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- Two summer projects you can build in a day —complete with patterns!
- Build an office heirloom: the traditional white oak filing cabinet
- Plus: A Craftsman end table and tips from a pro on buying a router



TODAY'S

Issue 40

WOODWORKER[®]

PROJECTS, TIPS AND TECHNIQUES



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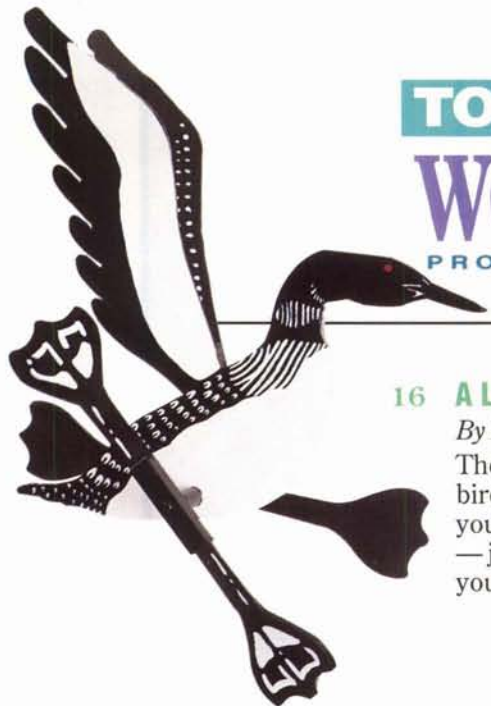
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TODAY'S

WOODWORKER®

PROJECTS, TIPS AND TECHNIQUES



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By Dan Jacobson

The Minnesota state bird is about to fly into your neighborhood — just don't laugh when you see it land!



8 Traditional White Oak Filing Cabinet

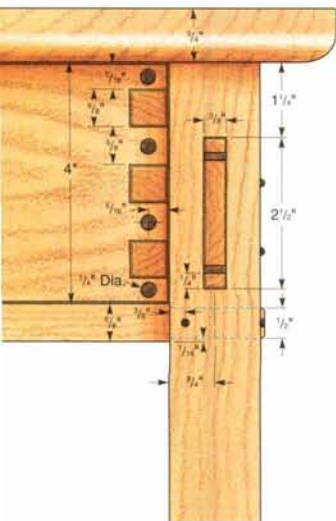
By Rick White

A traditional design worthy of any woodworker's time. Use rift or quartersawn oak to create this classic office heirloom.

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An original project inspired by the works of Gustav Stickley and the brothers Charles and Henry Greene.



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We're moving! By the time you get this copy of your favorite magazine, we'll be busy making fresh sawdust and typos in our brand new shop and office.

4 Tricks of the Trade

A fold-down extension table, finishing with fillers and making your own shop jig knobs.

5 Today's Wood

Try creating your own ebony with black aniline dyes.

6 Today's Shop

Tim Johnson doesn't like routers, but he can't get along without one (or two).

19 Finishing Thoughts

Painting tips from a pro.

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.

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ON THE LEVEL

The Big Move Is On

By the time you read this (if everything goes as planned), we should be settling into our new office and shop in Medina, Minnesota. It's only about twenty miles from our current location in Rogers, but it's a whole new world for the *Today's Woodworker* staff. Now we've got lots of room to spare in both our office and shop. In fact, Rick White and his trusty crew of woodworkers are already busy in their expanded shop, working on new projects for upcoming issues.

But before I get ahead of myself, I want you to know about two great articles in this issue. Tim Johnson (*he built the Jelly Cupboard reproduction featured in Issue 34*), is back with some solid information on buying a router. Look for his article on page 6. And finishing expert Steve Jordan (*he last showed us how to work with shellac in issue 39*), is back with some terrific painting tips. I know...everyone knows how to paint, but trust me; you'll be surprised at what's left to learn.

We asked Steve to cover painting because of the two weekend projects featured in this issue—the rocking pony and the loon whirligig. Readers who have been with us awhile might remember the last time we featured a rocking toy, back in issue 29. Boy was it a hit. An editor with *American Baby* magazine decided to build that project and over the next couple of months we made about 700 new woodworking friends who just had to have that issue.

Nick Thomas of Oak Lawn, Illinois was the latest to complete the rocking fish. Once all the woodworking was done, Nick asked an artist friend



Thanks to Dad, Kevin Thomas is ready to take a ride on the rocking fish featured in issue 29.



You can bet Howard Cameron's granddaughter is a happy camper. He built her the foldup doll house featured in issue 31.

to take an airbrush to his efforts. (Our art department loved the results!)

Thanks to Arthur L. Donaldson, Jr. of Houston, Texas for *two Phone Center corrections* (see page 21, issue 38). The bottom shelf (piece 4) is 9", not 10 1/4" wide. And the rabbet is cut on the back edge of the upper shelf (piece 2) not the top rail (piece 5) as specified.

To wrap up, I'd like to share this great letter from reader Howard Cameron of Perry, Florida, who built the doll house from issue 31.

Larry N. Stoiaken

Dear Friends,

I looked at the doll house plans and thought "isn't that nice." My daughter looked at them and said "Wouldn't that be nice for your granddaughter."

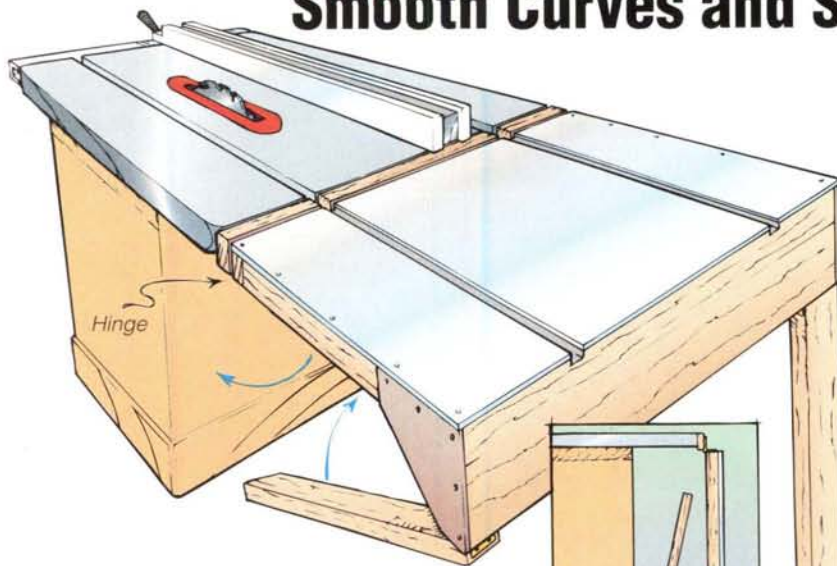
Grandchildren are great motivators! Being able to store this unit under a bed is a tremendous selling point for my daughter, who lives in an apartment. By the way, the ends of tongue depressors make great shingles. My granddaughter figures I made this just for her, but in reality I also made it for her mother, remembering when she was a little girl about Rachael's size.

It was fun, thanks for the plans.

HELP WANTED

We're looking for a new editor to join our staff—someone with solid woodworking and writing skills.

Smooth Curves and Short Rulers



Folding Extension Table

Extension tables are standard add-ons in many professional shops, but in a home workshop they can take up too much space. I've compromised by building fold-down extension tables that swing out of the way when not in use. The keys to each table are the splits in the legs, which are strategically located and hinged to allow them to fold under the machines.

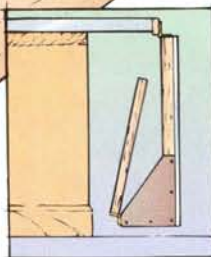
I cut plywood table tops to size and reinforce them with 1 x 2 strips and corner gussets. After bolting another 1 x 2 to the back edge of the machine I connect each table to the wood strip with hinges (if your machines aren't already bored for a couple of bolts, you'll have to drill holes yourself). Once the tables are secured you can make the legs and hinge them into place.

*Jeff Greef
Soquel, California*

But I Don't Do Windows

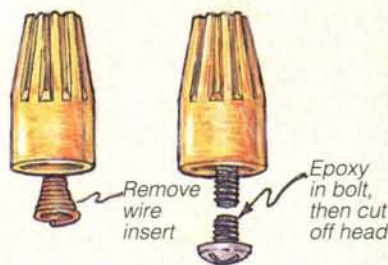
I used to rub off excess wood filler with a rough cloth, but I've found a better method. Now I wipe across the grain with a metal backed rubber squeegee, the kind used for cleaning windows. I scrape off the excess filler and save it for use at a later date. In my experience, two coats applied like this make a very good finish.

*Harry Tuttle, III
Wayzata, Minnesota*



This extension table is out of the way when not in use.

PICK OF THE TRICKS



Mini Jig Knobs

I've found that store bought knobs are too big for some jobs and often get in the way when used on my jigs. After failing to come up with smaller alternatives, I finally ended up making my own from standard electrical connection wire nuts and machine bolts.

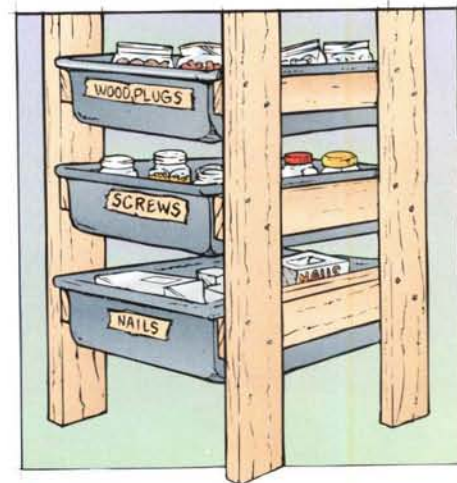
To make the knobs I removed the wire insert from the nut cap by turning counterclockwise with a screwdriver. Next, I filled the cap with epoxy and inserted a bolt. Later, after the epoxy dried, I cut the bolt to length. Different wire nuts allow for the use of various bolts, up to 1/4" in diameter, and adding a rubber washer between the knob and the jig increases the gripping strength.

*Tony Wladyka
Mountainside, New Jersey*

A Place for Every Nut

Every shop has a collection of small spare parts, and they're always difficult to store and find. One day, while browsing at a discount store, I came up with a great idea. I picked up some inexpensive 12 quart dish pans and built a storage rack to hold them. Now, when I'm building a special toy for one of my nine grandkids and need a nail, screw or nut, I just take the appropriate drawer to my bench and root through my supply.

*A.K. Larrimor
Union, Maine*

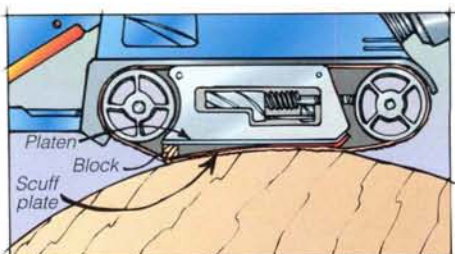


Short Rulers

I've always had problems making measurements at my lathe when working on a spindle less than four or five inches long. Without exception, the lathe centers always seem to get in the way.

One day I stumbled on the perfect solution. I took apart an old broken tape measure and cut the steel tape into pieces 1", 2" and 3" long. Once the short pieces of tape were secured to wooden holders with double sided tape, I had a set of mini-rulers that were ideal for my turning needs. They also come in handy for lots of other uses around the shop.

*Oscar Williams
Lincoln, Nebraska*



Smooth Curves

Do you have trouble sanding outside curves, such as the edge of a round table top? Try putting a piece of $3/8"$ x $3/8"$ wood under the thin metal scuff plate of your belt sander—use masking tape to hold the strip in place. When sanding, keep the work-piece positioned in front of the wood block and you'll easily match the curve of the edge.

Michael Burton
Ogden, Utah

The Biscuits are Served

My old oak table was missing many of the pins used to align the table halves and leaves, and the pins that were still there were broken or loose.

Instead of just replacing the pins, I went one better. I removed all the table pins and filled the empty holes with dowels. I then cut matching slots in the table halves and leaves using my plate joiner. The #20 biscuits keep the leaves in perfect vertical and horizontal alignment. Be sure to layout accurate centerlines for guiding the cuts, and glue the biscuits into just one table half and one side of each leaf. Sanding a taper on the exposed edge of each biscuit eases the fit of the table top parts, and coating them with varnish will protect them for many years.

Dick Dorn
Oelwein, Iowa



Ebony (*Diospyros* spp.)

By Gordon Hanson

Only reaching the lower levels of the rain forest canopy, ebony trees are relatively small, but specimens that yield black wood have made the species larger than life in reputation.

Ebony comes from a variety of species growing in the tropics of India, Africa, Malaysia and Indonesia. While the most valuable wood has the characteristic solid black color, much ebony lumber is brown, tan, red or gray—often with stripes and bands creating variations in color. Interestingly enough, persimmon, a domestic wood sometimes called white ebony, is a member of the same family.

Two common characteristics of ebony are its extreme hardness and brittleness, which make the wood difficult to work with both power and hand tools. Cutting edges are likely to experience severe blunting, and chipping is also a common problem. Pre-boring before driving screws or nails is essential to avoid splitting. Ebony is so dense and finely grained that it even poses problems for gluing. To minimize adhesion problems, use epoxies or try the new generation of polyurethane adhesives like Gorilla glue.

Because they are such small trees, ebony lumber is generally only available in small pieces. Consequently, use of the wood is limited to accent pieces and small projects, which

works out just fine since weight and lack of structural strength makes ebony inappropriate for most larger applications anyway. Ebony is a good candidate for any project requiring a highly polished luster.

For years, woodworkers have been fascinated with coloring less expensive woods to look like ebony. The process is called ebonizing, which was popularized during the Arts and Crafts period early in this century.

Before the introduction of modern stains, woodworkers wanting to ebonize wood made their own stain by soaking a steel wool pad or rusty nails in vinegar for about a week. According to Bob Flexner, author of *Understanding Wood Finishing*, this homemade stain is from a bygone era, is difficult to use and often produces inferior results.

Flexner recommends black aniline dye for ebonizing because it darkens the wood without obscuring the grain. To ensure a dark color, he applies two coats of dye or mixes the aniline powder in a higher concentration than suggested on the package. Of course, starting with a darker colored wood in the first place will also aid in the ebonizing process. As with any staining project, test the dye on a piece of scrap wood of the same species before applying it to your workpiece.



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.

Buying A Router

By Tim Johnson



I don't like routers—they're noisy, they spew dust all over and they spin a very sharp piece of metal at higher rpms than any other tool in my shop. And I know I'm not alone in this regard, especially after reading that 60% of all routers purchased are used just once or not at all.

Despite my dislike of routers, I have to admit that mine is one of the most frequently used tools in my shop. The worn handles and scarred housing, as well as the repair bills over the past fifteen years, are telltale signs of my dependence on this machine. I may not call myself a router enthusiast, but I've used them enough to know what works and what doesn't.

The Basics

The most important consideration for a general purpose router is ease of operation. Weight is also beneficial for absorbing vibration, but you have to balance this against motor size and smoothness. As for horsepower, don't buy more than you need. My 7/8 hp Stanley has worked fine for a wide variety of operations for many years.

When shopping for a new router, one of the first things you'll notice is the different mechanisms for adjusting the depth of cut (See Figure 1). On a plunge router, the motor is mounted on two spring loaded posts that allow it to move up and down like a drill press. Twist ring routers have a spiral groove in the motor housing that engages pins on the inner walls of the base. Rack and pinion style routers adjust by means of a gear.



Figure 1: Routers are available in three basic styles: plunge, twist ring and rack and pinion (left to right).

Plunge routers are a poor choice for general purpose routing. They're heavy, the plunge mechanism limits maneuverability, and the capabilities of the tool exceed the needs of most router operations. Additionally, unless they're equipped with a micro adjust-

ment knob, you'll find that setting exact cutting depths is difficult. The argument is often made that plunge routers are ideal for cutting mortises, but believe me, a mortising attachment on a drill press or a benchtop mortiser are far better tools for this operation.

Twist ring routers are typically lighter than plunge routers and more maneuverable, and the graduated scale (usually divided in 64ths, although I don't trust their accuracy) allows you to make minute changes quickly. Twist rings, however, are prone to jamming.

Rack and pinion routers are also lighter than plunge routers and allow for quick height adjustments, but once again, setting the bit often requires a ruler and a few test cuts. On balance though, I prefer rack and pinion routers for general routing situations.

Dedicating a router to a router table brings other considerations to the forefront, and my first choice here would be a plunge router. Most plunge routers accept a crank style height adjuster that's easy to reach and operate under a table. According to Steve Mozis at Seven Corners Hardware in St. Paul, Minnesota (a mail order supplier of power tools), one in three people purchases a router to make raised panels for kitchen cabinet doors. For this operation he recommends a table mounted router with a 3 hp motor, soft start capability and electronic variable speed control. In addition, the router should be designed to keep debris out of the motor and have controls that are conveniently located for upside-down use.

Handle Styles

When shopping for a router, don't just hold them in your hands. Instead, set each one on a counter and ask if you can turn the motor on (without a bit, please), then make passes as if you were routing the edge of a board. Note the weight distribution and smoothness of the motor, listen to the noise level and feel the heft and positioning of the handles. Like a fine hand plane, a good router will be an extension of your hands.

Five Safety Tips

1. Always unplug your router before changing bits.
2. Make sure the switch is turned off before you plug in the router.
3. Be prepared for a quick jerk as you turn on the router.
4. Plan your routing so the bit pushes against the wood as it cuts.
5. After switching the router off, hold it on the workpiece until the bit stops spinning.

Handles play an important part in the feel of a router (See **Figure 2**). Among the three common styles, I like pommel grips best. Being close to the workpiece, they provide better control and a variety of gripping positions. Shaft handles keep hands farther from the workpiece and often get in the way. D-grip handles are comfortable, but encourage unsafe, one handed operation. I do like the way shaft and D-grips incorporate the on/off switch, but I've found that using a foot operated switch is even better.



Figure 2: Although there are many slight variations, you'll find that routers have handles that are either shaft grips (left), pommel grips (center) or D-grips with secondary pommels (right).

Collets

A bad collet makes a bad router, and few things aggravate me more than a slipped bit. A good collet is long, cone shaped and has at least three expansion slots for enhanced gripping ability. Collets attached to the tightening nut have the additional advantage of

preventing bits from getting stuck.

Most medium duty routers come with both 1/4" and 1/2" collets, so you'll have access to the full spectrum of router bits. Some routers require two wrenches to tighten the bit and collet, and others have a shaft lock mechanism in lieu of one of the wrenches. I like the latter set up, even though it has worn out on my router—you're less likely to mash your knuckles when using only one wrench.



Figure 3: For the tightest grip on router bits, better collets have tapered bodies with at least three expansion slots.

Accessories

Router accessories abound, but the most essential are an adjustable edge guide and rub collars (See **Figure 4**). An edge guide is an adjustable fence that mounts to the router base and holds the router at a fixed distance from the edge of a board. Rub collars also mount to the router base, but rather than follow the edge of a



Figure 4: Along with a new router, every basic woodshop should be outfitted with an edge guide (left) and a set of rub collars.

for eye, ear and breathing protection. Like I said in the beginning, routers are messy, loud and potentially dangerous. Make safety a part of your routine and I guarantee you'll feel better when your done.

What to Buy

If you're hoping that I'll recommend one all purpose router that can satisfy every need, I'm afraid I'm going to disappoint you. The ideal shop, in my opinion, has at least two routers. I think a well equipped shop should include a small twist ring or rack and pinion router for everyday use, and a big plunge router for router table use and the occasional situation when plunging capability is beneficial. Routers with a 1½ hp motor are sufficient for almost every operation and a 1/2" collet capacity permits the greatest range of router bits.

Don't choose a router by the shape of its base. You can tailor sub bases for any particular bit or operation. For general routing, I prefer round bases, but always mark one point as a reference just in case the base isn't concentric. In fact, you shouldn't expect that the bit is centered in the base—routers aren't machined to such close tolerances. A rectangular base is stable for routing against a fence, but is incapable of following a curved template.

If you insist on having only one router, think small, and if your needs grow you can always buy a bigger one. You might look for used machines and save a few bucks. After all, 60% of the routers sold are just lying fallow on some garage or basement shelf.

board, they are designed to bear against a template for routing wood to a shaped profile. Rub collars come in a variety of sizes to accommodate different bit diameters.

Beyond the standard accessories, I also recommend that everyone leave room in their router buying budget

Tim Johnson is a woodworker and owner of Complements, an antique store in Minneapolis, Minnesota.

A Traditional Oak Filing Cabinet

If you're a woodworker, there's only one kind of filing cabinet suitable for holding your important papers.

By Rick White

Around my house, the 2,000 pound gorilla that can't be tamed is paper. It's the build-up of receipts, old tax forms, canceled checks, magazine clippings, project ideas and, of course, those nasty bills that keep on coming. Since I didn't know how to stem this flow of paper, I settled on what seemed like a simpler goal: getting it all organized.

Of course, being as I'm a woodworker, I couldn't just go out to the store and buy one of those chintzy steel filing cabinets common to every office under the sun. That would be too easy. Instead, I got busy looking through old office catalogs and came up with my own design for a traditional oak filing cabinet. It holds letter size folders in a two drawer format and employs some new hardware for Pendaflex style hanging folders. To support the weight and provide smooth as glass action, I chose Accuride slides especially rated for file drawers (see hardware kit at right).

Selecting Your Stock

Traditional filing cabinets typically were made of white oak, either rift cut or quartersawn. I decided to go with rift cut stock for my project, but whichever wood you choose, be sure to sort through it after returning from the lumberyard and designate pieces for various parts of your cabinet. Boards that are well matched in color and grain pattern are best for gluing into the top and drawer faces (pieces 1 and 27), while the really straight grained material is a good choice for the front and side framework (pieces 2-5 and 14-18). Leave the least desirable stock for the back framework and internal frames (pieces 6-11).

Begin by cutting pieces a little oversize for jointing and gluing into the top and two drawer faces. I always get this step out of the way early so the glue can dry while I move on to other things. Simple edge to edge butt joints are fine here—use dowels or biscuits only if you need help aligning the boards.

Planning Ahead: The Traditional Filing Cabinet Project

To complete this project your main tools will be a table saw with a dado blade set, a router and a router table. Expect to spend about 35 hours to build and finish your filing cabinet and plan on enlisting the help of a friend when you're ready for the carcass glue up.

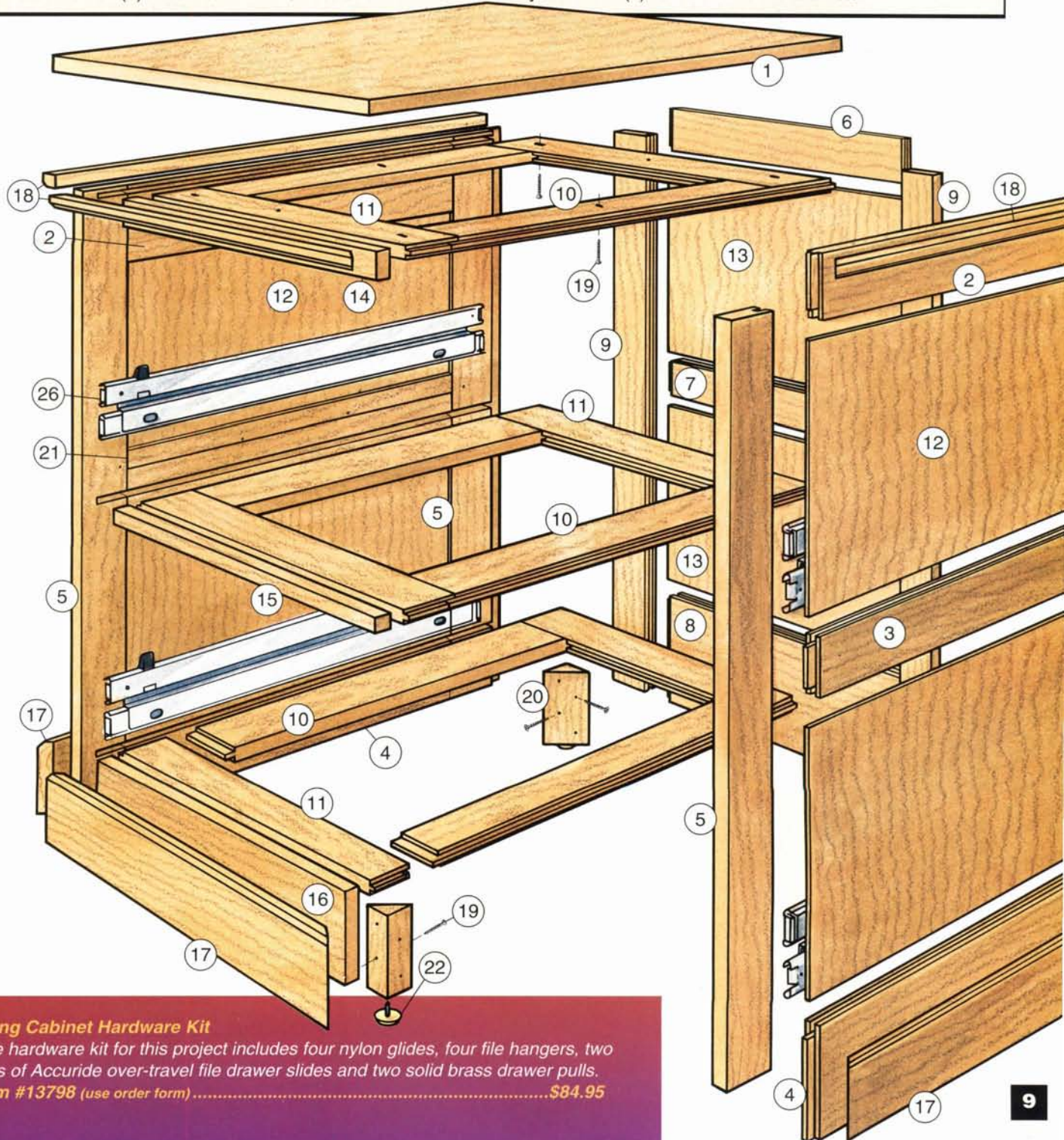
This piece, as shown above, was stained (walnut) and top coated with General Finishes' two step system.

- A half sheet of 1/4" white oak plywood
- 25 board feet of 3/4" white oak
- 12 board feet of 1/2" poplar (drawers)

MATERIAL LIST

	T x W x L
1 Top (1)	3/4" x 17 3/8" x 24 1/4"
2 Upper Side Rails (2)	3/4" x 3 1/4" x 19 1/4"
3 Middle Side Rails (2)	3/4" x 2 1/2" x 19 1/4"
4 Lower Side Rails (2)	3/4" x 5 1/2" x 19 1/4"
5 Side Stiles (4)	3/4" x 2 1/2" x 30"
6 Upper Back Rail (1)	3/4" x 3 1/4" x 11 1/16"
7 Middle Back Rail (1)	3/4" x 2 1/2" x 11 1/16"
8 Lower Back Rail (1)	3/4" x 5 1/2" x 11 1/16"
9 Back Stiles (2)	3/4" x 2 1/2" x 30"
10 Internal Rails (6)	3/4" x 2 1/2" x 17 3/8"
11 Internal Stiles (6)	3/4" x 2 1/2" x 14 3/4"

	T x W x L
12 Side Panels (4)	1/4" x 19 1/8" x 10 1/4"
13 Back Panels (2)	1/4" x 10 7/8" x 10 1/4"
14 Upper Facing (1)	3/4" x 1 1/2" x 14 1/4"
15 Middle Facing (1)	3/4" x 3/4" x 14 1/4"
16 Lower Facing (1)	3/4" x 3 3/4" x 14 1/4"
17 Baseboard (1)	3/4" x 3" x 72"
18 Cornice Molding (1)	1/2" x 3/4" x 72"
19 Screws (24)	#8-1 1/4"
20 Corner Blocks (4)	1 3/4" x 1 1/4" x 3"
21 Shims (2)	1/4" x 1" x 18 1/4"
22 Nylon Glides (4)	1/2" diameter



Filing Cabinet Hardware Kit

The hardware kit for this project includes four nylon glides, four file hangers, two sets of Accuride over-travel file drawer slides and two solid brass drawer pulls.

Item #13798 (use order form)\$84.95



Figure 1: Plough grooves in the rails and stiles first, then use a 1/2" dado blade, a set up block and your miter gauge to cut the tenons. Later you can rout the outside edges with a chamfering bit.



Frame Joinery

Following the panel glue ups, cut stock for all the stiles and rails and prepare to form the stub tenon joints. For the external frames, the grooves that hold the panels also serve as the tenon mortises. To make life easy, I used the same set up for cutting grooves in the internal frame stiles, which serve as the mortises for the stub tenons on the rails.

Since your plywood panel material probably isn't a full 1/4" thick, using a dado blade will not give you a tight fit. Instead, try making several passes with a standard saw blade. Raise the blade a little over 1/2" and adjust your fence to center the stock on the blade. Plough a kerf in one edge of all the internal and external stiles, and in one edge of the external rails, (except the 3 middle rails, which are grooved on the top and bottom), then turn each piece end for end and make a second pass to keep your grooves centered. Now shift the fence in small increments and continue following this cutting sequence until the plywood fits the grooves snugly.

To cut the tenons, install a 1/2" dado blade in your table saw and raise it 1/4". Clamp a set up block to your fence and use the miter gauge to support the stock during the cuts (See Figure 1). For the sake of accuracy, cut a sample tenon using extra wood from your supply of oak, and check its fit in a groove. When you get this sample tenon fitting properly, cut the tenons on all the internal and external rails for your file cabinet.

Assembling the Frames

Once the primary joinery is completed, cut the plywood panels to size (pieces 12 and 13) and dry assemble the cabinet sides and back. Position the rails as shown in the **side and back elevations** (see the **Pinup Shop Drawings** insert between pages 12 and 13), then mark pencil lines on the stiles so they're even with the edges of the rails. These marks will help during the routing operation coming up next and provide alignment assistance during the glue up.

For a special effect, I routed chamfers on the edges of the rails and stiles that outline the panels. Take the frames apart and chuck a chamfering bit in your router table. Raise the bit for 1/8" deep cuts and draw lines on the fence indicating the bit's cutting area (See Figure 2). Now draw lines 1" from the shoulders of your rails and 1" from the pencil lines you just drew on the stiles, and extend these lines onto the back of your stock. Chamfer the edges, using the lines on the stock and fence for starting and stopping the cuts. Now go ahead and glue the side, back and internal frame assemblies together.

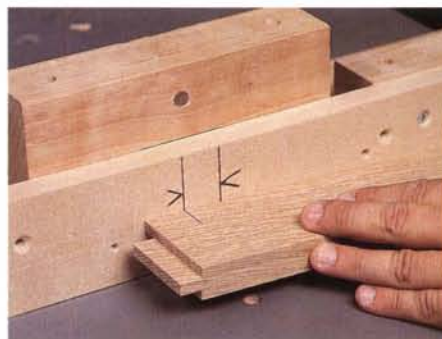


Figure 2: Mark the router table fence to show the chamfering bit's cutting area, then use these lines and those on your stock to begin and end the cuts.

A Few More Joints

To keep the file cabinet as strong and square as possible, I secured the internal frames to the side frames with tongue and groove joints. As with most joinery, it's best to cut the grooves and then the tongues for the tightest fit. Install a 1/4" straight bit in your router table and raise it a hair over 1/4". As you can see on the **side and back elevations**, the grooves do not exit the front of the side assemblies, so you'll have to mark the router table fence and the frames for starting or stopping the cuts, just as you did earlier when chamfering the frame edges. Rout the grooves, then square the stopped ends with a chisel.

Cutting tongues on the internal frames is a simple operation that calls for a table saw, a 1/4" dado blade and a protective wood face on your fence (See Figure 3). Cut a test tongue first and check its fit in a groove, then proceed with the cuts on your frames.

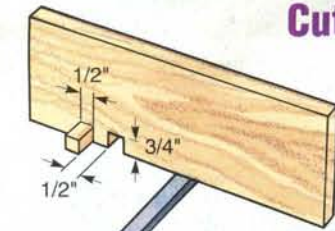
To adequately support the drawer slides for the top drawer, I recommend cutting two shims from your scrap 1/4" plywood (pieces 21) and gluing them to the upper panels just above the middle rails. These shims provide a firm mounting strip for screwing the slides into the cabinet.



Figure 3: After cleaning glue off the internal frames, form tongues on the rails with a 1/4" dado blade. Be sure to clamp a wood face to the fence.

You have two more steps to complete before assembling the carcass. First, install a 13/16" dado blade in your saw and cut a 3/8" deep rabbet on the back edge of each side frame, as shown on the **side frame elevation**. These rabbets will house the back frame assembly. Next, drill the fixed and elongated holes in the upper internal frame that you'll use for screwing the top to the cabinet.

Cutting Finger Joints



Step 1: Start by securing a 7" x 15" piece of plywood to your miter gauge and cut a 3/4" tall notch with a 1/2" wide dado blade. Glue a tight fitting guide pin in the notch and resecure the fence so the pin is precisely 1/2" from the blade.



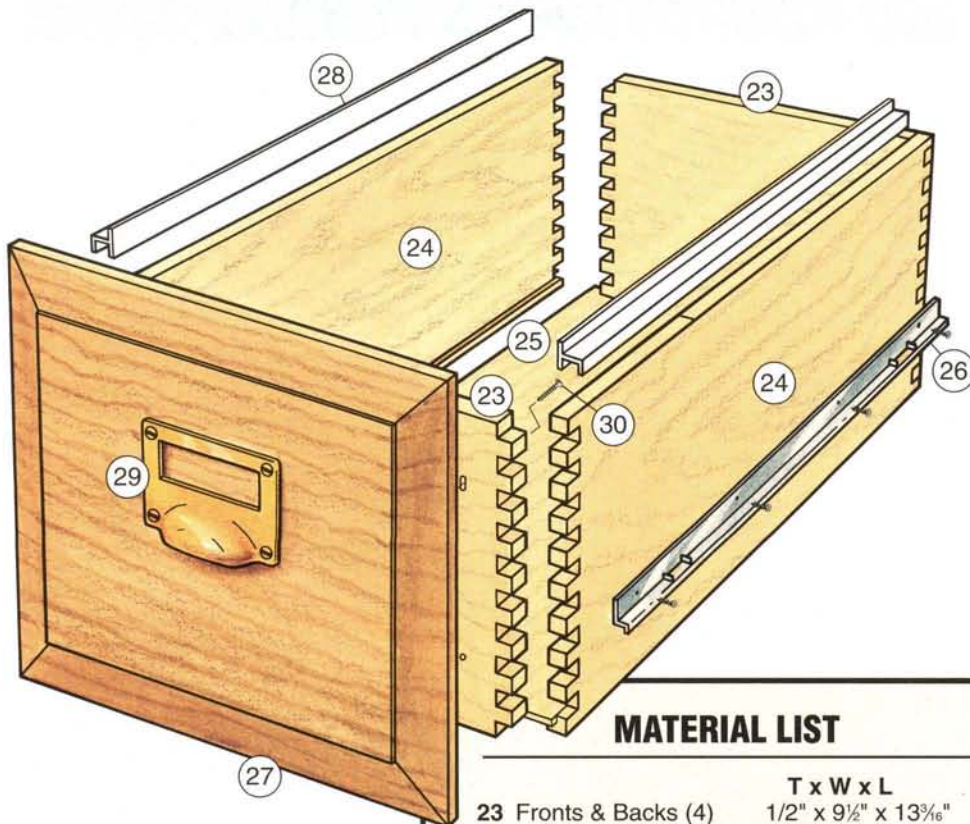
Step 2: Cut a gap in a scrap piece with the jig to make a spacer for positioning the drawer fronts and backs during the edge cuts.



Step 3: Clamp the spacer to the jig and hold a front or back piece next to it while making the edge cuts that begin each set of fingers.



Step 4: Remove the spacer, then slip each gap over the guide pin to make the next cut. Follow this step for cutting fingers in the sides as well.



Now glue the internal frames to the side frames, checking and double checking to keep the assembly square. After the glue sets, cut stock for the three facings (pieces 14, 15 and 16) and glue these to the front edge of each internal frame. Reinforce the bottom facing by gluing and screwing corner blocks (pieces 20) to the inside corners.

Before moving on to the drawers, rip one piece of 3/4" stock long enough for the baseboards (pieces 17) and mill an extra wide piece of 1/2" material for the cornice moldings (pieces 18). Rout a chamfer along one edge of each piece, then rip the molding stock to width and miter all the pieces to length. Glue and nail the baseboards and moldings to the cabinet, then sand the top and cut it to size. Position the top on the cabinet, extend the pilot holes from the internal frame and drive in the screws (pieces 19).

Making and Installing the Drawers

Begin making your drawers by cutting 1/2" thick poplar stock for the sides, fronts and backs (pieces 23 and 24). Make sure the edges and ends of each piece are square, as this is crucial for cutting accurate finger joints.

Now make a simple finger joint jig for your table saw, as described in the **Cutting Finger Joints** box above. Cut the fingers, then plough a groove in each piece for holding the drawer bottoms (pieces 25), as shown in the **drawer elevation** on the insert. To get a tight fit, I made two passes using a standard blade, following the technique I described earlier for cutting the frame grooves.

Spread glue on the fingers and clamp the drawer walls tight around the drawer bottoms, testing as you go to make sure the assemblies remain square. When the glue hardens, sand all the finger joints flush.

MATERIAL LIST

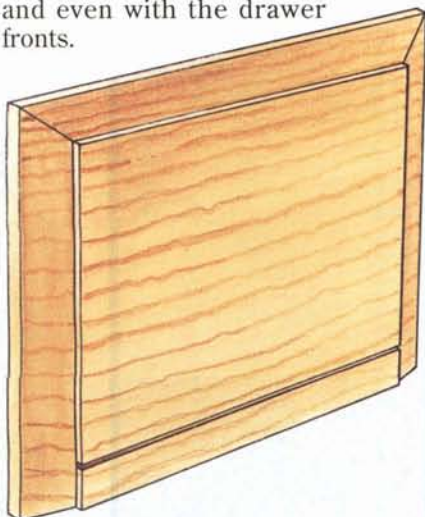
	T x W x L		T x W x L
23 Fronts & Backs (4)	1/2" x 9 1/2" x 13 5/16"	27 Drawer Faces (2)	3/4" x 12" x 14 1/4"
24 Drawer Sides (4)	1/2" x 9 1/2" x 22"	28 File Hangers (4)	White plastic
25 Drawer Bottoms (2)	1/4" x 12 5/8" x 21 1/2"	29 Drawer Pulls (2)	Solid brass
26 Drawer Slides (2)	22" Accuride #4034	30 Screws (8)	#8-1"



Figure 4: Install the large component of each slide 3/8" from the front edges of the cabinet so the drawer faces can sit flush in the openings.

The drawer slides (pieces 26) are comprised of two components: one large unit that mounts inside the cabinet and another that hangs from the drawer side. Unfortunately, the larger components don't have a pilot hole that aligns with the rear stile of each side assembly. To improve the load capacity of the drawers I recommend that you layout and drill a pilot hole 1/2" from the back end in the larger slide components. Next, position the slides 3/8" from the front edge of the cabinet (See **Figure 4**) and drill pilot holes at the center of the horizontally elongated slide holes. Drive in a couple of the screws supplied with the hardware, but hold off on the rest until you get the drawer properly fitted.

Now draw a line 3" from the bottom of each drawer side, as shown in the **drawer elevation** (see insert). Position the bottom edge of the smaller slide components flush with the lines and even with the drawer fronts.



So that no tear out affects the finished panels, bevel the cross grain edges first, then the long grain edges. A light, second set of passes through the blade will leave very smooth surfaces.

Drill the pilot holes and drive in the screws. Slip the drawers into the cabinet and engage the clips that hold together the two members of each slide. You'll notice right away that the slides allow 1/8" of clearance below the drawer.

Much of the traditional look of this cabinet is due to the raised panel drawer faces (pieces 27). Since I don't have a fancy shaper, I raised the panels on my table saw (see the **Cutting Raised Panels** box below) after hand planing the faces flat and trimming them to fit the cabinet drawer openings.

Now install each face on a drawer assembly with four screws and slide them into the cabinet. Adjust the slides forward or back to align the bevels on the drawer faces with the front edges of the cabinet. Once you get everything to align, remove the drawers and drive the remaining slide installation screws.

Wrapping Up

Remove the drawer slides and sand the file cabinet one last time to 180 grit, then reinstall the slides and glue the back assembly into the rabbets. Let the glue set, then sand or plane the

back edges of the side frames perfectly flush with the back assembly.

I stained and topcoated all the oak parts of the cabinet with General Finishes' two step system. I left the poplar drawer boxes unstained, but did apply the topcoats. Three applications of the topcoat gave me the durable satin finish I was looking for.

Remount the slide hardware and cut the folder hangers (pieces 28) to length so you can install them on the top edge of the drawer sides. Mount the brass pulls and nameplates (pieces 29) to the drawer faces, as shown in the **drawer elevation**.

Believe it or not, this completes the construction of your file cabinet. Personally, I could never have rested with a steel version in my home. The authentic appearance of this cabinet fits with my furnishings and, as a woodworker, it just feels better to have built the real thing.



Low profile styrene file hangers replace the clumsy metal hardware often found on traditional filing cabinets.

Cutting Raised Panels



Step 1: Set your table saw blade height at 1/8", clamp the fence 1/4" away and make four cuts in the top surface of each panel to define the fields.

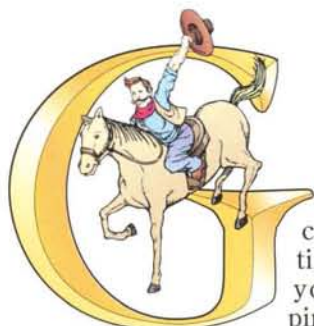


Step 2: Raise the blade 1 1/2" and tilt it 12°. Clamp a tall wood face to the fence, set the fence 3/8" from the blade and make the bevel cuts.

Scout's Painted Pony

With our full size patterns and step by step instructions, you'll have this stable steed ready for painting in just a few hours.

By Chris Inman



Idly little cowpokes. It's time to saddle your favorite pinto pony and hit the trail. You're in for a safe ride on this trusty steed, which stands just two hands tall and has an amply large girth for a wide, stable stance. All your youngster has to do is hang on and enjoy the ride.

Unlike most rocking horses on the market, this design is truly safe for toddlers. Its low center of gravity and broad base make it very difficult to tip over, and having the seat so close to the floor makes mounting and dismounting easy. If, or should I say when, the kids fall off, you'll rest easy knowing their tumble will be a short one.

You'll also like the fact that this rocking pony is made entirely from two small panels of 3/4" Baltic birch plywood (see page 15 for the complete kit). The shaped pieces for the rocking horse are easy to cut with a band saw or jigsaw, and are shown on the **Full Size Pattern** insert between pages 12 and 13. There isn't any complicated machining as all the joints are held together with screws and glue. Covering the screws with wood plugs completes the construction and provides a good base for your finish.

Paint is the recommended finish because it hides the plugs and the edges of the plywood. It also brings lots of color to a kid's project, which is always a good idea. If you're looking for a gift that will impress the kids or grandkids, this one will get you there with only four or five hours of work in the shop and a couple more in the finishing room.



Squeals of delight fill the room as eighteen month old Scout Inman rears up her champion pinto pony.

Getting Started

Begin building your rocking horse by cutting all the patterns from the insert and laying them out on your plywood, as shown on the **plywood cutting diagrams** on page 15. Once you complete the layout, cut the plywood into sections with your table saw—rip the straight edges for each pattern along the layout lines and leave the braces (pieces 1 and 2) running a little long for now.

Next, layout the slot and alignment lines on the seat (piece 3), as shown on the pattern, and chuck a 1/2" straight bit in your router. As you probably know already, 3/4" plywood is a little thinner than the measurement suggests, so the best way

to get a tight fit between the seat slot and the horse's head (piece 4) is by making several passes with an undersized bit. With that in mind, mount a fence to your router and adjust it to align the 1/2" bit with one edge of the slot layout. Make several passes with the fence in this position (See **Figure 1**), adjusting the cutting depth until the bit extends through the thickness of the plywood. Now, leaving the bit at this depth, readjust the fence a hair at a time until the width of the slot fits the head piece perfectly. After completing the routing operation, use a sharp chisel to chop the end of the slot square.



Figure 1: Cut the slot in the seat using your router, a fence attachment and a 1/2" bit, making several passes to ensure a tight fit with the head.



Figure 2: For the smoothest edges possible, install a fine toothed blade in your jigsaw to cut the shaped pieces of the rocking horse.



Figure 3: To smooth all the tight turns in the head, first use a file, then switch to a wood wedge with adhesive backed sandpaper covering its end.

Cutting the Shapes

With the slot machining done, use a band saw or jigsaw to cut all the plywood pieces to shape. Stay just outside the lines and keep the cuts as steady as you can (See **Figure 2**). The smoother your cuts, the less you'll have to sand.

Next, chuck a 3" diameter drum sander in your drill press and sand as many curves as you can reach. Clamp any identical pieces together so you sand them to matching profiles.

For smoothing the rocker edges (pieces 5) the best tool is a belt sander. Clamp them together in a vise and take frequent breaks to run your hand along the edges—when you feel a graceful curve that doesn't break the rhythm of your stroke, you'll know the sanding is done. After getting the curve just right, mark a line across both rockers at one end—the marks will help orient the rockers in the same direction on the final assembly.

Smoothing the edges of the head takes a little more elbow grease. Sand what you can with the drum sander and a palm sander, then use a file to get into the tight areas of the neck and mouth, and between the ears. After filing the saw marks off, wrap the end of a wooden wedge with 100 grit sandpaper and work into the nooks and crannies again (See **Figure 3**). Before moving on to the assembly, drill the hole for the handle (piece 6).

Corralling the Horse Parts

To begin assembling the rocking horse, clamp the support (piece 7) to the underside of the seat, making sure to align the support's edges with the layout lines. Drill four counterbored pilot holes for #8-1 1/4" wood screws (pieces 8), then take the pieces apart, spread glue on the support, staying away from the slot, and screw the assembly back together. Fill the counterbores with wood plugs (pieces 9) and use a palm sander to smooth out any unevenness along the front edge of the assembly.

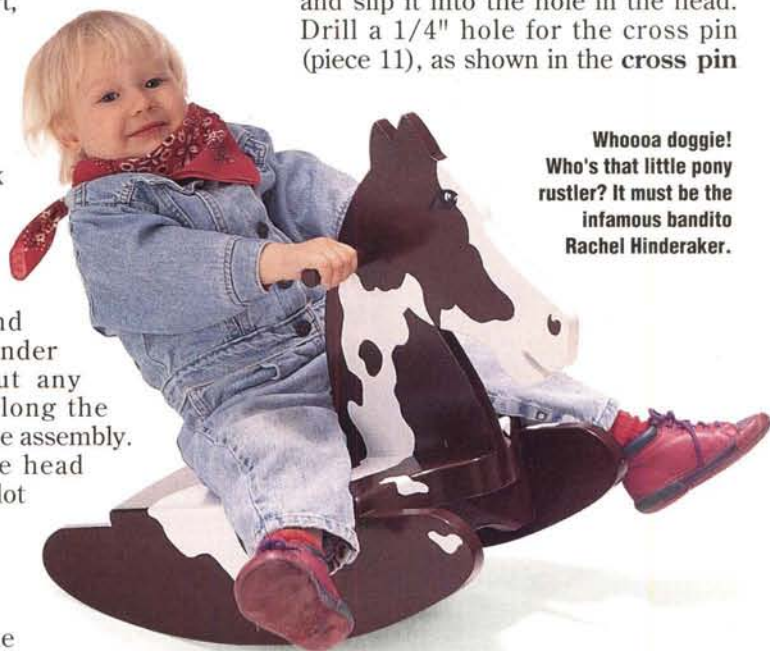
Now slip the head into the seat slot and drill four counterbored pilot holes through the support into the

neck. This is a preliminary step, so don't drive any screws just yet.

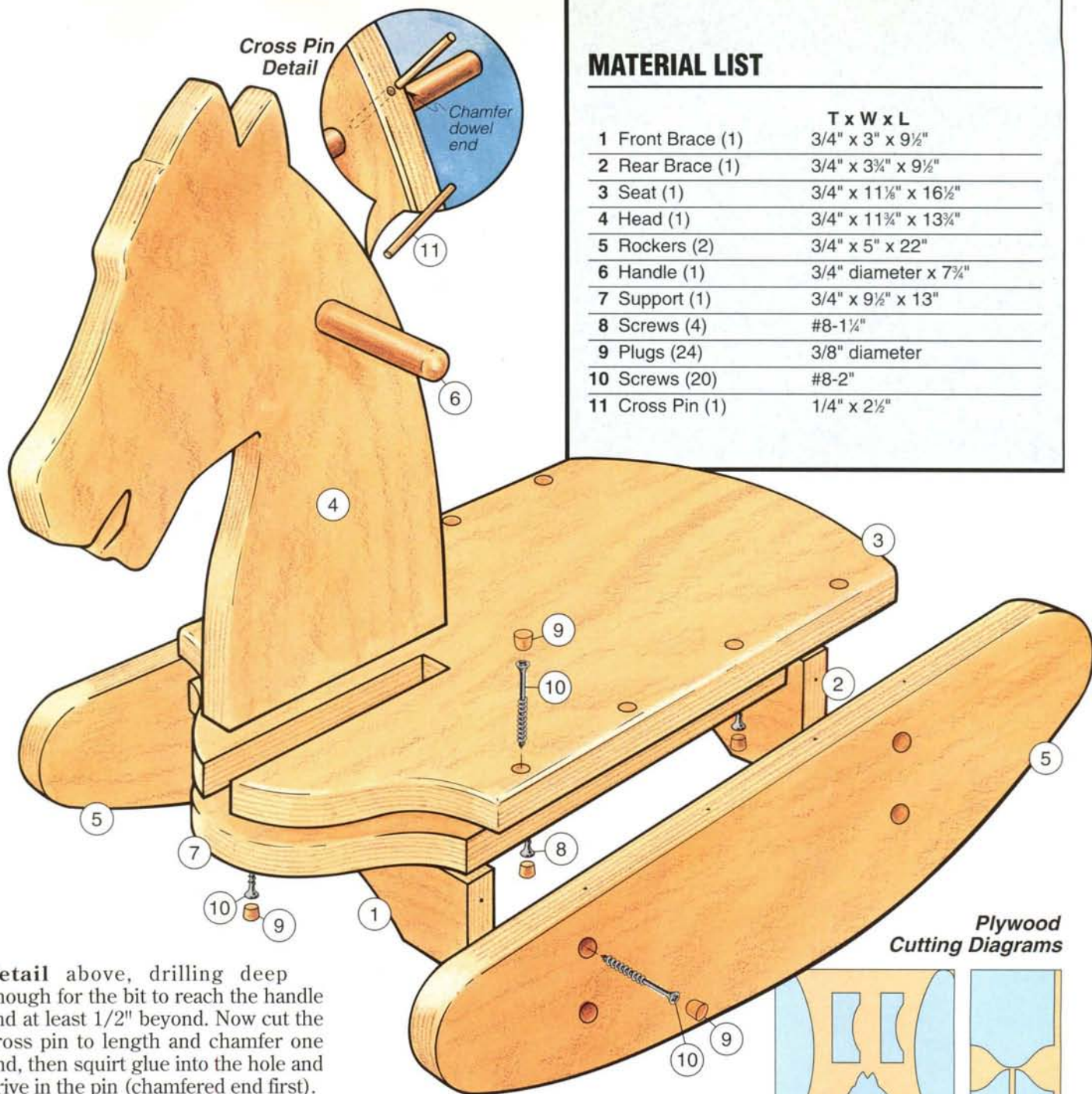
Sand the plugs flush with the support, then snug the rockers into position in what are now rabbets along the edges of the seat assembly. Center the rockers on the seat and be sure the marks you made earlier face the same direction. Drill four counterbored pilot holes near each edge of the seat and into the rockers, then separate the pieces to spread glue along the joints. Reassemble the pieces and drive in #8-2" screws (pieces 10). Once again, fill the counterbores with plugs.

Now cut the braces to exact length and slip them into position between the rockers, making sure they butt up tightly against the support and seat. Drill counterbored pilot holes, then pull the braces back out. Spread glue on their top edge and ends, and install them with the longer screws. After the glue sets, sand the plugs and the edges of the seat flush with the rockers.

Before mounting the head on the base assembly, chuck a piloted 3/8" roundover bit in your router and rout the outside edges of the rocking horse seat (without routing into the slot). Next, cut the handle to length and slip it into the hole in the head. Drill a 1/4" hole for the cross pin (piece 11), as shown in the **cross pin**



Whooooa doggie!
Who's that little pony rustler? It must be the infamous bandito Rachel Hinderaker.



MATERIAL LIST

	T x W x L
1 Front Brace (1)	3/4" x 3" x 9 1/2"
2 Rear Brace (1)	3/4" x 3 3/4" x 9 1/2"
3 Seat (1)	3/4" x 11 1/8" x 16 1/2"
4 Head (1)	3/4" x 11 3/8" x 13 3/4"
5 Rockers (2)	3/4" x 5" x 22"
6 Handle (1)	3/4" diameter x 7 3/4"
7 Support (1)	3/4" x 9 1/2" x 13"
8 Screws (4)	#8-1 1/4"
9 Plugs (24)	3/8" diameter
10 Screws (20)	#8-2"
11 Cross Pin (1)	1/4" x 2 1/2"

detail above, drilling deep enough for the bit to reach the handle and at least 1/2" beyond. Now cut the cross pin to length and chamfer one end, then squirt glue into the hole and drive in the pin (chamfered end first).

The base is now ready to receive the head. Spread glue in the seat slot and slide the head into place, then drive in the four long screws. Cover the screws with plugs and, after the glue sets, use a chisel to shave the plugs flush with the support. Wrap up the construction steps by sanding the cross pin flush with the edge of the head and easing all the sharp corners of the assembly.

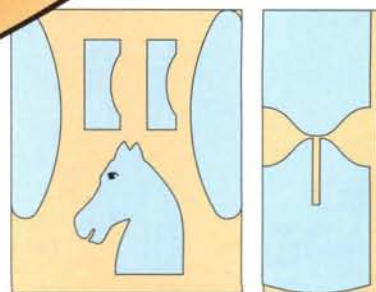
Finishing

For ease of cleanup, Scout's horse is covered with latex paints. The first coat was white primer, and this was followed by two coats of white paint.

To create the pinto pony effect, I added several coats of chestnut brown. You can follow this example, or paint your horse any colors you want. Don't hesitate to use unrealistic colors if you prefer. Whichever way you go, add the black eyes after your base coats dry—they give the horse a much friendlier look.

Now put your prized rocking horse into action by enlisting the help of your favorite toddler. The thrill of the ride will keep your little trail hand busy, and you'll relax knowing that this painted pony couldn't buck even if it wanted to.

Plywood Cutting Diagrams



Painted Pony Kit

A hardware and wood kit is available for this project that includes two pieces of 3/4" thick Baltic birch plywood, an 8" length of 3/4" diameter birch dowel, a bag of 3/8" diameter wood plugs and plenty of wood screws in 1 1/4" and 2" lengths. **Item #13855 (use order form) ..\$54.95**

The Looney Bird Whirligig

Bring the northwoods to your doorstep this summer with this looney whirligig.

By Dan Jacobson



The loon is the official Minnesota state bird, despite the fact that most folks around these parts think it's the mosquito. Mosquitos may grow bigger than loons up here, and there certainly are more of them, but printing pictures of a mosquito in flight just doesn't draw in the tourists like a loon floating on a remote northern lake. Besides, what would we do with all the loon calling contests in the state if we switched?

Now loons, you must understand, aren't the most graceful members of the bird kingdom. When they land their legs rotate as if they're running on top of the water. It struck me that this awkward movement would lend itself perfectly to a simple whirligig. So once I got past pondering the loon/mosquito question, I headed down to the shop for a few hours and came up with this weekend project.

Cutting the Patterns

One reason building this whirligig is so easy is that almost all the pieces are shown on the **Full Size Pattern** insert between pages 12 and 13. Cut out the patterns and trace them onto some 3/4" and 1/4" plywood (see page 18 for a complete hardware and wood kit). Bandsaw the body, wings and feet to shape (pieces 1, 2 and 3), and cut pieces of hardwood to size for the hubs (pieces 4). Make sure the thickness and width of each hub mea-



sure 3/4" exactly. Next, cut a dowel to length for the hub support (piece 5).

After all the pieces are cut to size, draw angled lines on the ends of the wing mount as shown in the **wing mount detail** on page 18, and carefully shave the sides to the lines using a sharp chisel.

Making the Hubs

Cutting kerfs in the hubs for holding the feet could have been tricky, but I came up with a simple jig that yielded accurate results and made the operation very safe. To build your jig, cut two pieces of scrap wood to size, as shown in the **kerfing jig elevation** on page 18, then install a 3/4" dado blade in your table saw. Tilt the blade 20° and raise it so the highest tip is 3/8" above the table saw surface. Now, with the help of your miter gauge, crosscut a groove into the center of each piece (See **Figure 1**). Clamp the halves of the jig together and slip a hub into the square hole. If the fit is too tight, raise the blade a hair and pass the jig pieces through a second time (be sure to align the blade with the first cuts). When the fit is right, spread a couple spots of glue on the jig pieces (keeping the glue well away from the grooves) and clamp them together with a hub installed to align the jig pieces. Make sure no glue squeezes out on the hub.

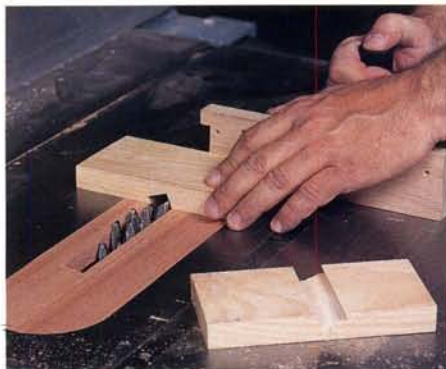


Figure 1: Tilt a 3/4" dado blade 20° and cut a V-groove in each half of the kerfing jig. Combining the halves will form a perfect hole for the hubs.

Let the glue dry, then use a chisel to clear any squeeze out from the opening. Next, set up your saw with a standard blade raised 1" and use the rip fence to center the jig on the blade. Slip a hub into the jig and pass the assembly through the blade (See **Figure 2**). After completing the first cut, turn the jig around and run it through the blade again. Making double cuts like this will keep the kerfs centered on the hubs. Now slip the other end of the hub into the jig and make the same cuts again, making sure the cutting angle comes out opposite the first kerf. Follow this procedure with the second hub, then move the fence a hair and repeat the cutting process with both hubs. Continue moving the fence and enlarging the kerfs until the feet fit snugly into the hub slots.

Assembly

Get the loon ready for final assembly by using a drill press and a 3/4" bit to bore the hole in the body for the hub support. Next, switch to a 5/32" bit and drill a pilot hole in the ends of the hub support, making sure to center the holes on the dowel (See **Figure 3**). While you're at it, chuck a 1/4" bit in the drill press and bore the hole in each hub.

Tap the bushings (pieces 6) into the hub holes and file the ends flush with



Figure 2: The jig safely holds the hubs at the correct cutting angle. Leading with one end of the jig, and then switching to the other keeps the kerfs centered.

the wood if necessary. Now sand the parts for your whirligig and glue the feet into the hubs —driving in a couple of short brads will hold each joint tight while the glue dries. Be sure to use a water resistant glue, like Titebond II, for assembling this project. Blend the edges of the feet into the hubs with sandpaper or a file, then spread glue in the body hole and tap the hub support into place. Once again, drive a brad into the bottom edge of the body and through the hub support to pin the dowel in place while the glue dries.

Now turn the loon upside down and drill a hole in its bottom edge, as shown on the pattern. In case you're wondering, I prefer to leave this operation until now because the hub supports give me a visual guide for holding my drill straight. You'll use the hole for mounting the whirligig on a post and nail.

With a belt sander, taper the end of each wing so they blend into the bodies, then glue them to the wing mount. Next, assemble the feet and hubs to the hub support with screws and washers (pieces 7 and 8) and move on to the finishing.

Painting Your Loon

Painting my loon whirligig was a lot of fun. The colors are so distinct and there are lots of dots and loops and

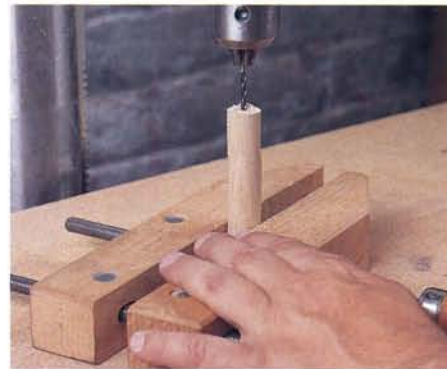
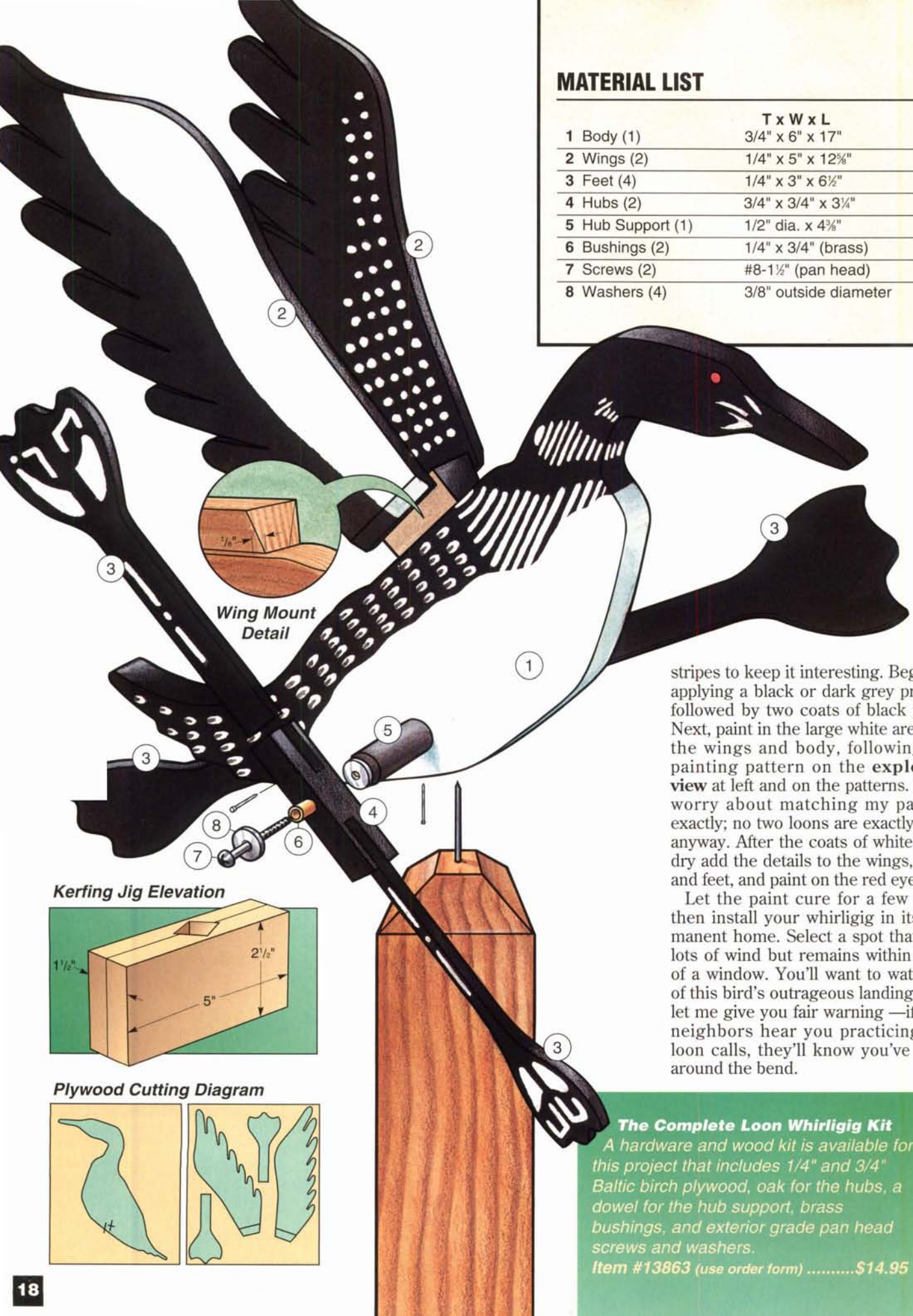


Figure 3: Holding the hub supports with a handscrew clamp will keep them square to the bit while drilling pilot holes for the screws.

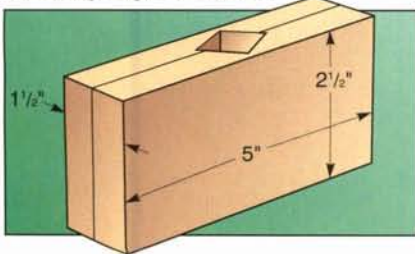
MATERIAL LIST

	T x W x L
1 Body (1)	3/4" x 6" x 17"
2 Wings (2)	1/4" x 5" x 12 5/8"
3 Feet (4)	1/4" x 3" x 6 1/2"
4 Hubs (2)	3/4" x 3/4" x 3/4"
5 Hub Support (1)	1/2" dia. x 4 3/8"
6 Bushings (2)	1/4" x 3/4" (brass)
7 Screws (2)	#8-1 1/2" (pan head)
8 Washers (4)	3/8" outside diameter

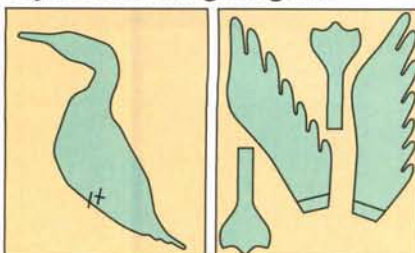


Wing Mount Detail

Kerfing Jig Elevation



Plywood Cutting Diagram



stripes to keep it interesting. Begin by applying a black or dark grey primer, followed by two coats of black paint. Next, paint in the large white areas on the wings and body, following the painting pattern on the **exploded view** at left and on the patterns. Don't worry about matching my pattern exactly; no two loons are exactly alike anyway. After the coats of white paint dry add the details to the wings, body and feet, and paint on the red eyes.

Let the paint cure for a few days, then install your whirligig in its permanent home. Select a spot that gets lots of wind but remains within sight of a window. You'll want to watch all of this bird's outrageous landings, but let me give you fair warning—if your neighbors hear you practicing any loon calls, they'll know you've gone around the bend.

The Complete Loon Whirligig Kit

A hardware and wood kit is available for this project that includes 1/4" and 3/4" Baltic birch plywood, oak for the hubs, a dowel for the hub support, brass bushings, and exterior grade pan head screws and washers.

Item #13863 (use order form)\$14.95

Painting Tips from a Pro

By Steve Jordan

Preparation is the underlying key to any successful finishing job, and that includes painting. It's the elbow grease you expend getting ready to finish that makes the difference.

To get your project ready for paint, start by scraping off any dried glue and filling your dings and depressions with wood putty. Most putty works fine for deep holes and gouges, but for shallow dents, polyester and epoxy fillers hold better than spackling compounds or plastic wood. After the filler dries, sand your entire project with 120 grit paper, making sure to get into all the corners. Once the wood is smooth, vacuum your shop and project, and go over the piece with a tack rag.

Filling the Grain

For a smooth finish, open grained woods like oak, walnut and mahogany require paste wood filler before priming (avoid spackling or common wood fillers). Brush on the filler as it comes from the can or thinned slightly, and remove the excess with a plastic putty knife (plastic won't gouge your wood). As the filler begins to dry, wipe across the grain with burlap. Timing is important here — wiping too soon will pull the filler from the wood pores, but waiting too long leads to a lot of unnecessary sanding. Give the filler a few days to dry, then sand with 220 grit paper.

Primers

A good painted finish always includes a first coat of primer. Primers penetrate the wood for a strong, durable bond, they're easy to sand and prevent bleed-through from knots and extractives. Like paint, primers are available in oil based and water based versions, as well as special formulations for faster drying, low odor or stain killing situations. It's usually safe to use an oil primer under latex paint, a latex primer under oil paint or either paint type over an alcohol based primer. My rule of thumb, however, is to stick with one brand of

primer and paint and to always try to use latex over latex and oil over oil.

Latex versus Oil Paint

Strong opinions resound when painters are asked whether latex or oil is best. I've found that the question boils down to a few choices. For starters, oil paints smell and can be toxic if applied in unventilated areas. Thinning and applying oil paints can be tricky, they tend to dry slowly and clean up requires a solvent, which can create a disposal problem. Latex paints, on the other hand, clean up easily with water and have little odor, but they're nearly impossible to sand and since they dry quickly, you don't get much time for repairs.

On balance, my preference is for oil because it's durable, attractive and easy to sand and repair. As for the choice of sheen, there are more trade-offs. Glossier paints usually last longer and are easier to clean, but they're harder to apply and tend to show irregularities. Low sheen paints generally diminish irregularities and make touch-ups less apparent.

Painting Technique

Choose a location to paint your project that is above the floor and protected from the wind and direct sun — intense sun can create blisters under the finish. Ideally the temperature will hover between 65 and 80 degrees; if it's too cold, paint will run and if it's too hot, brush strokes will show.

Apply oil based products with a high quality, pure bristle brush (not a throw-away brush). After coating leg ends or other areas that will contact the floor, prime your project from the top down taking care to follow the grain. To allow the primer to flow out better and prevent sags, I recommend keeping your working surfaces horizontal as often as possible.

Let the primer dry for 24 hours, then sand lightly with 220 grit paper to remove dust nubs and brush marks. Clean off the sanding residue with a

For shallow dents, polyester and epoxy fillers hold better than spackling compounds or plastic woods.

For a smooth finish on open grained woods, use paste wood filler before priming (avoid spackling compound and common wood fillers).

Whenever possible, keep the work surfaces horizontal to allow for better flow and fewer sags.

When sanding between coats, if your paper gums up the finish is not ready.

Try tinting the primer close to the color of the paint to ensure better coverage.

tack rag and apply the first coat of paint using long, even strokes. Sand lightly with 220 stearated (gray) paper between coats or, if you're really picky, try 400 grit wet/dry paper lubricated with water or naphtha. If your sandpaper gums up, the finish is not ready for sanding or repainting.

Apply latex paints in the same manner, but with a synthetic bristle brush. Since it's so difficult to sand water based paints, I always paint a sample board first to find out if the paint needs thinning. If the dried sample shows excessive brush marks, thin the paint slightly with water or a product designed for water based enamels (Floetrol, for example).

Most enamels will cover the primer in two coats, but some light colors (especially yellows) might require an additional coat. One old painter's trick I use is to tint the primer to the color of the paint to ensure better coverage.

Steve Jordan is the finishing expert at The Landmark Society of Western New York in Rochester, New York.

Craftsman End Table

Impeccable construction and exposed joinery highlight this Arts and Crafts original.

By Darrell Peart



Irony is the word I would use to describe my introduction to the Arts and Crafts movement. A cabinet shop I worked for some time ago secured a contract to build several Stickley style tables and display cases. What I thought would be a chance at making some fine furniture turned out to be an exercise in fraud. The pieces were made with pasted on joinery and an abundance of particleboard — exactly the kind of poor craftsmanship and low grade materials that gave rise to the movement in the first place.

Despite the shoddy construction of these pieces, I was drawn to the designs and philosophy of the movement. At the library I learned about Gustav Stickley and the brothers Charles and Henry Greene. The end table featured here is my latest effort in a series inspired by their original pieces. A friend and fellow woodworker dubbed an earlier, stouter version of this table “atomic furniture” (below). In the event of a nuclear attack, he explained, this table would be the only object left standing in Seattle! I couldn’t tell if this was a compliment or a criticism, but I revelled in the notion that something I built could withstand a nuclear blast. In any event, his comment made me reconsider the table design, and the result is what I call “atomic lite.”



The author's admiration for Arts and Crafts designers inspired a series of furniture pieces, including this end table made of cherry and ebonized walnut.

First Things First

My table is made of cherry, which breaks a little with the Arts and Crafts tradition. Historically, quartersawn white oak was the wood of choice, although mahogany was preferred by the Greenes. Any hardwoods will work just fine for this project.

To get your project going, mill stock for the legs, aprons, rail and stretchers (pieces 1 through 6), making sure the lumber is flat and free of any twist or warp, with edges that are perfectly square to the surfaces. Beginning with material that meets these criteria will ensure a smooth work progression throughout the project.

Darrell's first version of this design was called the “atomic table” for its apparent ability to survive even the most severe conditions.

Now set aside the major parts of the table so you can cut the tenon wedges, crosspins and drawer pull (pieces 7, 8, 9 and 17). Getting these pieces going early gives them plenty of time to soak in the black aniline dye (see *Today's Wood* on page 5). Cut the wedges (See **Figure 1**) and drawer pull (see the **drawer pull elevation** on page 23) from scrap walnut, and cut the pins from walnut dowels. Roundover one end of each pin using a drill press and file (See **Figure 2**), and file a chamfer on the top edges of the pull. Now soak all the pieces in water soluble aniline dye for at least one week. Be sure to use a glass container — metal could adversely affect the dye and the wood.

Mortise and Tenon Joinery

The aprons, stretchers and legs are held together with mortise and tenon joints. The only difference from what you might be used to is that with my project many of the tenons stick out

A wooden chair with a green seat cushion and a backrest featuring vertical wooden slats and decorative carvings. The chair is shown against a background of stylized green foliage.

Start by laying out all the mortises on the legs and stretchers, as shown in the **table elevations** at right. I used a plunge router with a straight-edge fence and a spiral cutter to hollow out the longer mortises (**See Fig-**

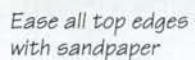


ure 3), and a drill press with a 1/4" bit for all the smaller mortises. After completing the machining, use a chisel to square the corners of the longer mortises and chop the smaller mortises to full size. Be sure to work from both outside surfaces to avoid tearing out the rims of the mortises.

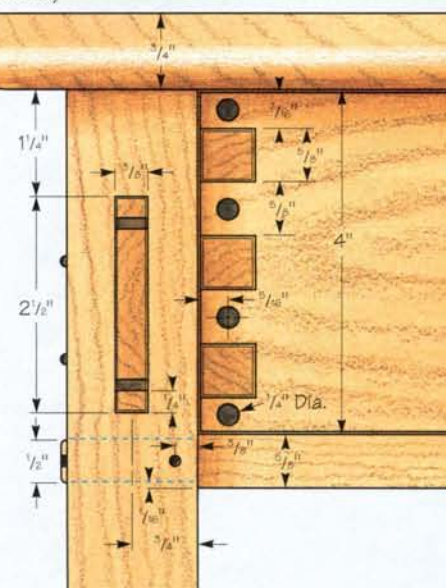
out the slots for the wedges and use a band saw for the cuts. Follow up by drilling a 1/8" hole at the end of each slot to reduce the chance of splitting when driving in the wedges.

Assembling the Table Base

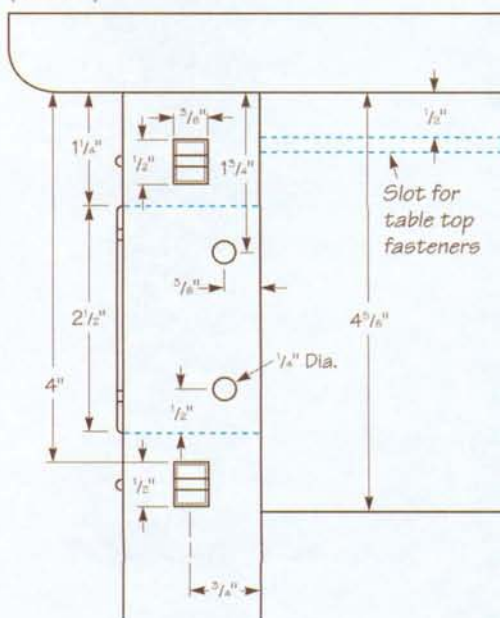
Table Elevations (Front view)



Rout with a $\frac{3}{4}$ " roundover bit



(Side view)



(Back view)

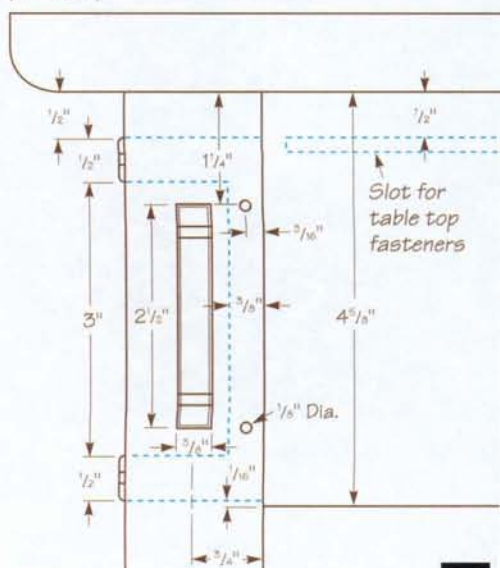




Figure 4: Form tenons using a 1/2" dado blade, a set up block and a miter gauge, adjusting the blade height for the various tenon layouts.



Figure 5: To remove the extra waste for the back apron tenons, screw a tall fence to your miter gauge and clamp the stock for each pass.



Figure 6: Make a pad for driving in your pins by boring a shallow dimple in one end of a piece of scrap wood.



up, however, wipe the ends of all the exposed tenons with a coat of oil/varnish finish. This will prevent any glue from sticking to the exposed tenon areas during the table assembly. After the oil dries, glue the front legs to the front rail and stretcher. Square the clamped subassembly, then shoot some glue into the wedge slots with a syringe and tap in the wedges. Later, when you've removed the clamps, cut and file the wedges flush with the tenons and touch them up with black aniline dye using a very fine brush.

Now glue the two rear legs to the rear apron and stretcher, and drive in the wedges. Complete the base by joining the front and rear subassemblies with the side aprons and middle stretcher. Drive in the remaining wedges and layout the holes on the

legs for the crosspins (see the **table elevations**). Bore the holes using a hand drill and a 1/4" bit, making sure they pass through the tenons plus 1/4". Next, cut the dyed pins to length for each location, remembering to allow for the 1/8" projection of the rounded ends. Squirt glue into the holes and drive in the pins with a hammer and a simple jig (See **Figure 6**).

Before moving on to the drawers, glue up boards for the top (pieces 11). Later, cut the top to size, rout the edges and sand to 220 grit (see the **elevations** on page 21).

Building the Drawer

The drawer is held together in the front with finger joints and in the back with dado joints. (**Note:** A jig for cutting finger joints is described on page 11, but remember that the finger size and spacing are different for this project.) After constructing the jig and milling the drawer stock to size (pieces 12, 13 and 14), cut the finger joints, as shown in the **table elevations**. I recommend cutting a sample joint first to make sure the finger size and spacing work out with your jig and blade. Be sure the bottom edges of the drawer align.

Once you've perfected the finger joints you can complete the machining on the drawer parts. Cut dados in the drawer sides for the back, as shown in the **drawer elevation** at right, then use your router table and a 3/16" bit to rout grooves in the drawer walls for housing the bottom. I made two sets of passes with this undersized bit to get a tight fit with the plywood bottom (piece 15). Be sure to stop the groove in the drawer front to keep it from showing on the completed drawer. Complete the drawer bottom grooves, then switch to a 3/4" bit and plough 5/16" deep stopped grooves in the drawer sides for the drawer runners (pieces 16), as shown in the **drawer elevation**.

Square the ends of all the stopped grooves with a chisel.

Now position the drawer pull (pieces 17) on the drawer front and use your drill press to bore two 3/8" dia. x 1" deep holes for the cherry pull pins (pieces 18). Dry assemble the drawer and drill 1/4" holes for pinning the sides to the back, as shown in the **drawer elevation**, then take the drawer apart and roundover the corners of the fingers with a file.

Glue and clamp the drawer parts together, then squirt glue into the holes for the back pins (pieces 8) and drive them into place. After removing the clamps, shave the back pins and front fingers flush with the drawer sides, and refile the sharpened finger edges. Layout and drill the cross pin holes in the drawer front joints, as shown in the **table elevations**, and drive in the ebonized cross pins.

Now roundover one end of each pull pin using the drill press and file technique shown in **Figure 2**. Squirt glue in the drawer pull and drawer front holes and drive the pins home. Finally, cut the drawer runners to length, round the front end a bit and mount them in the table base with screws (pieces 19), as shown in the **table elevations**.

Finish your project with three coats of the same oil/varnish product you used earlier on the tenon ends, but avoid getting too much in the drawer runner grooves and on the runners — the drawer will stick. When the last coat of finish is dry, secure the top to the base with the table top fasteners.

Hopefully you'll agree that I've captured the spirit of the original Arts and Crafts designs. And even though my new "atomic lite" table may succumb to a nuclear blast, I'm confident it will last more than a few generations in your family.

Darrell Peart is a woodworker based in Seattle, Washington.

MATERIAL LIST

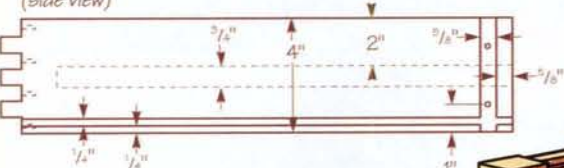
	T x W x L
1 Legs (4)	1 1/2" x 1 1/2" x 21 1/4"
2 Side Aprons (2)	3/4" x 4 5/8" x 19 3/4"
3 Rear Apron (1)	3/4" x 4 5/8" x 19 3/4"
4 Front Rail (1)	5/8" x 1 1/8" x 19 3/4"
5 Front and Rear Stretchers (2)	5/8" x 5/8" x 19 3/4"
6 Middle Stretcher (1)	5/8" x 1 1/2" x 18 7/8"
7 Wedges (22)	1/4" x 3/8" x 1 1/2"

	T x W x L
8 Pins (20)	1/4" dia. x 2"
9 Pins (12)	1/8" dia. x 2"
10 Table Top Fasteners (9)	Steel with screws
11 Top (1)	3/4" x 22" x 22"
12 Drawer Front (1)	5/8" x 4" x 16 3/4"
13 Drawer Sides (2)	5/8" x 4" x 17 3/4"
14 Drawer Back (1)	5/8" x 17 1/4" x 15 3/4"

	T x W x L
15 Drawer Bottom (1)	1/4" x 17 1/4" x 16"
16 Drawer Runners (2)	3/4" x 7/8" x 16 1/2"
17 Drawer Pull (1)	1/2" x 1" x 7"
18 Drawer Pull Pins (2)	3/8" dia. x 1 1/8" (cherry)
19 Screws (6)	#8 x 1 1/2"

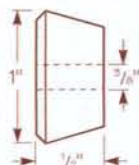
Drawer Elevation

(side view)



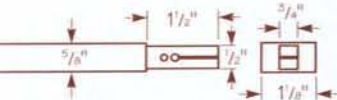
Drawer Pull Elevation

(end view)



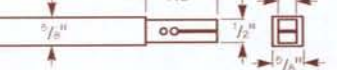
Front Rail

(side/end views)



Front/Rear Stretcher

(side/end views)



Middle Stretcher

(side/end views)

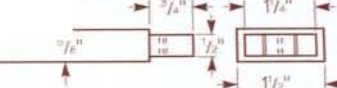
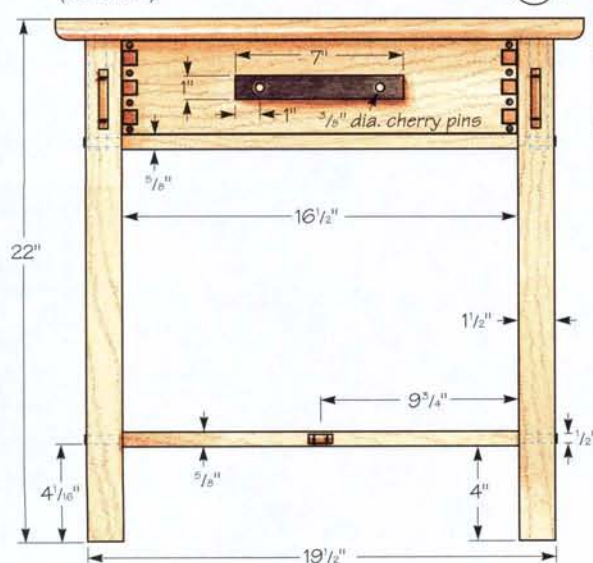


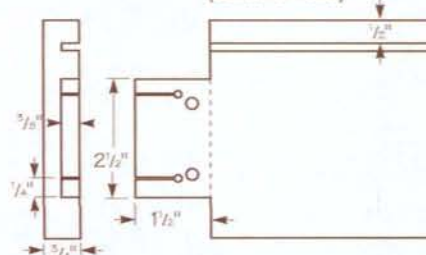
Table Elevation

(front view)



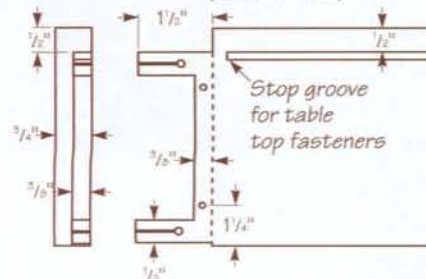
Side Apron

(side/end views)

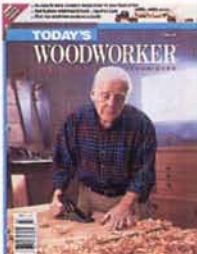
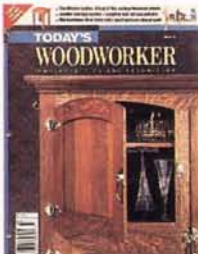
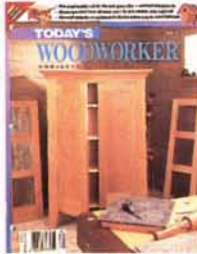
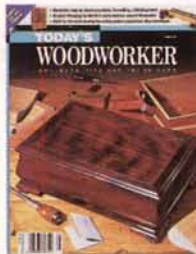
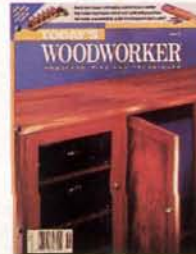


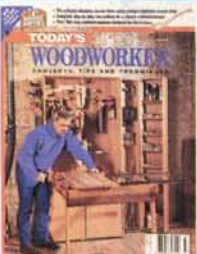
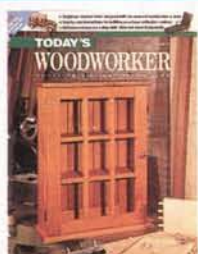
Rear Apron

(side/end views)



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Feet

3

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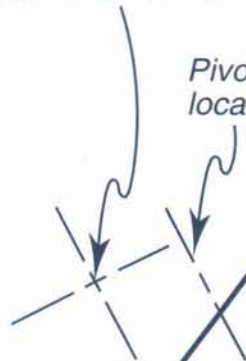
igig

Body

1

*1/2" hole for Hub
support (piece 5).*

*Pivot hole
location.*



Rear Brace

2

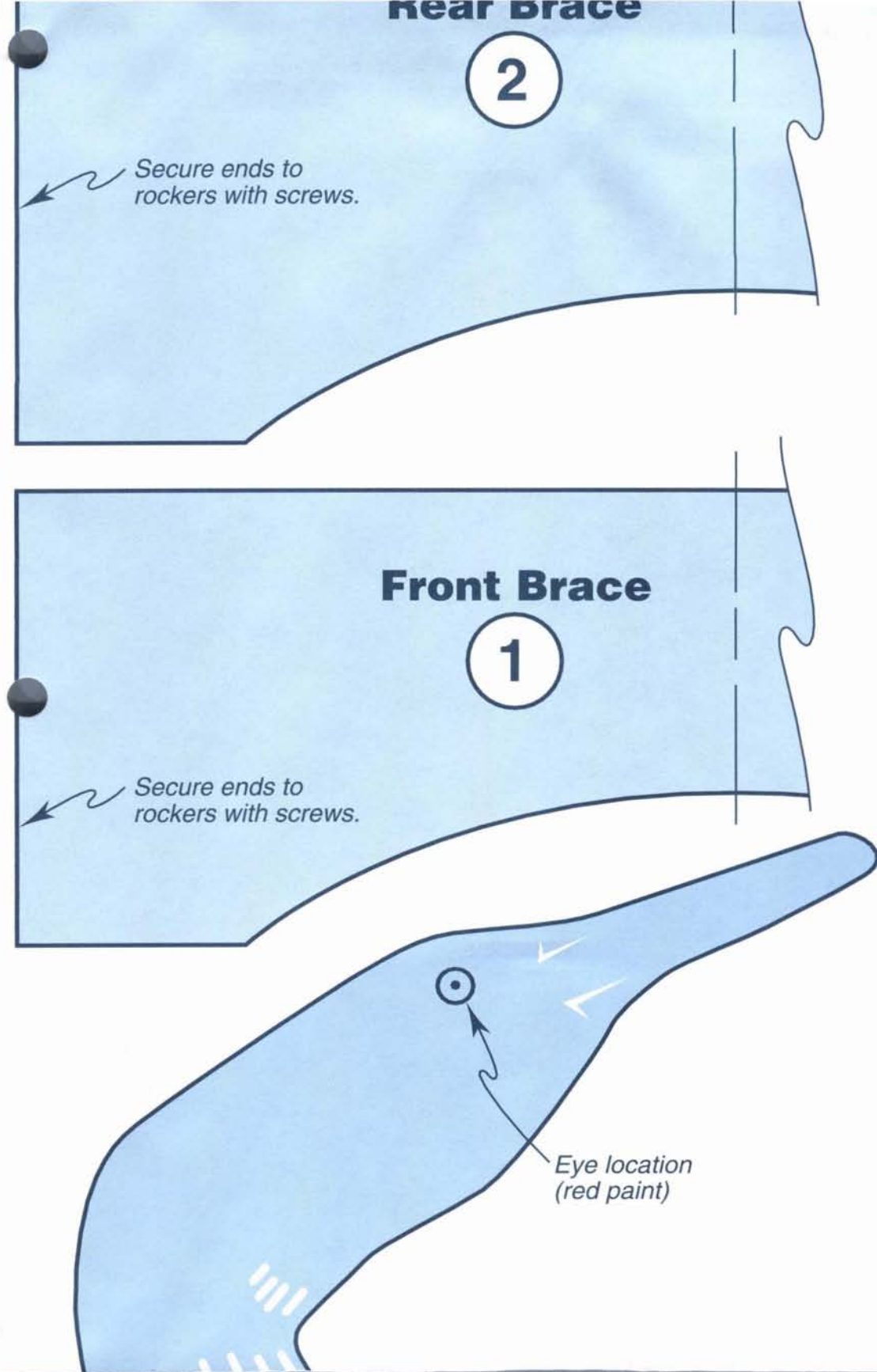
Secure ends to
rockers with screws.

Front Brace

1

Secure ends to
rockers with screws.

Eye location
(red paint)

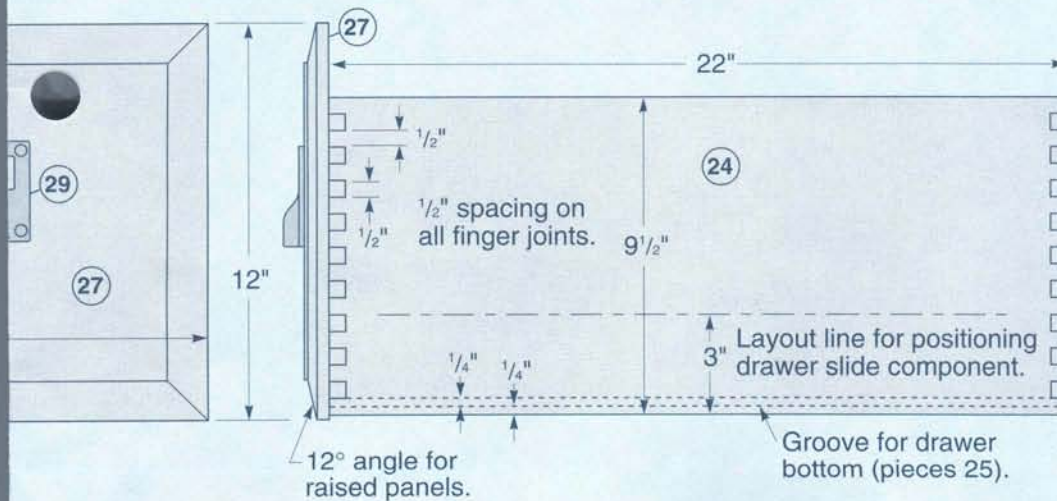


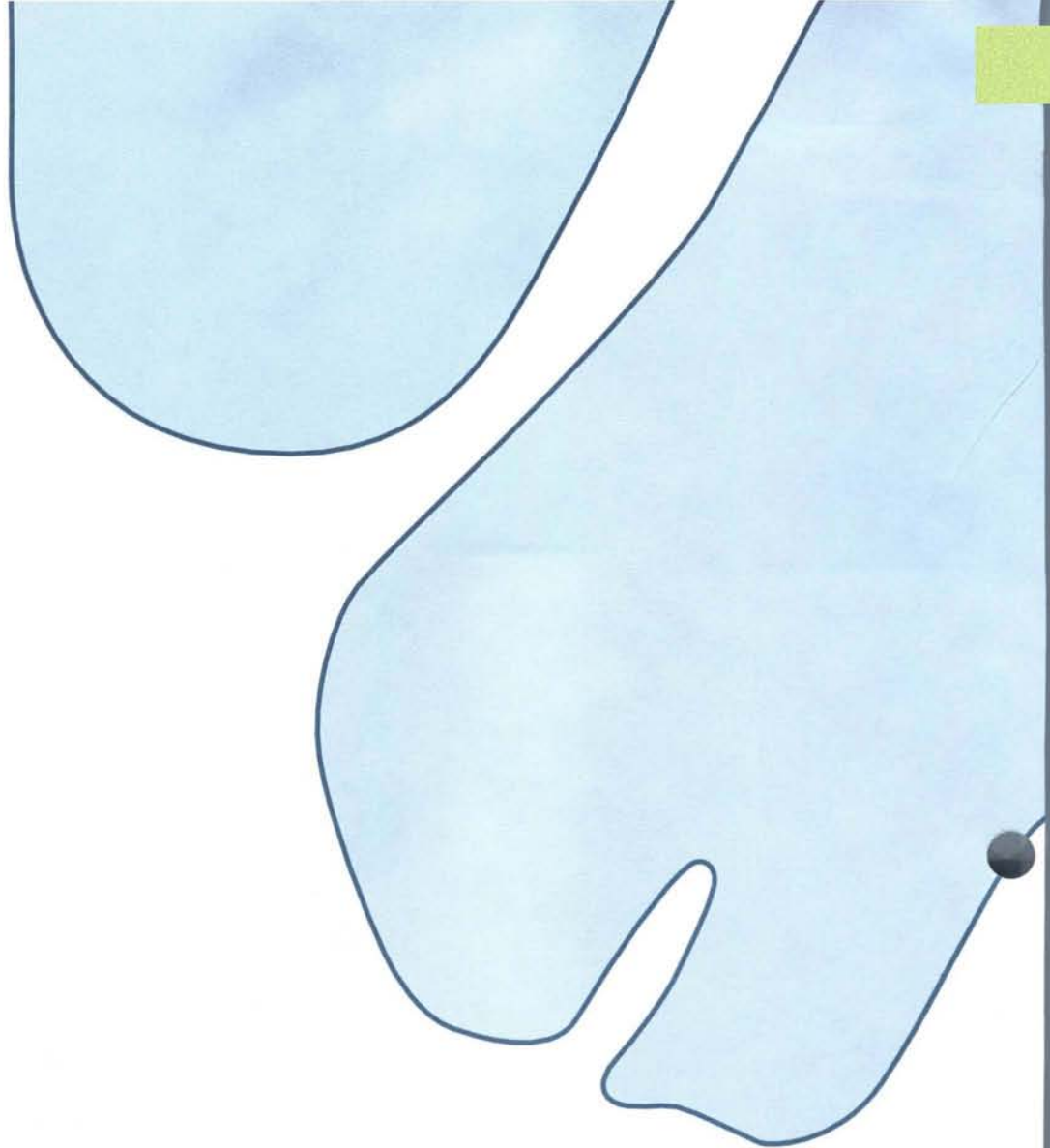
	T x W x L
Internal Stiles (6)	3/4" x 2 1/2" x 14 3/4"
Side Panels (4)	1/4" x 19 5/8" x 10 1/4"
Back Panels (2)	1/4" x 10 7/8" x 10 1/4"
Upper Facing (1)	3/4" x 1 1/2" x 14 1/4"
Middle Facing (1)	3/4" x 3/4" x 14 1/4"
Lower Facing (1)	3/4" x 3 3/4" x 14 1/4"
Baseboard (1)	3/4" x 3" x 72"
Cornice Molding (1)	1/2" x 3/4" x 72"
Screws (24)	#8-1 1/4"
Corner Blocks (4)	1 3/4" x 1 3/4" x 3"

	T x W x L
21 Shims (2)	1/4" x 1" x 18 1/4"
22 Nylon Glides (4)	1/2" diameter
23 Fronts & Backs (4)	1/2" x 9 1/2" x 13 3/16"
24 Drawer Sides (4)	1/2" x 9 1/2" x 22"
25 Drawer Bottoms (2)	1/4" x 12 5/8" x 21 1/2"
26 Drawer Slides (2)	22" Accuride #4034
27 Drawer Faces (2)	3/4" x 12" x 14 1/4"
28 File Hangers (4)	White plastic
29 Drawer Pulls (2)	Solid brass
30 Screws (8)	#8-1"

ions

(Side View)

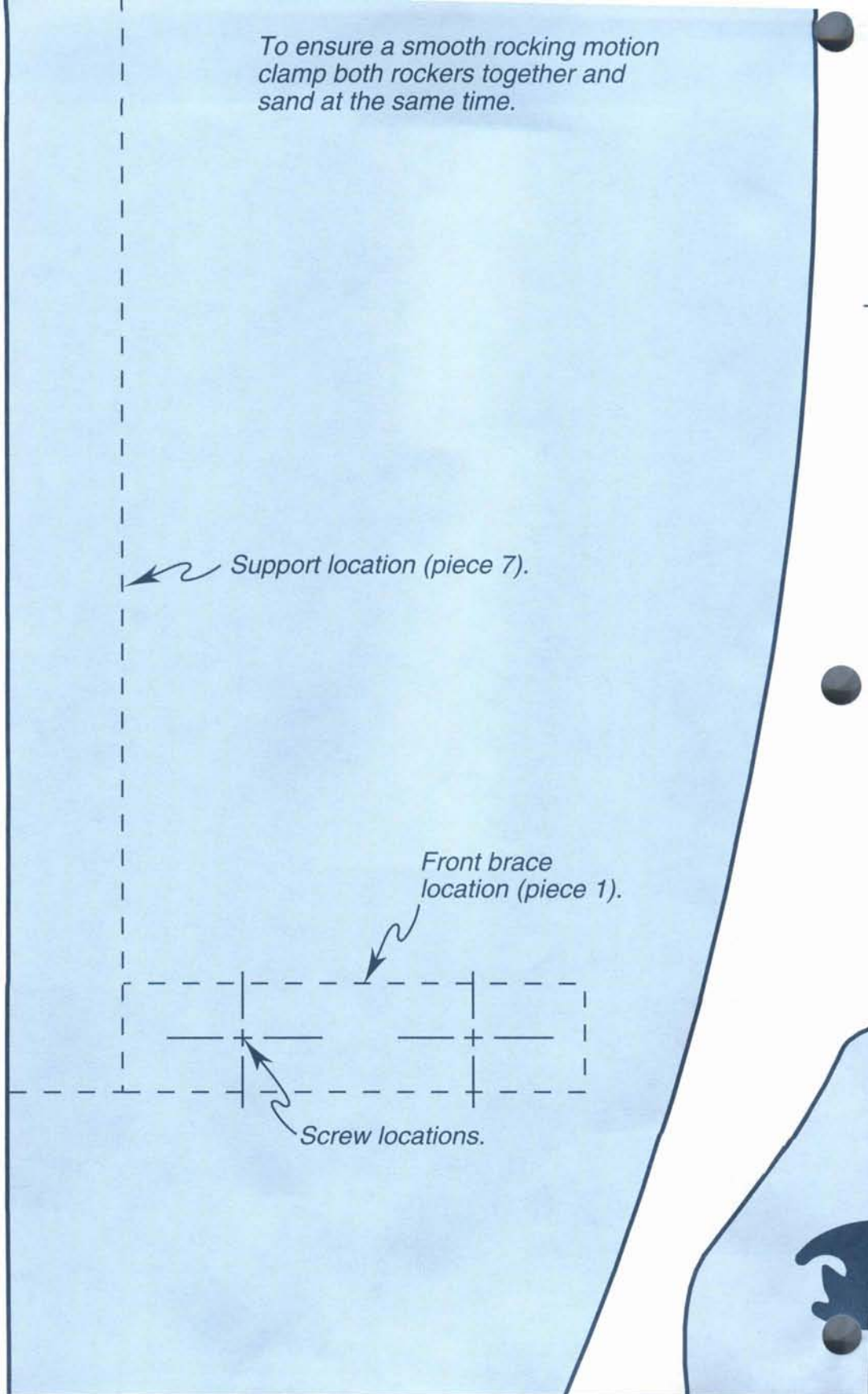




Scout's Painted Pony

*To ensure a smooth rocking motion
clamp both rockers together and
sand at the same time.*

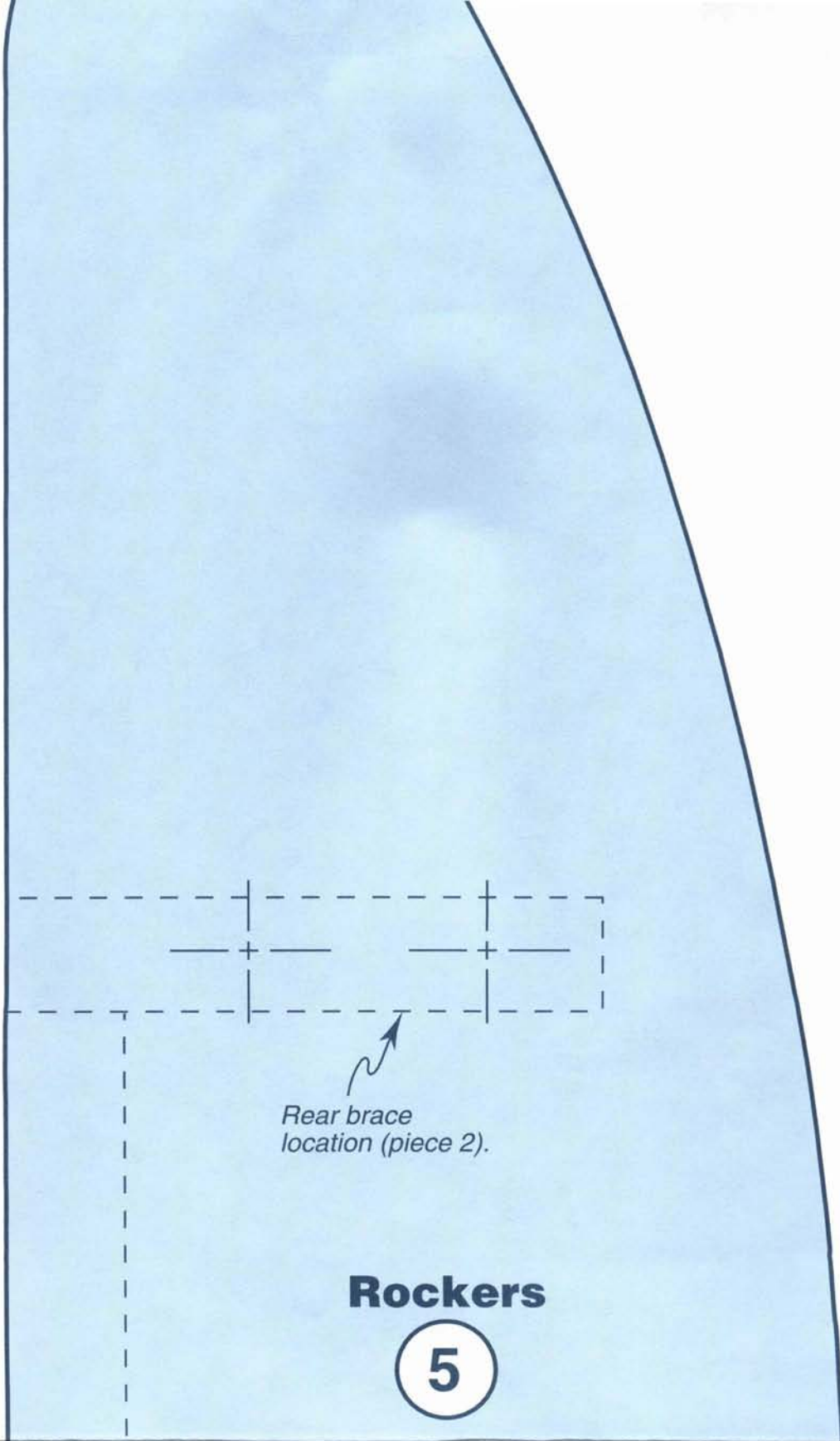
Support location (piece 7).



The diagram shows a light blue wooden rocker piece with a curved bottom edge. A vertical dashed line on the left side indicates the support location for piece 7. An arrow points from the text 'Support location (piece 7)' to this line. In the lower-middle section, a dashed rectangular box represents the front brace location for piece 1. Inside this box, four small crosses mark the screw locations. An arrow points from the text 'Front brace location (piece 1)' to the top-right corner of the dashed box. Another arrow points from the text 'Screw locations.' to one of the crosses inside the box. On the right side of the rocker, there are three circular holes and a small decorative cutout near the bottom.

*Front brace
location (piece 1).*

Screw locations.

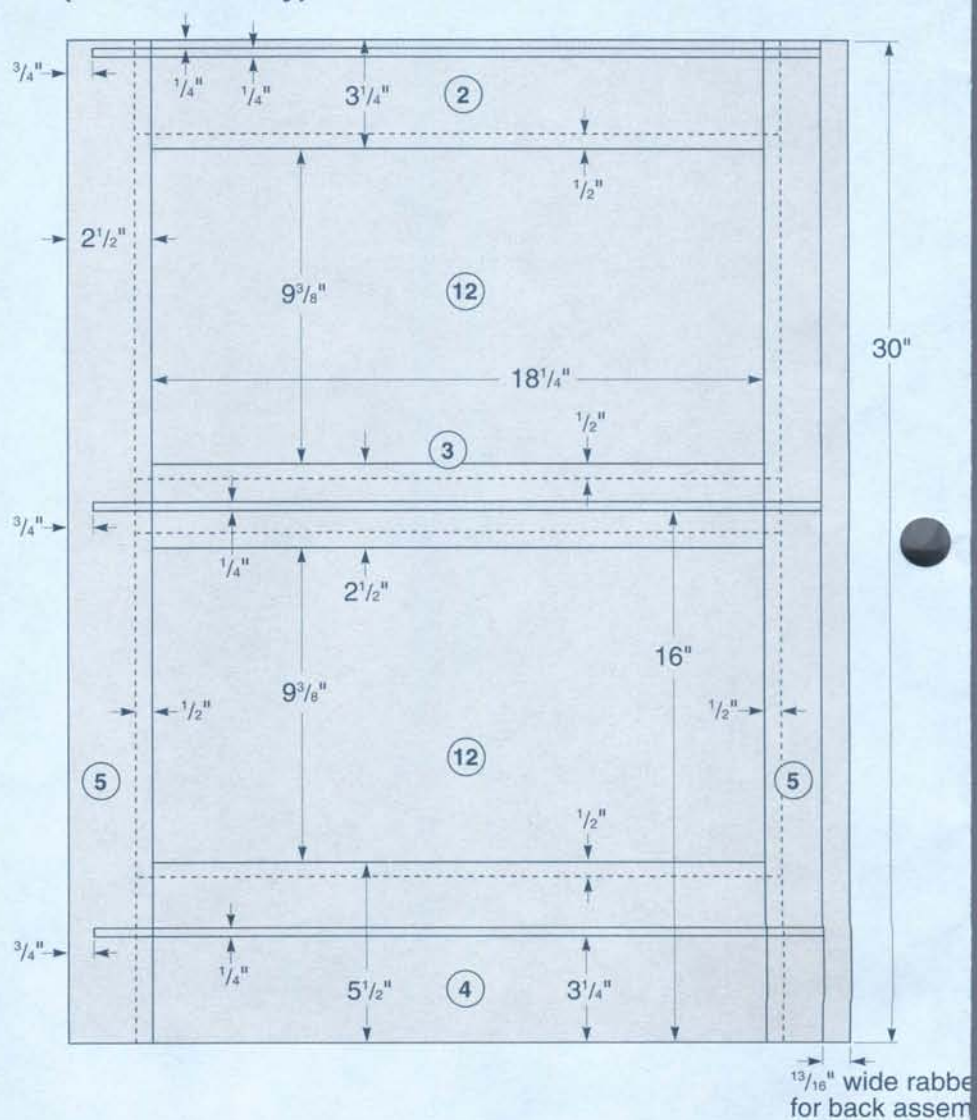


*Rear brace
location (piece 2).*

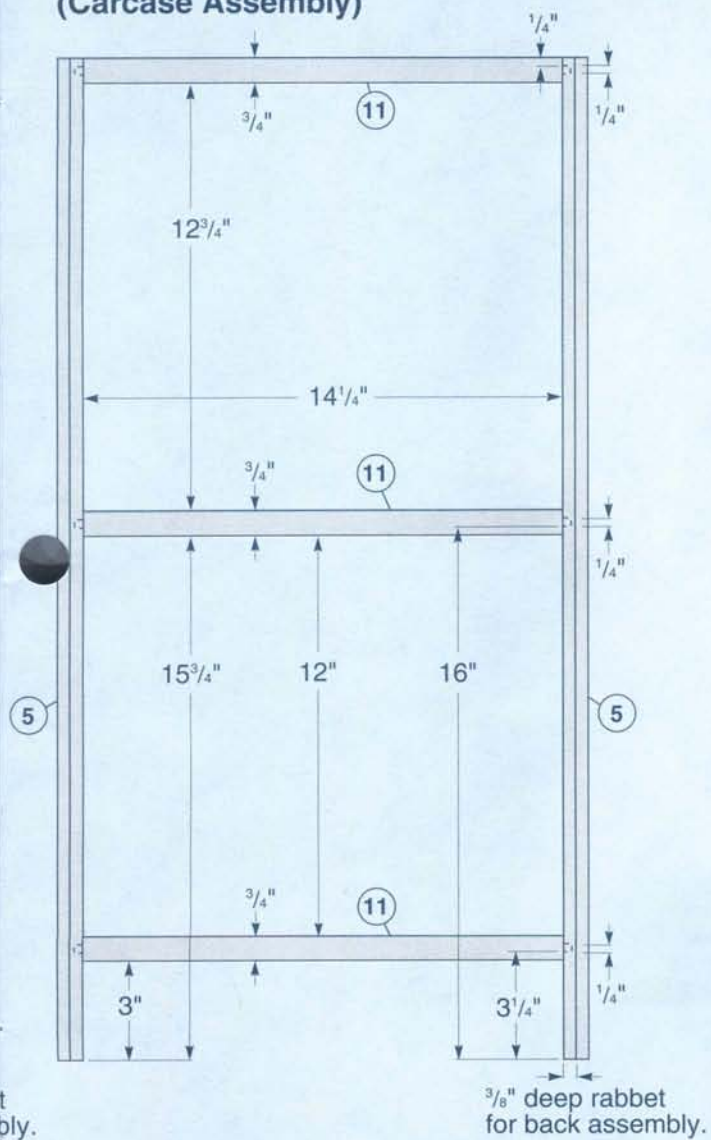
Rockers

5

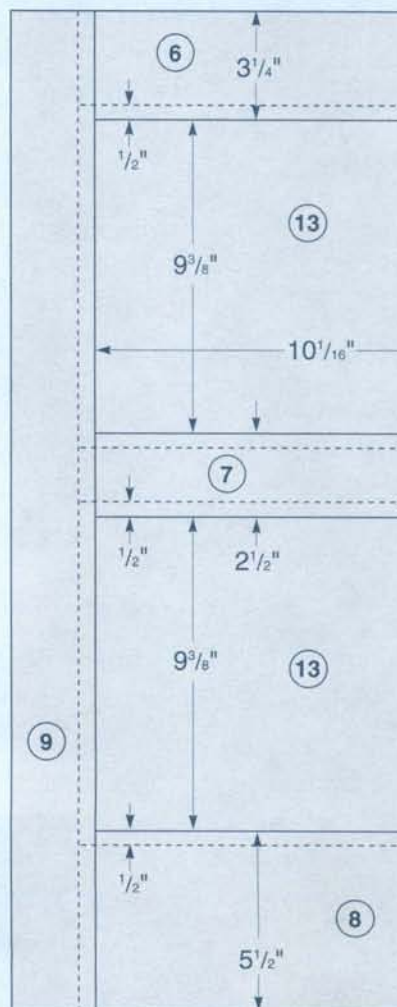
(Side Assembly)



(Carcase Assembly)



(Back Assembly)



Seat

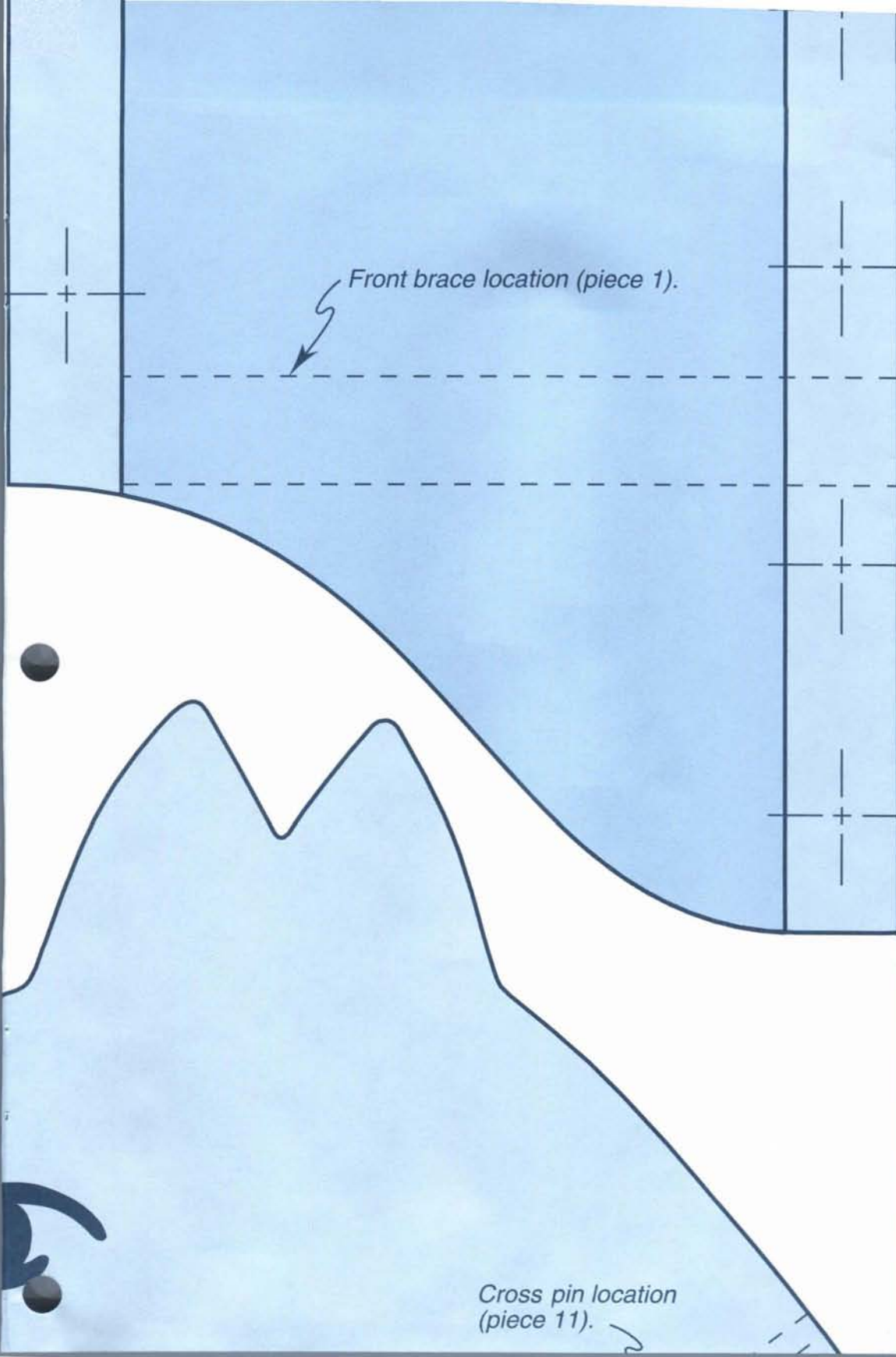
Use line to position
Rocker (piece 5)
underneath the seat.

Rear brace loca
Butt against end

Support

7

Screw locations.

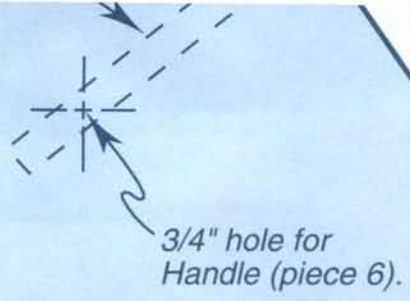


Front brace location (piece 1).

Cross pin location
(piece 11).

Head

4



Fit into seat slot and secure
to support with screws.

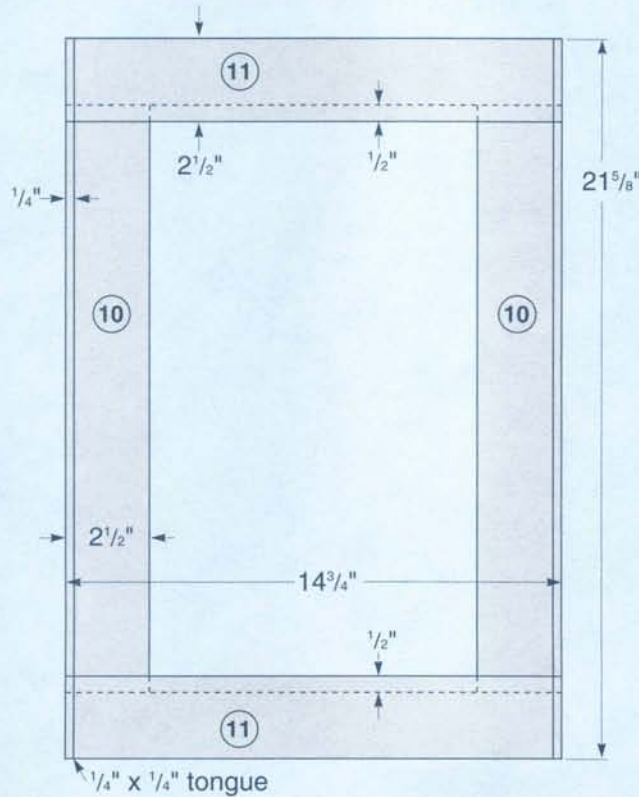
An arrow points from the text to the bottom edge of the white seat slot diagram.

Material List

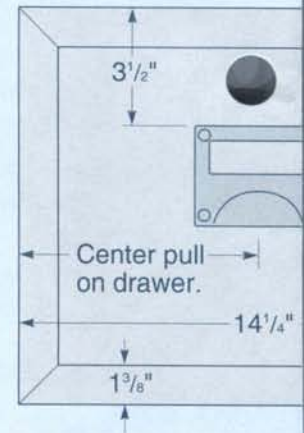
	T x W x L	
1 Top (1)	3/4" x 17 5/8" x 24 1/4"	11
2 Upper Side Rails (2)	3/4" x 3 1/4" x 19 1/4"	12
3 Middle Side Rails (2)	3/4" x 2 1/2" x 19 1/4"	13
4 Lower Side Rails (2)	3/4" x 5 1/2" x 19 1/4"	14
5 Side Stiles (4)	3/4" x 2 1/2" x 30"	15
6 Upper Back Rail (1)	3/4" x 3 1/4" x 11 1/16"	16
7 Middle Back Rail (1)	3/4" x 2 1/2" x 11 1/16"	17
8 Lower Back Rail (1)	3/4" x 5 1/2" x 11 1/16"	18
9 Back Stiles (2)	3/4" x 2 1/2" x 30"	19
10 Internal Rails (6)	3/4" x 2 1/2" x 17 5/8"	20



(Internal Frame Assembly)



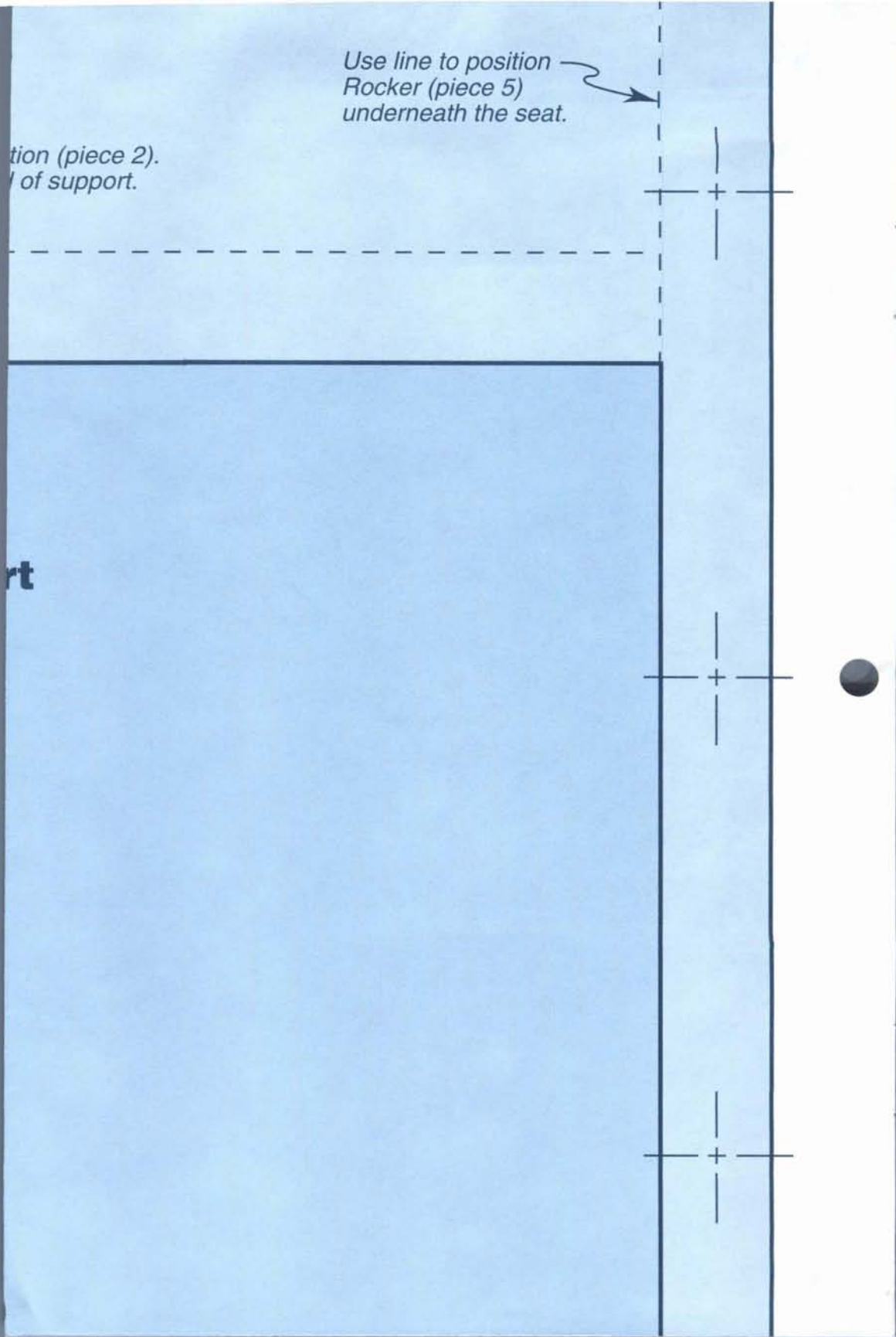
Drawer Elevat (Front View)



tion (piece 2).
of support.

Use line to position
Rocker (piece 5)
underneath the seat.

rt

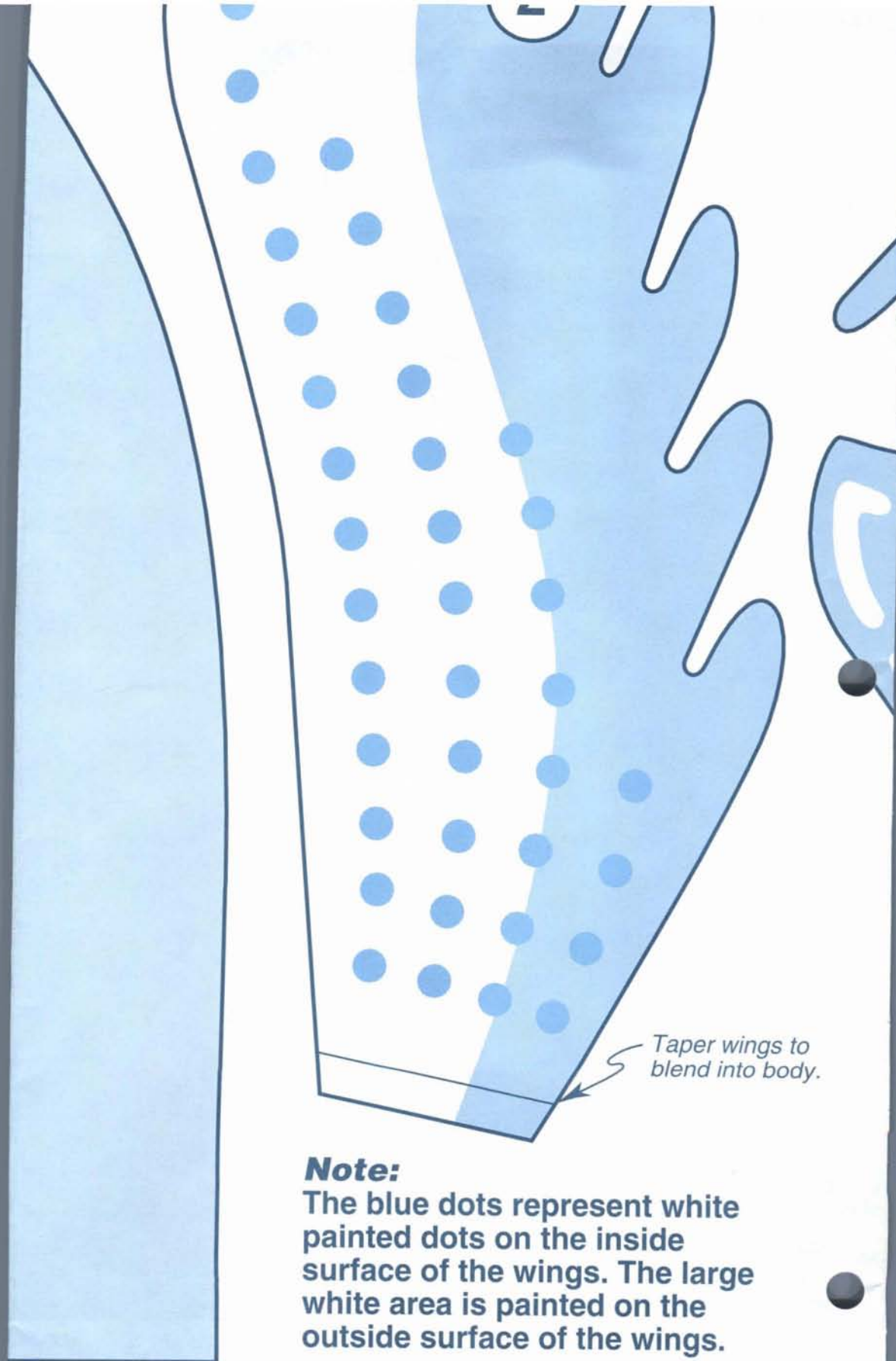


Route slot for Head
(piece 4) in seat only.

Sand the seat and support
at the same time.

Loon Whirl

Wings



Note:

The blue dots represent white painted dots on the inside surface of the wings. The large white area is painted on the outside surface of the wings.