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THE WORLD'S LEADING WOODWORKING MAGAZINE

NOVEMBER 1996 ISSUE NO.92

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living

Page 53

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MPA

WOOD ONLINE™

at <http://www.woodmagazine.com>

In response to numerous user requests, we've recently added a searchable index to our worldwide web site. The index is a handy way to look for that lost project, tool test, or technique article from issues 1 through 90 of **WOOD** magazine. In addition, we've added a tour of Idea Shop® I, including photos, descriptions, and back-issue references for over 16 how-to-build projects from this popular woodworking shop article. Also, check out our five new **WOOD PLANS®** at our Company Store.

THE EDITOR'S ANGLE

Wanna have some fun this Christmas?



Proudly introducing the Snow Family—Mister and Missus Snow, and Little Snowflake—a fun group if there ever was one.

I don't know about you, but until a couple of years ago, hauling out the outdoor Christmas decorations each year was one of my least favorite honey-do's. It seemed like I never got into gear until after the first snowstorm. And climbing up on that 12' ladder to hang lights along the fascia board was a real nerve-racking adventure.

Thankfully, things have gotten much better ever since I made a pair of the slot-together deer that we developed for our magazine readers a couple years back. Now, when my wife has the urge for me to begin my yearly task, I just go up into the attic and reach for my ready-to-position decorations. It couldn't be easier. Or could it?

Since the deer have proven to be so popular with our friends and relatives (and so easy for me to set out each year), I'm going to try something new this year. Some weekend real soon, I'm going to build and paint the Snow Family (that's them in the photo above),

and surprise my wife with them. Then, come January, after treating our holiday visitors with the fruits of my handiwork, I'll move the Snow Family up to the attic where they can pal around with the deer until I call them into service next year.

The Snow Family (our adaptation of a Judy Gale Roberts design) is only one of the four new outdoor ornament designs we've come up with for this holiday season. As with our other outdoor ornaments, the new ones are much too large to put in the magazine, but we do have plans available.

Here's a tip: If you want to be the Christmas-decoration champion on your block this year, turn to *page 98* and take a look at our selection of full-sized holiday **WOOD® PLANS**. You'll be glad you did. And so will your neighbors. ❁

Larry Clayton

Better Homes and Gardens®

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THE WORLD'S LEADING WOODWORKING MAGAZINE

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This issue's cover wood grain: poplar

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TALKING BACK

Here's a biplane parts source

Several readers have contacted us about their difficulty finding the ½"-thick stock we used to construct the Barnstormin' Biplane featured in our August 1996 issue. If you find yourself in a similar situation—unable to find wood in the species or thickness called for in our projects—rest assured that we have a source for you. Heritage Building Specialties, 205 North Cascade, Fergus Falls, MN 56537 (call 800/524-4184) will supply all the individual pieces listed in the bill of materials for the biplane or most any other project featured in *WOOD* magazine. These pieces are cut slightly oversized in width and length, and are of the type of lumber called for in the bill of materials. The lumber for the Barnstormin' Biplane, kit no. W891, sells for \$53.95 postpaid.

We welcome comments, criticisms, suggestions, and even compliments. Send your correspondence to: Talking Back, *Better Homes and Gardens*® *WOOD*® Magazine, 1912 Grand Ave., Des Moines, IA 50309-3379. To contact us via computer, use these on-line addresses: CompuServe: 74404,3516 Internet: 74404.3516@compuserve.com



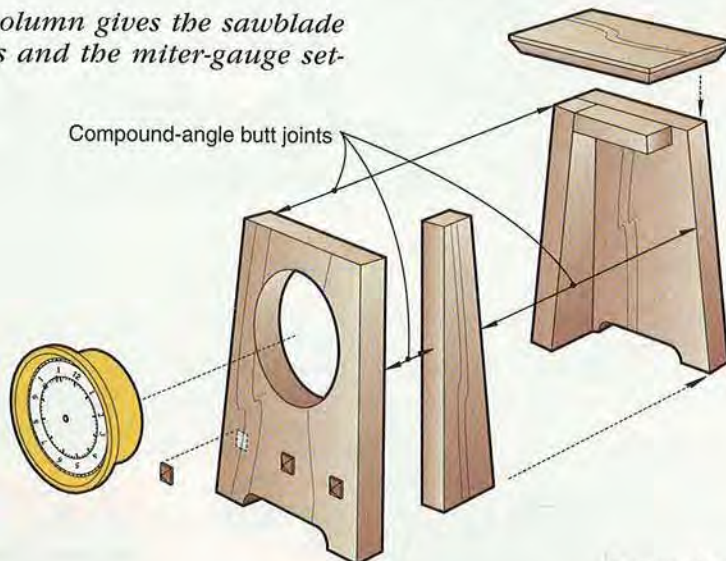
Clarification on the compound-miter article

The chart listing miter-gauge settings in the article "What Woodworkers Need to Know: Compound Miters" has a column under the Four Sides listing titled Butt. Would you explain what you mean by this title?

—William Wichman, Lexington, Ky.

tings for cutting the joints when the end or edge of one side of a box butts against the side of another. See the drawing below of our "Timeless Timekeeper" (November 1995 issue) for a design with compound-angled butt joints.

This column gives the sawblade angles and the miter-gauge set-



Continued on page 8

COMPOUND

A D V A N T A G E

Lock-off Button
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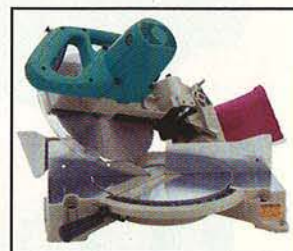
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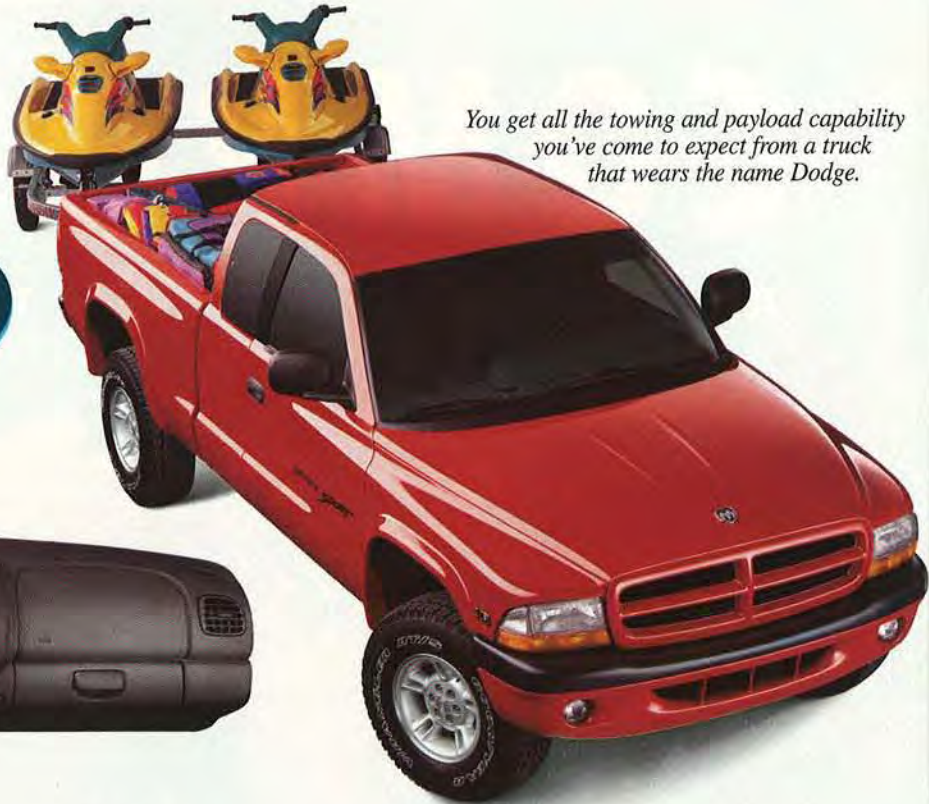
The all-new Dodge Dakota has the longest wheelbase in its class, which makes for a smooth ride. Yet its turning circle is up to 5-1/2 feet smaller than before.



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It's full of surp



The all-new Dakota is the roomiest truck in its class. There's even a forward-facing rear seat in Dakota Club Cab, with enough hip room to seat three across. Your passengers will be beside themselves with comfort.

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Continued from page 4

CMT Tools CEO replies to letter in previous issue

I am writing in response to a letter from Bernard J. Bobinski that appeared in your October 1996 issue, page 4.

In his letter, Mr. Bobinski correctly stated that all router bits sold by CMT Tools are now manufactured in the United States. Over 90 percent of those bits are produced in our new state-of-the-art factory here in Florida. The balance are manufactured to our strict specifications by a few selected suppliers. Eventually all of our bits will be produced in our plant. Production in our own facility has given CMT Tools better control of quality, costs, and inventory, advantages that are translating into better service for our customers.

It is true that most of our router bits used to be manufactured in

Italy, and we have made occasional design changes during the transition to U.S. production. I take issue with Mr. Bobinski's assertion that the "definite difference" he noticed in the design of our Rail and Stile Set reflects a reduction in quality. There will continue to be design changes in some of our products from time to time, but I assure all of your readers that when CMT Tools alters a bit our intention is to improve, not reduce, quality. If CMT Tools was unwilling to embrace change, we never would have introduced bits with anti-kickback design and our trademark orange coating.

I regret that Mr. Bobinski saw fit to return a number of apparently unused router bits to CMT Tools, including some bits produced by our former supplier in Italy. I feel

certain that had he given our American-made bits a chance he would have been pleased with the results. In any case, let me emphasize that customers who are unsatisfied with any of our products need only return the items for a full refund. That was CMT Tools' policy when we opened our doors over five years ago, and it will never change.

—Carlo M. Venditto, CEO, CMT Tools, Oldsmar, Fla.



How do I set my miter gauge to 85°?

The article "What Woodworkers Need to Know: Compound Miters" in the April 1996 issue calls for a miter angle of 85°. My miter gauge only goes out to 60°. How can I make that cut?

—Carl Hersbberger, Scottsdale, Pa.

Carl, we based this chart on the miter gauges in our shop. These gauges read 90° when square (perpendicular to the miter-gauge guide bar) and go out to a 30° setting. So, when our chart reads 85° for the miter gauge setting, you

should adjust your gauge to 5° off the perpendicular.

We realize that many miter gauges read 0° when adjusted to square, and extend to a 45° or 60° angle. See the chart below for the settings for these miter gauges. ♣

SIDE-TILT ANGLE	FOUR SIDES				FIVE SIDES		SIX SIDES		EIGHT SIDES	
	BUTT		MITER		MITER		MITER		MITER	
	blade°	miter°	blade°	miter°	blade°	miter°	blade°	miter°	blade°	miter°
5°	1/2	5	44 3/4	5	35 3/4	3 1/2	29 3/4	2 1/2	22 1/4	2
10°	1 1/2	9 3/4	44 1/4	9 3/4	35 1/4	7 1/4	29 1/4	5 1/2	22	4
15°	3 3/4	14 1/2	43 1/4	14 1/2	34 1/2	10 3/4	29	8 1/4	21 1/2	6
20°	6 1/4	18 3/4	41 3/4	18 3/4	33 1/2	14	28 1/4	11	21	8
25°	10	23	40	23	32 1/2	17	27 1/4	13 1/2	20 1/4	10
30°	14 1/2	26 1/2	37 3/4	26 1/2	30 1/2	20	26	16	19 1/2	11 3/4
35°	19 1/2	29 3/4	35 1/2	29 3/4	28 3/4	22 1/2	24 1/2	18 1/4	18 1/4	13 1/4
40°	24 1/2	32 3/4	32 1/2	32 3/4	26 3/4	25	22 3/4	20 1/4	17	15
45°	30	35 1/4	30	35 1/4	24 1/2	27 1/4	21	22 1/4	15 3/4	16 1/4
50°	36	37 1/2	27	37 1/2	22 1/4	29	19	23 3/4	14 1/2	17 1/2
55°	42	39	24	39 1/4	19 3/4	30 3/4	16 3/4	25 1/4	12 1/2	18 3/4
60°	48	41	21	41	17	32 1/4	14 1/2	26 1/2	11	19 3/4

JET's rebate

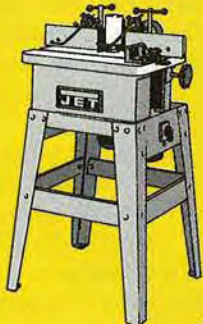
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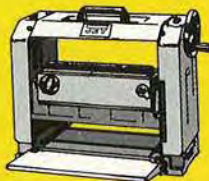
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JWP-12
Planer

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JWCS-10
Cabinet Saw

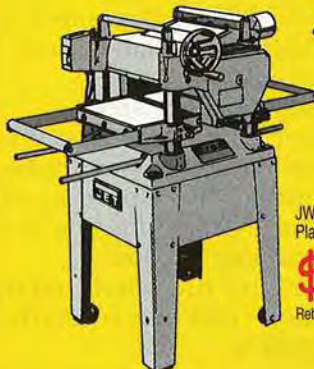
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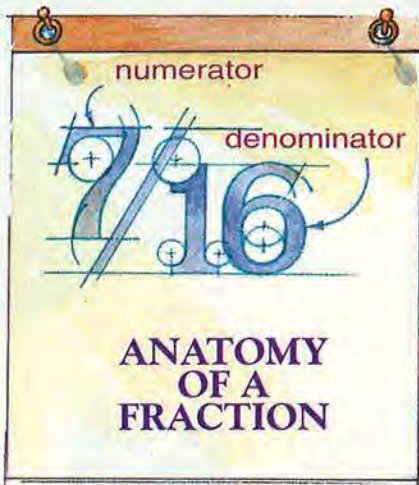
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What
woodworkers
need to know

FACING FRACTIONS FEARLESSLY

Those pesky fourths, eighths, and sixteenths give lots of woodworkers fits. But, you can't get through a project without them. Here are some rules and hints to help you figure out fractions.



Adding and subtracting fractions

Problem: You're laminating three pieces of stock, one $\frac{3}{16}$ " thick, one $\frac{5}{16}$ ", and one $\frac{7}{16}$ ". How thick will the lamination be?

Solution: To add fractions that have the same denominator (the number below the line), simply add the numerators (the *numera-*

tor is the number above the line). Then, put that sum over the denominator, 16, in this case. So, $3+5+7=15$, giving us $\frac{15}{16}$ " for the thickness of the lamination.

A complication: What if you want to add $\frac{1}{8}$ ", $\frac{1}{4}$ ", and $\frac{5}{16}$ "?

Solution: To add fractions with different denominators, you must first convert them so they have the same (or a *common*) denominator. Generally, with woodworking dimensions you can't go wrong picking the largest in the group, 16 in our example, for the common denominator.

To convert a fraction to a different denominator, $\frac{1}{8}$ to 16ths, for example, figure out how many times 8 (the denominator of the given fraction) will go into 16 (the denominator you want to use). Then, multiply both the numerator and denominator of the given fraction by that result to convert it to the new fraction. In the example, 8 goes into 16 two times, so multiply both the numerator and denominator by 2: $(1 \times 2) / (8 \times 2) = 2/16$.

Following the same process, $\frac{1}{4}$ becomes $(1 \times 4) / (4 \times 4)$, or $\frac{4}{16}$.

(As long as you multiply *both* the numerator and denominator of a fraction by the same number, you do not change the fraction's value. You also can reduce a fraction to its lowest terms by dividing both the numerator and denominator by the same number— $\frac{4}{8}$ becomes $\frac{1}{2}$, for instance, when you divide both the numerator and denominator by 4.)

Using this method, the original three dimensions, expressed with a common denominator, become $\frac{2}{16}$ ", $\frac{4}{16}$ ", and $\frac{5}{16}$ ". Adding them up like this $(2+4+5)/16$ " gives $\frac{11}{16}$ ".

Subtraction works the same way. If you plane $\frac{1}{4}$ " from a board that's $\frac{13}{16}$ " thick, what's the new thickness? $\frac{13}{16} - \frac{1}{4} = \frac{13}{16} - \frac{4}{16} = \frac{9}{16}$ ".

Remember these steps:

1. Express all fractions in terms of a common denominator.
2. Add or subtract the numerators to find the new numerator.
3. Place the new numerator over the common denominator.

Improper fractions and mixed numbers

Problem: Sometimes your answer will be an *improper fraction*, something like $\frac{8}{8}$ or $\frac{21}{16}$. What do you do with these?

Solution: If the numerator and denominator are equal, the fraction equals 1. But, if the numerator is larger than the denominator, your answer can be expressed as a mixed number—a whole number and a fraction.

To convert an improper fraction to a mixed number, first determine the whole number. Let's look at the $\frac{21}{16}$ example. Since we're in 16ths, $\frac{16}{16}$ represents 1.

A glance at the numerator, 21, shows that 1 is the largest whole number contained in the improper fraction, since 16 goes into 21 only once. So, write down 1 as the whole-number portion of the answer, and take 1 away from the improper fraction by subtracting $\frac{16}{16}$ from it: $\frac{21}{16} - \frac{16}{16} = \frac{(21-16)}{16} = \frac{5}{16}$. This remainder, $\frac{5}{16}$, becomes the fraction portion of the mixed number, $1\frac{5}{16}$.

Here's another example, $\frac{27}{8}$. In this case, $1 = \frac{8}{8}$. Analysis shows that 8 will go into 27 three times ($8 \times 3 = 24$), but not four ($8 \times 4 = 32$).

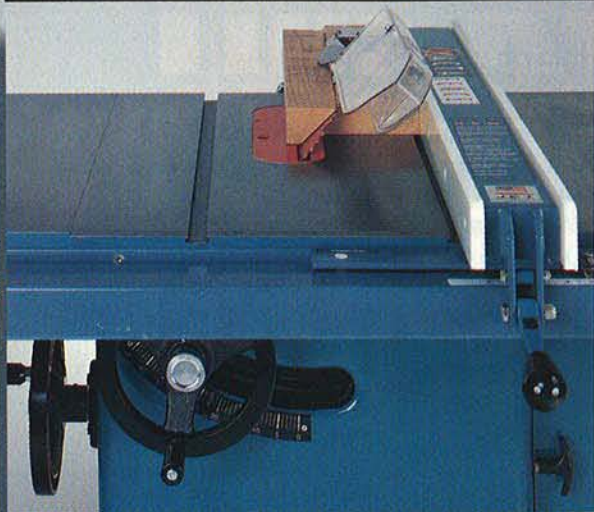
So, the largest whole number in $\frac{27}{8}$ is 3. Then subtract 3, in the form $\frac{24}{8}$, from the original improper fraction to find the remainder: $\frac{27}{8} - \frac{24}{8} = \frac{(27-24)}{8} = \frac{3}{8}$. Combined with the whole number, this yields the answer, $3\frac{3}{8}$.

Remember these steps:

1. Determine the largest whole number in the improper fraction.
2. Subtract the whole number from the improper fraction to find the remaining fraction.
3. Combine the whole number and the remaining fraction for your answer.

Continued on page 12

CUT RIGHT



CUT LEFT



Only JET offers a choice of either Left or Right cutting tilting arbor tablesaws.

Introducing two great new tablesaws from JET: one with a blade that tilts to the left, one with a blade that tilts to the right.

The XACTA SAW™ Left and the XACTA SAW™ Right join JET's line of quality woodworking tablesaws. Both saws feature a powerful 3 belt drive with either a 3 or 5 HP motor. The cast iron tables are the largest in the industry. Both saws also come fully

equipped with the new, highly acclaimed XACTA FENCE™ System.

For a limited time each saw comes with a unique FREE accessory package valued up to \$336.

Experts agree about

JET. *American Woodworker* "Good features, performance and value. Delta and Powermatic, look out!"
Fine Woodworking "The first thing we noticed was that the fit and finish were exceptional."

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Adding or subtracting mixed numbers

Problem: What's the total length of two parts, one $5\frac{3}{4}$ " long and another one $4\frac{5}{8}$ " long?

Solution: You can either add the whole numbers and fractions separately, or convert the mixed numbers to improper fractions. To convert, multiply the fraction's denominator by the whole number. Add the fraction's numerator to that result, then place the sum over the fraction's denominator.

It's easier than it sounds—you can probably do it in your head. Let's convert $5\frac{3}{4}$. First, multiply the denominator (4) by the whole number (5), $4 \times 5 = 20$. Add the fraction's numerator (3), $20 + 3 = 23$. This becomes the numerator of your new improper fraction. The denominator is the one in the mixed number's fraction. So, $5\frac{3}{4} = \frac{23}{4}$. For $4\frac{5}{8}$, $8 \times 4 = 32 + 5 = 37$, over the denominator 8, or $\frac{37}{8}$.

To answer the question, then, add $\frac{23}{4}$ and $\frac{37}{8}$. Make the common denominator 8 ($\frac{23}{4}$ becomes $\frac{46}{8}$). Thus, the total length is $\frac{46+37}{8}$, which is $\frac{83}{8}$, or $10\frac{3}{8}$ ".

Remember these steps:

1. Multiply the fraction's denominator by the whole number.
2. Add the fraction's numerator to the answer from step 1.
3. Put the resulting number over the fraction's denominator.

Multiplying a fraction by a whole number

Problem: Will four $\frac{3}{16}$ " strips laminate to $\frac{3}{4}$ "?

Solution: To multiply a fraction by a whole number, multiply the fraction's numerator by the whole number. The denominator remains unchanged. Thus, $4 \times \frac{3}{16} = \frac{4 \times 3}{16} = \frac{12}{16}$, which reduces to $\frac{3}{4}$ ".

Remember these steps:

1. Multiply the fraction's numerator by the whole number to find the new numerator.
2. Place the new numerator over the original denominator, which remains unchanged.

A quick trick: dividing a fraction in half

Here's a quick way to divide a fraction in half. You can do this in your head in most cases.

Problem: You need to mark the middle of an edge on a piece of stock $\frac{5}{8}$ " thick. What measurement do you use for half of $\frac{5}{8}$ "?

Solution: Just *multiply* the denominator by two. So, half of $\frac{5}{8}$ " = $\frac{5}{(8 \times 2)}$ " = $\frac{5}{16}$ ".

This works in reverse, too. To double a fraction, just *divide* the denominator by two. For example, $2 \times \frac{3}{8}$ " = $\frac{3}{(8/2)}$ " = $\frac{3}{4}$ ".

Figuring fractions with your calculator

Woodworking dealers sell calculators that allow you to enter fractions or mixed numbers directly, thereby avoiding the entire problem of manipulating fractions. Until you get one, you can add, subtract, multiply, and divide fractions using any standard floating-point calculator. Here's how.

Enter the fraction: Key in the numerator (say 5), hit the division key, then enter the denominator (say 8). The calculator will show a decimal point followed by several digits ending in 5. This is the decimal equivalent of the fraction, .625 in this case.

Do your calculations: To add or subtract fractions with the calculator, you'll have to write down the first fraction's decimal equivalent, or enter it in the calculator's memory. Then, convert the next fraction, write it down or add it to memory, and so forth. It's just about as easy to do it on paper.

But, you can multiply or divide the fraction you've entered simply by hitting the appropriate key, entering the multiplier or divisor value, and pushing the = sign.

Let's multiply $\frac{5}{8}$ by 7. With .625 already showing on the calculator's display, push the times button, enter 7, then hit =. The display should now read 4.375.

This is the calculator's version of a mixed number. So write down the 4. Subtract it from the calculator display by pressing the minus key, entering 4, then pushing the = key. The display shows .375.

Return to a fraction: Now, convert this decimal number to a fraction. Look closely, first; it may be one you know, something like .25 ($\frac{1}{4}$), .5 ($\frac{1}{2}$), .75 ($\frac{3}{4}$).

Otherwise, multiply it by 4, 8, or 16, depending upon the number of digits to the right of the decimal point. If there are 2 digits to the right of the decimal point,

multiply by 4; if 3, multiply by 8; if 4, multiply by 16. (If it goes to 5 places, multiply by 32.) This multiplier will also be the denominator.

For our .375, depress the multiplication key, enter 8 (because there are 3 digits to the right of the decimal), then hit =. The display will show 3, which goes over 8 to form $\frac{3}{8}$. Combine this with the whole number 4 to reach the answer, $4\frac{3}{8}$.

This goes faster in practice than you can read it. Once you've figured a few fractions on your calculator, you'll breeze right through them. ♣

Illustrations: Jim Stevenson Written by Larry Johnston



This Router Is Timeless, The Offer Isn't.



If you are ready to get serious about your project, then you're ready to invest in the router that woodworking professionals and cabinet makers everywhere depend on every day. Porter-Cable.

Make that investment now and you can get a 90th Anniversary Limited Edition version of this industry standard and the accompanying carrying case together at a very special price.

This commemorative router possesses all the classic features of the Porter-Cable 690 plus a couple of new ones that set it apart. Like the dazzling, aluminum housing and a unique, black carrying case that comes with every purchase.

However, the 90690 is a limited edition router. And

when the tools are gone, so is the offer.

To own a piece of Porter-Cable's unparalleled 90 year history, and to start making a little woodworking history of your own, stop by your local Porter-Cable dealer, visit us on the internet at <http://www.porter-cable.com> or call 1-800-487-8665 (519-836-2840 in Canada) today. Because pretty soon, this offer will be history.

PORTER+CABLE

THE WOODWORKER'S CHOICE



Stenciling Basics

Try this easy enhancement for your country projects

You say you don't have an artistic bone in your body? No matter. With stencils you can add painted designs to your projects with ease. Here's how we made the pine cone design featured on the table-lamp project on *page 62*.

Before starting, round up a few basic stenciling supplies. Most art- and craft-supply stores carry what you'll need:

- A sheet of Mylar, frosted on one side and at least 1" bigger all around than your design.
- X-acto knife.
- A fine-point permanent marker. (We use an Ultra Fine Point Sharpie made by Sanford.)
- Painter's masking tape (it's less likely than standard masking tape to lift paint or tear your pattern).

- Stencil paint. (We use Stencil Paint Creme by Delta Technical Coatings. The pine-cone design requires these Delta colors: burlap brown, bark brown, snow white, jungle green, and yellow citron.)

- Stencil brushes. These specialized applicators have short, stiff bristles that hold up to the quick up-and-down "stippling" motion used for applying stencil paint. (The pine cone requires ½", ⅜", and ¼" brushes.)



First, make your stencil

Place your pattern onto a smooth, flat surface, and lay a sheet of Mylar (frosted side down) over the pattern. Tape both pieces to your work surface as shown in *Photo 1*. Trace the pattern onto the Mylar with a fine-point permanent marker.

Separate the paper pattern and Mylar, and tape the Mylar to a smooth, flat surface that you can cut into slightly, such as a bench-top or scrap of plywood. With an X-acto knife, remove the areas that will receive paint, as shown in *Photo 2*.

Hold the X-acto knife at a low (about 20°) angle to the Mylar when making long, flowing cuts

for areas such as the pine needles. For tight, turning cuts such as those for the pine cone scales, hold the knife nearly upright (about 70° should do it).

Position the stencil on your project. Then, secure it with masking tape.

Now, you're ready to paint

Most stencil patterns require paint colors that fall into three broad "values": dark, medium, and light. Generally you want to apply the medium colors first, then dark ones, and finish with light colors.

For the pine-cone design, start by masking off the needles. Then, dip just the bristle tips of



Continued on page 16

2-HP MOTOR. CAST-IRON BODY. RAZOR-SHARP TEETH. IT'S ENOUGH TO TURN MIGHTY OAKS INTO WEeping WILLOWS.

FOR QUICK, REPETITIVE CUTS, PUT THE POWER OF A CRAFTSMAN CONTRACTOR

SERIES COMPOUND SLIDE MITER SAW TO WORK FOR YOU. IT'S BUILT RUGGED WITH

A DIRECT-DRIVE MOTOR. AN ELECTRIC BRAKE THAT STOPS THE BLADE IN SECONDS.

AND WITH MITER STOPS AT 0°, 22.5° AND 45°, IT'S MORE THAN ENOUGH SAW

TO MAKE ANYONE HAPPY. UNLESS,

OF COURSE, YOU HAPPEN TO BE A TREE.

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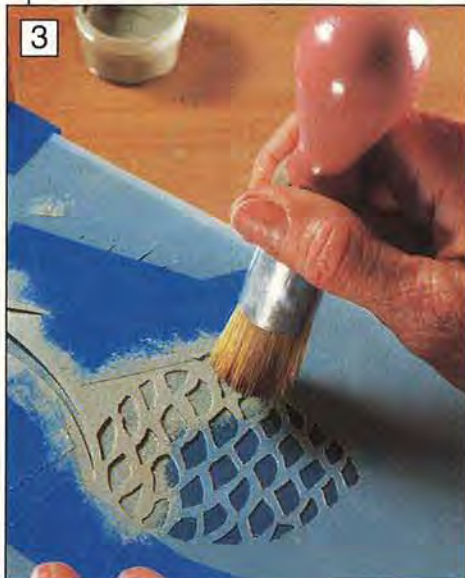


Stenciling Basics

Continued from page 14

a ½" stencil brush into burlap brown paint. Dab off excess paint by lightly tapping the bristle tips onto a rag or paper towel. (Always use the straight up-and-down stippling motion. Never stroke these brushes.) Stipple the paint onto all of the cone and branch areas as shown in *Photo 3*. If you need to load your brush with more paint, remember to always tap off the excess paint before restippling the project.

Next, dip the bristle tips of the ⅜" brush into the bark brown paint. Again, tap off the excess.



Apply the paint to the outside edges of the cone as shown in *Photo 4*. (You don't have to wait for the previously applied paint to dry.) This helps give the cone shape by making it appear spherical. "Blend" the bark brown into the burlap brown by lightly stippling the border area between the two colors.

Switch to a ¼" brush and stipple the upper part of each cone scale with bark brown paint as shown in *Photo 5*. Then, stipple the intersection of the branch, as well as the right sides of the branch. (See the photo in the



table lamp project on page 62 for exact placement of the paint.) The idea is to place the darkest colors where shadows would fall.

Thoroughly clean and dry the ¼" brush, and use it to apply snow white paint to the lower parts of each cone scale, applying more paint to the scales closer to the center of the cone. Add just a hint of white to the outer scales to simulate the look of freshly fallen snow. Occasionally lift the stencil as shown in *Photo 6* to see if you're achieving the desired look. Then, stipple white paint onto the left and upper edges of the branch.



Remove the masking tape, and stipple the needles with a clean ⅜" brush and jungle green paint. You can't mask the wet cone and branch, so be careful not to get green paint onto these areas. Then, highlight the needles with a light stippling of yellow citron paint applied with a clean, dry ⅜" brush.

Remove the stencil from the workpiece and wipe it off for reuse as soon as you finish painting. Be careful not to smudge the wet paint on the project. ♣

Written by Bill Krier
 Technical consultant: Susan Henry
 Photographs: Wm. Hopkins



THE NEW RYOBI DETAIL BISCUIT JOINER

THE DIFFERENCE BETWEEN WOODWORKING AND WOODNOTWORKING.

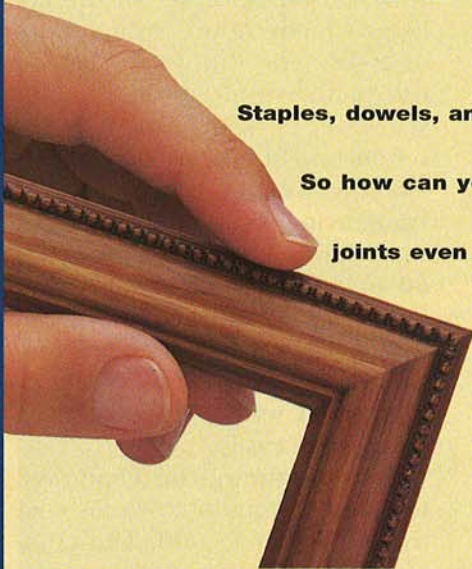
Staples, dowels, and glue won't do. Standard-size biscuits won't fit.

So how can you make neat, tight, professional joints even in small stock? With Ryobi's new

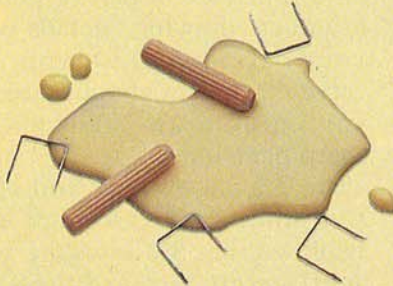
Detail Biscuit Joiner, that's how.



Standard biscuits stick out of small joints, and the mis-match shows, even after you trim the excess.



The new Ryobi Detail Biscuit Joiner uses miniature "Accu-biscuits" for neat, tight, professional joints.



This compact powerhouse cuts smaller slots and uses miniature

"Accu-biscuits™" to fit where standard biscuits don't. And its price

is as small as its biscuits. But the Detail Biscuit Joiner is big

on performance, from its beefy motor to its die-cast

base and see-through fence. So see the

new Ryobi Detail Biscuit Joiner at your

local home center. It'll get

your wood working like

never before.



Ryobi "Accu-biscuits" (actual size).



The Ryobi Detail Biscuit Joiner does everything that a bigger tool does, and fits in small joints where a bigger tool won't.

RYOBI
Exceed Your
Expectations™

CARVING WITH PINPOINT PRECISION

This ultrahigh-speed tool makes it easy

It takes tiny cutters to carve the fine detail lines that give carvings realism. With this ultrahigh-speed rotary tool, you can use the smallest bits you've ever barely seen.

The Paragrave ultrahigh-speed rotary carving tool *below right* emits a distinctive muffled shriek as it twirls its bit at 300,000 rpm. Once you rid your mind of the thought that the last place you heard a sound like that was in a dentist's office, working with the Paragrave tool becomes a joy.

It's no coincidence that the tool sounds like a dentist's drill. Paragrave inventor and company president Lew Jensen practiced dentistry in Utah until he unlocked the artistic and craft-working possibilities of the air-powered dental drill.

He made the heart of that device—a tiny air turbine—the basis for a rotary carving and engraving tool. Mouths still hang wide open when Lew wields his drill. Now, though, it's because people are awestruck by the fast-spinning tool's capabilities.

Fast, smooth cutting

Artists and engravers employ the Paragrave tool on everything from glass to precious metals. And now, more and more woodcarvers have discovered it. For woodcarvers, the Paragrave tool offers the opportunity to take detailing to a further, finer level than previously possible.

For carving fine details into wood, the ultrahigh-speed rotary tool offers several advantages. Foremost is the smooth, vibrationless power produced by the

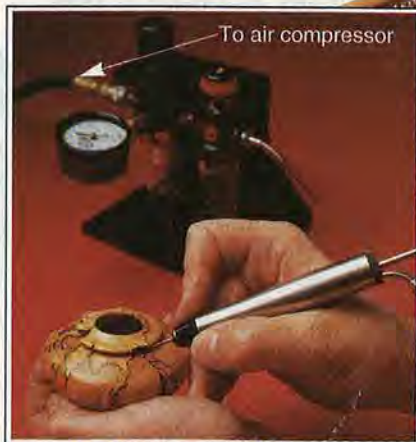
air turbine. This allows precise grinding or drilling. In fact, you can carve on eggshells with the smooth-running Paragrave.

In addition, it's docile and controllable. With its microscopic bit spinning fast and true, there's none of the grabbiness often associated with rotary carvers. And if you overload the cutter, it simply stalls without damage.

The Paragrave proves light and maneuverable, too. You can hold it just like a pen or pencil, in effect "drawing" details onto your carvings. And, you can carve those lines about as thin as you could draw them with a sharp pencil.

The minuscule burs and abrasive stones generate high heat while cutting. By adjusting how aggressively you use the tool, you can control the burning and use it to your advantage.

Carving along the spalting lines on the rim of a small turned vessel is just one of the many precise tasks the Paragrave tool takes on easily.

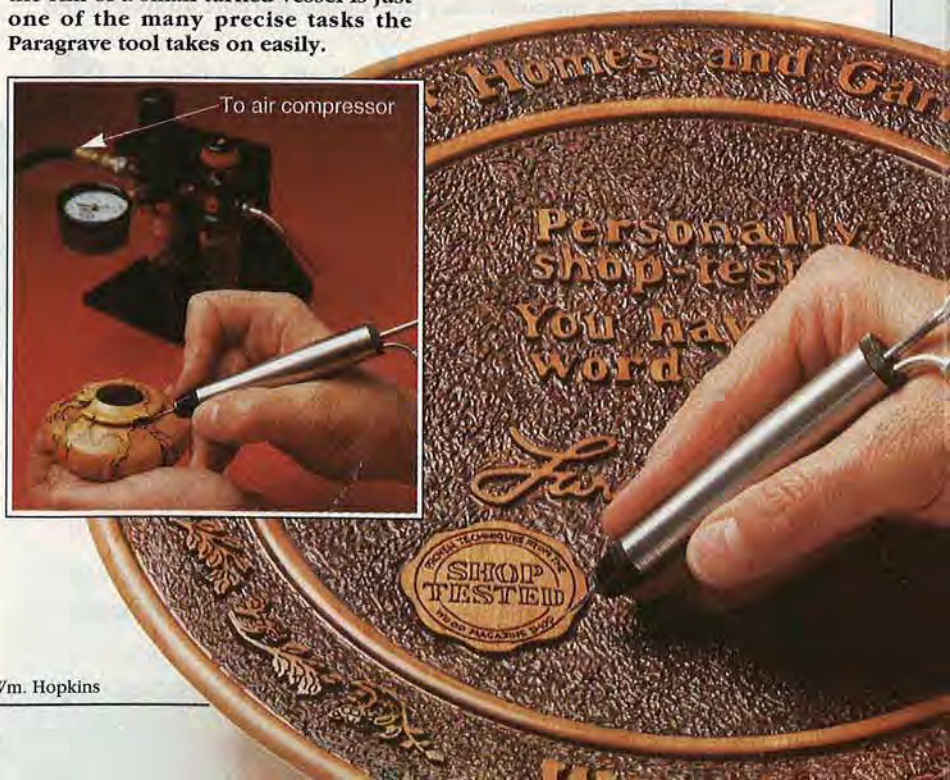


We give it a whirl

The Paragrave tool in the *WOOD*® magazine shop has logged many hours on a variety of tasks. The tool is so easy to use that several editors' youngsters successfully used it on school and hobby projects.

When it came my turn to try Paragraving, I carved the rim of a small turning to accent the spalting maple's markings, shown *below left*. The bowl was small to begin with, and the black fungal tracings in the wood were thin, but I was able to cut right up to them easily.

Kits containing the Paragrave tool and various accessories cost from \$500 to \$3,000. The company produces engraving patterns and instructional materials to cover almost any situation. For a catalog, write to Paragraphics Corp., 1455 West Center, Orem, UT 84058. Or, you can call 800/624-7415. ♣



Written by Larry Johnston Photographs: Wm. Hopkins

**FOR THOSE OF YOU WHO KNOW BETTER
THAN TO CONSIDER AN IMITATION.**



Limited Edition Unisaw® includes 52" Unifence®, 50-tooth ATB combination blade, chrome handles and personalized insignia plaque.

Your choice of Unifence or Biesemeyer® Fence available on all models other than Limited Edition.

A HUNDRED DOLLAR REWARD FROM DELTA.

Old-timers will tell you that you're not just buying that Unisaw for right now. You're buying it for what it'll be doing for you ten, fifteen—maybe twenty years down the road. That's when you'll be glad you didn't try to save a couple hundred bucks way back in 1996—by settling for a saw that was touted to be as good as the Unisaw.

Feature for feature, the Unisaw stands unmatched, period. Equally important to consider, are parts and service. (Truth is, we can still provide parts and service today, for a 1937 Unisaw.)

All that said, we know how tempting it can be to save a few bucks by buying a knock-off from overseas. (Meanwhile—the Unisaw you've always wished for could be coming off our production line in Tupelo, Mississippi, as we speak.) This calls for a special deal.

Okay, here goes: Buy any Delta Unisaw between July 1 and December 31, 1996 and we'll send you a rebate check for \$100. Even on this Limited



Edition Unisaw, as seen on *The New Yankee Workshop*—a saw that'll be offered this one time only.

Call for the name of the Delta dealer nearest you where you can take advantage of this one-time offer. Delta International Machinery Corp., 800-438-2486.

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Our top tip makes ripping boards with one rough edge a painless procedure.

Ripping boards with one rough edge can prove uncomfortable. If you use your hand to hold the wood flush against the fence, you're certain to get splinters. Yet a feather board like the one shown *above* won't hold tightly against an uneven edge.

Reader Allen Ulrich came up with a handheld ripping guide, *right*, that earned him the top-tip tool prize for this issue.

Your ideas could be worth big money if you send them to us. We pay \$40 for each tip we publish, and you'll be eligible to win a tool prize for the best tip of the issue. To be considered, send a letter with a photo or drawing of the tip to:

**Tips From Your Shop
(and Ours)**

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Des Moines, IA 50309-3379

Our goal is to publish only new and original shop tips, so please send your idea only to *WOOD* magazine. Also note that we cannot return your submissions. Thanks, and keep those shop tips coming.

Kerry Gibson

GENERAL-INTEREST EDITOR

Ripping guide steadies rough-edged stock

Do you need a safe, secure way to rip lumber with one rough edge? This ripping guide costs next to nothing, and it keeps lumber tight against the fence.

To start, cut the 1½×3½×10" ripping guide from a piece of smooth hardwood such as maple. Then, put a dado blade in your tablesaw, tilt it to 20°, and rip the angled rabbet as shown in the inset drawing *bottom*. Finish the guide by chiseling or sanding a slight bevel on the infeed end of the rabbet. This will prevent the guide from snagging on splinters or rough edges of the stock.

To use the ripping guide, hold the rabbet against the rough edge of the board on the left side of the blade and about four inches behind the leading edge of the blade as shown in the drawing *below*. Then, push

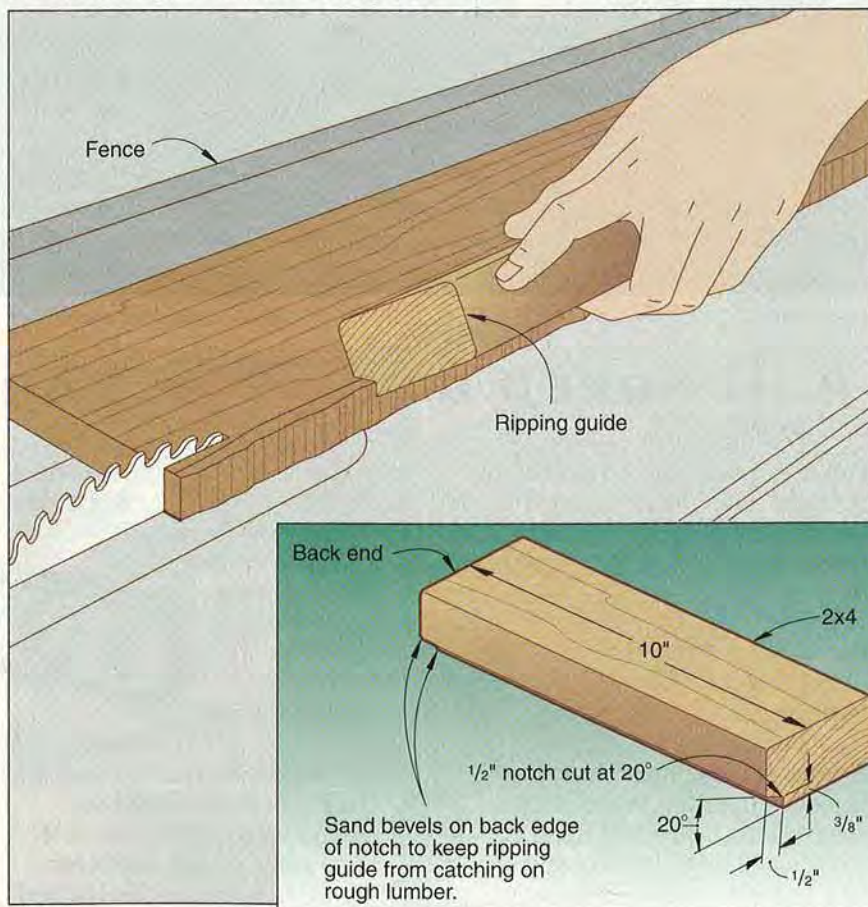


For submitting the best tip in this issue, Allen receives a Sears 8" Benchtop Radial-Arm Saw, model 23480N.



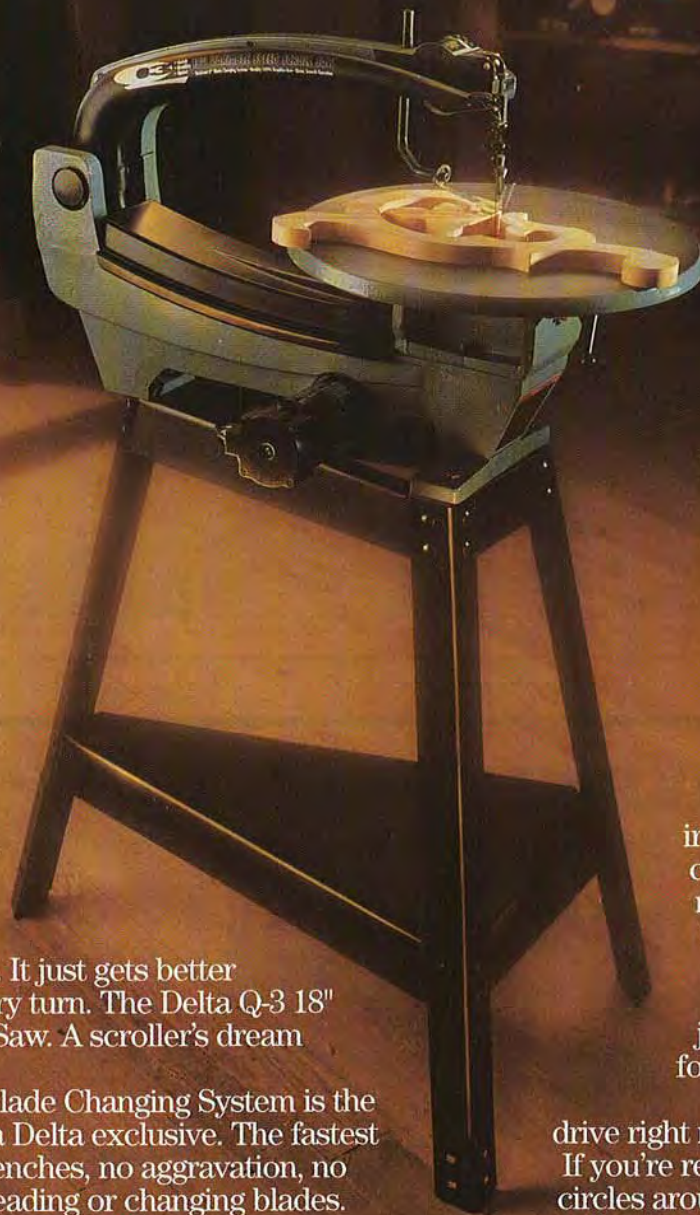
the workpiece snug against the fence, and feed the wood into the blade. Keep the ripping guide and your hand stationary as you feed the workpiece into the saw blade.

—Allen Ulrich, McClure, Ohio



Continued on page 22

THE DELTA Q-3. LIKE A FORMULA RACE CAR WITH A BLADE.



We're talking pleasure here. Precision. Power. Wait 'til you get your hands on this high-performance machine. It just gets better and better around every turn. The Delta Q-3 18" Variable Speed Scroll Saw. A scroller's dream machine.

Its Quickset™ II Blade Changing System is the second generation of a Delta exclusive. The fastest in the industry. No wrenches, no aggravation, no wasted time while threading or changing blades. You'll find it on no other saw.

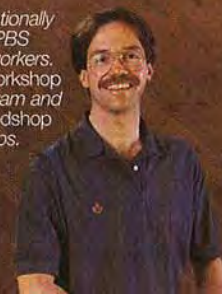
The arched, graphite composite arm eliminates vibration. So smooth and quiet you can listen to the sweet sound of your blade cutting wood, instead of your saw breaking the sound barrier. And at the very tip of that graphite arm you'll find the control switches. Right under your nose, instead of having to fumble around below the table.

As you'd expect, the cast iron table tilts to allow bevel cutting. But what you might not expect is the fact that the adjustable steel stand also tilts forward to give you a better view of the job, and just the right angle for comfortable operation.

This one's ready to test drive right now at your Delta dealer. If you're ready to cut circles around the rest, call us for the dealer

nearest you. Delta International Machinery Corp., 800-438-2486. In Canada, 519-836-2840.

Delta is proud to nationally fund these two PBS programs for woodworkers. The New Yankee Workshop hosted by Norm Abram and The American Woodshop with Scott Phillips.



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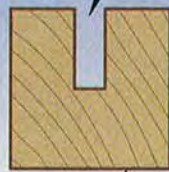
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Bar clamp anchors fence for bandsaw or drill press

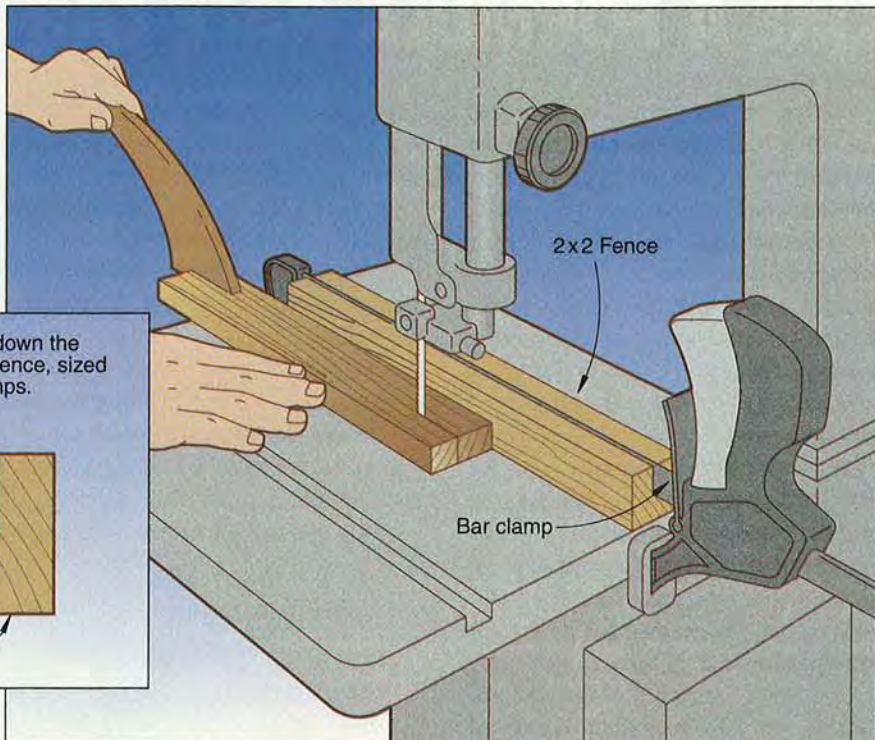
Need a fence for a bandsaw or a drill press? Here's an easy-to-make and inexpensive solution.

Cut a piece of 2x2 hardwood stock about 1/8" shorter than the machine's table, and joint all four edges to ensure the stock is square. Then, cut a groove down the middle of the stock that's as wide as your clamp bar is thick, and as deep as your clamp bar is wide. Now, just tap the bar of your clamp into the groove. To use the fence, position it parallel with the miter slot, then tighten the clamp to hold your fence firmly in place on the table.

Cut a groove down the middle of the fence, sized to fit your clamps.



Fence



—Glen E. Plum, Riverside, Calif.

\$50 REBATE.

Contractor's Saw® with any Unifence®, Biesemeyer® Fence or Precision Saw Guide. (Shown here with Biesemeyer Homeshop Fence and accessory table board and legs.)



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14" Band Saw with 3/4 hp Model #28-275
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\$75 REBATE.
DJ-15 6" Jointer with any motor configuration.

\$100 REBATE.

DJ-20 8" Jointer with any motor configuration.



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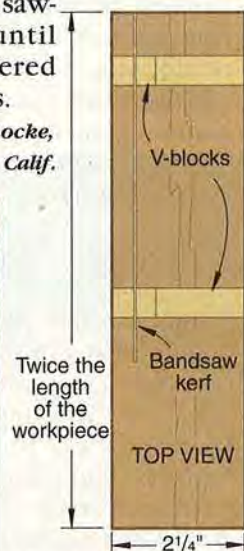
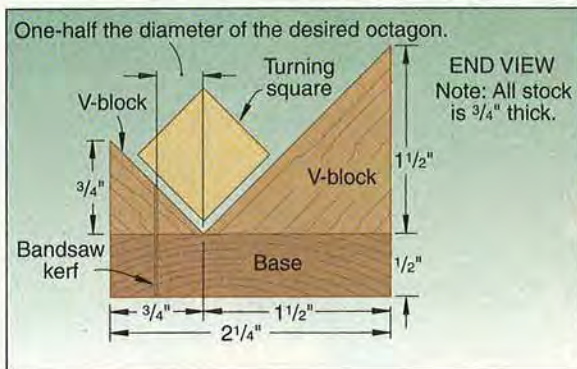
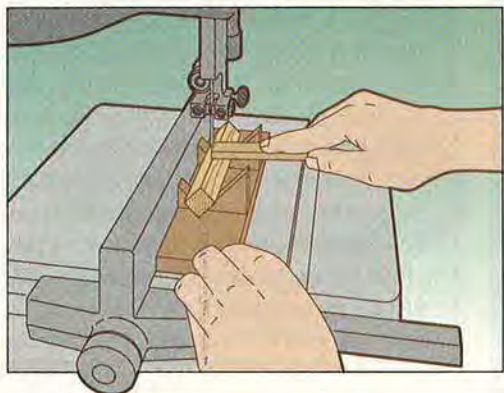
Carrier helps you bandsaw small turning squares safely

Chamfering the edges of a small turning square to get an octagon can prove dangerous on any power saw. This bandsaw accessory jig holds the stock securely and keeps your fingers away from the blade. The dimensions below *middle*, are sized for a piece of $\frac{3}{4}$ "-square stock, but you can modify the dimensions to accommodate almost any size of turning stock.

To build the carrier, cut out the base, and glue and screw the right-angle V-blocks to it as shown. Now, place the carrier on the bandsaw table, with the stock sitting in the V-blocks. Push the fence against the edge of the carrier, and position them so the horizontal distance from the kerf to the apex of the V-blocks equals half the diameter of the turning-stock octagon. Hold the stock in

place with a small piece of scrap-wood, and push the stock and carrier through the blade as shown. Cut along the length of the carrier base only far enough to trim the stock. Rotate the stock and repeat the sawing step until you've chamfered all four corners.

—Michael Locke,
Huntington Beach, Calif.



Continued on page 24

\$25 REBATE.

12" Variable Speed Lathe
Models #46-700/701 with
or without stand.



\$50 REBATE.

15" Planer
with stand
Model #22-675



TODAY, YOU'LL APPRECIATE THE REBATES. LATER ON, YOU'LL APPRECIATE THE QUALITY.

Here's a chance that doesn't come along every day. A chance to put Delta Quality in your shop and get a check in the mail from Delta to boot. But only from September 1-December 31, 1996.

Granted, that rebate check will probably be spent by the time you get around to cashing it. But that new Delta machine will become more valuable each time you flip the switch. And you can take that to the bank.

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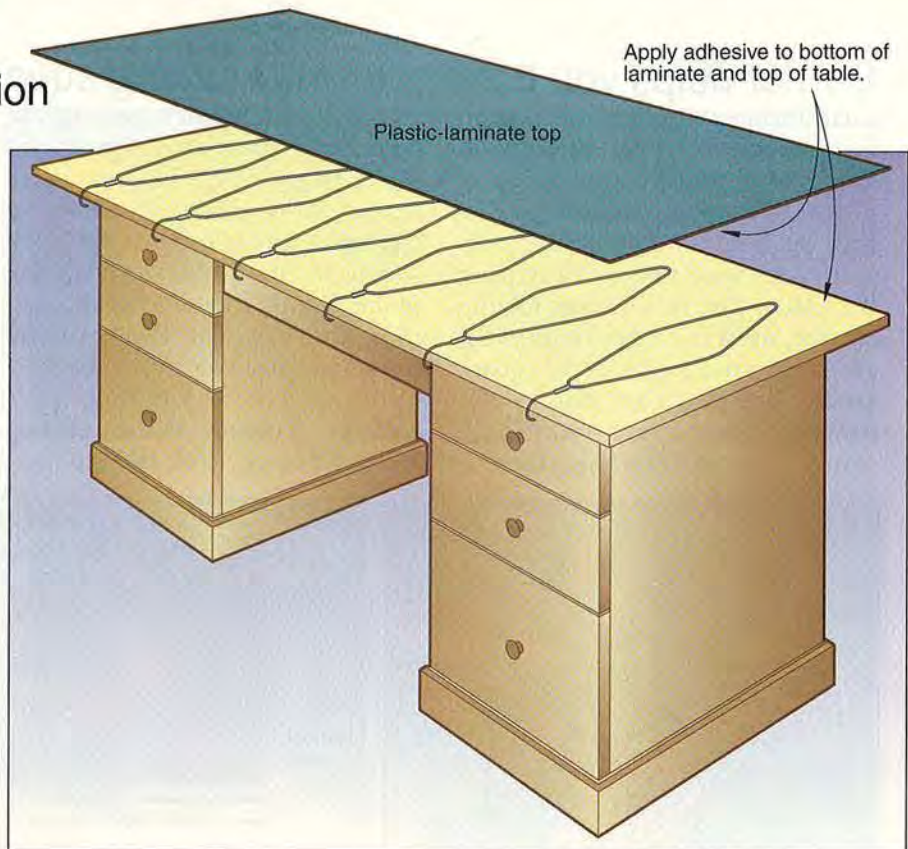
Continued from page 23

Coat hangers help position big pieces of laminate

If you've had trouble in the past aligning big pieces of plastic laminate over a surface coated with contact cement, the solution's hanging in your closet. Ordinary coat hangers make excellent positioning aids.

First, coat your surfaces with contact cement. While that's drying, grab some wire coat hangers and bend them into the elongated shape shown *right*. When the contact cement becomes tack-dry, lay the coat hangers as shown about 8" apart. Then, place your plastic laminate on top of the coat hangers, and align the laminate and substrate. Working from one end to the other, remove the coat hangers, and adhere the laminate to the substrate.

—Don Bendikson, Temecula, Calif.



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Hotmelt-glue feet stop project wobbles

Getting a flat-bottomed wood project to sit on a table or shelf without rocking can be difficult. If your projects need a footing, try this simple trick.

With a small Forstner bit, drill a $\frac{1}{16}$ "-deep hole in the corners of the base of the project. Then, place a dab of hotmelt glue in the holes. Fill the holes with enough glue so that it forms a slight dome above the surface of the wood. When the glue has gelled (but not hardened), turn the project over, and set it on a flat, level surface.

Put a spirit level on top of the project, and gently tap the corners to level it. After the glue hardens, these nonskid "feet" will help keep the project from rocking or sliding on tables and shelves.

help keep the project from rocking or sliding on tables and shelves.

—Roy Locke,
Panama City, Fla.

Drill a $\frac{1}{16}$ "-deep counterbore for hotmelt glue.

Hotmelt glue gun

Hotmelt glue

Continued on page 26

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TIPS FROM YOUR SHOP (AND OURS)

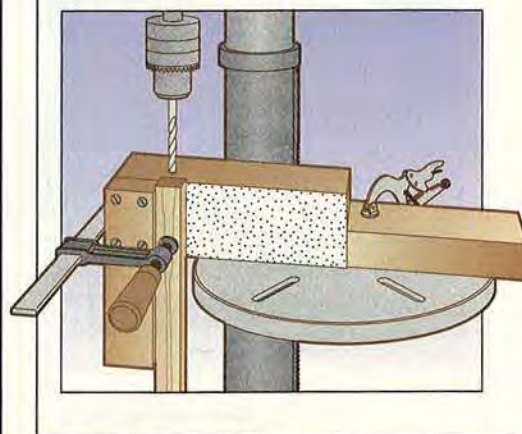
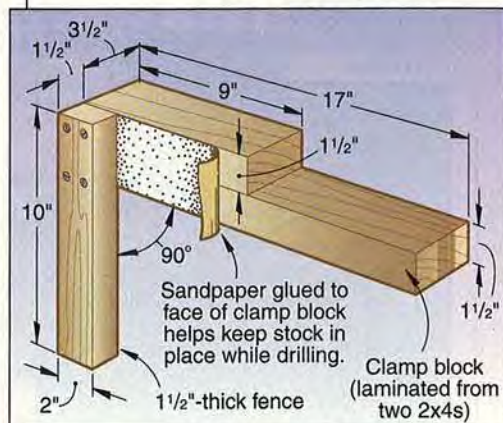
Continued from page 25

Bore vertical holes with scrap stock jig

Here's a quick-fix jig that will come in handy the next time you need to bore a vertical hole in the end of a long workpiece. To make the clamp block, laminate two 2x4s, one 9" long and the other 17" long, as shown in the drawing below. Then, joint the sides that face the workpiece and the drill-press table to achieve a perfect 90° angle.

Next, joint the edges and faces of the 1½x2x10" fence to perfect 90° angles. Use a framing square to align the two pieces at 90°. Then, fasten the fence to the clamp block with glue and four #8x2½" flathead wood screws, and adhere a piece of 150-grit sandpaper to the clamp block as shown. Now, clamp the jig to the drill-press table, clamp the workpiece to the jig, and you're ready to bore your hole.

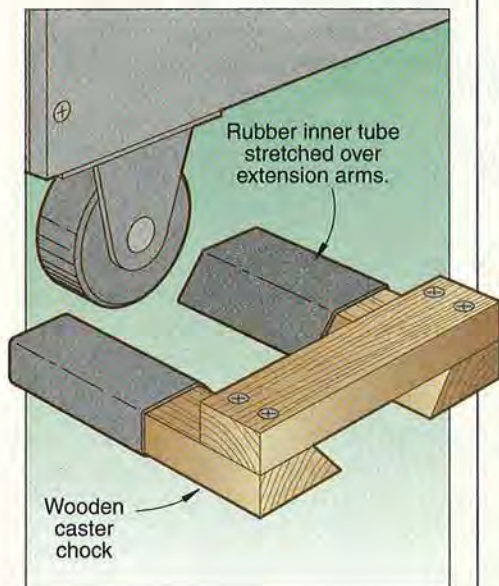
—E. C. Peters, Brighton, Ont.



Old inner tube halts caster chock slipping

If you discover that the chocks you built to secure the wheels on your mobile tools are creeping around, here's a way to stop them dead in their tracks. Take two 2" sections of an old inner tube and stretch them over the extension arms on the chocks. The rubber gives the chock enough grip to stop it from slipping even on smooth floors.

—James Shawl, DeKalb, Ill.



A FEW MORE TIPS FROM OUR WOODWORKING PROS

- Sometimes a narrow skew chisel comes in handy on a turning project. If you don't have one, substitute your parting tool, as shown in the photo on page 52.
- Find out how clockmaker Ed Stone makes invisible seams in veneer. See "Time Marches On," page 43.
- Rout strong drawer joints using a drawer lock bit. See the Routing the Drawer Joints detail drawing on the "Down-home Sideboard," page 57.

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D. Engstrom, Duluth, MN

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Circle No. 83

Looking for a source of lathe accessories

I am in need of a three-jaw chuck for my Delta lathe, and have not found a supplier in my magazines. Can you help me locate one?

—Daniel Theiss, Salem, Ohio

Dan, we found lathe chucks and other lathe accessories in the catalogs of several of our advertisers. Because Delta uses a relatively common spindle thread (1" x 8 threads per inch), there's a wide selection of chucks available for your machine. Including a chuck made by Delta: Part No. 46-590. Call 800/438-2486 for a Delta dealer near you.

For you readers who own another brand of lathe, don't give up hope. There's also a good selection of aftermarket accessories available for you—particularly if your lathe uses the Shopsmith-style $\frac{3}{8}$ " plain-shaft spindle, or the $\frac{3}{4}$ " x 16 tpi spindle that's used on Sears Craftsman lathes.

While we're on the subject of lathe parts, let's also take a look at the Morse taper joint used for spindle accessories. You'll find that most spur centers, tailstock centers, and tailstock-mounted chucks use this self-centering and self-holding joint.

These tapers come as either No. 1 or No. 2. Both taper approximately $\frac{3}{8}$ " per foot, but the No. 2 taper is thicker and slightly longer. You'll find the

Whether your woodworker's license reads "Beginner," "Intermediate," or "Advanced," you're bound to have a few questions about your favorite hobby. We can help by consulting our staff and outside experts. Send your questions to Ask WOOD®, Better Homes and Gardens® WOOD Magazine, 1912 Grand Ave., Des Moines, IA 50309-3379. You can contact us via computer at these on-line addresses:

CompuServe: 74404,3516

Internet: 74404.3516@compuserve.com

#1 Morse taper used on Sears Craftsman lathes, and the #2 Morse taper used on the Delta and similar lathes. See the drawing below left for the dimensions of these tapers. (Please note that Shopsmith lathes use spur centers and accessories that have a $\frac{3}{8}$ " socket to fit over the motor shaft.)

Here are the addresses and phone numbers of some companies that list chucks, tapered centers, and other goodies for your lathe in their catalogs:

Woodcraft

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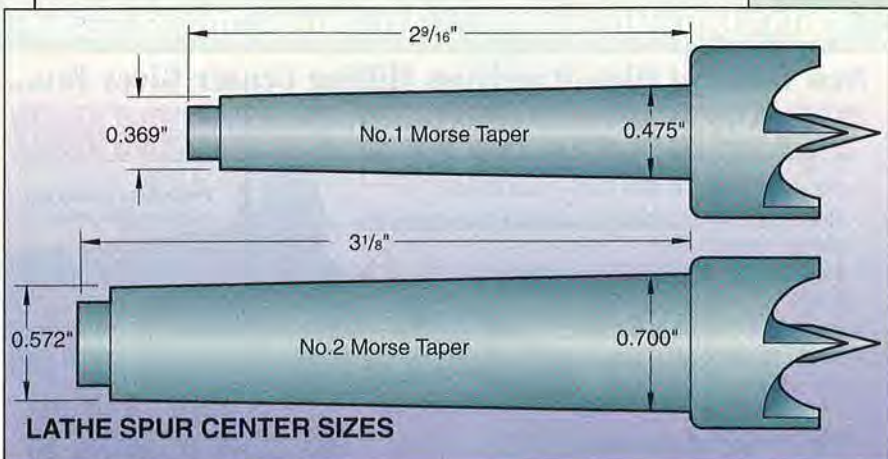
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800/523-4777 (East of the Mississippi)
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The best way to glue edges

What is the best procedure for preparing the edge of a board for gluing? Some of my friends swear by a sawn edge for a glue joint, and others use an abrasive to prepare the edges for gluing. Can you provide some guidance on this subject?

—Dale Swann, Schenectady, N.Y.

Yes we can, Dale. We prepare our boards for edge-gluing with a jointer. This gives us two mating glue

surfaces with little space between them, resulting in a thin glue line.

Woodworking glues bond best when mating surfaces are in tight contact. So, sawn or sanded surfaces probably will make for a weaker bond than edges that have been properly jointed.

Continued on page 30





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ASK WOOD

Continued from page 28

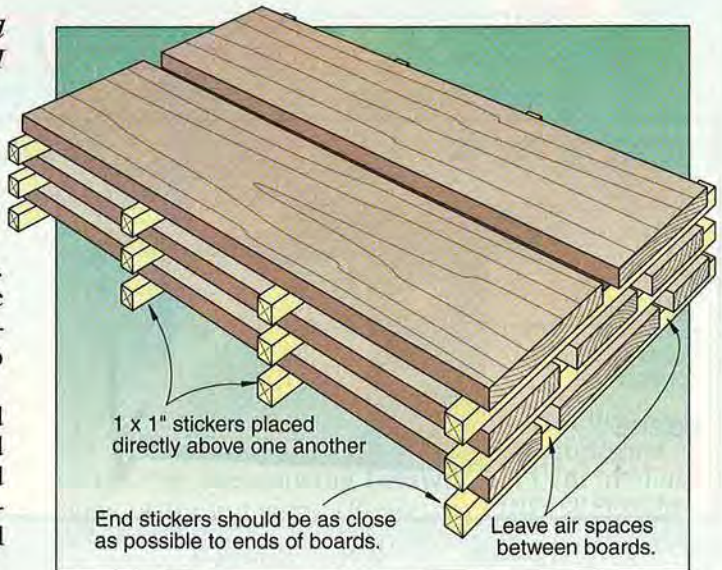
Rules to dry wood by

I have tried several times to cut and dry wild grape vines, cedar, oak, and other woods. It splits! I have oiled or painted the ends and de-barked the wood, but it still splits! Any suggestions?

—Raymond Russell, Saint Simon Island, Ga.

We can offer several general rules to follow when air-drying woods:

- 1 Cut your logs into boards as soon as possible. Drying your wood as boards greatly reduces the occurrence of stress cracks commonly seen in drying logs. Paint the ends of the boards to help reduce cracking as the wood dries.
- 2 Stack the boards in layers of even width, and separate the layers with "stickers." These should be 1x1" rough-sawn pieces of a nonstaining wood such as basswood, soft maple, or pine. Place stickers near the ends of the boards to help control checking of the wood as it dries.
- 3 You'll want good air circulation in the stack of wood. We prefer a covered outdoor location for stacking and drying new-cut boards.
- 4 To dry round sections of the wild grape vines, as well as sections of logs, we suggest that you first seal the ends with paraffin or a commercial end-



grain sealer. These work better than paint for sealing round sections of wood. They slow down the drying process and increase the chances of having usable wood when dry. You will have to determine the drying time for each species by trial and error.

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A reader who's hunting for a snipe cure

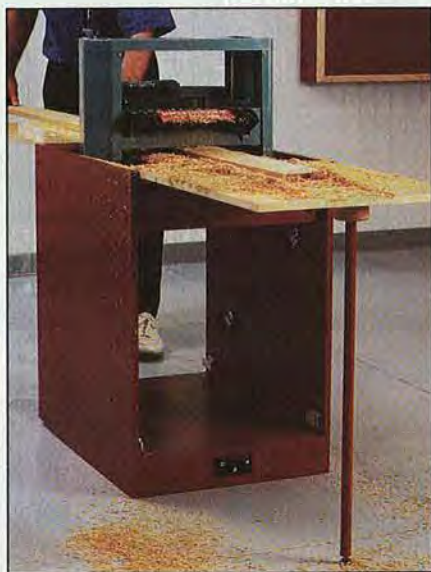
What can I do to prevent my surface planer from "sniping" the ends of the boards I plane?

—T.J. Cullen, Manahawkin, N.J.

Sniping (a cross-grain hollowing) may happen at either end of a board being fed into a planer. When only one feed roller controls the board, the end of the board can move up into the cutterhead. Unfortunately, you'll find it hard to totally eliminate snipe as the frames of most portable planers are not rigid enough to prevent some flex while planing. However, you can reduce snipe by supporting the board all the way through the planer.

To do this, you'll need to add an extension to your planer table. We designed our portable planer center, shown above (January 1995 issue) and an auxiliary planer bed ("10 Quick-and-Easy Scrapwood Jigs," December 1995 issue) for this purpose.

On many of these planers you can also lessen sniping by adjusting the bed rollers in the planer table. Consult your owner's manual for the specifics of how to handle this procedure. And for more snipe cures, see page 75 of our review of 12" portable planers. ♣



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WESTERN LARCH

The conifer that changes with the seasons

From the northern reaches of Alberta across the continent to Nova Scotia and Maine, you'll find a tree that most everyone calls tamarack. As a conifer (softwood), it's memorable because in the fall, it turns gold, then drops its needles as do hardwood trees. A larger version grows in the mountains of Idaho, Montana, and the Pacific Northwest, but there it's commonly named western larch. Different in name as well as size, the tamarack and the western larch may be North America's most unappreciated species.

Knowing woodsmen of the far north harvested tamarack for long-lasting boat parts and pier pilings. Yet, the lumbermen generally passed it by in favor of white pine.

In the West, lodgepole and ponderosa pine, along with Douglas fir, drew the loggers' attention because they are prone to grow in thick stands. The occasional lonely western larch, although large, was a heavyweight and hard to move. Today, the forest products industry makes greater utilization of the forest. That's especially true in the West, where the larch has earned a distinctive place.

Wood identification

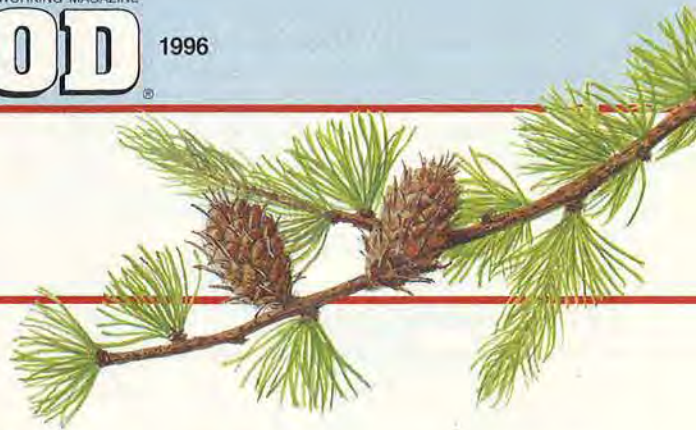
The tree you may know as tamarack, hackmatack, or eastern larch is the species *Larix laricina*. It grows from the Yukon east to Newfoundland and south to Wisconsin and New York.



The tamarack shares all the physical characteristics, except great size, of its commercially important cousin, western larch (*Larix occidentalis*), which is the focus here. Western larch primarily grows in the mountains.

In prime growing conditions, the western larch can attain a 200' height and a 7' diameter. Such a tree might have 100' of branchless trunk.

The western larch has fine, feathery, flexible needles that occur in clusters on the branches. Cones are about 1½" long. Each autumn, the needles turn yellow, then fall. Come spring, new needles appear carrying a bright shade of green. Larch's distinctive bark helps in identification, too. A dull cinnamon brown color, the bark grows in many small, irregularly rounded plates, sometimes nearly 6" thick.



Natural range

The wood of the larch ranks as one of the strongest among softwoods. And at 39 pounds per cubic foot air-dry, it's as heavy as many hardwoods. The hard, reddish brown wood has straight, uniform grain with tough fibers and a fine texture. Its extractives and resin make it durable.

Uses in woodworking

From a prime material for posts, railroad ties, and mining timber, larch has risen to find its way into boats, interior trim, cabinets, and furniture. It works well for outdoor projects.

Availability

Larch from the West is regularly marketed as lumber throughout the U.S., but it may be mixed with Douglas fir. For furniture and cabinets, you'll want boards graded B & BTR., C SELECT, or D SELECT. Expect to pay about \$2.50 per board foot. Tamarack lumber may be locally available at sawmills or from dealers specializing in boatbuilding stock.

Continued

PERFORMANCE PROFILE

western larch

(Larix occidentalis)

Larch

Photograph:
Western Wood Products Assn.

The industry looks on larch as a resinous wood. However, kiln-dried appearance grades will have less resin than construction grades. Remember, though, that western mills don't kiln-dry softwoods to the 8 percent moisture content you normally associate with kiln-dried hardwood boards. The larch you buy may have as much as 12-15 percent moisture content. And that's perfectly fine, if you let the wood acclimate in your home for a week or so to stabilize it before you start building. But prior to working your larch, read the following tips.

Machining methods

Larch is a softwood, yet it is about the hardest of all softwoods. That characteristic means you can successfully work it with hand or power tools, if you keep all tool cutting edges sharp.

- Like many other softwoods, the resin or pitch in larch will build up on your saw blade. To avoid the burning and blade wander that accompany this buildup, always use a Teflon-coated blade or every so often stop and clean the blade with steel wool dampened with acetone.
- Larch's straight grain, plus its hardness, gives it a tendency to splinter. A backing board reduces this when you rout cross-grain.
- The hardness of larch requires drilling pilot holes for all nails and screws before assembly.
- Except for the very highest appearance grades, larch boards will contain small, tight knots. These tend to blunt cutting edges, so use only carbide-tipped cutters and blades. You'll also want to seal the knots with shellac before applying a clear finish to prevent bleed-through.

- The resin in larch reacts unfavorably with paint, unless you first seal the wood with diluted shellac or conditioner. Stain and clear finishes work well.

Carving comments

- The hardness of larch varies considerably from earlywood to latewood. This means that the wood won't take detail without chipping or splintering.
- For sculptural carvings, pin knots and the cathedral figure from the growth rings add great visual interest.

Turning tips

- Larch sawn into thick stock blanks could contain resin pockets. If the pitch is still runny, droplets of it will appear on the surface of freshly turned wood. Let them harden before scraping off, then finish the wood.♣

SHOP-TESTED TECHNIQUES THAT ALWAYS WORK

Any exceptions—and special tips pertaining to this issue's featured wood species—appear under other headings elsewhere on this page.

- For more stability in use, always try to work wood with a maximum moisture content of 8-9 percent.
- Feed straight-grained wood into planer knives at a 90° angle. To avoid tearing, feed wood with figured or twisted grain at a slight angle (about 15° will do), and take shallow cuts of no more than 1/32".

- For clean cuts, rip with a rip-profile blade having 24-32 teeth. Smooth crosscutting requires at least a 40-tooth 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 tearout.
- Drill pilot holes for screws.
- Rout with sharp, preferably carbide-tipped, bits and take shallow passes to avoid burning.
- Carving softwoods means fairly steep gouge bevels—20° or more—and deeper cuts.

LARCH AT A GLANCE

Cost	\$ \$ \$ \$ \$
Weight	Ⓜ Ⓜ Ⓜ Ⓜ Ⓜ
Hardness	T T T T T
Stability	▲ ▲ ▲ ▲ ▲
Durability	⌚ ⌚ ⌚ ⌚ ⌚
Strength	🦵 🦵 🦵 🦵 🦵
Toxicity	☠ ☠ ☠ ☠ ☠
Workability	🔪 🔪
Look-alike:	Douglas fir

Compiled with woodworkers Joe Rhodes and Tom Elkan Illustrations: Steve Schindler

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2 PC. 3/4" HEAVY DUTY PIPE CLAMP SET

Constructed from heat-treated cast iron, these durable clamps keep your work rock steady. Just screw the handle side onto a 3/4" threaded pipe and slide the spring loaded end on. You're ready to go! Pipe not included.

- Handle screw operating range: 2-1/8"
- 1-1/2" throat depth
- Weight: 2-7/16 lbs.

ITEM 31255-4SHA **\$2⁹⁹**

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SAVE \$30 FROM OUR SUMMER '96 CATALOG

DRILL 1/4", 3/8", AND 1/2" SQUARE HOLES



MORTISING MACHINE

Make a square hole in the fraction of the time it takes by hand! Easier layout for professional mortise and tenon joints in furniture, cabinets, and restoration. Fence with hold down clamp keeps workpieces from lifting off the table. Large capacity - up to 5" maximum height. Includes fence, workpiece clamp, 1/4", 3/8", and 1/2" mortising chisels and bits.

- 5" max. workpiece height
- Accepts .745" chisel shanks
- 1/2 HP, 110V, 2.3 amps • 3-1/2" swing
- 59 lbs. ship. wt.

ITEM 30036-5SHA **\$179⁹⁹**

CENTRAL MACHINERY



10", 2 HP BENCH TABLE SAW

SAVE \$40 FROM OUR SUMMER '96 CATALOG

- Maximum depth of cut @ 90°: 3"; @ 45°: 2-1/2"
- Blade sold separately
- Motor: 2 HP, 115V, 60 Hz, 13 amp, 4500 RPM
- Shipping weight: 40 lbs.

ITEM 32648-5SHA **\$79⁹⁵**

10" SAW BLADE

- 40 tooth carbide tips • 5/8" arbor

ITEM 00529-3SHA **\$8⁹⁹**

CENTRAL MACHINERY



10" PLANER

SAVE 25% FROM OUR SUMMER '96 CATALOG

- 2 HP, 110V, 1 phase, 11 amp, 8000 RPM
- 5-1/8" working distance
- 10-1/8" x 9-1/8" feed table
- 19" x 16-5/8" x 16" overall dimensions
- 10-1/8" blade size
- 2-blade cutter head
- 61 lbs. ship. wt. • Stand sold separately
- 2-blade cutter head

ITEM 32377-3SHA **\$199⁹⁹**

CENTRAL MACHINERY

1/3 HP MOTOR



5 SPEED BENCH DRILL PRESS

- 620 to 3100 RPM
- 8-1/4" maximum distance spindle to table • 1/2" chuck
- 2" stroke, 8-1/4" swing
- 1/3 HP motor
- 22-1/2" high, 47 lbs.

ITEM 05901-7SHA **\$49⁹⁵**

DRILL PRESS WITH KEYLESS CHUCK

ITEM 34231-3SHA **\$54⁹⁹**

CENTRAL MACHINERY

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6" INDUSTRIAL RABBETING JOINTER

INCLUDES STAND

- Infeed table size: 22-1/2"
- Outfeed table size: 19-1/2"
- Motor: 1 HP, 110V, 4 amp, 4900 to 5900 RPM cutterhead speed
- Maximum depth of cut: 3/8"

ITEM 30289-5SHA **\$199⁹⁹**

REPLACEMENT BLADE SET

ITEM 33271-2SHA **\$15⁹⁹**

CENTRAL MACHINERY

FREE ACCESSORIES: Stand, 6" belt, 9" disc, open-end wrench, and hex key wrench

LIMIT 1



COMBINATION 6" BELT AND 9" DISC SANDER

1 HP, 110V, 8 amps, 3450 RPM, all ball bearing motor; overall height: 40"; table tilt 0° to 50°; table surface: 6-1/2" x 12-3/4"; two position work table for disc or belt use; disc speed: 1720 RPM; belt: 6" W x 48" L; belt speed: 1280 FPM; weight: 121 lbs.

ITEM 06852-6SHA **\$169⁹⁵**

ABRASIVES FOR METAL 5

TYPE	SIZE	ITEM	PACK PRICE
DISC	9"	01083-4SHA	\$9⁹⁹
BELT	6" x 48"	34514-1SHA	\$8⁹⁹

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- Tool weight 2-3/4 lbs.

ITEM 31308-3SHA **\$39⁹⁹**

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Variable speed, reversible; 0 to 600 RPM; Includes 6 pc. drill bit set, 6 pc. screwdriver bit set, magnetic extension bit, charger, battery, keyless chuck, and carrying case

ITEM 33165-2SHA **\$49⁹⁹**

13.2 VOLT BATTERY

ITEM 33214-0SHA **\$29⁹⁹**

29 PC. HIGH SPEED STEEL DRILL BIT SET

ITEM 02642-5SHA **\$9⁹⁹**

DRILL MASTER



20 PC. TIN COATED FORSTNER BIT SETS

Titanium Nitride runs cooler, cuts easier, and lasts longer than standard steel! Includes 3/8" shanks and individually organized wooden case. Stand shown not included.

- 20 sizes from 1/4" to 3/4" by 16ths, 7/8", 15/16", 1" to 2" by 8ths

ITEM 31130-7SHA **\$34⁹⁹**

16 PC. FORSTNER BIT SET

3/8" shanks. All sizes are indicated on the shanks. Includes individually organized wooden carrying case. Heat-treated, high carbon steel construction.

- Sizes: 1/4" to 2-1/8" by 8ths

ITEM 07525-8SHA **\$29⁹⁹**

CENTRAL MACHINERY



1" x 30" BELT SANDER

With the back plate in place, you can apply pressure for faster stock removal, sand curved or odd shapes by simply removing it.

- Motor: 1/4 HP, 2 amp, 60 Hz., 120V, 3450 RPM
- Die cast aluminum table: 5" x 5"
- Shipping weight: 19 lbs.

\$54⁹⁹ \$42⁹⁵

ITEM 07830-8SHA

1" x 30" RESIN CLOTH SANDING BELTS (PKG. OF 5)

GRIT	ITEM	PRICE
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80	04860-2SHA	\$6⁹⁹

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Multiple clutch plates permit instant adjustment. Simply depress plates to slide handle against workpiece. Includes heat-treated steel bars with cast iron jaws, plated steel screws, and hardwood handles.

- All clamps have 3/4" pads and throat depth of 2-3/4"

LENGTH	ITEM	PRICE
6"	34387-1SHA	\$3⁹⁵
12"	05975-4SHA	\$4⁹⁵
18"	31264-3SHA	\$5⁹⁵
24"	05976-5SHA	\$6⁹⁵
30"	34389-1SHA	\$7⁴⁵
36"	34388-1SHA	\$7⁹⁵

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WALNUT THE TREE THAT MARCHED WITH MILITARY HISTORY

Walnut's association with firearms goes back to the 17th century, when French musketeers selected a European species of it for the stocks on their muzzleloaders. Light, yet strong, the wood was easily worked and finished. But most important of all, walnut withstood the shock of recoil and remained stable under the worst of conditions, explains Bob Chenoweth in *Black Walnut* (Sagamore Publishing Co., Champaign, Illinois, 1995. Call 800/327-5557).

From that time on walnut formed the stocks of military weapons. Black walnut (*Juglans nigra*) was on the black-powder firearms carried by patriots in the American Revolution and by North and South in the Civil War.

As the sturdy grip on Springfield rifles, the wood survived World War I. GIs carried walnut-stocked M-1s through World War II and Korea, adding to the wood's battlefield heritage.

Later, in Vietnam's early stages, M-14s and M-16s still sported walnut. Then along came the M16-A1, and with it a composition stock of hard plastic. Perhaps walnut was too scarce, too expensive, or maybe not tough enough for the modern military. Whatever the reason, walnut's encounters with conflict were over.

Today, a vestige of this history remains. The 3,000 cadets of the United States Military Academy at West Point, New York, proudly parade with their M-14s—still stocked with black walnut.

Although walnut was replaced in combat by plastic, the rifles of West Point cadets still sport the wood.



Illustration: Jim Stevenson



The New Grizzly G1067Z

Our new G1067Z 7" x 40" Swivel-Head Wood Lathe beats the competition hands-down when it comes to quality and value. Can be used for spindle turning or the headstock and tool rest can be rotated for convenient bowl turning. Automatic speed control has six settings. No more changing belts!

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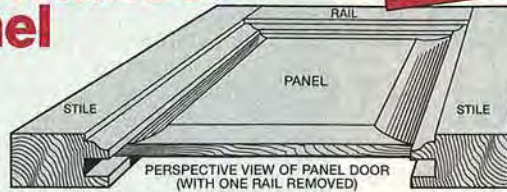
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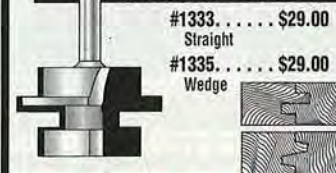
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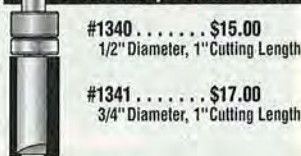
BULL NOSE



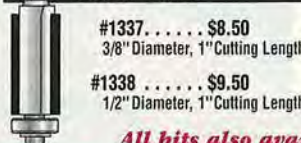
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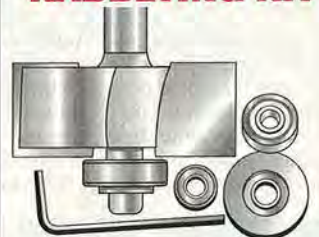
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Simon Willard patented the banjo clock in 1802. Its weight-driven movement in the long case enabled it to run for eight days. Ed's gilded "Bride's Banjo" sells for \$3,000.

Time Marches On

In his Maryland workshop, Edward Stone replicates the clock craftsmanship of Early America.

Tick TOCK. Tick TOCK. To most of us these clock sounds are comforting ones. Not to Edward Stone. He much prefers an evenly pitched "tick tock, tick tock."

"The most practical way to adjust a brass, mechanical clock movement is by ear," says the 63-year-old clockmaker. "You have to listen and adjust it until the ticks equal the tocks in volume. Otherwise, you can rest assured that in a few hours the clock will stop. But when you get 'tick tock,' it will run for a century."

In fact, Ed, who is quite a historian, says that a lot of early Simon Willard movements are working as well today as they did in 1802. "Willard patented the movement and his timepiece which came to be called the banjo clock, in that year," Ed explains. "It was one of the first American departures from the tall-case clock, or what we call a grandfather clock. The brass mechanism was powered by a seven-pound weight that traveled up and down the case. This enabled it to run for eight days." Since Willard was still making these clocks well into his eighties, Ed figures he has 20 years to go.

Ed also notes that during the early 1800s, silent-running clocks like Willard's banjo were



In his study, Edward Stone checks out a gilded finial for a clock case. On the desk is a double-decker and shelved behind him are three more types of his handmade pillar-and-scroll clocks. All have reverse-painted door glasses.

actually called timepieces. Only those that chimed, rang, or gonged to mark the passing of time were referred to as clocks. These timeless tidbits and many more emerge as Ed, speaking comfortably as he moves about his Bowie, Maryland, shop, unveils a fascinating part of American history. And it's one period that he has come to know quite well.

Time Marches On

Getting a focus on clocks

"I build clocks from what I call America's Golden Age of clockmaking," says the crewcut craftsman. "That was from about 1800 to 1840, and includes the styles invented and made by Simon Willard, Seth Thomas, Chauncey Jerome, Elnathan Taber, and of course, Eli Terry."

Ed studied the works of these inventors and clockmakers following his retirement from the U.S. Forest Service, where he had put in 27 distinguished years as a landscape architect. A hobby woodworker since high school, he had tooled up to build furniture and cabinets when he no longer had to show up at the office. But a course on Early American decoration at Washington, D.C.'s Smithsonian Institution altered his focus.

"The course was in bronze-powder stenciling, one way by which clocks, Hitchcock chairs, and other items were decorated," recalls Ed. "The teacher found out that I was a woodworker, and asked me if I could make boxes. She and other members of a historical society needed boxes of an Early American type to stencil. So, I went to their museum and made measurements and sketches of the kinds of boxes they wanted, then began making them. Eventually I began building some clocks for them to decorate, too. Before long, I had completely drifted into clockmaking and was hiring them to decorate my clocks. And I've been a clockmaker ever since."

That happened eight years ago. Yet Ed's then-new fascination with clocks wasn't unlike what happened to a young America during his favorite historical period, when ingenuity and craftsmanship begot clocks.



Ed makes the scrollsawn splats (top trim pieces) for coffin clocks from 1/4" curly maple or mahogany with a cross-grain inlaid plinth up the center.

Mass production in wood

Just as he might have woven a story around a campfire in his Forest Service years, Ed talks about clock history. "Before 1802 in the United States, mostly tall-case [grandfather] clocks were produced. And after 1840, clocks really went into mass production, with manufacturers using decals or printed decoration instead of handpainting. And it was about then, too, that rolled brass and stamping machines appeared in the U.S., so the cost of brass movements went down considerably. Wooden movements couldn't compete. The way I look at it, clockmaking was pretty much the first mass-production effort in this country. And it all began with Eli Terry."

"In 1793, he completed his apprenticeship as a clockmaker," Ed continues, "and set up shop making tall-case clocks with brass and the less-expensive wooden movements. We believe he later took the opportunity to



In their day, these timepieces (called coffin clocks today) were popular for banks, schools, and churches where their simple style looked more appropriate than the fancier banjos, which shared the same movement.

watch Eli Whitney make government-contract gun parts in Connecticut. Whitney was to figure out how to make the parts interchangeable and produce them in a factory. Before then, guns were made one at a time by a blacksmith or gunsmith, and no two were alike. No one had ever done before what Whitney was doing. Well, Terry figured he could make clocks that way, too."

Terry knew firsthand of customer reluctance to pay the higher cost of brass movements (even further inflated by British taxes), so he turned to New England's hardwood forests—cherry for gears, oak for front and back plates, etc.

"In 1807, Terry managed to finalize a contract with two brothers to make 4,000 wooden movements for tall-case clocks over three years," tells Ed. "Everyone in New England laughed because nobody had made that many in a whole lifetime! Terry ended up spending the first year rigging the

machinery to run by waterpower. A young joiner by the name of Seth Thomas was hired to assist. In the second year they produced 1,000 movements, and the other 3,000 in the third year. Then, Eli took his money and retired."

America first marks time

Apparently, though, Terry got bored in retirement. Around 1816, he invented the pillar-and-scroll shelf clock, and began producing them. Because he had mass production of the movements down pat, he could keep the price low, even while using hand-painted and gilded dials and glass tablets (door panels). At \$15 a clock, the average family could now own one.

Ed laughs at the irony of this historic achievement. "Of course, in those days, clocks were relatively unnecessary," he says. "Most people got up with the sun and worked until the sun went down, then ate and went to bed. Nobody worried much about it; the clock was pretty much just a status symbol. Due to Terry's factory system to mass-produce clocks, however, it suddenly became necessary for people to be somewhere at a certain time—to start their jobs in the factory, for instance."

The smaller, shelf-style clocks were popular with peddlers, too, who hauled and sold them in the western frontier. "Travelers' journals from those days often mention bare-bones frontier homes with only a table, one chair, and a Connecticut shelf clock," Ed points out. "They bought a clock to decorate their places.

"Peddlers also had a unique way of selling," he notes. "They'd tell the farmer and his wife that they would leave the clock with them for a month. If they liked it, they could pay for it when the peddler came back through. The folks would get used to the clock and not want to give it up!"



Early American clockmakers liked to lay veneer for the clock door in a chevron pattern. For a perfect seam, Ed tapes a joint together from the veneer's face side, then glues the back side. Next, he lays it flat to dry. The green seamstress' trim board provides an unequaled mar-free cutting surface, he claims.



Ed lifts thin 23-karat gold leaf onto the sized trim piece with a squirrel's-hair gilder's tip, then burnishes it in place with a small paintbrush. "Gold paint will tarnish, real gold won't," says Ed.

The case for clocks

If you can find one today, an original Eli Terry pillar-and-scroll shelf clock in excellent condition might sell for several thousand dollars, according to Ed. A Willard banjo might carry a six-figure price tag. "But there are lots of counterfeit Simon Willard banjos," he says.

In comparison, Edward Stone's clocks seem quite reasonable. At \$3,000, his extensively gilded "Bride's Banjo" (shown *page 39*) is the most expensive. A pillar-and-scroll clock with fretwork and figured wood tops out at \$1,500. At the lower end, you can buy a simpler coffin clock (named such because of the case's resemblance to one) with a mahogany or curly maple case for around \$550.

What will you have purchased? A finely crafted, fairly authentic reproduction of a period clock.

"Fairly" authentic? Ed explains. "I change a few of the ways in

Continued

Time Marches On

which the originals were done because I want my clocks to last longer. For example, on old clocks the craftsmen joined the casework expertly. But then to make the back, they nailed on boards—like they were banging together an orange crate. To cover it up, they pasted on a large advertising label. It's called a 'papered back,' visible through the door. I paper the backs of all shelf clocks, too, but the advertisement is over ¼" Baltic birch."

From going over old clocks, Ed also discovered that veneer was used extensively. "On a clock door, they'd put ⅛" mahogany veneer over pine. To hold the glass in place, they'd just let the veneer lap over into the cutout."

Ed veneers, too, but with limits. He veneers the solid-mahogany doors of his shelf clocks (most of which are done in a chevron pattern, as shown *preceding page*), the apron across the bottom, and the filigree-sawn pediment at the top. Only solid mahogany or curly maple becomes casework: Tops are ½" stock, bottoms and sides ¾".

No wooden movements

The solid cherry-wood gears in the movements used by early New England clockmakers had their faults, notes Ed. Besides humidity, which could warp them, the gears would pop teeth. "Of course, it wasn't hard to cut another and insert it," he says. "But if five or six teeth in a row broke, the gear was probably done for."

Ed doesn't attempt to re-create wooden movements because most customers cannot easily obtain repairs for them. He relies on quality windup brass movements of German origin, American weight-driven movements, or Japanese-made quartz, battery-powered movements. All swing their pendulums and some

count out the hour on a bell, gong, or chime rods. If the customer prefers the battery-powered, Ed makes and installs simulated winding stems and dial holes to preserve the original appearance.

"Unfortunately, quartz movements don't make tick-tock sounds as the originals did. And whoever designs quartz movements these days seems to know nothing about clocks," comments the clockmaker, "because you cannot have a pendulum swing too slowly. The more slowly they swing, the more majestic the clock looks. Yet, almost all quartz movements swing too fast, and that drives me crazy."

Ed mounts clock movements on a "subdial" made of either ¼" or ⅝" Baltic birch plywood. "I usually finish the case, fit the movement to the subdial, and then install the real dial that's



To bring out the figure in curly maple, Ed triple-stains with water-soluble aniline dye. Sanding with 320-grit between coats lightens the "flat" areas for more contrast.



This cross-banded banjo with a carved mahogany lower bracket and a reverse-glass painting of two War of 1812 frigates is a popular style and brings \$1,150.

handpainted and gilded on Masonite or metal," he explains. "Then, I put the glass in the door. On the banjos, the last thing that goes in are the reverse-painted glasses. I do some of them, but have most done by a Michigan artist for \$200 and up, so they're a valuable element."

Accenting the wood

"Most people who see my maple coffin clocks [see page 40] call the case wood 'tiger' maple. We [woodworkers] know it as curly or fiddleback," says Ed. "Whatever it's called, my customers like it, so I've come up with a finishing technique to accentuate the figure."

After the curly maple has been finish-sanded, Ed brushes on his specially blended mixture of water-soluble aniline dye (see photo below left). "That raises the grain," he says. "Then, when I go to take the fuzz off with 320-grit sandpaper, it takes the stain off the flats, but leaves it in the curls. I end up staining it three times, sanding after each coat. But because of the sanding, what I'm really getting is three coats on the curls and one on the flats. The staining and sanding accents the figure. And the dye colors the wood without fogging or obscuring it as oil stain can."

The accenting completed, Ed turns to a fairly flat finish that he likes on his coffin clocks. He wipes on several coats of polymerized tung oil, or sometimes Minwax antique oil, which works almost as well, he says. Pillar-and-scroll clocks, and the banjos, get a few coats of Bartley's gel varnish ("It dries so fast that it doesn't pick up any dust"). Over the varnish, Ed lays down paste wax, then buffs it.

The clockmaker admits that he's extremely fussy about his wood, from the selection to the finishing. He travels to a hardwood supplier in Pennsylvania to hand-pick his



Ed builds few "triple-decker" clocks, but the one he's assembling will feature a whaling theme, popular in New England during the period. Note the "subdial" visible behind the clock he's working on. It will support the movement.

figured maple and mahogany stock, even buying cupped and twisted boards if they display the best curl. He knows that passes through his 10" Inca jointer/planer will flatten the figured boards.

"Other woodworkers I know—especially furnituremakers—say I'm crazy to pay \$8 a board foot for curly maple. And I say, what does it matter for a clock that only has two or three board feet of wood in it? I make my period clocks for special people. I put my name on them. So the clocks therefore have to be special." ♣

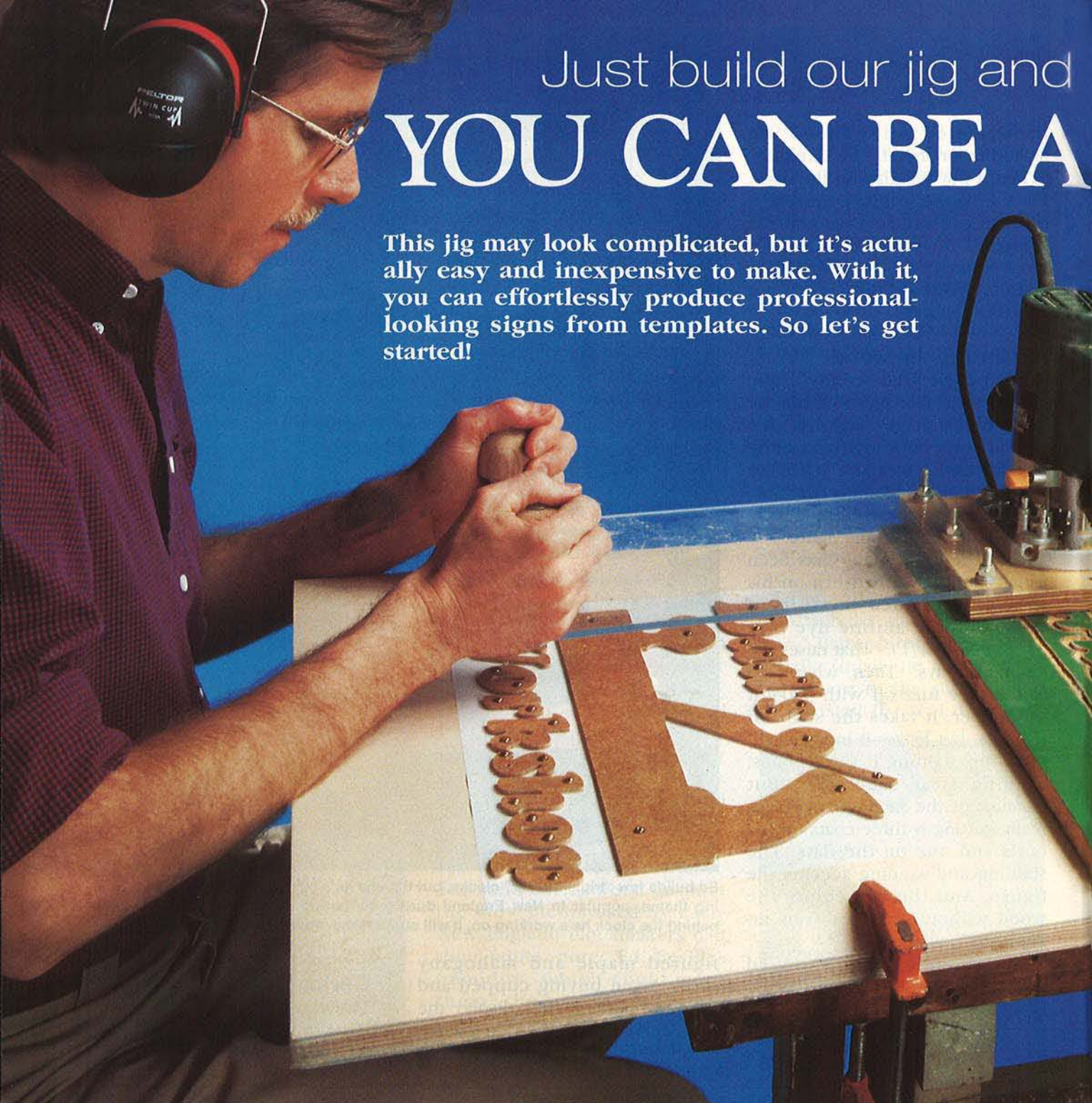
Written by Peter J. Stephano
Photographs: Steve Uzzell

Curious about clocks?

The National Association of Watch & Clock Collectors, Inc., maintains a museum and research library at its national headquarters. For information, write: National Association of Watch & Clock Collectors, Inc., 514 Poplar St., Columbia, PA 17512.

For a copy of Ed Stone's descriptive color clock brochure and price list, send \$4 (U.S.) to:

Edward H. Stone
13200 Forest Dr.
Bowie, MD 20715.



Just build our jig and **YOU CAN BE A**

This jig may look complicated, but it's actually easy and inexpensive to make. With it, you can effortlessly produce professional-looking signs from templates. So let's get started!

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cutting. The bottom line for many of us woodworkers becomes, "I could probably do it, but is it really worth the trouble?" The answer is a resounding "Yes!"

Read on and we'll teach you the mechanics for fab-

ricating your own signs, using our exclusive jig. This clever pattern duplicator provides you impressive precision and control over the machining and you'll find yourself saving loads of time on production work.



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SIGN-MAKING PRO



The photos at *right* show two types of template setups. The positive print template, *left*, creates a raised-image sign. The stencil-type template, *right*, cuts a negative print image into the face of the sign.



First, let's build the jig

STEP 1

Make the plates and arms

Start by cutting the three 8×8" plates (A, B, and C) out of 3/4"-thick Baltic birch plywood. Stack the three plates together with double-faced tape between the

plates to hold them securely. Drill 1/4" holes through all three plates where shown in the Hole Pattern drawing on *page 46*.

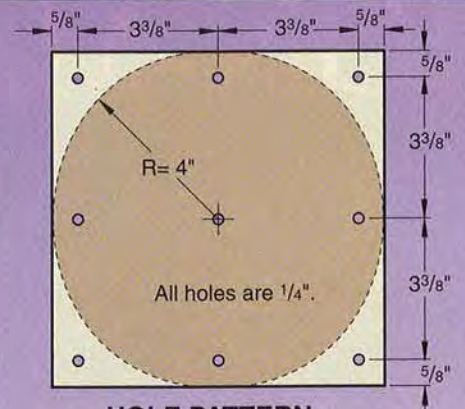
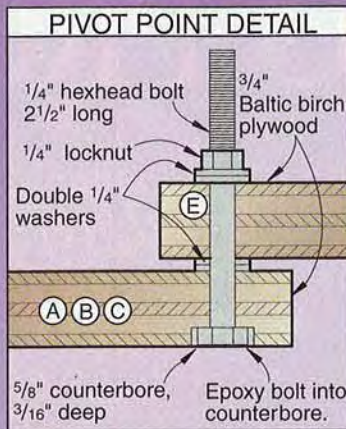
Now, separate the plates, and cut the pivot plate (B) into a circle having an 4" radius. Then, drill the counterbores and countersinks

where shown in the Exploded View drawing.

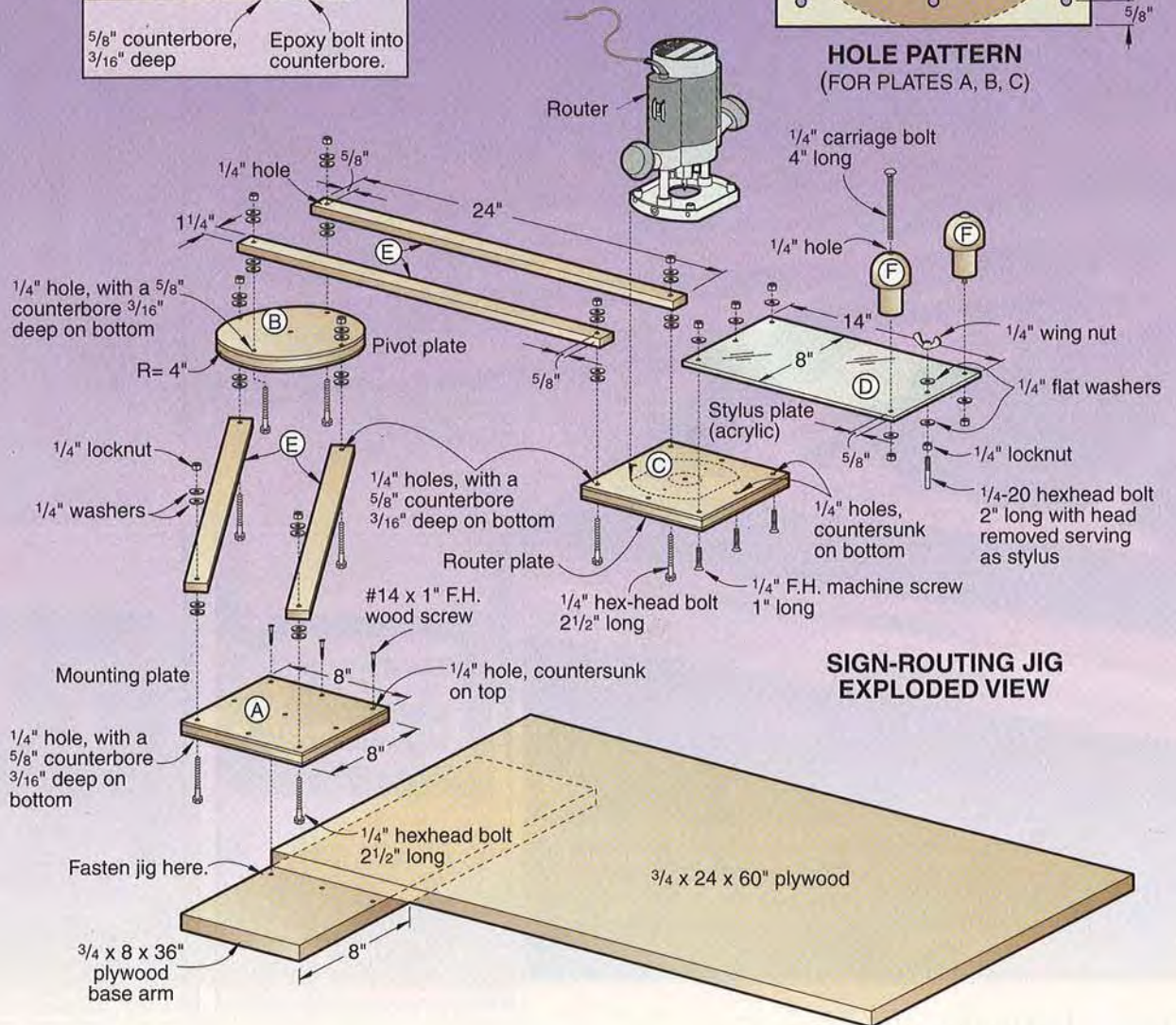
To complete the router plate (C), remove the plastic baseplate from your router and secure a 1/4" straight bit with a 1/4" shank into the collet. Place the plywood plate onto the base of the router,

Continued

YOU CAN BE A SIGN-MAKING PRO



HOLE PATTERN
(FOR PLATES A, B, C)



A word about routers

You can use any router you like with our sign-routing jig, but a lightweight router (1 1/2 hp or less) works best. The less the router weighs, the less effort it takes to maneuver the jig. Also note that to mount your router to the plywood, you may need to buy an extra set of screws that are longer than the screws that hold the regular baseplate.

Bill of Materials					
Part	Finished Size			Material	Qty.
	T	W	L		
A	¾"	8"	8"	BPL	1
B	¾"	8" dia.		BPL	1
C	¾"	8"	8"	BPL	1
D	¼"	8"	14"	AC/PL	1
E	¾"	1¼"	24"	BPL	4
F	2" dia.		3½"	O	2

Materials Key: BPL—Baltic birch plywood, AC/PL—acrylic or polycarbonate, O—oak.

Supplies: 8 hexhead bolts ¼x2½", 2 hexhead bolts ¼x2" (with heads removed), 2 carriage bolts ¼x4", 3 flathead machine screws ¼x1", 14 lock-nuts ¼", 39 washers ¼", 3 #14x1" flathead wood screws, 1 wing nut ¼".

using the bit as a centering pin. Now, mark the locations of the router's mounting screw holes onto the plywood. Remove the plywood plate from the router, and drill holes at the marked locations that equal the diameter of the router's mounting screws. Countersink these holes so that the mounting screws will sit flush

with the plate. Finally, rebores the opening for the bit to 1" for chip clearance.

To make the stylus plate (D), cut a piece of clear ¼" acrylic or polycarbonate to the dimensions shown. Drill ¼" holes along the front and rear edges, using the holes in the edge of plate A or C as a template.

Finally, cut out four identical pieces of ¾"-thick birch plywood to make the two pairs of arms (E). Stack these with double-faced tape as you did with the plates, and drill all the bolt holes. Counterbore where shown on the Exploded View drawing.

STEP 2

Shape a pair of hardwood handles

To make the two handles for the stylus plate, laminate enough hardwood stock (we used oak) to create a blank measuring 2x2x12". Strike diagonal lines from the corners on each end to

find the center of the blank. Now, chuck a ¼" brad-point bit into your drill press, clamp the blank vertically in a handscrew clamp, and bore a hole 3⅝" deep. Bore into the opposite end the same way.

Next, tighten a ¾" round-over bit into your table-mounted router. Adjust the fence as needed, and round over each of the long edges. Then, place the blank against the table's miter gauge and perpendicular to the fence. Round over all four edges of each end of the blank as shown in the photo *below left*.

Switch to a ¾" round-nose bit raised ½" above the table. Adjust the fence 1½" from the bit, place the blank against the miter gauge with its end butted against the fence, and cut the knob-to-shaft taper. Adjust the fence away from the bit, and continue routing along the knob shafts as shown *below right* to a point 4" in from each blank end.

Continued



With the knob blank placed against the miter gauge and at a right angle to the router-table fence, round over the ends.



Using your miter gauge and a ¾" round-nose bit, rout the knob-to-shaft taper and the shaft with multiple passes.

YOU CAN BE A SIGN-MAKING PRO

Now, bandsaw across the blank $3\frac{1}{2}$ " from each end to create the two knobs. Insert a $\frac{1}{4}$ " carriage bolt into one knob, and secure it with a washer and locknut. Chuck the protruding end of the bolt into the drill press and sand the handle smooth, starting with a coarse sandpaper and working up through finer grits. Repeat to finish shaping the second knob.

STEP 3

Make the stylus

The stylus traces the outline of the templates. It must equal the diameter of the router bit you are using. We found it was best to hog out the waste material with a $\frac{1}{4}$ " straight bit, then rout the outline of the letters and templates with a $\frac{1}{8}$ " straight bit.

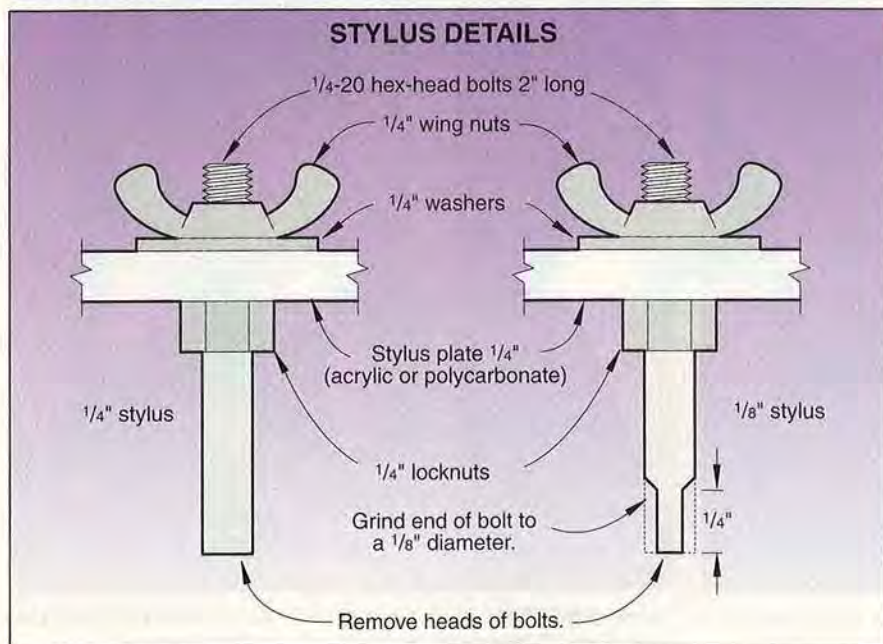
We made our $\frac{1}{4}$ " stylus from a $\frac{1}{4}$ -20 \times 2" hex bolt with the head cut off. The threads of this bolt run up through the stylus plate where you secure it with a wing nut as shown in the Stylus Details drawing below.

To make the $\frac{1}{8}$ " stylus, take a $\frac{1}{4}$ -20 \times 2" hex bolt with the head removed, and chuck the threaded portion into a portable electric

drill. With the drill running at a slow speed, switch on your bench grinder, and carefully touch the end of the bolt to the wheel on your bench grinder as shown below. (The drill gives you a safe, substantial handle, and the spinning bolt will be uniformly ground.) Continue grinding until you've reduced the diameter of the lower $\frac{1}{4}$ " of the shaft of the bolt to $\frac{1}{8}$ ".



Grind the end of a $\frac{1}{4}$ -20 \times 2" hex bolt to make the $\frac{1}{8}$ " stylus.



STEP 4

Assemble the jig

Assemble the jig as shown in the Sign-Routing Jig Exploded View drawing. Next, epoxy the bolt heads into the counterbored holes in the plates. When the epoxy dries, tighten the locknuts so that the arms fit snugly against the plates, but move without binding.

Next, screw a $\frac{3}{4}$ \times 8 \times 36" plywood base arm to the underside of a 2 \times 4' sheet of $\frac{3}{4}$ " plywood, and clamp this assembly to a small benchtop. Screw the mounting plate (A) to the base arm as shown in the Sign-Routing Jig Exploded View drawing.

Put a $\frac{1}{4}$ " straight bit in your router and mount the router to the router plate (C), but keep the tip of the bit above the bottom of the plate for now. Finally, secure the $\frac{1}{4}$ " stylus into the stylus plate.

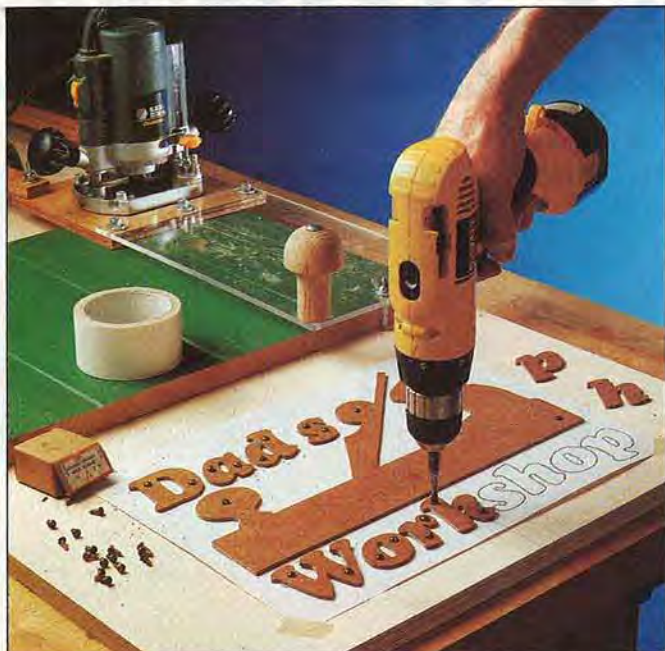
STEP 5

Scrollsaw and install your sign template

Make two copies of the paper pattern for the letters and design from the *WOOD PATTERNS*[®] in the center of this magazine. Tape one copy to the lower edge of the plywood (the edge closest to the stylus), centering it. (Set the other copy aside for now.) Then, check to make sure the stylus will reach around all the letters and shapes in the sign. If not, reposition the paper pattern closer to the mounting plate, and check the stylus reach again.

With spray adhesive, attach the other copy of your sign to a piece of $\frac{1}{8}$ " tempered hardboard that is smooth on both sides. Then, cut out the letters and pattern shapes with your scrollsaw.

Now, drill pilot holes in the letters and pattern for the mounting screws. We drilled $\frac{1}{8}$ " pilot holes for #6 \times $\frac{1}{2}$ " roundhead screws. The location of the holes is not criti-



Position the design and letter templates onto the paper pattern on the plywood and secure them in place with roundhead wood screws.



Carefully lower the router bit onto the workpiece while positioning the stylus in the waste area of your template. Arch the stylus plate to engage the stylus before the bit touches down.

cal, just put them as far apart as possible to secure the pieces.

Place the template letters on their outlines on the paper pattern one at a time. Drill pilot holes into the plywood, and drive in the screws to secure the letters as shown *above left*. You can attach parts too small to accept a screw (such as apostrophes and commas) with double-faced tape.

Now, let's make a sign

At last, you're nearly ready to rout. But first, you'll need to position the wood for the sign. Mark the centerline of your paper pat-

tern and the centerline of your sign material. Center the sign material on the paper pattern, and move it forward 16"—the distance from the stylus to the router bit. To secure the sign material, drive four brads or finish nails into the corners of the wood. Position these brads or nails in a waste area where you won't hit them with the router bit.

Now, lower the 1/4" router bit to a depth of no more than 1/4". Place the router plate on the front edge of the sign material where the bit can spin freely without touching the workpiece.

Turn on the router and grab the handles on the stylus plate. Lift up on the handles until the router is

clear of the sign material. Slowly lower the stylus plate so that the stylus lands in a waste area of the pattern. But be sure to flex the stylus plate by pulling back on the handles as shown *above right*. This enables the stylus to touch the template before the router bit touches wood. Then relax the pressure on the handles to lower the bit into the wood and start routing. Rout the outside of the letters and patterns in a counter-clockwise direction and the inside letters or shapes clockwise. Once you've removed most of the material, switch to your 1/8" straight bit and matching stylus and complete the fine detail work, routing in the same directions as before. ♣

Ideas for templates: They're everywhere

In the *WOOD PATTERNS* section in the center of the magazine, we've provided a template for the type style we used to rout the signs in this article. But you're certainly not limited to just this style, or this sign. With

our jig you can use any pattern, design, or type style that you can cut on a scrollsaw and maneuver a 1/8" stylus around. For your own patterns and letters, check out an art-supply store. There you will find clip-art books loaded with

line art ranging from flowers to holiday themes, and most everything else in between. You'll also find a wide array of alphabet patterns which can be enlarged on a copier to obtain the size of type you need.

A clever turning for sewing and showing SEWING CIRCLE

If, like us, you're more adept at turning wood than sewing on buttons, this enjoyable project offers a practical advantage. We suspect that if you turn one of these enchanting sewing kits and present it to someone who sews, you may never have to worry about putting your buttons back on again.



A century and more ago, seamstresses treasured fancy sewing kits like this, though not for everyday use. Worn on a neck ribbon, much like

Project Prep

Stock: 1×1×7" walnut for body and thimble, 3/8×5" walnut dowel rod for needle case.

Lathe equipment: 3-4" faceplate, live (rotating) tail center, jaw chuck (if available).

Turning tools:

- 1/4" spindle gouge
- 1/2" and 1" skew
- 1/2" roundnose scraper
- 3/16" parting tool

Lathe speeds:

- Roughing: 500-800 rpm
- Finish-turning: 1000-1200 rpm

a locket, such a kit would more likely be saved to be shown and admired on some special occasion, such as a sewing social. And if a suitor or spouse had turned the nesting containers on a treadle lathe, that made the set even more enviable.

To turn one yourself, grip one end of a 1×1×7" piece of stock in your lathe chuck. Install a live center in the tailstock, and bring it up to support the free end. Round the stock to 7/8".

No chuck? Try this

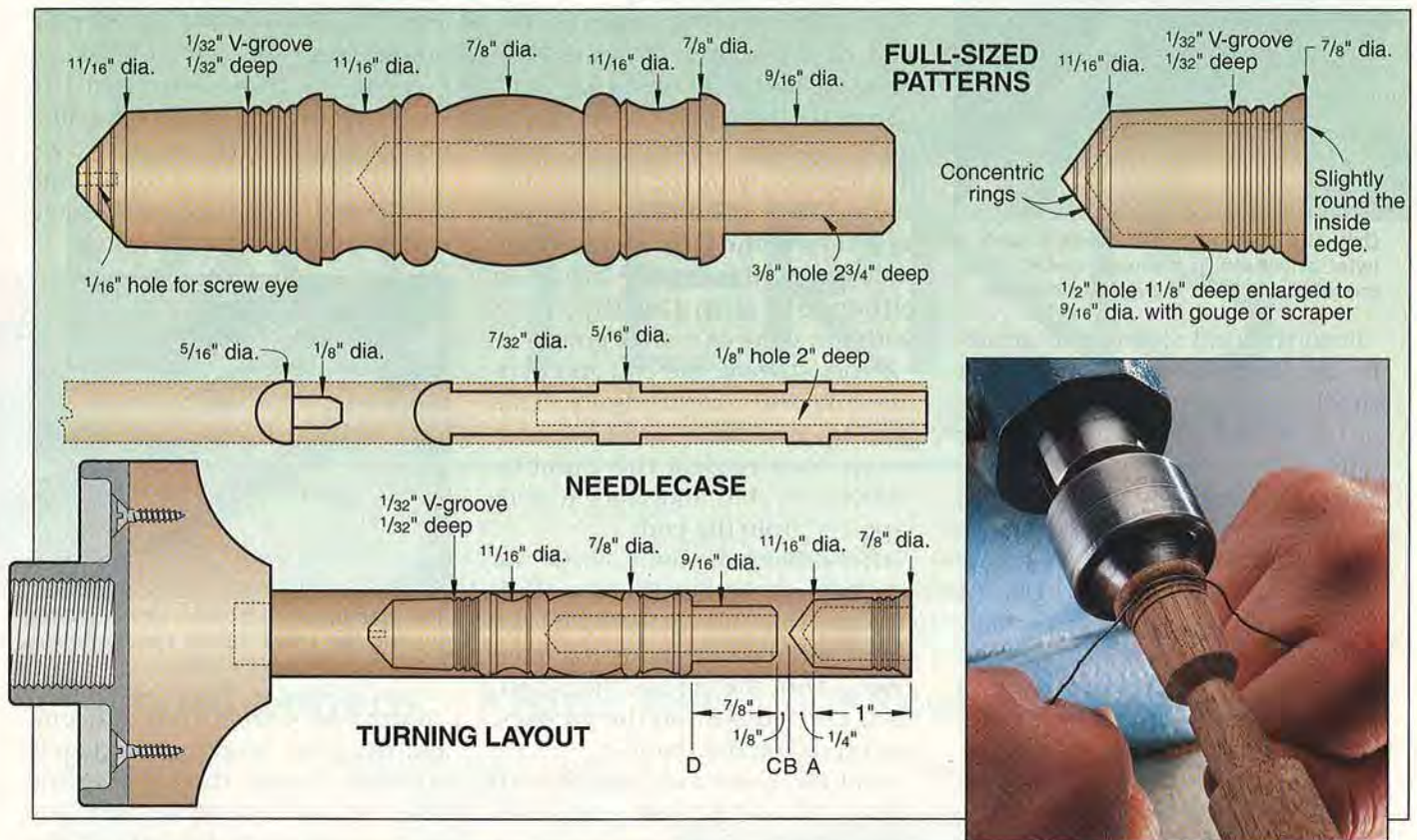
If you don't have a lathe chuck, mount the stock between centers. Round it down to 7/8" diameter, and form a 3/4" tenon 1/2" long at the tailstock end. Then, dismount the stock, and remove the drive center from the lathe.

In place of the drive center, install a 3-4" faceplate with a 1-1/2"-thick scrapwood disc of the same size attached. True the face and side of the disc. Then, bore a 3/4" hole 5/8" deep into the center to create a jam chuck for the workpiece.

To bore the hole, plunge a small gouge (we used a 1/4" spindle gouge) straight into the center of the disc, 5/8" deep. (To mark the center easily, start the lathe, then put a pencil point against the disc at the approximate center. Move the pencil toward the center until it draws a point instead of a circle. The point is the center.)

Enlarge the starting hole with a gouge or scraper. Take it easy as you enlarge the hole; the tenon on the workpiece needs to fit snugly into it. Test the fit often.

CENTERPIECE



Glue the workpiece tenon into the hole. For a quick start-up, choose cyanoacrylate adhesive or five-minute epoxy. Bring the tailstock up to center the workpiece.

Turn a thimble to start

Three major parts make up the sewing kit: the body, a thimble that doubles as its lid, and the combination thread bobbin and needlecase that fits inside. We'll start with the thimble.

Draw a line on the workpiece 1" from the tailstock end (Line A on the Turning Layout drawing). Also draw lines 1 1/4" (Line B), 1 3/8" (Line C), and 2 1/4" (Line D) from the tailstock end. Note the corresponding features on the drawing.

Form the bead for the thimble rim at the end of the stock. Then, taper the thimble side to 11/16"

diameter at the 1" line. Decorate the side of the thimble with V-grooves where shown.

After cutting the V-grooves with the point of the skew, burn them in. To do this, wrap the ends of a 12" length of thin copper or steel wire around two dowels for handles. Then, with the workpiece turning, press the wire into the grooves, as shown *above right*.

Begin to shape the end of the thimble, but leave it connected with a tenon about 1/2" in diameter. At the same time, turn a tenon about 9/16" diameter between lines B and C. The diameter need not be precise now. Later, you'll size it to fit the inside of the thimble.

Now, hollow the thimble

Bore the thimble hole. To do this, we installed a 1/2"-capacity Jacobs-

A short length of steel or copper wire works fine for burning in the grooves on the thimble. Don't apply a lot of pressure; just let friction do the work.

type drill chuck in the lathe's tailstock. (You can buy a 1/2" chuck mounted on a Morse Taper shaft for this purpose from many woodturning dealers, including Craft Supplies USA, 800/551-8876, and Packard Woodworks, 800/683-8876. The cost is about \$40.)

Chuck in a 1/2" bit (we used a 1/2" Black and Decker Bullet twist drill), and wrap a strip of masking tape around it 1 1/8" from the tip. This will be your depth gauge. Run the lathe at a slow speed, and advance the bit toward the workpiece. Guide the turning with your hand, bringing its center to the point of the bit.

Continued

SEWING KIT



Drill the hole into the thimble with a twist drill held in a chuck mounted on the tailstock. Mark the depth with tape.

Feed the drill slowly and steadily, as shown *above*, retracting it slightly a couple of times to clear chips. Drill until you reach the tape mark.

Using a small gouge or scraper, enlarge the hole to $\frac{5}{16}$ ", but be careful not to make the hole larger than the tenon on the body. (A hole slightly smaller than $\frac{5}{16}$ " may better suit some needleworkers. If possible, test the size as you work.) Take small cuts to prevent overenlarging the hole or dislodging the turning from the jam chuck. Keep the wall of the hole straight, and slightly round the inside edge at the rim for comfort.

Part off the thimble. Cut in as far as you can while shaping the end with the skew. Then saw off the thimble $1\frac{1}{4}$ " from the end.

Fit the thimble to the body

Test-fit the thimble on the body tenon. With the small skew or a sanding block, adjust the tenon diameter so the thimble fits over it snugly. It must fit all the way to the shoulder on the body. You should be able to pull it off with little effort, but it shouldn't be loose enough to fall off.

Now, to finish turning the thimble, chuck it on the sized tenon. Shape the end to the profile shown, taking light cuts. Then, using the point of the skew or parting tool, cut a series of concentric rings on the end. Space

them about $\frac{1}{16}$ " apart, and keep them uniformly deep and wide. Remove the thimble.

Complete the body

Make a light truing cut across the end of the tenon, if necessary. Bring the tail center up for support.

Turn the beads and coves at the middle of the body. First, mark the features with the point of the skew. Work from the center out as you form the large center bead, then shape the smaller beads on either side of it. Cut the coves with the skew or a small gouge.

Before shaping the end and parting off, drill out the body. This calls for the same tailstock chuck setup used to drill the thimble. Chuck a $\frac{3}{8}$ " bit, and mark it with tape $2\frac{3}{4}$ " from the end.

After drilling the body, shape the end nearest the headstock to look like the thimble. (It helps to put the thimble on the body for reference.) Turn the tapered sides first, then cut and burn in the grooves, as you did on the thimble.

Sand the body and thimble with 150-, 220-, and 320-grit sandpaper. Then, form the thimble end as you part off the body. When you reach the point that the tenon holding the turning is only $\frac{3}{16}$ " or so, cut the concentric rings into the end. If you can't quite get in with a skew or parting-tool point, use a nail or a piece of steel rod with a point ground on it.

Finally, part off the body. Drill a $\frac{1}{16}$ " pilot hole in the end of the body to receive a screw eye for the necklace. Apply a clear finish to the body and thimble.

Now for the needlecase

Drill a $\frac{1}{8}$ " hole 2" deep straight into the center of a 5" length of $\frac{3}{8}$ " walnut dowel rod. Chuck the undrilled end in a headstock-mounted Jacobs-style drill chuck. (Or, a jam chuck with a $\frac{3}{8}$ " hole.) Engage the point of the live tail center in the drilled hole.

Turn the blank down to $\frac{5}{16}$ " diameter. Then, referring to the Needlecase illustration, mark the three $\frac{7}{32}$ "-diameter sections on the blank, and turn them to that diameter. We did most of the turning on this small part with a $\frac{1}{2}$ " skew. For the sections between the shoulders where an even smaller one would have been handy, we angled the parting tool toward the work and employed it as we would a skew, shown *below*.



The parting tool comes in handy for turning the small thread spools on the outside of the needle case.

Form the case's rounded end and the plug, working alternately on both. To size the stem on the plug, set your calipers a hair larger than the body diameter of the bit you drilled the case with.

As you get close to completing the plug, sand both pieces lightly. Then, part off the needlecase and the plug. Apply a clear finish.

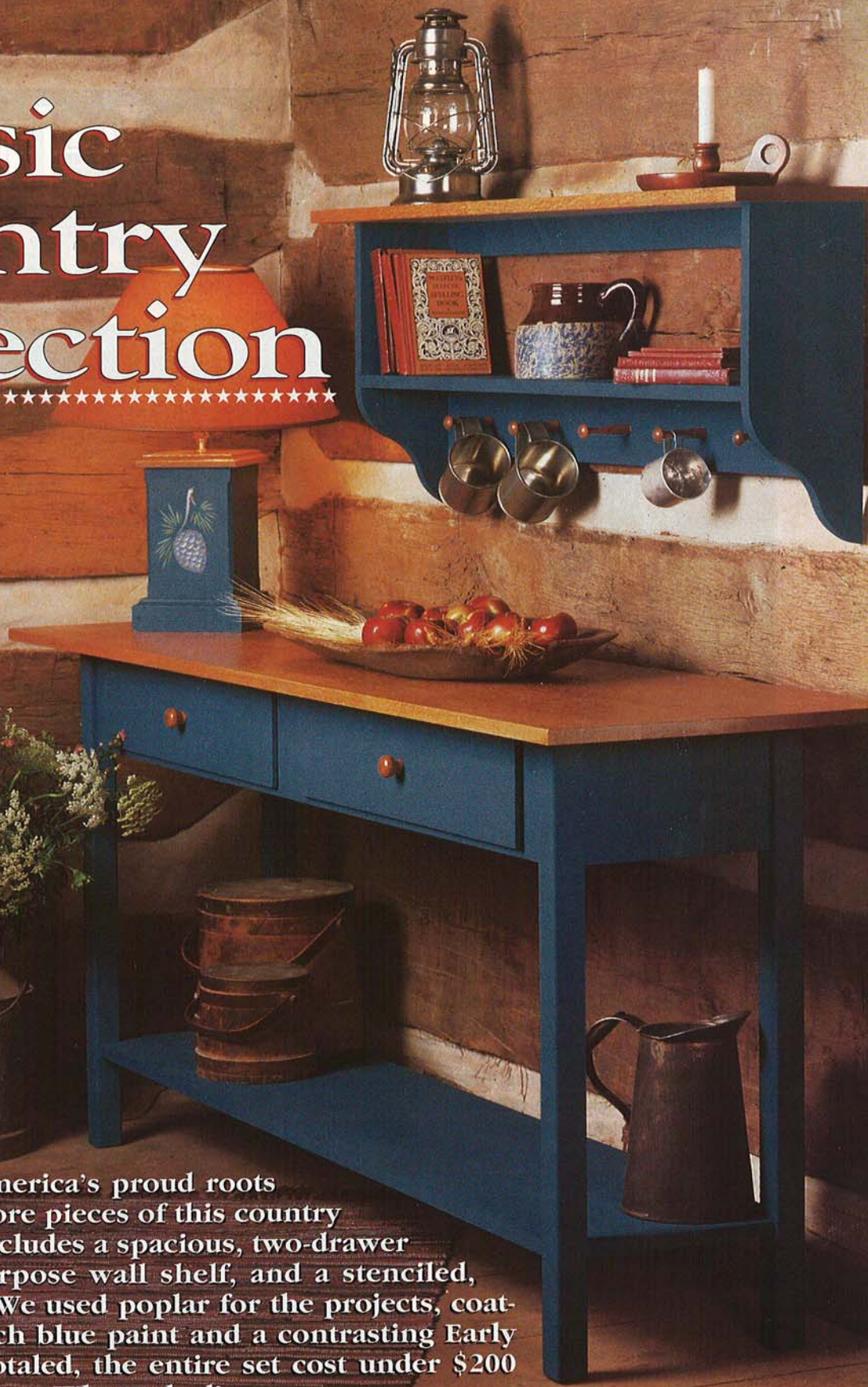
Wrap it up

You can hang the sewing kit from a ribbon, which would be traditional, or a necklace chain. Drive a screw eye appropriate for whichever you choose into the pilot hole in the end. Enlarge the hole, if necessary.

Wind some thread onto the spool sections of the needlecase. To secure the free ends, make a knife cut in each hub. Drop a needle and a pin or two into the case to complete the set. ♣

Project Design: S. Gary Roberts
Photographs: Wm. Hopkins; John Hetherington
Illustrations: Roxanne LeMoine

Classic Country Collection

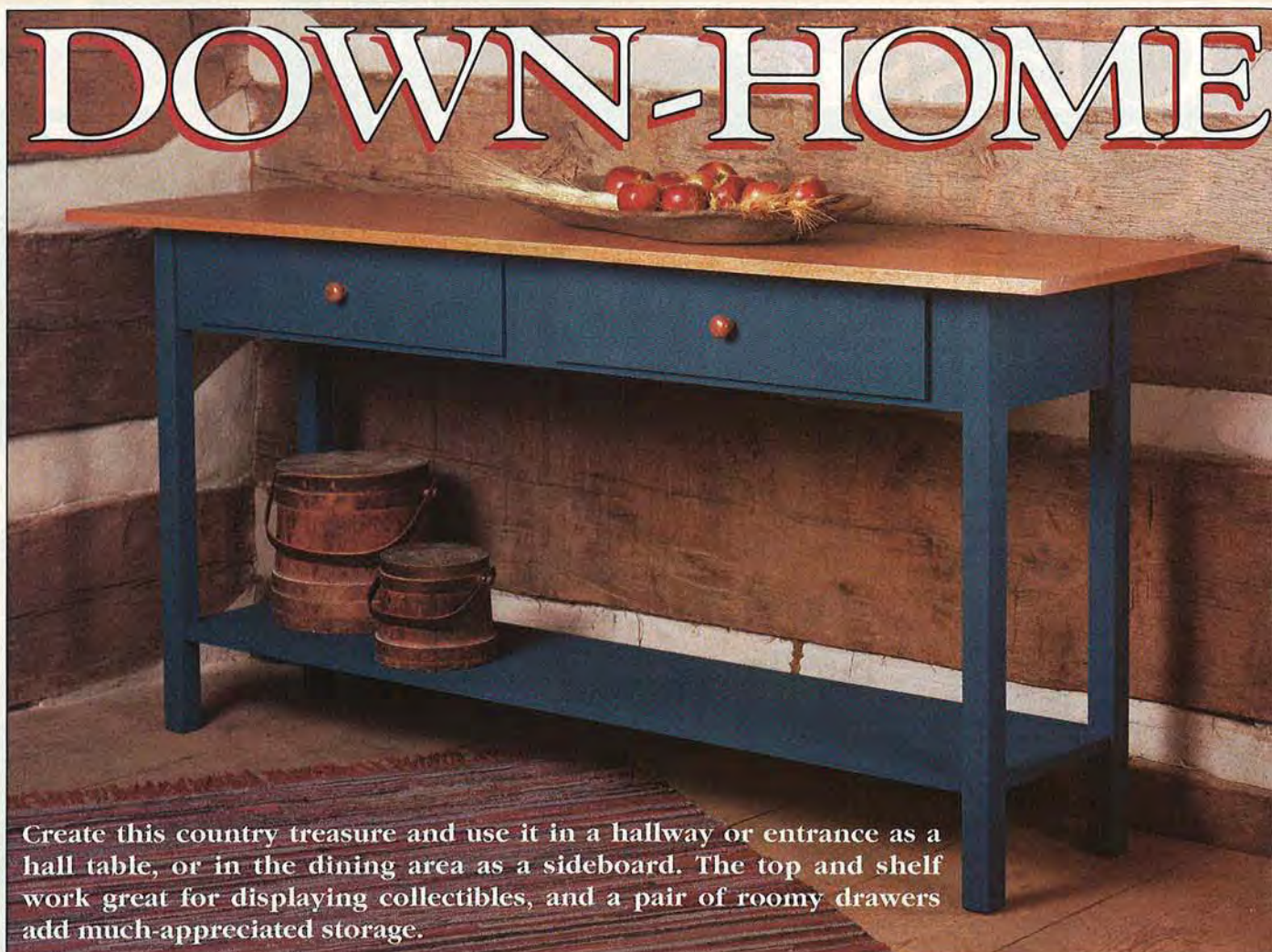


Stay in touch with America's proud roots by building one or more pieces of this country trio. The collection includes a spacious, two-drawer sideboard, a multipurpose wall shelf, and a stenciled, informal table lamp. We used poplar for the projects, coating each with a French blue paint and a contrasting Early American stain. All totaled, the entire set cost under \$200 in lumber and hardware. What a deal!

Continued



DOWN-HOME



Create this country treasure and use it in a hallway or entrance as a hall table, or in the dining area as a sideboard. The top and shelf work great for displaying collectibles, and a pair of roomy drawers add much-appreciated storage.

To start, machine the four legs

1 From laminated stock or 8/4 material (commonly called eight-quarter stock), cut four 1 3/4"-square legs (A) to 32 1/4" long. Mark the mortise locations on adjacent surfaces where dimensioned on the Leg drawing.

2 Fit your table-mounted router with a 3/8" straight bit set to cut 1/2" deep. Position the router-table fence to cut a mortise centered along the edges of the legs where marked to cut the mortises. Clamp a stop to the fence to ensure all eight mortises are exactly 6 1/8" long. Rout the mortises where marked. Chisel the round-routed ends square.

3 Mount a 45° V-block support to your miter gauge as shown in the photo below. Fit your table saw with a 3/4" dado blade. Cut a 3/4"



Secure a 45° V-block support to your miter gauge to cut the 3/4" notch in each leg.

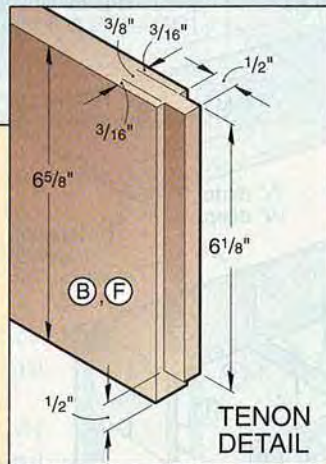
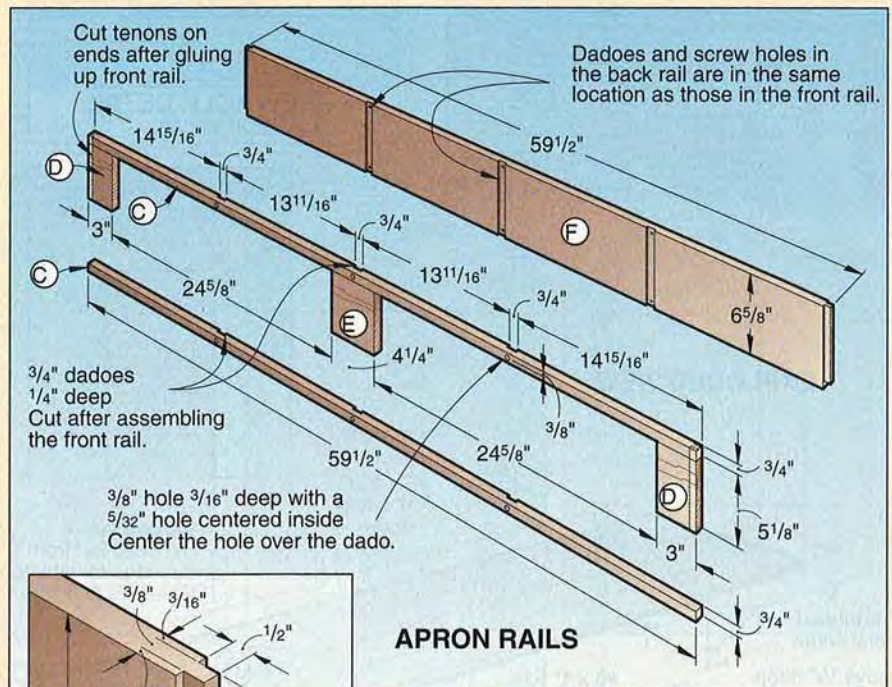
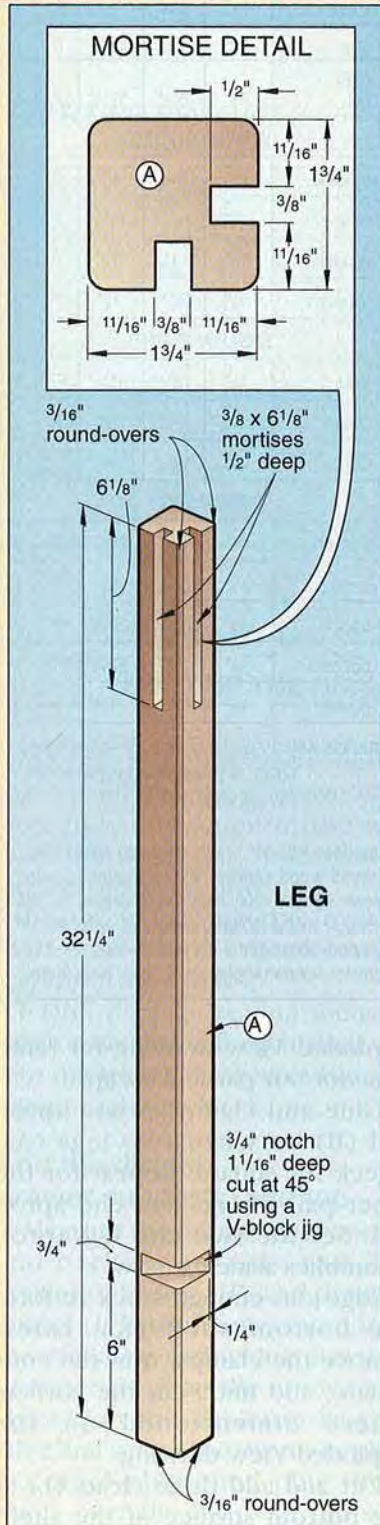
dado 1 1/16" deep and 6" from the bottom end of each leg as shown in the photo and dimensioned on the Leg drawing.

4 Mount a 3/16" round-over bit into your table-mounted router. Position the fence so the leg rides against the fence *and not* the piloted bearing. Rout round-overs on all but the top ends of each leg. Without the fence, the router bit would gouge into the areas around the notches and mortises where the bearing would not have a surface to ride on.

The apron rails and bottom shelf come next

1 Cut the end apron rails (B), the front-apron rail pieces (C, D, E),

SIDEBOARD



and the back apron rail (F) to the sizes listed in the Bill of Materials.

2 Keeping the ends flush, glue and clamp the front-apron rail pieces (C, D, E) together in the configuration shown on the Apron Rails drawing.

3 Using your tablesaw fitted with a miter-gauge extension and a dado blade, cut tenons on the ends of the front, back, and end apron rails. See the Tenon detail accompanying the Apron Rails drawing for reference. (We cut scrap stock first to verify a tight fit

of the tenons in the mating leg mortises.) Use a stop on your miter-gauge extension for consistent tenon lengths.

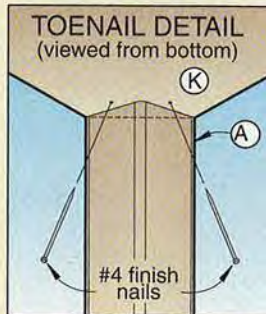
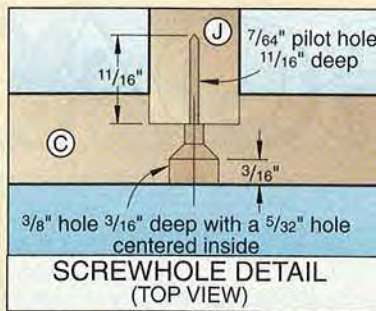
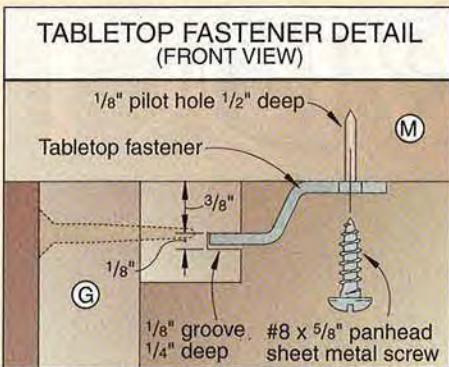
4 Mark the locations, and cut three 3/4" dadoes 1/4" deep on the *inside surface* of the front and back apron rails (C, F) where dimensioned on the front rail on the Apron Rails drawing.

5 Mark the centerpoints, and drill 3/8" holes 3/16" deep centered over the dadoes cut in the previous step where located on the Apron Rails drawing. Then, drill a 5/32" hole, centered inside each 3/8" counterbore.

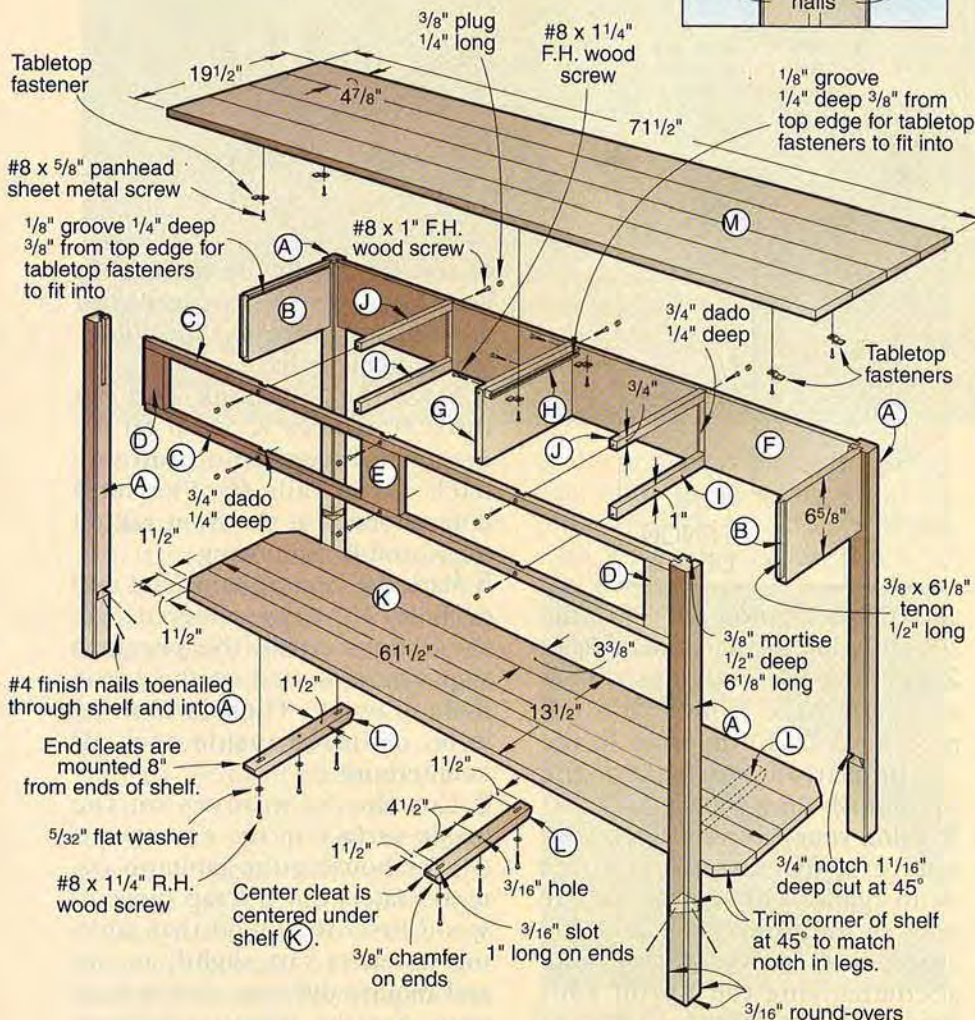
6 Cut the 1/8" grooves on the inside surface in the end aprons (B) for housing the tabletop fasteners later. Cut a scrap piece of wood first. We found that tabletop fasteners vary slightly in size and require different groove locations. See the Tabletop Fastener detail accompanying the

Continued

DOWN-HOME SIDEBOARD



EXPLODED VIEW



Bill of Materials					
Part	Finished Size			Matl.	Qty.
	T	W	L		
LEGS AND APRON RAILS					
A legs	1 3/4"	1 3/4"	32 1/4"	P	4
B end rails	3/4"	6 5/8"	11 1/2"	P	2
C rails	3/4"	3/4"	59 1/2"	P	2
D stiles	3/4"	5 1/8"	3"	P	2
E stile	3/4"	5 1/8"	4 1/4"	P	1
F back rail	3/4"	6 5/8"	59 1/2"	P	1
DRAWER GUIDES					
G divider	3/4"	6 5/8"	12"	P	1
H cleat	3/4"	3/4"	11 1/2"	P	1
I supports	3/4"	1"	12"	P	2
J supports	3/4"	3/4"	12"	P	2
SHELF AND TOP					
K shelf	3/4"	13 1/2"	61 1/2"	EP	1
L cleats	3/4"	1 1/2"	12"	P	3
M top	3/4"	19 1/2"	71 1/2"	EO	1
DRAWERS					
N fronts	3/4"	5 5/8"	25 1/8"	P	2
O sides	1/2"	5 1/16"	12"	P	4
P backs	1/2"	49/16"	24 3/4"	P	2
Q bottoms	1/4"	12"	23 3/4"	PW	2
R guides	3/16"	3/4"	11 3/4"	P	4

Materials Key: P—poplar or pine, EP—edge-joined poplar or pine, EO—edge-joined oak, PW—plywood

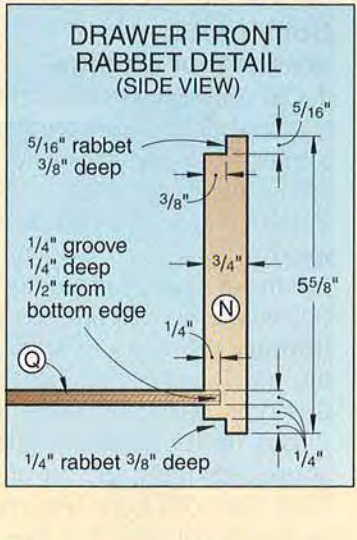
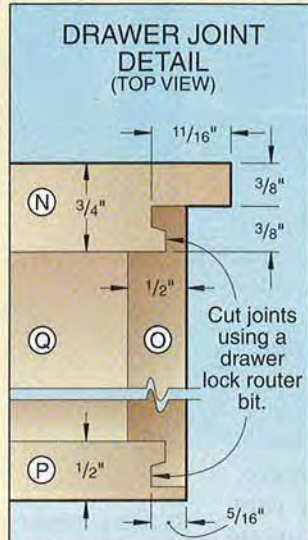
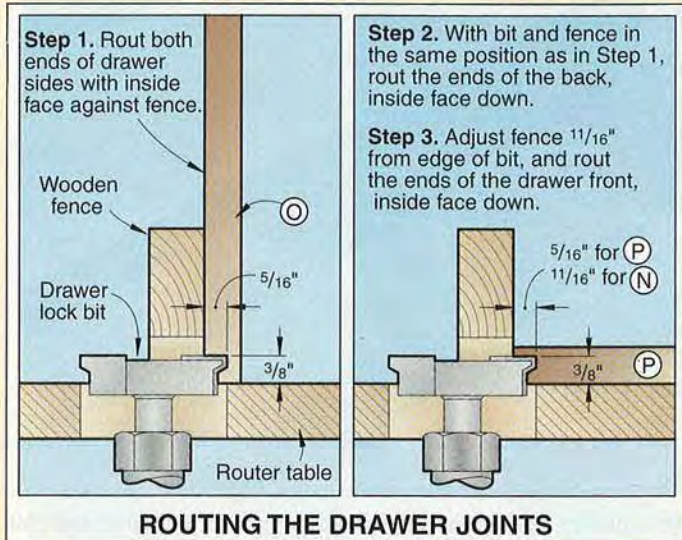
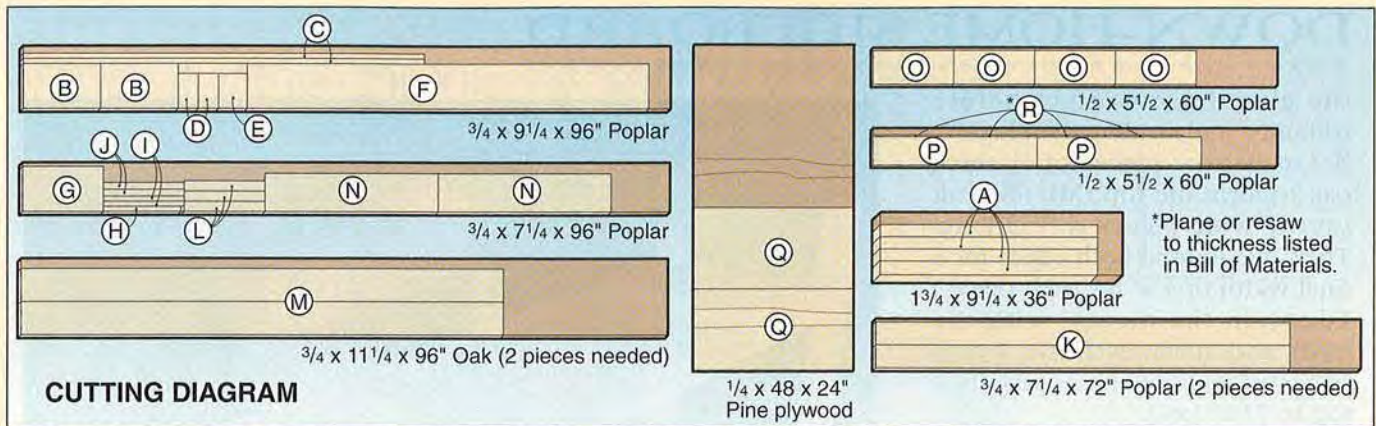
Supplies: #17x3/4" brads, #4 finish nails, #8x1" flathead wood screws, #8x1 1/4" flathead wood screws, #8x1 1/4" roundhead wood screws, 5/32" flat washers, metal tabletop fasteners with #8x5/8" panhead sheet metal screws, 2-1 3/16"- or 1 1/4"-diameter wooden knobs, paint, stain, clear finish.

Exploded View drawing for reference for our particular clip.

7 Glue and clamp an end apron rail (B) between two legs (A). Check for square. Repeat for the other pair of legs and end apron rail. Set the two end leg/apron assemblies aside for now.

8 Edge-join enough stock to form the bottom shelf (K). Later, remove the clamps, trim the ends square, and miter-cut the corners where dimensioned on the Exploded View drawing.

9 Cut and add three cleats (L) to the bottom surface of the shelf.



Note that the cleats have slots allowing the outside screws to move with expansion and contraction of the wide shelf. Drill the mounting holes and form the slots in the cleats now.

10 Glue and clamp the front and back rails and shelf between the end leg/apron assemblies.

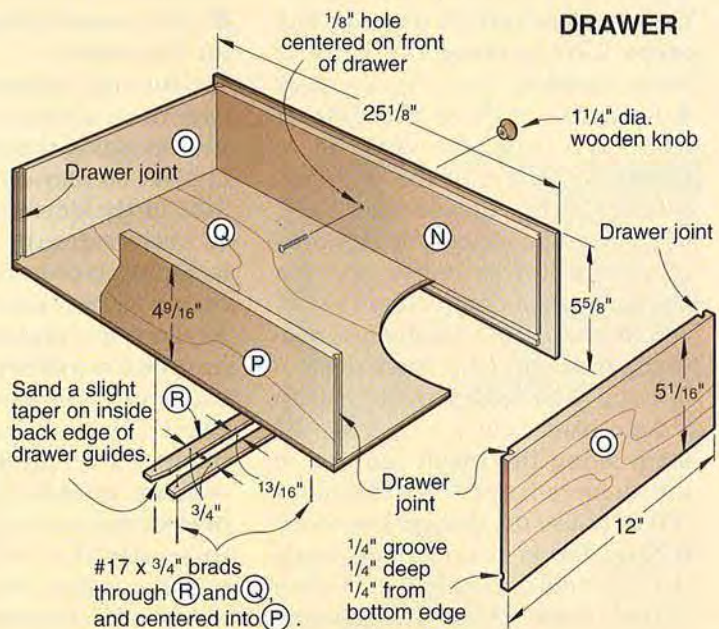
11 Drill pilot holes, and toenail two #4 finish nails through each shelf corner and into the legs. This secures the shelf to the legs at each notch.

Add the divider, drawer supports, and top

1 Measure the distance between the front and back apron rails. Cut the center divider (G), cleat (H), and drawer support guides (I, J) to the measured length from the thickness and widths listed in the Bill of Materials. Rout the groove in H where shown on the Tabletop Fastener detail. Glue and screw the pieces in place.

2 Cut 3/8" plugs, and plug the counterbores over the heads of the screws. Let

Continued



DOWN-HOME SIDEBOARD



the glue dry overnight before trimming and sanding the plugs.

3 Cut narrow pieces of $\frac{3}{4}$ "-thick oak to form the top (M). (We cut four 5"-wide pieces to 73" long. Then, we jointed both edges for a final width of $4\frac{7}{8}$ " for each piece.) Edge-joint the pieces, with the ends and surfaces flush. Later, trim the ends of the edge-jointed top to $71\frac{1}{2}$ " long.

Construct a pair of drawers for storage

1 Cut the drawer fronts (N), sides (O), backs (P), and plywood bottoms (Q) to the sizes listed in the Bill of Materials.

2 Using a drawer lock bit (we used a Freud #99-240 bit), rout the inside face of the drawer sides (O) where shown on Step 1 of the Routing the Drawer Joints drawing. (We realize not everyone has this type of bit, but the joint produced by it stands up to a lot of abuse, making it the bit of choice. Note that different bits may vary in profile of cut. See the Buying Guide for our source.)

3 Rout the ends of the drawer backs (P) where shown on the Steps 2 of Routing the Drawer Joints drawing.

4 Rout the ends of the drawer fronts (N) using the same bit as shown in Step 3 of the drawing. When routing the drawer ends, use a wooden extension mounted to your miter gauge to prevent chip-out when completing the cut across the grain. As always, test-rout a piece of scrap stock first.

5 Using your tablesaw fitted with a dado blade, cut a $\frac{1}{4}$ " groove $\frac{1}{4}$ " deep along the inside surface of the drawer fronts (N) and sides (O) to house the drawer bottoms.

6 Now, cut $\frac{3}{8}$ "-deep rabbets along the top and bottom edge of each drawer front where dimensioned on the Drawer Front Rabbet detail above the Drawer drawing.

7 Dry-clamp each drawer together. Measure the opening, and cut



Slide the drawer bottom guides against the drawer supports, and then glue and nail the guides to the drawer bottoms.

the drawer bottoms (Q) to size.

8 Drill holes in the drawer fronts for the knobs.

9 Glue and clamp the drawers together, checking for square. Just spot-glue the drawer bottoms in place so they don't rattle.

10 Cut the drawer bottom guides (R) to size, tapering the back inside edge of each where shown on the Drawer drawing.

11 Turn the project upside down on your workbench. Slide the drawers (also upside down) in place. Now, as shown in the photo above, position the drawer bottom guides (R) against the drawer supports (I). Use $\frac{3}{4}$ " brads to secure the back ends of the guides in place where shown on the Drawer drawing.

12 Finish-sand the carcass and drawers. Finish the sideboard to match your woodwork or other country pieces. (We used Mautz

French Blue on all but the top and knobs. For the top, we used Minwax Early American Stain, sealed with Deft Semi-Gloss Lacquer.) Using the fasteners, secure the top to the base. Screw a knob to each drawer front.

Buying Guide

Router bit. Freud #99-240 drawer lock bit, \$59.95 ppd. Puckett Electric Tools, 841 Eleventh St., Des Moines, IA 50309. Or call 800/544-4189 or 515/244-4189 to order.

Hardware. Two $1\frac{3}{16}$ "-diameter oak knobs (#SBH24) and bag of ten steel tabletop fasteners (#96N4). Constantines, 2050 Eastchester Rd., Bronx, NY 10461 or call 800/223-8087 for current prices and ordering information.♣

Written by Marlen Kemmet
Project Design: Darla and Chuck Raney
Illustrations: Kim Downing; Lorna Johnson
Photographs: Bill Hopkins; John Hetherington



GRACEFUL AND EASY WALL SHELF



Whether you use it for hanging coats, mugs, or hand-dipped candles, with this simply constructed accent, you can countrify your home's entry or kitchen in a hurry. The Shaker pegs and eye-catching paint capture the look of days gone by.

Start the construction with a pair of matching ends

1 Rip and crosscut the ends (A) to the size listed in the Bill of Materials and dimensions shown on the Shelf End drawing. Although pine is a popular material for country projects, we chose poplar. We've found poplar easier to paint, more stable, cheaper, and with fewer knots than pine.

2 Using the Shelf End drawing for reference, mark the radii on one shelf end. As shown in the photo

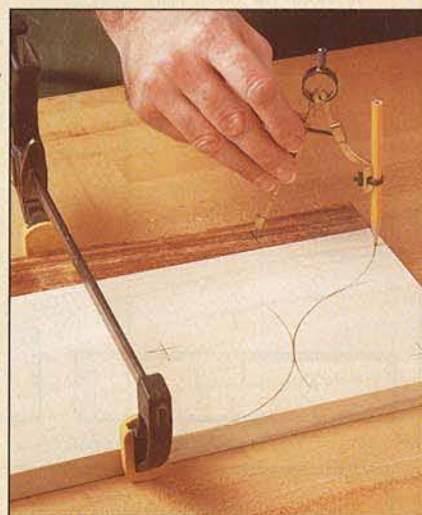
below right, we clamped a piece of scrap stock (stained in the photo for easier visibility) to the back edge of the end piece. You'll need to do this so you have a solid surface for marking the bottom arc with your compass.

3 Using double-faced tape, stick the two pieces together with the edges and ends flush. Bandsaw and sand the bottom front edge of the taped-together pieces to shape. Cutting and sanding both at one time ensures identically shaped end pieces. Separate the pieces and remove the tape.

4 Lay out and cut a $\frac{3}{4}$ " dado $\frac{1}{4}$ " deep on the *inside face* of both end pieces. (We did this on our tablesaw using the miter gauge fitted with a wood extension.) Be sure to mark both dados before cutting because it's easy to forget and cut both dados on the same face of each.

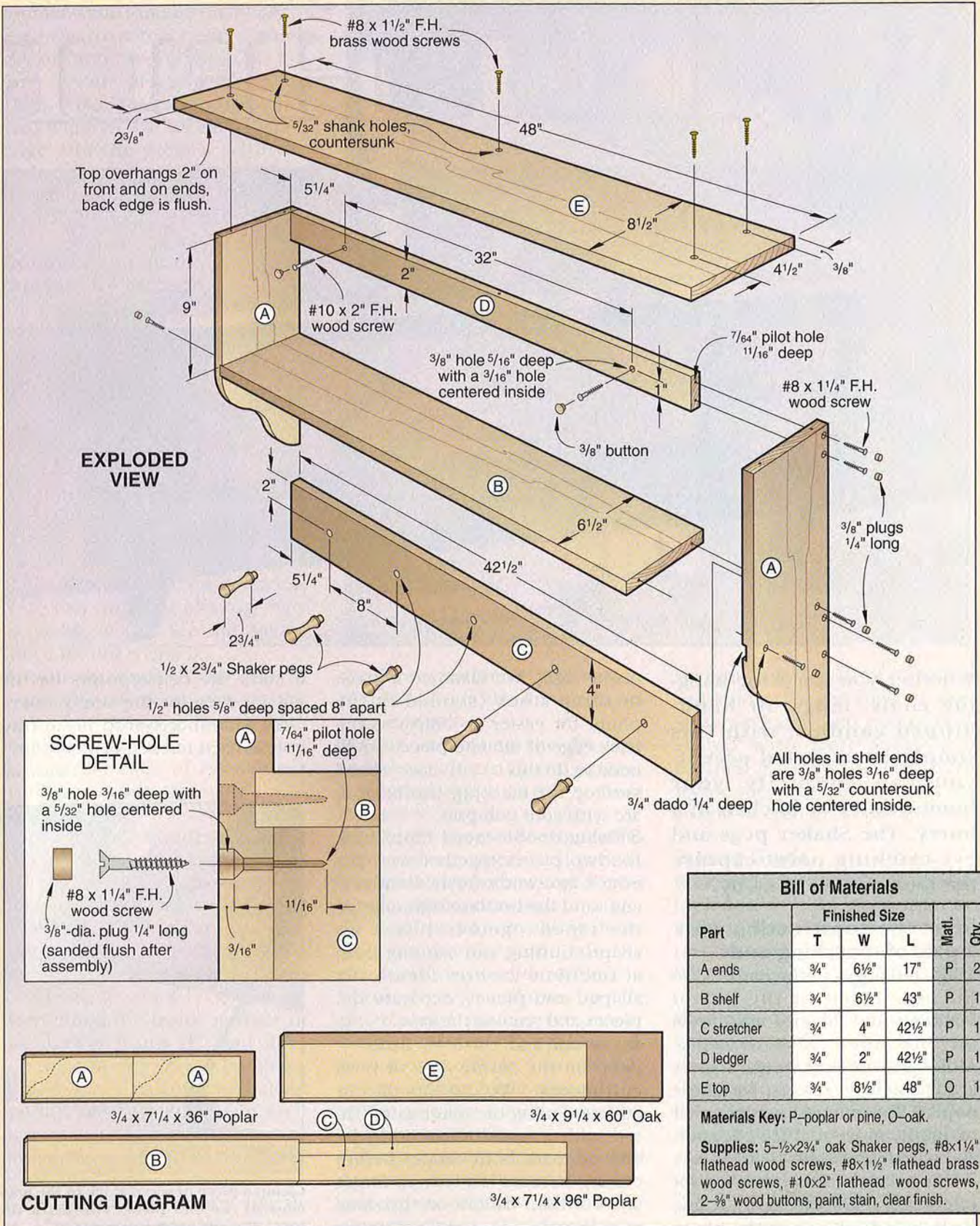
5 Mark the centerpoints on the outside face for the screw holes. Drill a counterbored mounting hole at each marked centerpoint.

Continued



Clamp a piece of scrap stock to the back edge of the end piece, and mark the three $\frac{3}{4}$ " arcs with a compass.

WALL SHIELD



Add the shelf, stretcher, and ledger strip

1 Cut the shelf (B), stretcher (C), and ledger (D) to size.

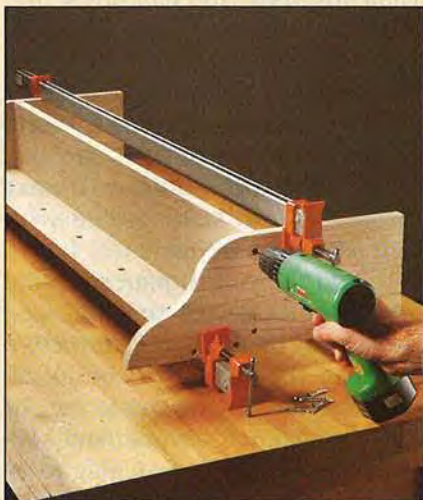
2 Lay out the hole centerpoints on the front face of the stretcher (C). Drill a $\frac{1}{2}$ " hole $\frac{3}{8}$ " deep at each marked centerpoint. (We've found that the tenons on Shaker pegs vary slightly in length and diameter. We recommend drilling mounting holes in scrap stock first to verify a tight fit.)

3 For securing the completed project to the wall later, mark the centerpoints, and drill a pair of counterbored holes in the ledger (D). If you plan on using this for hanging coats or displaying heavy items, position the holes in the ledger to center over wall studs where you plan to hang the shelf.

4 Glue and clamp the shelf assembly together. Check for square. Drive the screws as shown in the photo below.

5 Using a $\frac{3}{8}$ " plug cutter, cut a plug for each of the counterbored holes, except those in D. You'll cover these with buttons after hanging. Glue the plugs in place, aligning the grain of the plug with that of the surrounding wood. Allow the glue to dry 48 hours

A cordless drill works great for driving the screws to assemble the clamped-together shelf pieces.



before trimming and sanding flush. This allows the swelling of the wood fibers caused by the glue to dry out. If you trim a plug too soon after gluing, the plug will continue to shrink, creating a depression after the plug has completely dried.

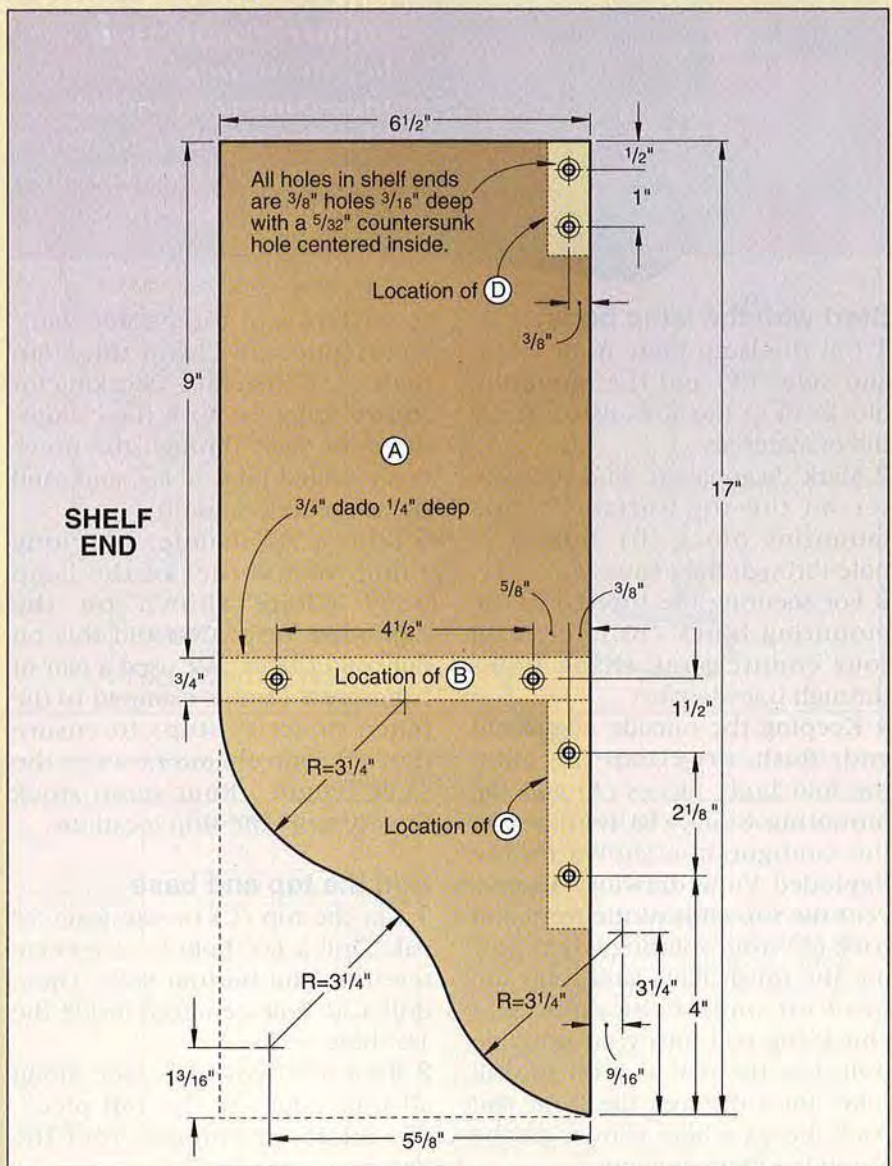
Add the top shelf and then the finish

1 Cut the top (E) to size from $\frac{3}{4}$ " oak. Mark the five centerpoints, and drill mounting holes for mounting the top to the end pieces and ledger later.

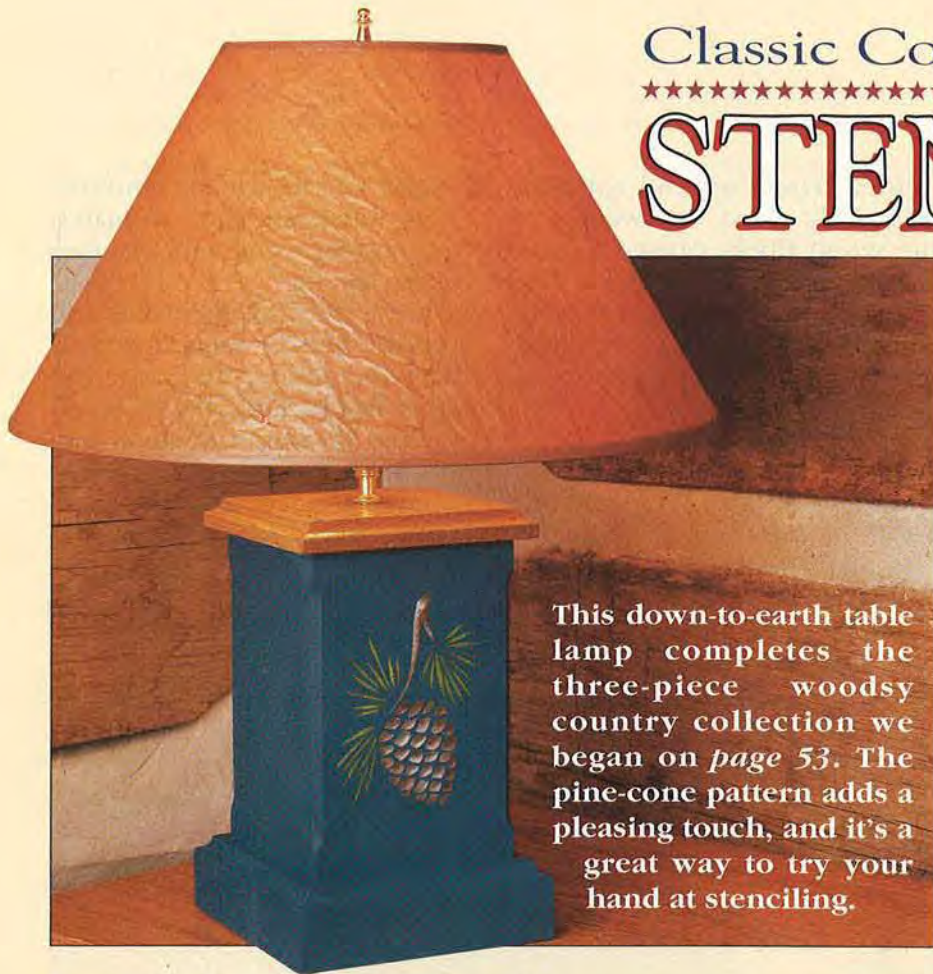
2 Sand all the pieces smooth. Then, finish the shelf to match your current woodworking or other country pieces.

3 Screw the top in place, and glue the Shaker pegs in place. Hang the shelf, and cover the screw heads with the $\frac{3}{8}$ " wood buttons. To keep the wood buttons from falling out yet easily removed if necessary, hold each in place with a dab of silicone. 🌲

Written by Marlen Kemmet
Project Design: Darla and Chuck Raney
Illustrations: Kim Downing
Photographs: King Au



STENCILED



This down-to-earth table lamp completes the three-piece woodsy country collection we began on page 53. The pine-cone pattern adds a pleasing touch, and it's a great way to try your hand at stenciling.



You'll need several clamps to clamp the lamp body together. Don't forget to check for square.

3 Cut a piece of $\frac{3}{4}$ "-thick stock to 2" wide by 36" long for the base-molding pieces (D). Now, rout a $\frac{3}{8}$ " cove $\frac{3}{8}$ " deep along one edge of the 36"-long strip. Sand the strip smooth.

4 Miter-cut the four base-molding pieces (D) to wrap around the lamp body. Glue and clamp the pieces in place.

5 Cut a $\frac{3}{16}$ " cord-access notch in the bottom edge of the lamp where shown on the Exploded View drawing.

Paint, stain, and add the lamp parts

1 Fill any voids and nail holes, and then sand the lamp smooth.

2 Finish the lamp body to match your current woodworking or other country pieces. We used Mautz French Blue on all but the top (C). For the top, we used Minwax Early American stain, sealed with Deft semigloss lacquer.

3 To add the stencil pattern to the lamp front (A), see the full-sized pattern on the *WOOD PATTERNS*® insert in the center of the magazine. See the Buying Guide for our source of stencil material and supplies. And, see our stenciling technique article on page 14 for

Start with the lamp body

1 Cut the lamp body front, back, and sides (A) and the mounting block (B) to the sizes listed in the Bill of Materials.

2 Mark diagonals to find the center on the top surface of the mounting block (B). Bore a 2" hole through the center.

3 For securing the top (C) to the mounting block (B) later, drill four countersunk shank holes through B.

4 Keeping the outside edges and ends flush, dry-clamp (no glue) the four body pieces (A) and the mounting block (B) together in the configuration shown on the Exploded View drawing. To prevent the top ends of the front and back (A) from splitting when driving the finish nails later, clip the head off one of the nails, and chuck the nail into your portable drill. Use the nail as a bit to drill pilot holes through the front and back pieces where shown on the Exploded View drawing.

5 As shown in the photo *above right*, glue and clamp the lamp body (A, B) together, checking for square. Later, remove the clamps, drive the nails through the previously drilled pilot holes, and sand the lamp body smooth.

6 Rout a $\frac{1}{4}$ " chamfer $6\frac{3}{4}$ " long along each corner of the lamp body where shown on the Exploded View. (We did this on our router table. We used a pair of handscrew clamps clamped to the fence to act as stops to ensure that all four chamfers were the same length.) Rout scrap stock first to verify the stop locations.

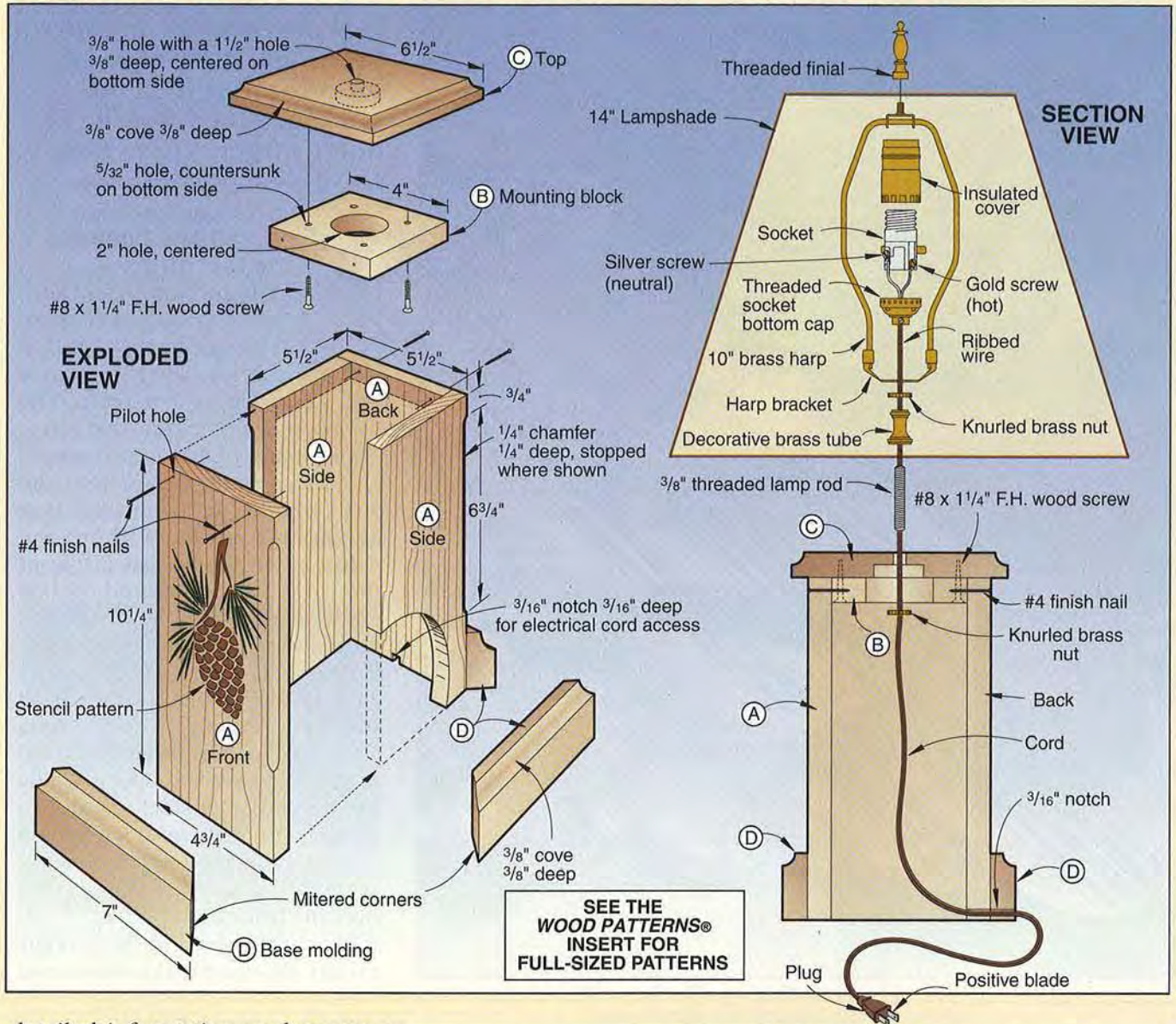
Add the top and base

1 Cut the top (C) to size from $\frac{3}{4}$ " oak. Drill a $1\frac{1}{2}$ " hole $\frac{3}{8}$ " deep centered on the bottom side. Then, drill a $\frac{3}{8}$ " hole centered inside the $1\frac{1}{2}$ " hole.

2 Rout a $\frac{3}{8}$ " cove $\frac{3}{8}$ " deep along all four edges of the top piece. (To minimize chipout, rout the end grain ends first.)

Wiring diagram: The silver colored screw is the neutral, but it should be attached to the ribbed conductor. The broadest blade on the plug is neutral, not hot as originally shown. See Talking Back August 1997, page 4 for illustration. Click here to view.

COUNTRY LAMP



detailed information on how we stenciled our lamp.

4 Center the top (C) over the mounting block (B), and drive screws through the previously drilled holes in B to secure the top to the lamp body.

5 Add the lamp parts to the lamp in the configuration shown on the Section View drawing.

6 To protect the surfaces the lamp will be sitting on, we recommend gluing felt or cork to the bottom end of the lamp. 🌱

Bill of Materials					
Part	Finished Size			Matl.	Qty.
	T	W	L		
A sides	3/4"	4 3/4"	10 1/4"	P	4
B mounting block	3/4"	4"	4"	P	1
C top	3/4"	6 1/2"	6 1/2"	O	1
D* molding	3/4"	2"	7"	P	4

*Initially cut the molding as one long strip, and then miter-cut it to exact length.

Materials Key: P—poplar or pine, O—oak.

Supplies: #8x1/4" flathead wood screws, #4 finish nails, paint, stain, clear finish.

Buying Guide
Lamp kit. 10" detachable harp, brass finial, socket, brown cord with plug, and all the fittings shown on the Section View drawing. Catalog no. LP769. Constantines, 2050 Eastchester Road, Bronx, NY 10461 or call 800/223-8087 to order.

Stencil kit. Five paints; 1/4", 3/8", and 1/2" stencil brushes; one 12x18" sheet of 4mil Mylar, stencil-cutting knife, tracing pen for Mylar. #619 CL, \$29.95 ppd. Stenciler's Emporium, P.O. Box 536, Twinsburg, OH 44087. Or call 800/229-1760 to order.

Project Design: Darla and Chuck Raney

Illustrations: Kim Downing

Photographs: King Au

A KITCHEN ACCESSORY PARISIANS WOULD LOVE

Vive La



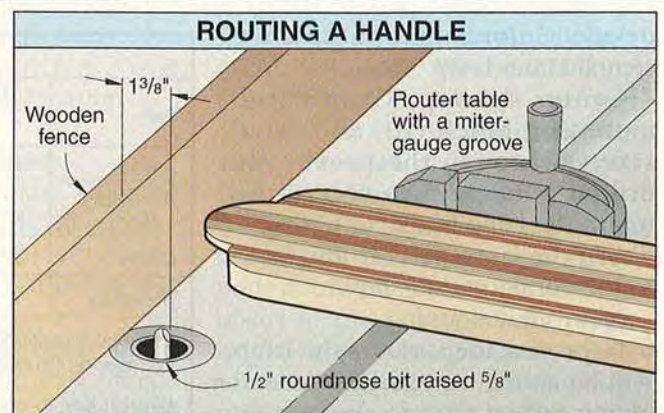
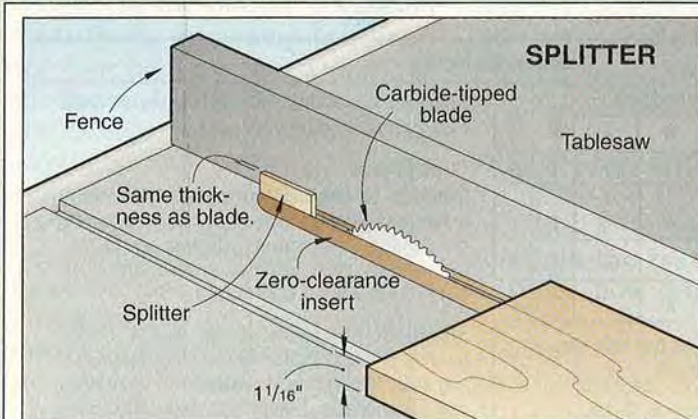
Whether it's French bread or baguette bread you're serving at your next dinner party, you'll get high marks for presenting it on this stylish laminated board. And don't forget: These boards make great presents, too.

First, cut and laminate the thin strips

1 Build and install into your tablesaw a zero-clearance insert with a splitter. See the Splitter drawing for our setup. The insert prevents the thin strips from being pulled into the saw, and the splitter helps hold the strip being cut from vibrating against the blade. Without the splitter, we found that a few of the thin strips chattered against the blade, marring the surface and preventing a perfect glue joint later.

2 From $1\frac{1}{16}$ " stock (commonly called five-quarter stock), cut all the thin strips (A-F) to 24" long and to the widths listed in the Bill of Materials. See the Buying Guide for our source of stock. As shown in the photo *at right*, we used a pushblock made from a piece of scrap 2x4 to safely push the stock over the blade and splitter.

3 Lay out the strips in the configuration shown on the Full-Sized



French Breadboard!

End pattern. Then, glue and clamp the pieces together keeping the surfaces and ends flush. If laminating this many strips at one time is a bit daunting, glue the board up in halves, and then join the two halves.

Machine the blank to a pleasing shape

- 1 Remove the clamps and scrape the excess glue from both surfaces. Face-joint one surface on the jointer until it is flat. Run the lamination through a planer to flatten the opposite face parallel to the first. Our cutting board ended up being $\frac{7}{8}$ " thick.
- 2 Make two copies of the full-sized pattern, and adhere one to each end of the lamination.
- 3 Cut and sand to the lines to shape the ends of the lamination.



A pushblock, a zero-clearance insert, and a splitter allow you to safely cut all the thin strips.

Form a handle on each end

1 Install a $\frac{1}{2}$ " roundnose bit in a table-mounted router, and adjust it to cut $\frac{5}{8}$ " deep. Using a miter gauge in the groove in your router table, make numerous passes to cut a $\frac{5}{8}$ "-deep depression $1\frac{3}{8}$ " long along the bottoms on the ends of the cutting board where shown on the Routing A Handle drawing. If your router table doesn't have a miter-gauge groove, cut the handle depressions on your tablesaw with a dado blade, and then use a large pushblock to make the final cut using a roundnose bit and your router table.

2 Sand the underside of the handle. Finish-sand the entire board. Apply several coats of Behlen's Salad Bowl Finish. 🍷

Written by Marlen Kemmet
Project Design: David Jordan
Illustrations: Roxanne LeMoine; Lorna Johnson
Photographs: Bill Hopkins

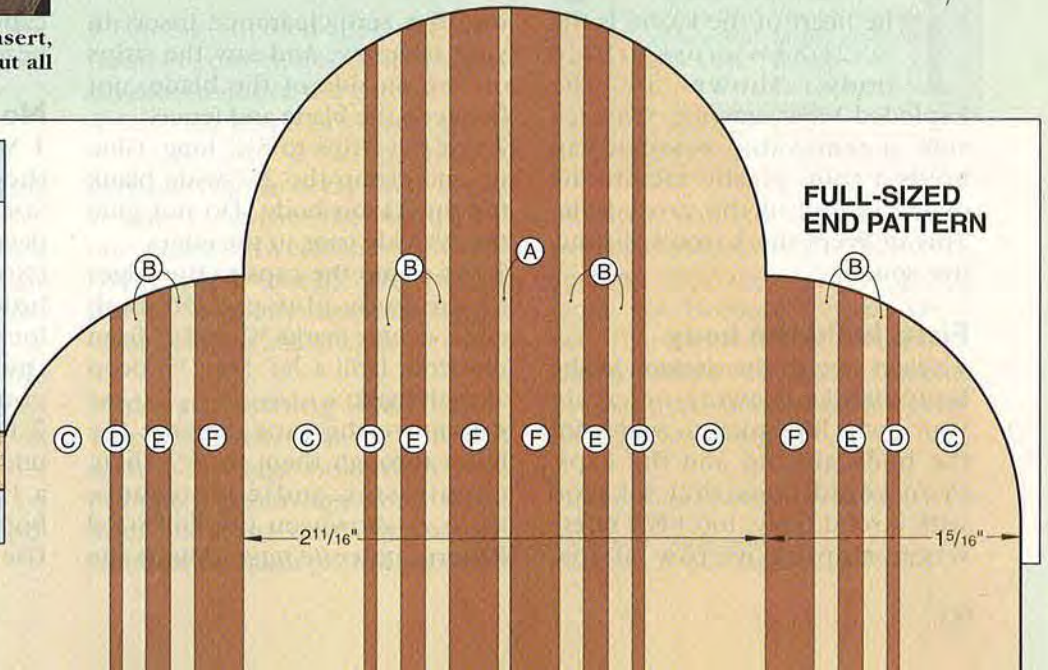
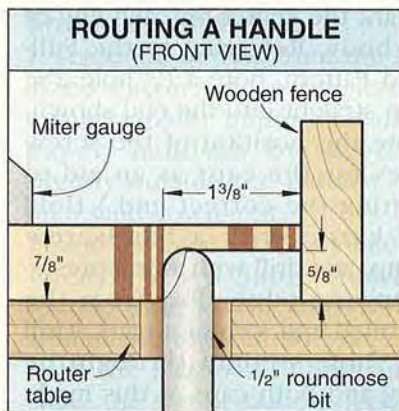
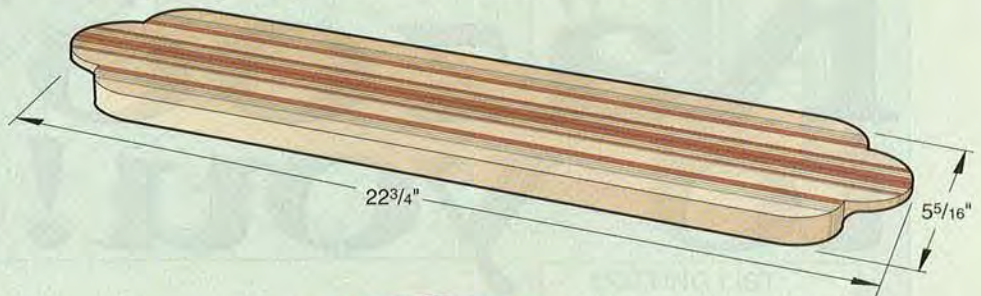
Part	Finished Size			Mati.	Qty.
	T	W	L		
A strip	$1\frac{1}{16}$ "	$\frac{1}{16}$ "	24"	M	1
B strips	$1\frac{1}{16}$ "	$\frac{1}{8}$ "	24"	M	8
C strips	$1\frac{1}{16}$ "	$\frac{5}{8}$ "	24"	M	4
D strips	$1\frac{1}{16}$ "	$\frac{1}{16}$ "	24"	C	4
E strips	$1\frac{1}{16}$ "	$\frac{1}{8}$ "	24"	C	4
F strips	$1\frac{1}{16}$ "	$\frac{1}{4}$ "	24"	C	4

Materials Key: M—hard maple, C—cardinal wood.

Buying Guide

Hardwood kit. Enough $1\frac{1}{16}$ "-thick maple and cardinal wood strips cut to the sizes listed in the Bill of Materials. Kit no. W921, \$14.95 ppd., contains enough strips for one breadboard, or kit no. W9215, \$64.95, with enough strips for five boards. Heritage Building Specialties, 205 North Cascade, Fergus Falls, MN 56537. Or call 800/524-4184 to order.

Behlen's Salad Bowl Finish. Pint, catalog no. BB615; quart, BB616. Call for prices. Constantine's, 2050 Eastchester Rd., Bronx, NY 10461. Or call 800/223-8087 to order.





K Easy to make, easy to play Kazoo to you!

The heart of the kazoo is the $\frac{3}{4} \times 2\frac{1}{4} \times 3\frac{3}{4}$ " cross-drilled body, shown in the Exploded View drawing. On each side, a removable wooden cap holds a thin, plastic membrane over the end of the cross hole. This delivers the kazoo's distinctive sound.

First, build the body

1 Select one of the designs in the Body Blanks drawing or create your own. Rip stock to width for the body glue-up and the caps. (You could construct a kazoo with a solid body, too.) For safety when ripping narrow strips,

install a zero-clearance insert in your table saw. And saw the strips on the outside of the blade, not between the blade and fence.

2 Cut the strips to $3\frac{3}{4}$ " long. Glue up and clamp the $2\frac{1}{4}$ "-wide blank for the kazoo body. Do not glue the $\frac{3}{8}$ "-wide caps to the edges.

3 Dry-clamp the caps to the edges of the body glue-up. On each edge, center marks $\frac{5}{8}$ " and 2" from one end. Drill a $\frac{5}{64}$ " hole $\frac{7}{8}$ " deep at each mark.

4 Remove the caps. Enlarge the holes through them to $\frac{1}{8}$ ". Then, countersink and counterbore them as shown on the Full-Sized Pattern, *opposite page*. Attach the

Had Antonio Stradivari built kazoos instead of his celebrated violins, they might have looked like this. He didn't, but you can. After you do, you'll have great fun rendering musical masterpieces.

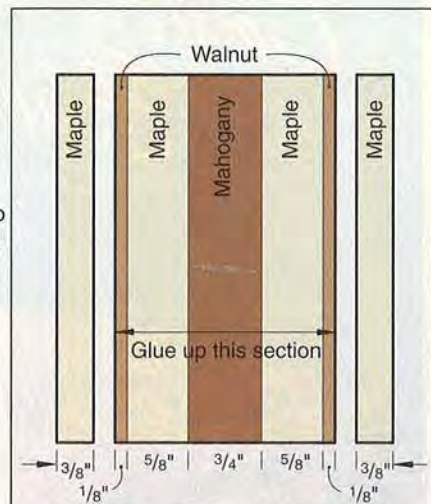
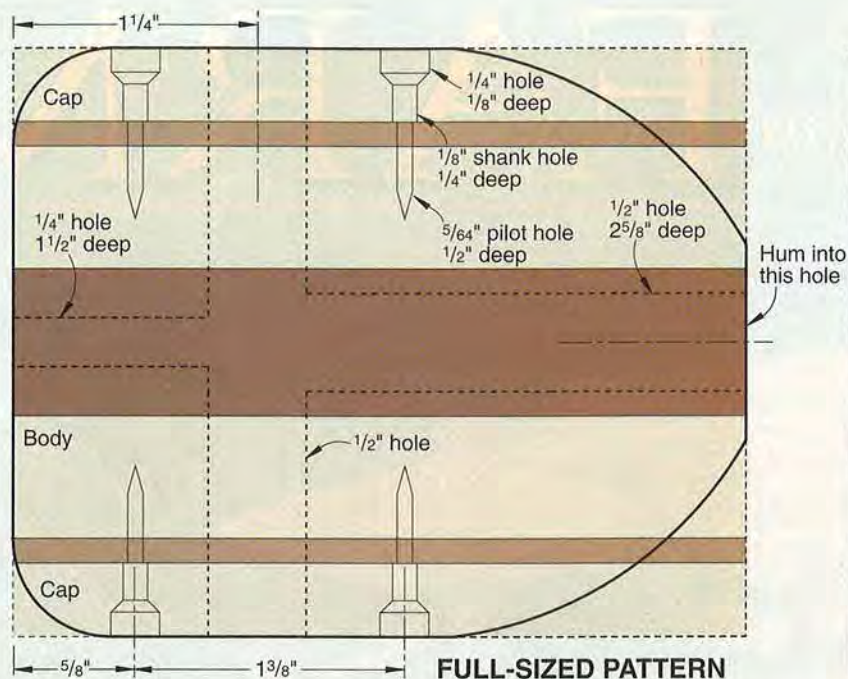
caps to the body with #5 $\times \frac{3}{4}$ " flat-head brass wood screws.

Now, drill the airways

1 Mark the center on each end of the body. Referring to the Full-Sized Pattern, bore a $\frac{1}{2}$ " hole $2\frac{5}{8}$ " deep straight into the end shown. (Note the position of the screw holes for the caps as an aid to locating the correct end.) Hold the kazoo with a handscrew clamp, and drill with a drill press.

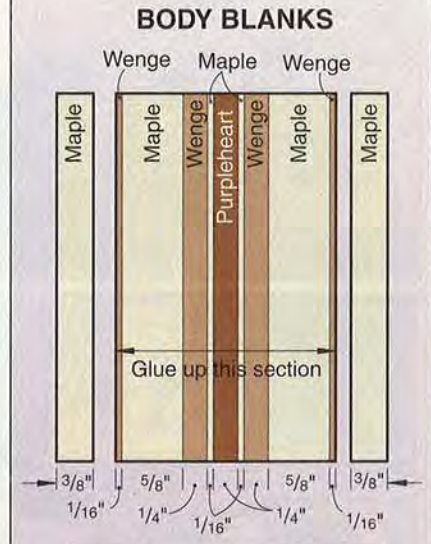
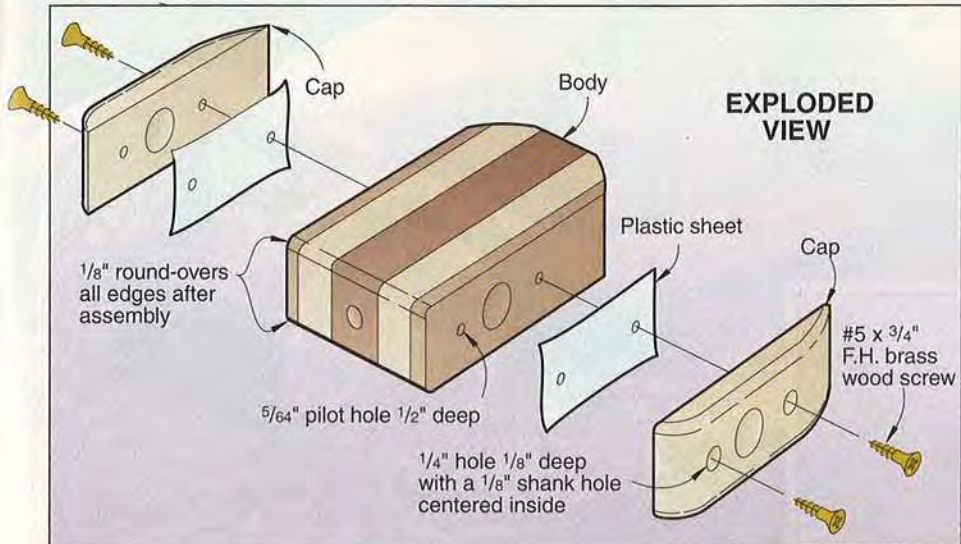
2 On one edge, $1\frac{1}{4}$ " from the undrilled end, center a mark. Drill a $\frac{1}{2}$ " hole straight through the body and both caps at this mark. Use a drill press for accuracy.





CUTTING LIST

3/4 x 1/8 x 3 3/4"	Walnut	-----2
3/4 x 3/8 x 3 3/4"	Maple	-----2
3/4 x 5/8 x 3 3/4"	Maple	-----2
3/4 x 3/4 x 3 3/4"	Mahogany	---1



CUTTING LIST

3/4 x 1/16 x 3 3/4"	Wenge	-----2
3/4 x 1/16 x 3 3/4"	Maple	-----2
3/4 x 1/4 x 3 3/4"	Wenge	-----2
3/4 x 1/4 x 3 3/4"	Purpleheart	--1
3/4 x 3/8 x 3 3/4"	Maple	-----2
3/4 x 5/8 x 3 3/4"	Maple	-----2

3 At the center mark on the undrilled end, drill a 1/4" hole into the 1/2" one.

Shape and finish it

1 Trace the outline from the Full-Sized Pattern onto the kazoo, using transfer paper or carbon paper. Bandsaw or scrollsaw slightly outside the pattern line, then sand down to it.

2 Sand the edge and faces smooth. Then, with a table-mounted router, form a 1/8" round-over all around the top and bottom. Rout with the kazoo standing on its edge, the top or bottom face riding on the bit's pilot bearing.

3 Finish-sand, then apply the clear finish of your choice. After the finish dries, remove the caps.

4 Cut two strips of plastic about 3/4" wide and 2" long from a garbage bag, grocery bag, bread wrapper, or the like. Sandwich one piece between the body and the cap on each side where shown. Trim any overhang with a razor blade or sharp knife.

Make something like music

To play the kazoo, purse your lips against the large hole, then buzz or hum. Just blowing won't work. After mastering the basics, which sometimes takes as long as two

minutes, you can brighten your performances with techniques such as trills and staccato notes. Once you become a kazoo virtuoso, there's no telling where you can go with your music. Outside, by popular demand is a pretty good guess, though. 🌿

Project Design: Robert D. Hutchinson, North Country Dulcimers
 Photograph: Wm. Hopkins
 Illustrations: Roxanne LeMoine; Lorna Johnson

Collector's
Edition

FARM



Start with the chassis

Designed by professional toymaker Steve Baldwin of Omaha, Nebraska, this hard-working little truck pleases children and adults alike. And thanks to the full-sized patterns for many of the parts, it goes together faster than you might imagine. Go ahead, give it a try.

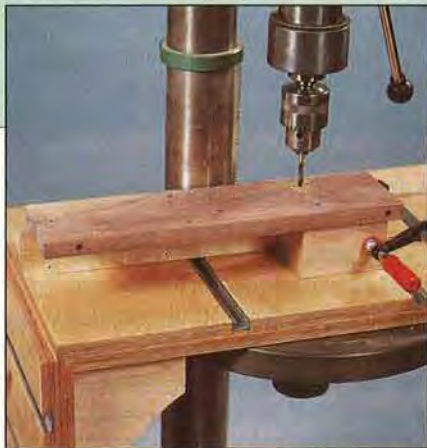
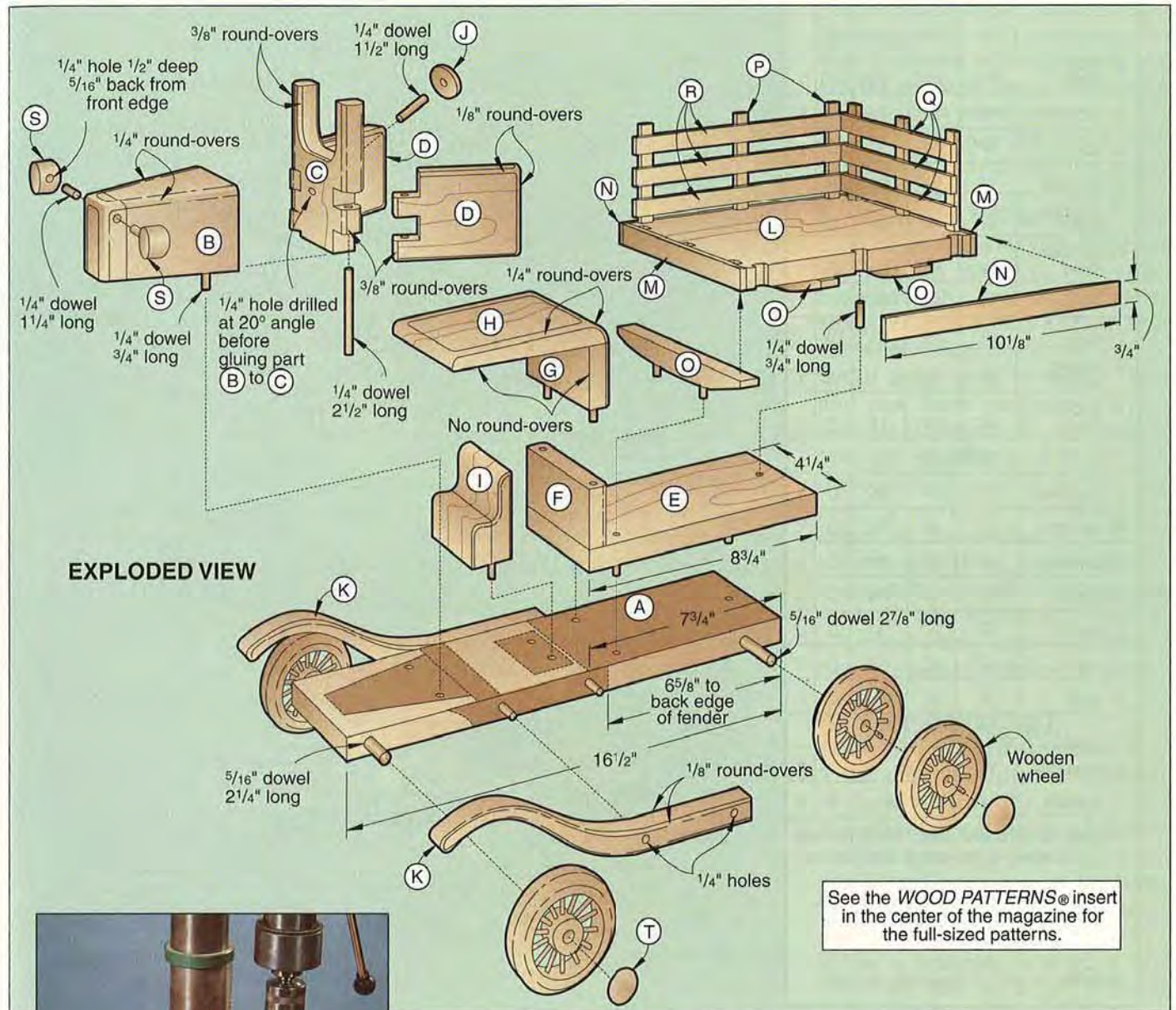
1 Cut the chassis (A) to the size listed in the Bill of Materials. Mark the seven centerpoints for the $\frac{1}{4}$ " holes on the *top surface* of the chassis where dimensioned on the Chassis drawing. Using a brad-point bit in your drill press, drill the $\frac{1}{4}$ " holes where marked.
2 Mark the four $\frac{5}{16}$ " axle-hole centerpoints on the *edges* of the chassis where shown on the Chassis drawing. Drill them 1" deep. We

used a large handscrew clamp to hold the chassis steady and square to the drill-press table when drilling the holes. *Don't* drill the $\frac{1}{4}$ " holes for the fenders now.

Laminate the stock and add the hood next

1 Using $\frac{3}{4}$ " and $\frac{5}{16}$ " stock, laminate the pieces to form the hood blank in the configuration shown on the Hood drawing. Note that the front of the hood is oak and the rest is cherry.

TRUCK



Using the previously drilled front two holes in the chassis as guides, drill mating holes into the bottom of the laminated hood.

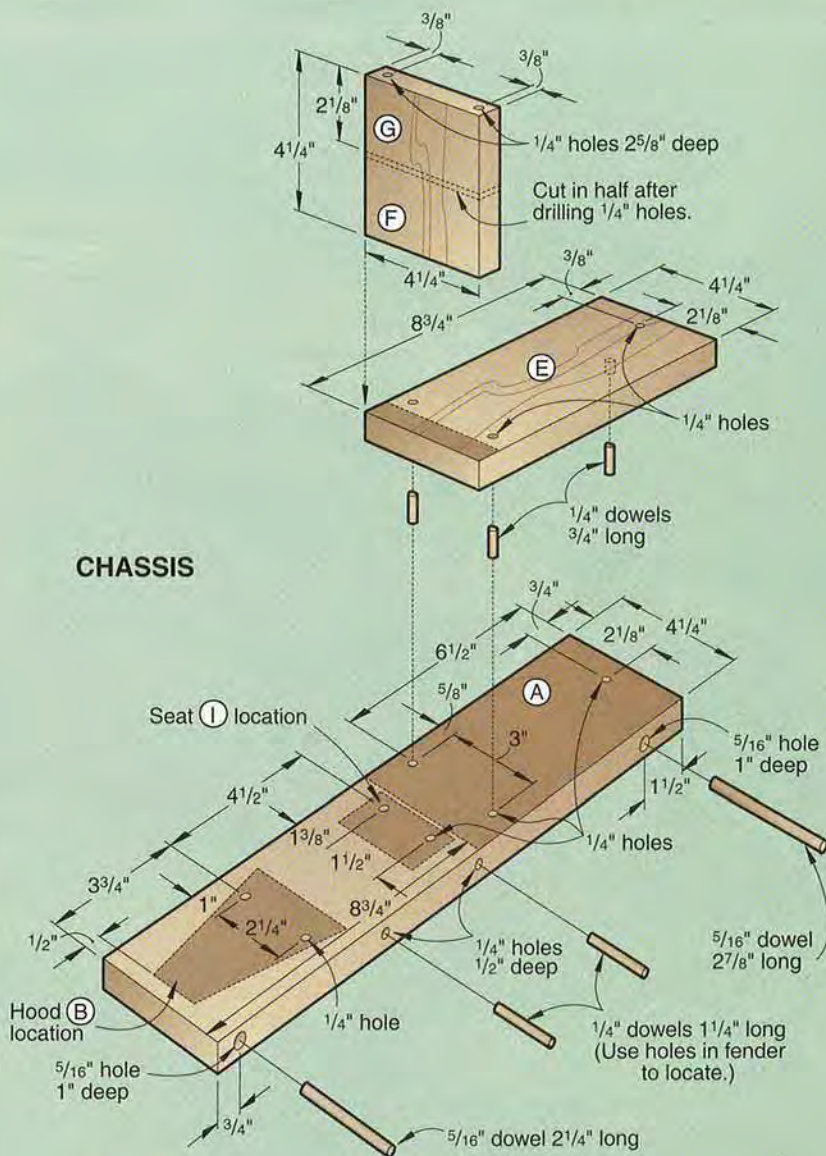
2 Mark the location where the hood will sit on the chassis ($\frac{1}{2}$ " from the front edge and centered side-to-side) where dimensioned on the Chassis drawing. Using double-faced tape, adhere the hood to the chassis. As shown in the photo at left, flip the chassis upside down. Then, use the front two $\frac{1}{4}$ " holes previously drilled in the chassis as guides, and drill $\frac{1}{4}$ " holes $\frac{3}{8}$ " deep into the bottom of the hood lamination.

3 Separate the hood from the chassis. Transfer the full-sized top view pattern from the **WOOD PATTERNS** insert in the center of the magazine to the hood lamination. Next, mark the centerpoints for the headlights on the sides of the hood where located on the Hood drawing. Drill a $\frac{1}{4}$ " hole $1\frac{1}{2}$ " deep on each side of the hood blank for the headlight-support dowels. Bandsaw and sand the hood to shape.

Collector's Edition FARM TRUCK

Bill of Materials						
Part	Finished Size			Mat.	Qty.	
	T	W	L			
CHASSIS AND CAB						
A chassis	3/4"	4 1/4"	16 1/2"	W	1	
B hood blank	2 5/8"	3 5/16"	4 1/8"	C/O	1	
C cab front	3/4"	4"	4 7/8"	C	1	
D doors	3/4"	2 3/4"	4"	C	2	
E box base	3/4"	4 1/4"	8 3/4"	W	1	
F* cab back bottom	3/4"	4 1/4"	2"	C	1	
G* cab back top	3/4"	4 1/4"	2 1/8"	C	1	
H cab top	3/4"	4 1/4"	5 1/2"	C	1	
I seat	1 1/2"	2 5/8"	2 7/8"	LW	1	
J steering wheel	3/8"	1 1/4" dia.		W	1	
K fender blanks	3/4"	2 3/4"	11"	C	2	
TRUCK BOX						
L truck bed	3/4"	7 3/8"	9 5/8"	O	1	
M box trim	1/4"	3/4"	7 3/8"	O	2	
N box trim	1/4"	3/4"	10 1/8"	O	2	
O ribs	3/4"	3/4"	7 7/8"	O	3	
P stakes	1/4"	1/2"	4"	O	12	
Q slats	1/4"	5/8"	6 3/8"	O	6	
R slats	1/4"	5/8"	10 1/8"	O	6	
HEADLIGHTS AND HUBCAPS						
S* headlights	3/4"	1" dia.		C	2	
T* hubcaps	3/8"	7/8" dia.		M	4	
*Initially cut parts oversized. Trim to finished size according to the how-to instructions.						
Materials Key: W-walnut, C/O-cherry and oak, C-cherry, O-oak, M-maple, LW-laminated walnut						
Supplies: 1/4" and 5/16" dowel stock, clear finish						

CHASSIS



4 Rout and sand 1/4" round-overs on the hood where shown on the Exploded View drawing. (Since the hood is small and hard to handle, we did the routing on a router table fitted with a fence.)

5 Cut two pieces of 1/4" dowel to 3/4" long. Sand a slight taper on one end of each dowel. With the tapered ends protruding, glue the dowels into the holes in the bottom of the hood.

Now, for the cab front and swinging doors

1 Cut the cab front (C) and doors (D) to the sizes listed in the Bill of Materials. Transfer the full-sized patterns to all three pieces.

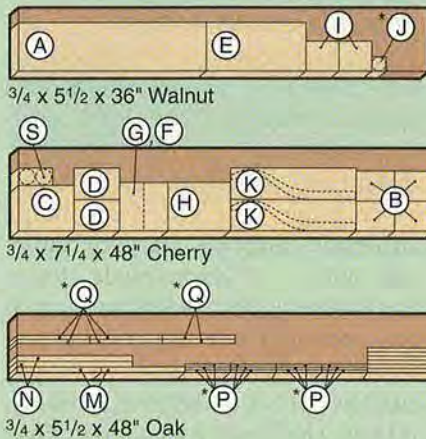
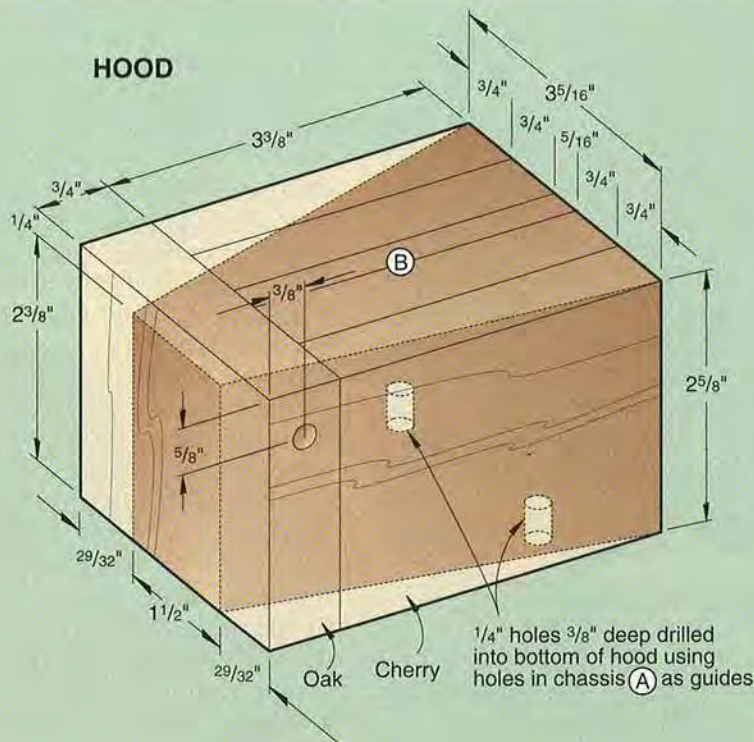
2 Drill 1/4" holes into the bottom of the cab front and doors where marked on the patterns.

3 Rout 3/8" round-overs along the mating edges of the cab and doors where shown on the

Exploded View drawing. Rout or sand 1/8" round-overs along the other edges. Now, bandsaw the pieces to shape.

4 Drill a 1/4" hole at a 20° angle on the inside surface of the cab front for the steering-wheel dowel.

5 Sand the pieces, and use a pair of 1/4" dowels that are 2 1/2" long to hinge the doors to the cab front. (We had to sand our dowels slightly so the doors would swing



CUTTING DIAGRAM

* Plane or resaw to thickness listed in Bill of Materials.

(G) where shown on the Chassis drawing. Drill a pair of $\frac{1}{4}$ " holes $2\frac{3}{8}$ " deep into the piece where shown on the Chassis drawing. Drilling the holes now ensures that the holes will align after you cut the piece in two. Crosscut the piece in two where shown.

4 Cut the cab top (H) to size. Glue and clamp the cab top to the cab back top (G).

5 Adhere the full-sized side view pattern of the cab top (H) from the pattern insert to one edge. Bandsaw the top of part H to shape. (Part G makes a handy handle when doing this.)

6 Cut a pair of $\frac{1}{4}$ " dowels $\frac{3}{4}$ " long and glue them into part G so the dowels protrude $\frac{3}{8}$ " and will fit into part F. Slide part F onto the dowels and against G. Sand or rout $\frac{1}{4}$ " round-overs along the edges of the assembly (F, G, H) where noted on the Exploded View drawing. Sand the assembly smooth, and separate F from G. Glue and clamp part F to the top front surface of the box base (E).

Add the contoured seat and steering wheel

1 Laminate two pieces of walnut to form a blank for the seat (I). Transfer the seat pattern from the pattern insert to one end of the blank, and cut the seat to shape. Sand the seat smooth, and add a pair of dowels to it.

2 Use a compass to mark a $1\frac{1}{4}$ "-diameter disc on a piece of $\frac{3}{8}$ "-thick walnut stock for the steering wheel (J). Drill a $\frac{1}{4}$ " hole through the center of the disc, and then cut and sand it to shape.

3 Cut a piece of $\frac{1}{4}$ " dowel to $1\frac{1}{2}$ " long, and glue it to the steering wheel (J).

A pair of shapely fenders come next

1 Cut two pieces of $\frac{3}{4}$ " cherry to $2\frac{3}{4}$ " wide by 11" long each for the fender blanks (K). Using double-faced tape, adhere the pieces face-

easily.) Glue the dowels to the cab front but not to the doors.

6 With the bottom edges flush and the hood centered from side to side against the cab front, glue and clamp the hood to the cab.

Construct the box base and the cab back and top

1 Cut the box base (E) to size. Tape it to the chassis where shown on the Exploded View

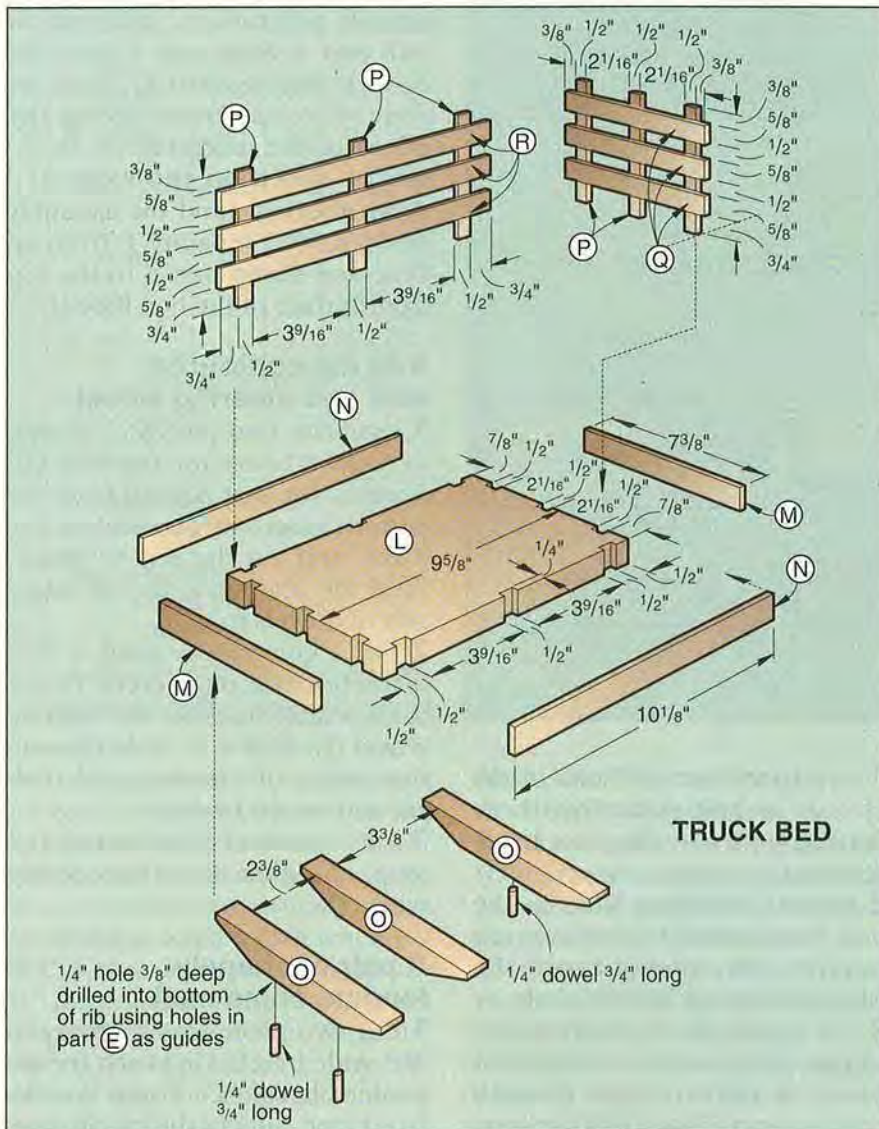
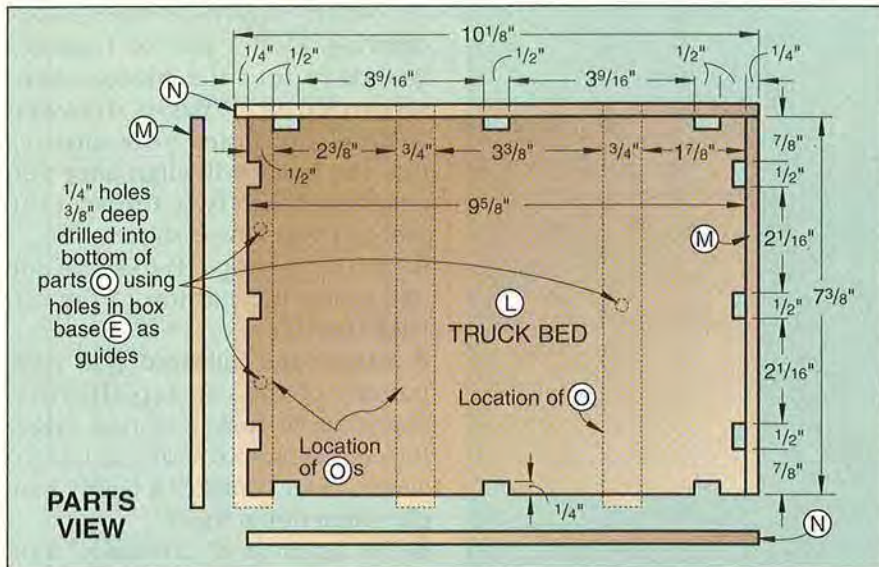
drawing, and use the holes in the chassis as guides to drill three mating holes in the box base. Separate the pieces.

2 For the rearmost hole in the box base, mark its centerpoint where dimensioned on the Chassis drawing. Drill the hole.

3 Cut a piece of $\frac{3}{4}$ " cherry to $4\frac{1}{4}$ " square. Later you'll crosscut this piece in two to form the cab back bottom (F) and cab back top

Continued

Collector's Edition FARM TRUCK



to-face, with the edges and ends flush. Adhere the full-sized fender pattern to one face of one piece.

2 Drill a pair of $\frac{1}{4}$ " holes through both pieces where marked on the pattern. Stick a $\frac{1}{4}$ " dowel through each hole to hold them flush. Bandsaw the pieces to shape to form the fenders.

3 With the fenders still taped together, sand the edges smooth to remove the saw marks. Separate the pieces and remove the tape.

4 Clamp the fenders to the chassis $6\frac{5}{8}$ " from the back edge where shown on the Exploded View. Using holes in the fenders as guides, drill $\frac{1}{4}$ " holes $\frac{1}{2}$ " deep into the edges of the chassis as shown in the photo *at right*. Glue $\frac{1}{4}$ " dowels $1\frac{1}{4}$ " long into the chassis for supporting the fenders.

5 Sand $\frac{1}{8}$ " round-overs along each edge of each fender.

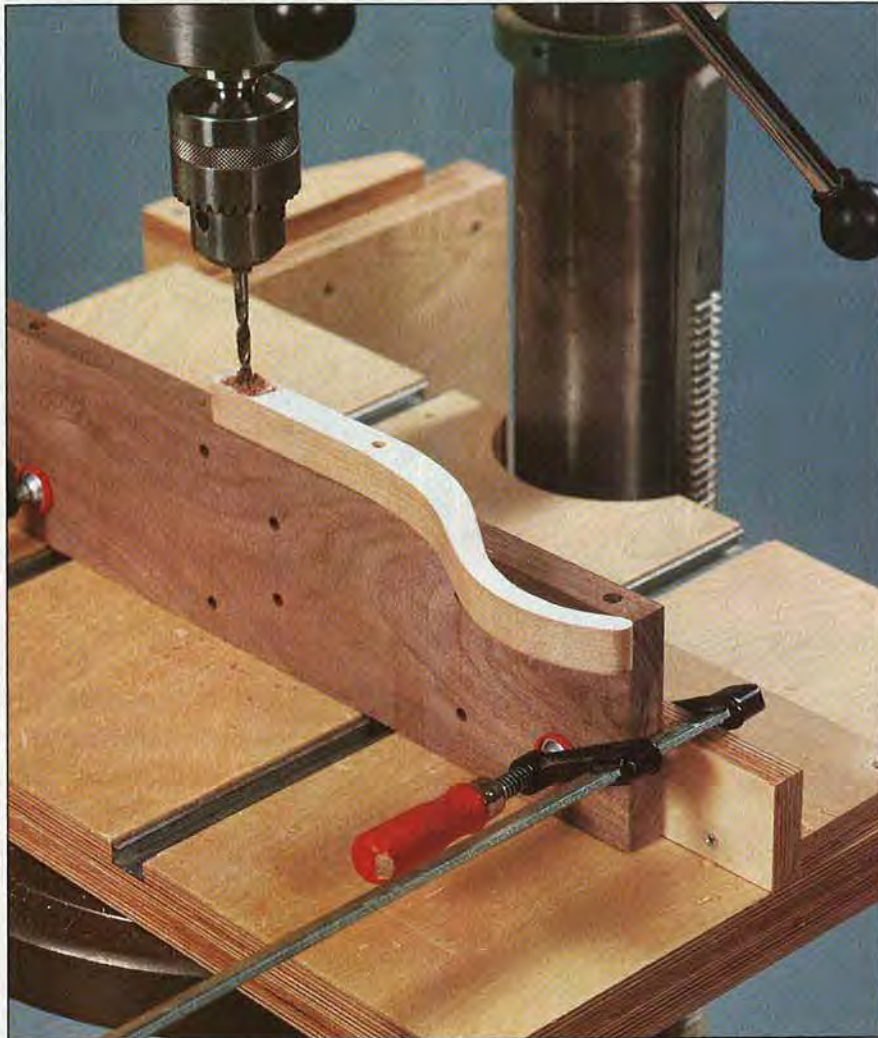
Add the truck bed and rails for heavy loads

1 Cut the truck-box bed (L) to size. Transfer the dimensioned notches from the Truck Bed drawing to the bed.

2 Add a 4"-tall extension to your miter gauge. The extension helps minimize chipout. Fit your table-saw with a $\frac{1}{2}$ " dado blade. Raise the blade $\frac{1}{4}$ " above the surface of the saw table. Supporting the truck bed against the extension, cut the notches where marked. (Since the notches are evenly placed, we used a stop on our miter-gauge extension, enabling us to cut several notches using the same setting.)

3 From the edge of $\frac{3}{4}$ " oak stock, rip the bed trim strips (M, N) to $\frac{1}{4}$ ". Crosscut the bed front, back, and side trim pieces to length, and glue them to the bed.

4 Transfer the full-sized pattern, and cut three box ribs (O) to shape. Glue the ribs to the bottom of the bed where shown on the Parts View drawing.



Tape the fenders to the chassis. Then, using the existing holes in the fenders as guides, use your drill press to drill mating holes in the chassis.

5 With the front edge of the bed (L/M) $\frac{1}{16}$ " from the back edge of the cab back (F) and centered side-to-side, clamp the two pieces together. Using the three previously drilled holes in the box base (E) as guides, drill $\frac{1}{4}$ " holes $\frac{3}{8}$ " deep into the ribs (O).

6 Cut three pieces of $\frac{1}{4}$ " dowel to $\frac{3}{4}$ " long each, sand a taper on one end of each, and glue the dowels in place in the ribs and box base.

7 Now, cut the box stakes (P) and slats (Q, R) to size. Sand the stakes so they fit easily into the notches in the truck bed (L). Glue the four assemblies together, being careful to align the stakes with the notches in the truck bed.

And finally, the headlights and hubcaps

1 To make the headlights (S), cut a piece of $\frac{3}{4}$ " cherry to $1\frac{1}{2}$ " wide by 3" long. See the *WOOD PAT-TERNS*® insert for reference.

2 Mark the locations, and drill a pair of $\frac{1}{4}$ " holes $\frac{1}{2}$ " deep.

3 Bandsaw (we used a $\frac{1}{16}$ " blade) the headlights to shape from the block. Then, hand-sand the back side of each headlight to the shape shown on the pattern.

4 Cut a pair of $\frac{1}{4}$ " dowels $1\frac{1}{4}$ " long. If children under the age of three will be playing with the finished truck, we recommend gluing the headlights in place. It eliminates the chance of a small child

swallowing them. For older children or for a display/puzzle model, leave the headlights removable from the hood.

5 To form the hubcaps (T), plane maple stock (bird's-eye looks great) to $\frac{3}{8}$ " thick. Use a compass to mark four $\frac{7}{8}$ "-diameter circles on the $\frac{3}{8}$ " stock. Now, drill a $\frac{5}{16}$ " hole $\frac{1}{4}$ " deep at each centerpoint left by the compass. Finally, cut the hubcaps to shape.

6 Crosscut four pieces of $\frac{5}{16}$ " dowel stock to the lengths ($2\frac{7}{8}$ " and $2\frac{1}{4}$ ") for the wheel axles shown on the Exploded View drawing. Glue a hubcap onto one end of each piece of dowel. Using the dowel as a handle, sand the outside surface of each hubcap to the shape shown on the pattern.

7 Finish-sand all the pieces, and add the finish, being careful not to get finish into the dowel-mounting holes. ♣

Buying Guide

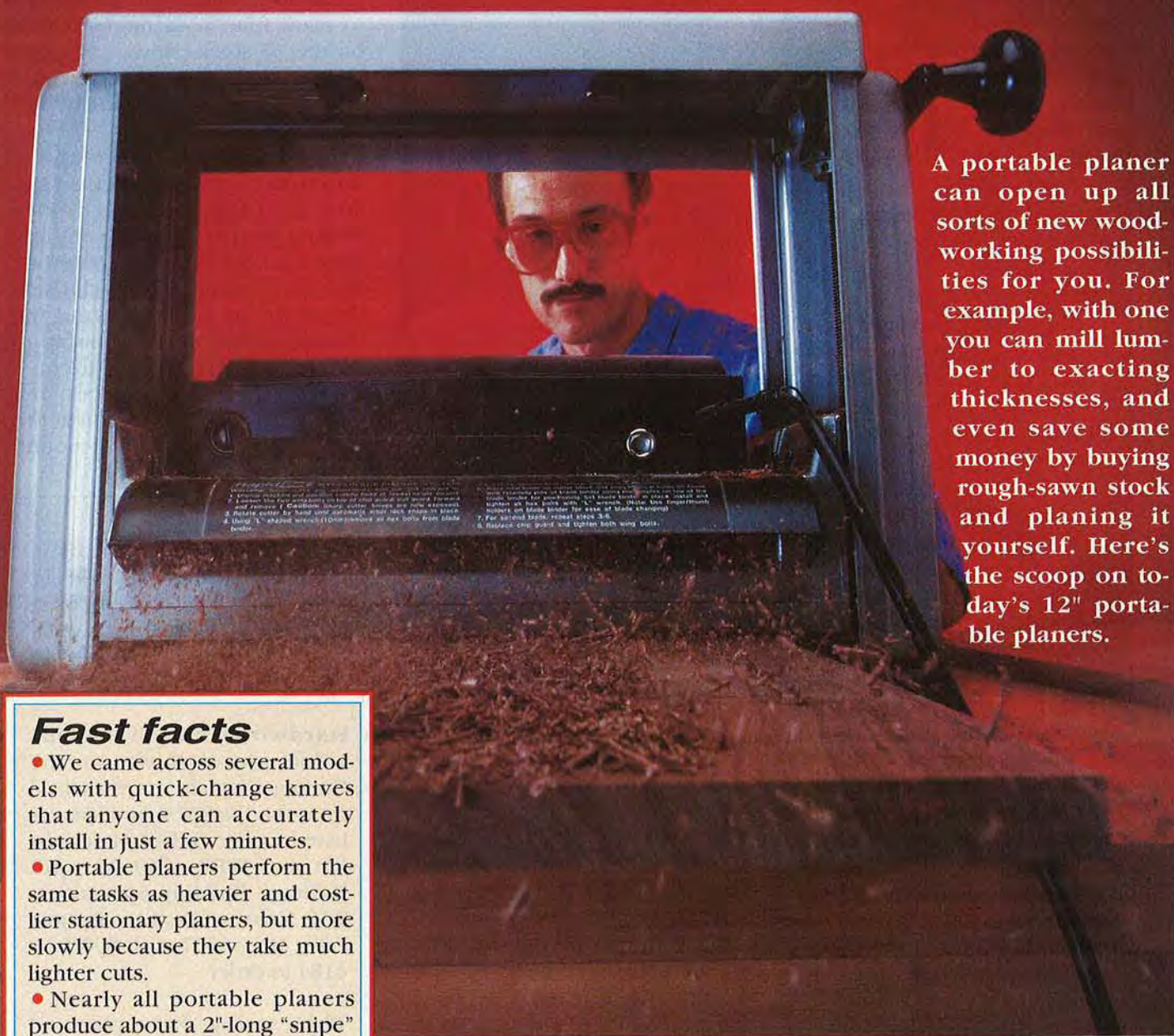
Spoked wheels. Six $1\frac{3}{16} \times 3\frac{1}{2}$ "-diameter, #508 spoked wheels. Key #WD1096, \$15.95 ppd. Cherry Tree Toys, Inc., P.O. Box 369, Belmont, OH 43718 or call 800/848-4363 to order.

Hardwood kit. All the individual pieces shown on the Cutting Diagram cut oversized from the thickness and species listed in the Bill of Materials. Kit no. W92, \$39.95 ppd. Heritage Building Specialties, 205 North Cascade, Fergus Falls, MN 56537. Call 800/524-4184 to order.

Toy catalog. For a plan and kit catalog of other toys from the designer of this project, send \$3 to Baldwin Toy Company, P.O. Box 37014, Omaha, NE 68137-0014.

Written by Marlen Kemmet
Project Design: ©Steve Baldwin
Illustrations: Roxanne LeMoine; Lorna Johnson
Photographs: Wm. Hopkins; John Hetherington

12" PORTABLE PLANERS



A portable planer can open up all sorts of new woodworking possibilities for you. For example, with one you can mill lumber to exacting thicknesses, and even save some money by buying rough-sawn stock and planing it yourself. Here's the scoop on today's 12" portable planers.

Fast facts

- We came across several models with quick-change knives that anyone can accurately install in just a few minutes.
- Portable planers perform the same tasks as heavier and costlier stationary planers, but more slowly because they take much lighter cuts.
- Nearly all portable planers produce about a 2"-long "snipe" on the ends of boards. But, we show you ways to deal with this problem.
- Machines with smooth, flat tables, and extension tables that don't flex, produce the best results with the least adjustment headaches.

We tested these planers

For this article we focused on popular models with 12"-long knives (meaning they will plane boards up to 12" wide). Most sell for \$400 or under, including the Delta 22-540, Grizzly G1017, Jet JWP12-4P, Ryobi AP12, and

Tradesman 8312, as well as the essentially identical AMT 4651, Bridgewood BW-12P, and Central Machinery 06469-7SFA (available from Harbor Freight). And, we included the Delta 22-560 (\$450), Makita 2012 (\$500), and Hitachi P12R (\$795).

Today's models are space saving and priced right

How portables compare to stationary planers

For the typical home woodworker, purchasing a portable planer makes a lot of sense. Most are affordable, and all of them will handle occasional thicknessing tasks for years to come. They're lightweight (53-80 pounds), so you can stow them away to save space, or take them to any worksite with 110-volt power. Their rapid (and noisy) universal motors turn a two-knife cutterhead at 8,000-8,500 rpm, producing smooth cuts in nearly any wood

(with sharp knives, of course). But, they're not for everybody.

If you plan to make heavy use of a thickness planer, such as planing 100 board feet or more of rough-sawn stock at a time, then you ought to focus on a stationary planer. These machines typically weigh several hundred pounds, and have 220-volt induction motors of at least 2 hp that help the cutterhead plow through deep cuts. So, planing the same pile of lumber that may take a half hour with a sta-

tionary planer may require several hours with a portable planer. And, such heavy work will quickly wear out a portable planer, but stationary planers will handle years of such work on a daily basis.

Most stationary planers have three or more knives at least 15" long for handling wider stock. The least expensive, Taiwanese-made stationary planers start at about \$700, but they don't have quick-change knives. Prices go up from there.

What we found on our snipe hunt

For years we've heard from readers wanting to know how to cure the "snipe" produced by their portable planers. Snipe refers to the slightly deeper cuts on both the infeed and outfeed ends of a planed surface. The sniped area is typically about 2" long—the distance between the centers of the cutterhead and the feed rollers.

Snipe occurs because the infeed roller and cutterhead combine to lift the infeed end of the workpiece, causing the cutterhead to remove more stock until the outfeed roller presses the piece flat against the planer bed. Similarly, as the piece exits the machine, the infeed roller loses contact with the workpiece, and the cutterhead and outfeed roller combine to lift the exiting end into the cutterhead. All portable planers produce some snipe because their construction just isn't rigid enough to completely withstand the forces of their own feed rollers and cutterheads.

Prior to our testing, we minimized each machine's sniping action by carefully making all pos-

Quick ways to minimize sniping

If you've made all of the necessary adjustments to your planer, and you're still getting snipe, even with true stock, don't give up hope! Here are some things you can do to win the war against snipe:

- As much as possible, plane your rough boards to final thickness *before* you cut individual workpieces to finished length. Then, the snipe may possibly fall on a checked or split end that you would remove as waste anyway.
- Take light cuts. The deeper the cut, the deeper the snipe, so take light finishing cuts as you near the final thickness.

- Raise the outside ends of your extension tables just a few thousandths of an inch above the main table. You'll have to experiment to find the height that best minimizes snipe.

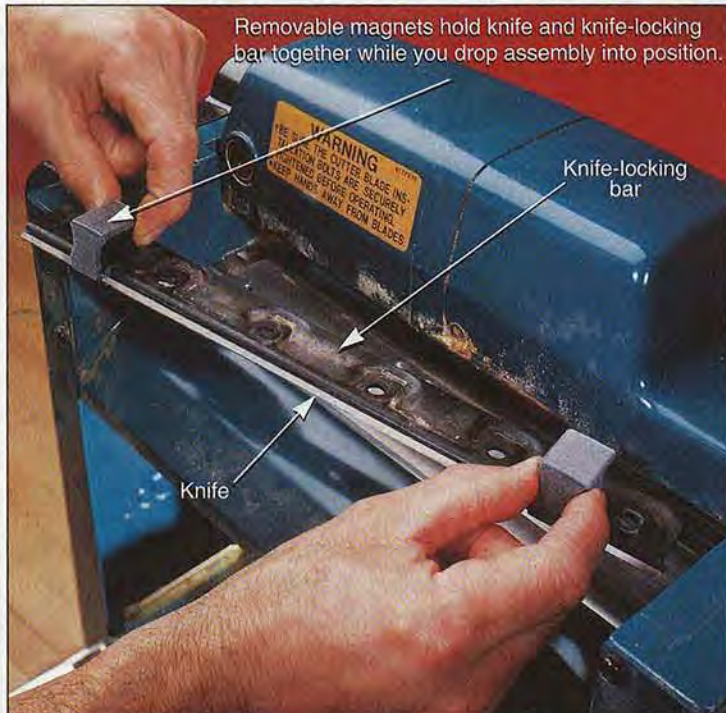
- Butt your boards end-to-end as you plane them. Then, the snipe will occur only on the front end of the first piece and the back end of the last piece. If you want no snipe whatsoever, or you're planing only one board, butt scrap pieces of the same thickness and at least 10" long against the board ends. The scrap pieces will be sniped, not your good board.

sible adjustments to its cutterhead, feed rollers, knives, and tables (just as any buyer should do). Only the Makita and Hitachi units required no adjustment, and produced nearly snipe-free results out of the box. Then, we measured the snipe depth produced on a perfectly true workpiece (warped stock will contribute to increased sniping).

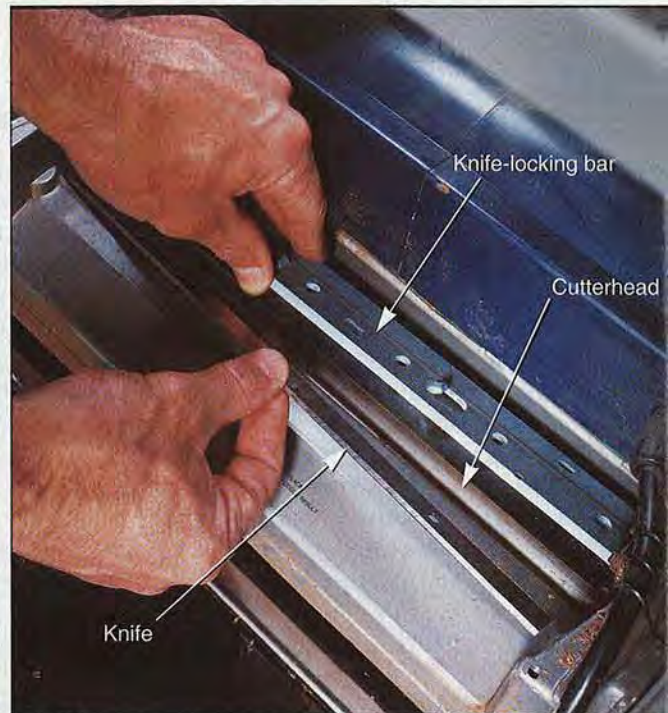
As you can see in the chart at the end of this article, the amount of snipe ranged from .0005" to .006" deep. That may not seem like much snipe, but we could easily see and feel any snipe deeper than .001". We found that .001" sniping required light sanding by hand or with a palm sander, and .002" sniping called for an aggressive random-orbit sander. Any sniping

Continued

PORTABLE PLANERS



After slipping the Makita knife under its locking bar, you need only align its groove with a ridge on the locking bar.



The quick-change Ryobi knives work like the Makita's, but have oval holes for alignment with the locking bar.

.003" or deeper required that we cut off the sniped area if the workpiece was destined for a visible spot in a project.

Some knives change much quicker than others

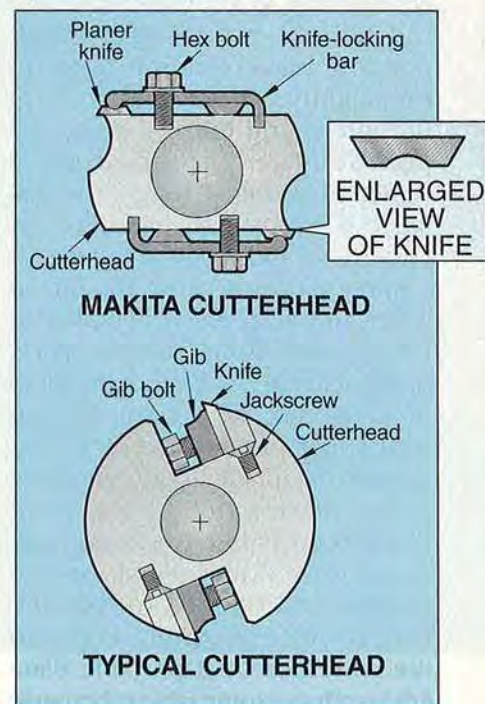
Three of the tested machines—the Delta 22-560, Makita, and Ryobi—have quick-change knives that we found easy and accurate to install. As shown *above*, these quick-change systems feature double-edged, disposable knives with built-in self-alignment features. Each Makita knife has a full-length groove that aligns with a ridge in a bar that locks the knife to the cutterhead (see *top* of illustration *right*). The Delta and Ryobi systems are similar, with oval-shaped holes in each knife that fit onto pins on the locking bar.

We found that with the quick-change systems we aligned the knives accurate to within .001". And, we could install both knives in about five minutes. With both quick-change systems you can

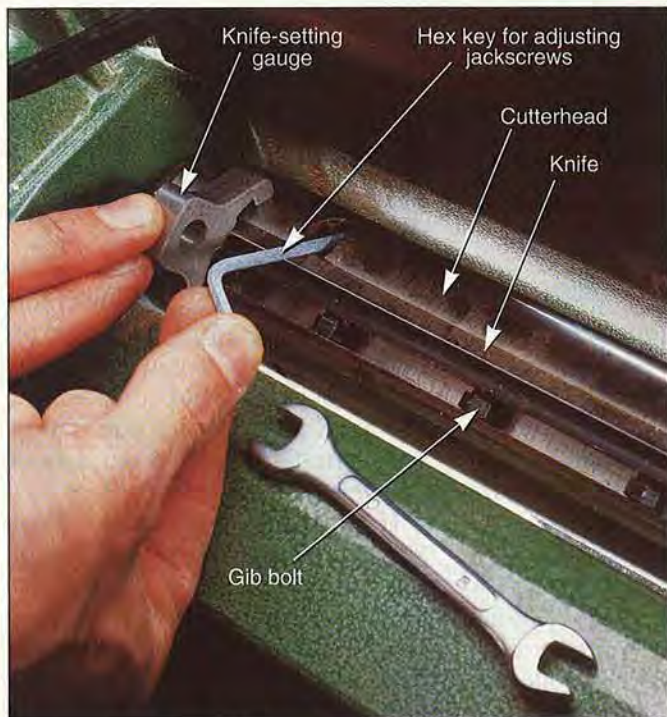
shift the knives slightly if you accidentally nick them while planing.

On the other hand, the AMT, Bridgewood, Central Machinery, Delta 22-540, Grizzly, and Jet units require at least a half hour for two knife changes, provided you have experience with such setups. Why so long? As shown in the *top left* photo on the *opposite page*, these machines require that you use a hex key to adjust each knife up or down until it contacts a small gauge (the Delta has springs instead that lift the knife up to the gauge). Then, you tighten a row of gib bolts to lock the knife in place. Unfortunately, tightening the gib bolts tends to shift the knife up or down, requiring you to repeatedly loosen the bolts, readjust the knife, and retighten the bolts. The drawings *right* show the differences between one of these typical cutterheads and a quick-change cutterhead such as the Makita.

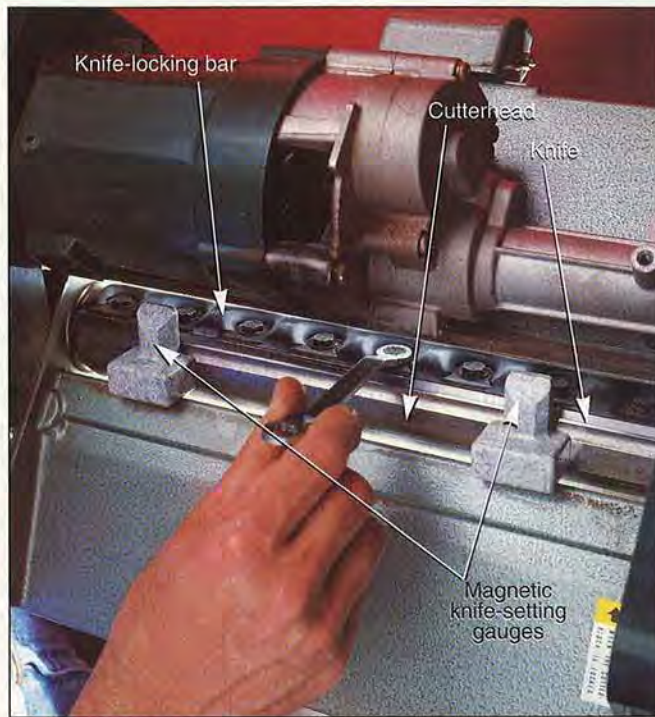
Like the Delta 22-560, Makita, and Ryobi, the Hitachi and



Tradesman have knife-locking bars instead of gib bolts. But, the knives don't self-align—you still have to use a gauge as shown in the photo *top right*, *opposite page*. In terms of convenience and accuracy, we rank this setup just



Like most planers, the Grizzly G1017 has the traditional and time-consuming gib-bolt system for securing knives.



The Hitachi requires knife-setting gauges, but its locking bar doesn't shift the knives as gib bolts tend to do.

below the self-aligning systems, but well ahead of the gib-bolt setup. It is the ideal setup if you prefer resharpenable knives to disposable (see *next* section).

**Disposable knives:
Are they a good deal?**

Both Deltas and the Jet, Makita, and Ryobi planers have narrow, disposable knives with two sharp edges. When one edge dulls you simply reverse each knife. When the next edge dulls, you toss the knives out. A set of two of these knives costs \$25-\$30, about the cost of having a typical two-knife set sharpened twice.

We like these disposable knives for two reasons. First, there's no downtime when your knives dull—you just reverse the knives or buy a new set. (With typical knives you need an extra set on hand so you can run the planer while your resharpening service has the knives.) And, many woodworkers do not have access to a qualified sharpening service in their area.

With that said, a traditional set of knives may make more sense for you if you have the equipment and skill to hone or resharpen your own knives. (It is not practical or advisable to sharpen disposable knives.)

More points to consider

• **Changing cutting depth**

Most of the machines require about 75 crank rotations to elevate their tables completely. The Makita makes this easier on your arm by needing only 38 rotations. The Delta 22-560 is between these extremes, needing 58 crank rotations for full elevation. The Tradesman needs only 50 rotations, but the elevating mechanism bound up when we tried to adjust it for 5"- to 6"-deep cuts.

• **The main tables**

The planers in our test have two types of main tables: smooth and flat metal sheet, or cast-aluminum with rollers (see photos *right*). We prefer the smooth and flat

Continued



The Hitachi has a perfectly smooth and flat table that requires no adjustment.



Like the similar Central Machinery and AMT planers, the Bridgewood has table rollers that we found difficult to adjust.

PORTABLE PLANERS

type found on the Deltas, Grizzly, Jet, Hitachi, Makita, Ryobi, and Tradesman. That's because we found the main-table rollers tricky to adjust to the right height and parallel to the cutterhead. And, we've seen these types of rollers seize up from sawdust contamination over time.

•Extension tables

Here, too, you will find two basic types: smooth and flat, or with rollers. We don't favor one type over the other, but we did find that a few of the roller types flex as much as 1/4" under pressure. As noted in the chart *right*, three similar machines received a "poor" rating under the heading "lack of extension-table deflection."

•Two approaches for getting up and down

Most of the tested planers have stationary main tables and cutterheads that elevate up and down. These hold a small advantage if you plan to use roller stands or bench surfaces to support long boards during infeed and outfeed. That's because you don't have to change the height of the support as you work.

Only the Hitachi and Makita have stationary cutterheads and elevating tables. Since these machines produced less snipe than most of

the other tested machines, we suspect that it may have something to do with the rigidity of the stationary cutterheads. Given a choice, we'll opt for less snipe over the convenience of stationary infeed and outfeed supports.

•Dust collection

Like their big, stationary brothers, portable planers produce mounds of sawdust in no time at all. So, we were disappointed that none of the tested units includes a dust-collection hood as standard equipment. For all but the Makita, you can buy hoods that connect to shop vacuums (2 1/4" port), or dust collectors (4" port). The optional Makita hood has a 3" port for connection to a Makita dust-collector hose. Optional dust-collection hoods range in price from \$20 to \$40. Or, you can fashion your own from 1/8" plywood. We show how in issue 43, *pages 48-49*. If you don't have a copy of this article, we'll be happy to mail you one. Send \$4 and a stamped, self-addressed envelope to:

Dust hood article
WOOD® Magazine, GA310
1912 Grand Avenue
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•Portability

The Makita is a hands-down winner here with the lowest weight

in the test (53 pounds) and easy-to-grasp carrying handles. If you plan to move your planer around a good deal, think twice before buying any planer weighing more than 70 pounds.

Our recommendations

The Hitachi was the best machine, but it wasn't \$300-\$500 better than the others. If you have \$800 to spend, you should consider one of the 15" Taiwanese-made stationary planers available from a number of importers.

If you can afford the \$500 Makita, you won't be disappointed. Its blades are a cinch to change, it snipes very little, and it's the lightest tool in the bunch.

For about \$50 less, the Delta 22-560 performs as well as the Makita, has a bit more power, but weighs 12 pounds more.

The hottest battle among portable planers is being waged at the \$400 price point. Here, three machines excel. The Ryobi AP12 stands out because it has quick-change knives. We like the Grizzly because it produced less snipe than the other machines in its price range. The Jet performed like the Grizzly and weighs less.

The budget-conscious should consider the Central Machinery unit. At only \$300 you may be willing to overlook its sniping. 🌲



PLANE FACTS ON TODAY'S PORTABLES

MANUFACTURER/ IMPORTER	MODEL	ELEVATION					SNIPING (DEPTH, INCHES)		PERFORMANCE (2)							WARRANTY (YEARS) (6)	COUNTRY OF ASSEMBLY (7)	SELLING PRICE	COMMENTS
		HEAD (H) OR TABLE (T) ELEVATES	STABILITY MECHANISM (1)	ROTATIONS FOR FULL ELEVATION	OPTIONAL DUST-COLLECTION PORT SIZE (INCHES)	MAIN-TABLE ROLLERS (Y) YES, (N) NO	INFEED	OUTFEED	EASE OF KNIFE CHANGES (3)	EASE OF ADJUSTING CUTTERHEAD PARALLEL TO MAIN TABLE (4)	LACK OF EXTENSION- TABLE DEFLECTION (5)	CONSTRUCTION QUALITY	ELEVATING EASE	PORTABILITY	WEIGHT (POUNDS)				
AMT	4651	H	FS	75	NONE	Y	.004	.004	F	G	P	G	G	G	67	*	T	\$355	Standard-issue Taiwanese portable planer similar to Bridgewood, Central Machinery, and other brands. Good results possible, but bed rollers require careful adjusting, and extension tables flex easily.
BRIDGEWOOD	BW-12P	H	FS	75	2 1/4	Y	.004	.004	F	G	P	G	G	G	64	1	T	390	See AMT 4651 comments.
CENTRAL MACHINERY	06469- 7SFA	H	FS	75	2 1/4	Y	.006	.004	F	G	P	G	G	G	66	***	T	300	Has a lower price than similar models sold by AMT and Bridgewood.
DELTA	22-540	H	SR	75	4	N	.006	.003	F*	E	E*	E	G	F	68	2	T	390	Features sturdy, four-post construction. Snipe was hard to control because of extension tables that rest on work surface.
	22-560	H	SR	58	4	N	.002	.001	E*	G	E	E	E	G	65	2	T	450	This new model features solid construction and a cutterhead lock that reduce snipe to a minimum. Has quick-change, double-edged knives.
GRIZZLY	G1017	H	SR	75	2 1/4	N	.002	.002	F	G	E	E	G	F	80	1	T	395	Heavy and sturdy. Least snipe of machines in its price range.
HITACHI	P12R	T	SR	75	4	N	.002	.0005	G*	*	E	E	E	F	74	1	J	795	If you have the money, here's your machine. One of the easiest blade-changing systems we have seen for reusable blades on any planer at any price.
JET	JWP 12-4P	H	SR	78	2 1/4 4	N	.003	.002	F	G	E	G	G	G	68	1	T	400	The newest Taiwanese portable planer being sold by a number of importers. Similar models also currently available from Star Tools and Sunhill.
MAKITA	2012	T	LS	38	3	N	.002	.001	E*	G	E	E	E	E	53	1	J	500	Quick blade changes, minimal snipe, low weight, and solid construction made this one of our favorite machines to use.
RYOBI	AP12	H	FS	75	2 1/4	N	.004	.004	E*	G	E	E	G	G	63	2	T	390	A solid machine in all respects with the easiest blade changes of similar-priced thickness planers.
TRADESMAN	8312	H	LS	50	2 1/4	N	.004	.004	G*	G	G	F	F	G	75	**	T	400	A solidly constructed machine with reusable blades that change easily. The cutterhead-elevation mechanism binds up with stock thicker than 5".

NOTES:

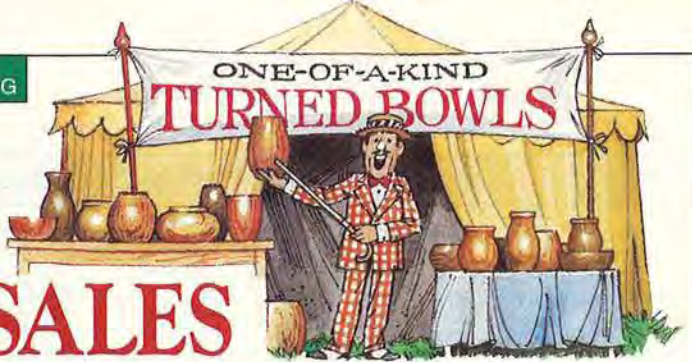
- (SR) Four steel rods
(LS) Two lead screws
(FS) Formed steel sides
- E** Excellent
G Good
F Fair
P Poor
- (*) Manufacturer's knives required.
- (*) Table is fixed parallel with cutterhead.
- (*) Extension tables rely on rigidity and flatness of surface supporting the planer.
- (*) One year for the motor, ten years for the rest of the machine.
(**) One year for labor, five years for parts, one year for the motor.
(***) One year for machine, 90 days for motor.
- (J) Japan
(T) Taiwan

Manufacturers' phone numbers:

AMT 800/435-8665	Grizzly (West of the Mississippi) 800/541-5537 (East of the Mississippi) 800/523-4777	Makita 714/522-8088
Bridgewood 800/235-2100	Hitachi (Harbor Freight) 800/362-7297	Ryobi 800/525-2579
Central Machinery (Harbor Freight) 800/423-2567	Jet 800/274-6848	Star Tools 888/678-8777
Delta 800/438-2486		Sunhill 800/929-4321
		Tradesman 800/243-5114



Written by Bill Krier Technical consultant: Bob McFarlin Photographs: Wm. Hopkins; John Hetherington; Bob Willits



Crafts-fair marketing: 10 WAYS TO BOOST YOUR SALES

Crafts fairs may be the ticket to sell your woodworking creations. But just showing up at one doesn't guarantee your success.

The first stop for many woodworkers who sell their work is a crafts fair. Some keep successfully selling at fairs for years. Others get discouraged and quickly give up. Success depends on many things, from your personality to the economy. The following tips should improve your luck regardless of other factors.

1 Strive for mass appeal.

You may dream of selling those \$500 or \$1,000 items, but most crafts-fair sales actually fall in the \$15 to \$75 range. Rude Osolnik of Berea, Kentucky, one of the nation's foremost woodturners, has sold plenty of bowls for three and four figures. But when selling at crafts fairs, he also needed such lower-priced items as candlesticks and weedpots.

2 Remember, it's a "show."

Knowledgeable crafters don't call crafts fairs "shows" for nothing. For instance, Greg Adams of Muncie, Indiana, makes some of his willow furniture while he's exhibiting at fairs. His work always draws a crowd.

3 Display like a retailer.

A wide selection is great. Clutter isn't. Take a consumer's-eye view of your booth. Buy or build vertical display fixtures to get more pieces in your booth. Veterans say that a good-looking booth can account for 25% of sales.

4 Emphasize your craft specialty.

Concentrate on what you do best and show it off. Take Norm Sartorius of Parkersburg, West Virginia. He makes elegantly crafted spoons, and strictly sticks with them (along with a smaller selection of lower-priced letter openers to boost sales volume).

5 Show how to use or display your product.

Spoonmaker Sartorius helps his customers understand exactly what to do with his sculpted products by displaying them in a hutch as buyers might do in their homes.

6 Be attentive, not pushy.

Crafts-fair shoppers don't want a sales pitch. On the other hand, you can't just sit there and ignore them. Be alert, and answer questions when someone lingers. At such times, bring up any interesting information you can about what you make.

7 Spread the word.

Keep business cards and/or brochures visible. To encourage repeat purchases, give everyone who buys something a card, too. Wrightsville, Pennsylvania, Windsor-chair maker Bill Wallick doesn't sell many chairs at shows, but generates business through the cards that he distributes at crafts fairs.

8 Tell a story.

If there's a special story about how you made a piece, put it on a card (with photos, if possible) or an information sheet next to the piece. Display newspaper or

magazine articles written about you and your work. Even a simple card telling about the wood species you used in a piece can help stimulate a sale.

9 Gather names.

Build a mailing list by keeping a guest book for customers to sign. Better still, raffle off a piece of your work, collecting names, addresses, and telephone numbers from everyone who enters. You also should record this same information off customers' personal checks.

10 Accept credit cards.

Taking plastic gives you a professional look, plus helps you ensure sales from those who don't happen to have a check or enough cash on hand. Of course, you'll pay a transaction fee, but increased sales should compensate. You can obtain vendor status through membership in some groups, such as the American Craft Council. ♣

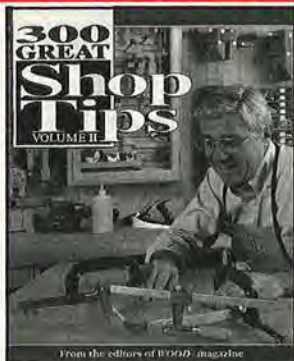


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Hitachi 8-1/2"x60Tx5/8"	\$179	\$109
DeWalt 8-1/2" & Ryobi 8-1/2"x60Tx5/8"	\$179	\$109
Delta 9"x80Tx5/8"	\$204	\$119
Ryobi-Makita & all 10"x80Tx5/8"	\$207	\$129
DeWalt, Makita, B&D, Hitachi 12"x80Tx1"	\$229	\$139
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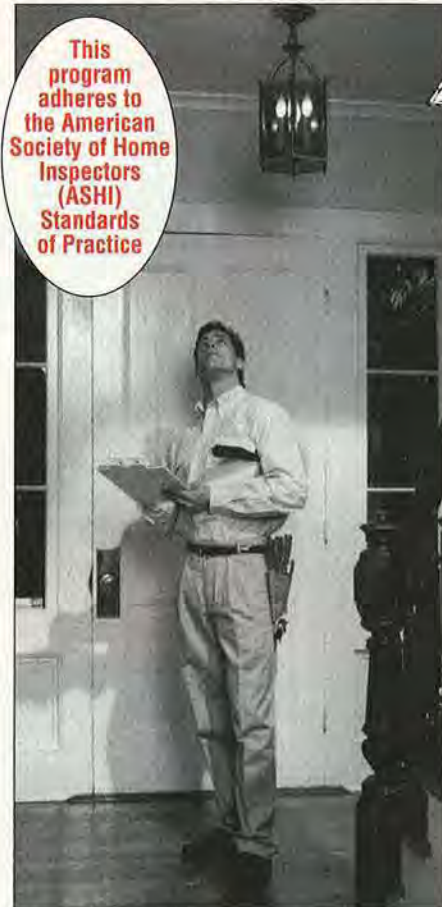
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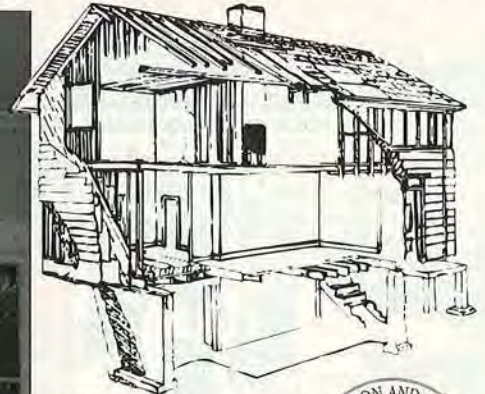
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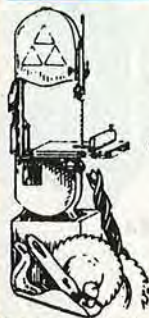
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The folks at Delta mounted a fan on the drum spindle just below the table. The fan pulls air downward, and a plastic housing directs the air into a dust collection bag at the back of the machine. Radial slots in the steel table inserts allow good air flow, yet still support the work piece. I found that the system did a good job of pulling in all airborne dust, and left only small amounts of dust on the table when I sanded pitch-laden pine. You also can connect a vacuum to the 1½"-port if you want extra suction.

A ¼-hp direct-drive induction motor, turning at 1725 rpm, provides smooth, quiet power to the spindle. The entire motor and spindle assembly rides up and down 7/8" to provide a steady 60 oscillating strokes per

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A large 18"-diameter cast iron table provides a stable work platform, although the surface finish could have been a little smoother. The B.O.S.S.'s 47-pound weight, combined with the smooth-running motor, make it virtually vibration-free.

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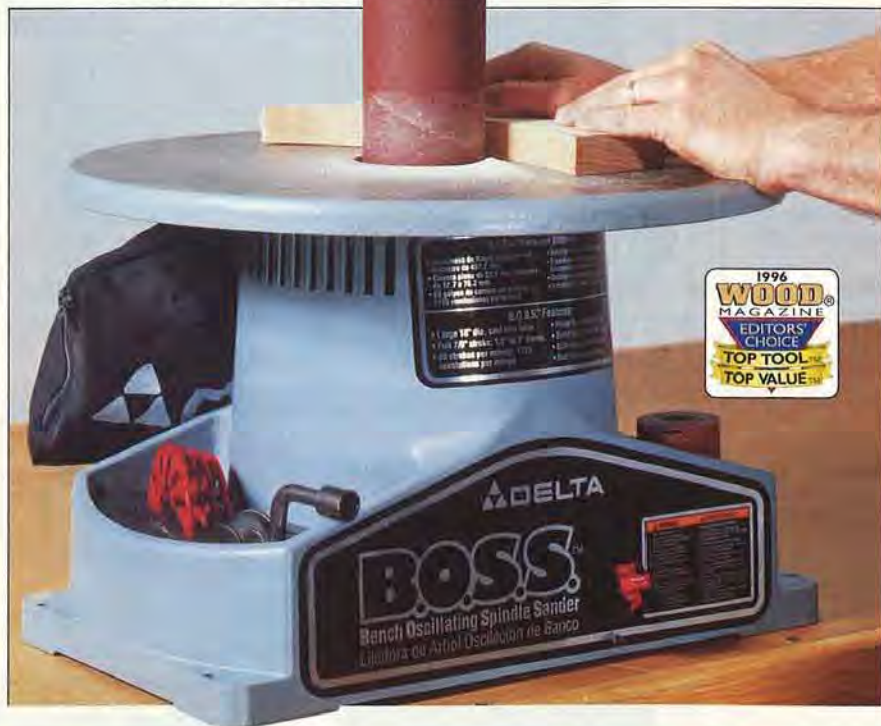
PRODUCT SCORECARD

Pattern Plastic

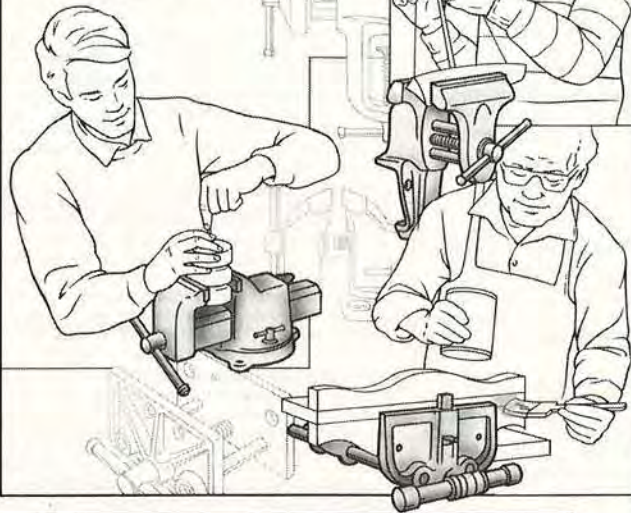
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Continued on page 100



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- 0408-1 Cordless Kit-Zbatt 172
- 0422-1 1/2" Cord's Hammr Rt Angle Drill 215
- 3107-1 VS Rt Angle Drill 223
- 5369-1 3/4" Falcon Kit 269
- 5371-1 1/2" Hammer Drill 187
- 5392-1 3/8" Hammer Drill 126
- 5397-1 3/8" Hammer Kit 149
- 5460 7" Polisher 178
- 5682 2 Hp Router 168
- 6236 4 x 24 Belt Sander 227
- 6008 1/8 Sheet Sander 127
- 6010 1/2 Sheet Sander 127
- 6148 NEW Mini Grinder 96
- 6175 14" Chop Saw 278
- 6266 NEW! Jig Saw 149
- 6285 7-1/4" Belt Sander 125
- 6460 10" Circular Saw 258
- 6491 10" Miter Saw 278
- 6628 VS Super Sawzall 177
- 6638-1 JR3000V Recip Saw 138
- 6546-1 LS1300 10" Miter Saw 199
- 6767-1 NEW 4 3/8" Planer 183
- 8975 Heat Gun 58

DELTA

37-070 \$257

6" Table Top Jointer

- 14-650 Hollow Morris Chisler 284
- 17-950 Oss Sander Kit 75
- 22-540 12" Planer 364
- 23-710 Sharpening Center 164
- 28-185 10" band saw 168
- 31-080 1" Belt 5" Disc Sand 88
- 31-480 2" Belt 6" Disc Sand 126
- 32-100 Plate Joiner 254
- 36-040 8" Compound Miter 149
- 36-090 Stack 10" Miter Saw 218
- 36-210 10" Compound Mit 246
- 40-150 15" Scroll Saw 115
- 40-560 16" Scroll Saw 168
- 35-617 10"x50T Cable Blade 34
- 35-677 14"x108T Cable Blade 75

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- 2469 36" w/ hand hole 46
- 2467 48" w/ hand hole 49
- 2468 72" w/ hand hole 104
- 2859 NEW Laser Level 325
- 2669 6 ft -3vial 99
- 2700 8 ft 6" -3vial 115
- 2701 8 ft -3vial 115

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- DW100 3/8" Drill 67
- DW106 3/8" Keyless Drill 74
- DW411 Palm Sander 58
- DW610 Router 148
- DW930 Cordless Saw 198
- DW935 Cordless Saw 236
- DW972K 12V Cordi drill 187
- DW974K 14V Cordi 198

DW705 12" Compound Miter \$358

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W2

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Continued from page 92

Two-stage lid snags big chips and heavy dust

One problem all single-stage dust collectors share is that they lose efficiency as their bags fill up with debris. That's because the filter surface area available for fil-

tering the air shrinks. Until now, the only solutions were to install an expensive cyclone separator between the source of the dust and your dust collector, build your own plywood and sheet-metal separator, or buy a two-stage dust collector. But this new, all-plastic, Dust Collection Separator does a great job at a fraction of the cost of these other separator options.

To use the Dust Collection Separator, you simply place it over the top of a trash can or barrel with a 24" outside diameter. Connect the inlet hose of your dust collector and the outlet hose from your tool to the separator and go to work. The cyclonic airflow created inside the barrel causes the wood chips and heavier dust particles to fall to the bottom. Only the fine dust particles end up in the dust collector bags.

With this device I could fill my trash can about 80 percent before I had to empty it—a big boost in convenience. And I rarely need to empty my dust collector bags.

The holes in the lid are sized to accept 4" flexible hoses, but there is no flange to clamp onto or sealing device to secure them. You just stick the hoses in the holes. Despite this loose arrangement, no dust escaped from the hoses, and the small amount of air leakage didn't affect the performance of my system.

—Tested by Dave Henderson



PRODUCT SCORECARD				
Dust Collection Separator				
Performance	★	★	★	★ ☆
Price	\$41.95 ppd.			
Value	★	★	★	☆ ☆
Tool Crib of the North, P.O. Box 14040, Grand Forks, ND 58208-4040 Call 800/358-3096.				

Continued on page 102

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3X18	.86 ea	4X36	1.35 ea
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PRODUCTS THAT PERFORM



Continued from page 100

Wax keeps tools rolling smoothly



For years, I've used a block of paraffin to lubricate certain machine parts and reduce metal-to-metal friction around the shop. Paraffin works fine for these applications, but I recently discovered an improved version of this old favorite.

Lube Wax Stick is a paraffin-based wax that has been formulated to be a bit more slippery than ordinary paraffin. I applied some Lube Wax to the rails of my tablesaw fence to help it glide smoother, and to a drill bit for drilling through some steel. Compared with paraffin, I found Lube Wax easier to apply and better at reducing friction. And unlike paraffin, I noticed that Lube Wax maintains its slipperiness even when the temperature in my shop dips below 50°.

Also, I found this product convenient to use and store. To dispense the wax, you just push on the bottom of the container. And the manufacturer puts a hole in the cap so you can hang it on a nail or hook.

—Tested by Dave Henderson

PRODUCT SCORECARD

Lube Wax Stick	
Performance	★ ★ ★ ★ ★
Price	about \$3.75 for a 2.5-oz tube
Value	★ ★ ★ ★ ☆
Formax Manufacturing Co., 3178 Bellevue Ave., Detroit, MI 48207. Call 800/242-2833.	

DELTA TOOLS	
Model Description	List Sale
31-280 Sanding Center w/stand	1250 789
31-695 6" Belt/9" Disc Sander	441 329
23-700 Wet/Dry Grinder	206 149
23-710 New Sharpening Center	217 169
23-800 6" Bench Grinder 1/4 HP	80 69
11-950 8" Drill Press	176 128
31-460 4" Belt/Disc Sander	198 135
40-560 16" 2 Speed Scroll Saw	230 165
40-540 New 16" var/spd Scroll Saw	249 179
11-990 32" Bench Drill Press	255 184
11-090 32" Radial Bench Drill Press	305 205
43-505 12" Bench Router/Shaper	398 299
22-540 12" Bench Top Planer	384 269
36-220 10" Compound Miter Saw	254 194
28-185 Bench Band Saw	213 175
37-070 NEW 6" w/spd Bench Joiner	351 245
14-650 Hollow Chisel Mortiser	280 239
39-990 NEW 10" Radial Arm Saw	981 779
33-055 8-1/4" Sawtooth comp w/legs	846 665
36-905 30" Unifence	346 245
36-906 50" Delta Unifence	444 319
36-755 10" Tilling Arbor Saw	1019
17-900 16-1/2" Floor Drill Press	490 399
37-190 6" Deluxe Joiner	603 489
36-275 8-1/4" Builders Saw	358 259
36-210 10" Compound Miter Saw	344 225
36-240 8-1/4" Compound Miter Saw	190 135
36-070 10" Miter Saw	217 165
34-555 Siding Table	487 325
34-444 10" Contractors Table	615
36-250 10" Slide Compound Saw	825 489
36-230 12" Compound Miter Saw	480 345
31-780 Oscillating Spindle Sander	253 188

DELTA REBATES!	
Prices shown are before rebate!	
\$25.00 rebate	
46-700 12" Wood Lathe	575 475
\$50.00 rebate	
28-275 14" Band Saw 3/4 HP	649
28-280V14" Band Saw 1 HP motor	798
34-445 10" Table Saw w/30" fence	839
22-675 NEW DC380 15" Planer	1175
43-355 3/4" Shaper 1-1/2 HP	849
\$75.00 rebate	
37-154 6" Joiner DJ-15	1289

MILWAUKEE TOOLS	
6527 NEW Sawzall with case	343 169
6528 above Sawzall w/wired cord	339 185
0408-6 12V Drill w/kwik chuck&2 batt	380 172
0224-1 3/8" Drill 4.5 amp magnum	236 132
0234-1 1/2" Drill 4.5 amp 0-850 rpm	255 129
0235-1 1/2" Drill w/keyless chuck	255 129
0244-1 1/2" Drill 4.5 amp 0-600 rpm	255 129
0222-1 3/8" Drill 3.5 amp 0-1000 rpm	213 119
0228-1 3/8" Drill 3.5 amp 0-1000 rpm	207 118
0375-1 3/8" close quarter Drill	255 148
0379-1 1/2" close quarter Drill	289 165
6546-1 cds Schrwdr 200 & 400 rpm	150 86
6547-1 6546-1 w/bats, 1/4" chuck & cs	185 105
5999 1/2" D-handle Hammer Drill Kit	356 194
6507 Original SawZall with case	278 146
597-1 3.5" w/spd Hammer Drill Kit	375 145
5371-1 1/2" w/spd Hammer Drill Kit	360 194
3107-1 1/2" w/spd right angle Drill Kit	214 124
3300-1 1/2" w/spd right angle Drill	378 199
5690 Router 2 HP w/collets	367 165
6142 4-1/2" Grinder w/cse & acc.	224 125
6265 7-1/4" Circular Saw 13 amp	229 125
6368 6365 w/fence, bld, & cse	259 142
6256 Top Handle Jig Saw	278 149
6490 10" Miter Saw	496 265
6491 6490 w carbide blade & bag	594 328
6494 10" Compound Miter Saw	585 315
0431-1 12V Drill w/ 2 batteries	441 229
6266-6 NEW Top Handle Jig Saw	315 165
6496 10" Slide Compound Saw	1050 569

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5/8" Bore - Industrial Grade	
Item Description	Teeth List Sale
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L8U2M010 Cut-off 10"	60 62
L8U4M011 Comb 10"	50 78
L8U5M010 Super Cut-off 10"	80 115
L7M2M010 Rippling 10"	24 68
L7U3M010 Cut off 10"	60 84
L8U7M010 Thin Kerf 10"	24 72
L8U8M010 Thin Kerf 10"	60 88
L8U9M010 Ultimate 10"	80 128
L9U1M010 Compound Miter 10"	60 84
F410 Quiet Blade 10"	40 95
F810 Quiet Blade 10"	80 135
TK303 7-1/4" Finishing	40 38
TK906 10" Combo	50 32
SD308 8" Dado - Carbide	230 119
SD506 6" carbide w/case & shims	292 145
SD508 8" carbide w/case & shims	344 168
FB100 16 piece Forstner Bit Set	338 194
94-100 5 pc. Router Bit Door System	320 169
BF3 NEW Router Table	495 289

The following tools have a \$30.00 rebate. Price shown is before rebate.
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 J5102 Biscuit Joiner w/fence & cs 355 179

The following tool has a \$50.00 rebate. Price shown is before rebate.
 TR215 8-1/2" Slide Cmpd Miter Saw 369

WAP VACUUMS	
Model Description	List Sale
766RDF 10 gallon turbo vacuum	845 465
766RDF-D "Drywall'er" 10 gal turbo vacuum	915 549
766RDF-DAS Above vac w/ auto start	950 589

MAKITA TOOLS	
6172DWE 3/8" v/spd Drill Kit w/ 2 batt	222 109
5090WD 3-3/8" Saw Kit 9.6 volt	280 148
DA391D 3/8 angle Drill 9.6V	166 109
DA391DW 3/8 angle Drill Kit 9.6V	341 179
ML9300 Incandescent Flashlight 9.6V	37

NEW CORDLESS DRILLS	
WITH 2.0 AMP HIGH CAPACITY BATTERIES	
6213DWAIE 12V 3/8" Drill Kit	325 185
6233DWAIE 14.4V 3/8" Drill Kit	358 199

SUPER CORDLESS SPECIALS	
6073DW 7.2V cds Drill Kit. Variable speed & clutch. Complete with battery, charger, & case.	Super Sale 99
7220DW 9.6 volt Stapler Kit. Complete with battery, charger, & case.	Super Sale 99

SENCO AIR NAILERS	
SFN1-1 Finishing Nailer 1" - 2" w/cs	448 345
SN325 Nailer 1-7/8" - 3-1/4"	665 419
SLP20 Plnner w/cs 5/8" - 1-5/8"	422 275
SKS Stapler 5/8" - 1-1/2"	390 279
S70 Framing - Clip Hd 2"-3-1/2"	725 449
SN60 Framing - Full Hd 2"-3-1/2"	708 449
SN65 15% more power than SN60709	469
SFN40 Finish Nailer 1-1/4 - 2-1/2"	569 389

BOSTITCH AIR NAILERS	
N80S-1 Stick Nailer	Super Sale 339
N80C-1 Coil Nailer	Super Sale 339
RN45 Coil Roof Nailer 3/4 - 1-3/4	645 369
N60FN-2 Finishing Nailer	557 335
BT35-2 Brad Tacker 5/8" - 1-3/8"	254 155
BT35-2K BT35-2 w/ cse, oil, & brads	279 165
CWC100 1 HP Pancake Compressor	440 289
MIIFS Flooring Stapler 15 gauge	902 525
S32SX-1 Finish Stapler 1/2" - 1-3/8"	245 155
S32SX-1K S32SX-1 with case & oil	269 165

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DW997K 1/2" Drill/Hammer Drill Kit	Sale 249
DW936K Saw Kit	Sale 249



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DEWALT TOOLS	
Model Description	List Sale
DW321K NEW Jigsaw Kit	300 169
DW364 7-1/4" Circ. Saw w/bake	294 158
DW610 1-1/2 HP 2 handle Router	266 152
DW411 1/4 sheet Palm Sander	88 58
DW100 3/8" Drill, 4 amp, 0-2500 rpm	118 68
DW682K Biscuit Joiner with case	448 219
DW705 12" Compound Miter Saw	374 359
DW625 3 HP w/spd Plunge Router	275

DEWALT CORDLESS DRILLS	
DW952K 3/8" variable speed w/ 2 9.6V XR batteries	284 139
DW962K 23/8" variable speed w/ two 9.6V XR batteries	330 179
DW972K 23/8" variable speed w/ two 12V XR batteries	362 189
DW904 12 volt flashlight	48 29.95
DW972K-2 drill & DW904 flashlight	Sale 205

HITACHI TOOLS	
CF8B2 8-1/2" Slide Compound Saw	1169 489
C10FC 10" Miter Saw	533 209
C10FS 10" Slide Compound Saw	1627 739
G12SA 4-1/2" Grinder 6.9 amp	177 95
NR83A Framing Nailer 2 - 3-1/2" Full Head	900 425
NR83AA Framing Nailer 2 - 3-1/2"	922 429
NT65A 16 ga. Brad Nailer 1 - 2-1/2, 749	325
NV45AB Coil Roofing Nailer 7/8 - 1-3/4"	935 419
EC6B 1 HP Oil Compressor	540 279
EC6C 1 HP Oil-less Compressor	580 295

BIESEMEYER FENCES	
B-50 50" Common Saw	443 325
T-SQUARE 52 52" Homeshop	360 269
T-SQUARE 40 40" Homeshop	335 249
T-SQUARE 28 28" Homeshop	325 239

PONY CLAMP FIXTURES	
Model Description	List Sale
50 3x21" Black Pipe	15.45 8.10
52 1/2" Black Pipe	12.65 6.95

BOSCH	
Model Description	List Sale
1587VS Top Handle "CLIC" Jig Saw	292 139
1587VSC 1587VS saw with case	Sale 149
1584VS Barrel "CLIC" Jig Saw	288 139
Bosch Metal Case for above Jig Saws	24
Bosch 30 blade assortment for Jig Saws	28.99
1584VS or 1587VS with steel case and 30 Bosch blades	Sale 175
3270DVS 3x21" v/spd Belt Sander	301 165
1276D NEW 4"x24" Belt Sander	379 219
1275DVSNEW 3"x24" v/s Belt Sndr	379 219
1276DVSNEW 4"x24" v/s Belt Sndr	408 229
1347AK 4-1/2" Grinder w/cse & acc.	172 105
1194VSR 1/2" w/spd Hammer Drill	272 155
1194VSRK above Drill w/ case	303 169
1604A 1-3/4 HP 2 Handle Router	269 142
1604AK same as above w/cse & acc	337 185
1613EVS 2HP v/s Plunge Router	369 199
1615EVS 3 HP v/s Plunge Router	356 209
1634VSR NEW Recip Saw 10.5 amp/335	159
3310K NEW 12V T-handle Drill Kit	345 178
3610K NEW 14.4V Drill Kit	354 195
3107DVS NEW 5" Random Orbit Sander	165 98
3107DVSK 3107DVS with case	195 115
3725DVS 5" Random Orbit Sander	256 149
3727DVS 6" Random Orbit Sander	266 154
69315 10" Slide Compound Saw	1050 589
6185K Biscuit Joiner	286 168
67001 67000 w/ variable speed	Sale 89.95
64050E In Lins Jig Saw	206 118
11230EVS SDS-max 1-1/2" Riry Hm910	519
11231EVS SDS-max 1-3/4" Rotary Hammer	1363 795
11223EVSNEW SDS-max 2" Rotary Hammer	1595 915
11224VSR 7/8" SDS Rotary Drill	404 229

STABILA LEVELS	
24640 24" Level w/ hand holes	62.20 43
24670 48" Level w/ hand holes	79.70 55
24680 72" Level w/ hand holes	145.45 99
27170 48" Level w/ hand holes	71.40 49
27000 78" Level w/ hand holes	146 102
80LMS NEW Laser Level System	532 365

AIRY AIR NAILERS	
Model Description	List Sale
02415K Brad Nailer 3/8" - 1 9/16"	180 96
02505K Brad Nailer 3/4" - 2"	296 164
02625K 1/4" Crown Stapler 3/8" - 1 9/16"	194 104
0545 1/4" Crown Stapler 3/4" - 1 9/16"	310 175

Above Nailers come w/case, fasteners, oil & wrenches
 0565T Angle Finish Nailer 1"-2-1/2" 386 205

PORTA NAILER	
501 Porta Nailer complete	295 209
501 Face Nailer complete	295 209

RYOBI SPECIALS	
RE600 3 HP Plunge Router	500 228
RE321 3x21" w/spd Belt Sander	310 148
AP120 10" Table Saw w/stand	1125 529
RE122 1/2" Bench Planer	884 389
OS540 Oscillating Spindle Sander	340 159
DC500 Detail Carver	120 65
HT205K NEW Multi Tool	115 59
CD125K 12V cordless Drill w/ 2 batt	175 109
CTH1442K 14.4V 3/8" Drill Kit	275 159

Msx6362 FEIN Triangle Sander w/spd	205
Msx625 FEIN New Air Triangle Sander	195
LPN672 PONY Air Palm Nailer w/glove	94.99
RTM01 RTM01 Drywall cut out unit	68.95

QUAL-CRAFT PRODUCTS	
2200 Pump Jack	79 58
2201 Pump Jack Brace	30 20
2203 Pump Jack guard rail holder	31 23
2204 Workbench & rail holder combo	53 39

PORTER CABLE	
9444 New Profile Sander Kit	220 119
7499 Ultimate Cut-out tool	119 69
97499 7499 w/ case & bits	150 89
600 1-1/2 HP Router 8 amp	278 142
90980 690 Router w/ steel case	309 159
9151 1-1/2 HP Router D-handle	303 158
9631 1-1/2 HP Plunge Router Base	338 184
6931 Plunge Router Base	139 79
695 1-1/2 HP Router/Shaper	418 235
696 Heavy Duty Shaper Table	238 135
351 3x21" Belt Sander w/bag	302 165
352VS 3x21" Belt Sander w/bag	321 165
360 3x24" Belt Sander w/bag	397 214
361 3x24" Belt Sander w/bag	377 204
362 4x24" Belt Sander w/bag	474 254

97751 1/2" w/spd Hammer Drill w/cse	212 115
NEW 3-1/4" Planer Kit w/ case	250 145
9118 Porta Plane Kit 7 amp	400 229
512 1/2 sheet Pad Sander	209 129
97549 Top handle Jig Saw 4.8 amp w/ case & blades	275 144
330 Speed Block Sander 1/4 sheet	120 65
556 Biscuit Joiner w/5565 fence	Sale 139
9345 6" Saw Boss 9 amp	207 114
9345 345 comp w/cse & carb bld	237 138
9647 TIGER CUB Recip. Saw	230 13

Color from Canada

At *WOOD*® magazine, we enjoy doing the research sometimes needed to answer readers' woodworking questions. William Skeffington of Markham, Ontario, Canada, sent us an especially interesting one.

He wanted to know the species of the brightly colored trio of wood samples (shown *top right*) he enclosed with his letter. "I get this wood from my place of work," he wrote. "It comes from Loudon, Tennessee, in the form of pallets." Bill salvages some of it for his wooden pictures (see the example *right*). He also was worried that the stock, because of its color, just might be toxic.

Given its U.S. origin, the wood wasn't hard to identify. It is tuliptree (*Liriodendron tulipifera*), or yellow poplar, as most woodworkers know it. And it's a popular pallet wood. In certain growing conditions, the normally whitish wood of yellow poplar becomes discolored by purple, black, and yellow streaks. Bill's samples are, however, the brightest of any the staff have seen. And this Canadian woodworker was relieved to find out his rainbow-hued stock wouldn't make him ill.

Nature did the staining on these pieces of tuliptree, also known as yellow poplar.

William Skeffington used all salvaged scrapwood for this humorous picture.

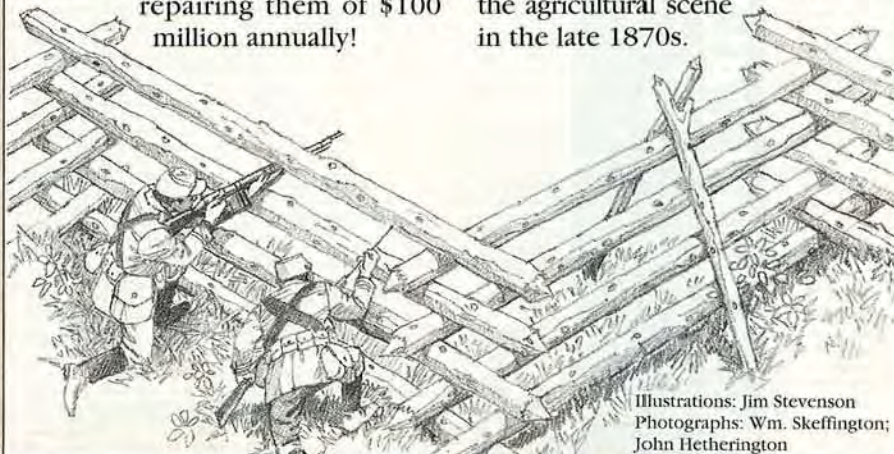


Fencing in with wood cost farmers millions

According to the late author and historian Eric Sloane, wooden fences built for the purpose of keeping livestock *in* were uniquely American. And valuable, too.

Following the Civil War, the U.S. Army inventoried the nation's fences because they had proved their worth for cover in battle. The final estimate was over two billion dollars' worth of wooden fences, and a cost for repairing them of \$100 million annually!

Farmers of the time didn't settle for any old wood for their fences, either. They preferred, in order, locust, cedar, chestnut, walnut (Yikes!), and white oak. If none of these decay-resistant woods were locally available, the fence cost went up because the stock had to be hauled in from a distance. No wonder barbed-wire fencing was so immediately successful when it appeared on the agricultural scene in the late 1870s.



Illustrations: Jim Stevenson
Photographs: Wm. Skeffington;
John Hetherington

Forest barber chairs aren't for haircuts

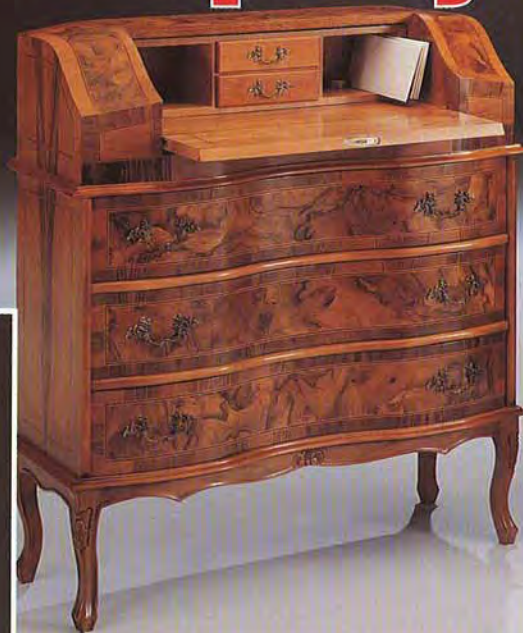
When a tree being felled by a logger splits up the middle from the cut, it becomes what they call a barber chair. The stump has a vertical chair back and seat. Some loggers also call the phenomenon a tombstone, because half of the butt kicks back dangerously.



Prizewinning plans

Professional craftsman and perennial Build-A-Toy® contest winner Mike Jagielo has decided to share more than his secrets to success (See "Build-A-Toy Winners Tell All...Almost," *WOOD* magazine, October 1996). In response to reader queries over the years about his remarkable pull toys, he's now made plans available for some of his past prizewinners. For information, drop a line with a SASE to: Mike Jagielo, 9965 Two Lakes Rd., Almond, WI 54909.♣

Your best projects



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When your work requires absolute precision and quality cuts, there is no substitute for the Freud LU85 -- at any price.

The LU85 produces a flawless cut that requires no sanding. It eliminates chipping and will improve the fit and beauty of your most demanding projects.

Only the award winning LU85 can give you this kind of performance, because no other blade is manufactured with the same care, strict tolerances and fine materials.

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The LU85 is a precision cut-off saw, ideal for your mitre saw or table saw, for the cutting of natural woods, low pressure laminates and mouldings.

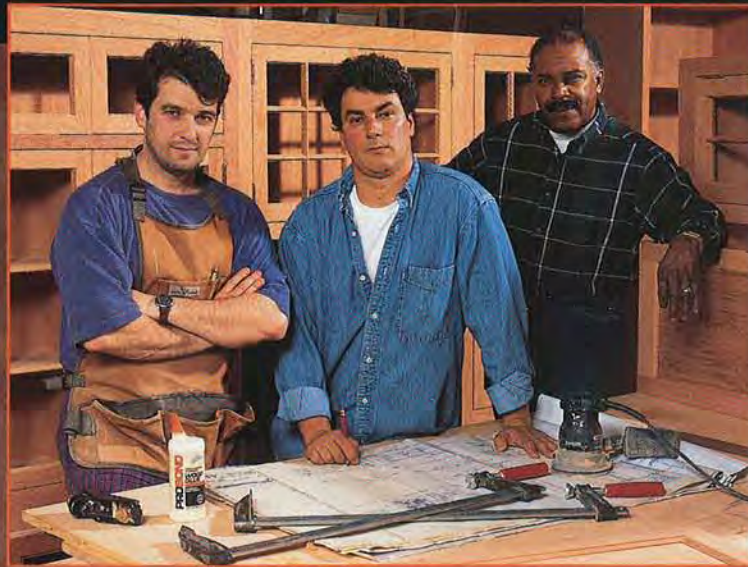
SIZE	TEETH	BORE
8"	64	5/8"
9"	72	5/8"
10"	80	5/8"
12"	96	1"
14"	108	1"
15"	108	1"

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Glue. Extensive field testing among professionals has confirmed ProBond's outstanding performance. In fact, among those expressing a preference, ProBond was rated higher in overall quality than the leading brand.

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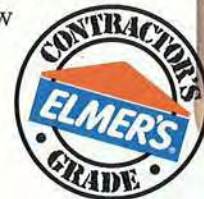
It pours easily. It's sandable and paintable. Plus it's resistant to heat and moisture.

New Bottle Works Great. ProBond's revolutionary bottle helps get the job done fast. The size and shape fit your hand perfectly. The offset spout delivers the right amount of glue right where you want it. Every time. Even in tight corners.

We even designed the cap and wide-neck bottle to be easy to open and easy to fill.

ProBond Wood Filler is as Professional as Our Glue. ProBond Professional Strength Wood Filler has a totally unique solvent formula. Dries fast. Won't crumble. Resists shrinking and cracking. It's easy to sand. It's stainable and available in colors that match most popular woods.

So next time you need wood glue or wood filler, step up to new ProBond.



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WOOD PATTERNS

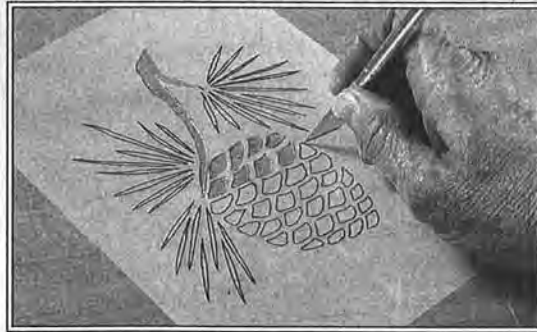
Full-sized for your woodworking convenience

NOVEMBER 1996

ISSUE 92

Dear Reader: As a service to you, we've included full-sized patterns on this insert for irregular-shaped and intricate project parts. You can machine all other project parts using the Bill of Materials and the drawings accompanying the project you're building.

- Stencil pattern
- Farm truck
- Routing patterns



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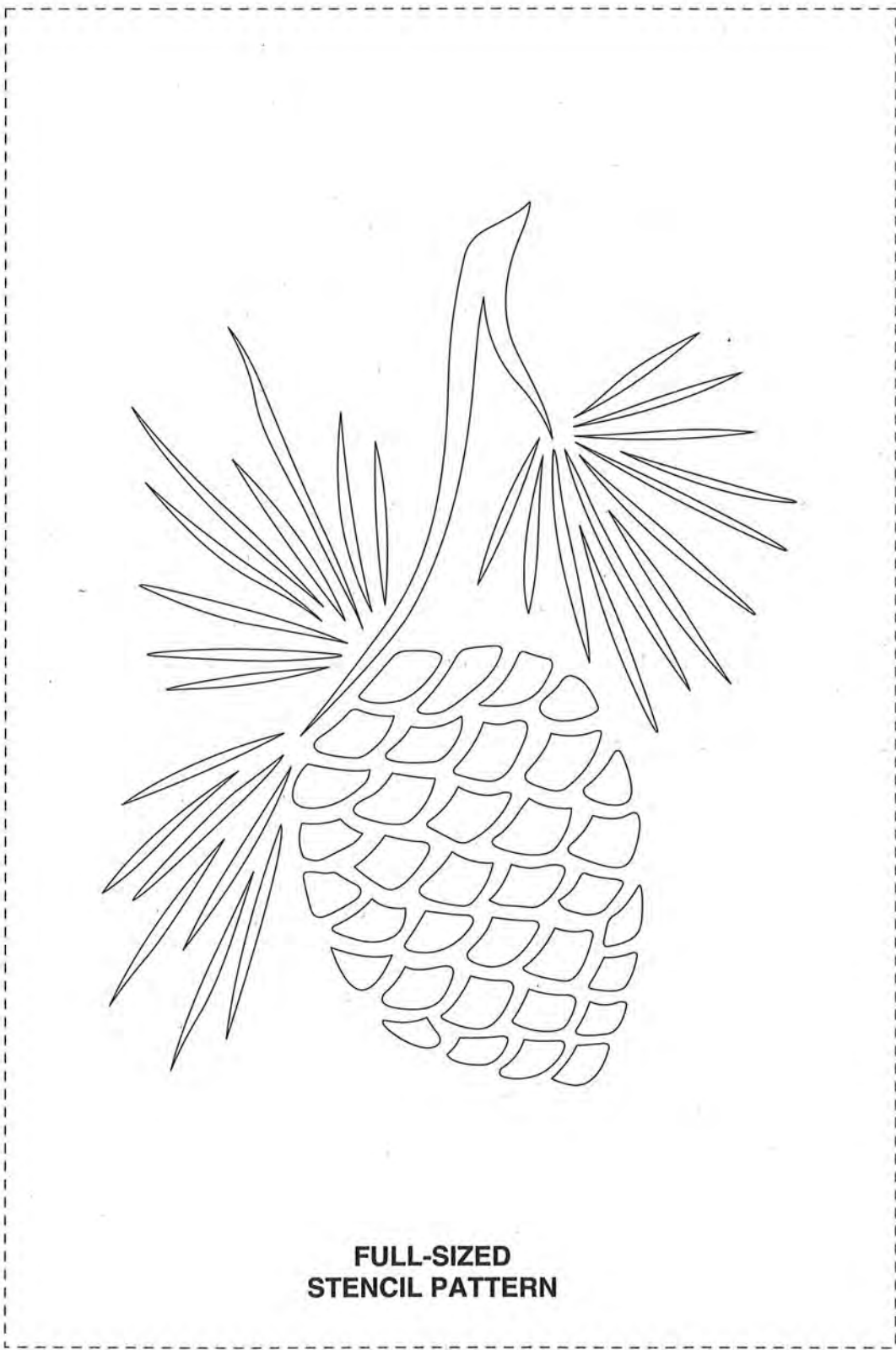


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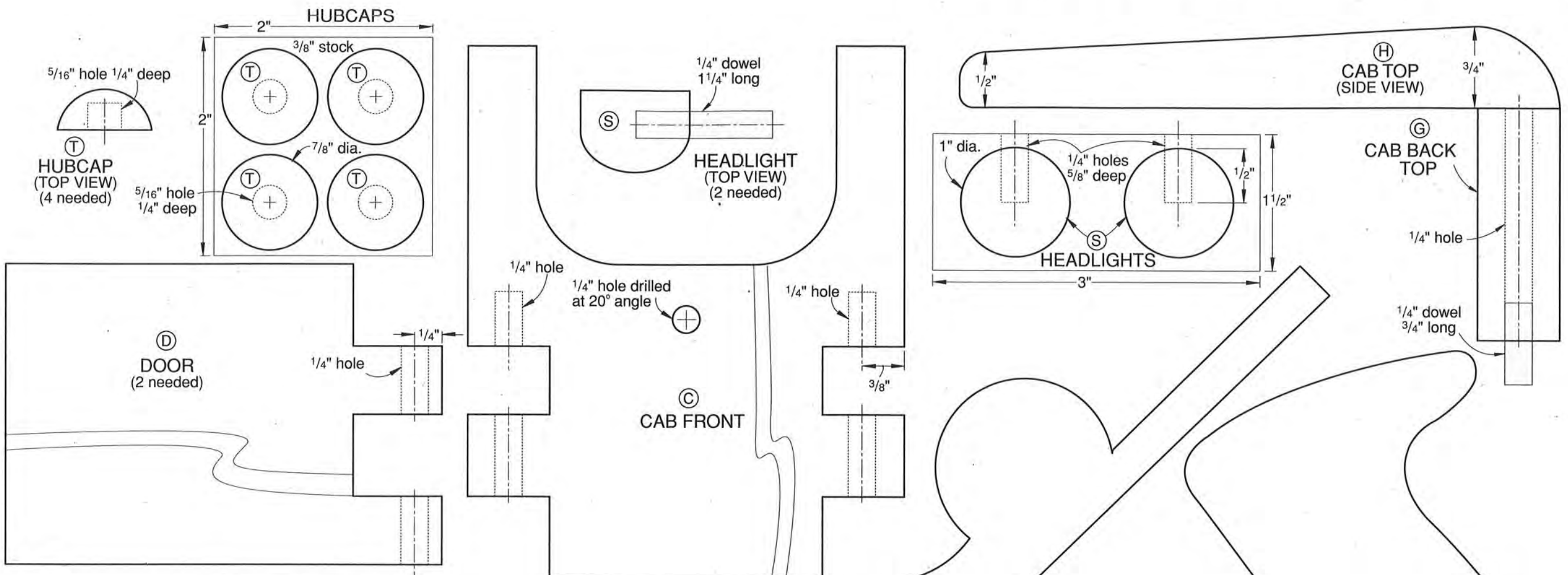


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FULL-SIZED STENCIL PATTERN

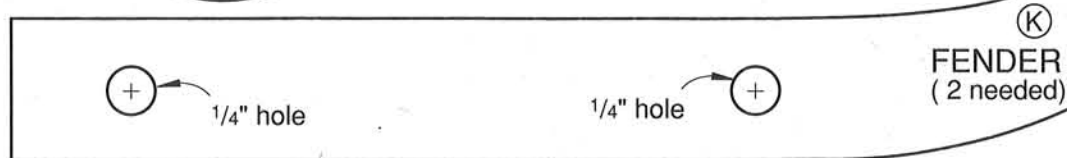


FULL-SIZED FARM TRUCK PATTERNS
(See other side for additional patterns)

FULL-SIZED PATTERN
FOR ROUTING TEMPLATE
(See other side for alphabet patterns)



FULL-SIZED FARM TRUCK PATTERNS



1/4" hole 3/8" deep drilled into bottom of rib, using holes in truck bed (E) as guides (Front rib only)

1/4" hole 3/8" deep drilled into bottom of rib, using holes in truck bed (E) as guides (Rear rib only)

1/4" hole 3/8" deep drilled into bottom of rib, using holes in truck bed (E) as guides (Front rib only)

