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WOODWORKER'S JOURNAL



October, 2001
Volume 25
Number 5

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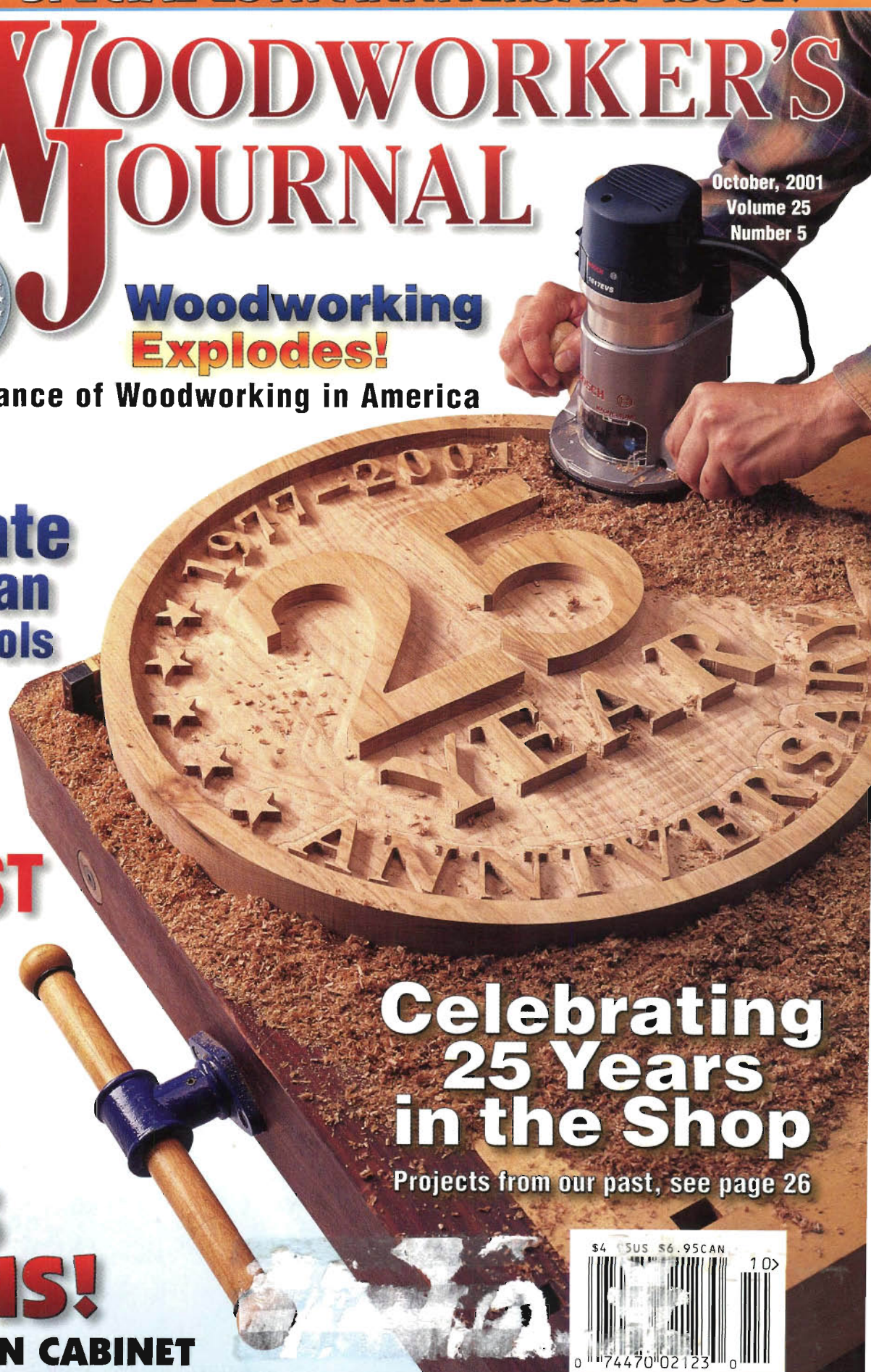
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Projects from our past, see page 26



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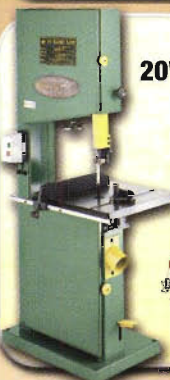
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- MOTOR: 1/2 H.P., 110V
- APPROX. SHIP. WEIGHT: 150 LBS.

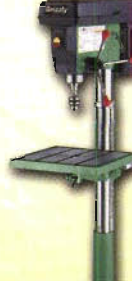


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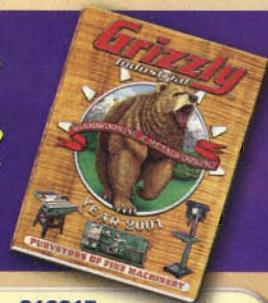
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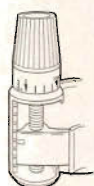
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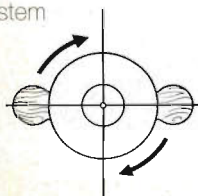
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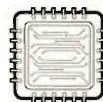


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Woodworker's Journal

Features

September/October 2001

Volume 25, Number 5

26 A Legacy of Sharing



The first 25 years of *Woodworker's Journal* tell a story of fine projects and generous woodworkers. The "voice of the woodworking community" takes a look back.

32 Rebirth of the Designer-Maker

By Ian Kirby

Over the past 25 years, an "information explosion" has inspired and motivated thousands of woodworkers to set up their shops for handmade items.



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38 Child's Adirondack Chair and Settee

By John English

With a few adjustments — like Spanish cedar and threaded inserts — a favorite project from our past gets a reprise.

45 Hinge Mortising Jig

By Ralph Bagnall

An adjustable jig guides your router along a simple deck, fence and base to create hinge mortises in varying sizes.

52 Ruhlmann Cabinet

By Mike McGlynn

A TV cabinet inspired by the "high priest of Art Deco," complete with ebony veneer, tapered legs and a stepped pediment top.



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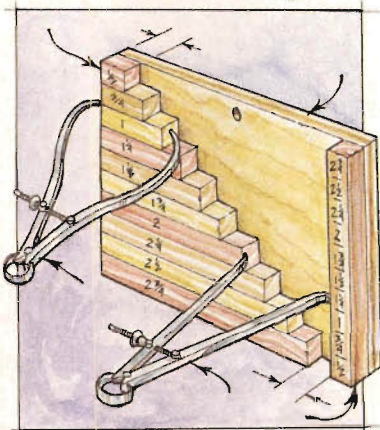
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(Kitchen Sink Not Included)



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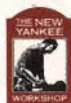
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Happy 25th Birthday



I consider myself to be a caretaker of sorts, the steward of a magazine that was well-established when I showed up and will continue its mission of entertaining and educating woodworkers long after I'm gone. The efforts of my two predecessors, founder James McQuillan (1977 - 94) and Charles Sommers (1994 - 98), provided a solid foundation, and I'm honored to follow in their footsteps.

I'm also grateful to the quarter million or so woodworkers responsible for the apostrophe in our title. It has always been your passion, your curiosity and your involvement that have driven this magazine.

Twenty-five years ago, when *Woodworker's Journal* and *Fine Woodworking* (the only other woodworking magazine with roots as deep as ours), began publishing magazines for amateur and hobbyist woodworkers, there simply wasn't anything out there like us. Oh sure, you'd occasionally find a "woodworking" project in *Popular Mechanics*, but there weren't too many mortise and tenon joints getting cut and nary a dovetail in sight.

It's no coincidence that the explosive growth of woodworking as a hobby and the evolution of the "designer-maker" (see Ian Kirby's essay on page 32) perfectly parallel the growth of our magazine. For 25 years, we've been walking woodworkers through projects ranging in difficulty from

beginner's basic to heirloom quality (see pages 26 and 38 for a few examples). Along the way, we've taught techniques, shared hundreds of shop tricks, compared tool values and offered a forum for you to interact with other members of the woodworking community. Woodworking keeps getting more and more popular, and our readership keeps growing.

As you settle back with this copy of your favorite magazine, grab a glass of your favorite refreshment and join us in offering a toast to *Woodworker's Journal*, the first 25 years — and the next.

Cheers!

Larry N. Stolaken

SEPTEMBER/OCTOBER 2001

Volume 25, Number 5

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25 Years ... and Going Strong

Happy Anniversary!

Good job, folks! After 25 years, you've emerged with more readers than ever and an editorial focus that appeals to novices and accomplished woodworkers alike.

Woodworker's Journal is a welcome relief from the drone of woodworking journalism. It's adventuresome and unpredictable, with a refreshing balance of projects, tool information and odd bits of news of the woodworking world. I'm glad to be counted among your contributors.

You have come a long way and deserve a lot of credit. Best wishes for another 25 great years.

*Ellis Valentine
former editor,
American Woodworker, 1993 - 98*

Congratulations upon your magazine reaching its 25th anniversary, and for bringing *Woodworker's Journal* into the ranks of the majors.

*John Kelsey
former editor,
Fine Woodworking, 1976 - 84*

25 Years of Reading WJ

You may be interested in knowing that I am one of the original subscribers to *Woodworker's Journal* and have saved each issue. In Volume One, Issue One, Jim McQuillan noted,



"Our special thanks to each and every one of the good people who had enough faith in us to lay six dollars on the line, without ever having seen a sample copy of our publication. Your response has been very encouraging and we intend to live up to ... or exceed your expectations."

Well, Mr. McQuillan did exceed our expectations, as evidenced in the magazine still being around and growing. Think he ever dreamed in 1977 that his magazine would lead to an online publication also (*Woodworker's Journal eZine*)? Keep growing as I intend to be a subscriber for the next 25 years also.

*Gerald R. Kempfer
Botkins, Ohio*

I think the biggest change in the last 25 years of woodworking can be explained in one word: interest! The interest in woodworking has grown

in leaps and bounds.

I feel the reasons for this are all the woodworking magazines, the tools available, woodworking shows and the demonstrations that they offer, and one last thing: woodworkers who share their knowledge with other woodworkers on all levels.

The last 25 years of woodworking is almost beyond words. I really do enjoy the *Woodworker's Journal* and look for each new issue to read, cover to cover.

*Rick Shrontz
Groveport, Ohio*

Sharing Our Special Year

Thank you for your fine article "DMT Machining Technology: Diamond and the Rough" in the *Woodworker's Journal eZine* (Volume 2, Issue 9). We thoroughly enjoyed the interview and were especially impressed by the final article and presentation with pictures on the Web. You did an excellent job of explaining a topic that can be highly technical.

*William D. Fletcher
DMT*

Marlborough, Massachusetts

WJ Responds

Thanks for the letter and congratulations to our friends at DMT — along with *Woodworker's Journal*, they're celebrating their 25th anniversary in 2001.

Mail Call! Contact us by

writing to "Letters",

Woodworker's Journal,

4365 Willow Drive, Medina,

Minnesota 55340, by fax at

(763) 478-8396 or by e-mail:

letters@woodworkersjournal.com.

We ask that all letters,

including e-mails, include

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number. We reserve the right to

edit for length and clarity.

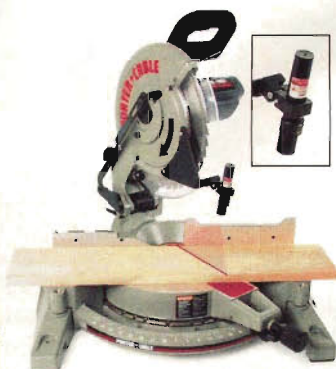
A Better Belt Sander

Rob, once again you selected a winner and were way off base. It is obvious that you never tried a Porter-Cable 503 3" x 24" belt sander before you selected the P-C 362 VS as the winner (*Shop Journal*, June 2001).

If you contact the company, they will tell you that the 503 is too pricey for the average woodworker, or at least that is what their salespeople will tell you at shows. That happens to be a bunch of bologna. I have been in several average woodworkers' shops and find most of them are equipped with \$2,000 table saws, \$1,500 lathes, several hundred dollars worth of router bits, and the list goes on. In most cases, I will see a wiggly-jiggly jumping machine called a belt sander.

When their work feels like a washboard, then I let them try one of my 503s — I become a hero.

Alfred Petersen
Fremont, Nebraska



Laser Adaptations

In regards to the "Laser Once, Cut Once" (*What's In Store*) article in the June 2001 issue of *Woodworker's Journal*, I requested more information from Carter Products regarding the Cableless Laser for use on compound miter saws. I mentioned its use with a DeWalt DW708 miter saw; they noted that "We have received numerous requests for a more universal bracket; however, it is not something we will have available for some time."

I was curious if any of your readers have used this Cableless laser with the DeWalt DW708 and, if so, how they mounted the laser to the saw's blade guard? The DeWalt DW708 is a very popular saw, as per your article in the same issue (*Tool Review*, "Sliding Compound Miter Saws"). Any response on this would be greatly appreciated.

Todd Surman
Amherst, New York

Letter from an Old Friend

Having had the good fortune to serve as managing editor of the



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LETTERS

Woodworker's Journal for some 15 years, I would like to extend my congratulations to all your readers and staff on the 25 anniversary of the magazine.

The *Journal* was not much more than a year old when Jim McQuillan, founder of the magazine, needed someone to build furniture projects and write about how to make them. So I was hired as his first full-time employee in the fall of 1978. The workshop was in the basement of Jim's house in northwestern Connecticut. My desk sat in the family room, next to the wood stove.

Back then I'd write articles longhand on a legal pad. Jim would do the art with pen and ink and take pictures with a black and white camera. The magazine was printed on newsprint stock. And words like cordless, computer chip and compound miter saw were as foreign to us as a Japanese power tool.

Yet, the magazine managed to grow and thrive, fueled by Jim McQuillan's unique vision of a woodworking publication filled with detailed project plans and practical information ... and an attitude that readers were the heart and soul of the magazine.

As years went by, we moved into a bright office filled with projects from earlier issues. New employees came

on board, adding fresh energy and enthusiasm, and the *Journal* became bigger and better. By the time the magazine was sold in 1994, and I moved on, it was being printed on glossy stock and the pages were filled with full-color images. The words cordless, computer chip and compound miter saw had become part of our everyday lexicon. And several Japanese power tools were getting regular use in the shop.

Although Medina, Minnesota is a long way from northern Connecticut, I'm please to see that much of Jim McQuillan's vision has survived the journey. Keep up the good work.

Tom Begnal
Associate Editor

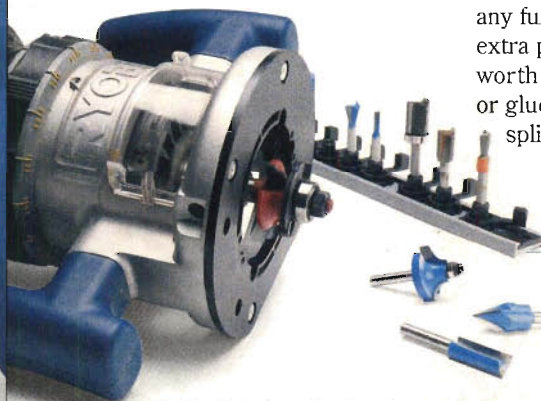
Fine Woodworking magazine
Newtown, Connecticut

Spin Control

Bill Hylton's article in the April 2001 issue discusses how to properly feed a router bit (*Today's Shop*, "Selecting Your Router Bits"): clockwise around the inside, and counterclockwise around the outside. If you think about what the bit is doing in the wood, you have a good chance of the bit splintering the workpiece. Instead, I feed it counterclockwise on the inside and clockwise on the outside. (I call it a climb cut.)

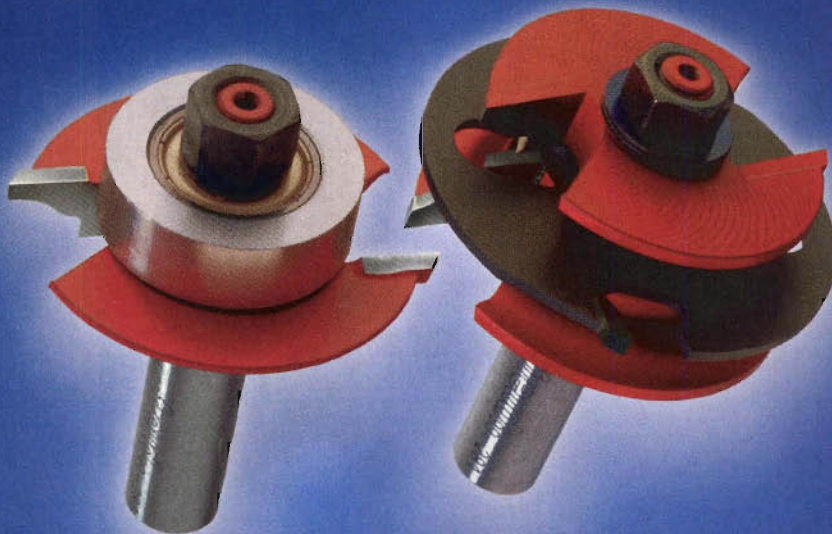
On your final pass, go around in the rotation that Bill mentions to clean up any fuzzies on your edge. The little extra passes with your router are worth the effort to avoid a door frame or glued-up top with tearing, chips or splinters torn from its edges.

Luke Wenk
Lakewood, Pennsylvania



Safety First: Learning how to operate power and hand tools is essential for developing safe woodworking practices. For purposes of clarity, necessary guards have been removed from equipment shown in our magazine. We in no way recommend using this equipment without safety guards and urge readers to strictly follow manufacturers' instructions and safety precautions.

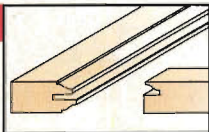
What's missing from the perfect cabinet?



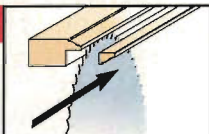
The perfect glass door...and the bits to make it.

Steps to Perfection

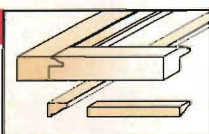
1 ROUT PROFILES ON STILES AND RAILS USING FREUD RECOVERABLE BEAD GLASS DOOR BIT SET.



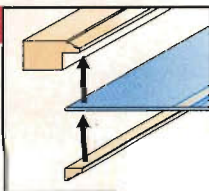
2 REMOVE BEADS WITH 1/8" KERF SAW BLADE (10" FREUD LM72 SERIES RECOMMENDED).



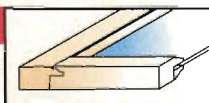
3 ASSEMBLE STILES AND RAILS. MITER CUT BEADS TO SIZE.



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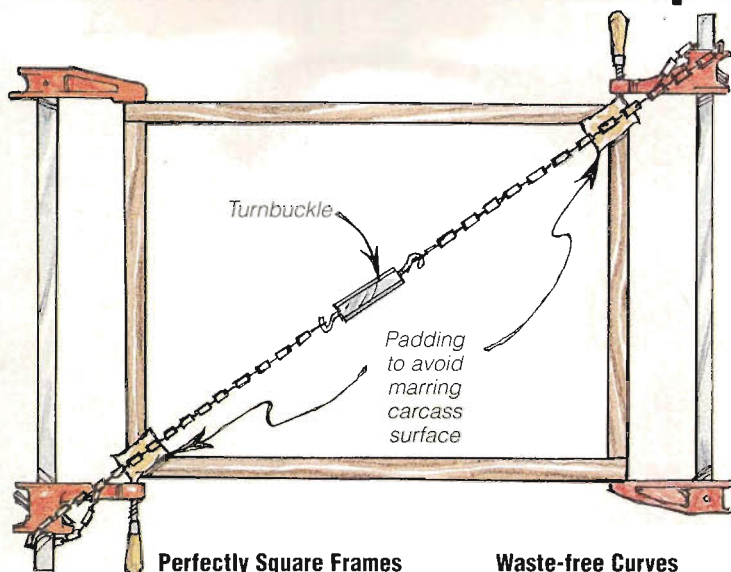
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25 Years of Readers' Shop Tricks



Perfectly Square Frames

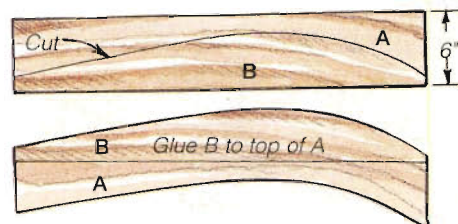
Squaring large carcasses can be a problem, especially if you don't have a clamp long enough to span the diagonal corners. Some lightweight jack chains and a small turnbuckle will do the job. After gluing and clamping, measure the diagonals to determine which two corners need to be pulled closer, then hook a length of chain to the clamps at those corners. Join the two chains with a turnbuckle, padding underneath if necessary to avoid marring the carcass, then tighten the turnbuckle until the carcass is square. Leave the chain on until the glue has dried.

*Kristian Eshelman
Highland Park, New Jersey,
(March, 1996; Volume 20)*

Waste-free Curves

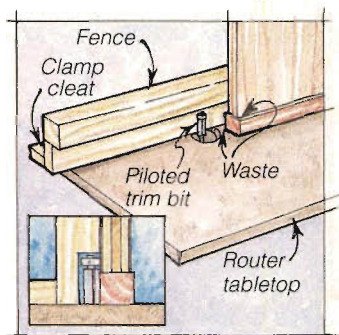
Cutting a curved piece from a straight board involves considerable waste. This can be especially painful if the wood involved is costly. It's possible to get the needed curved piece using narrow stock and end up with less waste, or no waste at all. The drawing below (left) shows a curved shape being cut out of a 10" board in one piece. The second drawing (right) shows how that same curved shape can be cut from a six inch board and then glued to the top edge, resulting in a curved piece equal to the one in the first drawing, but with no waste. The glued pieces must, of course, be carefully jointed. A simple enough idea ... but one that is often overlooked!

*The Editors
(July, 1977; Volume 1)*



Flush Trimming Router Fence

When you need to apply solid stock edging around a plywood panel and you want it to be flush with one or both faces of the panel, you can cut the edging slightly thick and carefully hand plane and sand it flush, but here's a better idea.



Make a special rabbeted fence for your router table and use a flush trim bit with a pilot bearing, as shown in the drawing. If the panel needs edging all around, glue and clamp the end strips on first and trim them flush. Then you can add and trim the side strips.

*The Editors
(November, 1986; Volume 10)*

Tricks of the Trade has been a readers' favorite for many years. Each issue, the editors get together with art director

John Kelliher and select the best of those on hand.

This time, we asked John to pick his favorite tricks

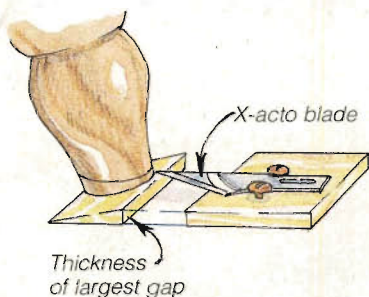
from the archives of

Woodworker's Journal.

Starting with 1977,

John stopped about every five years or so.

Be sure and submit yours for our next issue!



Chair Leveling Scribe

To level chair or table legs, place the piece on the table saw table. Shim under legs until the item is level. Cut a wood block to the thickness of the largest gap and fasten an X-acto blade to the block with two screws so the point of the blade protrudes slightly from the block. Holding the block flat to the saw table, scribe a line with the blade around each leg, then cut to length with a backsaw. (A deep scribe line will also prevent splintering where you cut.)

*Dick Coers
Peoria, Illinois
(January, 1996; Volume 20)*

Dual Caliper Board

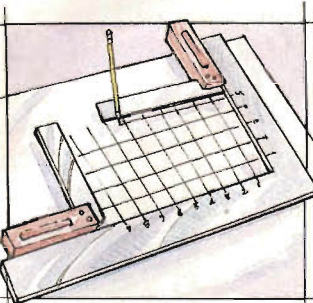
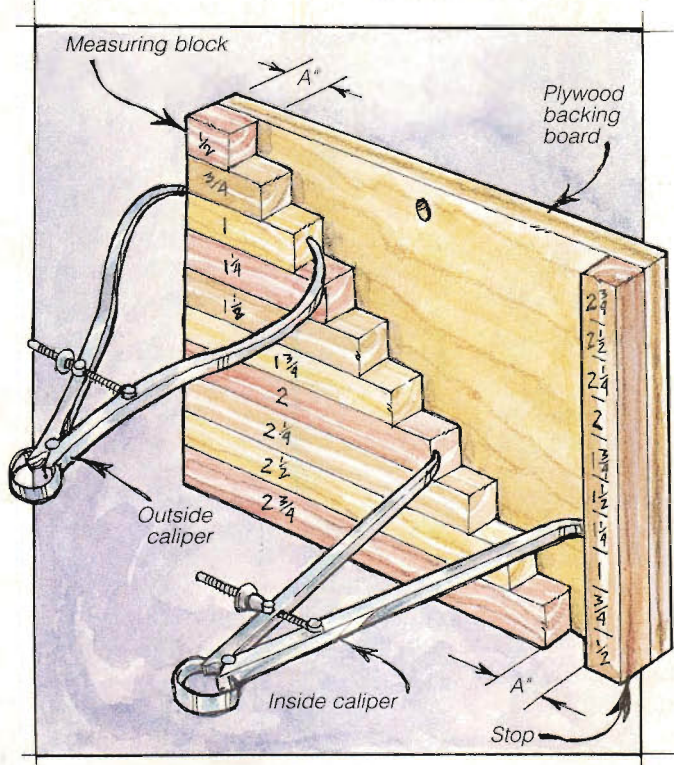
With this "Caliper Board" close to your lathe, you'll be able to quickly and accurately set distances on both inside and outside calipers. The one shown measures 1/4 inch increments, starting at 1/2" and continuing through 2 3/4", but the board can be customized to your needs.

The outside caliper distances are taken directly from the measuring blocks. Each block is cut to exact length from 3/8" by 3/8" stock, then glued to the plywood backboard as shown. To avoid cross-grain movement problems, be sure to use plywood for the backboard.

Once all the measuring blocks are added, the stop, also made from 3/8 inch by

3/8 inch stock, is glued to the right-hand side, as shown. By making the "A" dimensions the same (in this case 1/2 inch) you can use the board to take measurements with the inside calipers. To complete the Caliper Board, mark each dimension (use waterproof ink) on the measuring blocks and the stop, then finish with a couple of coats of varnish. Ours is mounted to a wall right next to the lathe.

*The Editors
(July, 1991; Volume 15)*



Laying Out Perfect Grids

Here is a quick and easy way to create a grid when you need to enlarge a grid pattern. Using two squares (a framing square and a try square work fine), position one of them over the paper and hold it firmly in place. Use a clamp or two to hold it, if necessary. Place the second square inside the first, then slide it along the edge and draw the lines as needed. Use one leg of the square to mark vertical lines, the other to mark horizontal lines.

*Barry Weaver
Lexington, North Carolina
(September, 1991; Volume 15)*

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Museums Honor Great Woodworkers

A Modern Father?

Nakashima in a New Light

A new exhibition, "George Nakashima and the Modernist Moment," could change the simplistic reputation of Nakashima (1905 - 1990) as a humble woodworker.

Mira Nakashima-Yarnall, George's daughter who now supervises the family's ongoing business, said, "I think this show will put Dad in another light. He's no longer just a woodworker; now he's a furniture designer. I don't think he was really given that status before this show."

Curator Steven Breyer has juxtaposed 15 Nakashima pieces from different stages in his career with examples of furniture by six important European modernist designers in a display at the James A. Michener Art Museum in Doylestown, Pennsylvania through September 14. Breyer asserts that all these designers, architects by training, shared a "formal vocabulary" based on using materials in a way that combined aesthetics and functionality. This involved a controlled approach to material selection and composition.

Nakashima's Bucks County studio, where he lived and worked for the last 45 years of his life, was organized around this principle of individual attention to each piece within the limited production setting,



Photo courtesy of the Michener Art Museum; from the Orange Group

The Michener's exhibit says European pieces like Charlotte Perriand's Slipper Chair (1953) share a "formal vocabulary" with Nakashima.

Although George Nakashima (1905-1990) is known for simple, natural forms, a new exhibit makes the case that his work embodies many aspects of 1940s and 50s European modernism. This Cross-legged Conoid Desk dates from the end of this period: 1960.



Photos above and below courtesy of Michener Art Museum; from the collection of Mira Nakashima-Yarnall.

where the bulk of the work was performed by a dozen or so skilled craftsmen under Nakashima's close supervision.



Nakashima — whose 1951 black walnut long chair is pictured here — was exposed to European thought as early as 1928, when he studied in France.

According to Mira, "Dad's approach to architecture as well as furniture was always hands-on. He never used drafting instruments — only raw sketches, much as a sculptor would work. He had a certain eye for form, and there was a distinctive look that came through in all the pieces that were made in the studio."

In the 1940s and 50s, Nakashima also forged relationships with

custom manufacturers Kroll and Widdicomb-Mueller, who produced and promoted his designs. During these collaborations, Nakashima was alternately challenged and frustrated by the limitations of large-scale production and the impersonality of the finished product. He came closest to an acceptable compromise with his extensive "Origins" line of coordinated furnishings produced by Widdicomb-Mueller between 1958 and 1960. In it, Nakashima was able to work out production methods that preserved the look and feeling of uniqueness he wanted, as well as employ idioms such as curved panels that were more efficient to produce in a manufacturing facility.

Mira says it is significant that the Michener exhibit includes two pieces from the Knoll line and one from the Widdicomb line, since it is the first time her father's manufactured pieces have been acknowledged as objects of art rather than just furniture, or "use objects."

Asked about her father's legacy, Mira said she felt his greatest

contribution was his respect for wood in its natural form, rather than just as a material that was to be cut to a particular shape. Nakashima is known internationally for this spiritual appreciation, and his work is included in the permanent collections of major museums around the world.

Robert Aibel, owner of Philadelphia's Moderne Gallery, which specializes in vintage furniture by Nakashima and Wharton Esherick, added, "George felt he could make a difference in the world through design. He made so many great pieces. I'm amazed at the number that were unique. To do that, you have to be sophisticated about production techniques. The marketplace has focused on his letting the wood speak for itself, yet everything he did was so carefully designed."

For more information on the Michener exhibit, call 215-340-9800 or visit www.michenermuseum.org. A show of 40 Nakashima pieces runs through September 15 at the Moderne. For more information, call 215-923-8536 or visit www.modernegallery.com.

— Ellis Valentine

A Woodworker's Life

Malooof at the Smithsonian

On September 14, the Renwick Gallery of the Smithsonian American Art Museum will open the first retrospective devoted to the work of Sam Maloof — the only craftsman to receive a "genius" award from the MacArthur Foundation. "The Furniture of Sam Maloof" contains 65 pieces designed and fabricated since 1960.

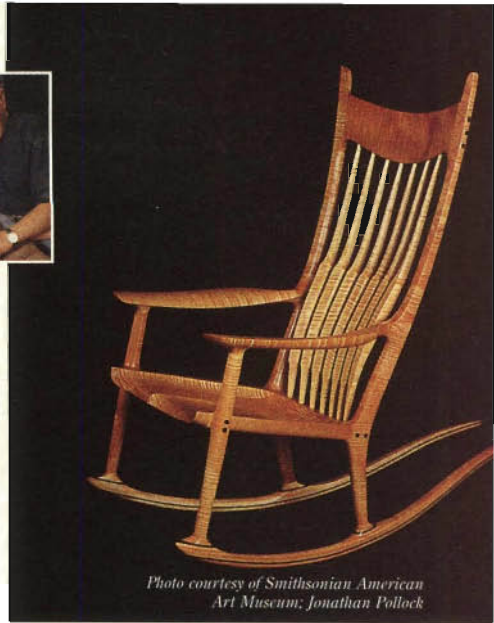


Photo courtesy of Smithsonian American Art Museum; Jonathan Pollock

Sam Maloof is famous for his all-wood rocking chairs: three former U.S. presidents own them.

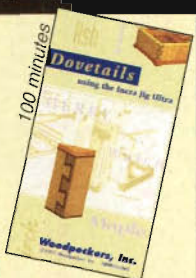
The show will present an overview of Maloof's lengthy career, which began in the early 1950s with a commission from industrial designer Henry Dreyfuss. Although Sam has been greatly involved with the American craft artist movement,

Shop Talk continues on page 18 ...

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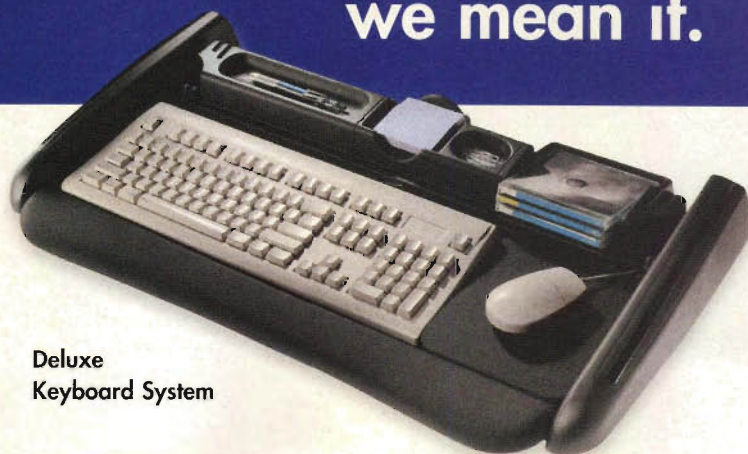


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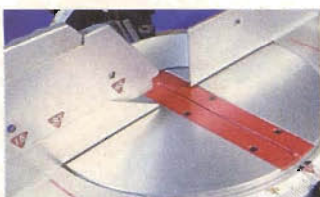
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Photo courtesy of Smithsonian American Art Museum; Jonathan Pollock



Sam Maloof's music stands, with handmade wooden mechanisms, are among the pieces that will be displayed in a Smithsonian retrospective of his work.

senior Renwick curator Jeremy Abramson says the "burgeoning community of accomplished amateur craftsmakers" which arose during the later decades of Sam's career has shifted his base of admirers. In *The Furniture of Sam Maloof*, a publication which will accompany the exhibition, Adamson writes that "Sam's true disciples" are "the legions of amateur or part-time cabinetmakers active in basement workshops across North America. To them, he [is] a woodworking hero."

Of particular interest to these woodworkers will be a special display devoted to Sam's workshop methods. Set in front of a large photo mural of Maloof's own shop, showing the craftsman at work in his own environment, as well as photo blow-ups of him shaping a rocking chair, a single rocker chair design will be exhibited at five different stages of completion. Starting with a pile of lumber marked for initial cutting and concluding with an assembled but unfinished piece — only sections of which have been shaped and sanded — this novel presentation will reveal the steps by which a talented designer-craftsman transforms wood planks into exquisitely shaped furniture of singular beauty.

The workshop section will also contain a rocking chair cut exactly in half and mounted on a wall. Visitors will be invited to touch this piece and appreciate the special tactile beauty of its finely worked surfaces. Since Maloof's hardwood furniture is intended to be touched — the silken surfaces with their soft forms and raised ridges, or "hard lines," are irresistible — the wall-mounted rocker will allow the public an intimate access denied elsewhere.

Pieces in the exhibit will be displayed in an unconventional

manner, with early designs or original prototypes, beside later examples of the same model. For example, the development of his famous low-back chair will be presented in examples dating from 1966, 1976, 1987 and 1994. A seven-minute film will reveal aspects of Sam's daily working life and the unique home he designed and built over 40 years. He shared this home with his wife, Alfreda (1911-1998), whose meticulous records of his work helped make this exhibition possible. For more information, call 202-357-2700 or visit www.AmericanArt.si.edu.

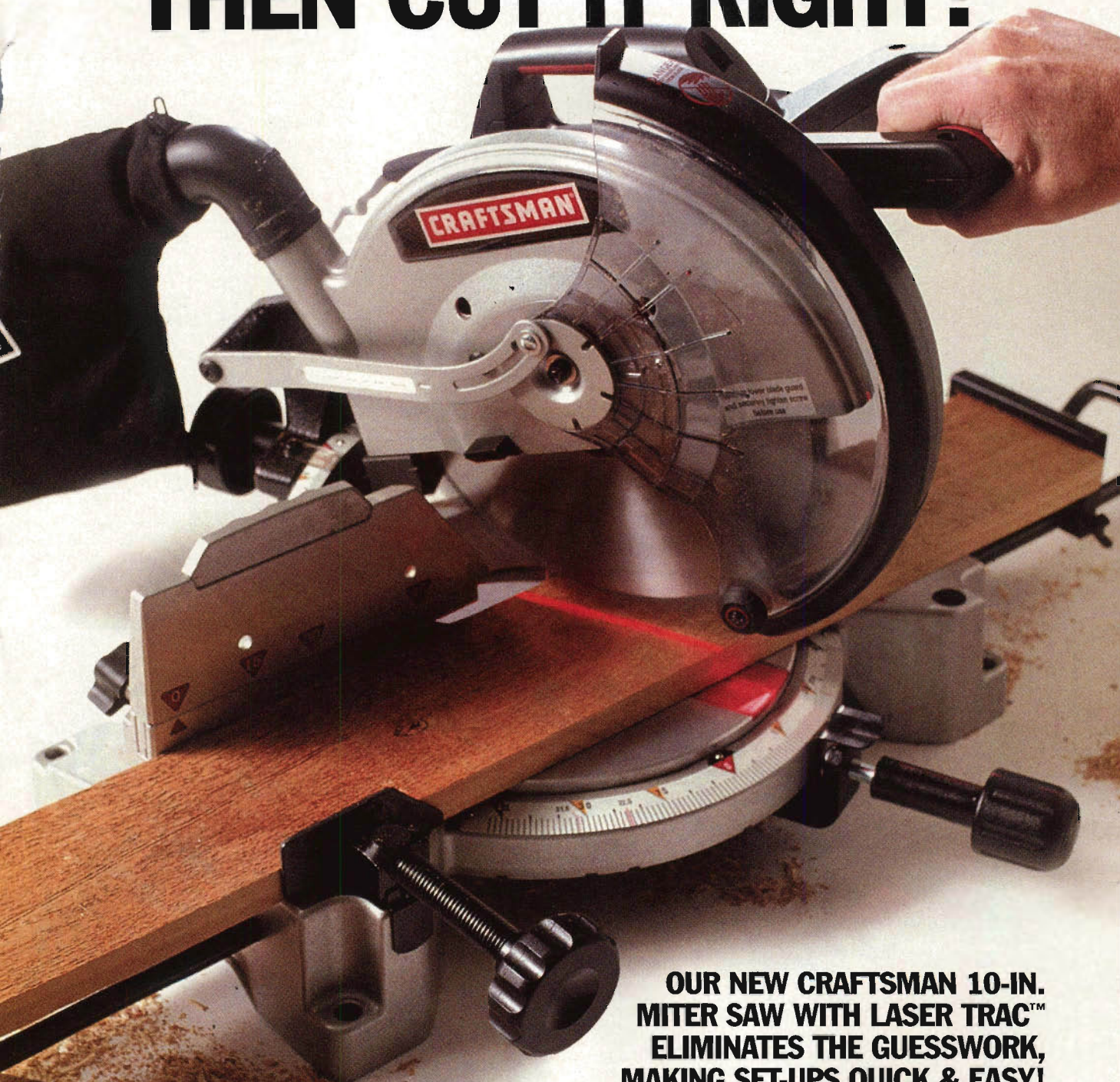
Wood Turning Shows

The Minneapolis Institute of Arts will present "Wood Turning in North America Since 1930," starting October 21 and running through the end of the year. From there the exhibition will move on to the Smithsonian's Renwick Gallery and then the Yale University Art Gallery.

To kick off the event, the Minneapolis Institute of Arts will hold a three-day symposium, starting October 25, which will bring together leading artists, scholars and collectors in the field.

The exhibition, organized by The Wood Turning Center and Yale University Art gallery, will feature over one hundred objects of turned wood, including pieces from institutional and private collections. For more information, go to: www.artsmia.org.

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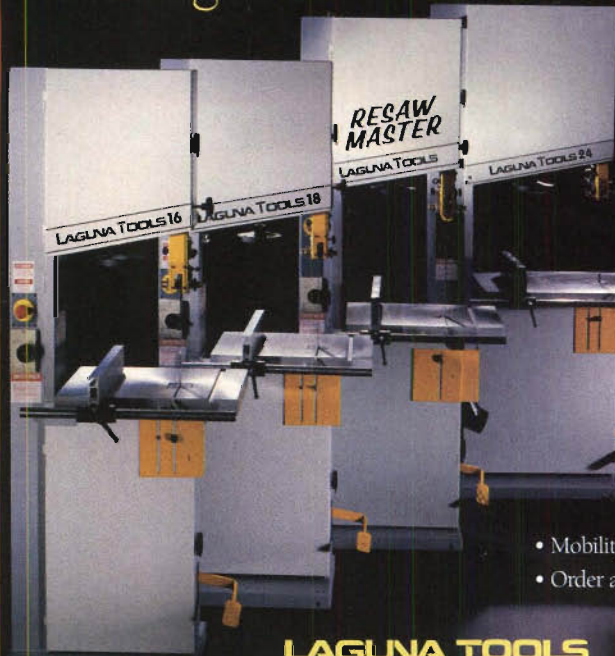
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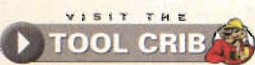


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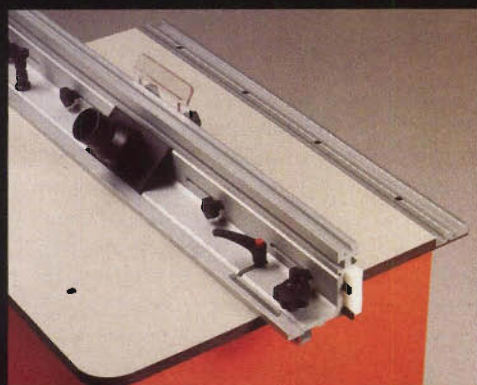
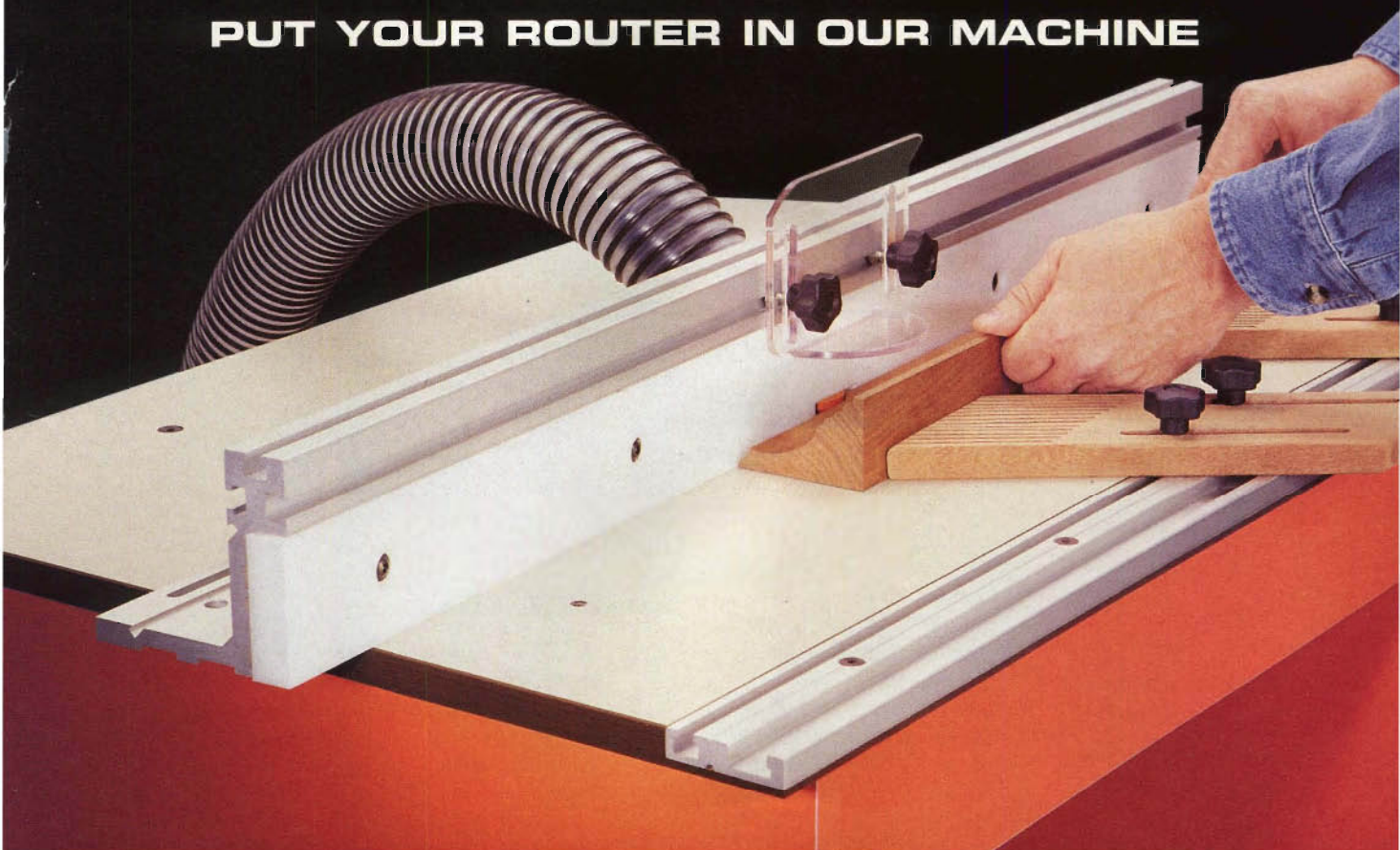
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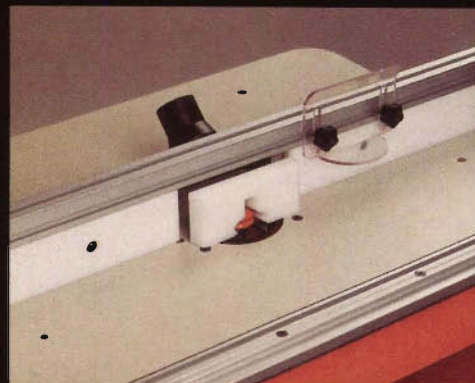
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Save Your Belts; Change Your Tires

Q In the April 2001 issue, the article "Put the Shine in Sharpening" says, "If you have inherited some oil stones, they will almost certainly need flattening." Well, how do I do that?

*Tom Coker
Havana, Illinois*

A Use carborundum powder on a piece of 1/4" glass (sold at automotive stores or shops which supply machinists). Put a teaspoon of the powder (begin with 80 or 100 grit for a badly hollowed oil stone) onto the glass, dimple the pile of powder and put a drop of water into the dimple. Mix the stuff into a paste and place the stone onto the goop and grind in a circular manner. Move up through the grits.

— Ian Kirby



Planning to sharpen your tools to a shine with oil stones? Ian Kirby recommends using carborundum powder to flatten those stones first.

Q I currently have several dozen sanding belts that have exploded under tension and have never tasted the fibrous meat of wood. I'm sure that I could use some suggestions on storage.

Also, how can I salvage brand new belts?

*Peter N. Williams
Kingsville, Texas*

Because of the tension and rpm of belt sanders, the splice is critical. The tapes, adhesives and pressures needed to join abrasive belts normally cannot be duplicated at home.

Your belts that have come apart can be salvaged in one of two ways. One is to use the material on blocks for hand sanding or tear them in strips for lathe work. The second solution: if you have a belt sander smaller than the belt that came apart, a manufacturer can cut out the old joint and "rejoin" the belt to accommodate the smaller sander.

— Greg Bleggi

Recall Notice!

A recall is in effect involving electric drills from Milwaukee Electric Tool and DeWalt Industrial Tool with defective switches.

For more information you can point your browser to

www.cpsc.gov
or call one of the manufacturers.

Milwaukee:
866-473-2288

DeWalt:
800-433-9258

— WJ Editors

A Keeping your abrasives in a controlled environment is the key to getting the longest life possible. The adhesives used to join the belts will break down over time no matter how the belts are cared for. This time period is usually about one year, less if they are exposed to extreme heat, humidity or freezing. Buy only what you will use in a year, or six months.



Keep your sanding belts in a controlled environment, and buy them according to usage, Greg Bleggi says.

continues on page 24 ..

Contact us by writing to "Q&A", Woodworker's Journal, 4365 Willow Drive, Medina, MN 55340, by faxing us at (763) 478-8396 or by e-mailing us at: Q&A@woodworkersjournal.com. Please include your home address, phone number and e-mail address (if you have one) with your question, so we can personally respond.

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QUESTIONS & ANSWERS

THIS ISSUE'S EXPERTS

Ian Kirby is a woodworker, designer and wood scientist who is a master of the British Arts & Crafts tradition.

Greg Bleggi is a sales manager at Econ-Abrasives (800-367-5886), which manufactures abrasive belts.

Mark Duginske is the author of *Band Saw Workshop Bench Reference* from Sterling Publishing Company.

Michael Dresdner is a nationally known finishing expert and author of *The New Wood Finishing Book* from Taunton Press.

Q

I ordered new tires for a 14" band saw. I believe the material is urethane, but I estimate that the tire would have to be stretched almost 2½" to get it on the wheel. Would you suggest a procedure for replacing the tires?

Larry Rook
Centerville, Massachusetts

A

New band saw tires are designed to be stretched over the wheel. Two things help to make the tire easier to manipulate. First, soak the tires in very warm water for about half an hour. The heat will make them momentarily more pliable. The second trick is to lather the tire with Ivory soap. The soap will lubricate the surface and can be wiped off after the tire is installed.

Remove the wheel from the saw and position it horizontally with a pipe or dowel through the hub. Secure the tire to the rim with a clamp and then lather the tire with soap.

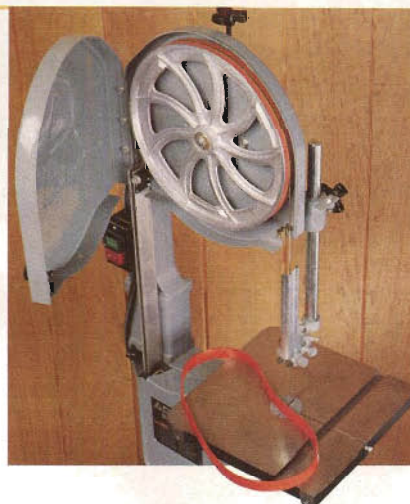
With a round screwdriver shaft wedged between the tire and the rim, pull the screwdriver and push the tire in place over the lip of the rim. (It is easier with the help of another person.) After the tire is in place, undo the clamp and rotate the screwdriver around the wheel under the tire. This will allow the tire to stretch evenly over the the wheel.

— Mark Duginske

Q

My big problem is glue. Could you please give me some hints on:

1. What kind of glue to use



Warm water, Ivory soap and a screwdriver will take the frustration out of changing band saw tires.

that won't leave marks after you stain? 2. How do I get rid of excess glue so it doesn't leave a mark or spot after I have stained?

Bob Bacon
Vancouver, Washington

A

It's critical to remove any glue spots or squeeze out before you stain — unless you stain first. (Check out "Pretreating: Work Backwards When You Can", featured in the April 2001 issue of *Woodworker's Journal*.)

Short of that, there is a lot to be said for glues that come off easily. My

favorite is hide glue. Spots will scrub off with hot water and a nylon abrasive pad or stiff bristle brush.

If you must scrape or sand glue off, make certain that the area you work on gets sanded to the same grit and type of sandpaper as the rest of the piece.

To find out before you stain whether or not you'll run into glue spot problems, wash the piece down with either mineral spirits or water. While the wood is wet, the glue spots will show up as faint, slightly whiter areas.

— Michael Dresdner



WINNER! For simply sending in his question on band saw tires, Larry Rook of Centerville, Massachusetts wins a **Bosch 1613 AEVS router**. Each issue we toss all new questions into a hat and draw a winner.

Pretreating will eliminate glue spots — just be sure to mark off and mask your glue joints before you stain or spray



Shhhh! Mini-Turbo vac at work.

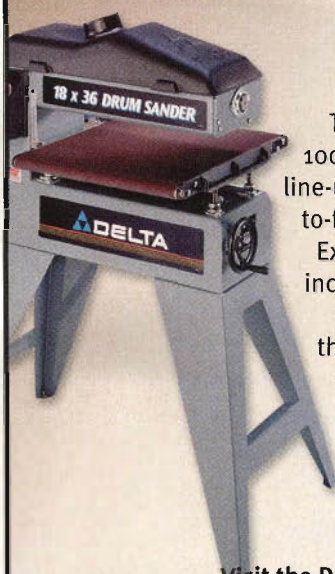
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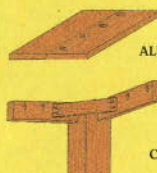
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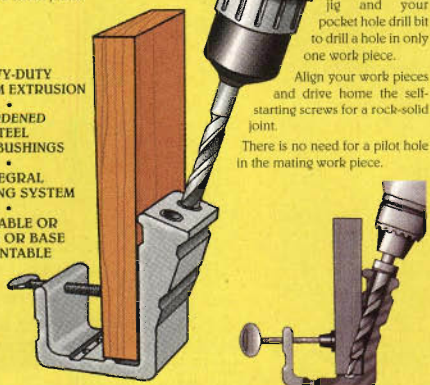
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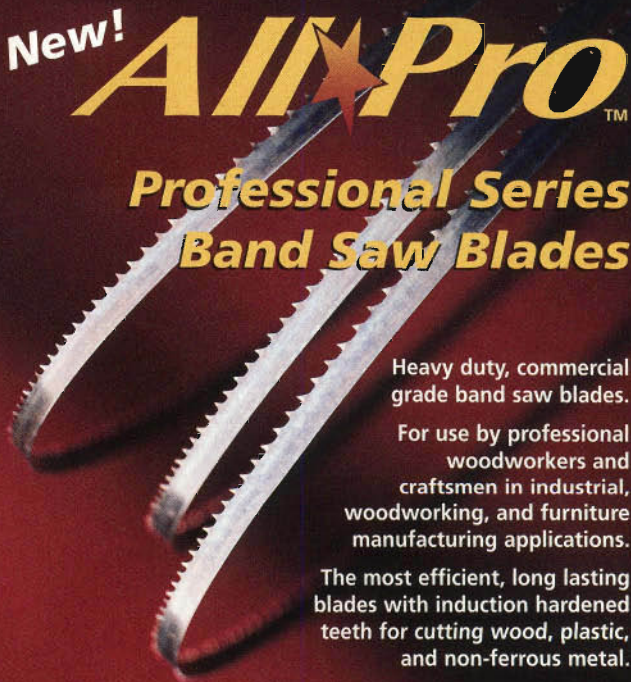
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1977 - 80

1983 - 84

1985 ...

WOODWORKER'S JOURNAL

A Legacy of Sharing

For 25 years, the Journal has strived to be what its name implies. A place where members of the woodworking community can meet and compare notes ... ask for a little help ... share a trick ... and show off a recently completed project. As the pictures here attest, a finer community can't be found. If there's one thing woodworkers have in common, it's that they're always building a project for someone else. What an honor it is that many of these projects got their start on our pages.



- The very first
- tabloid-sized
- newsprint issue
- rolls off the
- presses. Founder
- James J. McQuillan
- dedicates it to
- his uncle,
- Donald McLean,
- "a talented and
- prolific woodworker
- for 50 years."



- Reader Milton
- Kretsch waited
- for years to
- build the
- slatted
- cradle that
- appeared in the
- May 1985 issue.
- Finally, the
- arrival of the
- new millennium
- — and his first
- grandchild —
- kicked him into
- action.



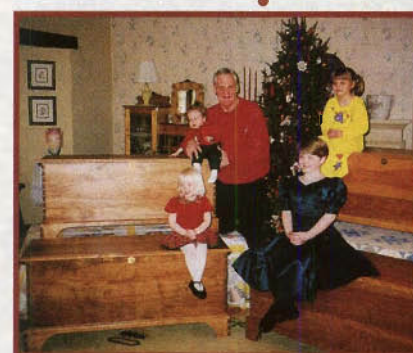
- One of the earliest
- projects we have
- a reader's photo of.
- Desmond Champion-
- Taylory built the tea
- cart from the July
- 1979 issue. He used
- a dogwood tree he
- had milled into lumber
- 20 years earlier.

Reader Ken Rankin's European spinning wheel, featured in the January 1983 Journal — a birthday gift to his wife.



Reader James Neighbors, Jr., saved his September and December 1984 issues for 15 years before deciding to tackle the grandfather clock. 250 hours later, his granddaughter had the gift of a lifetime.

September 1980: The Journal evolves from the tabloid format to a true magazine format. 32 pages long, 12" x 9" big.



Reader Harold Mayer had four grandkids, so, naturally, he built four Shaker blanket chests from the January 1987 issue.

Makita
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**THE LEADER
IN INNOVATION**

... 1987

1991 - 92

1994

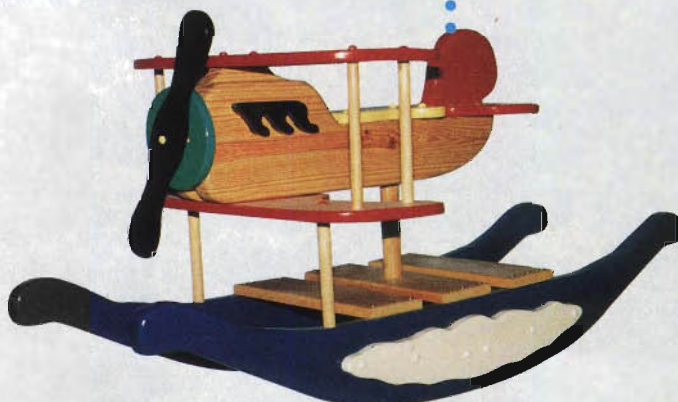


Reader Paul Friday turned to the March 1987 issue for his garden bench design and later modified the design to create complementary deck chairs. His wife Patty ended up with complementary 21st and 24th wedding anniversary gifts.

Reader Kenneth Peterson started out building one Pennsylvania small chest from the May 1991 issue for his oldest daughter. His wife and other two daughters liked it so much ...



Reader J.M. White worked on improving his skills for 8 years before tackling the chess set featured in the January 1992 issue — a special gift for his son.



Steve Moloney, who says, "I had almost as much fun building this as my son has riding on it," got the biplane from our January 1994 issue completed just in time for his son's second birthday.



After 17 years, founder and editor James McQuillan sells the Woodworker's Journal to PJS Publications, owners of 14 other magazines. "It is a given in the publishing environment today that larger companies have distinct advantages over smaller concerns," PJS explains.

The Woodworker's Journal



The 10th anniversary issue in January 1987 features the first use of color photography. The Journal hits 68 pages.

THEN

1974

Makita introduces a reasonably priced high powered Plunge Router

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1977

Makita offers a Miter Saw with numerous innovative features

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1983

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Model 2708

1990

The world's most popular jobsite Cordless Driver-Drill

Model 609SDW

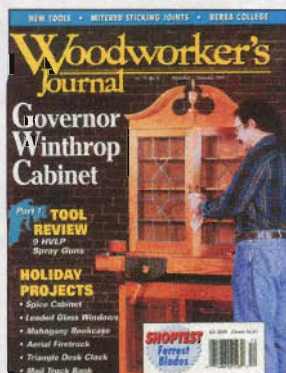


1995

1996

1997

A Legacy of Sharing (continued ...)



- The Journal collaborates with the Berea Woodcrafts shop (part of Berea College) on a beautiful Governor Winthrop cabinet.

A Frank Lloyd Wright-inspired Prairie Lantern makes the cover of the Journal. Prairie School, Arts & Crafts and Greene Brothers projects overtake Shaker and Colonial as most requested styles from readers.



The Journal celebrates its 20th anniversary. Editor Charles Sommers glances back at over 1,000 projects and techniques covering every conceivable aspect of woodworking.



- John Baumeister started out building the arbor from the March 1997 issue, but pretty soon he and his wife had added two side trellises based on the same design.



Three generations of woodworkers. James Dickerson was looking for a project he could build with his two sons, John (far right) and Jim. Grandson James (far left) ended up contributing hours of sanding on the four Governor Winthrop Cabinets.



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Random Orbit Sander



Model LS1013

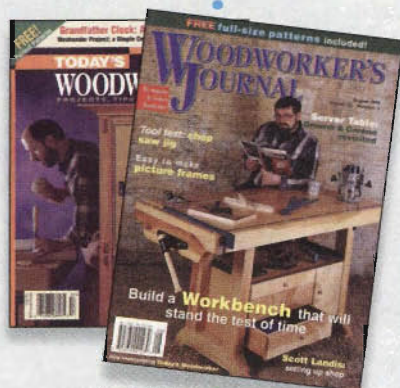
10" Slide Dual Component



Model RF1101

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AND NOW.



Rockler Press, publisher of Today's Woodworker magazine, buys Woodworker's Journal from PJS and merges it with Today's Woodworker, bringing 100,000 new readers on board.

The Journal features a year-long series; "Woodworkers of the Millennium."



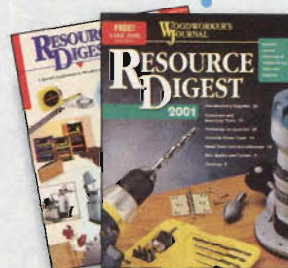
Gustav Stickley



Reader David Wagner completes the bookcase from the August 2000 issue. "... the most challenging project I've built in my eight years of woodworking."



In honor of Gustav Stickley, our "Woodworker of the 20th Century," the Journal builds a Stickley-inspired desk. A storm of controversy (and about two issues worth of "Letters to the Editor") is set off when the Journal mentions that many readers nominated Norm Abram.



Annual Resource Digest launched, with over 130 suppliers of woodworking tools and supplies.



World-class woodworker Mike McGlynn presents the first in a series of Greene & Greene projects for Woodworker's Journal.



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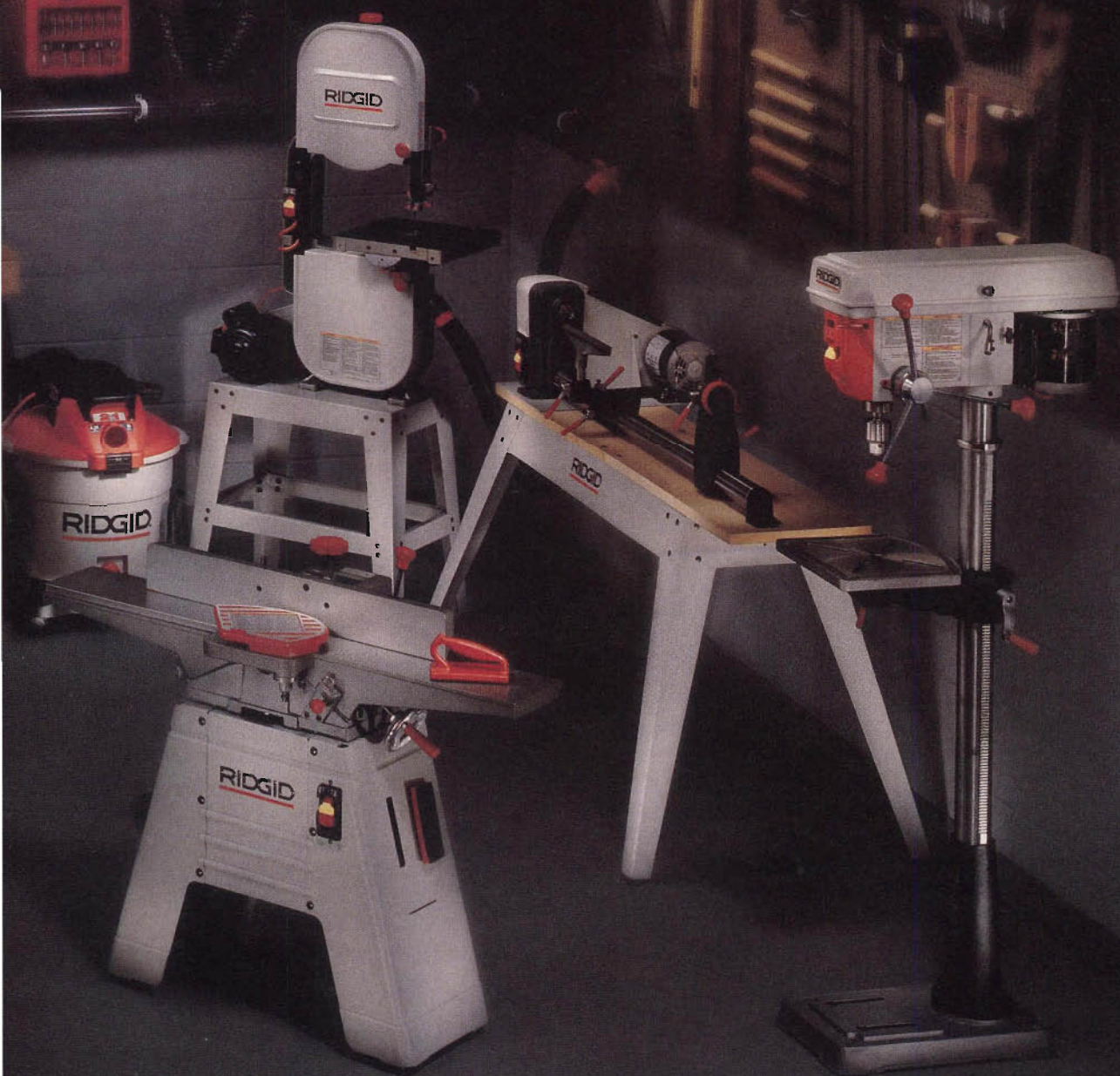
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(Circle No. 49 on PRODUCT INFORMATION form)

The Rebirth of the Designer-maker

The past 25 years of woodworking, says Ian Kirby, have witnessed an explosion of information and a return to the roots of the designer-maker craft.

By Ian Kirby



The current woodworking renaissance, says the author, has produced a class of woodworker never seen before ... "the small shop designer-maker." Lee Grindinger, who fits the description, showed his latest work at the Philadelphia Furniture and Furnishings Show this past April.

photo by
Ellis Valentine

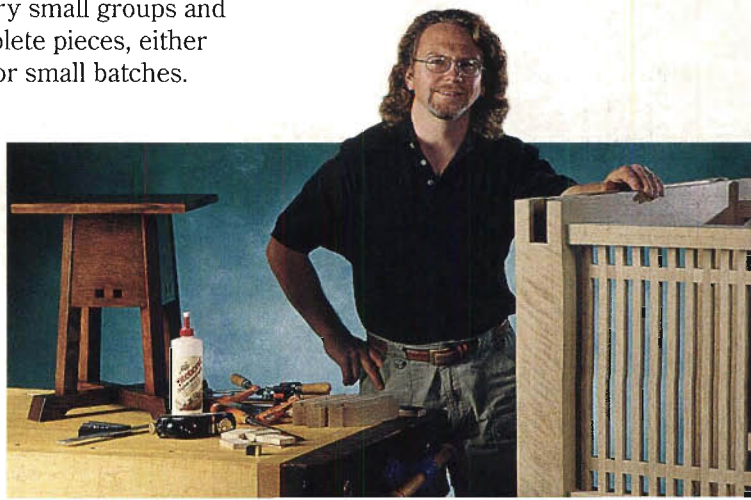
In April, I attended the 7th annual Philadelphia Furniture and Furnishings Show. As I went round the 240 exhibitors' booths the question I was most frequently asked was, "Is the show as good as last year?" An interval of a single year is too short to allow a sensible answer. The Philadelphia show and others like it, however, serve as mirrors, and what they reflect is the great advances woodworking has made since I first came to the United States from Britain 25 years ago. Back then I'm sure that it would have been a major challenge to assemble 24 exhibitors for a show, and their work surely wouldn't have demonstrated the diversity, imagination, and quality on display in Philadelphia.

The current woodworking renaissance has produced a class of woodworker never seen before. I call it the small shop designer-maker. I use the term to refer specifically to those who work in small shops, using a mix of hand tools and sophisticated machines on solid wood and materials developed for industry. They work alone or in very small groups and produce complete pieces, either one-of-a-kind or small batches.

Inspired by the Arts & Crafts movement, "designer-maker" and contributing editor Mike McGlynn creates handmade furniture like this fern stand and the cherry sideboard (far right).

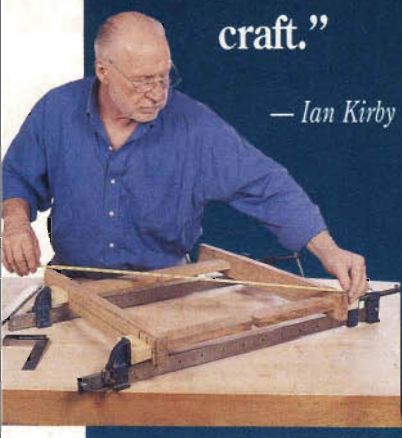
Woodworking Roots

To understand the emergence of the designer-maker requires a trip into the past. Acknowledging the many woodworking cultures that predate our own — Egyptian, Greek, Roman, Asian — I will begin in Europe about 800 years ago, using broad brush strokes and considerable historic license.



“...‘handmade’ embodies the notion that the same person who made the piece, also designed it, selected the wood, and applied the finish: it marks a real return to the roots of the designer-maker craft.”

— Ian Kirby



From about 1200 to about 1800, European furniture was made of solid wood fashioned by hand tools. A host of other products were made the same way — from ships to coaches, from barrels to violins. Indeed, the survival and development of our culture depended upon wooden things made by hand tools.

If through time travel you visited a shop, large or small, during this period, you would recognize all the tools in use — saws, files, rasps, chisels, planes, hammers, marking and measuring devices, axes, and adzes. The working methods would be equally familiar. If you asked a woodworker how to cut

a tenon, you would have been told much the same technique of marking and cutting no matter which shop or country you were in. Had amateur woodworkers existed at this time, their tools, materials, and working methods would have been the same as their professional counterparts. Although furniture styles changed regularly and sometimes radically, woodworking materials and methods changed very slowly.

Near the end of this 600-year period, Britain was swept by cataclysmic change that came to be known as the Industrial Revolution (1760 - 1830): Machines replaced hand tools; steam and later other kinds of power replaced human and animal muscles; and factories replaced small shops and cottage industry.

No longer was furniture carefully made for kings and bishops, but cranked out for the masses. By the Victorian era, the overriding goals were lowest price, any style, and maximum decoration.

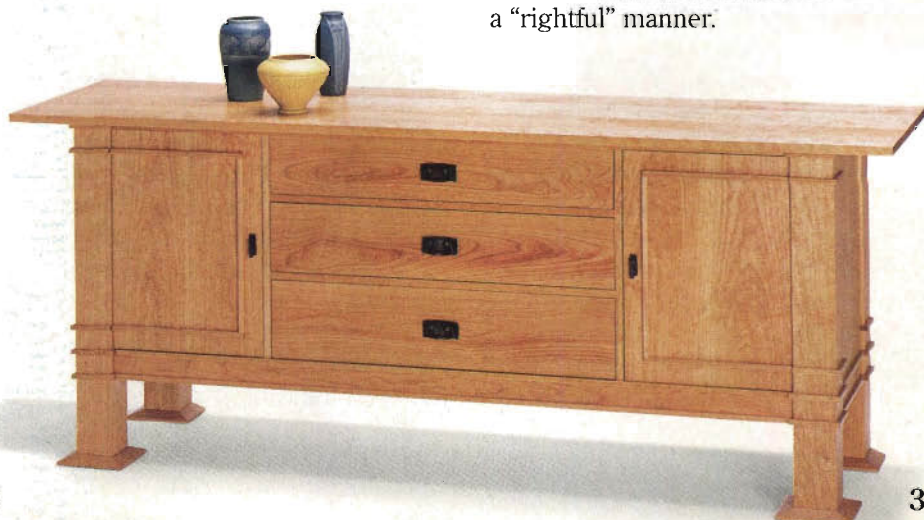
Yet the robust industrial machines had little impact on working methods. Like muscle-powered hand tools, they cut big pieces into small parts, they flattened and squared the parts, they made the same joints, they

shaped and carved the parts, and they then assembled parts into finished pieces.

The machines, however, had a major impact on workers, for during this period the professional woodworker became an industrial worker. He no longer had any influence on the design of the work and little influence on its construction. His skills — many of which were rendered useless by increasingly-automated machine operations — were focused on producing identical parts rather than complete pieces.

The Englishman William Morris (1834 - 1896) led the way in condemning the excesses of machine production, both the shoddy and excessively decorated nature of the products made and the horrible working conditions endured by those who made them. He advocated a return to simpler and more humane times, believing that a better life and better furnishings would follow if the machine was rejected by the professional woodworker. We call it the Arts & Crafts movement (1850 - 1914). It was guided by three tenets:

- the work should be designed in the simplest way,
- it should be made of the best materials, and
- it should be constructed in a “rightful” manner.





With no formal training in woodworking, contributing editor Rick White says that much of his knowledge comes from the magazines and books published in the past 25 years.

Rightful manner encompassed tool skills and working methods that produced the best results, measured by speed and efficiency, with no sacrifice of quality. It lies at the heart of woodworking by hand and remains central to today's small shop designer-maker.

The Great Divide

Ironically, the same tenets apply equally well to machine production, as exemplified by the Bauhaus School (1919 - 1933) in Germany. Bauhaus furniture was constructed mainly of metal, not only for its lightness and strength but also for the ease with which it could be manipulated in production. These elegant and beautiful designs had no place for decoration. Equally, their products had no connection to handcraft, and in this sense the Bauhaus was the seminal event that put the small shop woodworker on a completely different track from the industrial furniture maker.

Another rift that was to transform industrial woodworking occurred in the late 1960s and early '70s in the form of a technical development called particle board.

Particle board is a structural panel that, unlike solid wood, is dimensionally stable. It is made to exact thickness, available in practically any size, and can be surfaced with a wood veneer, plain or exotic. These characteristics allowed woodworkers to design, machine, and construct in ways not possible with solid wood.

Initially, particle board was viewed with disdain and misgivings by many small shops. Machines designed for industry were unaffordable by a small shop and attempts to emulate industrial practice without the right equipment — panel saw, edge bander, point-to-point borer, and dowel inserter — proved disastrous. Of course, the material rather than the procedure was blamed and particle board was undeservedly associated with shoddy products. Eventually we got over these earlier gaffes and learned how to use the material to good advantage as small shop woodworkers.

The Knowledge Explosion

Until the last quarter of the century, small shop woodworkers were getting along as best they could. It's clear from brisk tool and machinery sales that there was no lack of interest in the subject, but there was no rallying force to unite them. That changed in the mid-1970s. Previously in the history of woodworking, change resulted from new styles, new materials, and new techniques. This time, however, the catalyst was regularly

and widely distributed information, namely, woodworking magazines. They entered the market one after the other, followed by a landslide of woodworking books and how-to videos. Tool stores sprouted everywhere, along with mail order catalogs and television shows. Woodworkers formed associations, clubs, and guilds across the country.

Along with the deluge of information arose a diversity of woodworking interests with a direct connection to earlier times when wood was the essential material — a time before plastic, plywood, particleboard and medium density fiberboard. Then, practically everything was made of wood because it had to be. Now, if it can be made of wood, someone is making it.

The Rise of the Professional

In this past quarter century, a significant cadre of small shop woodworkers have revoked their amateur status to sell an amazing range of furniture, turnings, and carvings. Others work on domestic and commercial interiors, making kitchen cabinets, home entertainment centers, and other types of built-in fittings.

Small shop designer-makers characterize their work as "handmade," a term that is potentially confusing. True, the work is nearly always hand-assembled and hand-finished, but how many woodworkers today would actually dimension stock using a hand saw and a bench plane when a table saw, jointer and thickness planer are available? I believe that hand-made embodies the notion that the same person who made the piece also designed it,

selected the wood, and applied the finish: it marks a real return to the roots of the designer-maker craft.

A high proportion of these woodworkers have had no formal education as woodworkers, designers, or architects. They refer to themselves as "self-taught." Along with their own experience, they have progressed by reading, viewing, and attending short courses. As far as technical information goes, I think they have been served well by the media.

In a somewhat similar way, the machinery manufacturers have evolved. From earlier distinctly down-marketed machines we now find some first-rate pieces of equipment aimed at the shop that doesn't have 3-phase power. A manufacturer takes what is normally a piece of expensive equipment designed for a large industrial shop and redesigns it for the small shop at an affordable price. One of the first such machines was a bench model 13" thickness planer. It still leaves me agog to realize it costs one-tenth the price of the machine I used in my learning years.



Craig Nutt learned to create dovetails "through trial and error." These days, in addition to pieces like his steam-bent rocker, Craig is pushing his designs to the limit, as with the "Corncorde," commissioned for the Atlanta airport before the '96 Olympics.

Selling What You Make

Up to this point I've focused on the technicalities of making woodwork. If you are going to be a professional, there are two other factors involved, designing and selling. Before you make it, it must be designed and after you make it, it must be sold. Of the two, selling is easier to learn. Since there is no shortage of literature and seminars on the subject, I will limit myself to the following advice. You cannot afford to allow your enthusiasm for making a piece cause you to ignore who it's for or where and how to sell it. Equally important is the detachment that must accompany the selling of work.

All the effort and skill that went into the making is often followed by a reluctance to let it go. A good solution is to make at least three of anything. That way you improve production techniques while avoiding undue attachment to a single object.

Designing What You Make

Whether you are an amateur or a professional, if you plan to change the shape of a piece of wood, you are involved with design — for a woodworker there is no escape. Even if you make a reproduction, you are involved in design when you select and arrange materials. The design is what the observer or user reacts to. William and Mary. Chippendale. Thonet. Arts & Crafts. Each name evokes a shape, a style, a design.

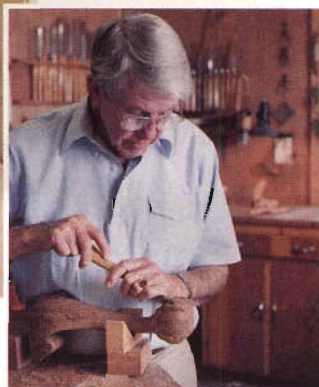
Within the trinity for success, Design-Make-Sell, design has been largely ignored or avoided over the past 25 years by the media that gave us good information on making. Perhaps because people's emotions often become aroused by even a casual conversation about design, it has been declared off-limits along with politics and religion. Nothing could be more intellectually harmful to woodworking.



When Dan Mack was starting out, good info on woodworking was scarce. "If I ever learn to do this stuff," he recalls saying, "I'm going to tell everything." Now on his third book, Mack has held good on his promise of freely sharing woodworking information.



The changing face of amateur woodworking: Twenty five years ago, "amateurs" tended to concentrate on birdhouses and home improvements. John McAlister has honed his skills and craftsmanship to the point that he recently received the Cartouche Award from the Society of American Period Furniture Makers. Says John: "I've never sold a piece, I'm strictly an amateur."



In my experience most woodworkers want to learn about design. The urge usually arises after considerable woodworking experience, as though they consider skill to be a prerequisite to design. This simply isn't the case. Unfortunately, if you get to the "I need to know design" stage after five years of learning to woodwork, then you've lost five years of design practice and improvement.

Design is an intellectual activity with a strong parallel to wood-working. To learn to woodwork you need information. You can get it from a teacher, a book, a video. Using that information, you develop skill through practice. You own that skill — no one can give it to you nor can you pass it on or give it away. To learn to design, you study proportion, pattern, color, and drawing. You develop a set of visual tools that will help you solve problems using your creativity. You own the creativity — no one can give it to you nor can you pass it on or give it away.

Many times I've been asked, "Where can I find courses or books on design?" The information, instruction, and exercises that would parallel the

technical information you need to learn to woodwork is not generally published. It's not that we don't know about it or fail to teach it in design schools, rather it's never been packaged specifically for the small shop woodworker. However, the day may come when woodworking magazines give as much space to learning to design as they have in the past to learning how to woodwork.

New Roads to Explore

Perhaps that day is not so far away, and the catalyst may not be design challenges posed by wood but upholstery. Each year I see more upholstery in furniture at shows like the Philadelphia Show. Upholstery greatly expands the design

challenge because it obliges you to select from a potentially huge range of options dealing with color, texture and, most times, pattern. The available color palette is endless: strong primaries to muted mixes around the color wheel. Textures vary from crushed velvet to slubbed silk and pattern, like color, is endlessly varied. What I see displayed instead is muted colors that look like camouflaged wood, textures that are at best nondescript, and patterns too shy to tell their messages.

I believe that an understanding of all things design is a pressing need for this new, large, and technically well-informed group of small shop designer-makers. In the late 1700s George Hepplewhite explained that the purpose of furniture is "to unite elegance and utility, and blend the useful with the agreeable." The alternative is to produce well-made but unattractive furniture. A good place to start broadening our design knowledge is knowing who did what and when. Fortunately, there's no shortage of books on past designers and their work.

I liken the development of woodworking in the U.S. over the past 25 years to our own development as individuals. It had its tottering childhood beginnings, it went through its adolescent years, and now it's on the brink of adulthood. The woodworkers of the past 800 years left a rich and inspiring legacy. Today's small shop designer-makers have a wider variety of materials to work with, better working conditions, more sophisticated equipment, and sharper, more accurate cutting edges. What a loss if we did not expand the craft and continue to "blend the useful with the agreeable."

The future of woodworking? Katie Fogarty's piece was featured in our October 2000 issue (along with the work of other students in George Trout's high school woodworking class). Said George, "I have to turn kids away ... that's a good problem."



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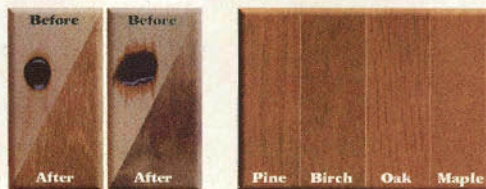


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Child's Adirondack Chair and Settee

By John English



In March 1993, the Journal featured a combination Adirondack chair and settee for children. For our 25th anniversary issue, we asked contributing editor John English to have a fresh go at the project.



I must confess ... I'm something of a plan pack rat. Great looking woodworking plans have a way of getting tucked into various storage areas, never again to see the light of day. As we were examining possible projects for our 25th anniversary, a light slowly dawned that I had a few "favorites" stashed away from the *Journal's* early years and this little Adirondack settee was on the top of my pile. I mentioned it to editor Rob

Johnstone over lunch one day, and he said I wasn't the only one who liked that plan. It's one of the most popular projects in the entire *Woodworker's Journal* archive!

Rob gave me the go-ahead to reprise the project for this 25th anniversary issue but, like most woodworkers who build projects from plans, I could not resist adding a few touches of my own. The result is a Spanish cedar chair/settee designed to be left

outdoors. Whenever you want to switch from individual chairs to a settee with a center table, it's a simple matter of unscrewing a few countersunk brass bolts from their threaded inserts. Then you use the same bolts to reassemble the set in its new configuration.

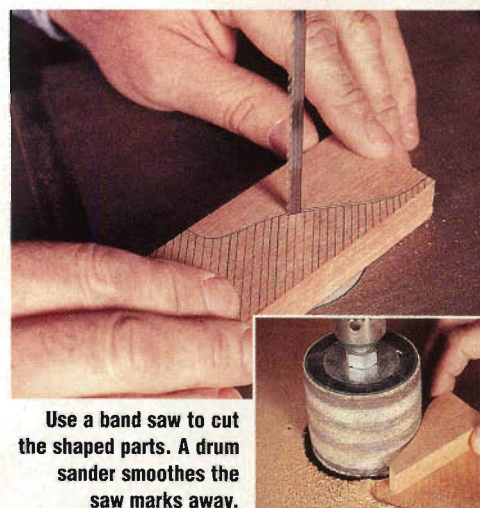
This is truly a project for all skill levels. Choose a weather resistant species such as redwood, western red cedar, Honduras mahogany, or the Spanish cedar that I used.



Laying Out Some Curves

There are a few shaped parts in this project — the front stretchers (pieces 5 and 6), back slats (pieces 9), arm rests (pieces 10) and brackets (pieces 11). A quick glance at the *Exploded View* and *Elevation Drawings* on pages 38 and 39 will orient these parts for you.

When you're ready to use our scaled *Elevations* to create your own full-size patterns, try the trick featured on page 15 of this issue. Cut out each pattern with a pair of scissors and stick them to the boards with a few dabs of glue — just enough to keep them flat. Then band saw them to shape and clean up the cuts with a drum sander mounted in the drill press.



Use a band saw to cut the shaped parts. A drum sander smooths the saw marks away.

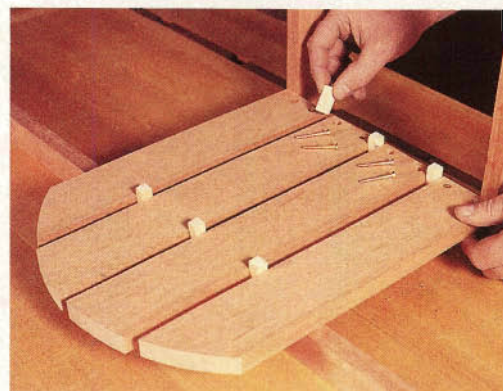


A disk sander works wonderfully for shaping the ends of the arm rests, the tops of the back slats and the front corners of the tray.

Assembling the Seats and Backs

With the parts all cut, you're ready to move on to the assembly, most of which is done with brass screws (pieces 16). As you proceed, be sure to keep the following approach in mind. To avoid splitting your wood, you need to predrill for every screw. Clamp the pieces together and drill through the first piece of wood with a 1/8" bit. Switch to a 1/16" bit and, using the first hole as a guide, drill almost all the way through the second piece. Countersink for the screws, and then drive them home. Brass screws are relatively soft, so take your time and make sure the driver is properly seated in the slot.

Start by screwing the seat stretchers (pieces 7) to the seat supports (pieces 2). Screw the back slats (pieces 9) to the stretchers, spacing them 1/2" apart as shown on page 38. Then mount the seat slats (pieces 8), spacing them 7/16" apart.



Use scrap spacers to align the seat slats properly when screwing them to the chair's back stretchers. Stock cut the same width as the stretcher supports the slats in this photo.

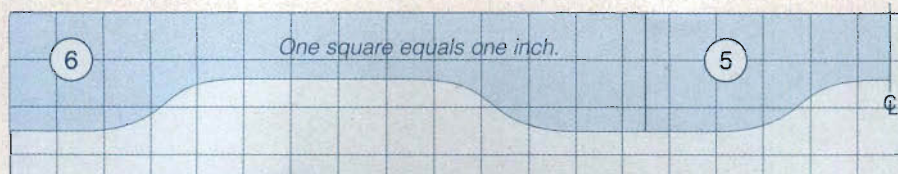
Cutting the Parts to Size

All of the parts in this project are 3/4" thick, so there's no need for a planer. You can quickly rip all the parts (pieces 1 through 13) to width. Check the *Material List* on page 38 for these dimensions. Note that the list includes enough material to build two chairs, plus the extra parts needed to convert them into a settee, complete with table.

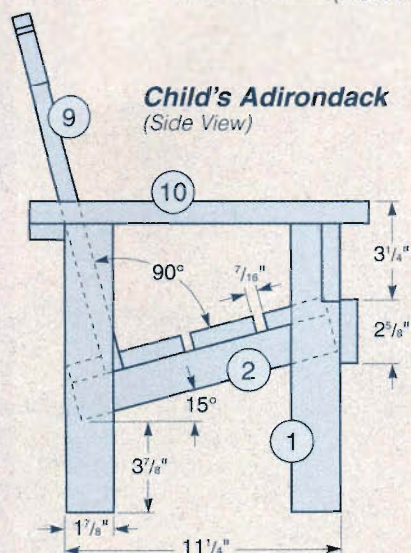
Next, cross cut all the parts to the lengths listed. As there are no angled, mitered or even bevel cuts required, this is simply a matter of using the miter gauge on your table saw to make a series of 90° cuts. Mark each part with the number it was given in the *Material List*.

Attaching the Seats to the Legs

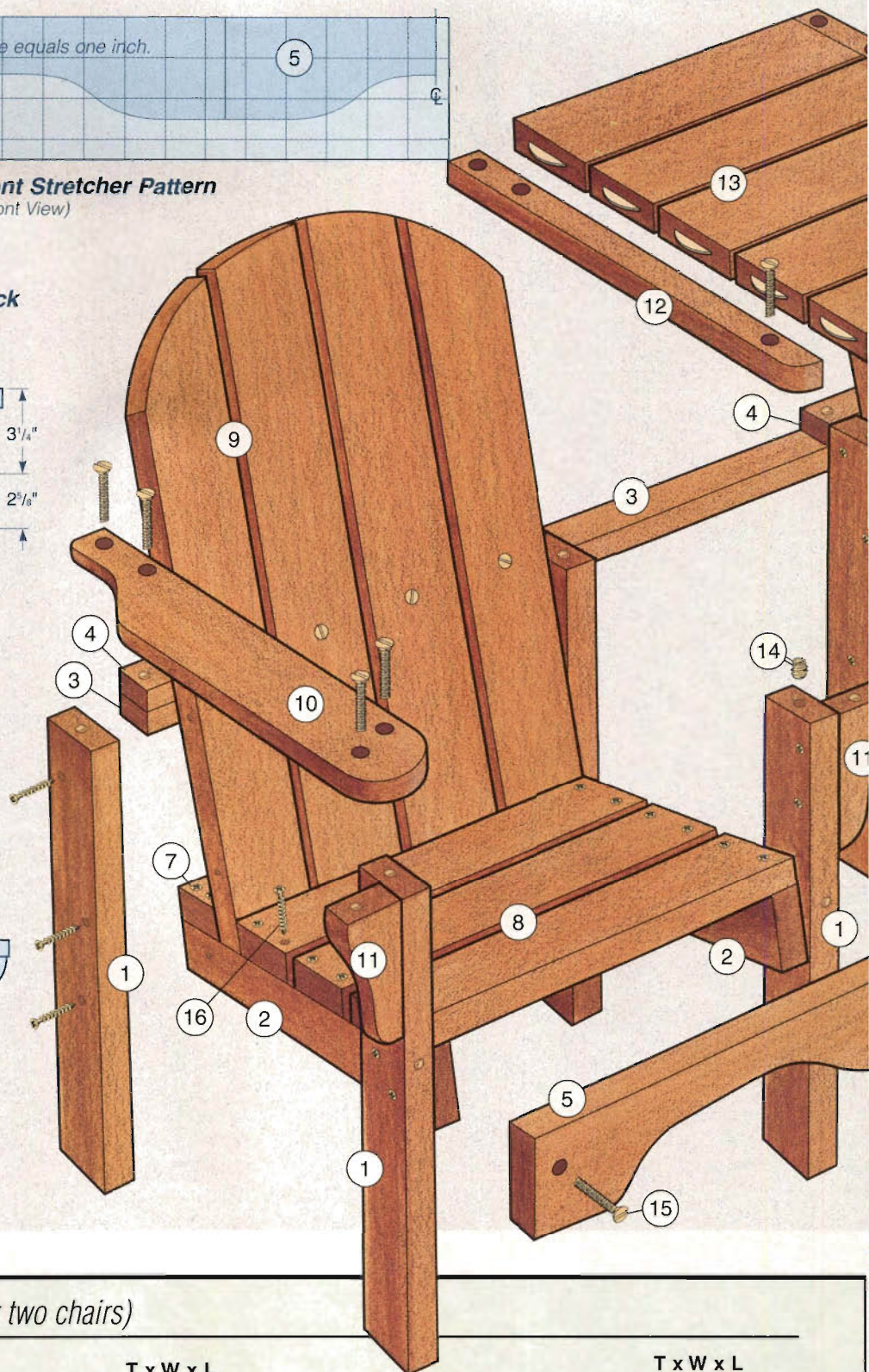
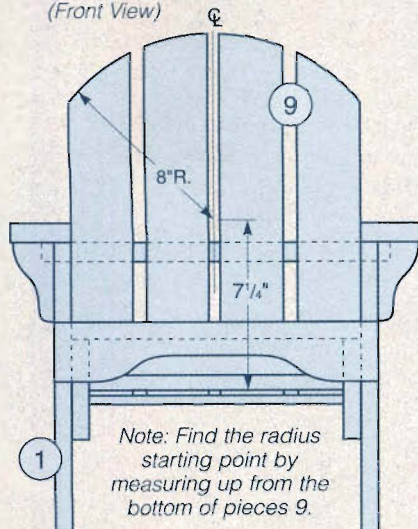
The first step here is to mount the legs (pieces 1) to the seat supports. To get everything lined up properly, you can use an old chairbuilder's trick: cut a piece of scrap plywood to fit between the legs (12" x 11 1/4"), set it on a flat surface and clamp the legs to it.



Bracket and Front Stretcher Pattern
(Front View)



Child's Adirondack
(Front View)



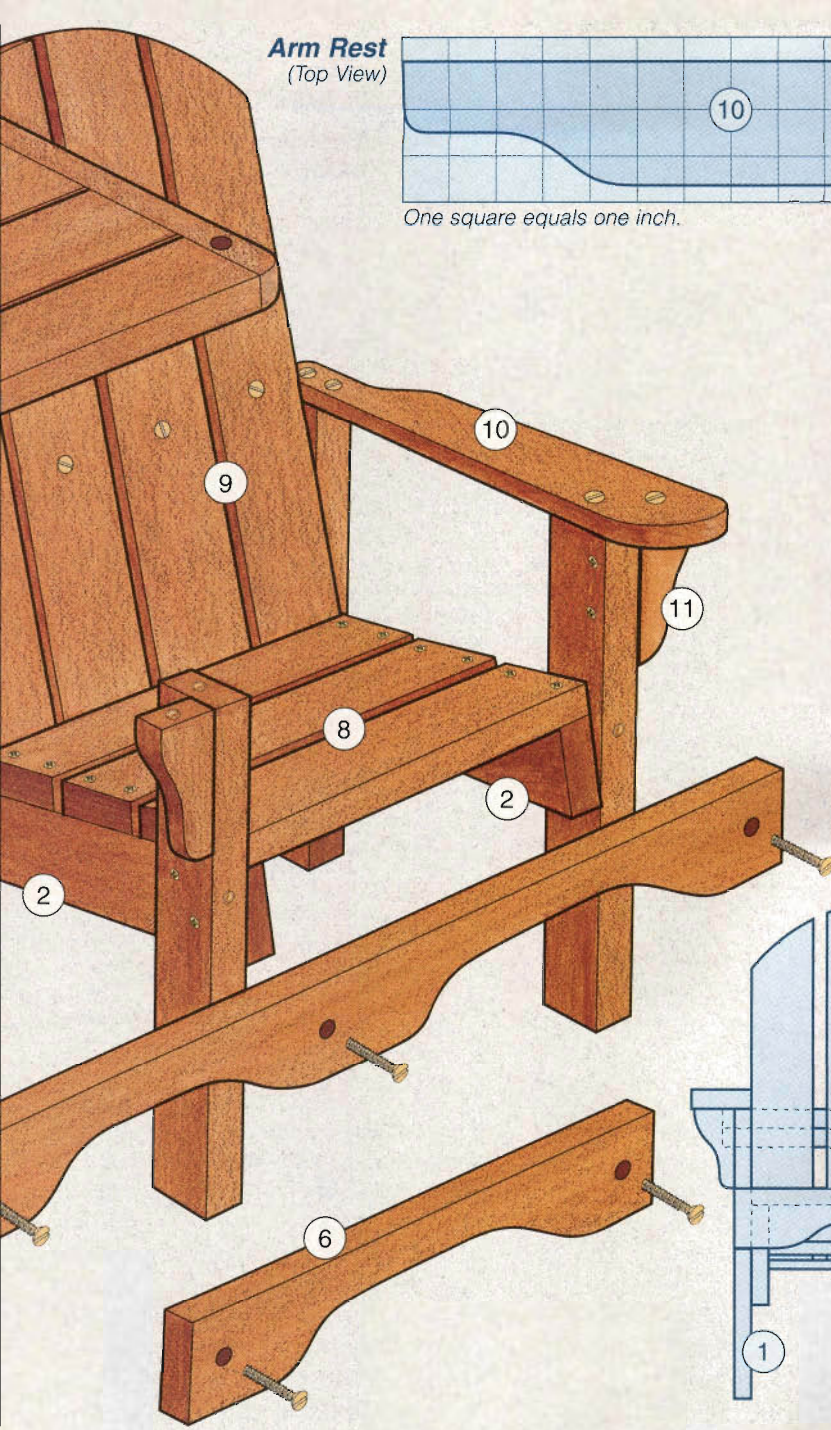
MATERIAL LIST (for two chairs)

	T x W x L
1 Legs (8)	3/4" x 1 7/8" x 12"
2 Seat Supports (4)	3/4" x 1 1/2" x 11"
3 Settee Back Stretcher* (1)	3/4" x 1 1/2" x 38 1/2"
4 Chair Back Stretcher (2)	3/4" x 1 1/2" x 14 1/2"
5 Settee Front Stretcher* (1)	3/4" x 2 5/8" x 37 1/2"
6 Chair Front Stretcher (2)	3/4" x 2 5/8" x 13 1/2"
7 Seat Stretchers (2)	3/4" x 1 1/2" x 12"
8 Seat Slats (6)	3/4" x 2 5/8" x 12"

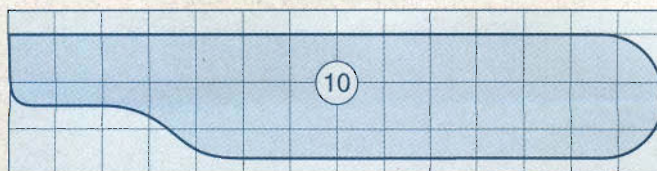
* Optional

** Before shaping

	T x W x L
9 Back Slats** (8)	3/4" x 2 5/8" x 15 1/4"
10 Arm Rests (4)	3/4" x 2 5/8" x 14"
11 Brackets** (4)	3/4" x 1 3/4" x 3 1/2"
12 Table Ends* (2)	3/4" x 1" x 14"
13 Table Slats* (5)	3/4" x 2 5/8" x 10"
14 Brass Threaded Inserts (32)	1/4" x 20 ID
15 Brass Bolts (32)	1/4" x 1 1/2"
16 Brass Screws (96)	#8 x 1 1/2"

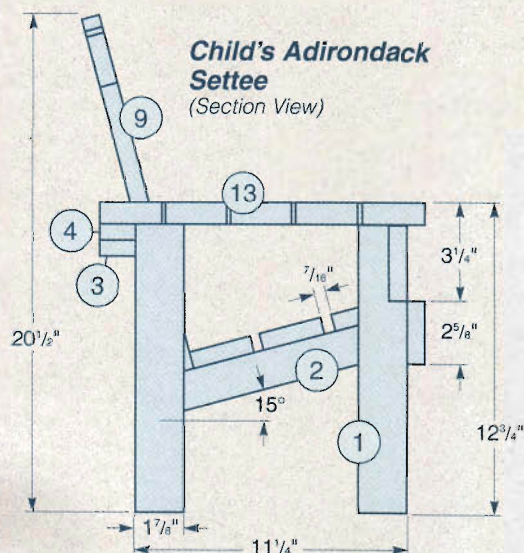
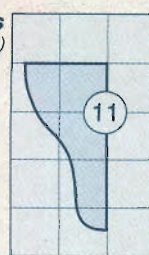


Arm Rest
(Top View)

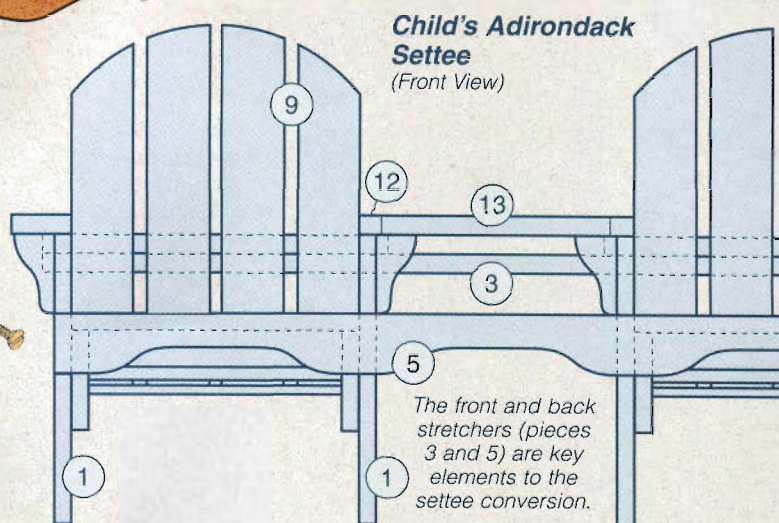


One square equals one inch.

Brackets
(Front View)



Child's Adirondack Settee
(Section View)



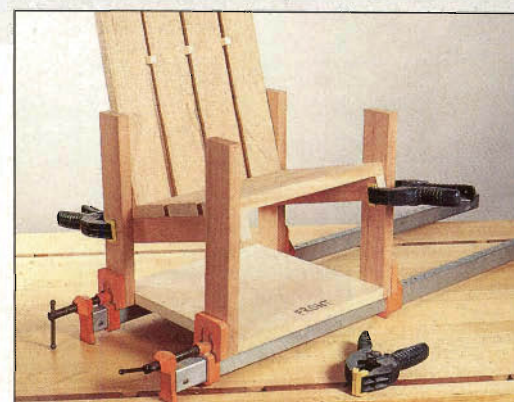
Child's Adirondack Settee
(Front View)

Screw each of the seat/back subassemblies to the legs next. Locating these correctly is a snap: make a mark $3\frac{7}{8}$ " up the inside of the back legs, then line up the seat so the bottom corner of each seat support is flush with one of your marks. Now tilt the seat/back subassembly so it angles at 15° , as shown in the *Drawings* above. When everything is lined up, clamp it in place, drive the countersunk screws home and remove your clamps. Use

screws and a dab of weatherproof glue to attach the four brackets (pieces 11) to the legs, leaving them flush on top.

Chairs or Settee?

It is a good idea to complete both chairs, then work on transforming them into a settee. All the remaining parts — except the table slats — are installed with brass bolts (pieces 15), which are driven into threaded brass inserts (pieces 14). This is done so



Here's a trick to hold the legs properly during assembly; clamp all four to a piece of plywood while you screw them to the seat subassembly.

the parts can easily be changed. You could use screws, but after a few conversions the holes will become enlarged and their holding power will diminish.

Locating the inserts is a matter of clamping the parts in place, then drilling a 1/8" pilot hole through both parts. The front, or more visible part, is then redrilled for the bolt. This is a 1/4" hole, countersunk to fit the head of the bolt. The inner, or hidden part, is redrilled to receive a threaded insert. The ones I used require

a 3/8" hole, and the insert is installed with a large flat screwdriver.

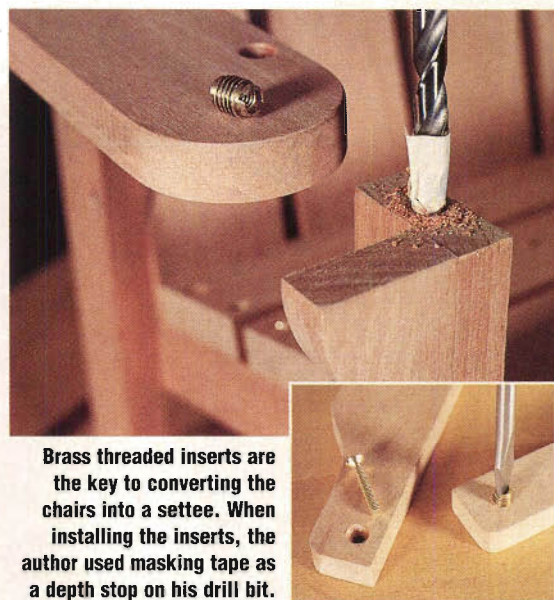
Mount the chairs' arm rests (pieces 10) and stretchers (pieces 4 and 6) in this manner. I found it easiest to attach the back stretcher to the arms, then install these subassemblies to the chairs.

For the settee, add the long stretchers (pieces 3 and 5) to the bottom face of the short ones (pieces 4 and 6). To gain extra gluing strength when attaching the two table ends (pieces 12) to the slats (pieces 13), I used my biscuit joiner. Then use the arm rests as a pattern to line up holes for the brass bolts. Finish up by rounding off the front corners of the table to match the arc on the arm rests.

Some Final Notes

As mentioned, my settee was constructed with clear Spanish cedar. This wood is a little hard to sand. Like butternut and some of the less dense softwoods, it tends to get a little "hairy." The solution is to apply a thinned coat of finish first (I used Spar varnish). Let it dry, then sand off the nubs before brushing on three full-strength coats.

If this project puts you in a mind to build a full-size Adirondack, don't mess around with scaling up this



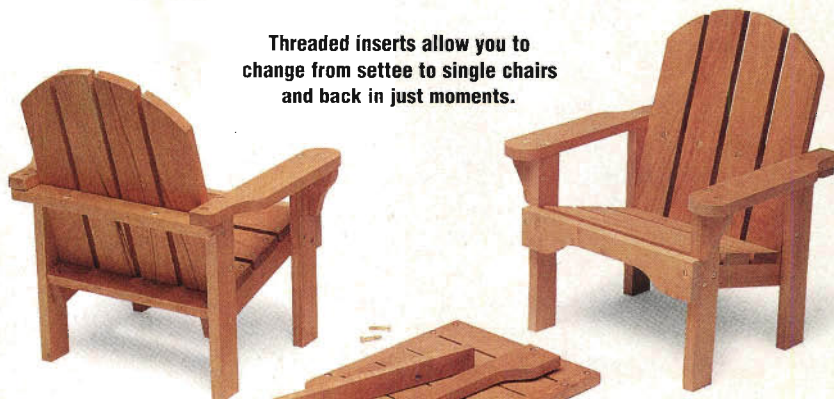
Brass threaded inserts are the key to converting the chairs into a settee. When installing the inserts, the author used masking tape as a depth stop on his drill bit.



Use the completed arm rests as patterns to accurately locate the holes for the brass bolts in the table.

chair. Instead, point your browser to www.woodworkersjournal.com and surf over to the "Plans, Plans, Plans" section of our web site. Now type "Adirondack" in the search engine at the top. In about two nanoseconds, you'll find seven great Adirondack plans to choose from!

Threaded inserts allow you to change from settee to single chairs and back in just moments.



Future Woodworkers of America

The generosity of our readers is remarkable and constant. Over the years, many of our subscribers have told us they've built this Adirondack set. Reader Liz Wojtkiewicz built the chairs for her friend's three young daughters. And, guess what, Liz "modified" them just a bit (hmm!). Michelle, Nicole and Emma Jewitt love their chairs. (They selected their own colors and helped paint them!) Now these young woodworkers can't wait to help Liz build a fourth chair for their baby sister, Leah.

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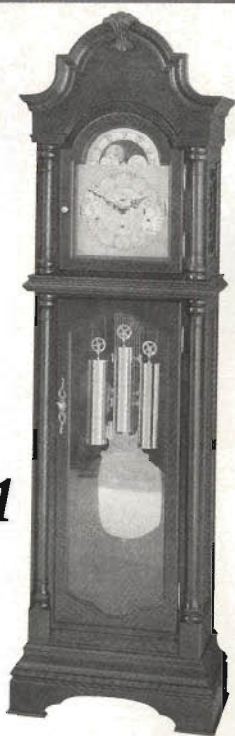
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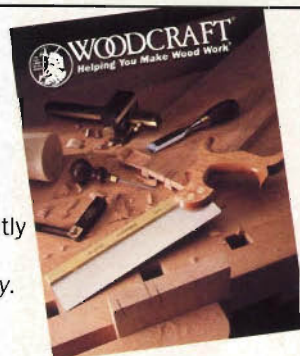
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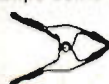
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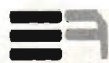
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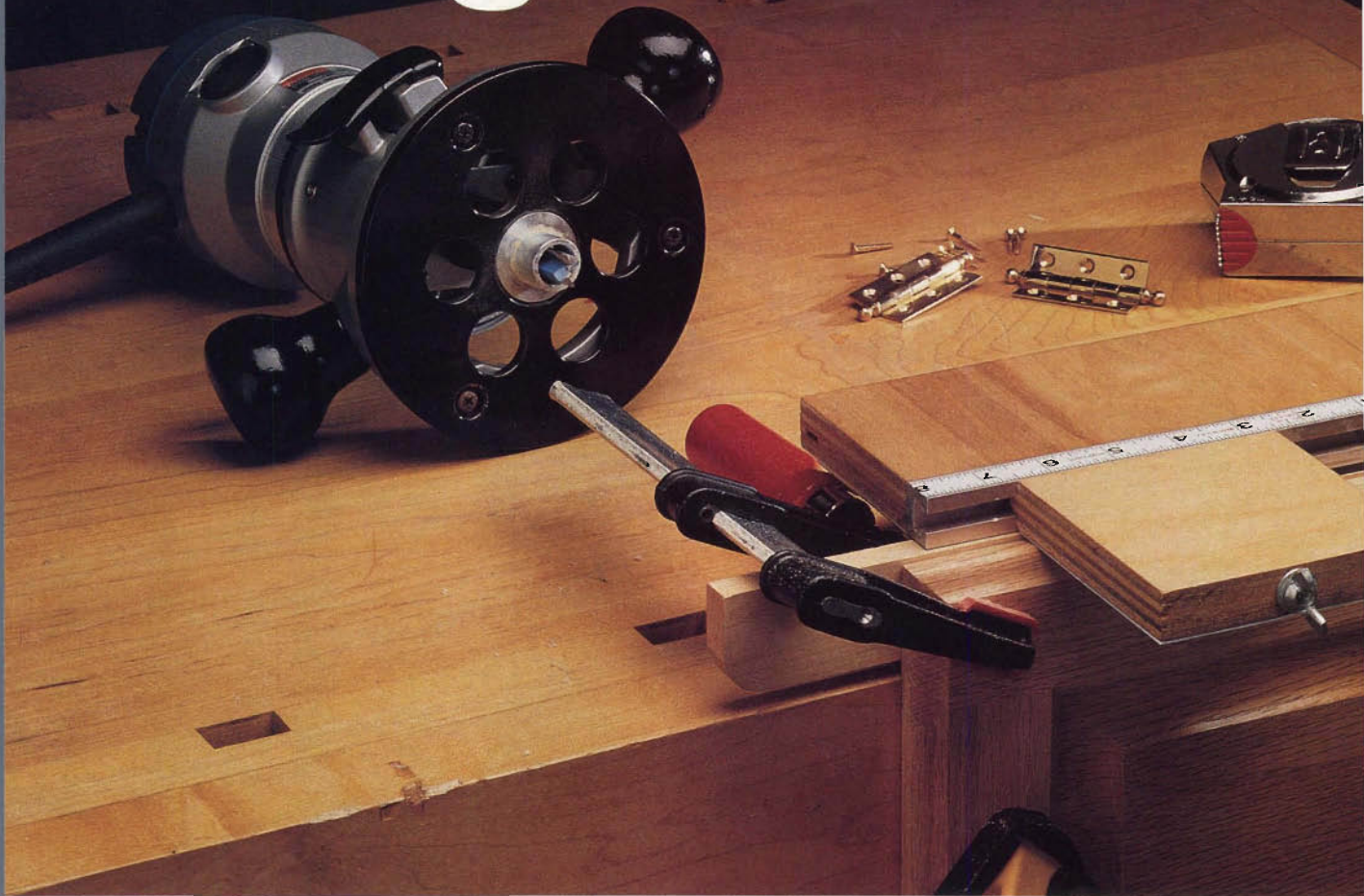
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Hinge Mortising



Recently, a project I was building required several hinges of varying sizes. As I was gearing up to create my series of routing templates, I decided it was the perfect time to design an adjustable jig instead. The jig turned out to be far simpler than you might think, consisting of four basic elements.

An "L" shaped deck (piece 1) establishes the side and back of the mortise, while a sliding panel (piece 2) controls the width. To locate the mortise inset, I added a simple base and fence subassembly (pieces 3 and 4) that slides underneath the deck and allows me to clamp the jig to whatever I'm mortising. The depth of cut, as you would expect, is set on the router itself.

Whenever I use this jig, my router is guided by a collar. The deck areas are essentially 4" wide to ensure that the router base always has a large enough surface to ride on while mortising.

As you can see in the *Drawings* above, the sliding panel is guided by a short length of aluminum T-track (piece 5). This allows me to quickly and easily set my mortise width with a simple hex head adjustment bolt (piece 6), along with a wing nut and washer (pieces 7 and 8).

One final note on construction details: I created all of the slots and long holes for this project in the simplest way possible, to ensure that it would be within the reach of woodworkers with limited tools. Not every shop has a really good router table or floor mounted drill press. If you do, and want to rout out your slots and drill a through hole for the adjustment bolt, all the better.

Creating the Deck

The deck is made from 3/4" good quality sheet stock. I used some leftover birch ply I had on hand, but melamine or MDF would work fine, too.

Congratulations to Woodwo

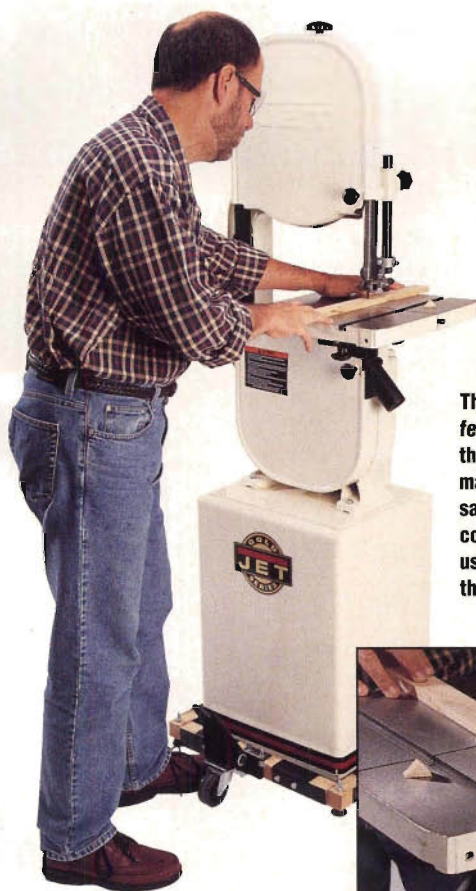
ng Jig

By Ralph Bagnall

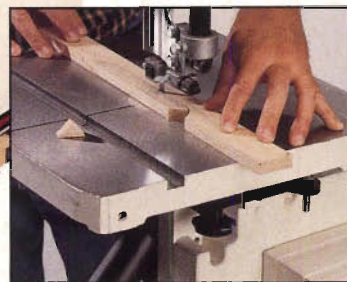


A 14" x 8" piece provides plenty of material for both the deck and the sliding panel. I started the "L" shape on my table saw, raising the blade as far as possible and then stopping the cut before crossing the intersection. You can finish the cuts on your band saw and clean them up with a file to ensure a smooth straight edge. The waste cut from the "L" can be used for the sliding panel.

Cut a section of T-track to length and drill three 3/16" mounting holes. They need to be countersunk, but a normal countersink will not fit inside the track. I turned to a 1/4" bit to form the countersinks, making sure I carefully controlled the depth of cut. Set and clamp the track in place, keeping it flush with the top face of the deck. If the bottom isn't flush, simply bond a piece of veneer or laminate (piece 9) to the underside of the deck (and the sliding panel, so they're exactly even). With the track clamped in place, mark the hole locations on the deck and



The cutouts on the fence and base of this jig can be made on the band saw. For the tighter corners, you can use your drill to get the milling started.



predrill these for #6 by 1" screws. Attach the track using these screws and a little epoxy. Before moving on, mark out and drill the two 3/8" holes on the underside of the deck (see *Drawings*) for the threaded inserts (pieces 10) which will accept the fence adjustment knobs, (pieces 11). Be sure you don't drill all the way through. Screw in the inserts, then sand the deck, keeping the edges square.

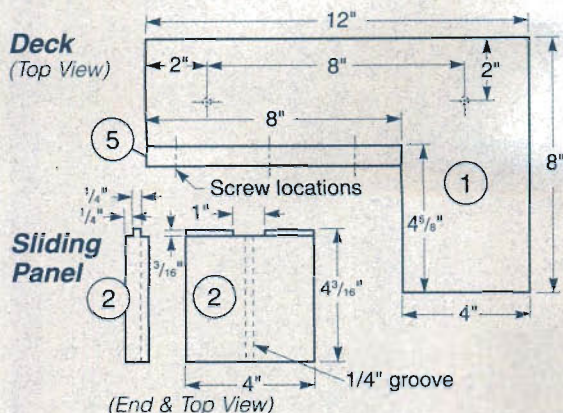
Adding the Sliding Panel

The sliding panel is used to set the width of the mortise. It is a simple square with a tongue milled on one edge to fit the open edge of the aluminum T-track, as shown above. Note that there is a 1" notch at the center of the tongue to accommodate the head of the adjustment bolt. The tongue needs to be carefully milled so that the tops of the deck and sliding platform are perfectly flush and snug when the adjustment bolt is tightened.

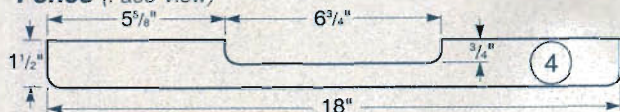
Next, a slot is milled into the underside of the panel for the adjustment bolt. To keep the bolt from wiggling around, I used hot melt glue to adhere a section of plastic drinking straw (piece 12) into the channel — you could also use brass tube. Of course,

orker's Journal on 25 years of

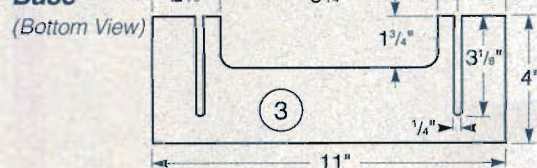
Deck
(Top View)



Fence (Face View)



Base



	T x W x L
7 Washer (1)	1/4"
8 Wing Nut (1)	1/4"
9 Plastic Laminate (1)	1/16" x 8" x 12"
10 Threaded Inserts (2)	1/4" x #20
11 Knobs/washers (2 each)	1/4" x #20 x 3/4"
12 Straw or Brass Tube (1)	1/4" x 3 3/4"

a self-adhesive measuring tape laid in the recess on top of the aluminum channel to help reduce my setup time.

For mortises in the edge of the workpiece, the hinge location needs only a single mark, 1/8" beyond the actual location. Clamp the ends of the fence to the workpiece, aligning the mark with the appropriate edge of the deck.

Now set the mortise depth across the workpiece. Tighten the underside knobs, ensuring that the fence is square to the deck, remembering to allow for the offset.



This easy to make jig consists of only four major parts, all of which can be milled to overall size on the table saw.



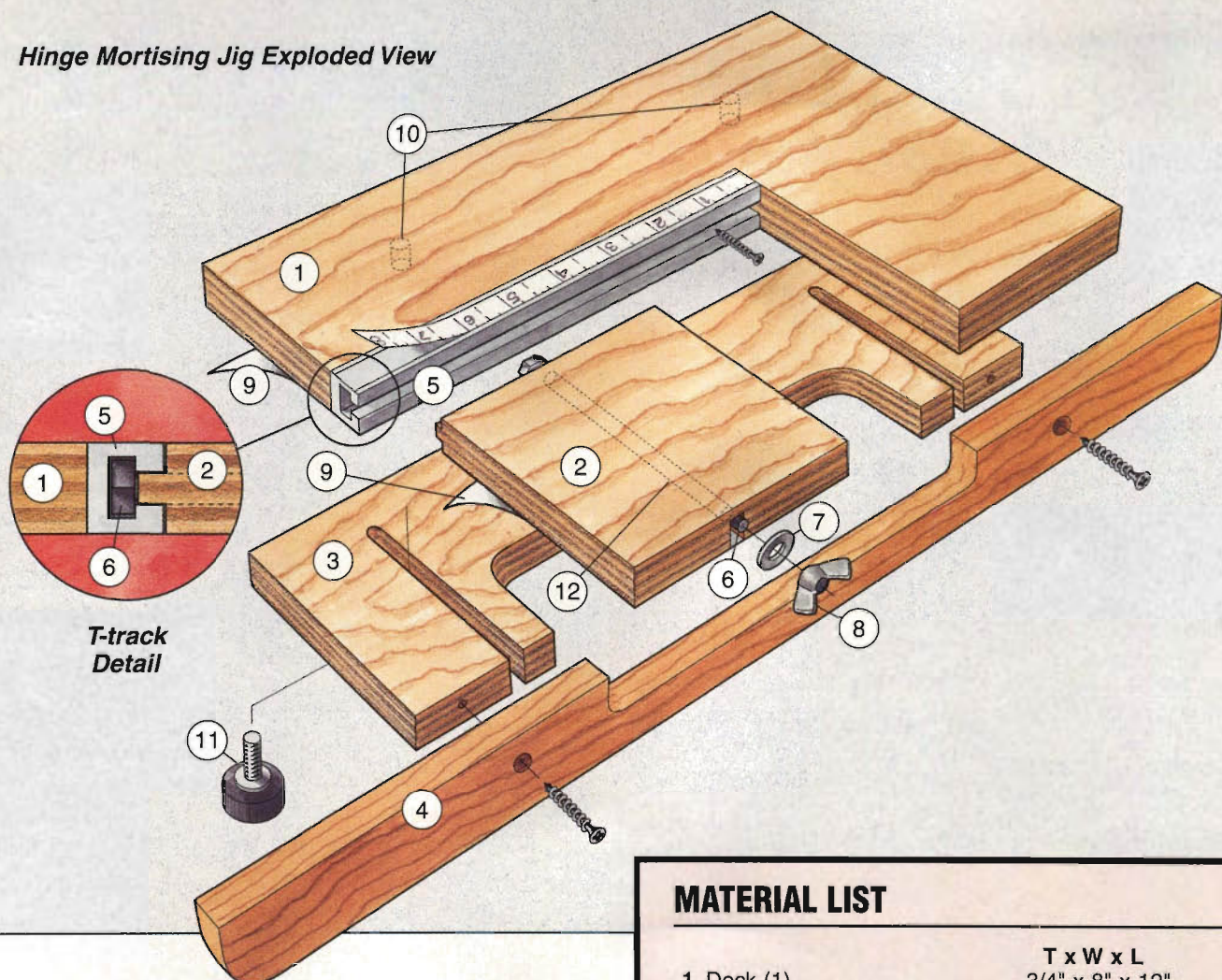
Once the jig is clamped in place, set your router to the proper depth and mill your first mortise. (It is always a good idea to do your test cuts in scrap lumber.) Square the corners with a sharp chisel if needed, and check the fit of the hinge. Once the fit is acceptable, the jig is ready to reclamp in the next location and mill the pockets.

For face mortising, remove the fence completely. The mortise location will need a second mark (properly offset) to provide the setback. Now clamp the deck to the face of the workpiece (keeping it square to the panel edge) and mill the pocket. The router depth should not need to be reset from an edge mortise.

Conclusion

I've been very pleased with my hinge mortising jig. A folding shelf unit I built recently required 10 hinges in two different sizes, or 20 mortise cuts. I was able to take just a few minutes to layout the marks for the hinges, then set up the jig and milled them out. Because of the quick setup, the entire process took about 15 minutes. Two spring clamps provide plenty of holding power and allowed me to move the jig from location to location very quickly.

Hinge Mortising Jig Exploded View



MATERIAL LIST

	T x W x L
1 Deck (1)	3/4" x 8" x 12"
2 Sliding Panel (1)	3/4" x 4" x 4 ³ / ₁₆ "
3 Base (1)	1/2" x 4" x 11"
4 Fence (1)	1/2" x 1 ¹ / ₂ " x 18"
5 Aluminum T-track (1)	3/4" x 5/8" x 8"
6 Adjustment Bolt (1)	1/4" x #20 x 4 ¹ / ₂ "

if you have a drill press, then that's a better solution. The slot should be milled deep enough so that the adjustment bolt can be centered on the T-track. The bolt head rides in the track and a washer and wing nut are used to lock the sliding platform in place.

Slip the bolt head into the track and snug the sliding platform to the deck. Make sure the face of the sliding panel is flush with the face of the deck. Adjust as needed by trimming or shimming the tongue with a little strip of laminate.

Building the Fence and Base

The fence is nothing more than an 18" long piece of hardwood, milled square and straight. I used 1/2" maple for this piece. Attached to the fence is the base, a piece of 1/2" birch plywood with two slots (see *Drawings*). The two pieces are glued and screwed together as shown above. They're also notched at the center for router bit clearance.

Adding the Hardware and Testing the Jig

You'll have to add the hardware to bring this jig to life. First, you'll need two knobs (I used plastic thumb screws) to screw into the threaded inserts you placed in the deck. Their studs have to be long enough to go through the base and into the deck. You'll also need the adjusting bolt with wing nut and washer to lock the sliding panel in place.

Using the jig is very simple. First, set the width of the mortise by adjusting the sliding panel. Because I use a 1/4" bit with a 1/2" collar, I set the jig 1/4" wider than the hinge. If you use a different setup, you'll need to adjust the offset. I outfitted my jig with

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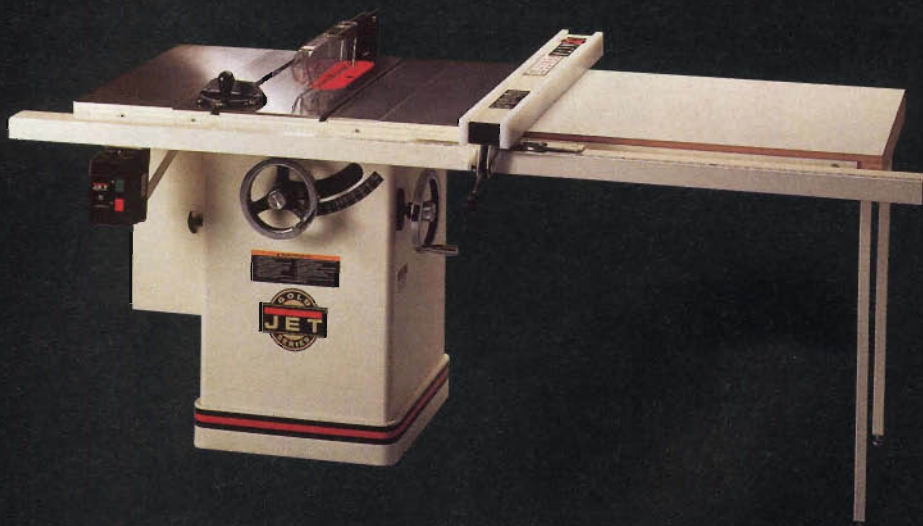
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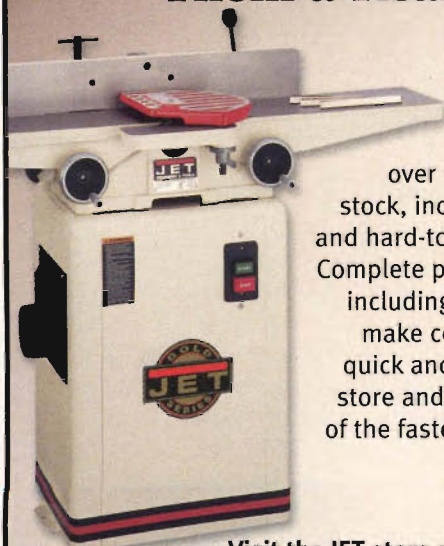
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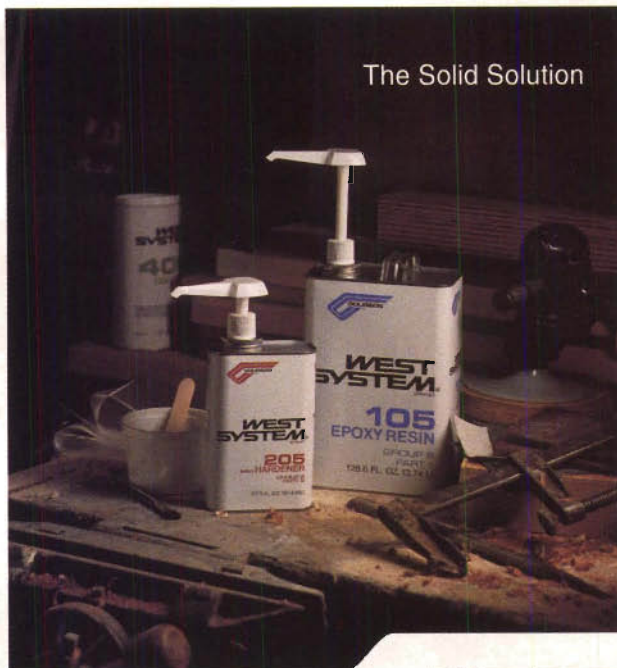
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Ruhlmann Cabinet

By Mike McGlynn



Early in the 20th century, a group of far-thinking designers began to mantle the world in new ideas expressed in beautiful new shapes. In the realm of furniture making, the high priest of this Art Deco movement was Jacques-Emile Ruhlmann.

Ruhlmann. The name is enough to strike fear into the hearts of even the most experienced woodworker. Jacques-Emile Ruhlmann designed some of the most complex and finely crafted furniture of the early 20th century. He is considered the high priest of the Art Deco furniture movement, and the craftsmen he employed were the finest of their day. I've long admired his designs and have thought about making a piece in his style for years. A recent room remodel at my home provided me with my chance.

Design Considerations and Construction Methods

After studying Ruhlmann's work, much of which has survived in wonderful condition, I made my design choices: maccassar ebony for the veneer and Avonite, a humane, man-made ivory substitute.

My next challenge was to figure out the construction methods and their sequence. Veneering is one of those tasks that give even accomplished woodworkers pause, myself included. Here are a few general suggestions and pratfalls to avoid. First, have the most stable core possible. In today's world this means medium density fiberboard and, where you must use solid wood, something like poplar or soft maple. Second, whenever possible, avoid veneering over joints, especially if the core is solid wood. I've seen it result in cracks too often. Third, in my view, vacuum bagging is by far the best way to lay up large flat panels. And finally, the best way to veneer edges and curved parts is with the iron-on method. Coat both the

veneer and your core with Titebond 2[®], let it dry, and apply the veneer with a hot iron. (More on that later.)

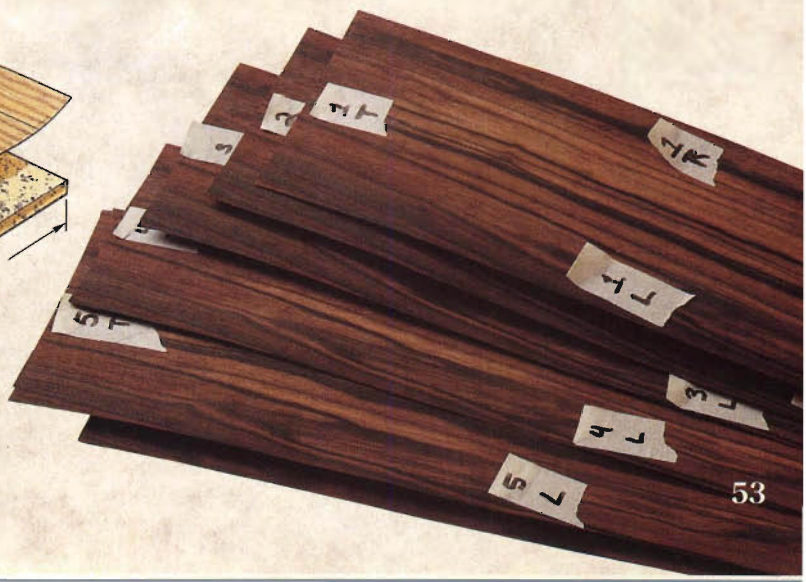
With those points in mind, you're ready to start your veneer work. Unfortunately, the first step is one of the most nerve-wracking: cutting and taping up the veneer panels. There is no way I can overemphasize the importance of planning your veneer layout in advance. My veneer arrived as 19 consecutive leaves approximately 11 ft. long and 5 1/4" wide. My first step was to label the leaves on all four ends, including the leaf number, to keep track of them during layup (see photo). Then I made a list of the veneer panel sizes I needed to lay up. To determine this, I increased the panel dimensions by 1/2" in width and 1" in length over the stock it needed to cover. I also determined the balanced book-matched pattern of my veneer leaves, as shown below.

Nontraditional Approach to Taping up Veneer Panels

Once you've edged your veneer (see photos on page 55), you're ready to tape. As far as I'm concerned, when it comes to flat panels, throw your traditional veneer tape as far as you can. Now pick it up and throw it again! I tried some on the pediment top and it took forever to sand off. So I decided to try an experiment using clear packing tape instead. With some scrap veneer, I taped up a small piece and vacuum bagged it with epoxy. To my joy, when I took the piece out of the bag the tape peeled off perfectly clean, with no problem. My new method is to put a piece of packing tape across the joint every 3 to 4 inches and then lay another piece the full length of the seam.



Book-matching your veneer is a simple matter of flipping over every other leaf. But balancing the pattern ... and keeping it all centered on the panel ... requires considerable forethought. For example, if your goal is a 20" wide finished panel and your rough veneer leaves are 5" wide, you will need six leaves approximately 3 7/16" wide (allowing for about 1/4" trim on each edge of the veneered panel).



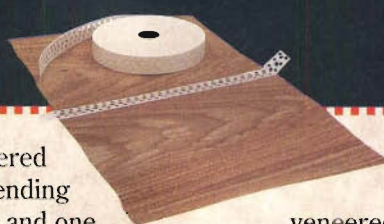
With the veneer all laid up, you're ready to prepare the core stock. I cut my panels 1/2" larger than the veneered panels so the veneer edges wouldn't get crushed in the bag. My choice of material for gluing the veneer to the core stock runs contrary to commonly held wisdom. I use epoxy for most of my veneering because my panels end up dead flat, and I have plenty of open time, which is important when working alone. I roll the glue on with a very short nap roller and put a single coat on both the panel face and the veneer back, and then place the taped-up veneer on the core stock. For my core stock I used white birch veneered MDF. Conventional wisdom says that ending up with two layers of veneer on one side and one on the other makes for an "unbalanced" panel. My experience has told me that, with the use of epoxy glue, this is not a problem.

The last step before placing the panel in the bag is to put a 1/4" melamine caul in place with some masking tape to make a sandwich that is easy to move. Vacuum bagging is a topic all its own, so I won't go into details here, other than to say I leave my panels in the bag for about 10 hours.

The veneer for the sides and pediment are pretty easy to lay up, but the front is much more complicated. The reason for this is that after taping up the veneer, but before laying it up, the parts that make up the face frame veneer must be trimmed off. I did this with a clamped straightedge and a sharp knife. I cut the vertical pieces, or stiles, off first because seams with the grain are harder to see than cross grain ones. Then I cut the top and bottom rail portions off. Once I had carefully

"When it comes to flat panels, throw your traditional veneer tape as far as you can. Now pick it up and throw it again!"

— Mike McGlynn



marked these pieces' orientations and relationships to each other, I set them aside until I was ready to veneer the face frame. After the veneered panels have dried, they should be sanded before being cut to size. It's easier to sand when you don't have to worry about burning through a sharp edge. Sand the panels to a 120-grit, making sure any epoxy bleed-through is removed.

Contemplating the Face Frames

Building and veneering the face frames (front and back) is like a puzzle. To prevent significant problems I needed to machine and assemble them in exactly the right order. The first step was to cut the birch

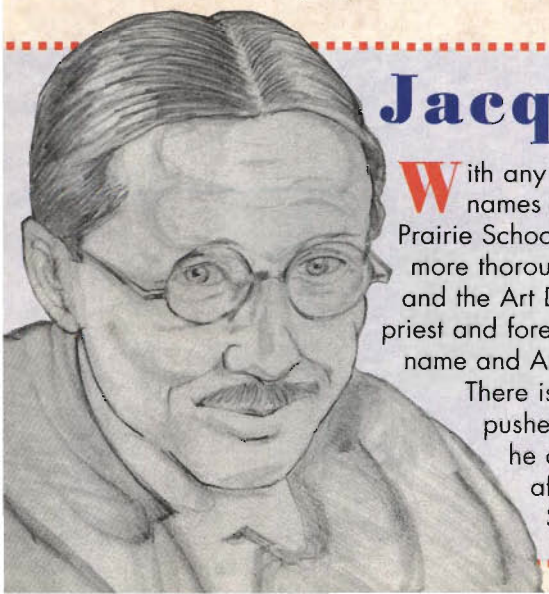
veneered MDF strips that make up the face frames. I made the stiles an extra 3/4" wide for mitering purposes, but cut the rails to exact width. All were left 1" long. Next, I needed to veneer the appropriate edges of the face frame, including the inside edges of the stiles and the inside (or exposed) edges of the top and bottom rails. I use the iron-on method for this process. (Oops: When you tape up this veneer, you'll have to go find the old-fashioned paper tape I told you to throw away!) After veneering, I trimmed the edges with a flush trimming bit and finished up with 80 grit sticky-back sandpaper on a hard block. Then I trimmed the parts to length.

I joined the face frame members (there is both a front and back face frame) with floating tenons made from yellow poplar. After marking their positions, I used my multi-router to cut the mortises in both the stiles and rails. For the back subassembly, the mortises need to accommodate the panel grooves.

Jacques-Emile Ruhlmann:

With any popular artistic movement, there are those designers or craftsmen whose names immediately evoke the genre. Think of Frank Lloyd Wright and the Prairie School or Gustav Stickley and the Arts & Crafts movement. But no name is more thoroughly identified with a school of thought than Jacques-Emile Ruhlmann and the Art Deco movement. Ruhlmann (1879-1933) was nothing less than the high priest and foremost practitioner of Art Deco. From 1919 until his death, Ruhlmann's name and Art Deco were virtually synonymous.

There is no doubt that Ruhlmann was a brilliant, original designer, and that he pushed his highly talented craftsmen to staggering levels of fit and finish, but he also had one other small detail working in his favor. At the age of 27, after the death of his father, Ruhlmann took over his family's business, Société Ruhlmann — a highly successful commercial painting and





The author's method for creating straight veneer edges is a sliding carriage that clamps all of the leaves together at the same time, with fully supported edges. His jig creates clean, dead-straight edges. After the first edge is established (right), small blocks (above) are screwed in to adjust the width of the veneer.



Plowing those grooves is the next step after cutting the mortises. I used 1/4" white birch veneered MDF for my back panels. The grooves for these panels should be cut 1/4" deep, using a router table and a down spiral bit to prevent veneer chipping. Remember, only the back face frame has panels.

Before putting together the back subassembly, I had to take care of two more steps. First, the back panels had to be cut so their grain would be balanced and lined up vertically in the cabinet. Second, the edges of the face frame members and panels needed to be cut to exact length and then sanded up to 120 grit. Assembling the face frames was routine. I used epoxy and meticulously cleaned up the squeeze-out with lacquer thinner.

While the face frames are drying, the side panels can be cut to length. These cuts are very important, because they are, in the case of the top edges, veneered over. The best way to make these cuts is on a table saw with a scoring blade. If that isn't available, be sure to apply tape and use a fine tooth blade to prevent chip-out.

Once the face frames are dry, they and the sides

have to be mitered. To ensure accuracy, I installed a temporary rail in the front face frame (to keep the stiles from flexing). I did this in the drawer area where the pocket screw holes would be less noticeable.

Putting the Pieces Together

I assembled the carcass using biscuit joints, glue and nails. It's critical that the biscuit joiner be indexed off the inside faces because the sides are slightly thicker than the face frames (due to being veneered). This allowed me to flush off the veneer on the side's miter and then overlay it with the face frame veneer. I applied Titebond® glue to the biscuits and joints, assembled the pieces, and "clamped" them by nailing a few finishing nails through the face frames into the sides. These nail holes will be covered by veneer. Once the glue had cured, I flushed up the side veneer to the face frame using a hard block and 80 grit paper and puttied the holes.

Before cutting the horizontal dividers, it's important to check their exact size, as these pieces need to be piston tight. All these dividers are made from birch veneered MDF, but before you can properly size the center divider, it must have its front edge veneered. In a move that I'm sure will make purists scream (but I think Ruhlmann would have approved), I attached the three dividers with a series of pocket holes and screws. I put four pocket holes per side and five on the front and back. (Don't install pocket holes on the center divider's exposed front edge.) You can't see the pockets on the bottom and center dividers, and I covered the top ones with a false panel. I screwed the dividers in place, keeping the top and bottom flush with the sides and the center divider exactly positioned.

Tricky Face Frame Veneering

I returned to the iron-on method to secure the veneer to the face frames. On the front, I used the veneer I cut from the large taped-up panel and then set aside. This achieves the seamless veneer pattern that is so

the High Priest of Art Deco

wallpapering firm. The success of Société Ruhlmann allowed him to run his interior design firm, Ruhlmann et Laurent, essentially as a money-losing business. In his notebooks Ruhlmann freely admits to losing money on virtually everything his firm turned out. Making an elaborate piece of furniture is much easier if you don't have to worry about

The three photos in this article are © Christie's Images, New York

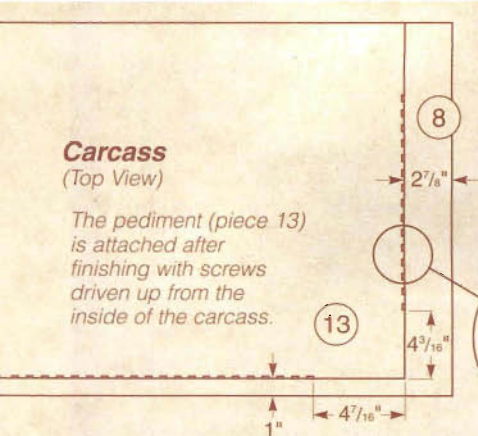


making a profit. That's not to say his pieces weren't expensive. There was, for example, a so called "slipper bed" that sold for 19,000 francs in the mid 1920s ... sufficient funds at the time to buy a nice house in Paris. By the way, the bed took 1,200 hours to build.

... Continues on page 58

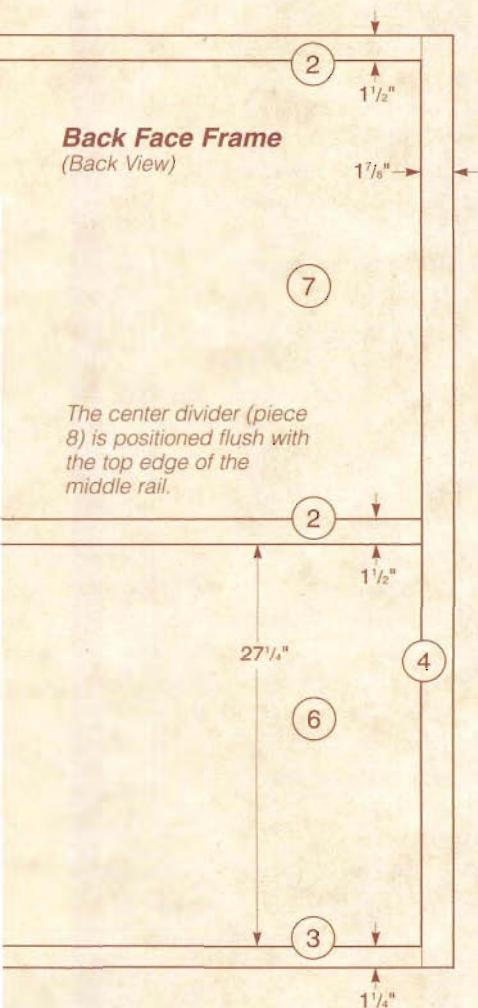
Carcass (Top View)

The pediment (piece 13) is attached after finishing with screws driven up from the inside of the carcass.

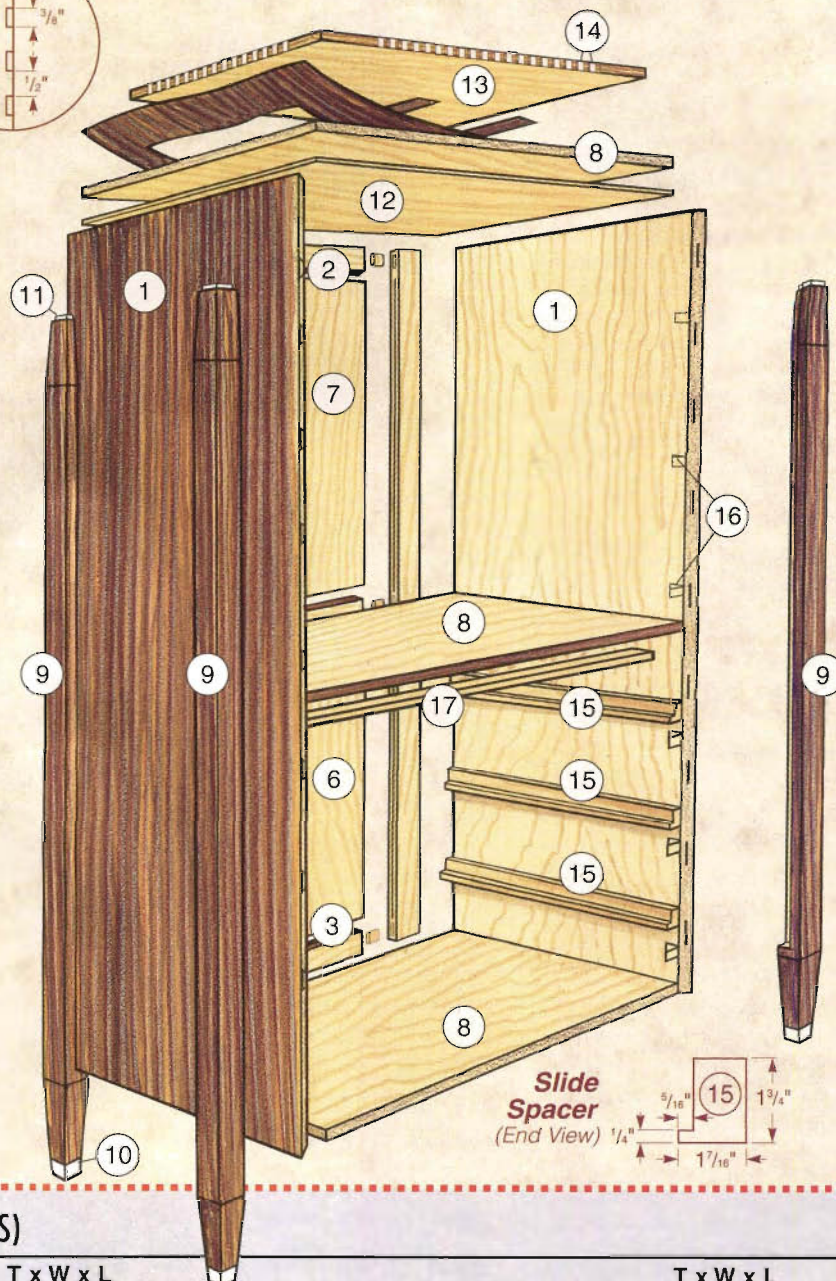
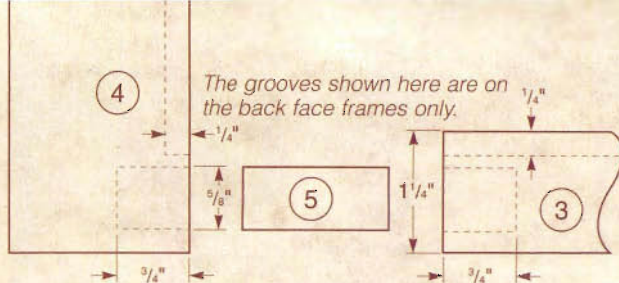


Back Face Frame (Back View)

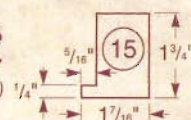
The center divider (piece 8) is positioned flush with the top edge of the middle rail.



Face Frame Floating Tenon Detail (Back View)



Slide Spacer (End View)



MATERIAL LIST (CARCASS)

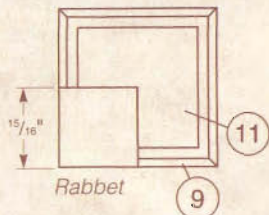
	T x W x L
1 Side Panels (2)	3/4" x 22" x 55 1/2"
2 Rails, Top & Middle (3)	3/4" x 1 1/2" x 30 1/2"
3 Rails, Bottom (2)	3/4" x 1 1/4" x 30 1/2"
4 Stiles (4)	3/4" x 1 7/8" x 55 1/2"
5 Floating Tenons (10)	1/2" x 5/8" x 1 1/2"
6 Back Panel, Bottom (1)	1/4" x 31" x 27 3/4"
7 Back Panel, Top (1)	1/4" x 31" x 24 1/2"
8 Horizontal Dividers (3)	3/4" x 20 1/2" x 32 3/4"
9 Legs (4)	1 7/8" x 1 7/8" x 54"
10 Leg Toes (4)	1 1/4" x 1 1/4" x 1 1/4"
11 Leg Caps (4)	1/4" x 1 7/16" x 1 7/16"
12 False Inside Top (1)	1/4" x 20 1/2" x 32 3/4"

	T x W x L
13 Pediment Panel (1)	1/2" x 21" x 28 1/2"
14 Pediment Dentil Fillings (53)	1/8" x 3/8" x 1/2"
15 Drawer Slide Spacers (6)	1 7/16" x 1 3/4" x 20 7/16"
16 Corner Cleats (24)	3/4" x 1 1/8" x 1 1/8"
17 Shelf Support (1)	13/16" x 1 1/4" x 32 3/4"
18 Doors (2)	3/4" x 15 1/8" x 27 1/8"
19 Door Inlay Material (1)	1/8" x 3/32" x 176"
20 Ball Catches (2)	Brusso
21 Stop Blocks (2)	1/2" x 1" x 1"
22 Soss Hinges (2 pair)	Brass 1/2" x 2 3/8"
23 Ebony Veneer (1)	Approx. 100 sq. ft.

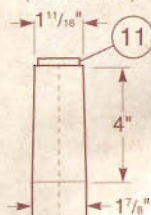
Corner Cleat (Top View)



Leg Top Detail (Top View)



Leg (Front View)



No room for error: If veneering the face frames is the most difficult part of this project, cutting the veneered front panel into doors and drawer fronts surely is the most nerve-wracking.

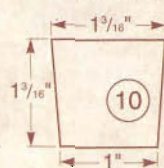
Ruhlmannesque. The first step to veneering the face frames is to make sure the inside (veneered) edges of the stile veneer are perfectly straight. The stile veneers need to be glued in place very accurately, with their inside edges lined up exactly with the inside edges of the face frame and placed exactly vertical, so all the grain lines up.

Veneering the rails is probably the hardest part of the entire project. It is critically important that the centerline of the veneer strip is the centerline of the cabinet. The problem I experienced with this process is that the veneer strip expands and contracts as you apply the heat of the iron. And once you apply the veneer with the iron, it will not move. A note from personal experience: it is better to have a slight gap (very slight!) at a joint that needs to be filled, than to have a bubble that you can't iron down. The veneer on the back face frame is not as critical and need not match quite as well.

Most of the top is covered by the pediment, so I simply veneered around the edge to 1" under the pediment line. I strayed from my own advice here and covered a joint ... two pieces of MDF screwed together — not likely to ever move. I applied a couple of veneer pads in the middle of the top so that when I drove screws up through them, the pediment wouldn't cup. At this point, I sanded the face frame veneer and top carefully to 120 grit. Do not use a power sander for this operation or you will almost certainly burn through, which, at this point, would be disastrous.

There is one last step that needs to be taken before the carcass is essentially complete. As you can see from the *Drawings* (at left), I attached the legs by means of screws driven through angled interior corner blocks. The holes on those blocks were made on the drill press before installation so they would be accurate. Finally, I glued the blocks in place and set the carcass aside for the time being.

Leg Toe (Front View)

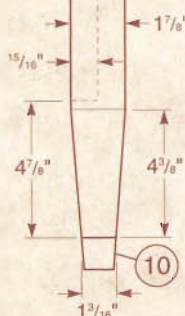
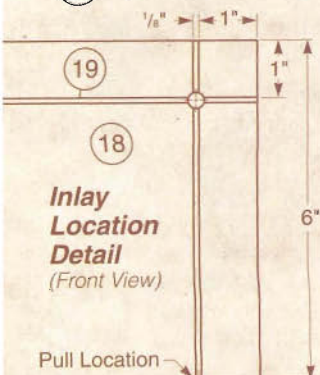


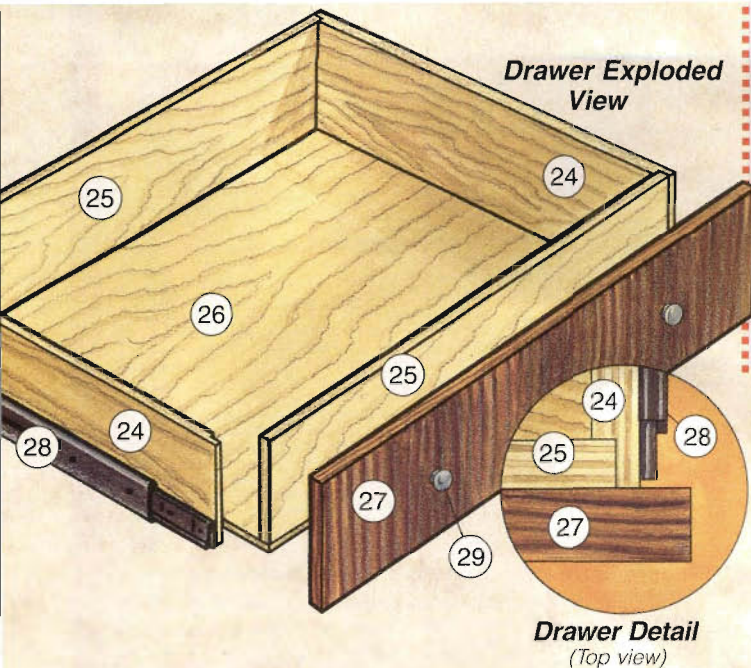
NOTE: The drawer pulls are centered top to bottom on the drawer face and 7 1/4" in from each end.

NOTE: Only one table saw setup is required for all the door inlay. In the same way, one setting on the drill press will locate all your dots.

Inlay Location Detail (Front View)

Pull Location





Drawer Exploded View

Drawer Detail
(Top view)

MATERIAL LIST (DRAWERS)

	T x W x L
24 Drawer Sides (6)	1/2" x 7 ³ / ₄ " x 20"
25 Drawer Fronts and Backs (12)	1/2" x 7 ³ / ₄ " x 29"
26 Drawer Bottoms (3)	1/4" x 20" x 29"
27 Drawer Faces (3)	3/4" x 8 ³ / ₈ " x 30 ³ / ₈ "
28 Slides (Knapp/Vogt 8405EB)	3 pair, black
29 Pulls (8)	Brushed nickel

Inlay: A Ruhlmann Hallmark of Precision

Inlay is one of Ruhlmann's hallmarks, and it must be precise. I cut my inlay grooves with a narrow kerf saw blade with flat top teeth. If a non-flat top-toothed blade is used there will be gaps under the inlay as it exits the door edges. I made the inlay grooves 3/32" deep and designed things so that I could use a single fence setting to form all the grooves at once, thus ensuring that they would line up when the doors were installed. Using a wide belt stationary sander at a friend's shop, I was able to reduce strips of Avonite (www.avonite.com) until they tap fit perfectly into the saw kerf. I then carefully ripped strips that would be about 1/16" proud when I installed them. After doing



Ironing on his own pre-glued veneer is a technique the author used to ensure perfect placement. He used this method on the leg caps (shown above), the long aspect of the legs and the cabinet's face frame members. Large panels are vacuum bagged.

Forming Doors and Drawers from the Front Panel

If veneering the face frames is the most difficult part of this project, cutting the front panel up into the doors and drawer fronts (photo, page 57) surely must be the most nerve-wracking. There is no room for error. Proceeding with extreme caution, I laid out, on bits of masking tape, my side cut lines. As with the rail veneer, it is very important that the center seam be exactly in the middle of the panel. To get the panel width it is necessary to subtract, from the face frame opening, the edge gap and the width of the veneer edging. So I carefully cut the panel to width, making use of my scoring saw. The next step is to lay out the horizontal cut lines. It is again necessary to account for the gap between the doors and drawer fronts and the veneer edging thickness. As I had meticulously planned this from the very beginning, I had a large enough panel to trim 1/8" off each end and then cut out three drawer fronts and the door panel ... exactly. The last step is to cut the door panel in half to make the two doors.

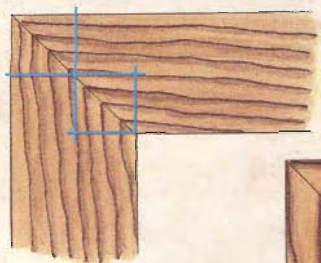
Edging the doors and fronts is pretty easy with one small caveat: edge all the doors and fronts in the same order. Do all the sides edges first, then the top and bottom edges, etc. When you're done, sand the whole thing to 120 grit and set the pieces aside for a bit.

Ruhlmann, continued...

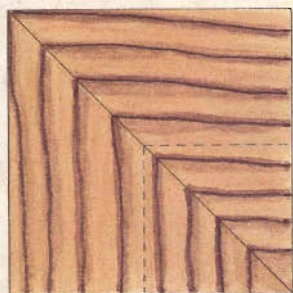
Ruhlmann employed the very finest craftsmen — over 60 woodworkers, finishers, and specialists who were paid 30 - 50% more than comparable workers of the day. I've had the privilege of viewing a number of Ruhlmann's pieces in person and can say, without hesitation, that the woodworking his shop turned out is the finest I've ever seen. The veneer and inlay work is simply mind-boggling,



with striking details like a 1/32" band of ivory inlay at the corner of each facet of an eight-sided, curved, torpedo-shaped leg veneered in Amboina burl. Ruhlmann noted that a highly skilled craftsman needed 40 hours to make one of these legs. The materials used in a Ruhlmann piece were the richest available. Many were veneered in either Maccassar ebony or Amboina burl veneer. Oftentimes writing or interior surfaces were covered in shagreen (sharkskin) or doeskin. Several of his cabinets feature elaborate metal lock plates created by either Foucault or



Subtle but important details: Although only a small portion of this veneer is seen past the Avonite leg caps (pieces 11), the author taped up mirror-matched veneer for the tops of the legs and then cut out two squares per seam line.



Rabbet where the leg joins the cabinet.

a bit of experimenting, I chose Roo glue to secure the inlay strips. This adhesive is made to be used with melamine, but it tested well with my Avonite, providing a tenacious grip. I knocked off the bottom corners of the inlay strip with sandpaper to help slip it into the groove a bit easier. The lines of inlay must be in place before the dot holes are drilled to provide support for the drill point at the line intersections. But getting the crosspieces to butt perfectly is not essential, as the dots will hide the intersections. When installing the inlay, I used a 4 inch block of wood to help tap it in with a hammer. This prevented the inlay from cracking (it's rather fragile). After the glue had dried, I smoothed the inlay flush with a scraper and sandpaper. Using a drill press with a fence and stop is the best way to drill the dot holes. Because all the lines are exactly equal distance from the edge, I was able, as with the inlay setup, to drill all of the holes with one setup. I used an 8mm bradpoint bit and moved to a tapered 5/16" plug cutter from Woodworker's Supply of New Mexico to cut the plugs from a piece of 1/2" Avonite. I found that it is crucial to keep blowing away the chips as the plugs were being made. If I didn't, the plugs would end up undersized and break off while I was still drilling. I glued the plugs in place with cyano-

Janniot — well-known metal sculptors of the day. And, in addition to furniture pieces, Ruhlmann designed a wide variety of lighting fixtures, fabrics, rugs, and other decorative items.

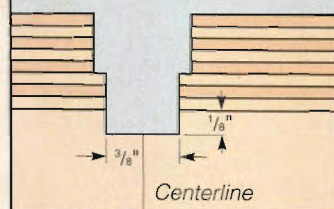
Ready to Invest in a Ruhlmann?

Stunning design, spectacular execution and limited volume combine to make Ruhlmann pieces among the most sought after and expensive antiques on the market. Last summer while in New York, I spotted a Ruhlmann sideboard cabinet in an antiques gallery. It was 7' long by 3' high by 20" deep. It was veneered in Maccassar ebony with a stylized horse and chariot



The author made this precise jig to form the dentil-inlay openings. Indexed off of centerlines, the jig surrounds the sides and the edge of the pediment to prevent blowout. Once it's lined up with marks on the blue tape, the jig is clamped in place for each rout.

The **Dentil Jig** must hold your rub collar tightly while forming the 1/8" deep by 3/8" wide dados.



acrylate glue and flushed them up with sandpaper. With everything in place, I gave the doors a once-over with 120 grit paper and set them aside.

Creating Legs That Can Handle a Little Stress

The legs of this cabinet take the most stress of any single part, so I decided to make the core from strong and stable poplar. First, I rough milled them about 3/8" oversized and let them sit for several days to adjust to equilibrium. Next, I straightened and squared them up on the jointer and milled them to size. For me, one of the elements that really makes this cabinet Ruhlmannesque is the tapered feet and tops of the legs. I shaped them with a sharp hand plane.

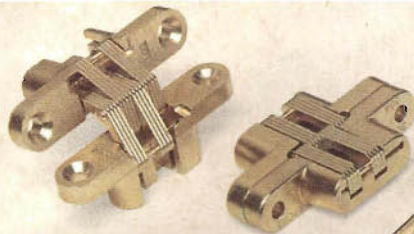
Veneering the legs is similar to veneering the door edges. Decide on a sequence, and do all four legs the same way. I chose to do the two side faces first, then the front and back faces. I applied one face of veneer at a time using the iron-on method. After applying each face, I flushed up the edges with a hard block and 80 grit paper. The iron-on method works particularly well

inlay done in ivory on the front. The price: a cool \$2.5 million. Just recently I returned to

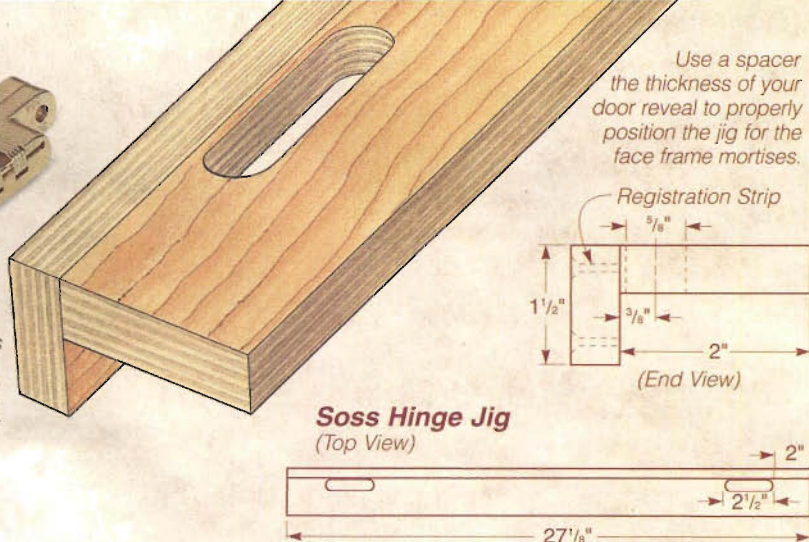
the gallery and the piece had been sold.

Ruhlmann was one of those rare individuals who had an endless amount of God-given talent and the financial means to bring his ideas to life. And it is a richer, more beautiful world because he did. —Mike McGlynn





Soss hinges work great, but they're a pain to install. They must be installed perfectly; there's no adjustment to them. This door-length jig was designed to rout both the door and face frame mortises perfectly aligned. A dual set of screw holes on the registration strip lets you align the jig on the front face of the door and face frame, while keeping the hinge mortise holes in the same relative position. Soss hinges are bi-level, so you have to mortise the center portion after the wing portion.



here, as it is very easy to work the veneer over the tapers without the use of complex cauls. It should go without saying that it is of utmost importance to keep track of your veneer arrangement. As you can see from the photos, the leg veneers are book-matched. This is a subtle point, but, when added to all the other subtle points, it sets the cabinet apart.

Another very subtle, but I think important, point is the veneer pattern on the very top of the legs. After the Avonite caps are set in place, there will be very little of the veneer showing, but it's still great to see the veneer parallel the exterior faces of the legs. The caps are made up by mitering, at 45 degrees, two matched strips of veneer and then mirror matching them. After taping up the mirror match, squares large enough to cover the leg top can be cut from along the seam line, as shown on the previous page. When gluing the caps on it is important to have the grain pointing the right way, with the long grain on the outside edges.

White "toes" are another Ruhlmann trademark. I glued up a block of Avonite and milled it to slightly larger dimensions than the bottom of the leg. Using the miter gauge jig shown in the photo in combination with a disk sander on my table saw, I tapered the Avonite blocks to match the leg taper. I intentionally



The author installed a disk sander in his table saw, in combination with a miter gauge jig, to taper the Avonite "toes," which must match the leg tapers. Here the author tests the setup with scrap lumber.

made the toes just a hair larger than the leg bottoms so I could flush them up after they were glued on. To glue the toes in place I used black cyanoacrylate glue from Stewart-MacDonald's Guitar Shop Supply (800-848-2273). Once again, I flushed up the toes with a hard block of 80 grit paper followed by some 120 grit.

Rabbeting the legs to fit the cabinet corners is a two-step process. I first made two stopped cuts on the table saw to remove most of the rabbet. At the bottom end the rabbet is carefully marked and then finished with a combination of hand saw and chisels. I cannot stress enough that these rabbets need to be exactly square and all at exactly the same distance from the bottom. This is because the entire carcass rests on them and any variation will make the cabinet sit unevenly. Sand the legs up to 120 grit, but take care not to round over the edges that meet the cabinet, as this needs to be a tight joint. The last step on the legs is to install their Avonite caps. To make these, I milled them to size and notched them to match the rabbet. Using a filler strip to simulate the carcass, I glued the caps in place with clear cyanoacrylate.

A Dentil-inlaid Pediment Tops it Off

Another favorite Ruhlmann design motif, especially on his cabinets, was a dentil-inlaid cap or pediment. After I cut my veneered pediment blank to size and edged it with the iron-on method, I noodled for quite a while on how to do the dentil inlay. I finally arrived at the jig shown in the photo (previous page). There are several keys to this jig: it is indexed off the inlay centerline, it surrounds both the sides and the edge of the pediment to prevent veneer blowout, and it fits the router guide tightly for a no-slop cut. Before I began, I marked all of the centerlines on a piece of tape so they would be more visible. I carefully routed all of the recesses, making sure my jig was properly aligned and clamped for each cut. The inlay material was again milled from Avonite so that it was a nice press fit and stood a little proud of the edge. I glued the dentil in with a clear cyanoacrylate. When I had finished flushing up the dentil I gave the entire pediment a sanding to 120 and set it aside.

Drawers and Other Details

As this is a face frame cabinet, and I used ball bearing slides, the slides needed spacers to move them out flush with the face frame opening. As you can see in the drawings, these spacers have a lip on the bottom, which I incorporated so the slides would have something to rest on during installation.

If you've read any of my past articles you know I'm not a drawer purist. I believe in making what works, not what tradition dictates. So, I made these drawers out of 1/2" Appleply plywood with rabbeted, glued and nailed corners. A simple, strong drawer that will never shrink or swell — like many "traditional" drawers seem to.

There is one last piece to make before we can start the finishing process. As mentioned earlier, to cover the pocket holes in the top, a false inside top will need to be made out of 1/4" birch veneered MDF. Sand this piece to 120 grit and set it aside.

Now it's just about time to prep everything for finishing. The last step is to form the mortises for the Soss hinges on the doors and stiles. The *Drawings* above provide the details of the jig I used to complete this step. Remember, there's no margin for error with these hinges! Once the mortises were formed, I went over every surface, including the inside, with 220 sandpaper. I made careful note of all edges, easing those slightly that needed it but leaving others, such as the leg rabbet edges, crisp and sharp. I took the time to go over every surface with a powerful light and look for any scratches that were missed.

To obtain the best result I finished this cabinet in several parts: the carcass box, the legs, the doors and drawer fronts, the false top, the pediment and the drawer boxes. I sprayed everything with two coats of vinyl sealer



It's All in the Details

How does this cabinet reflect the style of Jacques-Emile Ruhlmann? The harmony of its details, simple and elegant in themselves, yet beautiful and rich when viewed together. Dark straight grained veneer, laid up in a fluid book-matched pattern, contrasted by off-white inlay. Simple shapes combined into a pleasing complex design ... all join together to evoke Ruhlmann.

and two coats of 25° sheen catalyzed synthetic lacquer. I sanded between each coat with 220 grit sandpaper. Once the individual pieces were finished, assembling the carcass was quite simple. I started by clamping each leg in place and drilling a pilot hole, guided by the pre-drilled angle blocks. I then screwed the legs in place with 2 1/2" #8 screws. The pediment was attached with several 1" screws from the inside, two of which go through the veneer pads I mentioned earlier. After the pediment is installed, the false top can be added, with a few small brads.

Because I am using this cabinet for my TV, I decided to install a shelf support under the center divider. I set this piece 1 1/2" back from the front edge and attached it from the bottom. Then I wrapped up by installing the drawers, doors and their brushed nickel pulls. Two small stop blocks attached to the top rail and a couple of Brusso ball catches hold the doors flush.

To paraphrase Johnny Cash, I've built harder cabinets, but I really can't remember when. In reality, building this cabinet was a challenging and rewarding experience that greatly enriched my woodworking experience and vocabulary. I realize that the level of precision and cost might make most home woodworkers think it is out of their reach, but I disagree. The one major thing that this project reinforced for me was that the keys to fine and complex work are to take plenty of time and to think things through thoroughly. Good luck.

Contributing editor Mike McGlynn is a master woodworker. In past issues he has tackled a chair in the Prairie style of Frank Lloyd Wright and a number of pieces inspired by the Greene Brothers.

Premium European Power Tools

By Sandor Nagyszalanczy

They're expensive. They're exclusive. They're impressive. But are they worth the money? No, I'm not talking about the latest exotic sports cars from Ferrari or BMW. But rather, the portable power tools made in Europe by small manufacturers with reputations for building the best tools on earth. We've all seen them, but even those of us well-heeled enough to afford them have wondered if they're worth their high price tags.

Take two electric drills, one expensive, one bargain priced. They both have chucks and grips and motors and triggers and cords. When it comes to springing for a prestigious European model, how much more bang do you get for the buck? Does it perform better or are its features superior? I set out to answer these questions by examining seven premium tools built by four companies: Festo (now Festool), Fein, Lamello and Metabo.

Common Origins of Quality

Three of these companies — Fein, Festo and Metabo — build their tools in an area of Southern Germany known as Swabia, where precision manufacturing is a passion (Mercedes Benz, Porsche and BMW call the same area home). Lamello tools are made in Bubendorf, Switzerland, a country renowned for its world-class watches and precision machinery.

All four manufacturers have a lot of experience building power tools: Fein, who developed the world's first portable drill in 1895, has been in business for 125 years; Festo is more than 75 years old; Metabo started business in 1924; and Lamello, founded in 1944, is now run by the 3rd generation grandson of its originator. Indeed, Fein Power tools apprenticed toolmaker Robert Bosch, before he started the international tool & automotive electronics company that bears his name.

But unlike industrial giant Bosch, our four premium toolmakers have smaller factories, where premium tools are created by dedicated teams of engineers and technicians who oversee each model's design, development, and hand assembly.

Quality Construction

Niall Barrett, Sales Manager for Festo (now in transition to the new brand name "Festool") says with pride: "We build and hand-assemble all our tools to an astounding level of quality." Indeed, all four manufacturers build using only the highest quality components — bearings, gears, motor armatures, switches, wiring and electronics. By using top quality copper in the motor armatures and wiring, premium tools generate more power from smaller motors. Oversized, precision ball or needle bearings also help these tools achieve top performance under sustained loads and last longer than tools fitted with less expensive parts.

Festool ATF 55 E Plus
Street Price \$463

Festool OF 1000 E Plus
Street Price \$330

Metabo BST15.6
Street Price \$379

Metabo SXE450
Street Price \$284

Fein ASTE 638
Street Price \$525

Lamello Top 20
Street Price \$630

Fein MultiMaster MSXE 636-2
Street Price \$189





A soft starting motor and a plunging saw blade separate the Festool's AFT 55 E from the pack. With its unique features and quality construction this tool ranked highly with the author.

A Passion for Innovation

Committed to building ever better tools, premium power tool companies are passionate about developing innovative features and accessories. Festool takes a particularly systematic approach to power tool building, and virtually

all their tools are part of a system that allows many components to work together. Two examples include the MFT 800 "multifunction table" and "Systainer" tool cases. Useable with both Festool routers and circular saws, the MFT 800 works with their guide rail system, which steers the saw or router in a straight line. The table

allows a portable saw do the work of a sliding-compound miter saw, taking wide crosscuts, miters and compound angle cuts. Besides providing sturdy and organized storage for their tools, the "Systainer" plastic tool cases have a clever twist: Any number of Systainers can be interlocked, for

Tool Preview continues on page 64 ...

"I'm not talking about the latest exotic sports cars ... but rather, the portable power tools made in Europe by small manufacturers with reputations for building the best tools on earth."

To keep a close rein on quality control, these manufacturers build most tool components in-house, often developing state-of-the-art technologies. For example, Fein's new "high power" motors employ a proprietary construction method that presses the motors' fields together. This fills the empty spaces with thick copper wires, making motors more compact yet more resistant to over-loads. Terry Tuerk, Technical Services Manager for Metabo USA told Woodworker's Journal that "All Metabo corded power tools feature a unique 'winding protection grid' just behind the fan, which deflects dust and debris as cooling air is blown through the tool, thus preventing wear on the motor armature, which can result in premature failure."

These manufacturers serve a very diverse group of tool buyers. All four I spoke with were quick to point out that their power tools aren't targeted for do-it-yourselfers or casual users, but are rather designed for professionals. In fact, Lamello and Fein tools are industrially rated in Europe.



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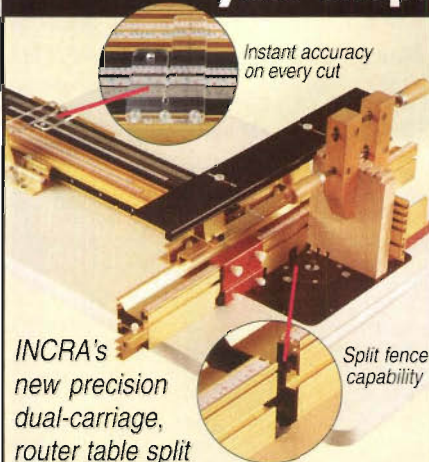
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TOOL PREVIEW



While its quality is beyond question, the Festool OF 1000 E has certain limitations the author finds problematic. It will not accept 1/2" shank router bits and has only a 7.5 amp motor. Its electronics, however, are impressive.



transporting multiple tools to and from a job site.

Ergonomics are another area where high-quality European tool manufacturers have traditionally led the pack. Metabo, Festool and Fein routinely do studies and testing before making critical decisions on handle design and the placement of switches and other controls on their power tools.

Putting the Tools to the Test

To get a better sense of what you get for the money, I spent a couple of weeks with seven premium power tools built by Festool, Fein, Metabo and Lamello. I put the tools through some rigorous woodworking chores and compared their features and quality to less expensive models made by Porter-Cable, DeWalt, Skil, Milwaukee, Makita, Bosch, Hitachi, Ryobi, Dremel, Freud and Virutec.

Festool ATF 55 E Plus

For their circular saws, Festool started with a basic sidewinder-style saw and added two interesting features: Blade plunge and variable speed. The most unique — and ingenious — element of the ATF 55 E Plus is its plunge cutting design, that lowers and retracts the blade from a housing above the saw's sole, thus doing away with a separate spring-loaded guard. A riving knife mounted just behind the blade (that plunges with the blade) prevents kickbacks, for greater safety. The Festool's plunge action is very smooth, and it's nice to not have to worry about a retractable blade guard hanging up on the workpiece, or making it hard to start a cut (as on thin or sharp-edged workpieces).

The ATF 55 E Plus is a sturdy combination of handsome cast alloy and reinforced plastic, yet it uses the same kind of pressed steel sole found on far less expensive saws, including the Skil 5275-05. Although it uses a proprietary 160 mm dia. blade (about 6 1/4"), its cutting capacities are only slightly less than most 7 1/4" bladed circular saws: Square cuts up to 2 1/8" thick and 45° bevels in 2x lumber. The blade runs on a hefty 20mm (3/4") arbor, for terrific stability.

Cutting metal with a circular saw? The Festool's continuously variable speed control lets you dial in the best speed for cutting wood or a variety of materials, including fiber board, plastics and (fitted with a special blade) non-ferrous metals such as aluminum and brass. The ATF 55 E Plus' electronics include soft start and motor feedback circuitry that ramps up blade speed slowly and keeps the blade

spinning at constant speed despite changing load. Festool's saw isn't the most muscular on the block: its 10 amps compares to 15 amps for the Porter-Cable 843 and Milwaukee 6390. However, it coaxes lots of performance from the power it does have on tap, no doubt aided by its sophisticated electronic motor control circuitry.

Festool OF 1000 E Plus Plunge Router

The OF 1000 E Plus is a smooth plunging machine that's more compact and lighter than most other small plunge routers. But unlike models such as the Porter-Cable 7529 and DeWalt DW621 (which accept 1/2" shank bits), the Festool is limited to using 6mm or 8mm European bits or 1/4" standard router bits. With a 7.5 amp motor, the Festool isn't as powerful as the Porter-Cable or DeWalt, but its efficient motor and electronic feedback circuitry provide more than enough torque for the small-to-medium-size bits it's designed to handle. The electronics in the Festool also provide impressive safety: If the bit slows or stalls, the motor shuts off before the tool can jerk out of the user's hands.

The Festool is packed with very similar features to other modern plunge routers: Variable speed,

soft start, depth stop turret and fine depth adjustment, and built-in collet lock. Setting the Festool's depth mechanism is easy, but the scale and fine-adjustment ring are calibrated in millimeters, which takes some head scratching if you're used to working in inches.

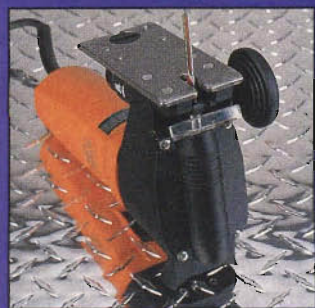
In use, the OF 1000 E Plus is smooth plunging, but not noticeably smoother than other similar-sized models. Like the DeWalt, the Festool's knob handle locks and releases the plunge mechanism. The other pistol-grip-style handle lets you use the tool single handed, though this takes some skill and practice to perform safely. A handle-mounted trigger lets you turn the router on and off without fumbling for a switch.

The Festool has very effective dust collection built into its base. It's similar to the DW621, but I prefer the OF 1000 E Plus' base-mounted hose connector, as opposed to DeWalt's top-mounted hose, which got in my way more often. The edge guide includes a housing that collects chips when edge routing your stock.

Tool Preview continues on page 66 ...



Fein's ASTE 638 jig saw is sturdily built and will last a lifetime. Fein's blade mechanism is mounted 2 percent off 90° for aggressive but controllable cutting. For all of its quality, it lacks features available on some cheaper models.



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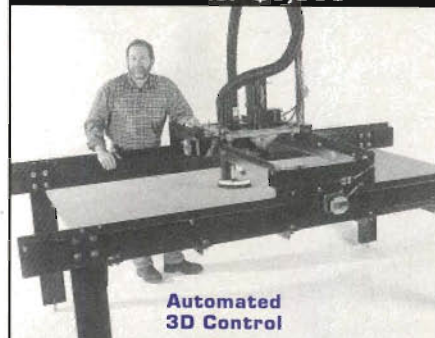
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Fein ASTE 638 Jigsaw

Fein's barrel-grip-style jigsaw is a compact, smooth-running machine with effective built-in dust control. Team the ASTE 638 with one of Fein's terrific shop vacuums (featuring an automatic switch that turns the vac on and off in concert with the tool), and you have an

excellent low-dust curve cutting system.

"We build and hand assemble all our tools to an astounding level of quality."

— Niall Barrett, Festool

Unfortunately, the Fein lacks some features found on even inexpensive jigsaw, such as the Skil 4470 and Freud FJ65. First, blade speed is limited to 2,600 strokes per minute (SPM), while speeds on the Bosch and DeWalt each go up to 3,100 SPM,

desirable if you want to rough cut thick softwood in a hurry. Rather than a variable speed trigger, the Fein has a simple on-off switch and separate speed dial. Its sophisticated electronics ramp up motor speed gradually, a safe and comfortable feature. A nearly ubiquitous jigsaw feature the Fein eschews is a selectable blade orbit. The Fein's blade mechanism is mounted 2 percent off 90° a design Fein says allows the saw to cut tough wood or metals aggressively without an orbital action.

Instead of offering toolless blade change, a feature that's hot on most newer jigsaws, the Fein's top knob unscrews to reveal an Allen wrench that's used to lock or loosen the blade. The simple blade clamp accepts most styles of blades, including Bosch's popular line.

To reduce vibration, a counter-weight balances the ASTE 638's reciprocating action, which runs on twin rails, for added stability. In use, I found the Fein did run very smoothly, although it just didn't cut wood as aggressively as the Bosch or DeWalt. The Fein also doesn't tilt for bevel cuts; not a huge issue, since woodworkers use jigsaws for square cuts 98% of the time.

Fein MultiMaster MSXE 636-2

The bright orange Fein detail sander is a simple machine that has impressive heft without feeling heavy or cumbersome. It has plenty of power on tap, regulated by a variable speed control set on a side-mounted dial. To achieve its sanding action, the MultiMaster uses a pivot drive which moves the pad in a small arc, like the windshield wipers on a car. In contrast, detailers like the Bosch 1294VSK and Ryobi DS2000 have eccentrically driven orbital-action pads, while other models, such as the Porter-Cable 9444VS and Dremel 6000 (profile sanders that double as detail sanders) drive their pads back and forth with an in-line action. I think Fein's pivotal action sanded the most aggressively with the least vibration; other detailers seemed to split their power between sanding and vibrating my hand. The Fein can leave noticeable cross-grain scratches, but this isn't a problem if you keep the sanding pad moving and don't let it "dig in" in any one place.

The Fein's pivotal motion facilitates a host of useful accessories, including a scraper blade and a unique semi-circular saw blade that can flush-cut dowels or door trim at the bottom, (handy when installing new flooring), trim pegs and more. The competition

sports versatility in a different fashion; the Porter-Cable and Dremel detailers accept sanding cauls that come in a plethora of different profiles, allowing you to sand molding and shaped edges.

Metabo BST15.6 Plus Cordless Drill

With their great portability and versatile ability to both drill holes and drive fasteners, modern cordless drills are a remarkable handful of power. Among the current crop of drills (14.4 - 19.2 volts), the 15.6 volt Metabo BST15.6 Plus demonstrates terrific "hand feel" and balance. Like other drills, including the DeWalt DW995 and Hitachi DS14DV, the Metabo has dual-range variable speed, an adjustable clutch and a 1/2"



It's a detail sander, it's a trim saw ... it's both! The pivotal motion of Fein's MultiMaster is the key to its functional superiority.

keyless chuck. I like the Metabo chuck's hex fitting on the end that lets you wrench-loosen it, a godsend if you need to remove a stuck bit. The BST15.6 Plus' mechanical clutch works well, but doesn't have as wide a range of settings as the DeWalt and it isn't as smooth to adjust.

The Metabo Plus-series drills have something no other models have: A patented Impuls® feature which electronically revs the bit as if you were turning the motor on and off rapidly. This pulsing action helps you start bits in hard materials, such as tile or sheet metal, without center-punching first and prevents the bit from "walking" out of a newly started hole. When driving screws, Impuls®

helps the bit seat in the screw head. It's also great for driving out stubborn screws with stripped heads.

The advanced technology packed into Metabo's motor (see page 63) really shows: The 15.6 volt motor churns up oodles of torque; even more than Porter-Cable's 19.2 volt drill produces. This is especially impressive, considering that the BST15.6 Plus weighs only slightly more than most 12 volt cordless drills.



Metabo's BST15.6 Plus cordless drill is unmatched in power to weight ratio and amp hours per charge. Its Impuls® technology is another industry first. The hex fitting on the chuck end is great for when you over tighten and can't get the bit loose.

Tool Preview continues on page 68 ...

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Metabo stuffs a lot of energy into its battery packs. At 2.4 amp-hours, their batteries have slightly more capacity than Porter-Cable or Hitachi drills provide (2 amp-hours), resulting in more holes bored or screws driven between recharging. Speaking of charging, Metabo is very shortly coming out with a 1-hour charger that uses microchip-control technology

“Our 8” random orbit sander has a 1,200 watt motor that can easily exceed that power output by 20 - 30% with no damage.”

— **Benny Huber, Fein**

that they claim will double the number of charges a NiCad battery pack can take over its lifetime.

Metabo SXE450 Random-orbit Sander

As opposed to palm-grip random-orbit (RO) sanders, such as the Porter-Cable 335 or right-angle-style models, like the DeWalt DW443, in-line random-orbit sanders, including the Metabo SXE450, feature a pair of handles that allow a comfortable grip you can vary to suit the sanding situation. The front handle on most in-line ROs is removable, allowing you to sand into a corner or other confined space. But the SXE450's is also repositionable: set it lower or higher as your comfort dictates.

The Metabo operates with more aggressiveness and smoothness than any ROs I've ever tried. It

seems to put all its energy into its 6" diameter sanding pad, rather than losing some of it as hand-tangling vibration. The Metabo's 3.8 amp motor is also one of the most powerful found in an RO sander. The unit's variable speed control features electronic feedback that keeps the selected speed constant, even during heavy-duty sanding. When the spinning disc bogs down a bit, an electronic sensor detects the reduced motor speed and supplies the motor with higher voltage to bring the speed of the rotating disc back up to par.

The Metabo's most unique — and useful — feature is selectable orbit size. A press of the red push button on its base sets the pad to a larger or smaller orbit diameter. The 1/4" orbit unleashes the tiger-like energy of the motor, for really fast stock removal while the 1/8" orbit turns the tool into a pussy cat, for more delicate finishing jobs.

The Metabo's disposable paper dust bag isn't a unique feature: it's also found on the Bosch and Festool ROs. But the SXE450's dust collection fan seems stronger than other models. It readily sucks the wood powder from the work, to keep the benchtop — and your lungs — cleaner.



Lamello Top 20 Biscuit Joiner

Built by the company who invented biscuit joinery, Lamello produces several different models of biscuit machines, all of watch-like quality. The first thing you notice about the Top 20, Lamello's premier model, is that all its metal surfaces are either precisely machined or are painted with a handsome hammered-finish. And the handsome solid beech wood storage box that comes with the unit makes even the nicest plastic or metal tool carrying case seem cheap in comparison.

The Top 20 doesn't have as many features as some of its competing models do, but those it does have are solidly constructed and easy to use. The unit's built-in tilting fence has detents for standard angles, but it doesn't adjust up and down (to handle different stock thicknesses) as does the Virutex AB11C or the Makita 3901. Instead, the Lamello changes blade height relative to the fence. A patented “step-memory” system (invented by the grandson

Tool Preview continues on page 70 ...



One of the author's favorite tools in this collection, the Metabo SXE450 random orbit sander is an excellent example of a premium European power tool. Its unique, yet practical features, combined with quality construction, make it a tool to be desired ... by any woodworker.

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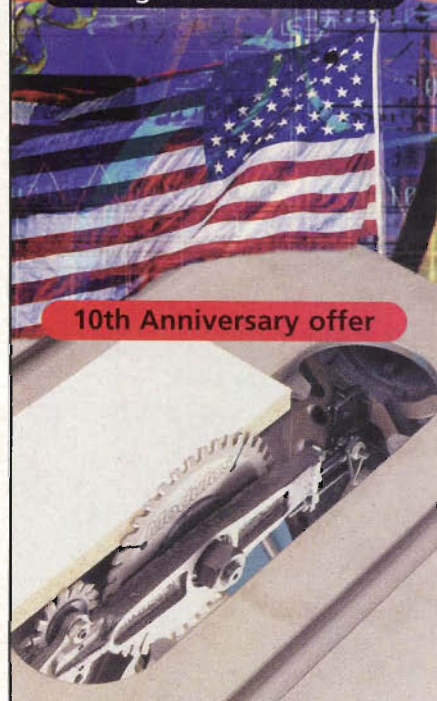
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The Gold Standard of biscuit joiners, the Lamello Top 20 has unmatched fit and finish. A patented "step memory" feature aids repeatability with very precise settings.

of Company founder Hermann Steiner) uses a top-mounted dial to move the blade up and down on its arbor. With a range of 3/16", you can center slots in stock between 5/8" and 1" thick. Click stops every .1 mm, assure very precise settings which are easily repeatable.

As are their other models, the Lamello Top 20 is constructed with oversized ball bearings and top-quality machined metal gears (instead of the less precise bushings and faster-wearing cast metal gears found in economy machines). Lamello even uses ball bearings in the plunge slide mechanism, which makes the unit plunge more smoothly than any other brand. To make a great machine even better, new Top 20s will sport a quieter and more powerful motor (with electronic feedback and soft start) by the time you read this article.

Conclusions

Do premium-quality drills, routers, saws and sanders bore truer, rout cleaner, cut straighter or sand smoother than their more common, yet affordable, siblings? Not really. What they do offer is advanced, often unique, features, enhanced performance and remarkable dependability. This isn't to say that premium tools are the only act in town: Due to high cost of manufacturing and exporting tools from Europe, American and Japanese power tools often deliver more bang for the buck, with tools that offer higher motor power and more features for less money (especially models aimed at the DIY market).

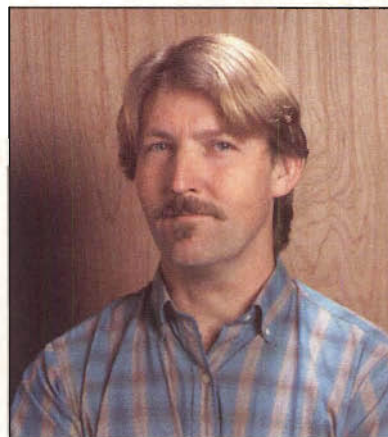
Does that mean that premium tools aren't worth their higher price tags? If you're a professional woodworker or someone who pushes their tools to the limit on a daily basis, I don't think you'll ever regret buying premium power tools. Clearly, these tools are designed and built to deliver a lifetime of dependable service. Just don't expect premium tools to perform magic. Even the highest-quality drill or saw does shoddy work in the hands of an inexperienced or uncaring craftsman. Conversely, a talented woodworker can get satisfying results even from bargain-priced tools.

Being born with a silver spoon in your mouth isn't a guarantee of success, and hence not all premium tools are winners. Despite their obviously high quality, the Festool router and Fein jigsaw were my least favorite tools from the group,

lacking the capacity or features of their competition. Further, American woodworkers might not like their "European" qualities, including the millimeter scales on the router and the barrel-style grip of the jigsaw. My overall favorites among the premium group? The remarkably smooth-running Metabo random-orbit sander would be my first choice, followed closely by the the Lamello biscuit joiner, Fein MultiMaster and Festool circular saw.

Ultimately, it's the intangible things premium power tools offer that are most interesting and satisfying: the kinesthetic thrill you get holding a quality chisel or handplane; the pride of using a tool likely to last a lifetime and be handed down to your progeny. If these intangibles are meaningful to you, then premium power tools are likely among your future purchases. Just start saving your money now ... or play the lottery more often.

Sandor Nagyszalanczy is a professional furniture designer, tool expert and author of seven books, including "Power Tools, An Electrifying Celebration and Grounded Guide" available from Taunton Press Books.



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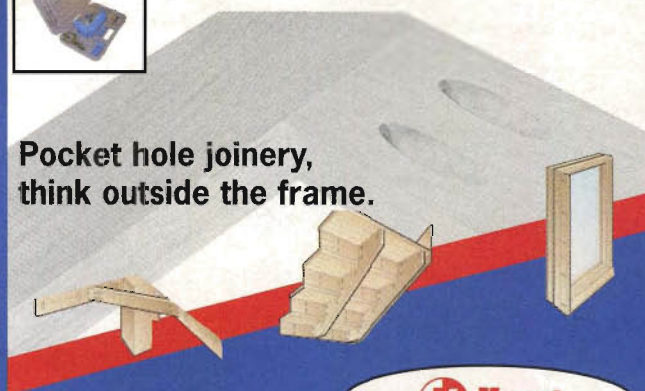
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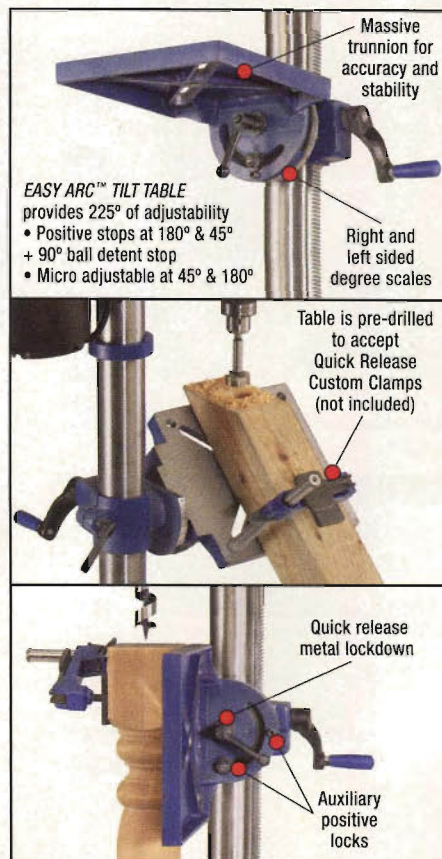
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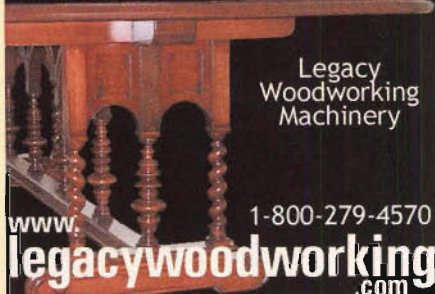
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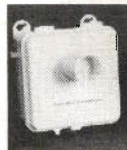
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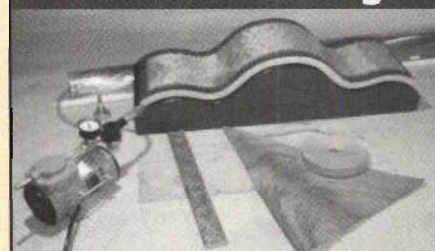


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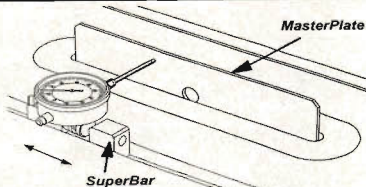
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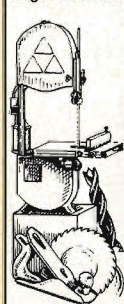
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Mid-size Band Saws

By Charles Self

From resawing to compound curves and everything in between, there's nothing quite like a band saw. Mid-size versions – those models that span the gap between strictly weekend work and the large pro tools – are finding their way into the shops of serious hobbyists everywhere. With that in mind, I reviewed six of the most popular models, and here's what I found.



Grizzly G4186Z

Grizzly's G4186Z

I like this band saw. Fit and finish are just fine, thank you, and the only work to set it up is installing the plug (I really like that!), table

Grizzly G4186Z

Street price: \$895
Amps: 18a/110v – 9a/220v
Weight: 305 lbs
Blade Length: 130"
Maximum Resaw: 9 3/8"
Phone: 800-523-4777
www.grizzly.com

and fence, then drawing the blade tight. The manual is better than most, and there's darned little real

assembly involved, so the whole process from crate to cutting is less than half a day. Unlike the photo at left, I intentionally installed my fence backward, with the long parts of the rails pointing out into the shop. The reasoning here was that, in its normal mode, you have to move a fence rail (the guide that the fence runs along) to remove the fence. My solution means that it is possible you are going to bump a hip occasionally, but it also means the fence can be slipped off easily.

There's plenty of power from the 18 amp, 110 volt/9 amp, 220 volt motor – it can be wired either way. It is rated at two horsepower, which, judging from the performance, seems reasonable. It was also the second easiest band saw in my review to assemble.

The saw takes 130" blades, and lists a 1 1/4" top width and a 1/8" bottom size. I used it with a 3/4" Olson resaw blade, and with a 1/8" Olson tight scroll blade, and found that it worked well with both ... and with all intermediate sizes, too. Among those were Olson's 3/4" 3-tpi skip tooth raker resaw blade; 3/16" 10-tpi regular style raker blade for scroll cuts; 1/4" 6-tpi regular raker general purpose blade; and the 5/8" 3-tpi hook style raker set resaw blade. This is the same selection used with each of the saws I reviewed for this article.

Table size on this saw is generous, and the table height is 34 3/4". It should work well for woodworkers of average height. Taller folks can build a plywood box to raise the saw to any height they need. A local musical instrument maker I know has added almost 8" to his band saw. Of course, he's 6'-5" tall!

The blade guides on the G4186Z, plus the miter gauge, are well up to snuff, and the overall fit and finish of this tool is excellent.

Dust collection is through a 4" port at the upper right rear, just under the back of the table.



Grizzly G1012

Grizzly's G1012

This less expensive 18" band saw could make a lot of sense for a person who is sure of his assembly skills and willing to put a little extra time into setup. For someone who

expects the saw to work out of the box, I'd recommend a close look at the previously mentioned G4186Z or the JET 18".

The G1012 is the lightest saw tested, weighing in at 265

pounds. The motor is rated at 20 amps for 110v use, and 10 amps for 220v use. It comes set up for 220v, and that's the way I tested it.

Setup time was about three times what it took to set up the next slowest. That was in part because of the stand design — lots of pieces — and in part because of the band saw design — lots of pieces! The doors are not hinged, but come off when two star wheels are removed on each. The blade cover on the left side pops out after the covers are removed. The motor is hung underneath the stand, and the three-speed pulley setup requires some fancy dancing with a plumb bob to align the pulleys.

The manual is fairly recent, but not as recent as the band saw, so I encountered some discrepancies. In fact, the manual reads as if it were written by someone who saw the assembly completed, but never actually performed it. That said, the saw did go together eventually. The various parts fit together well, and the finish was good.

The motor is very good, but changing speeds is difficult. There are no directions for doing so, and mostly it is a procedure that can result in your having to realign the pulleys with your plumb bob.

Tool Review continues on page 78 ...

Grizzly G1012

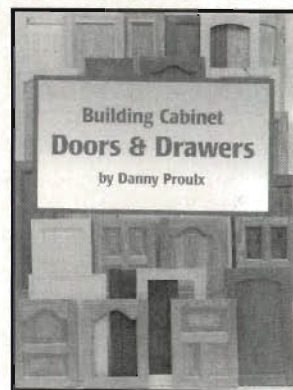
Street price: \$650
Amps: 20a/110v – 10a/220v
Weight: 265 lbs
Blade Length: 124"
Maximum Resaw: 9 1/8" plus
Phone: 800-523-4777
www.grizzly.com

The G4186Z is a single speed machine at 3,166 fps (feet per second). It resawed 5 1/2" thick oak about as fast as is safe, freehand, and the resulting cuts were smooth. A length of 8 1/4" cherry also fed quickly — which is a requirement with cherry, to prevent burning. Quarter inch thick strips came off nicely done and ready for sanding.

It offers about 9 3/8" maximum resaw height, and its 17 5/8" cast iron wheels provide the mass needed for smooth overall operation. The machine weighs 305 pounds in place (shipped weight is a little more), and table-tilt is 5° left, 45° right. The miter gauge is good, and fits in a straight slot. The trunnion is cast iron, and the saddle is cast zinc, so they won't wear out in a hurry.

The G4186Z works very well, and seems made for durability. Overall, I would say that it's a very good buy. Given its price, I'd up that to an excellent buy.

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My first two cuts in oak were wedged, so a little adjustment was needed. With some work on the guides and blade tension, all was well. Feed rate was more than acceptable.

The table size of the G1012 is 18" square, and the table tilts 5° left and 45° right. The saw is listed as accepting a 1/8" blade, and it worked well with Olson's All Pro 14 tpi regular tooth raker style tight scroll blade. Table height is 38", a boon for the taller worker (such as myself), but it might be a trial for shorter folks. The trunnions are cast iron, while the saddle is cast zinc. Two star wheels lock the table at the set angle.

The saw's upper guides are steel with two on each side of the blade, and Grizzly's thumbscrew fastener is a super feature, eliminating the need for a hex wrench. The rear stop is a roller bearing. Two come in from the side, and two come in from underneath (one on each side of the blade). Under the table, there is a single round guide, with a rear roller bearing. The guides can be a bit finicky, but work well when properly adjusted. Replacing the guides with Cool Blocks™ also helped.

Blade changes are made difficult by the addition of safety plates. The original blade required some thought to remove. The wheels are cast aluminum, 17⁵/₈" in diameter. Maximum listed resaw is 9³/₈". The miter gauge is good, and the dust collector connection is 1¹/₂".

Overall, the G1012 is a great low cost option for a shop owner who needs a band saw to cut 9¹/₂" (or a shade more) on resaws, with sufficient power. Some difficulty in setup and tune-up is well balanced by the promise of good durability over time.



Laguna LT18	
Street price:	\$2,095
Amps:	10a/220v
Weight:	425 lbs
Blade Length:	150"
Maximum Resaw:	12"
Phone:	800-234-1976
www.lagunatools.com	

Laguna LT18

Laguna's LT18

In essence, Laguna's hobby woodworking band saws stop with their 16" models. Those carry a price tag that's under \$2,000, and sometimes under \$1,500. To fit in our mid-size category, I went to their low end 18", the LT18. Well, the Laguna LT18 is definitely an 18" band saw, but it is no one's idea of a low end piece of equipment. And it really shouldn't be, with a price of \$2,095. But what does it offer for that kind of money?

Let's start with a table that probably weighs 100 pounds. It took two strong people to lift that up and pop it in place, then set the cast iron saddle on the cast iron trunnion before inserting and running in the huge bolt that handles adjustments and locking. This baby will definitely not be coming loose while you're working. The fence rail comes installed as part of the table.

The motor is not installed, so you get another good demonstration of what quality weighs. The motor is listed as a 3 HP unit or 2,200 kilowatts in European parlance (that works out to 10 amps at 220 volts). The LT18 comes with no cordset or plug, so you must supply those.

The table is immense — 24⁷/₈" wide by 19¹/₈" deep. Height to the table is 33¹/₂". The blade wheels are cast iron and, surprisingly to me, 17³/₈" in diameter; the smallest of any reviewed. On the other hand they're quite massive: thick and with almost no web openings to lighten them. Overall machine weight is 451 pounds, about 121 pounds heavier than the next heaviest machines. Table tilt is 10° left and 45° right.

Maximum resaw? This one will slice through 12" material without breathing hard. This is, to all intents and purposes, the band saw equivalent of the Unisaw and similar machines. It is an industrial tool that is suitable for the top end amateur shop (if you can afford it — and those 150" long blades

aren't cheap either). Add to that the heaviest overall weight of any of the band saws: this one is not fun to move around the shop, at about 425 pounds.

The blade guides are a European design, very nicely made and easy to use. The flat face of the roller bearings touches the blade, and an additional flat faced bearing backs up these and prevents front-to-rear distortion of the blade.

Maximum blade width is $1\frac{3}{8}$ " and Laguna says the LT18 will take $1/16$ " blades. I stopped at $1/8$ ", and all the blades worked well.

This band saw has a really heavy-duty wheel brush: it looks like a chunk cut from a factory broom. The dust collector outlet is 4" and is located in the lower part of the base, at the back.

Assembly was more complicated than it needed to be because the manual covers several models. The drawings are sparse and not accurate for this machine. I had some difficulty figuring out which bolt holes to use on the motor. And that thing is not light, so you hope to hit it the first time. It was just my luck that I bolted it down tight only to discover it had to be moved back to allow the drive belt to be inserted, which meant loosening bolts and general fiddling. The clearest directions are for the brake assembly, which is probably the easiest to figure out. The LT18 is the only one of these band saws that offers a brake — but the well balanced wheels seem to go on forever, with their great mass, if you don't gently brake. The metalwork (cast iron particularly) is superb. The welds almost have to be seen to be believed. The paint job was the only disappointment with this saw;

it seemed a bit slapdash. Without a doubt, this unit was the Cadillac of the saws tested, but then the price would demand that to be true.

continues on page 80 ...



Riser kits — available for most band saws — stretch the upright and allow for a longer blade ... and wider resawing.



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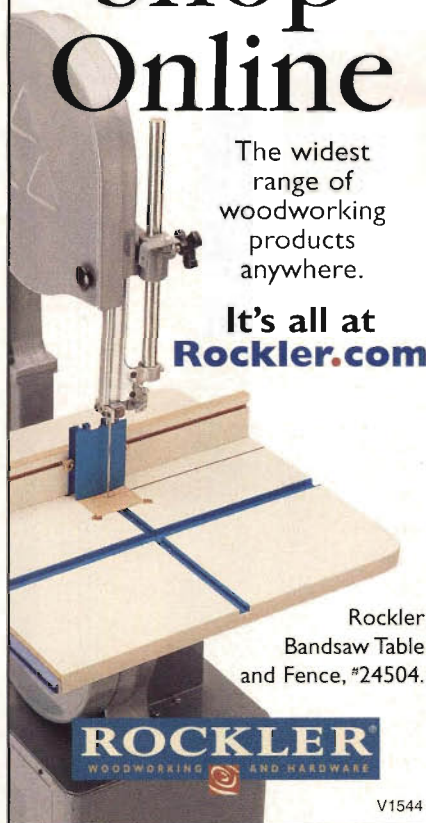
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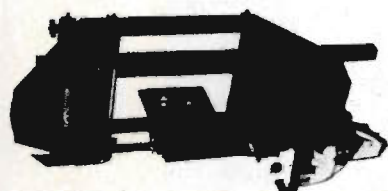
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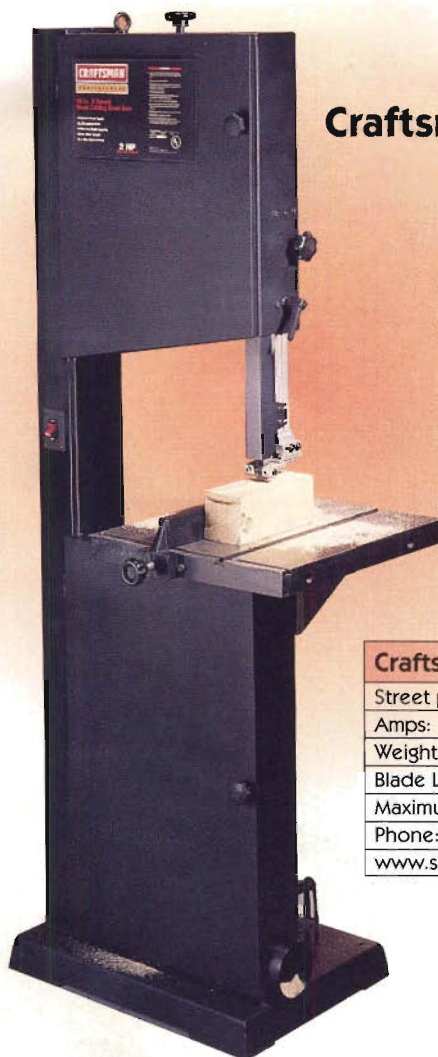
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Craftsman 18"



of these saws, be careful tensioning narrow blades: the machines are designed for wide blades up to an inch or so. Such blades are normally much thicker, too, and require more tension to work well. The Craftsman and Dayton saws list a 1" maximum blade width.

These two saws have basic round steel top blade guides, with square steel bottom guides, the right hand one of which is cut at an angle to give more bearing surface at the

blade. The guides work decently, but there was a large and immediate improvement in cutting when we replaced the

Craftsman 18"

Street price: \$1,150

Amps: 13.4a/110v - 6.8a/220v

Weight: 330 lbs

Blade Length: 133"

Maximum Resaw: 10 1/8"

Phone: 800-MY-SEARS

www.sears.com

top guides with Cool Blocks.™

The table is a solid casting, 18" wide by 19" deep, and is slotted for both the fence and the miter gauge. The fence is unusual in that it locks into a groove in the table, but it works well and locks tightly. Table height is 36 1/2" for both saws.

The trunnion is of cast zinc and a single star wheel adjusts and holds the angle of the table to the blade. It is imperative that the washer for the star wheel be installed, or the fastener cannot be drawn tight enough to assure a stable work surface. I would also add a lock washer, as additional security. The table tilt is 5° left, 45° right. The wheels are cast aluminum, 17 3/4" in diameter, helping to keep the saws' weights down to around 330 pounds. A brush is built in to keep the lower wheels clean.

Fit and finish on both units was very nice. The black paint looks very professional, and should prove easy to keep clean.

Craftsman's and Dayton's 18"

The Craftsman 18" band saw comes with a Marathon motor that draws 13.4 amps at 110v and 6.8 amps at 220v. The Dayton version is Grainger's very similar concept: they're almost identical, so I reviewed them as one.

Neither has an electric plug when delivered, and the motor, table and belts need to be assembled to the unit. The manual is only fair, but does a decent job of telling you how to get the motor on and select the pulley required. Both tools are two speed, with a low of 2,000 fpm and a high of 3,000. Both take 133" blades, and the claimed minimum blade width is 3/16", though we ran 1/8" Olson blades without problems. With all



With all of these saws, be careful tensioning narrow blades, because they are designed to be most useful with 5/8" to 1" wide blades.

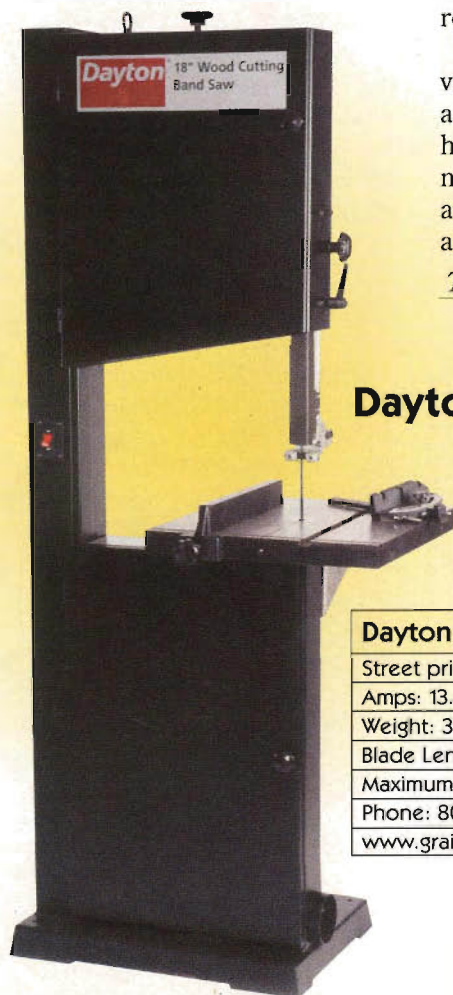
The 4" dust outlet is well placed at the bottom right side of the saw, where one expects sawdust to be dropping anyway.

Both of these saws are a bit on the pricey side. Depending on the catalog, they range from \$1,150 to \$1,199. That's a lot when compared to others in our test, like the JET (coming up next) and the Grizzly G4186Z offerings. If either Grainger or Sears are having one of their larger sales, though, the price reduction will swing the saw into the good value range. That said, the results, after minor tune-up, were excellent when resawing

both 5 1/2" thick solid red oak, and 8 1/4" cherry. The resulting cuts were reasonably smooth, vibration was low, it was easy to maintain the cut line, and the feed pressure required was medium. All testing was done with Olson blades, in this case their 3/4", 3-tpi skip tooth raker set blade. (All the resawing throughout our test was done with the same style blade, in appropriate lengths. Original equipment blades are often not very good, but, even if they were, there would be a distinct variation from brand to brand. Olson provided blades so we'd have excellent quality right on through, regardless of band saw brand.)

Both saws' miter gauges rate as very good, and both work in a T-slot. The measured maximum height for resawing with both machines is 10 1/2". These saws are solid performers that will do a good job, day in and day out.

Tool Review continues on page 82 ...



Dayton 18"

Dayton 18"

Street price: \$1,150
Amps: 13.4a/110v - 6.8a/220v
Weight: 330 lbs
Blade Length: 133"
Maximum Resaw: 10 1/2"
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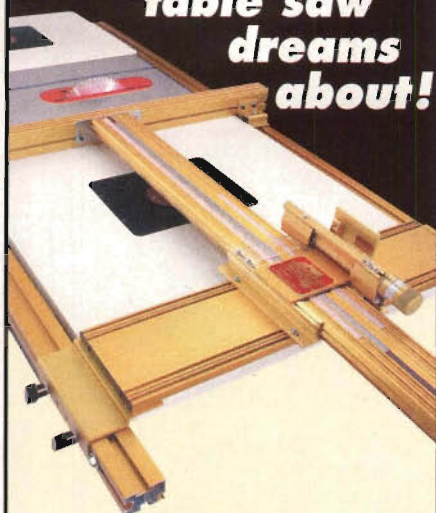
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TOOL REVIEW

JET JWBS-18



There is an easy tension guide on the rear of the saw, and the large wheels offer easy blade tensioning. This saw offers rack and pinion raising and lowering of the guard and guides. JET's guides are European-style roller bearings that reduce friction considerably and make setup for resaw simple. I felt

compelled to try the original blade with a resaw through 5½" oak. The resulting piece was ready for sanding. With an Olson blade, the cut was even cleaner, with as

easy a blade setup as is possible.

Height to the JET table is 37½", the second tallest of those tested. Table size is 19" x 19", and there's a T slot for the excellent miter gauge. The 4" dust collector duct is located at the upper right rear of the case. Maximum resaw height is 10¼".

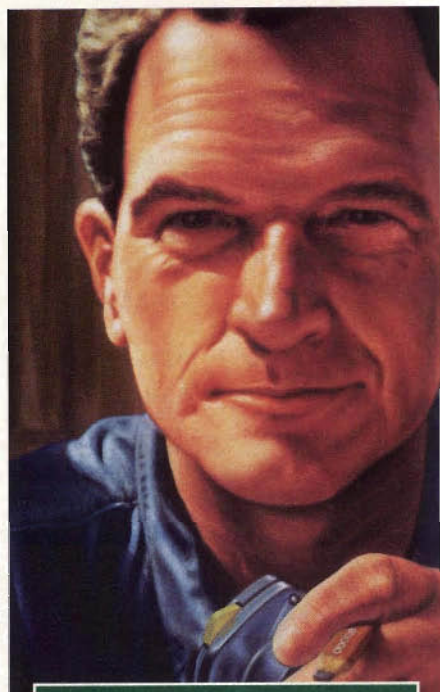
JET lists a maximum blade width of 1⅝", with a 1/8" minimum. Blade length is 133" and tensioning is super easy. Changing blades was easier on the JET than on the other saws. Part of that is the guides, part is the tensioning wheel and scale. The saw weighs 320 pounds, using 18¼" diameter cast iron wheels. The trunnion is cast iron and the saddle is cast zinc. Like all those reviewed, the table tilt is 5° left, 45° right.

There is a brush for sawdust on the lower wheel. Brushes, though, don't eliminate the need for an occasional wipe down of the tires to reduce buildup of sawdust, resin and similar problem-causing detritus. Priced at \$1,100, the JET band saw is my best buy, but recent sales have seen prices drop down under \$1,000, which makes it even more appealing.

JET'S JWBS-18

JET offers several touches that make it my top pick at \$1,100. The fit and finish on the model I received were excellent, assembly is almost non-existent, and most details seem very well thought out. It comes set with a 110v plug on its motor, but you can switch over to 220v if that's how your shop is wired. This 1½ HP rated motor draws 16 amps on 110v, so you can say goodbye to thoughts of a 15 amp circuit. The 220v draw is 8 amps. I didn't switch, as my 110v circuitry provided plenty of power.

Add the table, bolt the fence in place, tension the blade and off you go. The fence is a lift-off model, with a rectangular steel front bar and a ride-along steel angle iron in the back. The fence lifts off its bars when unlocked and the measuring tape on the fence is quite accurate.



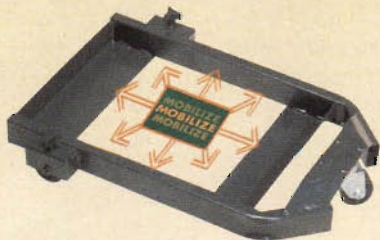
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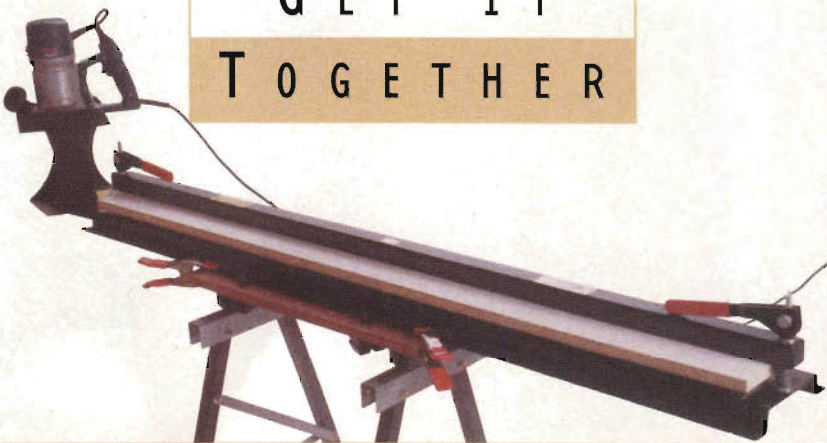
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Color Theory

By Michael Dresdner

Does your finish seem a little too “blue?” Are you close to matching a stain, but your new stain needs to be a little “warmer?” Take heart, color theory will get you there.

combined, the result is the “complement” of the third primary color. For instance, red and blue combine to create purple, so purple is the complement of yellow.

Complements Can “Kill”

Knowing about the complementary colors: red/green, blue/orange and yellow/purple, is important when creating or matching wood stains. They’re called “complementary” because when a color is placed next to its complement, both colors appear more vibrant to the eye. On the flip side, when they’re mixed together the result is always a gray color. Green “kills” red, orange “kills” blue, and purple “kills” yellow. In finishing then, if you try a stain and it looks too red, add a bit of green (red’s complement) to adjust the color.

The Color of Wood

Ask most people what color wood is, and they’ll say “brown.” In a broad sense that answer is correct, but if you’ve ever been faced with the challenge of creating the right wood stain, you’ve already discovered that wood comes in an infinite variety of “browns.”

The first step in learning how to create the colors you want is to learn how to “see” the colors in wood. The process may be somewhat bewildering at first, but once you start looking, you’ll eventually find colors you never noticed before. One trick that works for me is to look at wood like the Sunday paper. Have you ever looked at the color comic section of your Sunday newspaper? Under a magnifying glass, you’ll find that what appears to be a solid color at a distance is in fact thousands of little

Hardware and home improvement stores offer a dizzying array of pre-packaged stain colors, but rarely do they seem to have the exact color you need. Or perhaps they do, but when you get home you realize their stain sample was on a different species of wood than your project. Sound familiar? So how do you get a perfect match for that special color?

The good news is that you can create a unique color, or match a color to an existing piece. All you need are two things: a basic understanding of simple color theory, and the ability to “see” the colors in wood. With some patience, experimentation and a little knowledge about color theory, you’ll be surprised at how close you can get.

Color Theory

Color theory is a way of explaining how colors are created and how they relate to each other. Way back in kindergarten we learned, for example, that there are three primary colors: red, yellow and blue. They’re primary colors because they cannot be created by combining other colors.

In theory, you can mix primary colors to create every other color of the rainbow. Red and yellow combine to create orange; yellow and blue combine to create green; and red and blue combine to create purple. Not surprisingly, orange, green and purple are called secondary colors. Yet another classification of color is the complementary colors. When two of the three primary colors are



Mixing equal parts of complementary colors always gets you directly to a neutral gray.

This black cherry stain (top) was too purple, so a little yellow was added.



A red mahogany stain (top) was toned down by adding its complement, green.



A too orange maple stain (top) was neutralized by adding its complement, blue.



Getting to brown: In the three samples shown above, minor additions of the right color can make all the difference.

dots of just three basic colors. Combined together and viewed at arm's length, they appear as browns, greens, tans, and so on. Look closely at wood and you'll see a similar situation: a background speckled with contrasting bits of color formed by the wood grain. When you step back, your eye mixes these to one general color. If you mix those separate colors, you'll get a stain that comes close to matching the wood tone.

The colors of some woods, like osage orange or purpleheart, are obvious. It can be tricky, however, to match color in other situations, particularly with very dark or darkly stained woods. When you are not sure what direction the color should go, think of color values. Reds, yellows and oranges are "warm" colors, while blues and greens are "cool" colors. You might not see exactly what color is needed, but perhaps you will sense that the color is not "warm" enough or, conversely, needs to be "cooled" down. Try adding red or orange to warm up a stain, and blue or green to cool it.

Wood is Your Canvas

For watercolor artists, applying transparent colors on white paper is very straightforward: the color you apply is the color you see on paper. Working with stains on wood is a bit more challenging. When stain is applied to wood, the net result is the combination of the color of the stain and the color of the wood.

Predicting the effect of any given stain on a piece of wood is relatively simple if the wood is all one uniform color, but in nature

continues on page 86 ...

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FINISHING THOUGHTS

that's rarely the case. For woods that have more than one starkly contrasting color, it's important to consider how your stain color is going to affect each of the dominant colors in the wood.

A good rule of thumb is to concentrate your efforts on the lightest color in your wood sample, because it's going to be most affected by the stain you apply. Whenever possible, make samples

on scrap wood first, but if you can't, here's a way to second guess what will happen. Swipe some of your stain onto a piece of glass, then lay the glass atop the wood.

Using Color Theory

The best way to use color theory is to experiment with color mixtures on scraps of wood. (Keep a note pad and pencil handy so you can duplicate your results

later.) Just keep in mind that some topcoat finishes add an amber tone to overall color. "Woodtone" colors, such as those found in pre-packaged stains, are usually variations of the color brown.

Those browns are made by mixing a number of different colors together in varying combinations to produce a range of wood tones. You can mix pre-packaged stains in any amounts, as long as they have the same solvent: oil-based or water-based. Combining pre-packaged stains allows you to modify colors, but only to a limited degree. Since wood tones are mixtures of many hues, it may be difficult to get to your exact color.

Mixing primary and secondary colors with wood tones is a more accurate way to achieve the color effects you want. If you're working with oil-based stains, you can add Universal Tinting Colors (sold as "TintsAll" at Home Depot); Japan colors (woodworking catalogs) or artists' oil paints (art supply stores). If you're using water-based stains, you can mix them with UTCs or artists' acrylic paints. Bear in mind that when you're adding primary and secondary colors to a stain you'll have the most control of the color mixture if you stick with "pure" colors, such as those found on the color wheel. That is, choose a true blue rather than a turquoise color, a true red rather than a purple-red or orange-red, etc.

Testing Your Skills

Time to put color theory to the test. Select a stain that is closest to the shade you want, and apply it to your wood sample. If the color is too red, tone it down by adding a little green until the color looks right. Too orange? Add blue. Too purple? Add yellow. If the color needs to be warmer, try adding some red or yellow. Too warm? Tone it down with blue or green.

Learning how to create the ideal stain color is largely a matter of trial and error, but you'll find that it becomes easier over time as you develop the ability to see all the colors in the wood around you.



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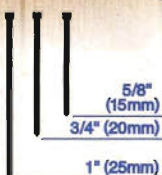
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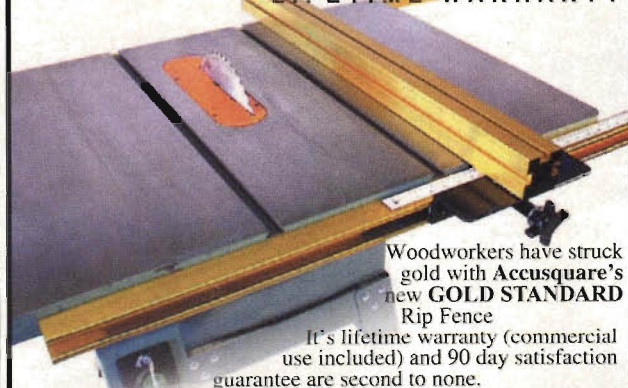
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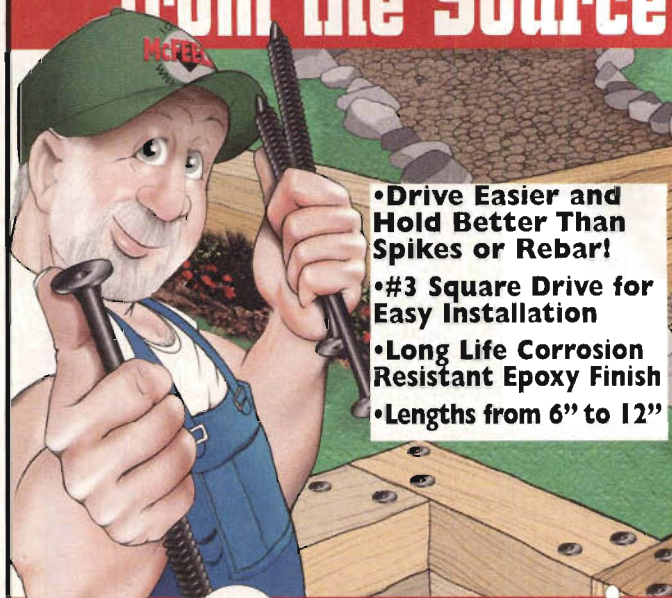
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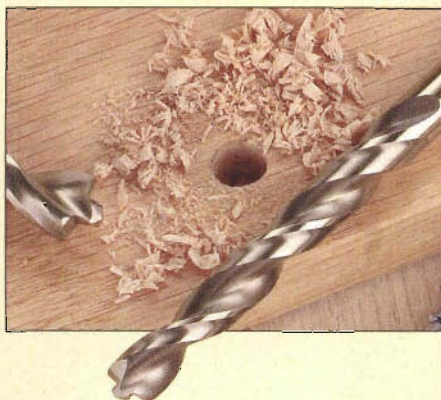
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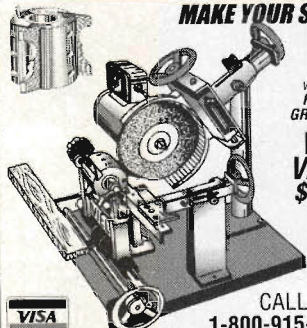
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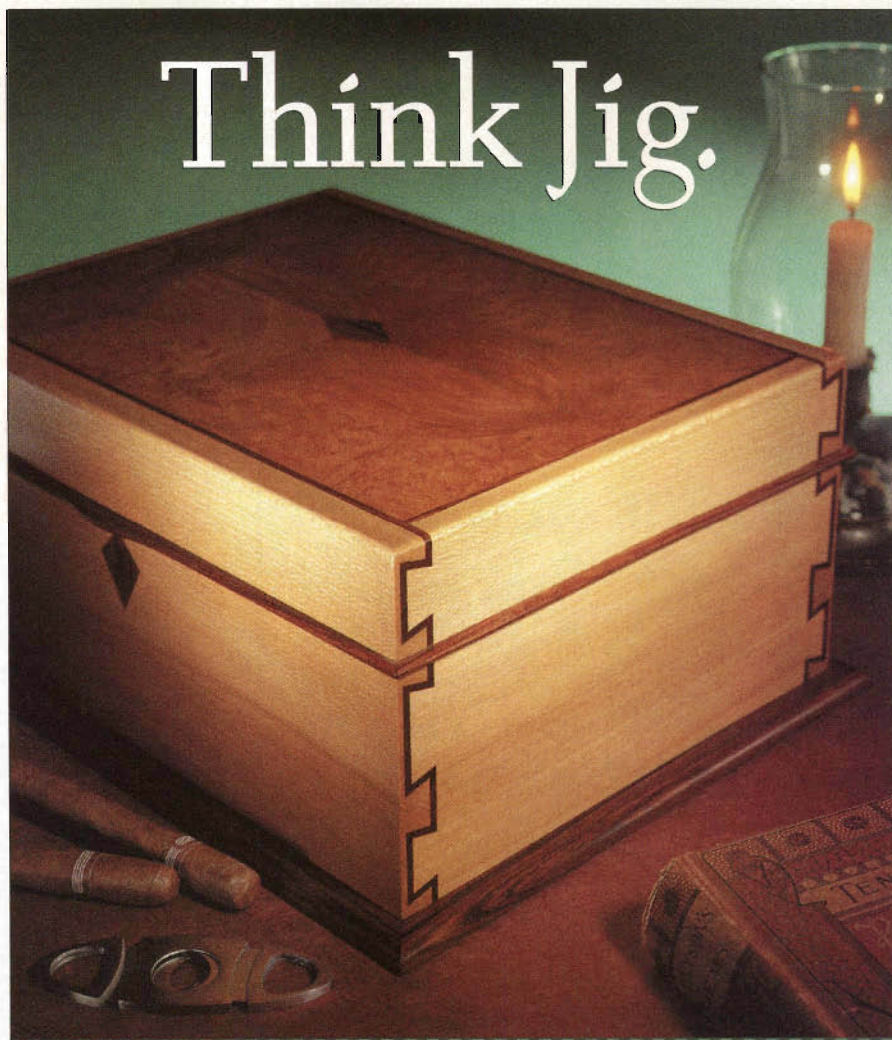
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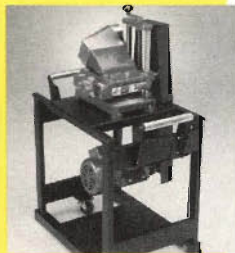
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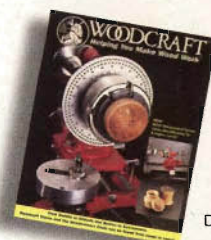


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Tool Gems

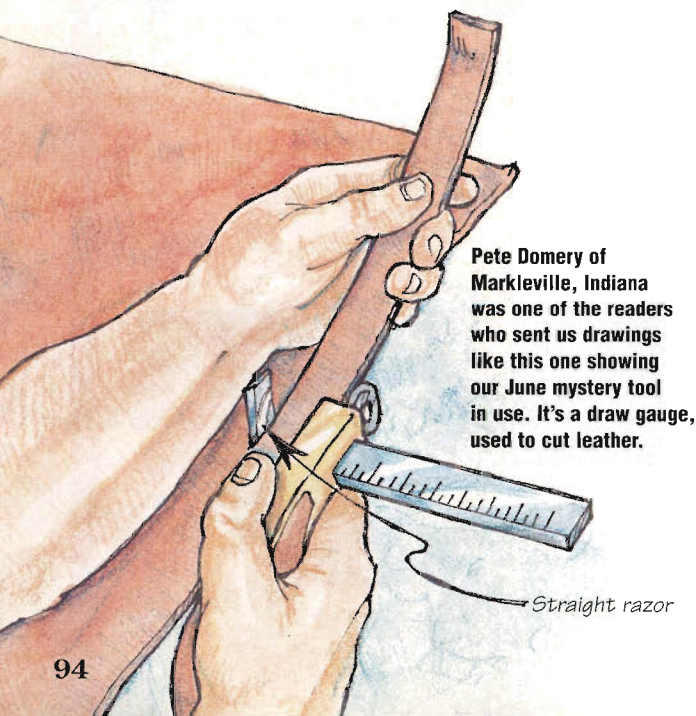
By Joanna Werch Takes

Our latest mystery tool (right) comes from **Bill Clough** of Meadville, Pennsylvania. While it certainly appears to be a gem of a tool — with a spoked gear, a corrugated disc and a sharp point among its many facets — Bill says, “It doesn’t do a thing in my jewelry shop.” Other than the obvious clue, the name *Strobel*, Bill hasn’t learned much since he picked up this tool in an antiques shop. I’m confident *Woodworker’s Journal* readers will add a little clarity to the situation.



Meanwhile, let’s ricochet back to the pistol grip tool that belonged to the grandfather of **Todd Nebel** from North Wales, Pennsylvania: it appeared in our *June 2001* issue. **Fred Toler** of Austin, Texas, was one of several to remark, “Mr Nebel’s grandfather may have been quite a woodworker, but my wager is that he was quite a leather worker as well.” The tool, said **Jim DelGado** of Bedford, Ohio, “is called a draw gauge.” It’s “used to cut harness straps, bridle reins, etc. from a side of leather,” added **Cindy McGaha** of Russell Springs, Kentucky.

Newt Phillips of Farmington Hills, Michigan remembers his father using the draw gauge for that purpose. “He’d start with a large piece of tanned leather of uniform thickness, and cut a straight edge on one side.” Then, according to **Virginia Stanley** of Ore City, Texas, the leather worker inserts a sharp blade into the thumbscrew end of the gauge,



Pete Domery of Markleville, Indiana was one of the readers who sent us drawings like this one showing our June mystery tool in use. It’s a draw gauge, used to cut leather.

—Straight razor



What’s a mild-mannered jeweler doing with this scary-looking tool? Nothing, yet. Perhaps one of you can help him figure out what it is.

or ruler, and puts the ruler into the handle. Measuring width from handle to blade, she tightens the handle’s thumb screw blade to hold the ruler in place. Next, said **Russell Ford** of Elmore, Alabama, “You simply draw the tool back so the blade cuts the leather, using the flat brass edge of the tool as the straightedge.” “The handle was curved to one side to provide clearance for your hand,” explained **James Brokaw** of Carlisle, Iowa.

As for Todd’s tool, **Tom O’Rourke** of Falls Church, Virginia, says if he looks to the right of the 4” area on the ruler, “the [manufacturer’s] name will be stamped on it.” The Gomph Company of Auburn, New York and CS Osborne of Connecticut are a couple of options. “During the 1800s,” said **Buzz Rademacher** of San Luis Obispo, California, “these tools were found in every leather or harness shop.”

Some of them are still around, and our readers have used them. **Art Rubin** of Chicago, Illinois, uses it “to make belts, gun slings and dog collars.” **Lawrence A. Barker** of Post Mills, Vermont, “used this tool to repair belts many times in a sawmill before V belts were common.” The grandfather of **Robert Graham** from Show Low, Arizona, “was a cowboy who used it to make and maintain his own tack and lariats.” **Tony Johnson** of Camillus, New York, used a plainer version “back in my ‘hippie days’ in the 60s to prepare belt blanks and the straps used in sandal making.” And **Ben Armentrout**, of San Jose, California, has even used it to cut veneer strips for woodworking.

You can still buy draw gauges, too, although most of the old tool aficionados who follow *Stumpers* seem to agree with Russell Ford’s sentiments on the all-metal option: they lack, he says, “the beauty and quality of workmanship that Todd’s tool possesses.”

WINNER! For taking the time to respond to *Stumpers*, **Charles McDuffee** of Montgomery, Alabama, 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 *Stumpers* Dept., *Woodworker’s Journal*, P.O. Box 261, Medina, Minnesota 55340. Or send us e-mail: jtakes@woodworkersjournal.com



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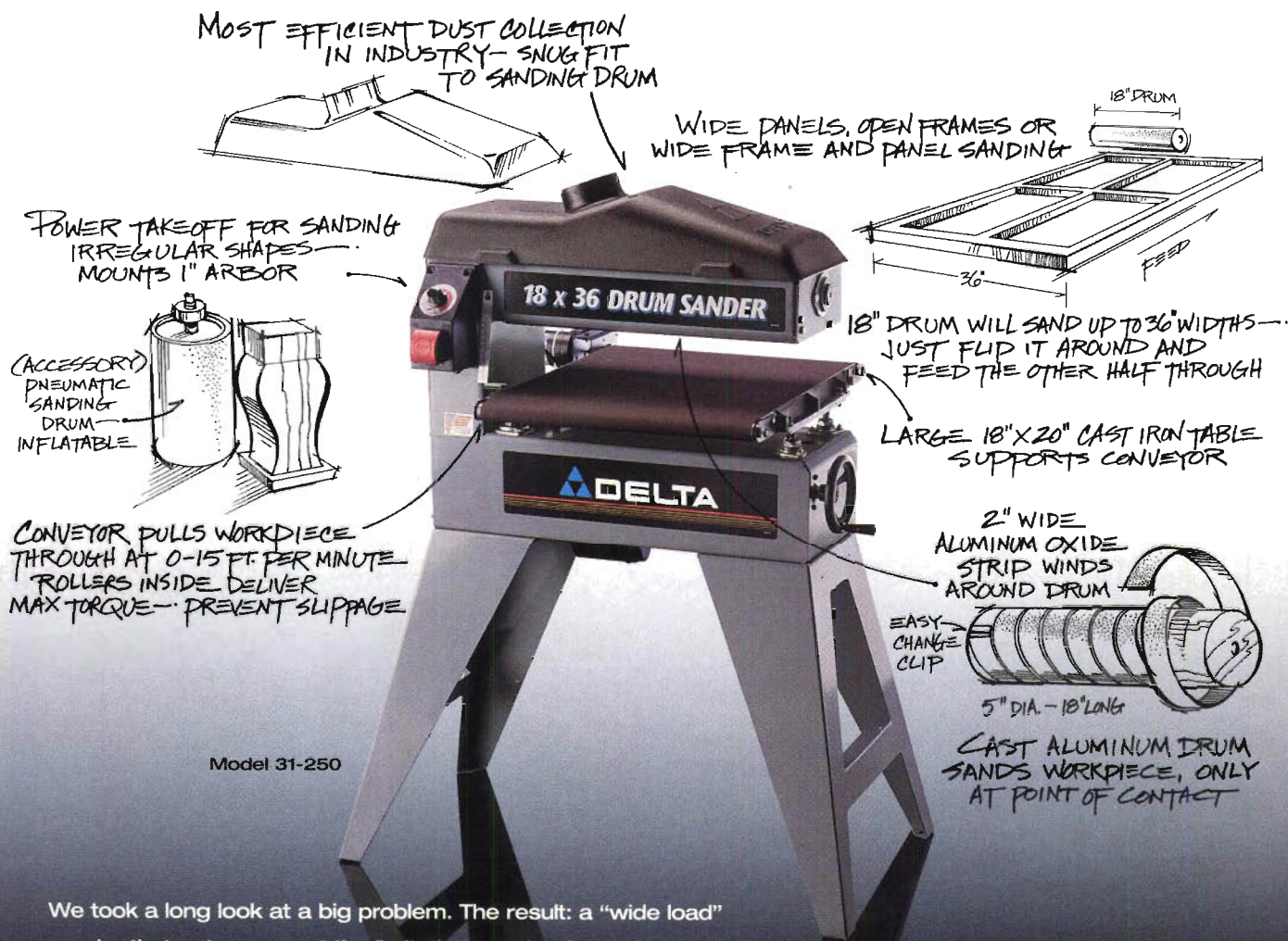


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