

Tool Test: Stationary sander and miter saw

WOODWORKER'S JOURNAL

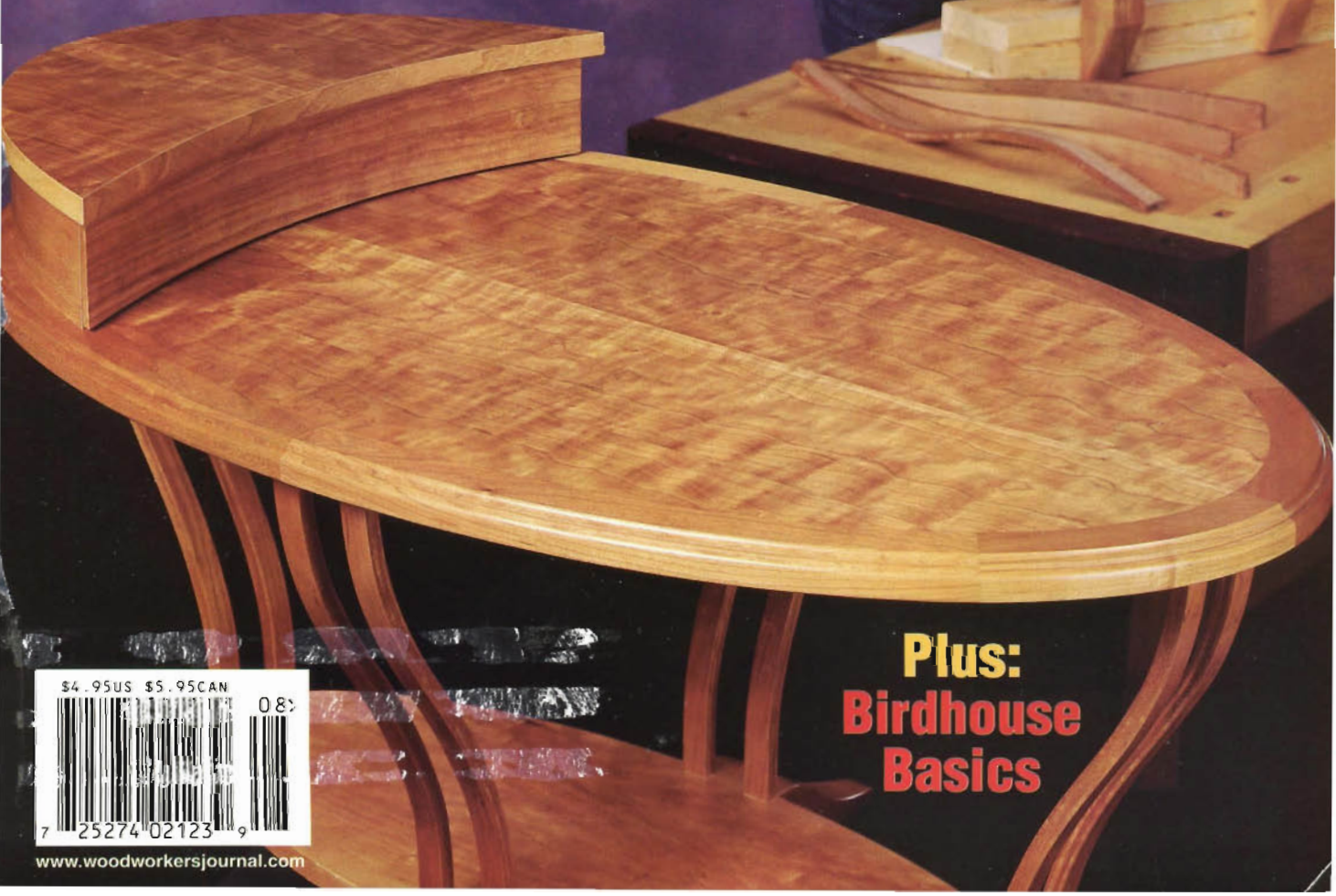
August 1999
Volume 23
Number 4

the magazine
for today's
woodworker

Oval Coffee Table

- Secrets of template routing
- How to lay out perfect ovals
- Shop Primer: dry bending made easy

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By John English

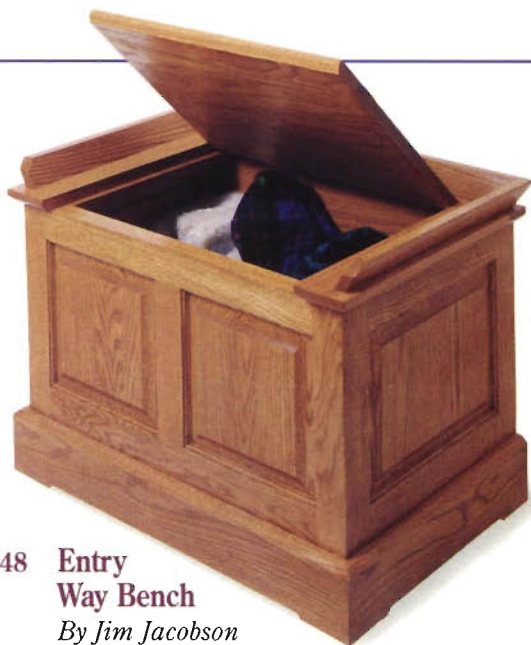
A weekend's work houses your feathered friends. Plus, a chart and special instructions help you build for the species you want to attract.



48 Entry Way Bench

By Jim Jacobson

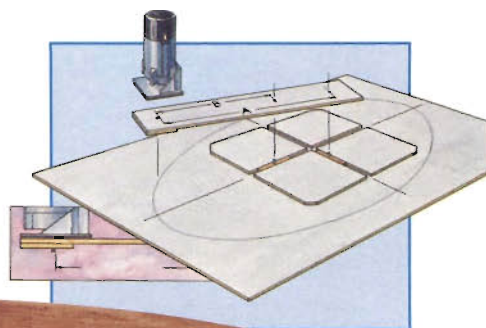
Stile and rail construction and a few raised panels elevate a simple little box to a classic — and quite handy — entry way bench.



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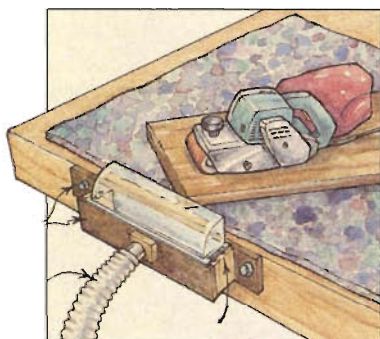
Your work is in our spotlight: and it's lookin' good!

Safety First

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



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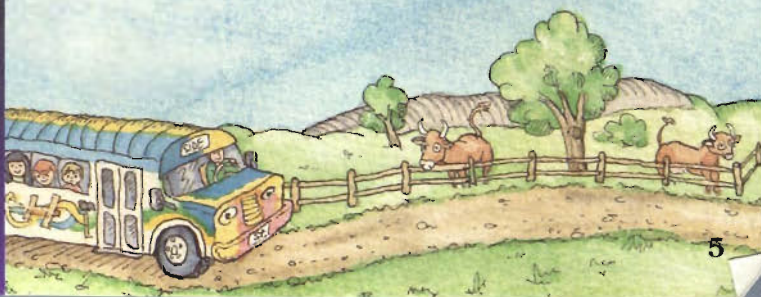
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Survey Says ...



Today's Woodworker:
This time it's our own Rick White — now in his tenth year as our top woodworker (see page 20).

The results of our first readership

survey since the merger of Woodworker's Journal and Today's Woodworker are in, and I thought you would enjoy a brief look at your fellow readers.

In a nutshell, you're men (92%) about 55 years old. About 90% of you own a home and two out of three of you went to college. A surprising 72% of you have access to the internet, up by a bundle since our last survey. After woodworking and home improvement, your next favorite hobby is fishing, but it lags by a considerable margin.

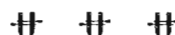
On average, you've been actively woodworking for twenty years and most of you rate your skill level between intermediate and advanced. Close to 90% of you have access to a workshop (583 square feet, on average) and you spend about eleven hours woodworking each week. It's not a cheap hobby: you spent, on average, \$1500 last year on tools and materials.

When it comes to our contents, most of you agree: you'd like to see

more articles on techniques, finishing and shop fixtures. Most of you prefer furniture projects over smaller projects but when it comes to styles it's a mixed bag, with Early American leading the pack. On average you built 10 projects in the past 12 months and, I'm proud to say, about half were based on plans from Woodworker's Journal.



Of course, we're not done surveying — it's an ongoing process around here. If you were missed during our big survey, don't despair; I've decided to place an instant survey in every issue, starting with this one. Check out page 67 and use the product information card to let us know how you like the projects in this issue. (And while you're at it, feel free to request info on any of our advertiser's products — it's a free service.)



Would you like to win a shop full of Ridgid power tools? To enter our contest (see page 13), all you have to do is send in your choice for the **Woodworker of the 20th Century**. And to make it easy for you, we've added a nomination box to the card between pages 66 and 67. Send in your nomination today!



Yesterday's Woodworker:
Benjamin Randolph, Woodworker of the 18th century, is featured in this issue on page 12.

Photo courtesy of Philadelphia Museum of Art.

Larry N. Storken

AUGUST 1999

Volume 23, Number 4

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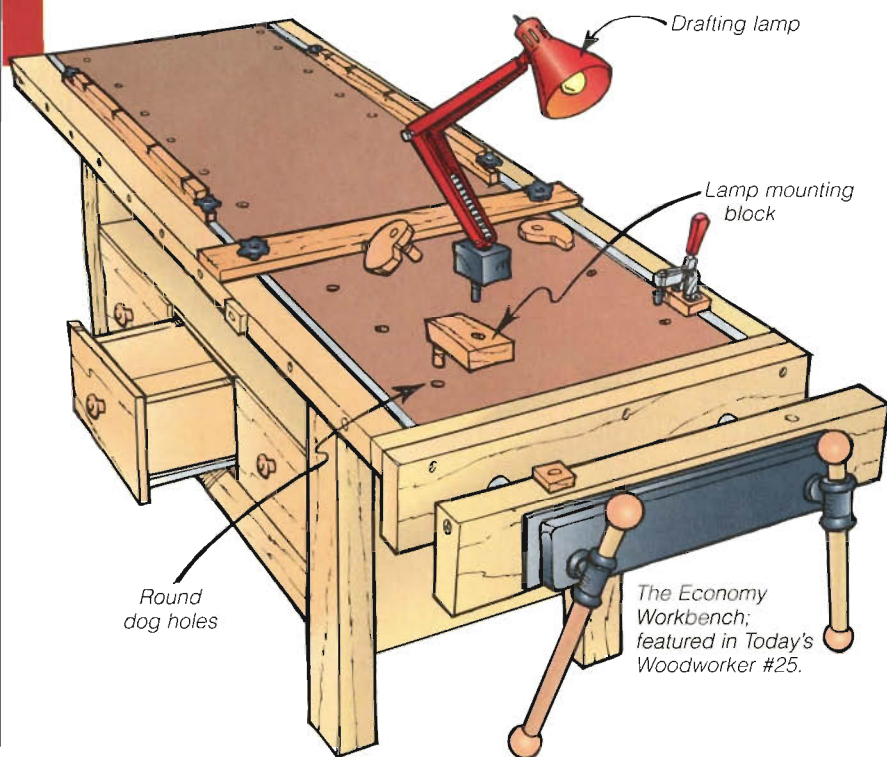


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Magnetics, Our Readers' Shop Secret



Inexpensive Holder for a Draftsman-style Lamp

Here's an idea I developed when I needed plenty of light for a small part I was sanding, and it works quite well with any workbench equipped with dog holes. Just take a piece of 2 x 4 stock and drill two holes several inches apart, one to fit the dog hole and one the size of the lamp base. To attach the board to the workbench, just slide a dowel through the 2 x 4 into the dog hole.

*Harold A. Hubbard
Berkeley, California*

Magnetic Tool Holder

I have several stationary woodworking tools, and they all seem to require different tools to change bits, blades, etc. I keep the right tool with each machine by using large magnets from old speakers. By simply sticking the magnet to the tool stand (and the

tool to the magnet) the wrench, Allen key, or whatever is always right where I need it.

*Richard Irvine
Gibsons, British Columbia*

Visit Your Local Machine Shop

I bought an old table saw at a garage sale for \$10. This saw was a Delta-Rockwell that no longer had a working motor. I took the table top (cast iron) to a machine shop to be modified to fit my Makita router. The bottom was milled flat and the upper surface was equipped with properly spaced countersunk mounting holes.

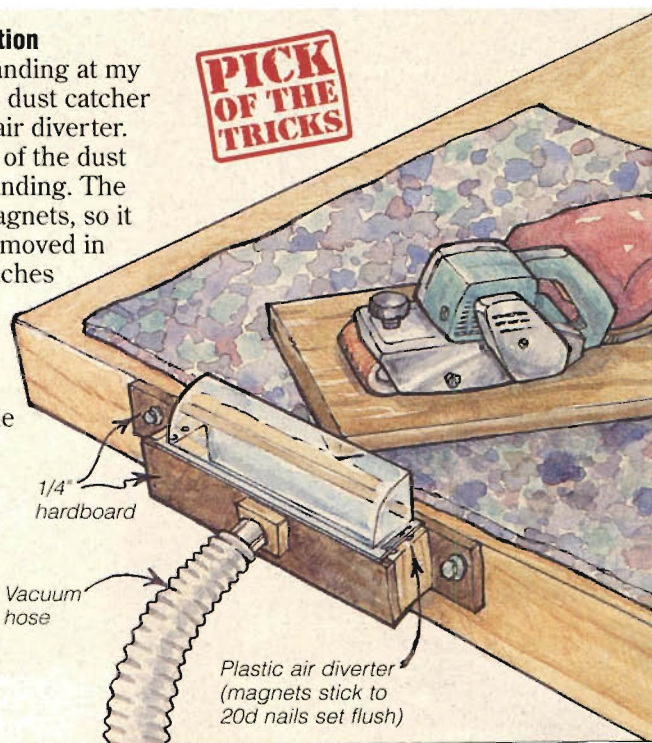
They then made a lipped hole in the middle of the top to receive a 2 3/4" diameter insert. I had them make three steel circles (with 1/4", 1/2" and 3/4" holes in their centers) of the proper thickness to be used as insert plates. Now I can easily switch plates depending on which router bit I choose to use. The adjustable fence that came with the saw works perfectly with the router as well, requiring no modification. The cost of the machining was \$85, so for a grand total of \$95, I have the best router table ever!

*Paul Dachel
Wisconsin Rapids, Wisconsin*

Inexpensive Dust Collection

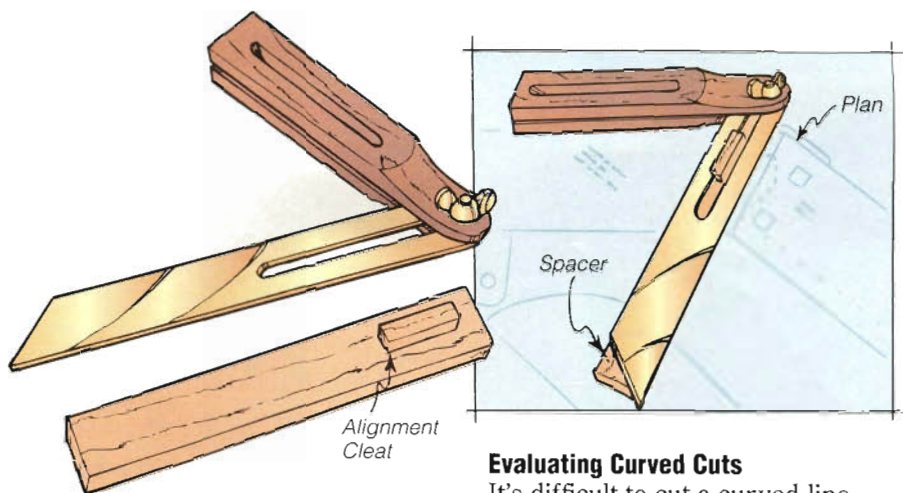
To collect dust while sanding at my workbench, I devised a dust catcher from a plastic register air diverter. It captures a good deal of the dust that spews out while sanding. The diverters come with magnets, so it can be mounted and removed in seconds. The hood attaches to a small box I incorporated onto the side of my workbench. The ends of the box have a couple of 20d nails for the magnets to grab hold of strongly.

*R.B. Himes
Vienna, Ohio*



Sliding T-Bevel Tip Keeps Transfers Accurate

When I needed to transfer angles from a plan to my workpiece, I found I sometimes lost accuracy because the two parts of the sliding T-bevel would not lie flat on the paper. To resolve this, I made a very simple jig consisting of a rectangular piece of hardwood to serve as a spacer between the bevel blade and the work surface. The spacer is the same width as the bevel blade and has a thickness which keeps both parts of the bevel flat on the drawing. An alignment cleat, which makes a snug but sliding fit in the blade slot, keeps the spacer strip aligned with the blade. To assemble the jig, I temporarily clamped the spacer strip on the blade, then secured



the cleat in place with a couple of dabs of epoxy.

To use, I install the jig on the bevel, place the combination on the plan and adjust for the angle. I then remove the jig from the T-bevel and transfer the correct angle to the workpiece. An accurate angle is virtually guaranteed.

*Bob Kelland
St. John's, Newfoundland*

Evaluating Curved Cuts

It's difficult to cut a curved line perfectly and, if you have cut away your mark, it's even more difficult to find exactly where the irregularities are. Try stretching a thin piece of band steel or even an old band saw blade around the curve. The exact position and severity of any irregularities will become immediately apparent.

*Michael Burton
Ogden, Utah*

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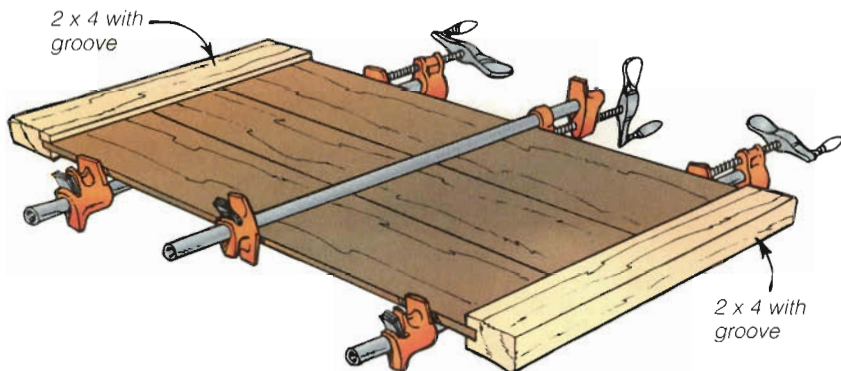
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Keep Panels from Buckling

I would like to suggest this method of keeping thin panels from buckling when glued and clamped. I plow grooves into a couple of 2 x 4s (or whatever is handy) to make custom end caps. Make the grooves the same dimension as the thickness of the stock you're gluing and slip them over the ends. I haven't had any problems with the caps ending up glued to the stock.

William P. Nichols
Ravenna, Ohio

Magnetic Catches for Small Boxes

Recently, a friend asked me to make a box for his fine Irish flute. It needed to be free of outside projections, including hinges. Setting magnets into the box to secure the lid properly was my solution. I chopped three opposing mortises in the top and bottom edges of the box and epoxied the magnets in place. A strong and simple solution.

Willard Anderson
Chapel Hill, North Carolina

Winner! R.B. Himes will receive a Makita LS1220 12" compound miter saw for submitting this month's Pick of the Tricks. **Woodworker's Journal** will pay from \$50 to \$150 for all Tricks of the Trade published. In addition, the reader whose trick is selected as our "Pick of the Tricks" will receive a free tool. To join in the fun, submit your original, unpublished trick to the editor. Include photos or drawings needed to explain your idea. Send all tricks to **Woodworker's Journal**, Dept. T/T, P.O. Box 261, Medina, Minnesota 55340. E-mail: editor@woodworkersjournal.com.



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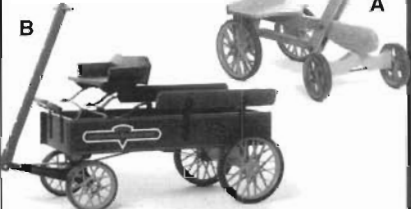
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Official Rules. Names are automatically entered with receipt of the postcard reply card. No purchase necessary. To enter without purchase, print your name, address and phone number on a postcard. Send to: WOODWORKER'S JOURNAL Delta Sweepstakes, 4365 Willow Drive, Medina MN, 55340. One entry per household. Entries must be postmarked by 3/15/00. No responsibility is assumed for lost, late, incomplete, illegible or misdirected entries. The Delta Sweepstakes is open to all legal residents of the United States 18 years of age or older at time of entry. Winners will be selected in a random drawing and will be notified within 30 days from deadline and may be required to complete an affidavit of eligibility and release, allowing Woodworker's Journal to use the winners' names for publicity, except where prohibited. Prize winners must respond within 30 days of notification or the prize will be forfeited and an alternate winner selected. All decisions are final. All prizes will be awarded. No duplicate prizes and no substitutions other than as necessary due to availability. Prizes may not be redeemed for cash or other consideration. Taxes are responsibility of the winner. Odds of winning dependent on total entries received. Sweepstakes open to residents of the U.S. only. All federal, state and local laws and regulations apply. Void where prohibited or restricted by law. Employees (and their families) of Rockler Companies Inc., Delta International Machinery Corp., and their affiliates are not eligible. For winners' names, send a self-addressed, stamped envelope to WOODWORKER'S JOURNAL Delta Winners, 4365 Willow Drive, Medina MN 55340 by June 1, 2000.



Chaise longue gains popularity

Birth of Cesar Chelox, first documented African-American toolmaker

Repeal of British tariff ushers in "Age of Mahogany"

Benjamin Randolph: Woodworker of the 18th Century

By Joanna Werch

Choosing one woodworker from "the golden age of cabinetmaking" was no easy task — especially when you consider that Philadelphia alone offered enough choices to start an argument or two.

Eighteenth century Philadelphia was both the birthplace of American independence and a primary stage for an exciting period in the history of woodworking. Benjamin Randolph, a prominent cabinetmaker working under the Sign of the Golden Eagle, managed to play a pivotal role in both achievements — and, in so doing, introduced American craftsmen to what came to be called the Federal style of furniture making.

Born in 1721 into a Quaker family, Randolph didn't leave much record of his youth. He did own a New Jersey sawmill with his brother Daniel: a handy resource for a budding young woodworker. Benjamin also served as an apprentice to Philadelphia joiner John Jones — or at least paid him



Photo courtesy of Philadelphia Museum of Art

Benjamin Randolph ran one of the more successful woodworking shops in 18th century Philadelphia.

rent in 1763. And it's likely that an inheritance from his father-in-law, who died that same year, helped him along the road to success. By 1764, he was buying 18th century status symbols like a horse and bridle, a cow and guns — and receiving deliveries of cedar boards.

At first, Randolph seems to have concentrated on house joinery and other carpentry work. The cabinetmaking enterprise developed as he slowly got acquainted with the right crowd. Like John Jones, Randolph was a member of St. Paul's Episcopal Church. So was Plunket Fleeson, an upholsterer who was the City of Brotherly Love's first promoter of the easy chair. Fleeson covered several chairs from Randolph's shop.

That shop developed during the 1760s. Randolph opened his doors at a Chestnut Street location in 1767, the same year he started calling himself a cabinetmaker. He'd already been working out of other locations for a couple of years, becoming a shop foreman overseeing apprentices and carvers.

Two of his carvers, Hercules Courtenay and John Pollard, had recently arrived from London and were probably working off their travel debt as Randolph's employees. Their luggage could have contained some of the influential design books of the day, like Thomas Johnson's *Book of Ornaments*: Randolph used some of its elaborate furniture images on his business cards.

Of course, the hottest selling woodworking title of the 18th century was Thomas Chippendale's *Gentleman and Cabinet Maker's Director*. Whether Randolph's employees brought a copy over on the boat or he borrowed the one belonging to Philadelphia's lending library, Randolph certainly had access to this important work. The pieces referred to in his advertisements for "all sorts of cabinet and chair work" during the 1760s and '70s were, for the most part, in the "Philadelphia Chippendale" style.



National Museum of American History, Political History Collection

The lap desk Randolph made for Thomas Jefferson is the piece credited with introducing American woodworkers to the Federal style.

c. 1725

Windsor chairs originate near England's Windsor Castle



1754

Thomas Chippendale publishes *The Gentleman and Cabinet-Maker's Director*

c. 1760s



John Goddard develops blockfront furniture in Newport, Rhode Island

1765

"Age of Satinwood" replaces "Age of Mahogany" in England

This American version of the Chippendale style mixed elements from the *Director* with those portions of earlier English styles that American woodworkers (and their customers) liked. It kept the classic structural lines of Georgian furniture from the 1730s and the S-shaped cabriole legs of the Queen Anne style — popular earlier in that century.

On top of these structural elements, Randolph and his colleagues added ornamentation in the Chippendale rococo style: free-flowing, asymmetrical items, often from nature. Generally, these "extras" showed up in carvings.

Sometimes, Randolph put carvings of swans on his furniture



Courtesy, Winterthur Museum

Randolph's Philadelphia Chippendale style combined cabriole legs and rail and splat carvings which emphasized curves.

— incorporating two important stylistic trends of the day, the free-flowing rococo ideal from Chippendale and the "line of beauty" curve from the Queen

Anne style. Randolph was also partial to carved finials: he and his shop produced them in the shape of flames, urns and busts, generally of 18th century heroes like Benjamin Franklin. Most of Randolph's pieces also had carved ball and claw feet, with the claws modeled after talons on American birds of prey. Although such feet were out of style in England, they were still popular in America.

Randolph made a good living selling his Philadelphia Chippendale pieces to wealthy customers. Political changes were afoot, however, that would impact his business and his style.

continues on page 14 ...

New Tools for a New Millennium!

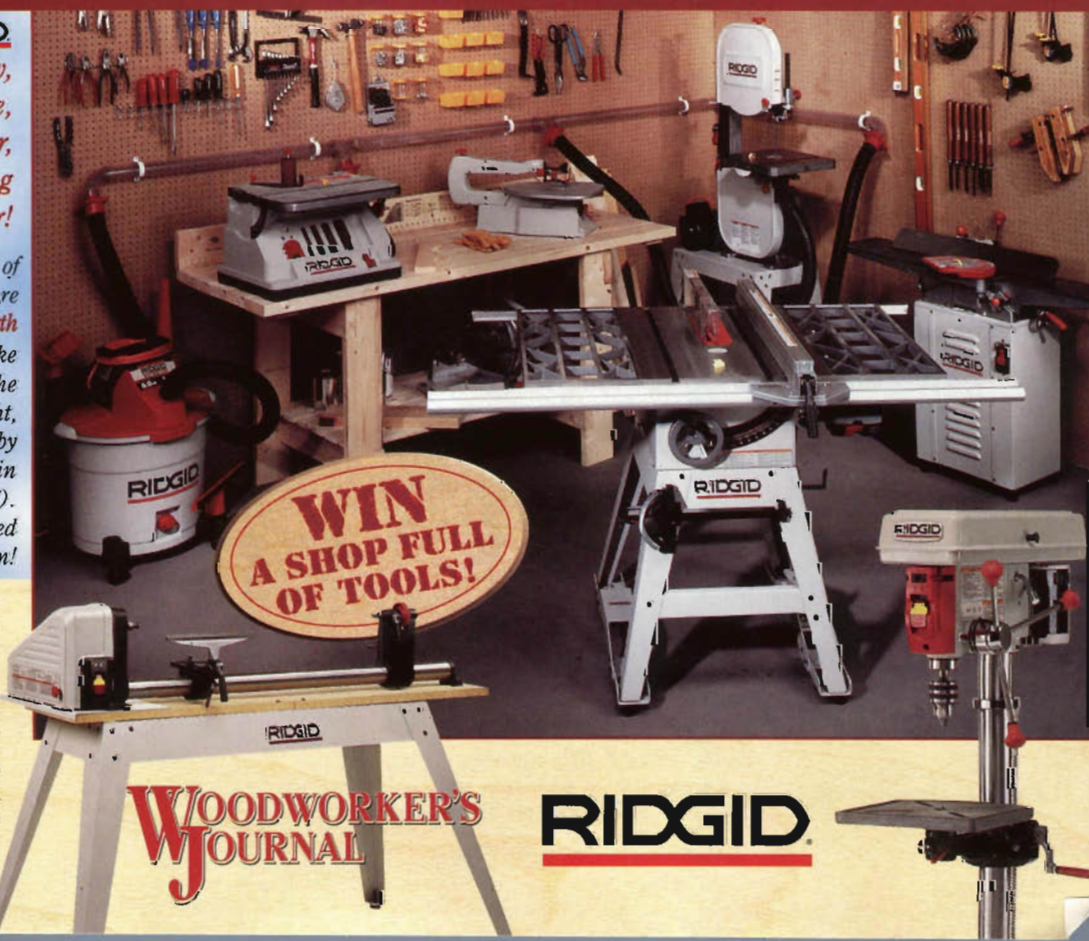
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The December issue of *Woodworker's Journal* will feature the *Woodworker of the 20th Century*, and you can help us make the selection! For a chance at the eight Ridgid tools pictured at right, send us your nomination by **October 1, 1999** (use the mail-in card between pages 66 and 67). Important: Your nomination need not win for you to win!

Official Rules No purchase necessary. One entry per household. Entries must be received by 10/1/99. Winner will be selected in a random drawing and will be notified within 60 days from deadline. All decisions are final. All prizes will be awarded. No duplicate prizes and no substitutions other than as necessary due to availability. Taxes are responsibility of winner.

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WOODWORKER'S JOURNAL

RIDGID

1775

American Revolution interrupts supply of mahogany from West Indies; bilsted (from American gum trees) is a substitute



1788

George Hepplewhite's The Cabinet-Maker and Upholsterer's Guide published posthumously

1790

Thomas Sheraton's The Cabinet-Maker and Upholsterer's Drawing Book published

... continued from page 13

While the Continental Congress met in Philadelphia, Thomas Jefferson was a houseguest of Randolph's. In May 1776, he paid for the construction of a lap desk. The wood, mahogany, was typical of Randolph's earlier pieces. The style was new: the desk is the first documented example of American neoclassical furniture. Its simple, delicate lines introduced American woodworkers to what became known as Federalism.

Instead of curves, Federalism emphasized straight lines. Ornaments weren't bold, like the carving on Chippendale-style pieces; they were in a fine scale, like the satinwood inlay banding around the desk's front drawer.

American woodworkers in several cities were quick to adopt the style, and it was the overwhelming choice of their customers for several decades. The American eagle soon became a common Federal ornament. The symbol of the young United States was certainly appropriate for a furniture style which developed without the previous eras' strong

English influence — the Revolutionary War interrupted regular contact between America and England.

Randolph's desk ended up playing an important role in the fight for freedom: Jefferson used it to write the Declaration of Independence. As for Randolph himself, he played host to Jefferson and to George and Martha Washington while they traveled to army camps before signing up himself. During the war, Randolph served as a dispatch carrier for Washington.

When peace came, Randolph sold his shop and retired to New Jersey, where he had bought his brother out at their sawmill. He died in 1791 and was buried at Philadelphia.

Some of Randolph's sample chairs descended through his second wife's family; other pieces from his shop stayed in the hands of his customers and their descendants.

Randolph used his own hands to translate the theories of designers



Photo courtesy of Philadelphia Museum of Art

Descendants of Randolph's wife kept this easy chair — the mask on the apron came from an 18th century design book.

like Chippendale into reality. The founding father of American Federalism, he played a critical role in the evolution of American craftsmanship — Randolph was one of the first furniture makers to harness the spirit of nationalism. For these reasons and more, Benjamin Randolph is our selection as the woodworker of the 18th century.



The mahogany Randolph used in this pair of card tables was the popular wood of the 18th century; Americans also liked the ball and claw feet. They are a stunning example of furniture developed in the 1700s.

Photo courtesy of Philadelphia Museum of Art



1791
Clearing average Pennsylvania farm requires cutting 6,000 trees

1799
Foot-powered jig saw patented



1800
To be continued ...

18th Century: Names that Echo Through the Ages

In the woodworking world, the 18th century boasts some major names. Two centuries later, the people who published furniture design books between 1750 and 1800 still seem to be getting most of the recognition.

The most well-known name from the era is probably **Thomas Chippendale** (1718 - 1779). Recent research suggests, however, that Chippendale himself merely published designs created by his employees — and didn't build furniture, either. His book, *The Gentleman and Cabinet-Maker's Director* of 1754, was a compilation of stylistic influences



A favorite ornament on Adam chairs was the lyre, which the ancient Greeks had also used as decoration.

popular at the time: the free-flowing rococo which had begun in France, where it took its name from rock gardens; the Oriental influence British traders brought back from China, along with the tea that sparked the idea for tea tables; and the pointed Gothic arches which were the 18th century romantics' idea of what the Middle Ages should've looked like.

Scotsman **Robert Adam** (1728 - 1792) did inspire the British movement toward neoclassical

Hepplewhite is best known for chair designs featuring the distinctive shield back.



furniture — although his focus was mostly on architecture. Adam got his ideas for bringing back ancient Roman and Greek designs “the right way” after spending time at the Pompeii and Herculaneum archeological digs. In 1773, he published *Works in Architecture* with his brother James.

George Hepplewhite (unknown - 1786) read their book and collaborated with the Adam brothers to make furniture in a simpler version of their taste. His own book, *The Cabinet Maker and Upholsterer's Guide*, was another collection of designs in use at the time — 1788, when his widow, Alice, had it printed posthumously.

Thomas Sheraton (1751 - 1806) gathered fame by collecting Adam-style designs and printing them in *The Cabinetmaker and Upholsterer's Drawing Book* of 1790. He was working on an encyclopedia for cabinetmakers, but only got up to the letter “C” before he died.

All of these 18th century craftsmen spread their influence through their books, but it's hard to call

Sheraton's chair backs were rectangular or square, with the splat and banisters supported on a crosspiece.



some of them woodworkers. They were contenders in the selection process, but unlike Benjamin Randolph, they weren't inclined to actually make sawdust.



Chippendale's book actually reflected a variety of styles: the most well-known, center, relied on rococo curves. Interest in the Gothic era (left) and the Orient (right) inspired other designs.

Painting in Wood & Other Pastimes

By Joanna Werch



American marquetry makers liked to express their patriotism through their craft, as in the tribute to three martyred presidents shown at left. The Museum of American Folk Art recently recognized the American contribution to marquetry by hosting a show, adding several pieces to the permanent collection and covering the craft in its magazine.



Pieces from the Past

American Marquetry

Marquetry, often considered the exclusive province of European artisans, has sometimes been called "painting in wood."

If that's the case, the Norman Rockwells among American marquetry makers are finally getting recognition: the Museum of American Folk Art in New York City recently accepted several pieces for its permanent collection and hosted a show on the art form.

"I like this focus on Americans, particularly because these

were people who truly loved the craft," master marquetry maker Silas Kopf told us after the show. The European marquetry makers were businessmen who made a living selling to the upper classes. America democratized the art. It didn't require fancy tools — just a saw, glue and lots of time — so it was accessible to 19th century immigrants. Of course, few people could afford to pay the actual value of the pieces, so they often ended up as priceless gifts or personal mementos, typically focusing on patriotic or religious themes.

Now that their work is finally gaining recognition, we asked Kopf

about the current state of marquetry. "I think it's an obvious evolution in terms of this generation of woodworkers getting involved," he said. "Twenty years ago, they were spending a lot of time learning how to make dovetails and other joints. Now they want to expand and do things more involved. I look at marquetry as being the high-water mark of decorative woodworking."

The Museum of American Folk Art looks at it as a fascinating artistic medium, and they've published a book for those who want to learn more about the American experience with this craft. You can get in touch with them at 212-595-9533 or <http://www.folkart.muse.org>.



The creator of the clock (above) used inlaid figures to represent the fleeting nature of time. Tidus Albrech of Missouri made the cabinet at right to commemorate the Statue of Liberty dedication.



Tools and Tots

TV Teaches Woodworking

Bob Villa. Norm Abram. Mr. Peabody. Put them together, and you get Homer, of *Homer's Workshop*. He's Home Depot's cartoon mascot come to life to teach kids about woodworking.

In the TV show's first year, Homer and his young helpers have built a bunch of cool kid stuff, like a lemonade stand, a soap box derby car and a gumball machine. It's basic woodworking for the six- to 12-year-old set. Homer (known to some adults as actor Harold McPherson) leads the kids through projects and takes them on related woodworking field trips.



Homer and his TV helpers build projects kids like. (Believe it or not, the cartoon Homer existed before the live version.)

His web site has a glossary of woodworking tools and a safety quiz that lets little Taylor and Jordan win a prize if they answer correctly. Punching in your zip code also tells you when the half-hour TV show airs in your region. It's syndicated to basic cable channels across the U.S. and Canada.

The kids in your life can check out Homer's Workshop at <http://www.homersworkshop.com> or call his hotline at 888-566-2229.

Little Guy Exits After Big Performance

Gary Green is a little guy who took a simple idea and made it big. The Performax founder built up his horizontal surface sander company so well that industry big guy JET Equipment and Tools came courting.

It all started when Gary took a woodworking class and learned how handy — and expensive — wide belt surface sanders were. He made a prototype drum sander,

and he and his wife Donna started Performax to sell it.

In 1992, they introduced their model 16-32. "At one time, I think we had back orders for nearly

a thousand of these models", Gary said. "It took us from a nice lifestyle business to a more profitable situation," Donna added.

They welcomed the JET buyout. "It was a logical consequence of the growth strategies of both companies," JET President Robert Skummer said. JET gets a new and exciting line of tools; Performax keeps its name and U.S. construction — and the little guy gets to join the big leagues.



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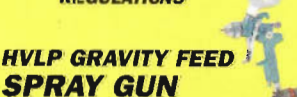
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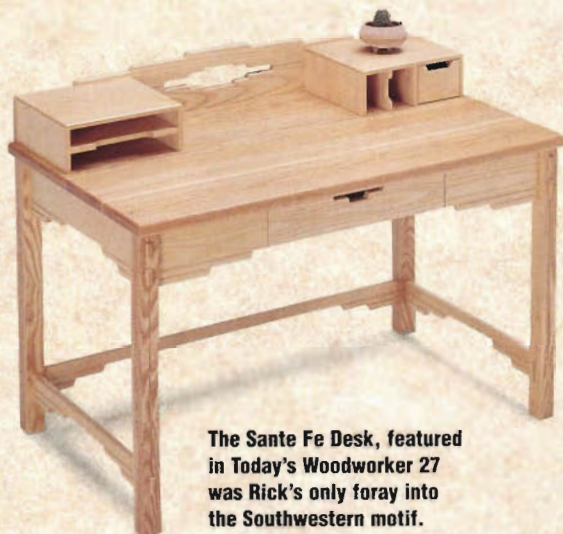
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That Old White Magic

By Joanna Werch



The Sante Fe Desk, featured in *Today's Woodworker* 27 was Rick's only foray into the Southwestern motif.

I can't imagine not doing woodworking," says Rick White.

For this Minnesota native, working with wood is both his job and his hobby. "There was a period of time when I was working all day in the shop ... and then I would go home and work in my own shop a little more," Rick said.

At home, his shop has displaced two cars (in spite of some pretty



"Projects for kids are the best," Rick says; "they never complain!" His Lego Center was featured in *Today's Woodworker* 14.

rugged winters). At work, his shop is the same one that produces many of the projects featured in *Today's Woodworker* and now the *Woodworker's Journal*.

Rick's interest in woodworking dates back to his childhood, when he helped his dad with remodeling projects and rebuilding a wooden boat. By high school, Rick was taking shop classes regularly — and was asked if he'd like to participate in a work program that would let him spend afternoons



"I can go out to the shop at six in the morning and the next thing I know, it's dark outside. I just get lost in the process."



The Grandfather Clock from the last issue of *Today's Woodworker* 57 was Rick's favorite project.

filling orders at The Woodworkers' Store warehouse. "It was," he recalls, "like asking a little kid if he'd like to work in the local candy store."

When the company decided to start selling project kits, Rick volunteered to make the first one: a checkerboard created from cut squares of veneer. One thing led to another, and he became more and more involved with woodworking on the job, especially once *Today's Woodworker* magazine set up shop on the premises in 1989. Rick was included in the very first issue, with a small sliding dovetail bookshelf. He has been a contributing editor and mainstay of the magazine ever since.

"Like most of our readers, I learned by trial and error," Rick said. He talked to other woodworkers about their solutions to various problems and learned that several "right" answers almost always seem to exist. These days Rick uses a sophisticated CAD system



The chessboard from *Today's Woodworker* 48 took Rick back to his woodworking roots.

for drafting purposes, but it's not always his starting point. "People tend to scribble out their ideas on a napkin and say, 'Can you make something like this?'" Rick said.

For his personal customers, he tends to do a lot of cabinetry, but his most interesting projects have been for the pages of the magazine. Out of the many projects he's completed for *Today's Woodworker* and *Woodworker's Journal*, Rick said the Stickley-inspired grandfather clock in the last issue of *Today's Woodworker*, before the merger, was probably the most fun to make.

Rick also built a beautiful Stickley-style hutch in the September 1994 issue of *Today's Woodworker* and matching chairs in the April 1999 issue of *Woodworker's Journal*, but he's never restricted himself to one particular style. His own furniture is "an assortment," he said: "I build whatever appeals to me. Like most woodworkers, I have a stack of

project ideas a foot high I'm going to do 'some day.'"



Rick is working on a table to match the Arts & Crafts style chairs from the April 1999 issue.

A good number of those sketches can be traced back to meetings with the *Woodworker's Journal* design team. "It's nice to talk shop with the artists here, because they're also woodworkers," he said. "In a matter of minutes they take an idea from your head and make a drawing of it." And the feeling is mutual, according to art director John Kelliher; "We call it White magic," he says.



Cover boy: Rick has graced our covers three times; first in January, 1990 and most recently in the December '98 issue. His clamping station from January 1995 was one of our most popular shop fixtures.

"Rick takes a quick sketch, works his way through a pile of cross-grain issues, solves impossible joinery requests and invents applications for hardware that didn't previously exist."

Rick's Walnut Book Shelves from *Today's Woodworker* 52 featured fluted stiles and carved rosettes.



It had an ironic title, but Rick's Shaker Vanity Mirror, from *Today's Woodworker* 41, was a big hit.

When he's working with any project, "Time goes by fast for me," Rick said. "I can go out to the shop at six in the morning and the next thing I know, it's dark out.

"I just get lost in the process."



WOODWORKING ON A BUS

By Natalie Cosby

For many school-aged children, woodworking is a dying art. But in southern California, a pair of professionals — one a woodworker, and one an artist — have started a literal “drive” to keep the art alive. Instead of students taking a bus to class, the woodshop class is bused to them.

Why a Woodworking Program?

The founders of Side Street Projects, a non-profit arts and educational organization in Santa Monica, California, watched as schools across the country cut their arts programming — and their woodshop classes — in favor of computer courses.

Joe Lutrell and Karen Atkinson worried that high technology was replacing hand technology in the schools. Joe, a professional woodworker, and Karen, a renowned installation and public artist, gave themselves the mission of creating an educational, enriching children's

woodworking program which utilized “hand technology.”

Despite cuts in budgets and classes, they figured there was one thing schools still had in plenty: asphalt. With a mobile workshop, they could travel to schools — or just about anywhere — and teach woodworking classes.

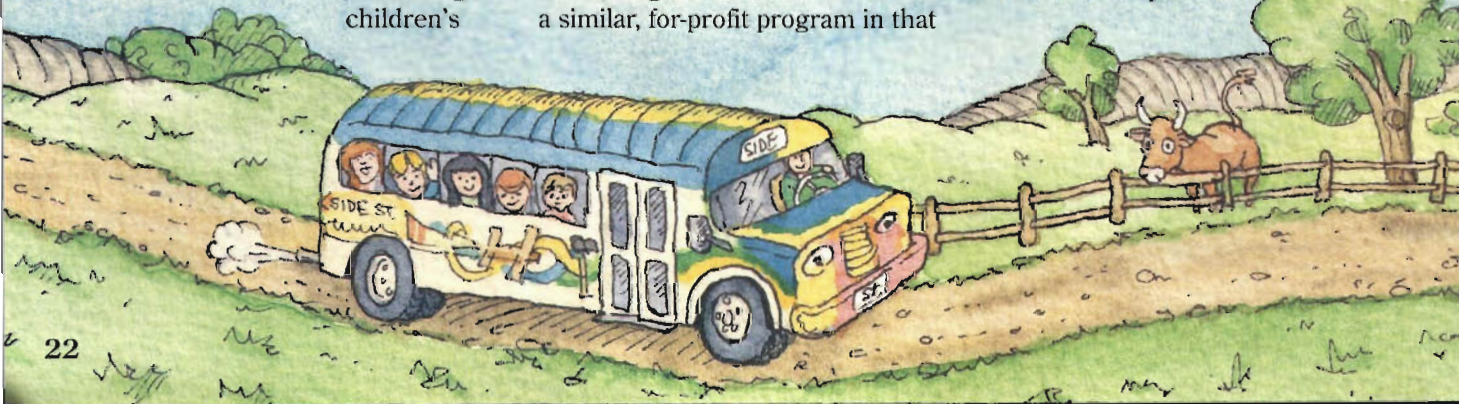
The Bus as a Workshop

They contacted Sheila Dawson, a San Diego resident who had run a similar, for-profit program in that

city. With her assistance, Joe renovated a transit bus into a workshop which uses every inch of interior and exterior space.



It's a magical woodworking tour: Side Street Projects offers courses in woodworking inside a transit bus renovated to contain 10 child-size workstations.





Joe and a team of volunteers built 10 work stations with adjustable height workbenches. The bus is wheelchair accessible, so two woodworking stations were constructed with this in mind. Each station has identical basic hand tools, supplies and materials, and essential safety equipment is on board at all times. Also, in the event electricity is not available at a site, the bus has been equipped with its own generator.

The first woodshop bus hit the road in 1998, and a second one joined the fleet in April of this year. They travel to schools, after-care programs, community centers and birthday parties throughout southern California.

Kids 'n Woodworking

The Woodworking on a Bus program is a basic course taught to beginning woodworkers ages five to 11. In one-hour sessions spread over a five- to eight-week



Young woodworkers on the bus enjoy having their own workstations. Karen Atkinson says most of the children, "especially the girls, have never really done anything like this."

time period, the kids learn how to use all the basic hand tools: screwdriver, drill, saw, hammer, etc. They also learn the principles associated with measuring.

When a child walks on the bus, the first thing he or she gets is a full safety demonstration. Joe is quick to say, "You come in with 10 fingers; we want you to leave with all 10." Then the workbenches are adjusted to the height of the child at the station. Next, the instructor goes through the names of each of the basic hand tools and how to handle them.

"Most of the kids have never touched woodworking tools," Karen Atkinson said. Some of the boys' fathers might have given them a hammer to play with, "but even in 1999, that still doesn't happen very often for the girls," she said.

The kids start their woodworking with something basic, like a name tag. "They hang it over their bench, and then they think we're geniuses because we remember their names," Karen said.





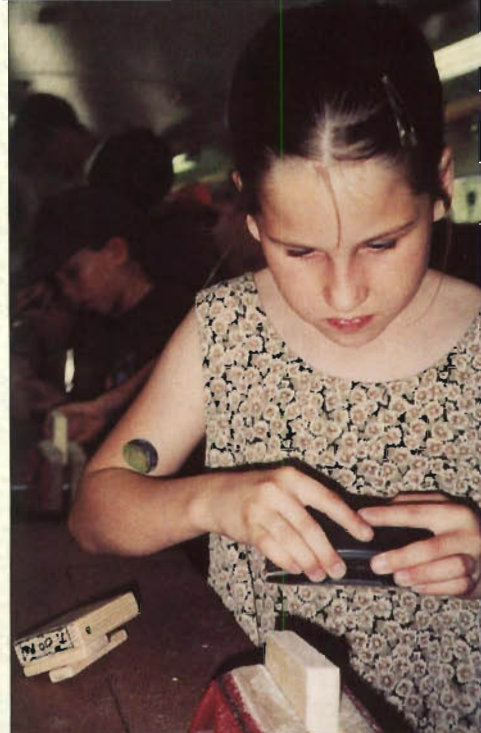
Frequently, the children make their own changes to the prototype, Karen said. For example, they might put mag wheels on a truck. "There's a lot of problem-solving and questions" during the process, she said.

Ultimately, somewhere between workshop sessions three and five, the goal is to have the children work without adult assistance and come up with their own toy or furniture design.

The kids' choices for these projects tend to be "whatever's current in popular culture," Karen said. "They'll build a wooden pager and hang it on their belt and play with it." Or they might make a memo holder, a toy motorcycle, or a Godzilla figure.

Karen and Joe say this kind of woodshop activity encourages thought organization, sharing abilities, decision-making and problem-solving — survival skills for adult life.

Already, the things the students learn during their woodworking classes are impacting other areas of their lives. "We teach them to clean



When the children learn woodworking, Karen and Joe say, they're also learning thinking and problem-solving skills.

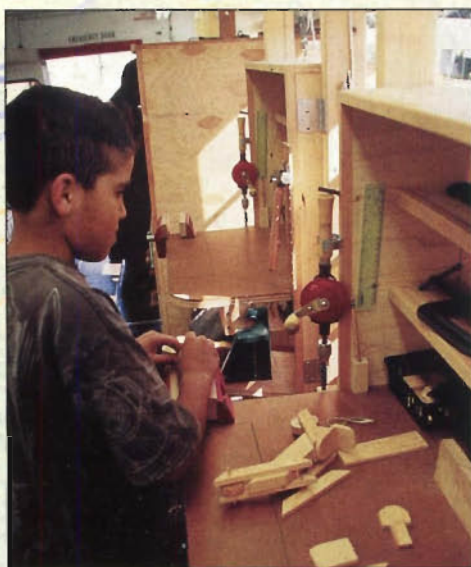
up their workstations — to put things away before starting a new project," Karen said. "One parent said her son is now cleaning up his desk at home, which he never used to do."

What the Future Holds for Woodworking on a Bus

All the Woodworking on a Bus instructors are artists as well as woodworkers, with creative art as their primary occupation. Joe and Karen find them through word of

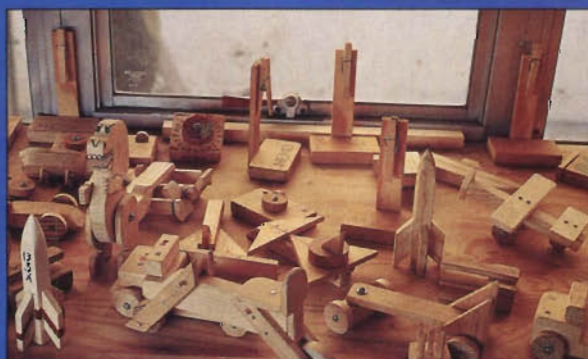
mouth or after someone expresses interest when the woodworking bus is at a gallery opening.

At the moment, the program has six active instructors, with four more in training. They are people who want to make

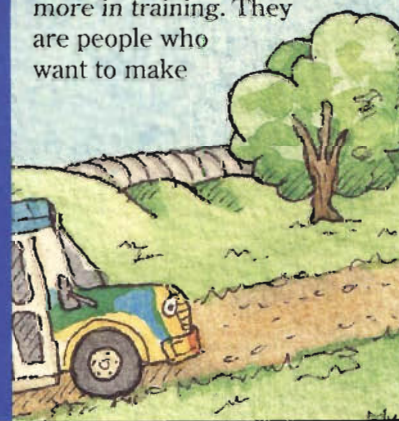


Children on the bus choose their own projects. "They're fascinated that they can make something in an hour and take it home," Karen said.

Early in the course, each student is led to the back of the bus to pick out a toy he or she would like to build. The available models include things like cameras, sailboats and trucks. The students receive a piece of uncut wood to take back to their stations. Using the pre-made toy as a model, children are assigned the task to make their own version of the toy using the uncut wood.



"Most of the kids have never touched woodworking tools."



sure the children learn creativity, not just how to saw a piece of wood. This was a craft they learned, and they hope that, through the children, they can give back what was taught to them.

Besides taking the bus to schools and after-school programs, the instructors teach one-time courses at Boy and Girl Scout events and birthday parties. Those programs, Karen said, last about an hour and a half, "pre-sugar." "The kids make their own party favor, then they go and have cake and ice cream."

The program is also receiving more and more requests to present programs at neighborhood festivals and other events, Karen said. "We're in such demand, we could easily have 10 buses on the road."

In the first year, the average number of kids involved in the program was 420 per month. The addition of the second bus in April allowed that number to double.

For the kids who do their woodworking on a bus as part of an after-school program, it's just one of the choices offered. If their parents are able to, they pay for the classes. For kids whose parents can't pay, Side Street Projects offers scholarships. And when the bus travels into community centers in low income neighborhoods, "we raise the funds," Karen said.

The non-profit organization seeks individuals or corporations to sponsor a child or children to attend the Woodworking on a Bus program. They are also constantly looking for businesses willing to donate materials such as lumber, tools, bottled water, and other supplies.



When they evaluate the program, "The kids react with absolute wonder when they realize they don't have to share their tools," Karen said. "They're very careful of their tools."



Woodworker Joe Lutrell is one of the founders of Side Street Projects and its Woodworking on a Bus program. The young students use their newfound woodworking skills to make toys they can play with between classes.

Eventually, the partners would like to buy a parking lot, where several buses could be checked in and out. "Our goal is to have a fleet of creative buses," Karen said. Some buses would cover additional topics like photography and printmaking. For now, though, the drive is focused on woodworking education.

For more information on the Woodworking on a Bus Project, you can visit www.sidestreet.org or give them a call at 310-829-0779.



An Oval Coffee Table

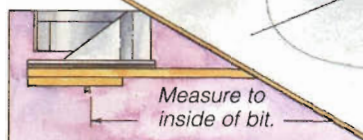
Contributing editor Mike McGlynn walks you through template routing, making perfect ovals and a great technique for dry bending wood.

By Mike McGlynn



Find the dimensions for routing your ovals on the **Pinup Shop Drawings**.

The distance from point A to the bit is half the length of the oval. The distance from point B to the bit is half the width of the oval.



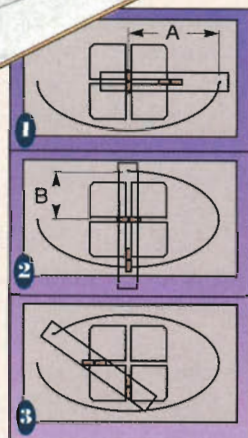
In the sequence at right, notice the relative position of the runners as the oval is formed. A little wax applied to the channels helps things moving smoothly.

Elliptical Routing

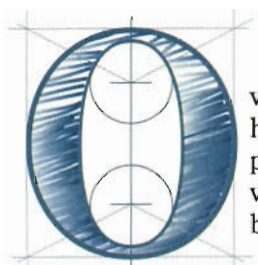
Use simple oval routing jigs to create the templates for the inlay top and the shelf. It's possible to make the actual top and shelf with these jigs, but the opportunity for error is just too great.

To make the jig, mount four blocks to the melamine template material, forming two channels. The runners, which attach to the router arm, slide tightly in these channels. The shape of your oval is determined by the points where the runners and arm are attached (points A and B). Point A registers the length of the oval, point B controls the width. Measure both distances to the inside edge of a 1/4" straight cutting router bit.

With the runners mounted and the blocks set, double stick tape the whole contraption to a work bench. Set the router for a very shallow cut, flex the 1/4" arm material up and start the router. Engage the bit slowly into the melamine and make a controlled cut around the entire ellipse. Repeat the process until you have just about cut through the melamine. Slice through the remaining material with a utility knife, sand the edge perfectly smooth, and patch any low spots if necessary.



Melamine is the perfect template material. It's smooth, hard and available in 1/4" thickness.



vals were at the heart of this project from the very start. It began with the request from an interior designer to build a coffee table to meet her clients needs. The first request was for the table to complement some existing metal and stone side tables as well as fit harmoniously with a curved couch. The second requirement was for the table to be made from highly figured wood (we chose select grade cherry to match the existing millwork). The last very specific request was for the coffee table to include a second level, which would capture a drawer for the TV remote. Such is the life of a custom furniture maker!

Making the Shelf

There are two large ovals in this project, the lower shelf and the inlay top. Both of them require making a specific template.

The shelf is a little less critical to the success of the table, so I recommend you start with it. The sidebar at right explains how to build a jig to rout a template for both the shelf and the inlay top. (Make both templates at the same time and set aside the larger oval for now.)

The first step in building the shelf is to select, mill and glue up the shelf blank from wood that is compatible in color and grain to the veneered top. Then rout an oval template for the shelf (piece 1, see the **Material List** on page 31).

Trace the outline of the oval onto the shelf blank and move to the band saw to cut its shape (Figure 1). Step to your belt sander and sand carefully to the line.

Ring Around the Table

For the best possible appearance, cut all the ring segments (pieces 2) from the same board. If that's not possible, find two boards as similar in grain and color as you can.



The author's oval cherry table was designed to go with two metal and stone side tables, similar to the one pictured above. Creating such elegant curves out of wood was a principle challenge in this project.

Face joint and mill your stock to the 1" finished thickness, then stick-up a couple of long pieces to the width indicated on the **Material List**. Next, lay out a full-size storyboard of the oval table top. (See the sidebar below.) Make the ring in two halves so you can trim the center joint of the oval on your table saw with the aid of a shooting board. It's the slickest way to a perfect center joint. With that in mind, lay your pieces directly on top of the storyboard and mark the intermediate miters. Make sure you leave a little extra material on the outside pieces (those that meet in the center of the ring) for trimming later ... it's the secret to a perfect oval ring.

After you have cut the segments for each half, it's time to glue them together. It's critical to do your glue-up on a perfectly flat surface which won't absorb glue. A piece of 1" melamine works great. The second necessity for this job is the right kind of clear packing tape. (I use it instead of clamps.) In my experience,

nothing else comes close to 3M® clear tape for holding power and for not leaving half its adhesive on the wood when you take it off.

Rip off four strips of tape about 12" to 15" long and hang them on the edge of your bench — it's bad form to be running around looking for tape as your glue joint lies



Figure 1: After tracing the oval shape onto your shelf blank, band saw the piece free. Then carefully sand to the traced line.

waiting. Next, spread yellow glue on one face of your matching joint. Lay the two pieces on top of your smooth surface and rub them together, aligning them at the last possible moment before they grab. Now take one of your pieces of tape and, after tacking one end down,

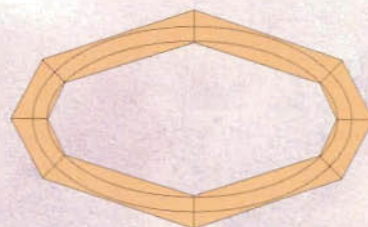
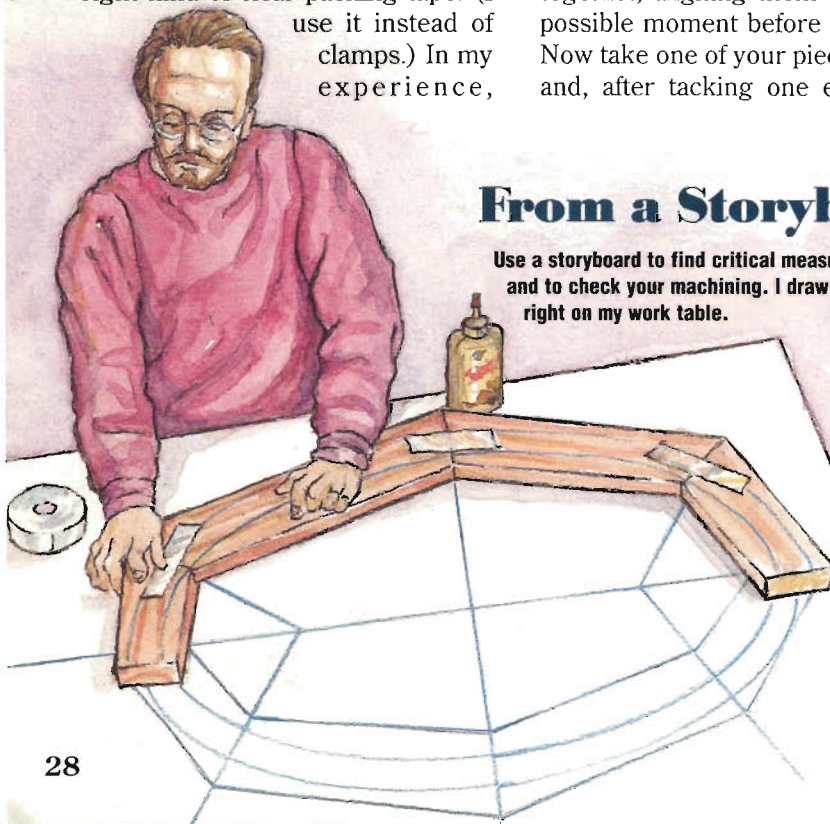
stretch it at a right angle across the joint, then tack the loose end down. If your joints fit right, and they must, you don't have to stretch the tape till it practically pops — just a little stretch is enough.

With extreme care, flip the top pieces over and apply another piece of tape in the same way to the back. (The other two pieces of tape are for when you get one stuck in your hair and the other sticks to itself.) Repeat this process until you have two glued-up halves. After the glue has cured, you can remove the tape and clean up any glue squeeze-out. Move your half-rings back onto your storyboard and mark the center joint lines on both the inner and outer edges of the (overlong) pieces.

Get the large oval template and use it, alone and with a spacer block, to scribe layout lines (1½" apart) to define the ring. Make a shooting board (a piece of 3/4" sheet stock works fine) to use on your table saw. Screw one half-ring (drill holes through waste areas that will be cut away later) to the shooting board with the cut-off

From a Storyboard

Use a storyboard to find critical measurements and to check your machining. I draw mine right on my work table.



A storyboard is basically a full-size drawing of a project. Include as many details as you can. It will help you check your parts for accuracy as you manufacture them. In the case of the oval table, the miter joints of the ring segments are critical. Use your storyboard to find the length of the segments and the angle of their joints.

marks positioned perfectly on the edge of the board. Slice the ring's center joint on the table saw. Repeat the process for the second half-ring. You can now, using the packing tape method, finish gluing the ring. When the glue has cured, clean up the joints, and move to the next step.

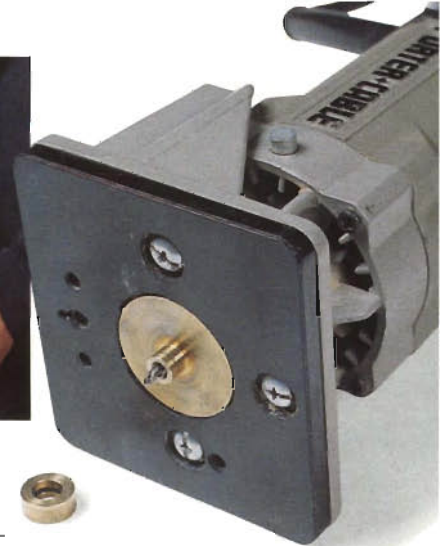
Routing with a Template Inlay Guide

The basic idea of a template inlay guide is very simple: the router uses a 1/8" spiral bit, while the template guide has a collar (it slips on and off) which offsets the cutter by the bit's exact width. You cut one piece with the template guide alone and the other piece with the collar installed. Which piece you cut with the collar and which is cut without is determined by whether you have an inside or outside template. For most large inlays, such as this table, I prefer to use an inside template. So, we'll use the guide with collar in place to rout the center blank and the guide alone to rout the ring.

The first thing to do in this inlay process is to mark the centerline, in both directions, on the inlay top



Figure 2: The offset collar is the key to this inlay template routing system. Rout one part with the collar on and the joining part without the collar ... you'll have two perfectly matching pieces.



(piece 3). You don't need to do this on the rim, because the glue joints are the centerlines.

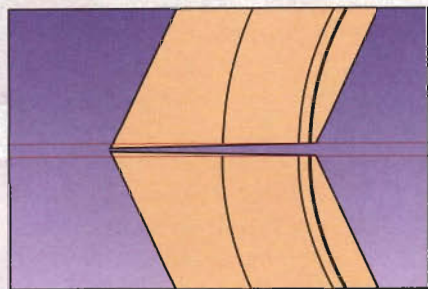
Secondly, with some double-sided carpet tape, attach your large oval template to the inlay piece. I recommend cutting the tape into 1/2" wide strips and to using it sparingly — it's possible to rip the veneer off if you use too much. Make sure your centerlines line up perfectly between the template and the inlay piece.

Next, set up your router with its template guide (collar on) and set it to cut to a depth of 1/8" into the inlay top. (That's as deep as you'll rout with this system; you'll finish the cut with a saw.) You can now turn the router on and very carefully lower the bit into the workpiece.

Make a complete pass around the template (see **Figure 2**). Move to the ring blank and place the large oval template properly (use the oval layout lines you made earlier and the glue joints as references). Repeat the operation, using the router without the collar on the template guide. It should be obvious that if you err, and the router drifts, it will do no harm to the inlay piece, but will cause irreparable harm in the rim piece: take it slow!

Now it's time to remove the waste from the top. Slice away the majority of the stock with a band saw

Note: You must not touch the routed edge! The rest of the waste can be

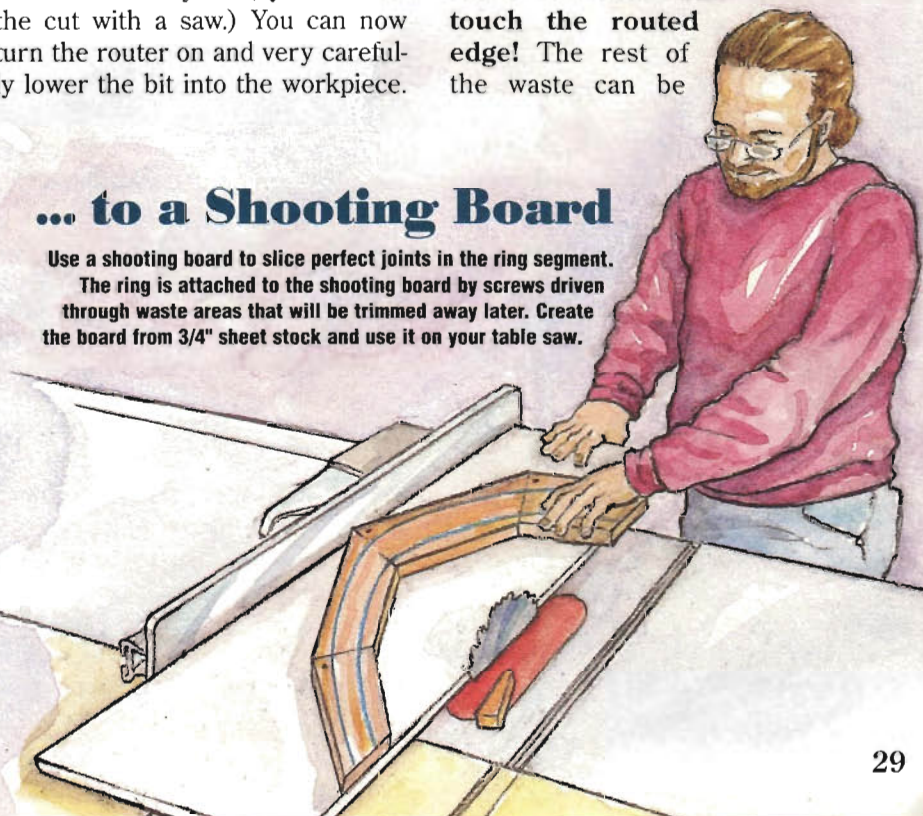


If your miters are off by even a half a degree it may cause a poor center joint in the ring. By using a shooting board, the ring's center joints can be perfectly adjusted to compensate for any variance in the oval ring halves.

... to a Shooting Board

Use a shooting board to slice perfect joints in the ring segment.

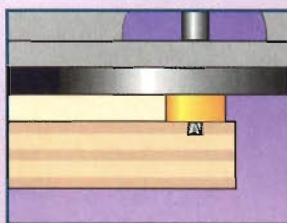
The ring is attached to the shooting board by screws driven through waste areas that will be trimmed away later. Create the board from 3/4" sheet stock and use it on your table saw.



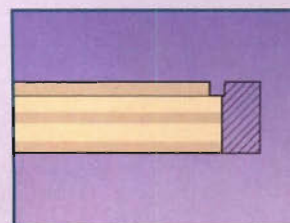
Template Routing

Ever wonder how those expert woodworkers manage to get amazingly tight inlay joints? A template guide, patience and careful attention to detail is one answer. The two sequences at right show you how to inlay the veneered top. Follow them closely and you'll join the ranks of expert woodworkers yourself!

Cutting the Inlay Top

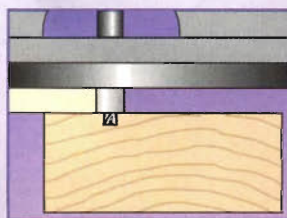


- 1 Place the template on the veneered top. With the collar on the template guide, rout an 1/8" groove around the oval template.

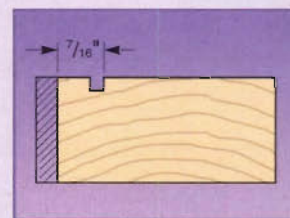


- 2 After template routing, remove the majority of the waste with a band saw. Do not touch the cleanly routed edge!

Rabbeting the Ring



- 1 Remove the collar from the template guide and, with the same template as before, rout an 1/8" groove into the ring.



- 2 Use a spacer block to help scribe a line 7/16" inside of the routed groove as shown above. Remove the waste to that line.

removed with a block plane, rasp or belt sander until you end up with the slightly undercut profile shown in the first sequence above.

With the groove established on the ring (step one in the second sequence illustrated above), mark a line 7/16" in from the routed edge. Use a jig saw with a fine blade to cut right up to this line, then use rasps and sandpaper to smooth up this edge.

The final step involves using a router with a bearing guided three-wing cutter (1/2" depth of cut, 1/4" wing) to remove the rest of the waste below your routed groove and to form a rabbet for the top to sit in. Make sure your last pass leaves you with a rabbet the exact depth of the inlay thickness. This is critical: if the depth isn't perfect, the inlay or the ring will be too high. Either one is a real problem.

Now comes the part that separates those with patience from those without — the final fitting of the top to the ring. During this process you must make every effort not to do any damage to either of your routed edges, especially the rim edge. The first step in this

process is to see how the two pieces fit initially. Make sure you keep the same ends lining up in case there is some slight asymmetry to your template. With this initial fit you will likely see some tight spots, mark them lightly with pencil. Use a hard block with adhesive-backed 120 grit paper to slowly start to take down these high spots. This is tedious work, but the results will be your mark of craftsmanship in this table, so take your time. Sand a little, fit, and sand again. Do not force the fit, or you will distort the rim. And don't round over the edge: it will cause an unsightly gap.

Once you have finished fitting, apply glue to the rabbet bottom and, using many clamps, glue the inlaid top into the ring.

After the glue has set, lay the template back on top and check the layout line for the outside of the ring. Slice to this line with a band saw. With sandpaper, rasps, and planes, clean up the edge so it is smooth, fair and square to the top. Using the appropriate router bits, you can now profile the top and bottom edges. Rout these edges very carefully to avoid chipping —

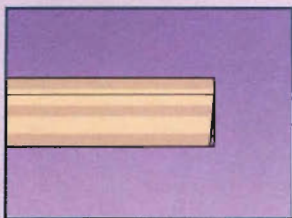
I do a lot of back cutting before I make a final, very light, forward pass. At this point, you can sand the top and set it aside.

Top to Bottom

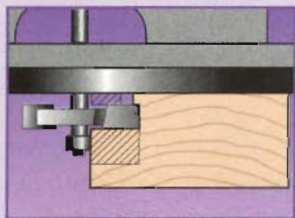
To make the laminated curved legs (pieces 4), refer to my *Techniques* article on page 54. Using the **Pinup Shop Drawing**, lay out the positions of the legs on the shelf with a pencil and ruler. Mark the center of each of these boxes, and drill a 3/16" hole all the way through. Countersink these holes well on the bottom side. Mark a spot at the center of the bottom ends of your curved legs and drill a 1/8" hole about 1 1/2" deep. Keep this hole straight and true.

Apply a small amount of glue to the bottom of the legs, and screw them in place with #8 x 1 1/2" screws. Make sure the corner of each leg touches the exact edge of the shelf and each leg lines up parallel with its mate.

Now, turn your attention to attaching the legs to the top. Begin by making up four leg blocks (pieces 5) as shown on the **Exploded View**. Place the tabletop



3 Using block planes, rasps and files, pare the top back to the routed groove. Slightly undercut the routed edge.

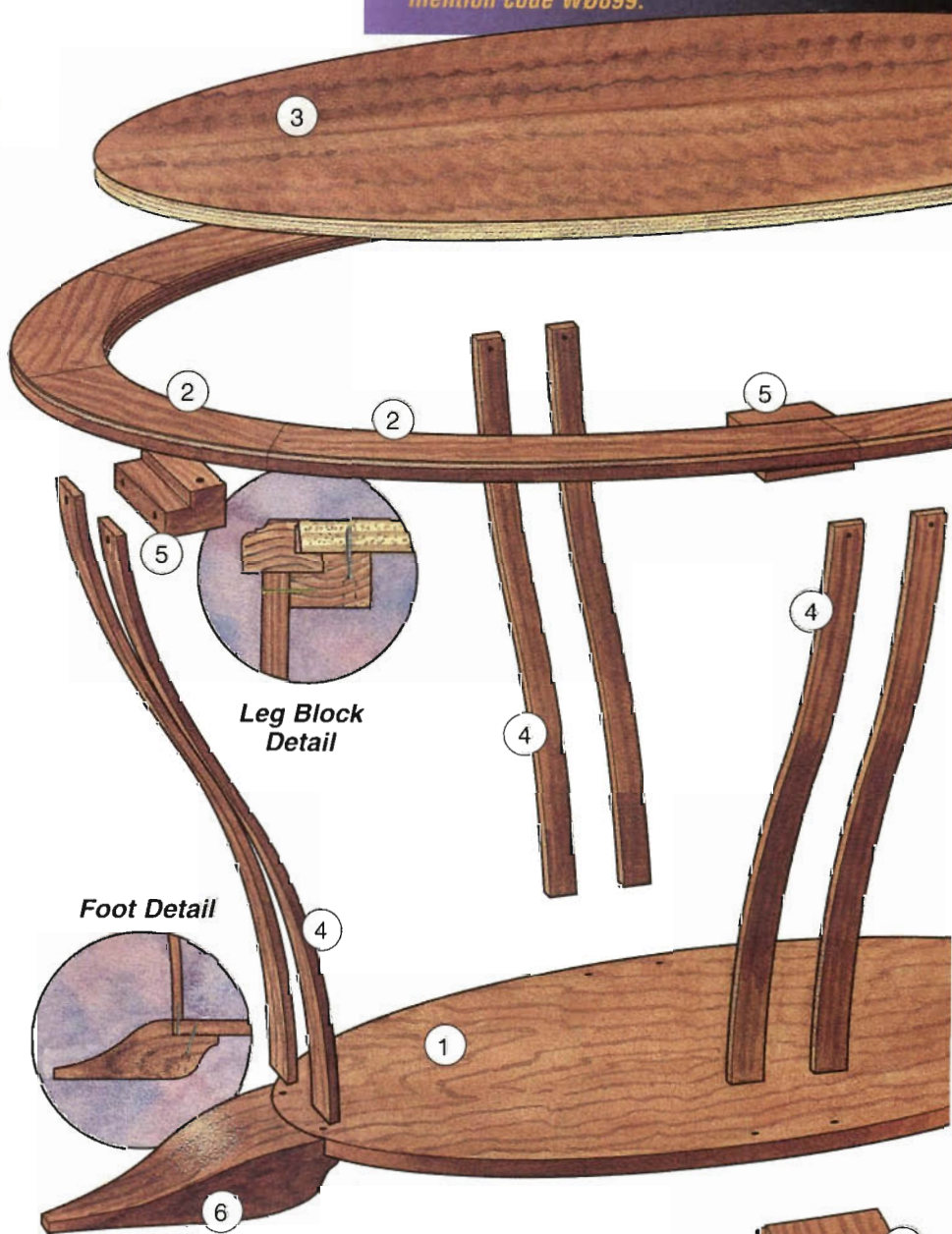


3 Use a three-wing cutter to undercut the ring groove. Start high and move down so your bearing has a surface to ride on.

upside down on a padded surface and set the shelf/leg subassembly roughly in place. Fit the legs to the leg blocks. When they fit well, turn the subassembly upright and glue the blocks to the legs, flush with the outside edges and tops of the leg pairs. When the glue is dry, drill a hole (to fit a #6 x 1½" brass flat-head wood screw) through each leg into the mounting block. You can now flip the base subassembly over again, line it up on the tabletop and mark attachment screw holes. After you drill the holes, take a test run by screwing the base subassembly to the top, then disassemble these pieces and set the tabletop aside.

Making and Fitting the Feet

It is important to glue up the four feet blanks (pieces 6) from properly colored and figured wood. The first step in fitting the feet is to make the cuts that will create their rabbets. To do this, you need to mark the curve where the foot meets the shelf. The inside edge of the foot should be 2¼" back from the edge of the shelf, measured along the centerline. When you have the foot in position, clamp it in



MATERIAL LIST

	T x W x L
1 Shelf (1)	3/4" x 11 7/8" x 28 7/8"
2 Ring Segments (8)	1" x 4 1/4" x 9" to 20" *
3 Inlay Top (1)	5/8" x 20 3/4" x 37 1/2"
4 Legs (16)	1/8" x 3" x 22"
5 Leg Blocks (4)	1" x 1 1/2" x 3"
6 Feet (4)	3" x 3" x 8 1/4"

*Mark the various ring segment lengths from your storyboard.

Oval Table Project Supplies

The following supplies are available from Woodworker's Journal.

Template Routing System #83642\$36.99

West System Epoxy Resin #37095....\$21.99

Epoxy Hardener #37136\$10.49

To order your supplies, call 800-610-0883 and mention code W0899.

place and mark the edge of the table on the top face of the foot blank. You can now make the two cuts that will define the rabbet on the table saw. It's extremely important that the rabbet be the exact depth of the shelf thickness: more or less and you leave yourself a ton of cleanup work. To carve the curves into the rabbets, use a sharp gouge or rasp to perfectly form the curved line you drew on the top edge, as shown in **Figure 3**. As with the inlaid top, it's important to remember the most accurate fitting is reserved for the area which shows; the rest can be undercut a bit. Test fit the feet and keep trimming until there is a clean joint between the feet and the shelf.

The feet now need to be shaped. The first step is to make a couple of templates to the shapes shown on the **Full-size Pattern**. Take the first template and mark one side of each foot. Very carefully, cut this shape out on a band saw (see **Figure 4**). Don't touch the joint edge!

Next, mark the second shape onto each foot and form them on a band saw. Then use a stationary belt sander to help complete the shape, as shown in **Figure 5**. Finish sand the completed shape. Lay out and drill the attachment holes as shown in the **Exploded View**. Set the feet in place and transfer the attachment hole locations to the bottom of the shelf. After pre-drilling these holes, apply glue to the entire rabbet and screw each foot in place. Be sure you clean up all squeeze-out.



Figure 3: After cutting rabbets into the feet on your table saw, form their visible edge so they match the shape of the oval shelf.



Figure 4: Make a template to transfer the shape of the feet to your blanks. Use your band saw to slice the curved shapes.



Figure 5: The distinctive and complex shape of the oval coffee table's feet is best completed on a belt sander.

You can now flip the top upside down and attach the base subassembly to it. Don't use glue on the top/leg joint. It isn't really needed, and leaving it off will make any possible future repairs easier. After attaching the top, go over the whole table to see if there is any touch-up sanding that needs to be done. The entire base and top are now complete. All that's left is the drawer and finishing.

Making the Drawer Box

Although the drawer case looks simple enough, it is actually quite complicated. Find the basic shape of the box top and bottom (pieces 7) by using your trusty oval template. Lay this shape out on two pieces of 1/2" material: either solid hardwood or baltic birch plywood. Make sure you mark the end points and the centerline, as shown on the **Pinup Shop Drawings**. Mark a point 1 3/4" back on the centerline and create a gentle curve that touches all three points with a flexible strip of hardboard (it's easiest if you get a buddy to help draw the line, as shown in **Figure 6**). Form the top and bottom on your band saw, then clamp them together and sand the edges so they are exactly the same shape.

At this point, I turned to one of my favorite materials, 3/8" bending plywood, to make the outside wall (pieces 8) of the case. Slice the bending ply and attach the first layer to the edge of one of the pieces you just cut with small staples (or brads) and glue. Make sure the plywood extends well past the ends: you'll trim it off later. In the same manner, attach the second shaped piece to the bending ply. Finish up by wrapping the second layer of bending ply around the whole shape. After the glue has cured, sand the outside face of the bending ply smooth.

Once that's done, laminate cherry veneer (piece 9) to the outside of the drawer box using yellow glue in conjunction with plastic packing tape and clamps where needed. When the glue has cured, very carefully trim the veneer-covered bending ply ends to match the curve of the drawer box face. This

MATERIAL LIST

	T x W x L
7 Box Top and Bottom (2)	1/2" x 8 ⁵ / ₁₆ " x 17 ¹ / ₈ "
8 Outside Wall (2)	3/8" x 3 ¹ / ₂ " x 33"
9 Cherry Veneer (1)	1/16" x 3 ¹ / ₂ " x 60"
10 Veneered Box Top (1)	3/4" x 20 ¹ / ₂ " x 11 ⁹ / ₁₆ "
11 Veneer Tape (1)	7/8" x 60"
12 Drawer Face (1)	3 ¹ / ₂ " x 3" x 19 ¹ / ₂ "
13 Drawer Sides (2)	1/2" x 2 ¹ / ₄ " x 6 ¹ / ₂ "
14 Drawer Front (1)	1/2" x 2 ¹ / ₄ " x 13 ¹ / ₂ "
15 Drawer Back (1)	1/2" x 2 ¹ / ₄ " x 7 ¹ / ₄ "
16 Drawer Bottom (1)	1/2" x 5" x 14 ³ / ₄ "

is best done with a fine tooth hand saw and some wood files. You'll cover the ends of the plywood later.

The veneered top (piece 10) for the drawer box is best made from a cutoff from the inlay top. Set the drawer box on top of this piece, making sure the grain orientation is correct. With a 7/16" spacer block and a pencil, trace the outside profile of the box. In a similar way, use an 11/16" spacer block to find the front edge's profile. Carefully cut out this shape and, with a hard hand sanding block, smooth the edges so they are fair and square. The easiest way to edge veneer this top is with hot melt edge tape (piece 11). Start with the outside edge first, then trim carefully. Move on to the concave edge next, and wrap up by covering the front edges of the bending ply. Finish sand this piece smooth and, with yellow glue and weights, glue it to the drawer box.

Making the Drawer

The drawer face (piece 12) is an oddly shaped piece. Glue up a blank to match the dimensions in the **Material List**. Strike the same gentle curve you used to form the front edges of the drawer box. Make the curved face cut on a band saw (see **Figure 8**) and clean it up carefully, since you'll be applying veneer to it. Now use the waste from the drawer front blank and some 1/4"



Figure 6: Strike a gentle curve for the drawer box top and bottom. A helper draws the line as you flex a strip to meet the three points.



Figure 7: Use glue and staples (or brads) to attach two layers of bending plywood around the shape of the drawer bottom and top.

melamine to make a jig to form the lip of the drawer face. See the **Exploded View** on the following page for details. Use a small router with a rub collar to rout the lip and remove the waste from the back side of the drawer face, as shown in

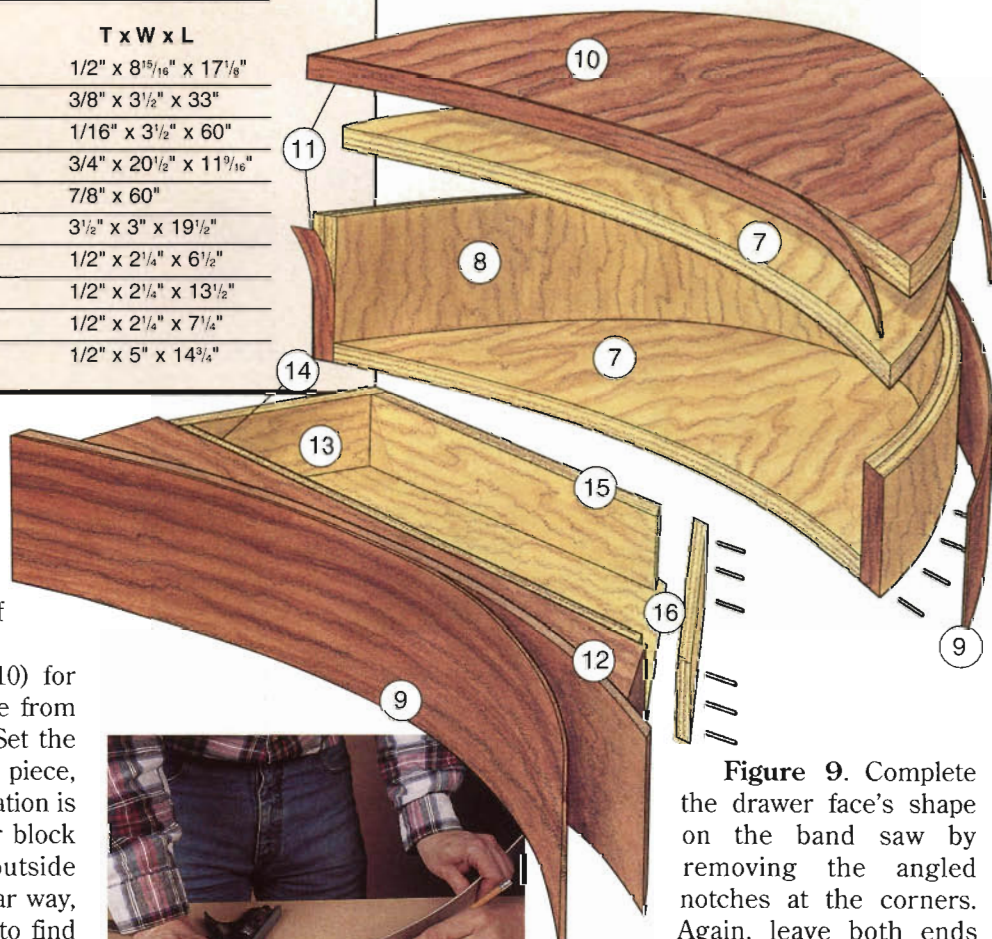


Figure 9. Complete the drawer face's shape on the band saw by removing the angled notches at the corners. Again, leave both ends long so you can trim them.

Veneer the drawer front to cover the lamination lines. This is best done with yellow glue and a bunch of spring clamps and pads. After the glue is dry, sand everything smooth and insert the drawer front into the drawer opening. With a very sharp pencil, mark the ends of the drawer front and carefully trim the excess to match the curve of the drawer box side. Clean this up and set the front aside, moving on to building the drawer.

The Drawer Box

Compared to making the drawer face, the drawer box is a snap. Cut the four box pieces (pieces 13 through 15) out of 1/2" baltic birch or solid cherry to the sizes and shapes found on the **Pinup Shop Drawings**. Glue and pin-nail those parts together to form the box. Next, lay the box on a piece of 1/4" plywood or solid wood and trace the

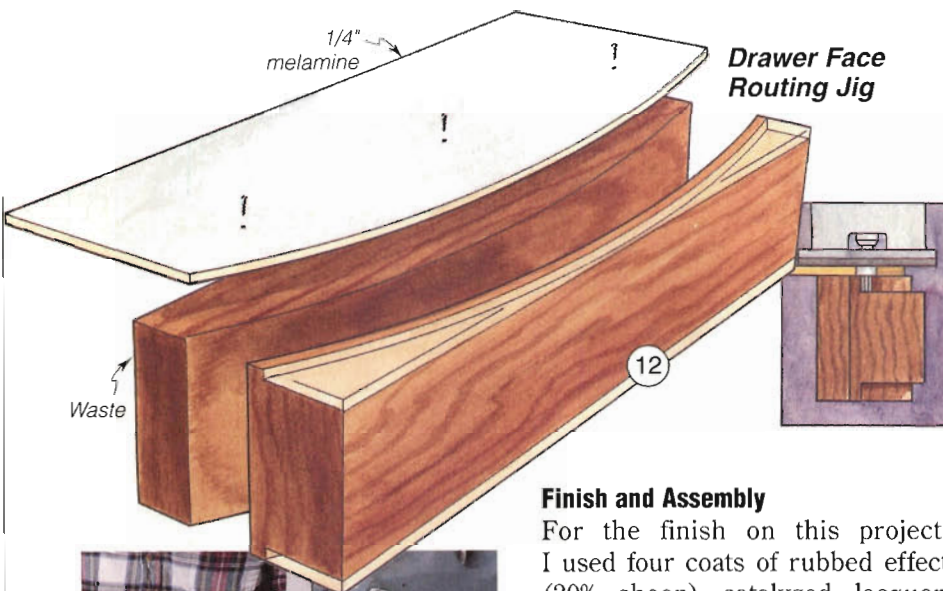
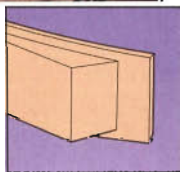


Figure 8: After striking the curve onto the drawer front blank, slice the curve on your band saw. Then make your routing jig (above).



Figure 9: With a rub collar on your router, remove waste until a smooth drawer-lip is formed. Complete the corner notches on the band saw.



outside shape of the box to form the drawer bottom (piece 16). Glue and clamp it in place and trim it flush with a router. Now sand the whole subassembly smooth.

The final step is to attach the drawer face to the drawer with yellow glue and spring clamps. Make sure the bottom edge of the face's inner surface is flush with the bottom of the drawer.

Finish and Assembly

For the finish on this project, I used four coats of rubbed effect (20% sheen) catalyzed lacquer, which I spray with an HVLP gun. If you're not set up for spraying finish, I think an oil finish, such as Defoil or Watco would work well. Carefully sand the whole piece to 600 grit. Apply several coats of finish, following label instructions and allow it to set for several days before you do the final assembly.

When the finish has cured, set the drawer case on the tabletop and get it aligned perfectly. Mark its position with a few pieces of masking tape. Remove the case and drill three 13/32" holes through the top, countersinking them well on the bottom side. Set the case back in place and transfer the screw locations onto the drawer case with a scratch awl. Drill the three holes with a 3/32" bit and attach the case with three #8 x 1" flathead screws. Slide the drawer into place, and you are done.

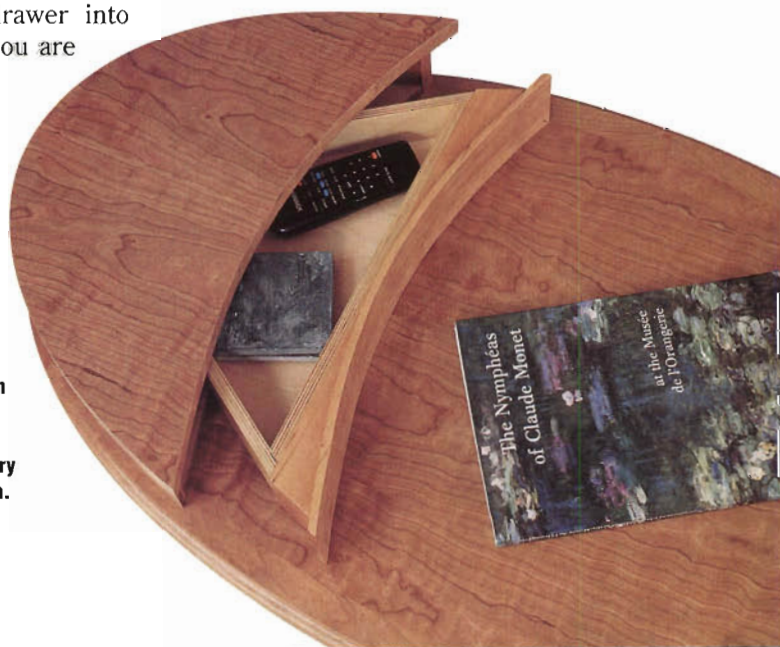
Final Thoughts

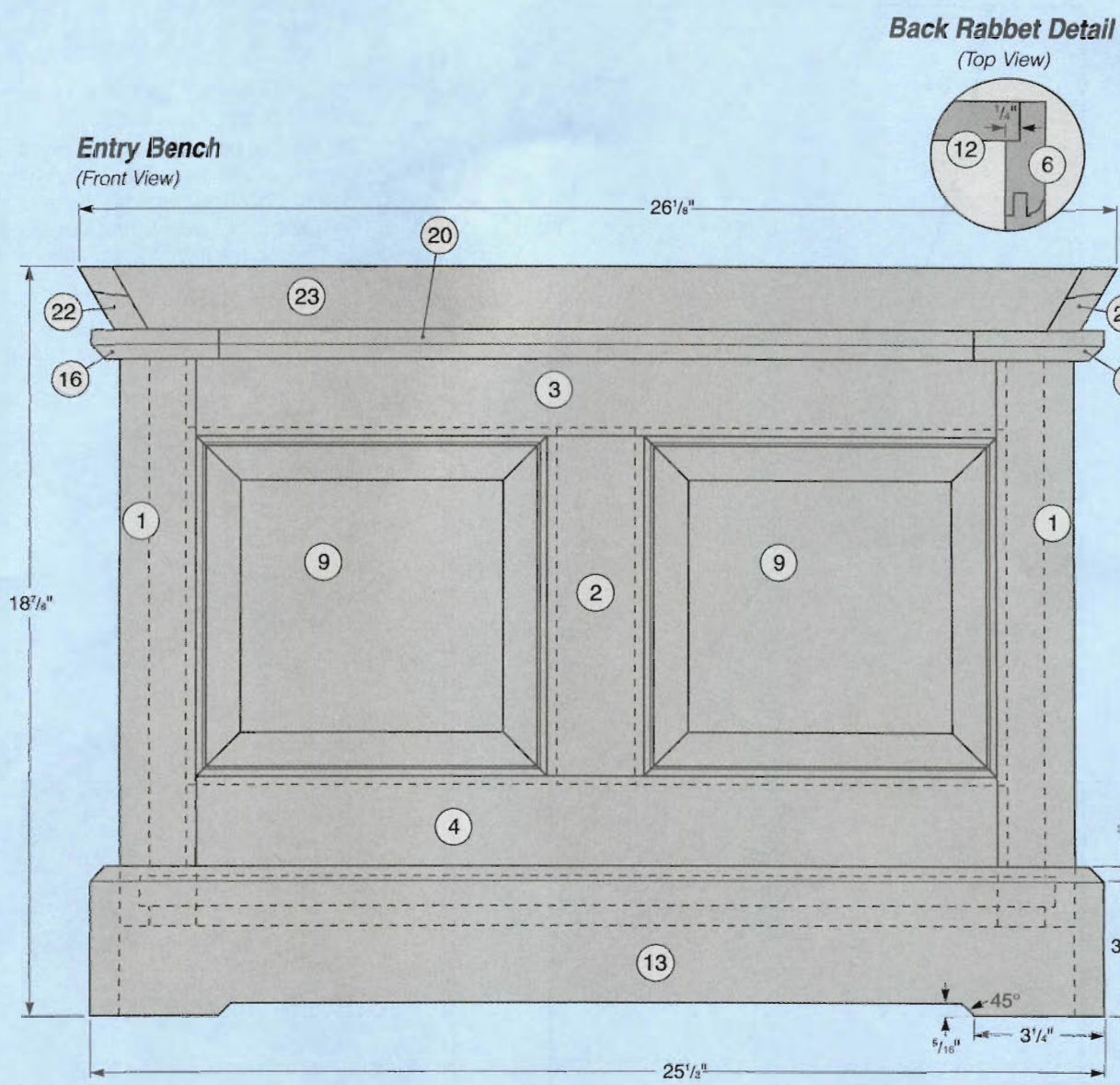
There are a couple of thoughts I'd like to leave you with. First of all, this table will not take a lot of heavy abuse; don't try tap dancing on it or using it to help you reach a book on your top shelf. The second point is that this is a very pleasing table without the drawer assembly on it. The nature of custom woodworking is such that you work hard to make a product to fit your client's needs. This client needed a TV remote drawer. If you don't, feel free to do a little customizing.

And last, whether you're a custom furniture maker or a weekend woodworker: from Gustav Stickley to your uncle Bud, one thing is commonly held. Woodworking is more than simply sticks glued together. It is a way of shaping the world around us. So enjoy the process, build a new world and keep on making sawdust!



Elliptical shapes, an inlaid top, curved legs and double decker construction combine for a stunning contemporary table design.

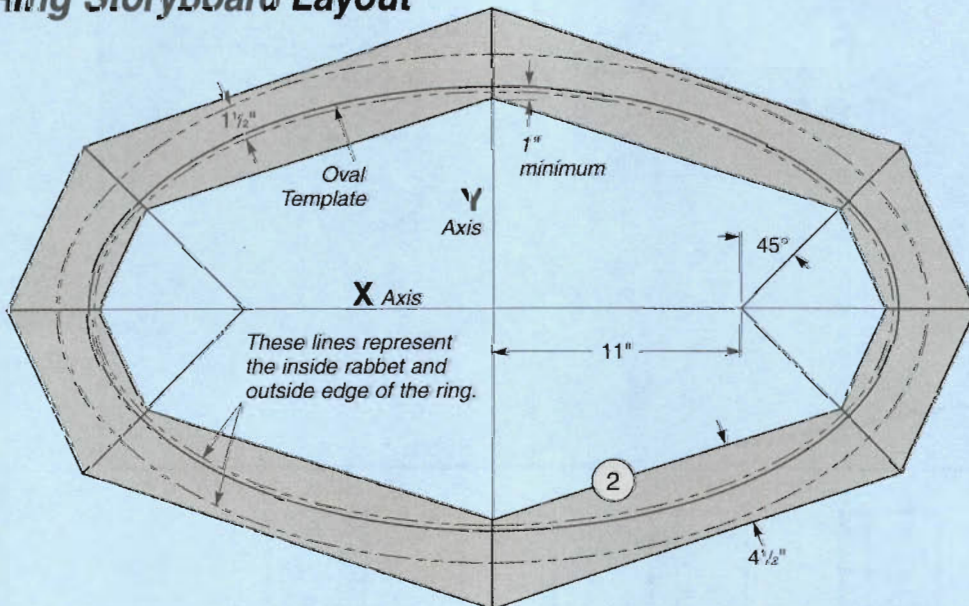




MATERIAL LIST

	T x W x L		T x W x L		T x W x L
1 Front Outer Stiles (2)	3/4" x 2 3/16" x 14 1/4"	9 Front Panels (2)	3/4" x 8 7/8" x 8 11/16"	17 Top Frame, Front (2)	3/4" x 3 1/4" x 15"
2 Front Center Stile (1)	3/4" x 2 7/16" x 8 3/16"	10 Side Panels (2)	3/4" x 12" x 8 11/16"	18 Lid Brace, Front (1)	3/4" x 1/2" x 22 1/2"
3 Front Top Rail (1)	3/4" x 2 3/16" x 20 1/8"	11 Bottom (1)	3/4" x 15 5/8" x 23 1/4"	19 Lid (1)	3/4" x 13" x 23 1/4"
4 Front Bottom Rail (1)	3/4" x 3 3/4" x 28 1/2"	12 Back (1)	3/4" x 13" x 23 1/4"	20 Lid Cap (1)	3/4" x 3 3/4" x 25 1/2"
5 Side Front Stiles (2)	3/4" x 1 7/16" x 14 1/4"	13 Front Skirt (1)	3/4" x 3 3/4" x 25 1/2"	21 Lid Hinge (2)	3/4" x 1 1/2" x 22 1/2"
6 Side Back Stiles (2)	3/4" x 2 1/16" x 14 1/4"	14 Side Skirts (2)	3/4" x 3 3/4" x 16 3/4"	22 Top Sides (2)	3/4" x 3 1/4" x 15"
7 Side Top Rails (2)	3/4" x 2 1/16" x 12 1/8"	15 Lid Brace, Back (1)	3/4" x 1/2" x 22 1/2"	23 Top Back (1)	3/4" x 3 3/4" x 25 1/2"
8 Side Bottom Rails (2)	3/4" x 3 3/4" x 12 1/8"	16 Top Frame, Sides (2)	3/4" x 3 1/4" x 15"		

Ring Storyboard Layout

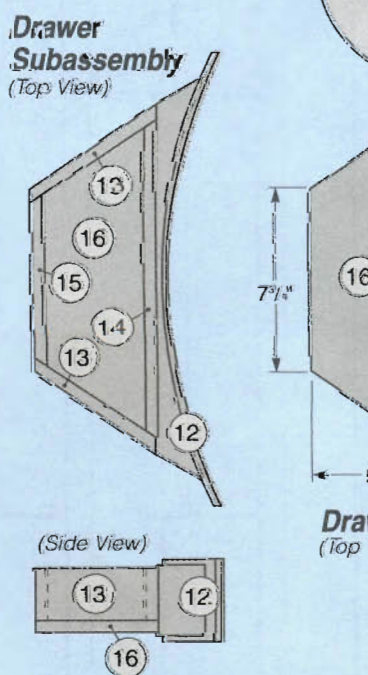
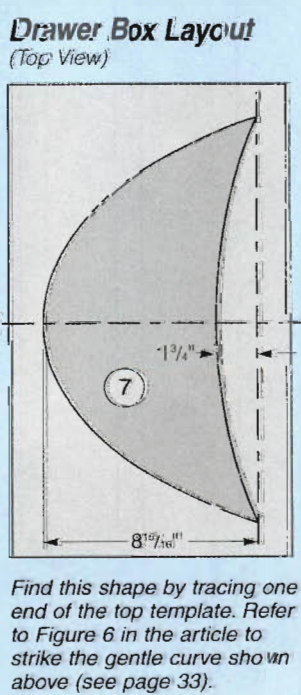
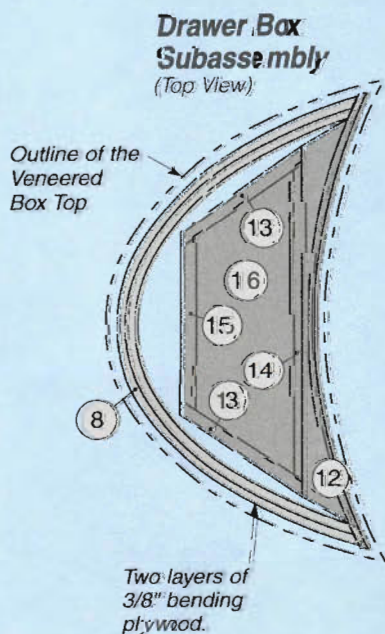
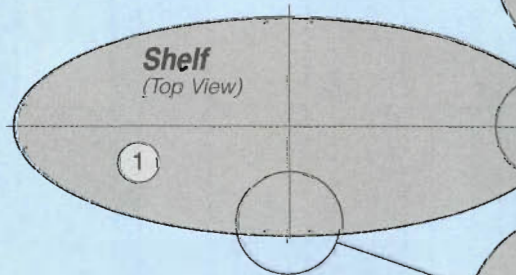


NOTE: To create your storyboard, start by drawing a horizontal and Y axis centerline on a solid flat surface. Then place the large oval template on the intersecting centerline and trace around the template in place. The help of a 1 1/2" square draw the outside edge of the ring onto the storyboard. The intersection points are 11" on either side of the centerline. Use a square protractor to lay out the additional angles including ring segment miters.

Key Template Measurements

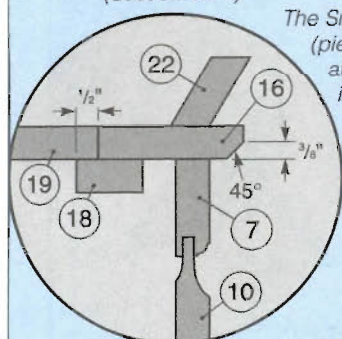
Top template	A=18 3/4"	B=10 3/8"
Shelf template	A=14 7/16"	B=5 5/16"

(See the Elliptical Routing sidebar on page 27.)



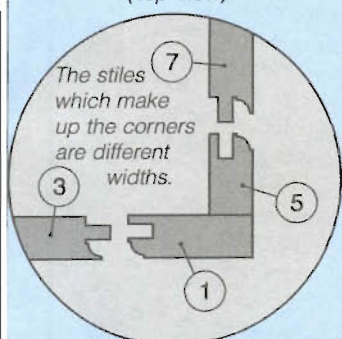
Rail, Frame and Top Side Detail
(Section View)

The Side Lid Braces (pieces 18) are applied after the frame is in place.

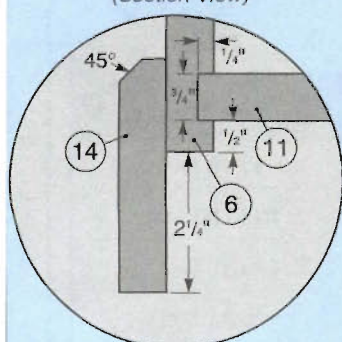


Stile and Rail Detail
(Top View)

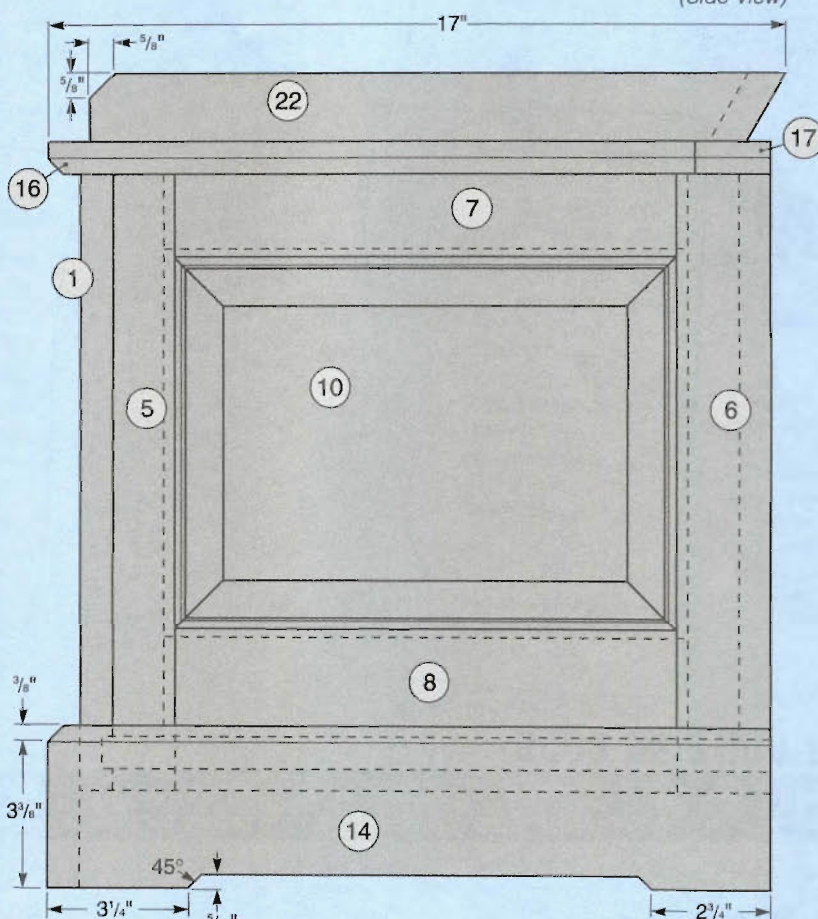
The stiles which make up the corners are different widths.



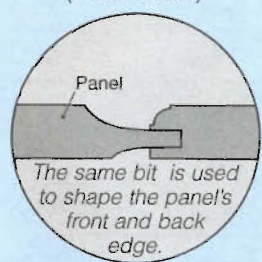
Skirt, Stile and Bottom Detail
(Section View)



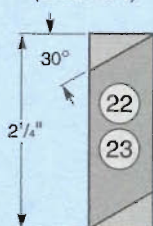
Entry Bench
(Side View)



Raised Panel Subassembly Detail
(Section View)



Top Sides and Back Machining Detail
(End View)



Rip your stock 2 1/4" wide. Don't move the fence but set the blade to 30° and take 2 more passes to form the bevels shown at left.

T x W x L

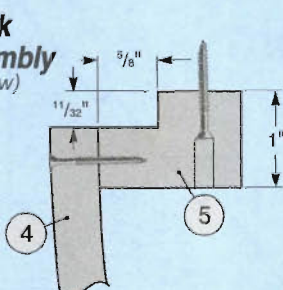
Back (1)	3/4" x 1 3/4" x 25 1/2"
Des (2)	3/4" x 1 1/2" x 14"
	3/4" x 12 7/8" x 18 7/8"
	3/4" x 2" x 18 7/8"
	1 1/2" Brass piano
	3/4" x 2 1/4" x 16 1/8"
	3/4" x 2 1/4" x 26 1/8"

MATERIAL LIST

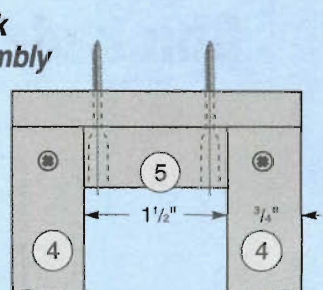
	T x W x L		T x W x L
1 Shelf (1)	3/4" x 11 7/8" x 28 7/8"	9 Cherry Veneer (1)	1/16" x 3 1/2" x 60"
2 Ring Segments (8)	1" x 4 1/4" x 9" to 20" *	10 Veneered Box Top (1)	3/4" x 20 1/2" x 11 9/16"
3 Inlay Top (1)	5/8" x 20 3/4" x 37 1/2"	11 Veneer Tape (1)	7/8" x 60"
4 Legs (16)	1/8" x 3" x 22"	12 Drawer Face (1)	3 1/2" x 3" x 19 1/2"
5 Leg Blocks (4)	1" x 1 1/2" x 3"	13 Drawer Sides (2)	1/2" x 2 1/4" x 6 1/2"
6 Feet (4)	3" x 3" x 8 1/4"	14 Drawer Front (1)	1/2" x 2 1/4" x 13 1/2"
7 Box Top and Bottom (2)	1/2" x 8 15/16" x 17 1/8"	15 Drawer Back (1)	1/2" x 2 1/4" x 7 1/4"
8 Outside Wall (2)	3/8" x 3 1/2" x 33"	16 Drawer Bottom (1)	1/2" x 5" x 14 3/4"

*Mark the various ring segment lengths from your storyboard.

Leg Block Subassembly
(Section View)

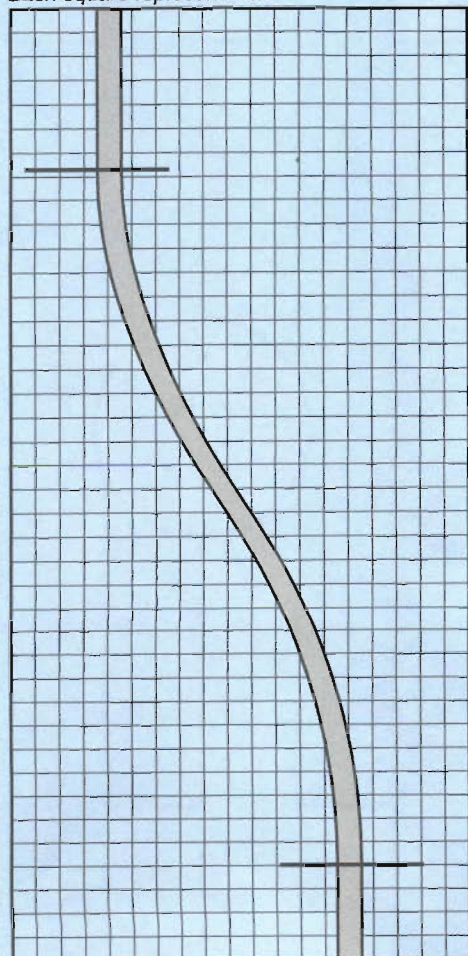


Leg Block Subassembly
(Front View)

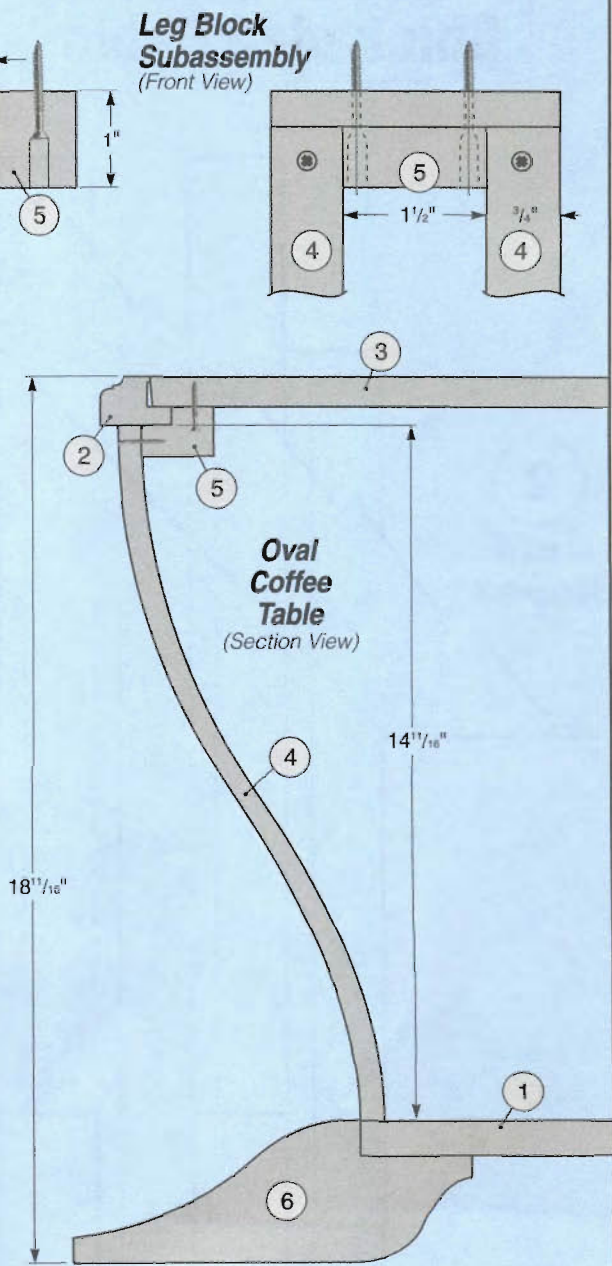


Laminated Leg Layout Graph

Each square represents 1/2"



Oval Coffee Table
(Section View)



Good Woods:

Wood that has above average weather resistance is essential for building a long lasting birdhouse. Our list includes:

Hardwoods

Alder
White Oak
Spanish Cedar
Mahogany
Teak

Softwoods

Red Cedar
White Cedar
Redwood
Cypress

Feed:

- 71% Black Oil Sunflower
- 49% Striped Sunflower
- 41% Sunflower
- 35% Hulled Sunflower
- 23% Peanut Kernels
- 16% White Proso Millet
- 14% Red Proso Millet
- 12% Niger Thistle
- 12% Canary Seed
- 9% Cracked Corn
- 8% Peanut Hearts
- 8% Milo (Sorghum)
- 7% Safflower
- 5% Hulled Wheat
- 2% Oats
- 2% Rape Seed

Preferred seed of desirable native birds.

Finishes:

The best finish for a birdhouse may be no finish at all. Birdhouses built from weather resistant woods, if they are mounted in an airy sheltered area, will last for many years. If you find the natural silver of exposed wood appealing, it is the very best idea as far as the birds are concerned. Any kind of toxic finish must be avoided. Another option is to use the same product you use to seal outdoor projects like decks, (A water sealant of one brand or another.) Another acceptable solution would be an exterior latex enamel. In any event, never finish the inside of a bird house. It must remain raw wood.

Maintenance:

Each winter, be sure to empty out the previous year's nesting materials. It's a good idea to leave the bottom of larger bird houses open during the winter, to avoid occupation by pesky squirrels and their ilk. If you used the water sealant method of finishing, you may need to renew the coverage every few years.

Information on this page was provided by the Minnesota Department of Natural Resources non-game wildlife program. More information and books are available at 800-657-3757.

BIRDY BUILDING CODE

Species	Entry Hole Size	Add 2" or 3" (wood chips)	Entrance (above the floor)	Floor Size	Mounting Height
Bluebirds	1 1/2"	no	6"	4" x 4"	5 to 10 feet
Red-headed Woodpecker	2"	yes	9"	6" x 6"	10 to 20 feet
House Wren	1"	no	3" to 6"	4" x 4"	4 to 10 feet
Nuthatches	1 1/4"	yes	7"	4" x 4"	6 to 14 feet
Titmice	1 1/4"	yes	7"	4" x 4"	6 to 15 feet
Downy Woodpecker	1 1/4"	yes	9"	4" x 4"	5 to 18 feet
American Kestrel	3"	yes	9" to 12"	8" x 8"	10 to 30 feet
Tree Swallow	1 1/2"	no	4" to 6"	5" x 5"	5 to 15 feet
Barn Owl	6"	yes	1" to 4"	10" x 18"	10 to 20 feet
Northern Flicker	2 1/2"	yes	12" to 16"	7" x 7"	5 to 30 feet
Flycatchers	1 1/2"	yes	6" to 8"	6" x 6"	6 to 20 feet

Oval Table

Chickadee Cabin

2
Roof Slopes

Entry Hole

Full-Size Patterns

PINUP SHOP DRAWINGS

- Open staples carefully, remove pattern and fold staples back in place.
- Use graphite paper (available at art supply stores) or cut and trace full-size patterns onto your stock.
- Cut out the elevation drawings and pin them to your shop wall.

Oval Table

Key measurements and elevations. Instructions for creating a life size storyboard and a graph for making the laminated legs.



Chickadee Cabin

The Full-Sized Pattern will provide all the information you need to layout the walls, grooves, roof segments and entry hole.



Entry Bench

All the elevation drawings and up-close details required to build this handy home project.



WOODWORKER'S JOURNAL
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All rights reserved.

6 Feet

The screws that attach the feet to the shelf must have oversized pilot holes drilled at a slight angle.

Make templates out of 1/8" hardboard and transfer this shape to the side of the feet.

6 Feet

Make templates out of 1/8" hardboard and transfer this shape to the top of feet.

Match this curve to the shape of the shelf.

Pilot hole

1 Sidewalls

1/8" X 1/8" log grooves

Lay out the notches, log-grooves, entry hole and gable ends from this pattern. The shape of the roof sections are also provided.



*Victorian Suite,
Today's Woodworker 34*



*Turned Apple
Birdhouse, Today's
Woodworker 15*



*Chickadee Cabin
(next page)*

If You Build it... They Will Come



According to the experts we asked, the most important rule in birdhouse design is getting the dimensions right. In the retail stores we checked out, almost every house used a horizontal format that made humans feel at ease, rather than the vertical design that songbirds prefer. And without exception, each and every one of them added a perch. All three agencies we checked with were adamant — this feature is detrimental to songbirds: while desirable species like to land on the edge of a hole, their predators use the nicely located perch to sit on while they stick their heads in the hole and attack the occupants. Another common mistake was to make the hole too big: it seems most of us have an exaggerated concept of the size of songbirds.

Choosing a Style

With the dimensions settled, the next aspect of design is style. There are three basic schools of thought here. By far the most common commercial style is a fairly plain house constructed of Western red cedar.

A second version is the overly ornate, painted and decorated house which has become quite popular in recent years. Common themes here are cowboy saloons, schoolhouses, Victorian mansions and the like.

The third and, in my view, most acceptable style is somewhere in between — a cedar home to meet all the birds' requirements, with a little external flair to pique the interest of their human neighbors. The log cabin project which begins on the next page is the result of this approach. It was designed and built with chickadees in mind, and made use of some clear Spanish cedar left over from the picnic table in our last issue. A nice grade of Western red cedar would work equally well.

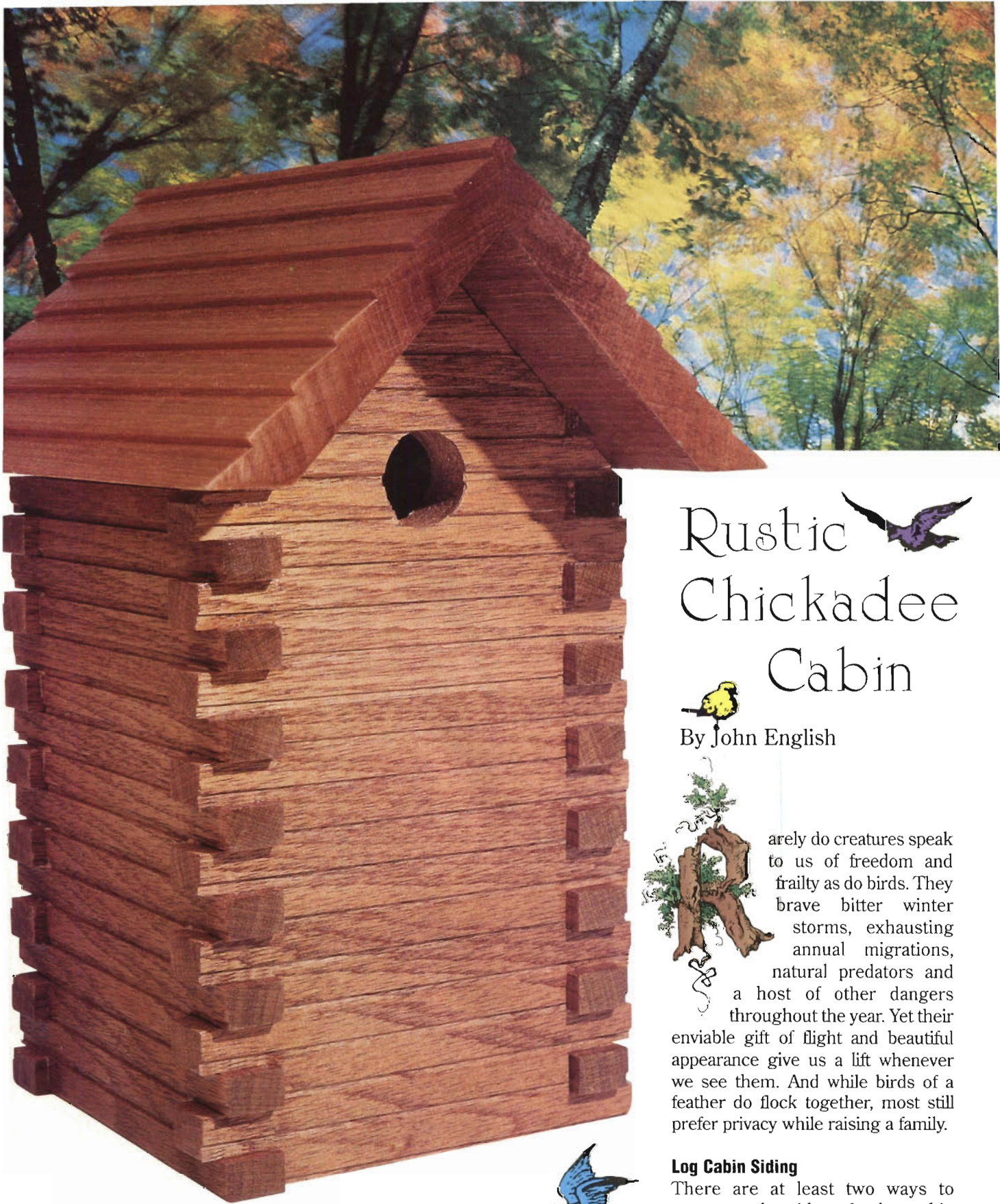
You would think that building a birdhouse would be a simple proposition, right? After all, most of us managed to hammer at least one together back in high school. Well, it turns out native songbirds are not always thrilled with the accommodations we provide. In fact, just about every one of the fancy birdhouses we found in local stores failed to meet the basic guidelines established by our state's Department of Natural Resources. Keeping that in mind, we decided to solicit some expert advice before designing our own version of this great beginner's project. Using input from the DNR offices in two states, and guidelines provided by the U.S. Game, Fish and Wildlife Service, we came up with our own birdhouse building basics.



*Victorian Feeder,
Today's Woodworker 22*

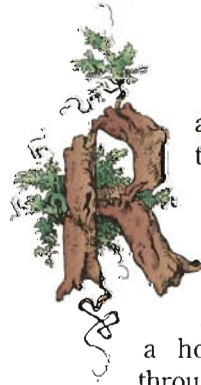
Birdhouse Basics

This issue's Full-size Pattern (left) includes important information on designing birdhouses. And don't forget to feed your new neighbors!



Rustic Chickadee Cabin

By John English



arely do creatures speak to us of freedom and frailty as do birds. They brave bitter winter storms, exhausting annual migrations, natural predators and a host of other dangers throughout the year. Yet their enviable gift of flight and beautiful appearance give us a lift whenever we see them. And while birds of a feather do flock together, most still prefer privacy while raising a family.

Log Cabin Siding

There are at least two ways to construct the sides of a log cabin birdhouse: You can mill each log individually and construct the building one piece at a time, or you

You can complete this attractive home for your feathered friends in a weekend!





can cheat. I decided to go this latter route and built each wall as a single unit. This is a relatively simple table saw process.

To prevent weak cross-grain problems at the corners you want the grain to run horizontally. So start out by edge gluing two 24" lengths of 1 x 6 stock together, to form a board large enough to yield all four sides. After the glue dries, follow the **Full-size Pattern** on the center pull-out to locate the vertical siding lines on the board's best face. Score these lines with a standard table saw blade set 1/8" deep (see **Figure 1**). Then reset your blade height and, with the aid of your miter gauge, crosscut the board to create the sides (pieces 1).

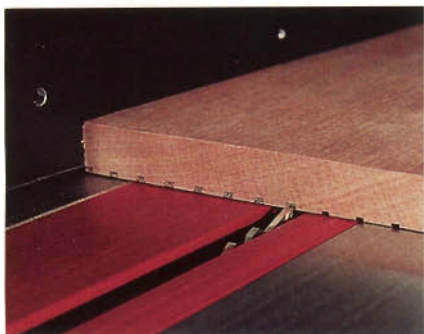


Figure 1: The author used an oversized blank for the sides so he could score all the log grooves at the same time.

Install a 3/4" dado head in your table saw to create the interlocking corners where the logs meet. The **Full-size Pattern** provides the key details and dimensions. Transfer them to your work pieces and use your miter gauge to keep the sides at 90° to the blade while you form the notches on two sides at a time, as shown in **Figure 2**.

A Shingled Roof

If you've built a dollhouse, you know how long it takes to cut and install shingles. I figured out how to get the same effect using a dado head in my table saw. The resulting profile is shown on the **Full-size Pattern**.

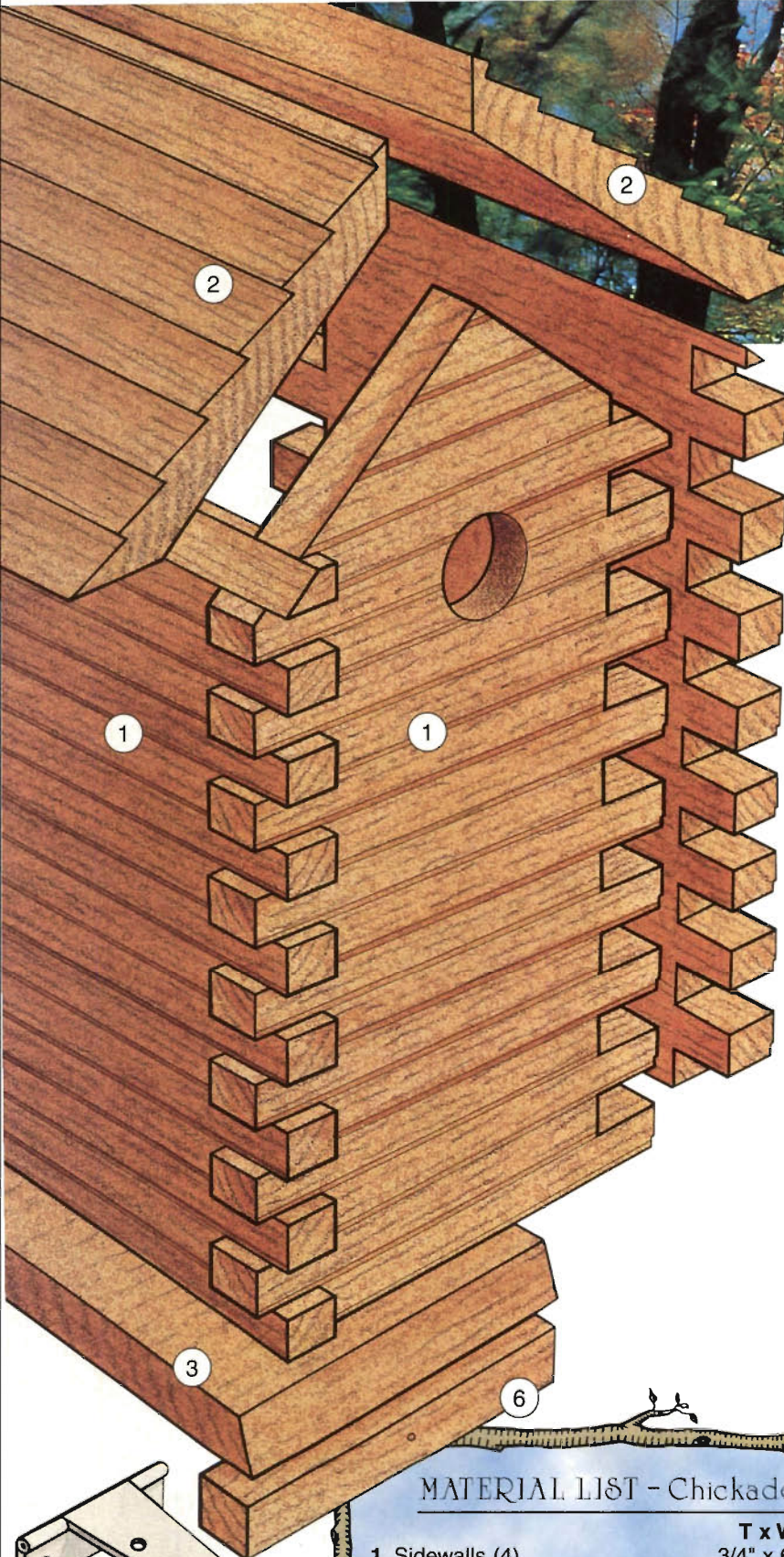
Begin by installing a 3/4" dado head in the saw and setting it to a 10° angle. As you're using nominal 1 x 6 stock, set the fence so it is 5 1/2" away from the farthest tip of the blade: this will line up your first cut with the outside edge of the

board. Adjust the cutter height so the lowest point of the angled cut is flush with the top of the saw table. After a test pass on some scrap, make your first cut in an 18 1/8" long piece of stock, which you can crosscut later to yield both sides of the roof (pieces 2).

After each cut, reset the fence so the next cut just touches the first. Continue until you complete all seven rows of shingles (see **Figure 3**). Since the angled cut is a hair shy of 3/4", you'll be left with an attractive ridge cap. When you're done, replace the dado head with a standard blade, set the angle to 45° and trim both edges, as shown on the **Full-size Pattern**. Set these pieces aside while you finish milling the sidewalls.

Figure 2: After crosscutting the scored sidewalls to size, form the corner joint notches, as shown at right. To reduce the number of passes, you can cut two walls at the same time.





Assemble and Trim the Walls

As this cabin is destined to become home to a family of chickadees, the front doorway must be sized accordingly. Choose one of the four sidewalls as the front of the house, then refer to the **Full-Size Pattern** to locate a $1\frac{1}{8}$ " diameter hole near the top. Clamp a piece of scrap to the back face while you drill the hole, to prevent tearout.

Test fit the four sides together. They shouldn't be overly tight: in fact, a little play is a good thing as the house will expand and contract quite a bit outdoors.

Glue the sidewalls together with waterproof polyurethane glue. Try to keep the glue toward the inside of the house, as it expands as it dries and is difficult to remove from the intersecting log corners. Gently clamp the assembly, making sure it's square as you apply pressure.

After the glue dries, raise your table saw blade to its full height and set the blade angle to 45° . With the birdhouse clamped firmly to an auxiliary fence on your miter gauge, trim the front and back gables to 45° (refer to the **Full-size Pattern**).

A 10" saw blade won't be tall enough to cut all the way to the peak. Simply reset the saw blade back to 90° and, with your miter gauge set at 45° , complete these four cuts (**Figure 4**).

Attaching the Roof

To preserve the delicate edges of the roof, I decided

MATERIAL LIST - Chickadee Cabin

	T x W x L
1 Sidewalls (4)	$\frac{3}{4}$ " x 6" x 11"
2 Roof Slopes (2)	$\frac{3}{4}$ " x $5\frac{1}{2}$ " x 9"
3 Floor (1)	$\frac{3}{4}$ " x $3\frac{3}{4}$ " x $3\frac{3}{4}$ "
4 Galvanized T-hinge (1)	$2\frac{1}{2}$ " x $3\frac{1}{2}$ "
5 Hinge Screws (6)	$\frac{5}{8}$ ", Predrilled
6 Cleat (1)	$\frac{3}{4}$ " x $\frac{3}{4}$ " x $3\frac{7}{8}$ "
7 Cleat Screw (1)	$1\frac{1}{4}$ ", Stainless steel



to forgo clamps while gluing the two slopes together. Instead, I made a hinge along the peak with masking tape, applied polyurethane glue, then folded the joint closed (see **Figure 5**). Two more strips of tape applied pressure to the joint while the glue cured. (Note: polyurethane glue doesn't seem to require the same degree of clamping pressure resin-based adhesives call for.)

Test fit the roof and mark the walls' locations on its underside with a pencil. Then use a sharp knife or a carving bit in a rotary tool to score shallow V-grooves just inside the pencil marks. These will prevent the glue from squeezing out on the visible side of the walls. Gently clamp the roof in place, using glue to secure it. When the glue dries, use a chisel to clean up any squeeze-out on the inside faces to ensure a toxic-free environment.

The Floor is a Clean-out

Trim the floor (piece 3) to the size shown in the **Material List**, then reset your saw blade and chamfer its front edge to 10°. The door is 1/8" shy on the sides to provide both ventilation and drainage.

Install the floor with a galvanized T-hinge (piece 4), setting the hinge so its flap is flush with the bottom of the back wall (see **Figure 6**). Doing so will automatically place the floor about 3/4" up from the bottom or the sides. This prevents moisture from wicking up into the house. Predrill for the hinge screws



(pieces 5) to help prevent splitting the cedar. Cut the cleat (piece 6) to size and secure it with a single stainless steel screw (piece 7). To clean out the house, simply remove the screw, and the floor will swing down automatically.

Wrapping Up

Sand the birdhouse thoroughly before applying a finish to the outside only. Wood preservative usually used on decking is a good choice, as it's specifically designed for rugged outdoor use. Oils are not a good option as they may be harmful to the birds, and Spar® varnish will eventually flake and wear off. Be prepared to recoat the house once a year.

If the finished house has a dark hue, make its home in the shade of a deciduous tree to prevent overheating in late spring and summer when the chicks are young. A round galvanized pole attached to the back wall with pipe clamps is a sound, predator-safe (as in squirrels and cats) approach. I don't recommend suspending the house, as some species won't nest in a swaying birdhouse.

You may install your birdhouse in any season, as birds need a safe refuge at several different times of the year. And if you give it to someone as a gift, you'll be doubly rewarded as both your friend and the birds will be delighted with their new birdhouse.



Figure 3: Rather than making many individual shingles, the author cleverly machines them into the roof sections with a dado head.



Figure 4: Complete the 45° cuts that form the roof peak with your miter gauge and an auxiliary fence on your table saw.

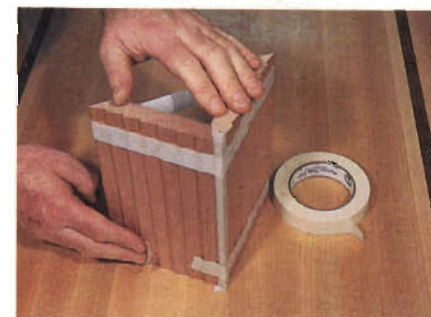


Figure 5: Try a tape "hinge" when gluing the roof sections together. Weather resistant polyurethane glue works well for this project.



Figure 6: A T-shaped strap hinge automatically recesses the floor the correct distance from the bottom edges of the house.

Entry Bench

By Jim Jacobson

Sharp to look at and solid to sit on, this raised panel project is a great opportunity to break out your stile and rail bit set ... or maybe you'll speed up the process with some pre-made panels.



Good buy

I confess ... I was tempted to buy my raised panels for this entry box from a custom cabinet door shop, rather than build them myself. My woodworking buddies say I'm crazy to go through all of the muss and fuss required to build raised panels — particularly when you can have them made, just as you wish, for not a lot more than the cost of your materials.



very year, I must say it a thousand times: “Wouldn’t it be great to have a place to sit down while I pull on my shoes or galoshes?” As I grow older, to a certain degree, that need has grown with me. And what about extra storage — wouldn’t it be wonderful to have a spot for gloves and hats, too? This year, I finally decided to do something about it. The result, this handy little entry bench, meets all of my needs and then some, and it was a gem of a project to work on. The front and sides are standard raised panels, the lid opens for storage, and the bench is a perfect fit for my busy little foyer.

Build the Frames First

The most logical starting point for this project is to create the raised panel frames, as these form the skeleton of the bench. For this operation, you’ll need to borrow or invest in a standard stile and rail set. That’s a router bit (or a matched pair of bits ... several profiles are available) that mills perfectly mated profiles on stiles and rails. I used a beading bit set, but an ogee, chamfer or concave profile is just as acceptable.

... or a woodworking sellout?

I think they’re missing the point — I really enjoy the process of woodworking. So the debate rages on between me and my pals. Are they a bunch of woodworking wimps because they send their raised panel work to a pro’s shop? Or am I simply a woodshop dinosaur, too entrenched in the prehistory of my hobby to take advantage of new technology? I must admit the woodworkers who make use of the custom panel shops are excellent craftsmen, and I certainly don’t hesitate to buy surfaced lumber and use other time savers ... but for me, a well made raised panel is part of the joy of woodworking: so I’ll just build ’em, OK?



Rip stock for all of the stiles and rails (pieces 1 through 8) about 1/16" larger in each dimension than the specific measurements shown in the **Material List** at right. Joint the stock to final dimensions, then trim the ends to length.



Using the Stile and Rail Set

Lay out your stiles and rails on the workbench (just butt them together for now), and mark the matching pairs where they meet. I like to use AA, BB and so on, to keep the parts oriented correctly during milling.

Chuck what I call the bead and groove cutter (see **Figure 1**) into your router and set the bit height. Practice on a piece of scrap (the exact dimensions as your actual stock) until the profile matches the elevations shown in the **Pinup Shop Drawings** on the center pull-out. This cutter will create the bead on the edge of the stile, plus the groove for the panel. It's a good idea to make these cuts in two or three passes, to get a clean profile safely. Mill one edge of each rail and the six outer stiles, and both edges of the front center stile. Then install the cope and tenoning cutter (**Figure 2**): this might be a separate bit, or a rearrangement of your first set-up. Look at the manufacturer's instructions for

Figure 1: Stile and rail bits are the best way to create the mating joints characteristic of frame and panel construction. With your first pass you'll form a bead and groove.

details. Use some scrap to set the height and test your fit, then mill both ends of the front center stile and both ends of each of the rails.

Making the Panels

Glue two or three well-matched boards together for each panel (pieces 9 and 10). Make sure to select stock with color and grain that is so similar the final joint becomes almost invisible. After cutting the panels to size, you can mill both the front and back



Figure 2: The rail ends are machined to fit into the grooves formed by the first cutter. Then use a raised panel bit (below) to shape both sides of the panels.



profiles with the same router bit as shown below. I used a vertical panel raising bit because its cutting edges are closer to the shaft than traditional horizontal bits, which makes it more stable: the tip of the bit actually travels at a slower speed.

Make each profile in several passes, with your router set to an appropriate speed. Machine the panels across the grain first, to minimize tearout, and clamp a high auxiliary fence to your router table fence to stabilize the workpiece.

Assembling the Frames and Panels

Sand the frame elements and apply stain (if you plan on staining your bench) to the panels: this will prevent color gaps later if the panels move after finishing. Glue and clamp the frames together, with the panels floating freely in their grooves. If you glued the panels in place, they would split as the wood reacted to changes in temperature and humidity.



Entry Box Project Supplies

The following supplies are available from Woodworker's Journal.

Stile and Rail Bit #90124.....\$124.99

Raised Panel Bit #90182\$64.99

To order your supplies, call 800-610-0883 and mention code W0899.



Material List

	T x W x L
1 Front Outer Stiles (2)	3/4" x 2 3/16" x 14 1/4"
2 Front Center Stile (1)	3/4" x 2 7/16" x 8 13/16"
3 Front Top Rail (1)	3/4" x 2 3/16" x 20 1/8"
4 Front Bottom Rail (1)	3/4" x 3 3/4" x 28 1/2"
5 Side Front Stiles (2)	3/4" x 1 7/16" x 14 1/4"
6 Side Back Stiles (2)	3/4" x 2 3/16" x 14 1/4"
7 Side Top Rails (2)	3/4" x 2 3/16" x 12 1/8"
8 Side Bottom Rails (2)	3/4" x 3 3/4" x 12 1/8"
9 Front Panels (2)	3/4" x 8 7/8" x 8 11/16"
10 Side Panels (2)	3/4" x 12" x 8 11/16"
11 Bottom (1)	3/4" x 15 5/8" x 23 1/4"

	T x W x L
12 Back (1)	3/4" x 13" x 23 1/4"
13 Front Skirt (1)	3/4" x 3 3/4" x 25 1/2"
14 Side Skirts (2)	3/4" x 3 3/4" x 16 3/4"
15 Lid Brace, Front (1)	3/4" x 1 1/2" x 22 1/2"
16 Top Frame, Sides (2)	3/4" x 3 1/4" x 15"
17 Top Frame, Back (1)	3/4" x 1 3/4" x 25 1/2"
18 Lid Brace, Sides (2)	3/4" x 1 1/2" x 14"
19 Lid (1)	3/4" x 12 7/8" x 18 7/8"
20 Lid Cap (1)	3/4" x 2" x 18 7/8"
21 Lid Hinge (1)	1 1/2" Brass piano
22 Top Sides (2)	3/4" x 2 1/4" x 16 1/8"
23 Top Back (1)	3/4" x 2 1/4" x 26 1/8"

Make sure the assemblies are flat and square as you apply clamping pressure. You can add a sandbag or two, if needed. When the glue has set, plow dados for the bottom (piece 11) and rabbets for the back panel (piece 12). Their dimensions and locations are shown on the

Pinup Shop Drawings.

Glue and clamp the side frames to the front frame as shown in the **Exploded View** on the previous page. While a simple butt joint is quite adequate here, you might want to use biscuits to help align the parts. Slide the bottom into its dado to help keep things square, then predrill for a couple of 4d finish nails in each side, to hold the back in place while it's being glued and clamped. (For stability, I used oak veneered MDF for the bottom and back.) Set and fill the nail heads and sand the filler smooth when it's dry.

The Skirt and Top

When the carcass glue is dry, rip and joint a board that's long enough to yield the front and side skirts (pieces 13 and 14). Mill a chamfer on its top edge (see **Pinup Shop Drawings**) using a router bit. Machine the three skirts to length, then band saw reliefs on their bottom edges as shown on the **Drawings**. Using your table saw's miter gauge, miter the skirt to wrap

around the box. Install the skirts with glue and clamps. Temporarily clamp a plywood straightedge to the carcass to keep the skirts aligned as you clamp them in place. Glue and clamp the front lid brace (pieces 15) in place next. Move on to the top frame (pieces 16 and 17). The bottom edge of this frame is chamfered to match the top edges of the skirts. I suggest chamfering

the ends of the frame back, then gluing it to the carcass. With the frame back already in place, it's a little easier to locate the chamfers on the edges of the top frame sides for a perfect fit. Use biscuits on the ends of the frame sides to help glue and clamp them into place. Now, position and glue the lid side braces (pieces 18) under the frame sides.

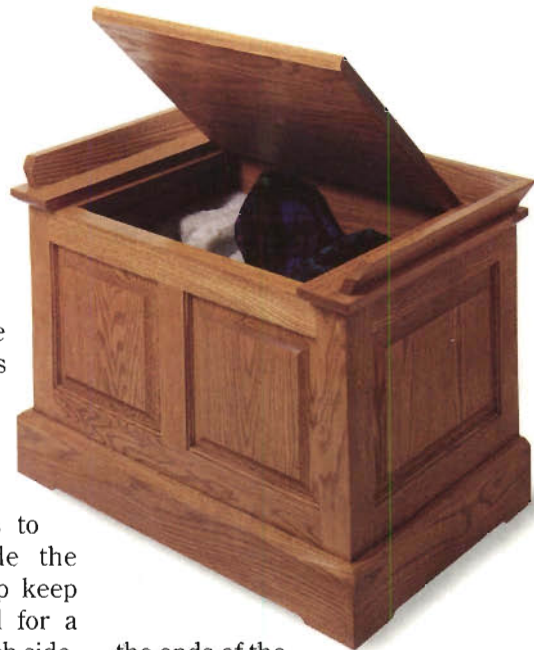
Install the Lid

The lid is a piece of veneered MDF (piece 19) with a strip of solid oak (piece 20) edge glued to it. Pick up the skirt's chamfer on the front edge of this edging, then dry fit the seat (allow for the depth of the hinge as you do). Trim the hinge (piece 21) to length, then predrill for its screws and install it.

Follow the directions in the sidebar to make the top sides and back (pieces 22 and 23), then glue and screw these pieces in place. Predrill for the screws and countersink their heads.

Finishing Up

Remove the lid hinge and sand all parts down through the grits to 220. Apply the stain of your choice (I used red oak, to even out the wood's natural colors), followed by three coats of clear finish. Reinstall the hinge, and you're finally ready to put on your boots in comfort.



Making Shadowbox Miter Cuts

The top sides and back are milled just like a shadowbox picture frame. Cutting their compound miters on a table saw is a two-step operation. Begin by adjusting the miter gauge and blade angles using the chart at right. The Desired Angle is the angle the seat side makes with the top (in this case, 60°). Cut one end of each frame piece with the miter gauge set for a left-to-right downward slope. Then reverse the miter gauge exactly 90° and reposition the frame segment for the cut at the other end. Make sure the piece is oriented with the toe of the miter ahead of the heel, then make your cuts.

Desired Incline	Blade Angle	Miter Gauge Angle
5°	43 $\frac{3}{4}$ °	85°
10°	44 $\frac{1}{4}$ °	80 $\frac{1}{4}$ °
15°	43 $\frac{1}{4}$ °	75 $\frac{1}{2}$ °
20°	41 $\frac{1}{4}$ °	71 $\frac{1}{4}$ °
25°	40°	67°
30°	37 $\frac{3}{4}$ °	63 $\frac{1}{2}$ °
35°	35 $\frac{1}{4}$ °	60 $\frac{1}{4}$ °
40°	32 $\frac{1}{2}$ °	57 $\frac{1}{4}$ °
45°	30°	54 $\frac{3}{4}$ °
50°	27°	52 $\frac{1}{2}$ °
55°	24°	50 $\frac{1}{4}$ °
60°	21°	49°

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Identical Curves: Dry Bending Made Easy

By Mike McGlynn

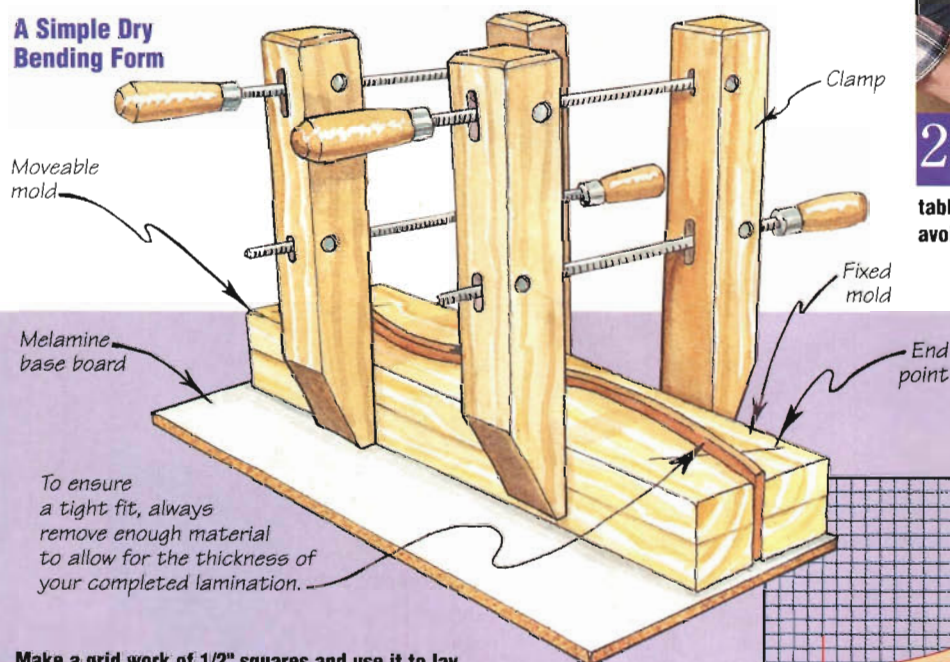
Wood grows as it will, gently curving or straight as an arrow. But when we buy it from our suppliers, it's in nice flat square pieces. So, when a project or a design demands complex curves or round aprons, what do you do? The easiest and probably the strongest option is dry or laminate bending. This technique, which takes advantage of the flexibility of thinly sliced straight-grained wood and the strength of multiple laminations, has become increasingly popular since the introduction of modern glues.

The gently shaped, paired legs of the oval coffee table, featured in this issue (see page 26), presented some of the typical challenges encountered with this technique, so I'll use that project to run through the basic principles of dry bending.

The first step in making the curved legs is to create the mold. Start by gluing a couple of 2" by 6" boards together, long enough to capture the legs. Using the diagram below, lay out a grid work of 1/2" squares and transfer the shape of the legs — marking the ends of the legs on the top face of the mold. To ensure a tight fit when you start clamping up laminations, remove 1/2" of stock from the middle of the mold. Smooth the inside faces of the mold halves, making certain the faces remain square to each other. Then line both faces of the mold with clear packing tape. The last step is to attach one half of the mold to a larger piece of 3/4" melamine or waxed board.

When selecting wood for your leg laminations, choose carefully. Each

A Simple Dry Bending Form



Make a grid work of 1/2" squares and use it to lay out the shape at right. Transfer the leg's profile to the mold material and remove the 1/2" thick leg shape from the mold. Mount one side of the mold to a base board.

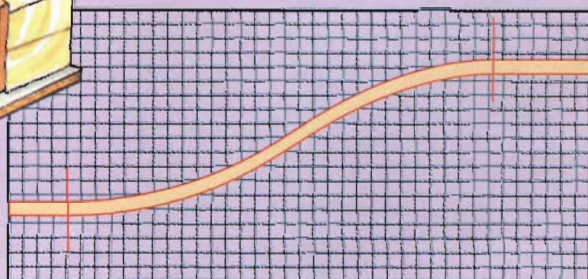


1 Rip thin pieces of straight grained wood on your hand saw, using a point fence to control the thickness of your cut. Be sure you make the pieces several inches longer than the finished length required.



2 Next, plane the laminations to a uniform thickness ... in the case of the oval table, just a hair under 1/8". Do your best to avoid snipe and tear-out.

Table Legs Shape





3 After spreading glue on the appropriate surfaces, clamp the laminations into the form. Line the mold with clear packing tape to ensure a good release and use a good quality epoxy with a long open time.



4 After the epoxy has cured, remove the leg blank and return to your band saw. Scribe the width of the leg and stay with your point fence to rip the individual leg sections.



5 Complete forming the laminated legs on your table saw. Use a squared up miter gauge and auxiliary fence to trim the legs squarely and to length.

piece should have the straightest edge grain possible. Cut and mill your laminations so you have pieces $1/8" \times 2" \times 22"$ (you should end up a hair under $1/8"$ to allow for the space the glue will take up). The height allows you to cut two legs from one lamination, achieving perfectly matched pairs of legs.

For gluing curved laminations, I prefer to use West System epoxy. Epoxies have an advantage in this application because they don't creep under tension, as yellow glues are prone to do. Before you apply the epoxy, it's a good idea to lightly sand the gluing faces. Epoxy is a mechanical bond and it can use a little extra tooth. Now apply glue to your four laminations, put them in the mold and clamp it tight. Make sure your laminations are pushed snugly down against the bottom of the mold. After the epoxy has cured, remove the leg blank from the mold — but not before transferring the end points to the edge of the blank.

When you are done gluing up the four legs, clean up the faces and edges of your laminations, but again, don't lose the end marks. The laminations can now be ripped into two pieces and cleaned up to their final $3/4"$ width. Using the end marks you made earlier, cut the legs to length, keeping them in matching pairs during this process. Once sanded, they're ready to be attached to the table.

The principles used to make these legs will allow you to create an almost unlimited variety of shapes. It is a practical and very creative technique in woodworking.

Straight talk about bendable wood

In general, most species of wood will bend if you select straight grained stock and slice it thin.

The denser a piece of wood, the thinner you need to slice it. Thus, a $3/16" \times 3/4" \times 60"$ piece of straight grained sugar pine will bend to

a much tighter radius than an identical piece of oak. Further, some species just seem more flexible. Cedar, ash and even hickory, though they have wide ranging specific densities, all have reputations as woods that bend well.

Selecting the proper glue for dry bending can also have a big impact. Glues differ as to how elastic they remain after they have cured. White glue is the most elastic,

epoxy is the hardest and least flexible. Yellow glue, polyurethane and plastic resin glues fall in between. I prefer very rigid glue. Open time is also critical to successful bending. In my

book, the more time you leave yourself to work with your laminations before the glue sets, the better. For that reason, long set epoxies and plastic resin glues are my strong recommendations.



Four by Twenty-four and More

By Jim Barrett



Combine a spindle sander with an oscillating 4" x 24" sanding belt and you've got Ridgid's new stationary sander. Useful for hundreds of operations, this is a tool that would be handy in anyone's shop.

If you've ever used an oscillating spindle sander, you already know the advantages it offers over a conventional sanding drum: The dual action enables you to use more of the sleeve's surface, which helps reduce clogging and paper wear.

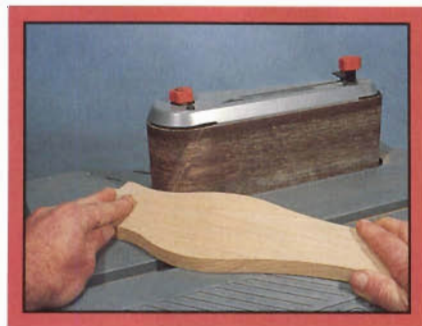
Now consider Ridgid's oscillating edge belt/spindle sander. This clever benchtop tool uses the same oscillating motion to drive a 4" x 24" sanding belt attachment, as well as a full complement of 4 1/2" tall sanding drums and sleeves, ranging from 1 1/2" to 3" diameter, replete with rubber drums, table insert, spacer rings, and spindle washers, all stored neatly on the front of the base. Switching between the belt attachment and various drums is stone simple: you just unscrew a knob on top of the drive spindle, slip off one attachment, make the switch, then replace the knob — it takes less than 2 minutes.

Similarly, large, comfortable Sof-Touch™ knobs are used to adjust belt tracking and the tension release lever on the belt attachment, backstop, and table-tilt mechanism. Aside from two small hex-head wrenches

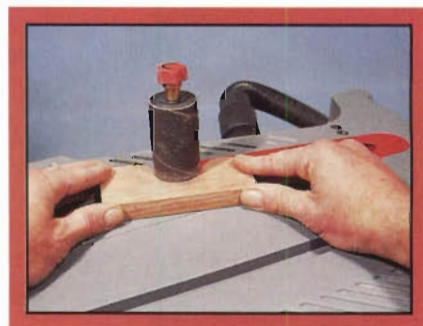
(provided) you'll need to initially level the front table and table insert and align the belt attachment to the table's miter slot, the Ridgid sports completely toolless operation. On the backside, you'll find a recessed storage area for the belt attachment and/or oblong table insert, depending on which is in use, plus holes for the hex wrenches. Complete on-board storage and toolless operation, combined with a concise, well-illustrated instruction manual, makes the Ridgid a real no-brainer to quickly set up and use out of the box.

Using the Belt

Compared with other stationary belt sanders, the oscillating belt on this machine is an odd duck indeed, but several advantages soon became apparent in my tests. The same dual action that produces crisp, smooth, scratch-free edges with the spindles also applies to the belt. The attachment takes commonly available 4" x 24" belts and enables you to sand the sides, ends and faces of boards up to 3 1/2" thick or wide. A removable backstop comes in handy for doing board ends and smaller work-pieces. In addition, the front table tilts from 0 to 47



The oscillating belt allows you to sand flat faces along with inside and outside curves. Changing belts is an easy, toolless operation.



With the drums in place, you have a standard oscillating drum sander. The standard variety of drum sizes is available.

degrees, with positive detents at 0°, 15°, 30° and 45° for sanding beveled workpieces. The table includes a slot that accepts a standard miter gauge, for greater accuracy when sanding the ends of boards on flush and miter cuts, or the tapered sides of smaller pieces. Ridgid offers a beautiful miter gauge as an optional accessory for about \$30. This heavy-duty gauge can be adjusted up to 60° left and right, with adjustable stops at 0°, 45° and 60° left, along with 30° and 45° right. Using a combination of the miter gauge and tilting table, I was able to sand compound miters.

The belt rotates counterclockwise (right to left). When sanding long pieces, you swing the back-



Storage for the large sanding plate and the drums is engineered into the body of the sander — a nice touch.

stop out of the way and feed the work in the opposite direction.

If you're sanding very long boards (over about 3 feet in length), it's best to rig up some type of additional support, such as roller stands beyond the infeed and outfeed sides of the table. The orientation and travel of the belt also enables you to sand out-

side curves on the belt face, and inside curves over 1½" in radius on the wider drive spindle end. Sanding curves on the smaller idler drum is not recommended, as doing so tends to kick the work up off the table and can also mess up the belt tracking.

Tool Preview continues on page 58...

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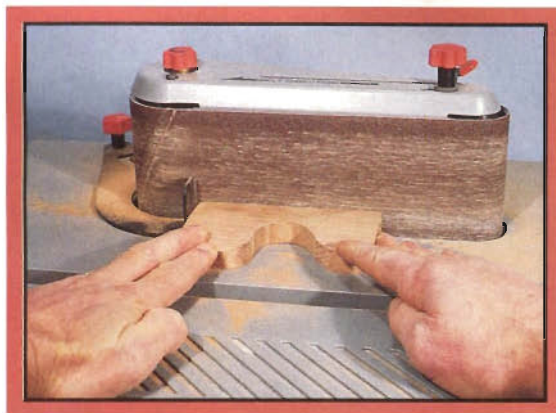
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... continued from page 57



A removable stop is a handy feature when sanding small or oddly shaped pieces. It adds an element of control and safety. Note the orange Sof-Touch™ adjustment handles.

Using the Drums

As mentioned, the switch-over between the belt attachment and various drum sizes is a cinch, with no tools involved. The sander comes with a set of 4½"-long drums and sanding sleeves. Ridgid provides sizes of 1/2", 3/4", 1", 1½" and 2" diameters — the same sizes used on several other popular benchtop oscillating spindle sanders. Suffice it to say, the replacement drums and sleeves are easy to find at most retail woodworking supply stores and through woodworking catalogs.

Other Features

The Ridgid sports a 4.3-amp induction motor, which I found had ample torque for sanding the thick-

est or widest stock the tool can take (about 3½", or the width of a standard 2 x 4 with the belt assembly, and 4" with the spindles). You can bog down the motor if you really lean into the machine, but with the aggressive oscillating action and

reasonably fast spindle speed, you only need a light touch to remove material efficiently with the drums and belt. As with any oscillating spindle sander, too much feed pressure will also flex or deform the sanding spindle and drums (especially the smaller diameter ones), affecting accuracy, as well as prematurely wearing out the spindle and drive components. My advice here is to arm yourself with a good selection of paper grits in



The tilting table coupled with an adjustable miter gauge allows you to accurately sand compound angles with ease.



Tools by the Numbers

Motor4.6 amp @ 110-120V
 Weight43 pounds
 Stroke Length3/4"
 Drum Length4 1/2"
 Belt Size4" X 24"
 Table Tilt0° - 47°
 Ridgid Info800-4-RIDGID

sleeves and belts — from coarse to fine — and get a feel for all of them. At 43 pounds the sander is light enough to lift on and off the bench, but heavy enough to stay put when sanding smaller pieces.

When I placed the unit atop my 34" tall workbench, I found the table surface a mite high for comfortably handling long boards or large workpieces, such as cabinet doors — and I'm over 6 feet tall. It's best to set the unit on a lower surface or place it across a pair of sawhorses (using the slots in the sander base provided for that purpose).

The lightweight and built-in sawhorse slots are just two features that make this tool suitable for on-site work. In addition, the front table tilts low enough to keep the stored drums, sleeves, and washers from falling out of their storage slots during transport. Recesses in the base housing under both sides of the stationary rear table provide convenient hand grips for hefting the machine.

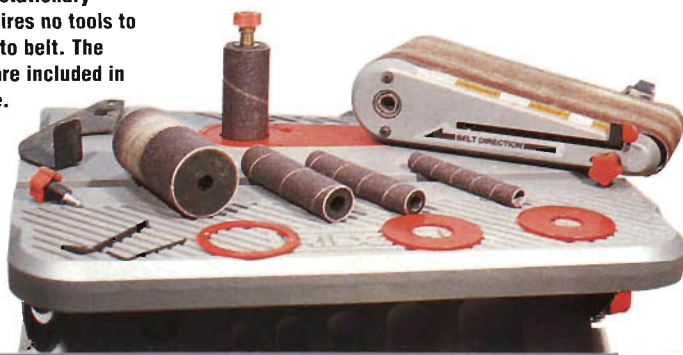
The rear-mounted dust port fits a standard 2 1/2" hose or fitting (in my case, necked down to work with a smaller Shop-vac). It works reasonably well to keep sawdust from building up underneath the table, which would otherwise foul the spindle drive mechanism. Not 100% effective, but certainly worth hooking up to.

Parting Thoughts

Made in the U.S.A. by Emerson Electric, this tool, as well as other Ridgid machines I've tested, sports good power, precision, and nice ergonomic perks, such as Emerson's patented Sof-Touch™ control knobs. While Ridgid tools haven't been on the market long enough to stand the test of time, indicators on this one include well-machined, smoothly operating parts, heavy-gauge, reinforced aluminum table and durable, molded plastic base with storage slots for all add-on parts. Also, Ridgid stands behind their products with a lifetime warranty. The sheer versatility of this sanding machine is quite impressive: from shaping or finish-sanding project components, to touching up saw cuts in trims and moldings — it's equally at home on the job site or in the shop. As much as I scratched my head to come up with various uses for this tool (and I found plenty), I'm sure there are many more I haven't discovered. At \$239, the price is well in line with dedicated benchtop spindle sanders of the same size. Sold exclusively by Home Depot, Ridgid is also developing a large network of independent servicing centers for repair and replacement parts — 118 centers at this writing, and another 200 projected within the year.

Tool Preview continues on page 60 ...

All of these features store easily on the body of the stationary sander, which requires no tools to change from drum to belt. The parts shown here are included in Ridgid's base price.



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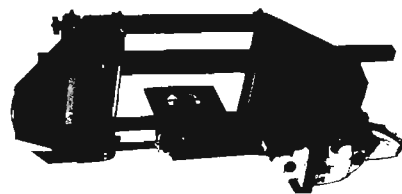
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(Circle No. 83 on PRODUCT INFORMATION form)

Makita's LS1220 Compound Miter Saw

By John English

Sometimes miter saws fall a tad short when you need them most. Recently, I was working on a large crown molding and my 10" blade couldn't quite manage the cut. It gets worse when you're cutting at an angle or when the blade is tilted for a compound miter. So you can see why Makita's new 12" compound miter saw, the LS1220, caught my eye: this saw will cut all the way through a 2 x 8 in one pass, even when the base is set at 45° and the blade is tilted to the same angle.

saw with a new carbide blade on hardwoods, medium density fiber-board (MDF) and Corian™, finding no

noticeable decrease or even a variance in power from one material to the next.

Makita

PART NO. 1225239

The 12" diameter of the LS1220 delivers impressive compound angle cutting depth.



Power to Spare

The first time I pulled the trigger on the LS1220, I was a little surprised at the sound it generated. That's because the high torque, 15 amp motor has a built-in slow starting feature: it takes about one second to build up to its full 3,200 rpm no-load speed. The result is constant blade speed (rpms) through even the most dense materials. I tested the

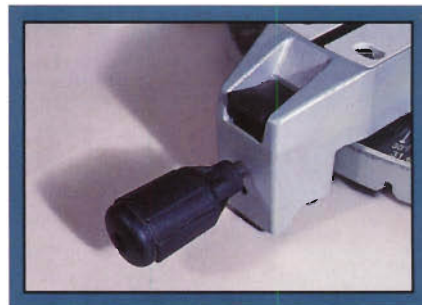


A holder for the blade wrench is built into the LS1220's base. This wrench also adjusts the depth of cut. The shaft can be locked in position during blade changes, so you don't have to jam it with a piece of scrap.

Despite the large motor, the LS1220 weighs only 37.5 pounds. That makes it portable enough to carry to a job site, yet still heavy enough to be stable during use.

Built-in Conveniences

One of the most common problems with miter saws on-site is that you never have a wrench handy when the blade needs changing. Makita addresses this by storing a socket wrench right in the base. Replacing



To set the miter, loosen a knob and press down on the lock lever as you move the carriage to the desired angle.

the blade is a two-step process: use the supplied wrench to loosen a hex bolt that holds the blade cover in place, then raise the cover and use the same wrench to remove the spindle nut that holds the blade in place. This is just a one-tool operation because the LS1220 features a built-in shaft lock that keeps the blade from revolving ... thus eliminating that ancient shop tradition of having to jam a stick behind the blade with one hand, while you loosen the nut with the other two! The blade cover fully wraps the blade when the handle is in the up position and automatically moves out of the way as the handle is lowered into the work.

Connecting the LS1220 to my shop's dust collection system only took a couple of minutes, and thereafter the large blade guards were most effective at directing waste to the port. Another nice safety feature of the LS1220 is a lock-off button on the power switch lever. This button must be depressed before the switch can be activated.

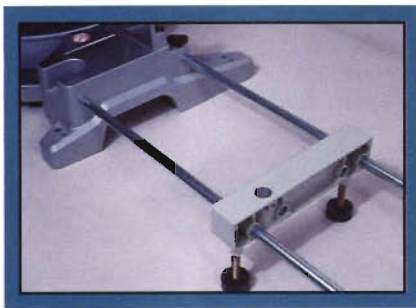


A moveable sub fence must be pulled out of the way before you can adjust the blade to chop compound miters.

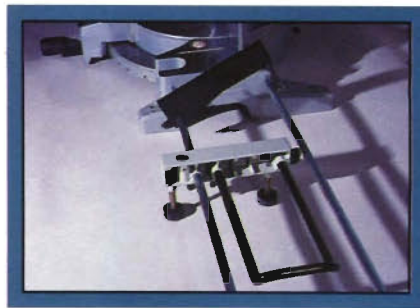
Cutting Operations

Most woodworkers rely on the kerf a miter saw makes in an auxiliary wooden base to line up cuts. This saw doesn't require a shop-supplied base. Instead, it's shipped with two plastic plates, each a little over an inch wide, that line up on either side of the blade. While the technicians at Makita install these plates, they let the new owner adjust them on-site to fit the thickness of the blade. As the plates wear, they can be adjusted several times over the years, which means you'll always have an accurate kerf line to locate your cut — a very nice feature if you move the saw around a lot.

Depth of cut adjustments are made with the same supplied socket wrench used earlier to change the blade. This is handy if the blade has been sharpened several times — the saw can be adjusted down so it still delivers the maximum cut that a 12" blade allows.



A holder assembly slides on two metal rods inserted in the saw base, and provides support for long workpieces.



An adjustable stop ensures that duplicate workpieces are of identical length, and a small holder provides interim support.

Miters and Bevels

Adjusting the LS1220 to cut a miter is simplicity itself: just loosen a knob, depress a locking lever with your thumb, and slide the base to the required angle. There are detents left and right of the 90° position at 15°, 22.5°, 31.6° and 45°. These are marked clearly, with numbers large enough to see easily. Once the angle is set, it can be locked between or at the positive stops by tightening the knob.

Compound miters are just as easy to set up. Once the angle has

been set, the blade can be tilted to a bevel angle by pulling up a lever at the back of the base. Set the bevel according to the built-in scale, then simply lock the carriage back in place by pushing the lever down again.

Note that the saw's fence is in two parts: when making bevel cuts, the smaller of these two parts (Makita calls it a sub fence) must be lifted out of the way, or it will interfere with the blade's travel.

Tool Preview continues on page 62 ...

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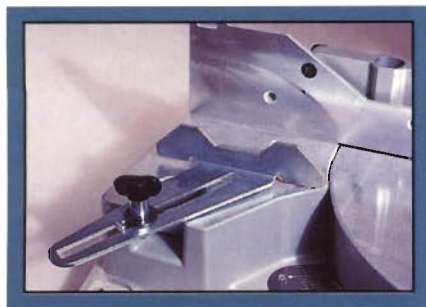
NEW - READY-TO-WRAP ABRASIVES

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Holding the Workpiece in Place

Even though the travel of a miter saw's blade pulls the workpiece toward the fence, it's still a good idea to *clamp* the wood in place. To this end, Makita offers a pair of optional horizontal and vertical vises that drop into the saw base. A knob on the horizontal vise handle engages and disengages the threads, so the clamping face can be slid quickly into place, then tightened with just a couple of turns. I found them more than adequate

for the job and used them to clamp several different sized pieces of stock, including 4 x 4 posts. They both did an admirable job of holding the work in place during all kinds of cuts.



A pair of crown dogs (one left and one right of the blade) can be set to support large crown moldings during compound cuts.

More Optional Accessories

The two vises aren't the only accessories that Makita offers for the LS1220. A pair of steel rods are available: they slide into the saw base on one end and into a cast metal holder assembly on the other, in effect extending the table to provide level support for long workpieces.

A smaller version of the holder assembly also is available. An adjustable stop, which Makita calls a set plate, can be installed on either of the steel rods to make accurate repetitive cuts.

Tools by the Numbers

Makita LS1220 Compound Miter Saw	\$389.00
RPM	3,200
Weight	37.5 pounds
Blade Size	12"
Motor	15 amp @110 - 120V
Miter Cut Available	45°
Makita Information	800-462-5482

Final Slice

All in all, I was more than pleased with what I found in Makita's newest chop saw. With its larger than ordinary blade and a solid array of features and adjustments, the LS1220 is an impressive power miter saw. Portable and sturdy, it would be a nice addition to any workshop where serious woodworking is the rule.

With this saw in your shop, there would be no problem cutting any angle you wish in the king of all crown moldings!



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Newly Discovered Old Favorites

By Al Welford

While modern hinges and new installation jigs have made hanging cabinet doors a much easier and woodworker-friendly proposition, getting the perfect hinge to

do exactly what you want can be a challenge. A key thing to remember early on is that your incredibly creative design might just be hinging on hardware that has yet to be invented. Which is why it's good to know about these two hinges. They are modern variations of old favorites, and the new features are actually honest-to-goodness improvements!

Grand Piano Change

Just when you think there is nothing new under the sun, along comes a fresh take on an old favorite. Few hinges have the versatility and staying power demonstrated by

piano hinges. Durable and attractive, they were probably invented shortly after dirt. Their only shortcoming was when you tried to secure them to very thin stock or end grain, they tended to pull out or split the thin lumber. These new editions feature two different wrap-around designs. Both allow you to drive your screws into the side of a piece of lumber or plywood, rather than the edge or end grain: a sweet solution to one of the few drawbacks of this venerable old standby. They're available in either antique bronze or bright brass finish and in full or half-wrap design options.

The piano hinge's forte is its versatility. A new version increases your options even more by allowing you to drive screws into side grain instead of end grain.



Elongated holes give you room for adjusting your screw placement along the piano hinge. An optional antique finish offers even more uses for this old standby.



It's easy on the eyes and even easier to install. This new long barreled finial hinge has a 35 mm cup mounting system.

Easy Elegance

Reflecting the elegant styling of days gone by, the long barreled finial hinge is a decorative addition to the growing options available in European-styled hinges. Its long, decorative barrel is right at home on many classic cabinet designs. The 35mm cup mounting system makes these hinges easy to install and allows for a great deal of door adjustment. Available in an antique bronze finish, they are 15" long. Use them in smaller doors (one hinge per door), or use multiple sets on larger door applications like enclosed bookcases, entertainment centers or armoires.

Al Welford is our resident hardware expert. Send him your questions or comments at Woodworker's Journal, Dept. HH, P.O. Box 261, Medina, Minnesota, 55340. Or e-mail him: editor@woodworkersjournal.com

Biscuits, Marbles and Gyros

Q I'm looking for hinges that can be mortised using biscuit joiners, as seen on the New Yankee Workshop recently. Any information you could provide would be greatly appreciated. It looks like a great way to mortise hinges. I'm surprised I am having this much trouble finding a source of them.

K. Olson
Hatfield, Pennsylvania

A We'll be glad to help you take a bite out of your biscuit hinge problem. At least two tool companies, Ryobi® and Lamello, make ornamental hinges for use with a biscuit joiner. Ryobi's hinges work with the DBJ50 detail biscuit joiner. You can find out more from Ryobi at 800-525-2579 or you can order a pack by calling 800-610-0883 (mention code W0899 and ask for item #11339).



Q I build small projects requiring several coats of finish, and a quart or pint size can tends to last for a long time. I know that doesn't sound like a problem, but the metal lid on the can takes so much abuse that it is worn out before the container is empty. I have tried putting the finish in a plastic container, but it dried up quickly. Any suggestions?

Alfred Rudy
Rydal, Georgia

A Don't lose your marbles — we have some solutions. Start by replacing the finish you use with a solid object, like marbles. They'll keep the finish near the top of the container, reducing the air in the can. If you'd rather keep your cat's-eyes clean, try spraying some BIOxygen™ on top of the finish to displace air and its drying effects. To reduce wear and tear on your lids, retire the screwdriver and use a paint can opener — available at local hardware stores.



Blow some BIOxygen™ across your finish to keep it from drying out. Or add marbles as you use finish to eliminate room for air.



Q Here's another mystery tool from my collection. As you can see, it has three prongs. Total length is 10", with the wooden handle at 4½". Each prong is a little less than 4" long and has large, circular threads. A metal stretcher crosses the tool at the level of the second thread.

Phil Flesland
New London, Minnesota

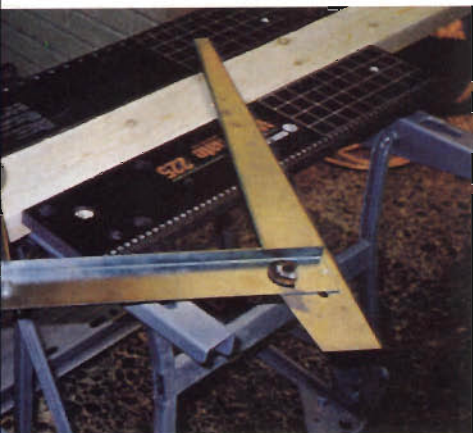
A Well, Phil, we're still not sure of the answer to your April '99 Stumper, but we think readers will want to take a stab at identifying this one. Mashed potatoes, anyone?



Winner! For taking time to respond to Stumpers, Roger Dabe of Xenia, Ohio wins a collection of American Tool's Quick Grip clamps. We toss all the Stumpers letters into a hat to select a winner. If you have a question or answer, send it to the editor: Stumpers Dept., Woodworker's Journal, P.O. Box 261, Medina, Minnesota 55340. E-mail: editor@woodworkersjournal.com.

We published the Montana Mystery Tool a year ago, (it was a spoke pointer) and the answer appeared in our December issue. We continue to get a few letters a week on that one. It's time to move on to the next mystery, folks!





Greg Speros went hunting for a crosscut saw guide like the one in his friend's shop. He ended up with more than he ever expected!

Q A few months ago, we published a *Stumper* from Greg Speros of Bellbrook, Ohio, who was looking for the crosscut saw guide pictured above. We thought the rest of our readers would enjoy hearing about the happy ending to his search.

The Editors
Woodworker's Journal

A "Years ago, when my father and I started working with wood, this was a tool we bought. I have had it for a long time and never used it," Roger Dabe wrote to Woodworker's Journal. "I live in Xenia, Ohio, which is only eight miles from Bellbrook."

When Roger read about Greg's desire for the tool he decided to get in touch with him, since they live within 15 minutes of each other. The tool changed hands, and Greg "is now the proud owner of the mystery guide," said Roger.

"I offered to pay for the tool, but Mr. Dabe refused," Greg told us. "I counter-offered with a free Greek gyro lunch at our church festival come September."

Greg was also the tool giveaway winner when his inquiry originally appeared in *Stumpers*. "And so, with the clamps I received, I have become a double winner," he said. "As the saying goes, 'my cup runneth over.'"



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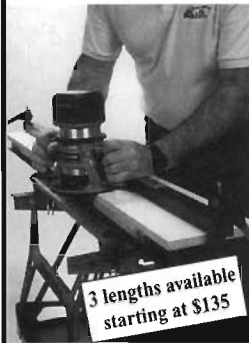
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I simply had to write and inform you of how pleased that I am with your product. I recommend it to any serious woodworker.

Best Regards,
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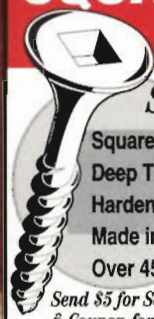


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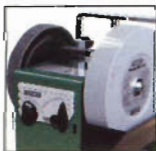


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Jamestown Distributors.....800-497-0010

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HUT Products.....800-547-5461

<http://www.hutproducts.com>

Bosch.....877-267-2499

<http://www.boschtools.com>

Whoops! In our last "What's in Store" we incorrectly stated that BIOxygen®, a great finish preservative, contains oxygen, instead of argon. As many of you noted, that was a big mistake!

Epoxy Ahoy

Jamestown Distributors is now offering the complete line of MAS brand epoxy system products. Because of its low viscosity, slow cure time and blush free attributes, MAS epoxy is very easy to use. Long cure time ensures good penetration into wood fibers, the key to successful bonds. For more information about the MAS epoxy system or other Jamestown products, call 800-479-0010.



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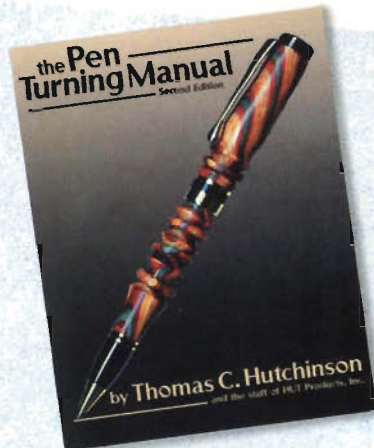
Radical Triple Roller

Wolfcraft's triple roller folding support stand is a solid shop performer. Sturdy yet portable, it features three 20" wide rollers on an adjustable stand. It folds flat for easy storage and is adjustable in height from a minimum of 27½" to its full extension of 43½".

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The *Pen Turning Manual* tells you just about everything you need to know about, well ... turning pens! Thomas Hutchinson's knowledge and love for the craft is displayed along with many designs for different styles of pens. Unbeatable for the novice or expert, it is easy to understand and provides over 120 useful illustrations. For more information, call HUT Products at 800-547-5461.



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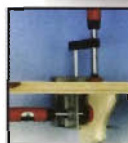
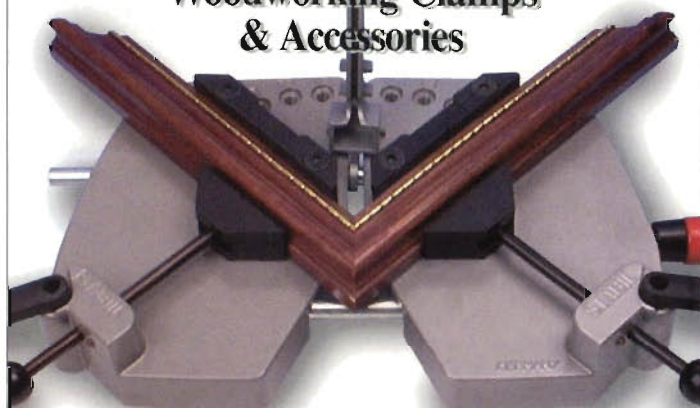


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Good Project Hunting

Hunting Down Ideas

I made the huntboard featured in the April 1995 Woodworker's Journal. I also used this project as the basis for my design of a chest of drawers. I scaled down the huntboard and added a top. Both my huntboard and my chest of drawers are of cherry with curly maple drawers.

*Teddie L. Chapman
Marietta, Georgia*



WJ responds: Your huntboard looks great, Teddie, and the chest of drawers is really impressive, especially with the contrasting woods. We're always glad to see how readers have adapted our designs to fit their own needs.



Crocodile Rocks

I built four Corky the Crocodiles (from Today's Woodworker issue 43) for my four grandsons. It was fun learning to use an air brush, plus it made all the difference in the world, appearance-wise.

*L.H. Scott
Elkton, Maryland*

WJ responds: We're sure your grandsons have lots of fun with these great reptiles. Are you sure this is your first use of an airbrush?



Let There Be Lights

I enjoy retirement almost as much as I enjoy reading Woodworker's Journal and making your projects. My latest effort was a pair of Prairie Lamps from the June 1998 issue. Lacewood, maple and mahogany were used for the column and cherry for the base. The shades were fabricated from laminated mica and the tablecloth was made by my wife.

*Bill Westerbeck
Crossville, Tennessee*

WJ responds: A glowing example of a great project, Bill!

King and Queen of the Shop

Here's a picture of our version of the chessboard featured in issue 48 of Today's Woodworker. My wife took up stained glass about eight months ago, and I became hooked on it, too. We're trying to incorporate woodworking and stained glass in our projects.

*Jim & Kathy Gainer
Galveston, Texas*



WJ responds: It's crystal clear why your teamwork is such a success. What a beautiful and innovative adaptation of our chessboard.



Winner! Jim & Kathy Gainer will receive a Bosch 1278 VSK belt sander for their contribution to End Grain. Send your letters and photos to: End Grain, Woodworker's Journal, P.O. Box 261, Medina, Minnesota 55340. If we publish yours, we'll throw your name in a hat for our free tool drawing. Photos of projects from the Woodworker's Journal or Today's Woodworker are eligible.

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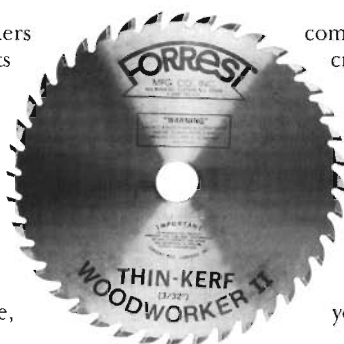
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	Sale Price	10% Off First Dado	15% Off Second Dado
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	Sale Price	10% Off First Blade	20% Off Second Blade
8", 8 $\frac{1}{4}$ ", 7 $\frac{1}{2}$ " x 60 Tooth	\$109	\$ 98	\$ 87
10" x 60 Tooth	\$129	\$116	\$103
12" x 60 Tooth	\$139	\$125	\$111

DURALINE HI A/T: 7 $\frac{1}{4}$ "-16" dia. avail.

Cuts melamine and plywoods perfectly. 220 mm & 300 mm available.

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8", 7 $\frac{1}{4}$ " & others available			
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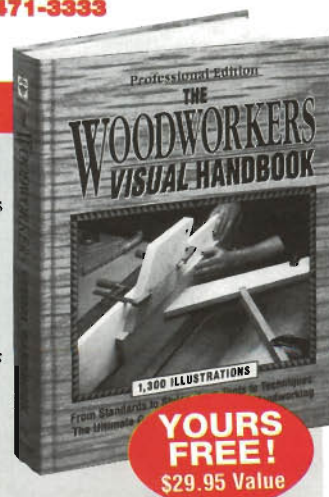
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