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See page 54

AIR-FILTRATION SYSTEMS
Page 48
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THE EDITOR'S ANGLE

A PROJECT-DESIGN TOOL YOU MAY WANT TO TRY

I don't know about you, but designing woodworking projects is not my strong suit. I can handle the woodworking part of most projects, provided I'm led every step of the way. But there better not be an incorrect dimension on a drawing or an instruction that's not clear, or it'll slow me down considerably.

That's why I'm especially appreciative of the guys on the staff who design many of the really terrific projects found on the pages of this magazine. By the time Jim Downing, our design editor, Jan Verc, the assistant design editor/project builder, and Chuck Hedlund, WOOD magazine's project builder, release a project for write-up, all the details have been tended to. That means that you and I can concentrate on the fun part: building the project.

Shortly after Jan joined the staff in 1994, I noticed that he and Jim began building full-sized or scaled models of some of the projects before construction began. I was curious about this right away, but it wasn't until the other day that we sat down and talked about this part of their design process.

It turns out that there are several good reasons why the guys use this design tool. According to Jim, building models "gives us an opportunity to test our joinery and to see how parts will fit together at an early stage. We also can take a good look at the proportions of the project before we build the full-sized prototype."

Jan adds, "It usually takes only an hour or two to build a model, and if you make a mistake at this stage, so what? Models also alert me to design problems that I might not be able to see if I were depending only on a drawing."

So how can building project models help those of us who don't design projects? Jim cites three ways. "If you're working with a plan and you're not sure the proportions are right, if you want to make a structural change to a project, or if you want to make style changes, building a model is definitely worthwhile."

Both Jan and Jim make 1/4" scale models of large furniture projects and 1/4" scale models of smaller projects, usually out of 1/4" sheet goods or solid stock. You can, too, by dividing the length and width of each project part by 8 or 4, depending on the scale you're using, cutting the parts to size, and then assembling your model.

Sound easy? It is. And model-building can save you lots of headaches in the building stage. Maybe it's time you give it a try.
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This issue's cover wood grain: curly walnut
MORE POWER LONGER.

Nothing outperforms or outlasts the new cordless system from DeWalt. With a 14.4 volt XR Pack™ extended run time battery and a high performance fan-cooled motor with replaceable brushes, they deliver the longest-lasting power for more professional applications than ever. And with their balanced, mid-handle or pistol-grip design and comfortable, non-slip grip, DeWalt’s new line of 9.6 volt, 12.0 volt and 14.4 volt Cordless Tools are easier to use day in and day out.

For more information on the most powerful line of Cordless Drill/Drivers, Impact Drivers, Hammerdrills, Screwdrivers, Saws and Chargers, call 1-800-4-DEWALT.

Guaranteed Tough.
HOW TO GET THINGS ROLLING

What woodworkers need to know

If your workshop isn’t quite large enough—and whose is—you can alleviate a lot of annoyances by making shop equipment mobile. Need to make the best use of your limited space? Want to handle materials more easily? For these and many other problems, the solution just might be as simple as putting something on wheels.

Casters provide a great way to make equipment movable, but using the wrong ones can bring you to a screeching halt. Here are five questions to help you choose the right casters for the job:

1. How heavy is the load?

Begin your quest for the correct caster by determining the weight of the load you’d like to roll around. You don’t have to accurately calculate the weight down to the last ounce; a realistic estimate is good enough. When you’re estimating, though, be generous. (The manufacturer’s shipping weight is a handy figure to use for tools and equipment.)

Take everything into account as you calculate the load. Include not only the weight of the tool, motor, and stand, but also the weight of any accessories—outfeed rollers or table extensions on a tablesaw, for instance.

Consider your usual shop practices, too. If, for example, you routinely flop full sheets of ¾” plywood or particleboard onto your tablesaw for cutting, figure on another 100 pounds of load on the casters carrying the saw.

Once you’ve determined the total weight, divide it by the number of casters you’ll be using—probably four—to find the minimum load rating necessary for each one. If you want to put four casters on a tablesaw weighing 270 pounds, each will need to support 67½ pounds. You’d be safe buying casters rated at 75 pounds, but ones tagged for a 50-pound limit probably wouldn’t hold up well under normal usage.

Determining the caster load this way assumes even weight distribution. But, the weight may be biased. For instance, the headstock end of a lathe weighs more than the tailstock end. To put the lathe on four casters, play things safe by dividing the weight by two or three instead of four. Generally, you can’t go wrong choosing heavier-duty casters for any application.

2. How do I attach the casters?

Casters commonly mount with either stems, as in Photos 1 and 3, or plates, Photos 2 and 5. Which style to use depends on the item you’re mobilizing.

Plate-mount casters are just the ticket for attaching to a solid flat surface, such as the bottom of a box or platform. Legs usually take stem-mount casters.

For a steadier stance, mount the casters as far as possible from the center of the load. Often you can improve balance and stability by

The stem on a typical light-duty furniture caster snaps into a socket like the one shown in the cutaway leg.

Here are three types of stems you’ll find. The one at left fits into a hole without a socket. The split ring on the shank holds it in place. The threaded stem screws into a ¾–16 thread on many manufactured items, but could be installed through a hole with a nut and washers. The plain-stem caster fits a socket that has a retaining ring inside.

Plate-mount casters, available in fixed-wheel and swiveling styles, mount with four bolts. Plate size, hole size, and hole spacing vary among different casters.

Continued on page 6
DeWALT's DW421 Random Orbit Sander took on all challengers and was chosen as the best all-around palm grip sander. The experts especially liked how smoothly it ran, its highly efficient dust collection system and its unique Controlled Finishing System™ that eliminates start-up scratching by keeping the sanding pad at a controlled speed on and off your work surface. Get your hands on a DeWALT Random Orbit Sander, and try the palm grip that left the competition in the dust. For more information, call 1-800-4-DeWALT.

* 1994 American Woodworker Editor's Choice award winner.
attaching them to outriggers, as shown in Photo 4.

To install plate-mount casters, simply position the caster, mark the mounting holes, and drill them. Then, attach the caster with nuts, bolts, and washers.

To install the socket for a stem-mount caster, drill a hole the size of the socket's outside diameter straight into the bottom of the leg. Drill about 1/4" deeper than the length of the caster stem. Drive the socket into the drilled hole, then snap the caster into it. Non-sOCKETED stem-mount casters fit into a hole the same size as the stem diameter.

3. What about the wheels?
How easily your castered equipment rolls around depends to a great extent on wheel diameter. Every wood chip, bit of litter, or imperfection in the floor poses a major obstacle for small-diameter wheels. Bigger ones can roll right over such things.

As a general rule, choose casters with the largest wheels possible. Plan to use casters with wheels at least 2" or 2½" in diameter to mobilize heavy shop equipment.

You'll find casters with solid rubber, plastic, or metal wheels. Any type will work for tool mobility. Rubber and plastic wheels, like those shown in Photos 1 and 3, roll smoothly across hard surfaces or carpet. They're quiet and don't mar most floor surfaces.

Metal wheels, like those in Photo 2, are designed for service on rough, hard, chip-littered floors. (That description sure fits a basement or garage shop with a bare concrete floor.) They have high impact resistance, and will stand up to a lot of abuse.

4. How do I make it stay?
Once you mobilize a piece of equipment, you have to keep it from rolling around when you try to use it. Luckily, that problem has some simple solutions.

Locking casters, like the one shown in Photo 5, provide one answer. They immobilize the equipment by preventing the wheels from turning—much the way setting the parking brake on your car locks the rear wheels to keep the car from rolling.

For greatest stability, install a locking caster at each corner. The one shown locks by clamping the frame tightly against the wheel hub. A foot lever sets and releases the brake. Another type features a brake shoe that bears against the wheel tread.

If you don't have locking casters, turn to the old, reliable chock. For convenience, make a U-shaped chock similar to the one shown right for each caster.

5. Where do I buy casters?
Most hardware stores and home centers sell furniture casters, and many stock a selection of industrial-style casters. Capacity ratings weren't stated in pounds for Asian-made industrial-type casters in some stores we checked; they were identified only as light-duty or medium-duty. The medium-duty would be a safer choice for workshop use.

Industrial-supply firms (find them in the Yellow Pages under Industrial Equipment and Supplies) usually stock a good variety of sturdy casters. Some of these companies sell to wholesale accounts only, however. And the ones that do sell to retail customers may not accept consumer credit cards or may have minimum-purchase requirements, so call ahead to be sure you'll be able to buy what you need. If you can't buy directly from the supplier, your hardware dealer might be able to order the casters for you.

Surplus or salvage stores are other good places to look for heavy-duty casters. Sometimes, you'll have to sort through a bunch of them to come up with a matching set. You may find the weight rating stamped into the side of the caster.

Photographs: John Hetherington;
Hopkins Associates
Illustration: Roxanne LeMoine
THE BEST TOOL IN THE JOINT.

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For cabinet construction, flush cuts can be made at 0° without having to remove the fence. And for fine woodworking, the fence can be located on either the inside or outside face of the mitered joint.

For exceptional features, high performance and quality construction, try the DeWalt Plate Joiner. Because superior joints come from a superior tool.

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5 SUREFIRE STEPS TO SANDING SUCCESS

OK, we’ll admit it. We don’t like sanding any more than you do. Nevertheless, we pay careful attention to this task because doing it well makes a big a difference in the finished look of a workpiece. Here’s how WOOD® magazine’s project builder, Chuck Hedlund, sands his projects to perfection.

Successful sanding actually starts before you ever touch a workpiece with abrasive. It begins when you select your stock from the local lumber supplier. By choosing pieces that are free of defects such as excessive planer marks or grain tearout, you decrease the amount of sanding you have to do to those boards. And the less sanding you do, the less likely that you’ll wind up with sanding marks. If you plane your own stock, be sure to adjust your machine properly and use sharp knives for best results. Likewise, it pays to adjust your saws properly, and to use high-quality, well-sharpened blades.

You also can spare yourself a lot of sanding by taking the time to precisely join your workpieces so their surfaces align. By doing so, you can often skip the next step and go directly to Step 3.

The sanding process often begins with a belt sander. These aggressive wood removers help you level glued-up panels, or quickly remove defects left by a planer.

In the WOOD magazine shop we use 80-grit sanding belts for 90 percent of our belt-sanding tasks. Since 60-grit abrasives leave deeper scratches, we reserve them for those rare occasions when we have to remove more than 1/8" of stock. If you have to use 60-grit abrasive, always follow that with an 80-grit sanding belt before proceeding to the next step. Whenever using 60- or 80-grit belts, move the sander with the grain only.

If a glue-up still isn’t quite flat after using an 80-grit abrasive, we use a 120-grit belt and “fan” the sander diagonally across the workpiece in two directions as shown below. Always follow this process by sanding with the grain with the same 120-grit belt.

Next, follow up with a finishing or random-orbit sander equipped with the same grit as your last belt sanding. If you start this step with 80-grit abrasive, follow that with a succession of 100-, 120-, and 150-grit abrasives.

Note: If you have a choice between a random-orbit or finishing sander for this step, we suggest you go with the random-orbit model. We find that these machines work faster than finishing sanders, but leave the surface just as smooth, and with fewer telltale “swirly” marks.

Continued on page 10
The innovative POWER PRESS™ Pipe Clamp, from the makers of QUICK-GRIP® Bar Clamps, is more than just a pipe clamp. By simply reversing the two movable clamping sections, it quickly becomes a spreader. Perfect for all kinds of woodworking applications, the POWER PRESS Pipe Clamp can do anything a regular pipe clamp can do, only faster. It works on both threaded and unthreaded pipe. And two rubber pads keep gripping surfaces from marring your work. The most versatile pipe clamp to hit the shelves, the POWER PRESS Pipe Clamp is going to revolutionize the way you work.

Look for it wherever quality tools are sold.
SANDING SUCCESS  

Of course, every rule has its exceptions. If, for example, your workpiece didn't require belt sanding to remove high spots, and it was planed precisely, you may be able to start this step with 120-grit abrasive.

Also, there are two times when you may want to stop this sanding succession at 120-grit. First, with softwoods you might find that 150-grit abrasives will clog quickly. In that case, don't use them. Second, keep in mind that sanding scratches show up less prominently on unstained surfaces. So, we often stop short of 150-grit abrasives on projects that aren't stained, just finished with a clear coat of oil or varnish.

4 Even in this power-tool woodworking world of ours, you still can't top a simple hand-sanding block for imparting a final, scratch-free appearance to a surface. Here again, start your sanding with the same grit that you used during the previous step.

To hand-sand successfully, wrap the abrasive around a flat block of hardwood. Be careful to sand only with the grain. Where the end of one piece meets the edge of another, sand right up to the intersection, as shown below, but don't cross it.

You should need to use only one grit, unless you notice that scratches just won't come out. In that case, drop down one grit. Then, go back to your original starting grit to finish up.

5 Finally, closely inspect your project for any remaining sanding scratches. It helps to use a light held at an angle to your project as shown below. Outside light through a window also works if you can conveniently move the project around in this light. If the light doesn't give you a clear indication, and you're still in doubt about the existence of scratches, you can double-inspect the surface by wiping it down with a rag wetted with denatured alcohol or lacquer thinner.

More scratch-free sanding pointers to live by
- Keep power sanders moving. If they sit in one spot for even a brief moment they will dig a hard-to-remove gouge or scratch.
- Don't start a power sander until it is in contact with the work surface. And, turn the machine off before lifting it from the surface.
- Never sand across the grain on a veneered surface. Why? You'll have to remove about 1/4" of stock just to get the scratches out.
- Softwoods scratch more easily than hardwoods. So, think twice before using a low-grit abrasive such as a 60-grit belt on softwood.
- You may have heard the expression, "Let the sander do the work." This simply means that you shouldn't bear down on a sander to make it remove stock more aggressively. The harder you push down, the greater the chance that you'll create unwanted gouges and scratches.
- Sand all surfaces of a project uniformly with the same sanding method and grit. This will help avoid uneven stain absorption.
- Vacuum dust and debris off project surfaces between sanding steps. This aids in seeing what you're doing, helps your sander work efficiently, and may prevent you from grinding loose bits of abrasive into a surface.

Written by Bill Krier with Chuck Hedlund  Illustrations: Jim Stevenson
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, 80 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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TALKING BACK

A change in the phone number
We published the wrong telephone number for Detroit Radiant Products in our September 1995 Tool Buyer's Update on page 26. The correct number is 800/222-1100. We apologize for any inconvenience this may have caused you.

Here's to woodworking and your health!
I thought I would send you a copy of a letter I sent to my doctor regarding the positive aspects of the exercise of woodworking:

"On my last visit, when you gave me a clean bill of health, you asked me what I do for exercise. When I said 'woodworking,' you agreed it has some exercise value as it involves a certain amount of reaching. I've been thinking this over, and concluded I could enlarge on the exercise, benefits, and therapy of woodworking.

"I am 71 years old, retired, and I spend between 4 and 8 hours a day in my woodworking shop. In addition to reaching, I walk, bend, kneel, stack, plane, saw, sand, sand, and sand. I twist screwdrivers and clamps, grip pliers, grasp hammers, and do many other hand exercises. I cut various joints (some by hand), assemble the work (both large and small), and again, sand (and sweep and vacuum). All this time, I rarely sit down, except for occasional trips up the stairs to visit and chat with my wife.

"I have to do calculations, make measurements, interpret plans, and make adjustments and changes of my own to each project. In the evening, I will often read woodworking magazines and books, and look through tool catalogs. And I usually go to sleep thinking about the next day's operations (on wood, that is).

"I do these physical and mental exercises 12 months a year, night or day, in rain or shine, or in the midst of a 12" snowfall. I believe there is little of my body and mind that doesn't get used in woodworking. And patience becomes more than a virtue — it is a necessity. As a bonus, when I'm finished I have a project that I can take pride in and use in my home, or give to one of my six children, six grandchildren, or to my friends."

—John C. Gavin, Schenectady, N.Y.

Don't shortchange my pasta allowance!
I enjoyed "The Spaghetti Specialists" pasta-utensils article in the June 1995 issue. But I must warn your readers that they may be placing their spaghetti pot on a diet if they drill the holes in the spaghetti measure as marked in the plans. The middle hole, at 1 1/8", won't hold twice as much spaghetti as the 3/4" hole. To get a proper double measurement, you need to enlarge this hole to 1 1/4". The 1 1/4" hole is correct, as it holds almost 3 times as much as the 3/4" hole. Remember, the area of a circle increases with the square of its diameter.

I've seen this type of error in many situations, and wonder how it originated. (Perhaps the diet police are behind it?) Anyway, I will continue to devote my life to stomping out this evil attempt to minimize the consumption of pasta.

—Harold T. McAleen, Lincoln, Mass.

Plastic washer cutter
The Shop Tip "Keep those toys rolling with plastic washers" in the November 1994 issue brought to mind a technique my brother showed me. We found a simple way to make these plastic spacer washers for our wooden toys. Make a "cookie cutter" from any hard, thin-walled tubing such as 3/4" diameter electrical conduit. Cut the tubing about 3" long, and sharpen one end with a file. I added an oversized, hardwood plug to the other end of the conduit as a pad for hammering. Place your new washer punch on flat plastic (such as a coffee-can lid), and strike it with a mallet or dead-blow hammer to cut out the discs. Use a smaller die or a paper punch to cut the axle hole in the washer.

—Gerald Peterson, Auburn, Calif.

Continued on page 16
They

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Buff
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Grind
Polish
Scrape

Ryobi's new Multi-Tool™ delivers more power than any other brand of rotary tool. When others bog down, this tool hangs tough. The Multi-Tool includes more bits, plus a carrying case. Yet it costs less. So for more power — and value — pick Ryobi.

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**TALKING BACK**

Continued from page 12

The article and pattern don’t agree

The “Collector’s Coffee Table” in the September 1995 issue has conflicting sets of measurements in the article and on the pattern sheet. The Bill of Materials and measurements in the article call for a 1¾"-square leg with a ½×3½"-long mortise. The pattern calls for a 1½"-leg with a ½×4"-long mortise. After checking the measurements of other parts in the article, I assume the pattern measurements are incorrect.

—Robert B. Josbel, St. Charles, Ill.

You are correct, Robert. Build your table using the measurements in the article. And please correct the measurements on the pattern to match those of the drawing left.

Some additional advantages of Excel glue

As a regular user of Excel glue, I felt some important characteristics of this glue were omitted from your June 1995 article “What’s New in Glues.” My northern Vermont shop is hard to heat. Consequently, I have found that Excel’s ability to successfully bond panels at 45°F to be of benefit. Other glues can’t match Excel’s ability for low-temperature curing.

Excel glue requires moisture to activate its drying agents. For wood with a moisture content of 8% or less, the glue manual recommends brushing or spraying water on the surface to be glued. I have found this to be a particularly important part of the procedure during the winter when relative humidity is low.

—Steve Edwards, Peacham, Vt.

This woodworker is starting early

The greatest testimony to any magazine or article is what the readers do with their newfound knowledge. My 3½-year-old daughter Brooke helped me build and paint the “Fanciful Furniture” toy shelf from the February 1995 issue. (This eventually became two shelf units when Daddy wasn’t paying attention and made two left sides.) Keep up the great projects!

—Bill Blaida, Naperville, Ill.
You asked for it again.
So, here it is!

Powermatic and Biesemeyer are at it again. And why not? Last year, the response to this free value added package was outstanding, and by your own request, we just made owning the best a whole lot easier. When you consider that over $300.00 worth of free options are combined with the precision, muscle, and legendary durability of the 66, a cheaper saw just won't cut it. On its own merits, the Powermatic 66 saw boasts the heaviest cast iron trunnion of any 10 inch saw on the market. It reduces vibration, ensures smoother cuts, and is the primary reason for the lifetime accuracy of this superior saw. To deliver even more horsepower to the blade, Powermatic installed a premium high efficiency two-3VX drive belt system. And the 66 saw is the only table saw in its class with a blade that tilts to the left, away from the fence (the correct way). In terms of safety, this means less chance of binding between the blade and the fence to reduce kickbacks. Also, bevel cuts are perfect every time because chipouts are on the inside corner - not on the outside.

To all this, add the perfect companion, Biesemeyer's T-Square® saw fence system. It's award-winning design utilizes only two moving parts to create an easy gliding, precision fence with a full 50 inch right hand and 12 inch left hand cutting capacity. A hairline pointer and built-in tape makes precise set-ups easier cut after cut. All of which means the Powermatic/Biesemeyer System will significantly reduce your cutting labor and wasted material. Your projects deserve the very finest cutting system available.

With the purchase of the 66 saw between now and December 31, you will receive $320.00 worth of FREE options. There's never been a better time to get the world's finest table saw system. It's the one you've always wanted. And we'll help you get it!

Call 1-800-248-0144 now for the name of your nearest participating Powermatic/Biesemeyer Dealer.
You can carve it,
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shape it, cut it,
rout it, in fact,

Corian® does almost everything wood
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Conceivably, we could have made Corian® surfaces exactly like wood. But then they wouldn’t be Corian®. You wouldn’t have your choice of colors and patterns. Options Mother Nature obviously overlooked. And without Corian® patterns and colors wouldn’t be uniform. Instead you’d have to live with the suspicion that something unpleasant lurked below the surface.

Corian® also resists nicks and scratches. Not so for you-know-what. And because it’s nonporous, stains never stick around. You can even finish Corian® in a number of finishes: from a rich matte to a high-gloss shine. So think of Corian® as your more colorful alternative. Because why confine your woodworking skills only to wood? For more information or to find out where to buy Corian®, call 1-800-4-CORIAN.

Circle No. 1120
The editors of WOOD® magazine designed this easy-to-build Corian cheeseboard with holiday parties in mind. Your kit comes with all the Corian and full-sized patterns needed to construct this multi-purpose cheeseboard in a few hours.

- Full-sized patterns with cutting diagram
- Corian cut to approximate size
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Dishwasher safe and FDA approved for food preparation, this beautiful cheeseboard made from easy-to-use Corian will provide years of enjoyment. Plus, it’s sized to easily store in the cupboard.

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or call 1-800-724-4008. Allow 3-5 weeks for delivery. Send check, money order, VISA, MasterCard or American Express. NY residents add 8% sales tax.
New shop-vacuum filter traps super-fine particles

In our April 1995 review of shop vacuums, we found that only the expensive German-made units (costing up to $650) were capable of trapping fine particles down to .3 microns in size. These super-small particles pose the biggest risk to your lungs because they remain suspended in the air for so long, and can lodge in the tiniest air passages deep in your lungs.

Now, W.L. Gore & Associates (the same folks who make waterproof, breathable Gore-Tex fabric for outerwear) have developed a replacement filter that traps 99.7 percent of particles at .3 microns in size. And it fits on the less-expensive shop vacuums found in most woodworker’s shops.

I installed a Gore Cleanstream filter on my Sears shop vacuum and tested its effectiveness with some red chalk dust. In our previous shop-vacuum test, this dust sailed through the cloth and pleated-paper filters found on less-expensive shop vacuums, but the Gore filter stopped it cold. Next, I picked up some drywall dust. The filter gradually clogged up, but also proved surprisingly easy to clean with just a few taps. Unlike the porous paper and cloth filters, the Cleanstream filter is a “surface” filter, meaning dust particles don’t penetrate its non-stick surface.

Besides working more effectively, the Cleanstream filter stands up well to water (the nemesis of most filters). I immersed my filter in water and even cleaned it with water without any ill effects to the filter.

You can purchase Cleanstream filters that fit most models of Sears, Shop-Vac, Genie, and Hoover vacuums. To mail order the Cleanstream filter that fits your vacuum call the toll-free telephone number listed below. Although these filters cost roughly twice as much as standard pleated-paper filters, the money is well spent if you’re concerned about breathing fine dust in your shop. And their sturdy construction leads me to believe that a Cleanstream filter will outlast a standard filter, possibly for the lifetime of your shop vacuum.

—Tested by Bill Krier

PRODUCT SCORECARD

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W.L. Gore & Associates, P.O. Box 1100, Elkton, MD 21922-1100. Call 800/758-6755 for more information.
Rip Fence Technology at its Best
Craftsman's New EXACT-I-RIP Fence and 10" Table Saw

Exact-I-Rip Advantage #1:
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Deluxe miter gauge has positive stops at 90° and 45°. Includes hold down clamp for more precise crosscutting.

Thin kerf carbide-tipped blade stays sharper longer than a regular steel blade for fast, smooth cuts.

Exact-I-Rip Advantage #2:
Lock the fence into place - at the front and rear - with just one lever, for consistent cutting width.

Exact-I-Rip Advantage #3:
Includes additional aluminum extension to help stabilize table for really large work pieces (such as 4x8 plywood sheets).

Exact-I-Rip Advantage #4:
Get pin-point accuracy in setting up your cuts, with the micro-adjust mechanism that lets you align the fence with precision.

Exact-I-Rip Advantage #5:
Set-up's a breeze, thanks to the high-tech thermoplastic polymer bearing surfaces built into the Exact-I-Rip fence system. The fence always slides smoothly and easily - so you can get right to work!

Cast iron table and extensions dampen vibration.
The smooth-running 3 H.P. (Max. Developed) capacitor-start, capacitor-run induction motor packs plenty of punch at 120V or 240V to cut stock up to 3-3/8" thick! Notched belt drive and spring-loaded motor mount reduces belt slippage for faster cuts.

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Think all table saws are pretty much alike?
Then you haven't checked out the Craftsman 10" Table Saw and Exact-I-Rip Fence Combo. Stock No. 29911. Together they cut the toughest jobs down to size - with an incredible new rip fence technology that gives you silky-smooth position changes, accurate cuts and a huge appetite for those large work pieces. In fact, the Exact-I-Rip fence is so terrific, we're offering it separately as a retro-fit option for other belt drive Craftsman table saws. Ask for accessory fence 29901.

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Start by opening the jaws of the clamp as wide as they will go. Then tie one end of your strapping material to the non-moving jaw of your clamp. Wrap the strapping around the project with a loose fit, tie off the other end on the moveable jaw, and squeeze the handle.

—Aaron Preisch, Lockport, N.Y.

Bent nail prevents damage to your router's guide bushing
Template guide bushings for your router can jam tight after just a little use. If you can't unscrew yours with your fingers, and you don't want to rough up the edge of the bushing with a pair of pliers, try this simple technique using a bent nail.

Drill a 1/8" hole on the edge of the bushing close enough to the center to clear the threads underneath. Then, the next time your bushing sticks, simply insert a bent finishing nail in the 1/8" hole, and push the other end of the nail counterclockwise against the center shaft on the bushing. The leverage from the nail will loosen the bushing easily.

—Henry Borger, Brooksville, Fla.

continued on page 24
Like Having A Lumberyard Right In Your Shop!

Craftsmen everywhere are using the low-cost Woodmaster to bring in welcome extra cash and to save on all their lumber needs. You can, too!

With the big 18-in. Woodmaster or the standard 12-in. model, you can quickly convert low-cost, rough lumber into valuable finished stock. You can turn out perfect picture frame moldings, crown, bed and base moldings, tongue & groove, door and window trim...all popular patterns...any custom design.

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[Form for requesting information]
Keep glue-ups flat with these toothy clauls

Build two or three of these serrated clamping clauls and you can prevent a lot of sanding due to uneven glue-ups. The serrated teeth provide even pressure across the workpiece so the boards don't ride up on each other when you tighten the jaws of your bar clamps.

Start by cutting the 1½x3" clauls 8" longer than the width of the panels you wish to glue-up. To prevent dents in the workpiece, use a softwood (like white pine). Run the edges that touch the workpiece over a jointer to ensure that they are perfectly straight. Next, cut the 45° tooth serrations about 2" apart and ½" deep. Finally, drill the vertical holes in the end for the carriage bolts, and attach the hardware.

To put the clauls to work, apply glue to the edges of your boards and assemble them, but without tightening the bar clamps. Put wax paper between the clauls and the workpiece to prevent the glue from attaching the clauls to the workpiece. Now, tighten the plastic knobs on the cauls, and then squeeze the boards together with the bar clamps.

—Jeffrey Anderson, Melbourne, Fla.

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Fine Woodworking JUN '91, page 81

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—Ernest Guerra Jr., San Antonio, Texas
Discover the World’s Most Creative and Satisfying Hobby... Build a Historic Wooden Ship Model!

Even if you’ve never built a model before, you can experience the pleasure and pride of accomplishment wooden ship modeling offers. You can build the two-masted schooner pictured here—a true-to-scale replica, decked out with gleaming brass fittings, delicate rigging—like in every detail.

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Sanding an even radius on workpieces like those used in the Young Artists Activity Center, page 70, can be tricky, especially if you're doing it freehand. But you can take the guesswork out of this process in a hurry with this quick-fix jig. To use the jig, you'll need an oscillating spindle sander or a drum sander attached to a drill press.

On the edge of a piece of 3/4" plywood, cut out a half circle that will accommodate your largest sanding drum as shown below. From the edge of this half circle, measure to a point 3/8" short of the radius to be sanded, and bore a 3/4" hole where shown. Now, glue a 3/4" dowel in the hole. The accuracy of the jig depends on the dowel standing 90° to the plywood, so leave the dowel long enough to check it with a square. After the glue dries, you can cut the dowel to a shorter length.

Next, mark the radius on the workpiece, and cut the curve just outside the line. Bore a 3/4" hole at the center point of the radius and slip the workpiece over the dowel. Adjust the plywood so the sanding drum just touches the long edge of the workpiece. When the jig is positioned correctly, clamp it to the sanding table, turn the sander on, and rotate the workpiece into the drum to sand a perfect radius.

If you don't want to bore a hole completely through your workpiece, you can bore the hole halfway through the stock, and cut the dowel just short of this depth. For smaller workpieces, you'll want to use a dowel with a smaller diameter.

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The 3D Router Carver System is a unique patented method of producing intricate carvings quickly, economically and with complete repeatability. With the Carver Bit, Carver Templates and your 1/2" collet plunge router you can carve any flat wooden surfaces with designs that rival the work of a professional carver. In fact, the 3D Carver System's speed, accuracy and economy make it equally attractive to the professional or the serious amateur. Besides your router, the system includes three key elements:

1) The 3D Carver Bit: A 1/2" shank, carbide tipped V-Groove Bit is encased in a 45° guide bushing. A threaded shaft within the bit's shank allows precise depth adjustment of the tip of the V-Groove bit.


2) Template Holding Frames: Clamped or locked to your workpiece, these frames hold the 3D Templates accurately in place.

3) Carver Templates: A total of 46 templates (with more in the works) produce a host of designs for cabinet doors, panel doors, door rails and corners, drawer fronts and many other applications.

How does the system work?

Using the 3D Carver is easy. The bit is installed in the router (1/2" collet only) with the plunge mechanism unlocked so that the router can move up and down as you route. The 45° bushing follows the slots in the template. As the slot gets wider, the router moves downward, so the v-groove gets wider. As the slot narrows, the router moves up and the groove gets narrower. That's it!

How do I get started?

We've made that easy. With a great introductory offer on two of our most popular designs. Our Classical Kitchen Set includes templates and holding frames to make the beautiful Kitchen Door and Drawer Front shown at right, plus a 3D Carver Bit, complete instructions and a free copy of our 3D Carver video. You'll save 20% off our regular prices! We also offer Kitchen Sets in five other designs, plus patterns for four-panel doors, door rails, rosettes & more, so be sure to ask for our complete catalog.

499-010X Classical Kitchen Set with 3D Carver™ Bit & free video!
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The 3D Carver System™ & Templates are protected by U.S. patent 5,146,965 & international patents.

The color orange on router bits is a registered trademark of CMT Tools.
Dealing with cracks in old timbers

Having heard that “old timers” made duck decoys from cedar, I purchased a 6 x 6” cedar beam at a “barn” sale. I then cut a decoy blank to shape with my bandsaw, and roughed out the head. The next day when I returned to work on this carving, I found the blank had developed a diagonal crack along its entire length. Now, I’m wondering, does wood get too dried out or old to use?

—Bruce Felting, Galloway, Ohio

It’s possible that wood can get too dry to use. However, it’s more likely that these cracks developed as a reaction to sudden stress changes in the wood brought on by cutting it from the beam.

It’s fairly common for building beams to enclose some pith (wood from the center of the tree). And your description of the crack in your decoy suggests the beam you bought includes pith. As a log shrinks while drying, stress-relief cracks will develop in the faster-drying outside wood, and move toward the center wood or pith. The faster the wood dries and shrinks, the larger the cracks will be. You can reduce the chances of cracking or checking in your wood by removing the pith from the wood you are drying.

Sawmills seldom cut the center sections of a log into lumber because of checking problems. However, these remaining center “cants” often become fence posts or other timbers, where the checking and cracking has little adverse effect.

There are a couple of ways to work around the problem of enclosed pith. First, we recommend cutting several decoy blanks to rough length from the beam. Allow these shorter sections to sit for a few days to adjust to the changes before roughing them into decoy forms. This allows the wood a more gradual adjustment to stresses, and the pieces with a tendency to crack may well do so at this point. Select the best of these sections for carving into decoys.

The cracked sections can sometimes be salvaged by splitting them lengthwise along the crack, followed by fastening the outside faces together to reform the block. Joint the outside faces, and glue the pieces together with a waterproof glue (see drawing left). This technique moves the pith to the outside of the block where it can be removed while carving and shaping the decoy.

Imitate ebony with aniline dye

My daughter-in-law asked me to build her a dining table with a top of white ash and legs and aprons made of ebony. However, I found the cost of ebony to be beyond my means. What can I use to obtain the even, dark-black look of ebony with a less-expensive wood?

—Clifton Myll, La Quinta, Calif.

Musical-instrument builders use an alcohol-based black aniline dye to color pearwood and other closed-grained hardwoods, and to even out the color of ebony. This dye penetrates the wood fibers, resulting in an even black color on the wood when dry. For pieces the size of your table legs and apron, we suggest you try this dye with yellow birch or hard maple. Both of these woods have a tight, closed grain, and will approach the appearance of ebony after being dyed.

To use aniline dyes, first sand the wood smooth, working through a series of abrasive grits and ending with 220-grit sandpaper. Then, apply the aniline dye with a foam-type brush, using overlapping brush strokes. Recoat with the dye if needed to obtain the even black color, and, when dry, seal the table with a clear-coat finish.

A 2-oz. container of black alcohol-soluble aniline dye powder, item # 99P06.10, costs $7.50 plus shipping from Garrett Wade Company, Inc., 161 Avenue of the Americas, New York, NY 10013. Call 800/221-2942.

Continued on page 35
The Adventures of Dusty Pyles

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Redwood frustration
I have some very good-looking, straight-grained redwood that I have used in a number of projects. However, I am having a problem finding a glue that will hold this wood together. I built a blanket chest with dovetailed joints and am having a lot of problems with the joints coming loose with the slightest stress. What glue should I use?
—Jim White, Grandview, Wash.

Jim, any good woodworking glue will adhere to redwood. We suspect the problems you are having with the joint failure on your blanket chest are more likely due to fiber separation of the redwood than a failure of the glue joint itself.

The lighter-colored, soft and porous earlywood in the annual rings of redwood will readily absorb glue, while glues don't bond well with the much denser and darker-colored latewood. The transition area from earlywood to latewood also has very little shear resistance. Consequently, when stress is applied to a glued redwood joint, the soft earlywood separates from the latewood, and then the weak fibers of the earlywood separate from the hardened glue.

A mechanical reinforcement of the dovetail joints should help solve this problem. Drill a 1/8" hole as far into the dovetails as your drill will allow, from the top and bottom of the joint. Then, apply glue to these holes, and reinforce the joint with a 1/4" dowel (as shown above) driven into each hole.

Continued on page 36

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The other side of the fence
I am thinking about purchasing an aftermarket fence for my Sears Contractor tablesaw. However, many of these fences seem to be used only on the right-hand side of the blade. My original fence can be used on both sides of the blade. Can you give me an example of when I would use my fence on the left side of the blade?

—Theodore A. Baca, Evans, Colo.

You can use the aftermarket fences on either side of the saw blade, depending on how you mount them to your saw. On many tablesaws, these fences are set up with most of their ripping capacity to the right of the sawblade.

We can give you at least two reasons for operating a tablesaw with the fence on the left side of the blade. First, a left-handed woodworker may find this set-up more comfortable and convenient to use than the traditional arrangement with the fence to the right of the blade.

Second, you may want to position the fence on the left side of the sawblade when bevel-ripping long boards on a tablesaw with a right-tilting blade. However, your Sears tablesaw blade tilts to the left, so you can make these cuts on your saw with the fence to the right of the blade.

For our readers who use a tablesaw with a right-tilting blade (Delta, for example), we recommend moving the fence to the left side of the blade for making long beveled cuts. This allows you to more safely pass the wood through the blade with little chance of binding.
WOOD ANECDOTE

WITCH HAZEL The tree of the water witch

Never growing more than 30' tall and with a thin trunk that removes its hard, close-grained wood from consideration as commercial timber, the witch hazel (Hamamelis virginiana) nonetheless may be the most interesting tree of North America. It has associations with missiles, medicine, and magic.

In its extensive range from Canada’s maritime provinces south to Florida and west to Iowa, it is the tardiest of trees. For instance, witch hazel’s delicate golden flowers appear in late autumn, after its faint yellow leaves have dropped. And the fruits that followed last season’s flowers only then completely ripen. But just before the snow flies, the fruit ensures witch hazel’s continued existence by ejecting, like missiles, its tiny seeds. They travel 25’ or more!

However, it wasn’t propelling propagation that attracted settlers to the witch hazel. An aromatic plant, the tree was thought to have medicinal qualities, and extracts of its bark, leaves, and twigs were touted as curative. Although this assumption proved false, witch-hazel extract became a popular ingredient in cologne.

To the new arrivals, witch hazel also seemed to resemble the familiar European hazel, which was said to have magical powers. Legend had it that witches could use the hazel tree to locate both wealth and water. So it wasn’t uncommon to find someone “witching” for water with a forked hazel branch.

The divining rod had to have grown so that one of the forks had faced north and the other south for exposure to rising and setting sun. With a fork in each hand, the water finder let the branch feel the “pull” of hidden water and bend in that direction.

Illustration: Jim Stevenson

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<th>Item #</th>
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<tr>
<td>1/2&quot; Shaper</td>
<td>#1903</td>
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### ROUND OVER BITS

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<th>Size</th>
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<td>1/8&quot; Radius</td>
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### TONGUE & GROOVE BITS

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### FLUSH TRIM BITS

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### PATTERN/FLUSH TRIM BITS

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### OGEE RAISED PANEL BIT

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### BULL NOSE BITS

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### KEYHOLE BITS

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### 45° CHAMFER BITS

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### 14° DOVETAIL BITS

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<tr>
<td>1/2&quot; Large Diameter</td>
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<tr>
<td>1/2&quot; Depth, 1/8&quot; Height</td>
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<tr>
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MERANTI

Frequently called Philippine mahogany, this wood isn't mahogany at all

Identifying, classifying, and naming native American hardwoods becomes child's play compared to the complexity involving what many of us refer to as Philippine mahogany. You see, in the world timber trade, the wood of many species with similar characteristics can sometimes be lumped together and sold under one name. That's the story behind Philippine mahogany.

The Philippine Islands, as well as Malaysia, Indonesia, and Southeast Asia, produce a great variety of hardwoods. But the most volume comes from a group of tree species known commercially as Philippine mahogany, due to the appearance of their lumber and the fact that the word mahogany is widely recognized. However, none of these species belong to the family Meliaceae that includes the New World mahoganies of the Swietenia genus, such as Honduras mahogany.

Generally, the trees that supply the timber for Philippine mahogany lumber and plywood belong to the huge plant family called Dipterocarpaceae. And in that family, the Shorea species has five distinct, commercially important trees named meranti.

Wood identification

In the Philippines, as well as elsewhere in their range, Shorea trees might be called red or white lauan, tangile, almon, as well as the descriptive "dark-red meranti" or "light-red meranti." But it is meranti (Shorea spp.) that makes up the greatest proportion of timber that's sold as Philippine mahogany. (Note: In botanical science, the letters spp. after the genus name means that several species in that genus share similar appearance and characteristics, e.g. Shorea spp.)

Meranti traditionally grows in well-drained soils at low altitudes. In ideal conditions, a meranti tree can reach a 200' height and a trunk diameter of 6'. A lumberman's dream, it will also be branch free for 90'. The bases of some trees feature the vanelike supports called buttresses.

Light-red and dark-red meranti produce medium-to-coarse textured wood that ranges in color from pale pink to brown and reddish-brown. The grain may be slightly interlocked.

At about 36 pounds per cubic foot air-dry, meranti is heavier than Honduras mahogany. However, it is not nearly as hard nor as strong, and lacks the durability and stability of a true mahogany. And you may find brittleness in some boards.

Uses in woodworking

Meranti represents a wood of world-wide commercial importance. As veneer, much of it becomes plywood, plywood paneling, cabinets, and hollow-core doors. In lumber form, meranti is worked into light structural framing, moldings and trim, and low-cost furniture. Meranti has little durability in outdoor projects.

Availability

Home centers and lumber retailers widely stock meranti plywood in a variety of thicknesses. Already milled, it is available as moldings and other interior trim parts. As lumber, you can buy select and better meranti (sold as Philippine mahogany) in up to 2" thickness for about $2.50 per board foot. Veneer should cost about 25 cents per square foot.

Continued
meranti
(Shorea spp.)

If you have ever machined genuine mahogany, which has been called the wood by which all other woods are measured, meranti will let you down. However, it does not possess any characteristics that could become particularly irritating. Follow these tips for woodworking success.

Machining methods
- Medium-to-coarse-grained meranti rips easily, but unless you use a smooth-cutting planer blade, expect to find a rather rough sawn edge of tiny fibers that require sanding to remove.
- Plane meranti to thickness by taking shallow cuts to avoid chipping and tearing.
- Not as hard as mahogany, and a bit brittle, meranti tends to easily tear out or splinter in jointing. But unlike some types of pine and fir that yield long splinters, those of meranti tend to be short.
- Crosscutting with either hand or power tools requires a fence or backing board on the exit side to prevent splintering, known as tearout. This also applies to routing across the grain. Always use sharp bits and blades for the least amount of aggravation.
- On the scrollsaw or with a jigsaw, avoid ragged cuts by sawing with a fine-toothed blade.
- Meranti, unlike some tropical woods (teak, for instance), does not contain extractives or traces of silica, so all types of woodworking glues work well.
- Screws (predrill for these) and nails hold well in meranti.
- Although this tropical wood accepts all types of stains and finishes, you should fill its open grain to obtain the smoothest, most attractive surface. Meranti holds paint well, too, but either fill first or use a good primer coat over its open grain.

Carving cautions
- Makers of classical furniture loved genuine mahogany because it could be carved in intricate detail. Not so with meranti. Chipping, occasional brittleness, and its open grain defeat attempts at fine detail that you might want to create.
- To avoid chipping, power carvers should use the less aggressive bits when working meranti.

Turning tips
- Round down meranti with a 3/4" gouge and a lathe speed no faster than 1,000 rpm to reduce chipping the wood.
- The open grain of meranti tends to collect finishing material if you apply it while the wood is spinning. The result is a wrinkled surface. You'll have better luck turning off the lathe to finish.

SHOP-TESTED TECHNIQUES THAT ALWAYS WORK

Any exceptions—and tips pertaining to this issue's featured wood species—appear under other headings elsewhere on this page.
- For stability in use, always work wood with a maximum moisture content of 8 percent.
- Feed straight-grained wood into planer knives at a 90° angle. To avoid tearing, feed figured or twisted grain at a slight angle (about 15°), and take shallow cuts of about 1/2".
- For clean cuts, rip with a rip-profile blade having 24-32 teeth. Smooth crosscuts require at least a 40-tooth saw blade.
- Avoid using twist drills. They tend to wander in the wood and cause breakout. Use Brad-point bits and a backing board under the workpiece to reduce wood tearout.
- Drill pilot holes for screws.
- Rout with sharp, preferably carbide-tipped, bits and take a few shallow passes to avoid burning the wood.
- Carving hardwoods means fairly shallow gouge bevels—15° to 20°—and shallow cuts.

MERANTI AT A GLANCE

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Look-alike: Honduras mahogany, African mahogany
THE MAN OF MANY MEDIUMS

Soft-spoken artist/craftsman Wayne Edwards lets his work do the talking

The first time I saw the 12'-tall bronze King Neptune sculpture/sundial shown above, I remember commenting to my wife: “WOW! The person who created this is really talented.” I didn’t realize how much so until four years later when we returned to Hilton Head Island, South Carolina, for vacation. By accident, I happened onto another of Wayne Edwards’ pieces of art. Only this time it was an impressive 18'-tall mahogany carving above the altar in Holy Family Catholic Church.

As I talked with the pastor about the carving, he just happened to mention that the same guy who did the carving also had done King Neptune. I was hooked. I just had to meet Wayne. And now you all can, too.

Continued on next page

Large photo: “This 25'-diameter bronze sundial, correct down to a minute or less, took me 1 1/2 years to complete. The company that commissioned the work wanted me to put a fence around it, but I feel that people should be able to make contact with it.”

Inset Oval: “A little bit over life size, this piece is carved of ash. I polychromed (colored) virtually the whole figure in flesh tones and of course some fabric and other details. It took me about four months to complete.”
THE MAN OF MANY MEDIUMS

Portrait of the artist—the early years
Growing up in a rural setting near his hometown, Charlotte, North Carolina, Wayne Edwards never gave much thought to being anything but an artist. His carpenter/builder father, perhaps unintentionally, instilled in Wayne a love of building and working with wood. "It was more a matter of watching the things he did and helping him rather than any structured instruction," Wayne offers.

Wayne and his folks didn't get to town very often, so he dreamed up lots of ways to entertain himself. That's how he got into doing things like building treehouses. He built his first one when he was 8 or 9 years old. "I designed them myself as I went, and whenever I needed some manual labor done, I'd recruit some of my neighborhood cronies to do the lifting," says Wayne.

School never was Wayne's thing. He spent the high-school years "mostly goofing off." And the closest he got to art education consisted of one day a year having some paper passed out and being asked to draw something. "I got in good with everybody in the class because I always did their assignment," Wayne chuckles with amusement.

Wayne, now 52 years of age, attended a private four-year art school in Sarasota, Florida, for 1½ years. That was long enough for him to meet his wife-to-be, Ceil, and to decide that he wanted to practice some of the skills he had learned in the classroom out in the real world.

"Actually, I wasn't ready for school," says Wayne. "If I had had any idea what I wanted from school, I'm sure I would have learned more than I did.

"Looking back on it now, though, art school was a great experience. I was around a lot of people who had a lot of talent and who were experimenting with lots of things."

"The next Michelangelo" meets the real world
When he left school, Wayne still was thinking in terms of being an artist of great renown, but that hasn't been the way it has turned out. "I've kind of found out that I get more satisfaction sometimes from doing more practical things, coming up with solutions to practical problems. It's almost more of a challenge to be on a playing field that has lines on it instead of there being no rules, which is the case often with fine art."

After Ceil and Wayne got married and decided not to be art students anymore, they moved back to Charlotte, where Wayne started working with his father building houses. After a couple of years of that, he got involved in doing some three-dimensional display work—similar to what the Disney folks do.

That lasted for about eight years. Then, he quit that job and started doing some woodcarving. He eventually opened up a woodcarving studio in Charlotte, doing commission work.

For the past 20 or so years, though, Ceil and Wayne have been making their living in and around beautiful Hilton Head Island, South Carolina. Wayne has

Right: "A few years ago I did a large sculpture for Maryland using Vermont marble, and had a pretty sizable piece leftover. It turned out to be just the right size for this dolphin sculpture. It took me about two weeks to complete and weighs about 200 lbs."
Left: “When I start on a project like this treehouse, I have basically no idea what it is going to look like when it's finished. I just stand up poles, connect them at some logical elevation, and build the first platform. I've built about 80 treehouses in this country and abroad. I like doing them because I can play like a kid and get paid for it. What more could you ask for.”

Note: Built around a live oak tree, this tree house stands about 35' tall.

"Believe it or not, in many cases, it's much easier to work with stone than it is to carve wood. Why? Because you're not dealing so much with grain and with a more unstable material. You don't have to worry about it splitting or cracking or whether it's seasoned correctly or whether you're using the right kind of wood for the project at hand."

A fascination with scale—large and small

Much of Wayne's work, from his multi-story treehouses like the one shown at left to the miniature playhouse he and Ceil made for their grandkids (shown below left), reflects his interest in scale. "I think what fascinates me the most is having to deal with the technical problems involved," says Wayne. "Working big—bigger than life—can be a problem. If you get close enough to work on it, you can't see what you are doing. You can't see the whole."

He further illustrates his point by talking about one of the grandest of all stone monuments. "If you are carving a Mount Rushmore, you've got to be as much an inventor as an artist because you've got to invent a process that hasn't been invented before. You can't just walk up to a mountain with a hammer and a chisel and start to work without a master plan.

I would have loved to have worked on something like Mount Rushmore. Just think of the satisfaction you'd get from figuring out how to remove that much stone in that length of time (14..."
years). And they did it without actually blowing the whole top off that mountain. Amazing!

At home in the coastal marshlands
By almost every measure, Wayne Edwards literally has it all. There's the flexibility and the freedom from the 8 to 5 workaday world most of us find ourselves in. Then there's the quaint, low country-style house overlooking the meandering Okatie River. And he's been fortunate enough to have found enough commissions of varying types over the years to keep food on the table and to keep him interested as an artist.

Has all of this turned out as planned? "Not really," says Wayne. "I've just kind of gone where somebody asked me to go, and done what somebody asked me to do. Don't get me wrong; there's nothing wrong with making plans. But you have to be willing to change them when the time comes. Otherwise, you'll beat your head against the wall trying to make them come true.

"There is one thing I would like to do sometime in the future, though. And that's to build a treehouse for Cell and me to actually live in. That would be great!"

Left: "I built this about 10 years ago for Cell as a Christmas present, mainly because of her interest in Noah's arks. Now, whenever I need a present in a hurry, I rush out and get a pewter figure for the ark."

Below: "In this 4x7 scene—the Ascension of Christ—I carved the disciples on the ground in the foreground and have the figure of Christ rising above. The background for the work is an oil painting."
Wayne's advice to would-be commercial artists

- You'll need to be versatile to make it financially. If someone wants a woodcarving done, you've got to be a woodcarver. If somebody wants a metal sculpture or a stain glass piece, you've got to go with that.

- Being disciplined is a must. You've got to be able to deliver the goods on time.

- Having the freedom to make choices you otherwise wouldn't be able to make is the best thing about being a commercial artist. I've had friends who say to me, "I don't know how you could sleep nights not knowing what exactly is coming next month or next year." And I say, "I don't know how you can sleep nights knowing exactly what is coming."

- Prepare yourself for some dry spells between jobs. And take advantage of the slow times by learning something new. It may come in handy sometime. Keeping yourself busy also keeps you from getting panicky about not having any work.

- Don't count on being rich and famous. It's mostly hard work.

Left: "This 18'-tall mahogany has relief carving, which hangs behind the altar in Holy Family Catholic Church in Hilton Head, S.C., is one of my favorites. A nun who was visiting there suggested the idea for the carving, and I did a small clay model to show everyone what it would look like. After I got the go-ahead, I spent six months doing the project. It's probably about six inches thick."

Left: "Being one-quarter Cherokee myself, I've always had an interest in Native Americans. This, combined with my fondness for working with clay, led me to create a series of 17 busts, most of which are historically accurate."

Written by Larry Clayton - Photographs: Bill Litell
AIR-FILTRATION SYSTEMS

Another Weapon in the Battle Against Workshop Dust

In the past year you’ve probably noticed a lot of advertising for a new category of products called air-filtration systems. So have we. To find out exactly what these products do, and which ones do it best, we ordered five popular models priced between $219 and $309. Here’s what we discovered.

How an air-filtration system can work for you

As you’ll see in this article, there’s nothing sophisticated about air-filtration systems. All of them consist of a sheet-metal box that you mount to any centrally located surface, such as a wall, ceiling, or shelf. Inside these metal boxes you’ll find a “squirrel-cage” blower that moves air through two or three filters. There’s also an on/off switch and power cord. That’s it.

Although simple in construction, air-filtration systems perform a valuable service by removing the superfine wood dust that hangs for long periods of time in your shop’s air. Although you cannot see some of this fine dust, it can do serious harm to your lungs. And, this dust eventually settles on shop surfaces, where it can easily be stirred up and put back into the air. It may even settle on the surfaces of your freshly finished projects.

Although our tests revealed that air-filtration systems do a good job of removing airborne dust, they are not a total solution to workshop dust. You also need a dust collector or shop vacuum for capturing the bulk of sawdust at the

How to select the right system for your needs

The air-filtration systems we tested advertise that they move between 350 and 500 cubic feet of air per minute (cfm). To find out for ourselves how much air each of the units moves under actual workshop conditions, we did our own cfm test. First, we subjected the units to the same amount of dust by mounting their inlet side to an opening in a plywood test chamber as shown right. Then, we created a cloud of dust in the chamber and allowed each air-filtration unit to run for a set amount of time. We repeated this procedure until the filters became dirty, but not totally clogged. Next, we shook the filters as clean as possible—just as you would do in your shop—and reinstalled them. We then took our cfm readings. As you can see in the chart at the end of this article, under the “air flow” heading, the systems ranged from 250 to 410 cfm under our testing conditions.

Besides telling you how well the various units move air, these ratings also help you buy an air-filtration unit that’s sized to meet your needs. To do this, determine the cubic feet of air in your shop, then divide that number by the cfm of the unit you intend to purchase. The resulting figure is the approximate number of minutes that it will take that unit to change your shop’s air once.

For example, let’s say you have a 20’×20’ shop with an 8’ ceiling. The number of cubic feet equals 20×20×8, or 3,200 cubic feet. Now, say you’re planning to buy the Penn State

We built a plywood test chamber and used it to subject each air-filtration unit to equal amounts of dust.
machine producing it. And, since it takes any air-filtration system some time to completely clear your shop's air, you should still wear an approved dust mask to protect yourself completely during and after you operate a dust-producing machine.

AC 460, which we tested as moving 410 cfm. Dividing 3,200 by 410 yields 7.8, the number of minutes for one air change.

Of course, the faster that such a machine cleans your shop’s air, the better. We recommend that you only consider a machine, or combination of machines, that requires no more than 10 minutes to change your shop’s air.

If none of the tested units appear large enough for your shop, you can buy larger versions from JDS, Penn State, Total Shop, or Trend-Lines. Or, for better air circulation in a big area, you can purchase more than one unit and position them at different spots in your shop. (You should locate an air-filtration system centrally, but as close as possible to where most fine dust is made, such as your sanding work area.)

What you need to know about filters

Except for the Hartville Tool unit, all of the tested machines have two filters on their inlet sides. The first filter, typically a 1"-thick version of pleated fabric or foam, traps most of the large dust particles. As shown below, a bag-type filter sits directly behind the first filter. It traps particles down to 1 micron in size. These filters cost about $30 to replace, and damage easily when you clean them, so the first filter serves mostly to keep the bag filter from clogging prematurely. The Hartville machine has a similar setup, but adds an inexpensive fiberglass filter (like the $1-2 versions for home furnaces) in front of its pleated filter (see photo A on the next page). We found little advantage to the three-filter setup.

Two of the tested units, made by JDS and Total Shop, have diffuser filters on their outlet sides, like

Thin prefilters capture the bulk of dust before it reaches the expensive bag filters. You can clean the Penn State prefilter shown here by spraying it with water.

Continued

PREFILTER

BAG FILTER
The outlet on the air-filtration unit from Hartville Tool consists of a mesh of small holes in the metal cabinet. The one shown on the JDS unit on the previous page. These disperse the flow of air from the cabinet, and prevent strong air currents that might chill you or kick up settled dust. They also muffle the noise level of the machine slightly. As shown in Photo B, the Hartville unit has an outlet that consists of a mesh of small holes in the cabinet. This disperses the air somewhat, but not as effectively as a diffuser filter.

In place of a diffusing device, the Penn State and Trend-Lines units have louvered outlets as shown in Photo C. Air blows strongly through these openings, but you can direct it with the louvers. We found this arrangement handy for boosting air circulation in larger shops. Conversely, the units with diffuser filters seem better suited to smaller shops (under 3,000 cubic feet) where drafts can be more annoying than helpful.

Depending on how much time you spend in your shop, and how much dust you put into the air, you'll probably find yourself cleaning the filters every 2 to 12 months. You'll find it easy to change filters on four of the tested machines. For example, with the JDS unit, you simply open a door and remove the filters as shown in Photo D. However, the construction of the Total Shop unit complicates this task considerably. As shown in Photo E, with this machine you must first remove sheet-metal screws that fasten the filters to the cabinet sides. Then, you have to cut a bead of caulking that holds and seals each filter in place. After cleaning the filters, you need to recaulk them into place. This restores the seal, and in the case of the metal-framed bag filter, helps add rigidity to the cabinet.
More points to consider

*Motors*
Four of the tested units have the same Dayton blower and motor. It doesn't require lubrication, but the Fasco blower and motor found on the Hartville Tool model requires a few drops of oil from time to time. All of the motors were easy to access.

*Cabinets*
We found all of the cabinets sufficiently solid, but the JDS was the most rack-free. The Hartville Tool, JDS, and Total Shop models are made of 18-gauge painted steel. The Penn State and Trend-lines units are made of galvanized sheet metal, like the ductwork in your home's heating/cooling system.

*Switches and cords*
We found all of the switches somewhat lacking because none of them seem well-suited to what we suspect is the most common form of installation—on a ceiling. Mounted this way, many of us would need a ladder to reach the switch. For this reason, we replaced the cord-mounted rocker switch on the Penn State unit in IDEA SHOP® 2 with a pull-chain switch on the cabinet.

Another good option you may want to consider is plugging the unit into a switched outlet on your ceiling. If you feel you have the necessary electrical skills, you can wire the switch to a timer so the air-filtration system stays on for a set amount of time, say 10 minutes, after you leave the shop.

Only the Hartville Tool model comes with a lighted switch. This proved handy as a visual reminder that the unit was running at times when the noise in our shop drowned out the blower noise.

Four of the units have 80 or 100-pound power cords. The cord on the Total Shop machine was markedly shorter at only 32'.

Thinking of building your own?

If you would like to design your own air-filtration system, you can purchase blowers and filters like those shown in this article. Just call a commercial-supply house such as W.W. Grainger (it has branches nationwide).

In the October 1992 issue of WOOD® magazine, we show how to build a mobile air-filtration cabinet that moves over 1,000 cfm of air and doubles as a tablesaw outfitter. For a copy of this article, send $2 and a stamped, self-addressed envelope to: Air-filtration cabinet article WOOD magazine 1912 Grand Ave. Des Moines, IA 50309-3379®

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**FRESH FACTS ABOUT AIR-FILTRATION SYSTEMS**

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**NOTES:**
1. According to a WOOD® magazine test conducted by an independent, certified professional engineer.
2. Air flow measured in cubic feet of air moved per minute (cfm).
3. Prior to test, all filter systems were equally subjected to wood dust, and then shaken clean to determine actual workhorse use.
5. (R): Rigid.
6. (S): Synthetic/nylon.
7. (C): Cartridge.
8. (F): Parentheses.

**COMMENTS:**
The most compact unit, and the only one with a lighted switch and built-in circuit breaker. Solid, rack-free cabinet. Well designed, but we wish its bag filter had more surface area.

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Written by: Bill Krier Photographs: John Hetherington Illustration: Brian Jensen
OIL-FINISH
How to safely handle materials

Last November, the television program Dateline NBC carried an alarming report on spontaneous-combustion hazards related to linseed oil—a chief ingredient in several wipe-on oil finishes. Graphic footage of burned homes and the people who perished in them made for some emotion-provoking programming. But, the show seemed biased against linseed-oil-based finishes. After all, thousands, if not millions, of woodworkers have used linseed oil without problems for a great many years. To get the full story here, I investigated this controversy myself. Here’s what I discovered.

Print this article

How drying oils can spontaneously combust
There’s no way around it. When you finish projects with so-called drying oils, you generate a number of rags soaked in the material by either applying or wiping up excess oil. (We’ll tell you what specific products are considered drying oils in the next section.) As the finishes in these rags dry, they absorb oxygen and release heat. Unless this heat has a way to escape, it can build up to the point that a fire starts. Most incidents of spontaneous combustion occur when someone disposes of oil-soaked rags by wadding them up and tossing them in a trash can. To find out how to correctly dry the rags, see the last section of this article, “Here’s the proper way to dispose of oily waste.”

Drying oils you should know about
For expert advice on this subject, I spoke with Roger Petty, director of manufacturing for Sunnyside, a producer of finishing oils and solvents. Petty told me that “linseed oil is just one of several drying oils that can create a spontaneous combustion problem. Other drying oils include walnut oil and tung oil. Sunnyside products such as acetone, mineral spirits, and lacquer thinner pose no spontaneous combustion hazard, but their vapors are flammable.”

On today’s market you’ll also find a number of so-called “Danish” oils that are typically a blend of linseed oil and various solvents and resins. These, too, are considered drying oils. So, what about stains, polyurethanes, and other finishing products that don’t have exact ingredients listed on their labels? If they contain drying oils, they should have a labeled warning about spontaneous combustion.

“The best advice you can give your readers is to ‘read those warning labels,’” Howard Mead, a spokesman with L&F Products, told me. (At the time, L&F Products owned Minwax, the parent company of Watco, a popular, linseed-oil-based finish. Minwax now has new owners who ceased deliveries of Watco last December. The Watco brand was then acquired by The Flecto Company last February.)

As Mead explained to me, you need to carefully examine container labels because the word “oil” may not even appear in the name of a product that poses a possibility of spontaneous combustion. And, formulations for identically titled products can change from state to state. For example, “brushes or rags soaked in Minwax Polyurethane, Polyshades (a combination polyurethane/stain product), and national brands of Minwax Wood Finish (oil-based stain) pose no spontaneous-combustion hazard and can go into the trash,” according to Mead. “But, in New York, New Jersey, and California, Minwax Wood Finish products have combustion warnings because the formulas had to be changed to comply with clean-air regulations for those states.”

Here’s the proper way to dispose of oily waste
All of the drying oil-based finishes that we’ve come across have similar directions for the proper disposal of oil-soaked rags and brushes. These directions tell you to place oil-soaked waste into a sealed, water-filled metal container immediately after use. Then, put the container in the garbage.

Since I’ve always hung oily rags to dry before tossing them out, I wondered if I had been doing it the wrong way. But, if I follow the suggested disposal procedure, where would I find enough paint cans to do it that way? And, it seems environmentally unfriendly to dump a container of oil-tainted water into the trash.

To find out what my fellow woodworkers do with their linseed-oil soaked rags, I did an infor-
mal poll of WOOD magazine staff members (we go through a lot of oil finishes in our on-site shop). Design editor Jim Downing lays the rags out flat on his concrete driveway to dry; Assistant Design Editor Jan Svec hangs the rags until they dry stiff. Chuck Hedlund, our Project Builder, follows the same procedure as Jan, and added, “The key to drying the rags properly is that you should never fold the rags over—all surfaces should be equally exposed to air so that heat can dissipate evenly.” With oil-soaked brushes, Chuck cleans them in a solvent such as mineral spirits, then hangs them to dry in a ventilated area away from heat sources.

So why do labels describe a procedure that few people seem willing to follow? At least one manufacturer, Sunnyside’s Roger Petty, was able to shed some light on the subject. “What we put on labels is largely dictated to us by lawyers. Since placing the rags in a sealed, water-filled, metal container is the most absolutely, positively safe method, it’s also the method that’s most legally defensible. You can safely handle the rags by hanging them, or placing them on concrete, but this isn’t as foolproof. A consumer might think he’s doing it right, but if he overlaps the rags or places them near a heat source, the hazard is still there.”

Products that contain drying oils come in many brands and titles, so always check for spontaneous-combustion warning labels before applying a finish.
Little buckaroos will ride into the night, or at least until bedtime, on this soon-to-be classic. Its stylish lines and straightforward construction make for a sure winner under the tree this holiday season. You'd better make templates, though, because you'll have plenty more orders after you let this one out of the barn.

**Start with the horse body**

1. Cut two pieces of 3/8"-thick cherry to 11 3/4"x24". With the edges and ends flush, glue and clamp the pieces face-to-face to form a 1 1/2"-thick body blank (A). (If you don't have 11 3/4"-wide stock, edge-join narrower stock and sand smooth before gluing face-to-face. Or, see our source of hardwood stock listed in the Buying Guide at the end of the article.)

2. Transfer the full-sized body pattern, hole centerpoints, and dowel alignment marks from the WOOD PATTERNS™ insert in the center of the magazine to the body blank. (We cut the paper pattern to shape, and used spray adhesive to adhere it to the wooden body blank.) Bandsaw the body to shape, and sand the cut edges smooth.

3. Drill four 7/64" pilot holes completely through the body (A) for aligning and attaching the legs later. Switch bits, and drill 1/16" guide holes (you'll drill them larger later) for the nostril, eye, and bridle. Backing the stock to prevent chip-out, drill a 3/16" hole for the eyeball and a 3/32" hole for the handle. (If you plan on using your horse strictly for decoration, we recommend not adding the turned maple handle.)

4. Mount a 1/4" core-box router bit or 1/4" twist-drill bit into your drill press, and drill a 1/8"-deep depression centered over the 1/16" guide holes for each nostril. (We clamped the body to our wooden drill-press table to keep it steady when drilling the depressions. A core-box bit leaves a slightly more pleasing-looking depression than a drill bit.)

5. Rout 1/4" round-overs on the 1 1/2"-thick body where shown on the full-sized body pattern and the photo above.
OK, let's form the tail, mane, and forelock

1. Cut the tail (B), mane (C), and forelock (D) blanks to the sizes listed in the Bill of Materials and shown on the Cutting Diagram.

2. Transfer the full-sized patterns from the insert to each blank. For ease in routing the round-overs on the forelock, we've located the pattern on one end of the blank. This extra length acts as a handle for safety when routing. Cut the pieces to shape, except for the portion of the forelock marked with a dashed line. You'll cut this edge to shape after routing.

3. Rout 1/4" round-overs on each piece where shown on the Exploded View drawing. There are no round-overs on the edges that mate with the body (A).

4. Cut the forelock to final shape, cutting along the dashed line.

5. Check the mating edges of the tail, mane, and forelock against the body of the horse. Sand the mating edges of the smaller pieces if necessary for a flush fit. Set the pieces aside; you'll add them later.

6. Aligning a doweling jig with the alignment marks, drill a pair of 3/8" holes 1 1/8" deep in the body and a mating pair in the tail. See the Dowel detail accompanying the Exploded View drawing for reference. Set the tail aside.

The wide, laminated saddle comes next

1. Cut the saddle-side blanks (E) to size, and transfer the pattern to one of the blanks. Using double-faced tape, adhere the two saddle-side blanks together face-to-face, with the edges and ends flush. Bandsaw the saddle sides to shape. Sand the edges of the taped-together sides flush, pry the pieces apart, and remove the tape.

2. To form the saddle center, cut two saddle-center blanks (F) to the size listed in the Bill of Materials. For a proper fit later, make sure the thickness of the saddle center is the same as that of the thickness of the horse's body. Glue and clamp the two blanks face-to-face with the edges and ends flush. Transfer the pattern, and cut the piece to shape.

3. Glue and clamp the saddle center (F) between the sides (E). Remove any excess glue before it dries. Sand the top edge of the laminated saddle flush.

4. Rout 1/4" round-overs along the outside edges of the saddle sides where shown on the Exploded View drawing.

Add the legs for a lengthy gait

1. Cut the front-leg blanks (G) and rear-leg blanks (H) to size.

2. Using the Legs drawing below for reference, transfer the taper lines to the inside surface, adjacent edges, and top end of all four leg blanks. The taper on the top end of each leg allows the legs to splay out from the body, making for a wider and more stable rocker base. Keep in mind that the front legs as well as the back are mirror images of each other.

3. Hand-plane and then belt-sand to the marked taper lines to form a taper on each leg as shown in the photo above. To remove the Continued
wood quickly after planing, use a 60-grit sanding belt. To further flatten the tapered areas, adhere a full-sheet of 100-grit sandpaper to a piece of ¼"-thick plywood. Clamp the plywood to your workbench top, and rub the tapered area of each leg against the sandpaper, being careful to keep the taper flat against the sandpaper. Use a straightedge to check that the tapered surface is flat.

4 Adhere the full-sized paper patterns to the **inside surface** of one front-leg blank and one rear leg blank, aligning the dashed edge-of-the-taper pattern with that on each leg blank. You'll be forming the right-hand legs first.

5 Bandsaw and sand to shape the leg blanks with the patterns attached. Use the one front leg (G) and one back leg (H) as templates to mark their outlines onto the remaining leg blanks. When marking the second set of legs, be sure that you'll end up with a pair of legs, not with two right-hand front or rear legs. Bandsaw the two remaining legs to shape.

6 With the edges and ends flush, use double-faced tape to adhere the two front legs together and then the two back legs **outside face to outside face**. Using the marked centerpoints on the pattern as guides, drill a pair of ½" holes through the tapered surfaces of both sets of legs. The ½" shank holes in the legs will align with the ¾" holes drilled earlier in the body.

7 Drill and countersink a ¾" hole at the hoof end of each leg for attaching the legs to the rockers later. Pry the legs apart, and remove the paper patterns.

8 Drill a ½" hole ¼" deep centered over the two ½" holes on the outside surface of each leg. (We clamped each leg to our wooden drill-press table to accurately center the ½" Forstner bit over the small hole and to keep the leg from moving when drilling.)

9 Rout ¼" round-overs on each leg where shown on the Exploded View and full-sized patterns. Hand-sand round-overs on the top narrower end of each leg.

10 Chisel the outside face of the hooves that will mate flush with the inside surface of the rockers later. See the Hoof Notches drawing for reference.

**Make a pair of laminated maple rockers**

1 From ⅛"-thick stock (we planed thicker stock to size), cut the rocker blanks (I, J, K) to the sizes listed in the Bill of Materials.

2 Cut a 24° angle on one end of each inner rocker blank (I) where shown on the Rocker Lamination and Forming the Rockers drawings. Next, cut a notch in each where shown.

3 Edge-join two Ks to each J where shown on Step 1 of the Forming the Rockers drawing. A simple glue joint will do. Do not use dowels or biscuits; they might

**Bill of Materials**

<table>
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<tr>
<td>M eye socket blank</td>
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<tr>
<td>N handle</td>
<td>⅛&quot;-diam. x 7½&quot;</td>
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**Materials Key:** LC-laminated cherry, M-maple, W-walnut, LW-laminated walnut, C-cherry.

**Supplies:** 8x1¼" flathead wood screws, #10x1½" flathead wood screws, ¾" dowel pins, 2" long, ½" walnut dowel, 1½" long, 61" of ¼"-wide leather strap, two 1" diameter rings, ⅛x⅝" ovalhead wood screws with #6 finish (countersunk) washers, ⅛" dowel for handle (N), clear finish.
show after cutting the rockers to shape. Remove the excess glue before it dries. Later, sand the joints smooth.

4 Following Steps 2 and 3 on Forming the Rockers drawing, complete the rocker laminations.

5 Transfer the full-sized patterns from the pattern insert to one of the rockers. Bandsaw the rocker to shape as shown in the photo above right.

6 Use the rocker as a template to mark its shape onto the other rocker laminations. Bandsaw the second rocker to shape. Tape the rockers together outside face to outside face, and sand the edges flush. Pry the pieces apart, remove the tape, and rout ¼" round-overs along all edges.

The platform slats tie the rockers together nicely

1 From ¾" maple, cut the platform slats (L) to size.
2 Rout ¼" round-overs along all edges of each platform slat.
3 Using a fence on your drill-press table, set the stop and drill a ⅜" hole ¼" deep centered at each end of each slat. Switch bits, and drill a ½" hole centered in each ¼" hole where shown on the Screw-Hole detail accompanying the Exploded View drawing. Sand each slat smooth.

Finish cutting the pieces

1 Cut the eye socket blank (M) to size from ⅛" cherry (we planed thicker stock to size). Transfer the full-sized pattern to the blank, and drill a ½" hole in each socket pattern. Fit your scrollsaw with a zero-clearance top, and scrollsaw the sockets to shape.

2 Glue and clamp (a spring clamp works well) the sockets to the horse’s head, and sand slight tapers on the pointed ends of each socket like that shown on the Eyeball detail accompanying the Exploded View drawing. We found it easier to sand the fragile sockets when they were secured to the head. We broke the first set trying to sand them unattached.

3 To form the eyes, crosscut a piece of ½" walnut dowel to 1⅛" long. (You could also use a birch dowel and stain it after sanding the ends to shape.) Sand each end to a dome shape like that shown on the detail. Glue the dowel centered in the horse’s head.

4 To form the handle (N), crosscut a piece of ¾" maple or birch dowel to 7½" long and sand its ends to a dome shape. Or, if you have a lathe, turn a piece of maple to the shape shown on the full-sized pattern. To prevent the handle from twisting loose from the horse’s head, hold the handle against the running blade on your bandsaw, and cut three ¼" glue grooves ⅛" deep. See the full-sized pattern for the location. The grooves prevent all of the glue from being squeezed out of the hole in the body when fitting the handle in place later.

Assemble the pieces, and call your little cowpokes

1 Align, glue, and clamp the tail, mane, forelock, and saddle to the body. Immediately wipe off any excess glue with a clamp cloth.

2 Align the holes in the leg tops with those in the body laminations. Glue and screw the four legs to the body. Hold the rocker against the ends of the legs (hooves) where located on the full-sized Rocker pattern and verify that the mating surfaces are flush. Chisel hooves more if necessary.
Clamp the rockers to the hooves. Using the previously drilled holes in the hooves as guides, drill a ½" pilot hole into each rocker. Glue and screw the rocker to the hooves.

4. Starting with the center slat and working out, screw the platform slats to the rockers.

5. Cut cherry and maple plugs to fill the counterbored holes in the body and slats. Plug the holes and sand the plugs flush.

6. Finish-sand, wipe off the dust, and add the finish. (We applied three coats of Minwax Antique Oil Natural Finish, steel-wooling between coats.)

7. As shown on the Bridle drawing, cut five strips of ¾"-wide leather to the lengths indicated. Purchase your own leather and supplies, or see the Buying Guide for our source. Using a ½" leather punch, cut ¼" holes in the leather where shown. Wrap the leather straps around the rings where shown on the drawing, overlapping the ends ¾". Secure the leather straps to the horse’s head with #6 x 1½" ovalhead screws and finish washers. Rivet the bridle to the 1"-diameter rings.

**Buying Guide**

**Hardwood and leather kit.** All the individual pieces shown on the Cutting Diagram cut slightly oversized in length and width from the thicknesses listed in the Bill of Materials from the type of wood noted. Plus, 61" of ¾"-wide leather for bridle, ½" leather punch, 8 rivets and setter, two 1"-diameter rings, eight ovalhead screws and finish washers. W83C, $169.95 ppd. Heritage Building Specialties, 205 North Cascade, Fergus Falls, MN 56537. Or call 800/524-4184 to order.
There's something satisfying about turning these lovely lidded containers. Maybe it's the way the simple shape showcases the wood's beauty, or it might just be the joy of transforming scrapwood into a treasure. Try it yourself, and see.

**Shape the outside**
Locate and mark the centers on a $1\frac{1}{2} \times 1\frac{3}{4} \times 4\frac{1}{2}$ turning square. (All dimensions and the Full-Sized Template, opposite page, refer to the middle-size container in the photograph at left. You can adjust the size to fit your particular stock, as we did with the two other examples shown.) Mount the stock between centers.

Round the stock to $1\frac{1}{8}$". This will be the turning's major diameter. At the headstock end, hold a pencil against the rotating blank $1\frac{1}{4}$" from the end. Draw another line $2\frac{3}{32}$" beyond that one ($3\frac{3}{8}$" from the end). These marks establish the height of the container. (For the pink ivory one, we marked off a $3$" section; for the bocote one, $1\frac{1}{4}$")

With the parting tool, cut in to a diameter of $\frac{1}{2}$" on the outside of each line, leaving a $2\frac{3}{8}$"-long section between the parting cuts, shown in the Body Blank illustration. Form a $\frac{1}{2}$" tenon on each end where shown. Leave the tip on the drive end large enough to accommodate the drive center.

Now, shape the body, forming the bottom at the headstock end of the blank. Starting $\frac{1}{2}$" from the headstock end of the central section, cut back and down toward the tenon to form the bottom curve. A $\frac{1}{2}$" spindle gouge or a skew will do the trick. Smooth the curve as you blend it into the side of the cylinder.

---

**Project prep**

**Stock:** You can turn vessels of this style from pieces of square stock $6$" long or less. The ones shown are from cocobolo with a macassar ebony lid, pink ivory with a spalted buckeye lid, and bocote with a walnut lid. The how-to instructions refer to the cocobolo container and its lid. For that one, you'll need $1\frac{1}{2} \times 1\frac{3}{4} \times 4\frac{1}{2}$" stock. The lid calls for $1\frac{1}{2} \times 1\frac{3}{4} \times 2$" material.

**Lathe equipment:**

- Drive center
- Live tail center
- 3-4" faceplate
- Spindle gouges $\frac{3}{8}$" (or other small size)
- Skew chisels $\frac{1}{2}$" and $1$"

- Roughing gouge $\frac{3}{4}$"
- Parting tool $\frac{1}{8}$" or $\frac{3}{32}$"

**Lathe speeds**

- Boring 500-800 rpm
- Roughing 800-1,200 rpm
- Finish turning 1,500-2,000 rpm
Then, starting from the same point and working toward the top (the tailstock end), taper the cylinder to 1½" diameter. Rough the taper with a spindle gouge, then finish it with a 1" skew. Keep the tapered side straight.

Part off the turning at the headstock end, where shown by the broken line. Leave the tenon attached to the top of the turning.

**Hollow it out**

Remove the lathe’s drive center, and install a 3–4"-diameter faceplate with a 1½"-thick auxiliary faceplate attached. True the auxiliary faceplate.

Now, bore a hole into the center of the faceplate to receive the turning’s bottom tenon. Bore the ½" hole with a gouge, making sure the tenon fits snugly. The hole’s depth should be about ¼" less than the length of the tenon.

Glue the bottom tenon into the hole. To accurately center the turning, slide the tailstock up and re-engage the live-center point into the mark it made on the top tenon. Cyanoacrylate adhesive (instant glue) works fine for mounting the workpiece.

After the glue dries, part off the top tenon. Install a drill chuck in place of the tail center, and chuck a ¾" Forstner bit into it. Using a low speed, bore into the body 1½" deep. (If you don’t have a drill chuck for your lathe, bore about 2" deep into the center of the turning with a ½" gouge.)

Complete hollowing the vessel with scrapers. Enlarge the opening to about ¾" at the mouth, creating a wall thickness of ⅛". Round the inside bottom to the shape shown by the template, going about 2" deep at the center.

Sand the turning. Measure the inside diameter of the opening, and write down the dimension. Apply a clear finish, then dismount the faceplate with the turning attached. Set it aside to dry.

**Make the classy cover**

Mark the centers on a piece of stock 1½×1½×2". Mount the stock between centers, and round it down to 1½" diameter. This will be the rim diameter. (When you turn a lid for a container of a different size than the one described, make the lid’s rim diameter equal to the major diameter of the body.)

Mark the turning ¾" from the headstock end. On the headstock side of the line, cut in to the diameter you measured as the inside diameter of the container opening. Then, turn a tenon that size at least ¼" long where shown on the Lid Blank illustration.

Begin shaping the top of the lid and the finial. Initially, form the top of the lid as a long tenon, shown in the illustration. Then, taking small cuts, alternately shape the finial and cut in along the parting line shown at the bottom of the lid. The goal is to have very little connecting material left at the bottom of the lid when you separate the waste at the tip of the finial.

Sand and finish the lid. Remount the faceplate with the container body attached, and part off the turning. Aim the tip of the parting tool slightly toward the top to make a concave bottom. Sand and finish the bottom, then start rounding up some scraps for another little lidded box.
CUTTING-EDGE CUTTING BOARD

Stylish stripes make this one a design leader

Subtle stripes and cutaway corners give this handy cutting board eye appeal. And our stress-free method for making the thin stripes gives it woodworker appeal, too.

Note: We used cherry, walnut, maple, and cardinal wood for our cutting board. You'll need a piece of cherry 3/4 x 8 x 16"; walnut, 3/4 x 3 1/2 x 21"; maple, 3/4 x 2 x 16"; and cardinal wood, 3/4 x 2 x 16".

Start with the stripes
1. Draw diagonal reference lines across one face of a 3/4 x 8 x 16" piece of cherry. Join one edge of the board. Then, rip the piece into nine 3/4"-wide strips. Install a sharp, smooth-cutting blade and a zero-clearance throat insert in your tablesaw to avoid circular-saw marks or burning on the sawn edge of the cherry.
2. Lay the strips in order on your bench, aligning the reference marks. Number the pieces 1-9, starting from the left edge.
3. Crosscut the walnut to 16" long. Join one edge of the long piece, and save the short cut-off piece for use later.
4. Glue the jointed edge of the walnut to the right edge of cherry strip no. 1, using water-resistant glue such as Titebond II. Ensure that both surfaces are flush, then clamp. Protect the edges with scrapwood blocks.
5. After the glue dries, rip the glued-up piece to 1 1/2" wide, cutting with the cherry against the saw fence, as shown in Photo 1, opposite page. The result will be a 3/4"-wide cherry strip with a 1 1/2"-wide walnut strip along one edge.
6. Joint the edge of the cut-off piece of walnut if necessary, and glue it to the right edge of piece 2. With the saw still set for 1 1/2", rip piece 2 to width.
7. Following the same procedure, add walnut strips to the right edge of pieces 3 and 4 and the left edge of pieces 6, 7, 8, and 9. Do not glue any walnut strips to piece 5.

Add red and white accents
1. Joint both edges of a 3/4 x 2 x 16" maple piece. Glue the walnut edge of piece 4 to the left edge of the maple and the walnut edge of piece 6 to the right edge.
2. After the glue dries, adjust your saw's rip fence to 7/8" cutting width. Place the cherry edge of piece 4 against the rip fence, and saw the strip. Then, saw piece 6 the same way.
3. In the same manner, glue the cardinal wood to the maple edge of pieces 4 and 6. Rip each piece to 1 1/2" wide.

Build the board
1. Lay waxed paper on your benchtop, then arrange pieces 1-9 in order on it. The stripe pattern should match the photo of the completed cutting board.
2. Glue the pieces together. Ensure that the glue-up lies flat and that both surfaces are flush. Clamp, protecting the edges with scrapwood. Wipe off the glue squeeze-out with a damp rag.
With the cherry strip against the fence, rip the glued-up stock to leave \( \frac{1}{8} \) of walnut along the edge.

Cut away the underside of the handle to the straight end of the board. Use the miter gauge for safety and accuracy.

3 After the glue dries, remove the clamps. Crosscut the glue-up to 15" long, and sand both sides with 100-grit sandpaper.

4 At each end of the board, mark a point centered from side to side and 1\(\frac{1}{8}\)" from the end. Using a Forstner bit and a drill press, bore a 2\(\frac{1}{4}\)" hole at each point. Back the workpiece with scrapwood, and clamp it to the drill-press table.

5 Photocopy the Full-sized End Pattern, above. Place it on the cutting board with carbon paper or graphite transfer paper underneath it, and trace the outline onto the board. Align the semicircular cutout for the handle with the hole drilled through the board. Repeat on the other end.

6 Bandsaw the ends. Cut the curved portions slightly outside the line, then sand to the line with a drum sander.

Put on the handles

1 Open your compass to a 1\(\frac{1}{8}\)" radius. Scribe two circles onto the piece of walnut cut off earlier.

2 Bandsaw or scrollsaw the two 2\(\frac{3}{4}\)"-diameter circles. Since these will be the handles, which must fit exactly into the semicircles on the ends of the board, cut slightly outside the line. Then, carefully sand them to fit the cutouts.

3 Glue the handles into place, and clamp. Ensure that both surfaces are flush. Align the handles' grain along the length the board.

4 After the glue dries, finish-sand the board with 150- and 220-grit sandpaper. Sand both faces and the edges. Eliminate the sharp corners by sanding slight round-overs along all edges.

5 Install a 3\(\frac{1}{4}\)" dado blade in your tablesaw. Adjust the cutting depth to \(\frac{3}{8}\)". Using the miter gauge, carefully saw the notch in each handle back to the square end of the board, as shown in Photo 2.

6 Sand the underside of the handles and the ends of the board. Apply at least four coats of salad-bowl finish, following the manufacturer's instructions.

Project Design: Ted Baldwin
Photographs: Hopkins Associates
Illustrations: Roxanne LeMoine
FOREVER-COUNTRY
PLATE RACK

Bill of Materials

<table>
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<tr>
<th>Part</th>
<th>Finished Size</th>
<th>Matl.</th>
<th>Qty.</th>
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*Length depends on actual width of pine crown molding (width may vary between manufacturers).

Materials Key: P-pine, BD-birch dowel.

Supplies: #8 x 1 1/4" flathead wood screws, 1" brads, #8 x 1 1/2" nails, 8-1/2" solid-brass cup hooks, latex paint, stain, clear finish.

Buying Guide
Spindles and shelf clips. 13-1/4" spindles with 1/4" tenons, 9100; 8-1/2"-diameter brass-plated shelf pins, HAF284. Constantines, 2050 Eastchester Rd., Bronx, NY 10461. Or call 800/223-8087 to order.

If your taste in furnishings leans toward country, this great-looking plate-rack project may be the answer to your prayers. Measuring 53" from top to bottom and just over 4' wide, it will house a serving for twelve in pleasing country style. Paint it like we did for the look shown here, or finish it to match your own decorating theme.

Start with the pine plate-rack sides
1 Cut the sides (A) to the size listed in the Bill of Materials from 3/4" stock (we used kiln-dried pine).
2 Transfer the full-sized side bottom pattern from the WOOD PATTERN™ insert in the center of the magazine to the bottom end of one side piece (A).
3 Using double-faced tape, adhere the two side pieces face-to-face, with the edges and ends flush. Cut the bottom end of the taped-together pieces to shape (we used a jigsaw). Now, sand the contoured edges flush.

4 Referring to the Section View drawing, mark outlines for the locations of parts D, E, and F. Mark the six centerpoints, and drill 1/8" guide holes (you’ll drill them to exact size later) for securing parts D, E, and F later. Use a wooden wedge to separate the pieces, being careful not to mar the soft wood. Remove the tape. Drill a counterbored mounting hole centered over each 1/8" guide hole on the outside face of each side piece. See the Screw Hole detail accompanying the Exploded View for reference.
5 Cut 3/4" dadoes and rabbets 1/4" deep across the inside face of the side pieces where dimensioned on the Section View drawing. Now, rout a 1/2" rabbet 3/8" deep along the back inside edge of each side piece, stopping the rabbet at the bottom dado. Chisel the bottom end of the rabbet square.

**The shelves, dividers, rails, and back boards come next**

1 Cut the shelves and top (B), dividers (C), top front rail (D), bottom back rail (E), and back top rail (F) to the sizes listed in the Bill of Materials.

2 For housing the dividers (C), cut a pair of 3/4" dadoes 1/4" deep in the middle two shelves (B). See the Exploded View and Top Shelf drawings for reference.
3. Make a shelf-hole template like that shown above right. Use the template and a portable drill fitted with a brad-point bit to drill \( \frac{1}{4} \)" holes \( \frac{3}{8} \)" deep on the inside face of the dividers (C). Trim \( \frac{1}{4} \)" off the bottom end of template. Now, as shown in the photo at right, clamp the template in place, and drill \( \frac{1}{4} \)" holes \( \frac{3}{8} \)" deep on the inside face of the side pieces (A) where shown above.

4. Mark spindle-location centerlines on the top surface of one shelf where dimensioned on the Top Shelf drawing above right. Drill the holes, but do not erase the marked centerlines yet. (To allow for just a bit of free play when attaching the spindles later, we used a \( \frac{1}{8} \)" drill bit. Test-drill holes first to determine the size of bit you’ll need. Tenon size on spindles varies slightly.)

5. For making the plate groove in the top shelf (B), mount a \( \frac{3}{8} \)" core-box bit to your table-mounted router. Position the fence, and clamp stops to the fence. (We had to attach an auxiliary wooden fence to our regular router-table fence for a fence long enough to clamp stops to.) Rout a \( \frac{3}{8} \)" groove \( \frac{1}{4} \)" deep and \( \frac{3}{4} \)" from the back edge of the top shelf where dimensioned on the Top Shelf drawing. Stop the plate groove \( 2" \) from each end.

6. Transfer the full-sized rail half-pattern from the WOOD PATTERNS™ insert in the center of the magazine to the bottom front edge of the top-rail blank (D). Repeat the process to transfer the other half of the pattern. Cut and sand the piece to shape, and use it as a template to transfer the pattern to the bottom back rail (E). Cut and sand it to shape.

7. Glue and clamp the shelves and dividers (B, C) between the sides (A). Slide the rails (D, E, F) in place, and drive the screws. Check for square. Make sure the back edges of the shelves don’t protrude into the rabbets cut in the back inside edges of the side.
pieces. You'll fit the back boards (G) into these rabbets next.

8 Cut the ½"-thick back boards (G) to size. Check their fit in the rabbeted back of the plate rack. Allow ½" clearance at the two outside edges for expansion. Cut a ¼" chamfer along the front edge of each where shown on the Exploded View drawing. Do not install the back boards yet.

**Top off the rack with decorative crown molding**

1 To add the pine crown molding (H, I), purchase a 3¼"-wide by 8'-long piece at a local home center. Select a straight, dry 2×4, and glue it to the back of the crown molding where shown on Step 1 of Ripping the Crown Molding drawing. Rip the edges where shown in Steps 1 and 2 of the drawing.

2 Measure and miter-cut the front piece (H) to length, and glue it to the top front of the plate rack. Repeat for the sides (I).

**Add the plate-divider and pin-rail assemblies next**

1 Cut the four dowel-mount strips (J) to size. Tape them together face-to-face, with the edges flush.

2 Mark the hole centerpoints on the top piece where dimensioned on the Plate Divider drawing. Mount a fence to your drill-press table to keep the holes centered edge-to-edge, and drill the ¼" holes through all four taped-together pieces.

3 From ¾" birch dowel stock, crosscut the plate divider dowels (K) to length.

4 Assemble (no glue) the plate dividers (J, K), and check their fit in the plate rack. You want the assemblies to slide in easily now because they'll be tighter after the project has been painted. Trim the dowels if necessary.

5 Cut the pin rail (L) to size. Center it end-to-end against the front edge of the top shelf (B), and use a square to transfer the marked centerlines on the top shelf to the pin rail. Use your drill press fitted with a fence and stop to drill the holes in the pin rail where marked. Now, erase or sand the marked centerlines off both the pin rail (L) and top shelf.

6 Glue the spindles into the holes in the pin rail. Then, fit (no glue) the bottom ends of the spindles into their mating holes in the top shelf and let the glue dry. This aligns the spindles for gluing in place in the top shelf later.

7 Cut the shelves (M) to size. Put shelf pins in the holes in the project, and test-fit the shelves.

**Paint and stain for a contrasting finish**

1 Cut ¾" plugs ½" long, and glue one into each counterbored hole. Sand the plugs flush.

2 Finish-sand all the parts (we sanded through 320-grit).

3 Paint the plate rack where shown in the opening photo. Stain the remaining pieces (G, K, J, L) and the spindles. (For an even stain, we applied Minwax Wood Conditioner to the pieces according to the directions on the can. Then, we stained the pieces with Minwax Early American stain and Minwax Fast-Drying Satin Polyurethane.)

4 Mark the cup-hook centerpoints on the bottom side of the second shelf (B). Drill pilot holes, and screw the hooks in place. Next, nail the back boards (G) in place with #18×1¼" nails. Using 1" brads, nail the plate dividers and spindle assembly in place.
Reminiscent of the Arts and Crafts style popular early in this century, this oak clock looks great anywhere. It's quick and easy to build, too.

Cut the case parts
1 Cut Parts A and B to the dimensions shown on the Bill of Materials. You could build the clock from any hardwood. But an authentic, period look calls for quartersawn white oak, shown in the photo. If you can't find any locally, see the Buying Guide.
2 Tilt your tablesaw's blade 4° from vertical, then bevel both ends of all four pieces. Saw the bevels so they're parallel; that is, saw one end of each piece with one face down, the other end with the other face down.
3 Refer to the full-sized patterns opposite page, and lay out the tapered sides on the front of each part A and part B. (With the part standing upright, the front slants back toward the top.)
4 Bandsaw the tapered sides, with the blade 90° to the table. Saw slightly outside the line, then sand or plane down to it. (If you have a taper-cutting jig for your tablesaw, you can use it to cut these parts.)
5 Lay out the bottom profile on each part A. Bandsaw the cutouts, using a 1/8" blade. Sand.
6 Cut the top filler (C) from 1/2"-thick stock. Rip an oversized piece to width first, with the tablesaw blade again tilted 4°. Then, cut the piece to length, bevel-cutting the ends. (The bevels converge, as shown on the Exploded View drawing.)
7 Using a holesaw or circle cutter and drill press, bore the 3" hole in the clock front where shown. Be sure to back the workpiece with scrapwood, and clamp both pieces securely to the drill-press table before boring.

Assemble the case
1 Lay the back (A) on your bench, the good side facing down. Glue the sides (B) and filler (C) to the upturned face, flush with the edges and top. Glue on the front.
2 Holding the clock case together while the glue is still tacky, stand it on your workbench. Align the front and back so the clock stands straight and steady, then clamp with rubber bands.
3 Cut the top (D) to size. Saw or rout a 3/8" chamfer around the bottom edges. Sand the top.
4 After the glue dries, sand the body. Glue the top into position—note that the smaller face joins to the clock body. Clamp the top.

Add the decorative buttons
1 Cut a piece of 3/8" square stock about 12" long. Choose a species that contrasts with your clock body. (We used walnut.) The extra length allows more safety and convenience when making the small buttons.
2 Set the miter gauge on your disc sander to 30°. On one end of the square stock, carefully sand a beveled face extending from one edge to the middle.
3 Turn the stock to the next face, and sand another bevel on the same end. Similarly, turn the stock to each of the remaining faces and bevel the end. All four beveled faces should meet in a point at the center of the end.
4 You'll end up with a pyramidal shape on one end of the square stock. Using a dovetail saw or other fine-toothed handsaw, cut the pointed end off 1/8" below the bottom edge of the bevels.
5 Make two more buttons the same way. Glue the three buttons to the front of the clock where shown on the pattern. (A piece of masking tape makes a great guideline to keep them level.)

**Complete the clock**

1. Apply a clear finish overall. If you want to give your clock an aged appearance, darken it with golden oak stain first.
2. Install the battery in the clock insert, and set the time. Finally, fit the clock insert into the hole in the front of the case.

**Buying Guide**

**Quartersawn oak.** Enough quartersawn white oak to build one clock case, item ART-BR-Wood, $12.95 ppd. in U.S.

**Quartz clock insert.** Style shown, item no. 200220, $15.95 ppd. in U.S.

Both from Schlabaugh and Sons Woodworking, 720 14th St., Kalona, IA 52247. Call 800/346-9665 to order.

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**Bill of Materials**

<table>
<thead>
<tr>
<th>Part</th>
<th>Finished Size</th>
<th>Mat.</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>¾” 5” 6¼”</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>B</td>
<td>¾” 1¼” 6¼”</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>C filler</td>
<td>¾” ¾” 2½”</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>D top</td>
<td>½” 3¼” 5½”</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

*Cut this part oversize initially, then cut to finished size in accordance with how-to instructions.

Materials Key: O—quartersawn white oak

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Project Design: Schlabaugh and Sons
Photograph: John Hetherington
Illustrations: Roxanne LeMoine, Lorna Johnson
YOUNG-ARTIST'S ACTIVITY

We've never seen a young child who doesn't just love to paint and draw on almost anything. With that in mind, we put our heads together to create a brightly colored place for your little one to put his or her creativity to work. To encourage tidiness, we've incorporated storage for crayons, pencils, and supplies under the hinged desktop. And to make things easy for you, we kept the construction simple yet sturdy.

Start with the side frames

1. From 3/4"-stock (we used birch), cut the side-frame bottoms (A), front uprights (B), and rear uprights (C) to the sizes listed in the Bill of Materials.

2. Mark 1 1/2" and 1 3/4" radii on the ends of parts A, B, and C where shown on the Exploded View drawing at right and Parts View drawing on page 92.

3. Bandsaw, then sand along the 1 3/4" radius to round both ends of A and B and the bottom end of each C. See the jig for sanding uni-

form radiuses on multiple pieces on page 28.

4. Mark centerpoints, and drill countersunk mounting holes in A, B, and C where shown on the Parts View drawing. Switch bits, and drill a 3/4" hole through A, B, and C at the centerpoints you marked earlier.

5. Rout 1/4" round-overs along all edges of the side frame parts A, B, and C (except the top ends of the rear uprights).

6. Using a short length of 3/4" dowel, align the bottom and front frame members (A, B) at a 90° angle. Using the previously drilled mounting holes in B, drill pilot holes in A, and screw the pieces

Continued

Bill of Materials

<table>
<thead>
<tr>
<th>Part</th>
<th>Finished Size</th>
<th>Matl</th>
<th>Qty</th>
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<tbody>
<tr>
<td></td>
<td>T</td>
<td>W</td>
<td>L</td>
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<tr>
<td>SIDE FRAMES</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A bottoms</td>
<td>3/4&quot;</td>
<td>3 1/2&quot;</td>
<td>23 1/4&quot;</td>
</tr>
<tr>
<td>B front uprights</td>
<td>3/4&quot;</td>
<td>3 1/2&quot;</td>
<td>22 1/4&quot;</td>
</tr>
<tr>
<td>C rear uprights</td>
<td>3/4&quot;</td>
<td>3 1/2&quot;</td>
<td>13 1/4&quot;</td>
</tr>
<tr>
<td>D dowel</td>
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<td>20&quot;</td>
<td>D</td>
</tr>
<tr>
<td>E dowel</td>
<td>3/4&quot; dia.</td>
<td>19 1/4&quot;</td>
<td>D</td>
</tr>
<tr>
<td>F caps</td>
<td>3&quot;</td>
<td>3&quot; dia.</td>
<td>B</td>
</tr>
<tr>
<td>SEAT AND DESK SUPPORTS</td>
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<td></td>
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<tr>
<td>G seat crossmember</td>
<td>3/4&quot;</td>
<td>2&quot;</td>
<td>15 1/4&quot;</td>
</tr>
<tr>
<td>H seat support</td>
<td>3/4&quot;</td>
<td>3&quot;</td>
<td>15&quot;</td>
</tr>
<tr>
<td>I desk crossmember</td>
<td>3/4&quot;</td>
<td>5 1/4&quot;</td>
<td>18 1/4&quot;</td>
</tr>
<tr>
<td>J desk support</td>
<td>3/4&quot;</td>
<td>7 1/4&quot;</td>
<td>18&quot;</td>
</tr>
<tr>
<td>K brace</td>
<td>3/4&quot;</td>
<td>5&quot;</td>
<td>5&quot;</td>
</tr>
<tr>
<td>L cleats</td>
<td>3/4&quot;</td>
<td>2 1/4&quot;</td>
<td>14 1/4&quot;</td>
</tr>
<tr>
<td>FLOORBOARDS AND SEAT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M floorboards</td>
<td>3/4&quot;</td>
<td>3 1/4&quot;</td>
<td>17&quot;</td>
</tr>
<tr>
<td>N seat</td>
<td>3/4&quot;</td>
<td>9&quot;</td>
<td>18&quot;</td>
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<tr>
<td>DESKTOP</td>
<td></td>
<td></td>
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<tr>
<td>O desk sides</td>
<td>3/4&quot;</td>
<td>3 1/4&quot;</td>
<td>18&quot;</td>
</tr>
<tr>
<td>P front</td>
<td>3/4&quot;</td>
<td>3 1/4&quot;</td>
<td>18&quot;</td>
</tr>
<tr>
<td>Q back</td>
<td>3/4&quot;</td>
<td>1&quot;</td>
<td>18&quot;</td>
</tr>
<tr>
<td>R bottom</td>
<td>3/4&quot;</td>
<td>15&quot;</td>
<td>18&quot;</td>
</tr>
<tr>
<td>S front</td>
<td>3/4&quot;</td>
<td>4&quot;</td>
<td>24&quot;</td>
</tr>
<tr>
<td>T top</td>
<td>3/4&quot;</td>
<td>15&quot;</td>
<td>24&quot;</td>
</tr>
<tr>
<td>U panel stop</td>
<td>3/4&quot;</td>
<td>1&quot;</td>
<td>20&quot;</td>
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</tbody>
</table>

*Initially cut parts marked with an * oversized. Trim to finished size according to the instructions.

Materials Key: B-birch, D-dowel, PL-plaid, EB-edge-jointed birch, BP-birch plywood.

Supplies: 3/8" x 3/8", 1" x 1 1/4", 3/8" flathead wood screws; 1/4"x2 1/4" continuous hinge, 1/4" diameter dowel stock, plastic containers, enamel paint: clear finish.
EXPLODED VIEW

See the Parts View drawing on page 92 for dimensioned details of parts A, B, C, F, I, K, O, and S.
together. Repeat the process to screw A to C. Note that the front upright (B) is mounted on the outside surface of the bottom part A and that the rear upright (C) is mounted on the inside surface of part A.
7 Unscrew the side frame pieces (A, B, C), and finish-sand them. Now, glue and screw each side frame together, once again using a piece of 3/4" dowel stock to align the pieces. Wipe off any excess glue with a damp cloth.

**Now, cut the base pieces to size and shape**
1 Cut dowels (D, E) to length from 3/4"-diameter dowel stock.
2 With a compass, lay out six 3"-diameter caps (F) on 3/4" solid stock. Drill a 3/4" hole 3/8" deep at the centerpoint on each cap.
3 Bandsaw the end caps (F) to shape. Just by repositioning it, you can use the same jig shown on page 30 to sand all the caps perfectly round.
4 Rout a 3/4" round-over along the outside face (the one opposite the 3/4" hole) on each cap. (For safety’s sake, we used a V-notched fence when routing the round-overs.)
5 Cut the seat crossmember (G) and seat support (H) to size. Rout 1/4" round-overs on the pieces where shown on the Exploded View drawing.
6 With the ends flush, glue and clamp G centered side-to-side to the bottom surface of H.
7 Cut the crossmember (I), desk support (J), and brace (K) to size and shape. Mark the openings on I where shown on the Parts View drawing, and scroll saw and sand the openings to shape. Or, use a circle cutter to form the holes.
8 Rout 1/4" round-overs along the edges of pieces (I, J, K) where shown on the Exploded View drawing. Finish-sand parts F through K.

**Cut the remaining pieces, and assemble the base**
1 Glue and screw the brace (K) to the crossmember (I), centered end-to-end and flush at the top edge where shown on the Exploded View drawing. Take care to properly countersink the screw holes since the screw heads will be exposed. All our screwheads sit 1/8" below the surface of the wood that they’re screwed through.
2 Glue and clamp the desk support (J) to the assembled parts (I/K). The desk support (J) should overhang the front edge of the desk crossmember (I) by 1 3/8" where shown on the Desk Top detail accompanying the Exploded View drawing.
3 Using bar clamps, secure assemblies G/H and I/J/K between and at a right angle to the side frames. Using the previously drilled holes in pieces B and C as guides, drill pilot holes centered into the ends of the mating pieces. Then, as shown in the photo below, drive the screws to secure the pieces.

**Clamp the seat and desk support assemblies between the side frames, drill pilot holes, and drive the screws.**
4 Cut the cleats (L) and floorboards (M) to size. Drill mounting holes in the cleats. Then, rout the edges of the floorboards.
5 Using the Parts View drawing for positioning particulars, screw the cleats (L) to the inside surface of the bottom side frame members (A), and then screw the floorboards to the cleats.

**The seat assembly comes next**
1 Edge-join enough 3/4"-thick solid stock to form a seat blank (N). Later, transfer the pattern from the pattern insert, and cut the seat to shape.
2 Rout a ¼" round-over along the top and bottom edges of the seat.
3 Position and clamp the seat to the seat support (H). The back edge of the seat overhangs the back edge of the seat support by 2¾". Drill mounting holes and screw the pieces together.

Now, let's add the desktop
1 Using the Parts View drawing, transfer the pattern and cut a pair of the desktop sides (O) to size from ¼" stock. Cut a ½" rabbet ¼" deep along both ends of the desk sides. Then, mark the centerpoints, and drill a pair of countersunk mounting holes through each desk side for screwing them to the front uprights (B) later.
2 Cut the desktop front (P) and back (Q) to size.
3 Glue and clamp the desktop pieces (O, P, Q) together, checking for square. Later, rout a ¼" rabbet ¼" deep along the bottom inside edge of the desk assembly where shown on the Desktop drawing at right.
4 Cut a piece of ¼" plywood to fit the rabbeted opening in the desktop bottom. Sand the corners of the desktop bottom (R) to fit the round-rabbeted corners. Drill mounting holes, and glue and screw the bottom piece in place.
5 Position the desktop assembly (O-R) where shown on the Exploded View drawing. Using the previously drilled holes in the front uprights (B) as guides, drill pilot holes, and screw the desktop assembly in place.
6 Cut the desktop front (S), desktop (T), and pencil stop (U) to the sizes listed in the Bill of Materials, bevel-cutting the mating edges of S and T at 20°. Cutting the mating edges at 20° and leaving a gap between the hinge helps prevent tiny fingers from getting pinched at the joint.
7 Mark and cut a 2" radius on the bottom corners of the desktop (T) and desktop front (S). Measure the diameter of your plastic containers (we used Play Doh® containers), and cut four holes in the desktop front (S).
8 Rout the edges of desktop pieces S and T where shown on the Desktop drawing. Note that the round-over stops where the pencil stop (U) will be attached. Rout or sand ½" round-overs on the edges of the pencil stop where shown above. Glue and clamp the pencil stop in place.
9 Use a hacksaw to cut a piece of 1½" continuous hinge to 23¼" long. Drill pilot holes, and screw the hinge centered end-to-end to parts S and T.
10 Position the desktop assembly (S, T, U) on the desk base (O-R), drill mounting holes, and screw the two assemblies together.

Finish-sand and paint
1 Disassemble the desk, finish-sand all the components, and apply a clear finish to those parts shown in the opening photo. Paint the other pieces with enamel paints. (For the smoothest and brightest finish, we used aerosol spray paints for both the prime and finish coats. Be certain that the primer is compatible with the finish coats.)
2 Reassemble the desk. Cut two 1½"-long pieces of ¾" dowel stock and glue the two remaining caps (F) to the assembled desk.

Written by Marlen Kemmet
Project Design: James R. Downing
Illustrations: Kim Downing; Lorna Johnson
Photographs: King Au, John Fletchington
THE GREAT A COLLECTIBLE THE

Project prep
Stock: White cedar, red cedar, pine, basswood, or other carving wood. Sizes: Body, 4x7x15; neck, 2x4x17/4; head, 2x4x10. See the Buying Guide for precut kits.
Carving tools: You can use gouges or power-carving equipment for this project.

Although protected by law today, herons once were hunted. Their plumage and skin prized by milliners for fancy hats, these graceful shoreline waders put money in the pockets of many a turn-of-the-century bayman.

These professional hunters along the eastern seaboard relied on decoys to attract the birds within gun range. Such working decoys, usually carved by the hunter himself, were often no more than rough-hewn approximations of the bird’s shape. But some carvers modeled and painted their decoys more realistically, thus establishing identifiable carving styles. Later, when folk-art collectors took an interest in the decoys, some of these carvings became more prized than the birds themselves once were.

Carver Frank Russell of Cambridge, Vermont, based this carving of a great blue heron on those old-time gunners’ decoys. “I call this carving a decorative contemporary primitive,” he says. “It’s in the style of the old, primitive working decoys, but it’s strictly decorative.”

The completed carving should look like an old decoy that’s been dragged out of an outbuilding or an attic. Given that, you can take a lot of leeway with your heron, detailing it, painting it, and distressing it as much or as little as you like.

First, cut out the blanks
Photocopy the body, neck, and head patterns from the WOOD PATTERNS™ insert in the middle of the magazine. Attach the patterns to the appropriate stock with rubber cement. Carefully register the two views for the head and body.

Bandsaw the Body Side View first. Saw the flat surface for the neck joint, then make a continuous cut along the bird’s back. Remove the waste from the back in one piece. (We’ll call this the top waste piece since it will face up when you cut the back view.) Then, saw along the bird’s breast, which will be the bottom. Save that waste piece, too.

This is a convenient time to drill the hole for the leg stake, so stand the body on its neck-joint surface on the drill-press table. Chuck a 1/2” bit in your drill press, and tilt the table to match the hole angle shown on the pattern. Stabilize the body with clamps, then drill a hole 3” deep where shown, centered side-to-side.

After drilling the hole, put the top and bottom waste pieces back onto the body. Fasten them with a few wraps of masking tape. (Don’t put on so much tape that you hide the pattern line on top.) Bandsaw the top view. After sawing the body, cut out both views of the head the same way. Then, saw out the side view of the neck. Draw a centerline along the edge all around each part.

Locate and mark the center on the joining surfaces of the head, neck, and body. You can draw diagonal lines on the neck and body surfaces to find the center. On the head, pick a point about midway along the centerline on the mating surface.

On both surfaces of the neck-to-body joint, draw a 13/4”-diameter
circle around the centerpoint. Draw a 15" circle on each surface of the head-to-neck joint. Then, drill a 1/8" dowel hole 1 1/2" deep at each centerpoint. Be careful to drill perpendicularly to the surface to allow rotation of the neck and head for positioning later.

**Rough out the body**

Begin rough-shaping the heron body by removing the square corners left by bandsawing. "When roughing out the blank, think of the egg that the bird came from," Frank suggests. "There are no square corners." Bandsaw or carve the corners to a roughly 45° angle, following the Bevel Line on the Side-View pattern. This should leave a band 1 3/4" wide along the middle of the front and back, as in Photo 1.

Refer to the patterns and Photos 2 and 3, then sketch guidelines for the wings and breast plume onto the body. Round the body to the shape suggested by the cross-section illustration A-A and Photos 4 and 5. Undercut the lower edge of the wing line toward the bird's tail as you round the body. Also, narrow the body slightly in front of the wing line so the wings will appear to be laid over the body.

And don't be timid about rounding. "Beginners' carvings always look square," Frank comments. He figures that fear of cutting away too much wood, largely caused by not knowing the subject, leads to the blocky look. To avoid that, study the in-progress photos as well as the photo of the completed carving. Refer to any photos or illustrations of herons you can find in books and magazines, too. The more pictures, the better. "You can't carve what you don't know," counsels the carver.

Continued
Undercut the wings over the tail. Shape the tail, again relying on the photos. Round the neck attachment point to the diameter established by the circle.

**Carve the head and neck**
Following the pattern drawing and Photo 6, pencil the carving lines onto the head blank. Round the corners of the head and rough-shape the beak. Shape the round surface to join to the neck. Bring the neck to a round section, carving to the diameters of the circles on the ends.

Temporarily install the head and neck on the body with dowels. Cock the head slightly to the bird’s left, and glue it to the neck. Dowel the joint for strength. Blend the neck and head together, filling the joint, if necessary.

Carve the crest at the back of the head and the detail lines shown in Photo 7. Drill a 3/16" hole about 4" deep at the eye location on each side. Make sure the eyes are located at the same spot on each side. (The heron takes 11 mm glass eyes, which will be set into the holes later with putty.)

Glue the neck to the body, if you wish. (You may not want to glue it. Many early hunters made their decoys in two parts for ease of storage and transportation. And if you don’t glue it, you can turn the head to the position that best suits the display location. If your heron will be outside, you should glue the neck on.)

**Hint at some feathers**
At this point, completing a primitive-style decoy, or slick, as hunters used to call them, only requires carving a few major details. “Generally, I shape major feather groups on the body without texturing individual feathers, merely giving the hint of a feather outline here and there,” Frank explains. “Then, when I paint, I outline representative feathers and quills with brush strokes.”

Study Photos 8 and 9 and the photo of the completed carving to see the feather groupings. Sketch in the lines for the feathers in the wing groups. Vary feather sizes slightly for a more natural look.

Begin carving the group highest on the heron’s back. Carve a slight relief along the feather line, then round the edge. Within each layer, the feathers overlap from the middle of the back outward. Each group lays over the next one down. The overlap can be subtle—a break of 1/16" or less defines the layers adequately. Note, too, the softness of the trailing edge of each layer. Groups should blend rather than stairstepping down the back.

Curved feather-like lines carved from the body onto the front of each wing suggest body feathering. Here, you could carve and texture body feathers and texture the wing groups for a more detailed carving. But for a slick, the smooth surface will be fine.

Lay out and carve the tail feathers as you did the wing groups. The tail feathers, too, overlap from the center outward. Carve the chest plumage next. The desired effect here is a ruffle of fluffy feathers—much like the feather boa so often seen draped around the femme fatale’s shoulders in an old movie.

Now, set the eyes. Mix a small amount of epoxy putty (available at hardware stores). Roll it into a ball, and push it into the eye hole. Then, press an 11 mm yellow glass eye into the putty until the eye protrudes about 3 mm from the side of the head. Trim off the squeezed-out putty. Roll that into a strand about 1/8" in diameter, and wrap it around the eye to form the eyelid. Model the eyelid, following the drawing. After the putty dries, sand off any bumps or lumps. Mask the eyes for painting.

**To burn or not to burn**
Before you start painting, decide whether you want to blast your carving with a propane torch. Why would you even consider doing that? To make it look old.

One aging or distressing technique involves rubbing the paint off in certain spots, giving the carving a well-worn look. Burned wood looks old and weathered when revealed this way. Don’t overdose it, though. Aging a few spots by burning will give your carving patina and charm; too much will give it the look of something that you dragged out of a campfire. Look at the carving; you’ll be able to tell where the paint would rub off during storage, transportation and use. These are the areas to burn.

You can burn the surface lightly, creating a toasty color, or more
8. 9 Some feathers are delineated on this decoy-style carving, others are suggested by the flame-like lines carved at the front of the wings. You could detail the bird further by texturing the feathers.

heavily, blackening the wood and raising the grain. After burning a spot, Frank removes charred wood with a stiff brush.

Add realism with paint
To paint the heron as shown, you’ll need artist’s acrylics (available from art-supply dealers) in these standard colors: Titanium white (TW), Paynes gray (PG), Mars black (BL), raw umber (RU), yellow ochre (YO), and burnt sienna (BS). Either tube or liquid colors will work; liquid ones don’t require as much thinning.

Sand the carving and seal it with shellac before painting. Prime the carving with a coat or two of white acrylic gesso (also available at art-supply stores). Mix a little PG into TW for the base coat, and paint the entire bird.

Darken the base gray with a touch of RU to paint the tail and the primary feathers of the wing (the ones that extend farthest back over the tail). Paint the top and bottom of the tail with the darker color.

Add a bit of RU to TW for the cheeks, jowls, and the top of the head. Bring the same ivory color down the back and sides of the neck, blending into the gray.

Paint the chest plumage the same TW/ RU color. Tint some MB with RU, then use that color and TW to highlight the chest plumage. Paint highlight lines randomly along the edges and centers of the wing feathers—but not every feather.

For the shoulder patch, tint BL with RU. Add a spot of BS at the upper edge. Paint the tip and underside of the bill YO, blending into BL and RU on the top.

Age the painted carving
Let the paint dry thoroughly before distressing and antiquing the heron. Then, using 0 or 00 steel wool, rub through the paint in the areas you burned previously, or down to the bare wood if you didn’t do any burning. Leave random, feathered edges, as if the paint had been worn off by years of rough handling and storage in burlap bags. You could also dent or scratch the wood and, if you’re really brave, break a piece off the bill, chest plume, or some other vulnerable spot.

To antique the distressed carving, thin RU with water to an inky consistency. Wash coats of it all over the carving, allowing it to puddle in depressed areas and carved features—places where dirt would build up. Don’t let runs create streaks on the smooth parts of the carving—blot them off with a towel. Also wipe the antiquing away in some high spots to create highlights. Let dry, then repeat the process until you achieve the look you want.

After the antiquing dries, sign the carving on the underside of the tail. Then, apply furniture wax. Let it set according to the manufacturer’s instructions, then buff it (Frank puts an old athletic sock on his hand to do this). Buff the high spots, but don’t try to get down into the depressed areas.

Build the base
To construct a stand like the one shown, draw a 9”diameter circle on 2”-thick stock. Laminate thinner stock, if necessary.

Tilt your bandsaw table to 45°. With the workpiece on the low side of the table, saw around the circle. Drill a 1/8” hole 1/2” deep centered on the top surface—the smaller face.

Texture the beveled sides and top with shallow, random grooves. Cut a 20” length of 1/8” dowel rod. Chamfer the ends to fit into the holes in the stand and heron. Mix a bit of RU into MB to paint both parts. Place the completed carving on the stand.

Buying Guide
Carving blanks. Full-scale basswood blanks cut both ways, leg dowel, and base for S-neck great blue heron, the project shown here, $27 ppd. in U.S. Also in straight-neck pose, same price. Half-scale blanks, either S-neck or straight-neck, $22. All available as heron or American white egret. Roaring Brook Woodcarving Kits, P.O. Box 1402, Glastonbury, CT 06033, (203) 657-8976.

Books, classes. Frank Russell power-carving books: Vermont Folk Figures, $9.95; Realistic Faces, $12.95; Realistic Animals, $12.95; Folk Figures, $12.95. Books, as well as information on classes and seminars, available from Stonegate Studios, 5 Russell Road, Box 2140, Cambridge, VT 05444, (802) 849-6692.
Don't need one, don't want one! That's the way I felt about computers. Then, about four years ago, the price on CAD* software dropped from the $3,000 range to as little as $150. Not long afterward, online services* started covering woodworking tips, techniques, and tool talk.

So I bought a home computer and went to work with Jim Downing, our design editor and a fellow computer enthusiast. We discovered lots of uses and techniques that we will introduce you to in this article. If you want to just dabble, you can try our scrollsaw sign-making method with a word-processing program*, subscribe to an online service, or try the single-purpose software* we found. And should you want to dig deeper into the digital woodworking universe, check out our report on CAD and drawing programs starting on page 82.

If you don't own a computer, read "What to look for in a home computer" on page 83 first. If you already own one, you can skip this section, grab your mouse*, and get started.

* If you run into a word that you don't understand with an asterisk by it, check out the definitions on page A15 in the boxes titled "Terms of the trade," or "What to look for in a home computer."

When you plug the software for "The Guide to Published Woodworking Plans and Techniques" into your computer, you can research articles from 27 woodworking magazines.

1. Create letters for scrollsawn signs and plaques
All you need to make letter patterns for your scrollsaw projects is a computer with a word-processing program and a printer. Word-processing programs offer dozens of type "fonts" (styles) that can be scaled to almost any size.

To create a letter pattern, you simply type the letters, then experiment by changing the font, size, and spacing between the letters and lines. When you've got the look you like, print the results and adhere the paper to the wood to be cut.

2. Locate thousands of woodworking articles
Thumbing through the back issues of woodworking magazines can eat up a lot of time. If you have a computer, however, you can install a program called "The Guide to Published Woodworking Plans & Techniques" and gain instant access to listings of 15,800 articles from...
your woodworking

27 woodworking magazines dating back 20 years. Published by woodworker and computer buff Art Gumbus, the Guide, shown below left, indexes articles in 37 different categories such as accessories, cabinets, jigs, routers, sanders, and so on. Art also publishes a book version, but the software contains a cross-index function that allows you to search for techniques in project articles.

The disk by itself (DOS®, or Macintosh® versions) runs $20. The book and the disk together cost $37. The book alone is $25. To order (specify PC or Mac), write to: KnotWhole Publishing, 5629 Main St.--Putney, Stratford, CT 06497. You can also contact Art via E-mail® at: America Online: ArtGumbus, or CompuServe: 76600,1176.

3. Calculate almost any compound miter

Years ago, woodworker Carl Shafer ran into a problem calculating the compound angles for a toy windmill he was building. So he looked up the mathematical formulas and put them into a Windows-based program.

To use Carl's Miter Calculator, simply type the number of sides you want, the slope, height, and width of the top or base into the appropriate boxes on your computer screen. The program will figure your miter-gauge angle, saw bevel angle, and their complements as shown on the computer screen above right. If you have a printer, you can print a paper template of the bevel angle and use this to set up your sawblade.

The Miter Calculator will figure angles for staved bowls, picture frames, shadow boxes, and tapered columns. The program is available through America Online as shareware®. To find Carl's program, type "MITER" in the America Online keyword section. The fee for downloading Carl's program is $25.

4. Surf the online services and write to WOOD®

Have you ever wanted to ask a group of woodworkers a question, or write a WOOD magazine editor and get a quick response. With a computer and a modem you can do just that using CompuServe, Prodigy, America Online, and other services. For a fee of roughly $10 a month, these services offer the text of many current magazines and newspapers, software to download (some of it free of charge), and forums where you can communicate with other special interest groups such as woodworkers.

If you want to get in touch with WOOD magazine editors in CompuServe, our E-mail address there is: 74404,3516. To find out more about CompuServe, call 800/848-8990.

Continued on next page
With a CAD program you can draw and dimension every aspect of a project right down to the hardware.

5. Draw your own projects with a CAD program

Anybody who has designed a woodworking project with paper and pencil knows how bothersome it is to make changes. With a CAD program, you draw on screen, just as we do to design projects such the lamp above. To draw different lines (straight or curved) or different shapes (rectangular or circular) you simply choose a different drawing “tool” from the “toolbox” located at the top or side of the screen.

The beauty of CAD programs is their ability to rotate, copy, shrink, enlarge, color, and make duplicate or mirror images of anything you draw—all this with a few clicks of your mouse. You can tweak designs until you get the proportions you like, or modify multiple copies for comparison. You can even make up your own cutting diagrams by copying project parts onto an outline drawing of the available lumber.

With CAD you can quickly measure and draw dimensions. And you get all the standard architectural scales, English and metric, in a range from 10X magnification to 1” equals 1-mile.

Below, we’ve listed some features to keep in mind when shopping for a CAD program, and on pages 82-83 we review six popular CAD programs we’ve tried. Unless otherwise noted, all the CAD programs reviewed include the features listed here.

Tutorials. If you’ve never worked with CAD before, shop for a program with a tutorial (a short introductory study of the program’s features). Many of the software manuals start with a tutorial, but some programs offer an even more useful feature—a self-guided tutorial that runs on the computer screen. Some companies also provide a video to preview functions on your TV.

Symbol libraries. To speed up the drawing of commonly-used elements, most CAD programs offer a symbol library with pre-drawn shapes. Many of these symbols, however, are geared for architectural, mechanical, or landscape work. As a woodworker, you should look for a symbol library that allows you to create your own custom profiles, such as hardware shapes, cabriole legs, and router-bit shapes.

DXF import/export function. To download project drawings from another computer or an online service, you will need a CAD program that contains a DXF (drawing exchange format) function. This will also allow you to share your drawings with other computer users.

Spreadsheets and databases. Architects and professional designers use spreadsheets and database functions in CAD programs to extract information from the drawings. This allows them to create a bill of materials and track costs for each project. This may prove valuable if you do woodworking for hire or big projects such as kitchen cabinets.
6. Get creative with a drawing program. CAD programs excel at straight-line drafting and some curves. But if your woodworking tastes lean more to scrollsawing, sign making, or projects that incorporate pictorial designs, you may want to choose a drawing program.

As shown in the hummingbird sign below you can wrap, slant, or skew letters and other figures around any shape with a drawing program. And most drawing programs come with hundreds of clip art profiles—shapes and patterns that you can use, modify, or build into your own designs.

All-purpose software programs (such as ClarisWorks or Microsoft Works) include a basic drawing program. Once you become familiar with these, you may want to step up to a fully-featured drawing program. The two most widely used programs include Claris-Draw, for Macintosh users, and Corel Draw for PC users.

To find out more about these drawing programs contact: Claris Corporation, 5201 Patrick Henry Dr., Santa Clara, CA 95052; call 408/727-8227. Or write to Corel Corporation, 1600 Carling Ave., Ottawa, Ontario K1Z 8R7; call 613/728-8200.

7. Search the forests of the world for the right wood

If you've ever wanted to substitute one wood for another, but didn't have enough information, check out WoodMatch. Compiled from data in hundreds of books, WoodMatch contains information on more than 300 species of tropical and temperate trees.

WoodMatch comes on a CD-ROM* or floppy disk, and you can conduct searches based on properties such as strength, weight, or hardness. Want a wood that bends like hickory? Look up the information on hickory, plug the bending data into the "Criteria Search" window, and the computer will find every wood with the same bending characteristics.

As a database, the program allows you to input your own information. Additionally, you can look up data on 300 wood-composite products such as particleboard and plywood.

You may also find useful the environmental profiles contained in this program. These profiles highlight species that are endangered or logged destructively, and then lets you search for better choices.

WoodMatch is available in PC or Mac versions for $39. You can also get a professional version containing additional technical information for $249. For information or orders contact: Tree Talk, Inc., P.O. Box 426, 431 Pine St., Burlington, VT 05402. Call 800/858-6230.

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Continued
HOME COMPUTERS

CAD PROGRAMS FOR WOODWORKERS

The following is a listing of the CAD programs we've sampled that offer features woodworkers can use. We've listed manufacturers' suggested prices. Shop around and you should be able to find most of these programs at lower prices.

3-D programs

DesignCAD 3D 5.0
This program comes in DOS and Windows versions. (We've used the company's 2-D/Windows program to make the drawings at WOOD for years.) The 3-D version, though, gives you both wire-frame and solid modeling capability. With the solid modeling you can create photorealistic images. The program's "Boolean" operations use one drawing to cut, carve, or drill into another drawn object. $499. (The company also sells a 2-D/3-D Macintosh version for $299.)


MiniCAD 6.0
With this Macintosh program you can switch easily between 2-D and 3-D modes. If you like a blueprint look to your screen, you can turn the background black and render lines and text in white. In the toolbox you'll also find rotation, walkthrough, and flyover functions which show you projects from different perspectives. This is an in-depth program—the tutorial alone runs over 200 pages. The company also sells a Windows version called Graphsoft CAD. $795.

Graphsoft Inc., 10270 Old Columbia Road, Suite 100, Columbia, MD 21046. Call 410/290-5144.

2-D programs

Drafix CAD
This Windows-based program lets you see four views of a project simultaneously. When changes in a dimension are made in one view, the other three views instantly incorporate that change. A CD-ROM included in the package contains more than 5,000 symbols. The program allows you to create and customize tool boxes, and comes with a helpful manual. A tutorial is available on request. $495.

Softdesk Retail Products, 10725 Ambassador Dr., Kansas City, MO 64153. Call 800/231-8574.

Dyna Designer
Billed as both a drafting and drawing program, this software package offers 2,000 commands. These can be activated by typing in a text command or moving a cursor across the Windows screen icons and menu bars. An overview window allows you to study the on-screen drawing in miniature. Drawings can be scaled to 16 decimal points for precision. You can create up to 256 layers within a program, and open and work on as many drawings as you can fit onto the screen. The program comes with a thorough tutorial and an 800-page manual. $399.

Ditek International, 2800 John St. #15, Markham, Ontario L3R 0E2. Call 905/479-1990.

Terms of the trade

CAD (computer-aided design) programs help you use a computer screen as a drafting board.

Online services connect home computers to one another and to vast banks of information.

Word-processing programs allow you to write, cut, paste, size, and rearrange text.

Megabyte: a million bytes. (A byte is a unit of information roughly equivalent to ten type-written, single-spaced pages.)

Shareware programs are downloaded from the online service to your computer.

Modems connect your computer via your telephone lines to other computers and the online services.

E-mail is a message or letter sent via modem from one computer to another.

Mouse: a hand-held device that lets you move a cursor around on your computer screen.
What to look for in a home computer

First, let’s define terms. The computer is generally referred to as hardware. This includes the screen, keyboard, mouse, and CPU (central-processing unit) which contains the “brains” of the computer. Software comes on floppy disks that you insert into the CPU. Each software program contains information to help you perform specific tasks such as write, draw, or play games. You can also get CD-ROM software which contains much more information than floppy discs. To read these, however, your computer must have an external or built-in CD-ROM drive.

You’ll find two basic choices in home computers: PCs (personal computers) or Macintosh (Mac) computers. Most PCs work in tandem with a user-friendly software program called Windows which replaces the clunky DOS (disk-operated systems) of the past.

The critical difference is that most software programs are written for just one type of system. You don’t want to buy a Mac only to find the software you want comes in a PC version.

You’ll also want to make sure that your computer has enough RAM (random-access memory) to support the software you want to use. Most home computers today come with 4MB (megabytes) of memory which is plenty for most tasks. But some drawing and CAD programs require up to 5MB. So identify what you intend to do with a computer first, find the software that will do it, and then choose the best computer to support the software.

Finally, do your homework. Study the books and magazines geared for beginning computer users. Ask a friend with a computer for advice, and if possible, log a few hours of practice on their machine.

Recommendations

For most home woodworkers and small shops, Drafix CAD, Dyna Designer, and MacDraft 4.0 will do well. If you are new to computers or CAD, however, a low-cost program like Turbo CAD will serve most of your needs without costing a lot.

If you want to study projects in three dimensions or create color renderings, choose one of the 3-D programs such as Design CAD 3D, or MiniCAD. Keep in mind that 3-D programs require more computer memory and take longer to master than 2-D.

Stay away from the “architectural” drawing programs you see in the stores or catalogs for under $50. These are fun programs to play with, but about all they do is allow you to manipulate preset room and landscape layouts. If a program doesn’t say “CAD” in the title or description, then it probably won’t give you the functions you need to draw woodworking projects.

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Advanced-design screws saw into wood

Most of us don’t give much thought to the quality of the screws we use—until one snaps off inside a workpiece. With the proliferation of low-cost, general-purpose “drywall screws,” the failure rate in wood runs high.

To prevent breakage, Häfele introduced Spax-S Screws, a product with a hardened-steel core and several other features that put them a notch above any other screw I’ve tried. The threads on the lower third of the Spax-S Screw have small serrations that cause the screw to “saw” down into the wood as you drive it. This sawing action reduces the splitting that occurs when ordinary non-serrated threads split or push aside the wood fibers. And the self-tapping tips of these screws bite into the wood easily so that you don’t have to push down hard or drill a pilot hole to get the screw started. On the head of the screw, a combination recess accepts square-drive or Phillips-head driver bits. Additionally, a low-friction coating on the screw helps to reduce the effort it takes to sink the screws.

To find out how much abuse these screws can take, I drove a dozen of them into 1”-thick pieces of oak and walnut without pilot holes. In every case, the screws pulled themselves clear through the wood without snapping off. The only splitting I encountered was when I screwed too close, within an inch or so, to the edge of a board.

A box of 1,000 Spax-S Screws costs about 50% more than the least-expensive drywall screws. But I think that these screws are worth the extra cost for any home woodworker who doesn’t want to risk digging out or covering up a broken screw.

—Tested by Dave Henderson

Set knives in seconds with the Planer Pal

Resetting the knives on a planer can frustrate even patient and careful woodworkers. The knife-setting gauges that come with most machines will only get you to within about .005”, and that’s still just a bit too much error for a smooth cut.

The Planer Pal is designed to set knives on most of the popular models of 10” and 12” planers with 1¾”-diameter cutterheads. It consists of two separate plastic shells, each with five magnets and an indexing pin on the concave underside of the shell. Four of the magnets hold the shell to the cutterhead. The fifth magnet sets the height of the blade.

To use the jig, set your knives loosely in the cutterhead, and place the shells on opposite ends of the cutterhead with their indexing pins pushed against the back edge of the gib slot. Adjust the knife until the center magnets just touch the knife edge. Now, tighten your bolts and repeat the operation on the rest of the knives.

When I used the Planer Pal, I was able to set the height of each knife on my planer to within .001” end-to-end and their height to within .002” difference from knife-to-knife. That’s accurate! I recommend the Planer Pal to anyone who owns a planer and wants to keep the knives aligned.

—Tested by Bob McFarlin

Continued on page 100
NEW THIS SEASON!

Holiday Cutouts Grace the Season
Decorate the season with these easy-to-build holiday cutouts.

Decorate your yard and home with these impressive holiday cutouts. Build them yourself for years of enjoyment, and a sense of pride and accomplishment. Full-size patterns and complete step-by-step instructions make each of these holiday decorations easy to build! Only a few tools and an evening or two are needed for each project. For professional results, just follow the simple cutting, painting and assembly instructions. It’s as easy as that! Plus, when the season’s over, disassemble and lay the pieces flat for space-saving storage. To assure your success, the experts at WOOD magazine designed and built each project.

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B&D adapts the Workmate to a portable tool box

When working away from the shop, I usually haul my tools around in a 5-gallon drywall bucket. But unless I drag clamps and sawhorses up from the basement, I lack an on-site means to clamp or hold a workpiece steady. The Black & Decker ShopBox, a hybrid of the Black & Decker Workmate and a portable tool box, solves these problems.

Like the Workmate, the 11x18" top of the ShopBox has two jaws that open and close to clamp workpieces. And it offers swiveling benchdogs that you insert in holes in the top and use to hold workpieces up to 11½" wide.

Below the hinged top, the ShopBox contains a tool-storage area that includes a portable tray for small odds and ends on the top, and a 9x15x7" storage well below. I managed to fit an electric drill, jigsaw, 20'-extension cord, and a few hand tools in it. At the bottom front edge of the ShopBox, another shallow plastic tray contains small bins covered with a plastic lid. These each hold a small handful of nails, screws, or hardware parts.

Compared with the Workmate, I found the vise handles on the ShopBox too close to the top—a sacrifice made to conserve space and keep the unit portable. But that's the only difficulty I experienced. I still tote the bulk of my tools in a drywall bucket, but by carrying the Shopbox in the other hand, I've got a portable workbench and clamp that eliminates the biggest hassle of working away from the shop.

—Tested by Tom Jackson

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Natural Prostate Relief

It's a natural fact. If you are a male over 40 and don't already suffer from a prostate gland disorder, the odds are 2 to 1 that you will before you are 59. By the age of 65, most American men have enlarged prostates.

As the years pass, mild discomforts can become disabling. Today, prostate surgery is the second most commonly performed surgery in men over age 65! Surgical complications can include total loss of bladder control and sexual dysfunction.

Prescription drugs may halt the swelling, but rarely end the suffering. Also, many prescription drugs may have side-effects, like weak erections and low sex drive.

Many doctors feel that prostate disorders can be treated or prevented by giving the prostate gland the nutrition it lacks.

Recent scientific research has shown how to remedy the underlying problems associated with prostate disorders—safely and effectively. These results have been published in the British Journal of Clinical Pharmacology, the American Journal of Gerontology, and papers from the National Cancer Institute. They reveal that several vitamins, minerals and natural herbs can dramatically shrink the prostate and improve urinary performance in older men.

"Now I get a good night's sleep without getting up every two hours to urinate."
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"I previously encountered discomforts such as bladder urgency. These problems are now completely absent."
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"Prostsafe has stopped the burning after urination."
-- Mr. C.E. Black
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"Before I used to have several bladder infections a year. Now I do not have any."
-- Mr. A. Simon
Charlotte, MI

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-- Mr. S.J. Hymel
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Improve bladder control!

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The reasons why men over 40 use Prostsafe are clear. If you are looking for relief, order Prostsafe today.

For as little as a dollar a day, that seems like inexpensive insurance against prostate disorders. If for some reason you are not satisfied, just return the unused portion within 30 days for a full refund.

The most modern application of these healthy ingredients is found in Prostsafe™ from Whitewing Labs. Prostsafe is the nutritional "tool kit" for men with benign prostate problems, and those who wish to prevent them. It is a mixture of zinc, serenoa serrulata, ginseng, certain amino acids, bee pollen and vitamins A, B-6 and E. Working as a team, these ingredients have been shown to shrink a swollen prostate.

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Benchtop drill press offers heavy-duty performance

If you normally associate Skil with portable power tools, the company's model HD3580 13" Benchtop Drill Press will change the way you think. To start, the 2¾"-diameter steel column gives this drill press a reassuringly solid feel. The quill, with its 3¼" spindle travel, and the table-elevation mechanism, operate with smooth, solid precision. A 9×10" cast-iron table allows for a maximum 15½" chuck-to-table distance.

The HD3580 comes with a 1,720-rpm ½-hp induction motor and a ¾"-capacity chuck. By changing the belt to different pulleys, you can change the chuck speed from 500 to 3,100 rpm. I found the belts and the belt tension easy to change.

The price of this drill press rates right up there with similar models from other manufacturers. What separates the Skil drill press, however, is its excellent fence. This cast-aluminum piece mounts on the column and provides a backstop and a vertical surface to which you can clamp workpieces. A centering rod included with the fence enables you to gauge the distance from the center of the chuck to the edge of the fence as shown in the photo right. Another accessory used in conjunction with the fence, an aluminum V-block, enables you to secure round or square stock on edge. Given the convenience and value of the fence, and the overall high quality of the rest of this machine, I think the new Skil drill press would make a good addition to any shop.

—Tested by Dave Henderson
FINISHING TOUCHES

OHIO WOODWORKERS TRIM A TREE

For each of the last 18 years the Women's Auxiliaries of Children's Hospital in Columbus, Ohio, have sponsored a Festival of Trees as a fund-raiser. Last November, 109 themed trees were donated to the festival by area individuals, businesses, clubs, and organizations. Many of the decorated trees were awarded prizes in different categories, then auctioned off to the highest bidder.

According to David Loy, president of the Woodworkers of Central Ohio woodworking club, the tree decked out by members sold for $4,000! "It also won First Prize in the handcrafted category, which had about 30 entries," he says. "The club members produced nearly 500 ornaments—both turned and scroll-sawn—to trim the 6½' tree. And we brightened it up with 2,200 lights."

Oh Christmas tree, oh Christmas tree

Close to 90 percent of all Christmas trees in the United States come from tree farms, says the National Christmas Tree Association, and all 50 states (even Hawaii) have such farms. In all, Christmas tree farms cover about one million acres, with each acre of growing trees producing enough oxygen every day to meet the requirements of 18 people. And for each tree harvested, usually 10 more are growing to desired height. Growers promptly replace cut trees with evergreen seedlings.

GRANDMA WAS RIGHT, ADMITS EPA

Who hasn’t heard that eastern red (aromatic) cedar repels moths and mildew? That’s why trunks, chests, and closets have been lined with the wood for generations, right?

Until lately, though, that notion was legally nothing but hearsay. Then, in March of last year, the U.S. government’s Environmental Protection Agency (EPA) granted de-regulation status to natural cedar products. EPA’s move means recognition of natural cedar products as a safe way to chase away moths, fleas, and mildew. Manufacturers of such products now can promote them as natural alternatives to pesticides and chemical mothballs without registering them with the EPA. To all you woodworkers, that means grandma was right after all!

In Japan, there’s spirit in the wood

The Japanese people’s fondness for wood may be due to the influence of Shinto, Japan’s indigenous religion. Shinto professes that almost every living thing—including a tree—possesses a spirit. That’s why traditional woodworkers and carpenters in that island nation strive to put a tree’s wood to use for things of beauty that will ensure the tree’s continued existence. ♠

Photographs: David Loy  Illustrations: Jim Stevenson
Proof that the apple doesn't fall far from the tree.

We've never set out to copy our Unisaw. But we've certainly learned a lot from it over the years. Most importantly, how to build a quality saw to fit the needs of its owner. Which is why we build more types and sizes of saws than any other company in the business. All with the heft and precision we put into our professional saws.

Take our new 10" Contractor's Saw II," for instance. Built with a massive cast iron carriage and trunnion assembly, topped off with a 20"x27" cast iron table and solid steel extension wings. Its powerful 1 1/2 HP motor and Jet-Lock® rip fence give you accuracy and capacity enough for the long haul.

Admittedly, we have an advantage when it comes to making and selling saws. All those years of building tools for professionals would seem to say that Delta would be a pretty good place to start, if you're in the market for a good bench saw or a cabinet saw or any saw in between. We figure you shouldn't have to be a professional in order to work like one.

For the name of the nearest dealer, home center or hardware store carrying Delta Tools, call Delta International Machinery Corp., 800-438-2486. In Canada, 519-836-2840.

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