October 1993 • Issue No. 64

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Page 82
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WOOD® Magazine’s
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▲ Auction hostess Louise Mandrell poses for a photo with Publisher Bill Reed and me.

Many may recall that in December of 1990 some of the winning entries from our Build-A-Toy contest were displayed at the American Museum of Folk Art in New York City. Then in 1991 we moved the event to Los Angeles and had our first toy auction.

But the most successful event to date was in 1992 when we exhibited your award-winning toys during the National Crafts Festival at Silver Dollar City in Branson, Missouri. Well over 300,000 people had the opportunity to view and appreciate your good work.

Then, in December, we and Silver Dollar City sponsored a benefit auction at the 4,000-seat Grand Palace Theater in Branson. Singer Louise Mandrell hosted the auction, singer/auctioneer extraordinaire LeRoy Van Dyke auctioned off the first few toys, and by afternoon’s end, the cashiers had taken in over $20,000 for the Marine Corps Reserve’s Toys-for-Tots program. All of you who took time to build toys for our Build-A-Toy competition can feel the satisfaction of having made many underprivileged kids very happy this past Christmas season.

Events such as those referred to above allow WOOD magazine to promote woodworking as a true art form, to reflect the excellent craftsmanship of you, our readers, and demonstrate the generosity of both WOOD readers and advertisers. And with your continued support, we’ll be able to make a difference in the years to come. A big thanks from all of us.

Join in the fun and giving
You say you just can’t wait to get into your shop and start on your toy for the next contest? Then turn to page 82 and check out all the details. Together, we can make this year’s Build-A-Toy competition better than ever.

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EDITORIAL MAILING ADDRESS: WOOD magazine, 1912 Grand Ave., Des Moines, IA 50309-0379.
White ash: good wood for good sport

Baseball bats, tennis racquets, hockey sticks, tool handles—these are only a few of the many uses of this versatile wood.

CRAFTSMAN CLOSEUP
Where realism rides the waves
Capturing the waterman’s way of life along the East Coast describes Steve Rogers’ devotion to modelbuilding. His authentic, scaled-down, wooden workboats tell gobs about the glory days of this area’s fishing industry.

Keep-on-trucking toy box
Build this sturdy recycling vehicle, and watch your kids work hard to fill it with the toys and stuffed animals strewn on the playroom floor.

Projects with porpoise
Dress up your desktop at home with this fine trio of accessories that includes a lidded box, a pencil box, and a letter holder.

TOOL BUYMANSHP
Lathes under $600
Is buying a new lathe too big an investment right now? You just might reconsider after scoping out these 10 hardworking models, all under $600!

CARVING
Perfect pachyderm
Experience power-carving at its finest by detailing this realistic replica of Nature’s largest land animal. See our special bit selection inside.
SHOP-TESTED TECHNIQUE
Turning between centers 52
Follow along as expert Rus Hurt tells how to shape flawless spindles. Then, try your hand at the potato masher design at the end of the article.

TURNING PROJECT
Sweet-tooth skewers 58
Sweeten your woodturning diet with our designs for easy caramel-apple handels. Instructions include a Better Homes and Gardens recipe.

Comfort-plus Shaker bed 60
Bring style to your sleeping quarters with this striking queen-sized bed. Later, build our matching tall chest and cheval mirror.

Five years and still a super contest 66
Check out the craftsmanship and creativity of the winning entries in our 1993 toy contest.

What woodworkers need to know about screws 68
Study up on today’s threaded fasteners and see what ones serve your needs best. You’ll learn a few driving tips along the way.

CRAFT SHOP
Autumn leaves 70
Accent an empty wall with the colorful shapes of fall.

Gentle giant of the woods 72
You don’t need carving credentials to form this sleek, shelftop moose.

Here’s the scoop on food-safe finishes 74
Discover the healthy approach for treating kitchen woodenware.

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While other geniuses have been out collecting their Nobel Prizes, ours have been experimenting in the basement again.

They look harmless enough. But send these men to the basement at Ryobi R&D, and they go wild. This year, it all started with the new OSS450 Oscillating Spindle Sander – the first in its price range to combine up-and-down and rotary motion for burn-free finishes on a huge array of shapes and contours. Which led to the new BS900 Band Saw for more intricate cuts and 9” capacity. Ah, then came the TDS4000K – the only cordless drywall and deck screw gun to operate at pro-standard 4000 rpm’s. The RA202 Radial Arm Saw, with its patented Control Cut™ feature for operator-selected saw head advance and automatic return. Our ever-popular Detail Sander. And the handy AP12 Portable Planer with its quick blade changes and lateral adjustment of knives to eliminate scoring. Fact is, whatever the tool – benchtop, cordless or handheld – some Ryobi genius is always finding a refreshingly better, more accurate and efficient way to get the job done. Are they really mad scientists? Probably not. Are they coming up with products you’ll be crazy about? You bet.
We welcome comments, criticisms, suggestions, and even compliments. Send your correspondence to: Talking Back, Better Homes and Gardens WOOD magazine, 1912 Grand Ave., Des Moines, IA 50309-3379.

How to size name on V.I.P. plaque
Your V.I.P. door plaque on page 70 of issue 60 was great. I've made three so far. However, the letters that we're supposed to use as templates, beginning at the bottom of page 40, are not the same size as those in your plaque.

Your plaque's "name" letters are 1½" tall while the pattern letters are ¾". What should we do about this discrepancy?

—Walter Childs, Memphis

Find a copy machine and enlarge the patterns to 117%, Walter. This will give you the 1½" size we actually used in our plaque. However, one note: If you are making a name with over seven letters, you might want to consider using the smaller, printed version, or even reduce them further in the case of a truly long name.

Hand protection while cutting glass
In your article on how to make leaded-glass panels in issue No. 61, you do not mention any hand protection. While working for a glass company, I learned that a glass sliver in the body is virtually undetectable. I urge anyone working with glass to protect their hands.

—Mike Greenelee, Cochran, Pa.

Mike, for another opinion we contacted several stained-glass professionals in our area. While they do not wear gloves while cutting glass, they do recommend other safety procedures.

First, they suggest keeping all work areas free of glass slivers. Use a bench brush and dust pan to clean slivers and glass scraps from the work surface after each series of cuts. This preventive measure also reduces the chance of a sliver scratching the next piece of expensive glass you cut.

Glass cutting is actually a controlled breakage, and occasional splinters may fly off. Our pros urge you to wear eye protection at all times.

For safety and effectiveness, our pros also strongly advise using running pliers to separate strips of glass. Such pieces could shatter in your hands.

Working with glass should be a safe and enjoyable craft, so long as you take your time and stay focused on the task at hand. If you should cut your skin, be sure to wrap it adequately so that lead cannot enter the wound.
Indiana oak grove keeps
USS Constitution shipshape

In reading the April 1993 issue, page 33, I found the article concerning the uses of white oak very interesting. The part about how this wood was used in the construction of the USS Constitution struck close to home.

You'll be happy to know that the U.S. Navy still maintains this fine ship with white oak from the hills of southern Indiana. I hope you can come out and visit our "Constitution Grove" someday. We'd love to have you.

—Nyle Riegle, Naval Surface Warfare Center, Crane, Ind.

What's wrong with radial arms?

In response to Jim Boelling's stand on radial arm saws in issue 60, page 30, he should realize a hobbyworker makes good use of the tools he has available. It might be wise for WOOD magazine to take another look. For some hobby and project workers, the radial arm saw is their primary saw.

—Bob Summers, Evansville, Ind.

We never wanted to leave the impression that people shouldn't use radial arm saws. We do prefer the miter saw, and were simply stating those reasons.

Adjustments to a snail

Smiley the rocking snail in the June 1993 issue looks like a real fun project to make and for youngsters to play on. But maybe we should sacrifice a bit of realism for safety's sake. A sudden stop or movement could cause the rider's head or eyes to collide with the antennae.

Eugene E. MacManan, Fern Park, Fla.

Eugene, we've received several letters from readers pointing out this problem with Smiley, and we have changed the design to protect our very precious riders. We recommend that the antennae pegs be shortened to 1" in length, and the mounting holes drilled 1" deep. After you install the pegs, the antennae will be small round knobs.

Other alert readers noticed another error in the snail plans, involving the placement of the snail's body on the slats. The measurement from the front edge of the slats to the front of the body should be 3½".

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WOOD MAGAZINE  OCTOBER 1993  7
No sawdust in "dream shop?"
In your "Home Workshops That Work" (issue 60, page 65), I couldn’t help but chuckle a bit when I read that Gil Wilmer regularly waxes and buffs all tabletops. It really does look like a “dream shop,” but I can’t see any sawdust. No disrespect intended, but does this shop really see work? My shop is in a 9x6' corner of my basement, and I’m lucky if I can find my workpiece. Still, it provides me with countless hours of pleasure, as does your magazine.
—Dennis Nelson, N. Olmstead, Ohio.

And now, the rest of the story... …
Thank you for the nice write up and the pictures of my shop in your April 1993 issue. I noticed the article says I regularly wax and buff all tabletops. I realize I may be a little compulsive but I really don’t do them regularly. Actually, the reason I wax them is for ease in moving heavy projects around and to prevent glue and paint from sticking to the workbench.
—Gilbert Wilmer,
Fair Oakes, Calif.

Copper nails still available
I have begun making the "What-Not Basket" shown on page 78 of your October, 1989 issue. But I have been unable to find the copper nails. I tried to order from Faering Design, the company listed in your buying guide, but they seem to no longer exist. Can you help me find the nails?
—Robert Bradley, Scotia, N.Y.

Faering Design still exists, Bob, but they don’t take phone orders. They just moved to a new location. Write to them at RD 2, Box 950, Putney, VT 05346.

Wants a Dubby cutoff fixture
I would like to receive information on the Dubby cutoff fixture shown in your “Tips” section of issue 59, page 10.
—Gerald Myers, Wellsville, Pa.

Gerald, you can call In-Line Industries at 800/533-6709, or write them at 661 Main St., Webster, MA 01570. The fixture sells for $135.95 ppd.

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Drill press gets around on an easy-to-build base

In most instances, casters work great for moving tools. A floor-standing drill press, with its high center of gravity and small base, is an exception. How can you move one of these heavyweights, short of grabbing it in a bear hug?

TIP: Construct a simple base like the one shown right from pieces of 2 x 4 and 3/4" plywood. Install a pair of 2" rigid-plate casters (nonswiveling) on the left side. With the base flat on the floor, locate the casters so the wheels clear the floor by about 1/4". Bolt the drill press to the base.

To move the drill press, stand facing the left side of the machine and tip it slowly toward you like a two-wheel dolly. Support the drill press securely by holding onto the table or head, as convenient. Tilt it just far enough for the wheels to contact the floor, and roll it away.

—Jeff Masterson, Monterey, Calif.

---

Paint bottles promote better biscuit gluing

Gently, you squeeze the bottle of woodworker’s glue, aiming to inject a bit of adhesive into a biscuit slot. Just a little more, now, and... splurt! As you wipe up the glue dripping from the project part onto your benchtop, you notice there still isn’t as much glue as you wanted in the biscuit slot. What’s a woodworker to do?

TIP: With soap and water, wash out an empty 2-oz. plastic bottle for acrylic paint, the kind sole painters use. Pour some glue into the container and screw on the top. The small opening, about 1/4" or so, lets you squeeze out small amounts of glue precisely where you want them, even into slots for small no. 0 biscuits. The bottle’s flip-top lid seals tightly.

—Sheila Heckman, Switchville, Pa.

---

Pipe clamp proves a boon to straight-line sawing

A portable circular saw often turns out to be the handiest tool you have for crosscutting large sheets of plywood. Without a guide, however, you’ll have a tough time making a straight cut.

TIP: With a pipe clamp, a straight piece of 1 x 4 stock, and a few pieces of hardware, construct an adjustable fence for your circular saw. (It works great with a router, too.) Choose a pipe clamp that spans the sheet you’re cutting, and then cut the 1 x 4 fence to that width. Attach the fence to the clamp with standoff conduit clamps, shown left, which prevent interference between the fence and the clamp. Close each conduit clamp with a bolt long enough to act as a leg to keep the fence from tipping. Cover the end of the bolt with tape or foam to prevent scratching the material.

—George Williams, Elk Grove, Calif.

Continued on page 12
Mill your own rough-sawn boards to the thickness you desire. Be free to really design your work, instead of being at the mercy of pre-dimensioned lumber.

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The Delta 12" Portable Planer.
Features a stationary, stainless steel table for smooth feeding, and extension tables for ample work support. A top-mounted control handle raises and lowers cutterhead for easy, precision adjustment.

Two-knife cutterhead makes 16,000 cuts/minute to assure a perfectly smooth finish. Surfaces stock from 1/8" to 6" thick, up to 12" wide, with absolute accuracy.

Cutterhead and feed assembly effortlessly ride up and down on four precision-ground steel columns. This adds stability and eliminates motor vibration. Feed rate automatically adjusts itself. Stationary table means infeed and outfeed levels stay put.

Move it to wherever you're working. Or move it into storage when it's not in use. Features built-in handles and removable table extensions.

Building On Tradition
DELTA
A Pentair Company
**TIPS FROM YOUR SHOP (AND OURS)**

**Continued from page 10**

**Go to a corner to store an abundance of stock**

If you have unlimited shop space, stop reading here. For the rest of us, storing project material poses a major problem. Just one full sheet of plywood covers up a big portion of precious wall space.

**TIP:** Move your materials into a corner. As shown below, you can stow everything from full sheets of plywood (if your shop has 8’ or more of headroom) to cut-off pieces into an area that extends only 40” along each wall. Construct the dividers from plywood and 2×2 stock, and attach them to the floor and ceiling. Add shelves to hold cut-off pieces and small stock, if desired.

—Doug Parker, Grandville, Mich.

---

**Floor-level air hose keeps a low profile**

A wall-mounted retractable reel keeps your air hose handy and protects it, too. Usually, the reel hangs at benchtop height for convenience. But the convenience ends as soon as the reeled-out hose blocks your path around the shop or sweeps a stack of project parts and tools off your benchtop.

**TIP:** Install the hose reel at floor level. That way, when it crosses your path, you can simply step over it. To keep the hose-end handy, snap it into a conveniently located spring clip, the type used to hang brooms.

—WOOD magazine’s IDEA SHOP™
Color-coded outlets help prevent electrical overloads

In some workshops, more than one electrical circuit serves the convenience outlets. Still, a dust collector, a work light, and a tablesaw could pop a circuit breaker if they end up plugged into the same circuit. You need to divide your loads among circuits, not just outlets.

TIP: For each outlet on the same circuit, paint a dot of one color on the outlet plate. (Acrylic artist's colors work great for color-coding.) Identify the circuit breaker in the load center with a corresponding color dot. Designate other circuits with other colors. Now, when you plug in equipment that will be running concurrently, make sure you don't plug too much of it into outlets marked with the same color.

—Bob Blackman, Sunrise Beach, Mo.

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**RBI Hawk Scroll Saws**

**SUPER HEAVY DUTY WOODWORKING EQUIPMENTS**

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Price</th>
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<tr>
<td>TS200HD</td>
<td>10&quot; SUPER HEAVY DUTY TABLE SAW, 3HP</td>
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<td>200HA</td>
<td>10&quot; SUPER HEAVY DUTY TABLE SAW, 3HP</td>
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<td>MB320</td>
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<td>SB300</td>
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<td>AP400</td>
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<td>JT660 6&quot; LONG BED JOINTER, 1HP</td>
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<td>JT860 8&quot; HEAVY DUTY JOINTER, 1HP</td>
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<td>1200 12&quot; HEAVY DUTY JOINTER, 3HP</td>
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<td>747 DUST COLLECTOR, 850 CFM, 1HP</td>
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<td>DB600 AIR DRUM SANDER, 1 HP</td>
<td>$285</td>
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**TIPS FROM YOUR SHOP**

**Continued from page 13**

**Flashlight announce phone calls and visitors**

Concentrating on your project with your earplugs in, the dust collector turned on, and a power tool running, it's not surprising that you might not hear the telephone ring. The same situation makes it easy for a visitor to enter your workshop without your knowing. A tap on the shoulder or a greeting from an unannounced guest is guaranteed to cause a shriek, or worse, an accident.

**TIP:** To avoid missing telephone calls when you're in the shop, install a flashing-light telephone signal. Radio Shack outlets and other sources sell a plug-in device that connects to your telephone line with a standard modular plug. A lamp (or lamps, up to a stated maximum) plugged into it will then flash whenever the telephone rings. For more visibility, use a colored bulb. Install several lamps or mirror spots in the corners of the shop so you can see the light from anywhere.


**TIP:** Visitors won't startle you if you hook up a visual "doorbell" in your shop. Near the entrance, install a switch that controls a lamp inside the shop. Use mirrors or additional lamps if necessary for visibility. Do not use your main shop lights as the signal. Post a large sign instructing persons entering the shop to flip the switch on and off several times, and to wait to be waved in. Make sure that everyone in your household understands the danger of entering the shop unnoticed.

-Edward DeMay, Canandaigua, N.Y.

**Continued on page 16**
Wanna' hear the latest in saw blades?

You can't!

You can't, because these new blades are absolutely quiet and vibration-free. All other blades vibrate. If you don't believe us, take the blade you're currently using, hold it by the arbor and tap it with a pen or pencil. Hear the ringing noise? That's the vibration, the same thing that happens when you make a cut. Now, tap the blade on this page. No really — try it! That's what our new blade sounds like.

Vibration does more than just make noise. It causes teeth to dull faster and makes the cut less precise. So how do we eliminate vibration? We laser cut patented anti-vibration reeds right into the blade body. The sound gets trapped in the reeds and there you have it, no vibration.

Not only is this the quietest blade, but the most precise. Why? Vibration causes micro-chipping on the edge of the workpiece and the kerf width to vary. We've also incorporated Freud's innovative new Square Tooth™ design — by taking the same amount of carbide as in our other blades and reshaping the tooth to make it thicker and shorter. A shorter tooth is less likely to follow the grain of the wood, thus permitting a more precise cut. A thicker tooth will also yield more sharpenings, extending the life of the blade. Also, our Titanium super micro-grain carbide lasts longer between sharpenings than other manufacturers' carbide.

A higher tooth angle prevents splintering and chipping. So we increased the bevel angle for each blade to give you a splinter-free cut. We have 3 blades to handle any woodworking project: 40 tooth ATB general purpose, 60 tooth triple chip for man-made materials, and 80 tooth ATB crosscutting.

So, there you have it. A new blade so advanced, that it will change woodworking forever! Go see your local dealer and ask them to let you tap our blade. It really is that good.

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TIPS FROM YOUR SHOP (AND OURS)

Continued from page 14

Box protects dust collector
Ka-chang! There goes another large chip or knot through your dust collector. It sure sounds like it could be doing some damage.

TIP: A simple drop box will catch those large pieces before they reach the dust collector. Build your box to the approximate dimensions shown right. Locate the inlet and outlet connectors about 2" above the floor of the box. Make tight joints, and use foam weatherstripping for a gasket on the cleanout cover. Install horizontally near the dust collector.

Airborne dust passes through to the dust collector, but heavier pieces drop out of the airstream and collect on the bottom of the box. Clean out the box periodically for maximum effectiveness.

—Bob Colpetzer, Clinton, Tenn.
Router mat flips out for more convenience
Your non-slip router mat sure comes in handy. But, when you roll it up to put away, you end up with a bulky bundle that's hard to store.

TIP: Hang the mat out of the way over an end of your workbench. Place the mat near one corner, fold it over the end of the bench-top, and fasten it with aluminum carpet edging or countertop molding. When you don't need the mat, simply flip it over the end of the bench.

—Chuck Hedlund, Des Moines, Iowa

MORE TIPS FROM OUR WOODWORKING PROS
• Having trouble achieving a smooth paint job? Try Medite instead of plywood. See our notes about it on page 38.
• Catch a wave, or at least laminate a decorative veneer wave between two pieces of wood. We'll show you how to do it; turn to page 40.
• For knockout joinery, see the bed bolts on page 61.

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Looking for a few good dulcimer parts
I am 72 years old and have been building dulcimers as a hobby for several years now. I have built 36 dulcimers from “scratch.” I need a good supplier of hardware parts for both fretted and hammer dulcimers, including geared tuners, tuning pins, fretwire, bulk musical wire, soundhole rosettes, etc. I am trying to find companies that supply such hardware. Do you know of any sources?
—Charlie Breeding, Davenport, Va.

We’ve tracked down several companies that handle dulcimer hardware and complete kits. See the listing in the box at right.
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ASK WOOD

Continued from 20

A lumber sticker in the family tree

I have been doing genealogical research on my family, and have a question that has plagued me ever since I discovered my great grandfather's occupation. He was born in 1851 and lived in southwest Ohio. The census listed him as a "lumber sticker." Do you or any WOOD readers know what that was? How did the name originate?

—Jimmy Smith, Beavercreek, Ohio.

Jimmy, unless some of our "old timer" readers respond to the contrary, we believe we've solved the mystery of your great grandfather's occupation. A check with the Forest History Society of Durham, North Carolina, confirmed our suspicion. Your great grandfather was a lumber grader—at that time, and even now, a highly specialized job. He used a scaling stick (thus the label) to determine the volume of logs or boards and was probably employed by a logging company or a lumber mill.

You can remove ink marks on wood

How do you remove those annoying ink marks on boards that come from the lumber store? Should I use a solvent?

—Ryan Sutton, Middletown, Ind.

Ryan, we asked our Project Builder, Jim Boelling, to help answer this one. He says, "Basically, you have only three viable alternatives: scraping, sanding, or cutting off or around the mark. Resist the temptation to use alcohol, lacquer thinner, or acetone to remove the ink marks. The reason: They can actually cause the ink to flow deeper and over a greater area."

Are all Taiwanese look-alikes alike?

Imported machinery—especially tools from Taiwan—proliferates in today's market. Many of these machines look very similar except for differing brand names. Do you have any information on Taiwanese manufacturers? Are there a great many of them? Are some better than others?

—Norman Sherry, Barnesville, Pa.

We talked to Steve Erbach, advertising director for Grizzly Imports. "Yes, Norman, there are many Taiwanese manufacturers, and the quality does vary by manufacturer. Often, quality from the same manufacturer depends on the specifications of the buyer. Most tools are built according to specifications given to them by an importer. Some importers choose higher grades of parts—switches, wirings, and bearings. Others are interested in buying the cheapest product available. In the end, we advise going with a company, like ours, that services what they sell, and always stocks parts."

Continued on page 24
What it takes to cut it as a Consumers Digest Best Buy.

You don't get named a Consumers Digest Best Buy without working at it. You have to be an outstanding value. That's the Dremel 1671 Scroll Saw.

The Dremel 1671 has a lot of features that make it a pleasure to use. It has two cutting speeds and a powerful motor that lets you buzz through wood up to two inches thick, as well as sheet metals and plastics.

The sturdy, 12-inch cast aluminum table is adjustable from 0° to 45° for accurate bevel cuts up to 1-inch thick. Of course, not all the features of the Dremel 1671 Scroll Saw are as obvious. A special mechanism quickly stops cutting action if the blade breaks. And the heavy cast-iron base keeps vibration to a minimum.

So if you're searching for the perfect scroll saw for your craft or other woodworking projects, check out the Dremel 1671.

A 16-inch throat and the ability to cut from both the front and the side, means you can handle large work pieces.

The saw accepts both plain- and pin-end blades, for the greatest possible cutting versatility. The see-through blade guard pivots out of the way for easy blade changing. And a convenient sawdust blower keeps your cutting line clear for accurate cuts.

And see why Consumers Digest placed it a cut above the rest.

For a free copy of the Dremel Scroll Saw Blade Application Guide write to: Dremel, Dept. S-W, P.O. Box 1468, Racine, WI 53406-1468.

DREMEL®
Continued from page 22

**Where can I get more training?**

I'm currently in the Air Force and am planning on retiring and opening an antique restoration business in Virginia soon. I really enjoyed your article on the Dakota Technical Institute (issue 49, page 46). I would love to find a similar school in my area so I can learn furniture construction, restoration, and finishing. Do you have a listing of these?

—David Taylor, Lt. Col., USAF

Dave, we contacted John Rybski with the National Association of Furniture Repair and Refinishing Specialists. He located Mark Weathersby, a furniture restorer in Norfolk, Virginia, who would be happy to take you on as an apprentice, or set up a special training program for you. You can contact him at his store, Craftsmanship by Weathersby, at 804/362-8412.

You should also contact the above association. They are just starting up, but they hope to become a comprehensive resource for folks just like you. Write them at NAFRRS, 321 S. Houghton, Milford, MI 48381. Or call 313/684-6411.

Also, a company called Minuteman offers excellent refinishing seminars, training programs, a full line of products, and technical support. Contact the company at 115 N. Monroe St., Waterloo, WI 53594; or call 800/733-1776.

And, here's a partial listing of some schools offering intensive woodworking programs:

- Penland School of Crafts: offers courses for beginning and experienced woodworkers. Write Penland, NC 28765. Call 704/765-2359.
- Anderson Ranch: summer seminars in fine woodworking and furniture design taught by master craftspeople. Write P.O. Box 5598, Snowmass Village, CO 81616. Call 303/923-3181.
- Oregon School of Arts and Crafts: fine woodworking and finishing. Three-year program, open quarterly classes, and workshops. Write 8245 SW Barnes Rd., Portland, OR 97225. Call 503/297-5544.
- Rockingham Community College: two-year fine and creative woodworking program, and a six-week basic program. Write P.O. Box 38, Wentworth, NC 27375. Call 919/342-4261.
- Yestermorrow: one-week basic, intermediate and advanced cabinetry, and two-week tutorial workshops. Studies aimed at students' specific interests. Write Design/Build School, RR 1, Box 975, Warren, VT 05674. Call 802/496-5545.
- Dakota County Technical College: beginning and advanced wood finishing. Write to the school at: 1300 145th St. East, Rosemount, MN 55068. Call 612/423-2281.
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down against the wall, making
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can also clamp a piece of ply-
wood in place and use the rack as
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WHITE
ASH

Good wood for great sport

Most people probably know white ash quite well. They’ve hefted it, grasped it in their hands, and worked with it for hours.

Anyone who has ever dug a hole with a spade, gathered leaves with a rake, or chopped weeds with a hoe has touched white ash. The tough, resilient wood leads hickory for handles on nonstriking tools.

Although white ash indeed classifies as utilitarian, it bests all woods in a sporting role. Wooden baseball bats (still the mainstay in pro leagues) have always been made of white ash. Before man-made fibers, it was also the wood of choice for tennis racks and skis. You’ll also find white ash as hockey sticks, polo mallets, oars and paddles, and playground equipment.

Chairmakers also prefer white ash due to its bending ease. And its workability, plus good looks, make white ash one of the top commercial woods in the furniture and cabinet industries.

Wood identification
White ash (Fraxinus americana) grows from the East to the Midwest. Green ash and blue ash—with somewhat weaker wood—share the same range, and commercially, they’re harvested and marketed together.

Preferring the well-drained loam soil found in river valleys, white ash can grow to 120’ tall and a diameter of 6’ with nearly half the trunk height clear of branches. You won’t find it in pure stands, though. Instead, the tree likes a mix of neighbors—hardwoods in the South, conifers in the North.

The name “ash” may originally have come from the gray color of the tree’s flat-ridged bark that’s cross-hatched with diamond shapes. As does walnut, white ash produces leaves 8” to 12” long that are made up of five to nine lance-shaped leaflets, each about 5” long. Near the leaves hang the fruit of last year’s growth—clusters of tan paddle-shaped wings with seed cases.

White ash differs in color from black ash (often called brown ash), its cousin in the market. White ash looks lighter—although it’s actually tan, not white. And even flat-sawn white ash can display bird’s-eye, fiddleback, and quilt-pattern figure.

The wood of white ash nearly matches hickory’s rating in strength, stiffness, and hardness. Yet, at 41 pounds per cubic foot, cream-colored white ash is lighter and easier to work. Although somewhat course-textured, white ash generally has straight and even grain.

Uses in woodworking
You can use white ash for any woodworking project that you would red oak: chairs, tables, desks, and cabinets. Although durable to exposure from the elements, it won’t, however, weather as well as white oak in outdoor projects.

Carvers and woodturners view white ash the same as red oak. Its hardness and coarse grain make it difficult to work.

Availability
Within white ash’s natural range, dealers that stock hardwoods should carry an abundant supply of white ash at about $2.25 per board foot. And wide boards are usually available. Some dealers may even carry 3”-diameter bat blanks and furniture squares.

Ash plywood costs about $60 per sheet in 3/4” thickness. You’ll also find ash veneer, in sheets and as edge-banding, carried by cabinetmaking suppliers.

Continued
From board to board, flat-sawn white ash can have some real wild grain. If that’s not the look you like, you’ll want to handpick for more subtle stuff. On the other hand, you can combine boards with figure, contrasting grain, and “defects” such as flecks from burrowing insect larvae (long deceased!), for eye-catching pieces.

Once you have your white ash, remember that it is hard, so expect the wood to have a moderate blunting effect on your hand or power tools. For best results, plan on sharpening your tools before you begin, and then again during the project. With power tools, you may want to tackle white ash with carbide-tipped cutters. Otherwise, the following suggestions will help you work this wood.

**Machining methods**

- Nearly as hard and as dense as sugar maple, white ash burns easily if you use dull or dirty blades and cutting edges. And the burns won’t easily sand off.
- Avoid burning when ripping the resistant wood by choosing a rip-profile blade with no more than 28 teeth. Then, don’t force-feed it.
- Be sure to feed white ash to the jointer so that the knives’ rotation follows the grain direction, or the wood will chip. Feed figured wood slowly and at a slight angle.
- Avoid burning and chipping with your router by taking shallow passes on the wood. In end-grain and all cross-grain passes, use a backing board on the exit side to eliminate chipping.
- Always use pilot holes for nails and screws, and drill them with brad-point bits to eliminate wander.
- White ash’s hardness means that you can’t skip grits when sanding or the wood scratches, and they’re hard to get out. It can, though, be sanded glass-smooth.
- Although the wood readily accepts all types of adhesive, it is slow to absorb, so a glue with a longer open time (white glue) performs better.
- Unlike maple, white ash won’t give you any problem in staining, and filling the grain for smoothness isn’t necessary.

**Carving comments**

Carvers haven’t traditionally been drawn to white ash. Maple-like in hardness, but failing to take fine detail, the wood probably seems more trouble than it’s worth. But if you want to carve white ash, treat it like red oak:
- Do rough-in work with a deeper bevel (25°–30°), and then grind to a shallower bevel (15°–20°) for details.
- Don’t attempt long slices with the grain because the wood will splinter. Instead, take shorter strokes and use stop cuts.

**Turning tricks**

Again, pretend you’ve encountered a really hard piece of red oak, and turn accordingly.
- Use only the very sharpest tools.
- Counter splintering by taking shallow cuts.

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**WHITE ASH AT A GLANCE**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Cost</th>
<th>Weight</th>
<th>Hardness</th>
<th>Stability</th>
<th>Durability</th>
<th>Strength</th>
<th>Toxicity</th>
<th>Workability</th>
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<td>Red oak</td>
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Compiled with woodworkers Jim Boelling, Chuck Hedlund, Pete Stephano
To Lewes, Delaware, craftsman Steve Rogers, there's nothing prettier than a boat beat up and battered by daily toil.

Continued

At dockside along the Lewes canal, modelmaker Steve Rogers displays a 33"-long Chesapeake Bay oyster dredge. Built one plank at a time, it sells for $1,895.

The original of this fishing boat, called a dragger, was spotted on Long Island Sound. In ¾" scale and detailed down to winch, pulleys, and nets, the 36" model will bring $1,795.
Master modelbuilder Steve Rogers doesn’t build sleek yachts, clipper ships, or warships of history. He crafts and sells workboats, the unkempt but oceans-going hangers-on from the days when men could make a decent living pulling catches from the sea. To him, these boats are an endangered species, threatened by replacements of fiberglass and aluminum. And when they’re gone, the practical craftsmanship of the watermen they represent will have passed, too.

“You know, when watermen are working, they don’t take real good care of their boats,” says Steve, a glimmer of amusement starting across his face. “They just do what they have to do.”

Steve continues, “I was down in North Carolina on the barrier islands scouting for boats. I saw this pie-shaped skiff pulled up on the bank. It was unusual, so I took some photos and made a few measurements. Awhile later, I met a local man and asked him if the one I’d seen was pretty common.” Steve stifles a snicker.

“He said it was pretty common all right. He called it an accident boat. You see, somehow the stern end had gotten smashed. But rather than pull it out of service to rebuild, the owner had simply cut the bashed part off and sealed the cutoff end by nailing on a couple of boards!”

Naturally, Steve went home and built a scale model of the awkward-looking craft. And as usual, his model faithfully reproduced the original. “It was so ugly, I couldn’t sell it,” he laughs.

**Craft born of necessity**

Although Steve had studied anthropology in college, the subject’s relevance was buried for years in an advertising career he groomed in Delaware. But it finally surfaced when he began building models full-time in 1989 at his Lewes home. Now Steve, 48, not only knows how workboats...
are built, but why they came to be that way.

"Most of the old boats are a reflection of the body of water they work in," he says as he studies the unfinished hull cradled in his hands. "For instance, Chesapeake Bay is characterized by chop—short intervals between waves of two or three feet high. And that just pounds the boats constantly. So a lot of the Chesapeake Bay boats have two things in their construction that make them withstand that."

He holds the hull up and slowly turns it. "The first thing is they are heavily built so they can take the constant pounding. In a New England lobster boat, for example, the planks might be 1" thick. But on a Chesapeake Bay boat they will be 1 3/4\"." Rotating the hull in his hands to peek inside, he continues. "The second thing is that the Chesapeake Bay boat uses a heavy log keelson which also serves as the structural back-bone piece inside. And the reason they call it a log keel is because, at first, that's exactly what it was. They went out and found a tree, and then hewed it to shape. So, here is this 10\'x10\' running the length of the boat!"

But there's an evolutionary side to Chesapeake Bay boatbuilding, too. And Steve knows the story.

"All modern working power boats on Chesapeake Bay are derived from the original sailboat, which is popularly called the skipjack, but better known by watermen as the bateau," he explains. "And, some say, the skipjack comes from the New England sharpie, a glorified row boat. They're flat-bottomed, and were rowed or sailed. Nothing sophisticated. But they were cheap and easy to build. You didn't have to be a shipwright. Like the watermen, Steve keeps his model building simple, too.

### Trimming Workboats Down to Size

Although Steve sometimes built from kits long ago when model-making was only a hobby, today he relies on actual boat measurements and photographs he takes on the spot. Sometimes, though, plans are a big help. "There is a catalog of old ship plans [detailed hull-line drawings, not the project-type plans familiar to woodworkers] that you can buy from the Smithsonian. I've used them to develop hull lines for forms and wooden masters," Steve says. Mostly, though, he relies on his practiced eye, skilled hands, and construction knowledge to shape the wood—part by part—into the completed whole. Size, though, always rates high in his planning.

For showing detail, Steve likes to make his boat models as large as possible. Of course, there are some limits.

"If they're intended to sit on someone's coffee table or fireplace mantel, then I can't build them much more than a few feet long," he says. "That's where scale becomes important."

For models, 1" scale (1/12) means that 1" equals 1' on the real boat. A model built to 1/2" scale (1/24) is half that, with 1/2" equalling 1' on the full-sized boat. In between, there's 3/4" scale (1/18). All translate to the length of the finished model." In other words, as Steve explains: "If I choose 1" scale for a 40' boat, the model is going to be 40" long."

Okay, but does Steve stick with scale throughout all the parts? That seems too tedious. Here's where Steve's knowledge of boat construction pays off.
"In most boats under 17' there is some part that is 1" square, but hardly anything smaller than that. Then, there are some 1¼" or 1½". In one-inch scale, a part dimensioned to ¾" is close enough to look like 1", or even 1¼" and 1½" he comments. "Besides, nobody in the commercial fishing world gets that precise."

**Miniature materials**
The first boats on the Chesapeake Bay—in fact, until right after the Civil War—were made by lashing long logs of yellow pine together, then hollowing them out and shaping them. But as boat designs evolved, they also become more refined, with planks and ribs replacing the logs. "Face it," he says. "A waterman didn't call in an engineer; he found simple solutions." So does Steve.

"Mostly, I like to use Idaho white pine. It's straight-grained, doesn't have a lot of knots, and I can find it at a local home center," he says. "Sugar pine works great, too, but it's harder to come by. The main thing is to have straight, rather tight grain. That's for planking and trim. For ribs that have to be bent, I like yellow poplar. For some small trim pieces I buy basswood, and then I also use some model-grade aircraft plywood in ¼" thickness—both of which I get at hobby stores that sell stuff for model airplanes."

"For framework and other structural members, it doesn't matter how you cut the wood," Steve says. "But for planking and trim, I have to have edge-grain."

To get it, he gang-rips his ¾" boards into ½" slivers at his benchtop tablesaw that sits at one end of the shop. "In the model, I'm concerned with the plank's width, because you really can't tell its thickness. I've found that ½" gives me strength but not too much stiffness," he notes.

Steve crafts the aircraft plywood into deck and cabin structures, or uses it to simulate repairs. "Engine covers, roofs, even spot repairs would have been done with plywood on a work boat because it was handy," he says.

Steve's fasteners fall into three categories: brads, nails, and sequin pins. His brads are 20 gauge and ½" long, the smallest you can buy. "I "clamp" the planking to the framework with them until the glue sets, and sometimes even leave them in because when they're sunk below the surface, they're really hard to see," he notes. "When I need more hold-

---

At $95, this 14" rowboat is the lowest priced in the modelmaker's line. "They're popular, if I trim them in green or blue," notes Steve. "Other colors, even if original, don't sell well."

Opposite page. This boat is called a Chesapeake Bay hand troller because from it watermen gather oysters by hand with long tongs. It sells for $695.
ing power, I go to nails about the same size. I go back and pull the nails out with a needle nose pliers because their heads would look out of scale. After painting, the dimples swell and close. The pins hold real thin pieces, and I can leave them in because they look like a carriage bolt.”

Steve supplements his brads, nails, and pins with masking tape and wooden spring-type clothespins. And in addition to the yellow glue, he relies on fast-setting cyanoacrylate to instantly bond unlike materials.

Of course, all modelers call on a variety of other materials also. Steve, for instance, cuts 22-gauge tin for plates and patches. Then, for steel, there’s the roll of aluminum with adhesive backing made for automotive bumper repair. It can be primed and painted. Add to this cotton mason’s twine for rope, carpet thread and kite string for lines, and several gauges of steel and copper wire for cables.

For sails, Steve calls upon his wife, Patricia. A fabric artist, she always has unbleached cotton muslin and sewing thread. Ship’s fittings, such as wheels and rudders, he buys from hobby shops or mail-order suppliers he finds in modelmakers’ magazines.

**How to paint grungy**

Steve has the perfect description of the look he achieves. “It’s as if you were at a Maryland waterfront and spotted a boat that just went out that morning and got some oysters or crabs,” he says. “It’s what I call low-level maintenance. Watermen don’t want their boats to sink, but they’re not into superficial appearance.”

Regardless of a boat’s ultimate grungy look, Steve starts all paint jobs rather conventionally. “I prime the inside of the boat with a solvent-based primer in a spray can to protect the glue joints,” he explains. “Next, I add latex ceiling white, sometimes colored with acrylic artists paints, over the primer and to the outside of the hull. This thick paint gives it the 12-coat, brushed look.”

Steve separates bottom, deck, and hull colors with masking tape. But being too careful doesn’t pay. “There is always wood and stuff in the water,” he says, “and paint at the waterline is always abraded by it, so mine must be knocked off in places.”

---

**BUILD A BOAT**

For a copy of Steve’s 64-page book *Model Boat Building Made Simple* (Steve and Patricia Rogers, 1992, Schiffer Publishing, West Chester, Pa.) containing color photos and step-by-step instructions for a rowboat, send $12.95 plus $4 postage and handling (US) to:

Steve Rogers
Bay Built Ship Models
227 Second St.
Lewes, DE 19958.

"On the metal, nobody primes it good anyway, so they have a problem making paint stick. To recreate that, I put tape over the paint and then pull it up."

When Steve completes the painting, sanding (to imitate wear), and other details, his models receive still another touch of realism—a weathering wash. With an airbrush, the modeler applies a heavy coat of waterproof black drafting ink and water mixed to a medium gray. “It might take several coats to get it right,” he says.

Finally, Steve mixes up a dull red, black, and brown to a rust color. He adds that wherever salt water would have rusted metal. For more detail, he’ll go back and pick at little areas inside the boat with a knife point so that they splinter. “If I put in some black,” says Steve, “they’ll appear as areas of dry rot.” A nice touch. 🍷

Written by Peter J. Stephano
Photographs: Steve Uzzell

WOOD MAGAZINE  OCTOBER 1993  33
KEEP-ON-RECYCLING TOY BOX

It makes picking up toys tons of fun!

What better way to teach children the valuable lesson of recycling than with this roll-around toy-box truck? Simply let your kids know that at the end of playtime all the toys go into the roomy open storage areas at the rear of the truck or under the seat. They just might jump at the opportunity to help out.

Start with the chassis and box

Note: To construct this project, you have your choice of several types of sheet goods. AB birch plywood and particleboard work fine. The edges of plywood always require extra effort for a flawless finished appearance.

Because of its paintability (we found the painted surface of this product smoother than either par-

Text continued on page 36
CUTTING DIAGRAM

EXPLODED VIEW

Bill of Materials

<table>
<thead>
<tr>
<th>Part</th>
<th>Finished Size</th>
<th>Matl.</th>
<th>Qty</th>
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</thead>
<tbody>
<tr>
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<td>¾&quot; x 14½&quot; x 34&quot;</td>
<td>P</td>
<td>1</td>
</tr>
<tr>
<td>B box sides</td>
<td>¾&quot; x 24&quot;</td>
<td>P</td>
<td>2</td>
</tr>
<tr>
<td>C box front</td>
<td>¾&quot; x 14½&quot; x 22½&quot;</td>
<td>P</td>
<td>1</td>
</tr>
<tr>
<td>D box top</td>
<td>¾&quot; x 11½&quot; x 14½&quot;</td>
<td>P</td>
<td>1</td>
</tr>
<tr>
<td>E cab sides</td>
<td>¾&quot; x 10&quot; x 18&quot;</td>
<td>P</td>
<td>2</td>
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<td>P</td>
<td>1</td>
</tr>
<tr>
<td>G shelf</td>
<td>¾&quot; x 14½&quot; x 16&quot;</td>
<td>P</td>
<td>1</td>
</tr>
<tr>
<td>H seat</td>
<td>¾&quot; x 9½&quot; x 10½&quot;</td>
<td>P</td>
<td>1</td>
</tr>
<tr>
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<td>1</td>
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<td>J supports</td>
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<td>P</td>
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<td>¾&quot; x 5½&quot;</td>
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</tr>
<tr>
<td>N wheels</td>
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<td>P</td>
<td>12</td>
</tr>
<tr>
<td>O hubcaps</td>
<td>¾&quot; x 2½&quot;-dia.</td>
<td>P</td>
<td>4</td>
</tr>
<tr>
<td>P headlights</td>
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<td>P</td>
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</tr>
<tr>
<td>Q bumper</td>
<td>1½&quot; x 3½&quot; x 13½&quot;</td>
<td>LP</td>
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</tr>
<tr>
<td>R axle supports</td>
<td>1½&quot; x 3½&quot;</td>
<td>16½&quot;</td>
<td>P/F</td>
</tr>
<tr>
<td>S stop</td>
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Materials Key: P=AA plywood (if available), AB plywood, or Medite, LP=laminated pine, P/F=pine or fir 2×4’s

Supplies: #8×1½" particleboard screws, #8×2" particleboard screws, #8×2½" particleboard screws, 1½" continuous hinge 10½" long, 1" birch dowel stock for axles, 4d finish nails, wood putty or filler, primer, and paint.
ticleboard or plywood), we used 3/4" Medite, a medium-density fiber panel. Medite paints well because it's grainless and free of voids. The edges cut cleanly and require minimal sanding. This material costs about the same as plywood, though it weighs about 20% more. Call 503/779-9596 for the Medite dealer nearest you.

If for safety reasons you prefer that the toy box remains stationary and not roll on the wheels, screw through the box sides (B) and into the inside face of the rear wheels (N).

1 Lay out and mark the outlines for the chassis (A), box sides (B), box front (C), box top (D), cab sides (E), cab front (F), and shelf (G) on 3/4" sheet goods. (We used a framing square for the straight lines and trammel points to mark the arcs.) See the dimensions on the Parts View drawing for laying out the chassis (A) and cab sides (E). The radius for the box side is shown on the Carcase Assembly drawing. For minimum waste, see the Cutting Diagram.

2 Glue and screw (we used particleboard screws) the chassis (A) and box front (C), between the sides (B), where shown on the Carcase Assembly and Side View drawings. See the article on page -n for screw selection information and the Screw Hole detail accompanying the Carcase Assembly drawing for hole size.

3 Cut four 17 1/4" long supports from scrap stock. Temporarily tape the supports in place in the box assembly where shown in the photo at right. Set the shelf (G) on top of the supports where shown in the photo, mark the screw-hole centerpoints, and drill the mounting holes. Then, glue and screw the shelf in place.

4 Fit the box top (D) between the box sides (B), and glue and screw it in place.

Now, add the nifty storage/seat assembly

1 Glue and screw the cab front (F) to the front top edge of the chassis (A).

2 Cut the seat (H), backrest (I), and seat supports (J) to size. See the Parts View drawing for the shape of the seat supports.

3 Rout a 3/8" round-over on all edges that will be exposed except where the continuous hinge will be attached to parts H and I.

4 Using a hacksaw, cut a piece of 1 1/2" continuous hinge to 10 1/4".

5 Screw the continuous hinge to the back edge of the seat and bottom edge of the backrest where shown on the Side View drawing.

6 Secure the backrest/seat to the front surface of the box front (C).

7 Drill the counterbored mounting holes through the cab sides (E). Attach the cab sides to pieces A, F, and I where shown on the Carcase Assembly drawing.

Tape four supports in place to hold the shelf in position when screwing it in place in the box.

5 Rout 1/8" round-overs along all accessible edges. (We found it easier to rout round-overs now, rather than before assembly.) Fill all the screw-heads with putty (we used Minwax High Performance Wood Filler), let the putty dry, and sand flush. Finish-sand the chassis and box, sanding a slight round-over on all edges not accessible with the router.
8 Drill the mounting holes, and glue and screw the supports to the inside face of each cab side. The supports keep the seat from falling down directly onto the top edge of the cab front (F) and pinching little fingers.

**Let's add the wheel supports and running boards**

1 Cut the two front-wheel supports (K) and running boards (L, M) to size and shape. See the Parts View drawing to angle-cut the ends of the supports (we did this on the bandsaw) and the Exploded View drawing to lay out the radii on the ends of the running boards.

2 Drill the mounting holes, and glue and screw the running boards to the bottom of the chassis where shown on the Side View drawing. Next, screw the wheel supports (K) in place.

*Continued*
Time to cut and glue the wheels together

1. Using trammel points or a large compass, mark the layout for twelve 10”-diameter circles on the sheet goods for the wheels (N). Mark a 5¼” hole (23/8” radius) on four of the middle pieces for the wheels. Mark a 5½” hole (2¼” radius) on the four outside wheel pieces. Mark four 2½”-diameter hubcaps (O).

2. Bandsaw the twelve wheel discs (N) and four hubcaps (O) to shape, cutting slightly outside the marked circumference. Drill blade start holes, and use a jigsaw to cut the 5¼” and 5½” holes in middle and outside wheel pieces.

3. Rout ½” round-overs along the edges of the inside and outside wheel pieces (O) and hubcaps (N) where shown on the Wheel Assembly drawing.

4. Use a large-diameter drum sander to sand the 5¼” and 5½” holes smooth and round.

5. Glue and nail each wheel together. Sand the edges flush. Center and glue the hubcaps in place.

6. Use the centerpoints used to mark the radii on the inside N pieces, bore a 1” hole 1½” deep through the inside N and into the hubcap (O).

Add the front trim

1. Cut the headlights (P) and bumper (Q) to shape. Note on the Exploded View drawing that we laminated two 3¼”-thick pieces together to form the 1½”-thick bumper. Rout the headlight and bumper apart and sand a 1” radius on the front ends of the bumper.

2. Bandsaw and sand a 1” radius on the front ends of the bumper.

3. Glue and screw the headlight and bumper to the cab front (F) where located on the Exploded View and Side View drawings.

Make the axle supports for a mobile truck

1. Cut two pieces of 2x4 stock to 16½” long for the axle supports (R). Mount a dado blade to your tablesaw, and cut a 1½” groove 1½” deep centered along one face of the 2x4 stock.

2. Crosscut two pieces of 1” dowel to 19¼” long for the axles. Glue or epoxy a wheel (N, O) onto each end of each axle dowel.

3. Using the dimensions on the Parts View drawing, lay out and cut the safety stop (S) to shape.

4. Glue and screw the safety stop to the rear running board centered from side to side. The stop keeps the toy box from tipping backwards when a child (or two) stands on the rear of the box.

5. Fit the axles into the groove in the axle supports, and screw the supports to the bottom side of the chassis (A) where shown on the Side View.

Paint your truck and let ‘er roll

1. Remove the axle supports and wheel assemblies. Fill all the screw head and nail holes with putty (we used Minwax High Performance Wood Filler). Finish the entire assembly, sanding a slight round-over on all edges.

2. To paint the toy box, remove or mask the continuous hinge. Prime all the parts (we used a gloss spray enamel). Mask the mating areas and paint as desired or use our combination as shown in the opening photo.

3. Reattach the wheel assemblies. Attach the recycle and name logos. See the Buying Guide for our source of self-adhesive logos.

Buying Guide

- Self-adhesive vinyl decals. Two recycle symbols (see intro photo for reference), two Recycle Now logos, plus two letterings of a child’s first name (up to 12 characters per name). $19.95 pdd. Kness Signs, 5291 NW, 72 Street, Johnston, IA 50131. No phone orders please.

Produced by Marlen Kemmet
Project Design: James R. Downing; Aaron Shaw
Photographs: John Hetherington; Wm. Hopkins
Illustrations: Kim Downing; Brian Jensen
PROJECTS WITH PORPOISE
They’re a shore thing

With your time at such a premium, sometimes it’s nice to head into the shop and build a project or two (or, in this case, four projects) in just an evening or two. This simple-to-make desk set fits that description to a T, featuring a pleasing nautical theme.

Note: You’ll need some thin stock for these four projects. You can resaw and sand or plane thicker stock to the thicknesses listed on the drawings.

First, launch the lidded box

Start with the base for the lidded box

1. From ½” cherry, rip a piece to 1¾” wide by 24” long for the box front, back, and sides.
2. Cut or rout a ¼” groove ¼” deep and ½” from the bottom edge along the length of the ½ x 1¾ x 24” cherry stock. (We cut ours on the tablesaw.) See the Lidded Box drawing for reference.
3. Miter-cut the box front, back, and sides to the lengths listed on the Lidded Box drawing.
4. From ⅛” stock, cut the box bottom to size. Finish-sand the base pieces; they’re easier to sand now than when assembled.
5. Dry-clamp the base pieces to check the fit. The base bottom should be slightly undersized to allow for expansion. Then, glue and clamp the base pieces, checking for square. Position (but don’t glue) the bottom in the groove.

Next, add the decorative lid

1. To form the lid top blank, cut a piece of ¼” cherry to 4 x 6½” long. Using carbon paper or a photocopy and spray adhesive, transfer the dolphin and wave patterns to the lid top blank.
2. Bandsaw the lid top in two, cutting through the wave line.

3. Cut a strip of walnut that measures ¼ x ⅝ x 7”. Glue the strip between the lid top halves as shown in the photo at left. Keep the ends of the two pieces of cherry aligned. (We placed the laminated lid top on a piece of waxed paper which, in turn, rested on a piece of plywood. The

Continued
PROJECTS WITH PORPOISE

Continuation from lidded box

waxed paper kept the pieces from adhering to the plywood, and the plywood allowed us to clamp the lid pieces flat.)

4 After the glue dries, remove the clamps, and trim the ends of the walnut flush with the cherry.

5 Drill a blade start hole, and scrollsaw the dolphin-shaped opening to shape. Remove the paper pattern. Sand the walnut strip flush with the top and bottom of the cherry lid pieces.

6 Measure the length and width of the assembled box base, and cut the lid to the same exact size.

7 Cut the lid bottom to fit snugly inside the base, allowing just enough of a gap to allow the lid to lift off easily. Now, position the lid top facedown on a flat surface, and lay the lid bottom on top of it. Position the box base, also upside down, on the lid and lid bottom, flushing the box with the outside edges of the lid. Slowly lift the base off the lid and trace around the lid bottom to locate it on the lid. Then, glue and clamp the lid bottom to the bottom surface of the lid top where marked, keeping the adhesive about 1/2" from the dolphin opening.

Make a fishy pencil box

1 Cut the pencil box front, back, sides, and bottom to the sizes listed on the Box drawing.

2 Dry-clamp the pieces together to check the fit.

3 Transfer the wave line and dolphin openings to the front piece. Drill a blade start hole and cut the dolphin openings to shape.

4 Glue and clamp the box together. Later, remove the clamps and bandsaw the top edge of the box to shape. Drum-sand the top of the box to remove any saw marks. Sand the pencil box smooth.

Do a dolphin letter holder

1 Cut the front and back blanks to 1/4 x 3 3/4 x 6". Using double-faced tape, adhere the two pieces face to face with the edges flush. Transfer the wave line to the top piece of 1/4" stock.

2 Cut the wave shape along both edges of the taped pieces and sand them smooth. Using a wood wedge, pry the pieces apart and remove the tape. A splash of lacquer thinner or acetone will dissolve stubborn double-faced tape.

3 Transfer the dolphin pattern to the front piece, drill the blade start hole, and scrollsaw the opening to shape.

4 Cut the bottom to size from 1/2" stock. Glue and clamp the pieces together with the ends flush.
Dive into the business-card holder

**BUSINESS CARD HOLDER**

1/4 x 2 1/8 x 3 1/2" Front and Back

1/4" 3 1/2"

2 1/8" 1/2 x 1 x 3 1/2" Bottom

Using the dimensions on the Business-Card Holder drawing and the how-to instructions for the letter holder, cut the pieces and assemble the card holder.

Finish-sand all four items. Apply a clear finish (we used Deft aerosol lacquer). ♠

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**FULL-SIZED PATTERNS**

Pattern for Box Lid (darker area only)

Pattern for Letter Holder sides

Photographs: Wm. Hopkins  Illustrations: Kim Downing

WOOD MAGAZINE  OCTOBER 1993
LOW LAT
What to look priced under

With the cost of high-quality lathes approaching $2,000 or more, we wondered if models priced under $600 would meet the needs of most woodturners. Our conclusion after thoroughly testing 10 machines: absolutely! As a matter of fact, a few lathes priced under $300 will satisfy the majority of beginning and intermediate woodturners. Here's what we discovered.

Lack of vibration: key to smooth cuts
Lathes work in an opposite fashion from other woodworking machines in your shop. Most machines have a rotating cutting edge that you push a workpiece through or over, but a lathe spins the workpiece at high speeds while you push a cutting edge into it. Since wooden workpieces are heavier, and never as well balanced as a metal blade, knife, or bit, a lathe must be built to minimize the vibration created by the workpiece. Excessive vibration will contribute to rough cuts because your turning tool will chatter along the surface, with a greater likelihood of it catching and gouging the workpiece.

To control vibration, a lathe should have heavy and well-built head- and tailstocks. Since these components hold the workpiece as it rotates, lightly constructed versions tend to shake along with the workpiece rather than hold it steady by absorbing the vibration. In our tests, lathes with beefy, cast-iron head- and tailstocks produced the least vibration.
Since these two parts absorb little of the vibration themselves, they transfer most of it to the bed of the lathe, and the stand or bench that the lathe rests on. For this reason, the bed needs to provide firm support without flexing. Although we prefer cast-iron beds, several reasonably priced models with tubular or formed steel beds achieved a "good" rating in the vibration category in the chart on page 47.

**What you need to know about tool rests**

As you turn wood, you constantly slide your index finger back and forth along the tool rest. This means the rest needs to be comfortable. It also should have a flat-ground top edge to smoothly slide your turning tool along. And it should be stable and securely locked in place so it doesn't move as you work. Here's a look at how the tested machines fared in both of these areas.

- **Stability:** All of the tool rests on our test models stayed put during turning tasks except for those on the Grizzly G1025 and Reliant NN100. Both models have tool rests with posts that secure to their bases with a hand-operated plastic knob. We found it impossible to hand-tighten these knobs to the point where they would keep the tool rests from rotating. We had to use a pliers to sufficiently tighten these knobs. The other tested lathes have levers, bolts, or setscrews that help give you sufficient tightening leverage (the bolts and setscrews require you to use a wrench).

*Continued*
LATHES

- **Comfort**: A rough, cast-iron surface with little paint on it will quickly irritate your skin as you pass your finger across it. Of the tested machines, the Delta, Record, and Williams & Hussey models had tool rests with smooth, nonirritating surfaces.

All ten of the tested lathes had tool rests that we deem acceptable for the occasional user except for the Reliant version, which earned the only “poor” rating. As you can see in the photo left, this rest has a rough surface and lacks a finger groove. We raised this point with Mr. Paul Blacker of Reliant, who said he would ask his supplier to change the design immediately.

- **Smoothness of the top edge**: The top of a tool rest should be milled straight and smooth. Of the tool rests that passed our comfort standards, only the Record tool rest failed in this area. However, this problem can be quickly corrected by simply grinding or filing the edge yourself.

**Changing speeds: How slow can they go?**
Both the Delta and Jet lathes allow you to change speeds “on the fly” by simply rotating a lever while the lathe runs. Both machines use a system with two pulleys that adjust in size as shown on the Jet left. To change speed, you turn a lever that opens or closes the spindle pulley. As this pulley opens, the spring-loaded motor pulley automatically closes, and vice versa. Opening the spindle pulley increases the speed, and closing it lowers the speed.

We found that this feature contributed to our enjoyment level because we didn’t have to fiddle with changing belts between pulley steps. Except for the AMT 4370, the other lathes have two pulleys with three or four steps (that give you a choice of three or four speeds). We found that three speeds were sufficient for nearly any turning task.

The AMT 4370 has three pulleys (one on the spindle, one on the
motor, and an idler pulley between them as shown previous page. We found no need for the many speeds that this system affords you, and changing two belts was a hassle. On the other hand, because of three pulleys the machine will turn as slow as 275 rpm. We found this low speed handy only for boring with large drill bits.

As you can see in the chart on page 47, the Jet, Delta, and Record lathes have low-end speeds in the 500–550 rpm range. Except for the AMT 4370, the other lathes turn no slower than 800 rpm. We found the 500–550 rpm speeds handy for rough-turning large, out-of-round workpieces.

**Locking handles give you hassle-free control**

No matter what you turn, you'll need to frequently change the position of the tool rest and lock it into place. When turning between centers, you also need to adjust and lock the tailstock. With most of the machines in our test, you need to use one or more wrenches to make these adjustments as shown below.

However, the AMT, Delta, Jet, and Sears models feature hand-operated levers that greatly simplify adjustments. Of these machines, the Delta levers (see photo bottom) were the most comfortable and effective. The Jet levers run a close second.

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**Swiveling headstock: Nice, if you need it**

Both the Delta and Jet lathes have headstocks that turn 90° for convenient outboard turning as shown below. This allows you to turn platters, chair seats, and other projects with diameters too large to fit over the bed of the lathe. Delta recommends you turn workpieces no larger than 16" in diameter in this application, and to us that size limitation seems about right for both models. Since you can turn 12"-diameter workpieces over the bed of both lathes, this feature gains you 4" of swing.

Pivoting headstocks make outboard turning a snap. Above is the Delta 46-700 with an optional tool-rest base extension and a curved tool rest.

If you think you'll use this feature, keep two things in mind. First, we found the Jet headstock easier to pivot because you simply unlock a lever, pull a stop pin, swivel the head until the stop pin drops, and then relock the lever.

With the Delta, you need to loosen a large capscrew beneath the headstock. We found it difficult to get an Allen wrench on this screw, and then turn it, because of the capscrew's location. After loosening the capscrew, you lift the head over a stop notch, reposition the head, and retighten the capscrew.

Also, the Jet lathe costs about $100 more than the Delta, but it comes with a stand and the tool-rest base extension necessary for many outboard-turning projects.

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The Record lathe (top) requires you to use a wrench to adjust the tailstock or toolrest base. On the Delta 46-700, large, comfortable levers make quick and easy work of all frequently performed adjustments.
LATHES

Fit and finish: what it means

In the chart right, we give the machines a rating for fit and finish. Let's take a closer look at each of these concerns.

- **Fit** refers to how well a machine's parts mate together, and this directly affects its performance. Generally speaking, higher-priced lathes have tool rests and tail stocks that mate better to the bed for a solid grip when locked. These well-machined components also slide along the bed without catching or binding.

- **Finish** relates to the smoothness and appearance of parts. Manufacturers gain a better finish through means such as grinding, buffing, and painting. Although largely cosmetic, a lathe's finish also can affect its performance (see earlier information under What you need to know about tool rests).

The example below of similar-appearing tailstocks illustrates what your extra dollars buy in terms of fit and finish. The tailstock on the left side of the photo belongs to the AMT model 373 ($95 without motor). The other tailstock is from the Williams & Hussey L82 ($498 without motor). Both tailstocks function similarly with a captured wheel for adjusting the tailstock center in and out. Little finishing was done to the AMT components after they came out of the casting mold. But, the W & H tailstock has been ground, and painted with a heavy coat of durable paint.

The W & H handwheel was ground and buffed smooth for comfort. AMT's thin, rough wheel was not comfortable to turn by hand. The threaded spindle on the Williams & Hussey moved with greater ease and smoothness than the AMT spindle. So, although both of these tailstocks will help you get the job done, the one with better fit and finish works better, and will last longer.

More points to consider

- **Ease of assembly.** The chart right rates the machines according to the length of time and difficulty of required assembly. Only the Delta was completely assembled and ready to go straight out of its box. The Grizzly G1174 was the most time-consuming because of the many parts required for its copying attachment (which we could not make work after considerable tinkering). The Reliant was the only model that arrived without assembly instructions.

- **Accessories.** When you buy a lathe, you're also buying the availability of optional accessories offered by the manufacturer. Of the manufacturers represented here, Delta and Record offer the most complete line of accessories.

- **Centers, live and dead.** We consider a live tailstock center a must-have accessory. These centers have bearings that allow the point of the center to spin along with the workpiece. The Delta, Record, and Sears lathes come with dead tailstock centers, although all three manufacturers offer optional live centers. Dead centers do not spin, so the friction of the workpiece spinning against the point of the center causes the end of the workpiece to burn.

![Image of tailstocks]

Extra dollars buy you a better fit and finish on similar-looking tailstocks from AMT (left) and Williams & Hussey.

However, these three machines were also the only models that accept Morse-taper accessories in their tailstocks. Accessories with Morse tapers change easily because you simply tap the end of the accessory to release it. The Williams & Hussey machine has accessories that attach with a set-screw; this unique feature requires you to purchase W & H accessories only. All of the other machines in our test have permanently mounted live centers on the tailstock. That's okay, until the bearing wears out. Then, you'll need to replace it.
### 10 LATHES: LET'S LAY IT ON THE LINE

<table>
<thead>
<tr>
<th>Headstock/Outline</th>
<th>Spindle Type</th>
<th>RPM Range</th>
<th>Powerhorsepower</th>
<th>Index Y/N</th>
<th>Ease of Assembly</th>
<th>Vibration</th>
<th>Fit/Finish</th>
<th>Tool Rest</th>
<th>Overall Rating</th>
<th>Accessories</th>
<th>Warranty (1)</th>
<th>Price With Motor / Switch (5)</th>
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<td>TT</td>
<td>Head Feeds 3-Step Tail</td>
<td>800-3,450</td>
<td>1/2* N</td>
<td>F</td>
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<td>5</td>
<td>6</td>
<td>LC, SP</td>
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<td>2 years 2 years</td>
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<tr>
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<td>Head Feeds 4-Step Tail</td>
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<td>3/4*</td>
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<td>G</td>
<td>6</td>
<td>6</td>
<td>FP, LC, SP</td>
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<td>8</td>
<td>8</td>
<td>DE, SP</td>
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<td>1 year 1 year*</td>
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<td>G</td>
<td>8</td>
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<td>DE, SP</td>
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<td>1 year 1 year*</td>
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<td>DP, 4JC, LT, LD, LS, PD, SD, WA</td>
<td>10 years 1 year</td>
<td>102 T</td>
<td>498*</td>
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</table>

4. E Excellent

5. G Good

6. F Fair

7. P Poor

5. Machines rated on a 1-10 scale, with 10 being the highest possible score. Performance rating does not take price into account. Value rating takes price and performance into consideration.

6. (*) Manufacturer carries a full line of accessories, with too many items to mention here.

7. (*) Motor warranty applies to optional motor supplied by manufacturer/importer.

### Our recommendations

For most tool buymanship articles, we have a hard time recommending one tool over other nearly equal models. Not this time! The Delta 46-700 emerged from this test as a clear winner because of its well-thought-out design, quality construction, excellent performance and features, and attractive price tag.

If you want to spend a little less, take a look at the Sears 22816 or the Record DML 24. We were initially leery about the Sears monotube bed, but we found it solid and stable. The Record has limited capacity, but it also has quality construction and performs well.

For outboard turning, the Jet offers the best such system in a lathe priced under $600. If you want to spend as little as possible, and plan to use a lathe only occasionally, buy the Grizzly G1025 or AMT 375 (an especially good deal if you already have an extra motor lying around).

Written by Bill Krier Technical consultant: George Graseth Photographs: John Hetherington
PERFECT PACHYDERM

Carve a small elephant that's big on realism

Bob Crumley carves exotic animals so lifelike that you expect them to herd up and wander away. Here's how to carve one of Bob's favorites, an African elephant. His tips on detailing and painting will help you achieve realism you may not believe yourself.

By the time Bob Crumley of St. Petersburg, Florida, picks up his tools to start roughing out one of his acclaimed wildlife carvings, he's already many hours into the project. Research accounts for that lead time, and it's as crucial to a successful carving as any of the tools he uses.

As he carves, Bob frequently refers to the stacks of research material he's gathered—usually photographs and illustrations from books and magazines. He'll even take a trip to the zoo with his camera or sketchbook to resolve anatomical questions about giraffes, elephants, and other exotic animals he has in the works.

For this project, Bob carved an African plains elephant (loxodonta africana). This elephant ranks as the largest of the species, and is a creature Bob finds interesting.

"The African elephant's large ears set it apart from the Asiatic elephant," Bob explains. "The female is slightly smaller than the male, but otherwise they look very much alike since both male and female have tusks," he adds.

Continued on page 50

WE USED THESE TOOLS AND SUPPLIES

Stock 4 x 8 x 6½" basswood, jelutong, or tupelo. Or, start with a precarved basswood roughout, $24.95 ppd. in U.S., from Rossiter Ruff-Outs and Carving Supply, 1447 S. Santa Fe, Wichita, KS 67211. Call 800/825-2657.

Tools
Flexible-shaft machine or hand-held rotary tool
Kutzall burrs
1/8" taper (T-18-E)
1/4" sphere (S-14-E)
1/4" flame (FL-14-E)
Abrasive point
#411½ Inverted cone, green grit

Ruby cutters
Small pear, fine grit
Small pear, coarse grit
Large taper, coarse grit

Diamond cutters
Small-diameter pointed taper
Small-diameter round-end taper
Small-diameter tapered cone
Small-diameter ball

Finishing supplies
Wood sealer    Black acrylic gesso
Acrylic artist's colors
White, black, raw sienna, raw umber,
burnt umber, yellow ocher, deep green
PERFECT PACHYDERM

First, you draw a blank
Start your carving by tracing the red cutting line from the full-sized pattern onto a 4 × 8 × 6½” piece of carving wood. Note the wood grain direction. Bandsaw the blank. (For a machined roughout, see the supply list on page 48.)

Draw a lengthwise centerline along the top and bottom edges. Pencil in the shape and location of the ears and legs on each side. Mark the foot locations on the bottom, following the Foot Placement drawing right.

Draw the trunk about ¾” wide, centered on the front. Curl the end slightly toward the elephant’s left side, starting about 1” above the bend near the end of the trunk. Offset the tip about ¾”.

Start roughing out at the widest part of the carving—the ears, in this case. With the Kutzalls and coarse ruby cutters, reduce the width in this area to about 3¼”.

Carve the body to about 2½” at its widest point (pattern section C–C’). For other rough dimensions, add ¼–¾” to the pattern measurements. Work over the entire surface, but don’t remove too much wood in any one area.

Check your progress against the photographs, illustrations, and cross-sections as you develop the general shape. Turn the carving frequently to view it from all angles. As you carve the feet and legs, ensure that the elephant stands firmly, without rocking.

Move up front for a while
Now, work on the mouth and ears. Looking from below, the lower jaw resembles a valentine heart, with the drooping, pointed end forming the elephant’s lip far right above.

For easier carving, Bob saws off the trunk below the tusk area. “The trunk is the last feature to work on, so you can glue it on easily later,” he explains.

Shape the front side of the ears before hollowing the back side. Notice in the photos above right and page 51 that the rolled-over top edge doesn’t attach to the head, and the bottom hangs free, joining the head 7/8” up.

Just above this ear-head junction, a bony structure runs toward the front of the head, roughly parallel to the ground. Carve this feature as a speed-bump shape extending ¾” in front of the ear. Blend it in as you round the front corners of the head, referring again to the photos.

Draw a ½” circle for each eye where shown. Both eyes should be visible from a direct front view. Carve a hemisphere in the circle, using a small diamond cutter. Refer to the Eye Detail with the patterns to carve the upper and lower lids.

The wood will probably become fuzzy when carving the eyes. Bob minimizes the problem by painting the area with lacquer sealer before carving. (He uses Teckay’s Rapid-Dri Wood Sealer, available from Curt’s Waterfowl Corner, Box 228, Montegut, LA 70377, 800/523-8474.)

By now, your carving should bear a striking resemblance to an elephant. Before adding the details that make it lifelike, sand the carving smooth.

To texture the skin, engrave random crooked lines with the diamond cutters. “The skin cracks in diamond patterns, and vary in depth,” Bob points out. Don’t make long, straight lines, nor a rigid, repeating pattern.

The saggy, baggy part
An elephant always seems to be wearing skin about one size too large. So, after texturing the skin, carve in deeper folds and wrinkles to make it look baggy.

Study the photographs for wrinkle-prone places—the shoulders, back of the neck, and around the hind legs, for example. Carve the
wrinkles deeper than the skin cracks, forming folds along natural body contours.

Add skin creases at the joints. "Just look for areas where movement would cause wrinkles, and cut them in," Bob advises. Wrinkle patterns vary from one elephant to another. In fact, some are identifying marks. "On the front leg, the pattern differs for every elephant, just like our fingerprints," Bob explains.

Scallop the trailing edges of the ears. Represent torn spots with a few short, narrow notches in the lower edge.

Carve the toes next. Draw four adjacent semicircles on the front of each front foot, three on each back foot. Incise the lines, and round each toe's edge slightly. Drill holes where shown, and carve the tail to a round section with a bulbous tip. Leave the tip attached to the left hind leg for strength. Texture the end with lines for hair, and part the tip (see right).

**Tackle the trunk and tusks**

Carve the tip of the trunk to a flattened funnel shape. Then, cut back the sides where shown on the pattern to form a pair of fingers (African elephants pick things up with them). Refer to the photo opposite page, far left, and bore 2 nostrils into the end.

Carve the rest of the trunk to shape. Form the two sinewy strands on the underside as you carve the corrugations. Now, glue the trunk onto the head, and blend it in.

From scraps, carve two round, curved tusks. Don't worry about making them exactly alike—they rarely are on real elephants. Flatten the bottom front end on each to simulate wear. Then, drill holes adjacent to the trunk, and glue the tusks into place.

Inspect the carving closely, and clean up any flaws before painting. To prepare the carving for painting, Bob goes over it with a defuzzing pad (from Curt's Waterfowl Corner). Then, he applies two coats of sealer.

**Paint it black**

Coat the carving with black acrylic gesso (available from art-supply stores). Thin the gesso so it flows into the texturing without filling it up. Wipe the gesso off, leaving the black in the skin wrinkles and folds for shadow effect. After the gesso dries, paint the carving with acrylic artist colors. First, apply a base coat of muddy gray—a mixture of raw sienna, black, and a bit of white. Mix a color you like, or match the color shown in the photographs. "Painting is an experiment," Bob remarks, "and an elephant's color varies greatly, depending on the amount of mud and dust on it."

**Highlight the hide**

After the base coat dries, mix some base color with a small amount of yellow ocher, and dry-brush it on to highlight the texture. To dry-brush, pick up some paint on the brush, and then wipe most of it off. Brush the carving with light, quick strokes. Don't try to cover the entire carving.

Next, without waiting for the paint to dry, dry-brush with raw umber, followed by raw umber mixed with yellow ocher. Dry-brush yellow ocher highlights on the top of the ears, head, and back, as if the elephant was standing in the sun.

Paint the eyes with raw sienna, adding a dot of burnt umber for the pupil. Dry-brush the tail hair, using burnt umber with a small amount of black added. Paint the tusks with two coats of titanium white. When dry, brush a thin wash coat of white with a bit of raw sienna added. For sheen, apply two coats of clear lacquer to the eyes and tusks when dry.

*Continued on page 76*
Practice these pointers and watch your results improve

Few things top the pleasure of watching a chair spindle, table leg, or other object take shape between the centers of a lathe. Of course, the possibilities go well beyond furniture parts. Just a few: candle holders, rolling pins, goblets, lamp bases, salt-and-pepper shakers, tool handles, noodle cutters, gavels, stair balusters, mallets, and pens. Whew!

To help you accomplish a variety of spindle projects, we asked expert Rus Hurt for a clear, straightforward approach to this subject. As you’ll see here, he didn’t let us down. Like most tasks, in woodturning, practice makes perfect. Practice also translates into fun. Why? Once you master the basics, you can confidently put a lathe tool to a spinning piece of wood without the likelihood that the tool will catch and mar the workpiece, or chatter wildly in your hands. With enough practice, wood shavings, not dust, will eagerly dance off your workpiece, leaving a surface that requires minimal sanding.

With this in mind, Rus, a seasoned woodturning pro from Port Wing, Wisconsin, came up with a surefire practice routine for honing your skills. We’ll also share with you some of his valuable tips, and show how to embark on, and complete, a project turned between centers.

But, even Rus’s method won’t work with dull tools. If you need help here, check out his sharpening pointers in the June 1992 issue of WOOD, pages 36-38.

Prepare the stock
If you’re working with square stock such as 2” or 3” turning squares, mark centerpoints on both ends at the intersection of diagonal lines drawn between opposing corners. If your completed workpiece will have a squared section (such as the four-sided section at the top of a table leg), you must square the stock so each face is the same width and forms a 90° angle with adjacent faces.

You’ll need these tools and supplies
Rus suggests the following tools and accessories for a basic between-centers-turning kit:

**Tools**
- 1¼” roughing gouge
- 1½” skew chisel
- ½” or ¾” skew chisel
- ¼” spindle gouge
- 3⁄16” spindle gouge
- ¾” diamond parting tool

**Grinder** (rough and fine stones)
**Face shield** *(a must!)*
**Mallet** *(dead-blow type)*
**Outside calipers**
**Tape measure**
**Straightedge**
**Pencil**
Rus's rules for better turning

Before stepping up to the lathe, keep in mind Rus's sound advice:

- **Always wear eye and face protection.** A full face mask protects you from flying chips of wood or other debris such as embedded nails, lead shot, etc.
- **Ride the bevel.** This rule can't be emphasized enough. Start every cut with the heel of the tool against the workpiece, and then raise the tool's handle until the bevel rubs the workpiece and the toe makes a cut.

- **Rough slow, turn fast.** Before turning your lathe on, check the machine's speed. Remember that larger, out-of-round workpieces require slow speeds. Generally, you can complete most roughing tasks at around 800 rpm, then change the lathe speed to about 1,500 rpm for shaping cuts.
- **Keep the tool rest close to the workpiece.** The tool rest gives your tool stability, so position it within 1⁄2" of the workpiece. Check the rest's position by rotating the workpiece by hand before turning on the lathe.
- **Round the edges of your tools.** Rus grinds round-overs on the edges of his skew chisels and scrapers as shown in Photo 1. This makes the tools more comfortable to hold, and easier to smoothly slide across the tool rest.

- **Position the lathe at a comfortable height.** To reduce fatigue and improve your results, adjust your lathe so the centers are 1" higher than your elbow.

![Diagram of bevel](image)

We do this by truing two adjacent faces at 90° to one another using a jointer. Then, we cut the other two faces with a tablesaw. For more advice on this subject, see page 71 of the January 1992 issue of WOOD magazine.

Although most lathes come equipped with a drive spur center for the headstock, Rus prefers a slightly different approach. He places a dead cup center in the headstock (see Photo 2 for a look at centers). This way, if your tool catches, the work will stop spinning, with little damage to the workpiece or your nerves. Rus prefers using a live cup center in the tailstock.

![Dead cup and drive spur center](image)

Now, with the dead cup center removed from the lathe, align its sharpened point with the centerpoint on one end of your stock. Tap the end of the cup center with a dead-blow mallet to make an indentation in the end of the stock. Replace the dead cup center in the lathe, align it with its matching indentation, and align the centerpoint on the other end of your workpiece with the tailstock center. Finally, securely sandwich the workpiece between the headstock and tailstock centers. Employ enough pressure so that the workpiece does not stop spinning under the cutting pressure of your tool.

Continued
A surefire routine for perfecting your skills

No matter how much you study woodturning, you simply have to put in hours of practice before you develop a good feel for how to position and move your turning tools. You can't get around it. The good news is that you only need to master a few basic procedures. These six will see you through most projects.

**Note:** If possible, practice these techniques using short and straight tree limbs 3-4” in diameter. Green wood turns much easier than dried stock, and you can’t beat the low price!

- **Rounding down**
  Before you make any shaping cuts on a turned object, round it down to a rough cylinder. To do this, hold a roughing gouge as shown in Photo 3, with the gouge rolled slightly toward the direction that you’re cutting (from right to left in the photo). Drop the tool handle below the tool rest and move the gouge across the workpiece following the sequence **bottom**. Note how Rus positions his index finger behind the tool rest for a consistent depth of cut.

- **Smoothing**
  To smooth the surface, adjust the tool rest up and position a large skew chisel near the top of the workpiece as shown in Photo 4. Skew chisels come from the factory with straight edges, but note in the photo that Rus grinds the edge to a slight arc to help it cut more effectively. To avoid catching the corners of the tool on the workpiece, restrict the cutting action to the middle of the edge.

- **Making beads**
  With your lathe running, mark pencil lines about ½” apart along the smoothed surface. These lines mark the center of the V-shaped cut between the beads.

  At every marked line cut to a depth of about ⅛” with the point of a skew chisel as shown in Photo 5. Stand just to the left of your workpiece and with light cuts “peel back” the left side of the V with a ⅛” or ¼” skew chisel as shown in Photo 6.

  With the left side of the V completed, stand to the right of the workpiece and cut the right side of the V as shown in Photo 7.

  Note that you must roll the chisel as you cut to keep its bevel in contact with the workpiece.

---

**Diagram:**

1. Stock to be turned
2. Move tool in this direction
3. Tool rest
4. Gouge
5. After turning to desired diameter move tool rest to the right and repeat procedure
6. Desired diameter of turning
- Cutting coves
  Smooth your practice piece again, and make \( \frac{3}{4}'' \)-deep parting cuts about 1'' apart as shown in Photo 8. Beginners tend to put the point of the tool straight into the workpiece. Don't! Instead, remember to start the cut with the heel of the bevel on the workpiece. Slowly raise the tool handle to initiate the cut.

Now, mark lines midway between each parting cut. With a \( \frac{1}{2}'' \) or \( \frac{3}{8}'' \) spindle gouge, cut each side of the cove with the gouge rolled slightly on its side as shown in Photo 9.

Rus holds the handle of the tool in his right hand when cutting the left wall of the cove, and switches hand positions when cutting the right wall. This helps maintain solid contact between the bevel and the workpiece.

Continued
• Transitioning from a square section to a cylinder
Many furniture legs have square sections at their tops where rails attach. Cutting away the corners at the bottoms of these square sections can be tricky business because these unsupported corners tend to chip and splinter, especially when you're working with hard or brittle stock.

To get the job done, hold a large skew chisel as shown in Photo 10, and make successive light cuts as depicted below. Keep the bevel of the tool in contact with the workpiece by rotating the tool throughout each pass. Photo 11 shows the tool's position at the end of each pass.

• Cutting square shoulders
This shape can also be tricky because of end-grain tearout on the vertical wall of the shoulder. To be successful you need to make two cuts, one called a "peeling" cut, the other referred to as a "slicing" cut.

First, hold a large skew chisel as shown in Photo 12 to make the peeling cut. This quickly wastes a lot of material, but it leaves a rough vertical wall. So, you need to slice the wall away holding the same tool with its pointed end down as shown in Photo 13. Remove no more than 1/16" of material. Gradually raise the tool's handle so it's almost level by the end of the cut.
Lay out your pattern and transfer it to your project
Like a road map to guide you on a trip, you need a full-size drawing of your turning project to steer you to its completion. As shown in the example above of a potato masher, your pattern should show key diameters and spacing between those diameters.

Next, transfer the positions of the diameters to your rounded-down turning blank as shown in Photo 14. To make the lines more visible, switch on your lathe and hold a pencil against the stock at each mark.

For each diameter on your pattern, set your outside calipers about \(\frac{1}{8}\)" shy of the finished diameter. (This leaves you extra material for final cuts and sanding later.) Make a parting cut at each marked diameter as shown in Photo 15. Put slight downward pressure on the calipers so it slips through the cut when you reach the correct diameter.

Note in the drawing below that you should part down to your thinnest diameters only after you remove all of the material between the largest diameters. This keeps the workpiece from wobbling unnecessarily.

Sanding and finishing
With your project completely turned and still mounted in the lathe, sand it with a succession of abrasives (120-, 220-, and 400-grit abrasives should do the trick). Set your lathe to about 1,500 rpm, and hold the sandpaper underneath as shown in Photo 16. After sanding, make the final parting cuts shown in the drawing below and in Photo 17.

With the lathe on its slowest speed, brush or spray on your finish while the workpiece spins. If you rub in your finish, you should leave extra material at each end of the workpiece so it doesn’t break off.

Finally, unmount the workpiece and saw away the excess stock at each end. Smooth and finish each end. ♦

Written by Bill Krier with Russ Hurt
Illustrations: Kim Downing
Photographs: Hopkins Associates
SWEET-TOOTH SKEWERS
FOR CARAMEL-APPLE LOVERS

We used these tools and supplies

Stock
1 1/4 x 1 1/4 x 6" hardwood, one piece for each skewer. (You'll need 14 skewers for our caramel apple recipe.) We used odds and ends of maple, walnut, and cherry from the scrap bin.

Lathe tools
Drive center, tail center
Spindle gouge, 1/4" and 1/2"
Skew, 1/2"
Parting tool, 1/8" and 1/4"

Lathe speeds (rpm)
Turning, sanding: 1100-1400

Caramel apples! What a treat! But as a woodworker, aren't you just a little put off by those boring sticks? For apples with flair, first turn these slick skewers. Then, for flavor to match, try our caramel apple recipe, straight from the Better Homes and Gardens® Test Kitchen.

Photocopy the full-sized patterns on the opposite page. Then, locate and mark the center on each end of each piece of stock.

Mount the stock between centers. (We used a spur drive center and a cup tail center.) With the lathe running at about 1100 rpm, round the square down to 1" diameter, using a 1/2" gouge.

With the lathe running, pencil-mark the workpiece 3/4" in from each end. On the waste side of these lines, cut straight in about 1/4" deep with your parting tool.

Next, using the full-sized half-patterns on the opposite page, lay out the turning. To do so, position the pattern against the side of the workpiece between the parting-tool cuts. With the lathe running, draw the line separating the 2"-long blade portion of the turning from the 2 1/2"-long handle. (We placed the blade end at the tailstock.) Mark the handle features with a pencil line at each template mark.

Turn the blade portion to 1/4" diameter with a skew or gouge. Don't taper the end just yet. Shape the handle with the same tools.

To keep the skewer sides parallel, sand one side and then hold it against a try square on the sander table.

A small gouge—1/4" or so—comes in handy for some details. And you'll need a 1/8" parting tool for the grooved handle. If you don't have one, cut V-shaped grooves with a larger parting tool laid on its side. Turn the top of the handle, leaving a tenon about 1/8"-diameter to connect the skewer to the waste.
Turn the blade to a point, leaving a 1/8" supporting tenon at the end. Sand the skewer with progressively finer grits from 100 to 400. Now, cradle the turning in your hand, and part it from the lathe at the top of the handle. Saw the waste from the pointed blade end with a coping saw.

To form the blade, sand one side flat. (We used a 1" belt sander.) Then, to keep the two flat sides parallel, place the sanded side against a try square as shown on the opposite page to sand the other side. Make the blade about 1/8" thick.

Finish-sand the blade. Apply a clear, food-safe finish overall. (We used salad-bowl finish.) Then, take your skewers and our recipe to the kitchen to make your well-deserved treat. 🍎

Caramel apples

14 small tart apples
1/2 cup butter or margarine
2 cups packed brown sugar
1 cup light corn syrup
1 1/4 cups (one 14-oz. can) sweetened condensed milk
1 teaspoon vanilla

Wash and dry the apples; remove the stems. Insert a skewer blade into the stem end of each apple.

Melt the butter in a 3-quart saucepan. Stir in the brown sugar, corn syrup, and a dash of salt. Mix well. Bring to a boil over medium heat, stirring constantly. Stir in the milk. Cook to 245° (firm-ball stage) for 12-15 minutes, stirring the mixture constantly. (The mixture should begin to boil gently over its entire surface.) Remove from the heat, and add the vanilla.

Dip each apple into the mixture, coating it evenly. Chill on a buttered baking sheet.
To accompany our Shaker-styled tall chest and cheval mirror, our design editor Jim Downing designed and built this queen-sized bed. For ease in assembly and moving, the bed features knock-down hardware. To complete the set, we'll be offering plans for a blanket chest and night tables in the future. How's that for a roomful of beautiful, complementary furniture?

Note: If you don't have the issues mentioned at left but would like a photocopy of the tall chest and/or cheval mirror articles, send a self-addressed stamped business-sized envelope and $2/article to WOOD Magazine's Shaker Furniture, 1912 Grand Avenue, Des Moines, IA 50309-3379.

Start with the laminated legs
1 Cut four 1 1/2"-thick pieces and two 3/4"-thick pieces to 2 7/8" x 37" for the headboard legs (A). (We used cherry, a wood relied on by Shaker craftsmen. The 37" dimension is 1" longer than the finished length of the leg.)
Bill of Materials

<table>
<thead>
<tr>
<th>Part</th>
<th>Finished Size</th>
<th>Matl. Qty.</th>
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<td>L</td>
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<td>B*</td>
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*Initially cut parts marked with an * oversized. Then, trim each to finished size according to the how-to instructions.

Materials Key: LC-laminated cherry, C-cherry, EC-edge-joined cherry, PL-plywood

Supplies: #10 x 1 1/2" flathead wood screws, #8 x 1 1/2" F.H. wood screws, finish.
2. To form two of the mortises, mark and cut a pair of notches in the two pieces of 3/4" stock where dimensioned on the Leg Lamination drawing. (We bandsawed the notches to shape; you also could use a jigsaw.)

3. Spread an even coat of glue on the mating surfaces of the three pieces making one leg. Be careful to keep glue off the areas next to the notched openings. With the edges and ends flush and a notched piece in the middle, glue and clamp the pieces face-to-face to form one leg (A). Remove any glue from the notches before it hardens. Repeat the process to laminate the second leg.

4. Scrape the glue from the edges. Then, joint or plane 1/16" from each laminated edge for a 23/4"-square lamination.

5. Starting with 221/4"-long stock, repeat the process in steps 1 through 4 above to cut and laminate the footboard legs (B).

6. For flat bottoms later, crosscut 1/2" off the bottom ends (not the tops) of each headboard and footboard leg. See the Leg Mortise drawing at right for reference.

7. Using a combination square, extend the top and bottom lines of the mortises to the correct adjacent surface on both the headboard and footboard legs. Then, using the Mortise detail accompanying the Leg Mortise drawing for reference, mark and machine the remaining mortise on the inside face of each leg (A, B). Remember that you're making a matching pair of headboard and footboard legs, with each pair having a left and right member. Mark the mortises, and hold the legs together to verify the locations before cutting.

Prepare the legs for turning

1. To minimize chip-out when turning later, cut a snug-fitting cherry filler block for the top mortise in each headboard leg where shown on the Leg Mortise.

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WOOD MAGAZINE  OCTOBER 1993
Bottom end of legs trimmed square before turning. Using a tablesaw with a V-block attached to the miter gauge, cut the reference kerfs as located.

1/2" waste removed when turning tops to shape.

**FOOTBOARD LEG**

**HEADBOARD LEG**

**LEG SHOULDERS**

Cut kerfs to act as reference marks and minimize chipping when turning.

**V-BLOCK**

**CUTTING THE SHOULDERS (side view)**

**FOOTBOARD LEG**

**HEADBOARD LEG**

**LEG PATTERNS**

Drawing. Using hot-melt adhesive, firmly secure the filler blocks in place in their mating mortises. Filler blocks aren't needed for the areas left square (unturned) on all four legs.

1. Mark diagonals on each end of each leg to find center. Then, mark the 1/2" waste on the top end of each leg.

2. Build a V-block jig for your miter gauge to the size shown on the V-block drawing, top right. Screw the jig to your miter gauge.

3. To act as reference kerfs and minimize chipping when turning, mark and cut eight 3/8"-deep kerfs in each leg where dimensioned on the Leg Shoulders drawing and as shown in the photo above. Notice here how we temporarily nailed a scrap of wood into the notched area to act as a stop.

4. Mark the centerpoints where shown on the Leg Patterns drawing at left, and bore a 1 1/2" hole 3/4" deep in each leg where shown. Note that these holes are bored in the surfaces opposite the side rail mortises.

**Turn the legs to shape**

1. Mark diagonals on each end of each leg to find center. Then, mark the 1/2" waste on the top end of each leg.

2. Mount a leg between centers on your lathe, with the bottom end against the headstock spindle. See the Full-Sized End Pattern for reference. For symmetrical legs, it's critical to center the spur and cone centers on the marked centers on the ends of each leg.

*Continued*
**SHAKER BED**

3 Using the dimensions on the Leg Patterns drawing on the previous page, turn each leg to shape. Remember, there's still a 1/2" of waste stock on the top ends of each leg. (We used a wide skew for the tapered portions and a 1/4" gouge for the coved areas next to the kerfs as shown above.)

4 With the leg still mounted to your lathe, sand the turned areas smooth. Stop the lathe and sand with the grain to remove any cross-grained sanding marks.

5 Using the Full-Sized End patterns for reference, turn the top and bottom ends of the leg to the shape shown on the drawing. Sand the leg smooth. Remove it from the lathe and use a dovetail saw to cut the waste tenons from the top end of the leg. Using a palm sander, sand the top of the leg smooth and to the shape shown. Repeat for each of the three remaining legs.

6 Using a 1/2" chisel, and being careful not to mar the wood surrounding the filler block, chip away at the filler block to open the mortise. Repeat for the other headboard leg.

**Let's form the headboard and footboard**

1 From 1 1/4"-thick stock, cut the rails (C) to size. (We planed 6/4—referred to as six-quarter stock—to the stated thickness.)

2 Using the Tenon detail accompanying the Headboard Assembly drawing at left for reference, cut a 1 3/8"-long tenon on each end of each rail (C).
3 Edge-join enough 3/4" stock to make the 11 3/4"-wide headboard (D). Scrape off the excess glue.

4 Plane or joint the bottom edge of the headboard blank. Then, trim both ends of the blank for a 63 1/4" overall length.

5 Lay out the arched top of the headboard using the Headboard drawing above for reference. (We first marked points for the arched top. Then, we cut a 3/16"-thick flexible strip of wood to the length of the headboard. Next, with a helper on hand to flex the strip over the marked points, we marked the arch.) Cut the headboard top to shape and sand smooth. Be careful not to sand the ends of the headboard to less than 3/4" thick. Sanded less than 3/4", the headboard will fit loosely into the headboard leg mortises.

6 Glue and clamp the headboard (D) and lower rail (C) between the headboard legs (A). (To keep the glue squeeze-out off the easily glue-stained cherry, we masked the wood surrounding the joints with masking tape. Use a damp cloth to immediately remove any glue squeeze out. Remove the masking tape, and use the damp cloth to remove any excess glue.)

7 Glue and clamp the remaining rail (C) between the footboard legs (B). Check for square.

8 Then, drill a 1/2" hole through each leg, centered inside each 1 1/2" hole. You'll use these holes later for housing the bed bolts.

Cut and tenon the side rails

1 Cut the side rails (E) to size. Cut a tenon on each end of each rail to the size shown on the Tenon detail accompanying the Exploded View drawing.

2 Using the Mounting Bolt detail accompanying the Exploded View drawing, mark the centerpoint, and bore a 1 1/8" hole 1 1/8" deep on the inside face of each side rail. To prevent boring through the side rail, you must use a flat-bottomed bit such as a Forstner.

3 Dry-clamp the side rails (E) into the leg mortises. Check for square. Using the previously drilled 1/2" holes in the legs as guides, chuck a brad-point bit into your portable drill, and quit drilling as soon as the bit bores into the ends of each side rail. Disassemble the pieces. Using a doweling jig to align the bit, continue drilling into the tenoned ends of the side rails until the bit reaches the 1 1/8" nut-access hole. A brad-point bit will greatly diminish the chance of bit wander.

4 Reinstall the tenoned side rails (if removed to finish drilling the 1/2" bolt holes) into the mortised legs. Insert the mounting bolts, and place a square (not a hex-head) 1/2" nut inside the 1 1/8" hole where shown in the Mounting Bolt detail accompanying the Exploded View drawing. Tighten the bolts until the bed frame is wobble free. See the Buying Guide for our source of hardware.

A sturdy platform plays a supporting role

1 Cut the platform cleats (F, G) to size. Drill countersunk 3/16" shank holes on 6" centers through the four cleats.

2 Screw the cleats to the inside faces and flush with the bottom edges of the end rails (C) and side rails (E).

3 Measure the opening, and cut the platform panels (H) to size from 3/4" plywood. Cut a 1 x 1" notch in the corners adjacent to the legs where shown on the Exploded View drawing. Lower the panels onto the cleats to check the fit. They should fit without scraping the rails (C, E) when lowered into place.

Produced by Marlen Kemmet  Project Design: James A. Downing  Photographs: Wm. Hopkins  Illustrations: Kim Downing

WOOD MAGAZINE  OCTOBER 1993
Bright enthusiasm often diminishes with time, but not with WOOD® magazine's fifth annual Build-A-Toy® contest. More than 300 handcrafted toys made the February 1 deadline. See the array in the photo, opposite page. (Look closely, entrants, you might spot yours!) In the student division, only Scott Robertson and his partner, Michael Lewis, both of Waltham, Massachusetts, were able to prevent a clean sweep by perennial champions from Newark, Ohio's Licking Valley High School. And home hobbyists topped the professionals by taking the Grand and First prizes. Yet, there were contest veterans among the winners, too. For a complete list of those who captured the prizes of trips and woodworking tools and supplies worth more than $16,000, see page 84. And look on page 82 for the 1994 Build-A-Toy contest rules.

Toys from this year's contest will again be exhibited at Branson, Missouri's Silver Dollar City during its National Crafts Festival from September 15 to October 31. (Call 1/800/858-8258 for details about a special WOOD reader's money-saving package of second-day-free tickets to Silver Dollar City and discount coupons for motels and attractions.) Then, on December 14, comes the Crafted for Joy Toy Auction to benefit the U.S. Marine Corps Reserve's Toys-for-Tots program. Last year's auction, hosted by Louise Mandrell at Branson's Grand Palace Theater (also this year's auction site), raised more than $20,000 to cheer needy kids at Christmas. So a hearty thanks to you caring readers who crafted an entry in the Build-A-Toy contest, and the supporting advertisers. We hope you'll set aside time now to build your 1994 entry.

Grand Prize winner William Perry, a home woodworker from Harmony, Pennsylvania, creatively crafted a five-layer face puzzle of oak, walnut, and cherry. His intriguing concept features interchangeable pieces so kids can build different faces, and even mix species.

Expertly made of maple and walnut, the Cessna float plane entered by Petersburg, West Virginia hobbyist Larry J. Weaver captured First Prize overall.

Neil Seely's walnut dachshund pull toy earned Second Prize in the professional division. The Rochester, New York, woodworker's toy also captured the Best Pull Toy award.

The Third Prize among the pros went to Richard Williams of Winslow, Maine, for his workable log skidder (logs included).

Home hobbyist James Weber, from Fayetteville, Ohio, rolled in with Second Prize in his division with his "Mr. Woodwrench" walnut race car.
Home hobbyist Third Prize was awarded to Margaret Aldrich of Traverse City, Michigan, for her guaranteed-to-entertain puzzle game based on the Goldie Locks and the Three Bears theme.

Jenny Lankous and Craig Sforza, both students at Licking Valley High School, Newark, Ohio, teamed up to take Second Prize in their division with an oak-and-walnut bulldozer.

An all-oak ferry boat on wheels by Byron Lewis and D.J. Weaver, caught the judge's attention for Third Prize in the student division.

Surrounded by wooden toys, Build-A-Toy judges start their search for winners. From right, Capt. Scott Nisely, USMC; WOOD magazine design editor Jim Downing; Iowa State University Extension education director Joyce Rouse; Silver Dollar City master toymaker Doug Andrews.

Photographs: John Hetherington
Around 1750, woodworkers discovered screws, fasteners that had been used mainly by gunsmiths and clockmakers until then. Today, woodworkers everywhere rely on screws for strong, easy-to-make joints, or to fasten together parts that may require disassembly.

First, a word about sizes

Here’s how to decipher a screw size, such as #8×1 1/4". The first number denotes the gauge, or diameter, of the screw. A larger gauge number signifies a larger diameter, starting with #0 (just less than 1/6") and running to #24 (almost 3/8"), a rare size. You’ll find #6 or #8 right for most work in 3/4" stock; for extra strength, go to #10 screws (about 3/16" diameter) or larger.

The number following the gauge is simply the length. It’s measured from the screw point to the widest part of the head.

When joining wood—piece A to piece B, say—we use a screw about 1 3/4 times as long as the thickness of piece A (which should be the thinner piece if both aren’t equal). So, if piece A is 3/4" thick, use a 1 1/4" screw. To attach hardware to wood, we usually select a screw nearly as long as the wood is thick.

Don’t flip over heads

Once you determine which screw to use, you may have something else to consider: What kind of head do you want on it? The choice is already made for you with drywall or deck screws—the flat-topped bugle head.

We found a couple of styles for particleboard screws (the ones we used on the toybox on page 35 cut their own countersinks via small nibs beneath the head), but each was in a different store. Shop around—what you get is the dealer’s choice.

For woodscrews, choose between the familiar flathead and roundhead. A flathead countersinks into the wood to leave a surface with no protruding screw head. Use flatheads for mounting hardware with countersunk holes, too.

When you need extra holding power, turn to a roundhead; the flat underside can exert greater clamping force against a surface. Use this one, too, for hardware, especially with slotted-hole adjustable mountings.

An ovalhead tapers on the underside like a flathead, but rises to a slight dome on top. You’ll find it atop some sheet-metal screws and brass wood screws.

We prefer ovalheads to flatheads for countersunk mounting holes in metal moldings and most hardware (except butt hinges). In these applications, ovalheads look neater because flatheads don’t always fit flush with the hardware.

Pick a panhead sheet-metal screw when you want a flat surface on the bottom of the head. Use these where you would use roundhead wood screws. They’re great for attaching hardware to thin stock.

When you have a choice, go for a Phillips or a square-recess head instead of a straight slot. Square-recess heads are the best of the lot. Not widely sold in hardware stores or home centers, square-recess screws are readily available by mail. McFeely’s, P.O. Box 3, Lynchburg, VA 24505-0003, 800/443-7957, fax 804/847-7136, carries a large selection.
screws

Drywall screws
Once, only contractors bought these sharp-pointed screws, originally made to fasten gypsum wallboard to metal wall studs. Today, the black screws have become the general-purpose woodworking screw.

Available in #6 and #8 diameter and a variety of lengths, these hardened screws take hold with a thread nearly twice as deep as a same-sized wood screw. Threads may be coarse (about half as many threads per inch as a wood screw) or fine. The fine-thread one has two separate, parallel threads, so it's sometimes called a twin-thread screw.

You can drive drywall screws without drilling, but you're better off with a pilot hole. Without one, you may break the brittle screw when driving it into harder woods. And the screw's sharp point can split some woods.

Deck screws
Buy these instead of drywall screws for outdoor projects. They resemble coarse-thread drywall screws, but have rust-resistant finishes. (We've found that the gray screws resist rust better than the gold ones.) Sizes range from #6 x 1" to #10 x 4 1/2".

Deck and drywall screws serve well for joinery. But their head design doesn't work very well for attaching hinges and other hardware.

Particleboard screws
Particleboard and similar materials pose a special problem—screw threads often hog out a hole in the material instead of gripping it. But, with a thread slightly finer than that of a coarse drywall screw, the particleboard screw takes a deep bite without crumbling the material. A pilot hole isn't necessary, but a shank hole ensures a tight joint.

You can use particleboard screws in wood, too; they hold better than most screws in end grain. Dealers we checked with carry #8 and #9 particleboard screws in lengths from 1" to 3".

Sheet-metal screws
Though made for metalwork, these screws offer some advantages for woodworking. The full-length thread engages more wood than does a wood screw of the same length. This makes the sheet-metal screw great for mounting hardware. And, there's just a pilot hole to drill.

Most dealers offer a wide selection of hardened sheet-metal screws, usually plated to resist rust. You'll find them made of stainless steel, too—your best bet for long-lasting outdoor projects.

<table>
<thead>
<tr>
<th>Pilot hole</th>
<th>WOOD SCREWS</th>
<th>DRYWALL, DECK &amp; PARTICLEBOARD SCREWS</th>
<th>SHEET METAL SCREWS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardwood</td>
<td>#4 1/4&quot;</td>
<td>#6 5/64&quot;</td>
<td>#10 3/16&quot;</td>
</tr>
<tr>
<td></td>
<td>#6 3/32&quot;</td>
<td>#8 3/32&quot;</td>
<td>#8 5/32&quot;</td>
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<tr>
<td></td>
<td>#8 9/64&quot;</td>
<td>#10 1/8&quot;</td>
<td>#10 5/32&quot;</td>
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<tr>
<td></td>
<td>#10 1/16&quot;</td>
<td>#12 7/64&quot;</td>
<td>#12 3/32&quot;</td>
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<tr>
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<td>#12 9/64&quot;</td>
<td>#14 5/64&quot;</td>
<td>#14 3/32&quot;</td>
</tr>
<tr>
<td>Softwood</td>
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<td>#6 5/64&quot;</td>
<td>#10 3/16&quot;</td>
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<td>#12 9/64&quot;</td>
<td>#14 5/64&quot;</td>
<td>#14 3/32&quot;</td>
</tr>
<tr>
<td>Shank hole</td>
<td>#4 1/4&quot;</td>
<td>#6 5/64&quot;</td>
<td>#10 3/16&quot;</td>
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<td>#12 9/64&quot;</td>
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<td>#14 3/32&quot;</td>
</tr>
</tbody>
</table>

Make it easy on yourself

No soap. Don't lubricate screw threads with soap. Beeswax or paraffin works better, and you don't risk rust and discoloration.

Tap first for brass. Prevent breaking the heads off brass screws by driving in a steel screw of the same size first. The steel screw will cut threads for the softer brass screw.

Tightening tricks. Fully threaded screws won't pull parts together if you just drive them in. Either clamp the parts tightly or drill a thread-clearance hole through the top piece to prevent a gap.

Right tip turns better. Make sure the tip of your screwdriver blade or power-driver bit fits the screw head snugly and is in good condition. Rounded corners on the straight blade or chewed-up wings on the Phillips point can spoil your project, and will certainly spoil your disposition.

Buy a bunch. Buy frequently used sizes by the box. For one thing, they're slightly cheaper that way. And you won't have to run to the store every time you need a couple. Buy drywall screws and deck screws by the pound. (Look for these screws in the bulk nail bins at the lumberyard.)

Illustrations: Kim Downing
Photograph: John Hethington
AUTUMN LEAVES

Scrollsaw a fall fantasy for your wall

PuttiNg together our wreath of scrollsawed fall foliage is almost as much fun as jumping into a pile of autumn leaves! What's more, the colors of the season will warm your home all season long.

Refer to the chart of blank sizes below right, and cut four blanks for each part letter. (For stock, we resawed 1/4" pine to 1/4" thick.)

Photocopy the five full-sized leaf patterns, and trace each to its corresponding set of blanks. Note the grain direction.

Drill blade start holes where shown for leaves A and B. Cut all parts A, parts B, and so on. Begin with the inside cuts. Then, cut the outside to shape. (We used a #5 blade, 0.038 x .016" with 12.5 teeth per inch for all sawing.)

Because the knob on the stem of part C fits into the notch on part A, cut both carefully. The most fragile part of the cutting comes at the point where the two stems cross on part D.

Sand all parts. Following label instructions, color the leaves with Delta's Home Decor gel wood stains and pickling gels, available in craft shops. Use the colors indicated on the patterns or your own. (Washes of thinned acrylic artist's colors also work.)

To begin assembly, draw diagonal lines to locate the center on a 20" square of cardboard or heavy paper. Draw one circle 18" in diameter (9" radius) and one 21/2" (11/4" radius) around the center. Lay waxed paper on the cardboard so you don't glue the wreath to it.

Glue parts A and B together. Then, place part C inside the arc, fitting the stem into the notch on part A, where shown in the detail drawing. Adjust as necessary, and glue. Complete the four assemblies, and arrange them on the cardboard as shown in Step 1 of the assembly drawings.

Place parts D in position as shown in Step 2. Adjust as necessary, lightly mark the overlap on parts A, B, and C, and then glue parts D into place. After the glue dries, glue a part E to the back of each part D (Step 3).

Let the glue dry thoroughly, and spray on clear polyurethane. Attach a hanger to the back.

Buying guide

Patterns. For information about other designs, send a SASE to Susan Evarts, 115 Kensington Ave. No. 8, Meriden, CT 06450. Please, no telephone requests.

<table>
<thead>
<tr>
<th>Blanks</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1/4 x 3 1/2 x 5 1/2&quot;</td>
</tr>
<tr>
<td>B</td>
<td>1/4 x 3 1/2 x 4 1/2&quot;</td>
</tr>
<tr>
<td>C, E</td>
<td>1/4 x 3 x 4&quot;</td>
</tr>
<tr>
<td>D</td>
<td>1/4 x 4 1/2 x 7 1/2&quot;</td>
</tr>
</tbody>
</table>

Project Design: ©Susan Evarts
Illustrations: Mike Henry
Photographs: John Hetherington
"They are so powerful, yet so gentle," says designer Kim Russell, explaining her fondness for the moose. Inspired by Native American themes, she captured that spirit in this design that you can cut and sand to shape easily.

You'll need walnut or other hardwood 1 3/4 x 4 x 6" for the moose body, a piece 3/4 x 3 1/2 x 4 1/2" for the antlers, and one that's 1/2 x 2 1/4 x 8" for the base.

Photocopy the full-sized patterns. Trace the body side view, antlers, and base patterns onto their corresponding pieces of stock.

On the body, drill a 3/8" hole where shown. Then, bandsaw the inside leg curve (Cut 1) with a 3/4" blade. Complete the cutting sequence shown on the pattern.

Mark a centerline along the sawed top edge, and then sketch the top-view outline onto the blank. On the bottom, draw the 3/4"-wide arcs where shown by the Foot Placement lines.

Now, with a stationary belt sander and an 80-grit belt, sand to the top-view outline. Taper the sides to 3/4" wide at the feet. Drum-sand the inside leg curve.

Next, draw two parallel lines along the inside curve between the front and back feet. Then, start at the top of the curve with a file or long sanding drum and form the 45° bevel from the line to the side of the body on each side.

With belt and drum sanders, round the front of the front leg, the underside of the head, and the curve from the nose to the hind foot. Sand the feet flat.
OF THE WOODS

Finish-sand the body. Clamp it in a vise (pad the jaws to protect the wood), and dimple the beveled areas with a centerpunch.

Scrollsaw the antlers. Belt-sand the curved top surface (see end view) to 3/8” thick at the center. Sand the curved bottom, tapering to 1/8” thick at the edges. Bevel the outer top edges, and sand smooth.

Tilt your scrollsaw table to 45°, and cut out the chamfered base. Sand the base.

Drill two 1/8” holes 1/4” deep where shown on the antlers. Epoxyl of a 1/2” piece cut from the pointed end of a #16 brad into each, pointed end out. Position the antlers on the moose, marking the hole locations on the head with the brad points. Drill the holes 3/8” deep.

Glue the moose to the base with 1/4” dowels 1/4” long. Finally, glue the antlers with epoxy. Apply a clear finish.

Project Design: @Kim Russell
Illustrations: Mike Henry; Kim Downing
Photograph: John Hetherington
HERE'S THE SCOOP ON FOOD-SAFE FINISHES

That bowl you just turned would be super for salad, or even ice cream. But what finish can you trust for food? In talking with manufacturers, we found some answers.

According to the folks we talked to in finish manufacturing, a "food-safe" coating generally implies one that won’t leave a toxic residue to contaminate food. And all spoke confidently about their product lines. “We sell Salad Bowl Finish that's guaranteed for that purpose,” says Jonathan Kemp, of the H. Behlen & Bro. company in Amsterdam, New York. “The dried film is nontoxic, only containing natural, edible oils and drying salts in an evaporating mineral-spirits solvent.”

The fact is, manufacturers say, while only a few finishes, like Salad Bowl Finish, advertise as food-safe, most finishes made are nontoxic when dry. For instance, mineral spirits—a common ingredient—is toxic. But, it leaves no residue after the finish cures.

To date—because of the high cost of testing—only one finish manufacturer has approval from the Federal Food and Drug Administration (FDA). That’s Torgenal, Inc., of Sheboygan Falls, Wisconsin, which produces 100 Clear, an epoxy coating that when dry results in a rock-hard finish considered completely food-safe. “100 Clear has FDA approval up to sterilization temperatures in excess of 150 degrees,” says Lisa Paul, marketing director.

Nontoxic, edible oils
Eco-Design, an Albuquerque-based company, sells finishing materials made in Germany. Contrary to other manufacturers, they believe that a nontoxic finish starts with the ingredients. “We use only all-natural and low-toxic ingredients,” claims company president Rudolph Reitz. “Essentially, all of our items are designed to be low-toxic, and selected products are food-safe. In fact, most of our finishes derive from completely edible materials. Our Natural Citrus Thinner contains—along with natural oils—d-limonene from citrus peels and FDA-approved isopar, a chemical for cleaning vegetables.”

Does that mean that all natural oils, such as tung or walnut oil, are food-safe, too? No, according to John Moser of Woodworker’s Supply, Inc., of Casper, Wyoming, because a label may state “100% Tung Oil,” but also contain toxic driers. Adds Reitz, “Studies have shown that tung oil could have a toxic effect on fetuses.” Pure walnut oil, though, is food safe.

Ask for an MSDS
If you aren’t sure what a finishing product contains, you can ask the company that makes it (or the retailer) to give you a material safety data sheet (MSDS). The law requires that they comply. On the MSDS you’ll find every ingredient, including toxic components. “Most of those so-called toxic ingredients are solvents and will evaporate,” Moser notes.

Manufacturers indicate that most oil-based finishes have three main components: an oil or a combination of oils, driers, and the solvent base that evaporates. “Pure tung oil needs a drying agent, or the oil will never completely dry,” says Moser. “Those driers stay with the finish. That’s why Behlen’s Salad Bowl Finish uses natural salt driers. Our Preserve, a completely food-safe product, consists of a blend of exotic nut-meal oils.”

And if you’ve heard that salad oil (or olive oil) works fine for bowls, you’ve heard wrong. “Those types of oils will never completely dry,” cautions Moser, “and salad oil will go rancid.”

FOOD-SAFE FINISHES
• Behlen’s Salad Bowl Finish and Preserve, from Woodworker’s Supply, Inc., 800/645-9292.
• 100 Clear Epoxy, from Torgenal, 800/558-7596.
• Herbal Primer and Oil Finish (for bowls) and Dubno-Primer Oil and Meldos-Hard Oil (for wood countertops), from Eco-Design, 505/438-3448.
• Rockler Salad Bowl Finish and Rockler Wood Preservative, from The Woodworkers’ Store, 612/428-3200.
• Walnut oil, generic, at health-food stores (16 ozs., $3). ♦

Illustration: Jim Stevenson
Perfect Pachyderm

Continued from page 51

Natural-habitat base

To build a base like the one Bob made, transfer the base outline to 7/2"-thick walnut. Bandsaw to shape and rout the top edge with a Roman ogee.

Draw a line on the top face 7/8" inside the Roman ogee edge. Carefully rout the area inside the line 3/4" deep. The bottom of the recess doesn’t need to be smooth. (The rotary carving tool does this job well.) Finish the base. (Bob uses Deft lacquer.) When the finish dries, mask the edge to protect it through the next steps.

Mix Durham’s Rock Hard Water Putty (available at hardware stores and home centers) to the consistency of heavy cream. Pour the mixture into the routed recess on the base and level it with the base edges.

Quickly mix another batch of putty, using little water. This should be crumbly, like damp sand. Sprinkle it on the wet base and let set for 10–20 minutes.

Lightly press the elephant’s feet into the stiffened putty to make slight footprints. Remove the elephant, and set the base aside to dry for a day or so.

When dry, drill a 1/4" hole through the base in the center of each footprint. Countersink the holes on the bottom.

Paint with a wash of thinned deep green in some areas, thinned raw umber in the rest. Dry-brush with mixed raw umber and raw sienna, followed by yellow ochre, and then white. When dry, remove the masking tape, and mount the elephant with a screw into each foot.

BASE

Enlarge gridded base drawing on a photocopying machine set at 140 percent.
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Sale: $109.00
800-502 10-pc. 1/4" & 1/2" shank set for Leigh Jig......List: $160.40
Sale: $129.00
800-617 5-pc. 1/4" shank set for Keller #1601 Jig......List: $146.50
Sale: $118.00
800-618 4-pc. 3/8" & 1/2" shank set for Keller #2401....List: $143.20
Sale: $114.00

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Patrick Spielman, Author
Router Basics, Router Handbook, Router Jigs and Techniques

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SHAKER BED

Continued from page 65

4 If you use the soft-side waterbed mattress described below, you’ll need an additional support between the plywood platform panels. To form the support, cut and join the pieces I and J as shown on the Support drawing. Later, you’ll position and secure the support under the plywood panels where shown on the Exploded View drawing and accompanying Support detail.

Finally, the finish
1 Disassemble the bed and finish sand all the pieces.
2 Finish as desired. (We applied two coats of gloss and one coat of satin Minwax fast-drying polyurethane.) Reassemble and nail the decorative covers centered over the 1½" holes in the legs.

Mattress options
You have several options for mattresses with this queen-sized bed frame. First, simply place a standard mattress directly on the plywood platform. Or, place a box spring and mattress directly on the platform (we prefer not to include the box spring). This makes the top of the mattress about 27° off the floor. High mattress heights are common in many country decor's, but less common in Shaker room settings.

You also can place a soft-side waterbed mattress on the platform. This mattress type weighs less than a standard waterbed mattress, and feels more like a regular spring one. Too, the soft-side mattress doesn’t require a heater and has side-independent adjustable firmness.

Buying Guide
• Shaker bed hardware kit. Four 13½" antique English bed bolt covers, JG-226, and four French bed bolts, JG-416. Stock no. WMBD-KIT, $23 ppd. Farmerstown Hardware and Supplies, 3155 State Route 557, Baltic, OH 43804. Or call 216/893-2464 to order.
Holiday Cut-Outs
You Can Create with Ease

Create a season full of holiday magic by making these easy but impressive projects. For each project, simply cut out the pieces to shape using simple tools, sand, paint and fit together. Full-size patterns for all curved pieces are included. When the season's over, just disassemble and lay the pieces flat for space-saving storage. Projects are easy to paint, use common lumber and require minimal assembly. The experts at WOOD® magazine designed and built each project to assure professional results.

PLAN 1–SANTA
(4’ Height)

PLAN 2–REINDEER
(3’W x 4’H)

PLAN 3–SMALL REINDEER
(28” Height)

PLAN 4–SLEIGH
(58”L x 35” H)

PLAN 5–ANGELS
(4’ Height)

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Mail to: WOOD MAGAZINE PLANS
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100% MONEY-BACK GUARANTEE IF NOT COMPLETELY SATISFIED.
1994 Build-A-Toy™ Contest

Everyone wins in this contest because all toys go to help needy kids at Christmas. And that gives you a great feeling. Of course, your toy could win you one or more dandy prizes, too—brand-name tools, woodworking supplies, finishing materials, and more. In fact, there's over $16,000 worth of merchandise that you would just love to have in your shop!

Look over the prize list on the facing page. Check out how many ways you can win—either as a hobbyist woodworker or a professional. There are even categories for a group effort, so come on woodworking clubs and shop classes, start building!

But don't forget, Build-A-Toy is much more than a contest.

CRAFT A TOY FOR JOY
When you enter WOOD magazine's Build-A-Toy contest, you automatically contribute to the U.S. Marine Corps Reserve's caring program, Toys for Tots. You'll receive a commemorative "I Crafted a Toy for Joy" sticker to prove it. That's because all handcrafted entries are sold at auction to raise money for the Marines to buy many, many more toys. Last year, at the magnificent Grand Palace Theater in Branson, Missouri, Build-A-Toy entries sold for up to hundreds of dollars each as eager bidders vie for the examples of your craftsmanship. And if your entry brings $100 or more, we'll let you know with a personal letter that you can display with pride.

So set aside time right now to plan and build your entry. Read the rules and guidelines shown at right. Get your entry in by February 1, 1994, and then proudly say, "I CRAFTED A TOY FOR JOY!"
WOOD Magazine’s 1994 BUILD-A-TOY Contest Prizes & Sponsors

**Grand Prize (Original Design)**
Professional: Your choice of Bosch power tools totaling $2,000
Hobbyist: A tablesaw, jointer, planer, and bandsaw from Grizzly valued at $2,000

**First Place (Original Design)**
Professional: Your choice of $1,500 in Delta power tools
Hobbyist: Your choice of $1,500 in Delta power tools

**Second Place (Original Design)**
Professional: From AMI, a Hegner Multimax scroll saw worth $1000
Hobbyist: A shopful of Craftsman benchtop power tools worth $1000

**Third Place (Original Design)**
Professional: Your choice of Skil power tools totaling $500
Hobbyist: Your choice of Skil power tools totaling $500

**Citations (All Designs)**
Best Use of Wood
Professional: $250 in Constantine’s merchandise
Hobbyist: $250 in Formby’s finishing supplies
Best Clear Finish
Professional: $250 in Formby’s finishing supplies
Hobbyist: Campbell Hausfeld HVLP sprayer
Best Action Toy
Professional: $250 in Dremel tools
Hobbyist: $250 in Dremel tools
Best Painted or Dyed Finish
Professional: $250 in Trend-Lines merchandise
Hobbyist: $250 in merchandise, The Woodworkers’ Store

Best Doll Accessory
Professional: $250 in merchandise, Meisel Hardware Specialties
Hobbyist: $250 in merchandise, Meisel Hardware Specialties
Best Educational Toy
Professional: $250 in Dremel tools
Hobbyist: $250 in Dremel tools
Best Pull Toy
Professional: $250 in Dremel tools
Hobbyist: $250 in Dremel tools
Best Transportation Toy
Professional: $250 in Crafts Supplies USA merchandise
Hobbyist: $250 in Toys-N-Joys merchandise

**Special Awards**
Best Toy from a Woodworking Club
$250 in Leichtung merchandise; Milwaukee Tool $500 miter saw
Best Toy from a Shop Class
$250 in Delta tools; $250 in 3-M supplies

**WOOD Magazine’s 1994 BUILD-A-TOY™ Competition**

WOOD Magazine’s 1994 BUILD-A-TOY™ Competition

There is no limit to the number of entries. Please provide the following information for each toy submitted:

- My entry is:  
  - Original design
  - Built from plans
- My skill level is:  
  - Student (K-12)
  - Home Hobbyist
  - Professional
- My affiliation:  
  - WW Club
  - Shop Class

*For Original Design entries, I certify that I have designed and built this toy myself. Should my entry win, I agree to cooperate with WOOD Magazine to supply builder’s notes and a bill of materials for publication.

Signature: ____________________________
Date: ____________________________

**1994 Rules**
1. Projects must fit into a box no larger than 2 x 2 x 2. The primary material should be wood but may incorporate other materials.
2. Please follow Consumer Product Safety Commission guidelines; nontoxic wood finishes only; no parts smaller than 1 1/4" square or toys for children under three years of age; no sharp corners or points; pull strings longer than 12" should not have leads or other attachments that could tangle and form a loop.
3. Entries must be received by February 1, 1994. All entries must be postmarked; collect entries will be refused. Attach an entry label, photo copy of an entry label or a 3 1/2" x 5" card with your name and address to each toy.
4. Woodworkers who build toys from existing plans will be eligible for Citations prices only. Woodworkers who build their own original designs will be eligible for all prizes.
5. Entry constitutes permission to use winner’s name, hometown and photographs for promotional purposes. Employees and family members of Meredith Corporation and their affiliates and subsidiaries are ineligible. Void in Quebec.
6. Winners will be selected and notified by mail or phone about April 15, 1994, and will receive the prize directly from the manufacturer/distributor. For a list of winners, send a self-addressed stamped envelope to BUILD-A-TOY, 1912 Grand Avenue, Des Moines, IA 50309-3379.
7. Meredith Corporation will donate all entries and auction money received from entries to the U.S. Marine Corps Reserve Toys for Tots program.
8. Professional woodworkers who enter their toy as an original design; Toy must be your own original design. A different approach to an existing toy would qualify. Please do not enter toys with only subtle changes from published patterns.
9. A panel of representatives from the U.S. Marine Corps Reserve, Meredith Corporation and woodworking aspects will judge the toys on child appeal, craftsmanship, originality, and durability. The panel’s decision will be final.
10. Professional woodworkers include woodworking teachers and improve earning income by selling wooden toys.

HERE ARE THE CHAMPS

From trucks and trains to dinosaurs and doggies, here's the complete list of what entry took what in the 1993 edition of WOOD® magazine's annual Build-A-Toy® contest (see photos of the top winners' projects on pages 66-67).

**BEST USE OF WOOD IN THE HOME-HOBBYIST DIVISION**: Roger Zack for his walnut and maple Ford pickup truck.

**GRAND PRIZE** (Expense-paid vacation for family of four at Silver Dollar City, Mo.): William P. Perry, Harmony, Pa., face puzzle.

**FIRST PRIZE** (A day at WOOD® magazine's IDEA SHOP®): Larry J. Weaver, Petersburg, W.Va., float plane.

**SECOND PRIZE** ($1,500 in Trendlines merchandise): James Weber, Fayetteville, Ohio, race car.

**THIRD PRIZE** ($1,500 in Delta merchandise): Margaret Aldrich, Traverse City, Mich., three bears puzzle.

**BEST USE OF WOOD ($1,500 in Craftsman Corner merchandise)**: Roger Zack, Bloomington, Minn., Ford pickup truck.

**BEST FINISH ($300 in Behlen merchandise)**: William Trumble, Grants Pass, Ore., colorful vintage truck.

**GREATEST NUMBER OF TOYS ENTERED ($1,000 in Porter Cable merchandise)**: Robert Sylvain, Granby, Conn., action folk toys.

**BEST TRANSPORTATION TOY ($1,000 in Vermont American merchandise)**: tie, shares prize, George Cole, Sequim, Wash., jalopy car, and Don L'Hoste, Kenner, La., merry-go-round airplane ride.

**BEST PULL TOY ($500 in Meinel Hardware merchandise)**: Joseph Young, Massapequa, N.Y., alphabet-blocks truck.

**BEST PULL TOY** ($500 in Dremel merchandise): Jenny Linkous/Craig Sforza, Newark, Ohio, bulldozer.

**BEST FINISH ($200 in Behlen merchandise)**: Jason Smith/Nathan Wright, Newark, Ohio, bank tractor and wagon.

**JAY WYE'S WHIMISCIAL, COLORFULLY PAINTED, CRAYON-CARRYING DINOSAUR CAPTURED A BEST FINISH AWARD IN THE PRO DIVISION. IT'S ALSO A GREAT PULL TOY.**

**SECOND PRIZE ($1,500 in Eagle America merchandise)**: Neil Selly, Rochester, N.Y., dachshund pull toy.

**THIRD PRIZE ($1,000 in Atlas Copco merchandise)**: Richard T. Williams, Winslow, Maine, log skidder.

**BEST USE OF WOOD ($1,500 in Dremel merchandise)**: Henry J. Gorczyński, Batavia, N.Y., trolley.

**BEST FINISH ($500 in Behlen merchandise)**: Jay Wye, Amesbury, Mass., dinosaur crayon carrier.

**GREATEST NUMBER OF TOYS ENTERED ($250 in Econ-Abrasives merchandise)**: Steve Forrest, Sunrise, Fla., tic-tac-toe sets.

**BEST TRANSPORTATION TOY ($1,000 in clamps from American Tool Co.)**: David Gelst, Pocono Lake, Pa., zoo train.

**BEST PULL TOY ($500 in Sears Craftsman merchandise)**: Neil Seely, Rochester, N.Y., dachshund pull toy.

Photographs: John Hechtinorton
**PRODUCTS THAT PERFORM**

This simple, affordable stop ensures accurate cutoffs

Every woodworker with a radial-arm saw, or miter saw mounted in a stand, should have a stop system for cutting multiple workpieces to exactly the same length. You can make your own stop from a few scraps of wood, some simple hardware, and an adhesive-backed measuring tape. But why do it when you can buy the Sure Set Saw Gage for less than $30? This product works great and should last a lifetime.

Before mounting the Sure Set to my radial-arm saw, I had to make a fence that stands 1 1/2” above the table of the saw to accommodate the height of the stop. Once in place, the simple device worked without a hitch. It has a large knob for tightening it into place, and fine-adjustment screws on both sides. This allows you to use the stop on either side of the blade. The product comes with a self-adhesive-backed, 48” measuring tape that you can mount to the left or right of the blade.

—Tested by Bob McFarlin

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Sure Set Precision Saw Gage, $27.45 postage paid from Quinn Tool Engineering Co., 4123 Mexico Road, Suite B, St. Peters, MO 63376. Call 314/926-8004.

Continued on page 86

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PRODUCTS THAT PERFORM

Continued from page 85

Flush-sanding drum gives smooth results

Whenever I need several identical, curved workpieces, I first make a template of the shape. This way, I can bandsaw my stock to rough shape, attach the template, and rout the workpiece to the finished shape with a flush-trimming bit that works off the template's edge. This usually does the trick, but occasionally the router bit will tear out a chunk of grain, especially in highly figured stock.

Woodworker Ken Picou experienced the same problem, so he invented Robo-Sander, a sanding drum that works like a flush-trimming router bit. The product has a 3"-high, 3"-diameter sanding drum, 1/2" shank, and 3"-diameter template guide that functions like the pilot bearing on a flush-trimming bit. (You also can buy a light-duty version with a 1 1/2"-high, 2"-diameter sanding drum and 1/4" shank.)

I found that the Robo-Sanders cut much slower than a router bit, so I'll only use one when absolutely necessary. For figured pieces, such as quilted maple, I advise taking the time to bandsaw as close as possible to the layout line to save on sanding time. I'll still use my router bits for non-furred stock, but I may employ the Robo-Sander on end-grain sections where I suspect grain-tear-out problems. I'll also use the Robo-Sander for workpieces too thick for flush-trimming bits.

When using the Robo-Sander you must carefully choose your abrasives. A coarse abrasive (50-grit) will cut quickly, but will leave an edge that needs further smoothing (not a problem if you plan to rout a shape into the edge). Finer abrasives will cut slower, or possibly burn the surface, and won't cut to the same depth as coarser abrasives.

I recommend that you use the 3" version for most applications, and resort to the light-duty model only for stock thinner than 1/4".

—Tested by Chuck Hedlund

Robo-Sander, $32 (3" model) and $15 (2" unit). Add $3.50 per order for shipping. Ken Picou Design, 5508 Montview St., Austin, TX 78756. Call 512/454-3425.

Get a (good-looking) grip on your toy wheels

Just because you build toy cars and trucks out of wood, it doesn't mean you should shy away from good old rubber tires. At least, that's how I feel, especially after trying Rubbariders. These wooden wheels circled by synthetic-rubber tires offer convincing authentic looks. But besides this, I found that Rubbariders give your toys much better traction than wheels made entirely of wood, and they don't leave marks on hardwood or vinyl floors.

Rubbariders come in three diameters (1", 1 1/4", and 1 1/2"). Each wheel comes with an axle.

—Tested by Chuck Hedlund

Rubbariders, $11.95 ppd. for a 12-pack (four of each size), from The Woodworkers' Store, 21801 Industrial Blvd., Rogers, MN 55374. Call 612/428-4101.

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Special fasteners offer several advantages
When I first saw the Double T Fastener, I asked myself "Does the world really need a new type of fastener?" After giving it a thorough tryout, I think this product deserves a place in the shops of many woodworkers.

The 1¼"-long fastener has pointed ends and a shoulder area halfway between the ends. To join two pieces of stock, you hammer one end of a Double T Fastener into a workpiece using a special setting tool (the 5" hollow steel tube on the right side of the photo). Then, you align the mating workpiece and pound it into place with a rubber mallet. When working with hardwoods, I suggest you drill ¼" pilot holes, and use the fasteners like dowel centers to mark hole placements on the mating surface.

In my tests, the fasteners held strongly, but I suggest that you apply glue to the joint if you want it to remain tight under stress. This unique product comes in handy anytime you want to avoid a nail hole, such as when attaching moldings. It also works great for joining end-to-end small moldings that won't accommodate splines or biscuits.

Tested by Chuck Heidlund
Double T Fasteners, $8.99 ppd. for 50 fasteners or 30 fasteners with a setting tool. Gifts of Creation, P.O. Box 875, St. Joseph, MI 49085-0875. Call 616/429-8818.

Continued on page 88
**A top-notch mat cutter**

Like a lot of woodworkers, I prefer to make my own picture frames. And, I also like the satisfaction and money savings I gain by cutting my own mats. But, I wasn’t completely satisfied with my old hand-held mat cutter, so I tried the Alto 45° Mat Cutter. I’m glad I did.

This sturdy, ergonomically designed model fits comfortably into my hand, giving me added control and less fatigue. Unlike other hand-held mat cutters, the Alto has adjustment screws in its base for fine-tuning the position of your cut. Another screw in the handle allows you to adjust the depth of cut (especially important for making decorative, V-shaped border grooves).

The design of the Alto gave me a clear view of the exposed blade, so I was able to quickly and easily line up my cuts. With my old mat cutter, the blade plunged through the middle of the base, making me guess where the blade would enter the mat.

The tool comes with five blades and a thorough sheet of instructions. Additional 5-packs of blades cost $1.50.

*Tested by Bob McFarlin*

**Inexpensive lettering guides make for affordable words**

With my sights set on making a scrollsawn sign, I stopped by my local art store for some help. There I found reasonably priced, stencil lettering guides that helped me quickly and easily trace letters onto my workpiece.

Because of their clear-plastic construction, the C-Thru line of stencils make alignment of the letters a snap. They have smooth, die-cut edges and are thick enough to last a lifetime. You can buy the guides in 10 style types, in upper- and lower-case letters from ¾” to 10” high, as well as numbers and punctuation. You also can buy stencils with a variety of graphic elements.

—Tested by Chuck Hedlund

*C-Thru Stencil Lettering Guides, $3.75 to $29.95, depending on size of characters (most characters under 4” cost less than $6 per set). Contact the C-Thru Ruler Co., P.O. Box 356, Bloomfield, CT 06002. Call 203/243-0303.*
Bet you can’t top these new dado shims

With a quality dado-blade set, you can cut clean-as-a-whistle dadoes in any widths between 1/4" and 1 3/16", as long as you shim the chipper blades. I used to slip scraps of paper onto my saw’s arbor to accomplish this, and then I graduated to using durable, commercially made metal shims. Both of these methods take lots of time because you have to tediously remove your blades and chipper to replace the shims.

Nowadays, I use a set of plastic shims from Veritas that give me a real speed advantage. Because these flexible shims have a slot cut into them, I can leave the chipper in place when I switch shims. In no time at all, I change the width of my dado cut until I have it just right.

I checked my box of Veritas shims with a dial indicator and found all of them perfectly flat and precisely their stated thickness. The 14 color-coded shims come in their own plastic carrying case containing four shims in each of these thicknesses: .002", .010", .020", and .050" thick.

—Tested by Bob McFarlin

Veritas Dado Shims, item 05/13.01, $6.95 plus $4 shipping for orders up to $25, or $5.50 shipping for orders $25-$50. Call 800/667-2986.

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BARRELMAKING'S TOP TOOLS

TWO PLANES THAT GAVE COOPERS A HEAD START

We don't see many wooden barrels these days. But back when the staved vessels with bulging sides were the principal containers for commerce, they were everywhere, and in an astonishing array of sizes.

Cooopers, as barrelmakers were called, didn't produce just a few standard sizes. Instead, they constructed a variety of barrels to accommodate customary quantities of countless commodities. One reference lists 11 barrel sizes for gunpowder alone, eight for soap, and seven for beef—all different.

Whatever the barrel size, all coopers faced the same challenge: making round kegs from rectangular boards. That called for some tools unique to the trade. None were more specialized than a pair of planes called the howel and croze, shown above.

CLOSING A BARREL

Installing the heads was one of the last steps in barrel-making. The head’s tapered edge fits into a narrow groove (the croze) cut into the middle of a shallow hollow (the howel), as shown right. Each cut and the tool to make it shared a name—a howel gouged out the howel; a croze, the croze.

After assembling the staves, the cooper trimmed the barrel ends and beveled them on the inside. Then, he grabbed a howel.

With the howel's fence riding on an end of the barrel, the coooper swung the curved, round-sloped plane around the inside of the barrel. The uniform surface formed by the howel ensured that the croze, made next, would be the same depth all around, resulting in a tight-fitting head.

The croze had cutters like saw teeth (think of a dado set). Used the same way as the howel, it cut a narrow groove to receive the beveled edge of the barrel head.

Some howels and crozes were factory-made with iron bodies and fences, but most were shop-made of wood, often beech. Because the wooden fence became grooved with use, some coopers added metal to the face of the fence to reduce wear.

Howels and crozes faded from the trade as machine-made barrels became more common. And then with changes in product marketing and packaging, wooden barrels themselves disappeared, along with the trade.

Tools from the collection of Paul Gorham, Indiana, Iowa
Photograph: John Hetherington
There's a private mansion in Lenox, Massachusetts, with a library finished in wood. And the wood happens to be purpleheart (Peltogyne paniculata), that, true to its name and unique in the world, is purple.

According to wood historians, that 1930s' installation of purpleheart, or amaranth as it was called then, marked the first commercial use of the wood in the U.S. Today, you can still find commercial examples (although comparatively tiny ones) of purpleheart, such as in the butts of billiard cues. However, in northern Brazil where it grows, purpleheart ranks as just another common material.

Appearing brown when freshly sawn from a log, purpleheart heartwood soon takes on its distinctive hue. With continual exposure to the air, it turns a rich red-wine color, and outdoors will eventually weather to black. Yet, Brazilians couldn't care less about the color. To them, purpleheart has always been a working wood.

Because of its hardness and density, purpleheart turns easily and requires little sanding. It's also very strong and durable, so nates turn it into wheel spokes for their carts, tool handles, and parts for agricultural implements. But they also employ it as initially gaudy dock pilings, boat decks and planking, bridge timber, railroad ties, and even plywood.

You'll never see purpleheart in quantity outside of Brazil, though. That's because the wood weighs nearly 60 pounds a cubic foot. Sometimes it's so dense that logs won't float. That means that the timber must be hauled rather than rafted to the mills, and it proves to be quite a task moving logs greater than 3' long.

Illustration: Jim Stevenson

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PROJECT PLANS—Full-size patterns for over 500 easy-to-build woodworking projects. Nation's leading source for scroll saw patterns, cow projects, toy plans, yard ornaments, wood furniture, etc. Over 3000 hard-to-find specialty items. Send for your big new 80-page catalog. MEISEL HARDWARE SPECIALTIES. $2.00. Circle No. 407.

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SQUARE DRIVE SCREWS—Thousands agree—once you try them you will never want to use anything else! The square drive recess virtually eliminates warping and damage during driving. A different thread design results in exceptional holding power, and they are heat treated for strength. Sizes from 4" to 10" in 1/16" to 1/4". With stainless steel, brass, bronze plated, and zinc plated stock. Michigan, keyboard, drill sheet, and more for the craftsman! KLOCKIT. $1.00. Circle No. 2450.
Hurricane Andrew played no favorites during its rampage. Native trees, cultured landscape trees, and fruit groves alike were equally felled. And among the casualties were more than 20 species of rare, tropical trees on the 84 acres of the Fairchild Tropical Garden near Miami. But unlike most other trees downed by the storm, Fairchild’s unique trees were turned into boards. The boards—needing seasoning—were sold at auction to raise funds toward restoration of the gardens.

According to Nathan Collins, of Wood-Mizer South in Newnan, Georgia, who spent two and one-half days helping mill the wood, there were some pretty special species available. About 700 board feet of Indian elm, for instance. And 250 board feet of lacewood. Then there was yellowwood, logwood, paradise tree, and tamarind, to name a few.

Volunteers from Wood-Mizer help to turn a blowdown of rare trees into over 3,000 board feet of even rarer lumber.

IS THIS REAL WOOD?

Believe it or not, woodworkers, some folks just can’t tell the difference between fake wood and the real thing when they shop around in a furniture store. But the Hardwood Institute, based in Memphis, plans to help straighten out the confusion.

Following the lead (quite a few years’ lead) of the cotton and wool industries, the Hardwood Institute has developed a distinguishing label for products made of genuine hardwood. The new mark is being made available to manufacturers and retailers to place on their products. “It’s just that we think people have the right to know what it is they’re buying,” explains Walter Fields, Hardwood Institute chairman. “We think that if it’s made out of real hardwood—walnut, oak, or maple and such—the buyer ought to at least know that it is genuine, versus a printed piece of paper or plastic.” Right on!

ANSWERING THE CALL

At this time last year, National Guardsmen, relief agencies, and citizen volunteers were answering the call for help from those devastated by Hurricane Andrew in southern Florida and Louisiana. But businesses also responded.

For instance, the DeWalt Industrial Tool Company of Hampstead, Maryland, sent $50,000 worth of corded and cordless power tools to the inflicted areas. They also furnished roving vans that provided tool drop-offs and repairs.

Building materials arrived, too. Truck convoys from the Pacific Northwest brought donations from labor, timber companies, and grassroots groups. Members of the Northeast Lumber Manufacturers Assoc. sent over $200,000 worth of pine sheathing materials. Weyerhaeuser, Boise Cascade, and Champion gave over 30 semi-trailer loads of plywood and lumber. The Louisiana forest products industry made hundreds of tons of material available in their state. National Forest Products Assoc. president Barry Cullen called the effort “one of the most intensive emergency supply efforts ever.”

THE WORLD’S GREENEST NATION

In Finland, a country half the size of Texas, pine and spruce forests cover two thirds of the land, more than in any other nation. About 10 percent of the forested lands are protected as parks. The remainder is managed for sustained yield, and the forests’ annual growth exceeds annual harvest by 30 percent. For comparison, forests cover about one third of the United States, and about 20 percent of that is permanently protected. In 1990, annual growth of U.S. forests exceeded harvest by 37 percent (and has been over 25 percent for the last 40 years).
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Editor, Workbench Magazine

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