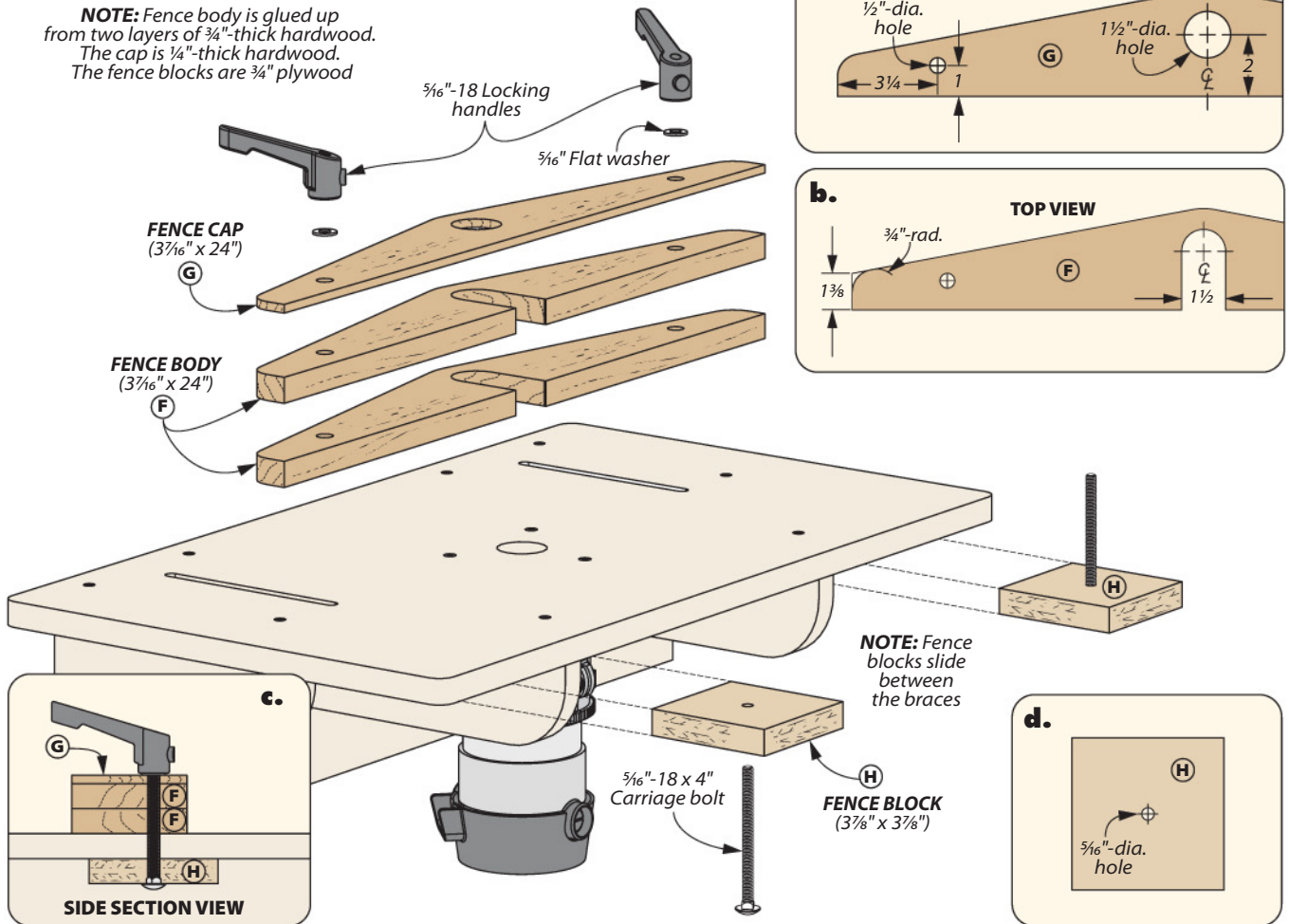
EASY ADJUSTING FENCE

A good router table requires a solid fence to match. The one shown on the next page offers the right balance of features.

FENCE BODY. The body of the fence is glued up from two layers of hardwood. Plywood would work as well, but I like the smooth edge of the hardwood compared to the edge of plywood.

A rounded notch in the center accommodates a recessed router bit as well as dust collection, as you can see in detail 'b.' I drilled out the end of the notch and

NOTE: Fence body is glued up from two layers of $\frac{3}{4}$ "-thick hardwood. The cap is $\frac{1}{4}$ "-thick hardwood. The fence blocks are $\frac{3}{4}$ " plywood



cut away the waste at the band saw. I smoothed the edges with a file.

A thin cap layer is glued on top of the body. This piece has a hole to accept the hose from your shop vacuum, as shown in detail 'a.' Size the hole for your vacuum hose. Be sure to center it over the notch you formed in the fence body.

At this stage, drill a hole at each end that aligns with the adjustment slots in the table. Locate the holes so that the bit opening in the table and fence are aligned. At the band saw, cut the tapers on the back edge of the fence, as shown in details 'a' and 'b.' These aren't strictly necessary, but add visual appeal.

CLAMPING BLOCKS. The fence is attached to the table with carriage bolts, washers, and locking handles. The carriage bolts pass through blocks to increase the bearing surface. Size the blocks to slide smoothly between the braces. Just like that, you're ready to clamp this table in place and get to routing.

MATERIALS, SUPPLIES & CUTTING DIAGRAM

A Table Top (1)	$\frac{3}{4}$ ply. - 16 x 28
B Inner Braces (2)	$\frac{3}{4}$ ply. - 3 x 15
C Outer Braces (2)	$\frac{3}{4}$ ply. - 3 x 9
D Cleat (1)	$\frac{3}{4}$ ply. - 5 x 24
E Lip (1)	$\frac{3}{4}$ ply. - 2 $\frac{1}{4}$ x 23
F Fence Body (2)	1 $\frac{1}{2}$ x 3 $\frac{7}{16}$ - 24
G Fence Cap (1)	$\frac{1}{4}$ x 3 $\frac{7}{16}$ - 24
H Fence Blocks (2)	$\frac{3}{4}$ ply. - 3 $\frac{7}{8}$ x 3 $\frac{7}{8}$

- (20) #8 x 1 $\frac{1}{2}$ " Fh Woodscrews
- (2) $\frac{5}{16}$ "-18 x 4" Carriage Bolts
- (2) $\frac{5}{16}$ "-18 Locking Handles
- (2) $\frac{5}{16}$ " Flat Washers

$\frac{3}{4}$ " x 5" - 49" Hardwood (1.7 Bd. Ft.)



$\frac{1}{4}$ " x 5" - 25" Hardwood (.87 Sq. Ft.)



ALSO NEEDED: One 48" x 48" Sheet of $\frac{3}{4}$ " Baltic Birch Plywood

Garden Tower

Pump up the visual interest of your yard or garden this season with this one-of-a-kind cedar structure.

If you're looking to add an eye-catching focal point to your outdoor living space this year, then this garden tower is sure to fit the bill. Made from inexpensive, durable, and great-looking dimensional cedar boards, the design is guaranteed to gain the attention of your friends and neighbors.

A PARISIAN TRIBUTE. At first glance, I'm sure this wood "yard art" is reminiscent of another, much larger famous structure that belongs to our French friends across the pond. Though its design shares a few similarities with that famous tower in Paris, you should be able to handle this one quite easily over the course of a few weekends in your woodworking shop.

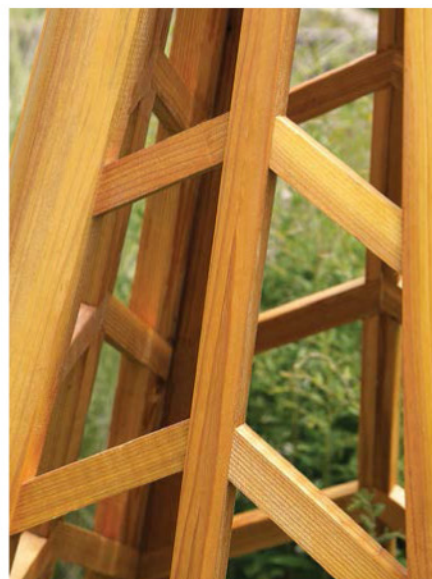
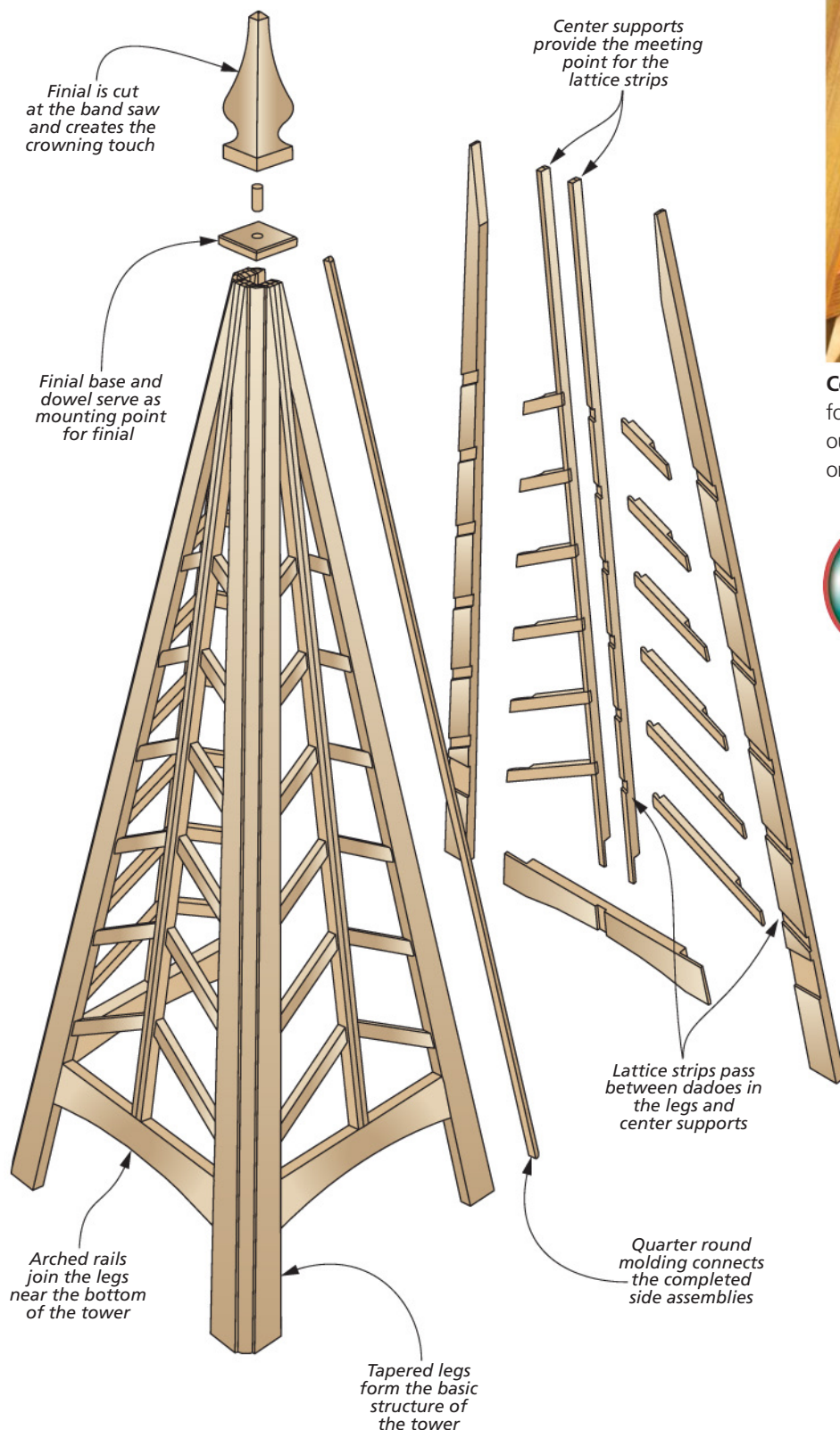
DETAILS OF THE DESIGN. That's not to say this unique project isn't without its challenges, however. One look at all those angles, and you can see where I'm going here. But don't worry, you won't have to brush up on your geometry before calculating all the different angled dadoes, miters, and rabbets in this project. I've come up with a "cut to fit" method of building the tower that simplifies things quite a bit.



CONSTRUCTION DETAILS

OVERALL DIMENSIONS:

25¼" W x 86⅞" H x 25¼" D



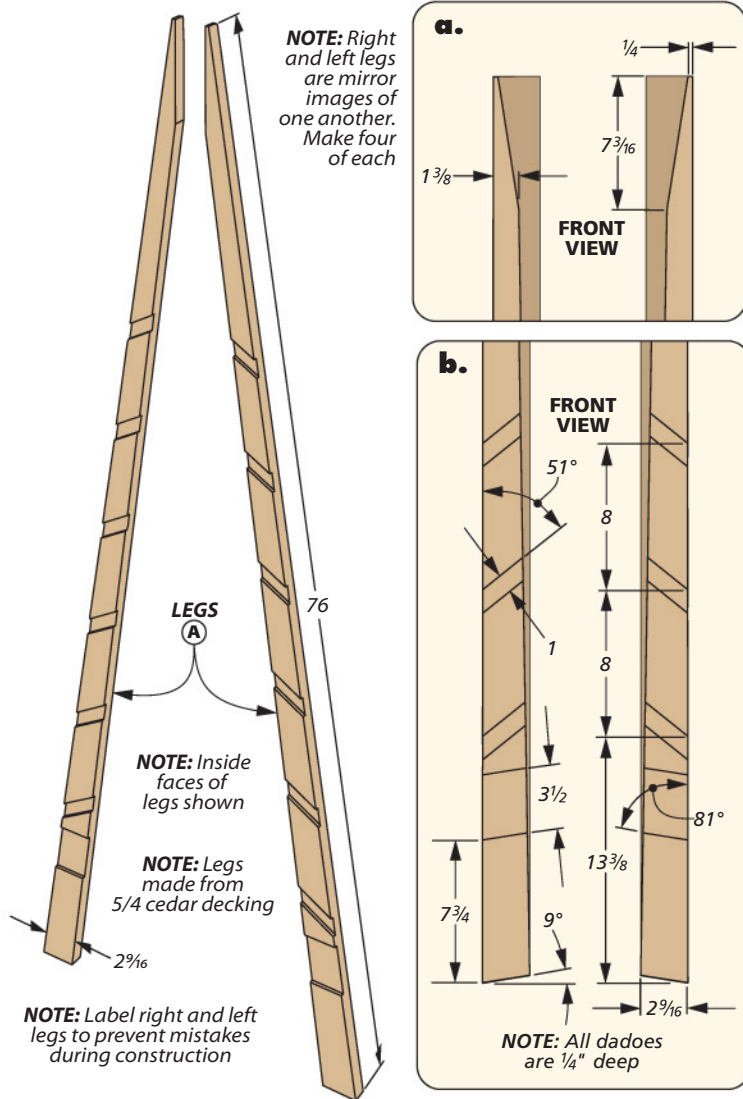
Center Supports. The angled lattice strips form the “ribs” of the tower. You can find our “cut to fit” method for flawless results on page 58.



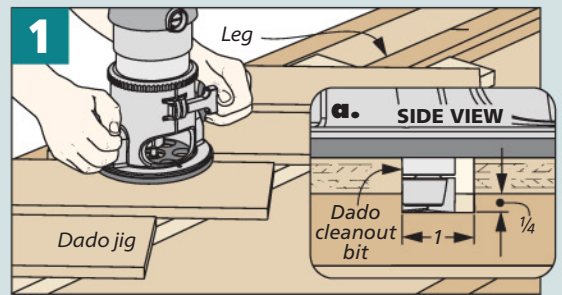
For a full-size finial pattern, go online to Woodsmith.com/magazine/sip



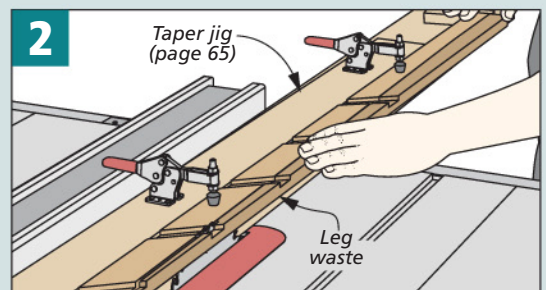
Topping it Off. The finial is the crowning touch for the cedar tower. It only requires a few band saw cuts as shown on page 61.



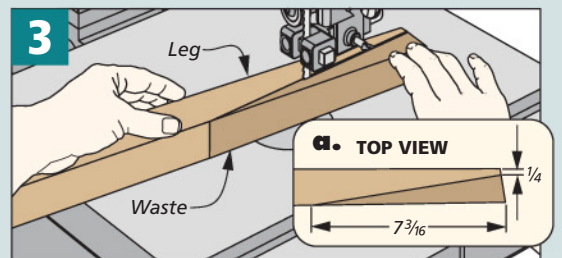
Shape the Legs



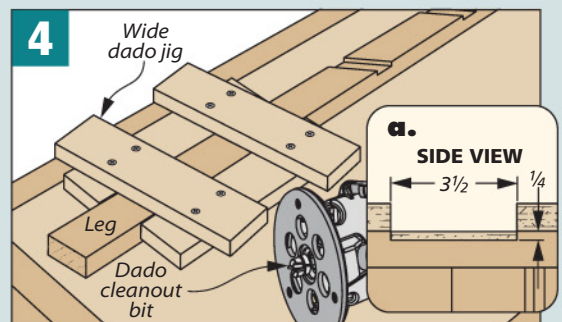
Dado Jig. This simple dado jig works with a dado cleanout bit in your router to cut three dados at a time. Details for building it are on page 64.



Long Tapers. To ensure smooth cuts and consistent results from leg to leg, I made a jig for the table saw for cutting the long tapers.



Short Tapers. For the second tapers where the legs come together at the top, cut them carefully at the band saw before sanding them smooth.



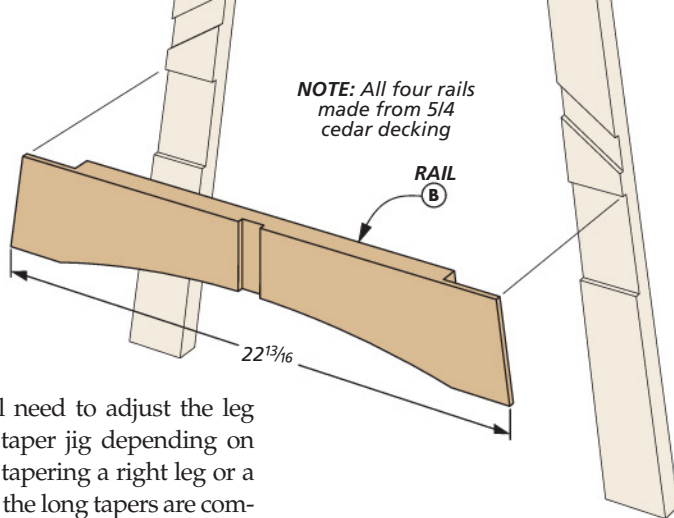
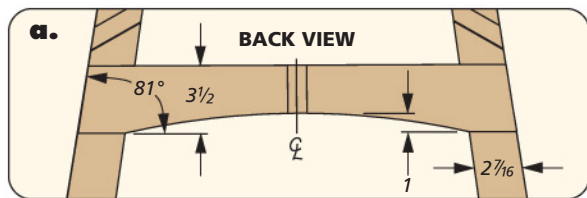
Wide Dados. This router jig is similar to the one shown above but wider. Use care when routing so that the router doesn't tip into the wide opening.

Start with the Legs

The place to begin your work on the garden tower is with the legs. There are eight legs total: Four right legs and four left legs. And as you can see above, these aren't your ordinary furniture legs. They're tapered from top to bottom and feature angled dados to hold the lattice strips, as well as a wider angled dado at the bottom to accept the rail.

LEG BLANKS. This may all sound a little overwhelming, but it's easy to make the legs by tackling them one step at a time. And that starts with making blanks from cedar decking that match the overall length and width of the legs. You can see the blanks for the right and left legs in details 'a' and 'b' above. Make sure to remove the rounded edges of the decking as you're sizing the blanks. Then lay out the shape and dado locations, and finish up the blanks by trimming the miters at the top and bottom of each.

DADOES. The six angled dados on each leg that hold the lattice strips are the next order of business. You'll notice that they're all 1" wide and equally spaced from one another. Also, the dados on the right legs are mirror images of those on the left. These cuts would



be a tough task at the table saw, so I made a couple of mirror-image jigs that can be used to rout three of the dadoes at a time (Figure 1, previous page). The jig details are in Shop Notes on page 64.

TAPERS. With all the dadoes for the lattice strips cut, the next step is cutting the long taper on each leg. With a taper of this length, it's tough to get the precision needed with a band saw. So I opted to make a simple taper jig for my table saw. This is shown in Figure 2 on the previous page and in Shop Notes on page 65.

Note that you'll need to adjust the leg position in the taper jig depending on whether you're tapering a right leg or a left leg. Once all the long tapers are complete, the shorter taper at the top of each leg is accomplished with a simple band saw cut (Figure 3, previous page).

WIDE DADOES. There's one other pair of mirror-image jigs to build for these legs, and those are used to cut the wide dadoes for the rails near the bottoms of

the legs. The jig is shown in position in Figure 4 on the previous page, and the details for building it are at Woodsmith.com/magazine/sip. With the legs complete, you can turn your attention to the rails that join each pair of legs.

Add the Rails

RAILS

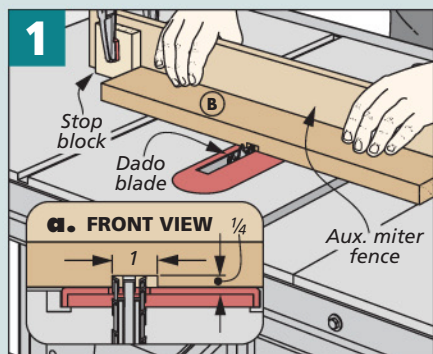
Like the legs, the rails are made from cedar decking. You'll get started by cutting the four rails to their overall dimensions, again removing the rounded edges of the boards.

CENTER DADO. The first order of business on the rails is the center dado. Later on, this dado accepts a pair of center supports that run vertically up each side of the garden tower. Cutting this dado is a simple two-pass process, as shown in Figure 1 at left.

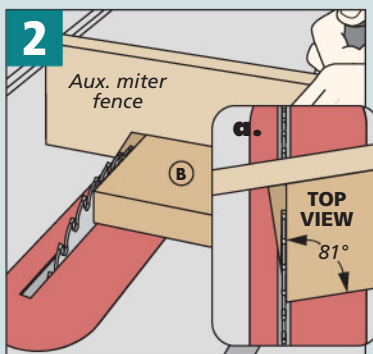
MITERS & RABBETS. You'll notice that the two ends of each rail have miters and rabbets that are mirror images of each other. This requires two mirror-image miter gauge setups to cut them. However, this isn't a difficult process. Just tilt your miter gauge (with an auxiliary fence) to the appropriate angle for one of the miters and rabbets, and make the miter cut on one end of each rail first (Figure 2). Once that's done, switch to a dado blade to cut the wide rabbet on each rail in multiple passes, starting with the shoulder cut first (Figure 3).

Now it's just a matter of reversing your miter gauge setting and repeating the process on the opposite end of each rail, as shown in Figure 4.

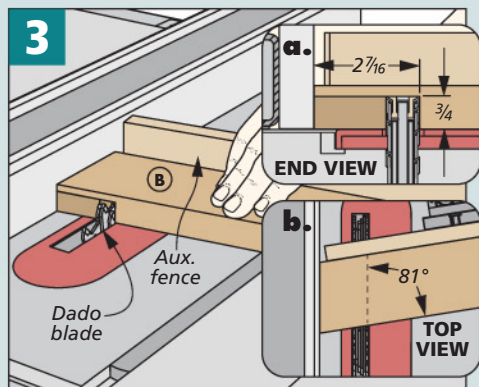
ARCS. The last element on each rail is a subtle arc along the bottom (detail 'a' above). Cut just outside the layout line at the band saw and sand it smooth.



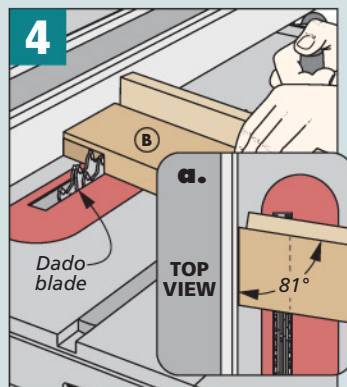
Center Dado. Position the rail slightly off-center, so you can flip it end for end between cuts to center the dado.



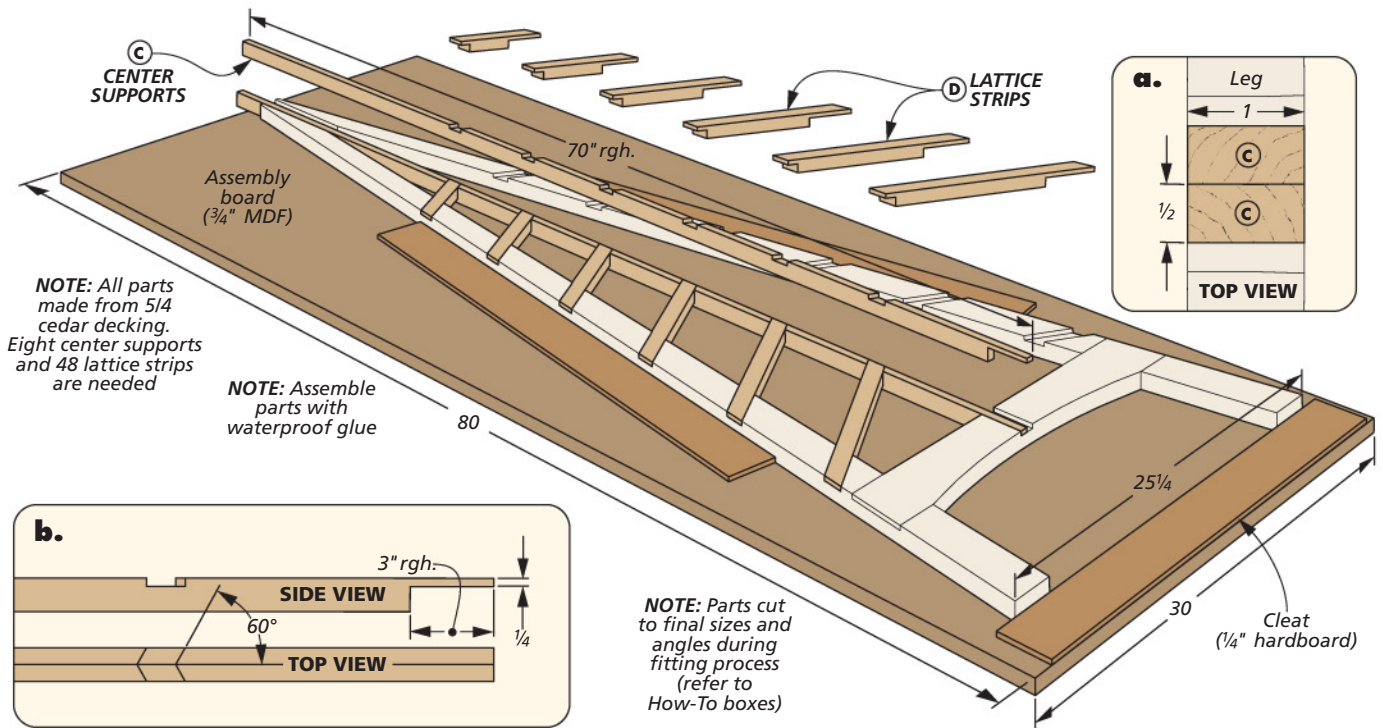
Miters. After setting the miter gauge at the proper angle, trim the miter on one end of each rail.



First Rabbet. Now switch to a dado blade to cut out the rabbet on one end of each rail, starting with the shoulder.



Second Rabbet. Reverse the miter gauge to cut the miter and rabbet on the opposite end.

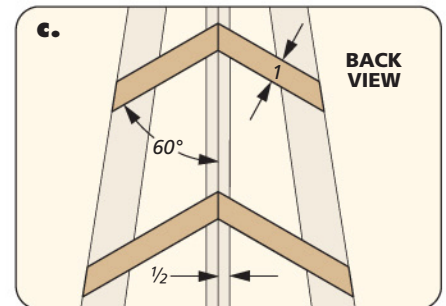


Assembling a Tower Side

The next two parts to add to the garden tower are the vertical center supports, and then the lattice strips that form the "ribs" of the structure. There are quite a few angled cuts involved with putting this all together correctly, so I employed a bit of a different approach for assembling each side of the garden tower. As you can see in the drawing above, it involves laying out the components of a side on an assembly board and cutting each part to fit as you add it to the assembly.

CENTER SUPPORTS

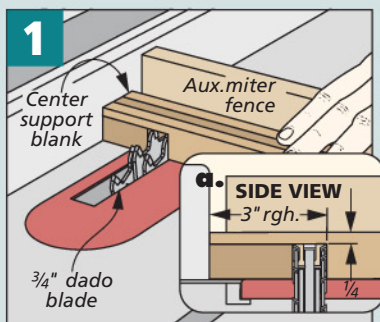
The work begins with the center supports, which are 1" thick and just 1/2" wide. Because of this, it's easiest to prepare an extra-long blank that's wide enough for a couple of strips, and then cut the wide rabbet that will fit over the rail along the bottom of the blank (Figure 1). I actually cut this rabbet a bit wider than needed. This way, it's easy to trim by hand to match the arc on the bottom of the rail later on. With the rabbet



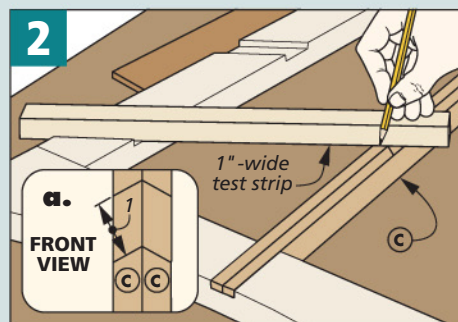
complete, you can rip the center supports to the final overall width.

CENTER SUPPORT DADOES. As you can see in detail 'c' above, each center support requires angled dados that are the

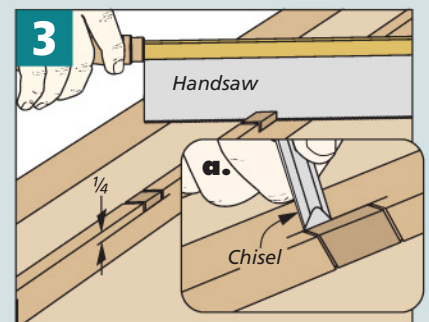
Form the Center Supports



Rabbet Blank. Pass the center support blank over a dado blade, forming the shoulder first.



Lay Out Dados. The easiest way to ensure accuracy with all the center support dados is to use a test strip to help lay them out.



Saw & Chisel. The strips are so narrow that it's easy to complete the dados with some hand tool work.

mirror image of the support right next to it. The easiest way to cut these accurately is to put a whole side together on an assembly board (shown on the previous page), and then use a test strip to lay out the dado locations on the center supports (Figure 2, previous page). Then you can cut them with a handsaw and chisel (Figure 3).

LAYOUT FOR LATTICE STRIPS

Now you're ready to turn your attention to the lattice strips that fit the dadoes in the legs and the center supports. There are 12 strips for each side, 48 in all, so you can get started by ripping a number of extra-long strips for the "cutting and fitting" portion of the process that's coming up next.

Each lattice strip is a different length. And due to the taper on the legs, they also have a different angle of miter cut

on the outside end of each. However, following this layout and cutting procedure should simplify the process.

CENTER MITERS & RABBETS. One thing that's consistent on each lattice strip is the angle of the miter and rabbet where they meet on the center supports (detail 'c', previous page). So after setting up your miter gauge at the proper angle, you can trim that miter and then switch to a dado blade for cutting the rabbets (Figures 1-3 below). Note that you'll need to rotate the miter gauge the opposite direction to cut the miters and rabbets on the mating strips.

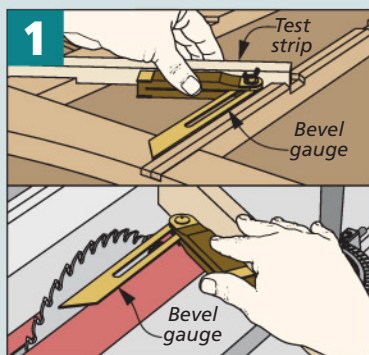
OUTSIDE MITERS & RABBETS. The outside miters and rabbets, of course, are a little trickier. The legs are tapered, which means each miter is a slightly different angle, and each rabbet will be a different size. However, you can ease the process by laying all the strips into the assem-

bled side on your assembly board. Then mark and cut the outside miter on each, as shown in Figure 4 below.

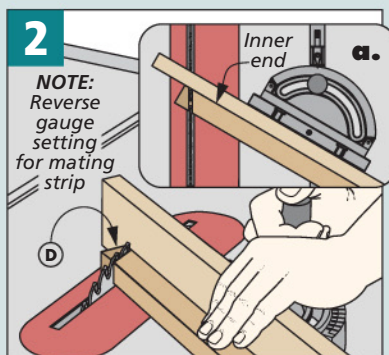
The angle on the shoulder of each rabbet will be consistent on all the lattice strips. But the overall width of the rabbet will differ. To tackle this, mark the location of each rabbet shoulder as indicated in Figure 5. Then you can rotate your miter gauge to match the shoulder angle, and line up the shoulder line with the dado blade. Cut the shoulder of each rabbet first (Figure 6), before sliding the strip in order to remove the rest of the waste with a few more passes over the blade.

REPETITION. You're finally ready to glue and clamp all the pieces of the tower side together. Of course, there isn't just one side of this garden tower, but four. So you'll need to repeat the process again for the other sides of the project.

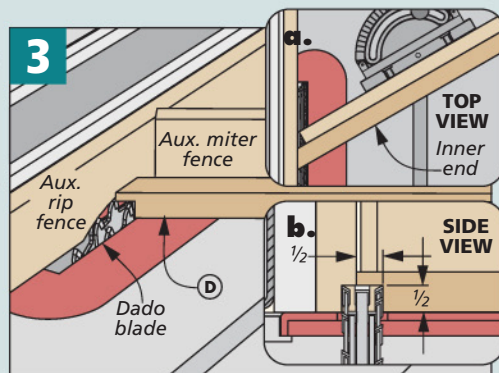
Add the Lattice Strips



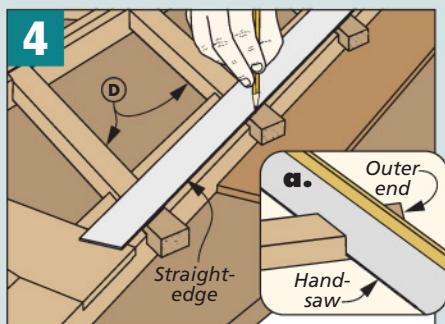
Position Miter Gauge. Use a sliding bevel gauge to position the miter gauge for the center miters.



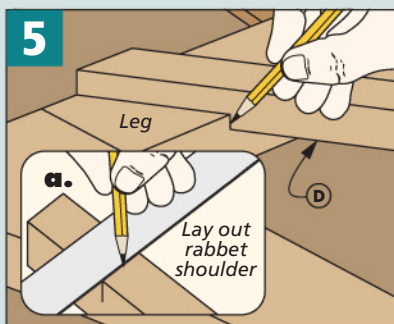
Miter. Now you can trim the miters on the lattice strips where they'll meet in the middle.



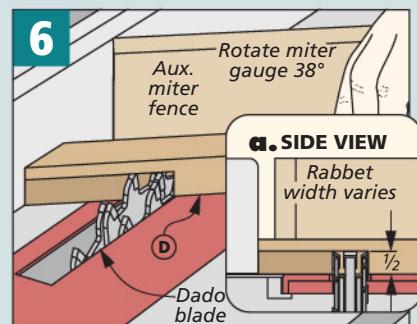
Rabbets. Switch to a dado blade, and cut the rabbet on the end of each lattice strip using the same miter gauge setting.



Outside Miters. Place all the lattice strips into the assembled side, and then mark and cut them to final length.



Rabbet Layout. Now reinsert the lattice strips, and lay out the rabbet locations on each one.



Rabbets. The final step on the lattice strips is to cut the rabbet that will fit in the legs on each one.

Putting it all Together

At this stage, you should have four assembled tower sides. All that's left is putting them all together with the help of some quarter-round molding, and then adding the crowning touch — the finial base and finial.

QUARTER ROUND. If you look at detail 'a,' you'll notice that the sides of the tower don't overlap. Rather, they meet corner to corner. The holding power between the sides is provided by the strips of quarter-round molding that fill the openings between the sides.

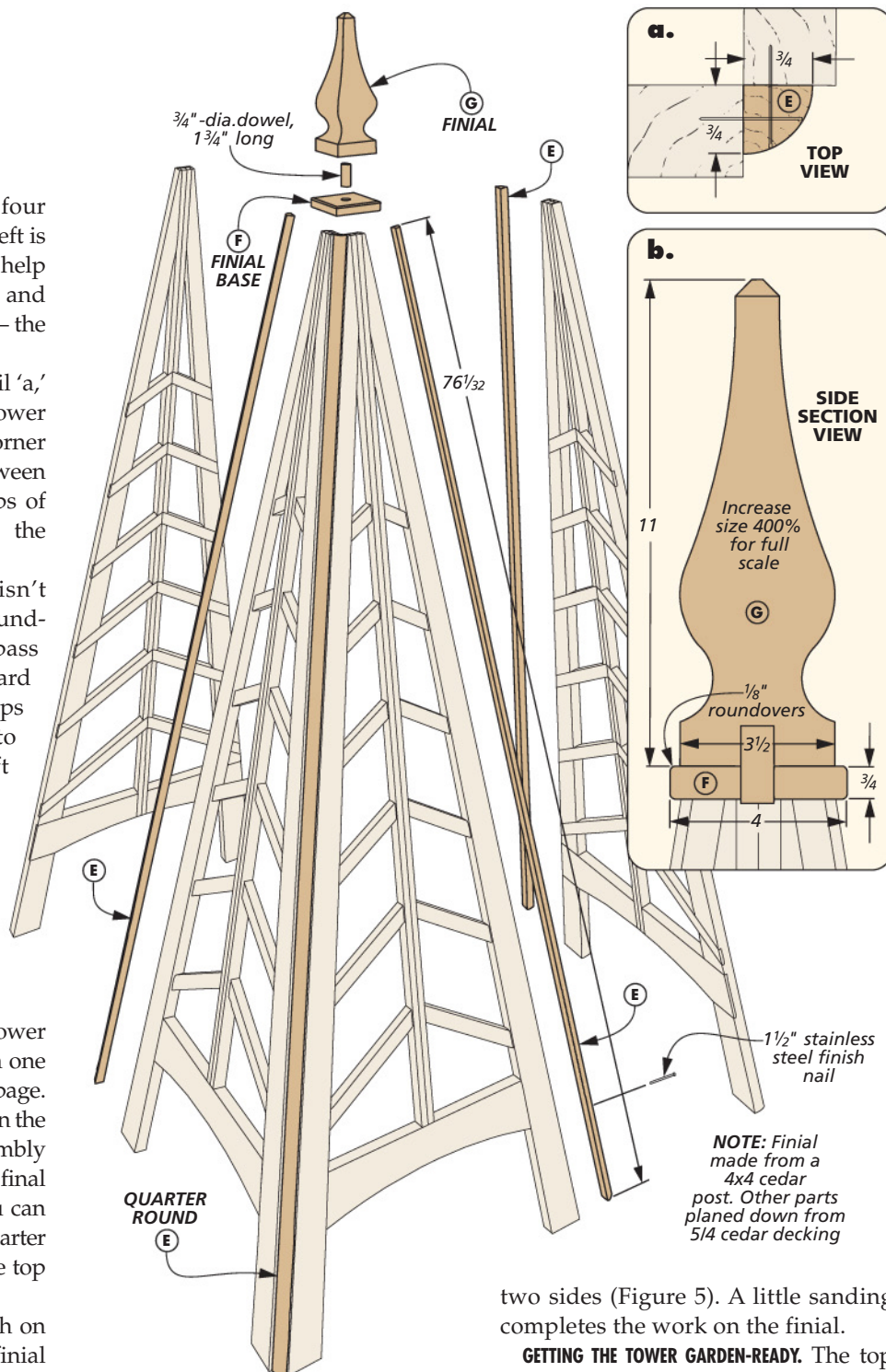
Making this quarter round isn't difficult. You just set up a $\frac{3}{4}$ " round-over bit in the router table and pass both edges of a $\frac{3}{4}$ "-thick cedar board through it. After ripping those strips to $\frac{3}{4}$ " wide, repeat the process to make a total of four strips. I left them extra-long at this point.

TOWER ASSEMBLY. With the quarter round in hand, you can glue and nail the strips to two of the sides, flush with the inside edges (Figure 1, following page). Use stainless steel finish nails, so that they won't rust or stain the cedar.

Next you can clamp the entire tower assembly together with it lying on one side, as shown in Fig. 2 on the next page. Once it's all aligned, glue and nail on the top side. Now flip the entire assembly over in order to glue and nail the final side in place. With that done, you can trim any excess off the end of the quarter round, so it lines up flush with the top and bottom of the tower.

FINIAL PLATE & FINIAL. The final touch on the garden tower is a decorative finial mounted to a base. The base is nothing more than a square made from cedar. You'll round the edges with a $\frac{1}{8}$ " roundover bit and then drill a centered hole for a dowel used to mount the finial, refer to detail 'b' above.

The finial is a little more elaborate. It's cut to shape on the band saw. (There's a full-size pattern available online at Woodsmith.com/magazine/sip).



But first, you'll want to drill the hole in the bottom of the finial blank for the dowel while it's square (see Figure 3 on the next page).

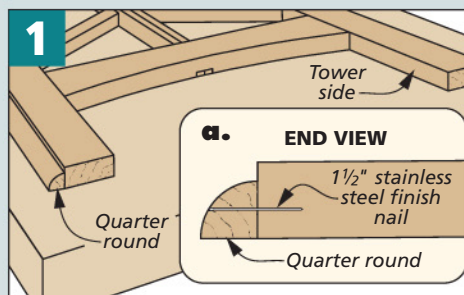
Cutting the finial isn't as difficult as it looks. Start by cutting out the shape on two opposing sides, as in Figure 4. Then reapply the cutoffs with double-sided tape before cutting the other

two sides (Figure 5). A little sanding completes the work on the finial.

GETTING THE TOWER GARDEN-READY. The top of the tower where the four sides come together is likely not completely flat, but you can take care of that with some sandpaper. Then nail on the finial base, and use a dowel and glue to secure the finial. Now all that's left is finding the perfect spot in your yard or garden for your new piece of artwork. It's sure to start some conversations at your next outdoor gathering.

Assemble the Tower

FIGURE 2

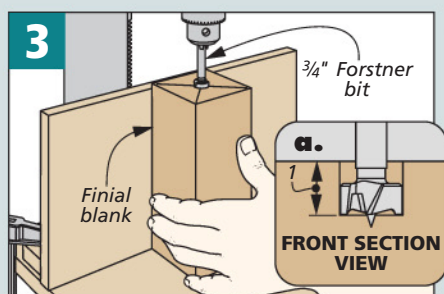
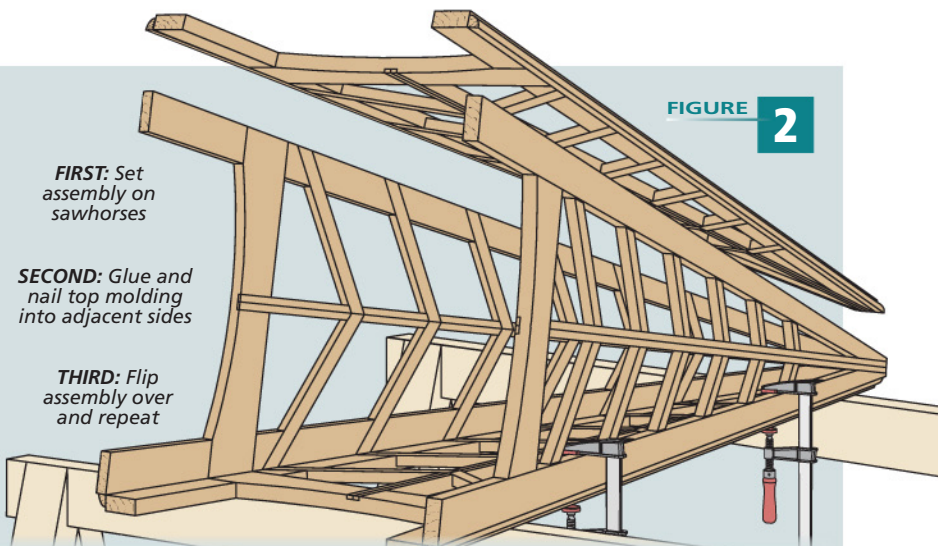


Quarter Round. Start by gluing and nailing the quarter round molding to two sides of the tower. Use stainless steel finish nails.

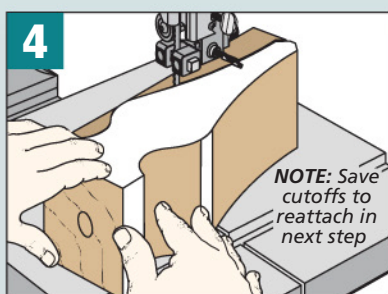
FIRST: Set assembly on sawhorses

SECOND: Glue and nail top molding into adjacent sides

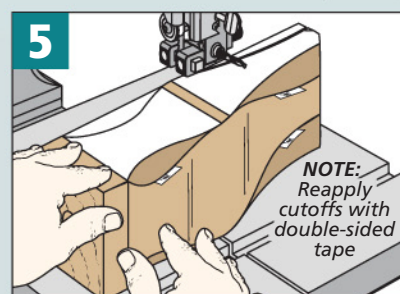
THIRD: Flip assembly over and repeat



Dowel Hole. Support the finial blank with a tall drill press fence while boring the hole for the dowel.



Cut to Shape. Apply the pattern, and cut along two sides of the finial at the band saw to form the shape.

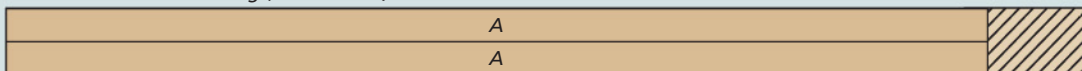


Final Cutting. After taping the cutoff pieces back to the blank for support, you can complete the finial.

MATERIALS, SUPPLIES & CUTTING DIAGRAM

A Legs (8)	1 x 2 ⁹ / ₁₆ - 76	E Quarter Round (4)	3/4 x 3/4 - 80 rgh.	• 1 1/2" Stainless Steel Finish Nails
B Rails (4)	1 x 3 1/2 - 22 ¹³ / ₁₆	F Finial Base (1)	3/4 x 4 - 4	• (1) 3/4"-dia. Dowel
C Center Supports (8)	1 x 1/2 - 66 ⁷ / ₁₆	G Finial (1)	3 1/2 x 3 1/2 - 11	
D Lattice Strips	1 x 3/4 - 575 rgh.			

5/4 x 6" - 84" Cedar Decking (Four Boards)



5/4 x 6" - 96" Cedar Decking



5/4 x 6" - 72" Cedar Decking



5/4 x 6" - 96" Cedar Decking



5/4 x 6" - 96" Cedar Decking



4x4 - 12" Cedar





Two Tables. Removable leaves turn the game table into a dining table, while a set of cleats provides clearance to leave a game set up for later.

Gaming Table

Whether playing for high-stakes or eating a home-cooked meal, this table makes the perfect place to spend time with friends and family.

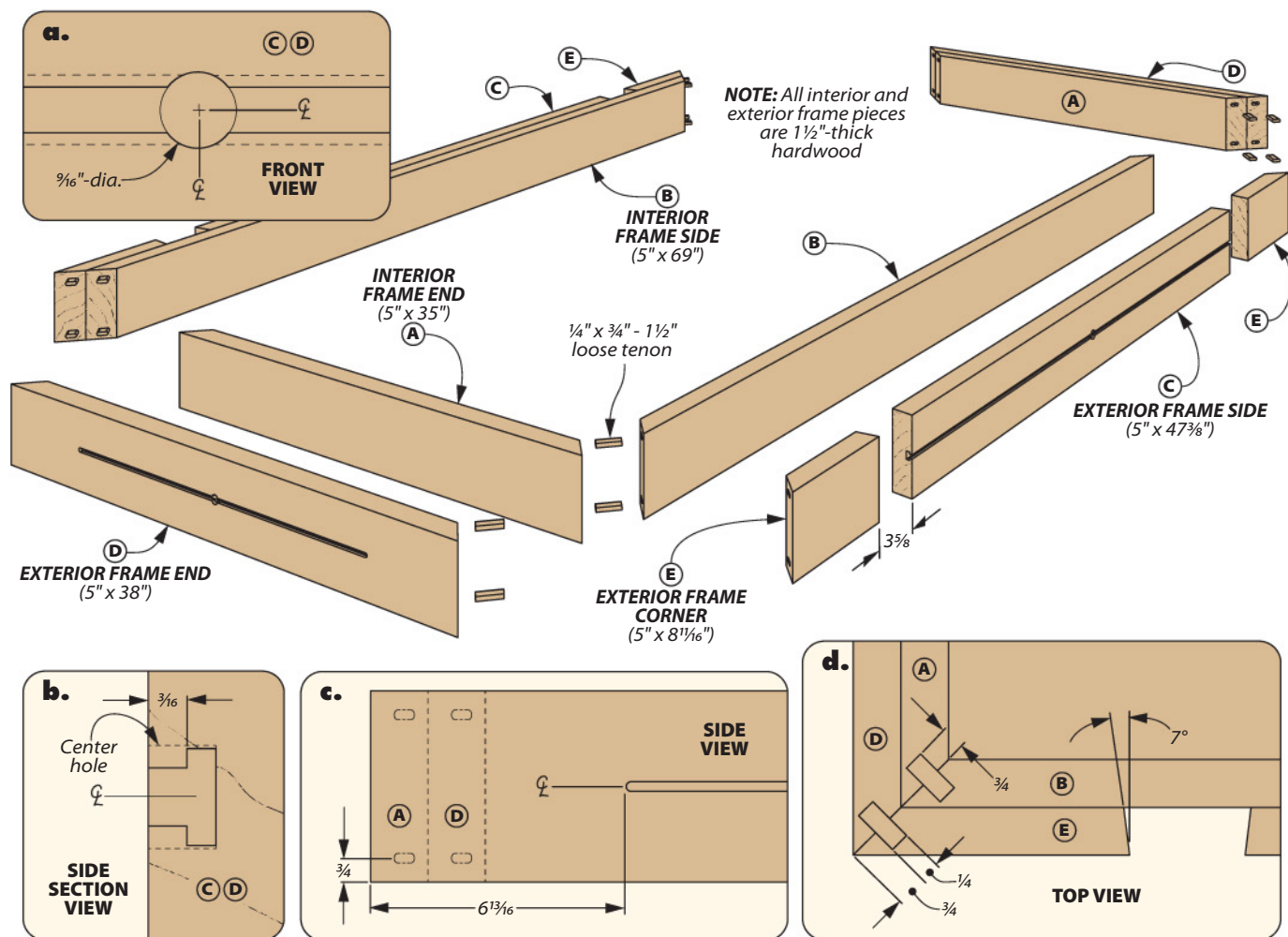
Nothing brings people together quite like a good game. It's a wonderful way to spend an afternoon — and an evening too, depending on the game in question. However, where to host the game is always an issue. Should we clear off the dining table, or all crowd around the coffee table in the living room? A felt-top, break-down poker table is always an option, but often an unsatisfying one, with its wobbly legs and layers of dust after being hauled out of a closet or garage. And what if the game isn't finished by the end of the night? Should we leave the game sitting out, or begrudgingly declare a draw?

As an avid game player, whether of the card, board, or dice variety, I was naturally intrigued by this table when our design editor, Dillon Baker, drew up the plans. The first thing that grabbed me was the construction: thick, black walnut with legs that dovetail into a mighty frame. Of course, I'm not so avid that I need a game table constantly at the ready, which is where the leaves come in. As you can see at left, four leaves drop in over the playing surface (with clearance for any ongoing games) to transform this into a beautiful dining table.

Additionally, Dillon designed a few accessories that fit into the slots in the sides of the table. These can be added and removed as needed, and adjusted for the current player's preference. All in all, this table is sure to be the centerpiece of any room it's in.



Edging & Veneer. Custom veneered and edged panels create a stable, flat dining surface that matches the beauty of the black walnut base.



A Laminated Frame

The work on this table begins with the frame. This frame is laminated together from two layers of walnut and later joined to the legs with dovetails. To make sure these joints fit snugly, we split the outer frame assembly into a number of smaller pieces.

INTERIOR LAMINATIONS. I began by making the interior pieces of the frame. These are large pieces, but they're quite simple. After planing them down and cutting them to width, I mitered them to length. Because of their size, a miter saw worked best.

With the pieces sized and shaped, there's one more order of business before moving to the exterior frame. For additional strength (and an easier assembly) I used a pair of loose tenons in each miter (details 'c' and 'd'). A plunge router and edge guide made these easy, as shown in Figure 1 and its details on the next page.

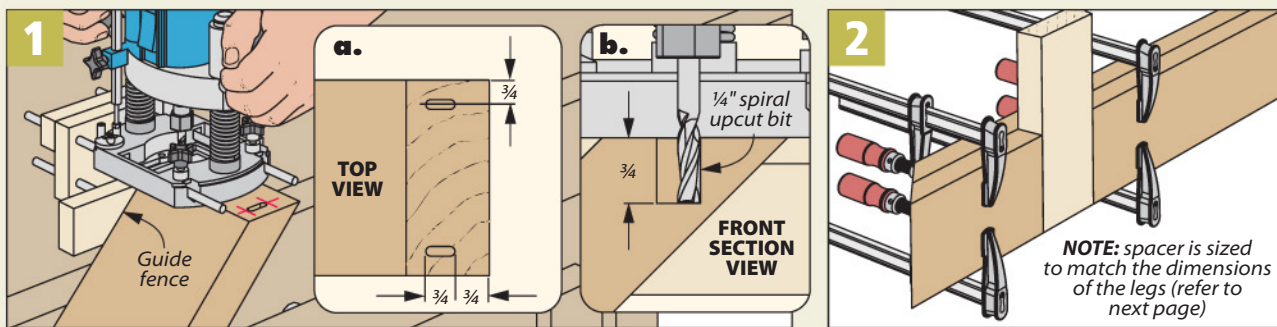


T-Slot Attachments. These three accessories attach to the slots in the frame sides, holding cards, dice, and drinks as you play. Visit Woodsmith.com/magazine/sip to see how to build these, as well as the leaf removal tool.

FRAME EXTERIOR

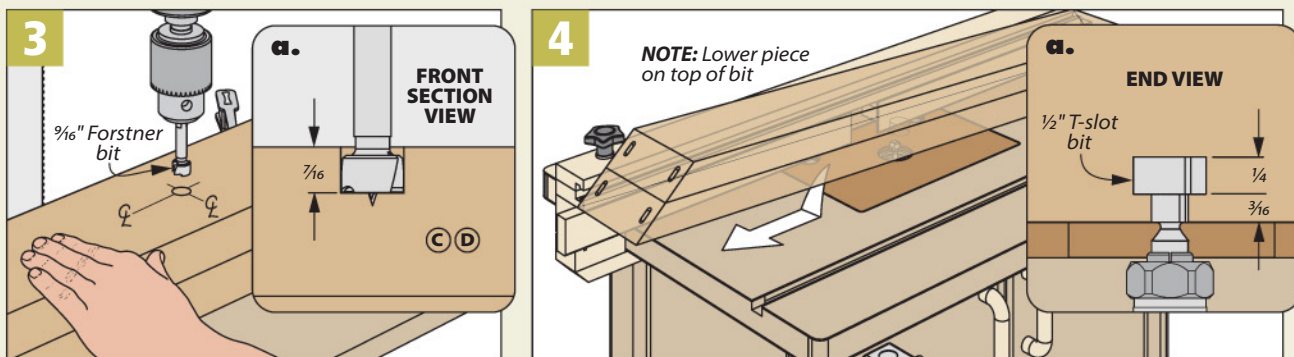
The outside of the frame will be a repeat in some ways of what you just did, but with a few additional steps along the way. The exterior consists of eight pieces. These will be cut to width and mitered as you did with the interior parts, but a few pieces will also need to be cut to length at a different angle (detail 'd').

Framing Up The Table



Routed Mortises. The mortises in the mitered corners of the frame hold loose tenons to help align the pieces during assembly and add strength to the joint. Make these using a plunge router, a spiral upcut bit, and an edge guide.

Side Glueup. When gluing together the frame pieces, apply wax to keep the spacers from being glued to the assembly.



Starting the Slots. Use a Forstner bit to drill a centered hole in the exterior ends and sides. This provides space to insert the T-slot bit.

T-Slots. To create the T-slots, first set the fence so the bit is centered on the workpieces. Lower the workpiece over the bit, then rout one side of the slot. Flip the piece to rout the other side to avoid backrouting.

When sizing these, I recommend making a spacer that matches the angle of the legs (detail 'd') and their width (dimensions on the next page). This way you can sneak up on the final fit to ensure a gap-free joint between the frame and the leg assemblies. I began with the frame ends, then made the corner pieces they miter against. To find the exact size for the exterior sides, I dry fit the spacers in place and slowly worked to get the sides fitting snugly between.

FACE GLUEUP. Once the exterior pieces have been cut, the frame can be assembled. To cut the mortises on the mitered ends, I used a router with a spiral upcut bit, along with an edge guide to keep the mortises aligned (as in Figure 1 above). After making the mortises, glue the exteriors to their matching interiors. As you can see in Figure 2, I used the leg spacers to assist when gluing up the sides.

ACCESSORY SLOTS. The photo at the bottom of the previous page shows a selection of accessories for the game table. These attach using T-bolts which slide into slots in the sides and ends of the frame (details 'a' and 'b,' previous page). To kick these off, use a Forstner bit to drill a centered hole (Figure 3). This will provide a starting point for routing the slot, and an entry point for the T-bolts in the accessories.

To create the slots, I used a T-slot bit at the router table (as in Figure 4). I set the fence so the bit was centered on the workpiece, then marked the bit's location on the fence along with the locations of the centered holes on the workpieces. This way, the hole can be lowered over the bit for the stopped slots.

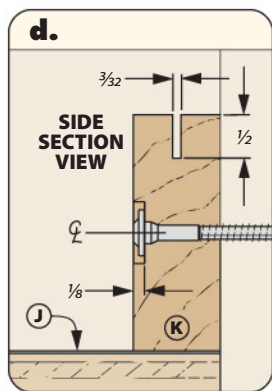
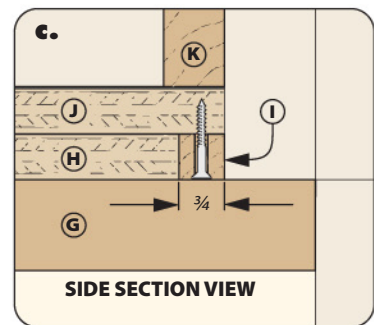
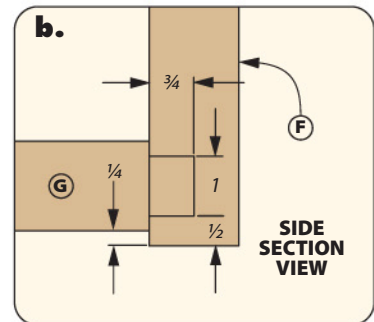
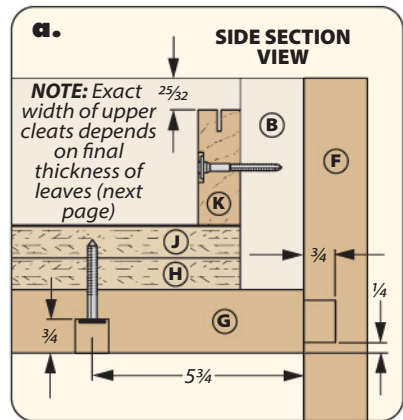
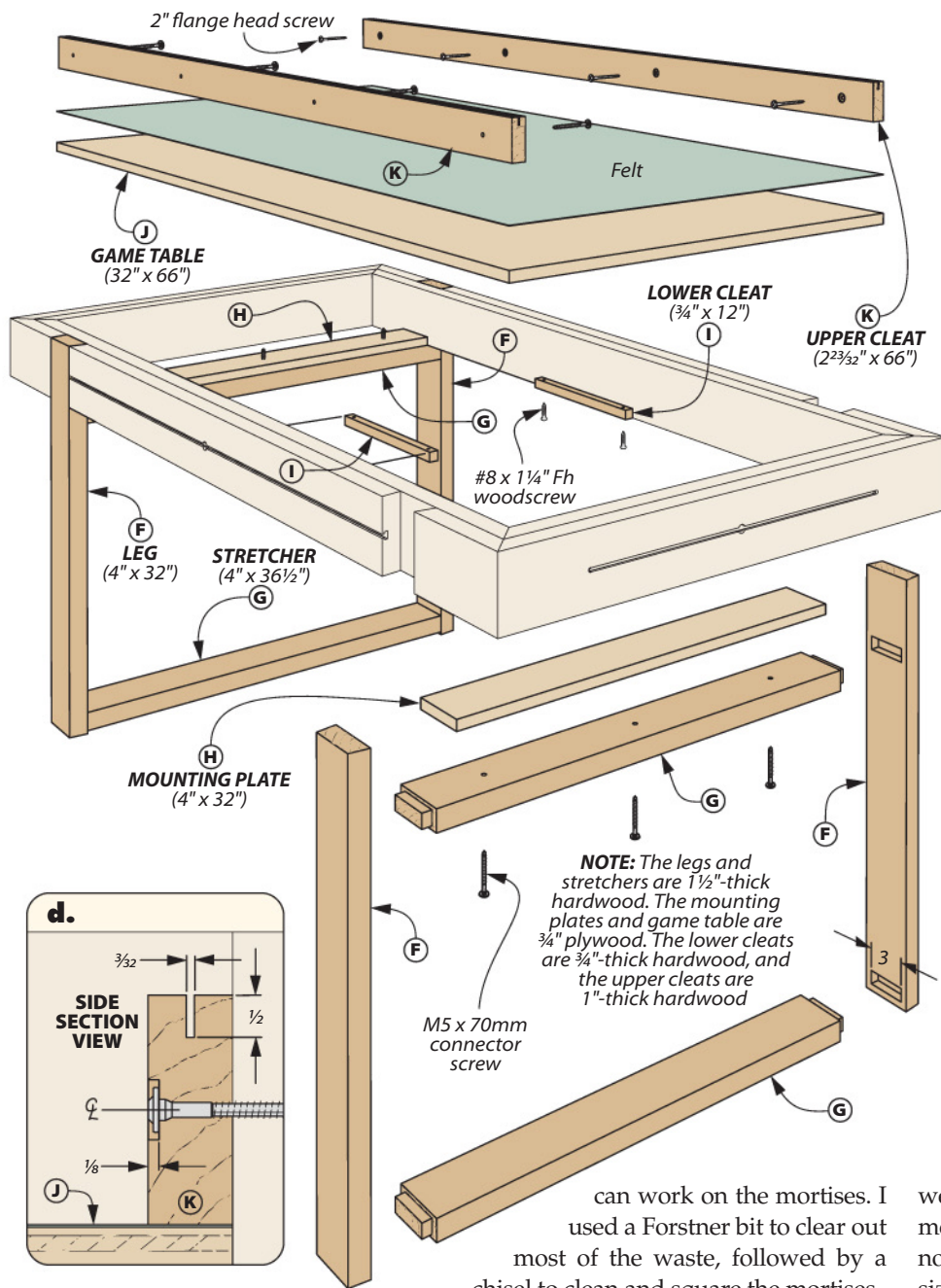
I started with the side pieces. These were through slots, so I began at one end and made a full pass through. The end

pieces however are stopped slots. Here I marked out the stopping point for the slots on the workpieces. I then lowered the piece onto the bit (Figure 4), and routed through to the stopping point. Once I reached it, I turned off the router, removed the piece, flipped the board, and finished the slot.

FRAME ASSEMBLY. Each of the four sides are now complete and ready to be joined. I made the loose tenons from hardwood, then gathered up my glue, clamps, and clamping squares. The tenons go a long way in keeping the miters aligned during the glueup, and clamping squares provide good pressure.



For more on making the attachments on the previous page, go to:
Woodsmith.com/magazine/sip



Legs & Game Table

The frame provides a central body to build the rest of the table around, and the first step is to get it standing. Two leg assemblies support the table. For a solid foundation, each assembly is made of two legs joined by two stretchers. These pieces are connected by mortise and tenon joints, as shown in detail 'b.'

LEGS. Since you've already made the frame, you can use the mortises to size the legs. After cutting them to length and bevel-ripping them to width, you

can work on the mortises. I used a Forstner bit to clear out most of the waste, followed by a chisel to clean and square the mortises.

STRETCHERS. The stretchers are another set of simple pieces. After sizing them, they'll need tenons on their ends to match the leg mortises. However, as you size these pieces and cut the tenons you'll want to dry fit the legs into the frame and sneak up on the stretchers' final size. This will ensure that the leg assemblies are aligned with the frame.

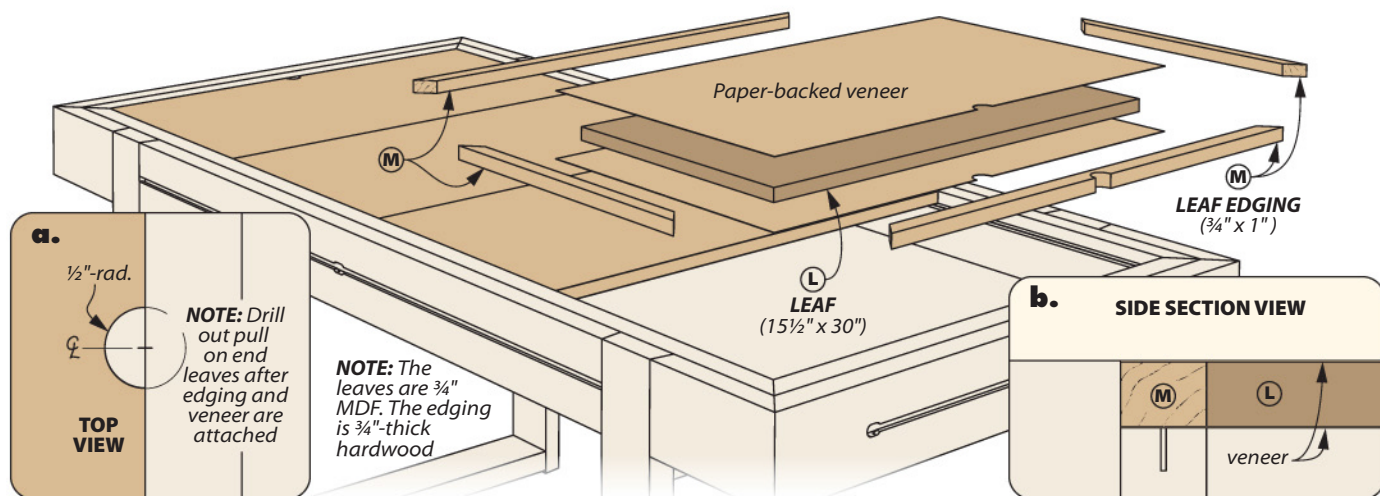
STANDING UP THE LEGS. Now it's time to put these together. Glue up the two leg assemblies. Once dry, they can be glued to the frame.

PLATES & CLEATS. The playing surface is the next big item on the docket, but first

we'll need the pieces that support it: the mounting plates and lower cleats. For now, both of these pieces can be cut to size. Then, the cleats can be glued to the interior sides of the frame (detail 'c').

PLAYING SURFACE. The playing surface is a plywood panel. However, like any classic game table, this will be wrapped in felt to give it a nice texture and keep pieces from sliding. I used simple, green felt, and glued it down with fabric glue. Now the surface can be attached with screws (details 'a' and 'c'). I first set it onto the cleats and mounting plates, then used large C-clamps to hold it in place. After drilling the pilot holes, I seated the panel with woodscrews.

UPPER CLEATS. A pair of upper cleats enclose the playing surface, support the



leaves (which we'll be adding next), and have a narrow slot for setting your cards in as you play (detail 'd,' previous page). To make the slots, you'll need a thin-kerf table saw blade. Center the blade on the edge of the piece, then cut.

Finally, the cleats can be screwed in place. Prepare by drilling counterbored pilot holes (detail 'd'), then install the screws.

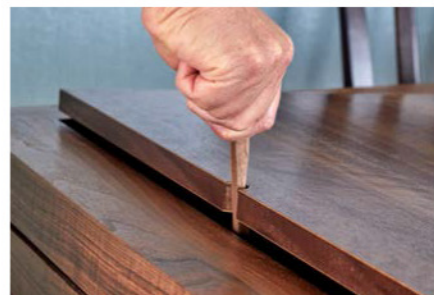
VENEERED DINING LEAVES

A set of veneered leaves finish up this table. These will sit on top of the upper cleats to transform the game table into a dining table.

EDGED & VENEERED. Each leaf is an MDF panel. Of course, while MDF is wonderfully stable, its look is less than appealing. In turn, I surrounded the panels with black walnut edging and covered them with paper-backed black walnut veneer.

After cutting both the MDF and all the edging to size, glue the edging around the panel. Now it's time to veneer. I started with oversized veneer sheets so they could be trimmed flush to the edging. I applied contact cement to both the panels and the veneer sheets. With a bit of help, I laid the veneer onto the panel and rolled it down flat. Once dry, I trimmed

the veneers flush. Finally, I drilled a pull to make them easy to remove with a tool (detail 'a').



Leaf Tool. MDF might be heavy, but this tool makes the leaves easy to remove. See Woodsmith.com/magazine/sip for more.

MATERIALS, SUPPLIES & CUTTING DIAGRAM

- A** Interior Frame Ends (2) 1 1/2 x 5 - 35
- B** Interior Frame Sides (2) 1 1/2 x 5 - 69
- C** Exterior Frame Sides (2) 1 1/2 x 5 - 47 3/8
- D** Exterior Frame Ends (2) 1 1/2 x 5 - 38
- E** Extr. Frm. Corners (4) 1 1/2 x 5 - 8 11/16
- F** Legs (4) 1 1/2 x 4 - 32
- G** Stretchers (4) 1 1/2 x 4 - 36 1/2
- H** Mounting Plates (2) 3/4 ply. - 4 x 32
- I** Lower Cleats (2) 3/4 x 3/4 - 12
- J** Game Table (1) 3/4 ply. - 32 x 66
- K** Upper Cleats (2) 1 x 2 23/32 - 66
- L** Leaves (4) 3/4 MDF - 15 1/2 x 30
- M** Leaf Edging 3/4 x 1/2 - 388 rgh.

- (16) 1/4" x 3/4" - 1 1/2" Loose tenons
- (6) #8 x 1 1/4" Fh Woodscrews
- (6) M5 x 70mm Connector screws
- (8) 1 1/4" Pocket screws
- (1) 36" x 72" Felt sheet
- (8) 2" Flange head screws

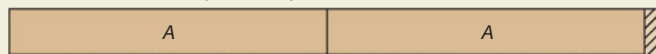
1" x 5 1/2"- 96" Walnut (4.6 Bd. Ft.)



1 1/2" x 5"- 72" Walnut (Four Boards @ 5.0 Bd. Ft. each)



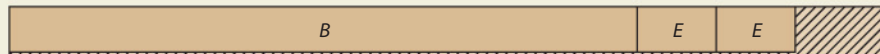
1 1/2" x 5 1/2"- 72" Walnut (5.5 Bd. Ft.)



1 1/2" x 5 1/2"- 96" Walnut (Two Boards @ 7.3 Bd. Ft. each)



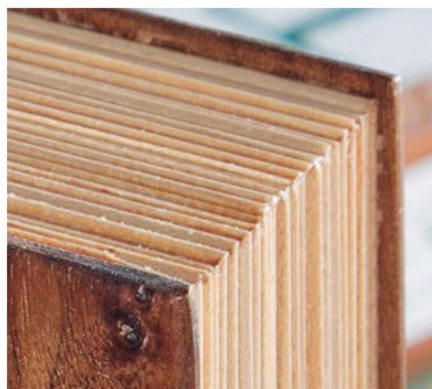
1 1/2" x 5 1/2"- 96" Walnut (Two Boards @ 7.3 Bd. Ft. each)



ALSO NEEDED: One 48" x 96" sheet of Baltic birch plywood, one 48" x 96" sheet of MDF, and two 48" x 96" sheets of paper-back walnut veneer

Book Boxes

These two volumes are clever, easy to produce, and make great gifts. What better way to spend a weekend in the shop?



Faux Pages. The rough-cut look on the sides of the case are created at the table saw. This technique yields the old-world look of deckle edge book pages.

Book boxes evoke mystery. The same kind of mystery that lurks in those special bookcases — the ones where you tilt out a certain book and part of the bookcase opens to a hidden passage.

As you see in the photos above and at left, the two books bear all the anatomy of a standard book, but they're structurally different.

The front and back boards, combined with the leaves of the pages, make up the case. The drawer consists of the spine, which is the drawer front, attached to the drawer box that slides into the case. We'll get to the drawers later. Here we'll build the identical cases. The horizontal

case top and bottom are made of cherry and the vertical case is made of walnut.

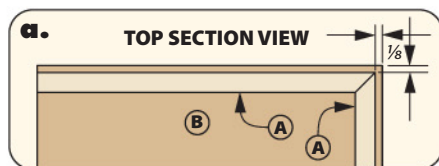
PAGES FIRST. Cut an oversized blank to score the pages in the surface. Then plane the board to thickness. Draw a centerline on the board and install a crosscut-alternate tooth blade in the table saw like you see in Figure 1 on the next page. Use the board to set your fence just off the centerline. Set the height of the blade to make a scoring pass in the surface of the board. After making the first pass, flip the board end for end and make the second pass. Then adjust the fence away from the blade by its width and repeat the process.



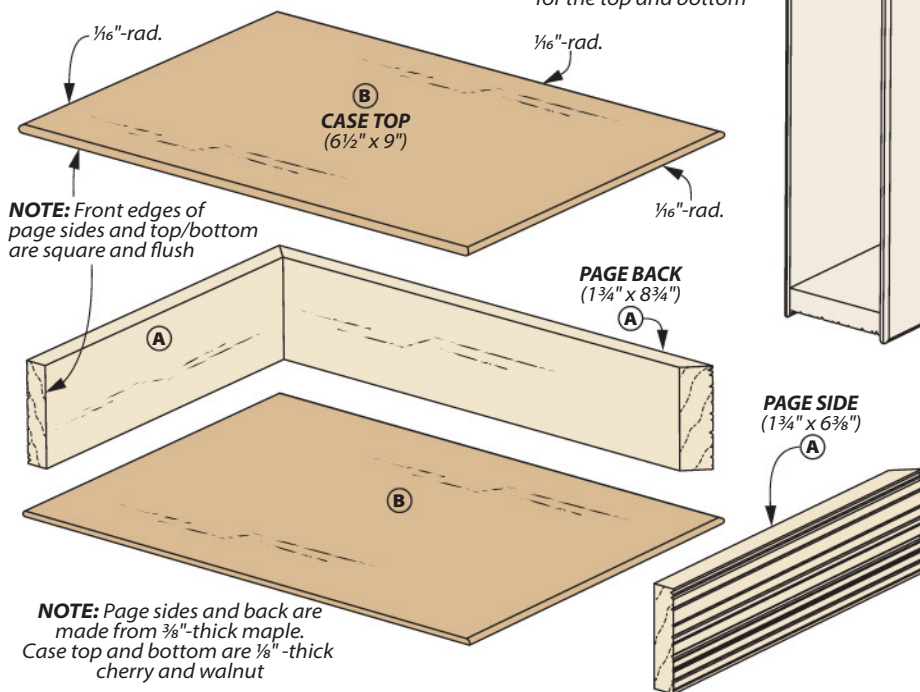
MAKE THE BOARDS. The front and back boards of the book are labeled as the case top and bottom. They're made of cherry (and walnut) planed to thickness. Cut the boards slightly oversized, and plane them $\frac{1}{4}$ " thickness. Then tape them to a sled and finish planing them to $\frac{1}{8}$ " thickness. Carefully pry them off the sled and trim them to their final size, removing any snipe that might have happened during the planing process. Leave the front edge (the edge that the drawer will rest against) square, but dress the other three edges for a book-like look of wear and tear.

GLUE UP THE CASE. Draw the reveal lines along the head, tail, and fore edges of the case top and bottom (detail 'a'). Align the page blank to the reveal line and mark the location of the miters at either end of the board.

Apply glue to the edge and hold it in place on the board until it tacks, then apply the clamps. Repeat this for the remaining two pieces. Now you can glue the remaining board to the pages. There's a good chance you'll have to touch up the crevices in the page corners with some folded sandpaper.



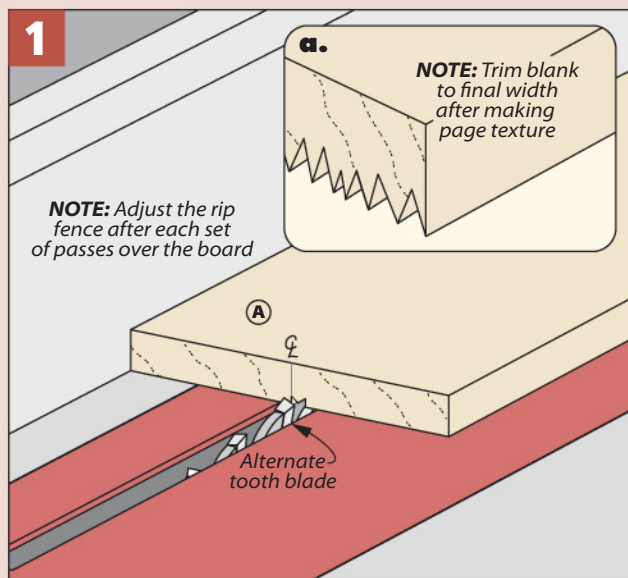
NOTE: The vertical case is identical to the horizontal case in size, but has walnut for the top and bottom



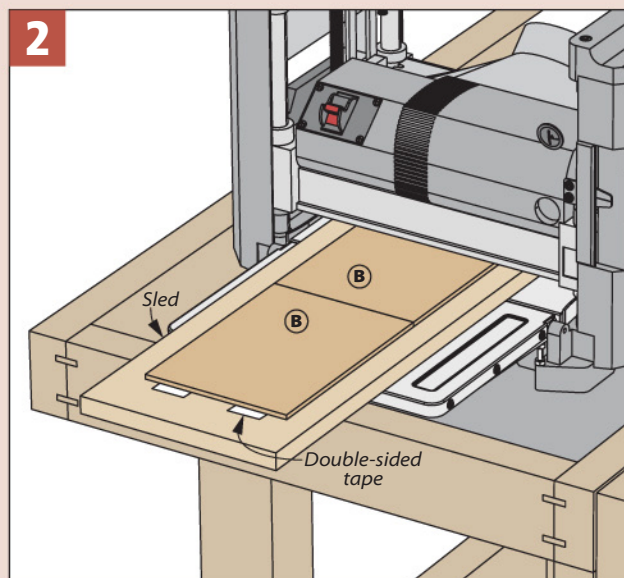
NOTE: Front edges of page sides and top/bottom are square and flush

NOTE: Page sides and back are made from $\frac{3}{8}$ "-thick maple. Case top and bottom are $\frac{1}{8}$ "-thick cherry and walnut

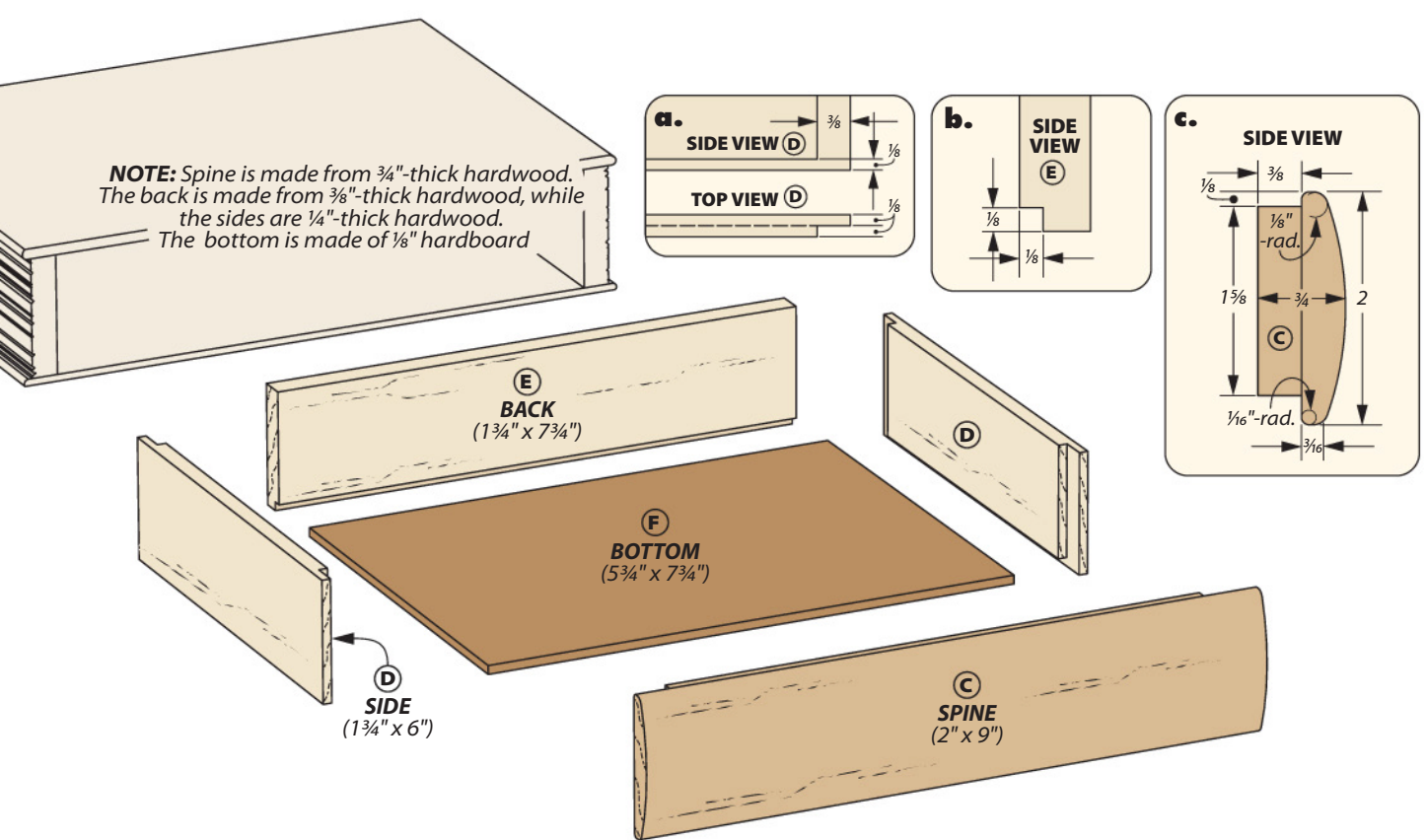
Making Case Parts



Off-Center Start. Creating the page look starts from the center out. Raise (or lower) the blade after each pass to add visual variety to the pages.



Thin Parts. Tape the oversized boards to a sled. After planing them to their final thickness, pry them free and trim each board to final size.



Making Two Distinct Drawers

The drawers that fit in the cases you just made are a simple build with good, solid joinery. The drawer you see above resembles a standard drawer. While the one on the next page is a vertical sleeve that is more like a magazine storage box, providing you with orientation options.

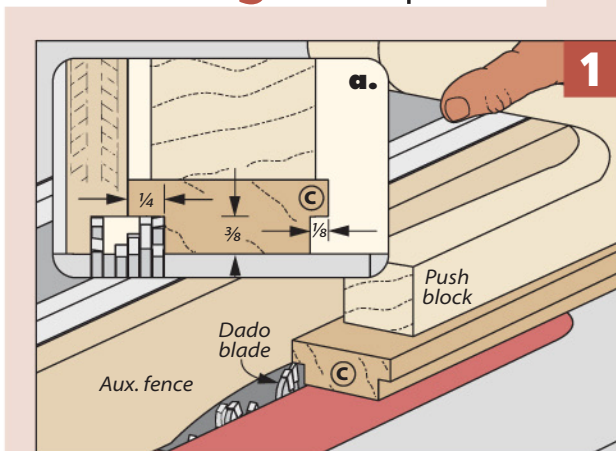
Start with the horizontal drawer. Cut the five parts that make up the drawer to size. Note that the sides are thinner than the back. The spine is made from a piece of $\frac{3}{4}$ "-thick hardwood.

SPINE FIRST. The rabbets on the back of the spine are three different widths.

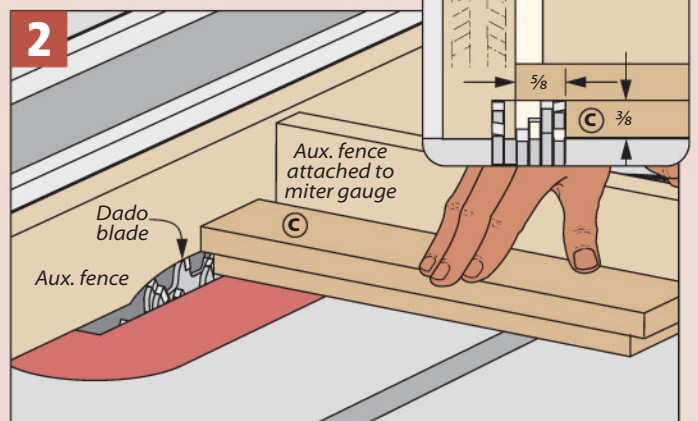
The widest are the two on the ends (Figure 2a). The one along the bottom is slightly narrower than the rabbet along the top (Figure 1a). They're all done at the table saw.

SHAPE THE SPINE. Detail 'c' above shows the profile of the spine. You can use a

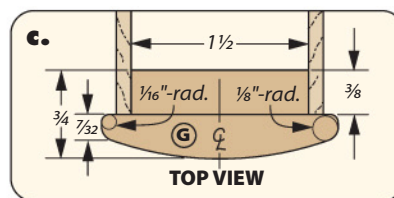
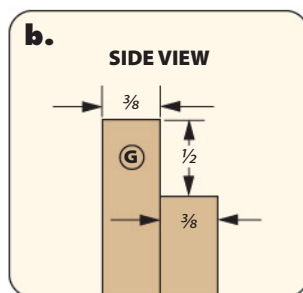
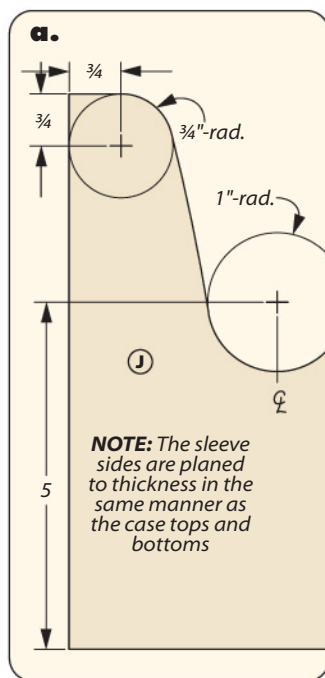
Rabbeting the Spines



Long Rabbets First. A push block holding the spine in place against the rip fence is the safest way to cut the rabbets along the length of the spine.



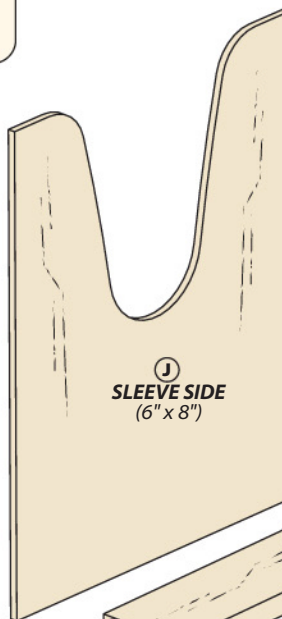
Rabbet the Ends. The ends of the spine are rabbeted as well. Here, you'll use your miter gauge with an auxiliary fence to support the spine during the cut.



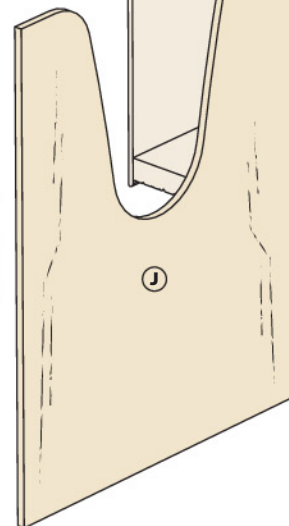
VERTICAL SPINE
(2" x 9")



SLEEVE SIDE
(6" x 8")



SLEEVE BACK
(1 1/2" x 8")



SLEEVE BOTTOM
(1 1/2" x 5 1/4")



NOTE: The spine is made from 3/4"-thick hardwood. The back and bottom are made from 3/8"-thick hardwood. The sleeve sides are made from 1/8"-thick hardwood

belt sander, spoke shave, or a hand plane to create the curved face — whichever tool you feel comfortable with is the right choice.

RABBETS. Cut the three rabbets in the sides, two wider ones for the front and back. Follow this by cutting the narrow one along the bottom edge of the sides and the back (details 'a' and 'b,' previous page). Then you can glue up the drawer.

VERTICAL DRAWER

The spine is similar to the previous version with the exception of the rabbet sizes: details 'b' and 'c' show this. Shaping the face of the spine is a repeat operation. The bottom and back are two boards that are butted together and held

in place by the sides.

THE SIDES. The sides are hardwood panels planed to thickness in the same manner as the book boards of the case were. Circle templates are used to make the openings in the sides and the rounded corners (detail 'a'). That's followed up

by sanding the rough work smooth.

As far as assembly goes: I glued the bottom and back to the sides, then glued the vertical spine in place. After finishing the boxes, they're ready to stow your valuables before they disappear into the bookcase.

MATERIALS, SUPPLIES & CUTTING DIAGRAM

A Page Sides/Backs	3/8 x 1 3/4 - 45 rgh.	E Drawer Back (1)	3/8 x 1 3/4 - 7 3/4	I Sleeve Back (1)	3/8 x 1 1/2 - 8
B Case Tops/Bottoms (4)	1/8 x 6 1/2 - 9	F Drawer Bottom (1)	1/8 Hbdb. - 5 3/4 x 7 3/4	J Sleeve Sides (2)	1/8 x 6 - 8
C Horizontal Spine (1)	3/4 x 2 - 9	G Vertical Spine (1)	3/4 x 2 - 9		
D Drawer Sides (2)	1/4 x 1 3/4 - 6	H Sleeve Bottom (1)	3/8 x 1 1/2 - 5 1/4		

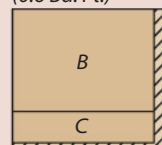
3/4" x 6 1/2" - 54" Maple (5.3 Bd. Ft.)



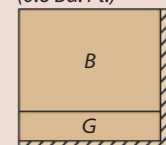
ALSO NEEDED: One 12" x 12" Sheet of 1/4" Hardboard

NOTE: All parts are resawn and planed to final thickness

3/4" x 9" - 10" Cherry (0.6 Bd. Ft.)



3/4" x 9" - 10" Walnut (0.6 Bd. Ft.)





Heavy-Duty Garage Cart

As much as I enjoy woodworking, there are plenty of tasks that occupy my time. Home repair, routine car maintenance, and keeping the mower running tend to fill out weekends. Chris Fitch faces this issue as well, and decided to combine business with pleasure, so to speak. He designed this garage cart to create an organized home for tools and gear. This custom workstation makes checking items off the to-do list much more enjoyable.

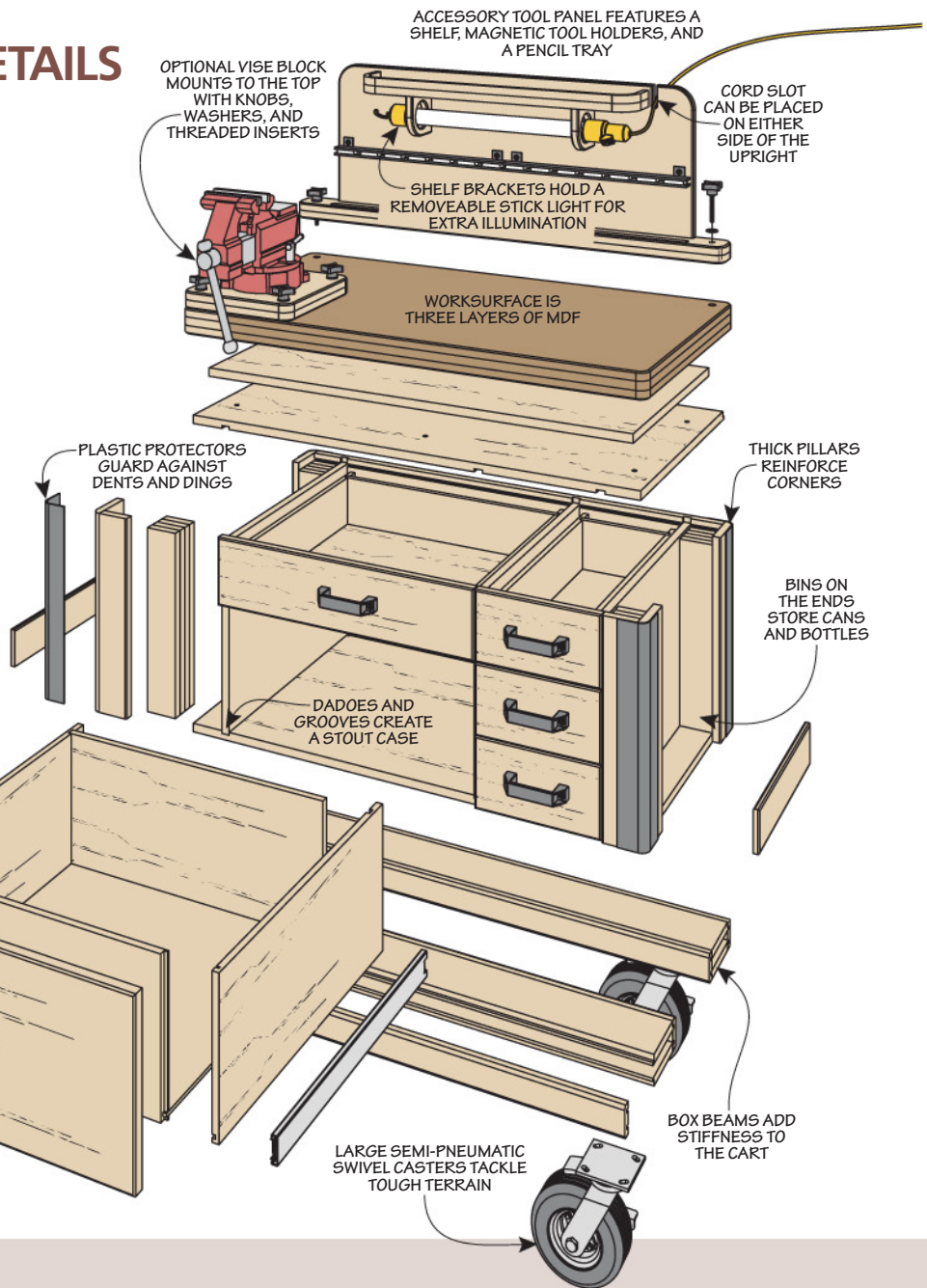
The cart combines a flat, no-nonsense worksurface with a bunch of drawers for storage. Large semi-pneumatic casters give it a smooth ride across cords and debris. Accessories allow for customization. You can add a machinist vise or a vertical tool panel at the back. Art director Todd Lambirth found a great application for the cart. Here he's loaded it up with all the essentials for keeping his hot rods in top shape.

CONSTRUCTION DETAILS

OVERALL DIMENSIONS:
48" W x 36" H x 28" D

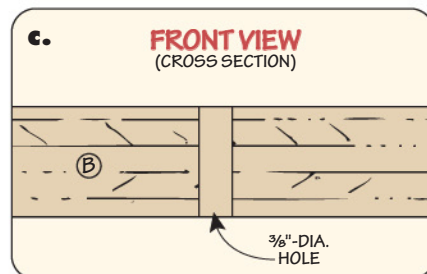
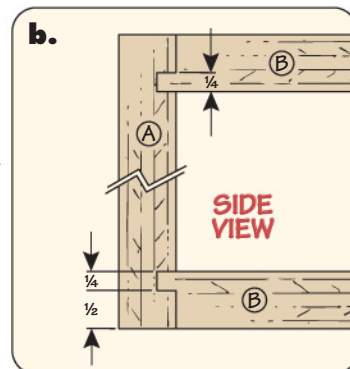
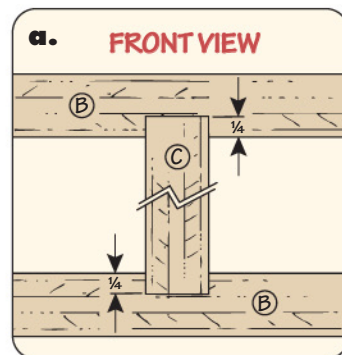
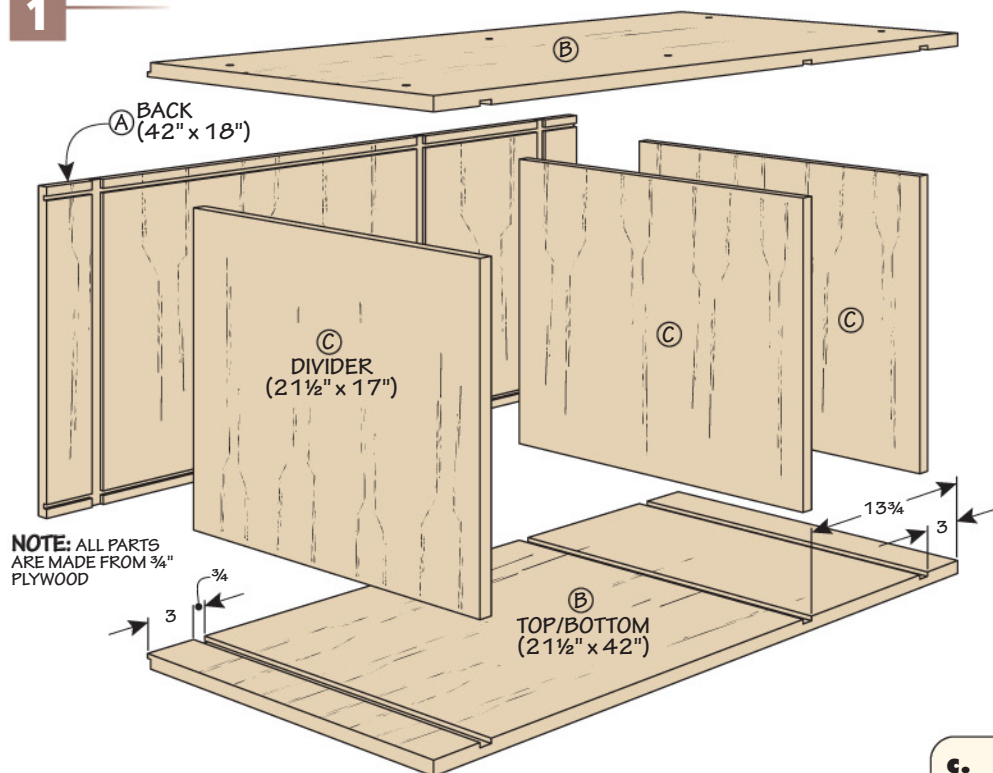


Casters. Big locking swivel casters allow this cart to go anywhere you need it to be. They're air cushioned to roll over obstacles.



MATERIALS & SUPPLIES

A Back (1)	42 x 18 - 3/4 Ply.	O Small Bottoms (3)	8 1/2 x 19 1/2 - 1/4 Hdbd.	• (1) 2 1/2" x 96" Corner Guard (cut to fit)
B Top/Bottom (2)	21 1/2 x 42 - 3/4 Ply.	P Small False Fronts (3)	5 15/16 x 1 11/16 - 3/4 Ply.	• (24) #8 x 3/4" Ph Sheet Metal Screws
C Dividers (3)	21 1/2 x 17 - 3/4 Ply.	Q Uppr. Front/Back (2)	5 x 22 1/4 - 1/2 Ply.	• (22) 3/8" x 3" Lag Screws
D Pillars (4)	3 x 16 1/2 - 3 Ply.	R Large Bottoms (2)	19 1/2 x 22 1/4 - 1/4 Hdbd.	• (28) 3/8" Flat Washers
E Front Stiles (2)	3 x 18 - 3/4 Ply.	S Uppr. False Front (1)	5 15/16 x 24 3/4 - 3/4 Ply.	• (6) 3/8" -16 Threaded Inserts
F End Stiles (4)	3 3/4 x 18 - 3/4 Ply.	T Lwr. Sides (2)	10 3/8 x 21 - 1/2 Ply.	• (6) 3/8" -16 x 2 1/2" Studded Knobs
G Bin Rails (2)	3 3/4 x 15 1/4 - 1/2 Ply.	U Lwr. Front/Back (2)	10 3/8 x 22 1/4 - 1/2 Ply.	• (4) 8" Semi-Pneumatic Swivel Casters
H Spacer (1)	19 1/4 x 40 - 3/4 Ply.	V Lwr. False Front (1)	11 15/16 x 24 3/4 - 3/4 Ply.	• (5 pr.) 20" Full-Ext. Drawer Slides w/Screws
I Top (1)	22 3/4 x 43 1/2 - 2 1/4 MDF	W Mounting Bar (1)	3 x 43 1/2 - 1 1/2 Ply.	• (20) #8 x 1" Fh Woodscrews
J Beam Sides (4)	2 1/2 x 43 1/2 - 3/4 Ply.	X Upright (1)	15 x 36 1/2 - 3/4 Ply.	• (5) 4 3/4" Plastic Drawer Pulls
K Beam Tops/Bttms. (4)	5 x 43 1/2 - 3/4 Ply.	Y Shelf (1)	4 x 28 - 3/4 Ply.	• (10) #14 x 1" Ph Woodscrews
L Vise Block (1)	11 x 11 - 1 1/2 MDF	Z Shelf Lip (1)	4 x 28 - 3/4 Ply.	• (9) #8 x 1 1/2" Fh Woodscrews
M Drawer Sides (8)	5 x 21 - 1/2 Ply.	AA Brackets (2)	4 x 4 - 3/4 Ply.	• (2) 18" Magnetic Tool Holders w/Screws
N Small Fronts/Backs (6)	5 x 8 1/2 - 1/2 Ply.			• (1) Fluorescent Work Light



Sturdy Case

A glance at Figure 1 shows that the skeleton of the cart bears a resemblance to a typical cabinet case. That's a good frame of reference to begin with. Ordinary cabinets don't move across uneven surfaces like this cart is meant to. Which means the construction needs to account for uneven stresses.

OVERBUILDING. In a bit of reversal, I'm starting with the case back. It's made of ¾" plywood instead of the usual ¼" stuff. The extra thickness allows for dadoes to accept the top and bottom (Figure 1b), as well as a set of grooves for the vertical dividers.

CONCERNING DADOES. While we're on the subject, let's examine the dadoes and plywood. Plans like these often refer to full-width dadoes in plywood based on the nominal dimension, ¾" in this case. The actual thickness of plywood sheets varies. Veneer core plywood is typically thinner, while MDF core and combination core often measure pretty close to their stated thickness.

If you cut dadoes at the table saw, you'll need to take some time to dial in the width of your dado stack. I usually use a router. Here, I have standard, undersized plywood, and metric bits to

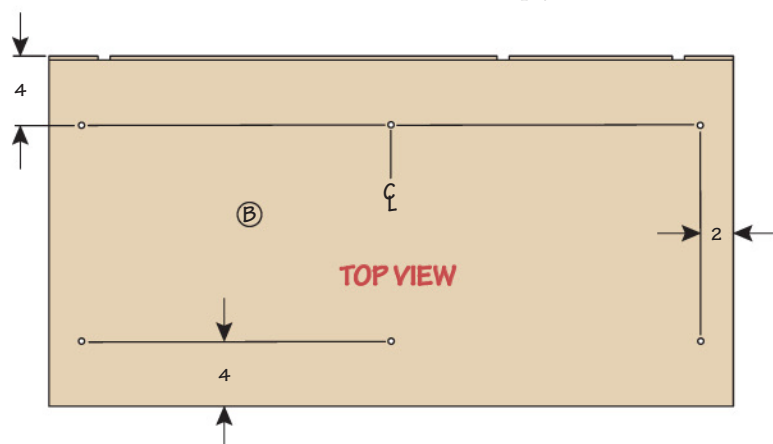
suit the material at hand.

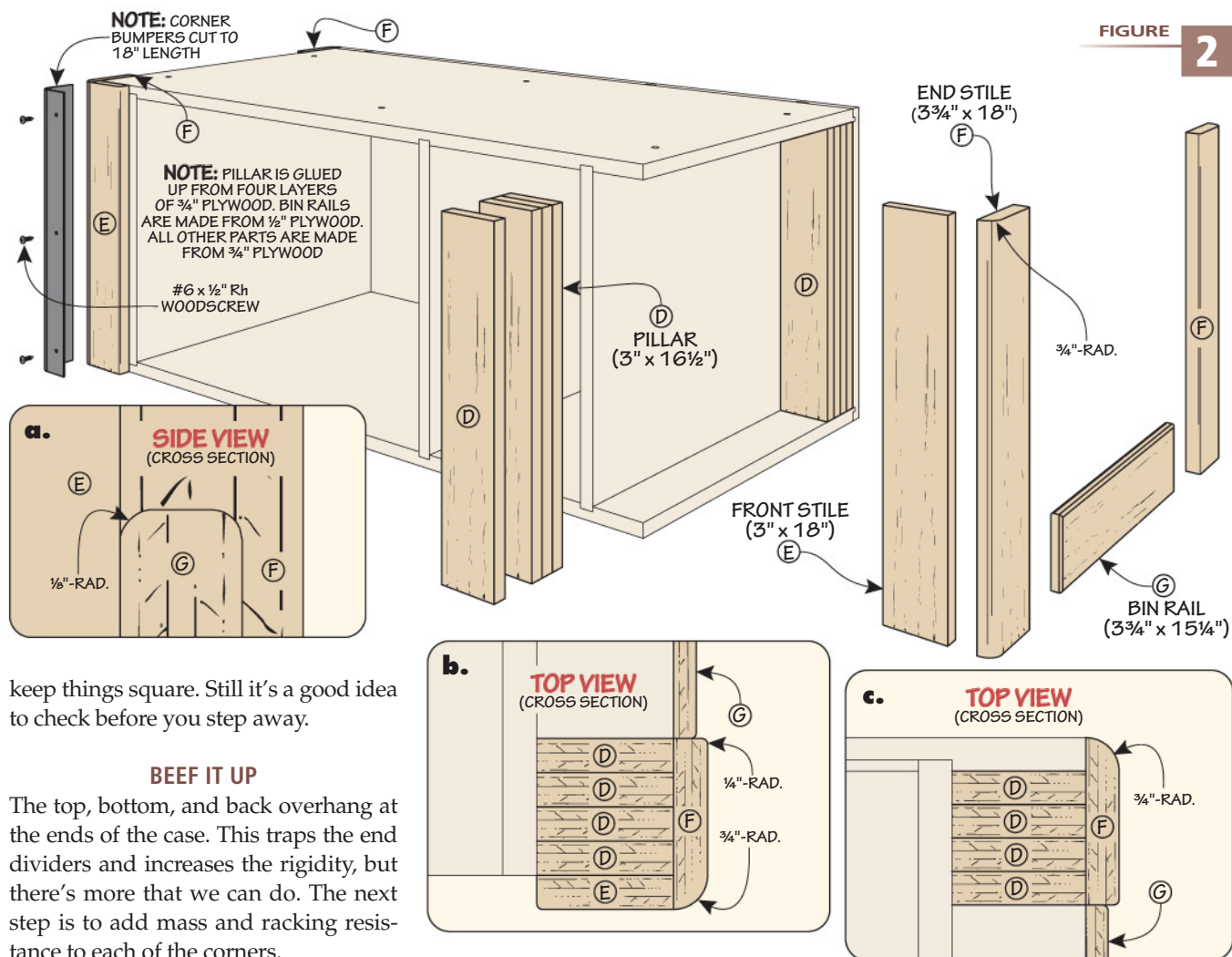
Since this cart will see some jostling, I aim for a tighter fit with the plywood. That means a fit that requires clamps or light mallet taps to seat. A slightly looser fit works in static cabinets, but I want the case of the cart to be as solid as possible.

REMAINING PARTS. The top and bottom have a tongue formed on the back edge to fit the dadoes in the back. You'll also need a matching set of dadoes to house the dividers, as in Figure 1a. Figure 1c and the drawing below detail mounting holes you drill in the top. The dividers only need to be cut to size.

ASSEMBLY. I spread a film of glue into the dadoes in the top and bottom. Then I tapped in the dividers, making sure they're flush at the front and back.

In order to install the back, flip the assembly face down. Add glue and press the back into place. Snug fitting joints and interlocking connections should





keep things square. Still it's a good idea to check before you step away.

BEEF IT UP

The top, bottom, and back overhang at the ends of the case. This traps the end dividers and increases the rigidity, but there's more that we can do. The next step is to add mass and racking resistance to each of the corners.

PILLARS. The means to accomplish this is to glue up pillars from four layers of plywood. This is shown in Figure 2. The width of the pillars matches the overhang on the top and bottom. Slather glue on the ends and one edge to glue the front pillars into place, flush with the front of the cart (Figure 2b). The case back offers another glue surface for the two pillars at the rear.

STILES. At the front of the cart, glue on an extra layer of plywood. Think of these stiles as forming a face frame of sorts. The drawer fronts will sit flush with the stiles when they're complete.

On the ends, a wider stile covers the pillar. A roundover dresses up the outside edge. Figure 2b shows how the stile overlays the pillar and front stile. The case back is covered in the same way, as you can see in Figure 2c.

STORAGE BIN. The remaining parts to make are a pair of rails. Cut them to fit between the end stiles. Take a look at

Figure 2a to see the roundover applied to the upper edges. When these are glued into place, they form a bin at each end of the cart. This is a handy place to corral spray cans or a roll of paper towels for quick clean-ups.

PAINT BREAK. Instead of charging ahead with the construction, this is a good time to hit the pause button. Sand all

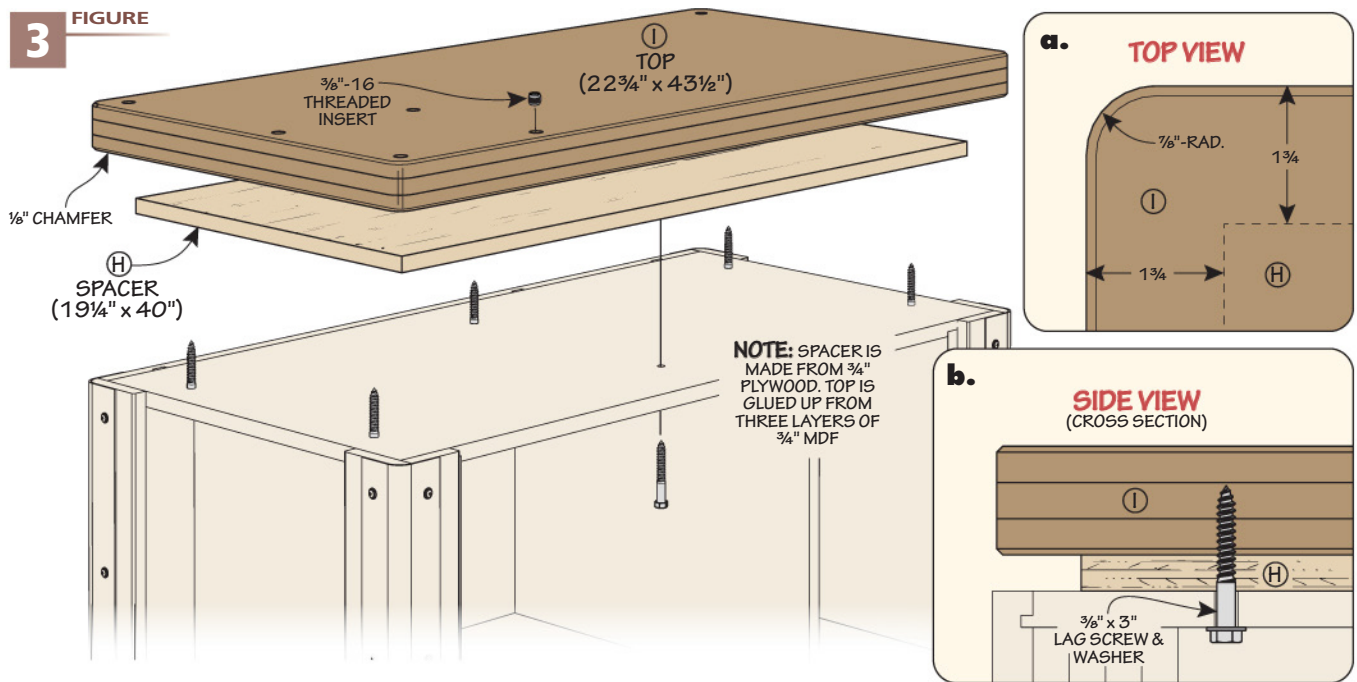
the surfaces and fill any voids and the exposed plywood edges. Then apply a coat of primer to the visible surfaces. Don't forget the inside of the bins. Touch up any imperfections you find, then it's time for the topcoat. Since this cart will see some stuff, an exterior paint is a solid choice.

Corner Bumpers

One of the intended uses of this cart is to serve as home base for car care and repair. While working on your vehicle, you don't want to ding it. The cart has plastic/rubber corner protectors applied. The cushioned surface protects both the cart and your project from collision damage.



3 FIGURE



Utility-Grade Workbench

A strong case sets the stage for the steps that come next. What we'll do in this stage is transform the generic storage case into a working cart. We'll do this by making a benchtop and adding mobility.

THICK, LOW-COST & DURABLE. Chris pictures this cart used for all kinds of tasks, few of them considered "fine" work. Pretty, showpiece tops are unnecessary. Instead the surface should emphasize flatness and the ability to take a punch, so to speak. MDF checks all the boxes with the side benefit of being affordable. Figure 3 shows this.

A plywood spacer creates a shadow line between the case the top (you can see this in Figure 3b). It's centered on the case.

ONE LAYER AT A TIME. Gluing up the three layers that make up the top presents some difficulties. The wet glue lubricates the parts. As you apply clamps, the pieces slide around, foiling your attempts to keep them aligned.

My solution is to slow down. I make the bottom layer first. Cut it to size and round the corners. The second layer is cut a little oversize in length and width. As I glue it on the first layer, keeping it aligned isn't an issue. Just make sure it

overlaps the edges. Once the glue sets up for an hour or so, I trim the overhanging edges using a router and a flush-trim bit. The third layer repeats these steps.

ACCESSORIZE IT. A chamfer eases the upper and lower edges of the top in order to prevent chipping. Then take a look at the drawing below. Those holes accept threaded inserts for some optional accessories you can make: a tool panel and the vise block shown on the next page. The drawing shows the vise position on the front left. But feel free to change it up as you see fit.

Threaded inserts and MDF don't always get along. As you drive the insert, the upper surface of the top tends to raise up. In order to prevent this, I like to chamfer the pilot hole first. The top is attached with stout lag screws, and washers.

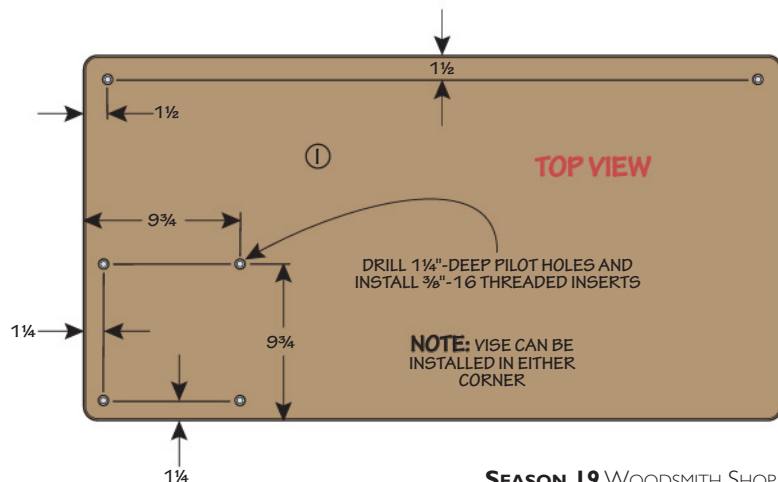
After extensive use, a damaged top is easily replaced with a fresh model.

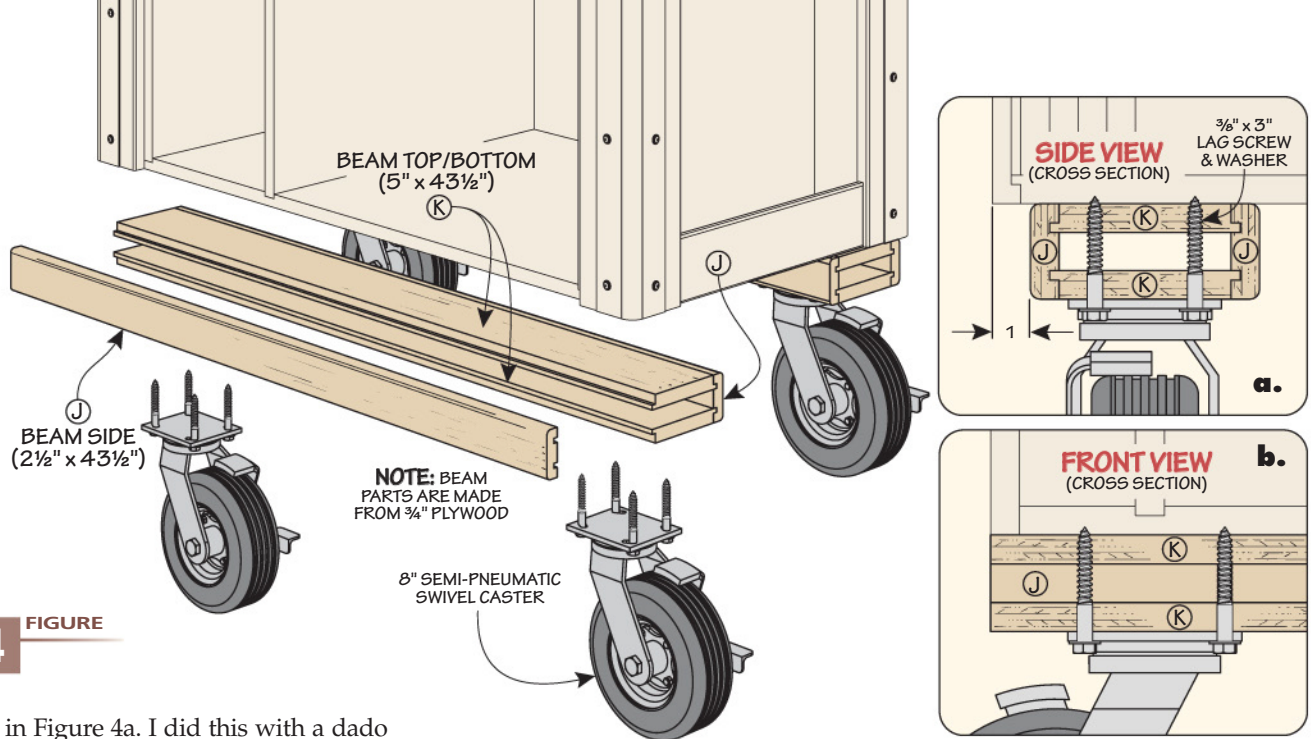
ROLL WITH IT

Let's shift the focus to the bottom of the cart. It would be simple enough to bolt on some casters and call it good. As I said, if this cart sees any "off-road" use, that results in twisting forces that transfer to the case. This will throw off the fit of the drawers.

SUPPORT BEAMS. To solve for this, we'll add long beams to the bottom of the cart as shown in Figure 4 on the next page. These plywood tubes add another level of rigidity — and a little height.

The construction of the box beams uses tongue and groove joinery. After cutting the sides, tops, and bottoms to size, cut grooves in the sides, as you can





4 FIGURE

see in Figure 4a. I did this with a dado blade at the table saw. The top and bottom have tongues formed along the edges. This is also done with a dado blade. An auxiliary rip fence allows you to recess the blade to size the tongues accurately and consistently.

ASSEMBLY & INSTALLATION. Glue up the beams, making sure to keep the joints tight and the assembly flat and square throughout. Once dry, take the completed beams to the router table to

round over the long edges. The beams are glued to the underside of the cart, as in Figures 4a and 4b. If you painted the case earlier, you may need to sand away the paint in order to get a good glue bond. The beams are painted as well once the glue dries.

BIG CASTERS. A heavy-duty cart calls for beefy casters to match. Budget casters from the discount store won't do. Chris

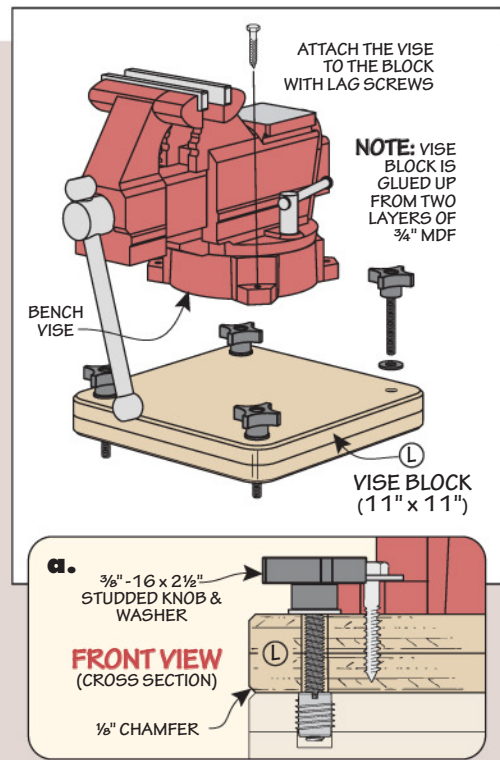
selected large 8" casters. These are semi-pneumatic swivel casters that provide a cushioned ride across all kinds of terrain. Each one locks to create a solid work platform.

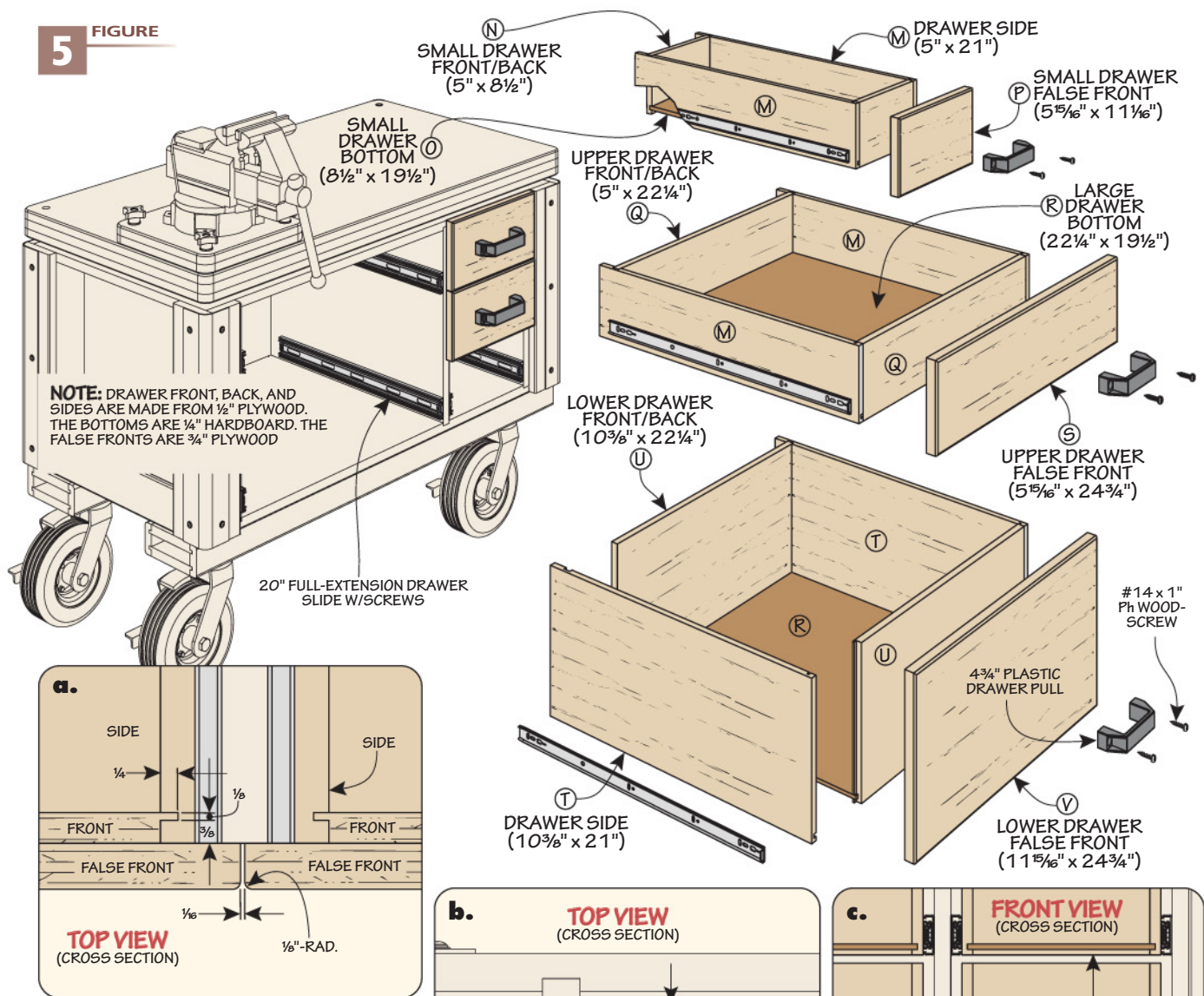
Figures 4a and 4b show how long lag screws attach the casters to the beams and also into the bottom of the cart's case. With that, the cart is mobile and easier to work around for the final steps.

Bench Vise Block



A machinist bench vise comes in handy for a lot of home and car care tasks. You just don't need one all the time. Attaching the vise to a thick MDF block allows you to mount it to the top of the cart with studded knobs and washers as needed, and remove it when it's unnecessary.





Double-Stack of Drawers

The two compartments in the cart's case hold five drawers, as you can see in Figure 5. This asymmetric layout provides a range of storage options. Three, small, identical drawers fill the right side. On the left side, you'll find two larger drawers. The lower one is about twice the depth of the upper drawer.

SIMPLE JOINERY. All the drawers share the same joinery: tongue and dado up front and dado at the back. So you can cut all the joints at once after the drawer sides, fronts, and backs are cut to size.

Begin the joinery by cutting a narrow dado at the front end of the drawer sides.

This is shown in Figure 5a. The backs of the drawer sides have a wider dado to accept the full width of the drawer back, as shown in Figure 5b.

Cut a tongue on the ends of each drawer front. The thickness of the tongue is sized for the dado in the sides. At this point, the sides, fronts, and backs receive a groove for the drawer bottoms. Take note that there are only two sizes of drawer bottoms, as you can see in Figure 5. These are made from hardboard.

The drawers ride on full-extension metal drawer slides. I located these so

they are flush with the lower edge of the drawer box, as in Figure 5c.

FALSE FRONTS. Applied false fronts put a pretty face on the drawers and conceal the slides. Size the false fronts to create an even gap between drawers and with the front stiles on the sides of the cart's case, as in Figure 5a. Add a small round-over to the false fronts. This eases the edges. It also helps conceal any inconsistencies in the spacing (just saying).

Don't forget to paint the drawer fronts before you attach them to the drawer boxes. The pulls that I selected are screwed on from the front. The pulls are centered on the false front.

Slotted holes in the drawer slides allow you to fine-tune the position of the drawers both up and down, as well as in or out. You can use this superpower to align the drawer fronts flush at the

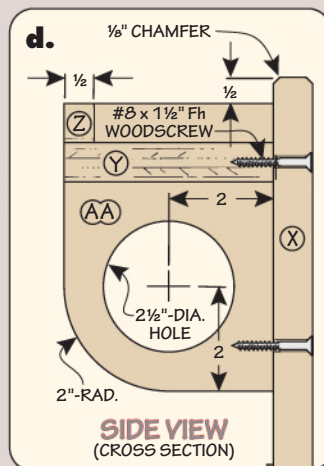
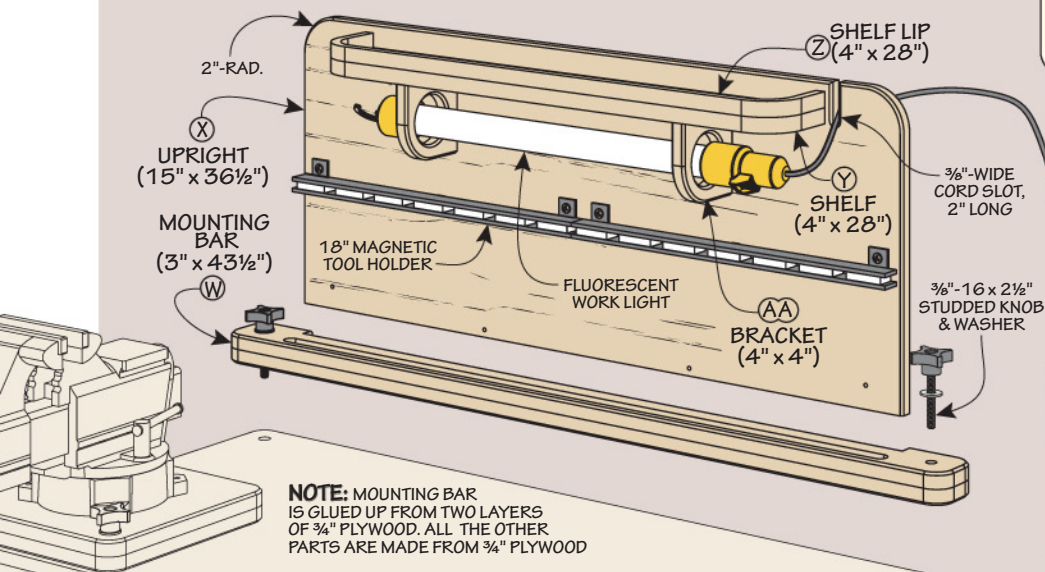
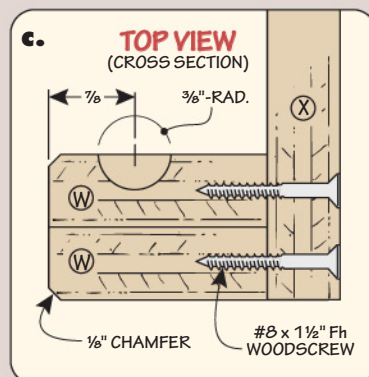
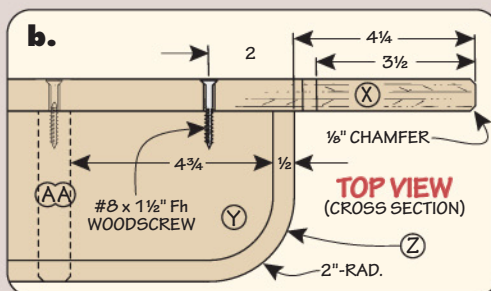
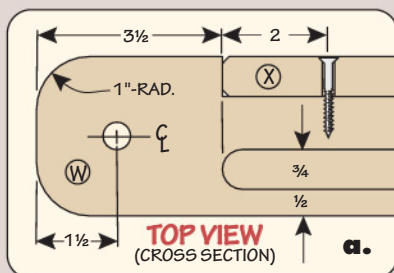
front. And you can tweak the vertical spacing, too.

Once you've positioned the fronts, it's time for the final loadout. Your tools and gear never had it so good.

Optional Tool Panel

This panel forms a back on the cart. It keeps parts from falling off the rear, and gives you additional storage options. A thick mounting bar has a long notch to hold the upright, as in the drawing below. Use a core box bit to rout a pencil groove in the bar (details 'a' and 'c').

A lipped shelf at the top of the upright is supported by large brackets. The lip is cut at the band saw and sanded smooth for an even border. A hole in the brackets provides a place to set a long work light for focused illumination, as in detail 'd.' I cut a slot in the upright to keep the light's cord out of the way. Magnetic tool holders round out the storage.



Pencil Box

Check out this clever design twist. A classic gift box that's sure to become a treasured keepsake.

Making boxes is a double delight. As a woodworker, I find the process a fun time in the shop. For the recipient of the box, there's a joy in taking in the craftsmanship — then figuring out what to put inside. That task is a bit easier with this project. It's ideal for the letter writer, journaler, or artist in your circle of friends and family.

The box finds inspiration from a vintage pencil case Dillon Baker came across. A sliding lid acts as a lock and conceals a small ruler. Two layers of compartments hold the writing instruments of choice. A pocket on the end lets you keep a small sharpener within easy reach.

On a project like this, I've found that if you're gonna make one, might as well make six (or seven). Once word gets around, you're going to get requests.



Staying Sharp. A round pocket in the end of the box is sized for a small hand sharpener. Flocking cushions the interior and adds a punch of contrast to the natural wood.



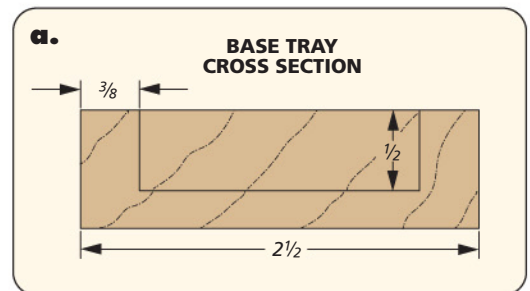
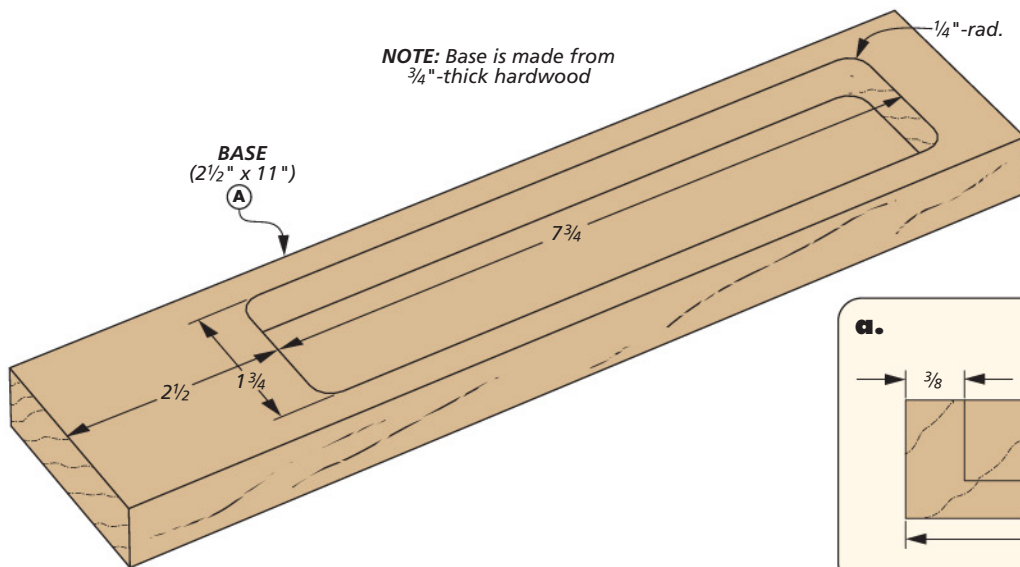
Mitered Connection. A compound miter cut creates an interlocking stop between the block and the pivoting tray. It also eliminates binding when opening the box.





Ruler Recess. A shallow recess in the underside of the lid holds a 6" rule. Perfect for sketching or list making.





Simple Base

The pencil box consists of three distinct layers, which guide the making. We'll work our way up from the bottom. You'll find there's a new challenge with each layer — fun.

MATERIAL MATTERS. Box projects are the ideal justification for all the small pieces of wood you've been "collecting" all these years. The versions here

are made from a single species of wood: cherry. But I feel like a mismatched version could be sweet, too. Or how about a "shop version" from Baltic birch plywood and hardboard?

THE BOTTOM. The drawing above shows what the bottom of the box looks like. Down here there's a single large recess for pens and pencils.

Forming the recess is an ideal task for some template routing. The box at lower left shows the setup I used. The opening in the template is made by gluing up four strips of plywood. The two short center strips are sized to form the opening.

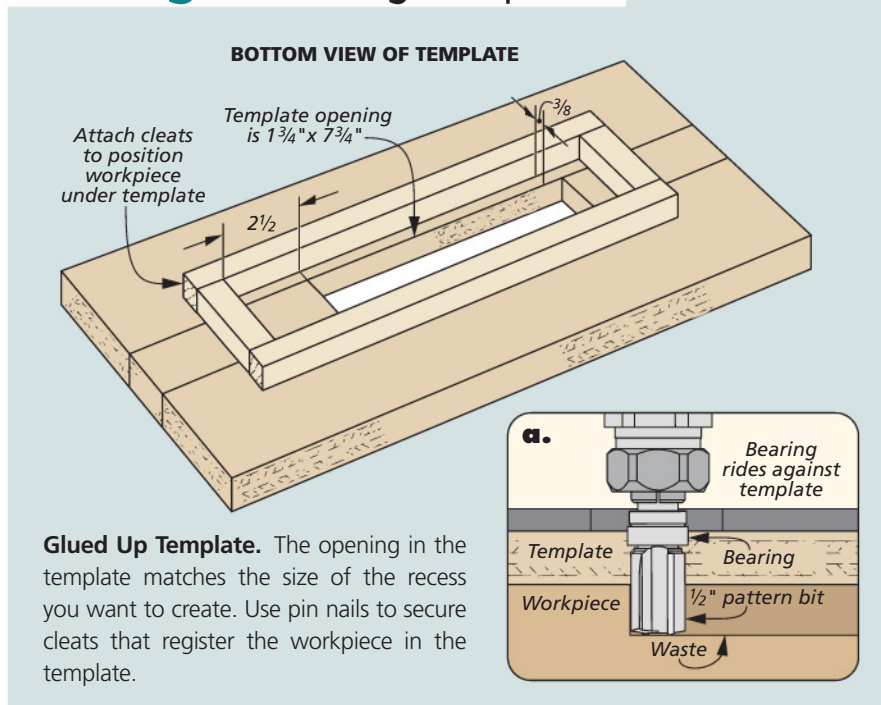
A set of cleats tacked on the bottom face of the template wraps around the workpiece, holding the template in place and locating the opening correctly.

A pattern bit like the one shown at left can do the job and leaves a smooth surface. Just be warned that the routing creates a blizzard of chips and dust.

One way to tame the storm is to drill out a lot of the waste with a Forstner bit at the drill press. This approach means the router is used just as a cleanup tool.

SWIRLS & DIMPLES. The point of a Forstner bit leaves small dimples at the bottom of the recess. The router bit's tracks are swirls. Never fear, though — I applied flocking to all the recesses. It easily hides any small blemishes.

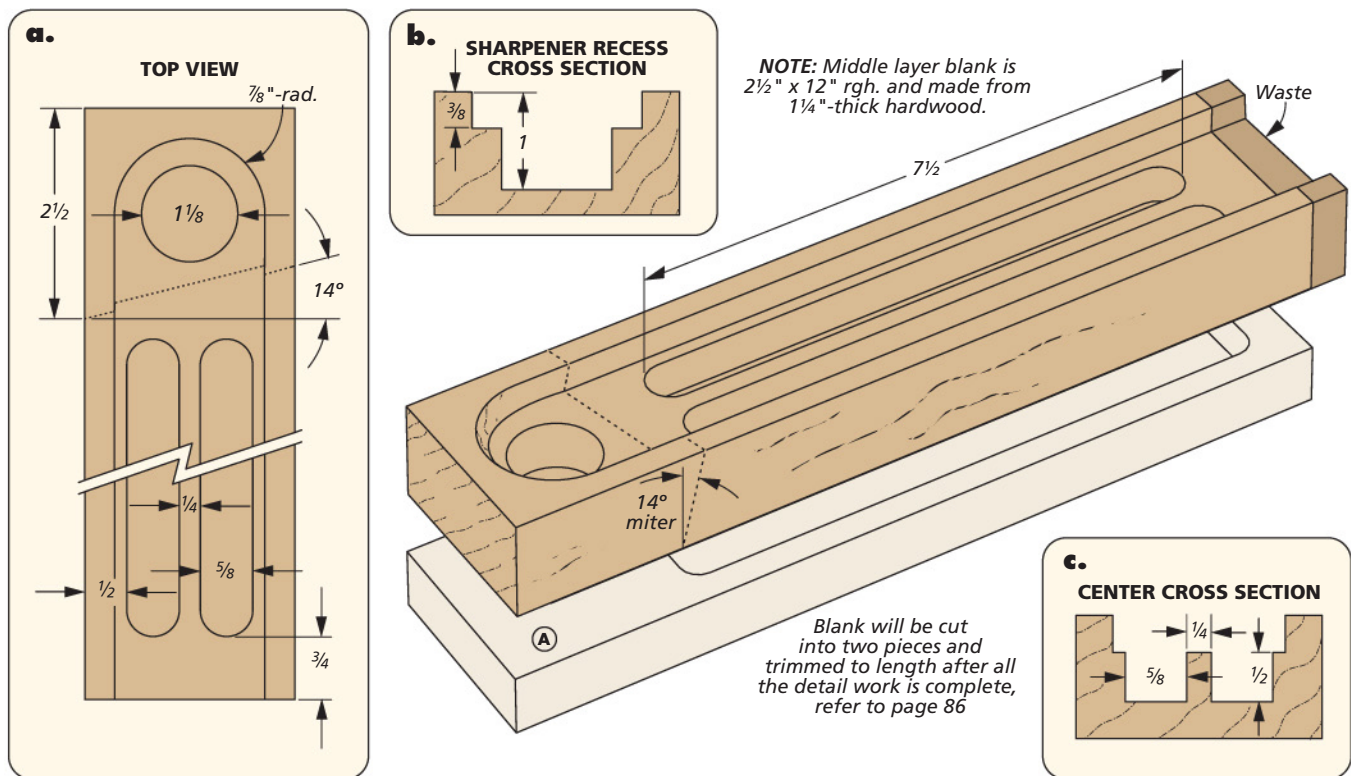
Making a Routing Template



MIDDLE LAYER

Let's move up to the next level of the box. There are a couple of details here that build on what we've talked about so far. This thick layer features a large recess. Set within it is the hole for the sharpener and a pair of long slots.

The drawing above shows another difference. This layer gets cut into two



pieces: a small block and a pivoting tray. For now, start with an extra-long blank that matches the width of the bottom layer.

DRILLING. Begin at the drill press. Drill a shallow recess at the end and then the sharpener pocket, as in details 'a' and 'b' above.

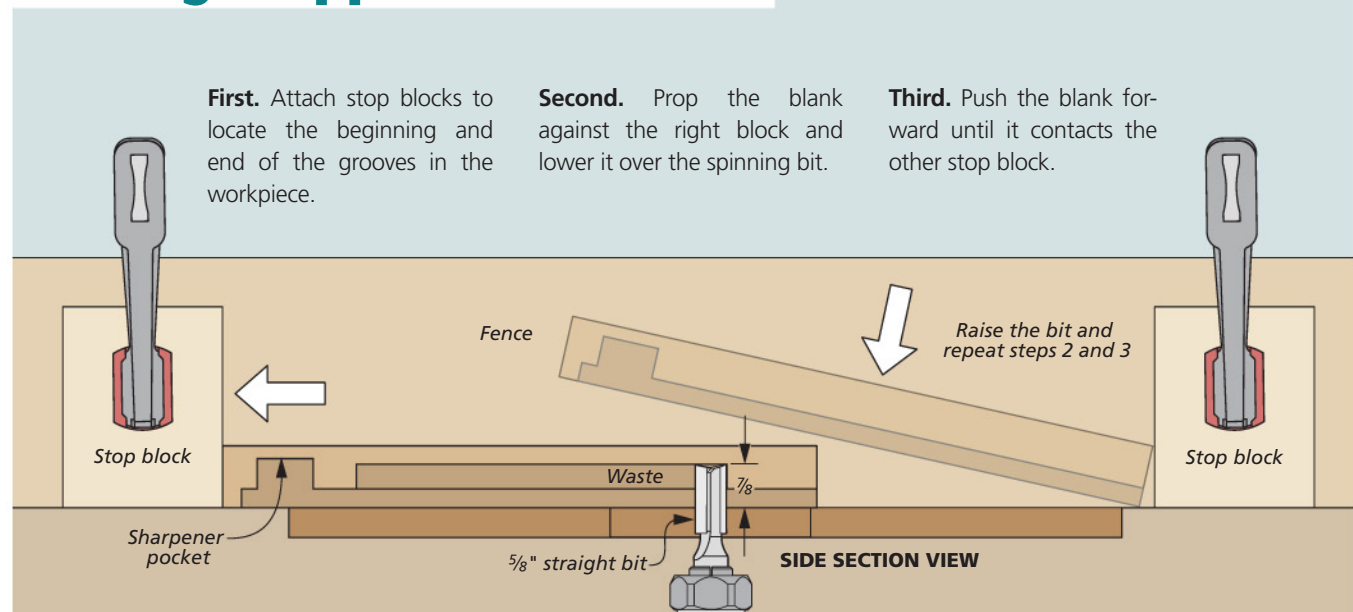
Make another template that extends the shallow recess through to the end of the blank. Later on this will house the lid. What's key here is that the sides of this channel align with the edge of the hole you drilled.

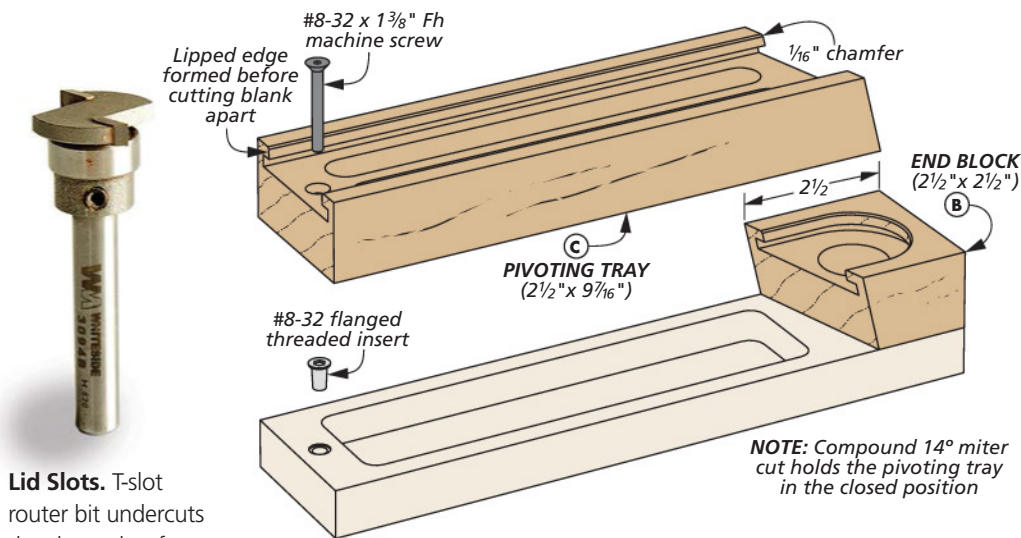
MORE GROOVES. A pair of grooves hold prized or frequently used writing

instruments. These are formed at the router table with a straight bit and a pair of stop blocks on the fence. The box below shows the setup.

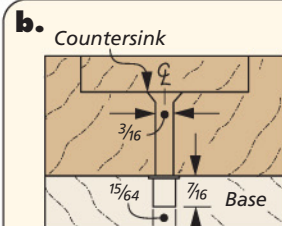
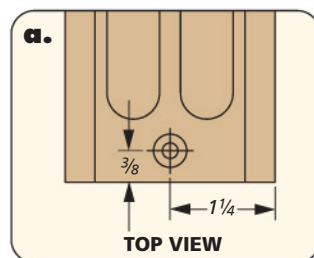
It's a good idea to rout these grooves in several passes (two or three). Raise the bit between each pass to minimize the strain on the router and the bit.

Routing Stopped Pencil Grooves





Lid Slots. T-slot router bit undercuts the channel to form a lip for the lid.



NOTE: Compound 14° miter cut holds the pivoting tray in the closed position

Magic Miters

There's more to do on the middle layer of this box. Sure, the difficult work is complete. That leaves a few fun steps that make the box so interesting.

ADD A LIP. The channel along the top of the middle layer creates space for the lid. The next step is to form a lip that allows the lid to slide in from the end. To do that, you'll use a T-slot bit like the one shown in the left margin. Take a look at Figure 1 below to see how it works.

The bearing on the shank of the bit follows the edge of the channel while the cutters undercut the edge, forming a lip. You'll make two passes, raising the bit after the first pass.

I chamfered the upper edge of the lip. There isn't room for a chamfer bit, so this one is done by hand with files and a curved sanding block.

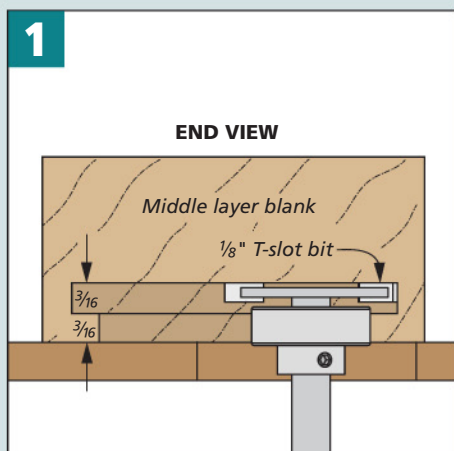
COMPOUND MITER. The time has come to separate the blank you've been working on into the two parts. The drawing above shows the location of the compound miter cut. Combining both a

miter and bevel creates a locking effect when the two parts are aligned, as shown in the photo on page 80.

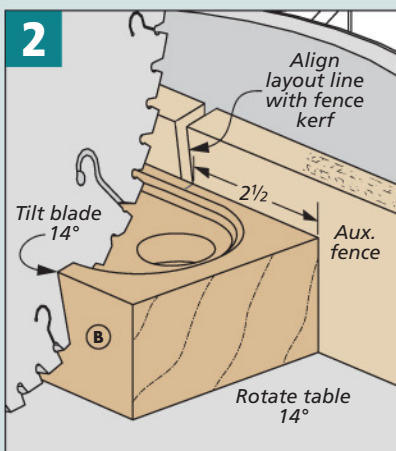
Figure 2 shows the cut on a miter saw. You can just as easily do it at the table saw (tilt the blade, angle the miter gauge) — or even by hand.

The small end block is glued to the base, as shown in Figure 3. Set the pivoting tray in place to mark its final length. Once the tray has been cut, drill a pivot hole in the tray. You can use this hole to mark the base for drilling a counterbored hole and installing a threaded insert.

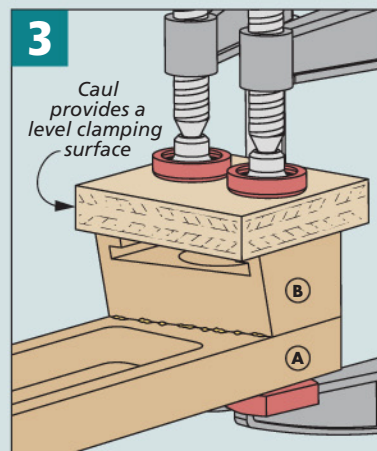
Middle Layer Details



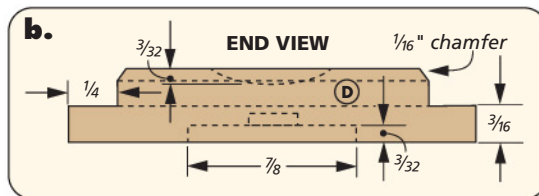
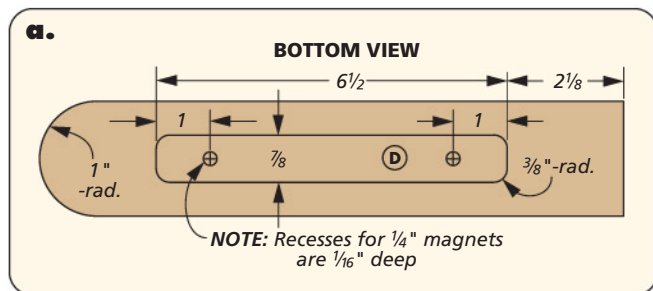
Lid Slot. Rout a lipped opening in two passes to accommodate the sliding, locking lid on the box.



Mitered End. Rotate the blade and tilt the miter saw to cut the end block free of the middle layer blank.



Glue it Up. When gluing the end block to the base, take care to keep the end and sides flush.



SLIDING LOCKING LID

Capping off the box is the sliding lid. Since it nestles within the tray and end block, you may not consider it a separate layer. What makes it distinct for me is that the lid does more than enclose the box. The bottom side has a shallow recess for a 6" rule.

ONE MORE GROOVE. The recess is where you can start. This stopped groove is formed in a similar method to the ones in the tray. The details are shown in detail 'a' above.

A pair of magnets hold the rule in place. But hold off on installing those until after the flocking.

The critical part of the lid is shaping the end to match the radius of the end block. There's no real shortcut here. It's a matter of patience and sanding.

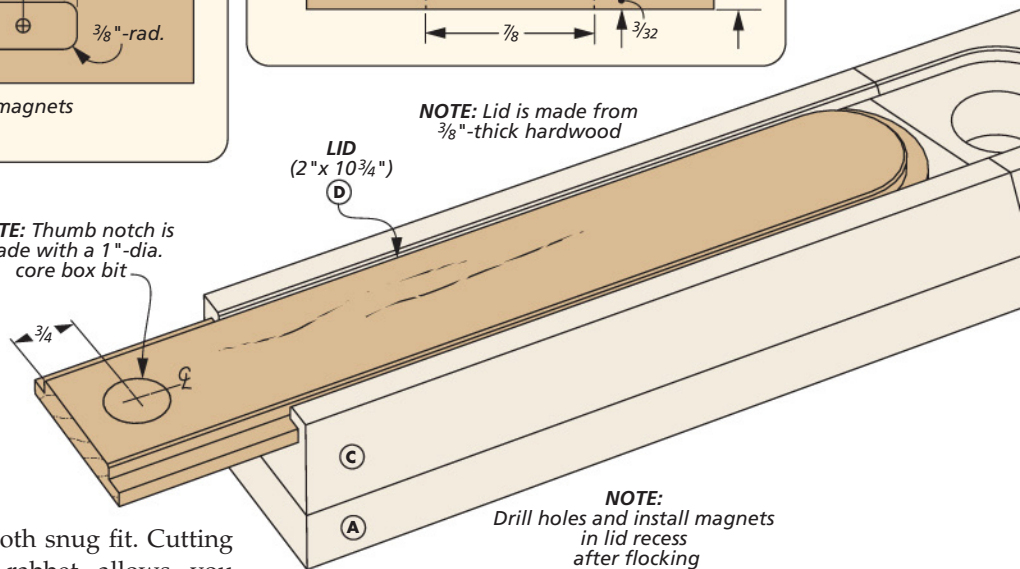
ROUTER RABBIT. I set up a rabbeting bit in the router table to make a tongue on the edge of the lid. You're aiming for a

NOTE: Thumb notch is made with a 1"-dia. core box bit

smooth snug fit. Cutting the rabbet allows you to slide the lid in place. Now you can also fine tune the round end profile until it's just right.

THUMB NOTCH. A dimple on the upper face of the lid serves as the pull. I installed a core box bit in the router table. The box below shows how to do it.

FLOCK YOUR BOX. I flocked all the recesses of the box. Brush a thick paint-like adhesive in the recess then use a puffer tool to distribute the fine flocking fibers. The velvet-like surface is a nice touch to a sweet box.

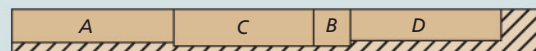


MATERIALS, SUPPLIES & CUTTING DIAGRAM

A	Base (1)	$\frac{3}{4}$ x $2\frac{1}{2}$ - 11
B	End Block (1)	$1\frac{1}{4}$ x $2\frac{1}{2}$ - $2\frac{1}{2}$
C	Pivoting Tray (1)	$1\frac{1}{4}$ x $2\frac{1}{2}$ - $9\frac{7}{16}$
D	Lid (1)	$\frac{3}{8}$ x 2 - $10\frac{3}{4}$

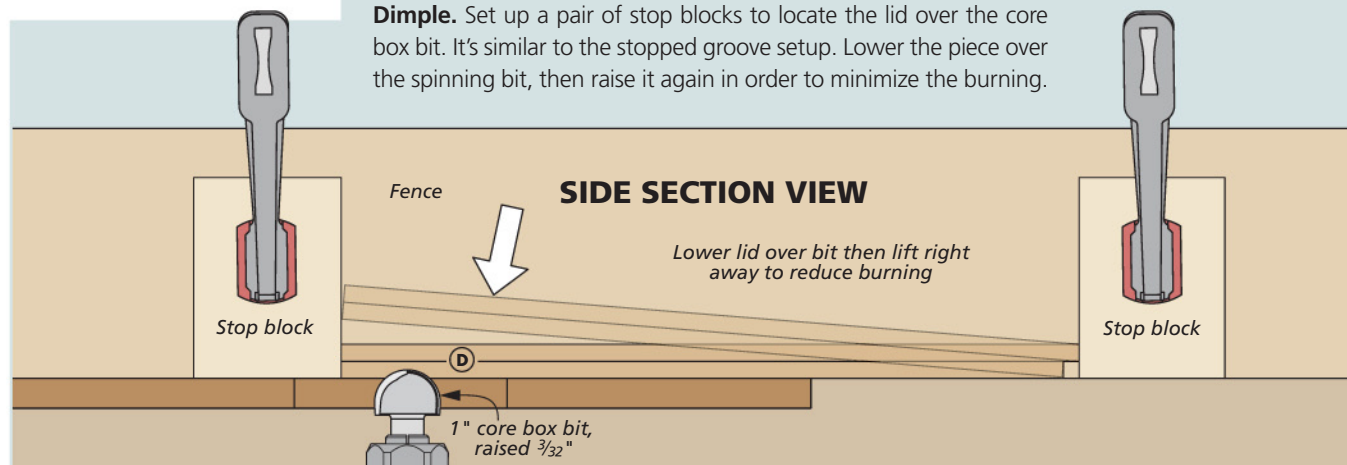
- (1) #8-32 x $1\frac{3}{8}$ " Fh Machine Screw
- (1) #8-32 Flanged Threaded Insert

$1\frac{3}{8}$ " x 3" - 36" Cherry (1 Bd. Ft.)



Thumb Notch

Dimple. Set up a pair of stop blocks to locate the lid over the core box bit. It's similar to the stopped groove setup. Lower the piece over the spinning bit, then raise it again in order to minimize the burning.



Atomic Cocktail Bar

While there's a strong retro vibe to this bar, the fact is it's a lot more durable and elegant than its predecessors.

As libation-oriented basement furniture from the 1950s goes, the homage you see to the right has a lot going for it. First, by comparison to the bars of the past that were built into the room with dimensional lumber and dressed with grass mats, it's light and unattached to the room it resides in. Mobility is a good thing. Second — no grass mats. That's not to say there isn't a place for the *Tiki* genre of party rooms, just not here. That's enough from the history side of things — let's take a closer look at this bar.

GOOD WOOD. Starting at the top, we've got nicely contrasting thick African mahogany that's the gentle yet firm focal point of the bar. The case parts are plywood, veneered with African mahogany as well, but left unstained to provide further contrast. Then there's the painted lattice front that brings a dynamic, lyrical energy to the bar.

GOOD SHAPES. It's not just the front of the bar that has pleasing shapes. The angled shelf and top that sport flowing corners play into the streamlined look of the Mid-Century movement. Lastly, the hairpin legs lighten the overall look and give the illusion that the bar is floating. The legs are not shop-made, they were purchased online and screwed to the underside.

JOINERY. Simple yet sturdy tongue and groove joinery is used to assemble the shell of the case. That's combined with the ubiquitous pocket screws holding the top, shelf, and bottom to the shell. All this means is the project will come together quickly. If you're so inclined, it's time to roll up the sleeves, head to the shop, and get after this project.

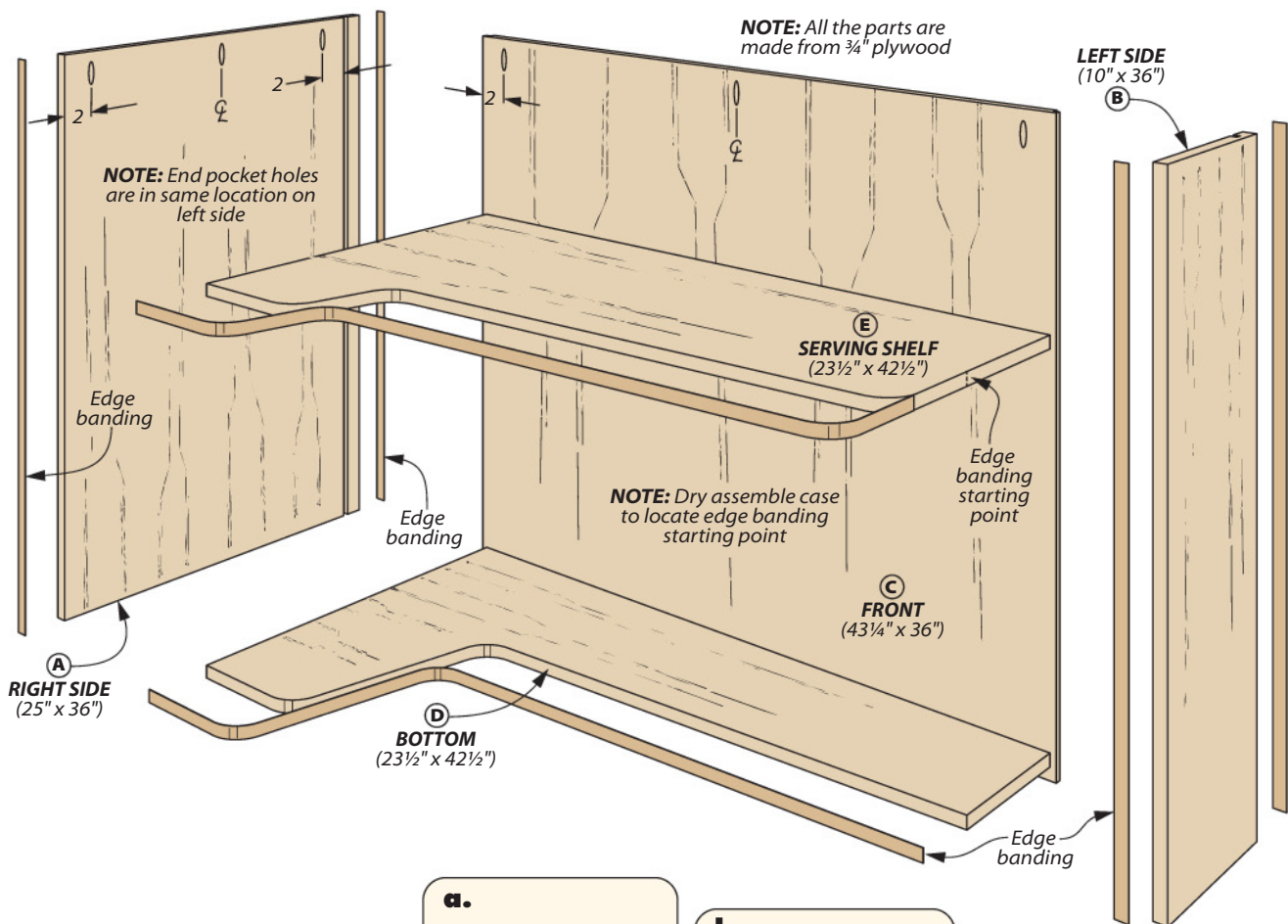


Latticed Front. The decorative lattice front on the bar is accentuated by the shadow-play that's created by the strips of wood that lift it away from the surface.



Storage Galore. Between the bottom and the serving shelf of the bar you'll find plenty of storage for whatever treats (liquid or otherwise) that you want to keep on hand for guests.



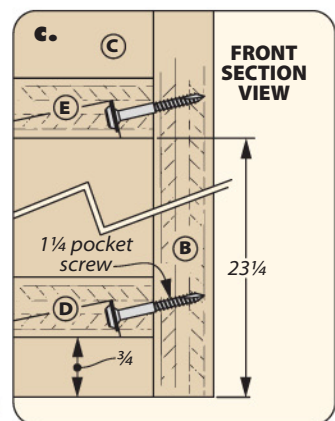
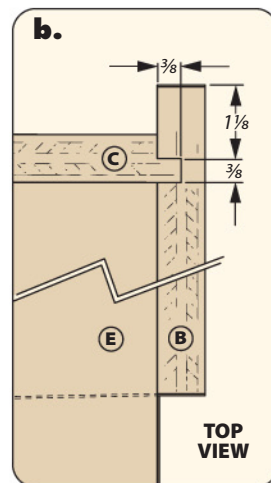
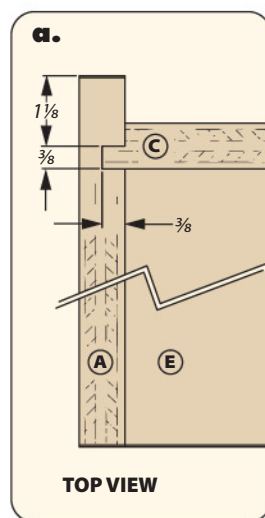


Shapely Shelves

The case of the bar is an austere affair that's comprised of five pieces of plywood. The plywood used on this project is loosely defined as a combi-core material. It's a plywood that has a veneer core sandwiched between outer layers of MDF covered with the wood veneer of choice. In our case, that was African mahogany (to partner with the wood top you'll make shortly).

GROOVES FIRST. Start by cutting the front, right, and left sides to size. (The reference point for these parts is from the front of the bar.) You'll cut the grooves with a dado set. Detail 'a' shows the groove that runs along the inside face of the right side. The groove on the left side (detail 'b') is a mirror cut that can be done at the same time with the same setup.

TIME FOR A TONGUE. To join the sides to the front, you need to make a tongue that runs along both edges of the front



(detail 'b'). This calls for a dado set buried in an auxiliary fence.

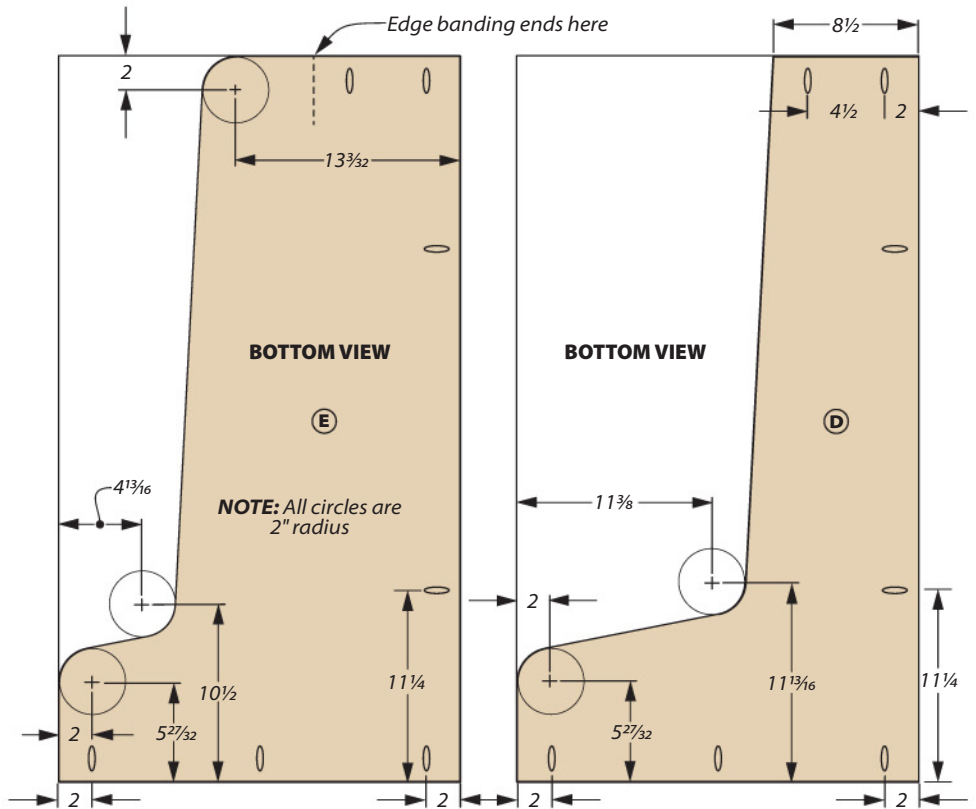
You might as well drill the holes for the pocket screws on the inside faces of the sides and the front. These are for fastening the top to the base. The pockets on the left side are set in the same distance from the edge as the ones you can see on the right side. Now you need to add edge banding to the exposed plies.

EDGE BANDING. The banding is a little wider than the plywood, so it's easy to hold it centered on the edge while ironing it in place. Once the edging has cooled, you can use a sharp utility knife to slice away the majority of the waste. Be mindful of the grain direction though. You don't want the knife to cut into the plywood. A sanding block makes quick work of removing any remaining material.

BOTTOM & SHELF

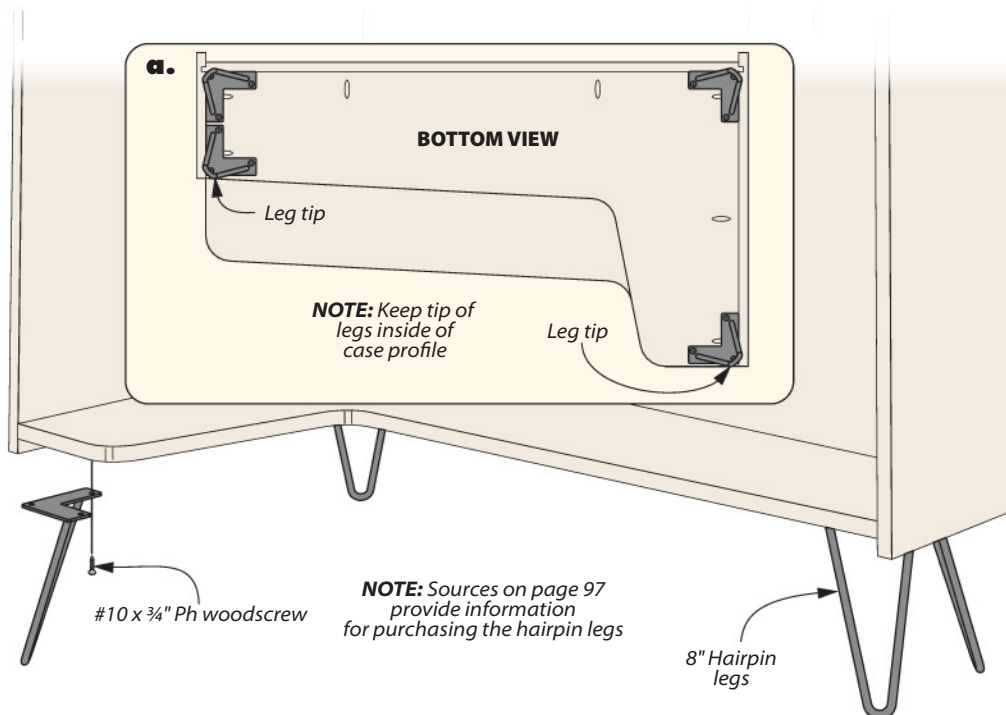
Next up is making the bottom and serving shelf. Their overall size is the same — but as you see in the drawings to the right, the final profiles of the two are different. The bottom stays within the contour of the sides, while the left side of the serving shelf is wider to accommodate storage. Once you've done the preliminary layout work, remove the excess material with a jig saw — staying on the waste side of the line. Then it's just a matter of using straightedges and curved templates along with your router and a flush-trim bit to hone the profile of the edges.

MORE EDGING. Before assembling the base, you'll need to add the edging to the parts you just made. The bottom is easy enough since both ends are trapped between the sides. But the edging on the left end of the serving shelf protrudes beyond the side. To nail down the location of the edging, dry-assemble the case and mark where the edging terminates. Then apply the edging from there. Once that's done, drill the pocket screw holes on the underside of both workpieces.

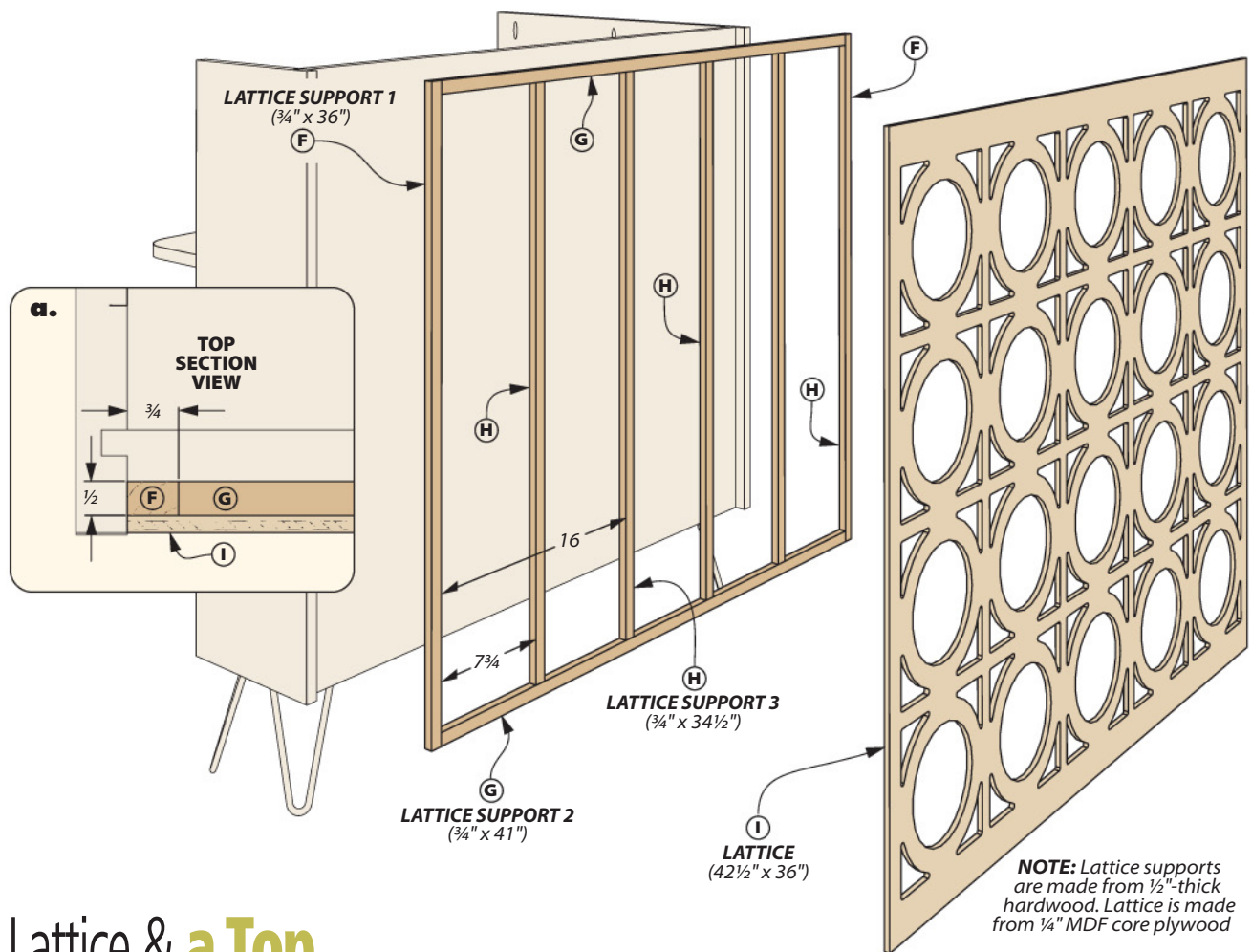


ASSEMBLY. I assembled the base face down. I started by applying glue to the grooves in the sides and clamping them to the front. From there, I used spacers to position the bottom in the case, then screwed it in place.

Next, attach the serving shelf (both locations are shown in detail 'c' on the previous page). The last thing to do here is flip the case upside down and screw the legs to the underside, as shown below.



Legs. The hairpin legs provide a buoyant lift to the bar, and are easy to install on the underside of the base.



Lattice & a Top

At this stage the bones of the bar are complete — all that's left to do is gussy up the front and add the top. Let's start with the front.

Leaving the front blank is always an option — it's a boring option though.

The plywood veneer does have a beauty of its own; there's no doubt. But the painted lattice with its repeating tondo motif cradled in a square brings the bar to life. On closer inspection, you'll notice that the lattice has a subtle ally in the supports that are brad nailed to the front of the bar (detail 'a').

THROWING SHADE. Simply stated, by lifting the lattice off the surface of the bar, the supports employ shade as a design element to enhance the look of the lattice. You clearly see this effect in the photos at the beginning of this project.

The supports that you see in the main drawing above and detail 'a' hide behind the perimeter and vertical ribs of the lattice. I ripped them out of the same material that's being used for the top. First I cut and installed the two vertical

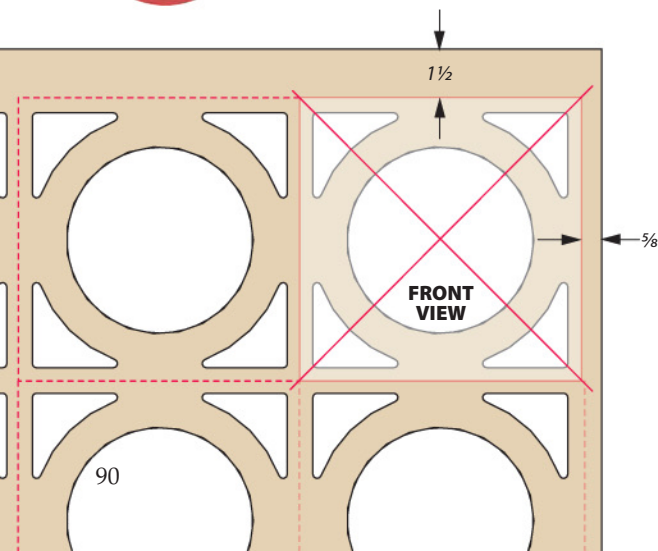
pieces that fit against the sides. Then it was time to cut and brad nail the long horizontal pieces at the top and bottom. Lastly, you need to cut and install the four field supports. Now you can focus on the lattice.

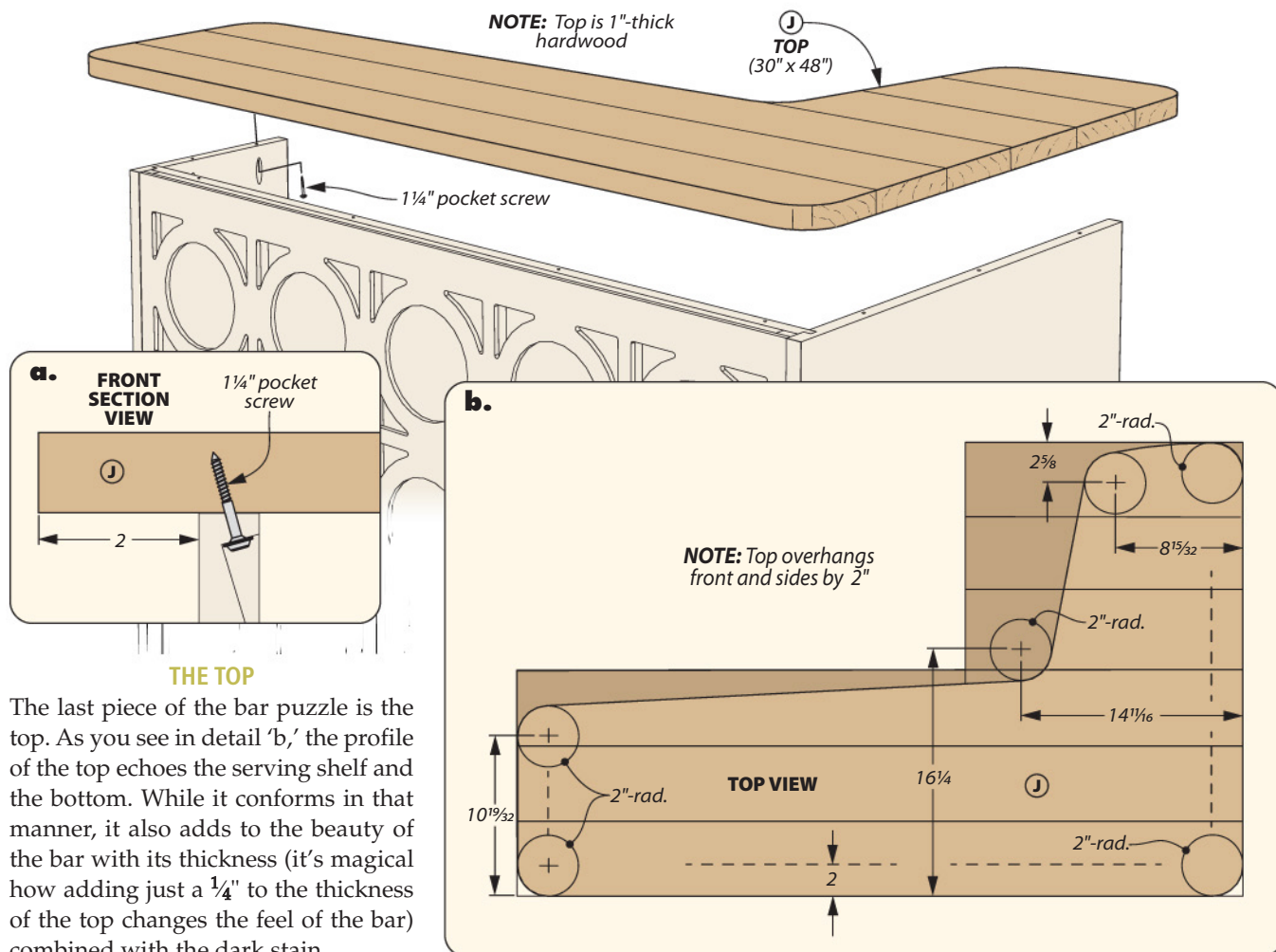
LATTICE PANEL. There are two ways to tackle the lattice panel. You can make a template to tile across the workpiece using a small router. (The pattern is shown in the drawing below to the left.) Or if you have a CNC machine at your disposal you can go download a pattern file. Both options are available at Woodsmith.com/magazine/sip.

Before installing the lattice you'll want to take a break and apply a couple of coats of lacquer to the front and the supports. Frankly, you could finish the whole base at this time. Only the top gets stain in this project. It's also a good idea to sand and paint the lattice as well. Then it's just a matter of nailing the lattice in place, filling, and painting any visible nail holes.



For more on a CNC computer pattern and full-sized pattern go to:
Woodsmith.com/magazine/sip





THE TOP

The last piece of the bar puzzle is the top. As you see in detail 'b,' the profile of the top echoes the serving shelf and the bottom. While it conforms in that manner, it also adds to the beauty of the bar with its thickness (it's magical how adding just a $\frac{1}{4}$ " to the thickness of the top changes the feel of the bar) combined with the dark stain.

GLUE UP & SHAPE UP. If you sized and glued up the panels shown in detail 'b' while I was chatting about its merits, good for you — otherwise you need to do that now. After you've packed away the clamps and scraped off any squeeze out, it's time to lay out

the profile. Bringing the top to its final shape is a repeat performance of making the bottom and serving shelf.

I chose to stain and finish the top before screwing it to the bar base. Both details show how the top is oriented on

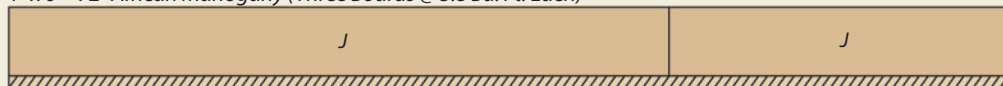
the base and held in place from underneath with pocket screws.

All that's left is to move the bar to its new home and stock it with refreshments. Whoever helps with the move is first in line.

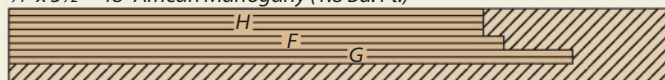
MATERIALS & SUPPLIES

A Right Side (1)	$\frac{3}{4}$ ply. - 25 x 36	F Lattice Support 1 (2)	$\frac{1}{2}$ x $\frac{3}{4}$ - 36	• $\frac{7}{8}$ " x 25' Mahogany Edge Banding
B Left Side (1)	$\frac{3}{4}$ ply. - 10 x 36	G Lattice Support 2 (2)	$\frac{1}{2}$ x $\frac{3}{4}$ - 41	• (4) 8" Hairpin Legs
C Front (1)	$\frac{3}{4}$ ply. - 43 $\frac{1}{4}$ x 36	H Lattice Support 3 (4)	$\frac{1}{2}$ x $\frac{3}{4}$ - 34 $\frac{1}{2}$	• (12) #10 x $\frac{3}{4}$ " Ph Woodscrews
D Bottom (1)	$\frac{3}{4}$ ply. - 23 $\frac{1}{2}$ x 42 $\frac{1}{2}$	I Lattice (1)	$\frac{1}{4}$ ply. - 42 $\frac{1}{2}$ x 36	• (22) 1 $\frac{1}{4}$ " Pocket Screws
E Serving Shelf (1)	$\frac{3}{4}$ ply. - 23 $\frac{1}{2}$ x 42 $\frac{1}{2}$	J Top (1)	1 x 30 - 48	

1" x 6" - 72" African Mahogany (Three Boards @ 3.8 Bd. Ft. Each)



$\frac{3}{4}$ " x 5 $\frac{1}{2}$ " - 48" African Mahogany (1.8 Bd. Ft.)



ALSO NEEDED: One 48" x 96" Sheet of $\frac{3}{4}$ " African Mahogany Plywood, One 48" x 48" Sheet of $\frac{3}{4}$ " African Mahogany Plywood, One 48" x 48" Sheet of $\frac{1}{4}$ " Birch Plywood



Picture Frame Moldings

Making your own picture frame moldings doesn't require much time or expensive equipment — just a router table and a few scraps of wood.

Considering how quick picture frames are to build, they sure are rewarding. With the simple ideas and instructions provided here, your finished frames will look every bit as nice as ones that you'd find in a frame shop. And since you can build them out of scraps, the cost will be next to nothing.

Each of the moldings on the next few pages can be made with just a few common router bits. (You'll need a router table and a table saw to rip the stock to width.)

MITERING. Making a frame is essentially a two-step process. First, you have to make the frame molding. There's plenty of options here, and you'll find some of our favorites in these next few pages. The second step is to miter the molding. This requires an accurate miter gauge at your table saw, as well as a few test cuts to find the right angle. Once you get that down though, mitering is simple.

RABBETS. Before you get started making all sorts of frames, I have one more

point that's worth mentioning. All of the frames included in this article are shown with a $\frac{3}{8}$ "-deep rabbet on the back. This rabbet is designed to hold a piece of glass, a photograph, and a cardboard backer. If you're planning on displaying a relatively thick work of art, or you want to use mat boards, take a moment to figure out whether you'll need to increase the depth of the rabbet. Keep in mind that this may mean using thicker stock for the frame in turn.

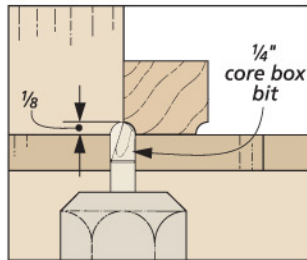
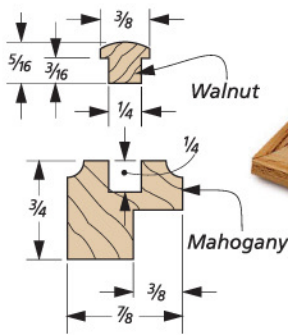
Accent Strip Frame

An easy way to dress up an otherwise ordinary-looking frame is to use a contrasting wood as an accent. In the frame in the far right photo, a mushroom-shaped accent strip is glued into a groove that is routed down the center.

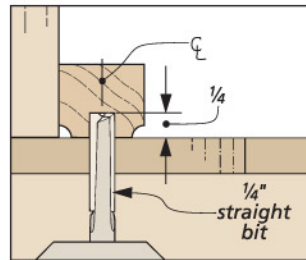
The main part of this frame is just a piece of $\frac{3}{4}$ "-thick stock with an $\frac{1}{8}$ " cove routed along each edge, as you can see in Step 1. Then, a groove for the accent strip and a rabbet for the glass and picture are routed (Steps 2 and 3).

The accent strip is just a $\frac{3}{8}$ "-thick piece of bullnose molding with a "tenon" that fits into the groove in the frame. This tenon is a hair shorter than the depth of the groove to prevent it from bottoming out and creating a gap where the accent strip and frame meet.

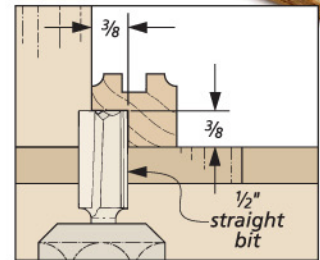
Because the accent strip is so small and narrow, it would be difficult (and possibly dangerous) to rout the profile after you've cut the blank to size. To solve this problem, you just need to rout the profile on the edge of a wider piece of stock, and then rip the inlay strip to size (Steps 4 through 6).



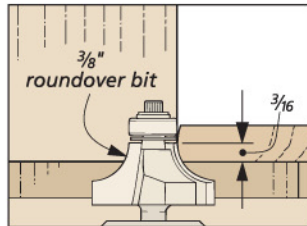
1 Using a $\frac{1}{4}$ "-dia. core box bit, rout a $\frac{1}{8}$ " cove along both edges of the frame blank.



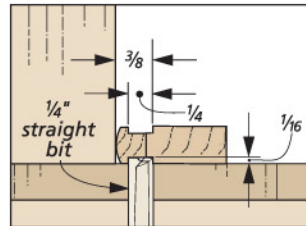
2 Hold the frame blank tight against the fence, and rout a groove down the center.



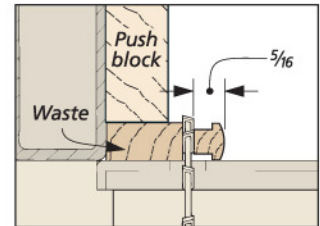
3 Before starting the accent strip, rout a rabbet in the frame for the glass and picture.



4 To add a bullnose profile to the strip, round over both edges of a wide blank.



5 Two passes with a straight bit create the shoulders of the "tenon" on the accent strip.



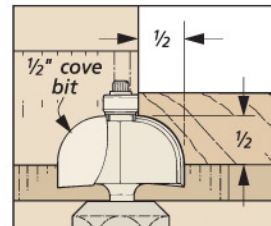
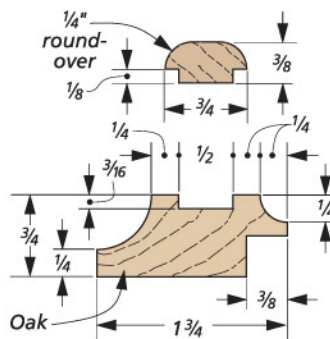
6 At the table saw, cut the accent strip from the blank and glue it to the frame.

Wide Accent Strip

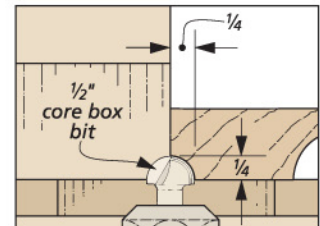
For a larger frame, the width of both the frame and the accent strip is increased. And to vary the appearance and lighten the look of the frame, two sizes of coves are routed along the edges of the frame (Steps 1 and 2).

Placing the larger cove on the outside edge of the molding gives the frame more of a three-dimensional look. This makes it appear less massive and cumbersome without sacrificing strength.

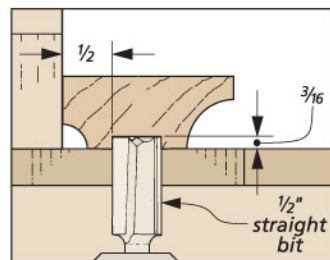
Here again, the groove for the accent strip is routed with a straight bit. But this time, the groove is centered between the two coves. It's not centered on the workpiece (Step 3). Keep this in mind when setting your router table fence.



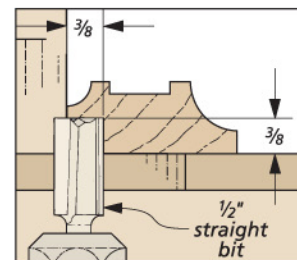
1 After cutting the frame blank to width, rout a $\frac{1}{2}$ " cove along the outside edge.



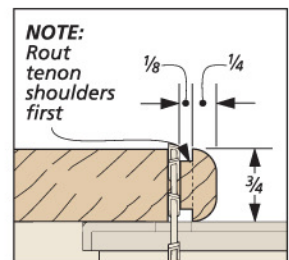
2 On the inside edge of the blank, rout a $\frac{1}{4}$ " cove, with a core box bit or a cove bit.



3 The groove for the accent strip is centered between the two coves, not the blank.



4 Before starting the accent strip, rout a rabbet in the frame for the glass and picture.



5 Shape the edges of the strip on a wide blank before cutting the piece free.

NOTE: Rout tenon shoulders first

Single Bead Profile

When making a piece of furniture, I often use “built-up” molding. This is just two or more simple pieces of molding that are stacked together to create a wider profile.

The same technique can also be used to make picture frame moldings. But instead of stacking the pieces one on top of the other, you simply “stack” them side by side.

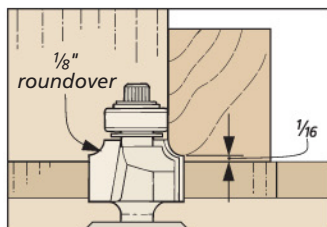
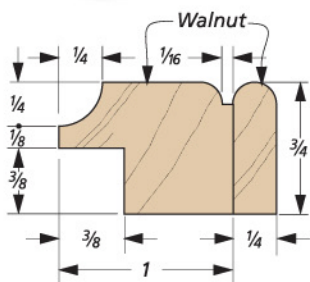
I added a simple bead molding alongside a cove molding. I used walnut for both the bead and cove moldings (lower photo at left), but you could use two types of wood for contrast.

To make the coved piece, rout a stepped roundover along one edge and

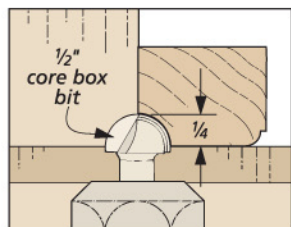
a cove along the other (Steps 1 and 2). The roundover creates a shadow line that helps set off the bead molding, making it stand out a little more. Then, rout the rabbet for the glass and picture on the inside bottom edge (Step 3).

To make the bead molding, rout an $\frac{1}{8}$ " roundover along both sides of a $\frac{1}{4}$ "-thick blank (Step 4).

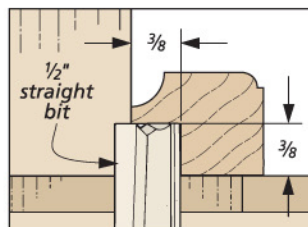
Finally, you can simply glue the bead molding to the cove molding. The trick here is to keep both pieces flush along the bottom. To do this, it helps to have a nice, flat surface to work on during the glueup. I used the top of my table saw (making sure to lay down some wax paper to protect it from glue).



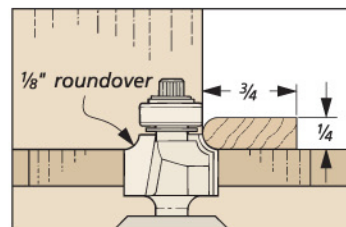
1 The first step is to create a small, stepped roundover on the outside edge of the frame.



2 The $\frac{1}{4}$ " radius cove can be made with a core box bit or a cove bit with a bearing.



3 Before starting on the bead molding, rout a rabbet in the frame for the glass and picture.



4 The bead molding is made by routing a roundover along two edges of a thin strip.

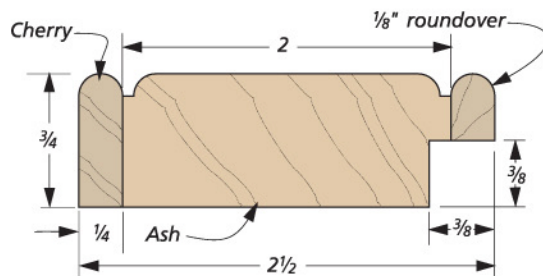
Double Bead Profile

For a larger picture frame, here's a wider molding profile that uses two beads — one on the inside and another one on the outside of the frame. The moldings sandwich a flat piece of wood that makes up the main portion of the frame.

Because of its simple, symmetrical design, this frame is very straightforward

in construction. It starts as a single blank, cut to width. (I used ash.) Then, rout a small roundover with a shoulder along the top edges of the blank (Step 1).

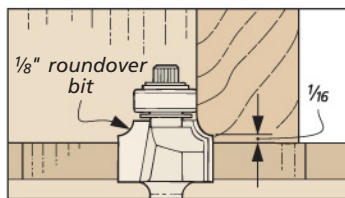
The bead molding for this frame is identical to the molding used in the frame above. I chose cherry this time to create a contrast between the beads and main part of the frame (upper photo at top of page).



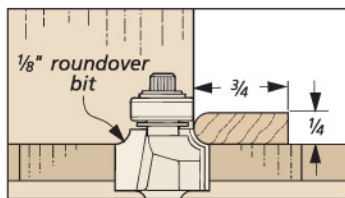
After you're done gluing the beads to the side of the frame, you can rout a rabbet for the glass and picture (Step 3).



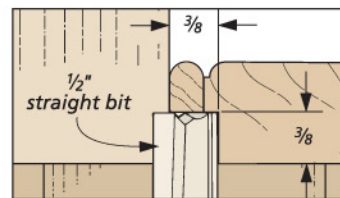
Router Safety. A rubber float (used for grouting tile) makes a great push block for routing profiles on narrow stock.



1 Rout a small roundover along both the inside and outside edges of the main frame piece.



2 To create the bead molding for the frame, rout a $\frac{1}{8}$ " roundover on both sides of a $\frac{1}{4}$ "-thick blank.



3 After gluing the bead molding to the edges of the frame, rout a rabbet along the inside edge.

Veneered Frame

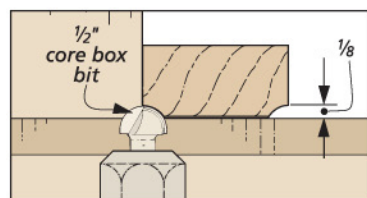
Building up a frame out of different species of wood is one way to create a molding profile with a “two-tone” effect. Another way is to veneer the surface of a blank before you rout the edges. Routing the edges not only creates a profile; it also exposes the wood under the veneer to highlight the profile.

The key is to select a veneer and wood that look good together but aren’t too close in appearance. For the lower frame

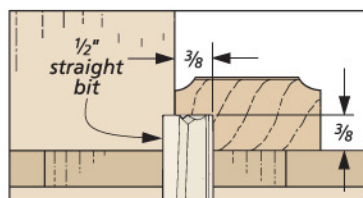
shown at right, I used a figured mahogany any veneer on a maple frame.

To make trimming the veneer easier, glue it to an oversized blank. After the glue is dry, rip the blank down to its finished width. Then, rout the coves along the edges of the veneered side (Step 1).

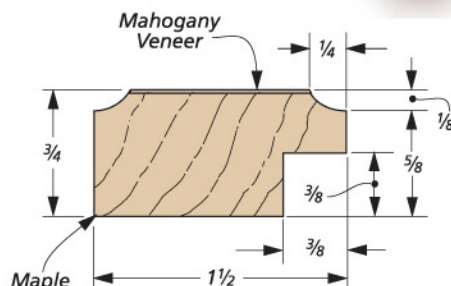
To complete the frame, just rout a rabbet along the bottom edge for the glass and picture (Step 2).



1 First, veneer the face of a wide blank and rip it to width. Then, rout a small cove along both edges.



2 After routing the coves, flip the piece over and rout a rabbet in the frame for the glass and picture.



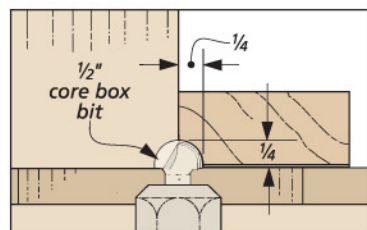
Two-Piece Veneered Frame

The veneering technique described for the frame above doesn’t have to be used exclusively on flat frames. For a frame with more depth, just veneer two pieces of wood of different thicknesses, and then fit them together (upper right photo).

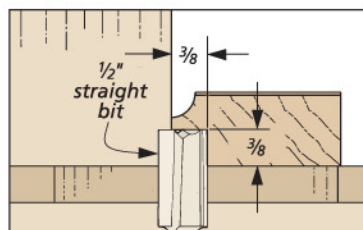
To begin, you simply veneer a blank and cut it to width. Then, cut a cove along one edge and a rabbet along another edge for the glass and picture (Steps 1 and 2).

The second piece of the frame fits around the outside of the first. This

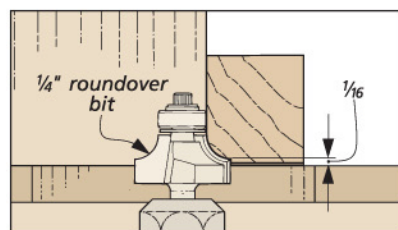
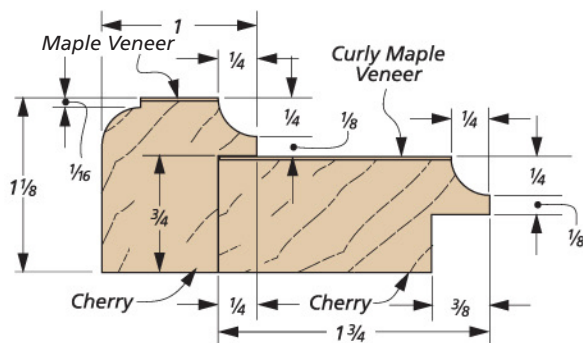
piece is veneered and cut to width. Rout a roundover along the outer top edge and a cove along the inside top edge (Steps 3 and 4). Then, rout a rabbet on the inside of the workpiece to allow it to fit over the first piece (as in Step 5 below).



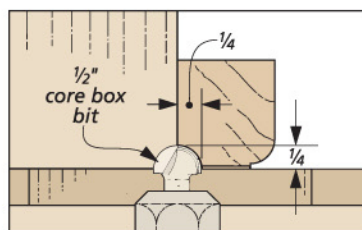
1 After veneering a 3/4"-thick frame blank and ripping it to width, rout a small cove along one edge.



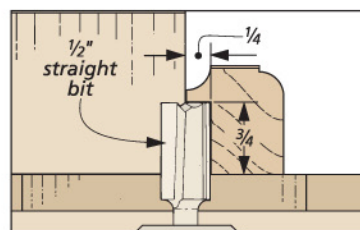
2 Once you’ve routed the cove, flip the piece over and rout a rabbet in the frame for the glass and picture.



3 For the second piece, rout a stepped roundover on one edge of a veneered, 1 1/8"-thick blank.



4 On the opposite edge of the blank, rout a small cove profile, using a 1/2"-dia. core box bit.

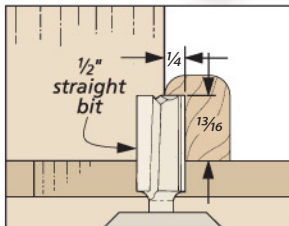
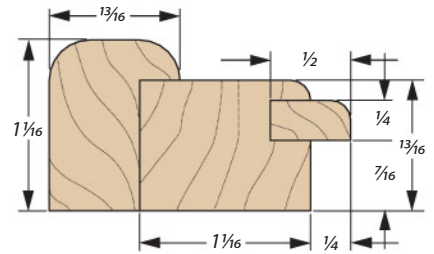


5 Finally, cut a shallow rabbet along the inside edge to allow the piece to fit over the first frame piece.

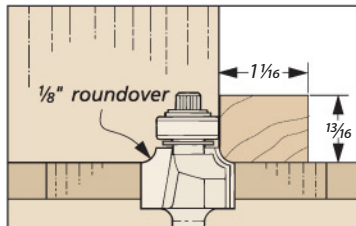
Multi-Profile

By cutting several strips and gluing them together, you can create all types of variations. The edges are rounded and a rabbet is cut to accept a second piece of stock, as in Step 1 below. (The second piece can be $\frac{3}{4}$ " thick instead of $\frac{13}{16}$ ".)

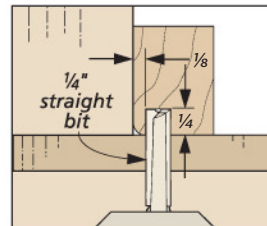
To make the second piece, round over the front corner, as in Step 2. Then cut a groove with a $\frac{1}{4}$ " straight bit to accept a third strip (Step 3). The third strip is cut about 1" wide so it's easier to handle. Step 4 shows the last piece of the puzzle, rounding one edge and then trimming it down to a $\frac{1}{2}$ " width. Finally, glue all three pieces together. For variations, make the third strip out of a contrasting wood, or paint it.



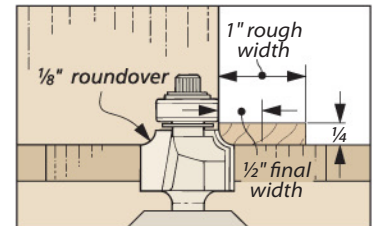
1 Cut first strip $1\frac{1}{16}$ " high. Round edges and cut rabbet.



2 Cut second strip to fit rabbet and round one edge.



3 Rout $\frac{1}{4}$ " groove in second strip to accept third strip.



4 Cut third strip and round edge. Then trim to $\frac{1}{2}$ " wide.

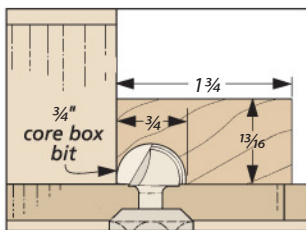
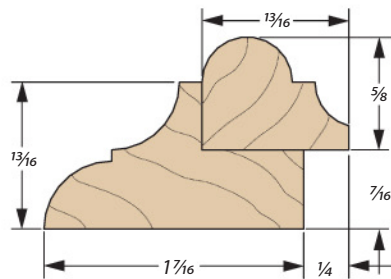
Stepped Profile

Usually, frames have a profile that tapers down to the picture on the inside edge. This one takes the opposite approach. The profile steps up from the outside edge to create something like a shadow-box. Again, this molding is made with two strips.

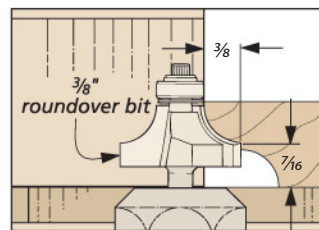
The outside strip starts with a $\frac{3}{4}$ " flute, Step 1. Then a $\frac{3}{8}$ " round-over bit is used to

create an ogee curve with a shoulder, Step 2. To mount the second piece, a groove is cut (Step 3), and then the outside edge is cut off to create a rabbet, Step 4.

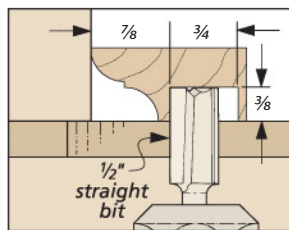
The second strip starts with a $\frac{1}{2}$ " flute, (Step 5). Then use a $\frac{1}{4}$ " round-over to make the ogee profile (Step 6) and round over the top edge (Step 7). Finally, trim the strip to fit the rabbet.



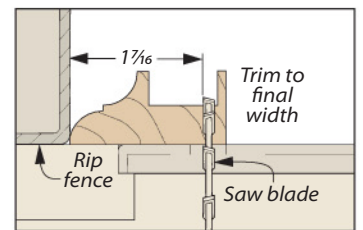
1 Cut the $\frac{3}{4}$ " flute along the outside edge of the first strip.



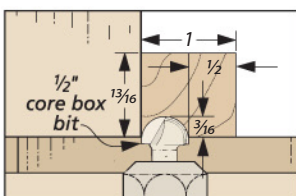
2 Then use a $\frac{3}{8}$ " round-over bit to create an ogee profile.



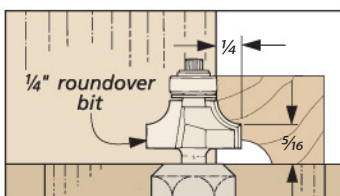
3 Use a straight bit to rout a groove to hold second strip.



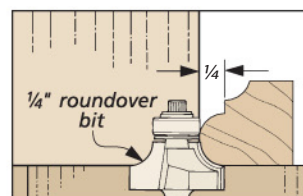
4 Cut off the edge of strip to create rabbet on inside edge.



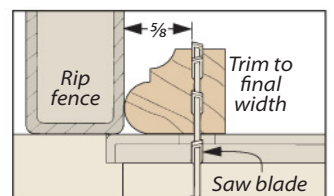
5 Second strip starts with a $\frac{1}{2}$ " flute on the edge of strip.



6 Then a $\frac{1}{4}$ " round-over bit is used to create an ogee profile.



7 To complete the second strip, round over the top edge.



8 Finally, trim strip down to fit rabbet, and glue in place.

Woodsmith Shop TV Season 19

Project Sources

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.

HOKKAIDO HALL TABLE (P. 6)

- **Lee Valley**
1/4" Shelf Supports 05H2042
- **Horton Brasses**
2" Butt Hinges PB-407
15/16"-dia. Iron Knob BK-2
1 1/8"-dia. Iron Knob BK-3
- **Rockler**
1 1/8" Magnetic Catch 26559
- **Woodline USA**
1/8" Bullnose Bit WL-1117

The alder used for the sideboard had a gorgeous, natural color that I chose to accentuate with a couple coats of boiled linseed oil. I followed that with a few additional coats of lacquer for that rich, glossy sheen.

HANGING TOOL RACK (P. 14)

The tool rack received several light coats of spray lacquer before being mounted to the wall.

- **McMaster-Carr**
Nylon Spacer 94639A859

TOOL TOTE (P. 20)

The insert doesn't need to be the same wood species as the rest of the tote. Ours was made out of cherry and finished with *General Finishes'* Seal-A-Cell, though any oil finish will work well. The tote and handle are lacquered.

- **Rockler**
Magnet Cups 31668
Rare-Earth Magnets 30810
Magnet Washers 37474

ROUND-TOP BOOKCASE (P. 52)

- **Lee Valley**
1/2" Shelf Supports 05H2042
- **Rockler**
10" Drawer Slides 48386
Bronze Knob 47144

• Oakwood Veneers

Veneer CherryFC4x12BFV-I
You'll have to search for a local source for the 3/8" bending plywood. Full-service lumber yards, or commercial building material suppliers are the best option. The bookcase was stained with Varathane's "Gunstock." (The drawer box was left unstained.) Then the bookcase was finished with two coats of lacquer.

ROUTER TABLE (P. 50)

Not all shop projects need to be finished. There's a strong case for just putting the router table to work as soon as you attach the fence. The "no-finish" finish develops a lived-in look in short order. The other shown in the article has our now-standard satin lacquer finish. This offers protection and makes the project appealing for photos.

- **McMaster-Carr**
Quick Clamp Handles ... 6385K31

GARDEN TOWER (P. 54)

The garden tower was stained with two coats of Penofin Ultra Premium Penetrating Oil Finish in "Transparent Cedar."

GAME TABLE (P. 62)

The hardware for the gaming table can be found at most hardware stores, and the felt can be purchased at a craft store or home center. We finished the table with a coat of oil and a few coats of spray lacquer.

BOOK BOXES (P. 68)

The cherry and walnut book boxes are unstained works of art. All that's needed is a couple of coats of lacquer to protect them for a long time.

GARAGE CART (P. 72)

• McMaster-Carr

Corner Guards 1103A97
3/8"-16 Threaded Inserts. 9019A136
20" Drawer Slides 11435A26
Nylon Handles 12375A72
3/8" Studded Knobs 5993K59
Mag. Tool Holder 6613A4
Work Light 1675K41

• Service Caster

Casters. . SCC-100S825-SNB-SLB

A flashy paint job is a surefire way to make your cart really stand out. Our hot rod version was painted in Benjamin Moore's "Electric Orange." Since it matches his cars so well, there's a good chance we won't get this cart back from Todd's garage.

PENCIL BOX (P. 80)

• McMaster-Carr

Machine Screw 91253A202
Threaded Insert. 92105A002
Rare-earth Magnet. 5862K141

• Whiteside

T-Slot Router Bit 3094B
15/16"-dia. Iron Knob BK-2
1 1/8"-dia. Iron Knob BK-3

• Lee Valley

Flocking Fiber. Varies by Color
Flocking Gun 98K1002

The components of the box have two coats of spray satin lacquer prior to applying the flocking fibers in the recesses.

ATOMIC BAR (P. 86)

• Lee Valley

Mahogany Banding. 41A0101
We ordered the hair pin legs online at *Hairpinlegs.com* by going to the Hairpin Legs dropdown menu and selecting 8" Black Powder Coat legs. The bar top was stained with Old Masters "Espresso" gel stain. Then the top and the body of the bar were finished with two coats of lacquer. The lattice was painted with Benjamin Moore's "Woodstock Tan."

MAIL ORDER SOURCES

Benjamin Moore
855-724-6802
benjaminmoore.com

Horton Brasses
860-635-4400
horton-brasses.com

Lee Valley
800-871-8158
leevalley.com

McMaster-Carr
Mcmaster.com

Oakwood Veneers
800-426-6018
oakwoodveneer.com

Old Masters
800-747-3436
myoldmasters.com

Penofin
800-625-5235
penofin.com

Rust-Oleum
rustoleum.com

Rockler
rockler.com

Service Caster
800-215-8220
servicecaster.com

Varathane
varathanemasters.com

Whiteside
800-225-3982
whitesiderouterbits.com

Woodline USA
800-472-6950
woodline.com



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10" 3 HP Heavy-Duty Cabinet Table Saw

Handle the largest of wide panels

- Digital readout for bevel angle
- Lockable magnetic switch
- 52" Rip capacity
- Footprint: 22½" x 21"
- Right and rear extension tables
- Shipping weight: ≈ 685 lbs.
- Cast-iron trunnions



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G0651 // ONLY \$2889

\$399
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(LOWER 48 STATES)

8" x 76" 3 HP Jointer

Flawless edges for fine joinery

- 40-Indexable-carbide insert spiral cutterhead
- Built-in mobile base
- Parallelogram table adjustment
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(LOWER 48 STATES)

15" 2 HP Benchtop Planer

Create flat surfaces with minimal effort

- 32-Indexable-carbide insert spiral cutterhead
- 12 and 22 FPM feed speeds
- Thickness DRO
- ¾" to 6" Material capacities
- Board return roller
- Footprint: 23½" x 19"
- Shipping weight: ≈ 157 lbs.



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G0999 // ONLY \$1359

\$199
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(LOWER 48 STATES)

15" 3 HP Extreme Series Planer

Achieve perfect thicknesses

- 52-Indexable-carbide insert helical cutterhead
- 16 and 28 FPM feed speeds
- 48" Cast-iron table
- Pedestal-mounted control panel
- Board return rollers
- Footprint: 22½" x 21½"
- Shipping weight: ≈ 553 lbs.



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\$349
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(LOWER 48 STATES)

14" 1 HP Bandsaw

Home resawing for custom lumber

- Deluxe extruded aluminum rip fence
- Quick-release blade tension
- 14" x 14" Precision-ground cast-iron table
- Heavy-duty steel stand
- ¾" Blade and miter gauge
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\$199
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21" Variable-Speed Scroll Saw

Tackle detailed cuts with exceptional control

- Saw tilts instead of table for greater functionality
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Increase efficiency with unique features

- 340–2860 RPM 12-speed spindle
- LED light increases visibility for drilling precision
- Push-button spindle depth stop for repeatable drilling
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- Footprint: 18" x 10½"
- Shipping weight: ≈ 133 lbs.



MADE IN AN ISO 9001 FACTORY

T33902 // ONLY \$655

\$199
FREIGHT
(LOWER 48 STATES)

6" x 48" Belt / 12" Disc Combination Sander

Efficient, precise sanding for pros

- Vertical, horizontal, or angled sanding
- Precision-ground cast-iron tables tilt 0–45°
- 0, 45°, and 90° Machined detents
- Heavy-duty miter gauge
- Steel cabinet base minimizes vibration
- Footprint: 19" x 21"
- Shipping weight: ≈ 327 lbs.



MADE IN AN ISO 9001 FACTORY

SB1093 // ONLY \$1655

\$255
FREIGHT
(LOWER 48 STATES)

2 HP Two-Stage Quiet Series® Cyclone Dust Collector

Next-level dust collection

- 74 dB Noise rating
- Advanced MERV-17 HEPA filtration
- Two-stage cyclone separation
- 35-Gallon collection capacity
- Automatic filter cleaner
- Footprint: 48" x 23½"
- Shipping weight: ≈ 485 lbs.



MADE IN AN ISO 9001 FACTORY

G0976 // ONLY \$3099

\$299
FREIGHT
(LOWER 48 STATES)

INTRODUCING

1½ HP Quiet Series® Horizontal Cyclone Dust Collector



Powerful Dust Collection, Designed for Peace and Productivity

The 1½ HP Cyclone Dust Collector delivers powerful performance with a 1-micron filter that captures fine dust for a cleaner, healthier workspace. Operating at just 71 dB, it ensures a peaceful work environment without sacrificing suction.

Its box-style design saves floor space and can support a custom wood top, turning your dust collector into a versatile workstation. Whether you're outfitting a compact shop or upgrading your dust management system, this cyclone delivers the performance and flexibility you need — without the noise or clutter.

Specifications:

- Required power: 110V, single-phase, 15A/7.5A
- Main inlet size: 6"
- Adapter inlet size: 4" (2)
- Filtration: 99.97% @ 1-Micron, two-stage
- Filter type: MERV-16 pleated cartridge
- 735 CFM airflow capacity
- Wireless remote control
- Footprint: 53" x 26"
- Dimensions: 53" W x 27½" D x 40½" H
- Approximate shipping weight: 510 lbs.



See the Grizzly dust collector in action!

60991

**INTRODUCTORY
PRICE**

\$2295



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