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TODAY'S

Issue 34

WOODWORKER[®]

PROJECTS, TIPS AND TECHNIQUES



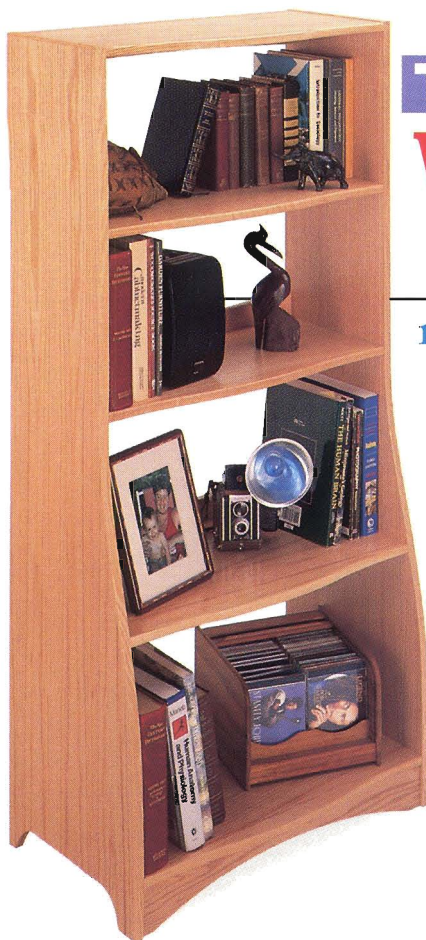
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TODAY'S

WOODWORKER®

PROJECTS, TIPS AND TECHNIQUES



10 KD Bookcase

By Chris Inman

One sheet of plywood, one weekend and a little hardware is about all it takes to build this sturdy knockdown bookcase.

8 The Birdhouse

By Larry Stoiaken

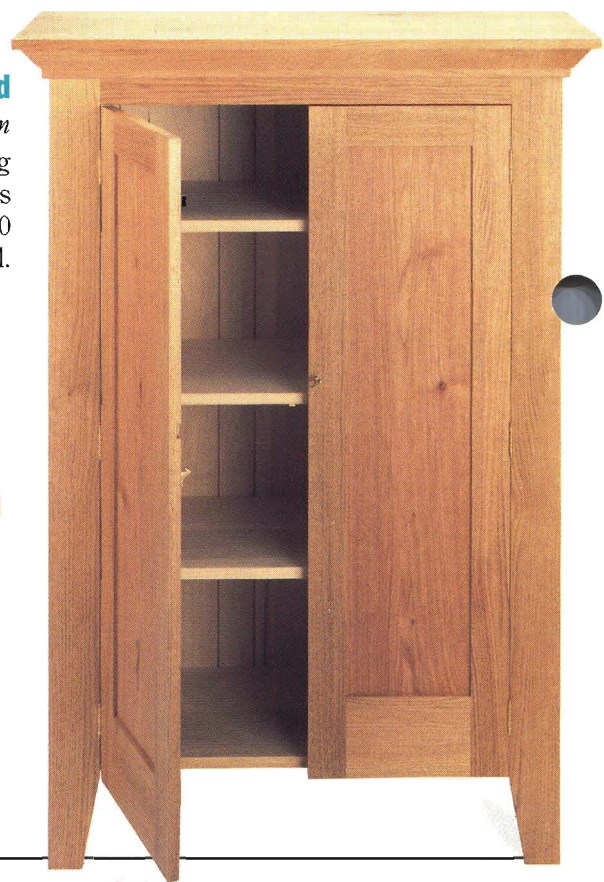
Here's the ideal abode for your songbird neighbors—and it matches our bird feeder project from issue 22.



13 The Jelly Cupboard

By Tim Johnson

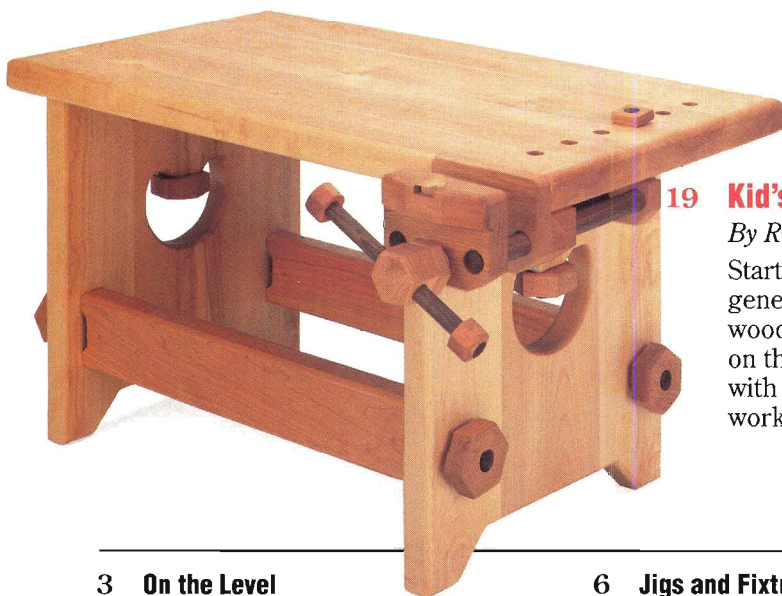
Take a woodworking lesson by building this reproduction of a 100 year old original.



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By Richard Starr

Start the next generation of woodworkers off on the right foot with this pint sized workbench.



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Try a threadbox kit for making your own woodscrews and nuts.

Safety First

Learning how to properly operate power and hand tools is essential for developing safe woodworking practices. For purposes of clarity, necessary safety guards have been removed from the equipment shown in some of the photos and illustrations in Today's Woodworker. We in no way recommend using this equipment without safety guards and urge readers to strictly follow manufacturer's instructions and safety precautions.

LARRY N. STOLAKEN
Editor in Chief

JOHN KELLIHER
Art Director

CHRISTOPHER A. INMAN
Editor

STEVE HINDERAKER
Associate Art Director

NANCY A. AMMEND
Production Manager

JEFF JACOBSON
Technical Illustrator

GORDON HANSON
Copy Editor

DAN JACOBSON
Project Designer

ANN ROCKLER JACKSON
Publisher

JIM EBNER
Director of Marketing

DEB HOLM
Circulation Coordinator

NORTON ROCKLER
RICK WHITE

STEVE KROHMER
AL WOLFORD
Editorial Advisors

TOM CASPAR
PETER KORN
RICHARD STARR
Contributing Editors

SUBSCRIPTION QUESTIONS

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ON THE LEVEL

Birdhouses to Garden Benches

Edward O'Brien, a subscriber from Venice, Florida, is the kind of woodworker we're always looking for. He sent along two pictures of the garden bench (right) that he made from issue 28 and pointed out that building it took about 50 hours longer than our estimate. At first we shuddered to think we could be so far off, but reading Edward's letter a little further put us at ease. He wrote: "this is the first woodworking project I've ever done other than a birdhouse."

Well, all we can say is ...congratulations. If you can build an heirloom garden bench with little or no experience in just 50 hours over our estimate, you deserve a hearty pat on the back.

When a reader like Edward trusts *Today's Woodworker* to help him bridge the gap between a birdhouse and a fine furniture project like the English garden bench, it's an important vote of confidence that we take very seriously. It tells us that the way we present projects makes them accessible to everyone. And when the results come out as fine as this bench, (check the tight fit on the arms), that's just icing on the cake! By the way, Edward already has orders for



Reader Edward O'Brien recently made the leap from birdhouses to garden benches in one fell swoop. It looks like birdhouse building provides a pretty solid training ground!

two more benches and we're betting that by the third one our time estimate will fall just about right!

Howard Cameron, another reader from Florida, completed work on the futon sofa bed from issue 26 and sent along the two photos below to share with fellow readers. Howard also built the bedside table from that same issue, customizing it to compliment his sofa. Howard's daughter and her husband visited recently and said the futon sofa was very comfortable.

++ ++ ++

Please have a look at this issue's back cover. We've finally found hardware for the steamer trunk and are again offering the complete kit—at a reduced price. A couple of revisions were necessary so a short instruction sheet will arrive with your kit. We had to send many checks back to disappointed readers while we searched for the replacement hardware for this kit and we're very sorry for any inconvenience we may have caused.

++ ++ ++

There's one last item. In recent surveys (we send them out randomly to subscribers after every issue) we've been asking for reaction to the idea of including a little advertising. We're specifically thinking about selling the inside and back covers to advertisers

and adding more pages to the magazine. Survey responses have been overwhelmingly agreeable to this idea. Does anyone feel differently?

Larry N. Storken

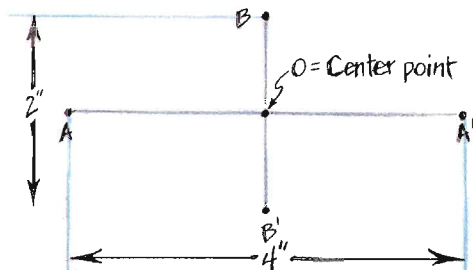


Reader Howard Cameron made the futon sofa from issue 26 opting for oak instead of the walnut used in the original.

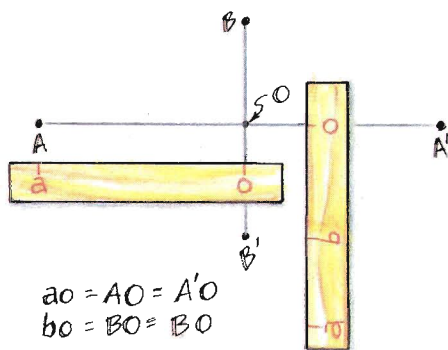


Drawing an Ellipse

The most elegant oval shape is an ellipse, and I have a method that makes this shape easy to draw. All you need to do is layout the major (AOA) and minor (BOB) diameters of the oval you want to create.

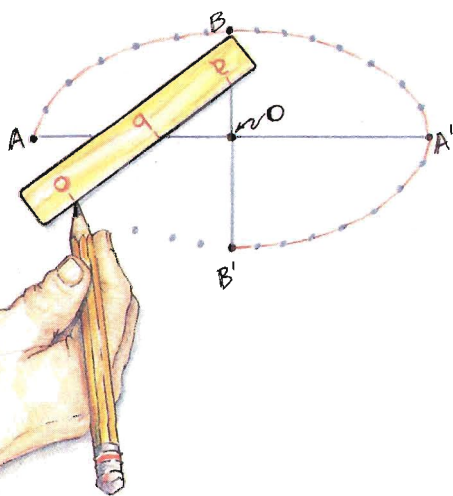


Once the axes are laid out, mark the length OA on a straight edge and label the points "o" and "a". Next, mark the length OB and label the new point "b".



Now align point "a" on the straight edge with the minor diameter and point "b" with the major diameter. Mark a dot on your wood at point "o" and repeat this procedure until you have dots surrounding the axes. Connect the dots with a pencil and you'll have a true ellipse.

*Cyril Fleisher
Chester, Pennsylvania*



Savvy Tool Tips

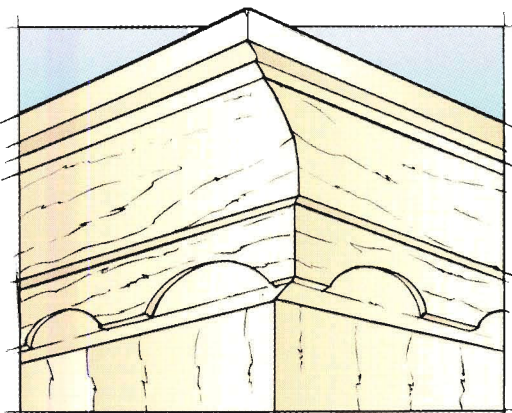
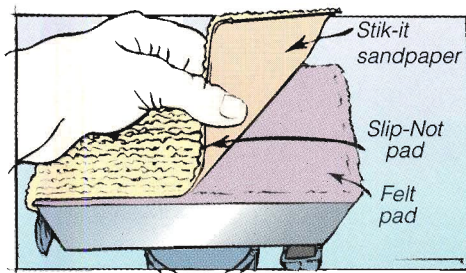


Plate Joiner Mouldings

I use my plate joiner to make a unique moulding for the tops of cabinets. After cutting slots along the edge of a board at 3" intervals, I plane the board down to reveal the arcs. By combining this strip with a home-made cove moulding and top plate I get a distinctive looking cornice.

*Dick Dorn
Oelwein, Iowa*



Quick Change Sanding Pads

I like using standard sandpaper in my orbital sander as well as the new 3M Stik-it paper, and I often alternate between them. This practice makes it difficult to choose between the felt pad that comes with the sander and the rubber pad for the Stik-it paper.

One day I noticed the self-adhesive paper sticking to a Slip-Not router pad, so I cut a piece of the pad to fit my sander and stiffened one side of it with a piece of Stik-it paper. My new sanding pad works just fine for the self-adhesive paper and I can remove it quickly when I want to use standard sandpaper.

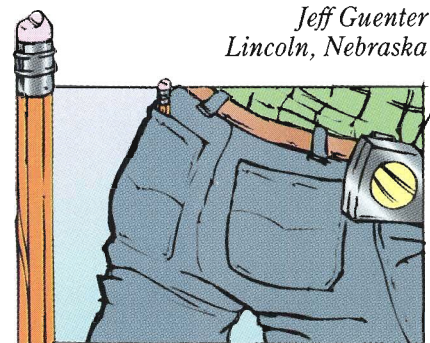
*Dick Dorn
Oelwein, Iowa*

The Perfect Label

In the past, whatever I used to label my tools rubbed off. But I've finally found a product that sticks to almost anything, can be removed easily and is inexpensive.

It's called fabric paint and you can find it at craft stores. It's non-toxic, cleans up with water, comes in a variety of colors and you can write with it like you would with a pen. In most cases the paint can be scraped off with a putty knife or razor blade. The cost is about a dollar for a one-ounce bottle.

*Jeff Guenter
Lincoln, Nebraska*



Pencil Protector

I don't know how many pencils I've broken over the years, but now I carry them in a jumbo ball point pen case for protection. I just take out the guts of the pen, cut off the top of the case and clip the protector in my pocket. As long as the pencil is longer than the case I can get at it easily.

*Bill Skinner
Charlotte, North Carolina*



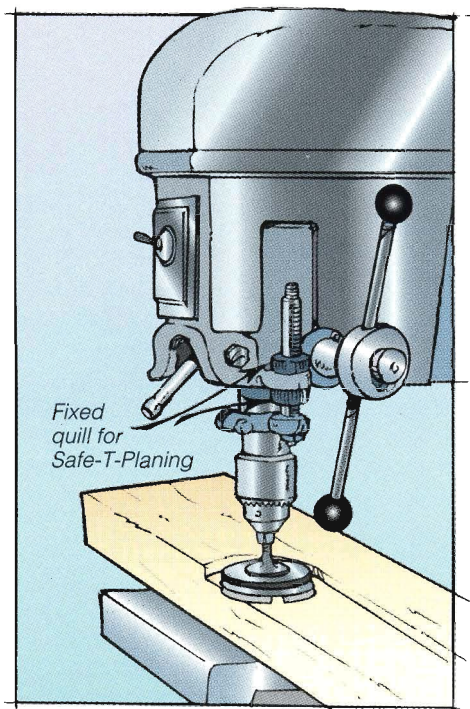
Toggle Clamps

By Al Wolford

Easy Drawer Alignment

When dealing with inset drawers, aligning the drawer fronts on the drawer boxes can be touchy. To get a perfect fit I apply double faced tape to the backside of the drawer front and press it into position against the box (which should be in the closed position). If the fit is a little off I reposition the front until it's right, then secure the assembly with screws.

*Alan Schmanke
St. Charles, Illinois*



Planing with Precision

I use a Safe-T-Planer attachment in my drill press to mill small boards to thickness. I also grind my planer blades using another drill press attachment. For both operations I get micrometer-like depth control by inverting the depth stop on the drill press.

*Raymond A. Dobelstein
Concord, North Carolina*

Today's Woodworker pays from \$35.00 (for a short tip) to \$150.00 (for each issue's "Pick of the Tricks") for all Tricks of the Trade published. Send yours to Today's Woodworker, Dept. T/T, Rogers, MN 55374-0044.



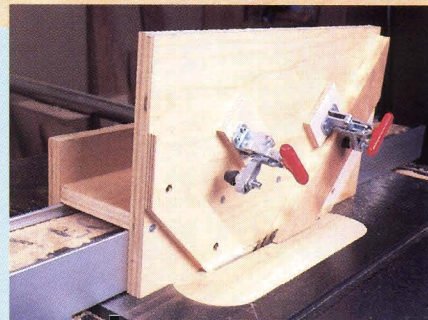
Toggle clamps are available for every fixture and jig you can imagine, and all of them will free your hands for safer woodworking.

Like most woodworkers, I'll bet you often wish you had an extra set of hands, and the thought usually occurs to you the moment you can't move for fear of jostling a crucial cut.

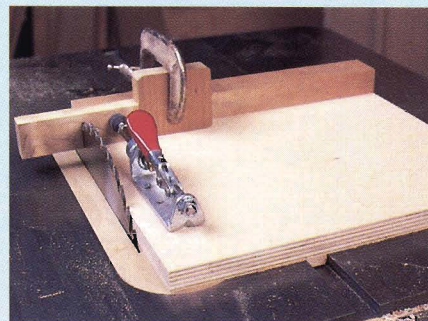
Short of a visit to Dr. Frankenstein, the best way I know of to gain those additional hands is by using toggle clamps to secure your workpiece. They free you to concentrate on the cutting, routing or drilling action, and make these operations safer by reducing the risk of kickback and keeping your fingers far from the blade or bit.

Toggle clamps are available in a range of configurations, but the woodworkers I talk with generally recommend hold-down and plunger styles for their jigs and fixtures. Unlike standard clamps, the quick release levers on toggle clamps make them easy to operate with one hand and, once you adjust them, they lock at the same position every time. These are distinct advantages when speed and repeatability are important considerations.

In a tight spot, a T-handled toggle clamp might work better than one with a post handle, although I find that T-handles require more effort to operate. In either handle style, models are available that exert over 300 pounds of pressure, perfect for my



A jig for cutting spline slots in mitered frame stock is an ideal application for hold-down toggle clamps.



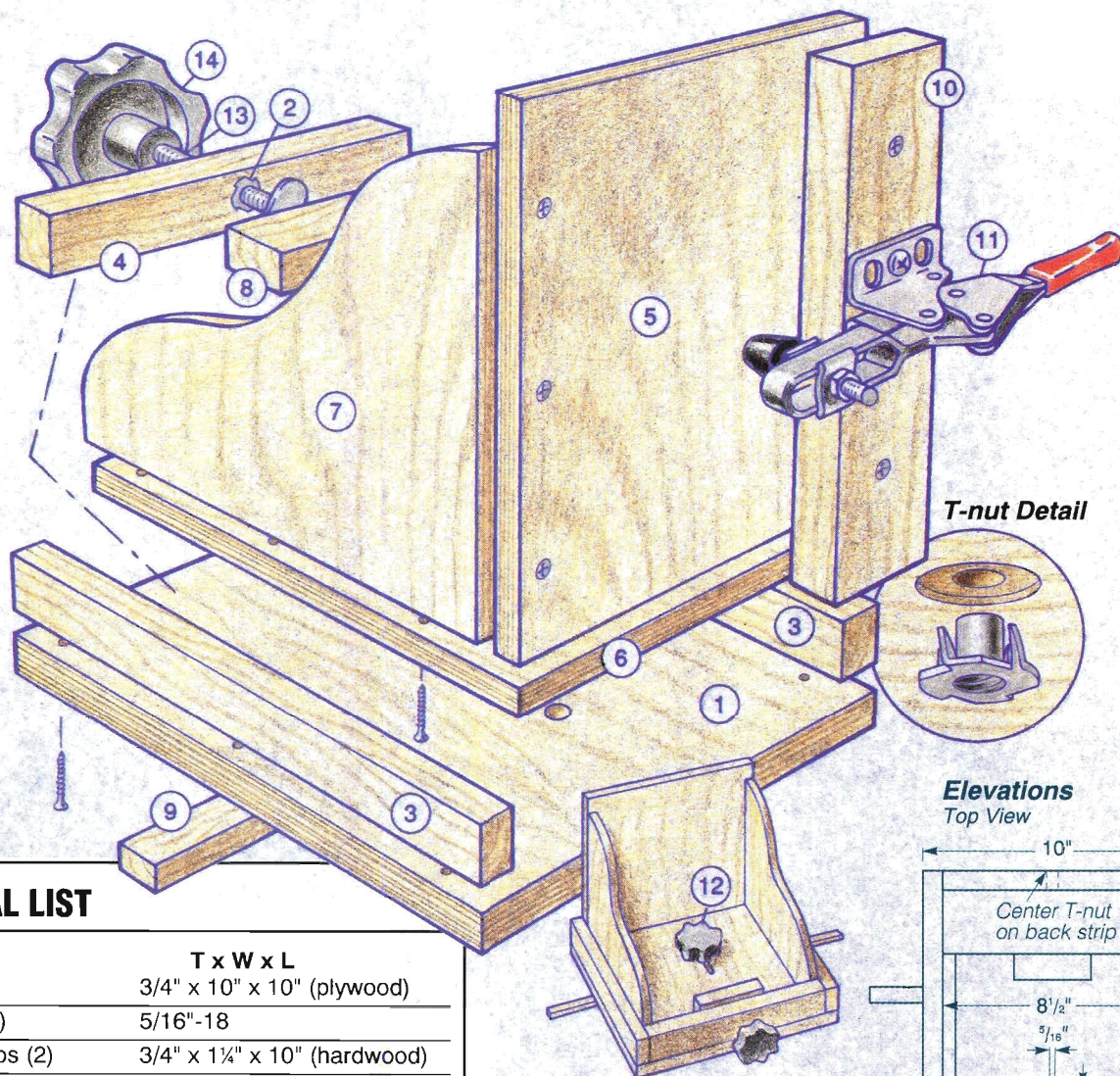
When crosscutting small workpieces, using a plunger style toggle clamp will allow you to keep your hands well away from the blade.

table saw and routing jigs. Lighter duty clamps are better suited for drilling and sanding fixtures. Whatever the application, there's a toggle clamp that will do the job.

Al is the technical service manager at The Woodworkers' Store. Send your hardware question to Al care of Today's Woodworker, Dept. HH, Rogers, MN 55374-0044.

Table Saw Tenoning Jig

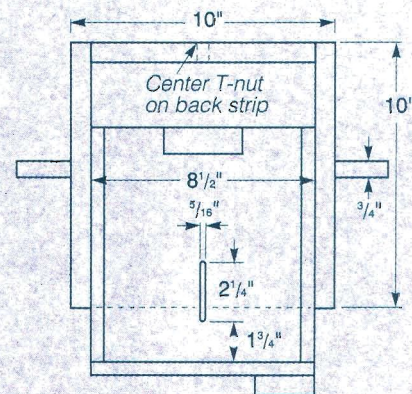
By Jeff Greef



MATERIAL LIST

	T x W x L
1 Base (1)	3/4" x 10" x 10" (plywood)
2 T-nuts (2)	5/16"-18
3 Side Strips (2)	3/4" x 1 1/4" x 10" (hardwood)
4 Back Strip (1)	3/4" x 1 1/4" x 8 1/2" (hardwood)
5 Fence (1)	1/2" x 10" x 8 1/2" (plywood)
6 Carrier Plate (1)	1/2" x 8 1/2" x 8 3/4" (plywood)
7 Fence Supports (2)	3/4" x 8 3/4" x 9" (plywood)
8 Bearing Block (1)	3/4" x 1" x 3" (hardwood)
9 Guide (1)	3/8" x 3/4" x 14" (hardwood)
10 Stop (1)	3/4" x 2 1/4" x 10" (hardwood)
11 Toggle Clamp (1)	Post handle type
12 Hold-down Knob (1)	Handle with 5/16"-18 bolt
13 T-bolt (1)	5/16" x 3 1/2"-18
14 Knob (1)	Handle with 5/16"-18 nut

Elevations
Top View



Front View

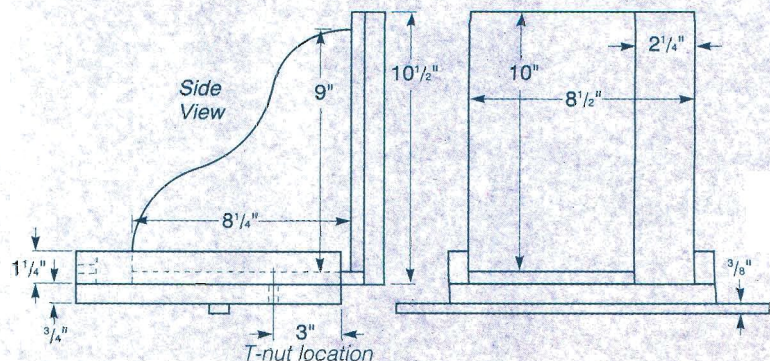
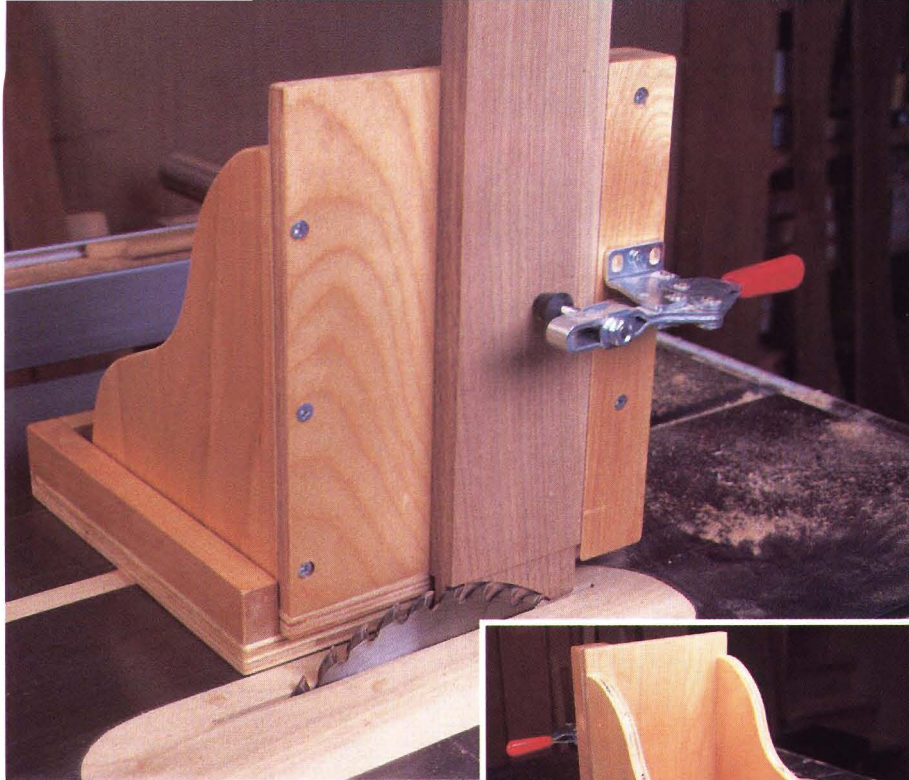


Table Saw Tenoning Jig Hardware Kit

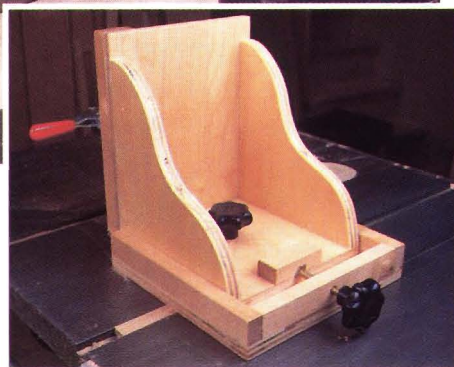
A hardware kit is available for this project that includes the hold down knob, the T-bolt and knob, a heavy duty toggle clamp and T-nuts.

Item #36962 (use order form)\$18.95



There are many ways to cut tenons, but one of the easiest and most accurate methods is with a table saw and tenoning jig. Some tenoning jigs are very elaborate, but the fact is, the simpler the jig the more it gets used. Complicated jigs take longer to build and set-up, and the additional capabilities just aren't needed that often. Building a simple jig, on the other hand, takes only an hour or two and, when it's done, will provide a means for precisely cutting tenons as well as open mortises for bridle joints and spline slots.

This basic tenoning jig has two sub-assemblies: the base and the carrier. The base rides in the table saw's miter gauge slot to keep the jig parallel with the blade. The carrier slides back and forth in the base so you can adjust the distance between the blade and the workpiece. The knobs and bolts provide the fine tuning control and hold-down lock that keep the jig in place.



Building the Jig

Begin by cutting the base (piece 1) to size and centering a counterbored pilot hole on the underside of the panel for a T-nut (pieces 2), as shown in the **T-nut detail** at left. Install the T-nut, then rip hardwood for outlining the base. Screw two of the hardwood strips (pieces 3) along opposite edges of the base (make sure the strips are parallel to each other) and cut the third strip (piece 4) so it fits between the first two. Drill a pilot hole through the center of the third strip, as shown in the **top view elevation**, and install a T-nut in the hole. Screw the strip along the back edge of the base.

Now cut 1/2" plywood for the fence and the carrier plate (pieces 5 and 6)

Equipping the tenoning jig with a toggle clamp and hold-down knobs makes the cutting operation safer and allows for easy adjustments.

—the plate should slide easily on the base, but without any slop. Next, lay-out and rout the slot in the middle of the plate for the hold-down knob (see **top elevation**).

Cut out the **full size pattern** of the fence supports (pieces 7) from the insert between pages 12 and 13 and lay out two supports. When you cut these pieces, make sure the corner of each one is truly 90° (you could make a jig for cutting angled tenons and mortises by cutting these corners at different angles). Now screw the fence to the supports, then screw the carrier plate to this assembly.

Cut hardwood to size for the bearing block (piece 8) and screw it flush with the back edge of the plate. The bearing block provides a footing for the fine tuning bolt to press against.

Carefully fit a hardwood guide (piece 9) to the miter gauge slot in your table saw, then clamp the guide to the bottom of the base. Since each table saw is a little different, you'll want to position the guide for your machine. Clamp the guide so the front edge of the base will fall about 1" from your table saw blade —be sure the guide is parallel with the carrier fence—then drill countersunk pilot holes and screw it to the base.

Screw a stop (piece 10) to the fence so it's 90° to the saw surface —drive the screws above the blade's path. Next, secure a toggle clamp (piece 11) to the stop for holding your workpiece. Now set the carrier on the base and install the hold-down knob and the fine tuning T-bolt (pieces 12 and 13). Spin the knob (piece 14) onto the T-bolt, then take the jig apart and coat it with varnish. You'll improve your jig's performance by waxing it regularly.

While this jig won't do everything, it will do a few things very well. Woodworkers who cut lots of tenons will appreciate the accurate, repeatable results, and they won't get bogged down building a jig that's over designed and difficult to set up.

Cutting accurate tenons is bread and butter work for this jig.

Bridle joint mortises are also easy to cut with a basic tenoning jig.

Jeff Greef is the author of a new book, **Make Your Own Jigs And Woodshop Furniture** (Better Way Books, 513-531-2222) due out in September.

A Bird's Eye View

House the neighborhood songbirds in style and introduce your child to the wonders of woodworking.

By Larry Stoiaken

My seven year old daughter's world usually revolves around school, barbies and playing with friends, but lately she has shown some interest in woodworking. Her questions got me thinking about projects we could build together, so I began looking for ideas in back issues of *Today's Woodworker*. When I came to the Victorian bird feeder in issue 22 I knew it would be the perfect project with a little help from Dan Jacobson. Within a few hours Dan, our project designer, had converted the feeder plan into a birdhouse blueprint and I was off to collect the materials for the weekend.

Although building the birdhouse requires some machining, I took the lead on difficult steps like routing and sawing, but let Elizabeth try her hand at the drilling. When it came to the sanding, the glue-up and the finishing, we pooled our efforts to complete the project in one day. As was recommended in several books on birdhouses, we chose cedar for its natural resistance to decay, and avoided using treated lumber because it poses a health threat to birds at nesting and feeding sites.

Cutting the Birdhouse Parts

Cut out the patterns for the birdhouse shown on the **full size pattern** between pages 12 and 13, and glue-up two oversized panels for the endwalls (pieces 1). Now trace the endwall pattern onto the inside surface of the panels, making sure to layout all the grooves and drilling locations—you'll need an entry hole in only one endwall.

To rout the endwall grooves, use a straightedge, a couple of clamps and a 1/2" straight bit. Clamp the straightedge parallel with each layout line, as shown in **Figure 1**, and rout the grooves 1/4" deep. When you've completed the routing, square the corners of the stopped grooves with a sharp chisel.

Bandsaw the endwalls to shape and



drill all the holes, as called for on the full size pattern. Next, mill stock for the sides, bottom, door and ridge beam (pieces 4 through 8). Cut these pieces to size, angling the edges on the sides and bottom, as shown in the **bottom detail** at right. Layout the hinge mortises on the door and narrow side piece, as shown in the **hinge mortise location** at right, and cut the mortises using your table saw, dado blade and miter gauge. While you're at it, drill pilot holes for the hinges (pieces 9) and bore a few drain holes in the bottom.

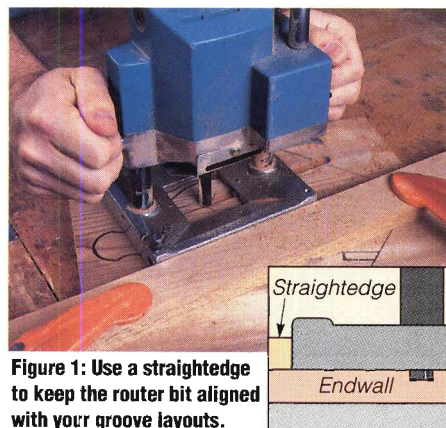


Figure 1: Use a straightedge to keep the router bit aligned with your groove layouts.

Now resaw stock for the fly rafters and gable ends (pieces 2 and 3). Trace the full size patterns onto the stock and bandsaw the pieces to shape.

Glue the sides and bottom to the endwalls with a waterproof adhesive like Resorcinol. To secure the ridge beam, drive a flathead screw (pieces 10) through each endwall after drilling countersunk pilot holes. Secure the fly rafters and gable ends to the endwalls with small brads and glue, then screw the hinges to the side wall and add the door to the assembly. Drill two countersunk pilot holes through the door into the bottom and drive a couple of exterior screws (pieces 11), as shown in the **side view elevation**.

Making the Roof

The clapboard roofing (pieces 12 and 13) is easy to make with your table saw. Rip 3/4" stock to width, then tilt the table saw blade 5° and adjust the fence to cut clapboard that's 1/2" thick at its thicker end. Now resaw enough stock to get the six clapboard pieces (**See Figure 2**). For safety, be sure to use a push stick and finger-board during this operation.



Figure 2: To resaw the clapboard, tilt the saw blade 5° (leaning away from the fence), and use a fingerboard and push stick during the cuts.

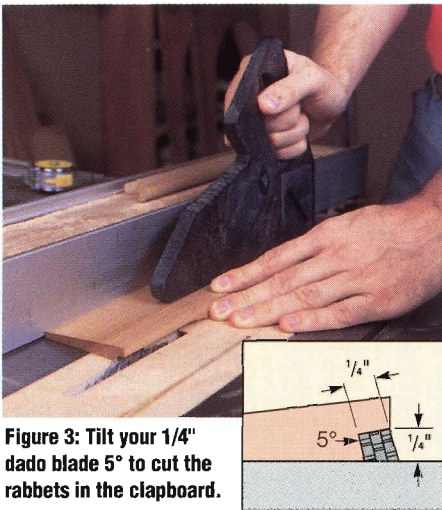
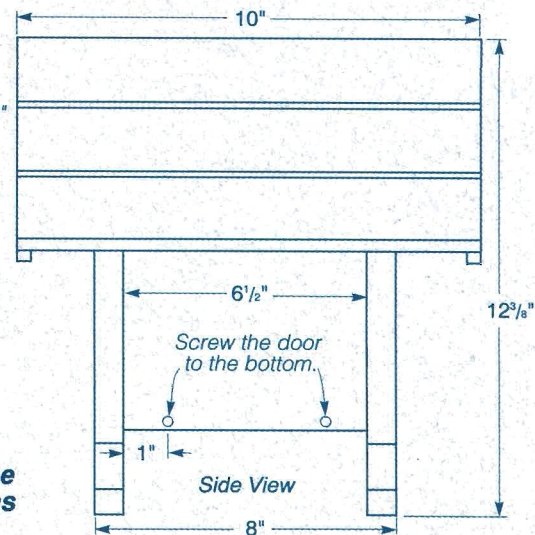
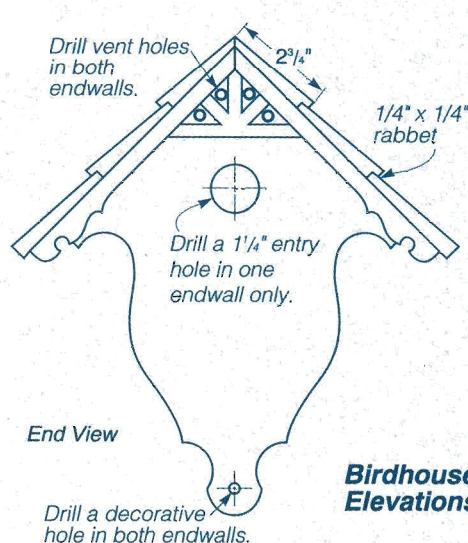
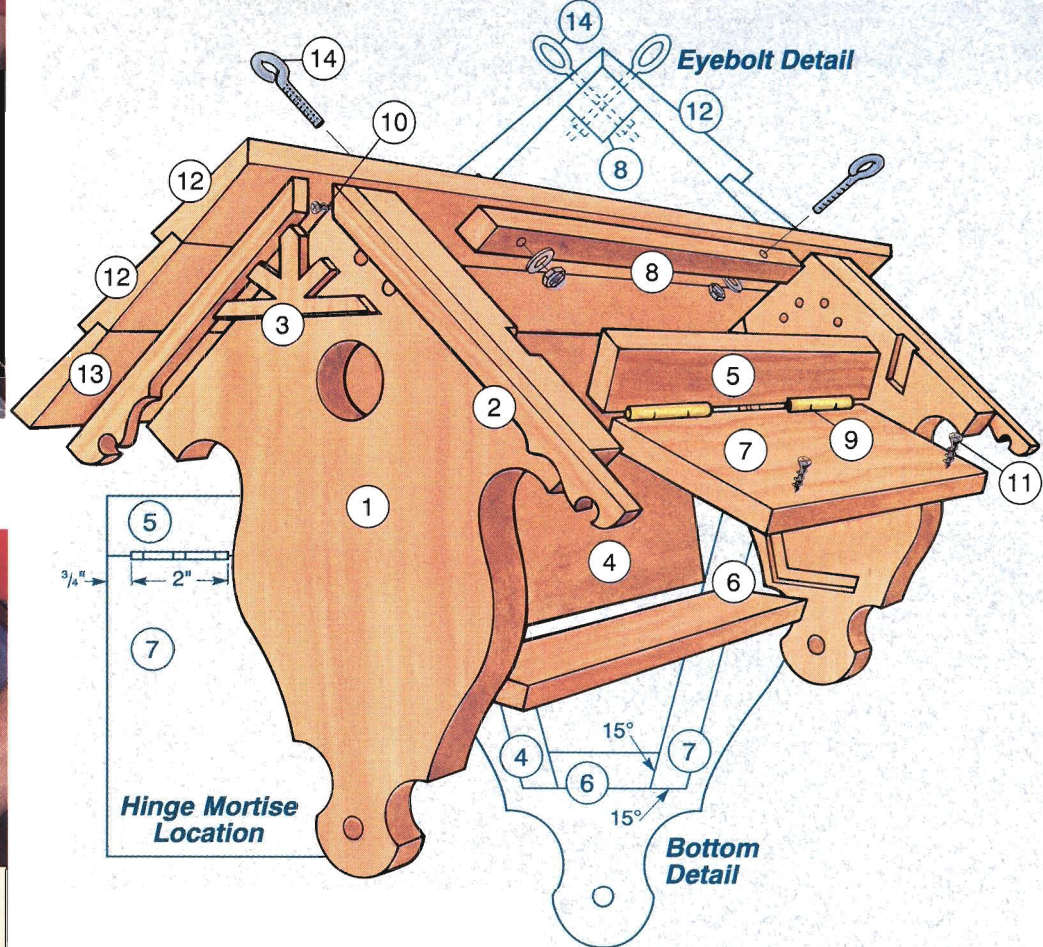


Figure 3: Tilt your 1/4" dado blade 5° to cut the rabbets in the clapboard.

Rabbet the upper tiers of roofing for a weathertight fit, as shown in the **end view elevation** at right, using a 1/4" dado blade tilted 5° (See **Figure 3**). Next, switch to a standard saw blade and rip a 45° edge on the clapboard for the peak. Trim the clapboard to length and install it with glue and brads. I recommend gluing the roofing strips to each other as well as to the structure.

Now drill pilot holes for the eyebolts (pieces 14) and install them, as shown in the **eyebolt detail** above. Coat the exterior of the birdhouse with a clear deck type finish and allow it to dry for at least a week. Reapply the finish every year, right after you clean out the old nest, to enjoy the longest possible use from your birdhouse.

Hang your birdhouse eight to ten feet off the ground with a nylon rope, and choose a location that has shrubbery nearby and is protected from the wind. These features are important to most small songbirds looking for nesting sites, and will increase your odds of attracting the friendly neighbors you want.



MATERIAL LIST

	T x W x L		T x W x L
1 Endwalls (2)	3/4" x 9 1/4" x 11 1/8"	8 Ridge Beam (1)	3/4" x 3/4" x 6 1/2"
2 Fly Rafters (2)	1/4" x 5/8" x 7 3/4"	9 Hinges (2)	1" x 2" brass
3 Gable Accents (2)	1/4" x 1 1/8" x 3 1/4"	10 Screws (2)	#6-2" brass
4 Side (1)	1/2" x 7 1/2" x 7"	11 Screws (2)	#6-1" brass
5 Side (1)	1/2" x 1 1/4" x 7"	12 Roofing (4)	1/2" x 2 3/4" x 10"
6 Bottom (1)	1/2" x 1 1/2" x 7"	13 Roofing (2)	1/2" x 2 3/4" x 10"
7 Door (1)	1/2" x 6 1/4" x 6 1/2"	14 Eyebolts (2)	#10 x 1 1/2"

Build a Knockdown Bookcase From One Sheet of Plywood

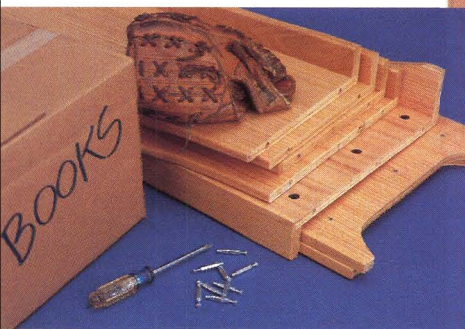
Here's proof that well designed knockdown furniture can be sturdy and attractive, while still maintaining its most important features —easy disassembly and compact storage.

By Chris Inman

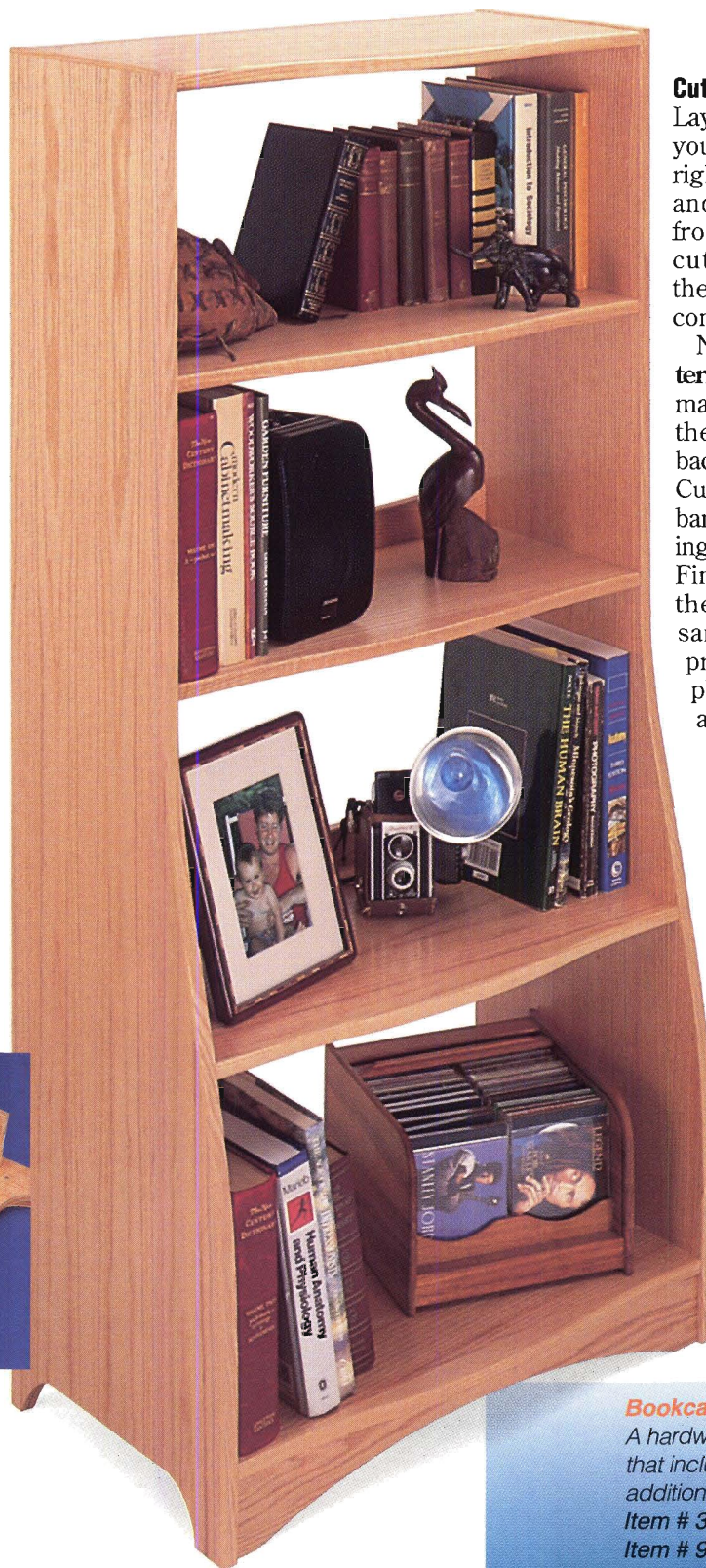
The old woodworkers' saw about never having too many clamps can easily be applied to bookcases. There just never seems to be enough of these versatile pieces of furniture around.

You may have doubts about how well knockdown furniture will hold up, particularly when you see what's stocked at discount stores. But if you use quality knockdown hardware and design plenty of bracing into a project, KD furniture can be as stylish as its conventionally built counterparts and survive many years of hard use.

The bookcase featured here comes apart with a few turns of a screwdriver and all the pieces can be stacked in a neat pile less than 7" tall. In addition to its knockdown capabilities, this project comes with another outstanding advantage: it can be completed in a single weekend using just one sheet of 3/4" red oak plywood and a few feet of solid stock.



When it's time to move, this knock down style bookcase will stack neatly into a pile less than 7" tall.



Cutting Your Plywood

Layout the bookcase panels on your plywood, as shown at top right in the **cutting diagram**, and cut the oversized pieces from the sheet. Now you can cut the individual pieces to their finished sizes with more control and accuracy.

Next, use the **full size patterns** between pages 12 and 13 to make hardboard templates for the sides, apron, shelves and back stops (pieces 1 through 7). Cut the templates to size, then bandsaw the curved edges staying just a hair outside the lines. Finish up by sanding right to the layout lines with a drum sander chucked in your drill press. Remember, your templates are the key to getting accurate plywood panels.

Now chuck a template routing straight bit in your router and clamp the side and apron templates to the plywood. Rout the curved edges on each of these pieces, but hold off routing the shelves until you've glued on the front edging.

Banding the Edges

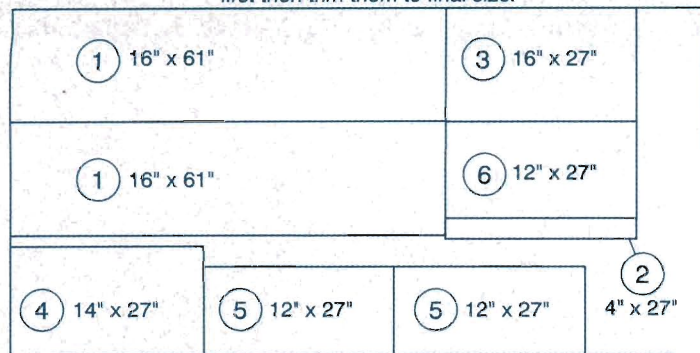
To protect the side panels and to improve their appearance, glue solid wood banding (pieces 8) to the edges. Begin by ripping 1/4" thick strips and adhering them first to the top edge of each side, then

Bookcase Hardware Kit

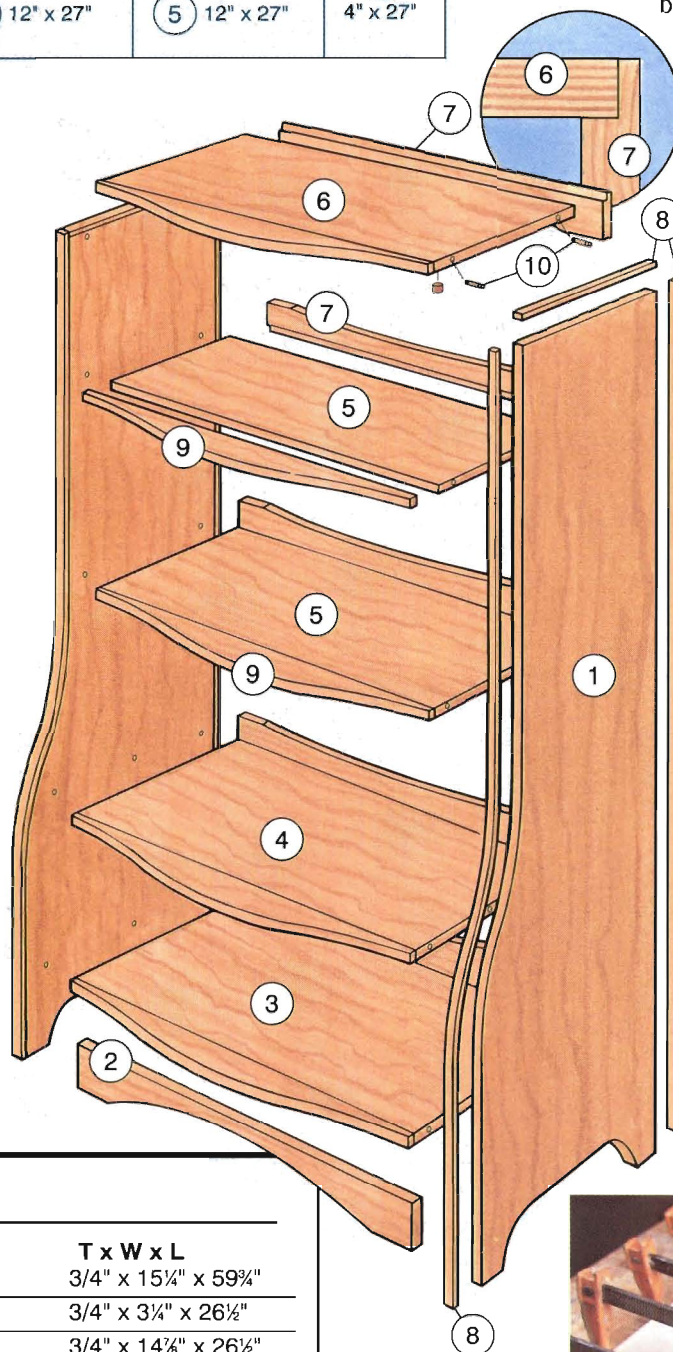
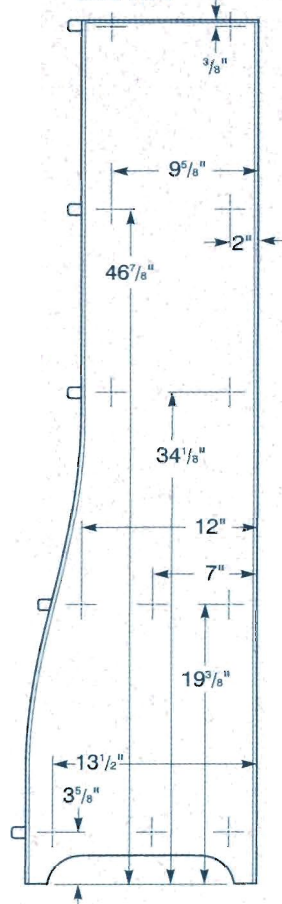
A hardware kit is available for this project that includes 24 minifix fasteners. In addition, the minifix jig is also available.

Item # 36921 (hardware kit)	\$13.95
Item # 92114 (minifix jig)	\$17.95

Cutting Diagram Cut oversized pieces from plywood sheet first then trim them to final size.



**Side Panel
Side View**



to the front and back edges. Be sure to use plenty of clamps to pull the banding tight against the curved front edge of the sides (See Figure 1 below).

The shelf back stops provide two important functions. They keep books and knick knacks from falling off the shelves and provide the essential bracing the bookcase needs to prevent racking, which would likely occur without any permanent joinery or a back panel to stiffen the assembly. Cut the back stops to size and plough a rabbet in each piece, as shown in the **back stop detail** at left. Now rout the back stops to shape using the template you made earlier. Glue the stops to each shelf, then cut stock for the front edging (pieces 9). Once all the edging is glued to the shelves, sand the joints flush and use your template and router to trim the front edging of each shelf to shape.

Minifix Fasteners

The beauty of Minifix fasteners (pieces 10) is that they can be taken apart as many times as you want without sacrificing their gripping ability. As a bonus, installing them is a breeze, requiring only a drill press and a hand drill.

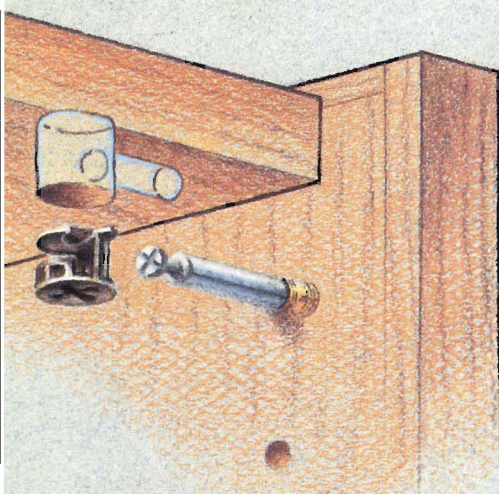
Laying out the drilling locations for the Minifix fasteners, however, must be exact. Take



Figure 1: The 1/4" banding will easily conform to the front edge of the sides, but use as many clamps as you can to get a seamless joint.

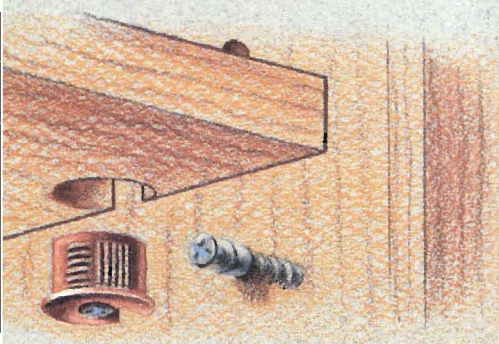
MATERIAL LIST

	T x W x L
1 Sides (2)	3/4" x 15 1/4" x 59 3/4"
2 Apron (1)	3/4" x 3 1/4" x 26 1/2"
3 Bottom Shelf (1)	3/4" x 14 5/8" x 26 1/2"
4 Second Shelf (1)	3/4" x 13 5/8" x 26 1/2"
5 Third & Fourth Shelves (2)	3/4" x 11 5/8" x 26 1/2"
6 Top Shelf (1)	3/4" x 11 5/8" x 26 1/2"
7 Back Stops (5)	3/4" x 2" x 26 1/2"
8 Banding Strips (1)	1/4" x 3/4" x 24 ft.
9 Front Edging (5)	3/4" x 1 3/8" x 26 1/2"
10 Minifix Fasteners (24)	3-part KD fitting



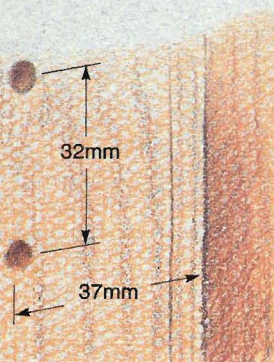
Minifix Fasteners

As the popularity of European style cabinetry has grown over the years, so has the quality of knockdown hardware. Among the best units available are the Minifix fastener (above) and its close cousin, the Rafix fastener (below). Both fittings provide several important features: they produce strong mechanical connections, they're easy to install and they're hidden from view once your project is completed.



In the bookcase project, Minifix fittings were used. When greater adjustability is required, Rafix would make a better choice since it allows you to drop a shelf into place without disassembling the unit.

There is another, unexpected use for Minifix fittings: if you're ever faced with a glue-up that exceed your bar clamping capabilities, install Minifix fittings to draw the pieces tightly together while the glue cures.



your time and, to guarantee consistency, start all your measurements from the back edges of the bookcase pieces (see the **side view elevation** on page 11). To make the casing and connecting rod holes even easier to lay out, a Minifix jig is available that comes equipped with a toggle clamp to secure the jig right on the plywood panels (see hardware kit on page 10).

Drill the holes in the sides with a 5/16" bit, using a drill press to stay straight and square to the surface, then tap the anchors into place with a rubber mallet. To improve the grip of the anchors it's a good practice to put a few drops of glue in the holes before driving the hardware into place. As soon as you install each anchor, drive in a connecting rod to spread the anchor's teeth. This step may cause a bulge on the outside face of the plywood if the pin hits a weak spot in the lamination. Should this happen, drill out the pin a little to relieve the pressure.

Now bore the 5/8" deep casing holes with a drill press and a 15mm

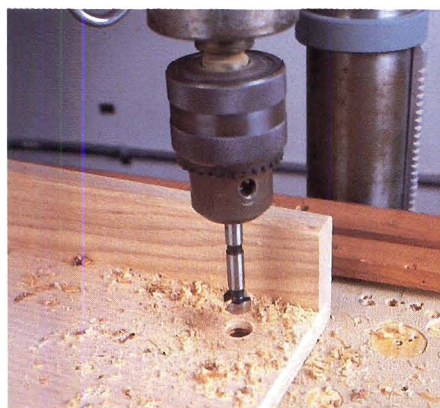


Figure 2: For boring accurate casing holes that are square to the plywood's surface, use your drill press and a 15mm Forstner bit.

Forstner bit (See **Figure 2**). Pay close attention to the depth of the holes, for drilling a little too deep could result in a glaring defect on the top surface of the shelves.

For the connecting rod holes in the edges of the shelves, nothing beats the Minifix jig for positioning your drill bit and holding it square to the material. Clamp the jig into position with its plastic plate bearing on the bottom surface of each shelf and drill the connecting rod holes with your 5/16" brad point bit (See

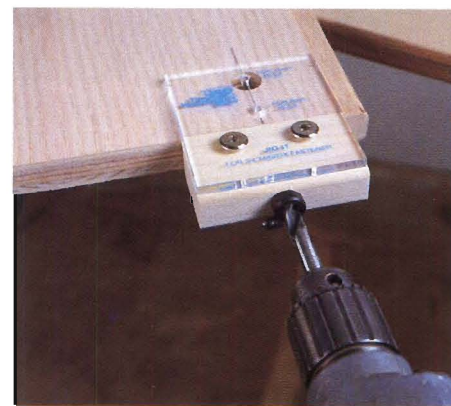


Figure 3: A Minifix jig is a handy tool for laying out the casing holes and drilling perfectly positioned connecting rod holes.

Figure 3). By registering the jig off the bottom of the shelves, you'll get perfectly positioned holes even if your plywood isn't a full 3/4" thick (which it rarely is).

Assembly

Before assembling the bookcase, glue the apron to the underside of the bottom shelf, positioning it 3/8" back from the corners of the shelf's front edge. After the glue dries, press the casings into the shelf holes, making sure the arrow on each fitting points toward the nearest end of the shelf. Now lay one side panel down and slip each shelf onto the connecting rods. Turn the casings clockwise with a #3 phillips screwdriver until the connecting rods are gripped securely and the panels are drawn together. (Note: for the back stops to effectively resist racking, the joints between the shelves and sides must be tight.) Add the other side panel to the assembly and check the fit of all the joints. When everything is adjusted correctly and you're satisfied with the fit of the assembly, take it apart for sanding and varnishing. I used three coats of polyurethane to ensure a tough, long lasting finish.

Undoubtedly, the completed bookcase will get lots of use. As a matter of fact, you'll probably find that having only one is not nearly enough to hold all the books and mementos you've collected over the years. Thankfully, the templates you made for this project can be used over and over, making it a lot easier to build more bookcases as the need arises.

Chris Inman is the editor of Today's Woodworker magazine and a professional woodworker.

The Jelly Cupboard Reproduction

Who says rustic charm has to be a thing of the past?

By Tim Johnson



I pulled into the driveway at Charley's Antiques one rainy Iowa afternoon. Charley's is the kind of place you read about—one ramshackle unheated building houses the good stuff, another lightless shanty contains still more good stuff, there are a couple of broken down semi trailers jammed with questionable stuff, and the excess is strewn haphazardly outside. Peering through the downpour, inching my van toward the buildings, I spied the silhouette of an abandoned cabinet left in the driveway. I immediately stopped and jumped out to take a closer look at the small, handmade, two door cupboard. Within minutes Charley approached, and we both knew this orphan cupboard was about to be adopted.

The fact that so many cupboards like this one have survived for a century or more is testimony to the integrity of their construction. Working with little more than planes, saws, and hammers, the builders combined common sense with efficiency, and often designed their cabinets based on an ancient Greek standard of proportions called the golden mean.

Because I was so fond of Charley's cupboard, I saved the original for myself and decided to build another one to sell. I chose butternut for the outside and poplar for the shelves and back. Both woods are easily worked with hand tools, which accounts for their popularity a century ago. I recommend using #1 common stock because large planks are often available in this grade. By cutting around the knots you'll get the lumber you need for less money, although I always keep a few knots as highlights on my rustic pieces.

Once you've carted your wood home, plane the butternut to 1" in thickness to reveal its color and grain patterns. Set aside the best straight grained pieces for the face frame and door frames, and choose interestingly patterned pieces for the door panels. Try to select pieces that are similar in color. Choose your next best



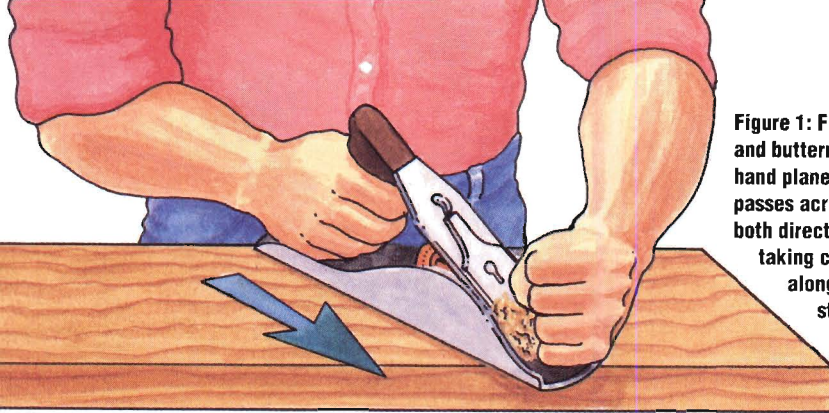


Figure 1: Flatten your poplar and butternut panels with a hand plane, making diagonal passes across the panels in both directions. Finish by taking clean up strokes along the length of the stock.



boards for the sides, and the remaining stock for the top—a slightly crowned grain pattern on the top's front edge is a nice touch. Remember, this cabinet is so simple that the visual impact of the wood becomes an important design element.

Getting Started

Begin building your reproduction by milling the poplar and joining it into oversized panels for the shelves (pieces 1). Make a couple of shelves 12" longer than necessary so you'll have testing material when you get to the joint fitting stage later on. After the glue dries, plane the shelves flat, first planing diagonally in one direction, then the other to create an "X" pattern (See **Figure 1**). Be sure to plane both sides of each shelf this way, then smooth the surfaces by taking light passes from end to end.

Now mill and join butternut for the sides and top (pieces 2 and 3), and plane these panels just as you did the shelves. Once you've finished planing, joint one edge of each side panel and cut them to size. Make sure the two panels match exactly and check their ends for squareness. Complete the same steps with the top, but rip it 1/4" wider than its finished width, then rip the panel again to a width of 15 3/4". The objective is to rip the front edge off the top now so you can rout the grooves easily, and then glue it back on after the joints are completed.

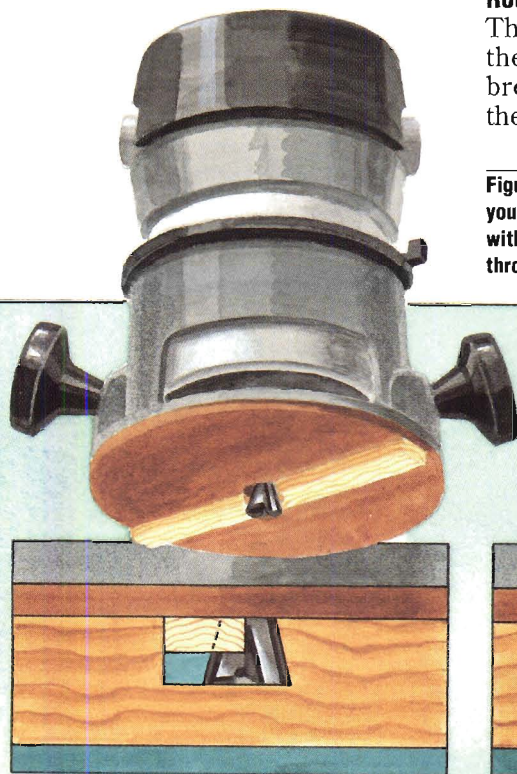
Machining the Sides and Top

The construction of many older cabinets focuses on a single joinery technique. On this cupboard, the shelves connect with the sides, and the sides to the top, with barefaced, dovetailed housing joints (see **joint detail** on page 16). The builder of the original

cupboard chose this joint because it's fairly easy to cut with hand tools. Imagine what he would say if he saw the joint cut with a table saw and router.

To form the joint, first install a 5/8" dado blade in your table saw and plough 3/8" deep dados in the top and sides, as shown in the **shelf locations drawing** on page 17. Cut a few dados in some scrapwood as well for use as testing material.

Next, make three hardboard baseplates for your router to use for cutting the dovetailed shoulder of each dado and the tail on the ends of the shelves and sides. Make these plates to match your router's current baseplate (the round one shown below in **Figure 2** is for a Porter-Cable router).



Step 1: Mount a fence to your first baseplate to position the dovetail bit so it just grazes the upper outside corner of the dados.

Now make two 1/2" wide by 1/4" thick hardwood strips to serve as baseplate fences and drill a router bit clearance hole in each one.

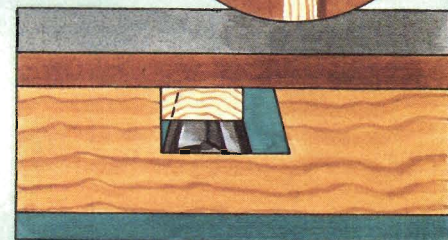
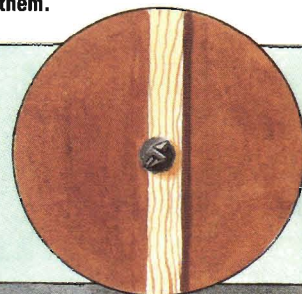
Screw a baseplate to your router and chuck a 14° dovetail bit in the collet. Lower the bit 3/8" to match the depth of the dados you just cut. Now position a fence on the baseplate as shown in **Step 1** of **Figure 2**. When the fence is set correctly, mark its position and glue it to the plate. Five minute epoxy works great here. Test this set-up on scrapwood to see that the bit just grazes the top corner of the dado wall.

Given that dados cut on the table saw usually have slightly irregular bottoms due to the imperfections of the panels, the router bit pass will probably shave the high spots. But since the bit isn't as wide as the dados, you'll need to make a second pass to even the dado bottoms. Switch to the second shopmade baseplate and glue on a fence the same way you did before, but this time position it as shown in **Step 2** of **Figure 2**. Once the epoxy sets, rout the remaining ridges in the dado bottoms. When you've completed the routing, glue the cutoff piece from the top back to the panel and trim its front edge to bring the top to final width.

Routing the Tails

The third baseplate makes routing the tails on the shelves and sides a breeze. Keep the dovetail bit set to the depth of the dados and secure a

Figure 2: Make three hardboard baseplates for your router and mill two hardwood fences to go with the plates. Drill bit clearance holes through all of them.



Step 2: Mount a fence to your second baseplate so the dovetail bit just grazes the lower inside corner of the dados.

scrap piece from a side panel in your bench vise. Now install your adjustable router fence and set it as shown in **Figure 3** below. Rout the end of the scrap piece and check the tail's fit in a dado. If it's too big or small, continue adjusting the fence until you get a perfect slip fit.

By now, your layout results are probably a hair different from mine, which means that your shelves may need to be a tad longer or shorter than the measurement in the material list. To find the exact shelf length you need, rout two pieces of side panel scrap and slide them into the dados in the top. Measure the distance between them and add the depths of two dados. The result is the perfect shelf length for your cabinet. Now joint and rip your shelves to width, and crosscut them to the length you just calculated. Make sure the ends are square, then rout the tails. Follow the same procedure to rout tails on the top end of each side panel.

Before assembling the carcass, cut rabbets in the sides and top for the back (pieces 4, 5 and 6). Install a 1/2" dado blade in your table saw and clamp an auxiliary face to the fence. Cut 3/8" deep rabbets in the sides and a 1/2" deep rabbet in the top. Be sure to stop the rabbet in the top 2 7/8" from each end. After squaring the ends of the top rabbet with a chisel, layout the feet pattern on the sides, following the **frame elevation** on page 16 and the **shelf locations** drawing on page 17. Carefully cut out the waste with a saber saw and sand the edges smooth.

Assembly

To begin assembling the carcass, have a friend hold the sides on their back edges while you slide the top onto the tails, but without using glue. This will hold the assembly steady while you glue the shelves in position. Spread a slow setting glue like urea resin or hide glue into the dados for one shelf and on the back 4" or so of the shelf's tails. Slide the shelf into position, tapping it with a hammer and block if necessary. Slipping 1/2" thick scrap pieces into the rabbets in the sides will keep the shelves from sliding through. Repeat this procedure for all four shelves, then draw the assembly tight with bar clamps and cauls (See **Fig-**

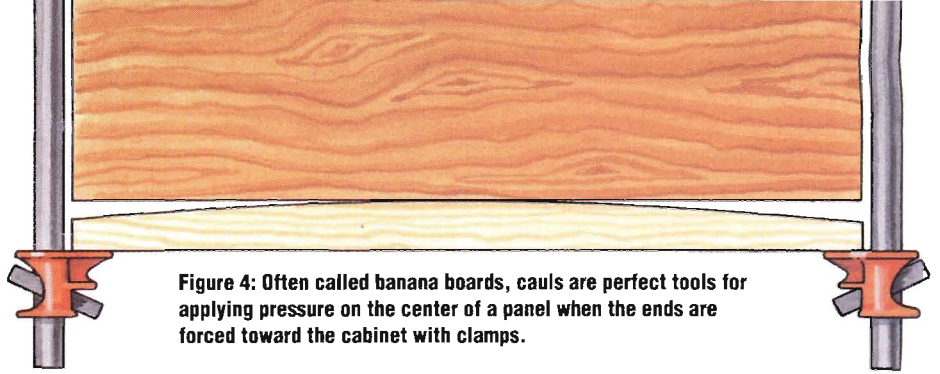


Figure 4: Often called banana boards, cauls are perfect tools for applying pressure on the center of a panel when the ends are forced toward the cabinet with clamps.

ure 4). You can use square headed nails to pull the joints tight (available from *Tremont Nail Company, P.O. Box 111, Wareham, MA 02571*). Be sure to check the cabinet for squareness and clean up any squeeze out after the glue becomes rubbery. Allow the cabinet to sit overnight, then glue the top to the sides.

Plane the front edge of each shelf flush with the sides, and take this opportunity to sand and finish the inside if you want (the old timers usually left the inside unfinished).

Mill 1/2" thick poplar for the cabinet back and cut these pieces to size. Next, rabbet the edges of the back pieces, as shown in the **back elevation** on page 16. Cut tapers on the bottom of pieces 4 to match the front stiles, as shown in the **Face Frame Elevation** on page 17. Glue and nail pieces 4 and 6 into place, making sure you avoid nailing through the rabbets. Now slide the remaining panels (pieces 5) into position, center them and drive one nail at each shelf location and at the top rabbet. This arrangement will allow for plenty of wood movement.

The Cabinet Face Frame

Mill the face frame stock (pieces 7 and 8) to thickness, then joint and rip the stiles 1/16" wider than the fin-

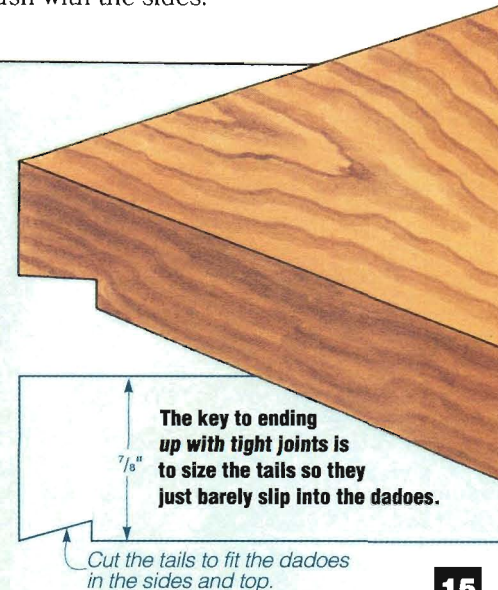
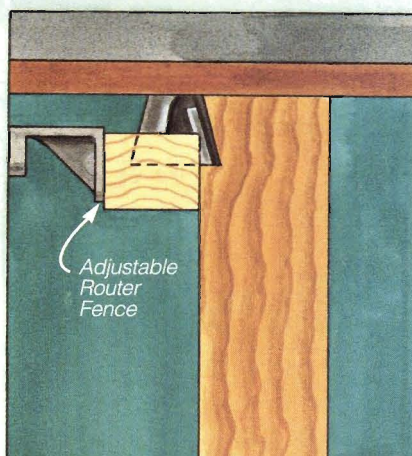
ished dimension and the rail to actual size—the lack of a bottom rail is one of the eccentricities I like best about this cabinet. Cut the pieces to length, double checking the material list dimensions against your carcass to determine the correct measurement. Cut the taper on the bottom of each stile following the **face frame elevation** on page 16.

Now form the tongue and groove joints on the face frame. First, rout a groove in each stile, as shown in the **face frame elevation**, then use your table saw to cut tenons on the rail to fit the stile grooves.

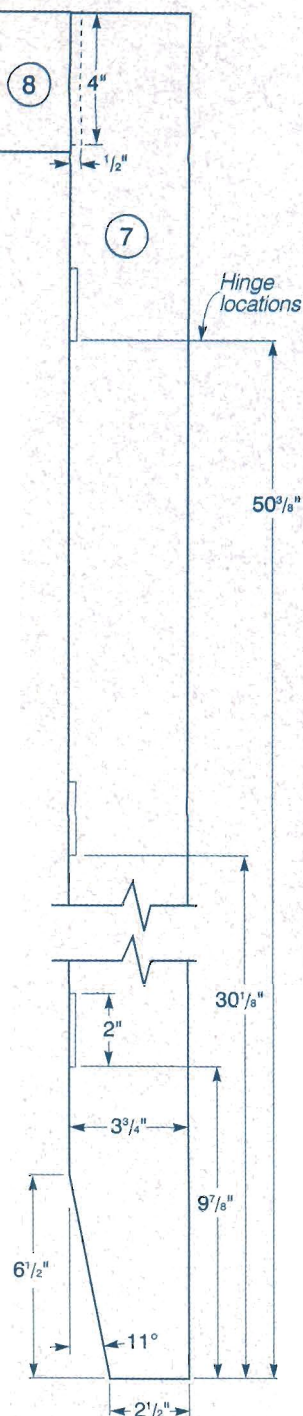
Dry assemble the frame and check its fit against the carcass—I cut a temporary lower rail that helped keep the frame square. When everything's in order, disassemble the frame, apply glue to the joints and clamp it back together. Remember to check for squareness.

Glue the face frame to the carcass, letting the stiles stick out from the each side about 1/16", and don't forget to glue the rail to the top. On the original cabinet, one nail was driven through the frame at each shelf location to stiffen the shelves. Allow the glue to cure, then glue blocks (pieces 9) into the corners formed by each pair of legs and plane the stile edges flush with the sides.

Figure 3: To rout the tails, mount the third baseplate on your router and guide the cut with your router's straightedge fence.



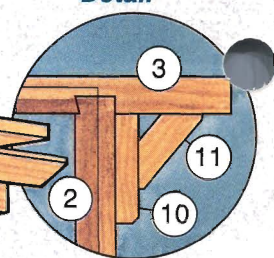
Face Frame Elevation Front View



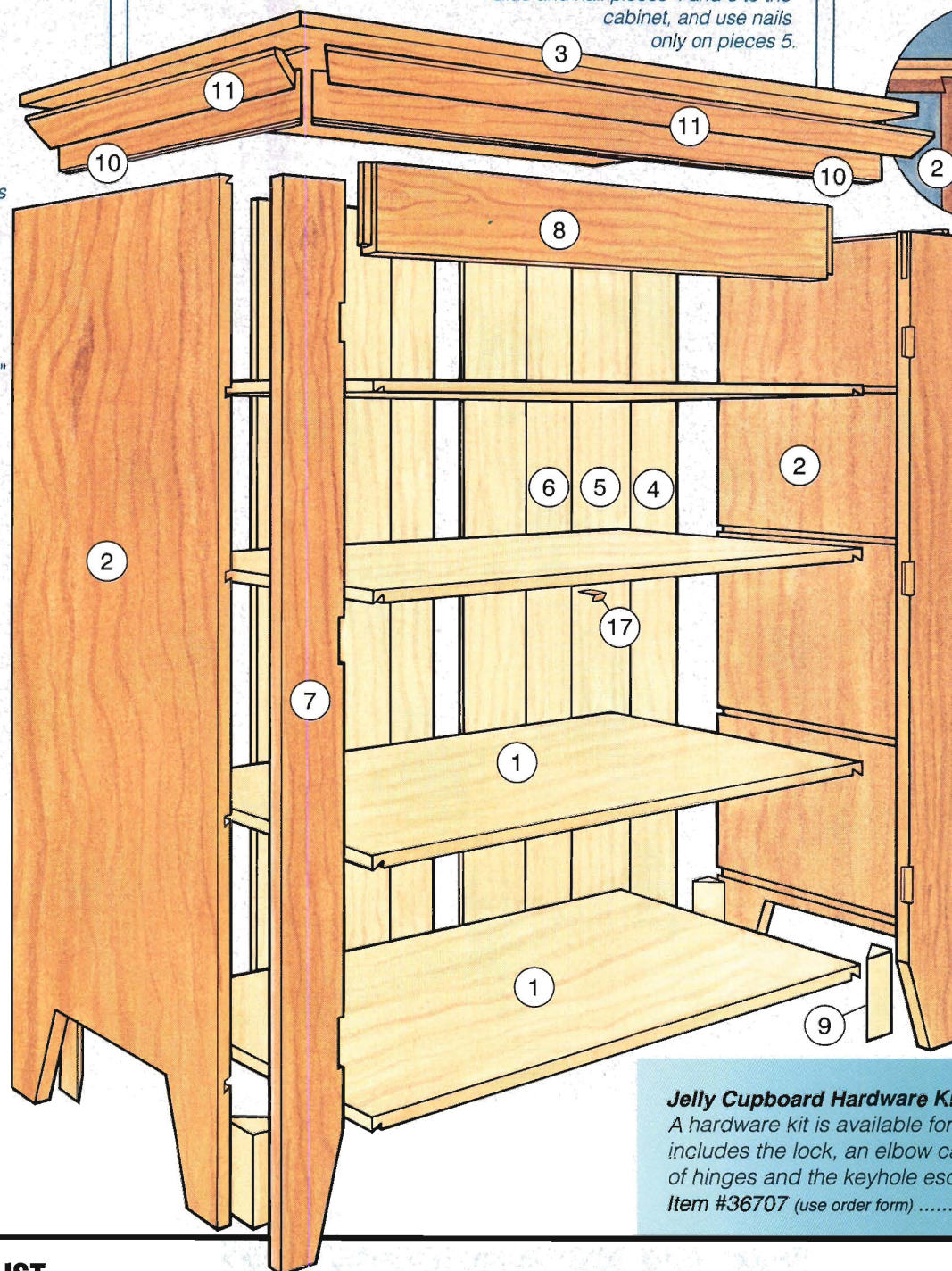
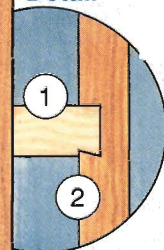
Back Elevation Top View



Corner Detail



Joint Detail



Jelly Cupboard Hardware Kit

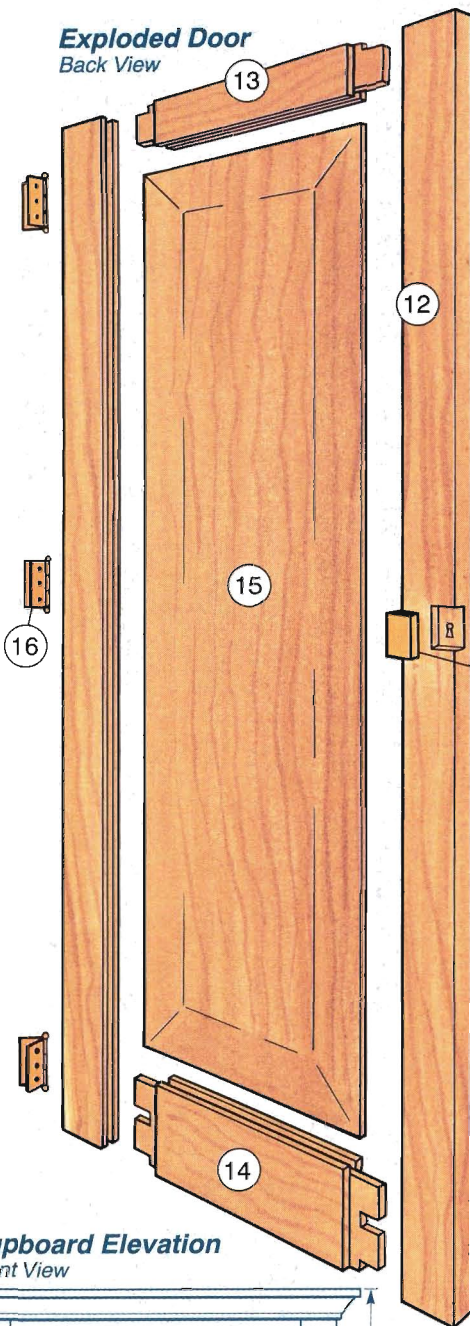
A hardware kit is available for this project that includes the lock, an elbow catch, three pairs of hinges and the keyhole escutcheon.

Item #36707 (use order form)\$25.95

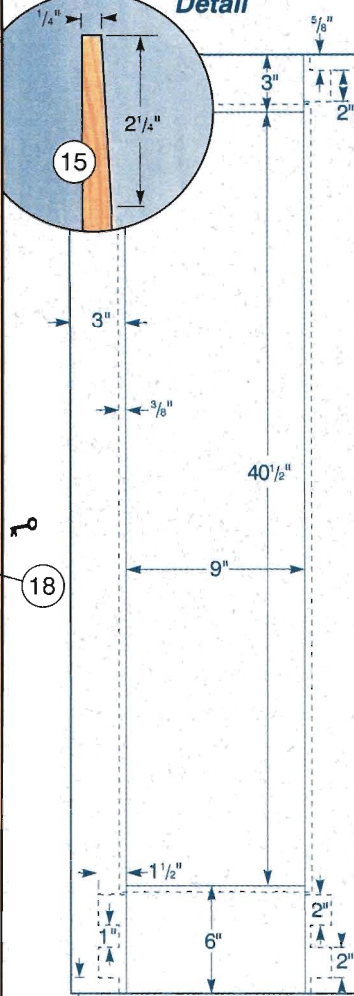
MATERIAL LIST

	T x W x L		T x W x L
1 Shelves (4)	7/8" x 15 1/8" x 36 3/4"	10 Base Crown Moulding (1)	1/2" x 2 3/8" x 80"
2 Sides (2)	7/8" x 15 3/4" x 60 3/4"	11 Top Crown Moulding (1)	3/4" x 2 1/8" x 80"
3 Top (1)	3/4" x 19 1/16" x 42 3/16"	12 Door Stiles (4)	7/8" x 3" x 49 1/2"
4 Back (2)	1/2" x 4" x 60 3/4"	13 Upper Door Rails (2)	7/8" x 3" x 12"
5 Back (3)	1/2" x 7 3/4" x 54 1/4"	14 Lower Door Rails (2)	7/8" x 6" x 12"
6 Back (2)	1/2" x 3 3/4" x 54 1/4"	15 Door Panels (2)	3/8" x 9 1/2" x 41 1/8"
7 Face Frame Stiles (2)	7/8" x 3 3/4" x 60 3/8"	16 Hinges (3 pair)	1 3/4" x 2" brass ball tip
8 Face Frame Rail (1)	7/8" x 4 3/8" x 31"	17 Elbow Catch (1)	Brass plated
9 Corner Blocks (4)	2" x 2 1/4" x 6 3/4"	18 Lock (1)	Half mortise-brass

Exploded Door Back View

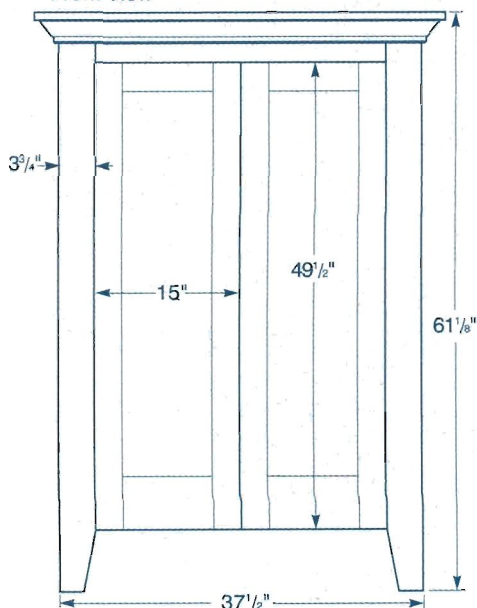


Panel Edge Detail

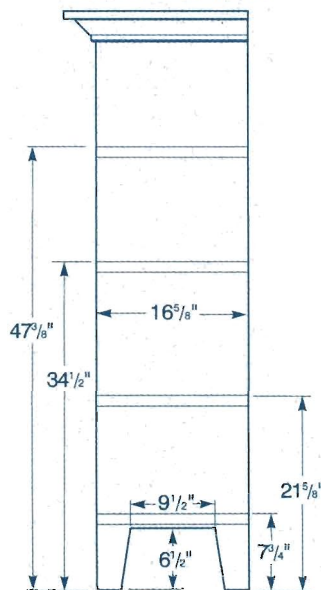


Door Elevation Front View

Cupboard Elevation Front View



Shelf Locations



Cut your crown mouldings (pieces 10 and 11) to shape, as shown in the **corner detail** at far left and on the **full size pattern**, and miter them to length. Glue and nail the front base moulding to the cabinet, but for the sake of wood movement, glue only the first 4" of the side base mouldings. Next, glue and nail the top mouldings to the base mouldings. Be sure to glue all the miters.



Figure 5: Once you've formed the tenons with your table saw, dado blade and miter gauge, cut the gap in each lower rail tenon with a hand saw.

Making the Doors

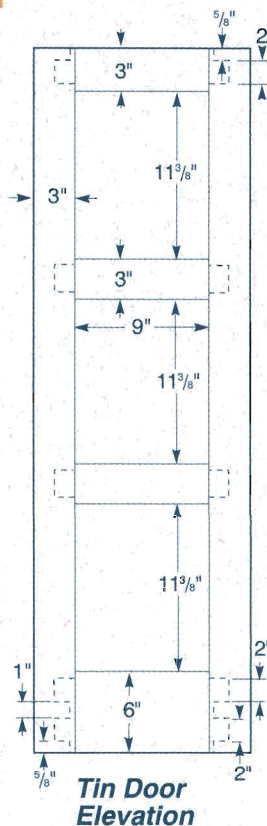
Mill your door frame stock to thickness, then joint and rip the rails and stiles (pieces 12 through 14) to width. Machine the grooves for housing the panels with a table saw and 1/4" dado blade. Set the rip fence on the saw to center the blade on your stock, and raise the blade to 3/8". Now run the appropriate edges of the stiles and rails through the blade.

Layout the mortises, as shown in the **door elevation** at left, then clear out the waste. I used my drill press and a hollow chisel mortising attachment, but you can easily drill out the bulk of the waste and clean up with a chisel if you prefer. I recommend cutting the lower mortises for the bottom rail tenons about 1/8" wider than called for in the door elevation to allow for seasonal movement.

Following the **door elevation**, form the rail tenons with your table saw, dado blade and miter gauge. Make sure the cuts are square to the stock and size the thickness of the tenons for a snug fit in the mortises. Cut the gap in the bottom rail tenons with a handsaw and chisel as shown above in **Figure 5** above.

Now mill and size the panels (pieces 15), remembering to allow for

Punched Tin Doors



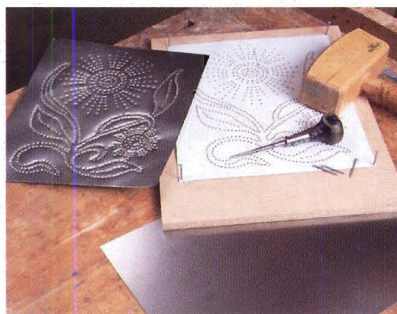
There's no secret to punching tin. All it takes is patience and a good design. To substitute tin doors in the jelly cupboard we added two rails to each frame (as shown in the elevation above), rabbeted the openings and cut the tin panels to fit. You'll find our punching design on this issue's **full size pattern**.

We do not recommend using vinegar or chemicals to develop a patina on the tin. After you punch your pattern, apply a coat of Deft spray lacquer (to prevent rusting) and wait about a year for your doors to mellow.

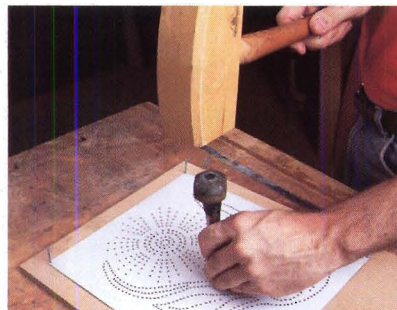
Tin Door Panels

Authentic tin panels measuring 10" x 14" are available by the individual piece.

Item # 21709 (use order form) ..\$3.25



It's easy to set up for punching tin: all you need is a sharp awl, a mallet, some backup boards and a pattern for each panel.



You'll get your best results if you tape the pattern in place and then nail the tin panel right to the backup board.

seasonal movement when ripping them to width —the panel width called for in the material list is a compromise between seasonal extremes. Use a hand plane to taper the back edges of the panels, as shown in the **panel edge detail** on page 17, until they fit into the frame grooves. This procedure is just like making old fashioned raised panels, only in this case the flat side will show on the front of the doors. Once the panels fit in the door frames, I highly recommend finishing them (prior to assembly) to prevent unfinished wood from becoming exposed when the panels shrink. Apply glue to the mortises, the tenon haunches and the first 1" of the tenon cheeks, and assemble the doors, keeping them flat and square.

Mortise the doors and the face frame stiles for the loose pin butt hinges (pieces 16). Loose pin hinges allow you to remove the doors easily during the fitting process —driving screws in and out of the butternut too many times would strip the pilot holes. Mount the doors, then plane their overlapping edges to a perfect fit —bearing in mind the season as you establish the gap between the doors. Remember, it's easier to shave a little material later than it is to add it back.

Following tradition, the right door latches to the left door, and the left door latches to the cabinet. An elbow catch (piece 17) will firmly hold the left door to a shelf, and a half mortise lock (piece 18) is ideal for the right door. Be sure to notch the left door so it can accept the lock plunger and install an escutcheon in the key hole. Like the original cupboard, the key to the lock acts as the pull for the doors.

After sanding the cabinet thoroughly, seal it with a wash coat of shellac, then finish with two coats of a quality varnish. In the old days these cabinets were almost always painted, so a color finish is appropriate if you prefer.

Once you've constructed your own jelly cupboard, I know you'll appreciate what those old timers accomplished with just a few hand tools. If you're lucky, some day a woodworker may stumble upon your piece and decide that it's worth reproducing.

Tim Johnson, a professional woodworker from Minneapolis, Minnesota, owns Complements, an antique store.

A Workbench for the 21st Century

The next generation of woodworkers might some day be using laser cutters and computer controlled chisels, but they'll still need to get started just like us old timers —with a sturdy workbench.

By Richard Starr

Having been a woodworking teacher for many years, I know how anxious kids are to dive into their first projects. And like their adult counterparts, nothing gets them off to a better start than a fine workbench.

The half pint bench I've designed is sized for four to nine year olds, although it could be altered easily for older children. What I like best about the design is the use of handmade wooden screws and nuts for the joinery, which gives the bench a real "woodworker's feel" and makes it easy to take apart. In addition, there's a fully functioning vise that takes further advantage of the wooden screw threading technique.

For a sturdy bench, I used 8/4 yellow birch for most of the assembly and sprinkled in cherry and walnut for interest. To save a few dollars, you could substitute construction lumber for all parts except the screws, nuts and vise jaws, but you'll lose the weight advantage that hardwood provides.

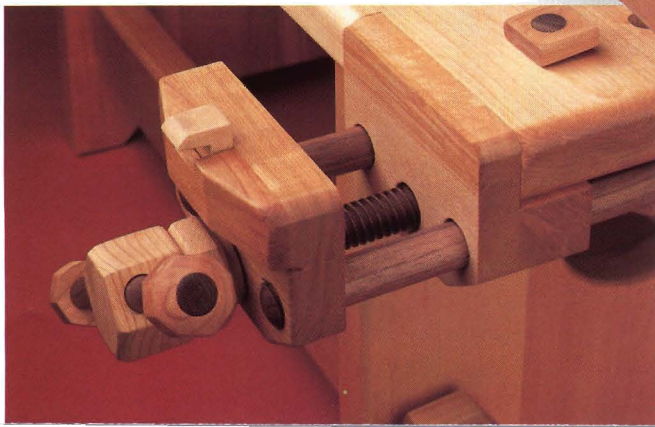
Making the Base and Top

Begin by gluing boards for the bench top and legs (pieces 1 and 2). Some woodworkers use dowels or biscuits in edge to edge joints, but I find that just gluing them together is sufficient. Plane and sand the panels, then trim them to width. Next, use the **full size pattern** of the legs to make a template out of 1/4" thick plywood. Trace the pattern onto the leg panels (including the drilling locations) and bandsaw them to shape.

Now draw a line on the face of the panels to help guide you while boring the top holes, which should be drilled at least 4½" deep to reach into the hold down openings. Drill these holes and the others with a 1½" spade bit.

To cut the leg openings I used my router, the template, a 1/2" straight bit and a rub collar (see **Figure 1** on the following page). Clamp the template to each leg and drill a starter hole through the waste area. Next, make consecutively deeper passes with your router until you cut through the stock. You'll have to stop routing occasionally to pry out the

Just like the real thing, this scaled down workbench features the tools every young woodworker needs, like a fully functional wooden vise and a bench dog system.



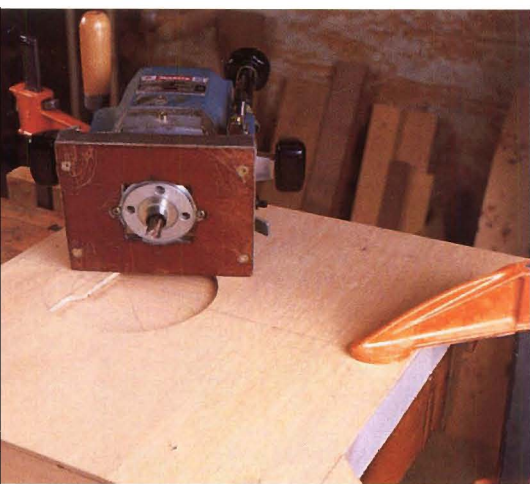


Figure 1: Clamp the leg template to your panel and rout the opening in 1/2" deep passes with a 1/2" straight bit and a rub collar.

shavings with a screwdriver. A spiral bit, which ejects its own shavings, makes a better choice if you have one.

Cut cherry to size for the rails (pieces 3) and, to ensure consistency from one rail end to another, make a plywood routing template from the **full size rail pattern**. Layout and drill the hole in the end of each rail for the wood screws, then rout the ends of the rails using the template as you just did with the legs. Shaping the rail ends will result in very rigid joints when they're connected to the legs.

Cut the top to size and use a saber saw to carefully remove the vise notch shown in the top elevation on page 22. Next, layout the bench stop holes, as shown in the top elevation. Clamp a fence to your drill press table to keep the holes in a straight line, and drill the holes at a 3° angle. The holes are angled to give the bench dog a firmer grip on any workpiece.

Sand, scrape and file all the edges of the legs, rails and top, then rout most of the edges with a 1/2" roundover bit. Places to avoid routing include the screw and nut contact areas on the legs (see full size pattern), the ends of the rails and the vise notch in the top.

Build the tray (pieces 4 and 5) out of baltic birch plywood and cherry, as shown in the **tray joint elevation** at right. Cut the pieces to size and plough a 1/2" wide by 1/2" deep groove with a dado blade in the center of each cherry rail. Rout the edges of the rails with a 1/4" roundover bit, and glue the tray parts together.

Making the Screws

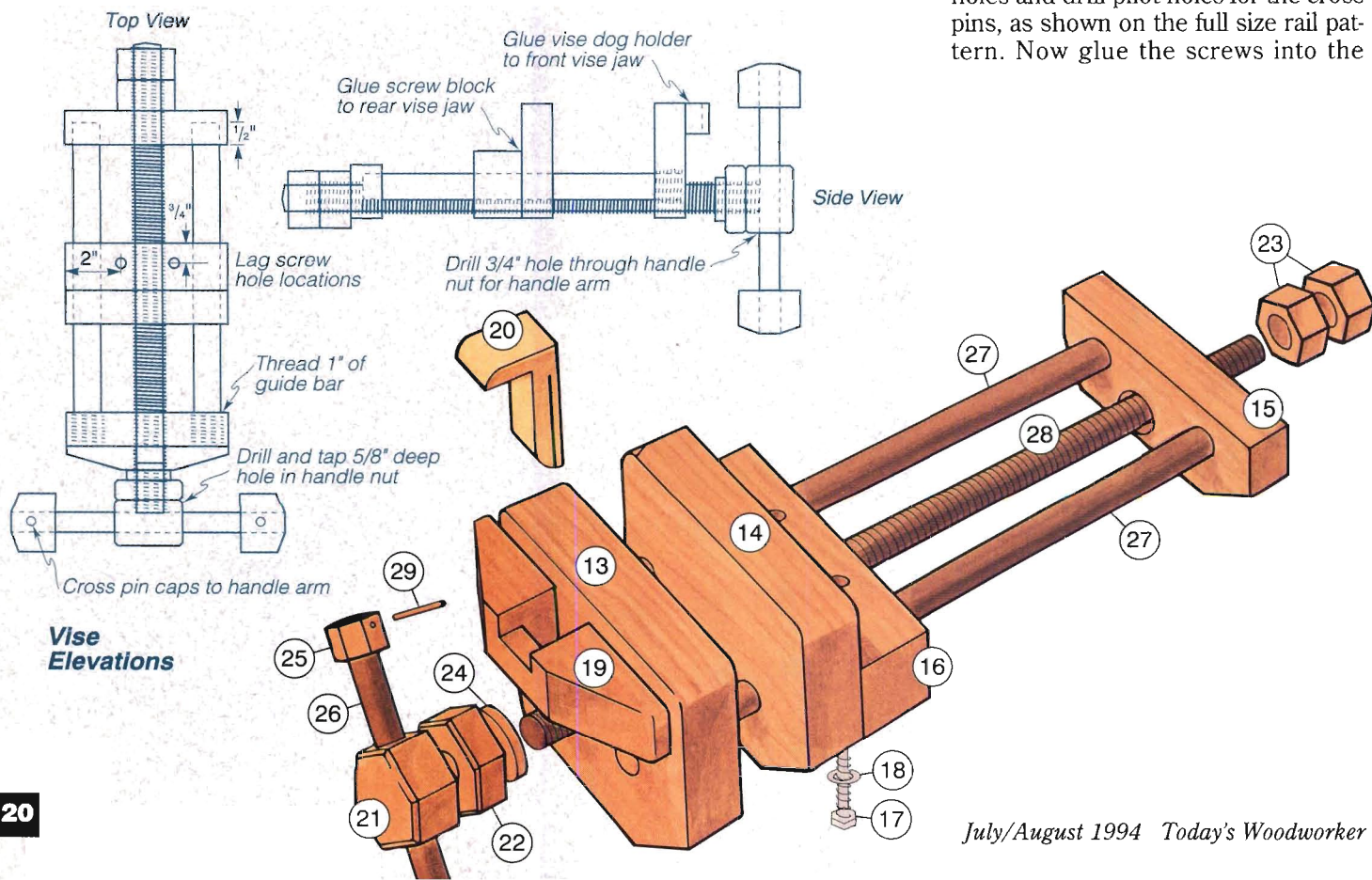
Threading the screws and nuts is an exciting step in this workbench project because it begins to tie everything together. You'll need a threadbox and tap, and time to practice. For

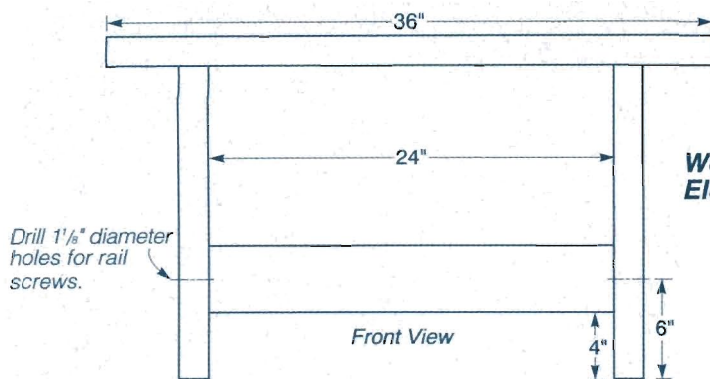
pointers on using a threading kit, read *Today's Shop* on page 23.

Thread the walnut dowels for the rail screws and top hold down screws (pieces 6 and 7), then make the hexagonal nuts (pieces 8 and 9) for joining the assembly. To make the nuts, first cut six pieces of 1 1/8" thick cherry stock to size, then trace the **full size pattern** of the nuts onto each block of wood. Mark the center of the nuts and drill the through holes using the bit size recommended in your threadbox instructions. My threading instructions called for a 7/8" pilot hole for the 1" tap. Thread the holes, then bandsaw the nuts to shape. Complete the nuts by sanding them smooth and chamfering the top and bottom edges.

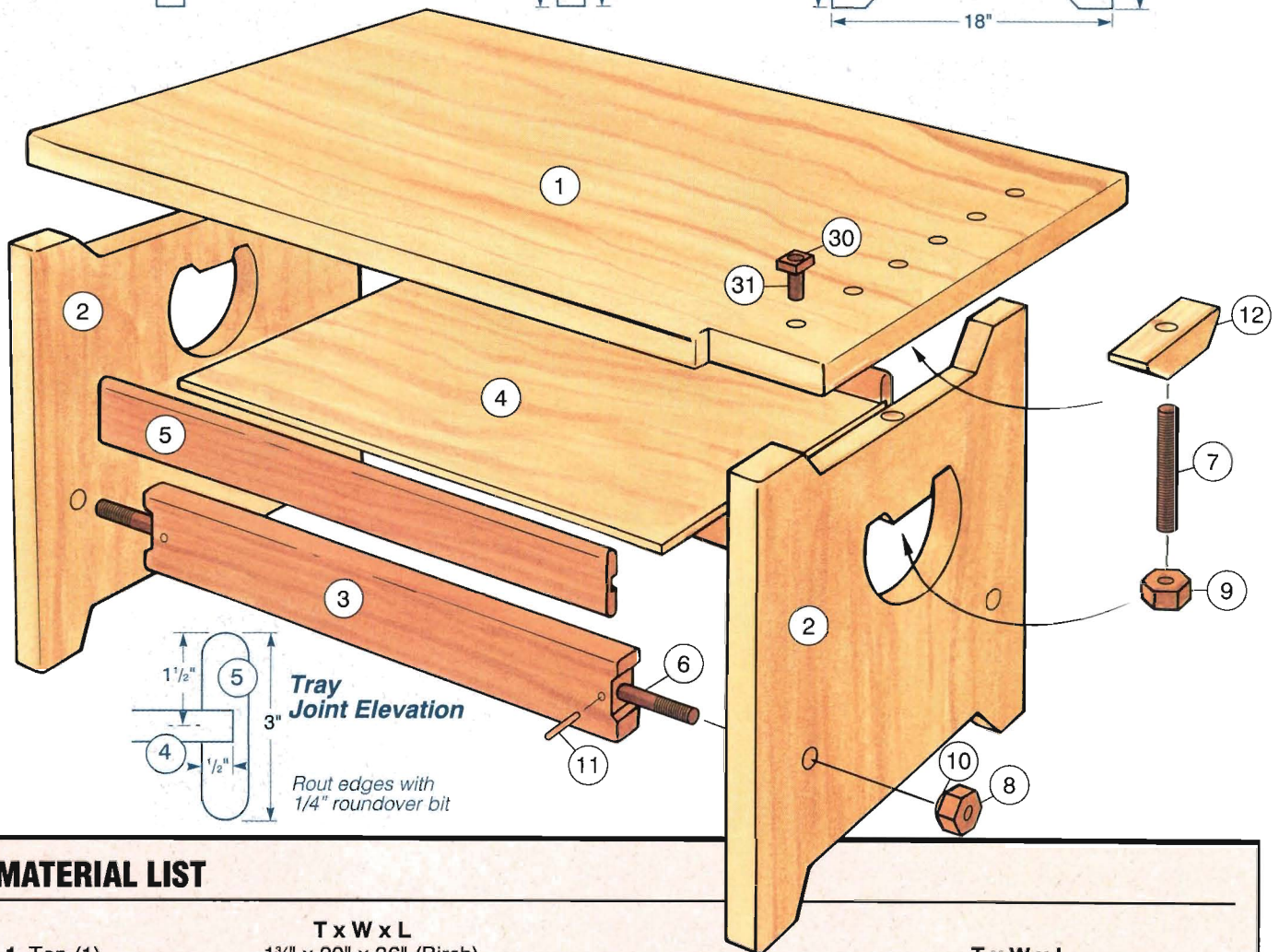
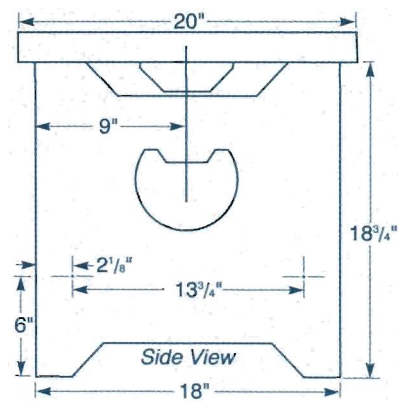
To focus the pressure of the nuts right on the joint areas, I made four 2" wooden washers (pieces 10) and glued them to the rail nuts. In addition, I made a 1 3/8" washer (piece 24) for the vise assembly lock nut. The washers also improved the appearance of the joints. Draw the washers with a compass on 3/8" thick cherry stock and mark the center of each circle. Drill a 1" hole in each layout and bandsaw the washers out of the stock. Sand the rail washers and glue them to the rail nuts.

Slip the wooden screws into the rail holes and drill pilot holes for the cross pins, as shown on the full size rail pattern. Now glue the screws into the





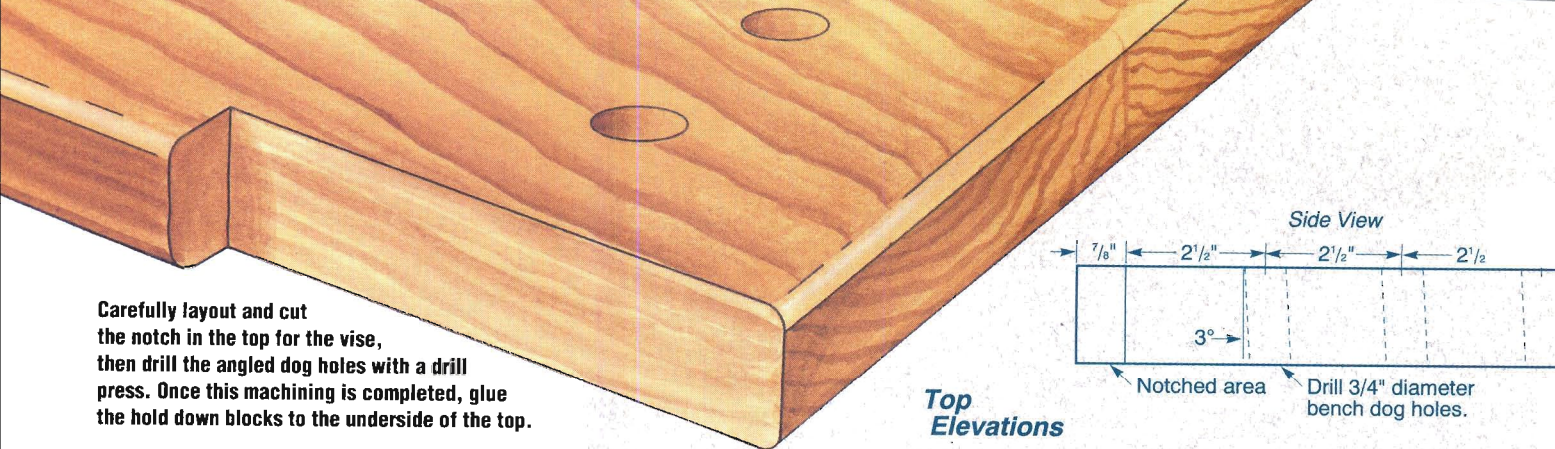
Workbench Elevations



MATERIAL LIST

	T x W x L
1 Top (1)	1 3/4" x 20" x 36" (Birch)
2 Legs (2)	1 3/4" x 18" x 18 3/4" (Birch)
3 Rails (2)	1 3/4" x 4" x 24" (Cherry)
4 Tray Base (1)	1/2" x 16 3/4" x 23 3/4" (Plywood)
5 Tray Edges (2)	3/4" x 3" x 23 3/4" (Cherry)
6 Rail Screws (4)	1" x 5 1/2" dowel (Walnut)
7 Top Screws (2)	1" x 7 1/4" dowel (Walnut)
8 Rail Nuts (4)	1 1/8" x 3 1/2" x 3 1/2" (Cherry)
9 Top Nuts (2)	1 1/8" x 3 1/2" x 3 1/2" (Cherry)
10 Rail Washers (4)	3/8" x 2" (Cherry)
11 Cross Pins (4)	1/4" x 2" dowel (Cherry)
12 Hold Down Blocks (2)	1 3/4" x 2 1/2" x 5 1/2" (Birch)
13 Front Vise Jaw (1)	1 1/8" x 4 1/4" x 6" (Cherry)
14 Rear Vise Jaw (1)	1 1/8" x 4 1/4" x 6" (Cherry)
15 Strap (1)	1 1/8" x 2" x 6" (Cherry)
16 Screw Block (1)	1 3/4" x 2 1/2" x 6" (Cherry)

	T x W x L
17 Lag Screws (2)	3/8" x 4"
18 Lag Washers (2)	3/8" inside diameter
19 Vise Dog Holder (1)	7/8" x 1 1/8" x 6" (Cherry)
20 Vise Dog (1)	1 1/8" x 1" x 2" (Birch)
21 Handle Nut (1)	1 3/4" x 2 1/2" x 2 1/2" (Cherry)
22 Front Lock Nut (1)	3/4" x 2 1/2" x 2 1/2" (Cherry)
23 Rear Lock Nuts (2)	1 1/8" x 2 1/2" x 2 1/2" (Cherry)
24 Lock Nut Washer (1)	3/8" x 1 5/8" (Cherry)
25 Handle Caps (2)	1 1/8" x 1 5/8" x 1 5/8" (Cherry)
26 Handle Arm (1)	3/4" x 10" dowel (Walnut)
27 Guide Bars (2)	1" x 12" dowel (Walnut)
28 Vise Screw (1)	1" x 17" dowel (Walnut)
29 Cross Pins (3)	1/8" x 2" dowel (Cherry)
30 Bench Dog Top (1)	1/2" x 1 1/2" x 1 1/2" (Cherry)
31 Bench Dog Tail (1)	3/4" x 2 1/4" (Walnut)



Carefully layout and cut the notch in the top for the vise, then drill the angled dog holes with a drill press. Once this machining is completed, glue the hold down blocks to the underside of the top.

rails and drive the cross pins through the joints. Cut and sand the cross pins flush with the rails, then assemble the rails to the legs. It's easy to overtighten the wooden nuts and damage the threads, so just spin the nuts on by hand until they're snug, and never use a tool for extra leverage.

Make the hold down blocks (pieces 12) in much the same way as you made the nuts. First cut two blocks of birch to size, then drill and tap a hole in the center of each one. Next, cut out the **full size side view pattern** of the blocks and trace it onto the stock. Bandsaw the pieces to shape and sand them smooth. Now chamfer the edges and carefully glue the blocks to the underside of the top, as shown in the **top elevation**. If positioned incorrectly the blocks will prevent the top from joining the base. After the glue dries, thread the hold down screws into the blocks and secure the top to the base.

Constructing the Vise

This vise has a number of parts, but studying the **exploded view drawing** on page 20 will show how simple its construction is. For the vise to work smoothly, however, the holes must be drilled precisely and squarely. Therefore, I recommend making templates for the vise jaws and strap, and suggest drilling all the holes with a drill press.

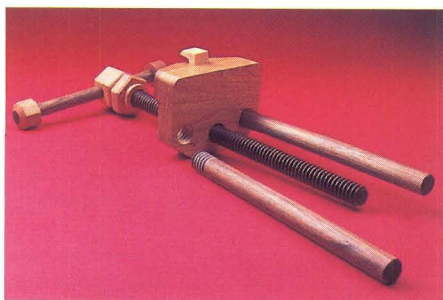
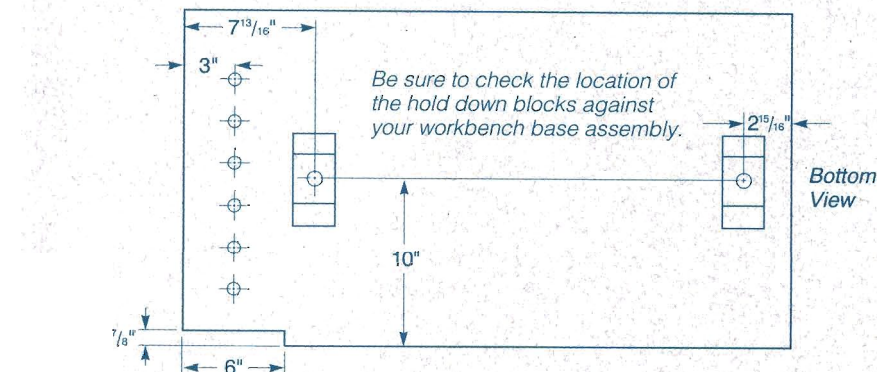


Figure 2: To put the vise together, first drive the guide bars and wooden screw into the vise jaws, then add the handle assembly and lock nut.



Make templates from the **full size vise and strap patterns**, and be sure to drill 1/16" holes at the hole locations. Next, cut oversized cherry stock for the vise jaws, strap and screw block (pieces 13, 14, 15 and 16), and glue the screw block to the rear vise jaw.

Use the templates to layout the hole locations on the jaws and strap, and drill the 1 1/2" diameter guide holes in the rear jaw assembly. Next, drill the center hole in the rear jaw in two stages. First drill a 1 1/2" diameter hole in the jaw, then continue through the screw block with your thread tapping pilot bit. The hole is drilled this way to minimize the effects of wood swelling, which could be damaging if the threads continued through the full thickness of the assembly.

Now bore the holes in the front jaw and the strap, and tap the guide holes in the jaw. Next, drill 3/8" mounting holes for the lag screws (pieces 17 and 18) in the screw block, as shown in the **vise elevations** on page 20.

Cut cherry for the vise dog holder (piece 19) and layout the notch, as shown in the **full size pattern**. Form the notch with your table saw and a 1/2" dado blade. Now trace the full size pattern of the holder (top view) onto your stock and bandsaw the piece to shape. Sand the holder and glue it to the front vise jaw, making sure to clean up any squeeze out right away. After the glue dries, bandsaw the jaw assemblies to shape.

Make the handle nut and lock nuts (pieces 21, 22 and 23) just like you made the rail nuts for the base assembly. Drill the hole in the handle nut, being careful to limit your depth to 5/8". Use extra care when tapping the hole so you don't crack the stock when you hit bottom. Bandsaw the nuts to shape after tracing the **full size pattern** onto the stock, then chamfer the edges. Drill a 3/4" through hole in the handle nut for the handle arm, as shown in the **vise elevations** on page 20. Wrap up this step by gluing the 1 5/8" washer you made earlier to the lock nut.

Using A Thread Cutter

By Richard Starr

Cut cherry for the handle caps (pieces 25) and drill a 3/4" hole through the center of each one. Trace the **full size pattern** of the caps onto your stock and bandsaw them to shape. Next, cut dowels for the handle arm, the guide bars and vise screw (pieces 26 through 28), and thread the appropriate dowels as shown in the **vise elevations** on page 20. Sand the handle arm vigorously so it fits into the hole in the handle nut, then install the arm and glue the caps into place. Cross pinning (pieces 29) the caps will guarantee a long lasting joint.

To assemble the vise, first screw the guide bars into the front jaw (See **Figure 2**) and slide the rear jaw onto the bars. If the fit is tight, try turning each guide bar a little to get everything aligned. Thread the vise screw through the jaws until it protrudes about 2" beyond the front jaw, then screw on the front lock nut and the handle assembly. Once the handle assembly is fully seated, turn the locking nut firmly against the handle nut. Next, close the vise jaws and slide the strap onto the back end of the screw and guide bars. Thread one rear lock nut onto the screw, stopping it about 1/8" from reaching the strap, then tighten the second lock nut against the first one (See **Figure 3**).

Lag screw the vise to the top and sand it flush with the bench top. Now rout the top right and top left edges of the vise with a 1/2" roundover bit to blend it into the top.

Bandsaw the vise dog to shape following the **full size pattern** and sand it to fit in the vise dog holder. The bench dog (pieces 30 and 31) is equally easy to make. Cut the top and tail to size, and center the 3/4" hole in the top. Glue the pieces together and cross pin them for added strength.

With a few coats of oil finish your workbench will be ready for business. You and some lucky youngster will quickly find that it's every bit as capable as a full sized version, and the wooden screws keep it completely steady. This bench is an ideal project for getting the next generation of woodworkers off on the right foot.

Richard Starr is a contributing editor for Today's Woodworker magazine and a woodworking instructor in Hanover, New Hampshire.



Wooden screws have been in use for centuries, dating back to the ancient Greeks, and the hand operated cutters we have today aren't much different from the originals. The 1" threadbox and tap kit used for the workbench is available from mail order woodworking suppliers for about \$40.00. These tools work best on hardwoods, although you can forget about threading in endgrain.

Tapping inside threads is easy once a pilot hole is drilled, but be sure to read your kit's instructions to find the recommended pilot hole size. When starting the thread, make sure your tap is square to the hole or you'll end up with threads that are off axis, which will cause the screw to wobble as it's turned. After you've cut the threads, pass the tap through the hole from the other side to cut any stubborn wood fibers.

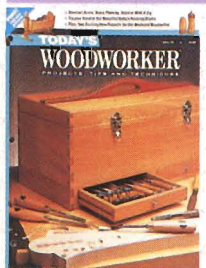
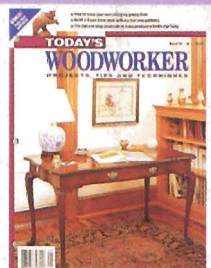
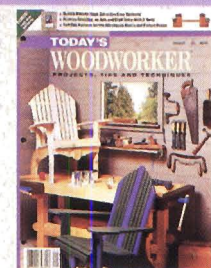
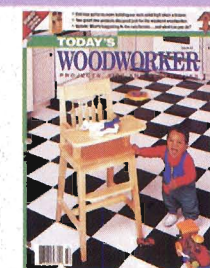
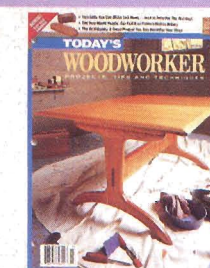
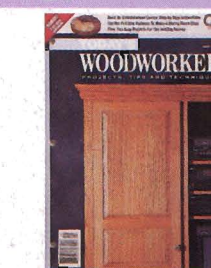
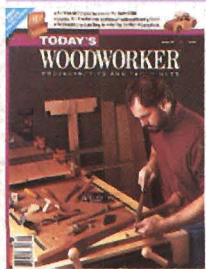
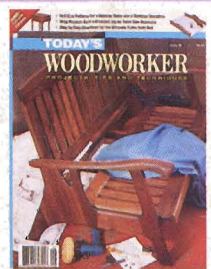
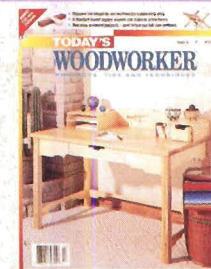
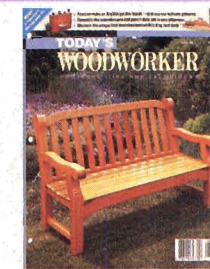
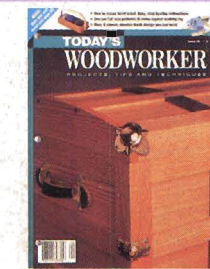
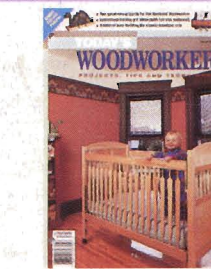
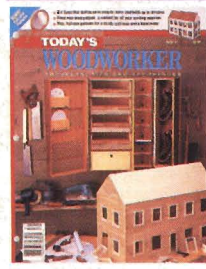
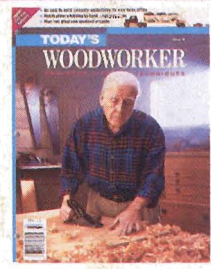
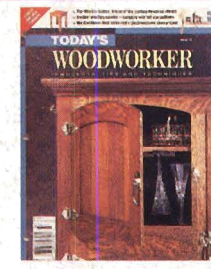
To make the holes in my projects look a little better, I drill counterbores about 1/8" on both faces of the stock prior to tapping the holes. Another way to make the thread entrance more attractive is to chamfer the hole using sandpaper or a

knife after the threading is completed. Newly threaded nuts are often rough or a little tight, but they do develop a burnished surface and a better fit with use.

When cutting outside threads on dowels, make sure your threadbox is in good condition. You can sharpen the cutter with the tiny stones that woodcarvers use on their V-gouges, but never remove metal on the outside of the V. Besides a sharp cutter, the key is to make sure that chips don't get caught in the tool.

Problems with cutting outside threads are usually due to defects in the wood. My experience threading walnut dowels has been excellent, and I've had good luck with maple and yellow birch. I get widely varying results with cherry. Coating dowels with mineral oil aids the threading process by softening the wood fibers. Avoid using dowels that fit tightly in the threadbox as well as undersized dowels that go through the box crookedly. I regularly chamfer the ends of my threaded rods with a belt or disc sander and roundover the tips into a slight dome.

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The Steamer Trunk Kit Is Back in Stock!

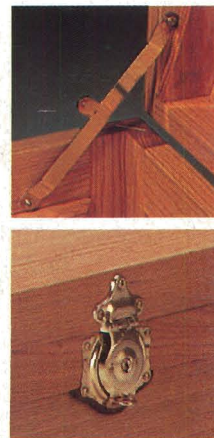
It has been awhile, but we now have all the parts to the steamer trunk kit back together again. Soon after offering this very popular kit the manufacturers of the spring lock and lid supports went out of business. We've found replacements for both parts and managed to knock a few dollars off the overall price while we were at it.

STEAMER TRUNK HARDWARE KIT

Includes the trunk corners, center corners, figure eight lock, catches, leather handles, unpinned loops, stop hinges and lid supports.

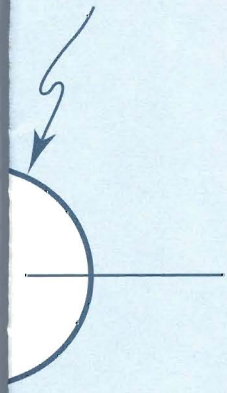
Item 94441 (Hardware kit)\$39.95

Item 89004 (Issue 29)\$3.95



Your kit will include an instruction sheet detailing changes required by the replacement parts.

Drill 1-1/8"
diameter hole for
rail screw connection.



ing required.

2
Legs

Full-Size Patterns

- Open staples carefully, remove pattern and fold staples back in place.
- Use graphite paper (available at most art supply stores) or cut and trace the pattern onto your stock.

The Jelly Cupboard

*The crown mouldings
and tin punching
pattern.*



Kid's Workbench

*Includes the leg,
vise jaws, strap,
vise dog holder,
vise dog and nuts.*



Victorian Birdhouse

*Includes the endwall, fly
rafter and gable accent
patterns.*



A Knockdown Bookcase

*You'll find patterns for the
bookcase sides, apron, back
stops and front edging.*

Tenoning Jig

The fence support pattern

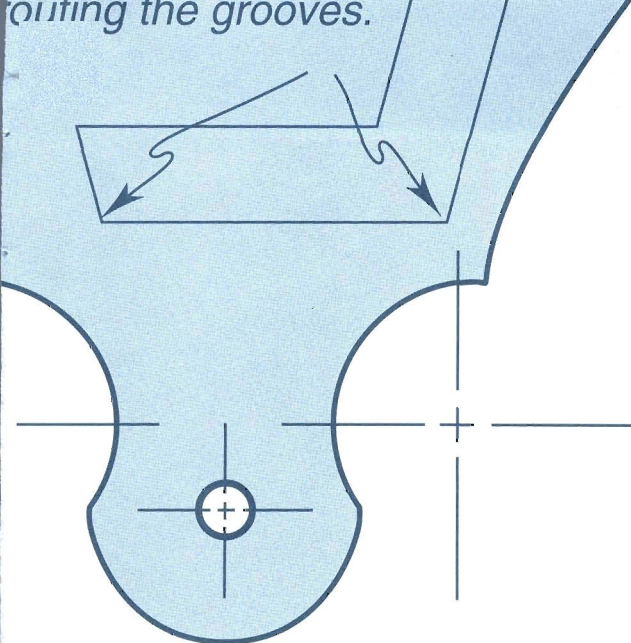
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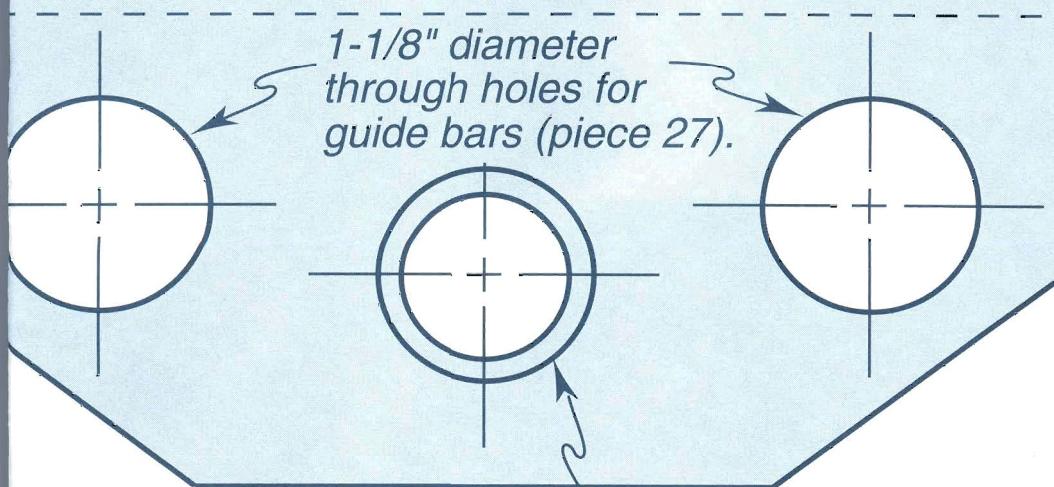
All rights reserved.

...lifting the grooves.



14 & 16

Rear Vise Jaw and Screw Block



*Drill 1-1/8" hole in rear jaw, then drill
a threading pilot hole in the screw block.*

5 rap igh

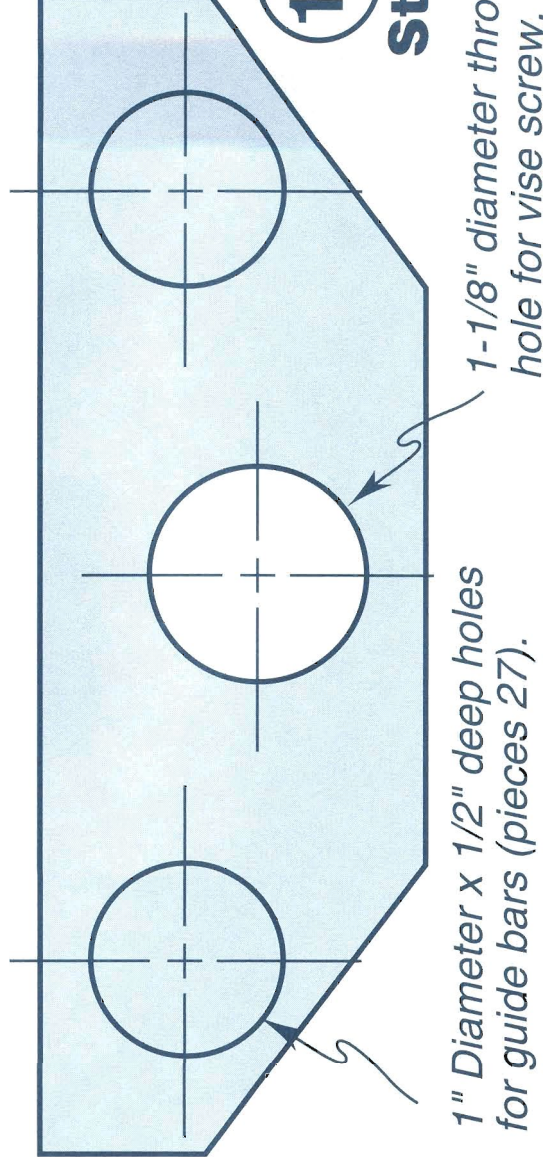
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9

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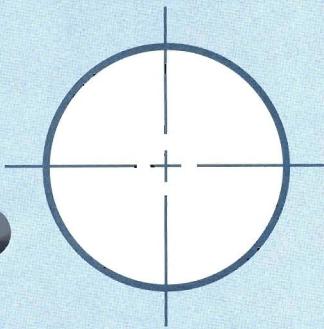
Vise Dog

Bandsaw kerf



Birdhouse

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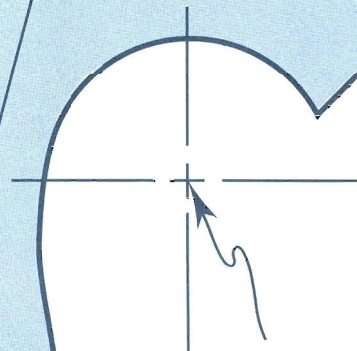
1

Endwalls

dwalls on oversized
out the grooves.
ng is complete, drill
the endwalls to shape.

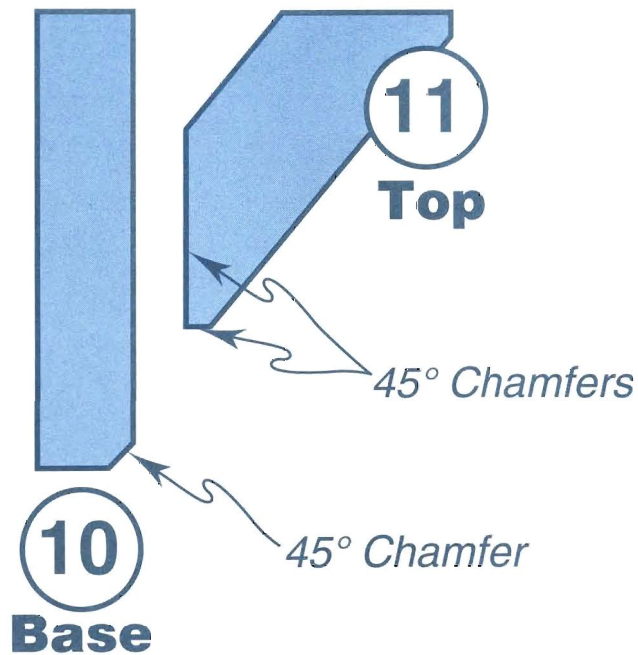
Drill 1-1/2" diameter
holes to help shape
birdhouse endwalls.

Use a chisel to clean
out the corners after

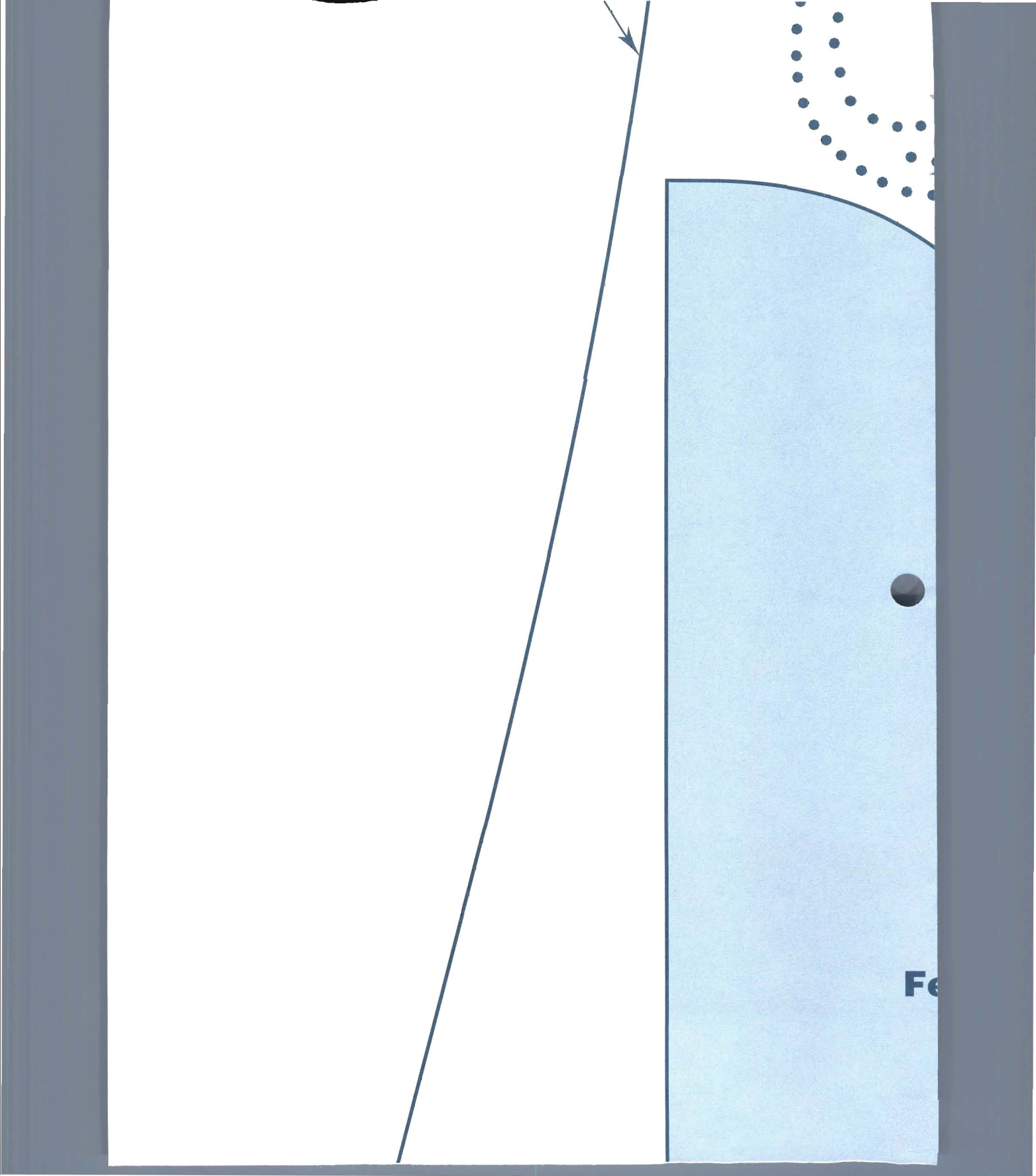


Jelly Cup

Crown Mouldings



Make a hardboard template of the bookcase side then use it to guide your router while cutting the pieces to shape.



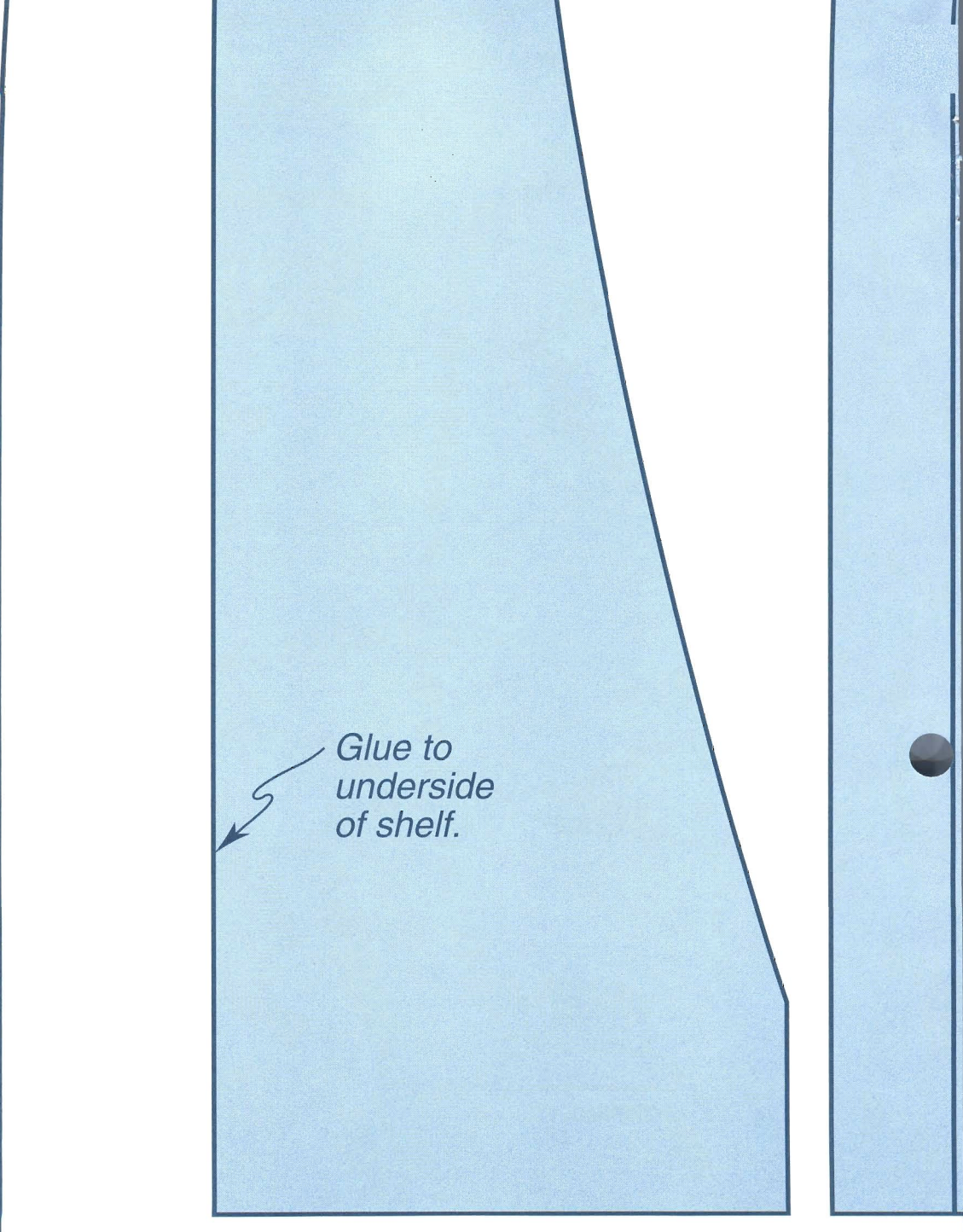
Make hardboard templates for the shaped bookcase pieces, then use them to guide your router while cutting the pieces to shape.

€

2
Apron

Cut 3/4" wide x 1/2" deep rabbet.

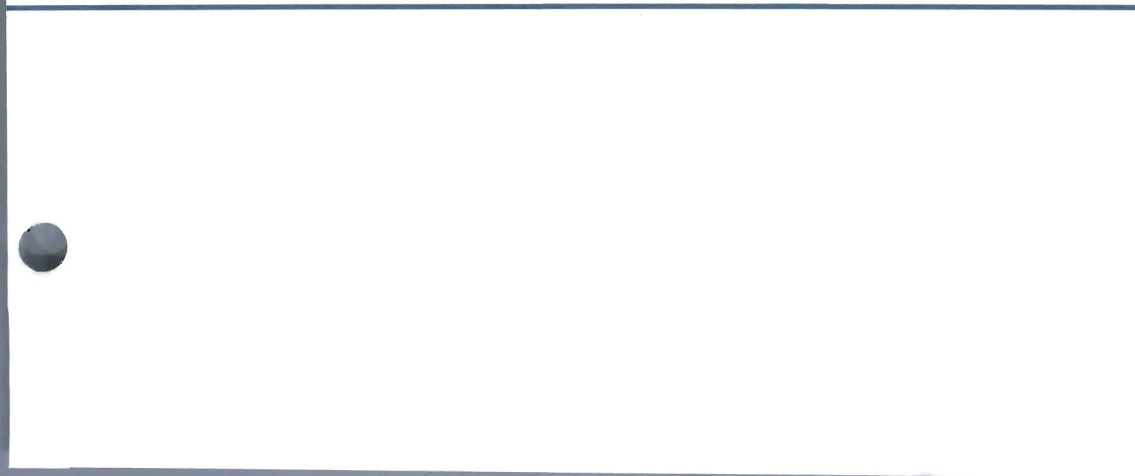
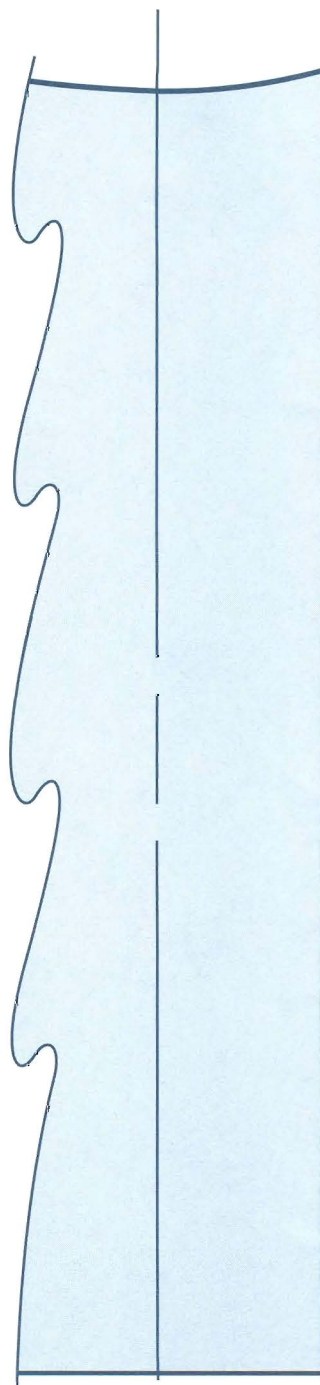
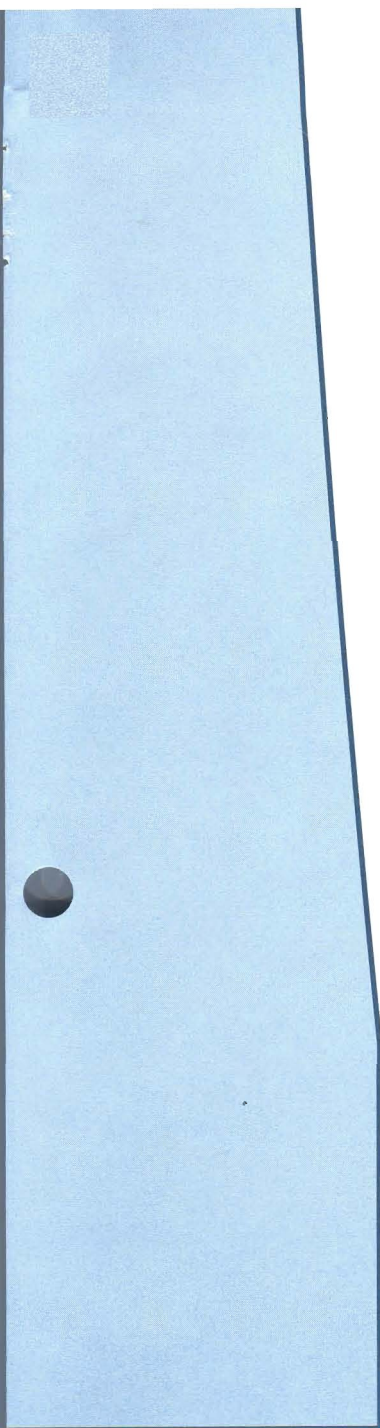


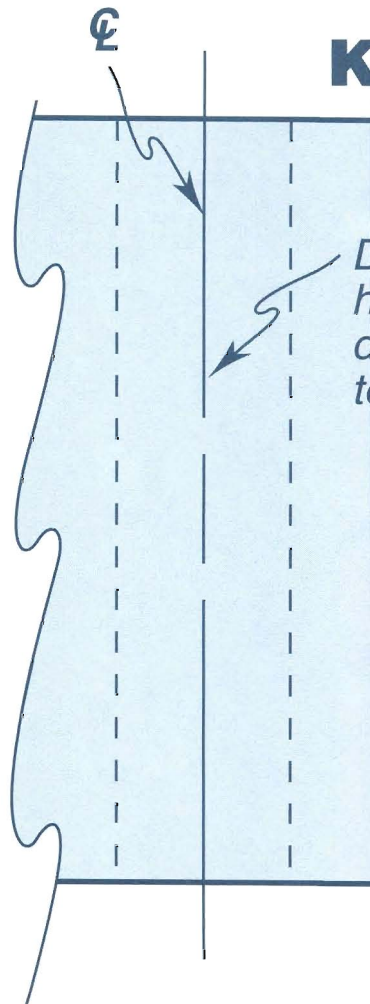
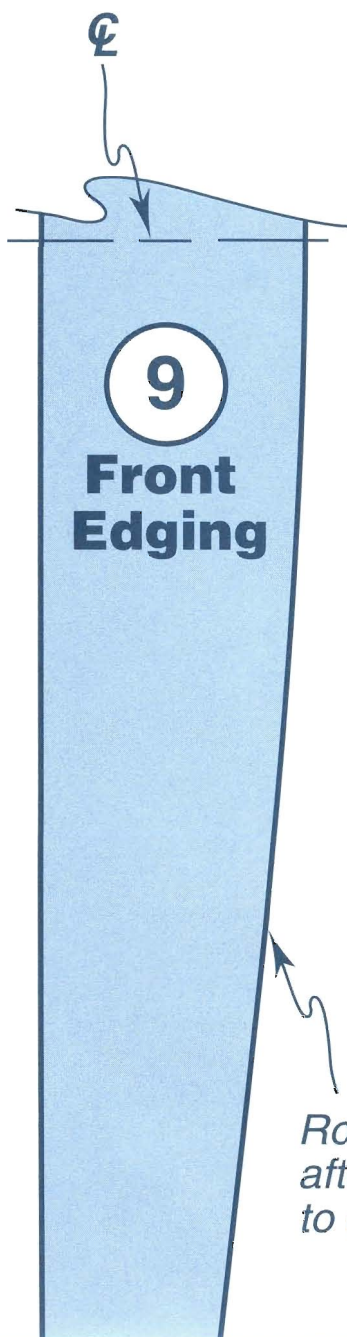


*Glue to
underside
of shelf.*

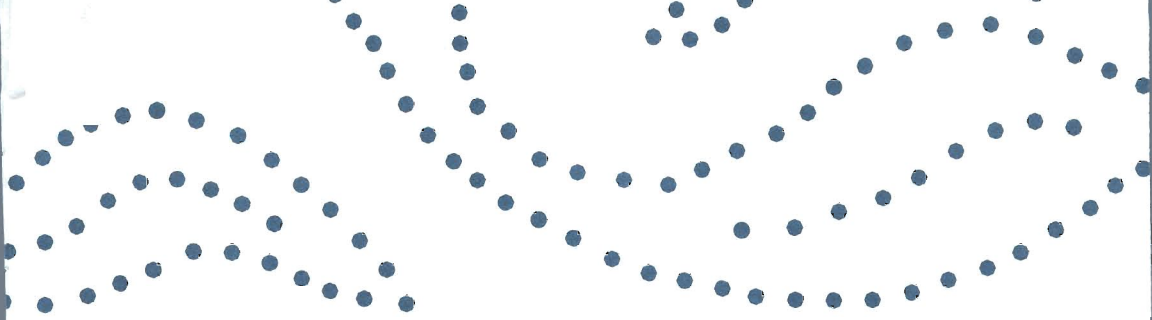
1
Sides

**Knockdown
Bookcase**





*Rout to shape
after gluing stock
to each shelf.*



Tin Punching Pattern

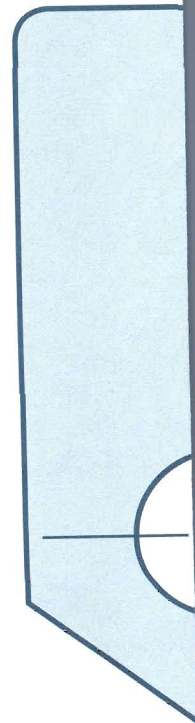
(Right door pattern shown. Make a reverse pattern for the left door panels.)

Tenoning Jig

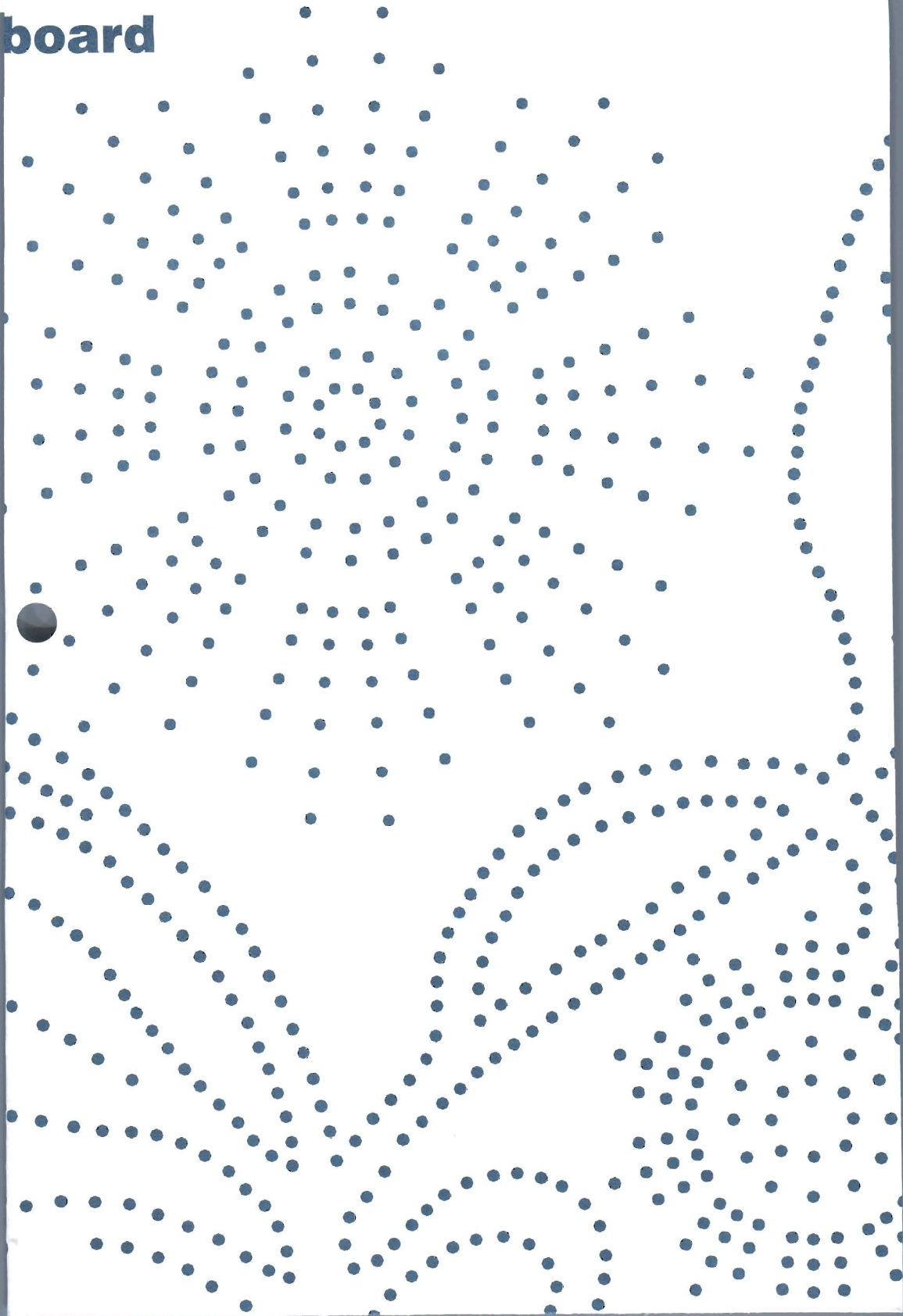


7

ence Supports



board

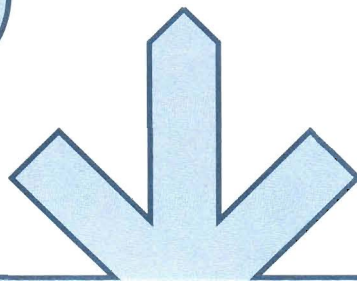
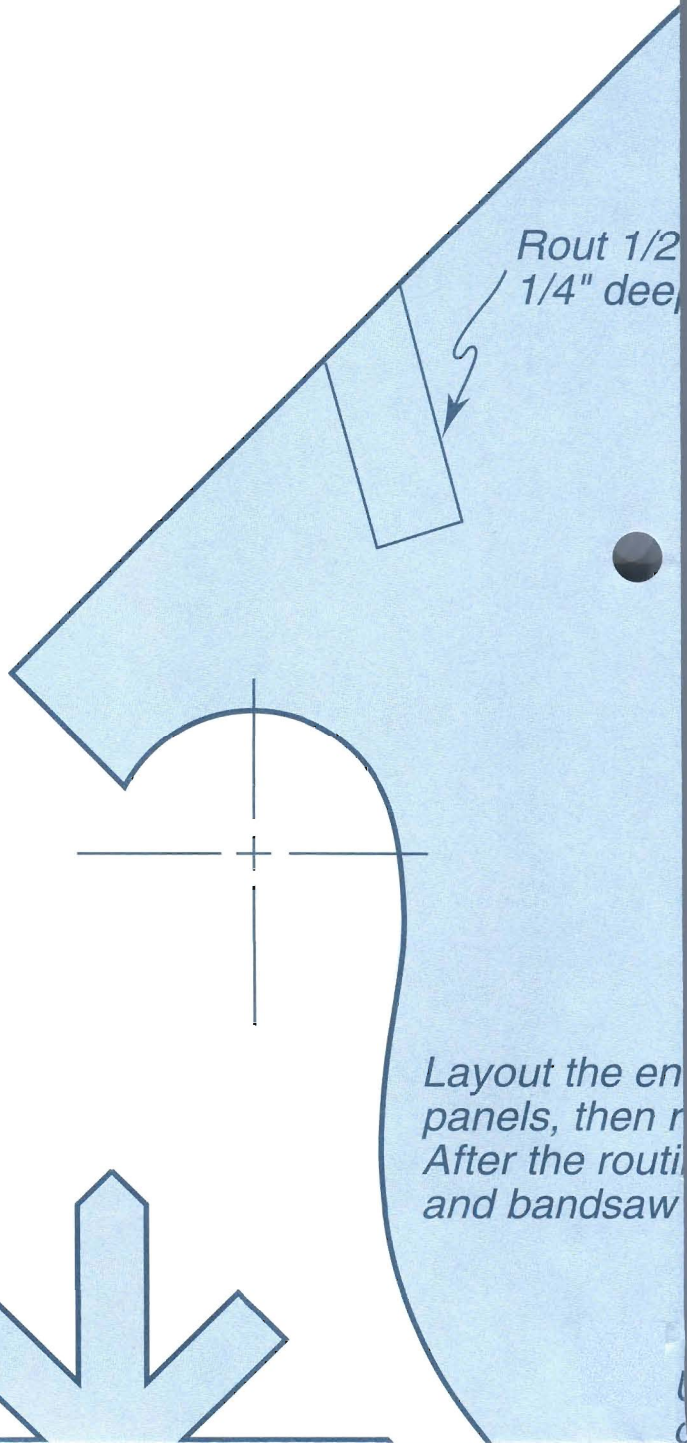
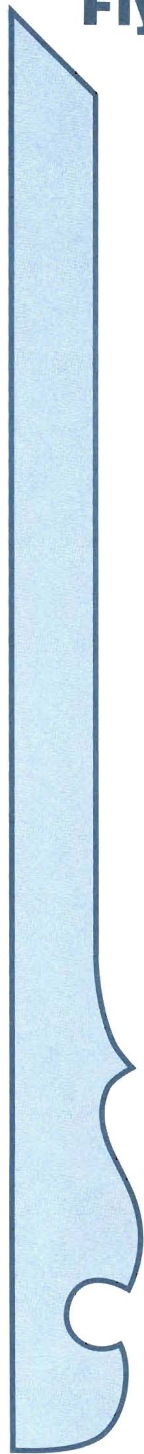


Fly Rafters

2

Rout 1/2"
1/4" deep

Layout the end
panels, then r
After the routi
and bandsaw



3

Gable Accents

13

Front Vise Jaw

*Thread holes for guide
bars (piece 27).*

*1-1/8" diameter
through hole for
vise screw (piece 28).*

Cut 3/8"

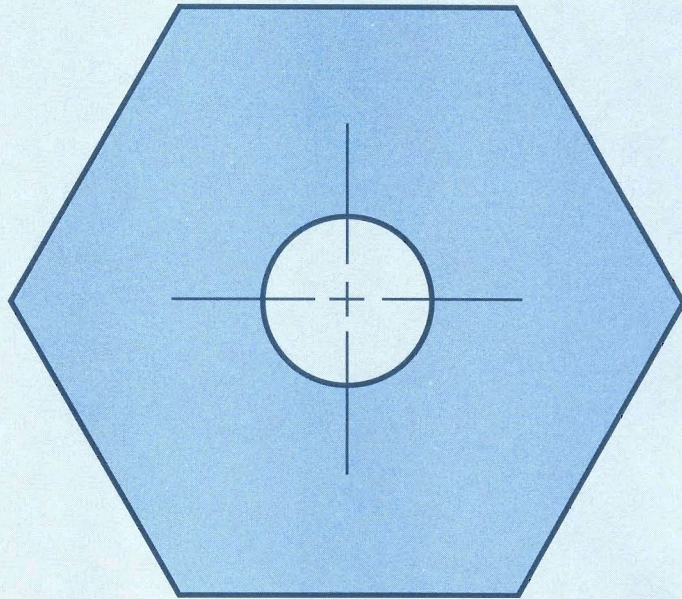
10

Vise Dog Holder

d's Workbench

Make a hardbo
then use it to g
while shaping t

aw centerline to
p guide your
l while boring the
screw hole.

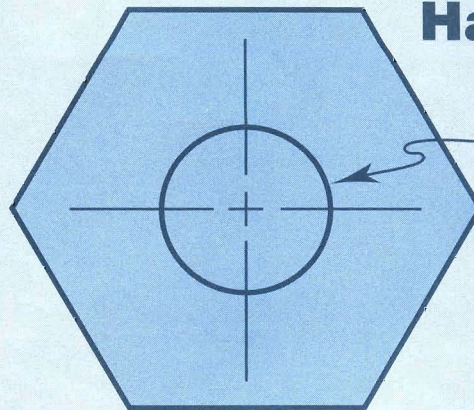


8

Ra
To

21

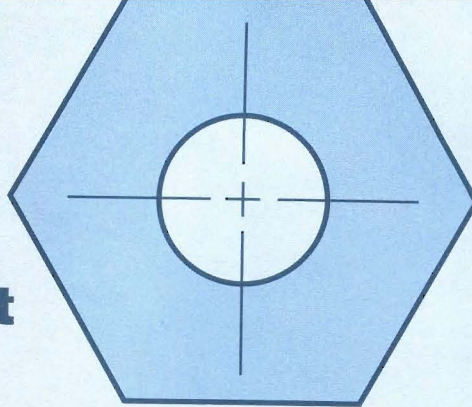
Handle N



Drill 5/8"
then care
hole unti
the botto

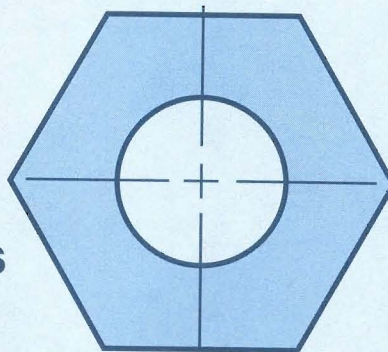
22

**Front
Lock Nut**



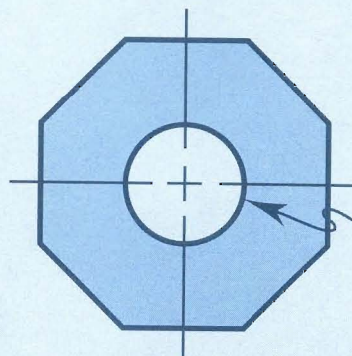
23

**Rear
Lock Nuts**



25

**Handle
Caps**



No threadi